HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: ROUNDEL HOMES INC — DATE: May-21 — WINTER NATURAL AIR CHANGE RATE 0.361 — HEAT LOSS ΔT °F. 78 — CSA-F280-12
BUILDER: GREENPARK HOMES — TYPE: PINETREE 3 — GFA: 2685 — LO# 90735 — SUMMER NATURAL AIR CHANGE RATE 0.113 — HEAT GAIN ΔT °F. 13 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-3/4				HALL			ENS-2				
EXP. WALL			31			31			5			25			11			12			6				32			11				
CLG. HT.			9			9			9			9			9			9			9				9			9				
FACTORS																																
GRS.WALL AREA	LOSS	GAIN	279			279			45			225			99			108			54				288			99				
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	0		0	0	0	0	0	0		
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	44	958	1828	0	0	0	0	0	0	0	0	0		40	871	1662	0	0	0		
SOUTH	21.8	24.9	0	0	0	8	174	199	0	0	0	0	0	0	12	261	299	12	261	299	8	174	199		0	0	0	0	0	0		
WEST	21.8	41.6	32	697	1330	16	349	665	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		
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	247	1128	186	255	1165	192	45	206	34	181	827	136	87	397	65	96	439	72	46	210	35		248	1133	186	99	452	74		
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		
EXPOSED CLG	1.3	0.6	300	394	176	160	210	94	52	68	31	194	255	114	193	254	113	162	213	95	88	116	52		175	230	103	66	87	39		
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		
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	194	506	83	14	37	6	0	0	0	0	0	0		74	193	32	46	120	20		
BASEMENT/CRAWL HEAT LOSS			0			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			2220			1898			274			2547			949			913			500				2427			659				
SUB TOTAL HT GAIN					1692			1150			64			2162			484			466			285			1983			133		
LEVEL FACTOR / MULTIPLIER			0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30			0.20	0.30		0.20	0.30			
AIR CHANGE HEAT LOSS			655			560			81			752			280			270			148				717			195				
AIR CHANGE HEAT GAIN					123			84			5			158			35			34			21			145			10		
DUCT LOSS			0			0			0			330			123			0			0				314			85				
DUCT GAIN					0			0			0			341			161			0			0			213			14		
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0		0		480	0		0		
HEAT GAIN APPLIANCES/LIGHTS					848			0			0			848			848			848			0			0			0		
TOTAL HT LOSS BTU/H			2875			2458			355			3629			1352			1182			648				3459			939				
TOTAL HT GAIN x 1.3 BTU/H					4086			1604			90			4872			2298			2064			398			3043			204		

ROOM USE			LV/DN				KT/FM				LAUN			W/R			FOY			MUD					WOD			BAS				
EXP. WALL			48				75				0			13			36			6					42			176				
CLG. HT.			11				11				9			11			11			11					9			9				
FACTORS																																
GRS.WALL AREA	LOSS	GAIN	528				825				0			143			396			66					378			1182				
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		3	65	48		0	0	0	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	28	610	1163	0	0	0			0	0	0	0	0	0		
SOUTH	21.8	24.9	32	697	797		12	261	299		0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	8	174	199		
WEST	21.8	41.6	0	0	0		77	1677	3200		0	0	0	0	0	0	0	0	0	0	0	0			14	305	582	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	25.8	4.3	0	0	0		21	543	89		0	0	0	0	0	0	40	1034	170	20	517	85			0	0	0	20	517	85		
NET EXPOSED WALL	4.6	0.8	496	2266	373		712	3253	535		0	0	0	143	653	107	328	1498	247	46	210	35			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			238	877	144	402	1481	244		
EXPOSED CLG	1.3	0.6	0	0	0		0	0	0		104	137	61	0	0	0	74	97	43	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		66	172	28	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								5958				
SLAB ON GRADE HEAT LOSS			0				0				0			0			0			0					0							
SUBTOTAL HT LOSS			2963				5800				309			653			3239			727					1182			8130				
SUB TOTAL HT GAIN					1170				4171				89			107			1624			120				726				528		
LEVEL FACTOR / MULTIPLIER			0.30	0.42			0.30	0.42			0.20	0.30		0.30	0.42		0.30	0.42		0.30	0.42							0.50	1.01			
AIR CHANGE HEAT LOSS			1245				2437				91			275			1361			306								9372				
AIR CHANGE HEAT GAIN					85				304				7			8			118			9								91		
DUCT LOSS			0				0				40			0			0			0								0				
DUCT GAIN					0				0				94			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					848				848				848			0			0			0				0				848		
TOTAL HT LOSS BTU/H			4208				8237				440			928			4601			1033					1182			17502				
TOTAL HT GAIN x 1.3 BTU/H					2734				6920				1350			150			2265			167				944				1907		

TOTAL HEAT GAIN BTU/H: 35369 — TONS: 2.95 — LOSS DUE TO VENTILATION LOAD BTU/H: 1670 — STRUCTURAL HEAT LOSS: 55026 — TOTAL COMBINED HEAT LOSS BTU/H: 56696

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

HVAC REVIEWED
Initials: PXV
Richmond Hill
City of Richmond Hill
Building Division

RECEIVED
Per: joshua.nabua
09/23/2021
BUILDING DIVISION
CITY OF RICHMOND HILL

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SITE NAME: ROUNDEL HOMES INC
BUILDER: GREENPARK HOMES

TYPE: PINETREE 3 | DATE: May-21 | GFA: 2685 | LO# 90735

HEATING CFM	1131	COOLING CFM	1131
TOTAL HEAT LOSS	55,026	TOTAL HEAT GAIN	35,094
AIR FLOW RATE CFM	20.55	AIR FLOW RATE CFM	32.23

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
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

#GOODMAN
GMEC960603BNA 60

FAN SPEED	
LOW	
MEDLOW	
MEDIUM	928
MEDIUM HIGH	1017
HIGH	1131

AFUE = 96 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 57,600
DESIGN CFM = 1131
CFM @ .6 " E.S.P.
TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

All S/A diffusers 4"x10" unless noted otherwise on layout.
All S/A runs 5"Ø unless noted otherwise on layout.

RUN #	1	2	3	4	5	6	7	8	9	10	11	12
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-3/4	BED-2	HALL	MBR	ENS-2	LV/DN
RM LOSS MBH.	1.44	2.46	0.35	1.81	1.35	1.18	0.65	1.81	3.46	1.44	0.94	4.21
CFM PER RUN HEAT	30	51	7	37	28	24	13	37	71	30	19	86
RM GAIN MBH.	2.04	1.60	0.09	2.44	2.30	2.06	0.40	2.44	3.04	2.04	0.20	2.73
CFM PER RUN COOLING	66	52	3	79	74	67	13	79	98	66	7	88
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.16
ACTUAL DUCT LGH.	38	48	22	63	57	44	45	65	61	30	55	46
EQUIVALENT LENGTH	120	150	160	130	170	220	220	140	180	200	160	130
TOTAL EFFECTIVE LENGTH	158	198	182	193	227	264	265	205	241	230	215	176
ADJUSTED PRESSURE	0.11	0.09	0.09	0.09	0.08	0.07	0.06	0.08	0.07	0.07	0.08	0.09
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6
HEATING VELOCITY (ft/min)	220	374	80	189	143	122	149	189	362	220	218	438
COOLING VELOCITY (ft/min)	485	382	34	403	377	342	149	403	500	485	80	449
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10
TRUNK	D	D	D	B	A	B	B	B	A	D	B	A

RUN #	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	KT/FM	KT/FM	KT/FM	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.75	2.75	2.75	0.44	0.93	4.60	1.03	4.67	4.67	4.67	4.67
CFM PER RUN HEAT	56	56	56	9	19	95	21	96	96	96	96
RM GAIN MBH.	2.31	2.31	2.31	1.35	0.15	2.26	0.17	0.71	0.71	0.71	0.71
CFM PER RUN COOLING	74	74	74	44	5	73	5	23	23	23	23
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	44	36	25	50	5	52	16	37	13	29	49
EQUIVALENT LENGTH	110	110	90	150	150	140	100	110	120	140	110
TOTAL EFFECTIVE LENGTH	154	146	115	200	155	192	116	147	133	169	159
ADJUSTED PRESSURE	0.11	0.12	0.15	0.09	0.11	0.08	0.15	0.11	0.12	0.1	0.1
ROUND DUCT SIZE	5	5	5	5	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	411	411	411	66	218	484	241	489	489	489	489
COOLING VELOCITY (ft/min)	543	543	543	323	57	372	57	117	117	117	117
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	C	D	B	D	A	D	C	D	B	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	

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	376	0.07	10.1	12	x	8	564
TRUNK B	611	0.06	12.5	18	x	8	611
TRUNK C	208	0.11	7.2	8	x	8	468
TRUNK D	1129	0.06	15.8	28	x	8	726
TRUNK E	0	0.00	0	0	x	8	0
TRUNK F	0	0.00	0	0	x	8	0
TRUNK G	0	0.00	0	0	x	8	0
TRUNK H	0	0.00	0	0	x	8	0
TRUNK I	0	0.00	0	0	x	8	0
TRUNK J	0	0.00	0	0	x	8	0
TRUNK K	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	1131	0.05	16.5	32	x	8	636
TRUNK Y	670	0.05	13.6	22	x	8	548
TRUNK Z	225	0.05	9	10	x	8	405
DROP	1131	0.05	16.5	24	x	10	679

RETURN AIR #	1	2	3	4	5	6	7									BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	95	75	75	85	75	360	185	0	0	0	0	0	0	0	0	181
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.	42	75	68	72	71	35	19	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	135	205	250	195	245	200	175	0	0	0	0	0	0	0	0	180
TOTAL EFFECTIVE LH	177	280	318	267	316	235	194	1	1	1	1	1	1	1	1	194
ADJUSTED PRESSURE	0.08	0.05	0.05	0.06	0.05	0.06	0.08	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.08
ROUND DUCT SIZE	5.8	6	6	6	6	10.3	7.5	0	0	0	0	0	0	0	0	7.4
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	14

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

HVAC DESIGNS LTD.
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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: PINETREE 3 LO # 90735
SITE NAME: ROUNDEL HOMES INC

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	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	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	180.2	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	180.2	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	100.7	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE V150H Location: BSMT
79.5 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-3/4	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	✓	3.5
W/R	BY INSTALLING CONTRACTOR	50	✓	3.5

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) [✓] HVI Approved

LOCATION OF INSTALLATION

Lot: Concession
Township Plan:
Address
Roll # Building Permit #

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

City of Richmond Hill
Building Division
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:
HRAI # 001820
Date: May-21

I REVIEW AND TAKE RESPONIBILITY 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

CITY OF RICHMOND HILL
BUILDING DIVISION
09/22/2022
RECEIVED
Per: joshua.nabua

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 90735 Model: PINETREE 3 Builder: GREENPARK HOMES Date: 2021-05-12

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1191	9	10719
First	1191	11	13101
Second	1494	9	13446
Third	0	9	0
Fourth	0	9	0
		Total:	37,266.0 ft³
		Total:	1055.3 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.361
SUMMER NATURAL AIR CHANGE RATE	0.113

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

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

0.361 x 293.13 x 43 °C x 1.2 = 5494 W

= 18744 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.113 x 293.13 x 7 °C x 1.2 = 282 W

= 962 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 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

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)

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

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 / HLlevel)
1	0.5	18,744	9,311	1.007
2	0.3		13,383	0.420
3	0.2		12,695	0.295
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: PINETREE 3 **BUILDER:** GREENPARK HOMES
SFQT: 2685 **LO#** 90735 **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 (ft^3):	37266.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.75	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 56.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	176.0 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 Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

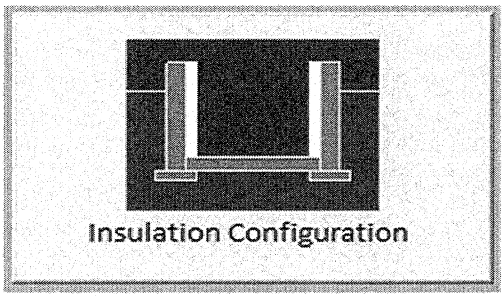
Michael O'Rourke

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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):	**17.1**	 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):	**2.0**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):		**1746**

TYPE: PINETREE 3
LO# 90735

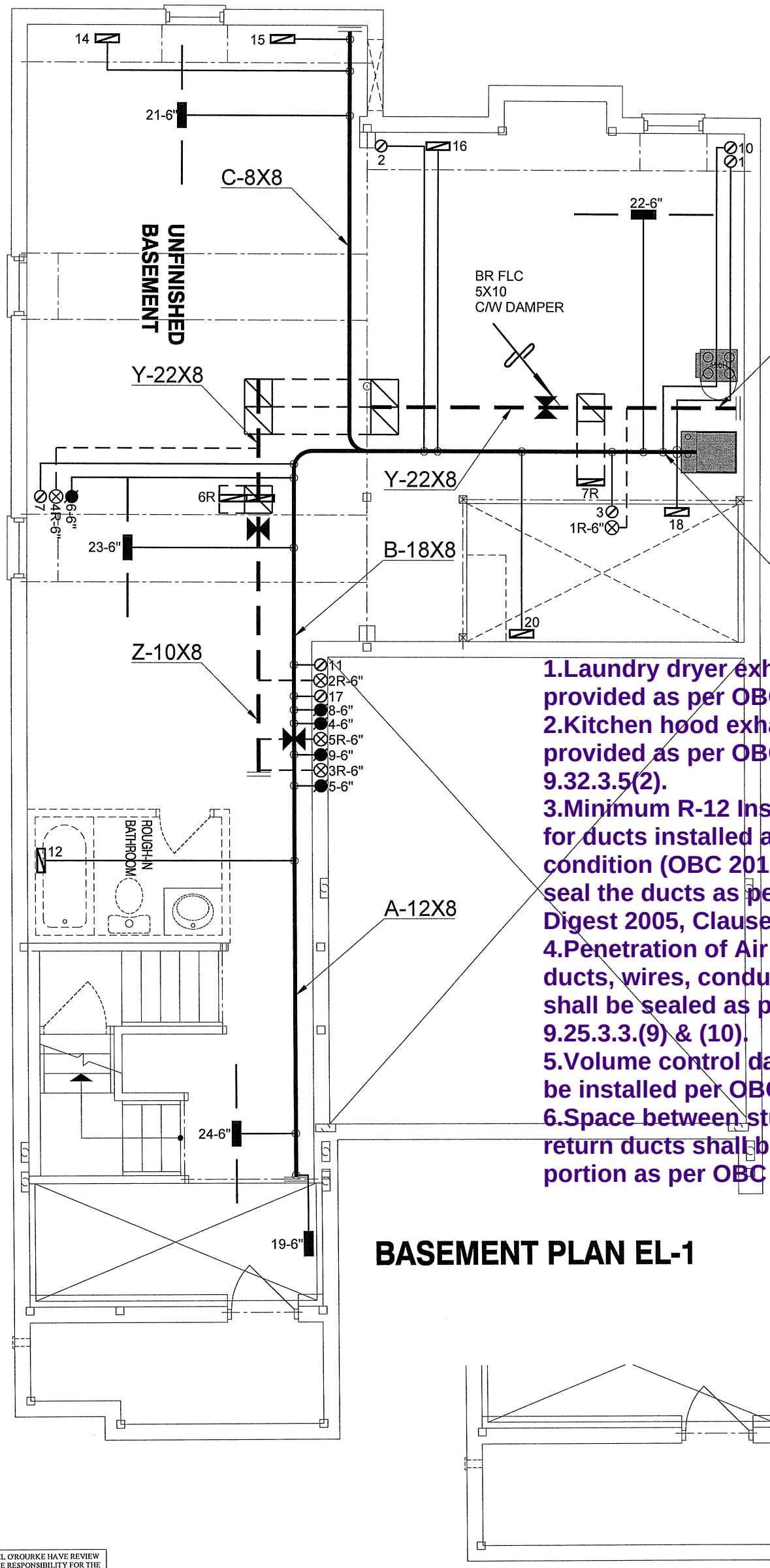
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

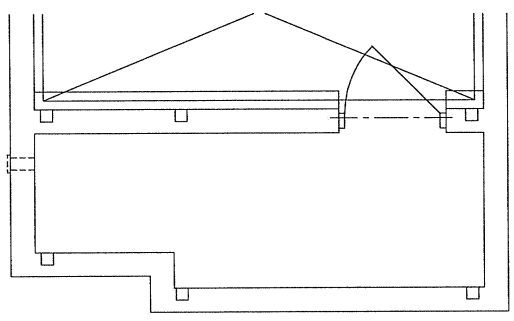
Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.92
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1055.3
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1406.7 cm^2
	3.57 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):	**0.361**
Cooling Air Leakage Rate (ACH/H):	**0.113**

TYPE: PINETREE 3
LO# 90735



BASEMENT LAYOUT
FOR DECK CONDITION

BASEMENT PLAN EL-1



BASEMENT PLAN EL-3

BASEMENT PLAN EL-2

City of Richmond Hill
Building Division

REVIEWED

By: **PV** Date: **Oct/04/2022**

Building Permit #: **RM#-22-00082**

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)

I MICHAEL O'ROURKE HAVE REVIEW 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.

CSA-F280-12
PACKAGE A1

HVAC LEGEND

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
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
GREENPARK HOMES

Project Name
ROUNDEL HOMES INC
RICHMOND HILL, ONTARIO

PINETREE 3 2685 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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.

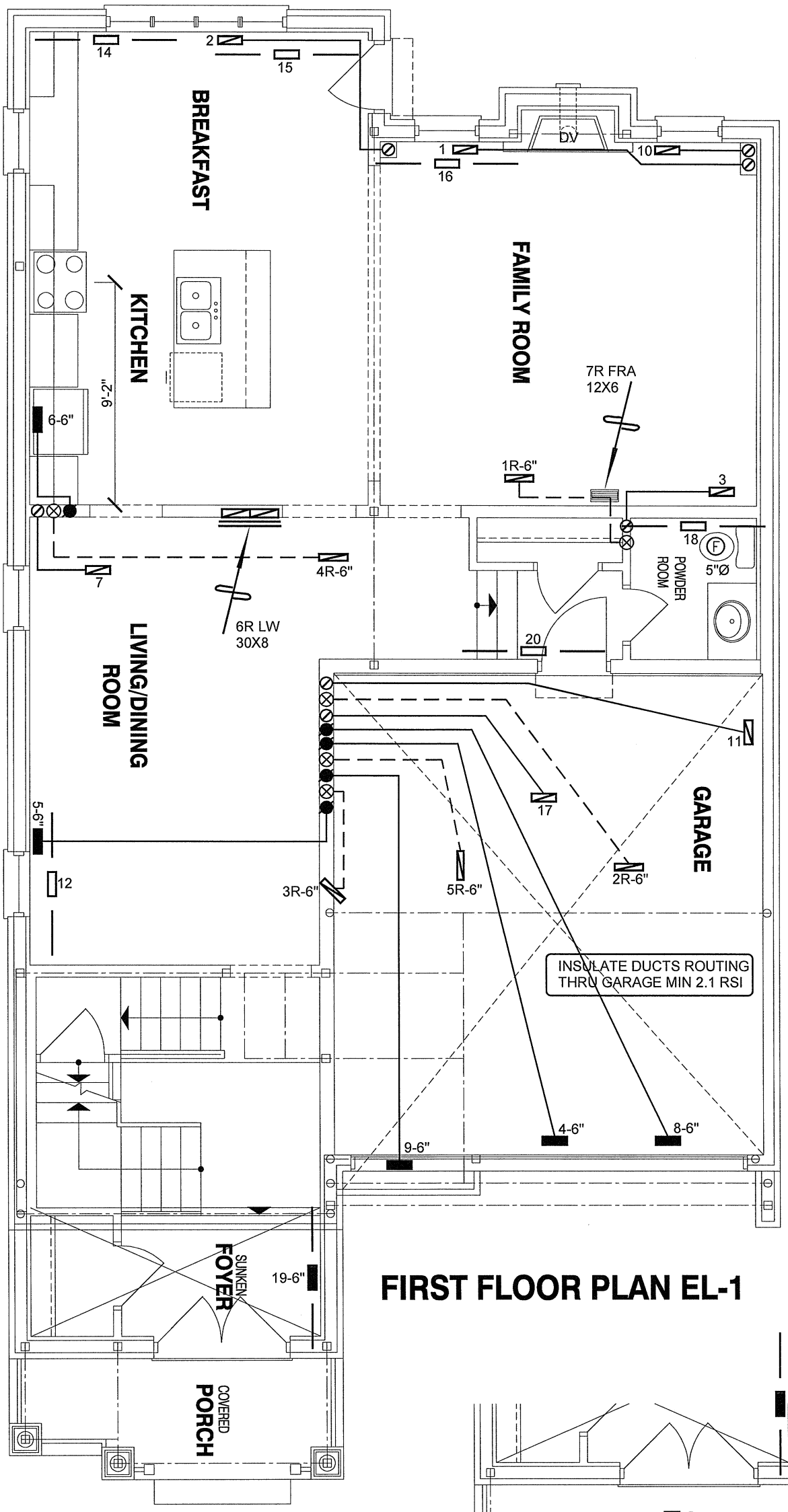
UNIT DATA		
HEAT LOSS	56696	BTU/H
MAKE	GOODMAN	
MODEL	GMEC960603BNA	
INPUT	60	MBTU/H
OUTPUT	57.6	MBTU/H
COOLING	3.0	TONS
FAN SPEED	1131	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	5	4
1ST FLOOR	7	2	2
BASEMENT	4	1	0

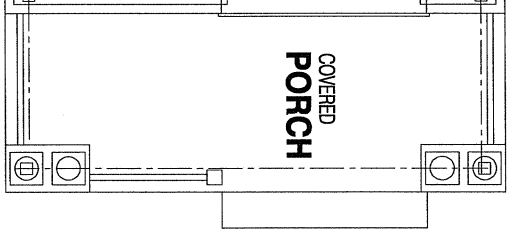
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

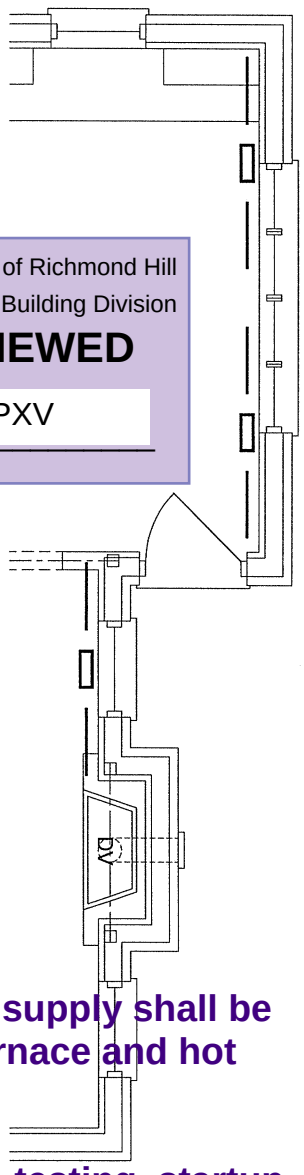
Date MAY/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90735



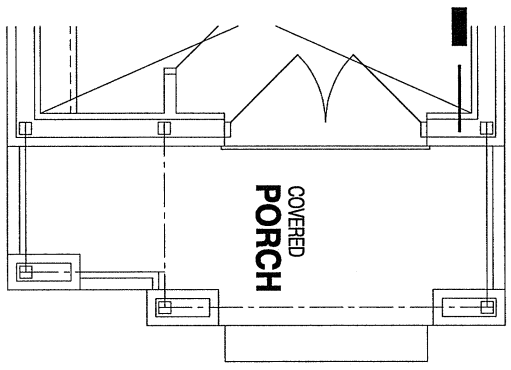
FIRST FLOOR PLAN EL-1



FIRST FLOOR PLAN EL-2



FIRST FLOOR LAYOUT FOR DECK CONDITION



FIRST FLOOR PLAN EL-3

Richmond Hill City of Richmond Hill
Building Division

HVAC REVIEWED

Initials: PXV

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).

I MICHAEL O'ROURKE HAVE REVIEW 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.

CSA-F280-12
PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
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No.	Description	Date
3.		
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1.		

REVISIONS

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RICHMOND HILL, ONTARIO

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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.

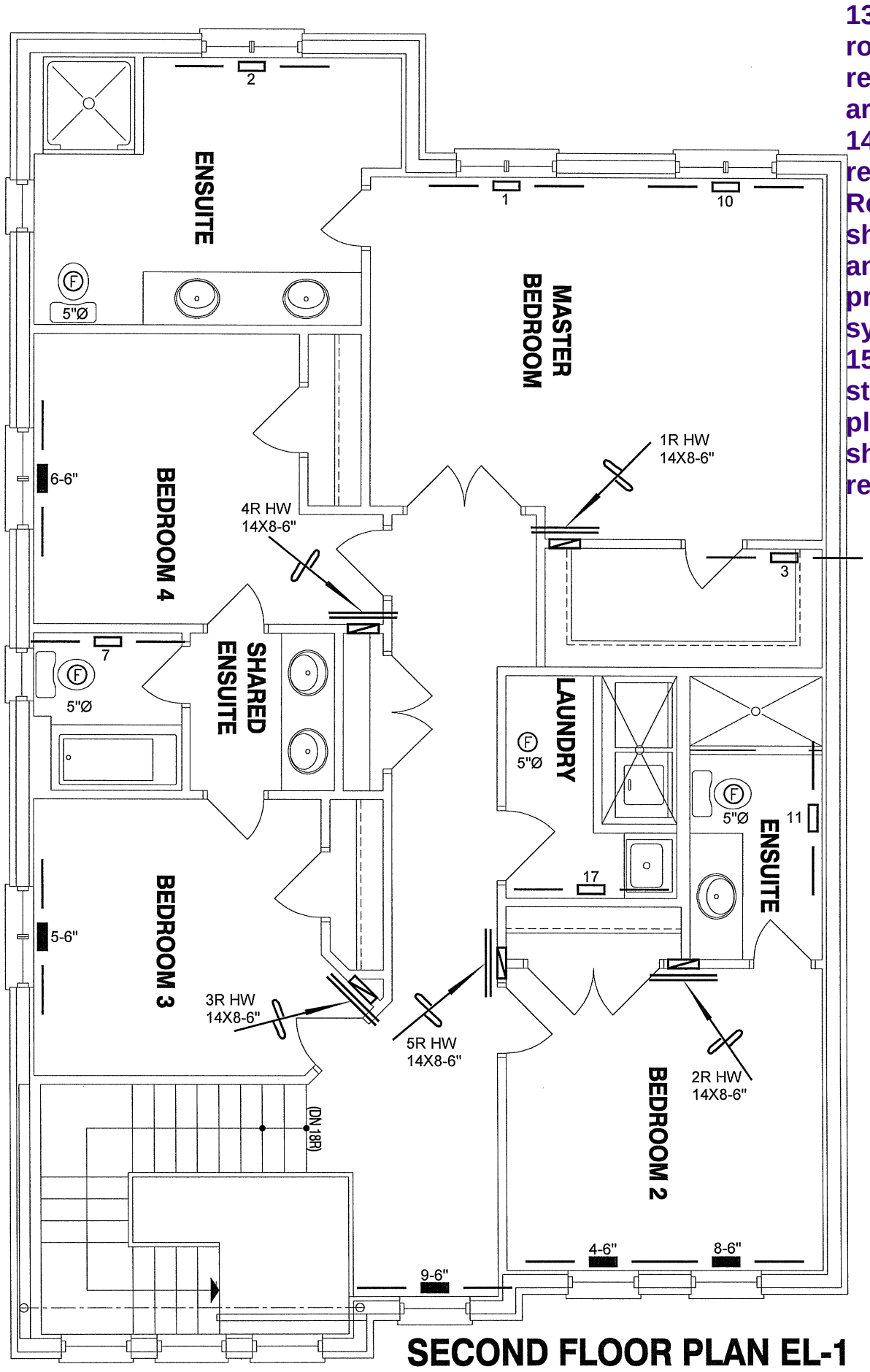
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date MAY/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90735

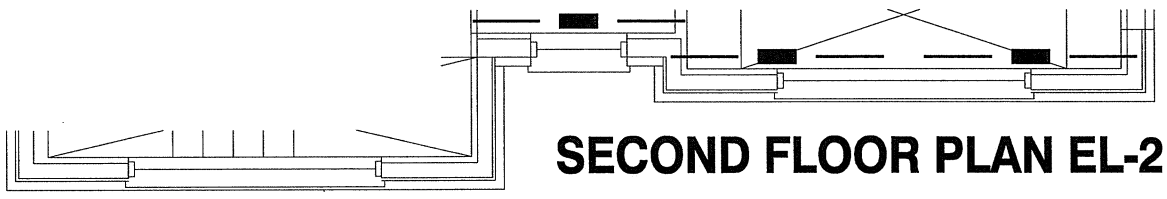
13.Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

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.

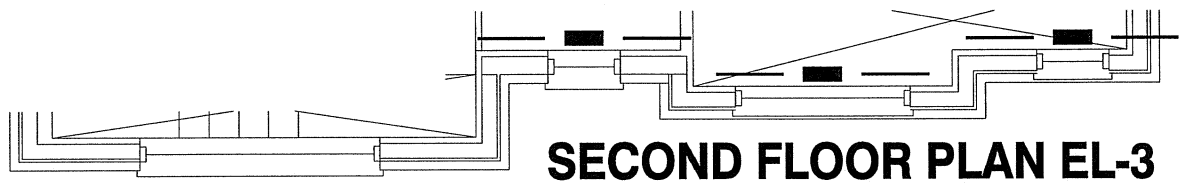
15. For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.



SECOND FLOOR PLAN EL-1



SECOND FLOOR PLAN EL-2



SECOND FLOOR PLAN EL-3

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CSA-F280-12

PACKAGE A1

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Sheet Title

SECOND FLOOR HEATING LAYOUT

Date MAY/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 90735

Richmond Hill City of Richmond Hill Building Division

HVAC REVIEWED

Initials: PXV