

SITE NAME: TRINGROUP										DATE: Sep-23			WINTER NATURAL AIR CHANGE RATE 0.354			HEAT LOSS ΔT °F. 78		CSA-F280-1:										
BUILDER: GREENPARK HOMES										TYPE: VILLA 1			GFA: 2258			LO# 102630			SUMMER NATURAL AIR CHANGE RATE 0.110			HEAT GAIN ΔT °F. 13		SB-12 PACKAGE A				
ROOM USE		MBR		ENS		WIC		BED-2		BED-3		BED-4		BATH		HALL												
EXP. WALL		32		21		7		13		29		30		6		14												
CLG. HT.		9		9		9		9		9		9		9		9												
FACTORS																												
GRS.WALL AREA		LOSS		GAIN		291		191		64		118		264		273		55		127								
GLAZING						LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN								
NORTH		21.8	16.0	0	0	0	7	152	112	0	0	0	10	218	160	0	0	0	0	0	0	0	0					
EAST		21.8	41.6	0	0	0	0	0	0	0	0	0	45	980	1870	39	850	1621	0	0	0	0	0					
SOUTH		21.8	24.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	392	448				
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				
SKYL.T.		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				
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				
NET EXPOSED WALL		4.6	0.8	271	1239	204	168	768	126	64	291	48	108	495	81	219	1000	165	234	1069	176	55	249	41	109	500	82	
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	278	365	163	158	208	93	66	87	39	146	192	86	129	169	76	140	184	82	90	118	53	237	311	139	
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	51	144	64	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	180	470	77	27	70	12	64	167	27	52	136	22	
BASEMENT/CRAWL HEAT LOSS																												
SLAB ON GRADE HEAT LOSS																												
SUBTOTAL HT LOSS				2040				1477				378		904				2763				2173		535		1339		
SUB TOTAL HT GAIN						1198				996		87		327				2252				1890		121		692		
LEVEL FACTOR / MULTIPLIER		0.20	0.25			0.20	0.25			0.20	0.25			0.20	0.25			0.20	0.25			0.20	0.25			0.20	0.25	
AIR CHANGE HEAT LOSS				520				376				96		230				704				554		136		341		
AIR CHANGE HEAT GAIN				85				71				6		23				160				134		9		49		
DUCT LOSS				0				0				0		0				347				273		67		168		
DUCT GAIN				0				0				0		0				343				304		13		74		
HEAT GAIN PEOPLE				240				2				480		0		0		1				240		0		0		0
HEAT GAIN APPLIANCES/LIGHTS				774				0				0		774				774				774		0		0		
TOTAL HT LOSS BTU/H				2560				1853				474		1135				3814				2999		738		1848		
TOTAL HT GAIN x 1.3 BTU/H				3298				1386				121		1773				4898				4344		186		1060		

Richmond Hill

City of Richmond Hill

Building Division

HVAC REVIEWED

Initials:

PXV

ROOM USE			DIN			KT/BF			FAM			PWD			FOY			MUD			WOD			BAS					
EXP. WALL			30			32			29			10			33			23			38			154					
CLG. HT.			10			10			10			10			10			10			9			9					
FACTORS																													
GRS.WALL AREA			LOSS GAIN			303			323			293			101			333			232			323			961		
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	3	65	48				
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	22	479	914	0	0	0	0	0	0	0	0				
SOUTH	21.8	24.9	25	545	622	0	0	0	0	0	0	7	152	174	0	0	0	0	0	0	0	3	65	75					
WEST	21.8	41.6	0	0	0	58	1263	2410	22	479	914	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				
DOORS	20.5	3.4	0	0	0	0	0	0	0	0	0	0	0	0	22	452	74	21	431	71	0	0	0	0	0				
NET EXPOSED WALL	4.6	0.8	278	1270	209	265	1212	199	271	1238	204	94	429	71	289	1322	217	211	965	159	0	0	0	0	0				
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	222	818	135	348	1282	211			
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0							5144				
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0								
SUBTOTAL HT LOSS			1815			2475			1717			582			2252			1396			948			6988					
SUB TOTAL HT GAIN				831			2609		1118				245		1206			230			384			404					
LEVEL FACTOR / MULTIPLIER	0.30	0.43				0.30	0.43		0.30	0.43		0.30	0.43		0.30	0.43		0.30	0.43				0.50	0.93					
AIR CHANGE HEAT LOSS			787			1073			744			252			976			605							7396				
AIR CHANGE HEAT GAIN				59			185		79				17		85				16						56				
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				
HEAT GAIN APPLIANCES/LIGHTS				774			774		774				0		0		0		0						774				
TOTAL HT LOSS BTU/H			2601			3548			2461			834			3229			2002			948			14384					
TOTAL HT GAIN x 1.3 BTU/H				2163			4638		2562				341		1679			320			499			1604					

TOTAL HEAT GAIN BTU/H:

31147

TONS: 2.60

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 45429

TOTAL COMBINED HEAT LOSS BTU/H: 47099

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

RECEIVED
Per: joshua.nabua

SITE NAME: TRINIGROUP

BUILDER: GREENPARK HOMES

TYPE: VILLA 1

DATE: Sep-23

GFA: 2258

LO# 102630

HEATING CFM	978	COOLING CFM	978
TOTAL HEAT LOSS	45,429	TOTAL HEAT GAIN	30,872
AIR FLOW RATE CFM	21.53	AIR FLOW RATE CFM	31.68

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

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	8	4
R/A	0	0	5	1	1

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

FAN SPEED LOW
MEDLOW 978
MEDIUM 1017
HIGH 1131DESIGN CFM = 978
CFM @ .7" E.S.P.

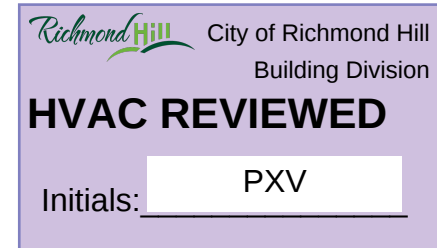
TEMPERATURE RISE 55 °F

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	BATH	HALL	BED-3	MBR	BED-4	ENS	DIN	KT/BF	KT/BF	FAM	FAM	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.28	0.93	0.47	1.13	1.91	1.50	0.37	1.85	1.91	1.28	1.50	0.93	2.60	1.77	1.77	1.23	1.23	0.83	3.23	2.00	3.83	3.83	3.83	3.83
CFM PER RUN HEAT	28	20	10	24	41	32	8	40	41	28	32	20	56	38	38	26	26	18	70	43	83	83	83	83
RM GAIN MBH.	1.65	0.69	0.12	1.77	2.45	2.17	0.09	1.06	2.45	1.65	2.17	0.69	2.16	2.32	2.32	1.28	1.28	0.34	1.68	0.32	0.53	0.53	0.53	0.53
CFM PER RUN COOLING	52	22	4	56	78	69	3	34	78	52	69	22	69	73	73	41	41	11	53	10	17	17	17	17
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	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	43	49	39	32	45	52	43	38	47	28	65	31	16	16	23	31	20	35	36	20	27	21	16	38
EQUIVALENT LENGTH	160	160	160	160	120	140	180	130	140	100	180	140	140	110	110	160	130	140	110	140	150	140	120	130
TOTAL EFFECTIVE LENGTH	203	209	199	192	165	192	223	168	187	128	245	171	156	126	133	191	150	175	146	160	177	161	136	168
ADJUSTED PRESSURE	0.08	0.07	0.08	0.08	0.09	0.08	0.07	0.09	0.08	0.12	0.06	0.09	0.1	0.12	0.12	0.08	0.1	0.09	0.11	0.1	0.08	0.09	0.11	0.09
ROUND DUCT SIZE	5	4	4	6	5	6	4	4	5	5	6	4	5	5	5	4	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	206	229	115	122	301	163	92	459	301	206	163	229	411	279	279	298	298	207	514	493	423	423	423	423
COOLING VELOCITY (ft/min)	382	252	46	286	573	352	34	390	573	382	352	252	507	536	536	470	470	126	389	115	87	87	87	87
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	A	D	B	D	C	D	D	D	B	C	B	B	A	A	A	A	C	C	B	A	A	B	C

RUN #	25
ROOM NAME	BATH
RM LOSS MBH.	0.37
CFM PER RUN HEAT	8
RM GAIN MBH.	0.09
CFM PER RUN COOLING	3
ADJUSTED PRESSURE	0.16
ACTUAL DUCT LGH.	38
EQUIVALENT LENGTH	170
TOTAL EFFECTIVE LENGTH	208
ADJUSTED PRESSURE	0.08
ROUND DUCT SIZE	4
HEATING VELOCITY (ft/min)	92
COOLING VELOCITY (ft/min)	34
OUTLET GRILL SIZE	3X10
TRUNK	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	314	0.07	9.4	10	x	8	565		TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	596	0.07	11.9	16	x	8	671		TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	235	0.06	8.8	10	x	8	423		TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	383	0.06	10.5	14	x	8	492		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	978	0.05	15.6	28	x	8	629
TRUNK Y	615	0.05	13.1	20	x	8	554
TRUNK Z	170	0.05	8.1	8	x	8	383
DROP	978	0.05	15.6	24	x	10	687

RETURN AIR #	1	2	3	4	5	6										BR
AIR VOLUME	98	99	85	85	85	360	0	0	0	0	0	0	0	0	0	166
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
ACTUAL DUCT LGH.	33	29	55	64	52	31	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	135	140	195	200	190	185	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	168	169	250	264	242	216	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.08	0.08	0.05	0.05	0.06	0.06	13.36	13.36	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.09
ROUND DUCT SIZE	5.9	5.9	6	6	6	10.3	0	0	0	0	0	0	0	0	0	6.9
INLET GRILL SIZE	8	8	8	8	8	8	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
INLET GRILL SIZE	14	14	14	14	14	30	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 1
SITE NAME: TRINIGROUP

LO # 102630

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
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 @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER:		GREENPARK HOMES
Name:	City of Richmond Hill Building Division	
Address:	HVA REVIEWED	
City:	PXV	
Telephone #:	Initials:	

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'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#: 102630

Model: VILLA 1

Builder: GREENPARK HOMES

Date: 9/25/2023

Volume Calculation

Air Change & Delta T Data

House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	980	9	8330
First	980	10	9898
Second	1298	9	11811.8
Third	0	9	0
Fourth	0	9	0
Total:			30,039.8 ft ³
Total:			850.6 m ³

WINTER NATURAL AIR CHANGE RATE	0.354
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

5.2.3.1 Heat Loss due to Air Leakage

6.2.6 Sensible Gain due to Air Leakage

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

$$0.354 \times 236.29 \times 43^\circ\text{C} \times 1.2 = 4335 \text{ W}$$

$$= 14793 \text{ Btu/h}$$

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

$$0.110 \times 236.29 \times 7^\circ\text{C} \times 1.2 = 223 \text{ W}$$

$$= 759 \text{ Btu/h}$$

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)	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	14,793	7,936	0.932
2	0.3		10,237	0.433
3	0.2		11,609	0.255
4	0		0	0.000
5	0		0	0.000

*HLairbv = Air leakage heat loss + ventilation heat loss

*For a balanced or supply only ventilation system HLairve = 0

Michael O'Rourke
BCIN# 19669CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

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Per: joshua.nabua

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: VILLA 1	BUILDER: GREENPARK HOMES
SFQT: 2258	SITE: TRINIGROUP
LO# 102630	

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 (ft ³):	30039.8	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.90	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	5.5 ft
LENGTH: 49.0 ft	WIDTH: 28.0 ft	EXPOSED PERIMETER:	154.0 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



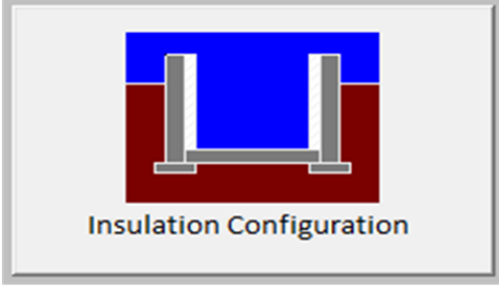
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BUILDING DIVISION

05/01/2024

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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):	14.9	 Insulation Configuration
Floor Width (m):	8.5	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.6	
Depth Below Grade (m):	1.68	
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):		1507

TYPE: VILLA 1
LO# 102630

Michael O'Rourke BCIN #19669

CITY OF RICHMOND HILL
BUILDING DIVISION

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HVAC REVIEWEDInitials: **PXV**

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):	7.68			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	850.6			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1133.9 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):	0.354			
Cooling Air Leakage Rate (ACH/H):	0.110			

TYPE: VILLA 1
LO# 102630

Michael O'Rourke BCIN# 19669

CITY OF RICHMOND HILL
BUILDING DIVISION

05/01/2024

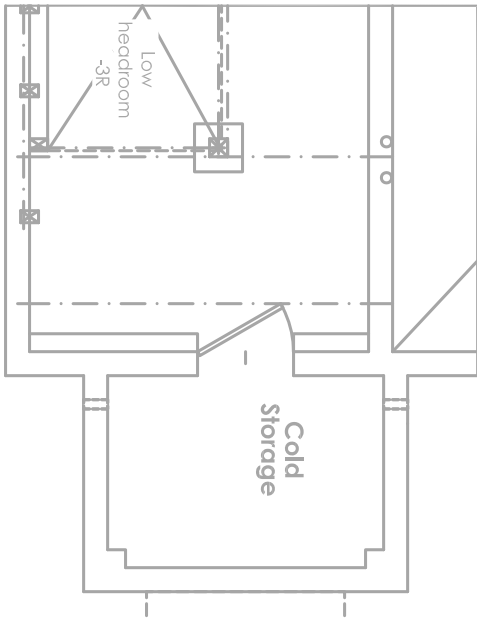
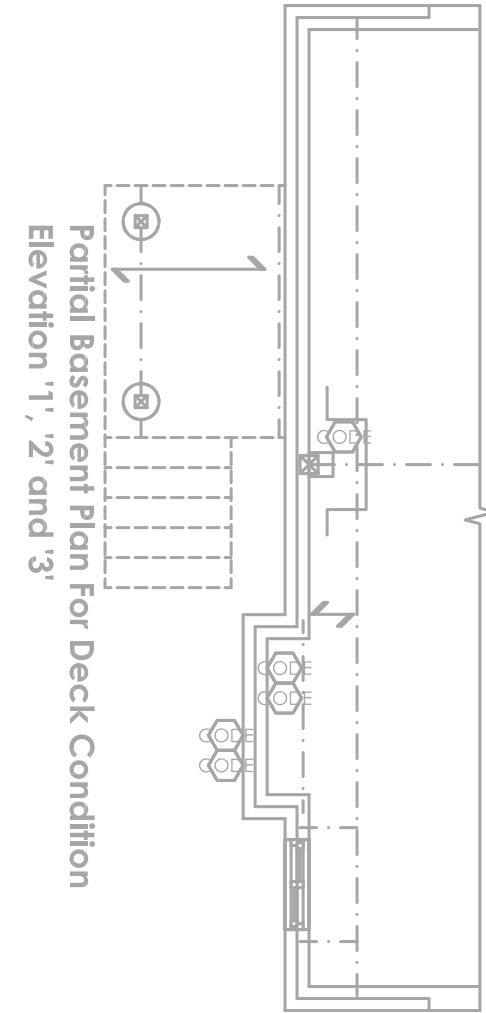

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Per: joshua.nabua

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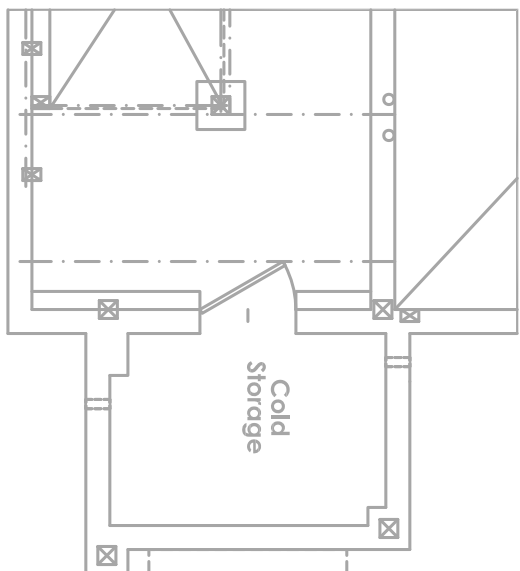
INSTALLATION TO COMPLY WITH THE LATEST ONTARIO BUILDING CODE. ALL SUPPLY BRANCH OUTLETS SHALL BE EQUIPPED WITH MANUAL BALANCING DAMPER. DUCTWORK WHICH PASSES THROUGH THE GARAGE OR UNHEATED SPACES SHALL BE ADEQUATELY INSULATED AND GAS-PROOFED

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

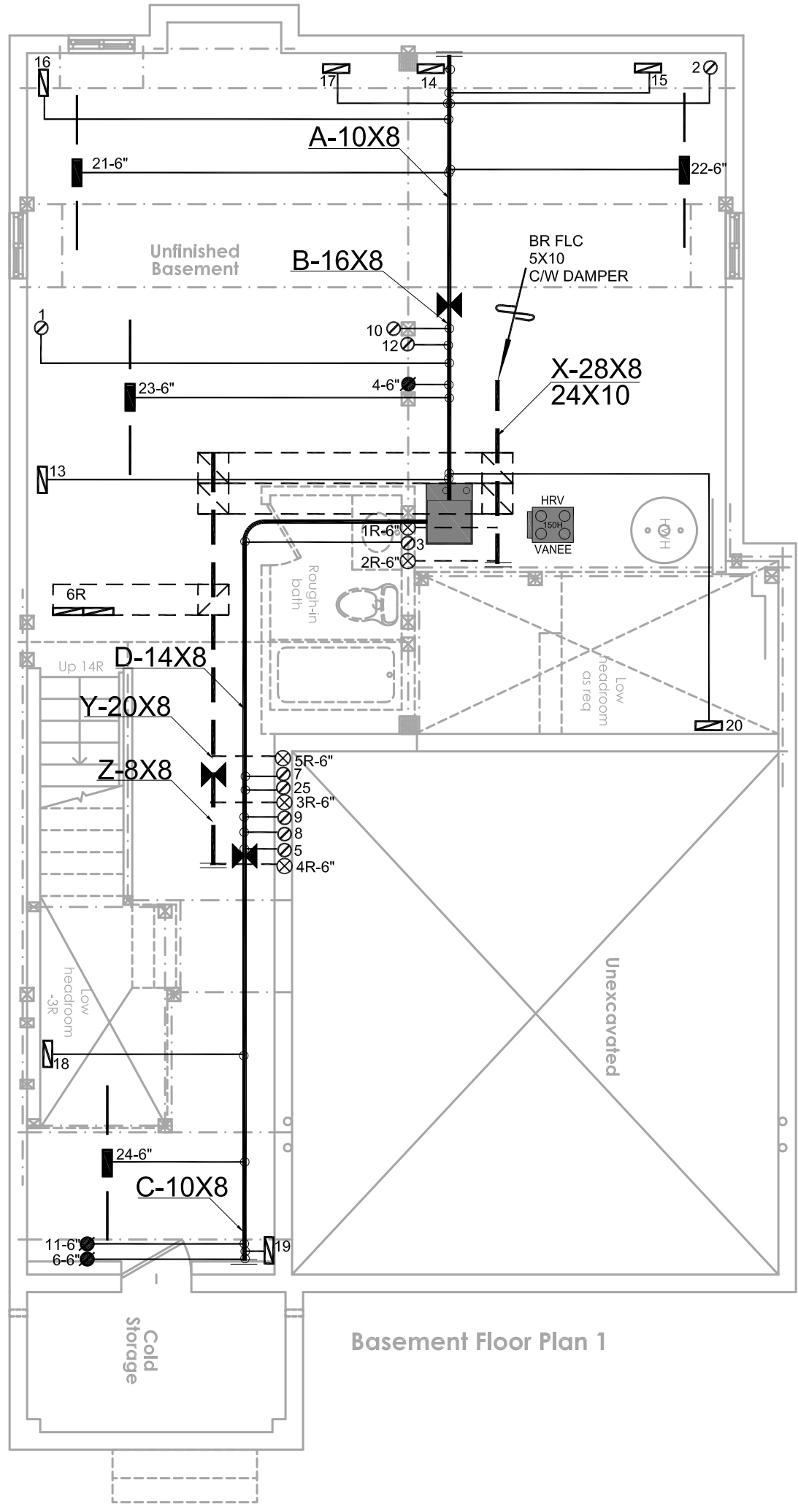
SUPPLEMENTAL EXHAUST FAN (MINIMUM 100 CFM) DISCHARGING DIRECTLY TO THE EXTERIOR WILL BE PROVIDED IN THE KITCHEN. EXHAUST DUCTS SERVING THE KITCHEN SHALL NOT BE SMALLER THAN RECOMMENDED BY THE MANUFACTURER OF THE FANS AND MUST AT LEAST MEET O.B.C. STATED MINIMUMS.



Basement Floor Plan 2



Basement Floor Plan 3



Basement Floor Plan 1

City of Richmond Hill
Building Division

REVIEWED

By: **PV** Date: **May/29/2024**

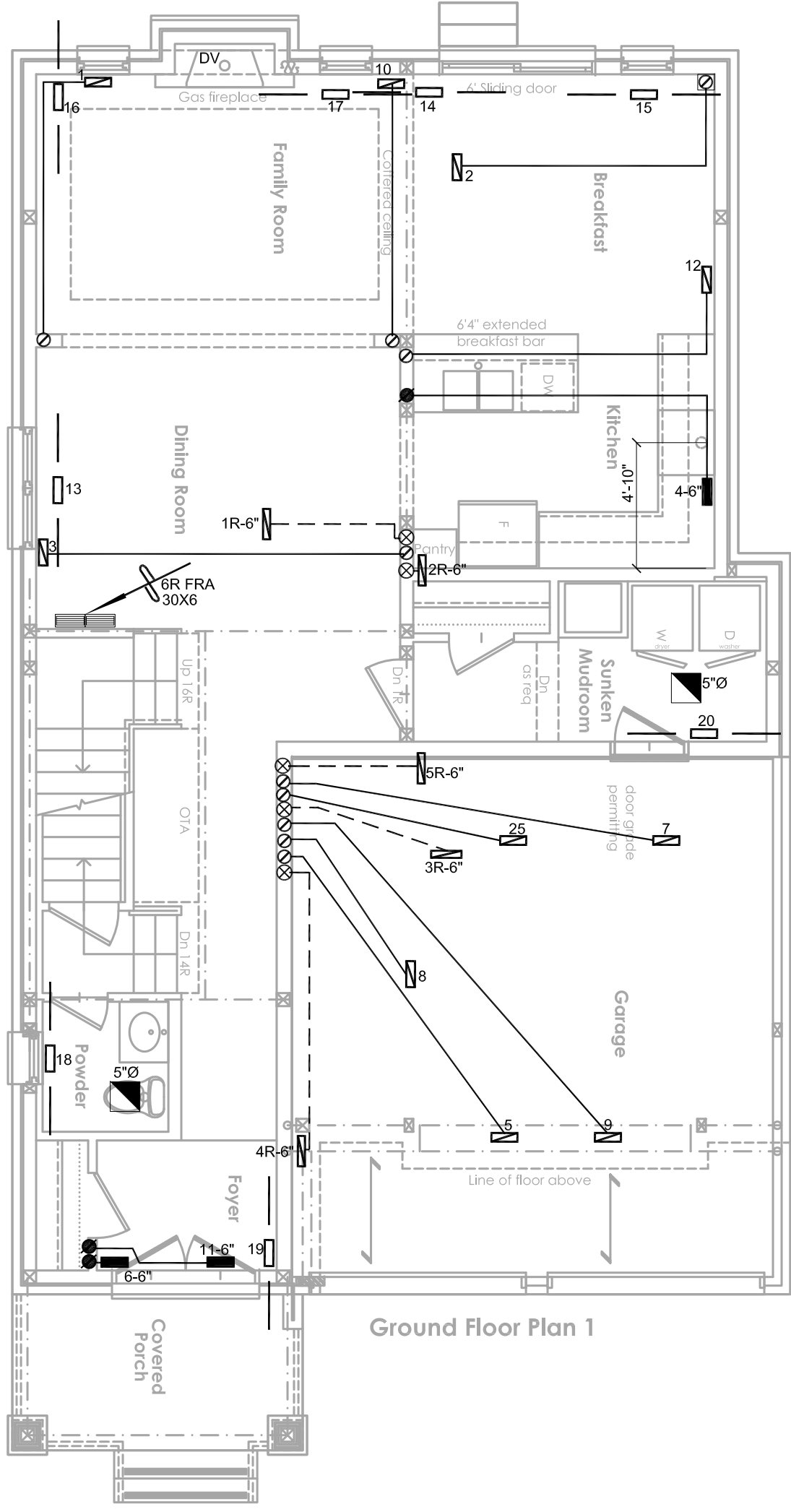
Building Permit #: **RM#-24-00023**

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.

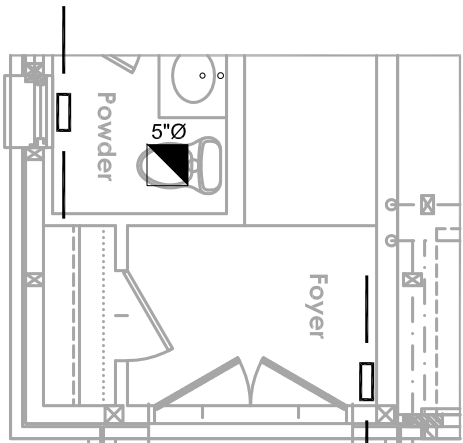
Building inspection line: 905-771-5465 (24 hr)
buildinginspections@richmondhill.ca
Building inquiry line 905-771-8810
building@richmondhill.ca

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.

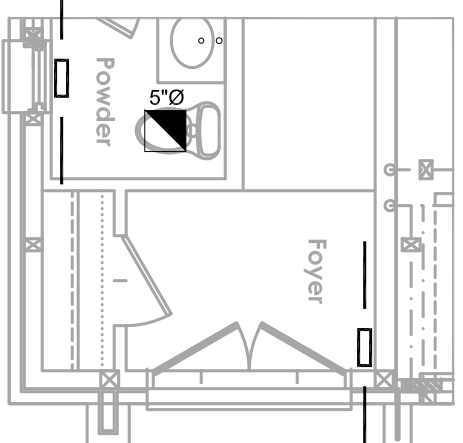
- Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).
- Kitchen hood exhaust duct shall be provided as per OBC 2012, Div.B 9.32.3.10, 9.32.3.5(2).
- Minimum R-12 Insulation Value required for ducts installed at unheated or exposed condition (OBC 2012 Div.B 6.2.4.3(10) and seal the ducts as per 6.2.4.3(11) & HRAI Digest 2005, Clause 4.5.
- 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).
- Volume control dampers to all branches to be installed per OBC 2012, Div.B, 6.2.4.5.
- 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)



Ground Floor Plan 1



Ground Floor Plan 2



Ground Floor Plan 3

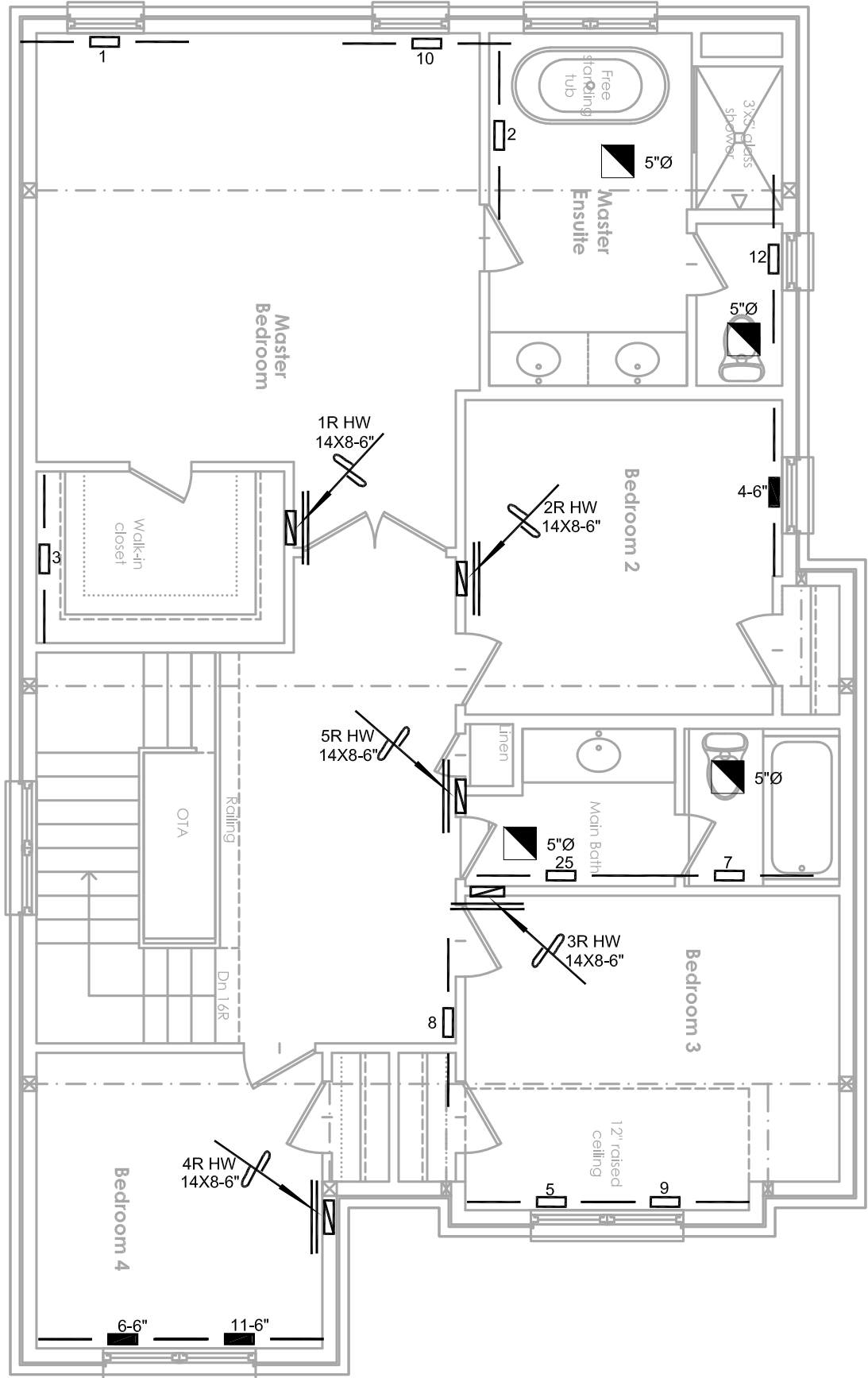
- Combustion air supply shall be provided to the furnace and hot water tank.

- 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)

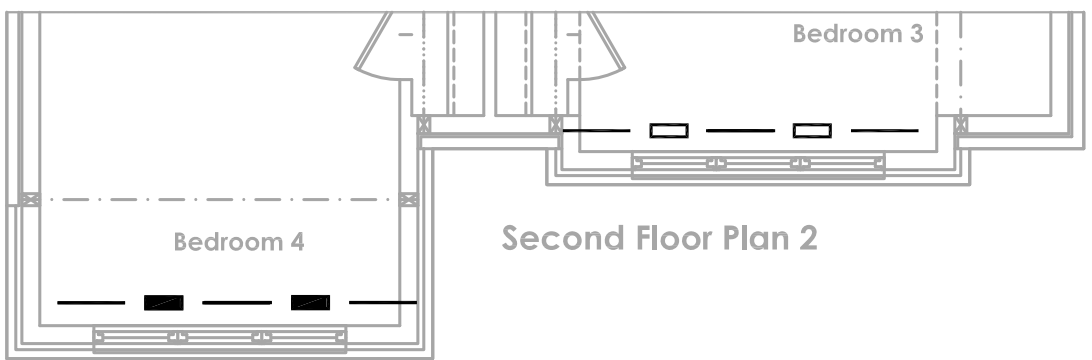
- HRV duct connection shall be in compliance with OBC 2012 Div.B 9.32.3.6(3) & 9.32.3.4(7).

- 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).

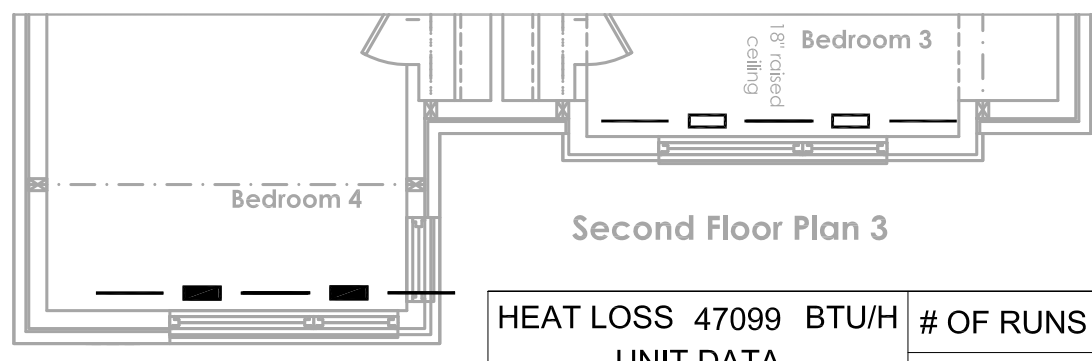
- Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.
- Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned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



Second Floor Plan 1



Second Floor Plan 2



Second Floor Plan 3

HEAT LOSS	47099 BTU/H	# OF RUNS	S/A	R/A	FANS
UNIT DATA		3RD FLOOR			
MAKE	GOODMAN	2ND FLOOR	13	5	4
MODEL	GMEC960603BNA	1ST FLOOR	8	1	3
INPUT	60 MBTU/H	BASEMENT	4	1	0
OUTPUT	57.6 MBTU/H				
COOLING	2.5 TONS				
FAN SPEED	978 cfm @ 0.6" w.c.				

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

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 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

SEPT/23

HR

By

SB-12 PACKAGE

A1

Michael Offutt has reviewed and attests responsibility for the design work and is qualified under division C.2.2 of the building code.

Michael Offutt BCMA 1999
HVAC Design Ltd.

HVAC DESIGNS LTD.

375 Finley Ave - Unit 202 - Ajax, Ontario L1S 2E2
Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacadesigns.ca
Web: www.hvacadesigns.ca
Specializing in Residential Mechanical Design Services

Client: GREENPARK HOMES

Project Name: TRINIGROUP RICHMOND HILL, ONTARIO

VILLA 1
2258 SQFT

Sheet Title: HVAC

Drawn By: HR

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

Date: SEPTEMBER 2023

LO # 102630

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BUILDING DIVISION
05/01/2024
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Per: joshua.nabulsi