

SITE NAME: TRINIGROUP		BUILDER: GREENPARK HOMES		TYPE: VILLA 12		GFA: 2787		DATE: Jun-24 LO# 102640		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	S-BATH	HALL	ENS-4			
				32	26	5	30	34	17	5	8	11			
				9	9	9	9	9	9	9	9	9			
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	GAIN		
NORTH	21.8	13.3	0	0	0	7	152	93	0	0	0	0	0	0	0
EAST	21.8	33.4	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	20.3	24	523	488	0	0	0	0	0	0	0	0	13	283
WEST	21.8	33.4	22	479	735	21	457	702	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	242	1106	182	206	941	155	45	206	34	236	1078	177	222
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	278	365	163	156	205	92	63	83	37	200	263	118	197
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															
SLAB ON GRADE HEAT LOSS															
SUBTOTAL HT LOSS				2473		1756		288		2604		3103		1696	
SUB TOTAL HT GAIN					1568		1041		71		2514		1083		476
LEVEL FACTOR / MULTIPLIER	0.20	0.25			0.20	0.25		0.20	0.25		0.20	0.25		0.20	0.25
AIR CHANGE HEAT LOSS				608		432		71		640		763		417	
AIR CHANGE HEAT GAIN					105		70		5		102		169		73
DUCT LOSS				0		0		0		324		0		0	
DUCT GAIN					0		0		0		250		0		0
HEAT GAIN PEOPLE	240		2	480	0	0	0	0	1	240	1	240	1	240	0
HEAT GAIN APPLIANCES/LIGHTS				645		0		0		645		645		645	0
TOTAL HT LOSS BTU/H				3081		2188		359		3568		3866		2112	
TOTAL HT GAIN x 1.3 BTU/H				3638		1445		98		3581		4638		2654	

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	H-OFF	DIN	KT/BF	FAM	LAUN	PWD	FOY	MUD	WOD	BAS
				36	17	38	33	7	9	26	23	38	182
				10	10	10	10	9	10	10	10	9	9
GRS.WALL AREA	LOSS	GAIN		360	170	380	330	63	90	260	230	342	1206
GLAZING	LOSS	GAIN		LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	21.8	13.3	0	0	0	57	1242	759	0	0	0	0	0
EAST	21.8	33.4	44	958	1470	0	0	0	0	0	0	0	0
SOUTH	21.8	20.3	44	958	895	48	1046	976	0	0	0	0	0
WEST	21.8	33.4	0	0	0	14	305	468	28	610	936	0	0
SKYLT.	38.1	101.5	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
NET EXPOSED WALL	4.6	0.8	272	1243	204	122	557	92	309	1412	232	270	1233
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	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
NO ATTIC EXPOSED CLG	2.8	1.3	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
BASEMENT/CRAWL HEAT LOSS													
SLAB ON GRADE HEAT LOSS													
SUBTOTAL HT LOSS				3160		1603		2958		2541		502	
SUB TOTAL HT GAIN					2569		1068		1459		1789		177
LEVEL FACTOR / MULTIPLIER	0.30	0.39		0.30	0.39		0.30	0.39		0.20	0.25	0.30	0.39
AIR CHANGE HEAT LOSS				1223		620		1145		983		123	
AIR CHANGE HEAT GAIN					172		72		98		120		12
DUCT LOSS				0		0		0		0		0	
DUCT GAIN					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	
TOTAL HT LOSS BTU/H				4383		2223		4103		3524		625	
TOTAL HT GAIN x 1.3 BTU/H				4403		2320		2863		3321		1084	

TOTAL HEAT GAIN BTU/H:

35891

TONS: 2.99

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 57500

TOTAL COMBINED HEAT LOSS BTU/H: 59170

SITE NAME: TRINIGROUP

BUILDER: GREENPARK HOMES

TYPE: VILLA 12

DATE: Jun-24

GFA: 2787

LO# 102640

HEATING CFM 1142
TOTAL HEAT LOSS 57,500
AIR FLOW RATE CFM 19.86

COOLING CFM 1142
TOTAL HEAT GAIN 35,616
AIR FLOW RATE CFM 32.06

furnace pressure 0.7
furnace filter 0.14
a/c coil pressure 0.28
available pressure for s/a & r/a 0.28

#*GOODMAN
GMEC960804CNA
FAN SPEED 80

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

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	2	1

plenium pressure s/a 0.15
max s/a dif press. loss 0.02
min adjusted pressure s/a 0.13

r/a pressure 0.13
r/a grille press. Loss 0.02
adjusted pressure r/a 0.11

LOW 0
MEDLOW 0
MEDIUM 0
MEDIUM HIGH 1142
HIGH 0

DESIGN CFM = 1142
CFM @ .7" E.S.P.

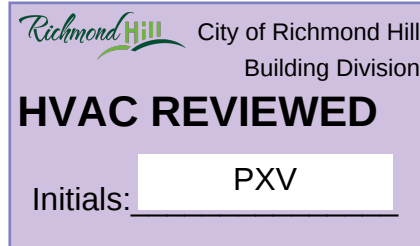
TEMPERATURE RISE 62 °F

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	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.	1.54	1.09	0.36	1.78	1.93	2.11	0.98	1.44	1.78	1.54	0.97	2.19	2.22	2.05	2.05	1.76	0.62	0.95	2.66	1.92	3.71	3.71	3.71	3.71
CFM PER RUN HEAT	31	22	7	35	38	42	19	29	35	31	19	44	44	41	41	35	12	19	53	38	74	74	74	74
RM GAIN MBH.	1.82	0.72	0.10	1.79	2.32	2.65	0.73	0.68	1.79	1.82	0.52	2.20	2.32	1.43	1.43	1.66	1.08	0.53	0.95	0.32	0.37	0.37	0.37	0.37
CFM PER RUN COOLING	58	23	3	57	74	85	23	22	57	58	17	71	74	46	46	53	35	17	30	10	12	12	12	12
ADJUSTED PRESSURE	0.14	0.14	0.14	0.14	0.14	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
ACTUAL DUCT LGH.	31	45	25	52	52	38	47	38	55	28	46	44	18	18	26	29	38	38	31	39	24	19	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	164	169	103	113
ADJUSTED PRESSURE	0.07	0.06	0.08	0.06	0.06	0.07	0.08	0.08	0.06	0.09	0.07	0.08	0.09	0.11	0.1	0.09	0.08	0.07	0.07	0.09	0.08	0.08	0.13	0.12
ROUND DUCT SIZE	5	4	4	6	6	6	4	4	6	5	4	5	5	4	4	5	4	4	5	4	5	5	5	5
HEATING VELOCITY (ft/min)	228	252	80	178	194	214	218	333	178	228	218	323	323	470	470	257	138	218	389	436	543	543	543	543
COOLING VELOCITY (ft/min)	426	264	34	291	377	433	264	252	291	426	195	521	543	528	528	389	402	195	220	115	88	88	88	88
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
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.	3.71	1.93	2.19	1.76	1.09
CFM PER RUN HEAT	74	38	44	35	22
RM GAIN MBH.	0.37	2.32	2.20	1.66	0.72
CFM PER RUN COOLING	12	74	71	53	23
ADJUSTED PRESSURE	0.14	0.14	0.14	0.14	0.14
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	0.08	0.05	0.08	0.14	0.07
ROUND DUCT SIZE	5	6	5	5	4
HEATING VELOCITY (ft/min)	543	194	323	257	252
COOLING VELOCITY (ft/min)	88	377	521	389	264
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	3X10
TRUNK	A	A	A	E	D



SUPPLY AIR TRUNK SIZE

FURNACE ROOM DATA															
	TRUNK	STATIC	ROUND	RECT			VELOCITY		TRUNK	STATIC	ROUND	RECT		VELOCITY	
	CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT		(ft/min)	
TRUNK A	257	0.05	9.5	12	x	8	386	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	447	0.05	11.7	18	x	8	447	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	657	0.05	13.5	24	x	8	493	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	309	0.06	9.7	12	x	8	464	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	487	0.06	11.5	16	x	8	548	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	1142	0.05	16.6	32	x	8	642
TRUNK Y	255	0.05	9.5	10	x	8	459
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1142	0.05	16.6	24	x	10	685

RETURN AIR #	1	2	3	4	5	6	7									BR
AIR VOLUME	145	85	85	85	85	387	85	0	0	0	0	0	0	0	0	185
PLENUM PRESSURE	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
ACTUAL DUCT LGH.	30	58	57	37	36	15	47	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	135	185	190	180	175	135	200	0	0	0	0	0	0	0	0	140
TOTAL EFFECTIVE LH	165	243	247	217	211	150	247	1	1	1	1	1	1	1	1	154
ADJUSTED PRESSURE	0.07	0.05	0.05	0.05	0.05	0.08	0.05	11.44	11.44	11.44	11.44	11.44	11.44	11.44	11.44	0.07
ROUND DUCT SIZE	7	6	6	6	6	9.8	6	0	0	0	0	0	0	0	0	7.7
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

TYPE: VILLA 12
SITE NAME: TRINIGROUP

LO # 102640

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:	City of Richmond Hill Building Division
Township:	Richmond Hill
Address:	HVAC REVIEWED
Roll #	Initials: PXV

BUILDER:	
Name:	GREENPARK HOMES
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:	June-24

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 102640	Model: VILLA 12	Builder: GREENPARK HOMES	Date: 6/5/2024																																																									
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%;">0.352</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.110</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	0.352	SUMMER NATURAL AIR CHANGE RATE	0.110	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
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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 295.31 x 43 °C x 1.2 = 5389 W = 18388 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.110 x 295.31 x 7 °C x 1.2 = 277 W = 944 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; vertical-align: middle;">18,388</td> <td>9,358</td> <td>0.983</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>14,252</td> <td>0.387</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>14,959</td> <td>0.246</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	18,388	9,358	0.983	2	0.3	14,252	0.387	3	0.2	14,959	0.246	4	0	0	0.000	5	0	0	0.000																														
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5	0		0	0.000																																																								
				Michael O'Rourke BCIN# 19669 																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: VILLA 12	BUILDER: GREENPARK HOMES
SFQT: 2787	SITE: TRINIGROUP
LO# 102640	

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 (ft ³):	37543.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	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:	182.0 ft

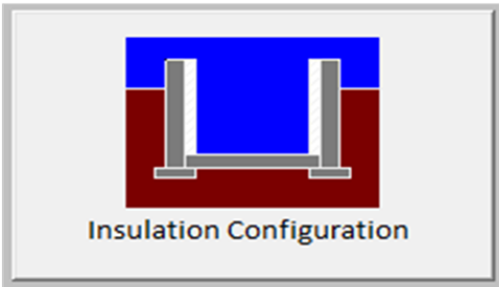
2012 OBC - COMPLIANCE PACKAGE		Compliance Package A1	
Component		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.65
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		22	17.03
Basement 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



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):	18.0	 Insulation Configuration
Floor Width (m):	9.8	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.1	
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):		1827

TYPE: VILLA 12
LO# 102640

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

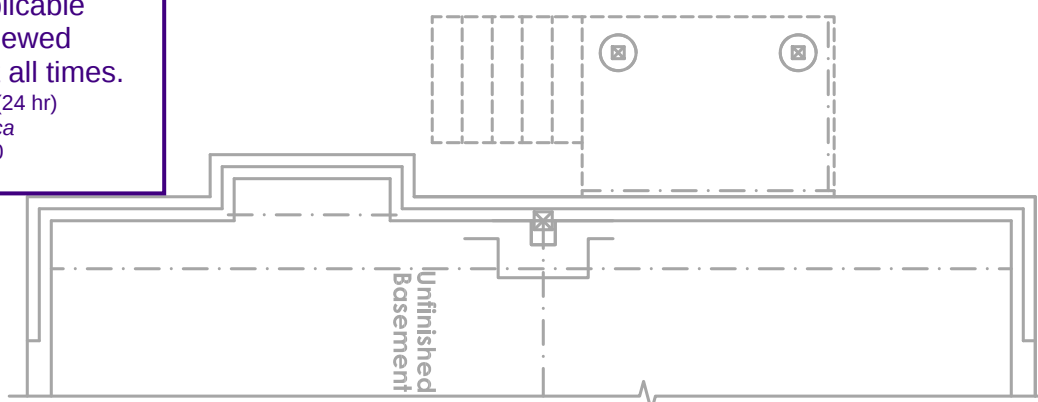
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	7.62			
Building Configuration				
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):	0.352			
Cooling Air Leakage Rate (ACH/H):	0.110			

TYPE: VILLA 12

LO# 102640

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.

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.

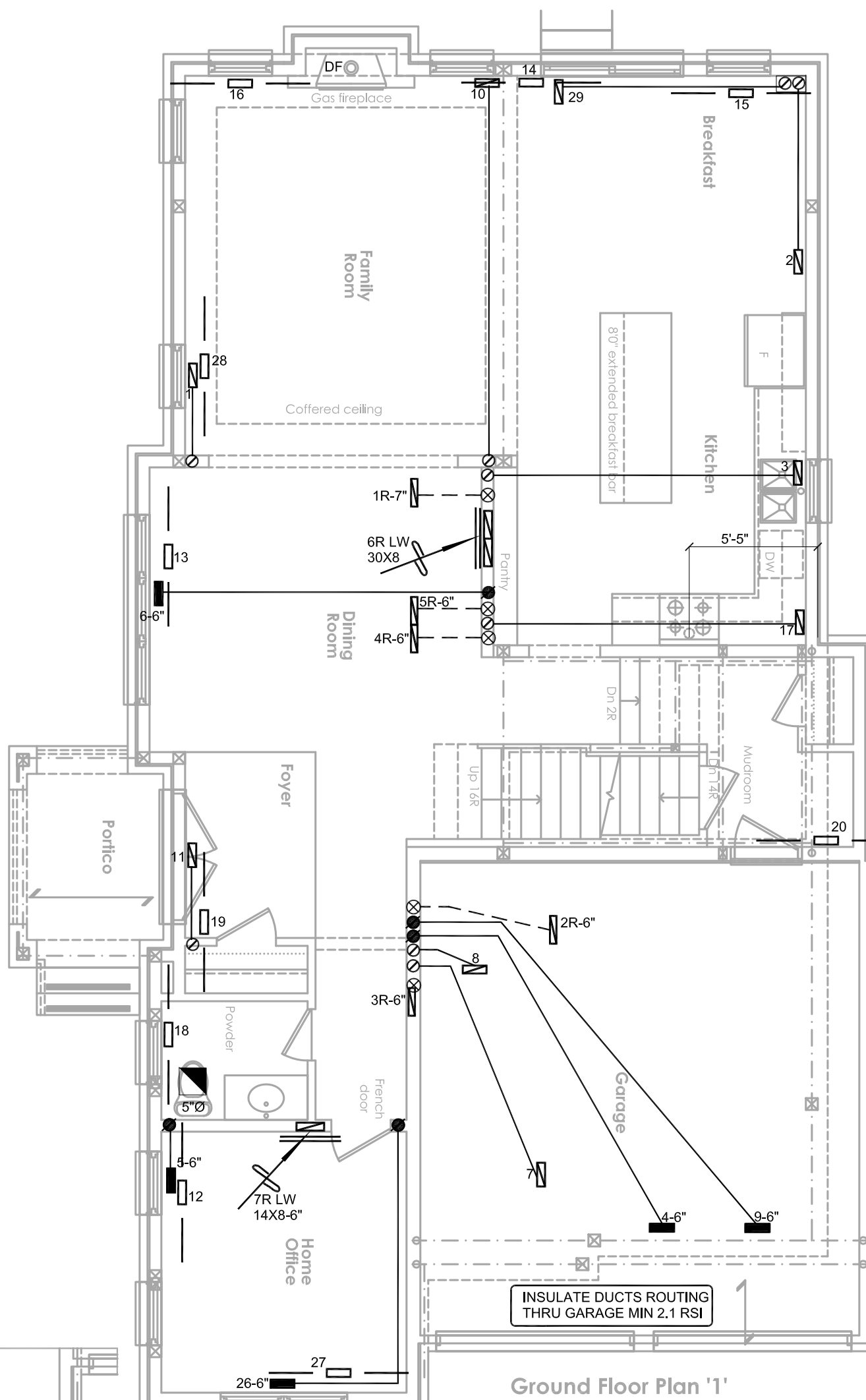
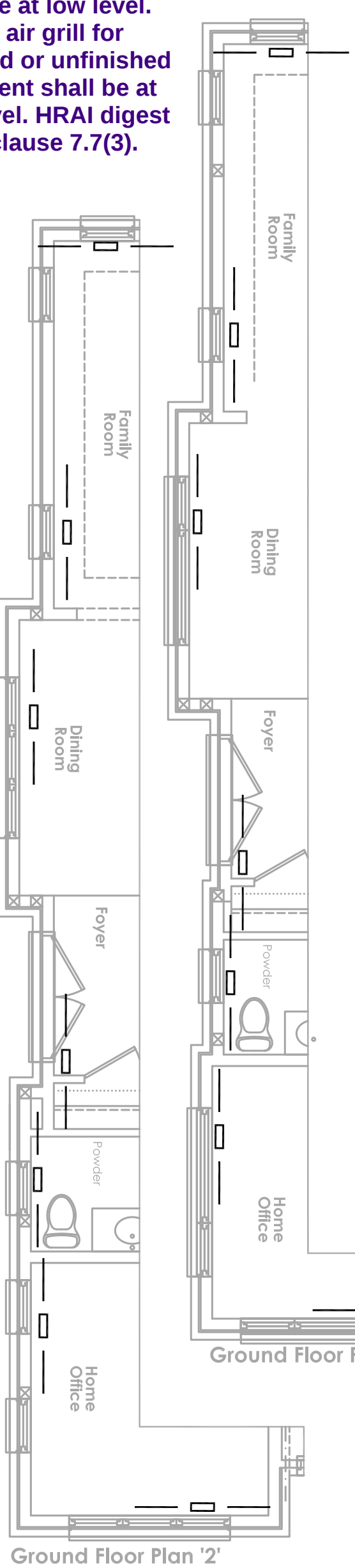


7. Combustion air supply shall be provided to the furnace and hot water tank.

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).

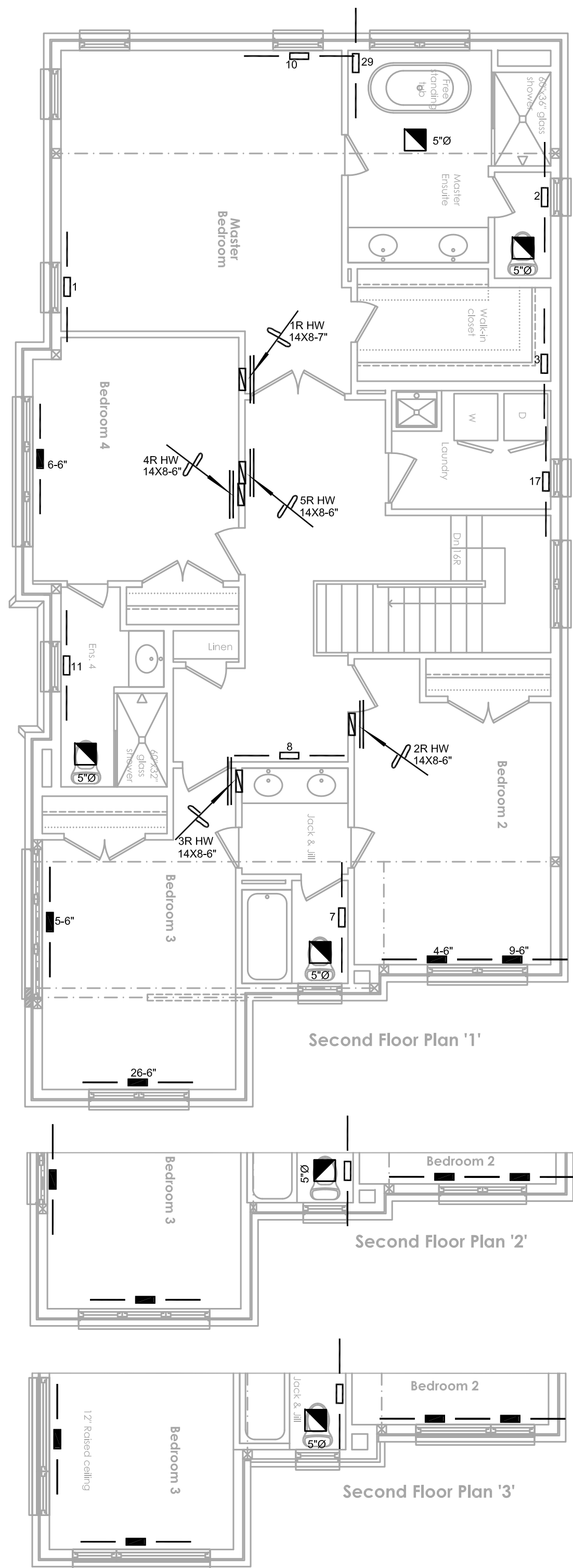
10. Supply air grill at finished basement shall be at low level. Return air grill for finished or unfinished basement shall be at low level. HRAI digest 2005, clause 7.7(3).



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 59170 BTU/H UNIT DATA		# OF RUNS	S/A	R/A	FANS
MAKE		3RD FLOOR			
GOODMAN		2ND FLOOR	14	5	4
MODEL		1ST FLOOR	10	2	2
GMEC960804CNA		BASEMENT	5	1	0
INPUT	80.0 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			
OUTPUT	76.8 MBTU/H				
COOLING	3.0 TONS				
FAN SPEED	cfm @ 0.5" w.c.				
1142					

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
	6" SUPPLY AIR STACK
	14X8 RETURN AIR GRILLE
	30X6 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
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

2	REVISED AS PER CITY COMMENT	JUN/24	YV
1	ISSUED FOR PERMIT	SEPT/23	YV
No.	Revision	Date	By

SB-12 PACKAGE

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 # 19660
HVAC Designs Ltd.

HVAC DESIGNS LTD.

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Specializing in Residential Mechanical Design Services

GREENPARK HOMES

Project TRINIGROUP

RICHMOND HILL, ONTARIO
M4L 1A 1G

2787 SQFT

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Drawn	by	Checked	by
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Scale	3/16"=1'-0"	Sheet No.
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SEPTEMBER 2023 1

102640
