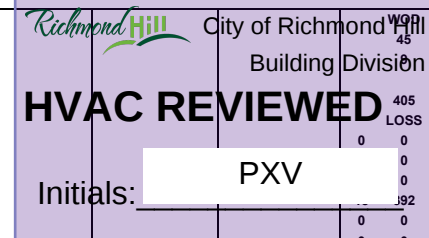


SITE NAME: TRINIGROUP		BUILDER: GREENPARK HOMES		TYPE: VILLA-9		GFA: 3043		DATE: Jan-24 LO# 103612		WINTER NATURAL AIR CHANGE RATE 0.352		HEAT LOSS ΔT °F. 78		CSA-F280-12	
										SUMMER NATURAL AIR CHANGE RATE 0.110		HEAT GAIN ΔT °F. 13		SB-12 PACKAGE A1	
ROOM USE	EXP. WALL	CLG. HT.	FACTORS	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	WIC-3	ENS-2			
				43	27	11	32	39	12	7	5	10			
				9	9	9	9	9	9	9	9	9			
GRS.WALL AREA	LOSS	GAIN		387	243	99	288	351	108	63	45	90			
GLAZING	LOSS	GAIN		LOSS	GAIN	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS			
NORTH	21.8	16.0	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	0	0	0	0
SOUTH	21.8	24.9	8	174	199	0	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	26	566	1080	16	349	665	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	353	1613	265	227	1037	171	99	452	74	248	1133	186	308
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	312	410	183	182	239	107	113	148	66	252	331	148	243
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			2763		1625	601	2993	2663	1173	584	747	676			
SUB TOTAL HT GAIN				1728	942	141	2105	2161	730	312	537	161			
LEVEL FACTOR / MULTIPLIER	0.20	0.29		0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29	0.20	0.29		
AIR CHANGE HEAT LOSS			801		471	174	867	771	340	169	216	196			
AIR CHANGE HEAT GAIN				127	69	10	155	159	54	23	40	12			
DUCT LOSS			0		0	0	386	0	0	0	96	87			
DUCT GAIN			0		0	0	316	0	0	0	58	17			
HEAT GAIN PEOPLE	240	2	480	0	0	0	1	240	1	240	0	0			
HEAT GAIN APPLIANCES/LIGHTS			659		0	0	659	659	659	0	0	0			
TOTAL HT LOSS BTU/H			3564		2095	775	4247	3435	1513	754	1059	959			
TOTAL HT GAIN x 1.3 BTU/H			3892		1315	197	4517	4185	2188	435	825	247			

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	LV/DN	FML	KT/BT	LIB	LAUN	PWD	FOY					
				15	34	45	23	32	12	22					
				10	10	10	10	10	10	10					
GRS.WALL AREA	LOSS	GAIN		150	340	450	230	320	120	220					
GLAZING	LOSS	GAIN		LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS					
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	0	0	0	0	9	196	374	18	392	748	0
SOUTH	21.8	24.9	30	654	747	0	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	0	0	0	30	654	1247	57	1242	2368	15	327	373	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	120	548	90	310	1416	233	378	1727	284	215	982	162	300
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			1202		2070	3295	1309	1781	703	1666					
SUB TOTAL HT GAIN				837	1480	3026	535	293	457	958					
LEVEL FACTOR / MULTIPLIER	0.30	0.50		0.30	0.50	0.30	0.50	0.30	0.50	0.30	0.50	0.30	0.50		
AIR CHANGE HEAT LOSS			600		1034	1646	654	890	351	832					
AIR CHANGE HEAT GAIN				62	109	222	39	22	34	70					
DUCT LOSS			0		0	0	0	0	0	0					
DUCT GAIN			0		0	0	0	0	0	0					
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0	0					
HEAT GAIN APPLIANCES/LIGHTS			659		659	659	659	659	0	0					
TOTAL HT LOSS BTU/H			1802		3104	4942	1963	2671	1054	2498					
TOTAL HT GAIN x 1.3 BTU/H			2025		2921	5080	1603	1266	638	1336					



TOTAL HEAT GAIN BTU/H:

35634

TONS: 2.97

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 55888

TOTAL COMBINED HEAT LOSS BTU/H: 57558

SITE NAME: TRINIGROUP

BUILDER: GREENPARK HOMES

TYPE: VILLA-9

DATE: Jan-24

GFA: 3043

LO# 103612

HEATING CFM 1142 COOLING CFM 1142
TOTAL HEAT LOSS 55,888 TOTAL HEAT GAIN 35,360
AIR FLOW RATE CFM 20.43 AIR FLOW RATE CFM 32.3

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

#GOODMAN
GMEC960803BNA 80

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

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	9	4
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.

plenium 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 0.12

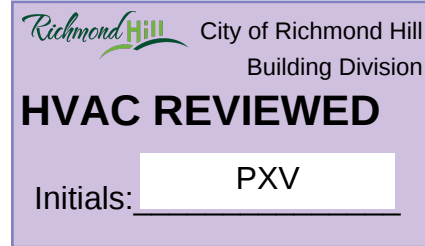
MEDLOW
MEDIUM 885
MEDIUM HIGH 1005
HIGH 1142

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

TEMPERATURE RISE 62 °F

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	BATH	WIC-3	BED-2	MBR	ENS-2	LV/DN	FML	KT/BT	KT/BT	LIB	LAUN	PWD	FOY	FML	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.78	1.57	0.77	2.12	1.72	1.51	0.75	1.06	2.12	1.78	0.96	1.80	1.55	2.47	2.47	1.96	2.67	1.05	2.50	1.55	4.86	4.86	4.86	4.86
CFM PER RUN HEAT	36	32	16	43	35	31	15	22	43	36	20	37	32	50	50	40	55	22	51	32	99	99	99	99
RM GAIN MBH.	1.95	0.99	0.20	2.26	2.09	2.19	0.43	0.83	2.26	1.95	0.25	2.02	1.46	2.54	2.54	1.60	1.27	0.64	1.34	1.46	0.67	0.67	0.67	0.67
CFM PER RUN COOLING	63	32	6	73	68	71	14	27	73	63	8	65	47	82	82	52	41	21	43	47	22	22	22	22
ADJUSTED PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14
ACTUAL DUCT LGH.	49	28	27	56	42	17	29	46	58	63	49	8	17	32	42	20	35	26	32	25	39	15	9	30
EQUIVALENT LENGTH	190	130	200	110	190	180	170	180	120	140	130	130	130	170	130	140	140	100	120	90	110	100	120	110
TOTAL EFFECTIVE LENGTH	239	158	227	166	232	197	199	226	178	203	179	138	147	202	172	160	175	126	152	115	149	115	129	140
ADJUSTED PRESSURE	0.06	0.09	0.06	0.09	0.06	0.07	0.07	0.06	0.08	0.07	0.08	0.11	0.1	0.07	0.08	0.09	0.08	0.12	0.1	0.13	0.09	0.12	0.11	0.1
ROUND DUCT SIZE	6	4	4	6	6	6	4	4	6	6	4	5	4	6	6	5	5	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	184	367	184	219	178	158	172	252	219	184	229	272	367	255	255	294	404	252	374	367	505	505	505	505
COOLING VELOCITY (ft/min)	321	367	69	372	347	362	161	310	372	321	92	477	539	418	418	382	301	241	316	539	112	112	112	112
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	A	D	C	B	D	C	D	A	D	D	B	A	A	C	A	C	C	B	A	B	D	C

RUN #	25	26
ROOM NAME	BED-3	ENS
RM LOSS MBH.	1.72	0.52
CFM PER RUN HEAT	35	11
RM GAIN MBH.	2.09	0.33
CFM PER RUN COOLING	68	11
ADJUSTED PRESSURE	0.15	0.15
ACTUAL DUCT LGH.	54	20
EQUIVALENT LENGTH	180	190
TOTAL EFFECTIVE LENGTH	234	210
ADJUSTED PRESSURE	0.06	0.07
ROUND DUCT SIZE	6	4
HEATING VELOCITY (ft/min)	178	126
COOLING VELOCITY (ft/min)	347	126
OUTLET GRILL SIZE	4X10	3X10
TRUNK	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	342	0.06	10.1	12	x	8	513	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	579	0.06	12.3	18	x	8	579	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	304	0.06	9.6	10	x	8	547	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	561	0.06	12.1	18	x	8	561	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 TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)	
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	607	0.05	13.1	20	x	8	546
TRUNK Y	409	0.05	11.3	14	x	8	526
TRUNK Z	535	0.05	12.5	18	x	8	535
DROP	1142	0.05	16.6	24	x	10	885

RETURN AIR #	1	2	3	4	5	6	7									BR
AIR VOLUME	85	85	85	90	95	360	144	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.	64	55	53	38	52	30	27	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	190	205	205	165	165	195	195	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	254	260	258	203	217	225	222	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.05	0.05	0.05	0.06	0.06	0.06	0.06	12.40	12.40	12.40	12.40	12.40	12.40	12.40	12.40	0.08
ROUND DUCT SIZE	6	6	6	6	6	10.3	7	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

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Per: joshua.nabua

TYPE: VILLA-9
SITE NAME: TRINIGROUP

LO # 103612

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>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Table 9.32.3.A.	TOTAL	<u>190.8</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>190.8</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>111.3</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
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-2	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:	January-24

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

INDIVIDUAL BCIN: 19669

MICHAEL O'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#: 103612

Model: VILLA-9

Builder: GREENPARK HOMES

Date: 1/5/2024

Volume Calculation

Air Change & Delta T Data

House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	1350	9	12150
First	1350	10	13500
Second	1693	9	15237
Third	0	9	0
Fourth	0	9	0
Total:			40,887.0 ft ³
Total:			1157.8 m ³

WINTER NATURAL AIR CHANGE RATE	0.352
SUMMER NATURAL AIR CHANGE RATE	0.110

Design Temperature Difference				
	T _{in} °C	T _{out} °C	ΔT °C	ΔT °F
Winter DTD _h	22	-21	43	78
Summer DTD _c	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

6.2.6 Sensible Gain due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

$$0.352 \times 321.61 \times 43^\circ\text{C} \times 1.2 = 5869 \text{ W}$$

$$= 20026 \text{ Btu/h}$$

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

$$0.110 \times 321.61 \times 7^\circ\text{C} \times 1.2 = 301 \text{ W}$$

$$= 1028 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

$$80 \text{ CFM} \times 78^\circ\text{F} \times 1.08 \times 0.25 = 1670 \text{ Btu/h}$$

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

$$80 \text{ CFM} \times 13^\circ\text{F} \times 1.08 \times 0.25 = 275 \text{ Btu/h}$$

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})
1	0.5	20,026	9,442	1.060
2	0.3		12,026	0.500
3	0.2		13,825	0.290
4	0		0	0.000
5	0		0	0.000

*HL_{airbv} = Air leakage heat loss + ventilation heat loss*For a balanced or supply only ventilation system HL_{airve} = 0Michael O'Rourke
BCIN# 19669CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

RECEIVED
Per: joshua.nabua

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: VILLA-9	BUILDER: GREENPARK HOMES
SFQT: 3043	SITE: TRINIGROUP
LO# 103612	

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):	40887.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 55.0 ft	WIDTH: 35.0 ft	EXPOSED PERIMETER:	180.0 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



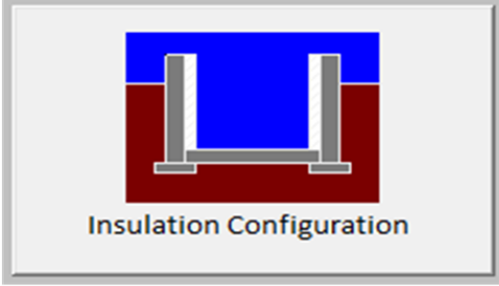
CITY OF RICHMOND HILL
BUILDING DIVISION

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):	16.8	 Insulation Configuration
Floor Width (m):	10.7	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	2.0	
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):		1797

TYPE: VILLA-9
LO# 103612

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):	7.62			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1157.8			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1543.4 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-9

LO# 103612

Michael O'Rourke BCIN# 19669

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

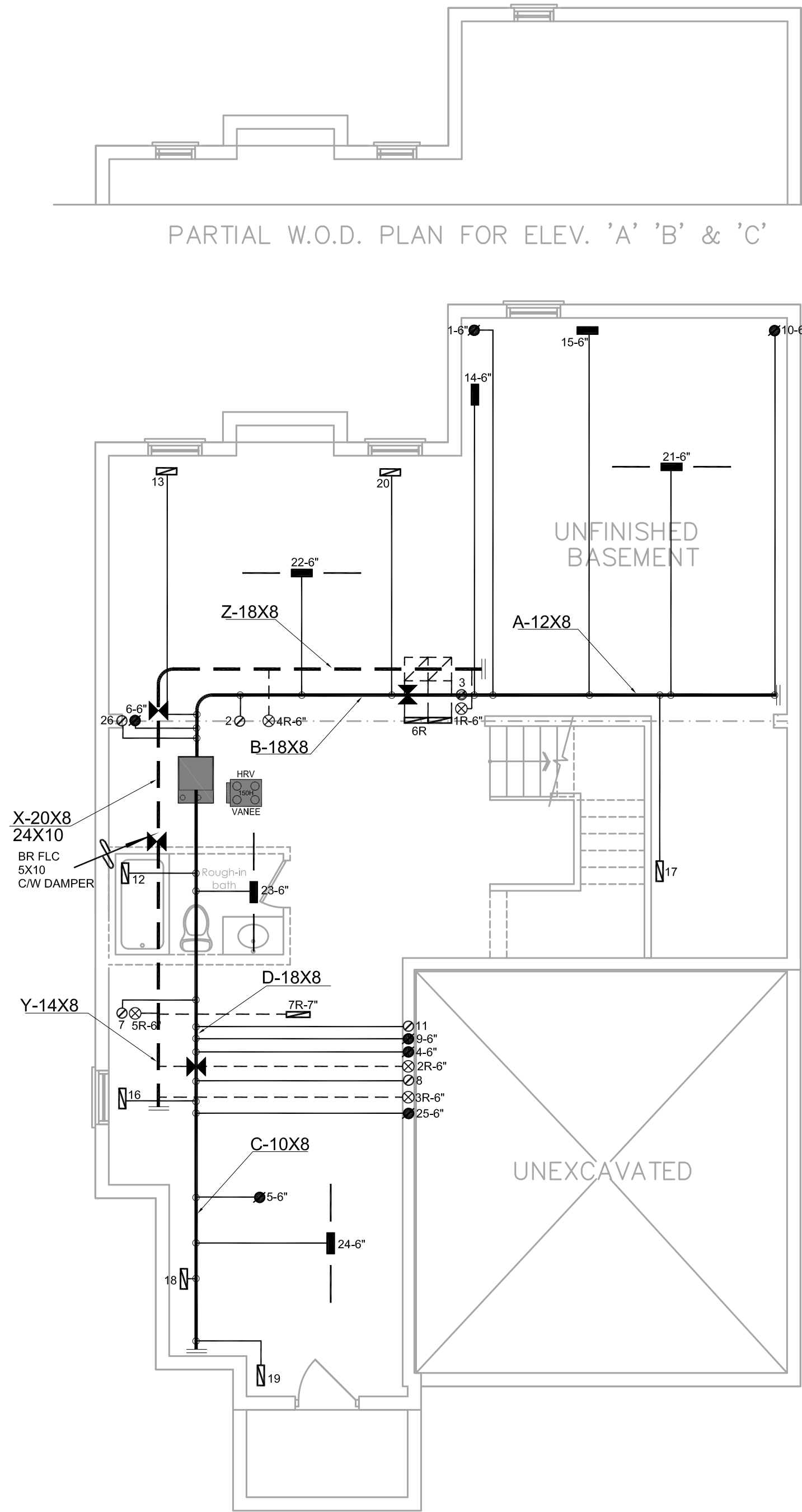
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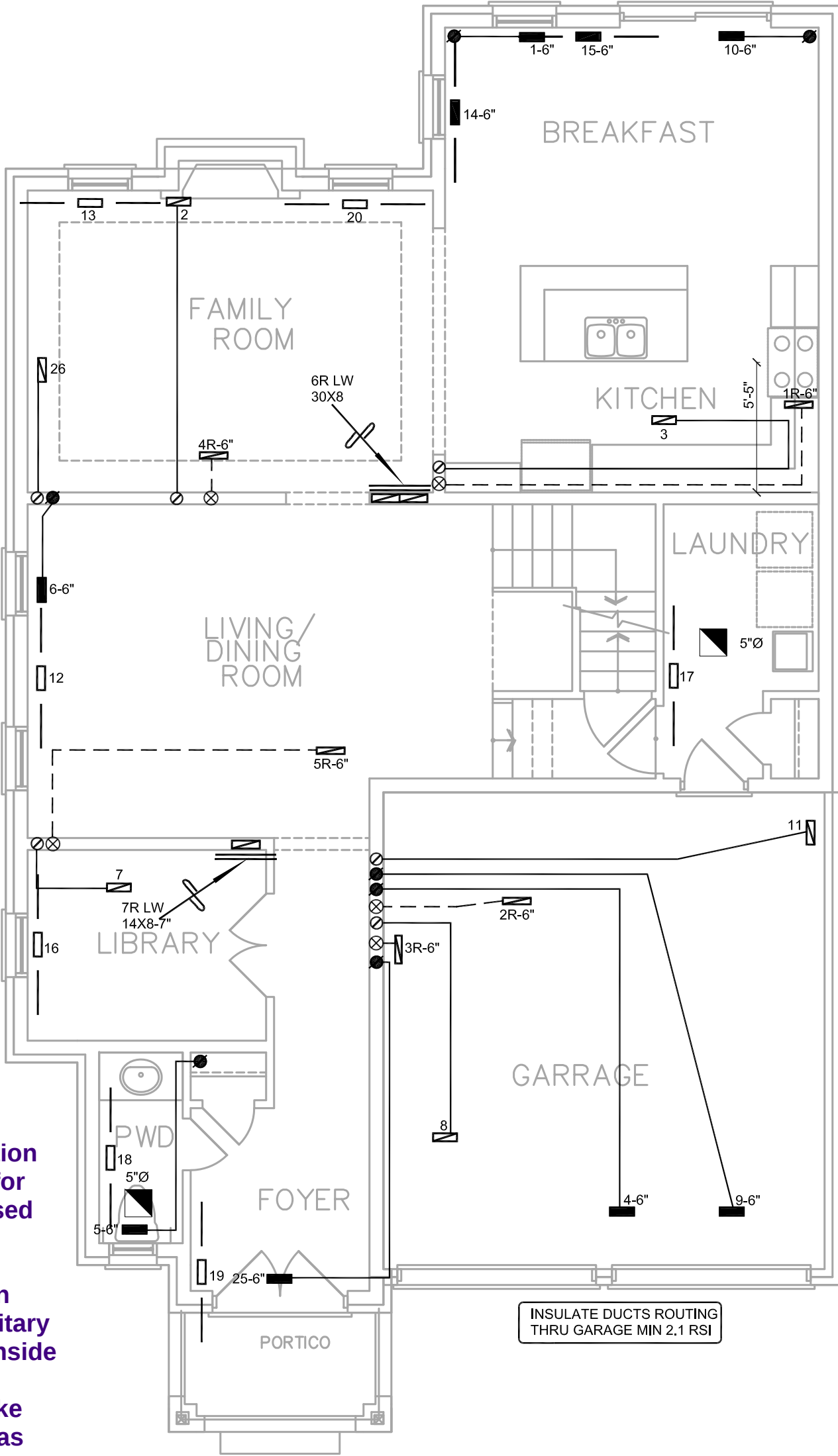
INSTALLATION TO COMPLY WITH THE LATEST ONTARIO BUILDING CODE. ALL SUPPLY BRANCH OUTLETS SHALL BE EQUIPPED WITH MANUAL BALANCING DAMPER. DUCTWORK WHICH PASSES THROUGH THE GARAGE OR UNHEATED SPACES SHALL BE ADEQUATELY INSULATED AND GAS-PROOFED

ALL S/A DIFFUSERS "4x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"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.



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.

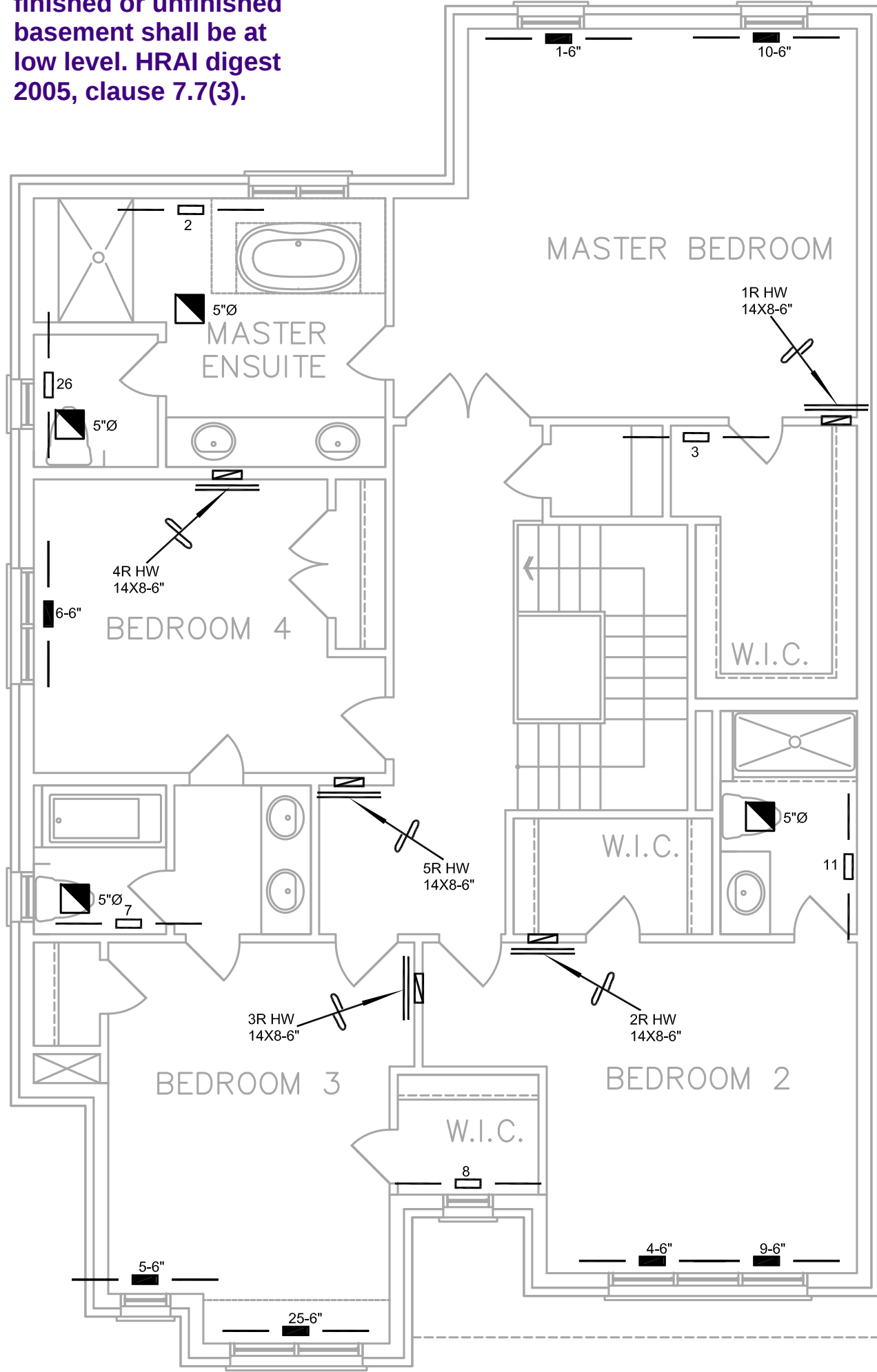


7. Combustion air supply shall be provided to the furnace and hot water tank.

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).



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)

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
	LT LIN 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

City of Richmond Hill
Building Division

REVIEWED

By: PV Date: May/30/2024

Building Permit #: RM#-24-00029

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.

HEAT LOSS	57558 BTU/H	# OF RUNS	S/A	R/A	FANS
UNIT DATA		3RD FLOOR			
MAKE	GOODMAN	2ND FLOOR	13	5	4
MODEL	GMEC960803BNA	1ST FLOOR	9	2	3
INPUT	80.0 MBTU/H	BASEMENT	4	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	3.0 TONS				
FAN SPEED	1142 cfm @ 0.6" w.c.				

2

1 ISSUED FOR PERMIT

JAN/24

YV

10/1

Revision

Date

By

SB-12 PACKAGE

A1

Michael Offutt has reviewed and is responsible for the design and is a qualified under division C.2.2 of the building code.

Michael Offutt BCMA 1998 HVAC Design Ltd.

375 Finley Ave - Unit 202 - Ajax, Ontario L1S 2E2
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Web: www.hvacedesigns.ca
Specializing in Residential Mechanical Design Services

Client

GREENPARK HOMES

Project Name

TRINIGROUP RICHMOND HILL, ONTARIO

VILLA-9

3043 SQFT

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Sheet Title: HVAC

Drawn By: YV

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

Date: SEPTEMBER 2023

LO #: 103612

CITY OF RICHMOND HILL

BUILDING DIVISION

05/01/2024

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Per: joshua.nabulsi