

SITE NAME: RESSEL GARDENS PHASE 3

LOT 281

DATE: May-20

WINTER NATURAL AIR CHANGE RATE 0.338

HEAT LOSS AT °F 71

CSA-E280-12

BUILDER: GREENPARK HOMES

TYPE: MOUNTAINASH 1

GFA: 2667

LO# 85962

SUMMER NATURAL AIR CHANGE RATE 0.131

HEAT LOSS AT 7 F.	71
HEAT GAIN AT 85 F.	12

CSA-280-12
BB 10 PAKISTAN 11

ROOM USE				MBR		ENS		FLEX		BED-2		BED-3		BED-4		ENS-2		ENS-3		HEAT GAIN AT "F."		SB-12 PACKAGE A		
EXP. WALL				38		22		41		11		24		12		10		12						
CLG. HT.				9		9		9		9		9		9		9		9						
FACTORS																								
GRS.WALL AREA				342		198		369		99		216		108		90		108						
LOSS GAIN				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN						
GLAZING				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN						
NORTH				19.8	16.0	0	0	0	7	138	112	15	297	240	16	316	256	15	297	240	0	0	0	0
EAST				19.8	41.6	0	0	0	0	0	0	71	1404	2960	0	0	0	74	1463	3075	0	0	0	0
SOUTH				19.8	24.9	0	0	0	0	0	0	17	336	423	0	0	0	0	0	0	16	316	398	0
WEST				19.8	41.6	32	633	1330	14	277	582	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
DOORS				23.5	4.3	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	310	1285	233	177	734	133	266	1103	200	83	344	62	127	526	95	92	381	69	83
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
EXPOSED CLG				1.2	0.6	325	387	191	120	143	71	238	284	140	238	284	140	209	249	123	144	172	85	120
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
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
BASEMENT/CRAWL HEAT LOSS						0			0			0			0		0			0			0	
SLAB ON GRADE HEAT LOSS						0			0			0			0		0			0			0	
SUBTOTAL HT LOSS						2305			1292			3423			944		2881			869			626	
SUB TOTAL HT GAIN							1754		897			3953			458		3595			552			307	
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		
AIR CHANGE HEAT LOSS						523			293			777			214		654			197			142	
AIR CHANGE HEAT GAIN							110					249			29		226			35			19	
DUCT LOSS						0			0			0			354		461			0			0	
DUCT GAIN									0			0			0		240			0			22	
HEAT GAIN PEOPLE				240		2	480		0		0	1	240		1	240		240		1	240		0	
HEAT GAIN APPLIANCES/LIGHTS							549		0		549		549		549		549		549		549		0	
TOTAL HT LOSS BTU/H						2829			1585			4200			1169		3889			1057			768	
TOTAL HT GAIN x 1.3 BTU/H							3761		1240			6176			1659		6594			1789			424	

ROOM USE			LV/DN			K/B/F			L/M			FOY			WOD			BAS		
EXP. WALL			28			69			27			47			47			170		
CLG. HT.			10			10			11			10			8			8		
FACTORS																				
GRS.WALL AREA			280			690			297			470			376			991		
LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN		
GLAZING																				
NORTH			19.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST			19.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH			19.8	24.9	27	534	672	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST			19.8	41.6	0	0	0	98	1937	4072	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
DOORS			23.5	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL			4.1	0.6	253	1049	190	592	2454	445	268	1111	201	416	1725	313	269	899	163	369
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
EXPOSED CLG			1.2	0.6	0	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
EXPOSED FLOOR			2.4	0.4	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
SLAB ON GRADE HEAT LOSS					0			0		0			0		0			0		0
SUBTOTAL HT LOSS					1583			4391		1758			2940		1064			1156		7491
SUB TOTAL HT GAIN						862		4517			430							703		506
LEVEL FACTOR / MULTIPLIER			0.30	0.42			0.30	0.42		0.30	0.42		0.30	0.42					0.50	0.85
AIR CHANGE HEAT LOSS					665			1846		739			1236		67					7478
AIR CHANGE HEAT GAIN						54		284			27									76
DUCT LOSS					0			0		0			0						0	0
DUCT GAIN					0			0		0			0						0	0
HEAT GAIN PEOPLE			240		0		0	0	0	0			0						0	0
HEAT GAIN APPLIANCES/LIGHTS						549		549			549								0	549
TOTAL HT LOSS BTU/H					2248			6238		2497			4175						1156	14969
TOTAL HT GAIN x 1.3 BTU/H					1906			6956		1309			1471						914	147

TOTAL HEAT GAIN BTU/H:

36256

TONS: 3.02

LOSS DUE TO VENTILATION LOAD BTU/H: 1515

STRUCTURAL HEAT LOSS: 47903

TOTAL COMBINED HEAT LOSS BTU/H: 49418

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: RESSEL GARDENS PHASE 3
BUILDER: GREENPARK HOMES

TYPE: MOUNTAINASH 1

DATE: May-20

GFA: 2667

LO# 85962

HEATING CFM 1131 COOLING CFM 1131
TOTAL HEAT LOSS 47,903 TOTAL HEAT GAIN 35,962
AIR FLOW RATE CFM 23.61 AIR FLOW RATE CFM 31.43

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

#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	6	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	13	14	15	16	17	19	21	22	23	24
ROOM NAME	MBR	ENS	FLEX	BED-2	BED-3	BED-4	ENS-2	FLEX	BED-3	MBR	ENS-3	ENS-3	LV/DN	K/B/F	K/B/F	K/B/F	L/M	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.41	1.59	2.10	1.16	1.94	1.07	0.77	2.10	1.94	1.41	0.56	0.56	2.25	2.08	2.08	2.08	2.50	4.18	4.03	4.03	4.03	4.03
CFM PER RUN HEAT	33	37	50	27	46	25	18	50	46	33	13	13	53	49	49	49	59	99	95	95	95	95
RM GAIN MBH.	1.88	1.24	3.09	1.66	3.30	1.79	0.42	3.09	3.30	1.88	0.16	0.16	1.91	2.32	2.32	2.32	1.31	1.47	0.60	0.60	0.60	0.60
CFM PER RUN COOLING	59	39	97	52	104	56	13	97	104	59	5	5	60	73	73	73	41	46	19	19	19	19
ADJUSTED PRESSURE	0.17	0.17	0.16	0.17	0.16	0.17	0.17	0.16	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	0.16
ACTUAL DUCT LGH.	33	50	58	43	47	44	19	52	40	39	35	40	30	22	35	44	41	37	37	15	26	39
EQUIVALENT LENGTH	180	130	180	150	150	110	150	110	140	130	190	160	110	110	150	120	120	110	130	120	140	120
TOTAL EFFECTIVE LENGTH	213	180	238	193	197	154	169	162	180	169	225	200	140	132	185	164	161	147	167	135	166	159
ADJUSTED PRESSURE	0.08	0.1	0.07	0.09	0.08	0.11	0.1	0.1	0.09	0.1	0.08	0.09	0.12	0.13	0.09	0.1	0.11	0.11	0.1	0.12	0.1	0.1
ROUND DUCT SIZE	5	4	6	6	6	5	4	6	6	5	4	4	5	5	5	5	5	6	6	6	6	6
HEATING VELOCITY (ft/min)	242	424	255	138	235	184	207	255	235	242	149	149	389	360	360	360	433	505	484	484	484	484
COOLING VELOCITY (ft/min)	433	447	495	265	530	411	149	495	530	433	57	57	441	536	536	536	301	235	97	97	97	97
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10
TRUNK	D	C	A	C	B	B	D	A	B	D	B	B	B	D	C	C	C	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	1.41	33	1.88	59	0.17	33	180	213	0.08	5	242	433	3X10	D
2	ENS	1.59	37	1.24	39	0.17	50	130	180	0.1	4	424	447	3X10	C
3	FLEX	2.10	50	3.09	97	0.16	58	180	238	0.07	6	255	495	4X10	A
4	BED-2	1.16	27	1.66	52	0.17	43	150	193	0.09	6	138	265	4X10	C
5	BED-3	1.94	46	3.30	104	0.16	47	150	197	0.08	6	235	530	4X10	B
6	BED-4	1.07	25	1.79	56	0.17	44	110	154	0.11	5	184	411	3X10	B
7	ENS-2	0.77	18	0.42	13	0.17	19	150	169	0.1	4	207	149	3X10	D
8	FLEX	2.10	50	3.09	97	0.16	52	110	162	0.1	6	255	495	4X10	A
9	BED-3	1.94	46	3.30	104	0.16	40	140	180	0.09	6	235	530	4X10	B
10	MBR	1.41	33	1.88	59	0.17	39	130	169	0.1	5	242	433	3X10	D
11	ENS-3	0.56	13	0.16	5	0.17	35	190	225	0.08	4	149	57	3X10	B
12	ENS-3	0.56	13	0.16	5	0.17	40	160	200	0.09	4	149	57	3X10	B
13	LV/DN	2.25	53	1.91	60	0.17	30	110	140	0.12	5	389	441	3X10	B
14	K/B/F	2.08	49	2.32	73	0.17	22	110	132	0.13	5	360	536	3X10	D
15	K/B/F	2.08	49	2.32	73	0.17	35	150	185	0.09	5	360	536	3X10	C
16	K/B/F	2.08	49	2.32	73	0.17	44	120	164	0.1	5	360	536	3X10	C
17	L/M	2.50	59	1.31	41	0.17	41	120	161	0.11	5	433	301	3X10	C
19	FOY	4.18	99	1.47	46	0.16	37	110	147	0.11	6	505	235	4X10	A
21	BAS	4.03	95	0.60	19	0.16	37	130	167	0.1	6	484	97	4X10	C
22	BAS	4.03	95	0.60	19	0.16	15	120	135	0.12	6	484	97	4X10	D
23	BAS	4.03	95	0.60	19	0.16	26	140	166	0.1	6	484	97	4X10	A
24	BAS	4.03	95	0.60	19	0.16	39	120	159	0.1	6	484	97	4X10	A

SUPPLY AIR TRUNK SIZE															RETURN AIR TRUNK SIZE												
	TRUNK	STATIC	ROUND	RECT						TRUNK	STATIC	ROUND	RECT						TRUNK	STATIC	ROUND	RECT					
	CFM	PRESS.	DUCT	DUCT	VELOCITY (ft/min)					CFM	PRESS.	DUCT	DUCT	VELOCITY (ft/min)					CFM	PRESS.	DUCT	DUCT	VELOCITY (ft/min)				
TRUNK A	389	0.07	10.2	12	X	8	584			TRUNK G	0	0.00	0	0	X	8	0			TRUNK O	0	0.05	0	0	X	8	0
TRUNK B	585	0.07	11.9	16	X	8	658			TRUNK H	0	0.00	0	0	X	8	0			TRUNK P	0	0.05	0	0	X	8	0
TRUNK C	316	0.09	8.8	10	X	8	569			TRUNK I	0	0.00	0	0	X	8	0			TRUNK Q	0	0.05	0	0	X	8	0
TRUNK D	544	0.08	11.2	14	X	8	699			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	9	10	11	12	13	14	15	16	17	19	21	22	23	24
AIR VOLUME	155	135	85	85	280	155	75	0	0	0	0	0	0	0	0	0	0	161				
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				
ACTUAL DUCT LGH.	41	56	52	52	38	29	54	1	1	1	1	1	1	1	1	1	1	15				
EQUIVALENT LENGTH	205	220	175	170	205	235	230	0	0	0	0	0	0	0	0	0	0	145				
TOTAL EFFECTIVE LH	246	276	227	222	243	264	284	1	1	1	1	1	1	1	1	1	1	160				
ADJUSTED PRESSURE	0.06	0.05	0.07	0.07	0.06	0.06	0.05	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	7.5	5.8	5.8	9.4	7.5	6	0	0	0	0	0	0	0	0	0	0	6.9				
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	8				
INLET GRILL SIZE	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	30	14	14	0	0	0	0	0	0	0	0	0	0	14				

TYPE: MOUNTAINASH 1
SITE NAME: RESSEL GARDENS PHASE 3

LO # 85982

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	4 @ 10.6 cfm 42.4 cfm
Other Rooms	7 @ 10.6 cfm 74.2 cfm
Table 9.32.3.A.	TOTAL 190.8 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	9.32.3.6.
Total Ventilation Capacity	190.8 cfm
Less Principal Ventil. Capacity	79.5 cfm
Required Supplemental Capacity	111.3 cfm

PRINCIPAL EXHAUST FAN CAPACITY
Model: VANE 65H Location: BSMT
79.5 cfm 3.0 sonas ☒ 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 Sonas	
ENS FV-05-11VK1 50 ☒ 0.3	
ENS-2 FV-05-11VK1 50 ☒ 0.3	
ENS-3 FV-05-11VK1 50 ☒ 0.3	

HEAT RECOVERY VENTILATOR	9.32.3.11.
Model: VANE 65H	
155 cfm high 64 cfm low	
75 % 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: May-20

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 85962		Model: MOUNTAINASH 1		Builder: GREENPARK HOMES																																																								
				Date: 04/05/2020																																																								
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr><td>Bsmt</td><td>1227</td><td>8</td><td>9816</td></tr> <tr><td>First</td><td>1227</td><td>10</td><td>12270</td></tr> <tr><td>Second</td><td>1440</td><td>9</td><td>12960</td></tr> <tr><td>Third</td><td>0</td><td>9</td><td>0</td></tr> <tr><td>Fourth</td><td>0</td><td>9</td><td>0</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>35,046.0 ft³</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>992.4 m³</td></tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1227	8	9816	First	1227	10	12270	Second	1440	9	12960	Third	0	9	0	Fourth	0	9	0	Total:			35,046.0 ft³	Total:			992.4 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%;">0.338</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.121</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td>22</td> <td>-17</td> <td>39</td> <td>71</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> <td>13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.338	SUMMER NATURAL AIR CHANGE RATE	0.121	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-17	39	71	Summer DTDc	24	31	7	13
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.338 x 275.66 x 39 °C x 1.2 = 4383 W = 14956 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ 0.121 x 275.66 x 7 °C x 1.2 = 285 W = 971 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 71 °F x 1.08 x 0.25 = 1515 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)																																																												
$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	14,956	8,647	0.865																																																								
2	0.3		10,672	0.420																																																								
3	0.2		13,172	0.227																																																								
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																																																												

HEAT LOSS AND GAIN SUMMARY SHEET**MODEL:** MOUNTAINASH 1**BUILDER:** GREENPARK HOMES**SFQT:** 2667**LO#** 85962**SITE:** RESSEL 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 (ft³):	35046.0	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: 48.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	170.0 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	-

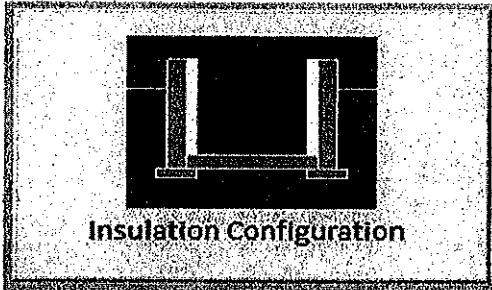
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



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):	14.6	 Insulation Configuration
Floor Width (m):	11.3	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.4	
Depth Below Grade (m):	1.52	
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):		1644

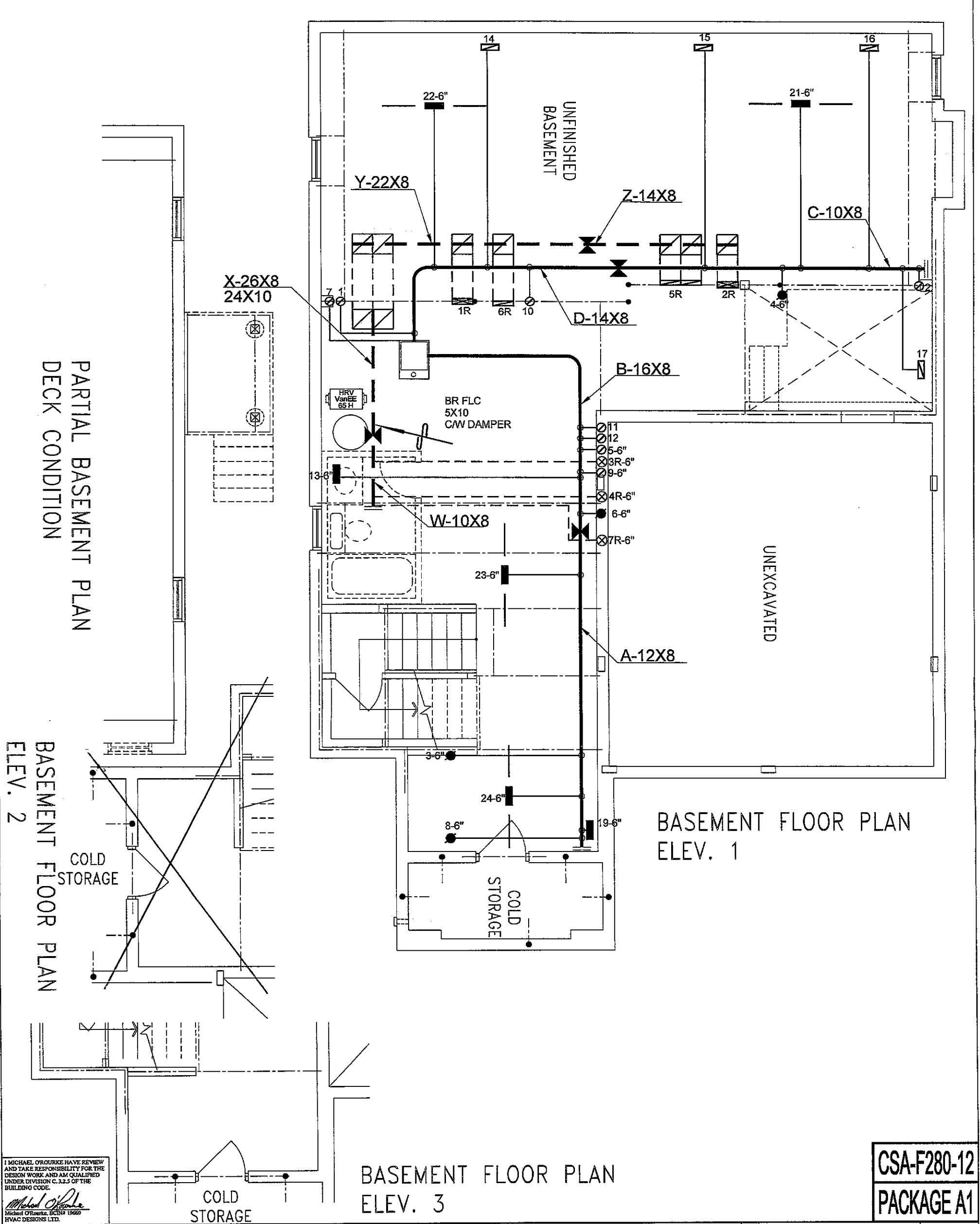
TYPE: MOUNTAINASH 1
LO# 85962

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):	7.62			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	992.4			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1322.9 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	37.5	37.5		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.338			
Cooling Air Leakage Rate (ACH/H):	0.121			

TYPE: MOUNTAINASH 1
LO# 85962



I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.32.3 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

BASEMENT FLOOR PLAN
ELEV. 3

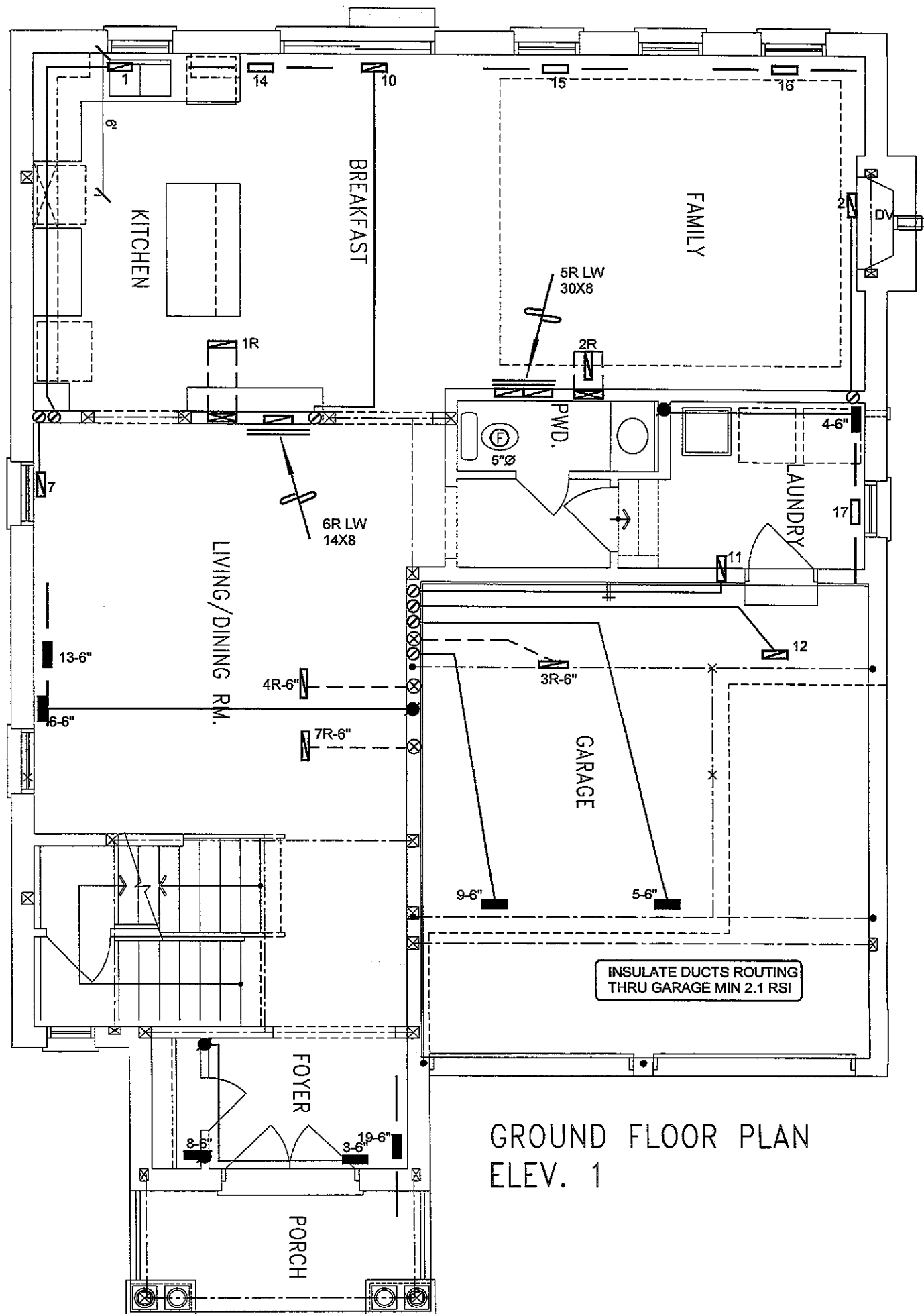
BASEMENT FLOOR PLAN
ELEV. 1

CSA-F280-12
PACKAGE A1

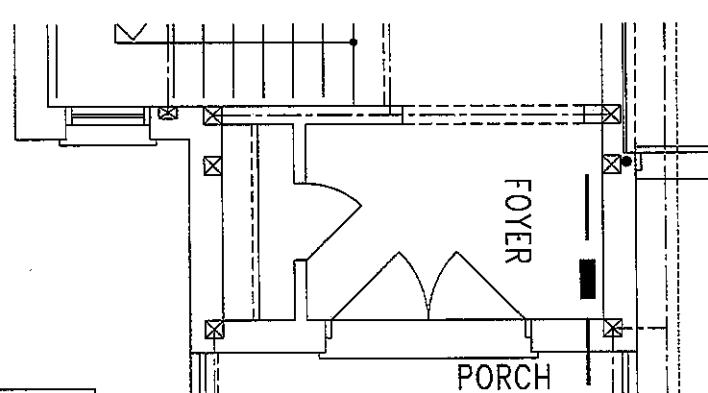
HVAC LEGEND						3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR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

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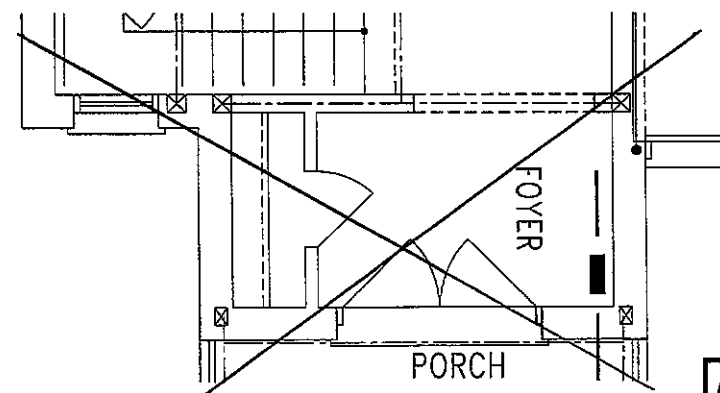
Client GREENPARK HOMES	HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 49418 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title BASEMENT HEATING LAYOUT	
Project Name RUSSEL GARDENS PHASE 3 HAMILTON, ONTARIO <i>LOT 281</i> MOUNTAINASH 1 2667 sqft		MAKE GOODMAN			3RD FLOOR			
		MODEL GMEC960603BNA			2ND FLOOR	12		5 3
		INPUT 60 MBTU/H			1ST FLOOR	6		2 2
		OUTPUT 57.6 MBTU/H			BASEMENT	4		1 0
		COOLING 3.0 TONS			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			
		FAN SPEED 1131 cfm @ 0.5" w.c.						
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.				Date APRIL/2020				
				Scale 3/16" = 1'-0"				
				BCIN# 19669				
				LO#	85962			



GROUND FLOOR PLAN
ELEV. 1



GROUND FLOOR PLAN
ELEV. 3



GROUND FLOOR PLAN
ELEV. 2

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

CSA-F280-12
PACKAGE A1

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.	Description	Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

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Client
GREENPARK HOMES
Project Name
**RUSSEL GARDENS PHASE 3
HAMILTON, ONTARIO**
LOT 281
MOUNTAINASH 1 2667 sqft

HVACDESIGNS LTD.
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.

Sheet Title	
FIRST FLOOR HEATING LAYOUT	
Date	APRIL/2020
Scale	3/16" = 1'-0"
BCIN# 19669	
LO#	85962

SECOND FLOOR PLAN
ELEV. 1

SECOND FLOOR PLAN
ELEV. 2

SECOND FLOOR PLAN
ELEV. 3

I MICHAEL O'BROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 12.5 OF THE BUILDING CODE.
Michael O'Brourke
Michael O'Brourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12
PACKAGE A1

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

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Client GREENPARK HOMES		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title SECOND FLOOR HEATING LAYOUT	
Project Name RUSSEL GARDENS PHASE 3 HAMILTON, ONTARIO <i>LOT 281</i> MOUNTAINASH 1 2667 sqft			Date APRIL/2020	Scale 3/16" = 1'-0"
		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.	BCIN# 19669	
			LO#	85962