

Schedule 1: Designer Information

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

A. Project Information				
Building number, street name			Unit no.	Lot/con.
Municipality	Postal code	Plan number/ other description		
RICHMOND HILL				
B. Individual who reviews and takes responsibility for design activities				
Name		Firm		
MICHAEL O'ROURKE		HVAC DESIGNS LTD.		
Street address		Unit no.	Lot/con.	
375 FINLEY AVE		202	N/A	
Municipality	Postal code	Province	E-mail	
AJAX	L1S 2E2	ONTARIO	info@hvacdsgns.ca	
Telephone number	Fax number	Cell number		
(905) 619-2300	(905) 619-2375	()		
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]				
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings				
☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection				
☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems				
Description of designer's work		Model:		
HEAT LOSS / GAIN CALCULATIONS		38-9		
DUCT SIZING		Bloomington		
RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY		OPT 2ND		
RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		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: _____				
☐ 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 22, 2021		 Signature of Designer		
Date		CITY OF RICHMOND HILL BUILDING DIVISION 08/10/2021 RECEIVED Per: <u>danielle.devitt</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.

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

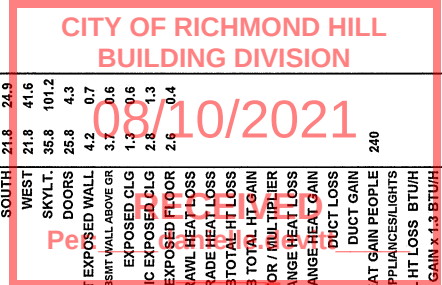
SITE NAME: CENTREFIELD (WEST GORMLEY) BUILDING: ROYAL PINE HOMES DATE: Apr-21
LO# 90458 OPT 2ND TYPE: 38-9 GFA: 2444 WINTER NATURAL AIR CHANGE RATE 0.227 SUMMER NATURAL AIR CHANGE RATE 0.071 HEAT LOSS AT °F. 78 HEAT GAIN AT °F. 13 CSA-F280-12 SB-12 PERFORMANCE

ROOM USE	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK			
EXP. WALL	31	21	5	13	30	11	6	26			
CLG. HT.	9	9	9	9	9	9	9	9			
FACTORS											
GRS.WALL AREA	279	189	45	117	270	99	54	234			
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN			
NORTH	0	0	0	17	370	272	0	0	0	0	0
EAST	0	0	0	0	0	0	0	0	0	0	0
SOUTH	0	0	0	0	0	0	0	0	0	0	0
WEST	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	17	370	706	0	0	0	0	0	0	0	0
DOORS	35.8	101.2	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	253	1064	175	172	723	119	45	189	31
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	257	338	151	114	150	67	55	72	32
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	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	1968	1243	262	1009	2778	589	782	1761			
SUB TOTAL HT GAIN	1406	892	63	438	2146	1805	319	1631			
LEVEL FACTOR / MULTIPLIER	0.20	0.19	0.20	0.19	0.20	0.19	0.20	0.19	0.20	0.19	0.20
AIR CHANGE HEAT LOSS	364	230	46	187	514	178	145	326			
AIR CHANGE HEAT GAIN	80	51	4	25	122	34	18	93			
DUCT LOSS	0	0	0	0	329	0	93	0			
DUCT GAIN	0	0	0	0	303	0	34	0			
HEAT GAIN PEOPLE	240	0	0	1	240	1	240	0			
HEAT GAIN APPLIANCES/LIGHTS	526	0	0	526	526	526	0	526			
TOTAL HT LOSS BTU/H	2332	1474	310	1196	3621	1137	1019	2087			
TOTAL HT GAIN x 1.3 BTU/H	3240	1226	87	1598	4338	1805	462	2925			

ROOM USE	FAM	KT/BR	FORM	BATH-2	PWD	FOY	LAUN	BAS			
EXP. WALL	35	34	20	14	14	44	11	158			
CLG. HT.	10	10	10	9	10	11	11	10			
FACTORS											
GRS.WALL AREA	354	343	202	126	141	488	122	1106			
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN			
NORTH	0	0	0	0	0	0	0	0	3	65	48
EAST	0	0	0	0	0	0	0	0	3	65	125
SOUTH	0	0	0	0	0	0	0	0	6	131	149
WEST	28	610	1163	47	1024	1953	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	284	1196	197	171	719	118	40	1034	170
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	2007	2481	1394	745	753	3166	946	7848			
SUB TOTAL HT GAIN	1401	2449	614	235	316	1052	156	694			
LEVEL FACTOR / MULTIPLIER	0.30	0.30	0.30	0.20	0.30	0.30	0.30	0.50			
AIR CHANGE HEAT LOSS	596	737	414	138	224	941	281	5323			
AIR CHANGE HEAT GAIN	80	140	35	13	18	60	9	40			
DUCT LOSS	0	0	0	88	0	0	0	0			
DUCT GAIN	0	0	0	25	0	0	0	0			
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0			
HEAT GAIN APPLIANCES/LIGHTS	526	526	526	526	526	526	526	526			
TOTAL HT LOSS BTU/H	2603	2609	1809	971	977	4106	1228	13171			
TOTAL HT GAIN x 1.3 BTU/H	2609	4048	1526	356	434	1446	897	1637			

TOTAL HEAT GAIN BTU/H: 28929 TONS: 2.41 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 41260 TOTAL COMBINED HEAT LOSS BTU/H: 42930

Michael O'Rourke



17.56
BTU/FT2

23.73
BTU/FT2

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

TYPE: 38-9
OPT 2ND
furnace pressure
a/c coil pressure
available pressure
for s/a & r/a

GFA: 2444 LO# 90458

DATE: Apr-21

HEATING CFM 970
TOTAL HEAT LOSS 41,260
AIR FLOW RATE CFM 23.51

COOLING CFM 970
TOTAL HEAT GAIN 28,654
AIR FLOW RATE CFM 33.85

****CARRIER**
59TN6A-060-14V 60
FAN SPEED
LOW 820
MEDLOW 0
MEDIUM 970
HIGH 1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000
DESIGN CFM = 970
CFM @ 6" E.S.P.

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK	BATH	MBR	BED-3	FAM	KT/BR	KT/BR	FORM	BATH-2	PWD	FOY	LAUN	BAS	BAS	BAS	BAS
RM LOSS MBH	1.17	1.47	0.31	1.20	1.81	1.14	0.51	2.09	0.51	1.17	1.81	2.60	1.61	1.61	1.81	0.97	0.98	4.11	1.23	3.29	3.29	3.29	3.29
CFM PER RUN HEAT	27	35	7	28	43	27	12	49	12	27	43	61	38	38	43	23	23	97	29	77	77	77	77
RM GAIN MBH	1.62	1.23	0.09	1.60	2.17	1.81	0.24	2.92	0.24	1.62	2.17	2.61	2.02	2.02	1.53	0.36	0.43	1.45	0.90	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	55	42	3	54	73	61	8	99	8	55	73	88	69	69	52	12	15	49	30	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	43	54	51	37	42	34	33	47	38	49	48	42	43	35	22	36	28	34	19	38	37	21	39
EQUIVALENT LENGTH	193	150	170	170	120	150	130	170	170	150	160	150	160	160	150	150	140	170	180	160	170	110	120
TOTAL EFFECTIVE LENGTH	204	204	221	207	162	184	163	217	208	199	208	192	203	185	172	176	198	144	199	198	207	131	159
ADJUSTED PRESSURE	0.09	0.08	0.08	0.08	0.11	0.09	0.11	0.07	0.08	0.09	0.08	0.08	0.08	0.09	0.11	0.1	0.09	0.11	0.09	0.09	0.08	0.13	0.11
ROUND DUCT SIZE	5	5	4	6	5	6	4	6	4	5	5	6	5	5	5	4	4	6	4	6	6	5	5
HEATING VELOCITY (ft/min)	198	257	80	143	316	138	138	250	138	198	316	311	279	279	316	264	264	495	333	393	393	565	565
COOLING VELOCITY (ft/min)	404	308	34	275	536	311	92	505	92	404	536	449	507	507	507	382	138	172	344	71	71	103	103
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	B	B	B	D	B	D	C	D	A	D	A	A	A	D	D	D	C	D	A	A	D	C

TRUNK

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
1	TRUNK A	345	0.08	9.4	10	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
2	TRUNK B	442	0.08	10.3	14	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
3	TRUNK C	223	0.07	8.3	8	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
4	TRUNK D	528	0.07	11.4	16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
5	TRUNK E	970	0.07	14.3	24	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
6	TRUNK F	0	0.00	0	0	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

SUPPLY AIR TRUNK SIZE

TRUNK	CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	345	0.08	9.4	10	0.15	TRUNK G	0	0.00	0	0	0	TRUNK O	0	0.05	0	0	8
TRUNK B	442	0.08	10.3	14	0.15	TRUNK H	0	0.00	0	0	0	TRUNK P	0	0.05	0	0	8
TRUNK C	223	0.07	8.3	8	0.15	TRUNK I	0	0.00	0	0	0	TRUNK Q	0	0.05	0	0	8
TRUNK D	528	0.07	11.4	16	0.15	TRUNK J	0	0.00	0	0	0	TRUNK R	0	0.05	0	0	8
TRUNK E	970	0.07	14.3	24	0.15	TRUNK K	0	0.00	0	0	0	TRUNK S	0	0.05	0	0	8
TRUNK F	0	0.00	0	0	0.15	TRUNK L	0	0.00	0	0	0	TRUNK T	0	0.05	0	0	8
RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
AIR VOLUME	75	85	85	85	75	340	85	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH	46	40	51	58	53	20	37	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	235	195	205	155	245	120	230	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	281	235	256	213	298	140	267	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.05	0.11	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
ROUND DUCT SIZE	6	6	6	5.8	6	8.6	6	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0

RETURN AIR TRUNK SIZE

TRUNK	CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	345	0.08	9.4	10	0.15	TRUNK G	0	0.00	0	0	0	TRUNK O	0	0.05	0	0	8
TRUNK B	442	0.08	10.3	14	0.15	TRUNK H	0	0.00	0	0	0	TRUNK P	0	0.05	0	0	8
TRUNK C	223	0.07	8.3	8	0.15	TRUNK I	0	0.00	0	0	0	TRUNK Q	0	0.05	0	0	8
TRUNK D	528	0.07	11.4	16	0.15	TRUNK J	0	0.00	0	0	0	TRUNK R	0	0.05	0	0	8
TRUNK E	970	0.07	14.3	24	0.15	TRUNK K	0	0.00	0	0	0	TRUNK S	0	0.05	0	0	8
TRUNK F	0	0.00	0	0	0.15	TRUNK L	0	0.00	0	0	0	TRUNK T	0	0.05	0	0	8
RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
AIR VOLUME	75	85	85	85	75	340	85	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH	46	40	51	58	53	20	37	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	235	195	205	155	245	120	230	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	281	235	256	213	298	140	267	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.05	0.11	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
ROUND DUCT SIZE	6	6	6	5.8	6	8.6	6	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0

TYPE: 38-9
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 90458
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	2 @ 21.2 cfm	42.4 cfm
Other Bedrooms	3 @ 10.6 cfm	31.8 cfm
Kitchen & Bathrooms	6 @ 10.6 cfm	63.6 cfm
Other Rooms	5 @ 10.6 cfm	53.0 cfm
Table 9.32.3.A.	TOTAL	190.8 cfm

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

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	190.8	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	111.3	cfm

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

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

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR				
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
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	☒ 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 #:	

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#: 90458		Model: 38-9		Builder: ROYAL PINE HOMES		Date: 4/22/2021																																																																	
Volume Calculation																																																																							
House Volume <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> <tr> <td>Bsmt</td> <td>1060</td> <td>10</td> <td>10600</td> </tr> <tr> <td>First</td> <td>1060</td> <td>10</td> <td>10706</td> </tr> <tr> <td>Second</td> <td>1384</td> <td>9</td> <td>12456</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="2">Total:</td> <td></td> <td>33,762.0 ft³</td> </tr> <tr> <td colspan="2">Total:</td> <td></td> <td>956.0 m³</td> </tr> </table>		Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1060	10	10600	First	1060	10	10706	Second	1384	9	12456	Third	0	9	0	Fourth	0	9	0	Total:			33,762.0 ft³	Total:			956.0 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="2">WINTER NATURAL AIR CHANGE RATE</td> <td>0.227</td> </tr> <tr> <td colspan="2">SUMMER NATURAL AIR CHANGE RATE</td> <td>0.071</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> </tr> <tr> <td>Winter DTDh</td> <td>22</td> <td>-21</td> <td>43</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> </tr> <tr> <td></td> <td></td> <td></td> <td>78</td> </tr> <tr> <td></td> <td></td> <td></td> <td>13</td> </tr> </table>								WINTER NATURAL AIR CHANGE RATE		0.227	SUMMER NATURAL AIR CHANGE RATE		0.071	Design Temperature Difference					Tin °C	Tout °C	ΔT °C	Winter DTDh	22	-21	43	Summer DTDc	24	31	7				78				13
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6.2.6 Sensible Gain due to Air Leakage																																																																							
$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																																																							
0.227	x	265.56	x	7 °C	x	1.2	=	160 W																																																															
							=	546 Btu/h																																																															
6.2.7 Sensible heat Gain due to Ventilation																																																																							
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																																							
80 CFM	x	13 °F	x	1.08	x	0.25	=	275 Btu/h																																																															
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																																							
$HL_{airr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																																							
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*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																																							

CITY OF RICHMOND HILL
BUILDING DIVISION

08/10/2021

RECEIVED

Per: danielle.devitt

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL:	38-9	OPT 2ND	BUILDER:	ROYAL PINE HOMES
SFQT:	2444	LO#	90458	SITE: CENTREFIELD (WEST GORMLEY)

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	33762.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 49.0 ft	WIDTH: 30.0 ft	EXPOSED PERIMETER:	158.0 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	11.13
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%	-

CITY OF RICHMOND HILL
BUILDING DIVISION

08/10/2021

RECEIVED

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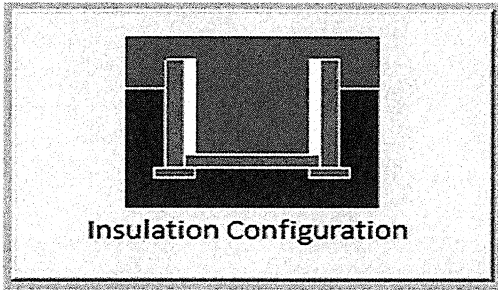
Michael O'Rourke

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.9	 Insulation Configuration
Floor Width (m):	9.1	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):	5325 btu/h	1560

TYPE: 38-9
LO# 90458

OPT 2ND

CITY OF RICHMOND HILL
BUILDING DIVISION

08/10/2021

RECEIVED

Per: danielle.devitt

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:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m ³):	956.0
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 892.5 cm ² 2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 37.5 Total Exhaust 37.5
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	0.227
Cooling Air Leakage Rate (ACH/H):	0.071

TYPE: 38-9
LO# 90458DEPRESSURIZATION TEST REQUIRED
BEFORE FINAL OCCUPANCY STAGE TO MEET
TARGETTED ACH
2.5 ACHCITY OF RICHMOND HILL
BUILDING DIVISION08/10/2021
OPT 2NDRECEIVED
Per: danielle.devitt



City of Richmond Hill
Building Division

REVIEWED

By: **PxV** Date: **SEP/10/2021**

Building Permit #: **BP#-2021-50828**

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: **BETTER THAN CODE/AIR TIGHTNESS 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.

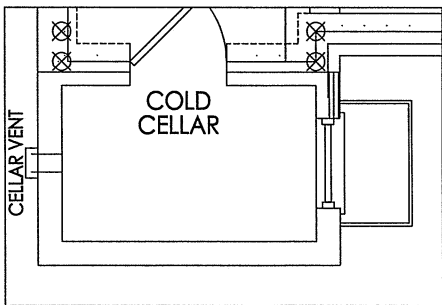
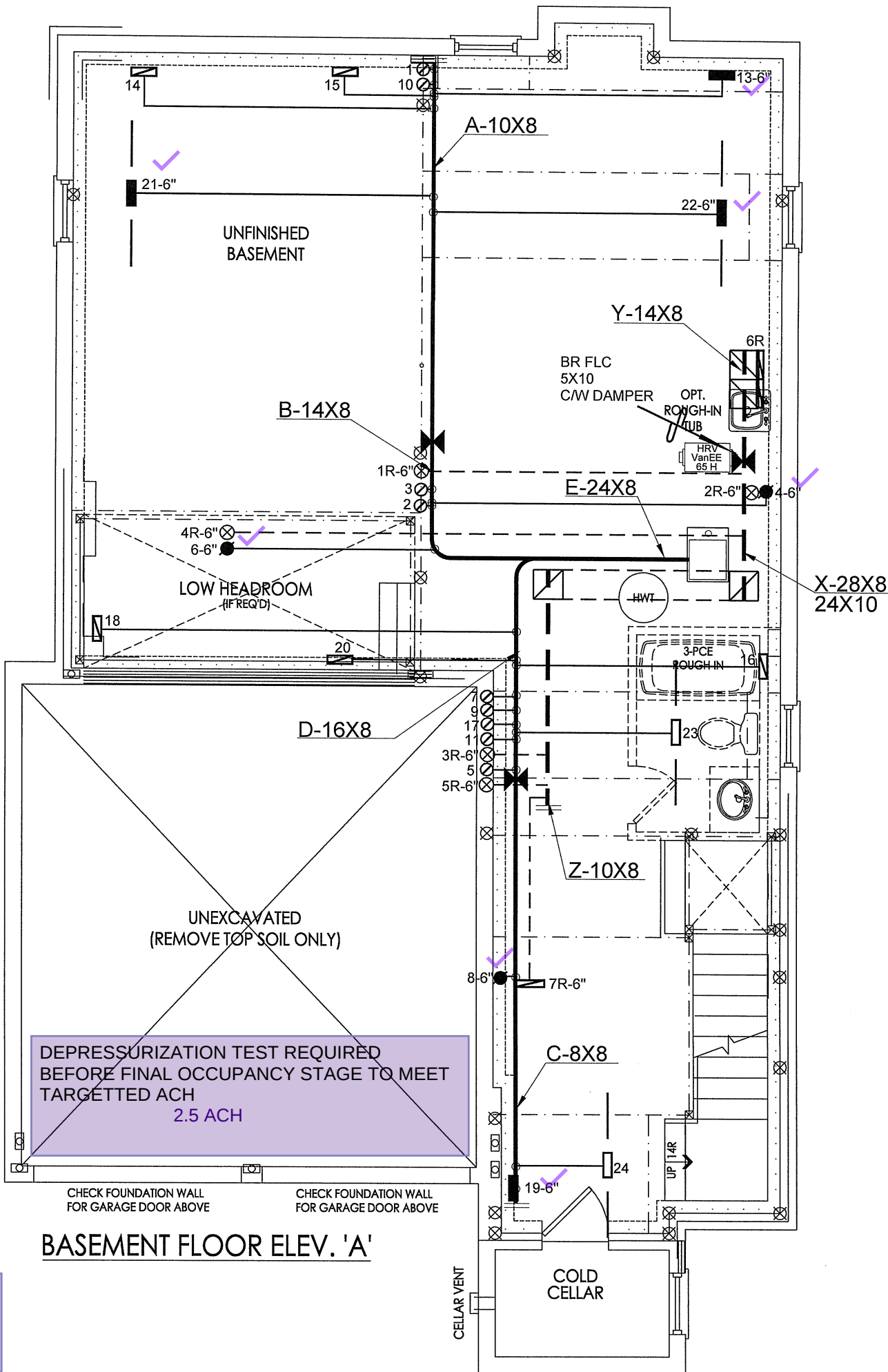
HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

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

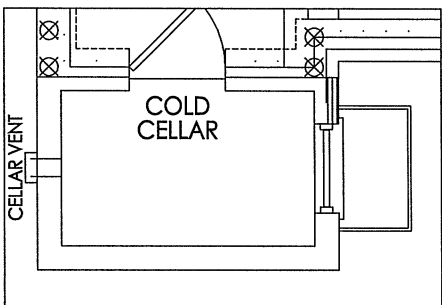
For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.

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).

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.



BASEMENT FLOOR ELEV. 'B'



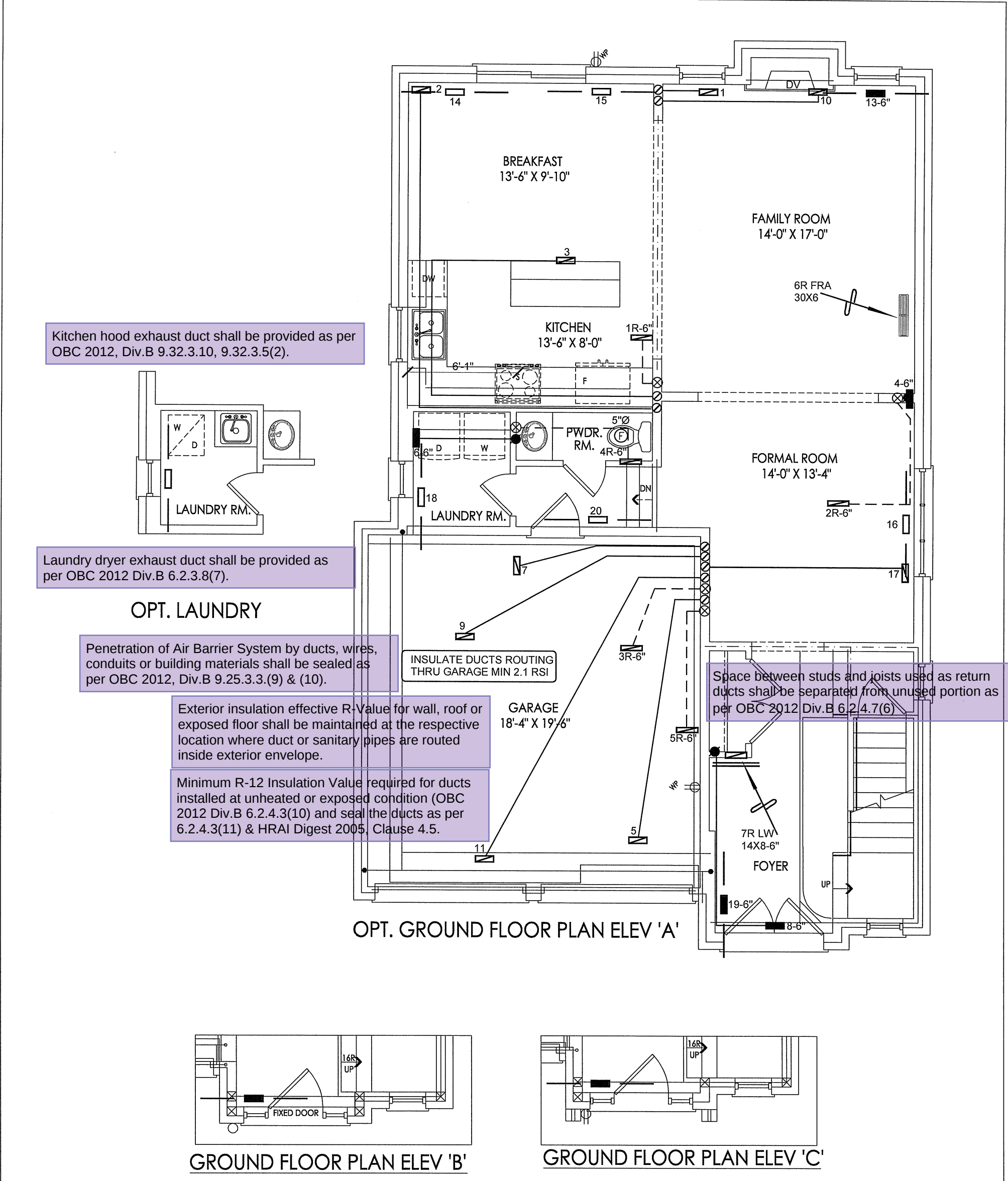
BASEMENT FLOOR ELEV. 'C'

CSA-F280-12

SB-12 PERFORMANCE

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

HVAC LEGEND								3.							
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.							
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.							
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description	Date					
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS							
ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.															
Client				REVISIONS											
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				HEAT LOSS 42930 BTU/H UNIT DATA			# OF RUNS S/A R/A FANS			08/10/2021	
								MAKE CARRIER			3RD FLOOR			BASEMENT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO				Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.				MODEL 59TN6A-060-14V			2ND FLOOR			HEATING LAYOUT	
								INPUT 60 MBTU/H			1ST FLOOR			Date APR/2021	
38-9 - OPT 2ND 2444 sqft								OUTPUT 58 MBTU/H			ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5" UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A			Scale 3/16" = 1'-0"	
								COOLING 2.5 TONS			BASEMENT			BCIN# 19669	
								FAN SPEED 970 cfm @ 0.6" w.c.			Per. Danielle Devitt			LO# 90458	



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

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND							3.		
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							REVISIONS		

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Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
Web: www.hvacdsgns.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.

08/10/2021

RECEIVED

Per: danielle.devitt

Sheet Title

FIRST FLOOR
HEATING
LAYOUT

Date

APR/2021

Scale

3/16" = 1'-0"

BCIN# 19669

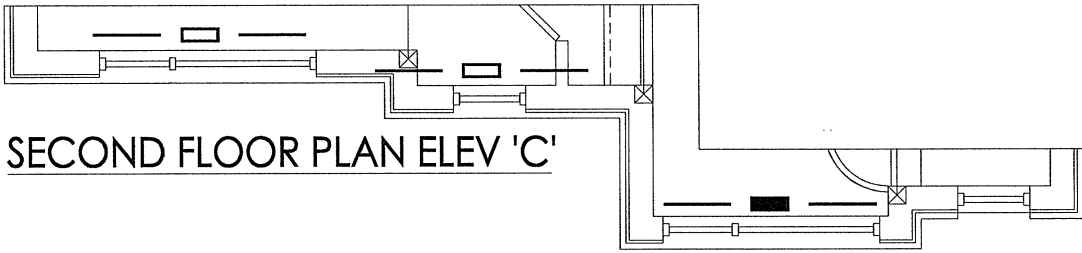
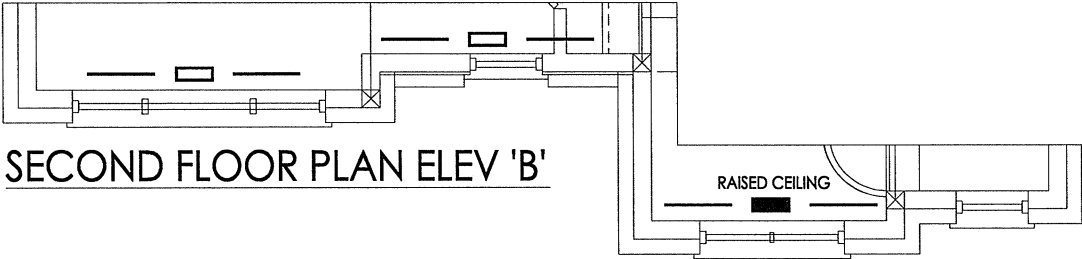
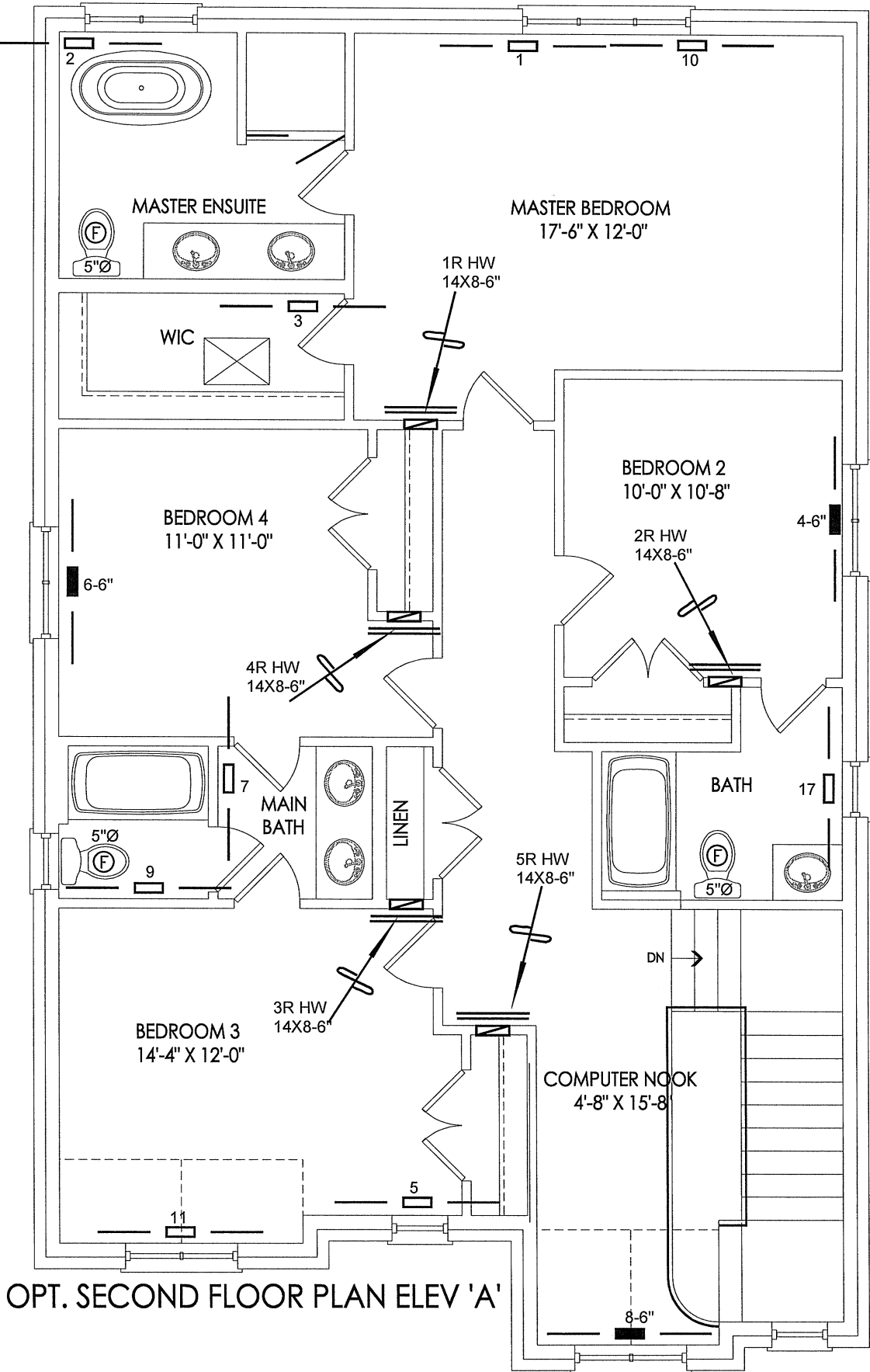
LO# 90458

38-9 - OPT 2ND 2444 sqft

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.

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.



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

CSA-F280-12

SB-12 PERFORMANCE

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Client
ROYAL PINE HOMES

Project Name
**CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO**

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
Web: www.hvacdsgns.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.

08/10/2021
RECEIVED
Per: danielle.devitt

Sheet Title
**SECOND FLOOR
HEATING
LAYOUT**
Date **APR/2021**

Scale **3/16" = 1'-0"**
BCIN# 19669

LO# **90458**

38-9 - OPT 2ND 2444 sqft

Schedule 1: Designer Information

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

A. Project Information				
Building number, street name			Unit no.	Lot/con.
Municipality	Postal code	Plan number/ other description		
RICHMOND HILL				
B. Individual who reviews and takes responsibility for design activities				
Name		Firm		
MICHAEL O'ROURKE		HVAC DESIGNS LTD.		
Street address		Unit no.	Lot/con.	
375 FINLEY AVE		202	N/A	
Municipality	Postal code	Province	E-mail	
AJAX	L1S 2E2	ONTARIO	info@hvacdsgns.ca	
Telephone number	Fax number	Cell number		
(905) 619-2300	(905) 619-2375	()		
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]				
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings				
☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection				
☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems				
Description of designer's work		Model:		
HEAT LOSS / GAIN CALCULATIONS		38-9		
DUCT SIZING		Bloomington		
RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY		OPT 2ND		
RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		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: _____				
☐ 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 22, 2021		 Signature of Designer		
Date				

NOTE:

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

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

CITY OF RICHMOND HILL
BUILDING DIVISION

08/10/2021

RECEIVED
Per: danielle.devitt

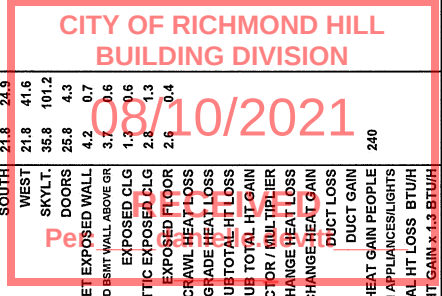
SITE NAME: CENTREFIELD (WEST GORMLEY) BUILDING: ROYAL PINE HOMES DATE: Apr-21 LO# 90458 OPT 2ND TYPE: 38-9 GFA: 2444 WINTER NATURAL AIR CHANGE RATE 0.227 SUMMER NATURAL AIR CHANGE RATE 0.071 HEAT LOSS AT °F. 78 HEAT GAIN AT °F. 13 CSA-F280-12 SB-12 PERFORMANCE

ROOM USE	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK			
EXP. WALL	31	21	5	13	30	11	6	26			
CLG. HT.	9	9	9	9	9	9	9	9			
FACTORS											
GRS.WALL AREA	279	189	45	117	270	99	54	234			
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN			
NORTH	0	0	0	17	370	272	0	0	0	0	0
EAST	0	0	0	0	0	0	0	0	0	0	0
SOUTH	0	0	0	0	0	0	0	0	0	0	0
WEST	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	17	370	706	0	0	0	0	0	0	0	0
DOORS	35.8	101.2	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	253	1064	175	172	723	119	45	189	31
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	257	338	151	114	150	67	55	72	32
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	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	1968	1243	262	1009	2778	589	782	1761			
SUB TOTAL HT GAIN	1406	892	0.20	0.19	0.20	0.19	0.20	0.19	0.20	0.19	0.20
LEVEL FACTOR / MULTIPLIER	364	230	46	187	514	178	145	326			
AIR CHANGE HEAT LOSS	80	51	0	25	122	34	18	93			
AIR CHANGE HEAT GAIN	0	0	0	0	0	0	0	0			
DUCT LOSS	0	0	0	0	0	0	0	0			
DUCT GAIN	0	0	0	0	0	0	0	0			
HEAT GAIN PEOPLE	240	0	0	1	240	1	240	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS	526	0	0	526	526	526	526	0	526	526	526
TOTAL HT LOSS BTU/H	2332	1474	310	1196	3621	1137	1019	2087			
TOTAL HT GAIN x 1.3 BTU/H	3240	1226	87	1598	4338	1805	462	2925			

ROOM USE	FAM	KT/BR	FORM	BATH-2	PWD	FOY	LAUN	BAS			
EXP. WALL	35	34	20	14	14	44	11	158			
CLG. HT.	10	10	10	9	10	11	11	10			
FACTORS											
GRS.WALL AREA	354	343	202	126	141	488	122	1106			
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN			
NORTH	0	0	0	0	0	0	0	0	3	65	48
EAST	0	0	0	0	0	0	0	0	3	65	125
SOUTH	0	0	0	0	0	0	0	0	6	131	149
WEST	28	610	1163	47	1024	1953	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	284	1196	197	171	719	118	40	1034	170
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	2007	2481	1394	745	753	3166	946	7848			
SUB TOTAL HT GAIN	1401	2449	614	235	316	1052	156	694			
LEVEL FACTOR / MULTIPLIER	0.30	0.30	0.30	0.20	0.30	0.30	0.30	0.50			
AIR CHANGE HEAT LOSS	596	737	414	138	224	941	281	5323			
AIR CHANGE HEAT GAIN	80	140	35	13	18	60	9	40			
DUCT LOSS	0	0	0	88	0	0	0	0			
DUCT GAIN	0	0	0	25	0	0	0	0			
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0			
HEAT GAIN APPLIANCES/LIGHTS	526	526	526	526	526	526	526	526			
TOTAL HT LOSS BTU/H	2603	2609	1809	971	977	4106	1228	13171			
TOTAL HT GAIN x 1.3 BTU/H	2829	241	1526	356	434	1446	897	1637			

TOTAL HEAT GAIN BTU/H: 2829 TONS: 2.41 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 41260 TOTAL COMBINED HEAT LOSS BTU/H: 42930

Michael O'Rourke



17.56
BTU/FT2

23.73
BTU/FT2

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

TYPE: 38-9
OPT 2ND
furnace pressure
a/c coil pressure
available pressure
for s/a & r/a

GFA: 2444 LO# 90458

DATE: Apr-21

HEATING CFM 970
TOTAL HEAT LOSS 41,260
AIR FLOW RATE CFM 23.51

COOLING CFM 970
TOTAL HEAT GAIN 28,654
AIR FLOW RATE CFM 33.85

****CARRIER**
59TN6A-060-14V 60
FAN SPEED
LOW 820
MEDLOW 0
MEDIUM 970
HIGH 1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000
DESIGN CFM = 970
CFM @ 6" E.S.P.

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK	BATH	MBR	BED-3	FAM	KT/BR	KT/BR	FORM	BATH-2	PWD	FOY	LAUN	BAS	BAS	BAS	BAS
RM LOSS MBH	1.17	1.47	0.31	1.20	1.81	1.14	0.51	2.09	0.51	1.17	1.81	2.60	1.61	1.61	1.81	0.97	0.98	4.11	1.23	3.29	3.29	3.29	3.29
CFM PER RUN HEAT	27	35	7	28	43	27	12	49	12	27	43	61	38	38	43	23	23	97	29	77	77	77	77
RM GAIN MBH	1.62	1.23	0.09	1.60	2.17	1.81	0.24	2.92	0.24	1.62	2.17	2.61	2.02	2.02	1.53	0.36	0.43	1.45	0.90	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	55	42	3	54	73	61	8	99	8	55	73	88	69	69	52	12	15	49	30	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	43	54	51	37	42	34	33	47	38	49	48	42	43	35	22	36	28	34	19	38	37	21	39
EQUIVALENT LENGTH	193	150	170	170	120	150	130	170	170	150	160	150	160	160	150	150	140	170	180	160	170	110	120
TOTAL EFFECTIVE LENGTH	204	204	221	207	162	184	163	217	208	199	208	192	203	185	172	176	198	144	199	198	207	131	159
ADJUSTED PRESSURE	0.09	0.08	0.08	0.08	0.11	0.09	0.11	0.07	0.08	0.09	0.08	0.08	0.08	0.09	0.11	0.1	0.09	0.11	0.09	0.09	0.08	0.13	0.11
ROUND DUCT SIZE	5	5	4	6	5	6	4	6	4	5	5	6	5	5	5	4	4	6	4	6	6	5	5
HEATING VELOCITY (ft/min)	198	257	80	143	316	138	138	250	138	198	316	311	279	279	316	264	264	495	333	393	393	565	565
COOLING VELOCITY (ft/min)	404	308	34	275	536	311	92	505	92	404	536	449	507	507	507	382	138	172	344	71	71	103	103
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	B	B	B	D	B	D	C	D	A	D	A	A	A	D	D	D	C	D	A	A	D	C

TRUNK

RUN #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK	BATH	MBR	BED-3	FAM	KT/BR	KT/BR	FORM	BATH-2	PWD	FOY	LAUN	BAS	BAS	BAS	BAS
RM LOSS MBH	1.17	1.47	0.31	1.20	1.81	1.14	0.51	2.09	0.51	1.17	1.81	2.60	1.61	1.61	1.81	0.97	0.98	4.11	1.23	3.29	3.29	3.29	3.29
CFM PER RUN HEAT	27	35	7	28	43	27	12	49	12	27	43	61	38	38	43	23	23	97	29	77	77	77	77
RM GAIN MBH	1.62	1.23	0.09	1.60	2.17	1.81	0.24	2.92	0.24	1.62	2.17	2.61	2.02	2.02	1.53	0.36	0.43	1.45	0.90	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	55	42	3	54	73	61	8	99	8	55	73	88	69	69	52	12	15	49	30	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	43	54	51	37	42	34	33	47	38	49	48	42	43	35	22	36	28	34	19	38	37	21	39
EQUIVALENT LENGTH	193	150	170	170	120	150	130	170	170	150	160	150	160	160	150	150	140	170	180	160	170	110	120
TOTAL EFFECTIVE LENGTH	204	204	221	207	162	184	163	217	208	199	208	192	203	185	172	176	198	144	199	198	207	131	159
ADJUSTED PRESSURE	0.09	0.08	0.08	0.08	0.11	0.09	0.11	0.07	0.08	0.09	0.08	0.08	0.08	0.09	0.11	0.1	0.09	0.11	0.09	0.09	0.08	0.13	0.11
ROUND DUCT SIZE	5	5	4	6	5	6	4	6	4	5	5	6	5	5	5	4	4	6	4	6	6	5	5
HEATING VELOCITY (ft/min)	198	257	80	143	316	138	138	250	138	198	316	311	279	279	316	264	264	495	333	393	393	565	565
COOLING VELOCITY (ft/min)	404	308	34	275	536	311	92	505	92	404	536	449	507	507	507	382	138	172	344	71	71	103	103
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	B	B	B	D	B	D	C	D	A	D	A	A	A	D	D	D	C	D	A	A	D	C

SUPPLY AIR TRUNK SIZE

TRUNK	CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK CFM	STAT. PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	345	0.08	9.4	10	621	0	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8
TRUNK B	442	0.08	10.3	14	568	0	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8
TRUNK C	223	0.07	8.3	8	502	0	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8
TRUNK D	528	0.07	11.4	16	594	0	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8
TRUNK E	970	0.07	14.3	24	728	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	0	0	0.00	0	0	8	0	0.00	0	0	8	0	0.05	0	0	8
RETURN AIR #	1	2	3	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AIR VOLUME	75	85	85	85	340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	46	40	51	58	20	37	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	235	195	205	155	120	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LENGTH	281	235	256	213	298	140	267	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.11	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
ROUND DUCT SIZE	6	6	6	5.8	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

TYPE: 38-9
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 90458
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	2 @ 21.2 cfm	42.4 cfm
Other Bedrooms	3 @ 10.6 cfm	31.8 cfm
Kitchen & Bathrooms	6 @ 10.6 cfm	63.6 cfm
Other Rooms	5 @ 10.6 cfm	53.0 cfm
Table 9.32.3.A.	TOTAL	190.8 cfm

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

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	190.8	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	111.3	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE 65H
Location:	BSMT
79.5 cfm	☒ HVI Approved

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

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

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

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

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

INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	

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#: 90458		Model: 38-9		Builder: ROYAL PINE HOMES		Date: 4/22/2021																																																																	
Volume Calculation				Air Change & Delta T Data																																																																			
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5.2.3.1 Heat Loss due to Air Leakage																																																																							
$HL_{airb} = LR_{airb} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$																																																																							
0.227	x	265.56	x	43 °C	x	1.2	=	3120 W																																																															
							=	10647 Btu/h																																																															
5.2.3.2 Heat Loss due to Mechanical Ventilation																																																																							
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																																							
80 CFM	x	78 °F	x	1.08	x	0.25	=	1670 Btu/h																																																															
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																																							
$HL_{airr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																																							
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*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																																							

CITY OF RICHMOND HILL
BUILDING DIVISION

08/10/2021

RECEIVED

Per: danielle.devitt

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL:	38-9	OPT 2ND	BUILDER:	ROYAL PINE HOMES
SFQT:	2444	LO#	90458	SITE: CENTREFIELD (WEST GORMLEY)

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	33762.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 49.0 ft	WIDTH: 30.0 ft	EXPOSED PERIMETER:	158.0 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	11.13
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%	-

**CITY OF RICHMOND HILL
BUILDING DIVISION****08/10/2021****RECEIVED**Per: danielle.devitt

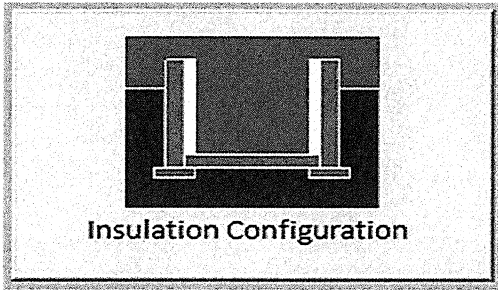
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Michael O'Rourke

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.9	 Insulation Configuration
Floor Width (m):	9.1	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):	5325 btu/h	1560

TYPE: 38-9
LO# 90458

OPT 2ND

CITY OF RICHMOND HILL
BUILDING DIVISION

08/10/2021

RECEIVED

Per: danielle.devitt

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:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m ³):	956.0
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 892.5 cm ² 2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 37.5 Total Exhaust 37.5
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	0.227
Cooling Air Leakage Rate (ACH/H):	0.071

TYPE: 38-9
LO# 90458DEPRESSURIZATION TEST REQUIRED
BEFORE FINAL OCCUPANCY STAGE TO MEET
TARGETTED ACH
2.5 ACHCITY OF RICHMOND HILL
BUILDING DIVISION08/10/2021
OPT 2NDRECEIVED
Per: danielle.devitt



City of Richmond Hill
Building Division

REVIEWED

By: **PxV** Date: **SEP/10/2021**

Building Permit #: **BP#-2021-50828**

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: **BETTER THAN CODE/AIR TIGHTNESS 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.

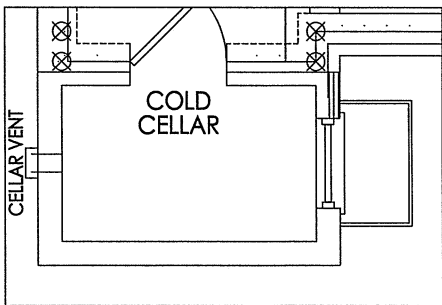
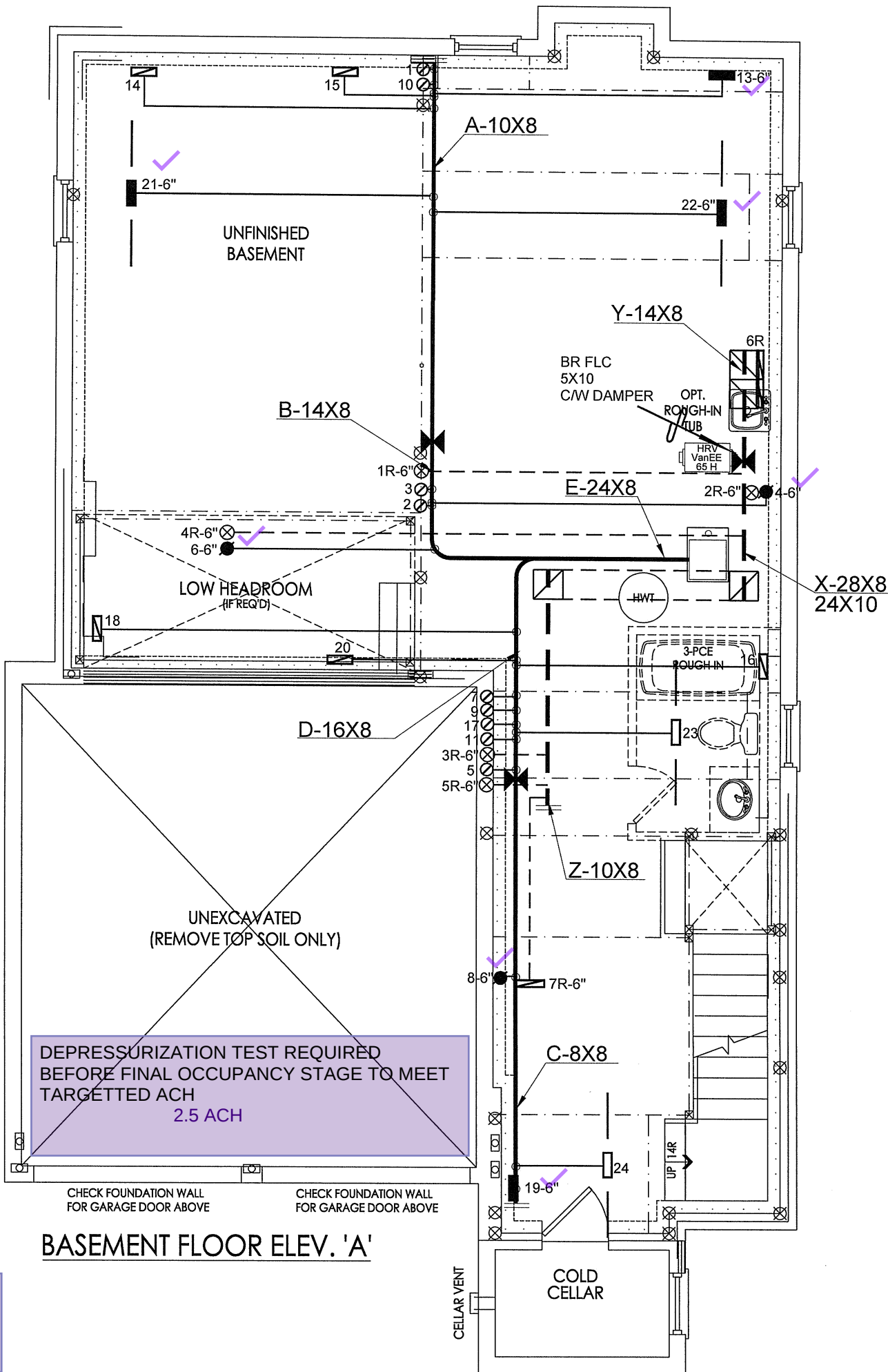
HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

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

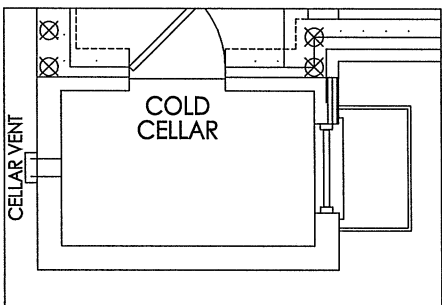
For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.

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).

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.



BASEMENT FLOOR ELEV. 'B'



BASEMENT FLOOR ELEV. 'C'

CSA-F280-12

SB-12 PERFORMANCE

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

HVAC LEGEND							REVISIONS		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	3.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	1.	
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.							Date		
Client							Date		
ROYAL PINE HOMES							Date		
Project Name							Date		
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO							Date		
38-9 - OPT 2ND 2444 sqft							Date		
HVAC DESIGNS LTD.							Date		
375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdsgns.ca Web: www.hvacdsgns.ca Specializing in Residential Mechanical Design Services							Date		
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.							Date		
HEAT LOSS 42930 BTU/H UNIT DATA							Date		
MAKE CARRIER							Date		
MODEL 59TN6A-060-14V							Date		
INPUT 60 MBTU/H							Date		
OUTPUT 58 MBTU/H							Date		
COOLING 2.5 TONS							Date		
FAN SPEED 970 cfm @ 0.6" w.c.							Date		
# OF RUNS S/A R/A FANS							Date		
3RD FLOOR 12 5 3							Date		
2ND FLOOR 7 2 2							Date		
1ST FLOOR 4 1 0							Date		
BASEMENT 4 1 0							Date		
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5" UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A							Date		
BASEMENT HEATING LAYOUT							Date		
Scale 3/16" = 1'-0"							Date		
BCIN# 19669							Date		
LO# 90458							Date		

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).

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).

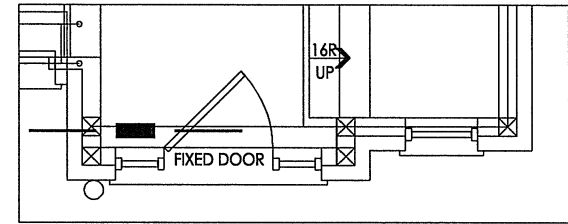
Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

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.

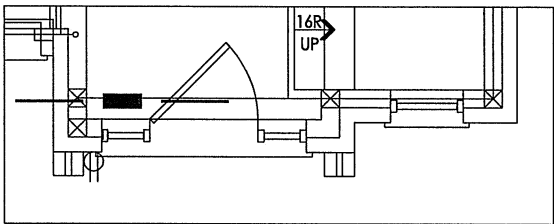
INSULATE DUCTS ROUTING THRU GARAGE MIN 2.1 RSI

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)

OPT. GROUND FLOOR PLAN ELEV 'A'



GROUND FLOOR PLAN ELEV 'B'



GROUND FLOOR PLAN ELEV 'C'

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

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

CSA-F280-12

SB-12 PERFORMANCE

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

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Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
Web: www.hvacdsgns.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.

08/10/2021

RECEIVED
Per: danielle.devitt

Sheet Title
FIRST FLOOR
HEATING
LAYOUT

Date APR/2021

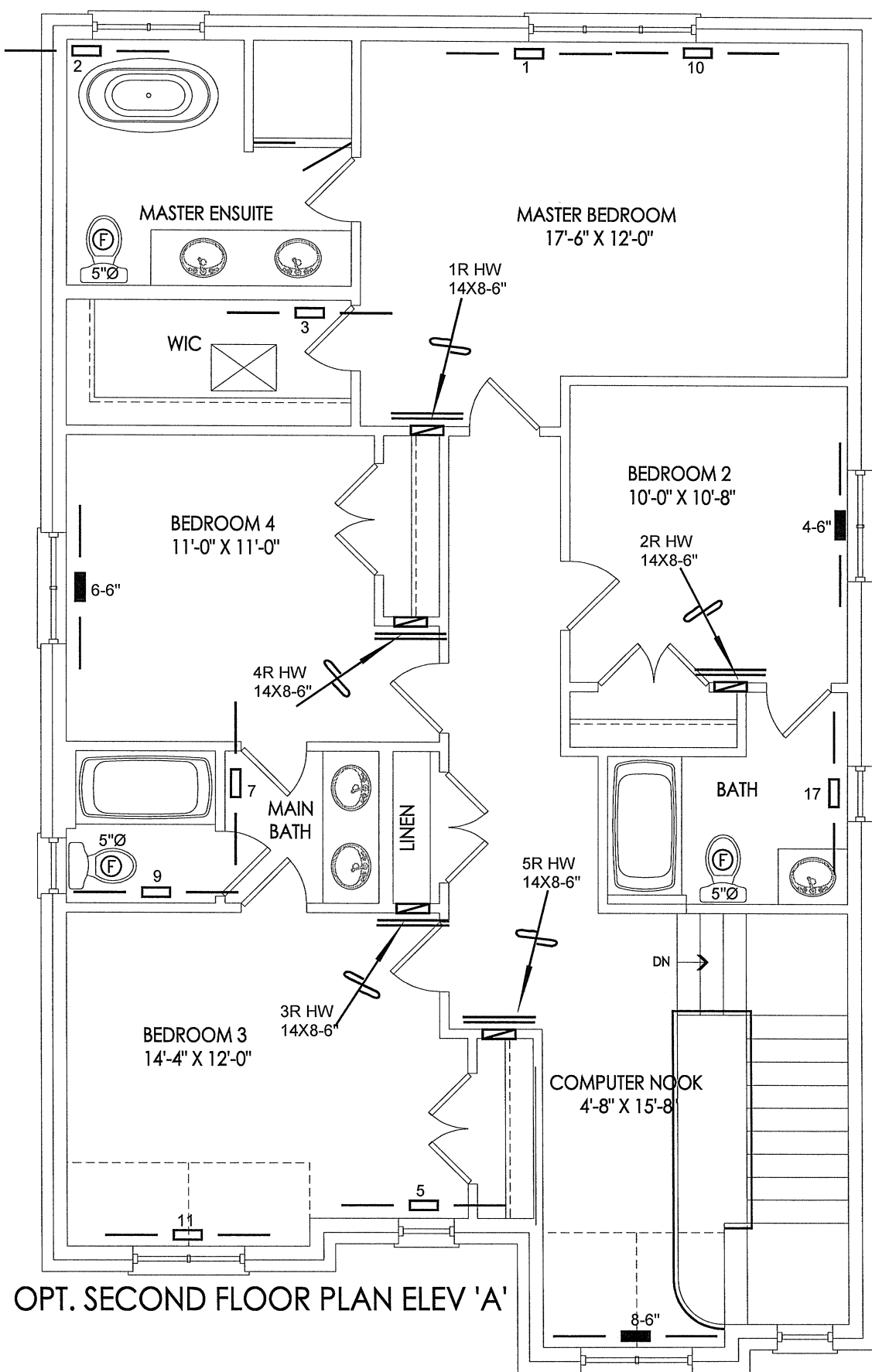
Scale 3/16" = 1'-0"

BCIN# 19669

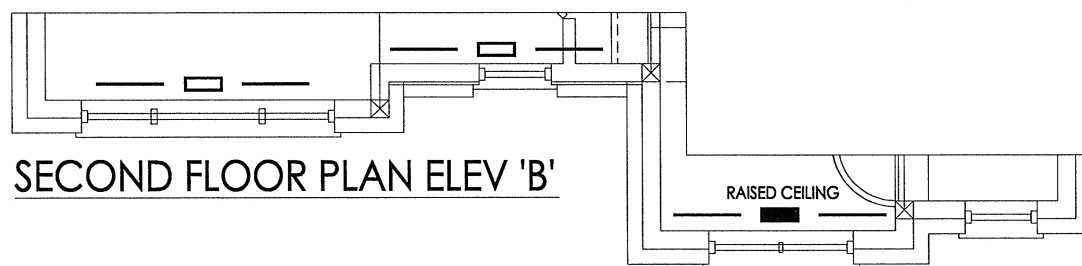
LO# 90458

38-9 - OPT 2ND 2444 sqft

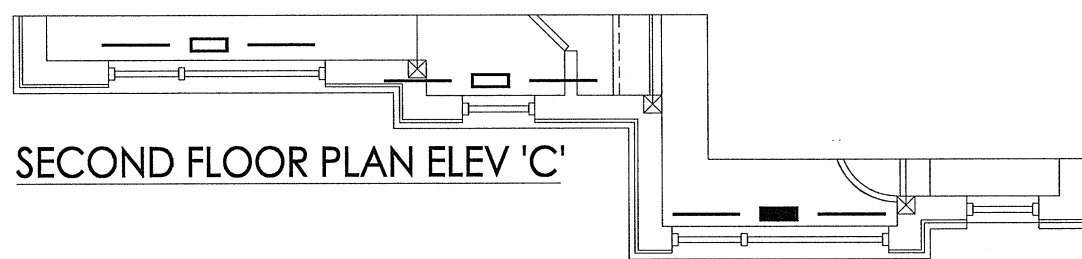
Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.



OPT. SECOND FLOOR PLAN ELEV 'A'



SECOND FLOOR PLAN ELEV 'B'



SECOND FLOOR PLAN ELEV 'C'

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.		
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	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description	Date
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Client	ROYAL PINE HOMES
Project Name	CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO

38-9 - OPT 2ND 2444 sqft

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08/10/2021

Sheet Title
SECOND FLOOR
HEATING
LAYOUT

Date APR/2021

Scale $3/16" = 1'-0"$

BCIN# 19669

LO#	90458
-----	-------

Schedule 1: Designer Information

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

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: jocelyn.aguilar

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 | ☒ HVAC – House | ☐ Building Structural |
| ☐ Small Buildings | ☐ Building Services | ☐ Plumbing – House |
| ☐ Large Buildings | ☐ Detection, Lighting and Power | ☐ Plumbing – All Buildings |
| ☐ Complex Buildings | ☐ Fire Protection | ☐ 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: 38-9 Bloomington FIN BSMT WUB Project: CENTREFIELD (WEST GORMLEY)
--	---

D. Declaration of Designer

I, MICHAEL O'ROURKE 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 individual "designer" under subsection 3.2.5. of Division C, of the Building Code.

Individual BCIN: 19669

Basis for exemption from registration and qualification: _____

- ☐ 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:

- The information contained in this schedule is true to the best of my knowledge.
- I have submitted this application with the knowledge and consent of the firm.

April 19, 2021

Date

Michael O'Rourke

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 WUB

DATE: Apr-21

WINTER NATURAL AIR CHANGE RATE: 0.227 HEAT LOSS AT °F: 78 CSA-F280-12

BUILDER: ROYAL PINE HOMES

TYPE: 38-9

GFA: 2444

LO# 87611

SUMMER NATURAL AIR CHANGE RATE: 0.071 HEAT GAIN AT °F: 13 HS-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK	B-BATH
				31	21	5	13	30	11	6	26	10
				9	9	9	9	9	9	9	9	10
GRS.WALL AREA	LOSS	GAIN		279	189	45	117	270	99	54	234	63
GLAZING	LOSS	GAIN		LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
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	0	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	26	566	1080	17	370	706	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	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	253	1064	175	172	723	119	45	189	31	100
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	257	338	151	114	150	67	55	72	32	166
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS			0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			1968		1243	262	1009	2778	960	782	1761	365
SUB TOTAL HT GAIN				1406	892	63	438	2146	589	319	1631	16
LEVEL FACTOR / MULTIPLIER	0.20	0.19			0.20	0.19	0.20	0.19	0.20	0.19	0.20	0.19
AIR CHANGE HEAT LOSS			364		230	48	187	514	178	145	326	235
AIR CHANGE HEAT GAIN				79	50	4	25	121	33	18	92	1
DUCT LOSS			0		0	0	0	329	0	93	0	0
DUCT GAIN			0		0	0	0	303	0	34	0	0
HEAT GAIN PEOPLE	240		2	480	0	0	1	240	1	240	0	0
HEAT GAIN APPLIANCES/LIGHTS				526	0	0		526		526	0	0
TOTAL HT LOSS BTU/H			2332		1474	310	1196	3621	1137	1019	2087	600
TOTAL HT GAIN x 1.3 BTU/H				3239	1226	87	1597	4336	1805	481	2924	22

BUILDING DIVISION

09/15/2021

RECEIVED
Per: jocelyn aguiar

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	FAM	KT/BR	FORM	LAUN	PWD	FOY	MUD	WUB	BAS
				35	34	20	14	14	44	11	17	132
				10	10	10	9	10	11	11	10	10
GRS.WALL AREA	LOSS	GAIN		354	343	202	126	141	488	122	170	924
GLAZING	LOSS	GAIN		LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	16.0	0	0	0	31	675	495	7	152	112	3
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	0	0	0	12	261	299	0	0	0	6
WEST	21.8	41.6	28	610	1163	47	1024	1953	0	0	0	131
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	149
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	326	1369	225	284	1196	197	171	719	118	119
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	10	28	13	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	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			2007		2481	1394	745	753	3166	946	1336	6573
SUB TOTAL HT GAIN				1401	2449	614	235	316	1052	156	311	522
LEVEL FACTOR / MULTIPLIER	0.30	0.30		0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.50
AIR CHANGE HEAT LOSS			596		737	414	138	224	941	281		5088
AIR CHANGE HEAT GAIN				79	138	35	13	18	59	9		47
DUCT LOSS			0		0	0	88	0	0	0	0	0
DUCT GAIN			0		0	0	77	0	0	0	0	0
HEAT GAIN PEOPLE	240		0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				526	526	526	526	526	526	526	0	526
TOTAL HT LOSS BTU/H			2603		3219	1809	971	977	4106	1228	1336	11661
TOTAL HT GAIN x 1.3 BTU/H				2608	4046	1526	1107	434	1445	214	405	1423

TOTAL HEAT GAIN BTU/H:

29199

TONS: 2.43

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 41687

TOTAL COMBINED HEAT LOSS BTU/H: 43357

Michael O'Rourke

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

FIN BSMT WUB
TYPE: 38-9

DATE: Apr-21

GFA: 2444 LO# 87611

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 41,687 TOTAL HEAT GAIN 28,925
AIR FLOW RATE CFM 23.27 AIR FLOW RATE CFM 33.54

furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure for s/a & r/a 0.35

CITY OF RICHMOND HILL
BUILDING DIVISION
RECEIVED
09/15/2021
Ms: Jocelyn Aquila
**CARRIER
59TN6A-060-14V 60
FAN SPEED 820
LOW 0
MEDLOW 0
MEDIUM 970
MEDIUM HIGH 0
HIGH 1520
AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000
DESIGN CFM = 970
CFM @ .6" E.S.P.
TEMPERATURE RISE 55 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	5
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK	BATH	MBR	BED-3	FAM	KT/BR	KT/BR	FORM	LAUN	PWD	FOY	MUD	BAS	BAS	B-BATH	BAS
RM LOSS MBH.	1.17	1.47	0.31	1.20	1.81	1.14	0.51	2.09	0.51	1.17	1.81	2.60	1.61	1.61	1.81	0.97	0.98	4.11	1.23	3.25	3.25	0.60	3.25
CFM PER RUN HEAT	27	34	7	28	42	26	12	49	12	27	42	61	37	37	42	23	23	96	29	76	76	14	76
RM GAIN MBH.	1.62	1.23	0.09	1.60	2.17	1.80	0.24	2.92	0.24	1.62	2.17	2.61	2.02	2.02	1.53	1.11	0.43	1.45	0.21	0.46	0.46	0.02	0.46
CFM PER RUN COOLING	54	41	3	54	73	61	8	98	8	54	73	87	68	68	51	37	15	48	7	15	15	1	15
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	43	54	51	37	42	34	33	47	38	49	48	42	43	35	22	36	28	34	19	53	53	21	39
EQUIVALENT LENGTH	150	150	170	170	120	150	130	170	170	150	160	150	160	150	150	140	170	110	180	190	190	110	120
TOTAL EFFECTIVE LENGTH	193	204	221	207	162	184	163	217	208	199	208	192	203	185	172	176	198	144	199	243	243	131	159
ADJUSTED PRESSURE	0.09	0.08	0.08	0.08	0.11	0.09	0.11	0.07	0.08	0.09	0.08	0.08	0.08	0.09	0.1	0.1	0.09	0.11	0.09	0.07	0.07	0.13	0.11
ROUND DUCT SIZE	5	5	4	6	5	6	4	6	4	5	5	6	5	5	5	4	4	6	4	6	6	4	5
HEATING VELOCITY (ft/min)	198	250	80	143	308	133	138	250	138	198	308	311	272	272	308	264	264	489	333	388	388	161	558
COOLING VELOCITY (ft/min)	396	301	34	275	536	311	92	500	92	396	536	444	499	499	374	424	172	245	80	76	76	11	110
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	B	B	B	D	B	D	C	D	A	D	A	A	A	D	D	D	C	D	A	A	D	C

RUN #	25
ROOM NAME	BAS
RM LOSS MBH.	3.25
CFM PER RUN HEAT	76
RM GAIN MBH.	0.46
CFM PER RUN COOLING	15
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	27
EQUIVALENT LENGTH	100
TOTAL EFFECTIVE LENGTH	127
ADJUSTED PRESSURE	0.14
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	558
COOLING VELOCITY (ft/min)	110
OUTLET GRILL SIZE	3X10
TRUNK	B

SUPPLY AIR TRUNK SIZE												RETURN AIR TRUNK SIZE											
	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	341	0.07	9.7	12	x	8	512	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0
TRUNK B	512	0.07	11.3	16	x	8	576	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0
TRUNK C	221	0.07	8.2	8	x	8	497	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0
TRUNK D	460	0.07	10.8	14	x	8	591	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0
TRUNK E	972	0.07	14.3	24	x	8	729	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	0	0	x	8	0
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	x	8	0	TRUNK T	0	0.05	0	0	x	8	0

RETURN AIR #	1	2	3	4	5	6	7									BR
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140
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.	46	40	51	58	53	20	37	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	235	195	205	155	245	120	230	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	281	235	256	213	298	140	267	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.05	0.11	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	6	6	6	5.8	6	8.6	6	0	0	0	0	0	0	0	0	6.3
INLET GRILL SIZE	8	8	8	8	8	6	8	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
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	14

TYPE: 38-9
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87611
FIN BSMT WUB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	☒ Direct vent (sealed combustion) only	
b)	☐ Positive venting induced draft (except fireplaces)	
c)	☐ Natural draft, B-vent or induced draft gas fireplace	
d)	☐ Solid Fuel (including fireplaces)	
e)	☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE		9.32.1(2)
☒ I	Type a) or b) appliance only, no solid fuel	
☐ II	Type I except with solid fuel (including fireplaces)	
☐ III	Any Type c) appliance	
☐ IV	Type I, or II with electric space heat	
☐ Other:	Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐ 1	Exhaust only/Forced Air System	
☐ 2	HRV with Ducting/Forced Air System	
☒ 3	HRV Simplified/connected to forced air system	
☐ 4	HRV with Ducting/non forced air system	
☐	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<u>2</u> @ 21.2 cfm <u>42.4</u> cfm	
Other Bedrooms	<u>3</u> @ 10.6 cfm <u>31.8</u> cfm	
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm <u>53</u> cfm	
Other Rooms	<u>5</u> @ 10.6 cfm <u>53.0</u> cfm	
Table 9.32.3.A.	TOTAL <u>180.2</u> cfm	

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

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>180.2</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>100.7</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> cfm	☒ HVI Approved

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

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

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

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

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

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

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

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED
jodelyngular

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87611	Model: 38-9	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
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>1060</td> <td>10</td> <td>10600</td> </tr> <tr> <td>First</td> <td>1060</td> <td>10</td> <td>10706</td> </tr> <tr> <td>Second</td> <td>1384</td> <td>9</td> <td>12456</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>33,762.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>956.0 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1060	10	10600	First	1060	10	10706	Second	1384	9	12456	Third	0	9	0	Fourth	0	9	0	Total:			33,762.0 ft³	Total:			956.0 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 40%;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.071</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <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> </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>		WINTER NATURAL AIR CHANGE RATE	0.227	SUMMER NATURAL AIR CHANGE RATE	0.071	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
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	Tin °C	Tout °C	ΔT °C	ΔT °F																																																								
Winter DTDh	22	-21	43	78																																																								
Summer DTDc	24	31	7	13																																																								
5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 265.56 x 43 °C x 1.2 = 3120 W = 10647 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 265.56 x 7 °C x 1.2 = 160 W = 546 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HLairve Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{clevel})</th> <th>Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center;">10,647</td> <td>8,274</td> <td>0.643</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>10,747</td> <td>0.297</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>11,508</td> <td>0.185</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> </tbody> </table> *HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0					Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)	1	0.5	10,647	8,274	0.643	2	0.3	10,747	0.297	3	0.2	11,508	0.185	4	0	0	0.000	5	0	0	0.000																														
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5	0		0	0.000																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-9	FIN BSMT WUB	BUILDER: ROYAL PINE HOMES HILL
SFQT: 2444	LO# 87611	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

09/15/2021

RECEIVED

Per: jocelyn.aguiar

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	33762.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 49.0 ft	WIDTH: 30.0 ft	EXPOSED PERIMETER:	141.0 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



CITY OF RICHMOND HILL
BUILDING DIVISION

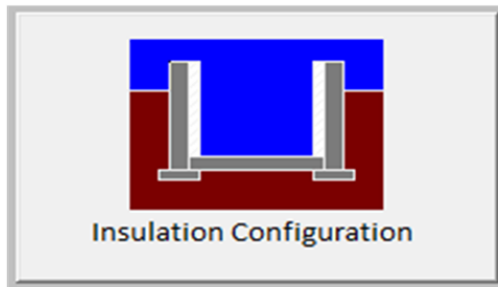
09/16/2021

RECEIVED

Per: jocelyn.aguiar

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.9	 Insulation Configuration
Floor Width (m):	9.1	
Exposed Perimeter (m):	43.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1367

TYPE: 38-9
LO# 87611

FIN BSMT WUB

CITY OF RICHMOND HILL
BUILDING DIVISION

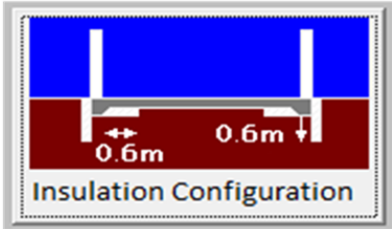
09/15/2021

RECEIVED

By: [Signature]

Residential Slab on Grade 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		
Length (m):	0.6	
Width (m):	4.6	
Exposed Perimeter (m):	5.2	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		40

TYPE: 38-9
LO# 87611

FIN BSMT WUB

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

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:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	956.0			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		892.5 cm ²	
	2.50		ACH @ 50 Pa	
Mechanical Ventilation (L/s):	Total Supply		Total Exhaust	
	37.5		37.5	
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-9
LO# 87611

FIN BSMT WUB



By: **PxV** Date: **SEP/10/2021**

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: BETTER THAN CODE/AIR TIGHTNESS 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.

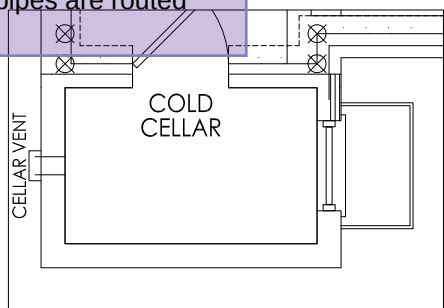
HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

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

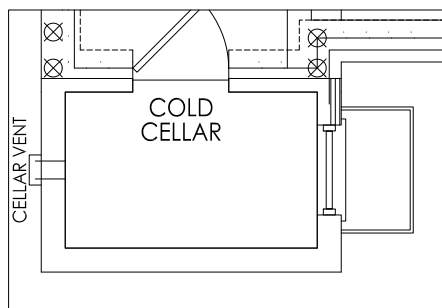
For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.

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).

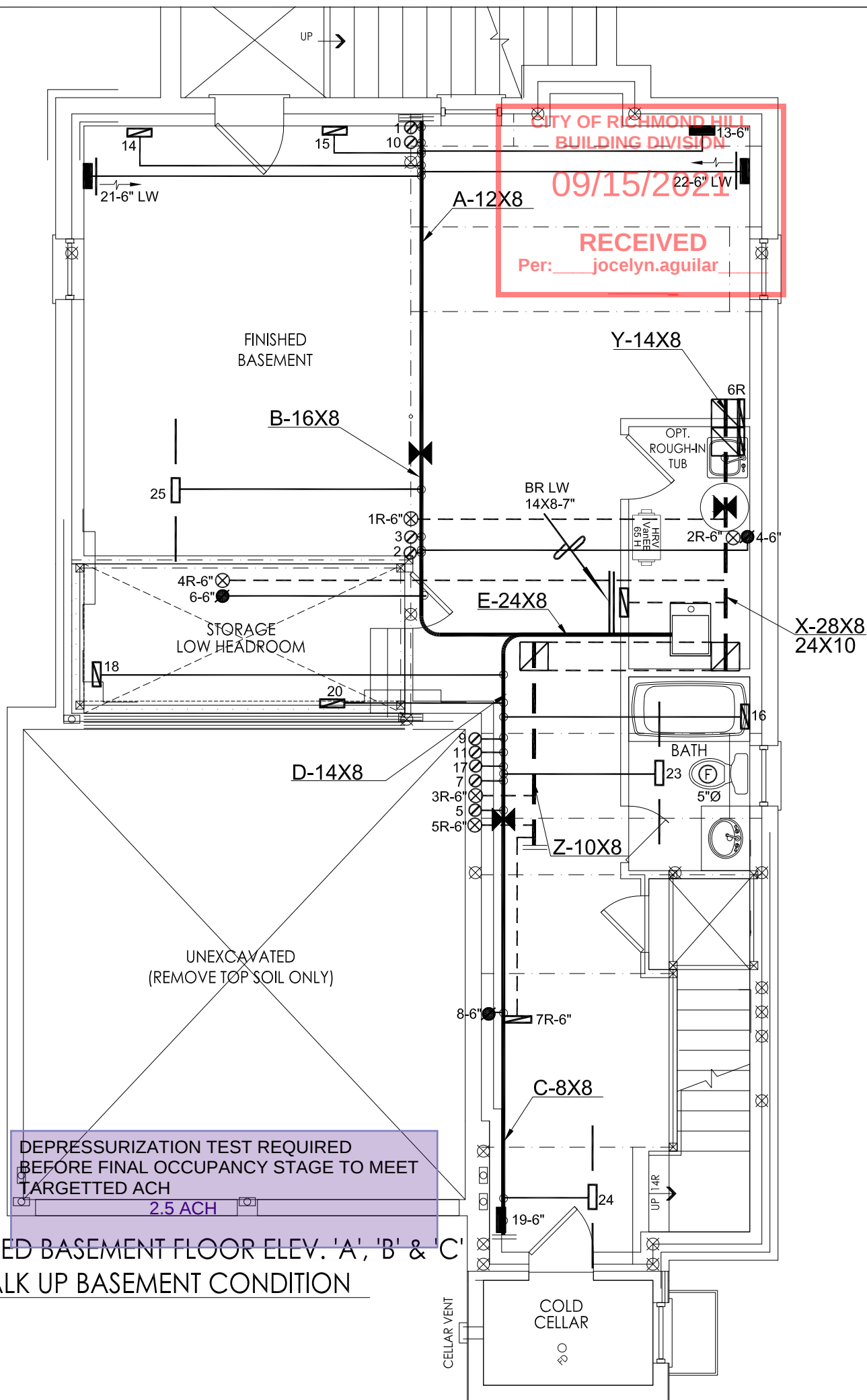
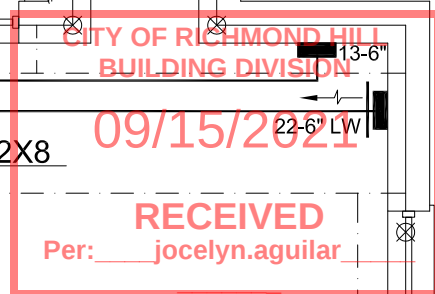
Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.



BASEMENT FLOOR ELEV. 'B'



BASEMENT FLOOR ELEV. 'C'



OPT. FINISHED BASEMENT FLOOR ELEV. 'A', 'B' & 'C'
OPT. WALK UP BASEMENT CONDITION

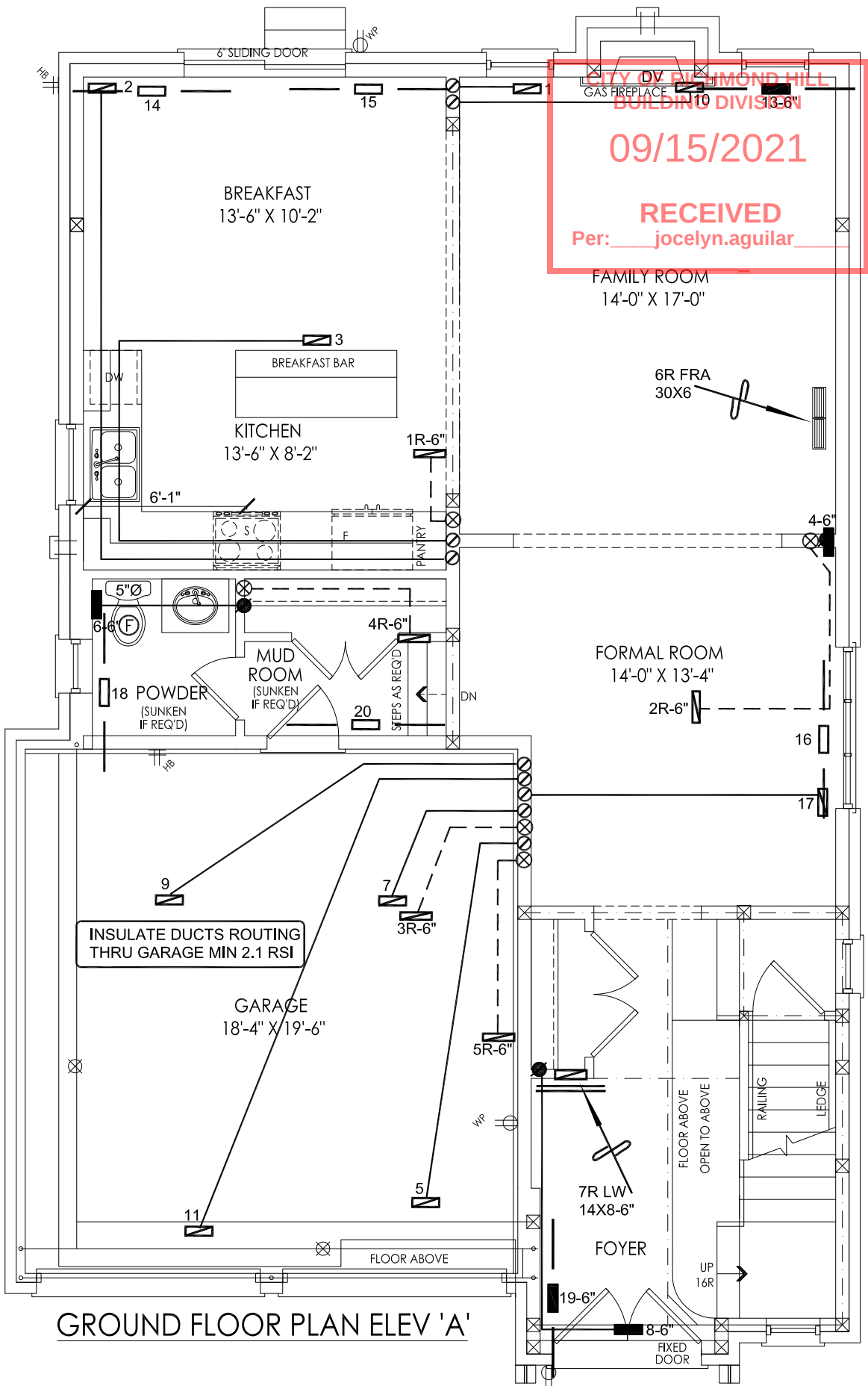
I MICHAEL O'ROURKE HAVE REVIEW
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 3.2.5 OF THE
BUILDING CODE.

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

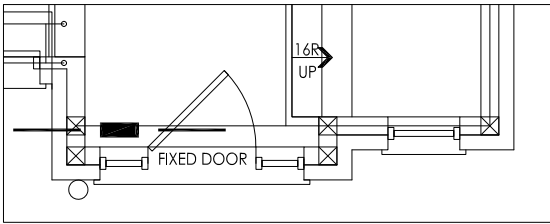
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT	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

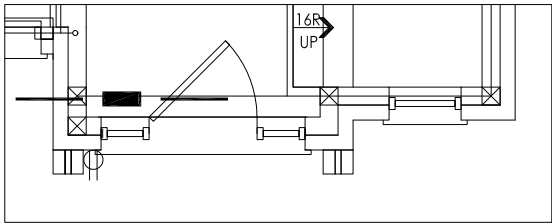
Client		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdsgns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services		HEAT LOSS 43357 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title	
ROYAL PINE HOMES				MAKE CARRIER		3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name		CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		MODEL 59TN6A-060-14V		2ND FLOOR 12 5 3				Date	
FIN BSMT WUB 38-9		2444 sqft		INPUT 60 MBTU/H		1ST FLOOR 7 2 2				SEPT/2020	
		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.		OUTPUT 58 MBTU/H		BASEMENT 5 1 1				Scale	
				COOLING 2.5 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				BCIN# 19669	
				FAN SPEED 970 cfm @ 0.6" w.c.						LO# 87611	



GROUND FLOOR PLAN ELEV 'A'



GROUND FLOOR PLAN ELEV 'B'



GROUND FLOOR PLAN ELEV 'C'

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

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

WUB

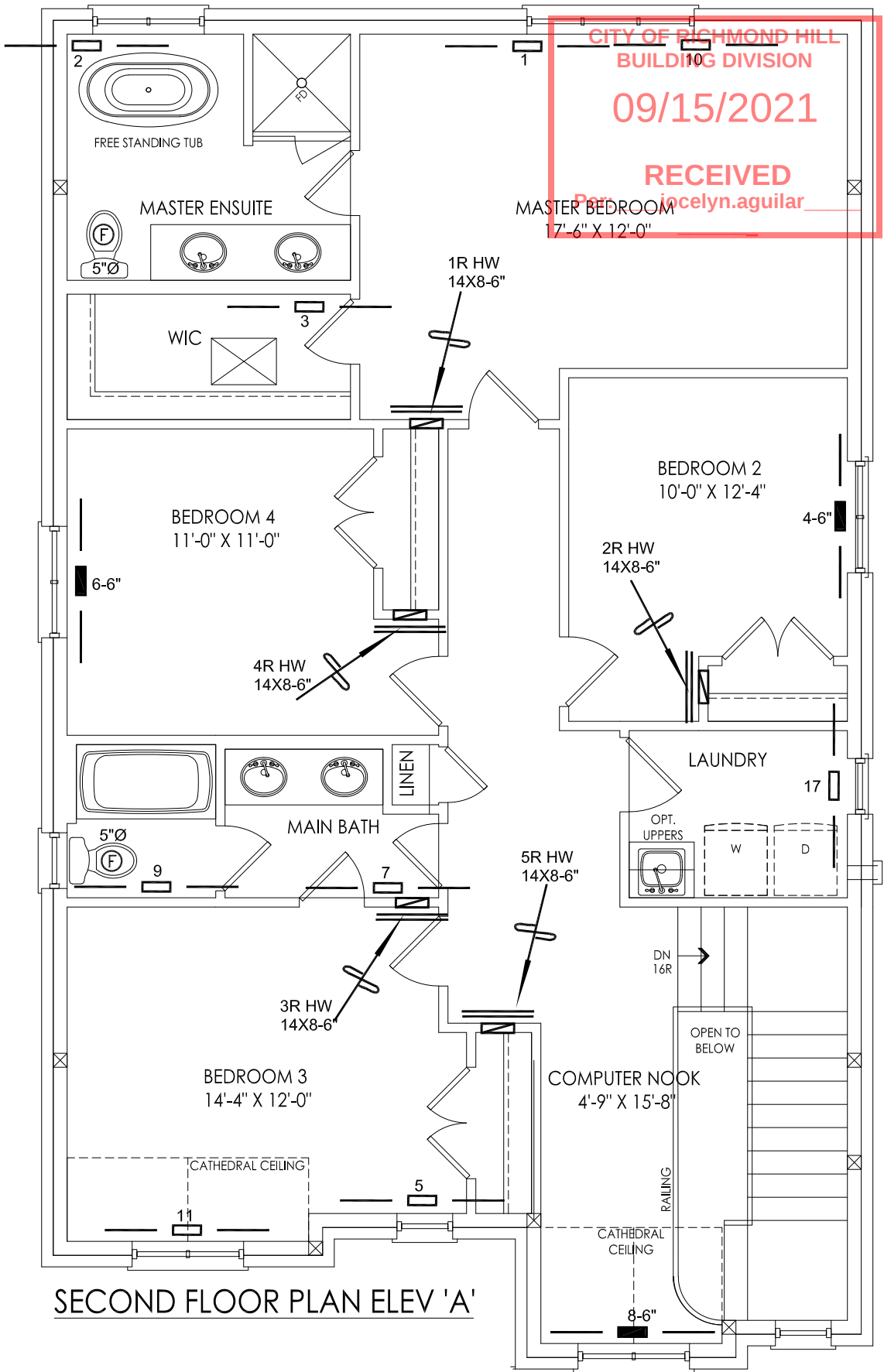
CSA-F280-12

SB-12 PERFORMANCE

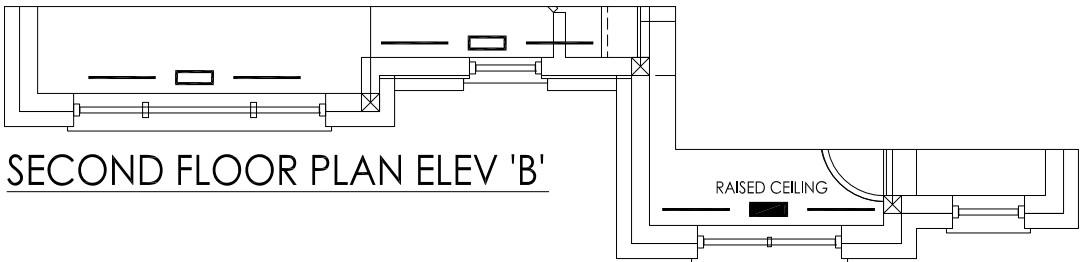
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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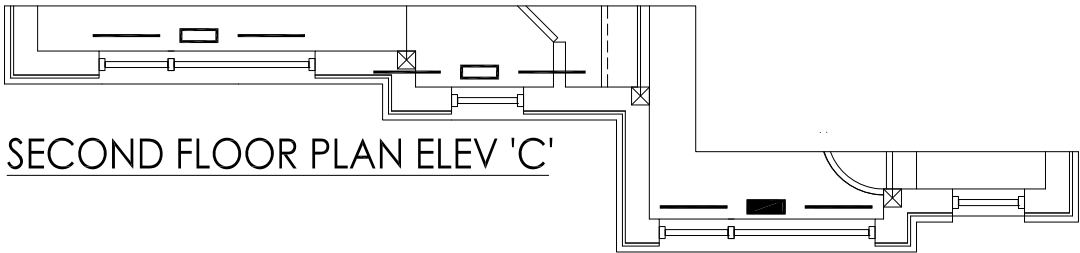
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
FIN BSMT WUB 38-9		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.	BCIN# 19669	
2444 sqft			LO#	87611



SECOND FLOOR PLAN ELEV 'A'



SECOND FLOOR PLAN ELEV 'B'



SECOND FLOOR PLAN ELEV 'C'

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

WUB

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			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
FIN BSMT WUB 38-9			BCIN# 19669	
2444 sqft			LO#	87611

Schedule 1: Designer Information

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

A. Project Information			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdsgns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 38-9 Bloomington 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 19, 2021		 Signature of Designer	
Date		CITY OF RICHMOND HILL BUILDING DIVISION 08/10/2021 RECEIVED Per: danielle.devitt	

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 0.227						HEAT LOSS ΔT °F. 78		CSA-F280-12					
BUILDER: ROYAL PINE HOMES										TYPE: 38-9		GFA: 2444		LO# 87610		SUMMER NATURAL AIR CHANGE RATE 0.071						HEAT GAIN ΔT °F. 13		SB-12 PERFORMANCE	
ROOM USE		MBR		ENS		WIC		BED-2		BED-3		BED-4		BATH		NOOK									
EXP. WALL		31		21		5		13		30		11		6		26									
CLG. HT.		9		9		9		9		9		9		9		9									
FACTORS																									
GRS.WALL AREA		LOSS GAIN		279		189		45		117		270		99		54		234							
GLAZING				LOSS GAIN		LOSS GAIN		LOSS GAIN		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		
EAST		21.8	41.6	0	0	0	0	0	0	0	0	0	42	915	1745	0	0	0	0	0	34	741	1413		
SOUTH		21.8	24.9	0	0	0	0	0	0	0	0	0	0	0	0	17	370	423	7	152	174	0	0		
WEST		21.8	41.6	26	566	1080	17	370	706	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		
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		
NET EXPOSED WALL		4.2	0.7	253	1064	175	172	723	119	45	189	31	100	421	69	228	959	158	82	345	57	47	198	33	
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	257	338	151	114	150	67	55	72	32	166	218	98	189	248	111	186	244	109	110	145	65	
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	30	84	38	0	0	0	0	0	0	
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	219	572	94	0	0	0	110	287	47	
BASEMENT/CRAWL HEAT LOSS																									
SLAB ON GRADE HEAT LOSS																									
SUBTOTAL HT LOSS				1968				1243				262				1009				2778				960	
SUB TOTAL HT GAIN						1406				892				63				438				2146			
LEVEL FACTOR / MULTIPLIER		0.20		0.19				0.20		0.19				0.20		0.19				0.20		0.19			
AIR CHANGE HEAT LOSS				364				230				48				187				514				178	
AIR CHANGE HEAT GAIN						80				51				4		25				122				34	
DUCT LOSS				0				0				0				0				329				0	
DUCT GAIN				0		0		0		0		0		0		303		0		0		34		0	
HEAT GAIN PEOPLE		240		2		480		0		0		0		1		240		1		240		0		0	
HEAT GAIN APPLIANCES/LIGHTS						526		0		0		0		526		526		526		526		0		526	
TOTAL HT LOSS BTU/H				2332				1474		310		1196		3621		1137		1805		1019		2087		2925	
TOTAL HT GAIN x 1.3 BTU/H						3240		1226		87		1598		4338		1805		482		2087		2925			

ROOM USE																	
EXP. WALL																	
CLG. HT.																	
FACTORS																	
GRS.WALL AREA	LOSS	GAIN															
GLAZING																	
NORTH	21.8	16.0	0	0	0	0	0	0	31	675	495	7	152	112	0	0	0
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	14	305	582
SOUTH	21.8	24.9	0	0	0	12	261	299	0	0	0	0	0	0	9	196	224
WEST	21.8	41.6	28	610	1163	47	1024	1953	0	0	0	0	0	0	0	0	0
SKYL.T.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	40	1034	170
NET EXPOSED WALL	4.2	0.7	326	1369	225	284	1196	197	171	719	118	119	500	82	132	557	92
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
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	70	92	41	0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	10	28	13	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS																	
SLAB ON GRADE HEAT LOSS																	
SUBTOTAL HT LOSS			2007			2481			1394			745			753		
SUB TOTAL HT GAIN				1401		2449			614			235			316		
LEVEL FACTOR / MULTIPLIER	0.30	0.30				0.30	0.30		0.30	0.30		0.20	0.19		0.30	0.30	
AIR CHANGE HEAT LOSS			596			737			414			138			224		
AIR CHANGE HEAT GAIN				80		140			35			13			18		
DUCT LOSS			0			0			0			88			0		
DUCT GAIN				0		0			0			0			0		
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					526			526			526			526			526
TOTAL HT LOSS BTU/H			2603			3219			1809			971			977		
TOTAL HT GAIN x 1.3 BTU/H				2609		4048			1526			1107			434		

CITY OF RICHMOND HILL
BUILDING DIVISION
08/10/2021
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TOTAL HEAT GAIN BTU/H: 28997 TONS: 2.42 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 41260 TOTAL COMBINED HEAT LOSS BTU/H: 42930

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

TYPE: 38-9

DATE: Apr-21

GFA: 2444

LO# 87610

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 41,260 TOTAL HEAT GAIN 28,722
AIR FLOW RATE CFM 23.51 AIR FLOW RATE CFM 33.77

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	12	7	4
R/A	0	0	5	2	1

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

LOW 820
MEDLOW 0
MEDIUM 970
MEDIUM HIGH 0
HIGH 1520

DESIGN CFM = 970
CFM @ .6" E.S.P.

TEMPERATURE RISE 55 °F

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK	BATH	MBR	BED-3	FAM	KT/BR	KT/BR	FORM	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.17	1.47	0.31	1.20	1.81	1.14	0.51	2.09	0.51	1.17	1.81	2.60	1.61	1.61	1.81	0.97	0.98	4.11	1.23	3.29	3.29	3.29	3.29
CFM PER RUN HEAT	27	35	7	28	43	27	12	49	12	27	43	61	38	38	43	23	23	97	29	77	77	77	77
RM GAIN MBH.	1.62	1.23	0.09	1.60	2.17	1.81	0.24	2.92	0.24	1.62	2.17	2.61	2.02	2.02	1.53	1.11	0.43	1.45	0.21	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	55	41	3	54	73	61	8	99	8	55	73	88	68	68	52	37	15	49	7	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	43	54	51	37	42	34	33	47	38	49	48	42	43	35	22	36	28	34	19	38	37	21	39
EQUIVALENT LENGTH	150	150	170	170	120	150	130	170	170	150	160	150	160	150	150	140	170	110	180	160	170	110	120
TOTAL EFFECTIVE LENGTH	193	204	221	207	162	184	163	217	208	199	208	192	203	185	172	176	198	144	199	198	207	131	159
ADJUSTED PRESSURE	0.09	0.08	0.08	0.08	0.11	0.09	0.11	0.07	0.08	0.09	0.08	0.08	0.08	0.09	0.1	0.1	0.09	0.11	0.09	0.09	0.08	0.13	0.11
ROUND DUCT SIZE	5	5	4	6	5	6	4	6	4	5	5	6	5	5	5	4	4	6	4	6	6	5	5
HEATING VELOCITY (ft/min)	198	257	80	143	316	138	138	250	138	198	316	311	279	279	316	264	264	495	333	393	393	565	565
COOLING VELOCITY (ft/min)	404	301	34	275	536	311	92	505	92	404	536	449	499	499	382	424	172	250	80	71	71	103	103
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	B	B	B	D	B	D	C	D	A	D	A	A	A	D	D	D	C	D	A	A	D	C

RUN #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	NOOK	BATH	MBR	BED-3	FAM	KT/BR	KT/BR	FORM	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.17	1.47	0.31	1.20	1.81	1.14	0.51	2.09	0.51	1.17	1.81	2.60	1.61	1.61	1.81	0.97	0.98	4.11	1.23	3.29	3.29	3.29	3.29
CFM PER RUN HEAT	27	35	7	28	43	27	12	49	12	27	43	61	38	38	43	23	23	97	29	77	77	77	77
RM GAIN MBH.	1.62	1.23	0.09	1.60	2.17	1.81	0.24	2.92	0.24	1.62	2.17	2.61	2.02	2.02	1.53	1.11	0.43	1.45	0.21	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	55	41	3	54	73	61	8	99	8	55	73	88	68	68	52	37	15	49	7	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	43	54	51	37	42	34	33	47	38	49	48	42	43	35	22	36	28	34	19	38	37	21	39
EQUIVALENT LENGTH	150	150	170	170	120	150	130	170	170	150	160	150	160	150	150	140	170	110	180	160	170	110	120
TOTAL EFFECTIVE LENGTH	193	204	221	207	162	184	163	217	208	199	208	192	203	185	172	176	198	144	199	198	207	131	159
ADJUSTED PRESSURE	0.09	0.08	0.08	0.08	0.11	0.09	0.11	0.07	0.08	0.09	0.08	0.08	0.08	0.09	0.1	0.1	0.09	0.11	0.09	0.09	0.08	0.13	0.11
ROUND DUCT SIZE	5	5	4	6	5	6	4	6	4	5	5	6	5	5	5	4	4	6	4	6	6	5	5
HEATING VELOCITY (ft/min)	198	257	80	143	316	138	138	250	138	198	316	311	279	279	316	264	264	495	333	393	393	565	565
COOLING VELOCITY (ft/min)	404	301	34	275	536	311	92	505	92	404	536	449	499	499	382	424	172	250	80	71	71	103	103
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	B	B	B	D	B	D	C	D	A	D	A	A	A	D	D	D	C	D	A	A	D	C

SUPPLY AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT			VELOCITY		TRUNK	STATIC	ROUND	RECT			VELOCITY
	CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT			(ft/min)
TRUNK A	345	0.08	9.4	10	x	8	621	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	442	0.08	10.3	14	x	8	568	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	223	0.07	8.3	8	x	8	502	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	528	0.07	11.4	16	x	8	594	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	970	0.07	14.3	24	x	8	728	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 TRUNK SIZE

TRUNK	STATIC	ROUND	RECT	VELOCITY			
CFM	PRESS.	DUCT	DUCT			(ft/min)	
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	970	0.05	15.6	28	x	8	624
TRUNK Y	340	0.05	10.5	14	x	8	437
TRUNK Z	245	0.05	9.3	10	x	8	441
DROP	970	0.05	15.6	24	x	10	582

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	75	85	85	85	75	340	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	46	40	51	58	53	20	37	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	235	195	205	155	245	120	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	281	235	256	213	298	140	267	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.05	0.11	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	6	6	6	5.8	6	8.6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	6	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CITY OF RICHMOND HILL
BUILDING DIVISION
08/10/2021
RECEIVED
Per: danielle.devitt

TYPE: 38-9
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87610

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	☒ Direct vent (sealed combustion) only	
b)	☐ Positive venting induced draft (except fireplaces)	
c)	☐ Natural draft, B-vent or induced draft gas fireplace	
d)	☐ Solid Fuel (including fireplaces)	
e)	☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE		9.32.1(2)
☒ I	Type a) or b) appliance only, no solid fuel	
☐ II	Type I except with solid fuel (including fireplaces)	
☐ III	Any Type c) appliance	
☐ IV	Type I, or II with electric space heat	
☐ Other:	Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐ 1	Exhaust only/Forced Air System	
☐ 2	HRV with Ducting/Forced Air System	
☒ 3	HRV Simplified/connected to forced air system	
☐ 4	HRV with Ducting/non forced air system	
☐	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Other Rooms	<u>5</u> @ 10.6 cfm	<u>53.0</u> cfm
Table 9.32.3.A.	TOTAL	<u>169.6</u> cfm

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

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>169.6</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>90.1</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE 65H
Location:	BSMT
<u>79.5</u> cfm	☒ HVI Approved

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

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

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

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

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

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

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	Per: <u>danielle</u> 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* MICHAEL O'ROURKE


CSA F280-12 Residential Heat Loss and Heat Gain Calculations
Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 87610

Model: 38-9

Builder: ROYAL PINE HOMES

Date: 4/19/2021

Volume Calculation
Air Change & Delta T Data
House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	1060	10	10600
First	1060	10	10706
Second	1384	9	12456
Third	0	9	0
Fourth	0	9	0
Total:			33,762.0 ft ³
Total:			956.0 m ³

WINTER NATURAL AIR CHANGE RATE	0.227
SUMMER NATURAL AIR CHANGE RATE	0.071

Design Temperature Difference				
	T _{in} °C	T _{out} °C	ΔT °C	ΔT °F
Winter DTD _h	22	-21	43	78
Summer DTD _c	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage
6.2.6 Sensible Gain due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

$$0.227 \times 265.56 \times 43^\circ\text{C} \times 1.2 = 3120 \text{ W}$$

$$= 10647 \text{ Btu/h}$$

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

$$0.071 \times 265.56 \times 7^\circ\text{C} \times 1.2 = 160 \text{ W}$$

$$= 546 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation
6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

$$80 \text{ CFM} \times 78^\circ\text{F} \times 1.08 \times 0.25 = 1670 \text{ Btu/h}$$

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

$$80 \text{ CFM} \times 13^\circ\text{F} \times 1.08 \times 0.25 = 275 \text{ Btu/h}$$

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{clevel})
1	0.5	10,647	7,848	0.678
2	0.3		10,747	0.297
3	0.2		11,508	0.185
4	0		0	0.000
5	0		0	0.000

*HL_{airbv} = Air leakage heat loss + ventilation heat loss

*For a balanced or supply only ventilation system HL_{airve} = 0

CITY OF RICHMOND HILL
BUILDING DIVISION

08/10/2021

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Per: danielle.devitt

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-9	BUILDER: ROYAL PINE HOMES
SFQT: 2444	SITE: CENTREFIELD (WEST GORMLEY)
LO# 87610	

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	33762.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 49.0 ft	WIDTH: 30.0 ft	EXPOSED PERIMETER:	158.0 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	94%	-

CITY OF RICHMOND HILL
BUILDING DIVISION

08/10/2021

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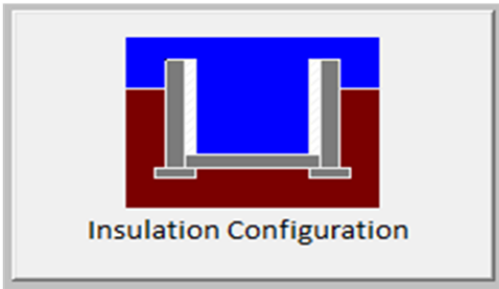
Michael O'Rourke

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.9	
Floor Width (m):	9.1	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):	1560	

TYPE: 38-9
LO# 87610CITY OF RICHMOND HILL
BUILDING DIVISION
08/10/2021RECEIVED
Per: danielle.devitt

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:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	956.0			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa. 2.50		892.5 cm ² ACH @ 50 Pa	
Mechanical Ventilation (L/s):	Total Supply 37.5		Total Exhaust 37.5	
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-9
LO# 87610DEPRESSURIZATION TEST REQUIRED
BEFORE FINAL OCCUPANCY STAGE TO MEET
TARGETTED ACH
2.5 ACHCITY OF RICHMOND HILL
BUILDING DIVISION

08/10/2021

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City of Richmond Hill
Building Division

REVIEWED

By: **PxV** Date: **SEP/10/2021**

Building Permit #: **BP#-2021-50828**

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: **BETTER THAN CODE/AIR TIGHTNESS 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.

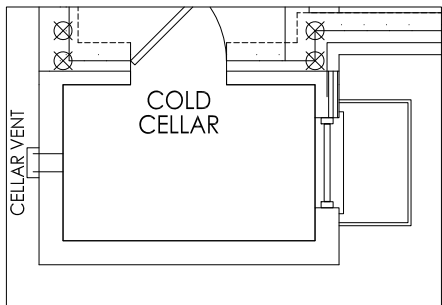
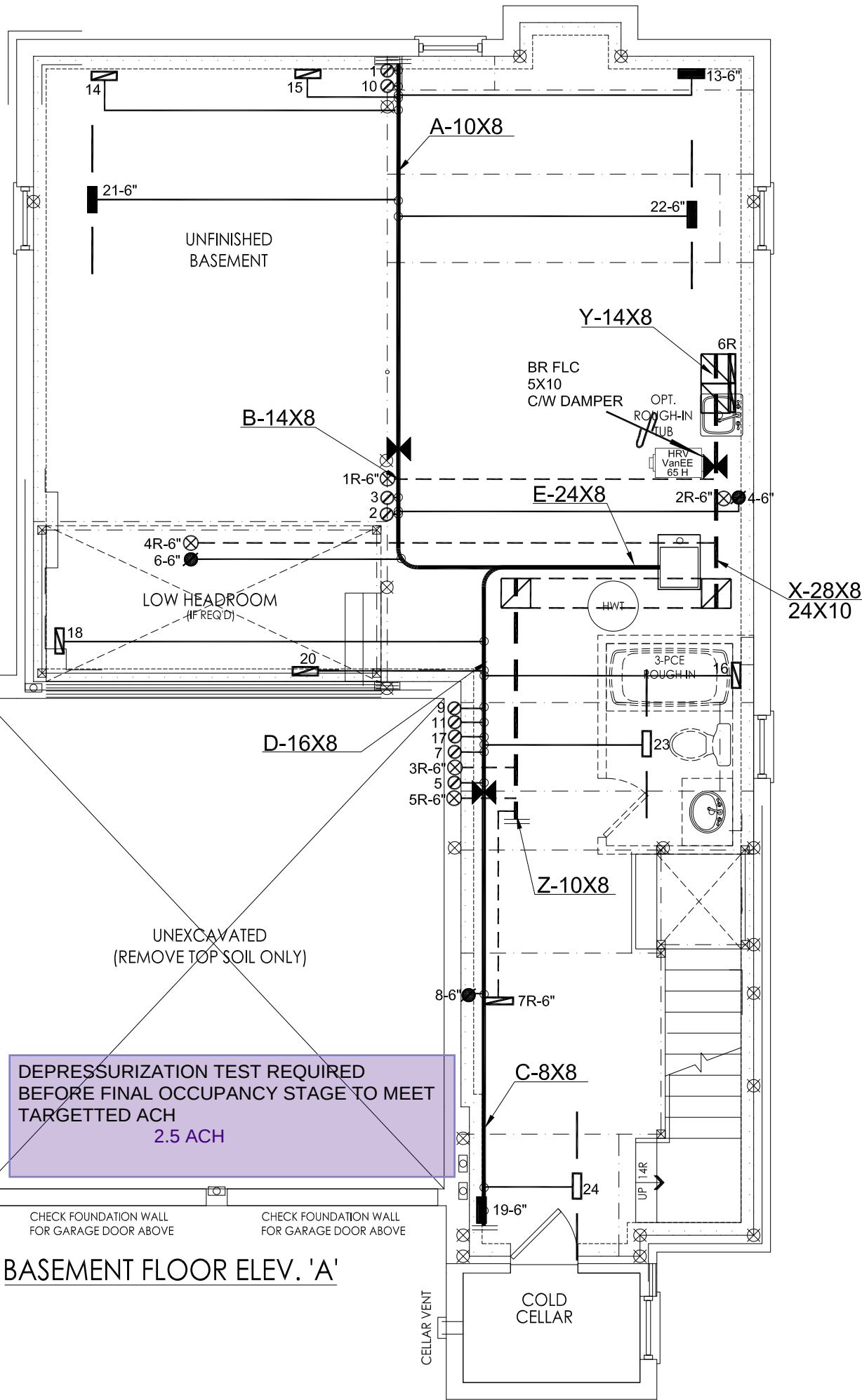
HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

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

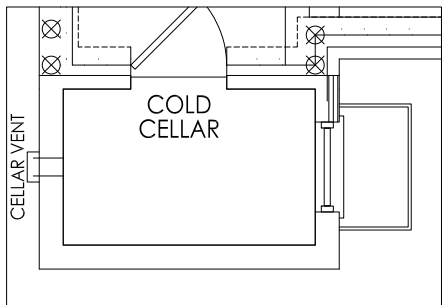
For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.

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).

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.



BASEMENT FLOOR ELEV. 'B'



BASEMENT FLOOR ELEV. 'C'

CSA-F280-12

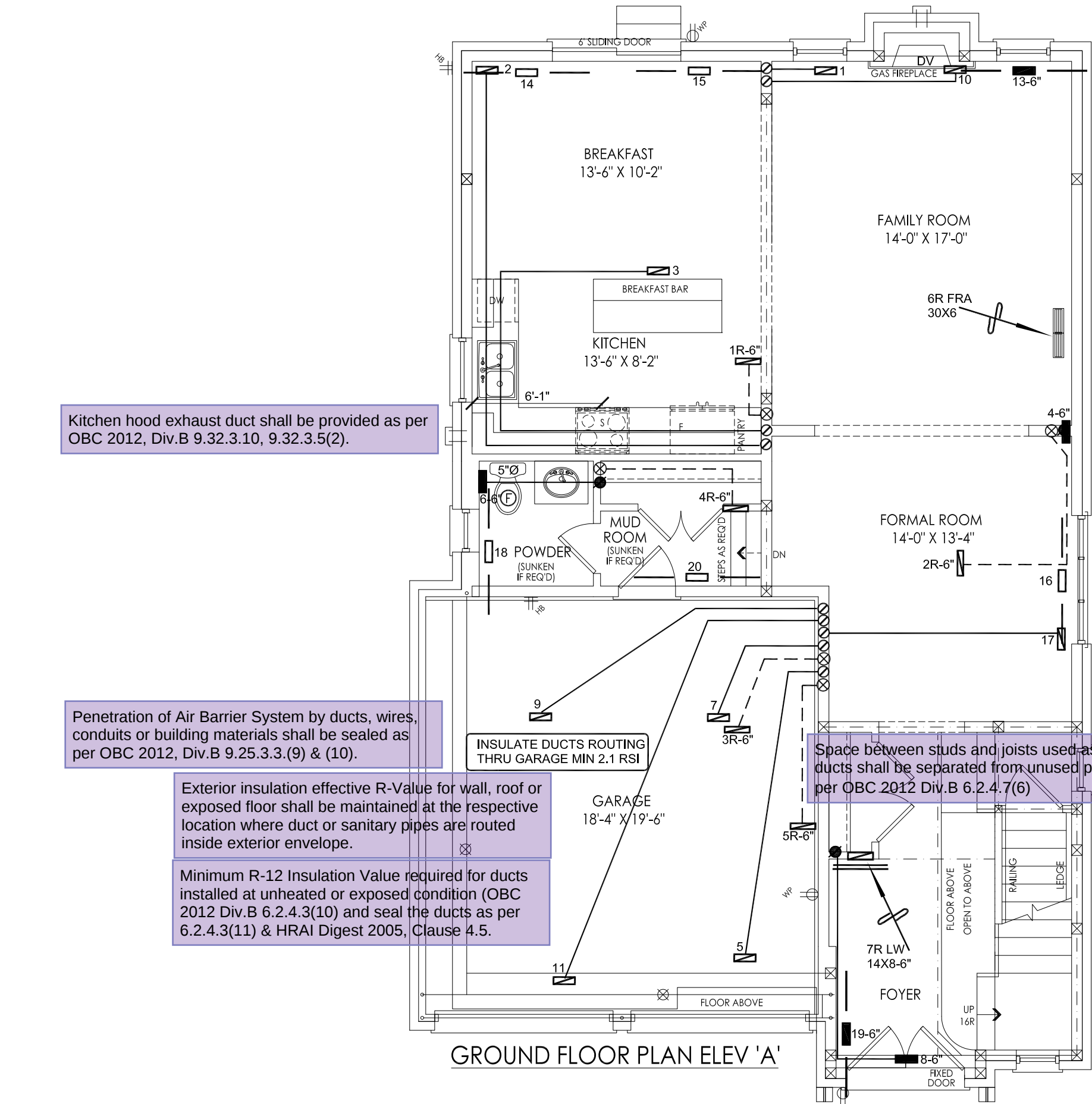
SB-12 PERFORMANCE

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

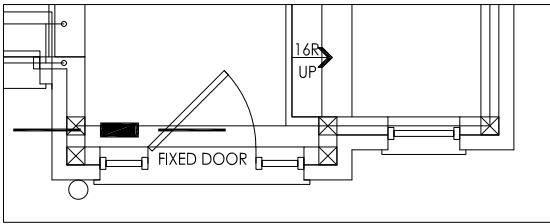
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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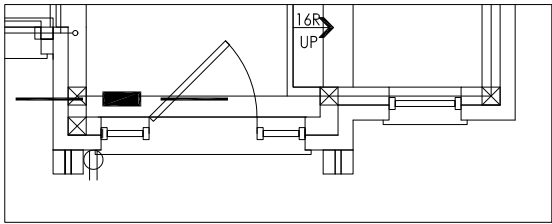
Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 42930 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title BASEMENT HEATING LAYOUT		
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			MAKE CARRIER		3RD FLOOR				Date SEPT/2020		
			MODEL 59TN6A-060-14V		2ND FLOOR						
			INPUT 60 MBTU/H		1ST FLOOR						
38-9		2444 sqft		OUTPUT 58 MBTU/H		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A				Scale 3/16" = 1'-0"	
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.		COOLING 2.5 TONS		FAN SPEED 970 cfm @ 0.6" w.c.				BCIN# 19669			
								LO# 87610			



GROUND FLOOR PLAN ELEV 'A'



GROUND FLOOR PLAN ELEV 'B'



GROUND FLOOR PLAN ELEV 'C'

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
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CSA-F280-12

SB-12 PERFORMANCE

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Client
ROYAL PINE HOMES

Project Name
**CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO**

38-9 2444 sqft

375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
Web: www.hvacdsgns.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.

08/10/2021

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Per: danielle.devitt

Sheet Title
**FIRST FLOOR
HEATING
LAYOUT**

Date
SEPT/2020

Scale
3/16" = 1'-0"

BCIN# 19669

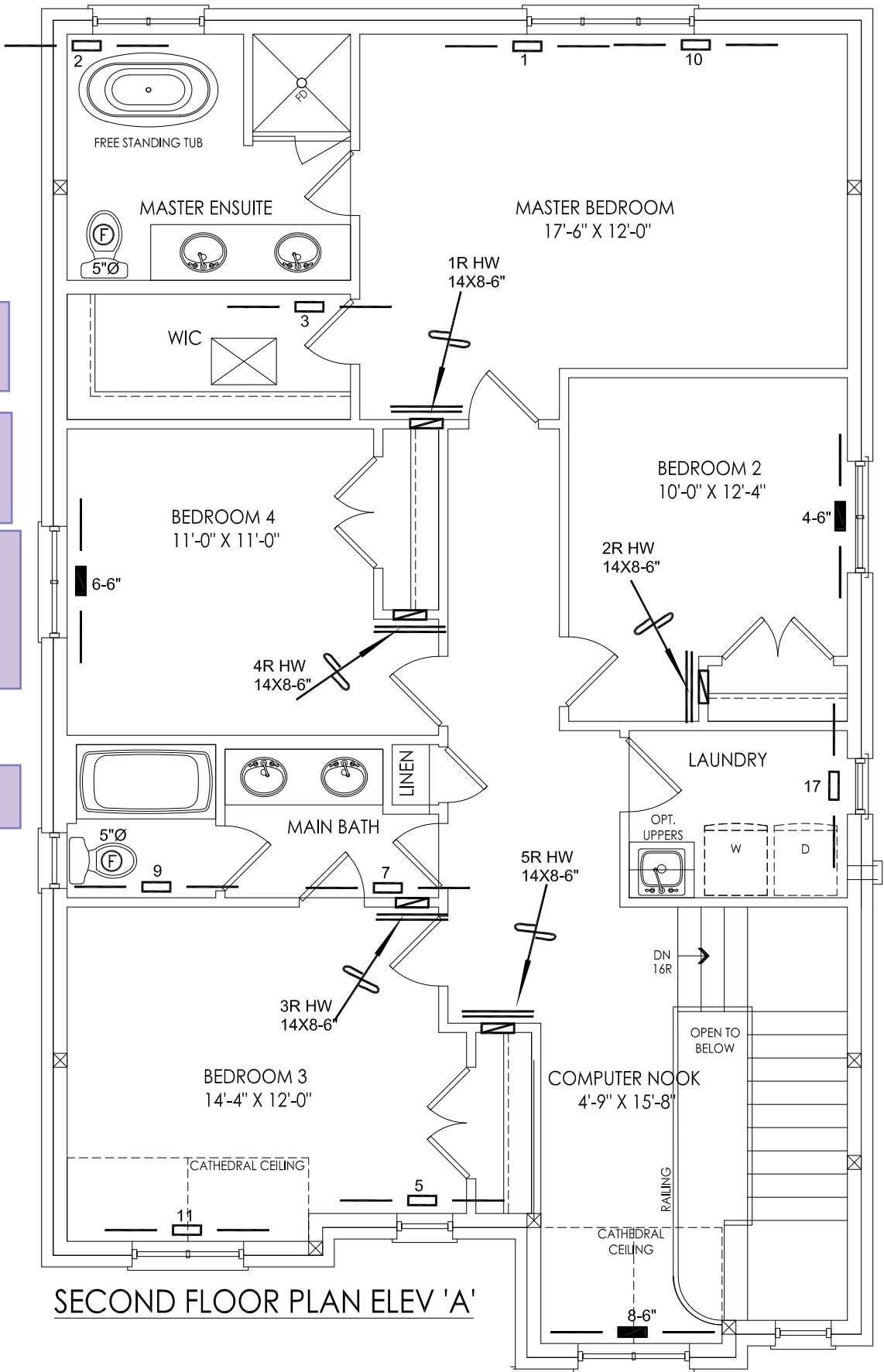
LO# **87610**

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)

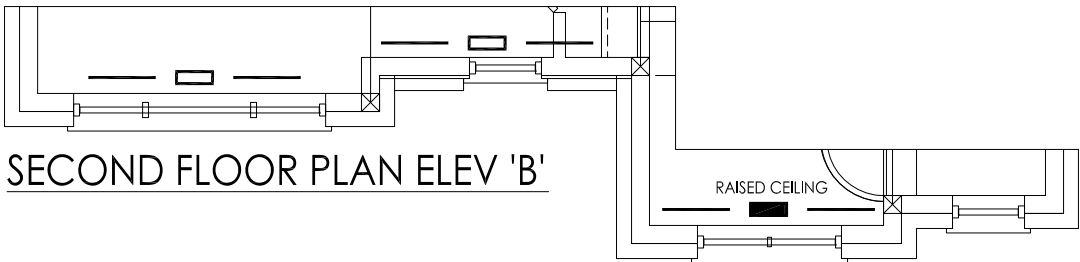
Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

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.

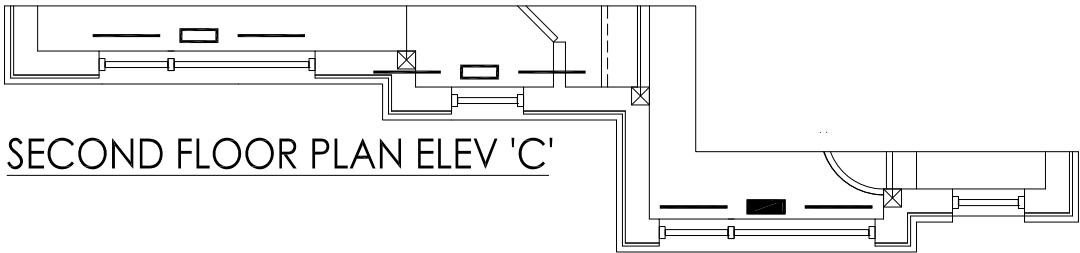
Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).



SECOND FLOOR PLAN ELEV 'A'



SECOND FLOOR PLAN ELEV 'B'



SECOND FLOOR PLAN ELEV 'C'

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CSA-F280-12

SB-12 PERFORMANCE

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Sheet Title
**SECOND FLOOR
HEATING
LAYOUT**

Date
SEPT/2020

Scale
3/16" = 1'-0"

BCIN# 19669

LO# **87610**