

SITE NAME: ROUNDEL HOMES INC										DATE: May-21		WINTER NATURAL AIR CHANGE RATE 0.352		HEAT LOSS ΔT °F. 78		CSA-F280-12						
BUILDER: GREENPARK HOMES										TYPE: GLENROWAN 1		GFA: 2612		LO# 90723		SUMMER NATURAL AIR CHANGE RATE 0.110		HEAT GAIN ΔT °F. 13		SB-12 PACKAGE A1		
ROOM USE		MBR		ENS		WIC		BED-2		BED-3		BED-4		BATH		ENS-2						
EXP. WALL		37		23		8		29		32		15		9		9						
CLG. HT.		9		9		9		9		9		9		9		9						
FACTORS																						
GRS.WALL AREA		LOSS GAIN		333		207		72		261		288		135		81		81				
GLAZING				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	7	152	112		
	EAST	21.8	41.6	0	0	0	0	0	17	370	706	26	566	1080	49	1067	2036	0	0	0		
	SOUTH	21.8	24.9	0	0	0	8	174	199	0	0	0	0	0	0	0	15	327	373	8	174	199
	WEST	21.8	41.6	35	762	1454	15	327	623	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		
DOORS		25.8 4.3		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		
NET EXPOSED WALL		4.6 0.8		298 1361 224		184 841 138		55 251 41		235 1074 177		239 1092 180		120 548 90		73 333 55		74 338 56				
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		358 470 210		129 169 76		29 38 17		274 360 161		185 243 109		242 318 142		128 168 75		112 147 66				
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		29 76 12		274 715 118		17 44 7		0 0 0		11 29 5		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				
SUBTOTAL HT LOSS				2594		1511		735		2715		2447		1193		705		638				
SUB TOTAL HT GAIN				1889		1037		777		1536		2332		606		334		233				
LEVEL FACTOR / MULTIPLIER		0.20 0.26		0.20 0.26		0.20 0.26		0.20 0.26		0.20 0.26		0.20 0.26		0.20 0.26		0.20 0.26		0.20 0.26				
AIR CHANGE HEAT LOSS		684		398		194		716		645		314		186		168		17				
AIR CHANGE HEAT GAIN		134		73		55		109		165		43		24								
DUCT LOSS		0		0		93		343		309		0		89		0						
DUCT GAIN		0		0		83		241		327		0		36		0						
HEAT GAIN PEOPLE		240		2		480		0		0		1		240		0		0				
HEAT GAIN APPLIANCES/LIGHTS				529		0		0		529		529		529		0		0				
TOTAL HT LOSS BTU/H		3278		1909		1022		3774		3401		1507		979		806		325				
TOTAL HT GAIN x 1.3 BTU/H				3941		1443		1190		3451		4670		1843		511						

ROOM USE	FAM		DIN		K/D		LAUND		W/R		FOY		WOD		BAS	
EXP. WALL	36		26		35		27		6		35		43		166	
CLG. HT.	10		10		10		10		10		11		8		8	
GRS.WALL AREA	360		260		350		270		60		385		344		959	
GLAZING	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
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	0	0	27	588	672	0	0	0	0	0	0	0	4	87
WEST	21.8	41.6	30	654	1247	0	0	0	63	1372	2618	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	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.6	0.8	330	1508	248	233	1064	175	287	1311	216	243	1110	183	53	242
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	340	1553	256	0	0
EXPOSED CLG	1.3	0.6	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
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			
SLAB ON GRADE HEAT LOSS			0		0		0		0		0		0			
SUBTOTAL HT LOSS			2161		1653		2684		1780		395		2716		1095	
SUB TOTAL HT GAIN				1495		847		2833		214		447		484		408
LEVEL FACTOR / MULTIPLIER	0.30	0.44			0.30	0.44		0.30	0.44		0.30	0.44			0.50	0.95
AIR CHANGE HEAT LOSS			941		719		1168		775		172		1182			8261
AIR CHANGE HEAT GAIN				106		60		201		27		15		32		63
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
HEAT GAIN APPLIANCES/LIGHTS				529		529		529		0		0		0		529
TOTAL HT LOSS - BTU/H			3102		2372		3851		2554		566		3899		1095	15860
TOTAL HT GAIN x 1.3 BTU/H			2768		1867		4632		1216		298		622		629	1300

Initials: PXV

HVAC REVIEWED

City of Richmond Hill
Building Division

TOTAL HEAT GAIN BTU/H:

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 49975

TOTAL COMBINED HEAT LOSS BTU/H: 51645

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

SITE NAME: ROUNDEL HOMES INC
BUILDER: GREENPARK HOMES

TYPE: GLENROWAN 1

DATE: May-21

GFA: 2612 LO# 90723

HEATING CFM 928 COOLING CFM 928
TOTAL HEAT LOSS 49,975 TOTAL HEAT GAIN 30,707
AIR FLOW RATE CFM 18.57 AIR FLOW RATE CFM 30.22furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure for s/a & r/a 0.35#GOODMAN
GMEC960803BNA 60
FAN SPEED LOW
MEDLOW
MEDIUM 928
MEDIUM HIGH 1017
HIGH 1131AFUE = 96 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 57,600DESIGN CFM = 928
CFM @ .6" E.S.P.

TEMPERATURE RISE 57 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	11	7	4
R/A	0	0	3	2	1

plenum pressure s/a 0.18
max s/a dif press. loss 0.02
min adjusted pressure s/a 0.16
r/a pressure 0.17
r/a grille press. Loss 0.02
adjusted pressure r/a 0.15

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	17	18	19	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	FAM	DIN	K/D	K/D	LAUND	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.64	1.91	1.02	1.89	1.70	1.51	0.98	1.89	1.70	1.64	0.81	3.10	2.37	1.93	1.93	2.55	0.57	3.90	4.24	4.24	4.24	4.24
CFM PER RUN HEAT	30	35	19	35	32	28	18	35	32	30	15	58	44	36	36	47	11	72	79	79	79	79
RM GAIN MBH.	1.97	1.44	1.19	1.73	2.34	1.84	0.51	1.73	2.34	1.97	0.32	2.77	1.87	2.32	2.32	1.22	0.30	0.62	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	60	44	36	52	71	56	15	52	71	60	10	84	56	70	70	37	9	19	15	15	15	15
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	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	47	29	45	55	54	19	36	49	61	38	48	31	34	39	28	29	32	36	30	32	29	39
EQUIVALENT LENGTH	140	150	130	150	150	120	160	140	150	140	180	120	100	140	120	120	160	100	110	140	150	130
TOTAL EFFECTIVE LENGTH	187	179	175	205	204	139	196	189	211	178	228	151	134	179	148	149	192	136	140	172	179	169
ADJUSTED PRESSURE	0.09	0.1	0.1	0.08	0.08	0.12	0.09	0.09	0.08	0.1	0.08	0.11	0.13	0.1	0.12	0.12	0.09	0.13	0.12	0.1	0.1	0.1
ROUND DUCT SIZE	5	4	4	5	6	6	4	5	6	5	4	6	5	5	5	4	4	5	5	5	5	5
HEATING VELOCITY (ft/min)	220	402	218	257	163	143	207	257	163	220	172	296	323	264	264	539	126	529	580	580	580	580
COOLING VELOCITY (ft/min)	441	505	413	382	362	286	172	382	362	441	115	428	411	514	514	424	103	140	110	110	110	110
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	D	C	B	B	A	C	B	B	A	D	B	C	B	D	D	C	A	A	C	D	A	A

RUN #	ROOM NAME	RM LOSS MBH.	CFM PER RUN HEAT	RM GAIN MBH.	CFM PER RUN COOLING	ADJUSTED PRESSURE	ACTUAL DUCT LGH.	EQUIVALENT LENGTH	TOTAL EFFECTIVE LENGTH	ADJUSTED PRESSURE	ROUND DUCT SIZE	HEATING VELOCITY (ft/min)	COOLING VELOCITY (ft/min)	OUTLET GRILL SIZE	TRUNK
1	MBR	1.64	30	1.97	60	0.17	47	140	187	0.09	5	220	441	3X10	D
2	ENS	1.91	35	1.44	44	0.17	29	150	179	0.1	4	402	505	3X10	C
3	WIC	1.02	19	1.19	36	0.17	45	130	175	0.1	4	218	413	3X10	B
4	BED-2	1.89	35	1.73	52	0.17	55	150	205	0.08	5	257	382	3X10	B
5	BED-3	1.70	32	2.34	71	0.17	54	150	204	0.08	6	163	362	4X10	A
6	BED-4	1.51	28	1.84	56	0.17	19	120	139	0.12	6	143	286	4X10	C
7	BATH	0.98	18	0.51	15	0.17	36	160	196	0.09	4	207	172	3X10	B
8	BED-2	1.89	35	1.73	52	0.17	49	140	189	0.09	5	257	382	3X10	B
9	BED-3	1.70	32	2.34	71	0.17	61	150	211	0.08	6	163	362	4X10	A
10	MBR	1.64	30	1.97	60	0.17	38	140	178	0.1	5	220	441	3X10	D
11	ENS-2	0.81	15	0.32	10	0.17	48	180	228	0.08	4	172	115	3X10	B
12	FAM	3.10	58	2.77	84	0.16	31	120	151	0.11	6	296	428	4X10	C
13	DIN	2.37	44	1.87	56	0.17	34	100	134	0.13	5	323	411	3X10	B
14	K/D	1.93	36	2.32	70	0.17	39	140	179	0.1	5	264	514	3X10	D
15	K/D	1.93	36	2.32	70	0.17	28	120	148	0.12	5	264	514	3X10	D
17	LAUND	2.55	47	1.22	37	0.17	29	120	149	0.12	4	539	424	3X10	C
18	W/R	0.57	11	0.30	9	0.17	32	160	192	0.09	4	126	103	3X10	A
19	FOY	3.90	72	0.62	19	0.17	36	100	136	0.13	5	529	140	3X10	A
21	BAS	4.24	79	0.48	15	0.17	30	110	140	0.1	5	580	110	3X10	C
22	BAS	4.24	79	0.48	15	0.17	32	140	172	0.1	5	580	110	3X10	D
23	BAS	4.24	79	0.48	15	0.17	29	150	179	0.1	5	580	110	3X10	A
24	BAS	4.24	79	0.48	15	0.17	39	130	169	0.1	5	580	110	3X10	A

SUPPLY AIR TRUNK SIZE															RETURN AIR TRUNK SIZE									
	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)			TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)	
TRUNK A	305	0.08	9	10	x	8	549			TRUNK G	0	0.00	0	0	x	8	0	0	0.06	0	0	x	8	0
TRUNK B	471	0.08	10.6	14	x	8	606			TRUNK H	0	0.00	0	0	x	8	0	0	0.06	0	0	x	8	0
TRUNK C	247	0.10	7.9	8	x	8	556			TRUNK I	0	0.00	0	0	x	8	0	0	0.06	0	0	x	8	0
TRUNK D	211	0.09	7.6	8	x	8	475			TRUNK J	0	0.00	0	0	x	8	0	0	0.06	0	0	x	8	0
TRUNK E	458	0.09	10.2	12	x	8	687			TRUNK K	0	0.00	0	0	x	8	0	0	0.06	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	0	0.06	0	0	x	8	0

RETURN AIR #	1	2	3	4	5											BR
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	138
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	0.15
ACTUAL DUCT LGH	56	53	54	44	13	1	1	1	1	1	1	1	1	1	1	15
EQUIVALENT LENGTH	185	175	180	190	135	0	0	0	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	241	228	234	234	148	1	1	1	1	1	1	1	1	1	1	160
ADJUSTED PRESSURE	0.06	0.06	0.06	0.06	0.10	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7.5	6.9	7.5	7.5	7.3	0	0	0	0	0	0	0	0	0	0	6.5
INLET GRILL SIZE	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	0	0	0	0	0	0	0	0	0	0	14

RETURN AIR #	1	2	3	4	5																			BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	155	125	155	155	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	138
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	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH	56	53	54	44	13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15
EQUIVALENT LENGTH	185	175	180	190	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	241	228	234	234	148	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	160
ADJUSTED PRESSURE	0.06	0.06	0.06	0.06	0.10	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7.5	6.9	7.5	7.5	7.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.5
INLET GRILL SIZE	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14

TYPE: GLENROWAN 1
SITE NAME: ROUNDEL HOMES INC

LO # 90723

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a) <input checked="" type="checkbox"/>	Direct vent (sealed combustion) only	
b) <input type="checkbox"/>	Positive venting induced draft (except fireplaces)	
c) <input type="checkbox"/>	Natural draft, B-vent or induced draft gas fireplace	
d) <input type="checkbox"/>	Solid Fuel (including fireplaces)	
e) <input type="checkbox"/>	No Combustion Appliances	

HEATING SYSTEM	
<input checked="" type="checkbox"/>	Forced Air
<input type="checkbox"/>	Non Forced Air
<input type="checkbox"/>	Electric Space Heat

HOUSE TYPE		9.32.1(2)
<input checked="" type="checkbox"/>	I Type a) or b) appliance only, no solid fuel	
<input type="checkbox"/>	II Type I except with solid fuel (including fireplaces)	
<input type="checkbox"/>	III Any Type c) appliance	
<input type="checkbox"/>	IV Type I, or II with electric space heat	
<input type="checkbox"/>	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
<input type="checkbox"/>	1 Exhaust only/Forced Air System	
<input type="checkbox"/>	2 HRV with Ducting/Forced Air System	
<input checked="" type="checkbox"/>	3 HRV Simplified/connected to forced air system	
<input type="checkbox"/>	4 HRV with Ducting/non forced air system	
<input type="checkbox"/>	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	2 @ 21.2 cfm	42.4 cfm
Other Bedrooms	3 @ 10.6 cfm	31.8 cfm
Kitchen & Bathrooms	5 @ 10.6 cfm	53 cfm
Other Rooms	4 @ 10.6 cfm	42.4 cfm
Table 9.32.3.A.	TOTAL	169.6 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	169.6	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	90.1	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE V150H	Location: BSMT
79.5 cfm	3.0 sones <input checked="" type="checkbox"/> HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
79.5 CFM	78 F	1.08	0.25

SUPPLEMENTAL FANS		PANASONIC	
Location	Model	cfm	Sones
ENS	FV-05-11VK1	50	0.3
BATH	FV-05-11VK1	50	0.3
ENS-2	FV-05-11VK1	50	0.3
W/R	FV-05-11VK1	50	0.3

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE V150H		
150 cfm high	35 cfm low	
75 % Sensible Efficiency @ 32 deg F (0 deg C)	<input checked="" type="checkbox"/> HVI Approved	

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

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

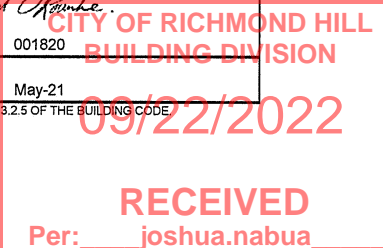
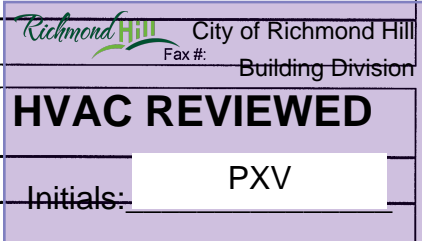
INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	

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-21

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



CSA F280-12 Residential Heat Loss and Heat Gain Calculations
Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 90723

Model: GLENROWAN 1

Builder: GREENPARK HOMES

Date: 5/10/2021

Volume Calculation
House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	1158	8	9264
First	1158	10	11580
Second	1432	9	12888
Third	0	9	0
Fourth	0	9	0
Total:			33,732.0 ft ³
Total:			955.2 m ³

Air Change & Delta T Data

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

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

$$0.352 \times 265.33 \times 43 \text{ °C} \times 1.2 = 4842 \text{ W}$$

$$= 16521 \text{ Btu/h}$$

6.2.6 Sensible Gain due to Air Leakage

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

$$0.110 \times 265.33 \times 7 \text{ °C} \times 1.2 = 249 \text{ W}$$

$$= 848 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

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

6.2.7 Sensible heat Gain due to Ventilation

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

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

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 _{airbv} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{clevel})
1	0.5	16,521	8,694	0.950
2	0.3		11,388	0.435
3	0.2		12,538	0.264
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_{airv} = 0

Per: joshua.nabua

09/22/2022

CITY OF RICHMOND HILL
BUILDING DIVISION

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: GLENROWAN 1

BUILDER: GREENPARK HOMES

SFQT: 2612

LO# 90723

SITE: ROUNDEL HOMES INC

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

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):	33732.0	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:	5.0 ft
LENGTH: 50.0 ft	WIDTH: 33.0 ft	EXPOSED PERIMETER:	166.0 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	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

 09/22/2022

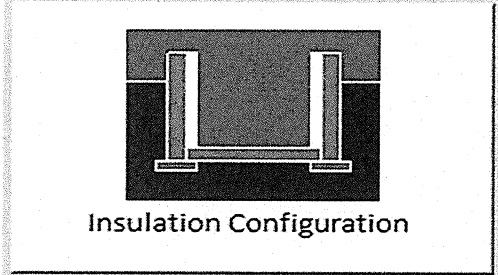
CITY OF RICHMOND HILL
BUILDING DIVISION

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):	15.2	 Insulation Configuration
Floor Width (m):	10.1	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.4	
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):	1651	

TYPE: GLENROWAN 1
LO# 90723CITY OF RICHMOND HILL
BUILDING DIVISION

09/22/2022

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):	955.2			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa. 3.57	1273.3 cm ² ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply 37.5	Total Exhaust 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: GLENROWAN 1

LO# 90723

City of Richmond Hill
Building Division**HVAC REVIEWED**

Initials:

PXV

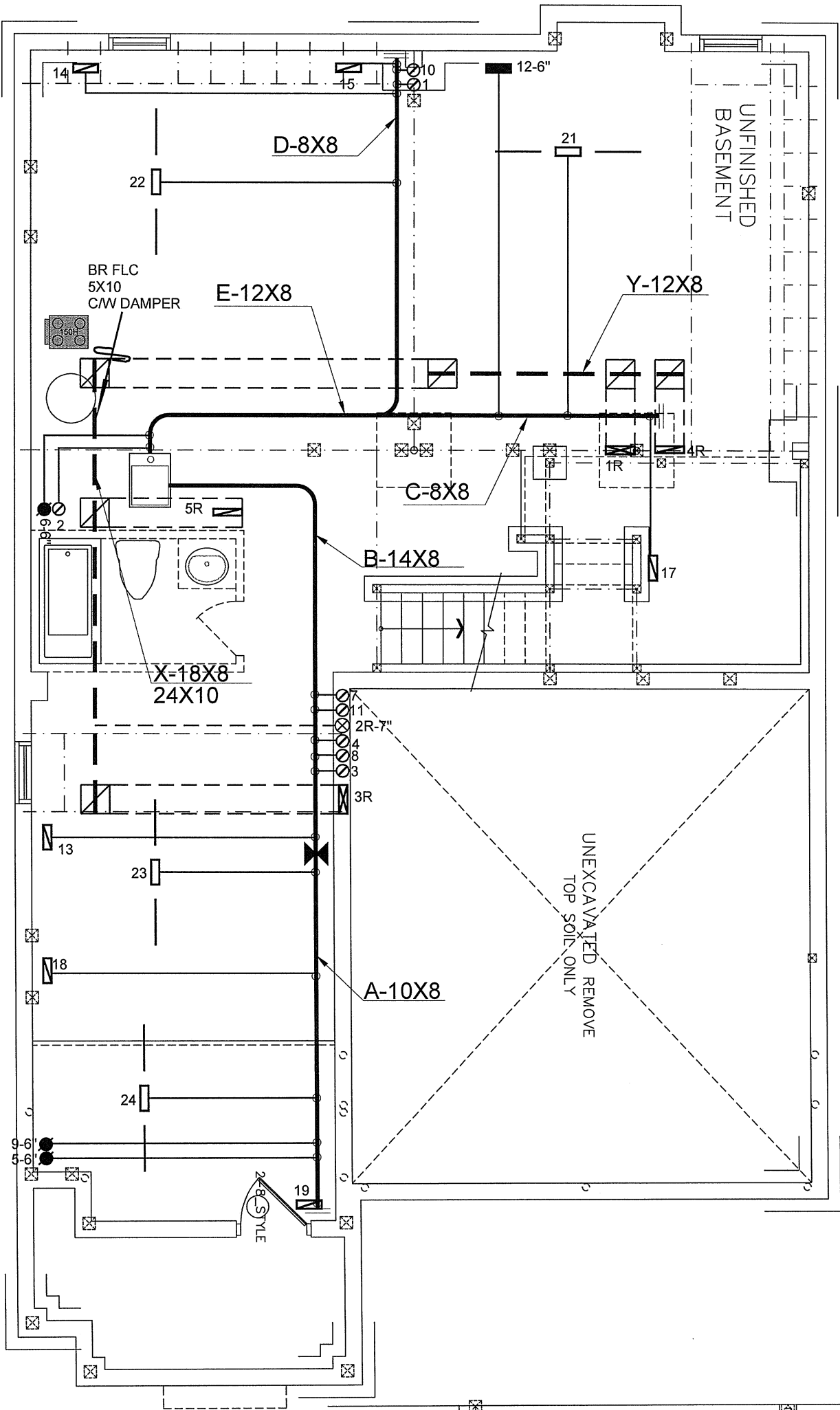
CITY OF RICHMOND HILL
BUILDING DIVISION

09/22/2022

RECEIVED

Per: joshua.nabua

BASEMENT PLAN 1





City of Richmond Hill
Building Division

REVIEWED

By: **PV** Date: **OCT/05/22**

Building Permit #: **BP#-22-00083**

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.

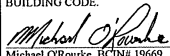
Building inspection line: 905-771-5465 (24 hr)
buildinginspections@richmondhill.ca
Building inquiry line 905-771-8810
building@richmondhill.ca

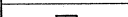











Ensure that R-Values and U-Values used for heat loss and heat gain calculations are consistent with the values specified by SB-12 Prescriptive Package: **A1** and the values used for architectural design.

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)

BASEMENT PLAN 3

BASEMENT PLAN 2

I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.3 OF THE BUILDING CODE.

Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND							3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No. Description Date
							REVISIONS	

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Client

GREENPARK HOMES

Project Name

ROUNDEL HOMES INC
RICHMOND HILL, ONTARIO

GLENROWAN 1 2612 sqft



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

Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

HEAT LOSS 51645 BTU/H
UNIT DATA

MAKE GOODMAN

MODEL GMEC960603BNA

INPUT 60 MBTU/H

OUTPUT 57.6 MBTU/H

COOLING 2.5 TONS

FAN SPEED 928 cfm @ 0.6" w.c.

OF RUNS S/A R/A FANS

3RD FLOOR

2ND FLOOR 11 3 3

1ST FLOOR 7 2 2

BASEMENT 4 1 0

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

Sheet Title

BASEMENT HEATING LAYOUT

CITY OF RICHMOND HILL BUILDING DIVISION

Date MAY/2021

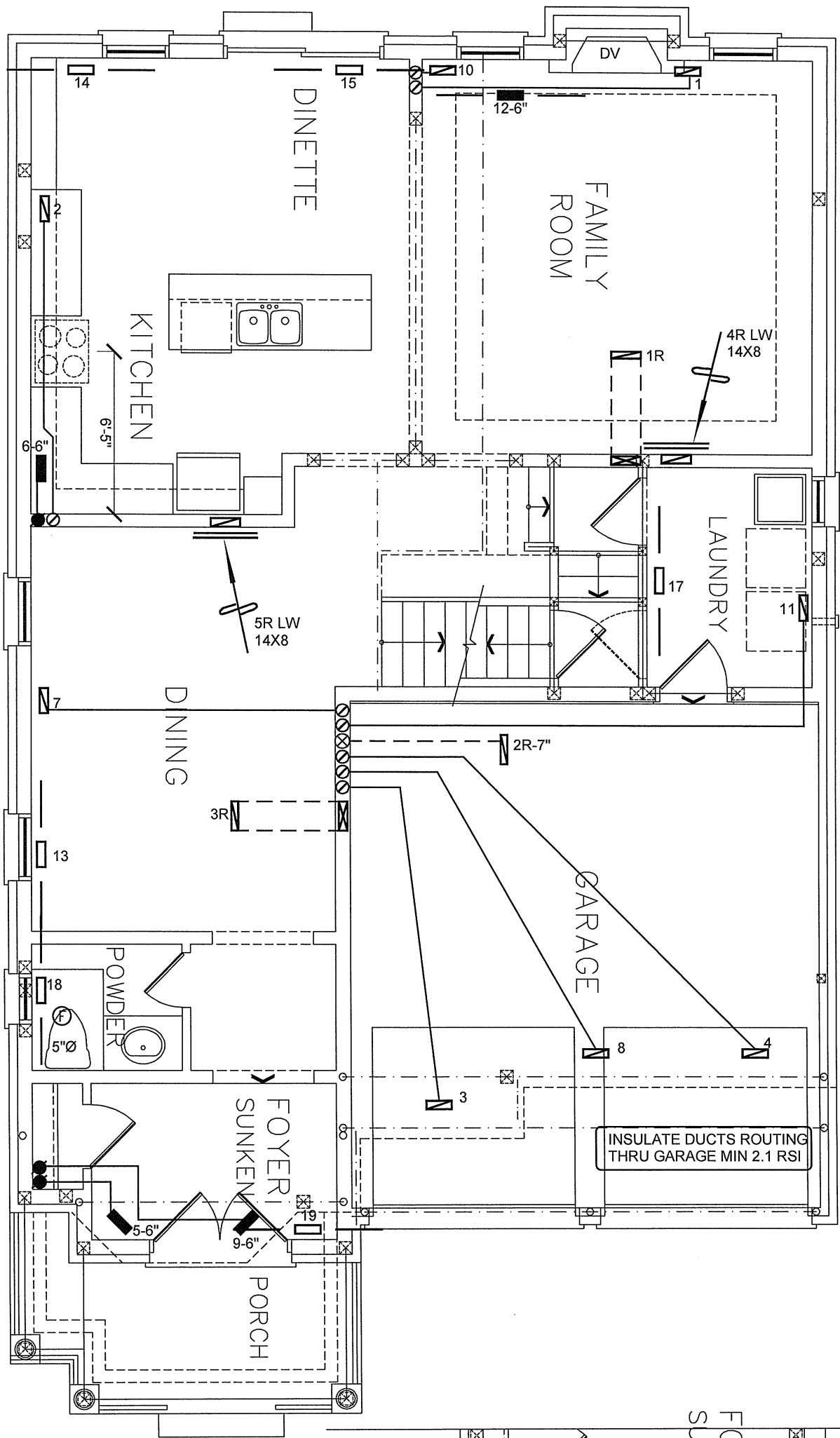
Scale 3/16" = 1'-0"

BCIN# 19669

LO# 90723

Per: joshua.nabua

FIRST FLOOR PLAN 1

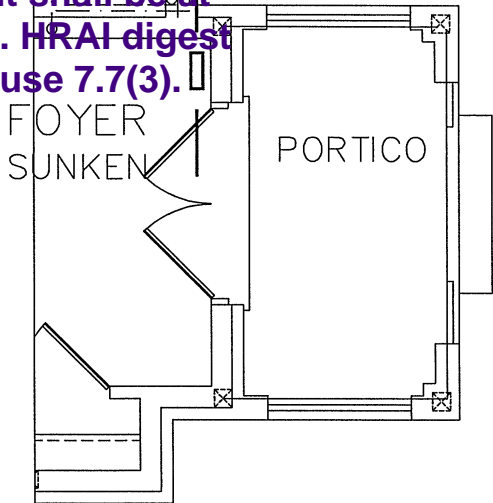


7. Combustion air supply shall be provided to the furnace and hot water tank.


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).



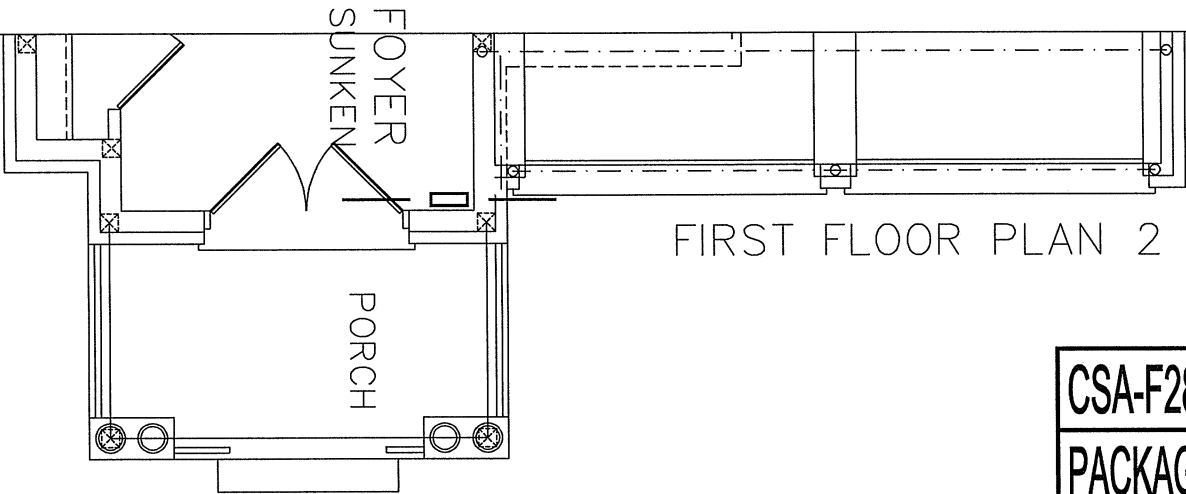
FIRST FLOOR PLAN 3

City of Richmond Hill
Building Division

HVAC REVIEWED

Initials:













PXV



FIRST FLOOR PLAN 2

I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.3 OF THE BUILDING CODE.

Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	Description	Date
							REVISIONS		

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Client

GREENPARK HOMES

Project Name

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RICHMOND HILL, ONTARIO

GLENROWAN 1 2612 sqft



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L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
Web: www.hvacdesigns.ca
Specializing in Residential Mechanical Design Services

Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title

FIRST FLOOR
HEATING
LAYOUT

CITY OF RICHMOND HILL
BUILDING DIVISION

Date

MAY/2021

Scale

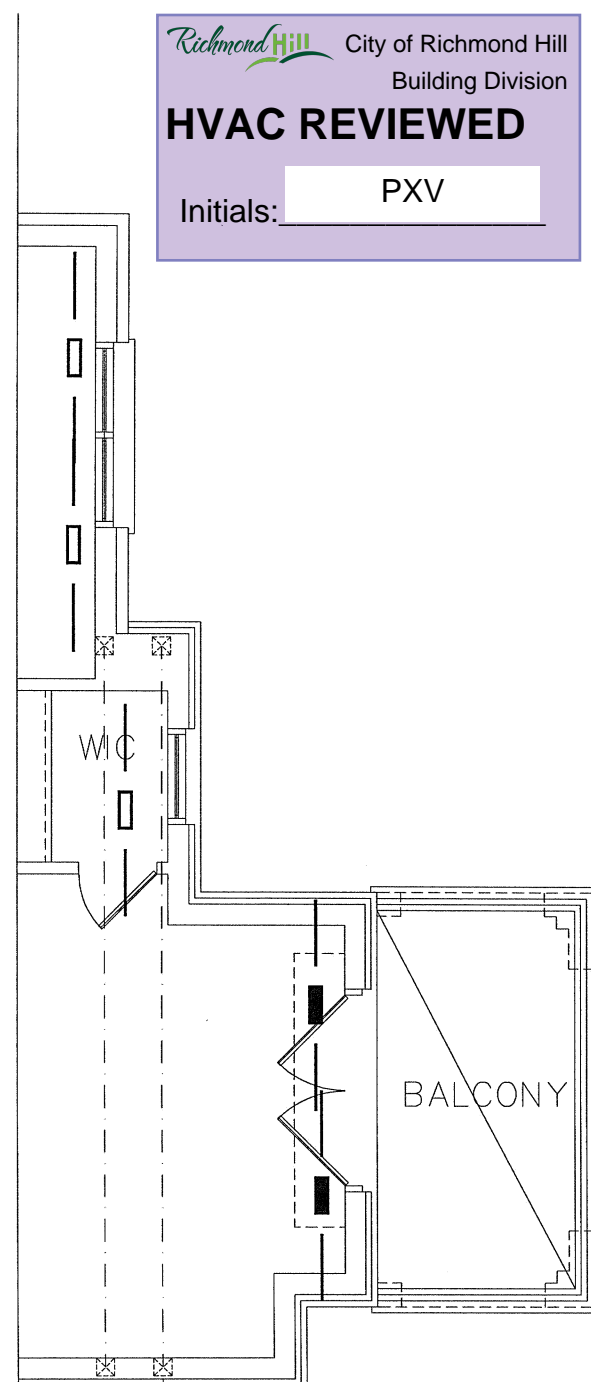
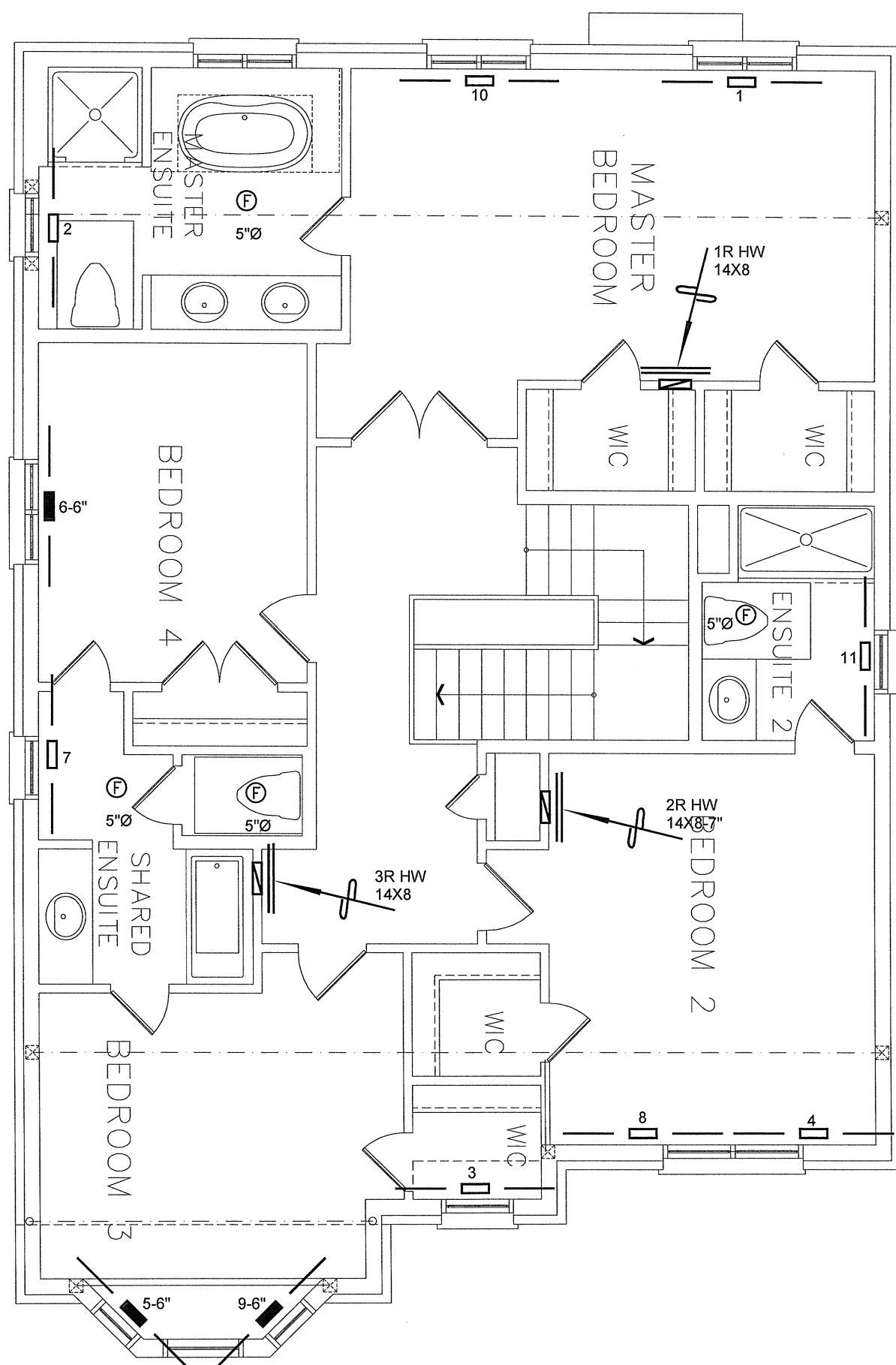
3/16" = 1'-0"

BCIN# 19669

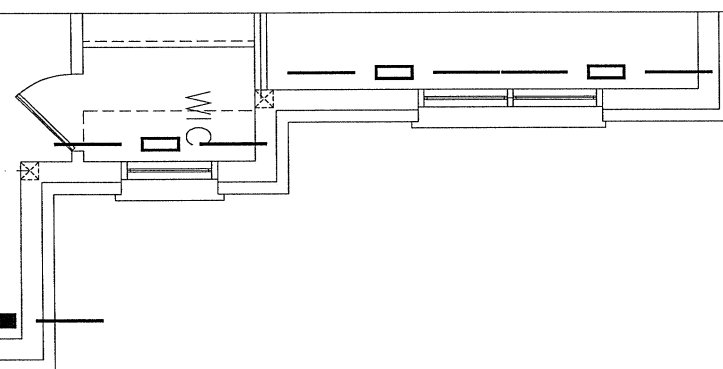
LO#

90723

Per: joshua.nabua



SECOND FLOOR PLAN 3



SECOND FLOOR PLAN 2













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.

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND								3.		
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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

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Sheet Title

SECOND FLOOR HEATING

CITY OF RICHMOND HILL

Date MAY/2021

Scale: $\frac{3}{16}'' = 1'-0''$

BCIN# 19669

LO#	90723
-----	-------

Per: joshua.nabua