

SITE NAME: TRINIGROUP		BUILDER: GREENPARK HOMES		TYPE: CAROL 12		GFA: 3214		DATE: Feb-24 LO# 101171		WINTER NATURAL AIR CHANGE RATE 0.352		HEAT LOSS ΔT °F. 78		CSA-F280-12	
										SUMMER NATURAL AIR CHANGE RATE 0.110		HEAT GAIN ΔT °F. 13		SB-12 PACKAGE A1	
ROOM USE	EXP. WALL	CLG. HT.	FACTORS	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-2	ENS-3	LOFT	ENS-4		
				35	28	0	18	24	17	8	16	20	12		
				9	9	9	9	9	9	9	9	9	9		
GRS.WALL AREA	LOSS	GAIN		315	252	0	162	216	153	72	144	180	108		
GLAZING	LOSS	GAIN		LOSS	GAIN	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS		
NORTH	21.8	16.0	0	0	0	0	0	0	0	8	174	128	0	0	0
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	0	0	0	23	501	573	0	0	0	0	12	261	499
WEST	21.8	41.6	36	784	1496	18	392	748	0	0	0	0	0	0	0
SKYLT.	38.1	101.5	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	20.5	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.6	0.8	279	1275	210	211	964	159	0	0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	305	401	179	212	279	125	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS				0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS				2460		2136		1387		926		1263		1099	
SUB TOTAL HT GAIN					1885		1604		1018		717		530		780
LEVEL FACTOR / MULTIPLIER	0.20	0.30		0.20	0.30	0.20	0.30	0.20	0.30	0.20	0.30	0.20	0.30	0.20	0.30
AIR CHANGE HEAT LOSS				728		632		410		274		374		325	
AIR CHANGE HEAT GAIN					119		101		35		19		45		33
DUCT LOSS				0		0		0		120		172		0	
DUCT GAIN				0		0		0		0		0		0	
HEAT GAIN PEOPLE	240		2	480	0	0	0	1	240	1	240	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				711		0		711		711		711		0	
TOTAL HT LOSS BTU/H				3187		2768		1797		1320		1636		1424	
TOTAL HT GAIN x 1.3 BTU/H				4152		2216		2011		448		1090		1656	



City of Richmond Hill
Building Division

HVAC REVIEWED

Initials: **PXV**

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	LV/DN	FML	KT/BT	OFFICE	LAUN	PWD	FOY	MUD			WOD	BAS
				27	36	38	37	17	16	12	12			47	198
				10	10	10	10	10	10	10	10			9	9
GRS.WALL AREA	LOSS	GAIN		270	360	380	370	170	160	120	120			423	1329
GLAZING	LOSS	GAIN		LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS			LOSS	LOSS
NORTH	21.8	16.0	0	0	0	0	0	9	196	144	0	0	0	0	0
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	70	1525	1743	28	610	697	0	0	0	0	0	0	0
WEST	21.8	41.6	0	0	0	32	697	1330	66	1438	2742	0	0	0	0
SKYLT.	38.1	101.5	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	20.5	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.6	0.8	200	914	150	300	1371	225	314	1434	236	258	1179	194	161
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	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	0	0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0	0	0	0	0	0	0	0			0	0
SLAB ON GRADE HEAT LOSS				0	0	0	0	0	0	0	0			0	0
SUBTOTAL HT LOSS				2439		2678		2872		1244		867		1166	
SUB TOTAL HT GAIN					1893		2252		2978		143		631		508
LEVEL FACTOR / MULTIPLIER	0.30	0.42		0.30	0.42	0.30	0.42	0.30	0.42	0.30	0.42		0.30	0.42	0.50
AIR CHANGE HEAT LOSS				1030		1131		1214		525		366		10813	
AIR CHANGE HEAT GAIN					119		142		188		9		40		61
DUCT LOSS				0		0		0		0		0		0	
DUCT GAIN				0		0		0		0		0		0	
HEAT GAIN PEOPLE	240		0	0	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				0		0		711		711		711		711	
TOTAL HT LOSS BTU/H				3469		3809		4086		1769		1234		1166	
TOTAL HT GAIN x 1.3 BTU/H				2616		3112		5040		872		1121		595	

TOTAL HEAT GAIN BTU/H: 41976

TONS: 3.50

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 62466

TOTAL COMBINED HEAT LOSS BTU/H: 64136

05/01/2024

SITE NAME: TRINIGROUP
BUILDER: GREENPARK HOMES

TYPE: CAROL 12

DATE: Feb-24

GFA: 3214 LO# 101171

HEATING CFM 1504 COOLING CFM 1504
TOTAL HEAT LOSS 62,466 TOTAL HEAT GAIN 41,702
AIR FLOW RATE CFM 24.08 AIR FLOW RATE CFM 36.07furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure
for s/a & r/a 0.35#*GOODMAN
GMEC960804CNA
FAN SPEED 80AFUE = 96 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 76,800

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	12	5
R/A	0	0	6	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 0.15LOW 868
MEDLOW 978
MEDIUM 1112
MEDIUM HIGH 1504
HIGH 1615DESIGN CFM = 1504
CFM @ .6" E.S.P.

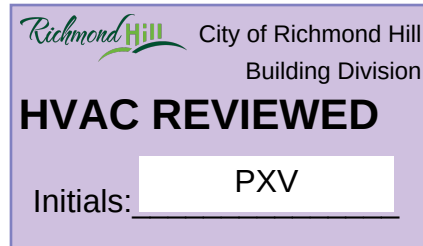
TEMPERATURE RISE 47 °F

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

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

RUN #	1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-2	BED-3	BED-4	ENS-2	ENS-3	LOFT	MBR	ENS-4	LV/DN	FML	KT/BT	KT/BT	OFFICE	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.59	2.77	1.80	1.80	0.97	1.32	1.89	1.64	1.59	1.42	1.73	1.90	2.04	2.04	2.56	1.33	1.04	1.77	1.23	4.21	4.21	4.21	4.21
CFM PER RUN HEAT	38	67	43	43	23	32	45	39	38	34	42	46	49	49	62	32	25	43	30	101	101	101	101
RM GAIN MBH.	2.08	2.22	2.01	2.15	1.32	0.45	1.09	1.66	2.08	1.08	1.31	1.56	2.52	2.52	2.81	1.29	0.17	0.87	1.12	0.45	0.45	0.45	0.45
CFM PER RUN COOLING	75	80	73	78	48	16	39	60	75	39	47	56	91	91	101	47	6	31	40	16	16	16	16
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	28	41	48	56	37	52	62	54	36	53	26	33	17	26	52	40	38	44	33	19	20	12	21
EQUIVALENT LENGTH	130	150	230	190	180	120	230	200	160	150	160	130	110	120	110	180	140	130	150	140	80	120	150
TOTAL EFFECTIVE LENGTH	158	191	278	246	217	172	292	254	196	203	186	163	127	146	162	220	178	174	183	159	100	132	171
ADJUSTED PRESSURE	0.11	0.09	0.06	0.07	0.08	0.1	0.06	0.07	0.09	0.08	0.09	0.11	0.13	0.11	0.1	0.08	0.1	0.1	0.09	0.1	0.16	0.12	0.09
ROUND DUCT SIZE	5	5	6	6	5	4	5	5	5	5	5	5	6	6	6	5	4	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	279	492	219	219	169	367	330	286	279	250	308	338	250	250	316	235	287	493	344	515	515	515	515
COOLING VELOCITY (ft/min)	551	587	372	398	352	184	286	441	551	286	345	411	464	464	515	345	69	356	459	82	82	82	82
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	C	D	B	C	D	D	A	C	C	A	A	A	D	C	D	D	C	A	B	B	C

RUN #	25	26	27	28	29	30
ROOM NAME	BAS	BED-3	BED-4	OFFICE	FML	LV/DN
RM LOSS MBH.	4.21	1.80	0.97	2.56	1.90	1.73
CFM PER RUN HEAT	101	43	23	62	46	42
RM GAIN MBH.	0.45	2.15	1.32	2.81	1.56	1.31
CFM PER RUN COOLING	16	78	48	101	56	47
ADJUSTED PRESSURE	0.16	0.17	0.17	0.16	0.17	0.17
ACTUAL DUCT LGH.	44	59	60	54	25	36
EQUIVALENT LENGTH	120	200	180	110	90	120
TOTAL EFFECTIVE LENGTH	164	259	240	164	115	156
ADJUSTED PRESSURE	0.1	0.07	0.07	0.1	0.15	0.11
ROUND DUCT SIZE	6	6	5	6	5	4
HEATING VELOCITY (ft/min)	515	219	169	316	338	482
COOLING VELOCITY (ft/min)	82	398	352	515	411	539
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	3X10	3X10
TRUNK	D	D	C	D	B	C



SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	321	0.09	8.9	10	x 8	578	TRUNK G	0	0.00	0	0 x 8
TRUNK B	659	0.08	12	16	x 8	741	TRUNK H	0	0.00	0	0 x 8
TRUNK C	842	0.06	14.1	24	x 8	632	TRUNK I	0	0.00	0	0 x 8
TRUNK D	463	0.06	11.3	16	x 8	521	TRUNK J	0	0.00	0	0 x 8
TRUNK E	0	0.00	0	0	x 8	0	TRUNK K	0	0.00	0	0 x 8
TRUNK F	0	0.00	0	0	x 8	0	TRUNK L	0	0.00	0	0 x 8

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (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	1504	0.05	18.4	32 x 10	677
TRUNK Y	480	0.05	12	16 x 8	540
TRUNK Z	250	0.05	9.4	10 x 8	450
DROP	1504	0.05	18.4	32 x 14	645

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	128	115	115	135	115	135	393	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	33	69	67	43	65	42	22	43	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	195	215	255	240	230	205	155	235	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	228	284	322	283	295	247	177	278	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.05	0.05	0.05	0.05	0.06	0.08	0.05	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	7	7	7	7.5	7	7	9.9	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

RECEIVED
Per: joshua.nabua

TYPE: CAROL 12
SITE NAME: TRINIGROUP

LO # 101171

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		9.32.3.1(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>6</u> @ 10.6 cfm <u>63.6</u> cfm		
Other Rooms	<u>4</u> @ 10.6 cfm <u>42.4</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 V150H
Location:	BSMT
<u>79.5</u> cfm	☒ HVI Approved

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

BY INSTALLING CONTRACTOR			
Model	cfm	HVI	Sones
BY INSTALLING CONTRACTOR	<u>50</u>	☒	<u>3.5</u>
BY INSTALLING CONTRACTOR	<u>50</u>	☒	<u>3.5</u>
BY INSTALLING CONTRACTOR	<u>50</u>	☒	<u>3.5</u>
BY INSTALLING CONTRACTOR	<u>50</u>	☒	<u>3.5</u>

HEAT RECOVERY VENTILATOR		9.32.3.11.	
Model:	VANEE V150H		
<u>150</u> cfm high	<u>35</u> cfm low		
<u>75</u> % Sensible Efficiency	☒ HVI Approved		
@ 32 deg F (0 deg C)			

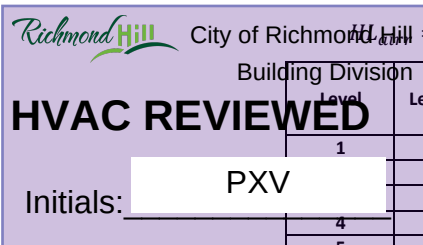
LOCATION OF INSTALLATION	
Lot:	Concession
Township	Plan:
Address	
Roll #	Building Permit #

BUILDER:	
GREENPARK 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:	February-24

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'ROURKECITY OF RICHMOND HILL
BUILDING DIVISION
05/01/2024
RECEIVED
Per: joshua.nabua

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																							
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																							
LO#: 101171		Model: CAROL 12		Builder: GREENPARK HOMES																																																			
				Date: 2/14/2024																																																			
Volume Calculation			Air Change & Delta T Data																																																				
House Volume			<table border="1" style="width: 100%;"><tr><td>WINTER NATURAL AIR CHANGE RATE</td><td>0.352</td></tr><tr><td>SUMMER NATURAL AIR CHANGE RATE</td><td>0.110</td></tr></table>			WINTER NATURAL AIR CHANGE RATE	0.352	SUMMER NATURAL AIR CHANGE RATE	0.110																																														
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SUMMER NATURAL AIR CHANGE RATE	0.110																																																						
<table border="1" style="width: 100%;"><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>1523</td><td>9</td><td>13707</td></tr><tr><td>First</td><td>1523</td><td>10</td><td>15230</td></tr><tr><td>Second</td><td>1691</td><td>9</td><td>15219</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>44,156.0 ft³</td></tr><tr><td colspan="3" style="text-align: right;">Total:</td><td>1250.4 m³</td></tr></tbody></table>	Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)	Bsmt	1523	9	13707	First	1523	10	15230	Second	1691	9	15219	Third	0	9	0	Fourth	0	9	0	Total:			44,156.0 ft ³	Total:			1250.4 m ³	<table border="1" style="width: 100%;"><thead><tr><th colspan="5">Design Temperature Difference</th></tr><tr><th></th><th>Tin °C</th><th>Tout °C</th><th>ΔT °C</th><th>ΔT °F</th></tr></thead><tbody><tr><td>Winter DTDh</td><td>22</td><td>-21</td><td>43</td><td>78</td></tr><tr><td>Summer DTDc</td><td>24</td><td>31</td><td>7</td><td>13</td></tr></tbody></table>			Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)																																																				
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																				
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.352 x 347.32 x 43 °C x 1.2 = 6338 W = 21627 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ 0.110 x 347.32 x 7 °C x 1.2 = 325 W = 1110 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)																																																							
 Initials: PXV $HL_{airbv} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$<table border="1" style="width: 100%;"><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">21,627</td><td>10,250</td><td>1.055</td></tr><tr><td></td><td>0.3</td><td>15,355</td><td>0.423</td></tr><tr><td></td><td>0.2</td><td>14,616</td><td>0.296</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>						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	21,627	10,250	1.055		0.3	15,355	0.423		0.2	14,616	0.296	4	0	0	0.000	5	0	0	0.000																								
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*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																							

Michael O'Rourke
BCIN# 19669

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

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Per: joshua.nabua

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: CAROL 12	BUILDER: GREENPARK HOMES
SFQT: 3214	SITE: TRINIGROUP
LO# 101171	

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
		WINDOW SHGC	0.50

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	44156.0	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:	6.0 ft
LENGTH: 62.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	198.0 ft


 City of Richmond Hill
Building Division

2012 OBC - COMPLIANCE PACKAGE

HVAC REVIEWED

Component

Initials:

PXV

Compliance Package A1

Nominal	Min. Eff.
---------	-----------

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	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	0.28	-
Skylights Maximum U-Value	0.49	-
Space Heating Equipment Minimum AFUE	96%	-
HRV/ERV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE



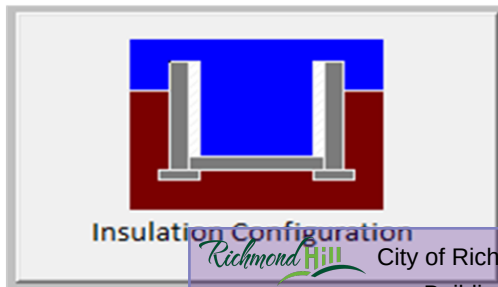
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BUILDING DIVISION

05/01/2024

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Per: joshua.nabua

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):	18.9	
Floor Width (m):	11.3	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.0	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	Initials: PXV
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		2027

TYPE: CAROL 12
LO# 101171

Michael O'Rourke BCIN #19669

CITY OF RICHMOND HILL
BUILDING DIVISION

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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):	7.62			
Building Configuration		HVAC REVIEWED		
Type:	Detached	Initials: <u>PXV</u>		
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1250.4			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1666.8 cm ²		
	3.57	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):	0.352			
Cooling Air Leakage Rate (ACH/H):	0.110			

TYPE: CAROL 12

LO# 101171

Michael O'Rourke BCIN# 19669

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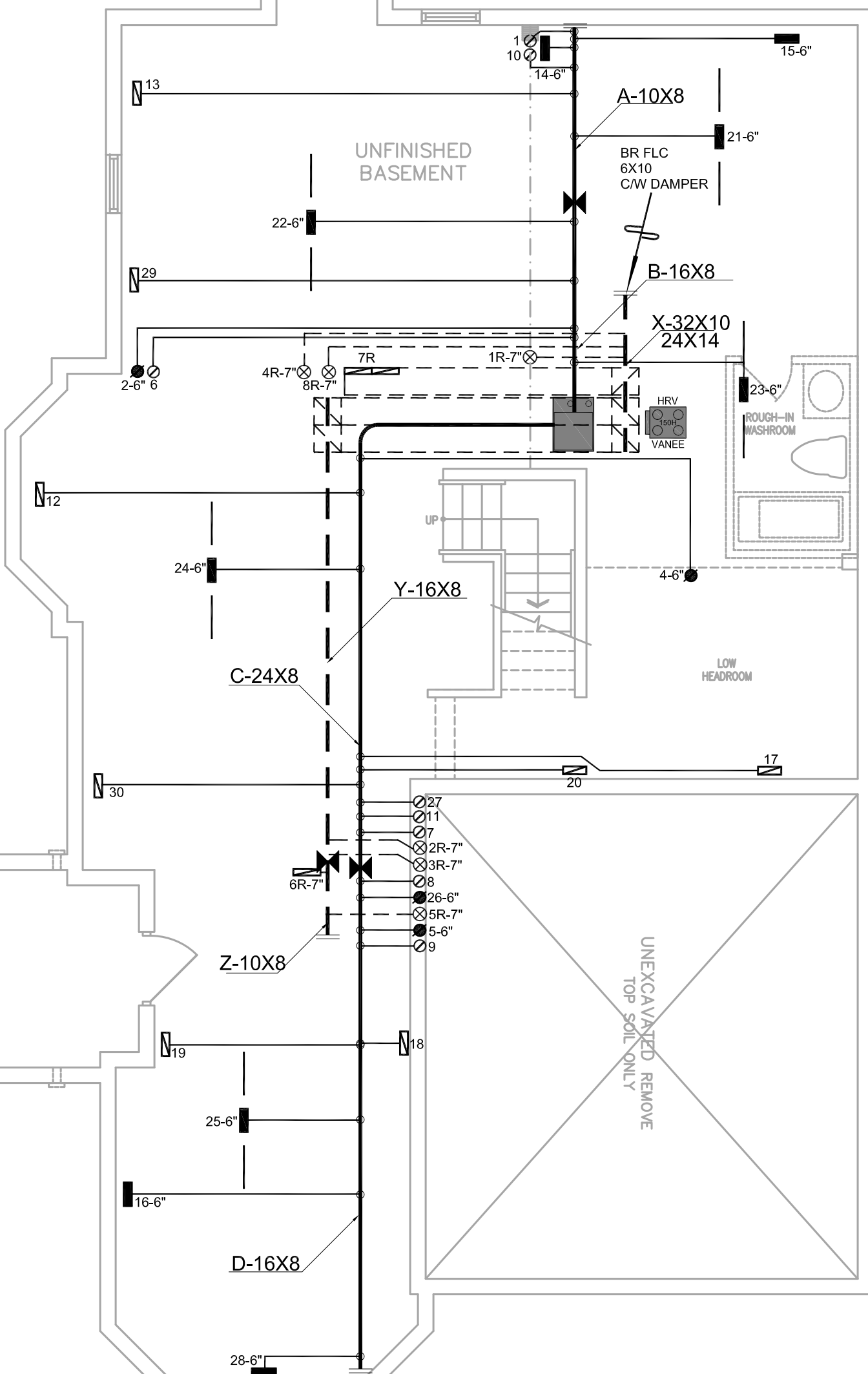
INSTALLATION TO COMPLY WITH THE LATEST ONTARIO BUILDING CODE. ALL SUPPLY BRANCH OUTLETS SHALL BE EQUIPPED WITH MANUAL BALANCING DAMPER, DUCTWORK WHICH PASSES THROUGH THE GARAGE OR UNHEATED SPACES SHALL BE ADEQUATELY INSULATED AND GAS-PROOFED

ALL S/A DIFFUSERS "4x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"X UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

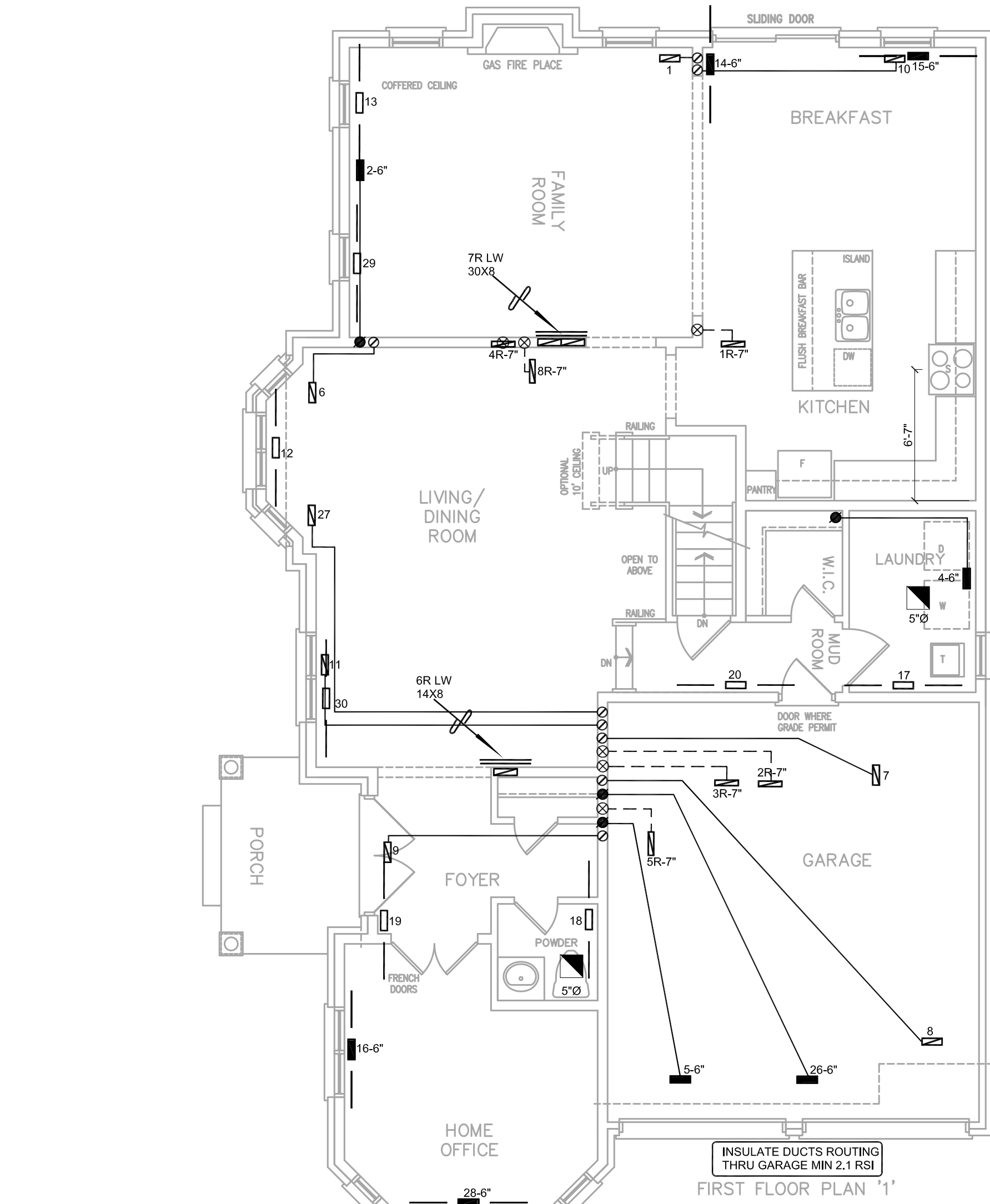
SUPPLEMENTAL EXHAUST FAN (MINIMUM 100 CFM) DISCHARGING DIRECTLY TO THE EXTERIOR WILL BE PROVIDED IN THE KITCHEN. EXHAUST DUCTS SERVING THE KITCHEN SHALL NOT BE SMALLER THAN RECOMMENDED BY THE MANUFACTURER OF THE FANS AND MUST AT LEAST MEET O.B.C. STATED MINIMUMS.

PARTIAL BASEMENT PLAN
FOR DECK CONDITION

City of Richmond Hill
Building Division
HVAC REVIEWED
Initials: PXV

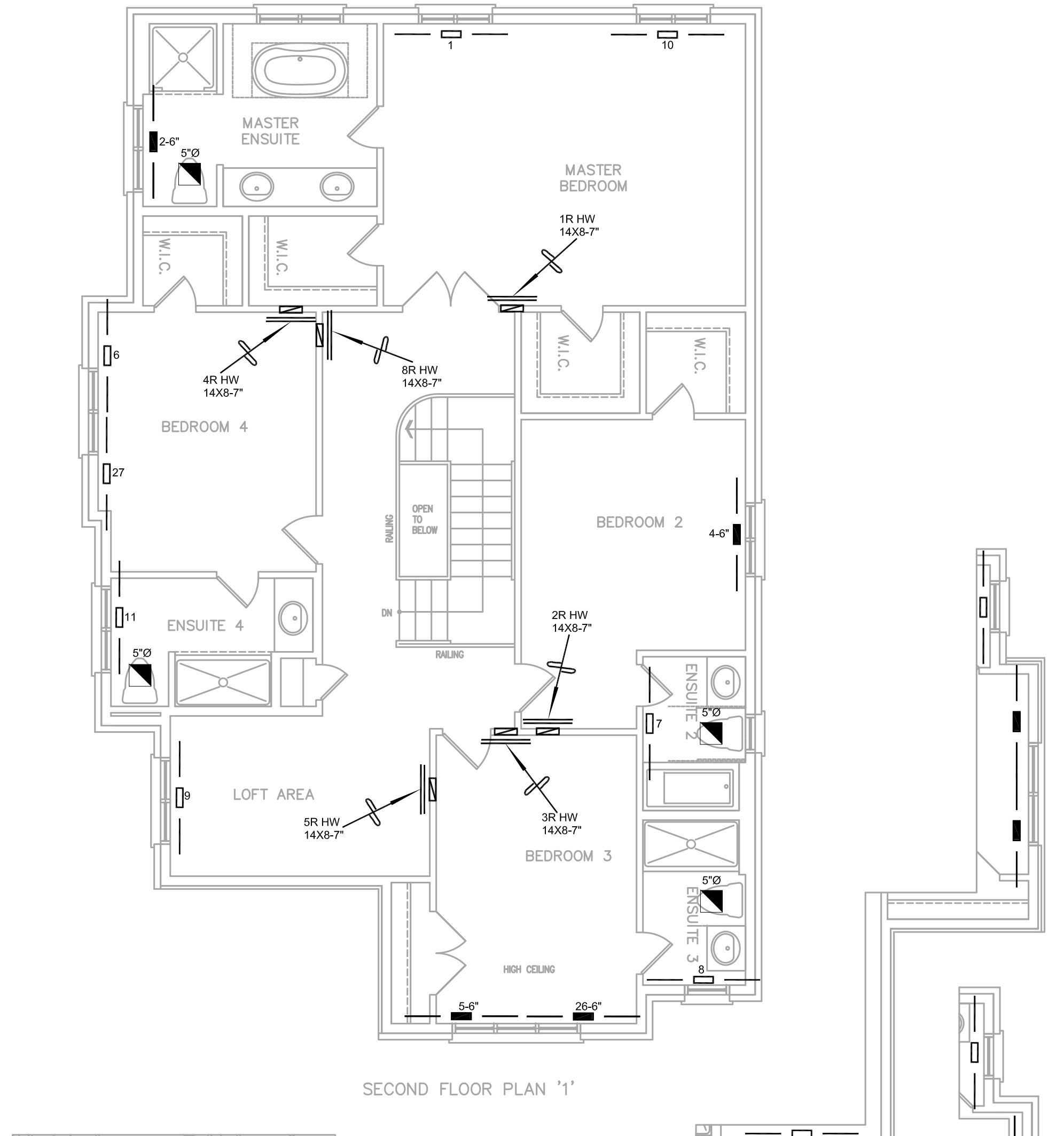


13. Exterior insulation effective R-value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.
14. Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7
- Return air inlet should be 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.
15. 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.



FIRST FLOOR PLAN '2'

FIRST FLOOR PLAN '3'



SECOND FLOOR PLAN '3'

SECOND FLOOR PLAN '2'

BASEMENT FLOOR PLAN '2'

BASEMENT FLOOR PLAN '3'

1. Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).
2. Kitchen hood exhaust duct shall be provided as per OBC 2012, Div.B 9.32.3.10, 9.32.3.5(2)
3. 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.
4. 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).
5. Volume control dampers to all branches to be installed per OBC 2012, Div.B. 6.2.4.5.
6. 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)
7. Combustion air supply shall be provided to the furnace and hot water tank.
8. 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)
9. HRV duct connection shall be in compliance with OBC 2012 Div.B 9.32.3.6(3) & 9.32.3.4(7).
10. 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).

HEAT LOSS 64136 BTU/H UNIT DATA	# OF RUNS	S/A	R/A	FANS
MAKE GOODMAN	3RD FLOOR			
MODEL GMCE960804CNA	2ND FLOOR	12	6	4
INPUT 80 MBTU/H	1ST FLOOR	12	2	3
OUTPUT 76.8 MBTU/H	BASEMENT	5	1	0
COOLING 3.5 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			
FAN SPEED 1504 cfm @ 0.6" w.c.				

HVAC LEGEND	
	SUPPLY AIR GRILLE
	SUPPLY AIR GRILLE 6" BOOT
	LINEAR BAR or LINEAR SLOT GRILLE
	SUPPLY AIR BOOT ABOVE
	6" SUPPLY AIR BOOT ABOVE
	SUPPLY AIR STACK
	6" SUPPLY AIR STACK
	14X8 RETURN AIR GRILLE
	30X8 RETURN AIR GRILLE
	FLOOR RETURN AIR GRILLE
	RETURN STACK ABOVE
	RETURN AIR STACK
	REDUCER
	SUPPLY DUCTWORK
	RETURN DUCTWORK
	FLEX DUCT
	EXHAUST FAN
	LINT TRAP by REVERSOMATIC
	DIRECT VENT
	LOW WALL
	HIGH WALL
	CEILING
	Z.D. MOTORIZED ZONE DAMPER
	M.D. MOTORIZED DAMPER
	EXHAUST PIPE
	CONCENTRIC VENT KIT
	CONCENTRIC HRV or ERV VENT KIT
	SINGLE WALL BOX by REVERSOMATIC
	DOUBLE WALL BOX by REVERSOMATIC
	TRIPLE WALL BOX by REVERSOMATIC
	DRYER BOOSTER FAN

2	ISSUED FOR PERMIT	DEC. 12/3	0
1	Revision	Date	By

SB-12 PACKAGE

A1

Michael O'Rourke has reviewed and taken responsibility for the design work and is qualified under division C.2.2 of this building code.
Michael O'Rourke BDB # 19889
HVAC Designer Ltd.

HVACDESIGNS LTD.

375 Finley Ave - Unit 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

Client: GREENPARK HOMES

Project Name: TRINIGROUP
RICHMOND HILL, ONTARIO

CAROL 12

3214 SQFT

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Sheet Title: ALL FLOOR HEATING LAYOUT

Drawn By: YV Checked By: MO

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

Date: JANUARY 2023

LG # 101171

3

3

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