

SITE NAME: TRINIGROUP				OPT 5 BED - WOB				DATE: Oct-23				WINTER NATURAL AIR CHANGE RATE 0.380				HEAT LOSS AT °F. 78				CSA-F280-12			
BUILDER: GREENPARK HOMES				TYPE: ROSE 5				GFA: 3349				SUMMER NATURAL AIR CHANGE RATE 0.118				HEAT GAIN AT °F. 13				SB-12 PACKAGE A1			
ROOM USE				MBR				ENS				WIC				BED-2				BED-3			
EXP. WALL				36				26				10				17				26			
CLG. HT.				9				9				9				9				9			
FACTORS																							
GRS.WALL AREA				324				234				90				153				234			
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN			
NORTH				21.8 16.0				0 0 0				0 0 0				0 0 0				0 0 0			
EAST				21.8 41.6				22 479 914				16 349 665				0 0 0				0 0 0			
SOUTH				21.8 24.9				0 0 0				14 305 349				0 0 0				32 697 797			
WEST				21.8 41.6				0 0 0				0 0 0				0 0 0				52 1133 2161			
SKYL.T.				38.1 101.5				0 0 0				0 0 0				0 0 0				48 1046 1994			
DOORS				20.5 3.4				0 0 0				0 0 0				0 0 0				0 0 0			
NET EXPOSED WALL				4.6 0.8				302 1380 227				204 932 153				90 411 68				121 553 91			
NET EXPOSED BSMT WALL ABOVE GR				3.7 0.6				0 0 0				0 0 0				0 0 0				0 0 0			
EXPOSED CLG				1.3 0.6				324 426 190				175 230 103				94 123 55				185 243 109			
NO ATTIC EXPOSED CLG				2.8 1.3				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				208 543 89			
BASEMENT/CRAWL HEAT LOSS				0				0				0				0				0			
SLAB ON GRADE HEAT LOSS				0				0				0				0				0			
SUBTOTAL HT LOSS				2285				1815				535				1493				2781			
SUB TOTAL HT GAIN				1332				1270				123				996				2509			
LEVEL FACTOR / MULTIPLIER				0.20 0.34				0.20 0.34				0.20 0.34				0.20 0.34				0.20 0.34			
AIR CHANGE HEAT LOSS				774				615				181				506				942			
AIR CHANGE HEAT GAIN				103				99				10				77				195			
DUCT LOSS				0				0				0				0				372			
DUCT GAIN				0				0				0				0				0			
HEAT GAIN PEOPLE				240				2				480				0				1			
HEAT GAIN APPLIANCES/LIGHTS				754				0				0				754				754			
TOTAL HT LOSS BTU/H				3059				2431				716				1999				4095			
TOTAL HT GAIN x 1.3 BTU/H				3470				1779				172				2688				5288			

ROOM USE			OFFICE			FML			KT/BT			LV/DN			PWD			FOY			MUD			WOB			BAS		
EXP. WALL			10			37			39			35			18			23			32			44			146		
CLG. HT.			10			10			10			10			10			10			10			9			9		
FACTORS																													
GRS.WALL AREA			100			370			390			350			180			230			320			396			876		
GLAZING			LOSS GAIN			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	44	958	703	0	0	0	0	0	0	0	0	0	8	174	128			
EAST	21.8	41.6	0	0	0	22	479	914	62	1351	2576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
SOUTH	21.8	24.9	22	479	548	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	87	100				
WEST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	16	349	665	22	479	914	0	0	0	0	0	0			
SKYLT.	38.1	101.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
DOORS	20.5	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	287	47	20	411	68	20	411	68			
NET EXPOSED WALL	4.6	0.8	78	356	59	348	1590	262	328	1498	247	306	1398	230	164	749	123	194	886	146	300	1371	225	335	1530	252			
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	0	0	0			
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	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	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	0	0	0	0	0	0	0	0	0			
BASEMENT/CRAWL HEAT LOSS																													
SLAB ON GRADE HEAT LOSS																													
SUBTOTAL HT LOSS				836			2069			2849			2356			1098			1653			1781			576		2515		
SUB TOTAL HT GAIN					606		1176			2823			933				788		1107			293			3410		4800		
LEVEL FACTOR / MULTIPLIER			0.30	0.57		0.30	0.57		0.30	0.57		0.30	0.57		0.30	0.57		0.30	0.57		0.30	0.57			2023		560		
AIR CHANGE HEAT LOSS				477			1180			1625			1344			626			943			1016					12017		
AIR CHANGE HEAT GAIN					47		91			219			72				61		86			23					201		
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	0		0	0		0	0		0	0	0		0	0		0			0	0	0		
HEAT GAIN APPLIANCES/LIGHTS					754		754			754			754				0		0			754					754		
TOTAL HT LOSS BTU/H					1312		3249			4474			3700			1724			2596			2797			3410		16818		
TOTAL HT GAIN x 1.3 BTU/H					1830		2628			4935			2287				1104		1551			1391			2630		191		

SITE NAME: TRINIGROUP
BUILDER: GREENPARK HOMESOPT 5 BED - WOB
TYPE: ROSE 5

DATE: Oct-23

GFA: 3349 LO# 102609

HEATING CFM 1298 ✓ COOLING CFM 1298
TOTAL HEAT LOSS 59,444 TOTAL HEAT GAIN 41,330
AIR FLOW RATE CFM 21.84 AIR FLOW RATE CFM 31.41furnace pressure 0.7
furnace filter 0.14
a/c coil pressure 0.26
available pressure
for s/a & r/a 0.30#GOODMAN
GMEC960804CNA 80AFUE = 96 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 76,800 ✓

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	8	5
R/A	0	0	5	3	1

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

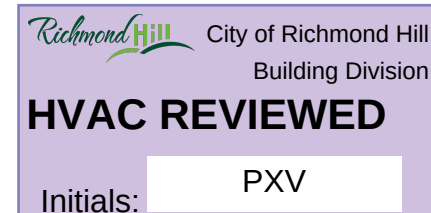
All S/A runs 5"Ø unless noted otherwise on layout.

plenum pressure s/a 0.16
max s/a dif press. loss 0.02
min adjusted pressure s/a 0.14
r/a pressure 0.14
r/a grille press. Loss 0.02
adjusted pressure r/a 0.12FAN SPEED 868
LOW 978
MEDLOW 1298
MEDIUM 1504
HIGH 1615DESIGN CFM = 1298
CFM @ .7" E.S.P.

TEMPERATURE RISE 55 °F

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-2	ENS-4	BED-5	MBR	ENS-3	OFFICE	FML	KT/BT	KT/BT	LV/DN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.53	1.82	0.72	2.00	2.05	1.74	0.69	0.71	1.44	1.53	0.75	1.31	3.25	2.24	2.24	3.70	1.72	2.60	2.80	4.05	4.05	4.05	4.05
CFM PER RUN HEAT	33	40	16	44	45	38	15	16	31	33	16	29	71	49	49	81	38	57	61	88	88	88	88
RM GAIN MBH.	1.73	1.33	0.17	2.69	2.64	2.28	0.39	0.31	1.95	1.73	0.40	1.83	2.63	2.47	2.47	2.29	1.10	1.55	1.39	0.92	0.92	0.92	0.92
CFM PER RUN COOLING	54	42	5	84	83	72	12	10	61	54	12	57	83	78	78	72	35	49	44	29	29	29	29
ADJUSTED PRESSURE	0.15	0.15	0.15	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.15	0.15	0.14	0.15	0.15	0.15	0.14	0.14	0.14	0.14
ACTUAL DUCT LGH.	53	51	38	29	57	58	34	46	36	63	49	15	36	39	28	26	46	37	31	43	30	17	35
EQUIVALENT LENGTH	180	170	150	140	140	170	140	120	200	180	170	130	110	120	120	130	130	100	160	150	130	140	140
TOTAL EFFECTIVE LENGTH	233	221	188	169	197	228	174	166	236	243	219	145	146	159	148	156	176	137	191	193	160	157	175
ADJUSTED PRESSURE	0.06	0.07	0.08	0.08	0.07	0.06	0.08	0.09	0.06	0.06	0.07	0.1	0.09	0.09	0.1	0.09	0.08	0.11	0.08	0.07	0.09	0.09	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	4	6	5	4	5	6	5	5	6	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	242	294	184	224	229	194	172	184	158	242	184	213	362	360	360	413	436	419	448	449	449	449	449
COOLING VELOCITY (ft/min)	396	308	57	428	423	367	138	115	311	396	138	419	423	573	573	367	402	360	323	148	148	148	148
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	A	B	B	D	C	B	D	D	A	D	B	A	A	A	D	C	C	D	A	A	D	C

RUN #	25	26	27	28
ROOM NAME	ENS	BED-3	BED-4	BAS
RM LOSS MBH.	0.61	2.05	1.74	4.05
CFM PER RUN HEAT	13	45	38	88
RM GAIN MBH.	0.44	2.64	2.28	0.92
CFM PER RUN COOLING	14	83	72	29
ADJUSTED PRESSURE	0.15	0.14	0.15	0.14
ACTUAL DUCT LGH.	40	51	64	15
EQUIVALENT LENGTH	160	120	170	100
TOTAL EFFECTIVE LENGTH	200	171	234	115
ADJUSTED PRESSURE	0.07	0.08	0.06	0.12
ROUND DUCT SIZE	4	6	6	6
HEATING VELOCITY (ft/min)	149	229	194	449
COOLING VELOCITY (ft/min)	161	423	367	148
OUTLET GRILL SIZE	3X10	4X10	4X10	4X10
TRUNK	B	D	C	B



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	451	0.06	11.2	14	x	8	580	TRUNK G	0	0.00	0	0	8
TRUNK B	656	0.06	12.9	20	x	8	590	TRUNK H	0	0.00	0	0	8
TRUNK C	259	0.06	9.1	10	x	8	466	TRUNK I	0	0.00	0	0	8
TRUNK D	642	0.06	12.8	20	x	8	578	TRUNK J	0	0.00	0	0	8
TRUNK E	0	0.00	0	0	x	8	0	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	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(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	220	0.05	8.9	10	x	8
TRUNK X	1298	0.05	17.4	28	x	10
TRUNK Y	513	0.05	12.3	18	x	8
TRUNK Z	390	0.05	11.1	14	x	8
DROP	1298	0.05	17.4	28	x	10

RETURN AIR #	1	2	3	4	5	6	7	8								BR
AIR VOLUME	85	85	85	85	85	343	135	175	0	0	0	0	0	0	0	220
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.	37	37	59	62	55	19	42	17	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	205	165	190	210	195	190	210	155	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	242	202	249	272	250	209	252	172	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.05	0.06	0.05	0.05	0.05	0.06	0.05	0.07	12.40	12.40	12.40	12.40	12.40	12.40	12.40	0.08
ROUND DUCT SIZE	6	6	6	6	6	10.1	7.5	7.5	0	0	0	0	0	0	0	8
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	14	0	0	0	0	0	0	0	24

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

RECEIVED
Per: joshua.nabua

TYPE: ROSE 5
SITE NAME: TRINIGROUP

LO # 102609
OPT 5 BED - WOB

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>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>5</u> @ 10.6 cfm	<u>53.0</u> cfm
Table 9.32.3.A.	TOTAL	<u>201.4</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>95.4</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>201.4</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>106.0</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE V150H
Location:	BSMT
<u>95.4</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 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
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-3	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 @ 32 deg F (0 deg C)	☒ HVI Approved

LOCATION OF INSTALLATION	
Lot:	Concession
Township	Plap:  City of Richmond Hill
Address	Building Division
Roll #	HVAC REVIEWED
BUILDER:	GREENPARK HOMES
Name:	Initials: <u>PXV</u>
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:	
HRAI #	001820
Date:	October-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

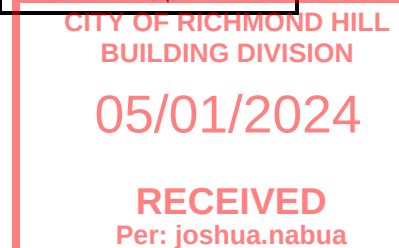


CITY OF RICHMOND HILL
BUILDING DIVISION

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#: 102609	Model: ROSE 5	Builder: GREENPARK HOMES	Date: 10/19/2023																																																									
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>1531</td><td>9</td><td>13779</td></tr> <tr><td>First</td><td>1531</td><td>10</td><td>15310</td></tr> <tr><td>Second</td><td>1818</td><td>9</td><td>16362</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>45,451.0 ft³</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>1287.0 m³</td></tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1531	9	13779	First	1531	10	15310	Second	1818	9	16362	Third	0	9	0	Fourth	0	9	0	Total:			45,451.0 ft³	Total:			1287.0 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%;">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	1531	9	13779																																																									
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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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.380 x 357.51 x 43 °C x 1.2 = 7044 W = 24035 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.118 x 357.51 x 7 °C x 1.2 = 361 W = 1233 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 78 °F x 1.08 x 0.25 = 2004 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 13 °F x 1.08 x 0.25 = 330 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;">24,035</td><td>8,211</td><td>1.464</td></tr> <tr><td>2</td><td>0.3</td><td>12,642</td><td>0.570</td></tr> <tr><td>3</td><td>0.2</td><td>14,185</td><td>0.339</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	24,035	8,211	1.464	2	0.3	12,642	0.570	3	0.2	14,185	0.339	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: ROSE 5	OPT 5 BED - WOB	BUILDER: GREENPARK HOMES
SFQT: 3349	LO# 102609	SITE: TRINIGROUP

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):	45451.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.70	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 61.0 ft	WIDTH: 34.0 ft	EXPOSED PERIMETER:	146.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	44.0 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



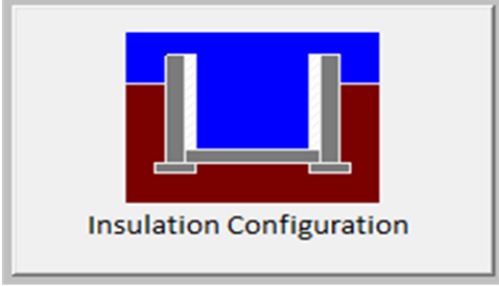
CITY OF RICHMOND HILL
BUILDING DIVISION

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):	4.6	 Insulation Configuration
Floor Width (m):	10.4	
Exposed Perimeter (m):	44.5	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.54	
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):		737

TYPE: ROSE 5
LO# 102609

OPT 5 BED - WOB

Michael O'Rourke BCIN #19669

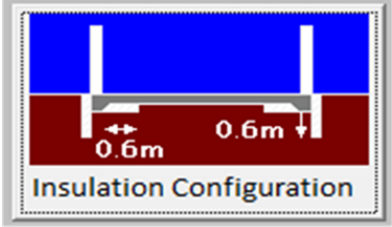
CITY OF RICHMOND HILL
BUILDING DIVISION

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):	1.5	
Width (m):	10.4	
Exposed Perimeter (m):	13.4	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		169

TYPE: ROSE 5
LO# 102609

OPT 5 BED - WOB

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):	1287.0			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1715.6 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	45.0	45.0		
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: ROSE 5
LO# 102609

OPT 5 BED - WOB

Michael O'Rourke BCIN# 19669

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

RECEIVED
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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.

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)

Richmond Hill City of Richmond Hill Building Division
REVIEWED
By: **PV** Date: **May/15/2024**
Building Permit #: **RM#24-00019**
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 Prescriptive Package: **A1** and the values used for architectural design.

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.

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)

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

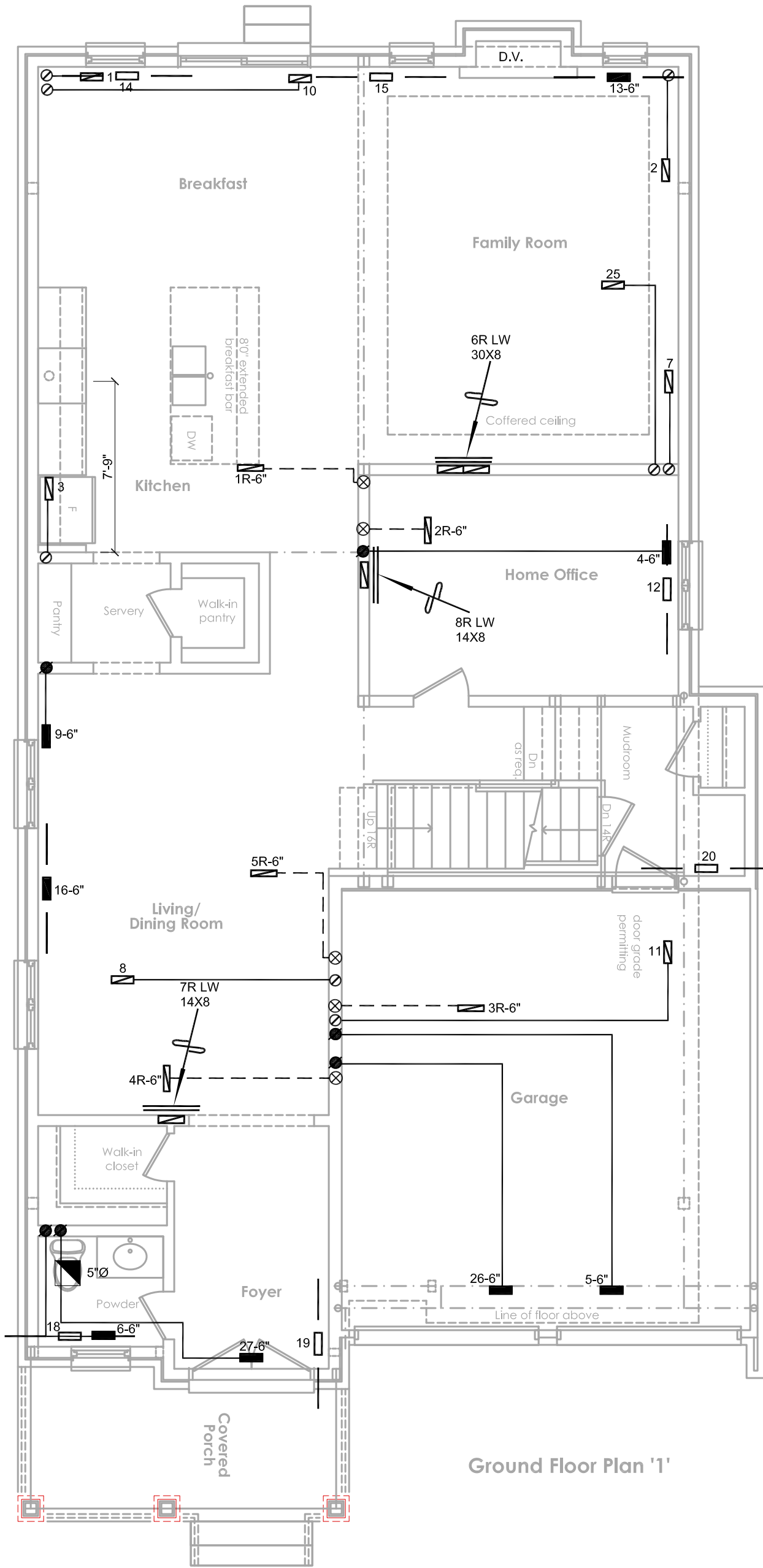
8. HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

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).

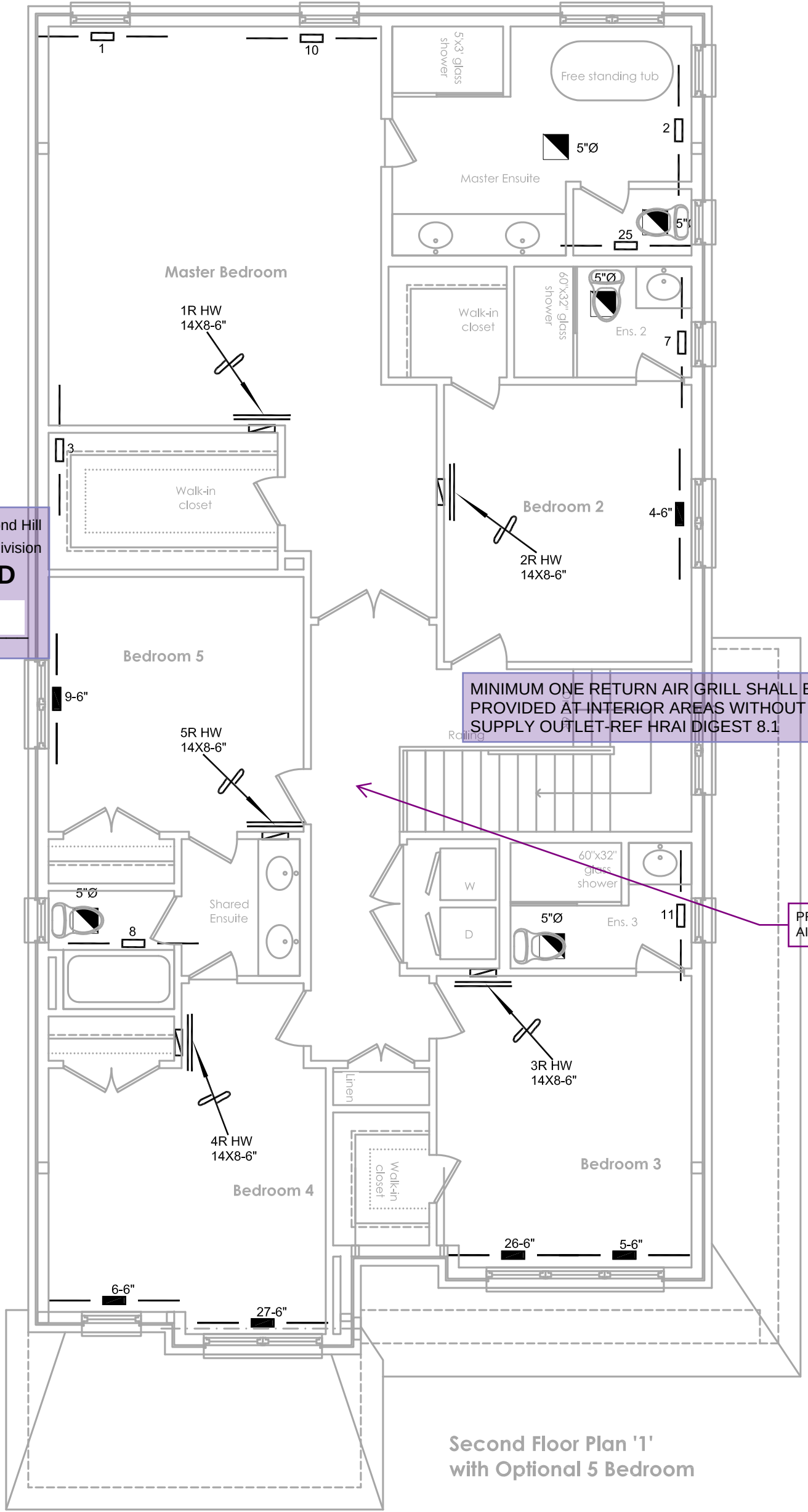
Partial Basement Plan For Walk-up Condition Elevation '1', '2' and '3'

Partial Basement Plan For Deck Condition Elevation 1, 2 and 3

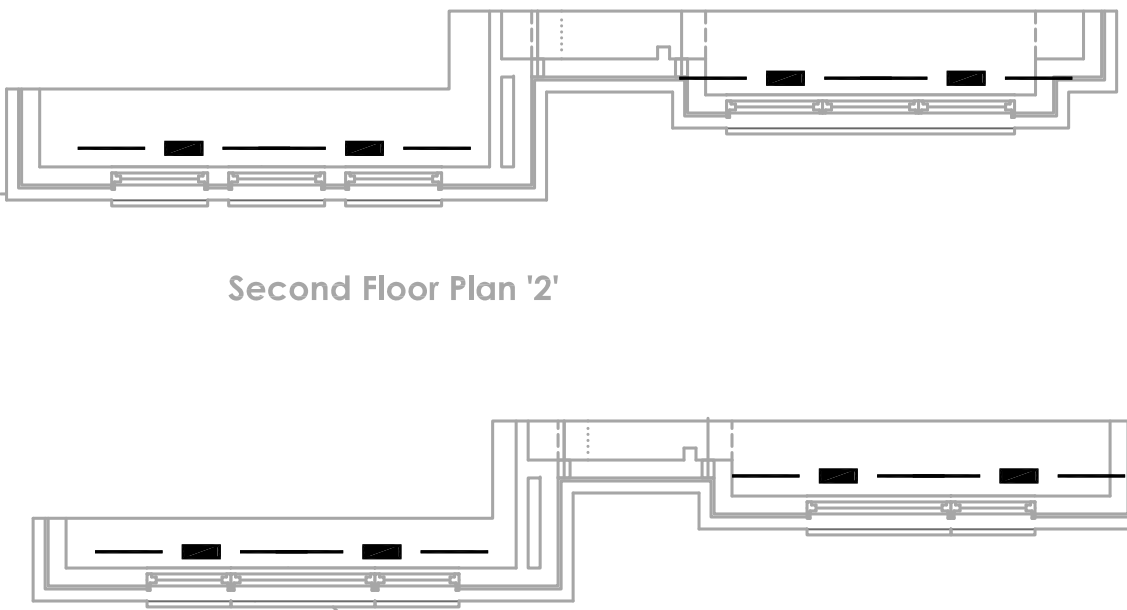


Ground Floor Plan '1'

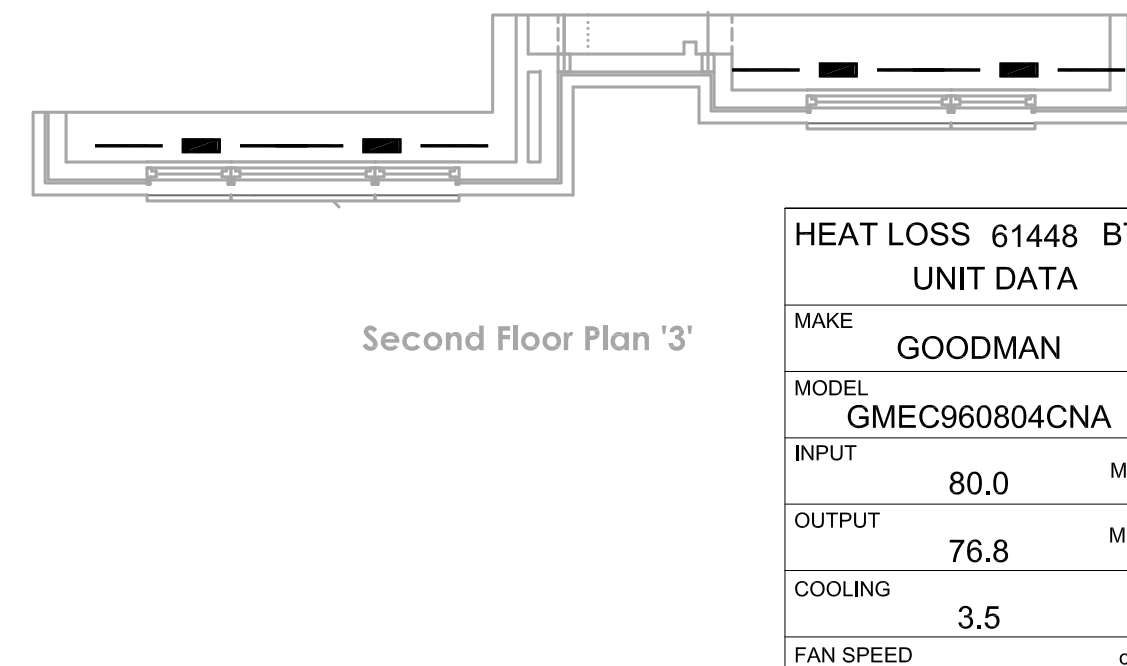
Richmond Hill City of Richmond Hill Building Division
HVAC REVIEWED
Initials: **PXV**



Second Floor Plan '1' with Optional 5 Bedroom



Second Floor Plan '2'



Second Floor Plan '3'

HEAT LOSS 61448 BTU/H	# OF RUNS	S/A	R/A	FANS
UNIT DATA	3RD FLOOR			
MAKE GOODMAN	2ND FLOOR	14	5	5
MODEL GMEC960804CNA	1ST FLOOR	8	3	2
INPUT 80.0 MBTU/H	BASEMENT	5	1	0
OUTPUT 76.8 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			
COOLING 3.5 TONS				
FAN SPEED 1298 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
	MOTORIZED ZONE DAMPER
	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	ADDED WUB	OCT/23	JW
1	ISSUED FOR PERMIT	SEPT/23	YV
Rev	Revision	Date	By

SB-12 PACKAGE
A1
Michael Offutt has reviewed and attests responsibility for the design work and is qualified under division C.2.2 of the building code.
Michael Offutt BC2M 1998
HVAC Design 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@hvacdsgns.ca
Web: www.hvacdsgns.ca
Specializing in Residential Mechanical Design Services

Client: GREENPARK HOMES
Project Name: TRINITY GROUP RICHMOND HILL, ONTARIO
ROSE 5 - OPT 5 BED - WOB
3349 SQFT
Sheet Title: HVAC
Drawn By: YV
Scale: 3/16"=1'-0"
Date: SEPTEMBER 2023
LO #: 102609
Per: joshua.nabur

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Per: joshua.nabur