

06/19/2024

REVISION
SB-12 PACKAGE A1

Per: philip.bose.varkey

SITE NAME: TRINIGROUP										WOB										DATE: Jun-24										WINTER NATURAL AIR CHANGE RATE 0.380										HEAT LOSS ΔT °F. 78										CSA-F280-12																																																																															
BUILDER: GREENPARK HOMES										TYPE: VILLA 6										GFA: 3040										LO# 102611										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										BATH										FLEX										ENS-2																																							
EXP. WALL										33										29										7										14										32										33										7										11										7																																							
CLG. HT.										9										9										9										9										9										9										9										9										9																																							
GRS.WALL AREA										FACTORS										297										261										63										126										288										297										63										99										63																													
GLAZING										LOSS										GAIN										LOSS										GAIN										LOSS										GAIN										LOSS										GAIN										LOSS										GAIN										LOSS										GAIN									
NORTH										21.8	16.0	0	0	0	14	305	224	0	0	0	32	697	511	0	0	0	0	0	0	44	958	1828	35	762	1454	12	261	499	0	0	0	0	0	0	7	152	112																																																																																		
EAST										21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	958	1828	35	762	1454	12	261	499	0	0	0	0	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	0	0	0	0	0	0	0	0	11	240	274	0	0	0	0	0	0																																																																																			
WEST										21.8	41.6	22	479	914	16	349	665	0	0	0	0	0	0	0	0	0	0	0	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	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	0	0	0	0	0	0	0	0	0	0	0	0																																																																																		
NET EXPOSED WALL										4.6	0.8	275	1256	207	231	1055	174	63	288	47	94	429	71	244	1115	183	262	1197	197	51	233	38	88	402	66	56	256	42	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																		
EXPOSED CLG										1.3	0.6	263	346	155	203	267	119	90	118	53	173	227	102	186	244	109	184	242	108	111	146	65	238	313	140	118	155	69	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	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	186	486	80	0	0	0	96	251	41	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										0										0																																																	
SLAB ON GRADE HEAT LOSS										0										0										0										0										0										0										0										0										0																																							
SUBTOTAL HT LOSS										2081										1976										406										1354										2803										2201										891										954										563																																							
SUB TOTAL HT GAIN										1275										1181										100										683										2201										1759										643										480										223																																							
LEVEL FACTOR / MULTIPLIER										0.20	0.31											0.20	0.31											0.20	0.31											0.20	0.31											0.20	0.31											0.20	0.31																																																										
AIR CHANGE HEAT LOSS										650										617										127										423										876										688										278										298										176																																							
AIR CHANGE HEAT GAIN										91										84										7										49										157										126										46										34										16																																							
DUCT LOSS										0										0										0										0										368										0										117										0										0																																							
DUCT GAIN										0										0										0										0										306										0										69										0										0																																							
HEAT GAIN PEOPLE										240	2										480	0	0	0	1	240	1	240	1	240	1	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																														
HEAT GAIN APPLIANCES/LIGHTS										465										0										0										465										465										0										465										0										0																																							
TOTAL HT LOSS BTU/H										2731										2593										533										1777										4047										2889										1286										1253										739																																							
TOTAL HT GAIN x 1.3 BTU/H										3005										1645										140										1868										4380										3367										986										1273										311																																							

ROOM USE			OFFICE		FML		KT/BT		LV/DN		LAUN		PWD		FOY		MUD						WOB		BAS		
EXP. WALL			11		35		40		21		8		9		33		30						40		144		
CLG. HT.			10		10		10		10		9		10		10		10						9		9		
FACTORS																											
GRS.WALL AREA	LOSS	GAIN	110		350		400		210		72		90		330		300						360		864		
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	
NORTH	21.8	16.0	22	479	351	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	87	64	
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	19	414	789	0	0	0	0	58	1263	2410	0	
SOUTH	21.8	24.9	0	0	0	0	0	0	11	240	274	44	958	1096	7	152	174	7	152	174	0	0	0	0	8	174	199
WEST	21.8	41.6	0	0	0	22	479	914	58	1263	2410	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	20	411	68	0	
NET EXPOSED WALL	4.6	0.8	88	402	66	328	1498	247	331	1512	249	166	758	125	65	297	49	83	379	62	291	1329	219	280	1279	210	
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	0	0	0	0	0	0	0	0	0	0	0	0	121	159	71	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	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	0	
BASEMENT/CRAWL HEAT LOSS																											
SLAB ON GRADE HEAT LOSS																											
SUBTOTAL HT LOSS			881			1978			3015			1717			608			532			2154			1690			
SUB TOTAL HT GAIN				418		1161			2933			1220			294			237			1076			278			
LEVEL FACTOR / MULTIPLIER	0.30	0.54				0.30	0.54		0.30	0.54		0.30	0.54		0.20	0.31		0.30	0.54		0.30	0.54		0.30	0.54		
AIR CHANGE HEAT LOSS			478			1072			1635			931			190			288			1168			916			
AIR CHANGE HEAT GAIN				30		83			209			87			21			17			77			20			
DUCT LOSS			0			0			0			0			0			0			0			0			
DUCT GAIN				0		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	0		0	
HEAT GAIN APPLIANCES/LIGHTS				465		465			465			465			465			0			0			465			
TOTAL HT LOSS BTU/H			1359			3050			4650			2648			799			820			3321			2606			
TOTAL HT GAIN x 1.3 BTU/H				1186		2221			4689			2304			1014			330			1498			992			

TOTAL HEAT GAIN BTU/H:

36585

TONS: 3.05

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 55676

TOTAL COMBINED HEAT LOSS BTU/H: 57346

06/19/2024

REVISED

Per: Michael O'Rourke

AFUE = 96 %

INPUT (BTU/H) = 80,000

OUTPUT (BTU/H) = 76,800

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

TEMPERATURE RISE 62 °F

SITE NAME: TRINIGROUP

BUILDER: GREENPARK HOMES

WOB

TYPE: VILLA 6

DATE: Jun-24

GFA: 3040

LO# 102611

HEATING CFM 1142 COOLING CFM 1142
TOTAL HEAT LOSS 55,676 TOTAL HEAT GAIN 36,310
AIR FLOW RATE CFM 20.51 AIR FLOW RATE CFM 31.45

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

#*GOODMAN
GMEC960804CNA
FAN SPEED 80

LOW 868
MEDLOW 978
MEDIUM 1142
MEDIUM HIGH 1142
HIGH 1615

plenum pressure s/a 0.15 r/a pressure 0.13
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.13 adjusted pressure r/a 0.11

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	8	4
R/A	0	0	5	3	1

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	FLEX	ENS	MBR	ENS-2	OFFICE	FML	KT/BT	KT/BT	LV/DN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.37	1.30	0.53	1.78	2.02	1.44	1.29	1.25	1.30	1.37	0.74	1.36	3.05	2.32	2.32	2.65	0.80	0.82	3.32	2.61	4.64	4.64	4.64	4.64
CFM PER RUN HEAT	28	27	11	36	42	30	26	26	27	28	15	28	63	48	48	54	16	17	68	53	95	95	95	95
RM GAIN MBH.	1.50	0.82	0.14	1.87	2.19	1.68	0.99	1.27	0.82	1.50	0.31	1.19	2.22	2.34	2.34	2.30	1.01	0.33	1.50	0.99	1.28	1.28	1.28	1.28
CFM PER RUN COOLING	47	26	4	59	69	53	31	40	26	47	10	37	70	74	74	72	32	10	47	31	40	40	40	40
ADJUSTED PRESSURE	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	54	28	26	56	78	79	68	60	24	62	17	9	26	31	40	44	54	53	64	60	50	38	46	41
EQUIVALENT LENGTH	160	160	160	160	200	170	200	120	180	130	130	180	130	90	130	110	200	140	110	130	120	130	130	100
TOTAL EFFECTIVE LENGTH	214	188	186	216	278	249	268	180	204	192	147	189	156	121	170	154	254	193	174	190	170	168	176	141
ADJUSTED PRESSURE	0.06	0.07	0.07	0.06	0.05	0.05	0.05	0.08	0.07	0.07	0.09	0.07	0.09	0.11	0.08	0.09	0.05	0.07	0.08	0.07	0.07	0.07	0.07	0.09
ROUND DUCT SIZE	5	4	4	6	6	6	5	5	4	5	4	4	5	5	5	5	5	4	6	5	6	6	6	6
HEATING VELOCITY (ft/min)	206	310	126	184	214	153	191	191	310	206	172	321	463	352	352	396	117	195	347	389	484	484	484	484
COOLING VELOCITY (ft/min)	345	298	46	301	352	270	228	294	298	345	115	424	514	543	543	529	235	115	240	228	204	204	204	204
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	D	D	B	A	A	A	B	D	C	D	D	D	D	C	B	B	A	A	B	A	B	C	D

RUN #	25	26
ROOM NAME	BED-3	BED-4
RM LOSS MBH.	2.02	1.44
CFM PER RUN HEAT	42	30
RM GAIN MBH.	2.19	1.68
CFM PER RUN COOLING	69	53
ADJUSTED PRESSURE	0.14	0.14
ACTUAL DUCT LGH.	75	83
EQUIVALENT LENGTH	200	170
TOTAL EFFECTIVE LENGTH	275	253
ADJUSTED PRESSURE	0.05	0.05
ROUND DUCT SIZE	6	6
HEATING VELOCITY (ft/min)	214	153
COOLING VELOCITY (ft/min)	352	270
OUTLET GRILL SIZE	4X10	4X10
TRUNK	A	A

SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE																
	TRUNK	STATIC	ROUND	RECT				VELOCITY		TRUNK	STATIC	ROUND	RECT				VELOCITY		TRUNK	STATIC	ROUND	RECT				VELOCITY
	CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT			(ft/min)			
TRUNK A	350	0.05	10.6	14	x	8	450	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0			
TRUNK B	630	0.05	13.3	20	x	8	567	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0			
TRUNK C	199	0.06	8.2	8	x	8	448	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0			
TRUNK D	1143	0.05	16.6	32	x	8	643	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	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 S	0	0.05	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	TRUNK T	0	0.05	0	0	x	8	0			

RETURN AIR #	1	2	3	4	5	6	7	8	0	0	0	0	0	0	0	BR
AIR VOLUME	95	85	85	85	85	135	85	297	0	0	0	0	0	0	0	190
PLENUM PRESSURE	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
ACTUAL DUCT LGH.	37	35	64	62	57	17	46	15	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	160	195	190	190	190	160	195	160	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	197	230	254	252	247	177	241	175	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.05	0.05	0.05	0.05	0.06	0.05	0.07	11.44	11.44	11.44	11.44	11.44	11.44	11.44	0.08
ROUND DUCT SIZE	6	6	6	6	6	7	6	9.2	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	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	X
INLET GRILL SIZE	14	14	14	14	14	14	14	30	0	0	0	0	0	0	0	14

TYPE: VILLA 6
SITE NAME: TRINIGROUP

LO # 102611
WOB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

REVISED
Per: philipose varkey

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	
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: June-24

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																																	
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																																	
LO#: 102611		Model: VILLA 6		Builder: GREENPARK HOMES			Date: 6/5/2024																																																										
Volume Calculation					Air Change & Delta T Data																																																												
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$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.380 x 321.63 x 43 °C x 1.2 = 6337 W = 21623 Btu/h					$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.118 x 321.63 x 7 °C x 1.2 = 325 W = 1109 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 6 **WOB** **BUILDER:** GREENPARK HOMES
SFQT: 3040 **LO#** 102611 **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):	40890.0	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: 62.0 ft	WIDTH: 30.0 ft	EXPOSED PERIMETER:	144.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	40.0 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



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

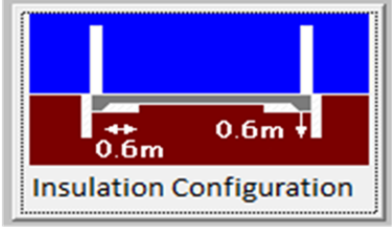
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	4.6	
Floor Width (m):	9.1	
Exposed Perimeter (m):	43.9	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.52	
Window Area (m ²):	1.1	
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):		691

TYPE: VILLA 6
LO# 102611

WOB

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):	9.1	
Exposed Perimeter (m):	12.2	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		146

TYPE: VILLA 6
LO# 102611

WOB

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):	1157.9			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1543.5 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 6
LO# 102611

WOB

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD. & 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.



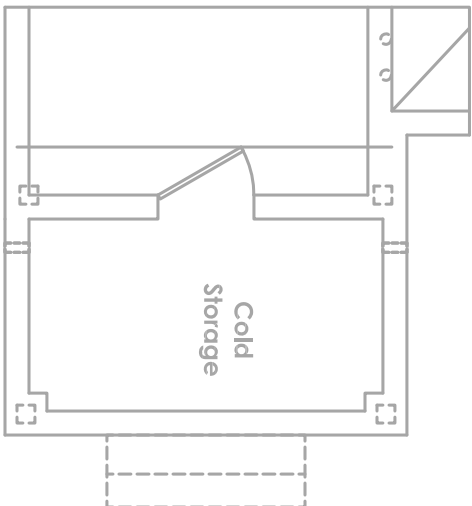
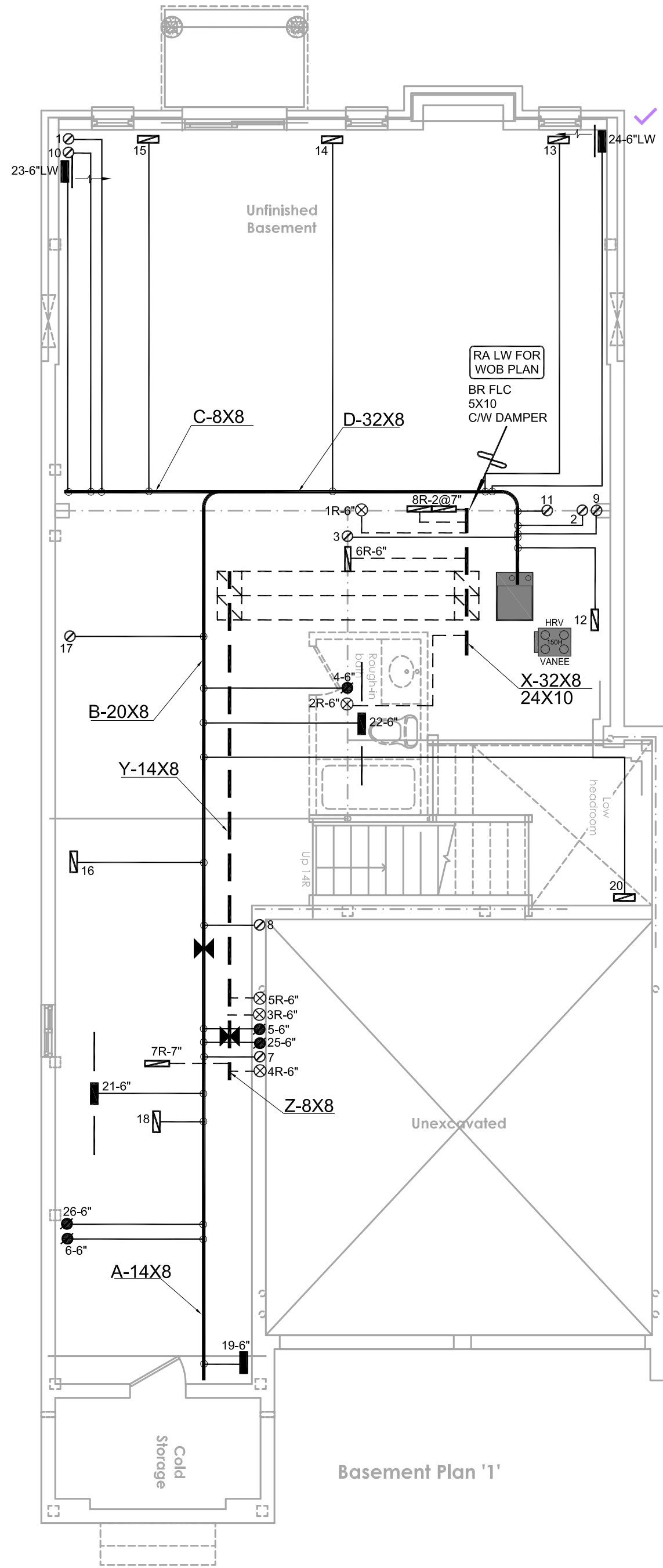
City of Richmond Hill
Building Division

REVIEWED

By: PV Date: June/19/2024

Building Permit #: RM#-24-00027

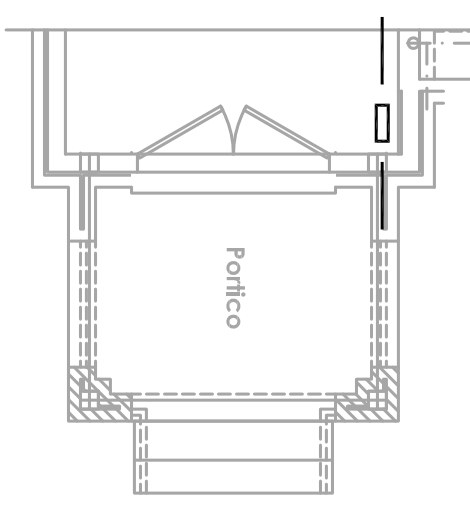
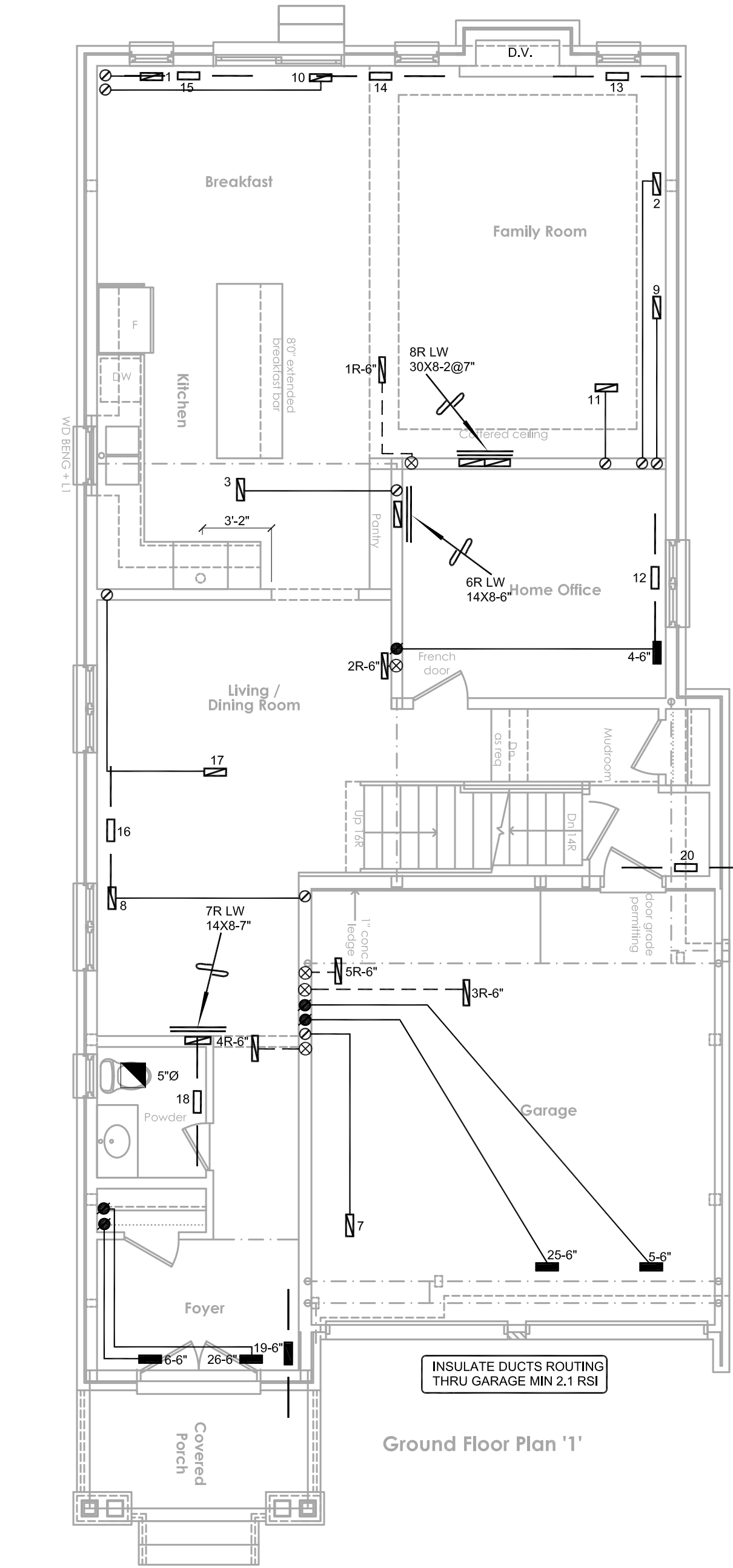
All construction shall comply with the Ontario Building Code and all other applicable statutory regulations. The reviewed documents must be kept on site at all times.
Building inspection line: 905-771-5465 (24 hr)
buildinginspections@richmondhill.ca
Building inquiry line 905-771-8810
building@richmondhill.ca



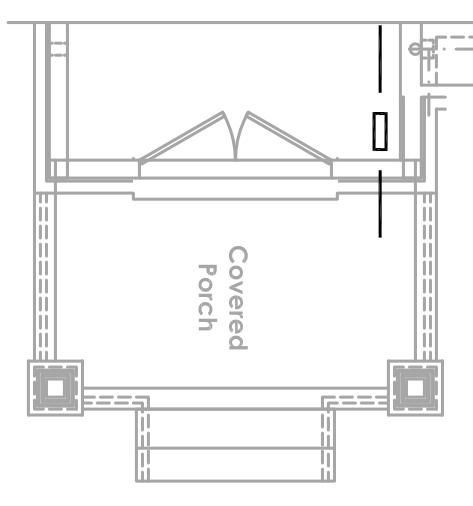
Basement Plan '2'

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)
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).

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.

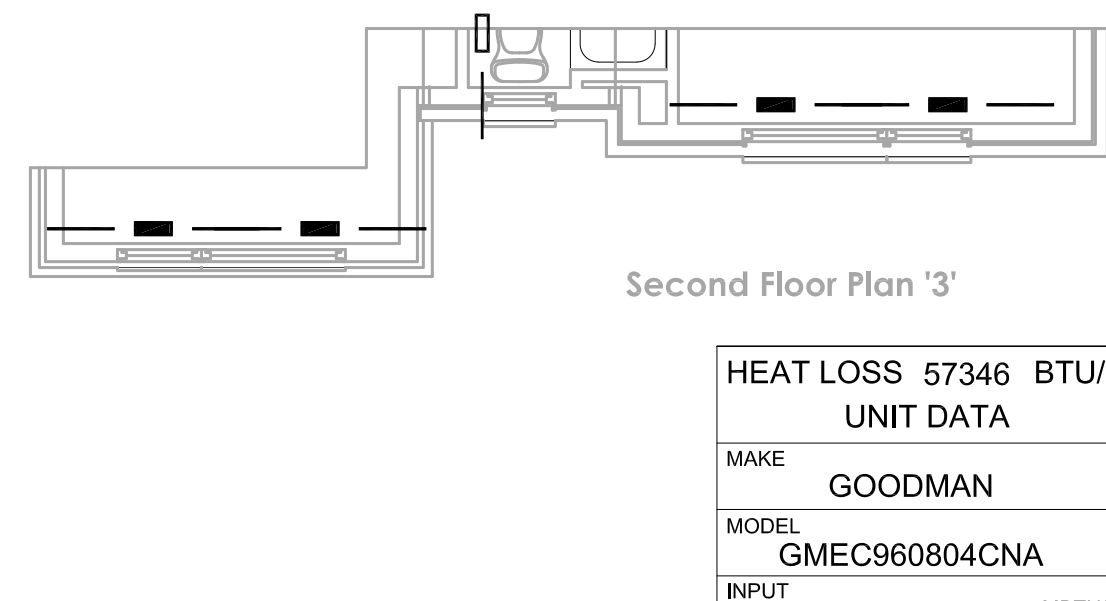
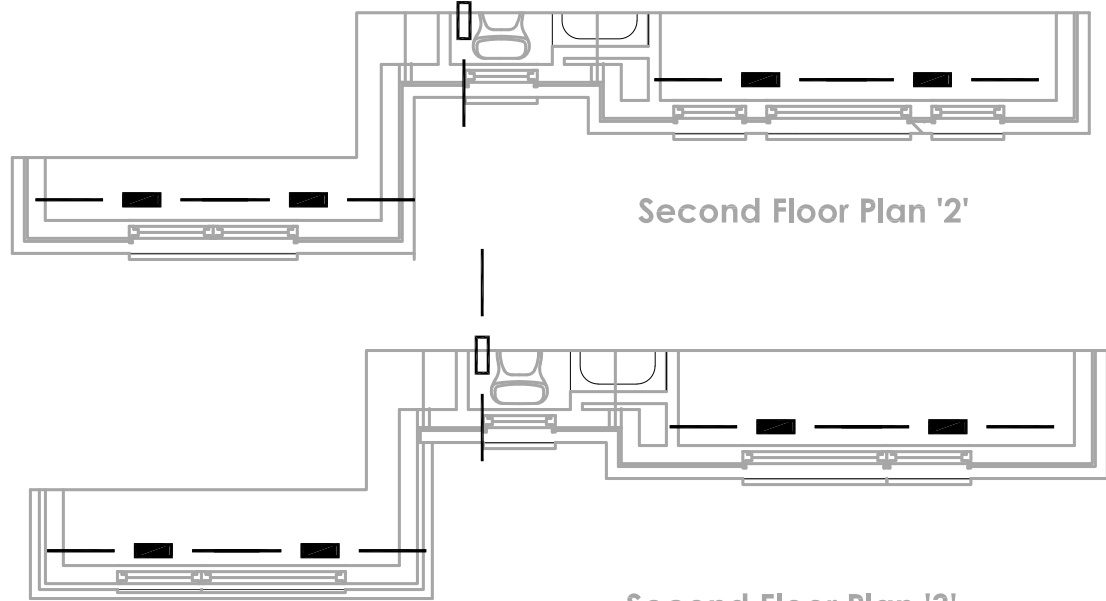
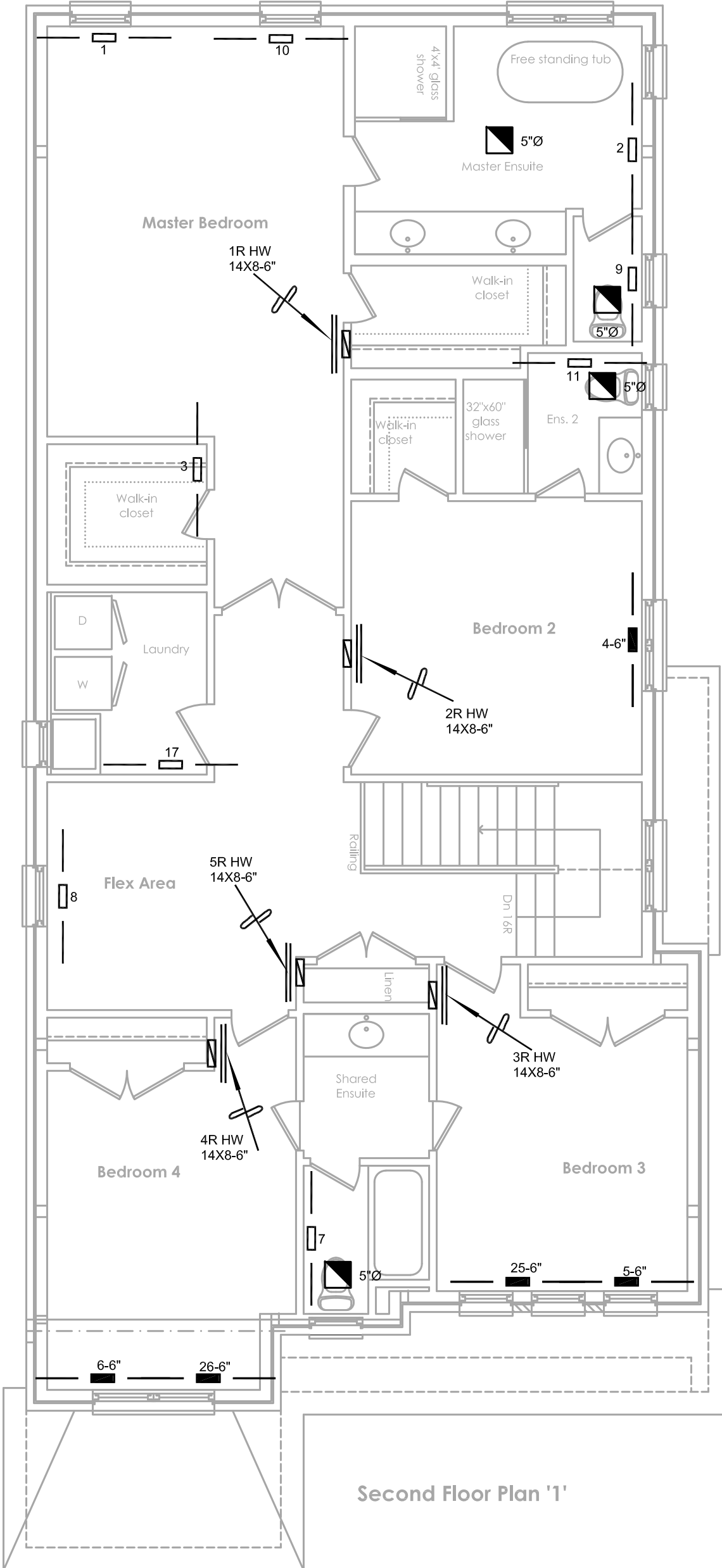


Ground Floor Plan '2'



Ground Floor Plan '3'

13. Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.
14. Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.
15. For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.



HEAT LOSS 57346 BTU/H		# OF RUNS S/A R/A FANS			
UNIT DATA		3RD FLOOR			
MAKE	GOODMAN	2ND FLOOR	14	5	5
MODEL	GMEC960804CNA	1ST FLOOR	8	3	2
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.				

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
	CEILING
	Z.D. MOTORIZED ZONE DAMPER
	M.D. MOTORIZED DAMPER
	EXHAUST PIPE
	CONCENTRIC VENT KIT
	CONCENTRIC HRV or ERV VENT KIT
	SINGLE WALL BOX by REVERSOMATIC
	DOUBLE WALL BOX by REVERSOMATIC
	TRIPLE WALL BOX by REVERSOMATIC
	DRYER BOOSTER FAN

2	REVISED AS PER CITY COMMENT	JUN/24	YV
1	ISSUED FOR PERMIT	SEPT/23	YV
Rev	Revision	Date	By

SB-12 PACKAGE

A1

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



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Email: info@hvacdsgns.ca
Web: www.hvacdsgns.ca

Specializing in Residential Mechanical Design Services

Client: GREENPARK HOMES	
Project Name: TRINITY GROUP RICHMOND HILL, ONTARIO	
VILLA 6 - WOB 3040 SQFT	
Copyright & Copy: © 2023 HVAC Designs Ltd.	
Sheet Title: HVAC HEATING LAYOUT	
Drawn By: YV	Checked By: MD
Scale: 3/16"=1'-0"	
Date: SEPTEMBER 2023	
LO #	102611
	1