HVAC DESIGNS LTD.

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SITE NAME: RUSSEL GARDENS PHASE 3 | LOT 314 | DATE: Sep-20 | WINTER NATURAL AIR CHANGE RATE 0.305 | HEAT LOSS ΔT °F. 71 | CSA-F280-12
BUILDER: GREENPARK HOMES | TYPE: MOUNTAINASH 5 | GFA: 3298 | LO# 87549 | SUMMER NATURAL AIR CHANGE RATE 0.109 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			FLEX			WIC-3			S-ENS		
EXP. WALL			33			30			7			27			37			12			5			11			5			6		
CLG. HT.			9			9			9			9			9			9			9			9			9			9		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	297			270			63			243			333			108			54			99			45			54		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	19.8	15.1	0	0	0	14	277	212	0	0	0	13	257	197	0	0	0	0	0	0	7	138	106	16	316	242	0	0	0	0	0	0
EAST	19.8	39.0	0	0	0	0	0	0	0	0	0	48	949	1873	62	1226	2419	0	0	0	0	0	0	0	0	0	9	178	351	0	0	0
SOUTH	19.8	23.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	316	376	0	0	0	0	0	0	0	0	0	7	138	164
WEST	19.8	39.0	32	633	1249	14	277	546	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.	34.6	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
DOORS	23.5	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	0	0	0
NET EXPOSED WALL	4.1	0.8	265	1099	199	242	1003	182	63	261	47	182	755	137	271	1123	204	92	381	69	47	195	35	63	344	62	36	149	27	47	195	35
NET EXPOSED BSMT WALL ABOVE GR	3.3	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	0	0	0	0	0	0	0
EXPOSED CLG	1.2	0.6	287	342	169	221	263	130	140	167	82	236	281	139	183	218	108	180	215	106	66	79	39	220	262	129	40	48	24	72	86	42
NO ATTIC EXPOSED CLG	2.6	1.3	0	0	0	0	0	0	0	0	0	16	41	20	45	116	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.4	0.4	0	0	0	0	0	0	0	0	0	241	571	104	0	0	0	0	0	0	68	161	29	69	163	30	40	95	17	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				2073			1820			428			2854			2682			912			573			1986			470			419	
SUB TOTAL HT GAIN					1616			1070			130			2469			2787			551			209			464			419			242
LEVEL FACTOR / MULTIPLIER			0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23	
AIR CHANGE HEAT LOSS				484			425			100			667			627			213			134			254			110			98	
AIR CHANGE HEAT GAIN					114			75			9			174			195			39			15			33			30			17
DUCT LOSS				0			0			0			352			0			0			71			134			58			0	
DUCT GAIN					0			0			0			349			0			0			22			50			45			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					603			0			0			603			603			603			0			0			0			0
TOTAL HT LOSS BTU/H				2558			2245			528			3872			3309			1125			778			1474			637			617	
TOTAL HT GAIN x 1.3 BTU/H					3658			1489			180			4985			4975			1862			320			710			641			337

ROOM USE			FAM			L/D			K/B			L/H			LND			W/R			FOY			MUD						WUB			BAS		
EXP. WALL			36			30			37			19			12			18			18			30						46			155		
CLG. HT.			10			10			10			10			9			10			11			11						8			8		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	360			300			370			190			108			180			198			330						358			853		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN		LOSS	GAIN	
NORTH	19.8	15.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	138	106				0	0	0	5	99	76
EAST	19.8	39.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	435	858	6	119	234	0	0	0				0	0	0	0	0	0
SOUTH	19.8	23.5	0	0	0	39	771	916	0	0	0	13	257	305	7	138	164	0	0	0	0	0	0	0	0	0				0	0	0	10	198	235
WEST	19.8	39.0	40	791	1561	0	0	0	59	1186	2341	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
SKYLT.	34.6	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
DOORS	23.5	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	938	170	0	0	0				20	469	85	20	469	85
NET EXPOSED WALL	4.1	0.8	320	1327	241	261	1082	196	310	1285	233	177	734	133	101	419	76	158	655	119	152	630	114	323	1339	243				348	1443	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.3	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	0				0	0	0	388	1295	235
EXPOSED CLG	1.2	0.6	0	0	0	0	0	0	0	0	0	0	0	0	180	215	106	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.6	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
EXPOSED FLOOR	2.4	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				0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0							4821		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0						217				
SUBTOTAL HT LOSS				2117			1863			2471			991			772			1090			1687			1477						2129			6882		
SUB TOTAL HT GAIN					1801			1112			2574			438			346			977			518			349							347			630
LEVEL FACTOR / MULTIPLIER			0.30	0.42		0.30	0.42		0.30	0.42		0.30	0.42		0.20	0.23		0.30	0.42		0.30	0.42		0.30	0.42								0.50	0.91	
AIR CHANGE HEAT LOSS				895			783			1044			419			180			460			713			624									8229		
AIR CHANGE HEAT GAIN					127			78			181			31			24			69			37			25										69
DUCT LOSS				0			0			0			0			0			0			0			0									0		
DUCT GAIN					0			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					0		0		0
HEAT GAIN APPLIANCES/LIGHTS					603			603			603			603			603			0			0			0						0				603
TOTAL HT LOSS BTU/H				3012			2636			3515			1409			952			1550			2400			2102						2129			15111		
TOTAL HT GAIN x 1.3 BTU/H					3291			2331			4367			1394			1266			1369			722			485							451			1693

TOTAL HEAT GAIN BTU/H: 36793 | TONS: 3.07 | LOSS DUE TO VENTILATION LOAD BTU/H: 1515 | STRUCTURAL HEAT LOSS: 51860 | TOTAL COMBINED HEAT LOSS BTU/H: 53375

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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

CITY OF BRAMPTON
Building Division
Planning & Development Department
FEB 04 2021
RECEIVED BY
DATE
REVISED TO

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SITE NAME: RUSSEL GARDENS PHASE 3 — LOT 314
BUILDER: GREENPARK HOMES — TYPE: MOUNTAINASH 5 — DATE: Sep-20 — GFA: 3298 — LO# 87549

HEATING CFM	1131	COOLING CFM	1131	furnace pressure	0.6					#GOODMAN		AFUE =	96 %
TOTAL HEAT LOSS	51,860	TOTAL HEAT GAIN	36,518	furnace filter	0.05					GMEC960603BNA	60	INPUT (BTU/H) =	60,000
AIR FLOW RATE CFM	21.81	AIR FLOW RATE CFM	30.97	a/c coil pressure	0.2					FAN SPEED		OUTPUT (BTU/H) =	57,600
				available pressure for s/a & r/a	0.35					LOW			
										MEDLOW		DESIGN CFM =	1131
				plenum pressure s/a	0.18	r/a pressure	0.17			MEDIUM	928	CFM @ .6 " E.S.P.	
				max s/a dif press. loss	0.02	r/a grille press. Loss	0.02			MEDIUM HIGH	1017		
				min adjusted pressure s/a	0.16	adjusted pressure r/a	0.15			HIGH	1131	TEMPERATURE RISE	47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	15	8	4
R/A	0	0	6	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	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-2	FLEX	WIC-3	MBR	S-ENS	FAM	L/D	K/B	K/B	L/H	LND	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.28	1.12	0.53	1.94	1.65	1.13	0.78	1.47	0.64	1.28	0.52	3.01	2.64	1.76	1.76	1.41	0.95	1.55	2.40	2.10	4.31	4.31	4.31	4.31
CFM PER RUN HEAT	28	24	12	42	36	25	17	32	14	28	11	66	57	38	38	31	21	34	52	46	94	94	94	94
RM GAIN MBH.	1.83	0.74	0.18	2.49	2.49	1.86	0.32	0.71	0.64	1.83	0.34	3.29	2.33	2.18	2.18	1.39	1.27	1.36	0.72	0.49	0.54	0.54	0.54	0.54
CFM PER RUN COOLING	57	23	6	77	77	58	10	22	20	57	10	102	72	68	68	43	39	42	22	15	17	17	17	17
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	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	37	56	39	59	56	34	34	51	45	39	39	22	10	40	31	27	20	33	41	44	57	37	5	31
EQUIVALENT LENGTH	190	160	150	130	170	200	220	160	110	130	150	140	130	150	160	140	180	110	90	140	140	140	140	130
TOTAL EFFECTIVE LENGTH	227	216	189	189	226	234	254	211	155	169	189	162	140	190	191	167	200	143	131	184	197	177	145	161
ADJUSTED PRESSURE	0.08	0.08	0.09	0.09	0.08	0.07	0.07	0.08	0.11	0.1	0.09	0.1	0.12	0.09	0.09	0.1	0.09	0.12	0.13	0.09	0.08	0.09	0.11	0.1
ROUND DUCT SIZE	5	4	4	6	6	5	4	4	4	5	4	6	5	5	5	4	4	4	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	206	275	138	214	184	184	195	367	161	206	126	337	419	279	279	356	241	390	597	528	479	479	479	479
COOLING VELOCITY (ft/min)	419	264	69	393	393	426	115	252	229	419	115	520	529	499	499	493	447	482	252	172	87	87	87	87
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	A	B	D	C	C	C	A	D	B	D	B	D	A	A	C	B	C	C	A	A	B	D	C

RUN #	25	26	27
ROOM NAME	BED-2	BED-3	ENS
RM LOSS MBH.	1.94	1.65	1.12
CFM PER RUN HEAT	42	36	24
RM GAIN MBH.	2.49	2.49	0.74
CFM PER RUN COOLING	77	77	23
ADJUSTED PRESSURE	0.17	0.17	0.17
ACTUAL DUCT LGH.	52	48	52
EQUIVALENT LENGTH	120	170	130
TOTAL EFFECTIVE LENGTH	172	218	182
ADJUSTED PRESSURE	0.1	0.08	0.09
ROUND DUCT SIZE	6	6	4
HEATING VELOCITY (ft/min)	214	184	275
COOLING VELOCITY (ft/min)	393	393	264
OUTLET GRILL SIZE	4X10	4X10	3X10
TRUNK	D	C	A

SUPPLY 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 A	296	0.08	8.9	10	x	8	533	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	545	0.08	11.2	14	x	8	701	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	325	0.07	9.5	10	x	8	585	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	585	0.07	11.9	16	x	8	658	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	1041	0.05	16	30	x	8	625
TRUNK Y	695	0.05	13.8	22	x	8	569
TRUNK Z	445	0.05	11.6	16	x	8	501
DROP	1131	0.05	16.5	24	x	10	679

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	90	85	90	90	85	75	360	85	0	0	0	0	0	0	0	171
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.	41	52	53	58	53	59	45	41	1	1	1	1	1	1	1	15
EQUIVALENT LENGTH	185	195	165	165	215	265	165	190	0	0	0	0	0	0	0	150
TOTAL EFFECTIVE LH	226	247	218	223	268	324	210	231	1	1	1	1	1	1	1	165
ADJUSTED PRESSURE	0.07	0.06	0.07	0.07	0.06	0.05	0.07	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	5.9	6	5.9	5.9	6	6	9.9	6	0	0	0	0	0	0	0	7
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	30	14	0	0	0	0	0	0	0	14

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Michael O'Rourke — INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: MOUNTAINASH 5 LO # 87549
SITE NAME: RUSSEL GARDENS PHASE 3 LOT 314

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	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	201.4	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	201.4	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	121.9	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

79.5 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
79.5 CFM	X	71 F	X	1.08	X	0.25

SUPPLEMENTAL FANS PANASONIC

Location	Model	cfm	HVI	Sones
ENS	FV-05-11VK1	50	✓	0.3
ENS-2	FV-05-11VK1	50	✓	0.3
S-ENS	FV-05-11VK1	50	✓	0.3
W/R	FV-05-11VK1	50	✓	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 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 #: 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: Michael O'Rourke.

HRAI # 001620

Date: September-20

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

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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 87549 Model: MOUNTAINASH 5 Builder: GREENPARK HOMES Date: 10/09/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1452	8	11616
First	1452	10	14520
Second	1846	9	16614
Third	0	9	0
Fourth	0	9	0
		Total:	42,750.0 ft³
		Total:	1210.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.305
SUMMER NATURAL AIR CHANGE RATE	0.109

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-17	39	71
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.305 x 336.26 x 39 °C x 1.2 = **4824 W**

= **16458 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.109 x 336.26 x 7 °C x 1.2 = **313 W**

= **1068 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 71 °F x 1.08 x 0.25 = **1515 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	16,458	9,011	0.913
2	0.3		11,687	0.422
3	0.2		14,089	0.234
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: MOUNTAINASH 5 LOT 314 **BUILDER:** GREENPARK HOMES
SFQT: 3298 **LO#** 87549 **SITE:** RUSSEL GARDENS PHASE 3

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	1	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):	42750.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	5.5 ft
LENGTH: 54.0 ft	WIDTH: 36.0 ft	EXPOSED PERIMETER:	155.0 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

Michael O'Rourke

HVAC Designs Ltd.
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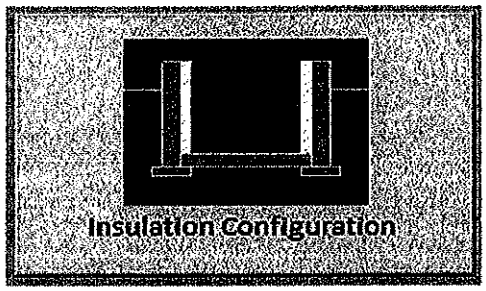
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

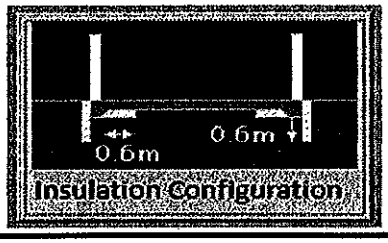
Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	**16.5**	
Floor Width (m):	**11.0**	
Exposed Perimeter (m):	**47.2**	
Wall Height (m):	**2.4**	
Depth Below Grade (m):	**1.68**	
Window Area (m^2):	**1.4**	
Door Area (m^2):	**3.7**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1413**	

TYPE: MOUNTAINASH 5 LOT 314
LO# 87549

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

Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
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):	4.6	
Exposed Perimeter (m):	7.6	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	**64**	

TYPE: MOUNTAINASH 5 LOT 314
LO# 87549

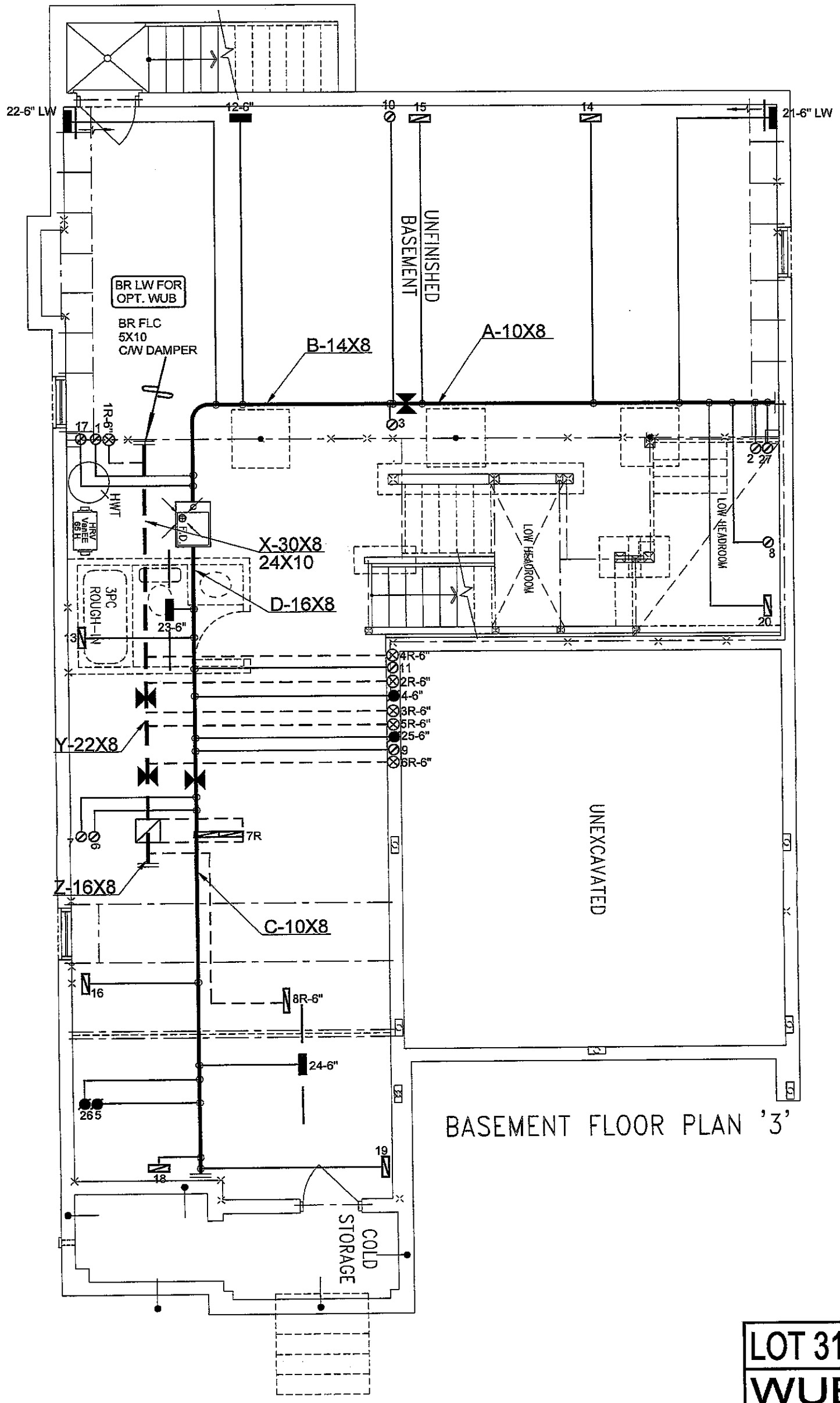
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Weather Station Location:	Open flat terrain, grass	
Anemometer height (m):	10	
Local Shielding		
Building Site:	Suburban, forest	
Walls:	Heavy	
Flue:	Heavy	
Highest Ceiling Height (m):	6.55	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	1210.5	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1613.7 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):	**0.305**	
Cooling Air Leakage Rate (ACH/H):	**0.109**	

TYPE: MOUNTAINASH 5 LOT 314
LO# 87549



BASEMENT FLOOR PLAN '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.

LOT 314	CSA-F280-12
WUB	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
RUSSEL GARDENS PHASE 3
HAMILTON, ONTARIO

LOT 314
MOUNTAINASH 5 3298 sqft

HVAC DESIGNS LTD.
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L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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.

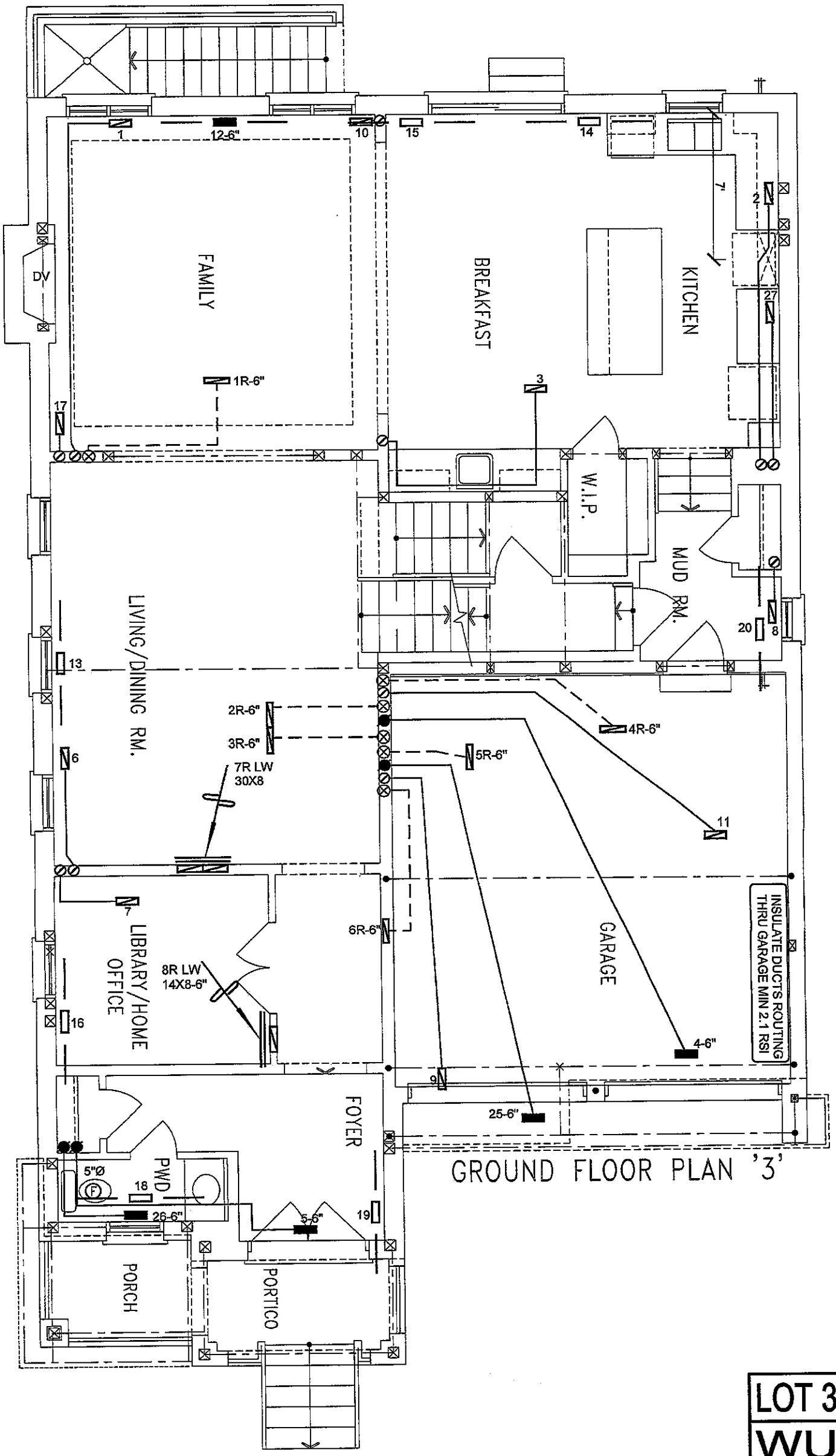
HEAT LOSS 53375 BTU/H	
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960603BNA
INPUT	60 MBTU/H
OUTPUT	57.6 MBTU/H
COOLING	3.0 TONS
FAN SPEED	1131 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	15	6	4
1ST FLOOR	8	2	3
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	SEPT/2020
Scale	3/16" = 1'-0"
BCIN# 19669	
LO#	87549



GROUND FLOOR PLAN '3'

1 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.

LOT 314	CSA-F280-12
WUB	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.		
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1.		

REVISIONS

Client
GREENPARK HOMES

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HAMILTON, ONTARIO

LOT 314
MOUNTAINASH 5 3298 sqft

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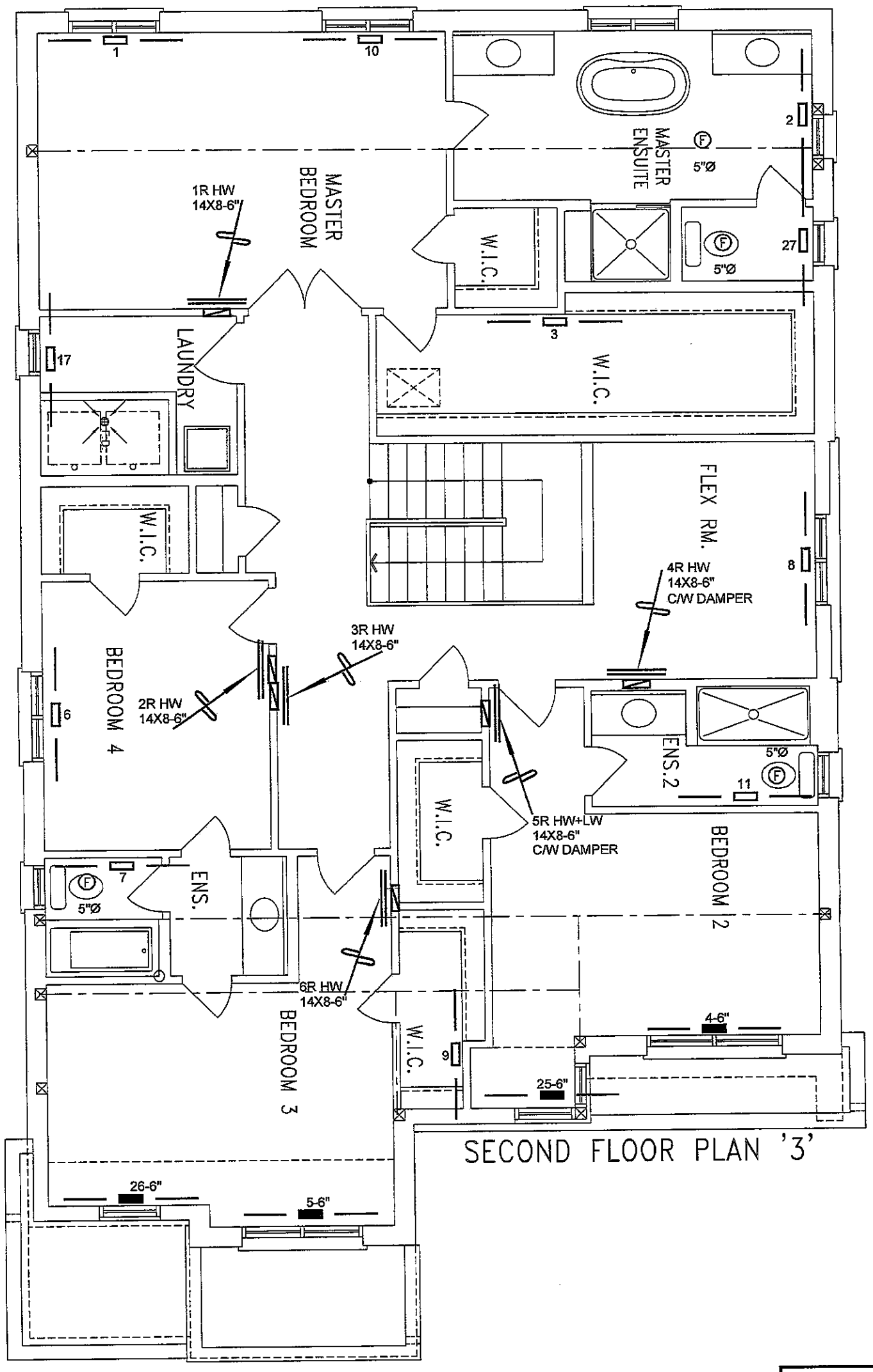
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87549



SECOND FLOOR PLAN '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.

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HVAC DESIGNS LTD.

LOT 314	CSA-F280-12
WUB	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.		
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1.		

REVISIONS

Client
GREENPARK HOMES

Project Name
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HAMILTON, ONTARIO

LOT 314
MOUNTAINASH 5 3298 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date	SEPT/2020
Scale	3/16" = 1'-0"
	BCIN# 19669
LO#	87549