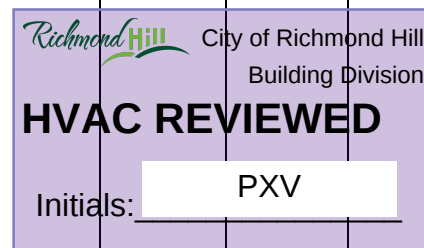


SITE NAME: TRINIGROUP										DATE: May-23		WINTER NATURAL AIR CHANGE RATE 0.322					HEAT LOSS ΔT °F. 78		CSA-F280-12								
BUILDER: GREENPARK HOMES										TYPE: VILLA 10		GFA: 2732		LO# 101191		SUMMER NATURAL AIR CHANGE RATE 0.101					HEAT GAIN ΔT °F. 13		SB-12 PACKAGE A				
ROOM USE				MBR		ENS		WIC		BED-2		BED-3		BED-4		ENS-2		WIC-3				S-BATH					
EXP. WALL				33		25		8		27		37		15		8		6				9					
CLG. HT.				9		9		9		9		9		9		9		9				9					
FACTORS																											
GRS.WALL AREA		LOSS GAIN		297		225		72		243		333		135		72		54				81					
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	15	327	240	0	0	0	0	0	0	0		
EAST		21.8	41.6	0	0	0	0	0	0	0	33	719	1371	44	958	1828	0	0	0	13	283	540	0	0	0		
SOUTH		21.8	24.9	0	0	0	18	392	448	0	0	0	0	44	958	1096	48	1046	1195	0	0	0	16	349	398		
WEST		21.8	41.6	24	523	997	18	392	748	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		
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		
NET EXPOSED WALL		4.6	0.8	273	1247	205	189	863	142	72	329	54	210	959	158	245	1119	184	87	397	65	57	260	43	41	187	31
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	
EXPOSED CLG		1.3	0.6	272	357	160	135	177	79	82	108	48	196	257	115	219	288	129	191	251	112	121	159	71	86	113	51
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	
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	0	0	0	196	512	84	23	60	10	0	0	0	121	316	52	86	225	37
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				2127		1825		437		2447		3384		1694		1062		808				902					
SUB TOTAL HT GAIN				1362		1418		102		1728		3247		1373		406		658				539					
LEVEL FACTOR / MULTIPLIER				0.20		0.21		0.20		0.21		0.20		0.21		0.20		0.21				0.20		0.21			
AIR CHANGE HEAT LOSS				444		381		91		511		706		353		222		169				188					
AIR CHANGE HEAT GAIN				66		68		5		83		156		66		20		32				26					
DUCT LOSS				0		0		0		296		409		0		128		98				109					
DUCT GAIN				0		0		0		264		423		0		43		69				56					
HEAT GAIN PEOPLE		240		2	480	0	0	0	0	1	240	1	240	1	240	0	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				586		0		0		586		586		586		586		0				0					
TOTAL HT LOSS BTU/H				2571		2206		528		3254		4499		2047		1412		1074				1200					
TOTAL HT GAIN x 1.3 BTU/H				3242		1932		139		3772		6048		2945		608		987				807					

ROOM USE		OFFICE		LV/DN		KT/BT		FML		LAUN		PWD		FOY	
EXP. WALL		42		17		40		31		13		27		18	
CLG. HT.		10		10		10		10		9		10		10	
FACTORS															
GRS.WALL AREA	LOSS GAIN	420		170		400		310		117		270		180	
GLAZING		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN	
NORTH	21.8 16.0	0	0	0	0	11 240 176	0	0	0	15 327 240	8 174 128	0	0	0	0
EAST	21.8 41.6	48 1046 1994	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8 24.9	48 1046 1195	48 1046 1195	0	0	0	24 523 598	0	0	0	0	0	0	30 654 747	0
WEST	21.8 41.6	0	0	0	0	66 1438 2742	28 610 1163	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
DOORS	20.5 3.4	0	0	0	0	0	0	0	0	0	0	0	0	12 246 41	0
NET EXPOSED WALL	4.6 0.8	324 1480 244	122 557 92	323 1476 243	258 1179 194	102 466 77	262 1197 197	138 630 104	138 630 104	138 630 104	138 630 104	138 630 104	138 630 104	138 630 104	138 630 104
NET EXPOSED BSMT WALL ABOVE GR	3.7 0.6	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	122 160 72	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
EXPOSED FLOOR	2.6 0.4	0	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	0
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS		3571		1603		3153		2311		953		1371		1530	
SUB TOTAL HT GAIN			3433		1287		3161		1955		388		325		891
LEVEL FACTOR / MULTIPLIER		0.30	0.36	0.30	0.36	0.30	0.36	0.30	0.36	0.20	0.21	0.30	0.36	0.30	0.36
AIR CHANGE HEAT LOSS		1291		580		1140		836		199		496		553	
AIR CHANGE HEAT GAIN			165		62		152		94		19		16		43
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	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS			586		586		586		586		586		0		0
TOTAL HT LOSS BTU/H		4863		2183		4293		3147		1152		1867		2084	
TOTAL HT GAIN x 1.3 BTU/H			5440		2516		5069		3426		1291		442		1214



CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

TOTAL HEAT GAIN BTU/H:

42014

TONS: 3.50

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 54927

TOTAL COMBINED HEAT LOSS BTU/H: 56597

SITE NAME: TRINIGROUP
BUILDER: GREENPARK HOMES

TYPE: VILLA 10

DATE: May-23

GFA: 2732 LO# 101191

HEATING CFM 1504 COOLING CFM 1504
TOTAL HEAT LOSS 54,927 TOTAL HEAT GAIN 41,739
AIR FLOW RATE CFM 27.38 AIR FLOW RATE CFM 36.03furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure
for s/a & r/a 0.35#*GOODMAN
GMEC960804CNA
FAN SPEED 80AFUE = 96 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 76,800

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	15	10	5
R/A	0	0	5	2	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15LOW 868
MEDLOW 978
MEDIUM 1112
MEDIUM HIGH 1504
HIGH 1615DESIGN CFM = 1504
CFM @ .6" E.S.P.

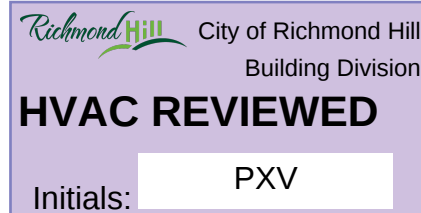
TEMPERATURE RISE 47 °F

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	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-2	WIC-3	BED-2	MBR	S-BATH	OFFICE	LV/DN	KT/BT	KT/BT	FML	LAUN	PWD	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.29	2.21	0.53	1.63	1.50	1.02	1.41	1.07	1.63	1.29	1.20	2.43	1.09	2.15	2.15	1.57	1.15	1.87	2.08	3.31	3.31	3.31	3.31
CFM PER RUN HEAT	35	60	14	45	41	28	39	29	45	35	33	67	30	59	59	43	32	51	57	91	91	91	91
RM GAIN MBH.	1.62	1.93	0.14	1.89	2.02	1.47	0.61	0.99	1.89	1.62	0.81	2.72	1.26	2.53	2.53	1.71	1.29	0.44	1.21	0.37	0.37	0.37	0.37
CFM PER RUN COOLING	58	70	5	68	73	53	22	36	68	58	29	98	45	91	91	62	47	16	44	13	13	13	13
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	31	35	21	53	62	47	46	50	55	39	45	46	20	19	28	31	41	18	35	21	18	11	23
EQUIVALENT LENGTH	160	150	150	120	180	170	150	190	120	160	190	120	160	100	90	160	200	150	170	140	80	100	130
TOTAL EFFECTIVE LENGTH	191	185	171	173	242	217	196	240	175	199	235	166	180	119	118	191	241	168	205	161	98	111	153
ADJUSTED PRESSURE	0.09	0.09	0.1	0.1	0.07	0.08	0.09	0.07	0.1	0.09	0.07	0.1	0.1	0.14	0.14	0.09	0.07	0.1	0.08	0.1	0.17	0.15	0.11
ROUND DUCT SIZE	5	5	4	5	6	5	4	5	5	5	4	6	4	6	6	5	5	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	257	441	161	330	209	206	447	213	330	257	379	342	344	301	301	316	235	374	419	464	464	464	464
COOLING VELOCITY (ft/min)	426	514	57	499	372	389	252	264	499	426	333	500	516	464	464	455	345	117	323	66	66	66	66
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	C	D	C	C	D	C	A	D	D	C	A	A	A	C	B	D	A	B	B	C

RUN #	25	26	27	28	29	30	31
ROOM NAME	BAS	BED-3	BED-4	OFFICE	LV/DN	FML	BED-3
RM LOSS MBH.	3.31	1.50	1.02	2.43	1.09	1.57	1.50
CFM PER RUN HEAT	91	41	28	67	30	43	41
RM GAIN MBH.	0.37	2.02	1.47	2.72	1.26	1.71	2.02
CFM PER RUN COOLING	13	73	53	98	45	62	73
ADJUSTED PRESSURE	0.16	0.17	0.17	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH.	44	52	41	44	25	20	58
EQUIVALENT LENGTH	110	190	180	120	140	140	180
TOTAL EFFECTIVE LENGTH	154	242	221	164	165	160	238
ADJUSTED PRESSURE	0.11	0.07	0.08	0.1	0.1	0.11	0.07
ROUND DUCT SIZE	6	6	5	6	4	5	6
HEATING VELOCITY (ft/min)	464	209	206	342	344	316	209
COOLING VELOCITY (ft/min)	66	372	389	500	516	455	372
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	3X10	3X10	4X10
TRUNK	D	D	C	D	C	A	D



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	365	0.09	9.3	12	x	8	548	TRUNK G	0	0.00	0	0	8
TRUNK B	672	0.09	11.7	16	x	8	756	TRUNK H	0	0.00	0	0	8
TRUNK C	835	0.07	13.6	24	x	8	626	TRUNK I	0	0.00	0	0	8
TRUNK D	467	0.07	10.9	16	x	8	525	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	0	0.05	0	0	x	8
TRUNK X	1504	0.05	18.4	32	x	10
TRUNK Y	360	0.05	10.8	14	x	8
TRUNK Z	0	0.05	0	0	x	8
DROP	1504	0.05	18.4	32	x	10

RETURN AIR #	1	2	3	4	5	6	7								BR
AIR VOLUME	140	120	120	140	120	440	196	0	0	0	0	0	0	0	228
PLENUM 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	0.15	0.15
ACTUAL DUCT LGH.	35	64	65	35	58	19	14	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	205	255	260	195	215	160	155	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	240	319	325	230	273	179	169	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.05	0.05	0.06	0.05	0.08	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7	7	7	7	7	10.3	7.4	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	8
	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	24

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

RECEIVED
Per: joshua.nabua

TYPE: VILLA 10
SITE NAME: TRINIGROUP

LO # 101191

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		<u>79.5</u> 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
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
S-BATH	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 Richmond Hill City of Richmond Hill Building Division
Name:	
Address:	
City:	
Telephone #:	
HVAC REVIEWED Initials: PXV	

INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	Fax #:

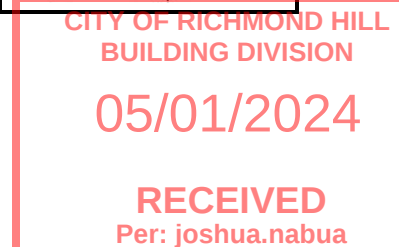
DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	May-23

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
INDIVIDUAL BCIN: 19669 *Michael O'Rourke* MICHAEL O'ROURKE

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#: 101191	Model: VILLA 10	Builder: GREENPARK HOMES	Date: 5/10/2023																																																									
Volume Calculation			Air Change & Delta T Data																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.322 x 285.91 x 43 °C x 1.2 = 4782 W = 16317 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.101 x 285.91 x 7 °C x 1.2 = 245 W = 837 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)																																																												
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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 10	BUILDER: GREENPARK HOMES
SFQT: 2732	SITE: TRINIGROUP
LO# 101191	

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):	36348.0	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: 53.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	170.0 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



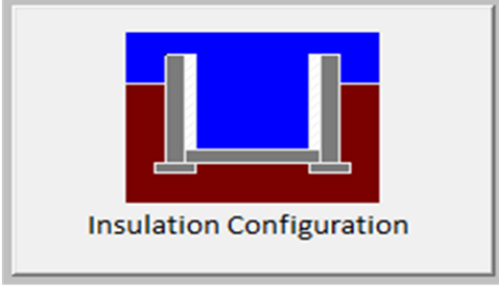
CITY OF RICHMOND HILL
BUILDING DIVISION

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):	16.2	 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):	1.5	
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):		1685

TYPE: VILLA 10
LO# 101191

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):	6.71			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1029.3			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1372.0 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):	0.322			
Cooling Air Leakage Rate (ACH/H):	0.101			

TYPE: VILLA 10

LO# 101191

Michael O'Rourke BCIN# 19669

CITY OF RICHMOND HILL
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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"x 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)

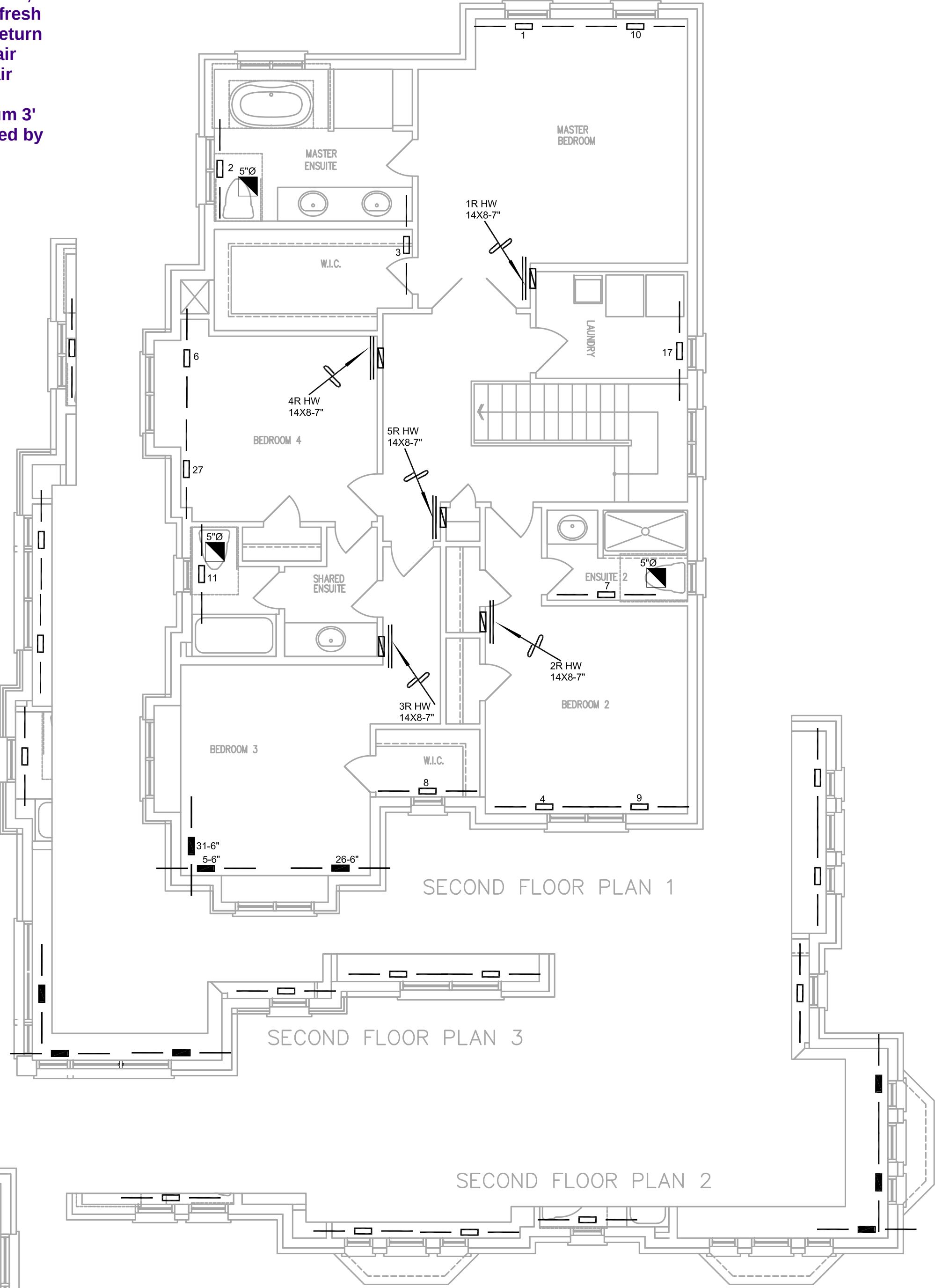
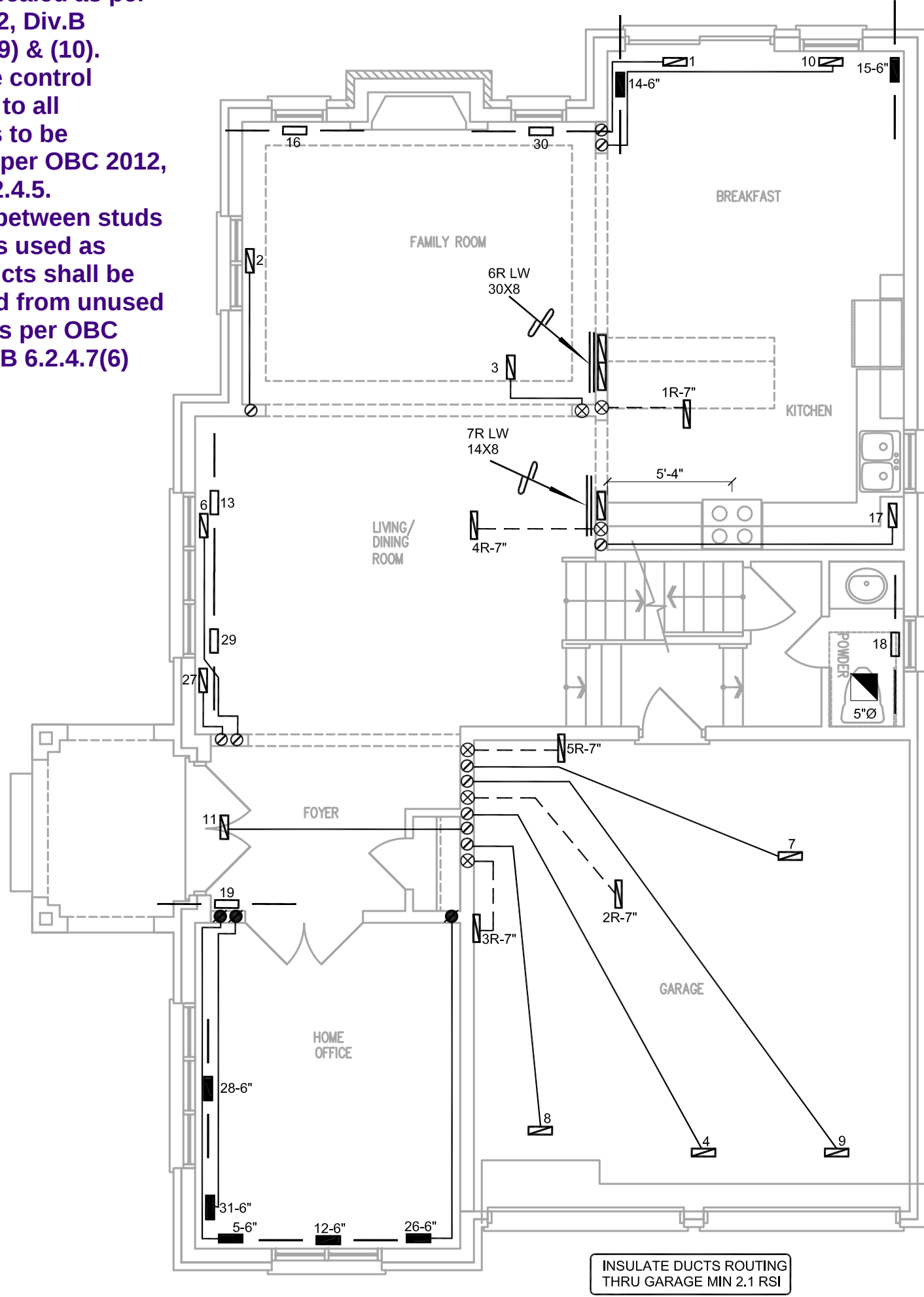
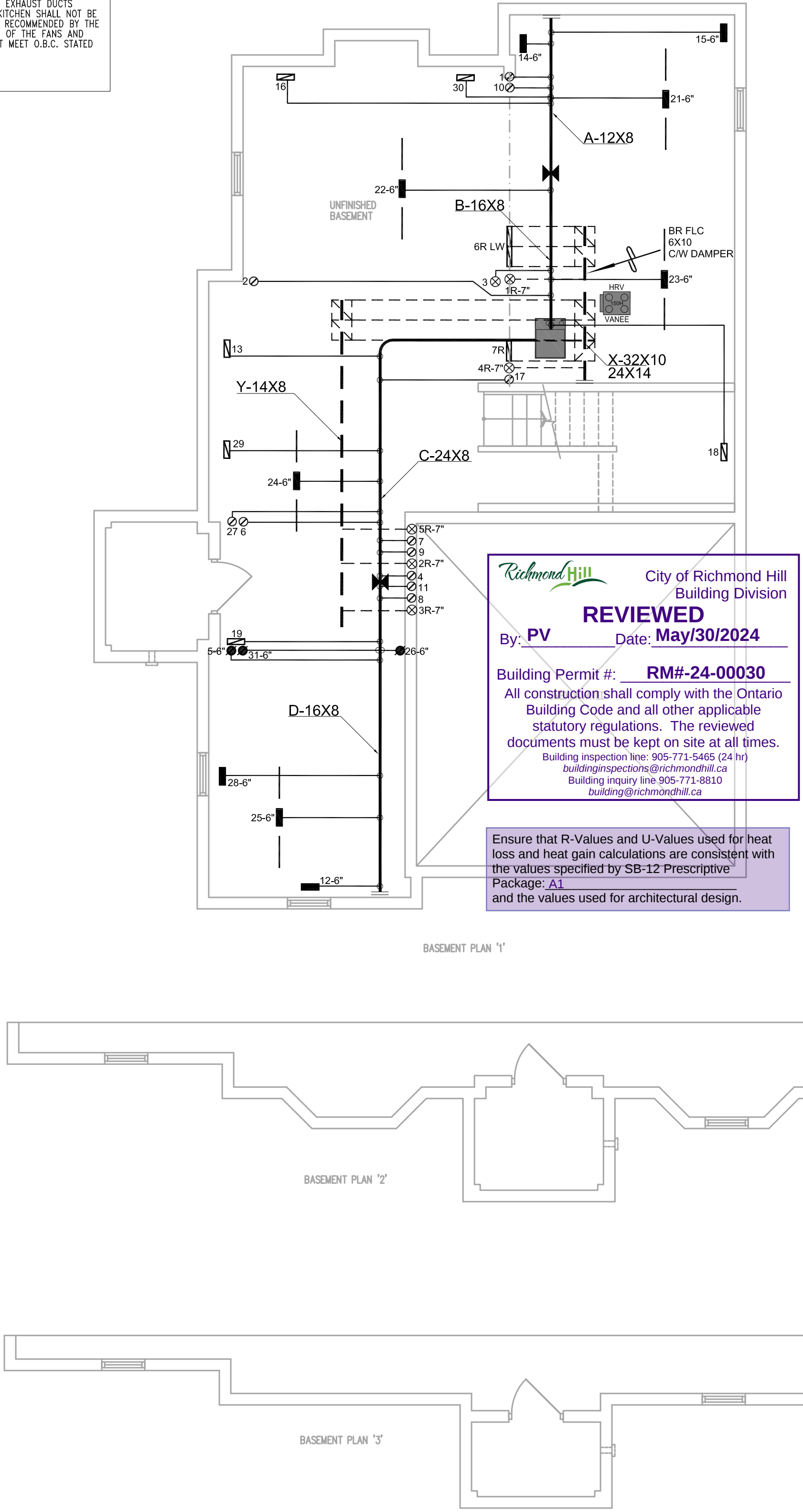
- 13.Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.
14. Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be 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).



HEAT LOSS 56597 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			
MAKE	GOODMAN	3RD FLOOR			
MODEL	GMEC960804CNA	2ND FLOOR	15	5	3
INPUT	80 MBTU/H	1ST FLOOR	10	2	2
OUTPUT	76.8 MBTU/H	BASEMENT	5	1	0
COOLING	3.5 TONS	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			
FAN SPEED	1504 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
	LT 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			
1	ISSUED FOR PERMIT	DEC. 11/23	0
No.	Revision	Date	By
SB-12 PACKAGE		A1	
I Michael O'Rourke have reviewed and take responsibility for the design work and am qualified under division C.2.2.5 of the building code.  Michael O'Rourke BCIN # 19869 HOAC Designs 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@hvacdesigns.ca
Web: www.hvacdesigns.ca
Specializing in Residential Mechanical Design Services

Client: GREENPARK HOMES
Project Name: TRINIGROUP RICHMOND HILL, ONTARIO
VILLA 10
2732 SQFT
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Sheet Title	ALL FLOOR HEATING LAYOUT	Checked By	MO	Sheet No.	1
Drawn By	YV	Date	MAY 2023	LD #	101191
Scale	3/16"=1'-0"				