

SITE NAME: TRINIGROUP

BUILDER: GREENPARK HOMES

TYPE: VILLA 12

GFA: 2787

DATE: Nov-23

LO# 103223

WINTER NATURAL AIR CHANGE RATE 0.380

HEAT LOSS ΔT °F. 78

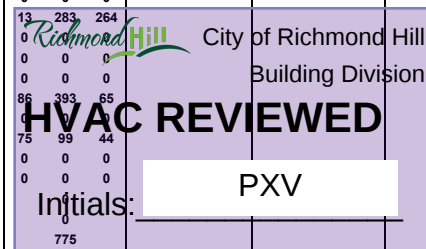
CSA-F280-12

SUMMER NATURAL AIR CHANGE RATE 0.118

HEAT GAIN ΔT °F. 13

SB-12 PACKAGE A1

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	S-BATH	HALL	ENS-4
			32	26	5	30	34	17	5	8	11
			9	9	9	9	9	9	9	9	9
FACTORS											
GRS.WALL AREA	LOSS	GAIN	288	234	45	270	306	153	45	72	99
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	13.3	0	0	0	7	152	93	0	0	0
EAST	21.8	33.4	0	0	0	0	0	0	11	240	368
SOUTH	21.8	20.3	24	523	488	0	0	0	0	0	0
WEST	21.8	33.4	24	523	802	24	523	802	0	0	0
SKYL.T.	38.1	101.5	0	0	0	0	0	0	0	0	0
DOORS	20.5	3.4	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.6	0.8	240	1096	180	203	927	153	34	155	26
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	278	365	163	156	205	92	63	83	37
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	81	211	35
BASEMENT/CRAWL HEAT LOSS			0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			2507	1808	288	2604	3103	1696	713	1051	775
SUB TOTAL HT GAIN			1634	1139	71	1517	2514	1083	476	445	373
LEVEL FACTOR / MULTIPLIER	0.20	0.26	0.20	0.26	0.20	0.26	0.20	0.26	0.20	0.26	0.20
AIR CHANGE HEAT LOSS			662	477	76	687	819	447	188	277	204
AIR CHANGE HEAT GAIN			99	69	4	92	153	66	29	27	23
DUCT LOSS			0	0	0	329	0	0	90	133	0
DUCT GAIN			0	0	0	249	0	0	50	47	0
HEAT GAIN PEOPLE	240	2	480	0	0	1	240	1	240	0	0
HEAT GAIN APPLIANCES/LIGHTS			645	0	0	645	645	645	0	0	0
TOTAL HT LOSS BTU/H			3169	2285	364	3620	3922	2143	991	1461	979
TOTAL HT GAIN x 1.3 BTU/H			3716	1571	98	3567	4618	2645	721	675	514



ROOM USE	EXP. WALL	CLG. HT.	H-OFF	DIN	KT/BF	FAM	LAUN	PWD	FOY	MUD	WOB	BAS
			36	17	38	33	7	9	26	23	40	142
			10	10	10	10	9	10	10	10	9	9
FACTORS												
GRS.WALL AREA	LOSS	GAIN	360	170	380	330	63	90	260	230	360	852
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	21.8	13.3	0	0	0	0	0	0	0	0	0	0
EAST	21.8	33.4	44	958	1470	0	0	0	0	0	0	0
SOUTH	21.8	20.3	44	958	895	48	1046	976	0	0	0	0
WEST	21.8	33.4	0	0	0	53	1155	1771	28	610	936	0
SKYL.T.	38.1	101.5	0	0	0	0	0	0	0	0	0	0
DOORS	20.5	3.4	0	0	0	10	205	34	0	0	0	0
NET EXPOSED WALL	4.6	0.8	272	1243	204	122	557	92	307	1403	231	270
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	71	93	42	0
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			3160	1603	2980	2541	502	687	1918	1386	503	1424
SUB TOTAL HT GAIN			2569	1068	2169	1789	177	381	684	228	2459	490
LEVEL FACTOR / MULTIPLIER	0.30	0.42	0.30	0.42	0.30	0.42	0.20	0.26	0.30	0.42	0.30	0.42
AIR CHANGE HEAT LOSS			1318	669	1244	1060	132	287	800	578	800	578
AIR CHANGE HEAT GAIN			156	65	132	109	11	23	42	14	42	14
DUCT LOSS			0	0	0	0	0	0	0	0	0	0
DUCT GAIN			0	0	0	0	0	0	0	0	0	0
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS			645	645	645	645	645	645	0	0	0	0
TOTAL HT LOSS BTU/H			4478	2272	4224	3601	634	973	2718	1964	3301	14471
TOTAL HT GAIN x 1.3 BTU/H			4382	2311	3830	3306	1083	525	943	314	3197	1709

TOTAL HEAT GAIN BTU/H:

40002

TONS: 3.33

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 57570

TOTAL COMBINED HEAT LOSS BTU/H: 59240

SITE NAME: TRINIGROUP

BUILDER: GREENPARK HOMES

TYPE: VILLA 12

DATE: Nov-23

GFA: 2787

LO# 103223

HEATING CFM 1298 COOLING CFM 1298
TOTAL HEAT LOSS 57,570 TOTAL HEAT GAIN 39,727
AIR FLOW RATE CFM 22.55 AIR FLOW RATE CFM 32.67

furnace pressure 0.7
furnace filter 0.14
a/c coil pressure 0.26
available pressure
for s/a & r/a 0.30

#*GOODMAN
GMEC960804CNA
FAN SPEED 80

AFUE = 96 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 76,800

DESIGN CFM = 1298
CFM @ .7" E.S.P.

TEMPERATURE RISE 55 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	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	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	S-BATH	HALL	BED-2	MBR	ENS-4	H-OFF	DIN	KT/BF	KT/BF	FAM	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.58	1.14	0.36	1.81	1.96	2.14	0.99	1.46	1.81	1.58	0.98	2.24	2.27	2.11	2.11	1.80	0.63	0.97	2.72	1.96	3.55	3.55	3.55	3.55
CFM PER RUN HEAT	36	26	8	41	44	48	22	33	41	36	22	50	51	48	48	41	14	22	61	44	80	80	80	80
RM GAIN MBH.	1.86	0.79	0.10	1.78	2.31	2.64	0.72	0.68	1.78	1.86	0.51	2.19	2.31	1.91	1.91	1.65	1.08	0.53	0.94	0.31	0.98	0.98	0.98	0.98
CFM PER RUN COOLING	61	26	3	58	75	86	24	22	58	61	17	72	76	63	63	54	35	17	31	10	32	32	32	32
ADJUSTED PRESSURE	0.15	0.15	0.15	0.15	0.15	0.14	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.	31	45	25	52	52	38	47	38	55	28	46	44	18	18	26	29	38	38	31	39	38	35	13	23
EQUIVALENT LENGTH	150	180	140	160	190	140	130	140	180	130	160	130	130	110	110	130	130	150	150	110	140	150	90	90
TOTAL EFFECTIVE LENGTH	181	225	165	212	242	178	177	178	235	158	206	174	148	128	136	159	168	188	181	149	178	185	103	113
ADJUSTED PRESSURE	0.08	0.06	0.09	0.07	0.06	0.08	0.08	0.08	0.06	0.09	0.07	0.08	0.1	0.11	0.11	0.09	0.09	0.08	0.08	0.1	0.08	0.08	0.14	0.13
ROUND DUCT SIZE	5	4	4	6	6	6	4	4	6	5	4	5	5	5	5	5	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	264	298	92	209	224	245	252	379	209	264	252	367	374	352	352	301	161	252	448	505	408	408	408	408
COOLING VELOCITY (ft/min)	448	298	34	296	382	438	275	252	296	448	195	529	558	463	463	396	402	195	228	115	163	163	163	163
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	E	D	E	B	A	C	B	B	B	E	B	A	C	D	D	D	C	A	B	C	D	D	E	C

RUN #	25	26	27	28	29
ROOM NAME	BAS	BED-3	H-OFF	FAM	ENS
RM LOSS MBH.	3.55	1.96	2.24	1.80	1.14
CFM PER RUN HEAT	80	44	50	41	26
RM GAIN MBH.	0.98	2.31	2.19	1.65	0.79
CFM PER RUN COOLING	32	75	72	54	26
ADJUSTED PRESSURE	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	46	58	45	19	45
EQUIVALENT LENGTH	120	190	130	80	140
TOTAL EFFECTIVE LENGTH	166	248	175	99	185
ADJUSTED PRESSURE	0.09	0.06	0.08	0.15	0.08
ROUND DUCT SIZE	6	6	5	5	4
HEATING VELOCITY (ft/min)	408	224	367	301	298
COOLING VELOCITY (ft/min)	163	382	529	396	298
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10
TRUNK	A	A	A	E	D

Richmond Hill City of Richmond Hill
Building Division
HVAC REVIEWED
Initials: PXV

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	290	0.06	9.5	12	x	8	435	TRUNK G	0	0.00	0	0	8
TRUNK B	510	0.06	11.7	18	x	8	510	TRUNK H	0	0.00	0	0	8
TRUNK C	747	0.06	13.5	24	x	8	560	TRUNK I	0	0.00	0	0	8
TRUNK D	349	0.06	10.2	12	x	8	524	TRUNK J	0	0.00	0	0	8
TRUNK E	550	0.06	12	16	x	8	619	TRUNK K	0	0.00	0	0	8
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	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
TRUNK P	0	0.05	0	0	x	8
TRUNK Q	0	0.05	0	0	x	8
TRUNK R	0	0.05	0	0	x	8
TRUNK S	0	0.05	0	0	x	8
TRUNK T	0	0.05	0	0	x	8
TRUNK U	0	0.05	0	0	x	8
TRUNK V	0	0.05	0	0	x	8
TRUNK W	0	0.05	0	0	x	8
TRUNK X	1298	0.05	17.4	28	x	10
TRUNK Y	315	0.05	10.2	12	x	8
TRUNK Z	0	0.05	0	0	x	8
DROP	1298	0.05	17.4	28	x	10

RETURN AIR #	1	2	3	4	5	6	7									BR
AIR VOLUME	155	115	115	115	115	400	85	0	0	0	0	0	0	0	0	198
PLENUM PRESSURE	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
ACTUAL DUCT LGH.	30	58	57	37	36	15	47	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	135	185	200	180	175	135	200	0	0	0	0	0	0	0	0	140
TOTAL EFFECTIVE LH	165	243	257	217	211	150	247	1	1	1	1	1	1	1	1	154
ADJUSTED PRESSURE	0.08	0.05	0.05	0.06	0.06	0.08	0.05	12.40	12.40	12.40	12.40	12.40	12.40	12.40	12.40	0.08
ROUND DUCT SIZE	7	7	7	6.7	6.7	9.9	6	0	0	0	0	0	0	0	0	7.6
INLET GRILL SIZE	8	8	8	8	8	8	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	24

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

RECEIVED
Per: joshua.nabua

TYPE: VILLA 12
SITE NAME: TRINIGROUP

LO # 103223

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 V150H	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
S-BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	BY INSTALLING CONTRACTOR	50	☒	3.5

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:	City of Richmond Hill
Address:	Building Division
City:	HVAC REVIEWED
Telephone #:	PXV

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:	November-23

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

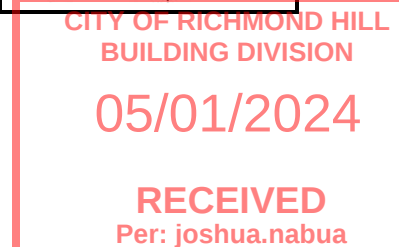
Michael O'Rourke

CITY 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#: 103223		Model: VILLA 12		Builder: GREENPARK HOMES																																																									
				Date: 11/3/2023																																																									
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>1246</td><td>9</td><td>11214</td></tr> <tr><td>First</td><td>1246</td><td>10</td><td>12460</td></tr> <tr><td>Second</td><td>1541</td><td>9</td><td>13869</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>37,543.0 ft³</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>1063.1 m³</td></tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1246	9	11214	First	1246	10	12460	Second	1541	9	13869	Third	0	9	0	Fourth	0	9	0	Total:			37,543.0 ft³	Total:			1063.1 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%;">0.380</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.118</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td>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> </table>			WINTER NATURAL AIR CHANGE RATE	0.380	SUMMER NATURAL AIR CHANGE RATE	0.118	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)																																																										
Bsmt	1246	9	11214																																																										
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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																																																										
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.380 x 295.31 x 43 °C x 1.2 = 5819 W = 19853 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.118 x 295.31 x 7 °C x 1.2 = 298 W = 1018 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">19,853</td><td>7,846</td><td>1.265</td></tr> <tr><td>2</td><td>0.3</td><td>14,273</td><td>0.417</td></tr> <tr><td>3</td><td>0.2</td><td>15,045</td><td>0.264</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	19,853	7,846	1.265	2	0.3	14,273	0.417	3	0.2	15,045	0.264	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


HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: VILLA 12	BUILDER: GREENPARK HOMES
SFQT: 2787	SITE: TRINIGROUP
LO# 103223	

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	0.60

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):	37543.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.60	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 59.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	142.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	40.0 ft

2012 OBC - COMPLIANCE PACKAGE

Component

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



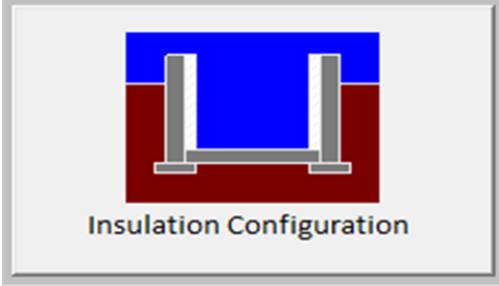
CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

RECEIVED
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):	4.3	 Insulation Configuration
Floor Width (m):	9.8	
Exposed Perimeter (m):	43.3	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.52	
Window Area (m ²):	0.6	
Door Area (m ²):	2.0	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		707

TYPE: VILLA 12
LO# 103223

Michael O'Rourke BCIN #19669

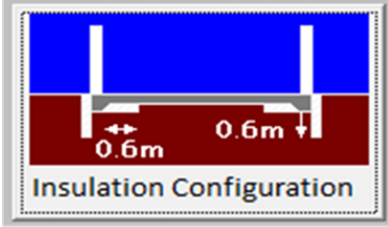
CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024


RECEIVED
Per: joshua.nabua

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):	1.2	
Width (m):	9.8	
Exposed Perimeter (m):	12.2	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		147

TYPE: VILLA 12
LO# 103223

Michael O'Rourke BCIN# 19669

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024


RECEIVED
Per: joshua.nabua

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):	8.53			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1063.1			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1417.1 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):	0.380			
Cooling Air Leakage Rate (ACH/H):	0.118			

TYPE: VILLA 12

LO# 103223

Michael O'Rourke BCIN# 19669

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

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ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD. & 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.

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"ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

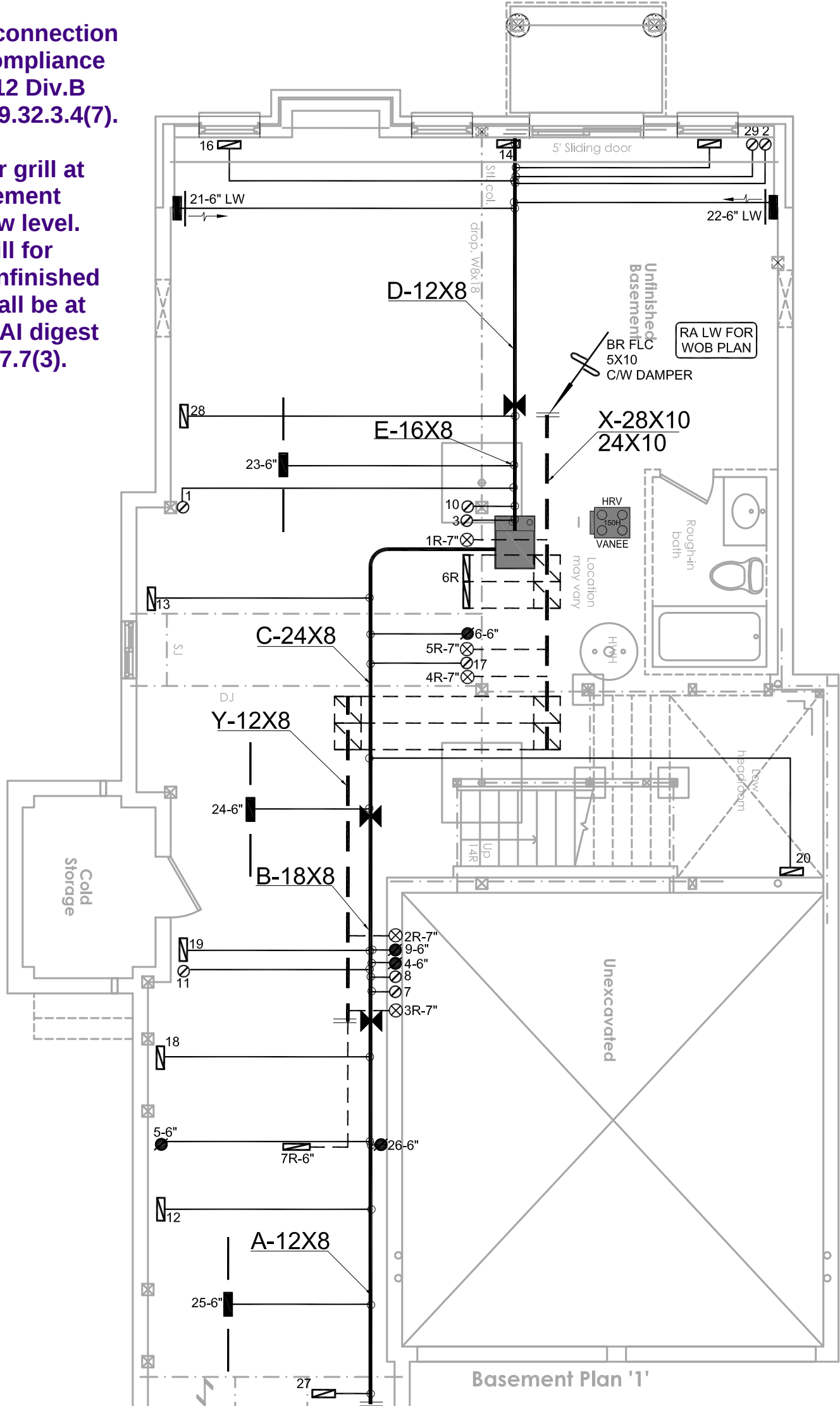
SUPPLEMENTAL EXHAUST FAN (MINIMUM 100 CFM) DISCHARGING DIRECTLY TO THE EXTERIOR WILL BE PROVIDED IN THE KITCHEN. EXHAUST DUCTS SERVING THE KITCHEN SHALL NOT BE SMALLER THAN RECOMMENDED BY THE MANUFACTURER OF THE FANS AND MUST AT LEAST MEET O.B.C. STATED MINIMUMS.

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).

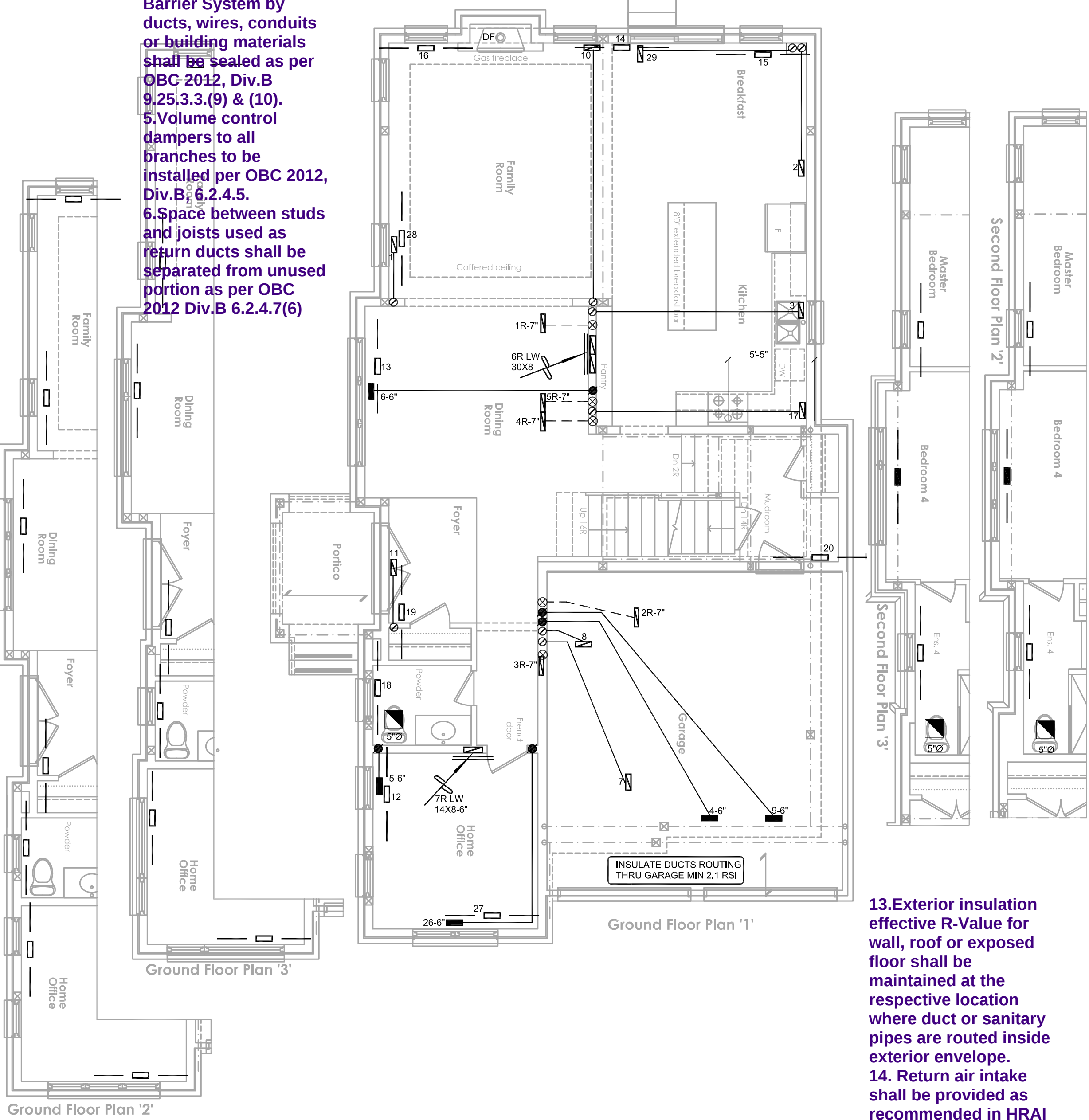
10. Supply air grill at finished basement shall be at low level. Return air grill for finished or unfinished basement shall be at low level. HRAI digest 2005, clause 7.7(3).



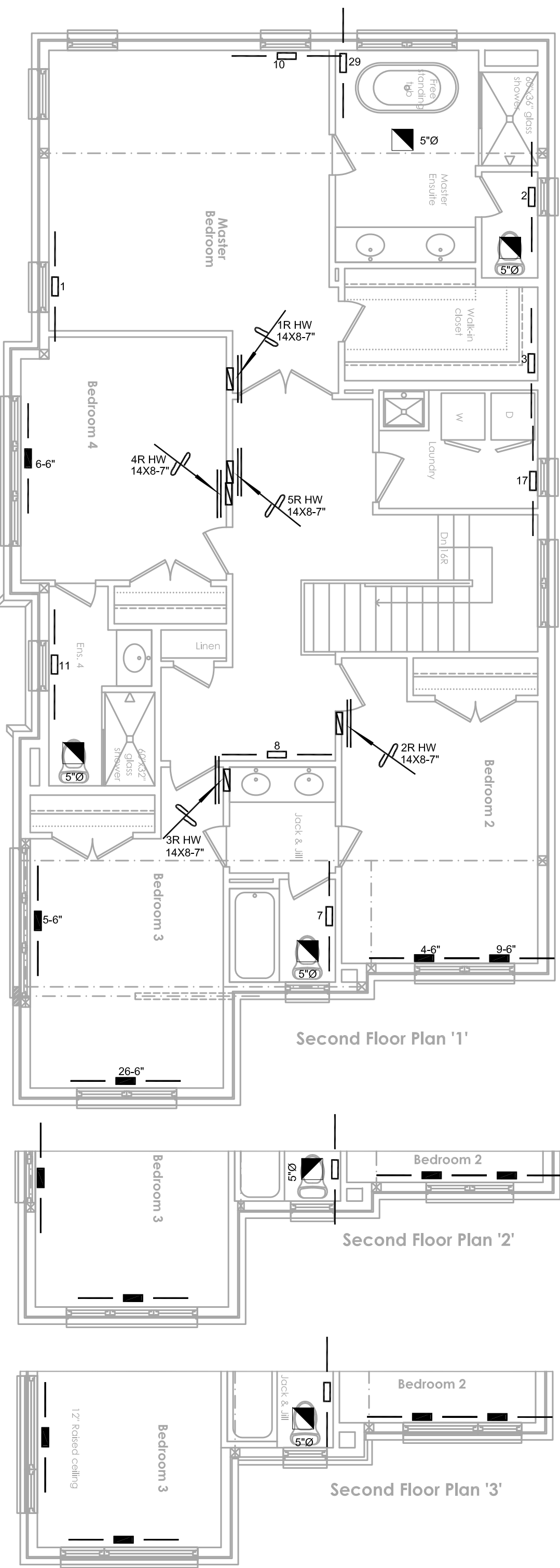
City of Richmond Hill Building Division
REVIEWED
By: **PV** Date: **May/30/2024**
Building Permit #: **RM#-24-00031**
All construction shall comply with the Ontario Building Code and all other applicable statutory regulations. The reviewed documents must be kept on site at all times.
Building inspection line: 905-771-5465 (24 hr)
buildinginspection@richmondhill.ca
Building inquiry line 905-771-6810
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 Prescriptive Package: **A1** and the values used for architectural design.

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)



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.



HEAT LOSS 59240 BTU/H	# OF RUNS	S/A	R/A	FANS
UNIT DATA	3RD FLOOR			
MAKE GOODMAN	2ND FLOOR	14	5	4
MODEL GMEC960804CNA	1ST FLOOR	10	2	2
INPUT 80 MBTU/H	BASEMENT	5	1	0
OUTPUT 76.8 MBTU/H				
COOLING 3.5 TONS				
FAN SPEED 1298 cfm @ 0.6" w.c.				

HVAC LEGEND	
	SUPPLY AIR GRILLE
	SUPPLY AIR GRILLE 6\"/>
	LINEAR BAR or LINEAR SLOT GRILLE
	SUPPLY AIR BOOT ABOVE
	6\"/>
	SUPPLY AIR STACK
	6\"/>
	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
	LT TRAP by REVERSOMATIC
DV	DIRECT VENT
LW	LOW WALL
HW	HIGH WALL
CLG.	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

ISSUED FOR PERMIT NOV/23 JN
By: Per: Date: By:
SB-12 PACKAGE **A1**
Michael Offutt has reviewed and is responsible for the design work and is qualified under division C.2.2 of the building code.
Michael Offutt BC2M 1999
HVAC Design Ltd.

HVACDESIGNS LTD.
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Web: www.hvacadesigns.ca
Specializing in Residential Mechanical Design Services

Client: GREENPARK HOMES
Project Name: TRINIGROUP RICHMOND HILL, ONTARIO
VILLA 12 - WOB
2787 SQFT

Sheet Title: HVAC
Drawn By: JN
Scale: 3/16"=1'-0"
Date: NOVEMBER 2023
LO #: 103223
Per: joshua.nabulsi