

SITE NAME: TRINIGROUP				WOB				GFA: 2741				DATE: Sep-23				WINTER NATURAL AIR CHANGE RATE 0.380				HEAT LOSS ΔT °F. 78				CSA-F280-12			
BUILDER: GREENPARK HOMES				TYPE: VILLA 7								LO# 102639				SUMMER NATURAL AIR CHANGE RATE 0.118				HEAT GAIN ΔT °F. 13				SB-12 PACKAGE A1			
ROOM USE				MBR		ENS		WIC		BED-2		BED-3		BED-4		ENS2/3		HALL				ENS-4					
EXP. WALL				33		25		7		13		31		31		8		14				4					
CLG. HT.				9		9		9		9		9		9		9		9				9					
FACTORS																											
GRS.WALL AREA		LOSS GAIN		297		225		63		117		279		279		72		126				36					
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	0	0	0	0	0	0	0	0	0	0	0	0	0		
EAST		21.8	41.6	0	0	0	0	0	0	0	0	0	41	893	1704	39	850	1621	0	0	0	0	0	0	10	218	416
SOUTH		21.8	24.9	0	0	0	7	152	174	0	0	0	0	0	0	0	0	0	19	414	473	0	0	0	0	0	0
WEST		21.8	41.6	20	436	831	16	349	665	0	0	0	0	0	0	0	0	0	0	0	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	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	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL		4.6	0.8	277	1265	208	202	923	152	63	288	47	97	443	73	238	1087	179	240	1096	180	72	329	54	107	489	80
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	310	407	182	159	209	93	72	95	42	153	201	90	148	194	87	136	179	80	90	118	53	256	336	150
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	54	152	68	45	127	57	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	0	0	0	202	527	87	33	86	14	13	34	6	34	89	15	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				2108		1633		382		1080		2854		2337		481		1328				495					
SUB TOTAL HT GAIN				1221		1084		90		482		2124		1952		113		719				495					
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	0.20	0.30	0.20	0.30	0.20	0.30	0.20	0.30	0.20	0.30	0.20
AIR CHANGE HEAT LOSS				624		483		113		319		844		691		142		393				168					
AIR CHANGE HEAT GAIN				98		87		7		39		170		156		9		57				74					
DUCT LOSS				0		0		0		0		370		303		62		172				53					
DUCT GAIN				0		0		0		0		316		298		12		78				53					
HEAT GAIN PEOPLE		240		2	480	0	0	0	0	0	1	240	1	240	1	240	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				631		0		0		631		631		631		631		631				0					
TOTAL HT LOSS BTU/H				2732		2116		495		1399		4068		3332		686		1893				810					
TOTAL HT GAIN x 1.3 BTU/H				3159		1522		126		1809		4526		4259		174		1110				765					

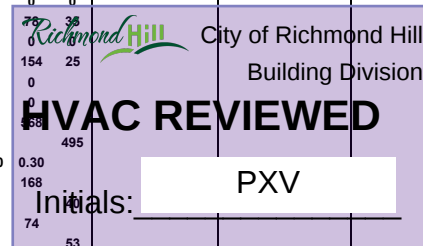
Richmond Hill

City of Richmond

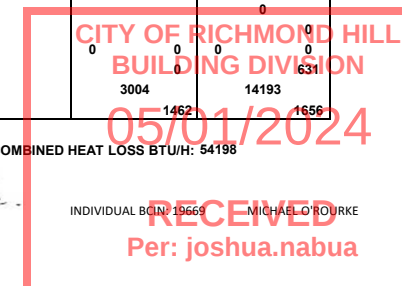
Building Department

HVAC REVIEW

Initials: PXV



ROOM USE	EXP. WALL	CLG. HT.	FACTORS	DIN	KT/BF	FAM	LAUN	PWD	FOY	MUD	WOB	BAS
				13	49	33	6	12	39	27	38	134
				10	10	10	9	10	10	10	9	9
GRS.WALL AREA	LOSS	GAIN		130	490	330	54	120	390	270	342	804
GLAZING	LOSS	GAIN		LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	LOSS	LOSS
NORTH	21.8	16.0		25	545	399	47	1024	751	0	0	0
EAST	21.8	41.6		0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9		0	0	0	25	545	622	0	0	0
WEST	21.8	41.6		0	0	0	11	240	457	22	479	914
SKYLT.	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		105	480	79	407	1859	306	308	1407	231
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6		0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6		0	0	0	0	0	0	62	81	36
NO ATTIC EXPOSED CLG	2.8	1.3		0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4		0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS				0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS				1024		3667		1886		449		669
SUB TOTAL HT GAIN					478		2136		1146		246	
LEVEL FACTOR / MULTIPLIER	0.30	0.52		0.30	0.52	0.30	0.52	0.20	0.30	0.30	0.52	0.30
AIR CHANGE HEAT LOSS				529		1894		974		133		345
AIR CHANGE HEAT GAIN					38		171		92		20	
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
HEAT GAIN APPLIANCES/LIGHTS				631		631		0		631		631
TOTAL HT LOSS BTU/H				1553		5562		2861		581		1014
TOTAL HT GAIN x 1.3 BTU/H				1491		3819		1608		1165		364



TOTAL HEAT GAIN BTU/H:

31795

TONS: 2.65

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 52528

TOTAL COMBINED HEAT LOSS BTU/H: 54198

Capacity required when HRV
running at full
speed=52525+3151=55675
btu/h, only 3.4% margin too low.
Builder to ensure a very tight
construction

SITE NAME: TRINIGROUP
BUILDER: GREENPARK HOMES

WOB
TYPE: VILLA 7

DATE: Sep-23

GFA: 2741 LO# 102639

HEATING CFM 978 COOLING CFM 978
TOTAL HEAT LOSS 52,528 TOTAL HEAT GAIN 31,520
AIR FLOW RATE CFM 18.62 AIR FLOW RATE CFM 31.03

furnace pressure 0.7
furnace filter 0.14
a/c coil pressure 0.24
available pressure
for s/a & r/a 0.32

#GOODMAN
GMEC960603BNA 60
FAN SPEED LOW

AFUE = 96 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 57,600

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	7	5
R/A	0	0	5	1	1

plenium pressure s/a 0.17
max s/a dif press. loss 0.01
min adjusted pressure s/a 0.16
r/a pressure 0.15
r/a grille press. Loss 0.02
adjusted pressure r/a 0.13

MEDLOW
MEDIUM 978
MEDIUM HIGH 1017
HIGH 1131

DESIGN CFM = 978
CFM @ .7" E.S.P.

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	ENS2/3	HALL	BED-3	MBR	ENS-4	BED-4	DIN	KT/BF	KT/BF	FAM	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.37	1.06	0.50	1.40	2.03	1.67	0.69	1.89	2.03	1.37	0.81	1.67	1.55	2.78	2.78	2.86	0.58	1.01	3.85	2.38	3.44	3.44	3.44	3.44
CFM PER RUN HEAT	25	20	9	26	38	31	13	35	38	25	15	31	29	52	52	53	11	19	72	44	64	64	64	64
RM GAIN MBH.	1.58	0.76	0.13	1.81	2.26	2.13	0.17	1.11	2.26	1.58	0.76	2.13	1.49	1.91	1.91	1.61	1.17	0.36	2.14	0.36	0.62	0.62	0.62	0.62
CFM PER RUN COOLING	49	24	4	56	70	66	5	34	70	49	24	66	46	59	59	50	36	11	66	11	19	19	19	19
ADJUSTED PRESSURE	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	38	52	34	40	45	46	41	31	48	51	42	51	24	40	30	45	18	29	30	16	46	42	24	32
EQUIVALENT LENGTH	130	180	180	140	140	140	160	120	150	170	130	190	130	120	120	120	160	160	110	160	190	180	80	120
TOTAL EFFECTIVE LENGTH	168	232	214	180	185	186	201	151	198	221	172	241	154	160	150	165	178	189	140	176	236	222	104	152
ADJUSTED PRESSURE	0.09	0.07	0.07	0.09	0.08	0.08	0.08	0.1	0.08	0.07	0.09	0.06	0.1	0.1	0.1	0.09	0.09	0.08	0.11	0.09	0.07	0.07	0.15	0.1
ROUND DUCT SIZE	5	4	4	6	5	6	4	4	5	5	4	6	4	5	5	5	4	4	5	4	5	5	5	5
HEATING VELOCITY (ft/min)	184	229	103	133	279	158	149	402	279	184	172	158	333	382	382	389	126	218	529	505	470	470	470	470
COOLING VELOCITY (ft/min)	360	275	46	286	514	337	57	390	514	360	275	337	528	433	433	367	413	126	485	126	140	140	140	140
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	D	C	D	D	B	A	B	B	B	D	B	A	D	C	C	C	D	A	A	D	C	C	D	A

RUN #	25	26
ROOM NAME	BAS	ENS
RM LOSS MBH.	3.44	1.06
CFM PER RUN HEAT	64	20
RM GAIN MBH.	0.62	0.76
CFM PER RUN COOLING	19	24
ADJUSTED PRESSURE	0.16	0.16
ACTUAL DUCT LGH.	27	65
EQUIVALENT LENGTH	140	160
TOTAL EFFECTIVE LENGTH	167	225
ADJUSTED PRESSURE	0.09	0.07
ROUND DUCT SIZE	5	4
HEATING VELOCITY (ft/min)	470	229
COOLING VELOCITY (ft/min)	140	275
OUTLET GRILL SIZE	3X10	3X10
TRUNK	C	C

SUPPLY AIR TRUNK SIZE										RETURN 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	217	0.06	8.5	10	x	8	391			TRUNK G	0	0.00	0	0	x	8	0		
TRUNK B	356	0.06	10.2	14	x	8	458			TRUNK H	0	0.00	0	0	x	8	0		
TRUNK C	389	0.07	10.2	12	x	8	584			TRUNK I	0	0.00	0	0	x	8	0		
TRUNK D	622	0.07	12.1	18	x	8	622			TRUNK J	0	0.00	0	0	x	8	0		
TRUNK E	0	0.00	0	0	x	8	0			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 #	1	2	3	4	5	6														BR
AIR VOLUME	95	85	85	85	105	363	0	0	0	0	0	0	0	0	0	0	0	0	0	160
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	39	36	48	49	35	23	1	1	1	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	145	175	185	190	135	150	0	0	0	0	0	0	0	0	0	0	0	0	0	180
TOTAL EFFECTIVE LH	184	211	233	239	170	173	1	1	1	1	1	1	1	1	1	1	1	1	1	194
ADJUSTED PRESSURE	0.07	0.06	0.06	0.06	0.08	0.08	13.36	13.36	13.36	13.36	13.36	13.36	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.07
ROUND DUCT SIZE	6	6	6	6	6	9.6	0	0	0	0	0	0	0	0	0	0	0	0	0	7
INLET GRILL SIZE	8	8	8	8	8	8	0	0	0	0	0	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	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	30	0	0	0	0	0	0	0	0	0	0	0	0	0	14

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

RECEIVED
Per: joshua.nabua

TYPE: VILLA 7
SITE NAME: TRINIGROUPLO # 102639
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>3</u> @ 10.6 cfm <u>31.8</u> cfm
Kitchen & Bathrooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm
Other Rooms	<u>3</u> @ 10.6 cfm <u>31.8</u> cfm
Table 9.32.3.A.	TOTAL <u>148.4</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	79.5 cfm

SUPPLEMENTAL VENTILATION CAPACITY	9.32.3.5.
Total Ventilation Capacity	<u>148.4</u> cfm
Less Principal Ventil. Capacity	<u>79.5</u> cfm
Required Supplemental Capacity	<u>68.9</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	
ENS2/3 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 ☒ HVI Approved	
@ 32 deg F (0 deg C)	

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

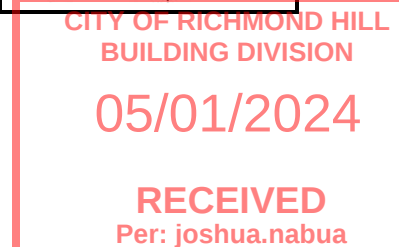
BUILDER:	GREENPARK HOMES
Name:	
Address:	
City:	
Telephone #: Fax #:	

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: September-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'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#: 102639		Model: VILLA 7		Builder: GREENPARK HOMES																																																								
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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>1213</td><td>9</td><td>10917</td></tr> <tr><td>First</td><td>1213</td><td>10</td><td>12130</td></tr> <tr><td>Second</td><td>1547</td><td>9</td><td>13923</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>36,970.0 ft³</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>1046.9 m³</td></tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1213	9	10917	First	1213	10	12130	Second	1547	9	13923	Third	0	9	0	Fourth	0	9	0	Total:			36,970.0 ft³	Total:			1046.9 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	1213	9	10917																																																									
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Design Temperature Difference																																																												
	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 290.80 x 43 °C x 1.2 = 5730 W = 19550 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.118 x 290.80 x 7 °C x 1.2 = 294 W = 1003 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 / HL_{clevel})</th> </tr> </thead> <tbody> <tr><td>1</td><td>0.5</td><td rowspan="5" style="text-align: center; vertical-align: middle;">19,550</td><td>7,422</td><td>1.317</td></tr> <tr><td>2</td><td>0.3</td><td>11,355</td><td>0.517</td></tr> <tr><td>3</td><td>0.2</td><td>13,221</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 / HL _{clevel})	1	0.5	19,550	7,422	1.317	2	0.3	11,355	0.517	3	0.2	13,221	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


HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: VILLA 7	WOB	BUILDER: GREENPARK HOMES
SFQT: 2741	LO# 102639	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):	36970.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 57.0 ft	WIDTH: 29.0 ft	EXPOSED PERIMETER:	134.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	38.0 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



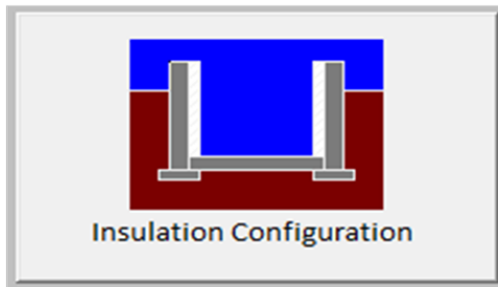
CITY OF RICHMOND HILL
BUILDING DIVISION

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):	8.8	
Exposed Perimeter (m):	40.8	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.51	
Window Area (m ²):	0.8	
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):		677

TYPE: VILLA 7
LO# 102639

WOB

Michael O'Rourke BCIN #19669

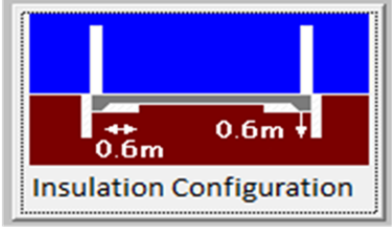
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RECEIVED
Per: joshua.nabua

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):	8.5	
Exposed Perimeter (m):	11.6	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		135

TYPE: VILLA 7
LO# 102639

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):	1046.9			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1395.5 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 7
LO# 102639

WOB

Michael O'Rourke BCIN# 19669

CITY OF RICHMOND HILL
BUILDING DIVISION

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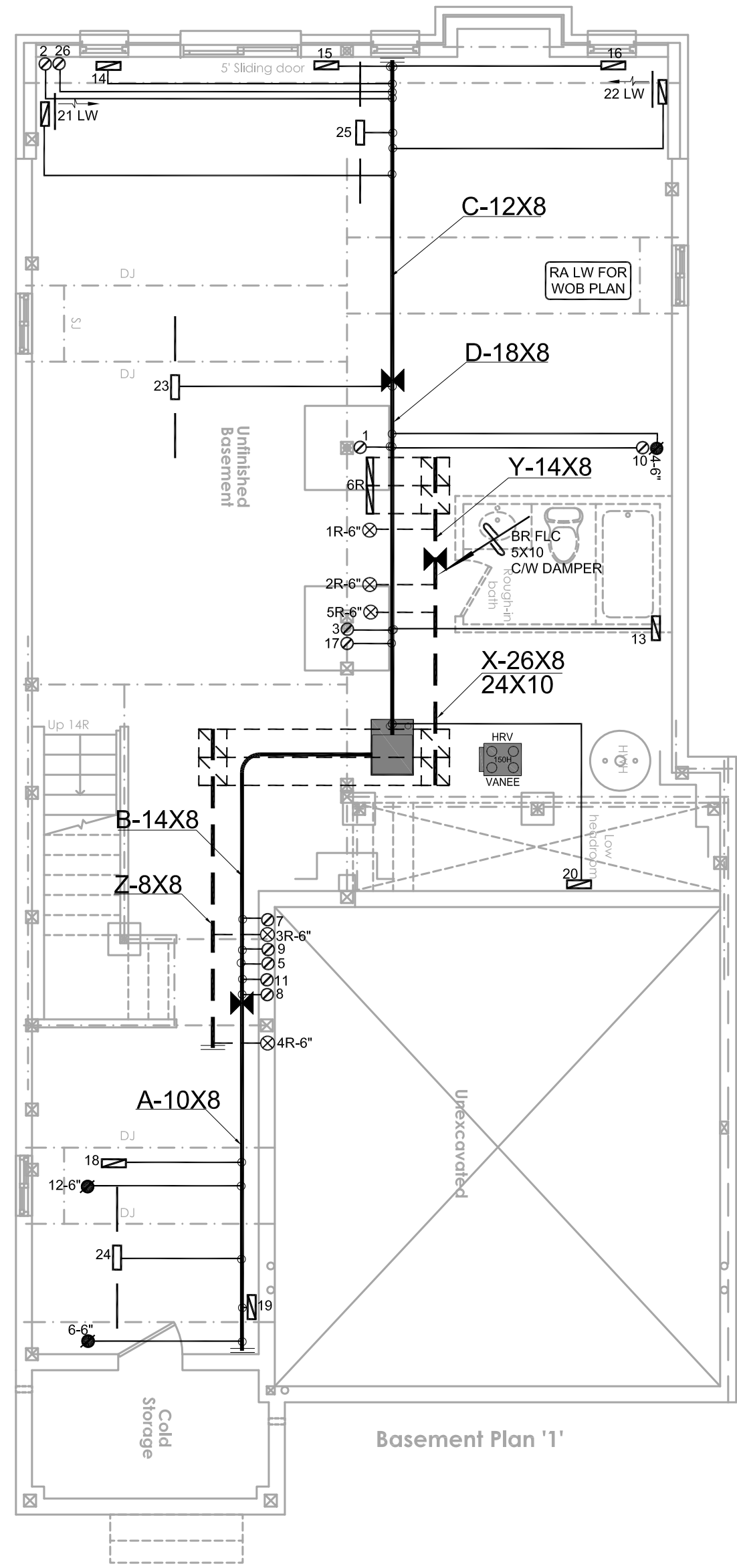
ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD. AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

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

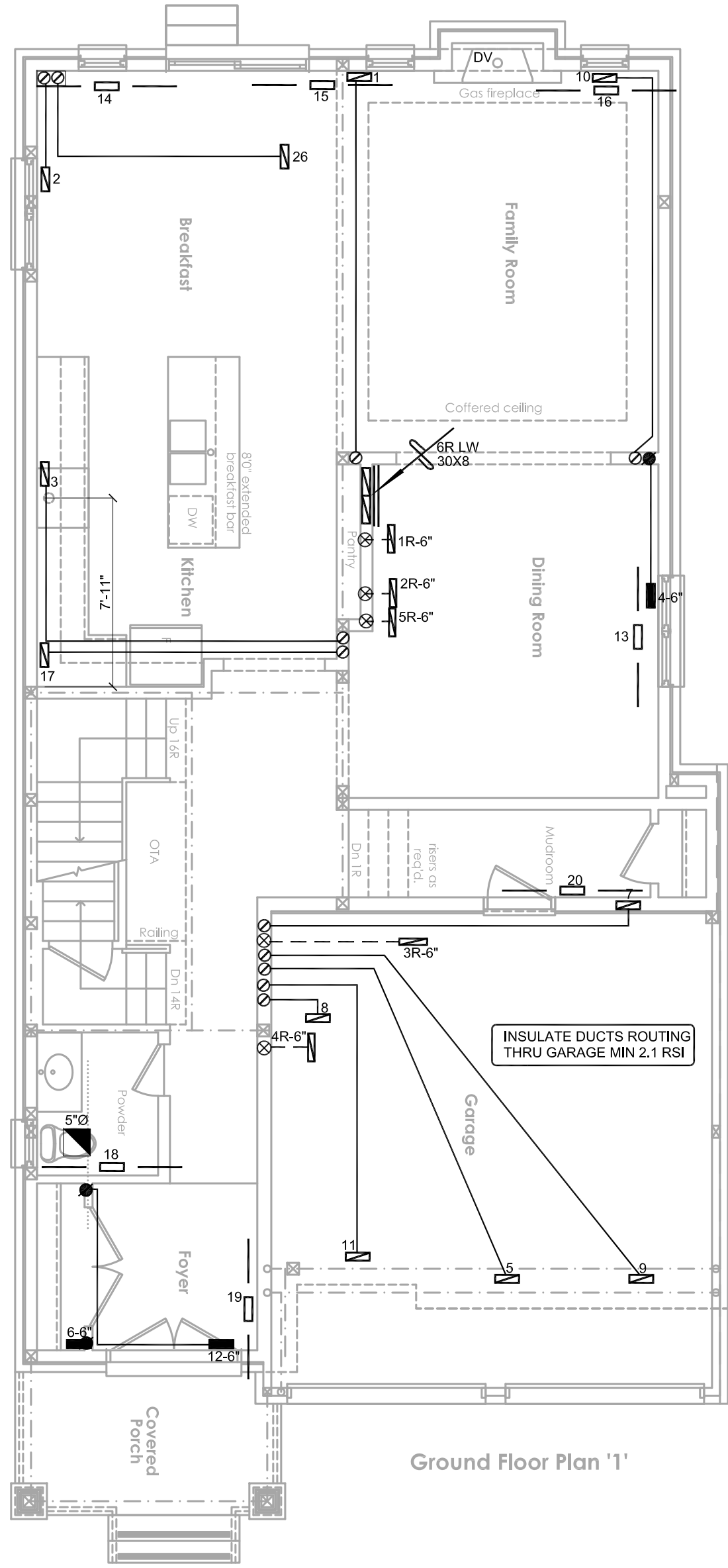
ALL S/A DIFFUSERS "4x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

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.

Capacity required when HRV running at full speed=52525+3151=55675 btu/h, only 3.4% margin , too low. Builder to ensure a very tight construction



- 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.



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).

