

SITE NAME: RUSSEL GARDENS PHASE 3

BUILDER: GREENPARK HOMES

TYPE: MOUNTAINASH 6

GFA: 3401

DATE: May-20

LO# 85971

WINTER NATURAL AIR CHANGE RATE 0.338

SUMMER NATURAL AIR CHANGE RATE 0.121

HEAT LOSS AT °F. 71

HEAT GAIN AT °F. 13

CSA-F280-12

SB-12 PACKAGE A1

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	MBR	ENS	WIC	BED-2	BED-3	BED-4	S-ENS	FLEX	WIC-3	ENS-3	
				34	29	8	34	33	26	0	11	8	6	
				9	9	9	9	9	9	9	9	9	9	
GRS.WALL AREA			LOSS GAIN	306	261	72	308	297	234	0	99	72	64	
GLAZING			LOSS GAIN											
NORTH	19.8	16.0	0 0 0	14	277	224	0 0 0	14	277	224	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	45 890	1870	64 1265	2859	0 0 0	0 0 0	32 633	1330
SOUTH	19.8	24.9	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	11 217	274	0 0 0	11 217	274	0 0 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 0 0	0 0 0	0 0 0	7 138
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	0 0 0	0 0 0
DOORS	23.6	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	0 0 0	0 0 0
NET EXPOSED WALL	4.1	0.8	274	1138	206	233	986	175	72	298	54	261	1082	196
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	0 0 0	0 0 0
EXPOSED CLG	1.2	0.6	285	340	167	204	243	120	130	155	76	272	324	160
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	0 0 0	10 26
EXPOSED FLOOR	2.4	0.4	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	285	678	123	30	71	13
BASEMENT/CRAWL HEAT LOSS														
SLAB ON GRADE HEAT LOSS														
SUBTOTAL HT LOSS				2108		1763		453	2973		2834		1357	
SUB TOTAL HT GAIN					1703		1100	131	2349		3215		547	
LEVEL FACTOR / MULTIPLIER	0.20	0.25		0.20	0.25		0.20	0.25	0.20	0.25		0.20	0.25	125
AIR CHANGE HEAT LOSS				537		449		116	767		721		345	
AIR CHANGE HEAT GAIN					121		78	9	167		229		39	
DUCT LOSS				0		0		0	373		355		0	
DUCT GAIN				0		0		0	411		0		57	
HEAT GAIN PEOPLE	240		2	480	0	0	0	1	240	1	240	1	240	0
HEAT GAIN APPLIANCES/LIGHTS				431		431		431	431		431		431	
TOTAL HT LOSS BTU/H				2845		2211		569	4104		3910		1702	
TOTAL HT GAIN x 1.3 BTU/H				3858		2093		742	4557		5883		1835	

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	L/D	FAM	K/B	L/H	LND	F-WIC	FOY	MUD		WOD	BAS
				50	35	44	10	7	12	15	24		46	182
				10	10	10	10	9	10	10	11		8	8
GRS.WALL AREA			LOSS GAIN	600	350	440	100	83	120	160	284		368	1048
GLAZING			LOSS GAIN											
NORTH	19.8	16.0	0 0 0	0 0 0	0 0 0	8 158	128	18 366	288	7 138	112	0 0 0	0 0 0	3 59
EAST	19.8	41.6	0 0 0	0 0 0	0 0 0	0 0 0	0	0 0 0	0	15 297	623	0 0 0	0 0 0	0 0 0
SOUTH	19.8	24.9	35 712	896	0 0 0	16 316	398	0 0 0	0 0 0	0 0 0	0	0 0 0	0 0 0	6 119
WEST	19.8	41.6	0 0 0	0 0 0	46 909	1911	33 652	1371	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 0 0
DOORS	23.6	4.3	0 0 0	0 0 0	0 0 0	20 469	85	0 0 0	0 0 0	40 938	170	20 469	85	20 469
NET EXPOSED WALL	4.1	0.8	464	1924	349	304	1260	228	363	1605	273	82	340	62
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	68 232	42	105	435	79
EXPOSED CLG	1.2	0.6	0 0 0	0 0 0	0 0 0	29 35	17	0 0 0	126	150	74	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 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 0 0
BASEMENT/CRAWL HEAT LOSS														
SLAB ON GRADE HEAT LOSS														
SUBTOTAL HT LOSS				2635		2170		3135		686		521		732
SUB TOTAL HT GAIN					1245		2140	2272		349		702		702
LEVEL FACTOR / MULTIPLIER	0.30	0.44		0.30	0.44		0.30	0.44	0.20	0.25		0.30	0.44	1289
AIR CHANGE HEAT LOSS				1168		953		1378		306		133		322
AIR CHANGE HEAT GAIN					89		162	162		25		16		80
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	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				431		431		431		431		431		431
TOTAL HT LOSS BTU/H				3793		3123		4513		1001		653		1053
TOTAL HT GAIN x 1.3 BTU/H				2284		3540		3725		1047		878		978

TOTAL HEAT GAIN BTU/H:

41894

TONS: 3.49

LOSS DUE TO VENTILATION LOAD BTU/H: 1516

STRUCTURAL HEAT LOSS: 58447

TOTAL COMBINED HEAT LOSS BTU/H: 57962

[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

SITE NAME: RUSSEL GARDENS PHASE 3
 BUILDER: GREENPARK HOMES

TYPE: MOUNTAINASH 8

DATE: May-20

GFA: 3401 LO# 85971

 HEATING CFM 1504 COOLING CFM 1504
 TOTAL HEAT LOSS 56,447 TOTAL HEAT GAIN 41,619
 AIR FLOW RATE CFM 26.64 AIR FLOW RATE CFM 36.14

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

 #**GOODMAN
 GMEC980804CNA 80
 FAN SPEED

 AFUE = 96 %
 INPUT (BTU/H) = 80,000
 OUTPUT (BTU/H) = 76,800

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	17	10	5
R/A	0	0	6	3	1

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

 plenum pressure s/a 0.18
 max s/a diff 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

 LOW 868
 MEDLOW 978
 MEDIUM 1112
 MEDIUM HIGH 1504
 HIGH 1615

 DESIGN CFM = 1504
 CFM @ .5" E.S.P.
 TEMPERATURE RISE 47 °F

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	S-ENS	FLEX	WIC-3	MBR	ENS-3	L/D	FAM	K/B	K/B	L/H	LND	F-WIC	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.32	1.11	0.57	2.05	1.30	1.70	0.30	1.04	1.40	1.32	0.57	1.90	1.56	2.26	2.26	1.00	0.65	1.05	2.83	2.13	3.72	3.72	3.72	3.72
CFM PER RUN HEAT	35	29	15	55	35	45	8	28	37	35	15	51	42	80	60	27	17	28	75	57	99	99	99	99
RM GAIN MBH	1.78	1.05	0.74	2.28	1.96	1.83	0.40	1.21	2.80	1.78	0.94	1.15	1.77	1.86	1.86	1.05	0.88	0.98	1.80	0.93	0.44	0.44	0.44	0.44
CFM PER RUN COOLING	64	38	27	82	71	59	15	44	101	64	34	41	64	67	67	38	32	35	65	34	16	16	16	16
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	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	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	37	35	22	65	67	49	44	34	56	26	45	35	26	31	24	19	49	53	46	23	15	22	33	33
EQUIVALENT LENGTH	120	150	160	150	200	190	170	150	160	140	180	120	110	140	130	100	180	140	130	120	140	120	120	180
TOTAL EFFECTIVE LENGTH	157	185	182	215	267	239	214	184	216	166	225	155	136	171	154	119	229	193	176	143	155	142	153	213
ADJUSTED PRESSURE	0.11	0.09	0.09	0.08	0.06	0.07	0.08	0.09	0.08	0.1	0.08	0.11	0.13	0.1	0.11	0.14	0.08	0.09	0.1	0.12	0.1	0.11	0.11	0.08
ROUND DUCT SIZE	5	4	4	6	6	5	4	4	6	5	4	4	5	5	5	4	4	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	257	333	172	280	178	330	92	321	189	257	172	585	308	441	441	310	195	321	551	419	505	505	505	505
COOLING VELOCITY (ft/min)	470	436	310	418	362	433	172	505	515	470	390	470	470	492	492	436	367	402	477	250	82	82	82	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10
TRUNK	D	F	F	C	A	C	B	C	B	D	C	B	F	D	D	F	C	A	A	F	F	D	C	A

RUN #	25	26	27	28	29	30	31	32
ROOM NAME	BED-2	BED-3	ENS	S-ENS	FAM	L/D	BAS	BED-3
RM LOSS MBH	2.05	1.30	1.11	0.30	1.56	1.90	3.72	1.30
CFM PER RUN HEAT	55	35	29	8	42	51	99	35
RM GAIN MBH	2.28	1.96	1.05	0.40	1.77	1.15	0.44	1.96
CFM PER RUN COOLING	82	71	38	15	64	41	16	71
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17
ACTUAL DUCT LGH	60	74	30	40	14	49	46	70
EQUIVALENT LENGTH	180	200	120	180	150	170	160	200
TOTAL EFFECTIVE LENGTH	240	274	150	220	164	219	206	270
ADJUSTED PRESSURE	0.07	0.06	0.11	0.08	0.1	0.08	0.08	0.06
ROUND DUCT SIZE	6	6	4	4	5	5	8	8
HEATING VELOCITY (ft/min)	280	178	333	92	308	374	505	178
COOLING VELOCITY (ft/min)	418	362	436	172	470	301	82	362
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	B	A	F	B	F	A	A	A

SUPPLY AIR TRUNK SIZE

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	457	0.06	11.2	14	588
TRUNK B	616	0.06	12.6	18	616
TRUNK C	875	0.06	14.3	24	656
TRUNK D	289	0.10	8.3	8	650
TRUNK E	1164	0.06	16	30	698
TRUNK F	340	0.09	9.1	10	612

RETURN AIR TRUNK SIZE

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK G	0	0.00	0	0	0
TRUNK H	0	0.00	0	0	0
TRUNK I	0	0.00	0	0	0
TRUNK J	0	0.00	0	0	0
TRUNK K	0	0.00	0	0	0
TRUNK L	0	0.00	0	0	0
TRUNK O	0	0.05	0	0	0
TRUNK P	0	0.05	0	0	0
TRUNK Q	0	0.05	0	0	0
TRUNK R	0	0.05	0	0	0
TRUNK S	0	0.05	0	0	0
TRUNK T	0	0.05	0	0	0
TRUNK U	0	0.05	0	0	0
TRUNK V	585	0.05	12.9	20	527
TRUNK W	150	0.05	7.8	8	338
TRUNK X	919	0.05	15.3	28	591
TRUNK Y	685	0.05	13.7	22	560
TRUNK Z	535	0.05	12.5	18	535
DROP	1504	0.05	18.4	24	645

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	75	75	135	115	75	75	185	400	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	68	68	57	74	67	69	21	23	38	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	245	235	215	235	220	215	155	160	285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	313	303	272	309	287	284	176	183	323	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
ROUND DUCT SIZE	6	6	7.5	7	6	6	7.5	9.9	7.5	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
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	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	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: MOUNTAINASH 6
SITE NAME: RUSSEL GARDENS PHASE 3

LO # 85971

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	6 @ 10.6 cfm	63.6 cfm
Other Rooms	9 @ 10.6 cfm	95.4 cfm
Table 9.32.3.A.	TOTAL	233.2 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	233.2	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	153.7	cfm

PRINCIPAL EXHAUST FAN CAPACITY			
Model: VANE 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
S-ENS	FV-05-11VK1	50	☒	0.3
ENS-3	FV-05-11VK1	50	☒	0.3
F-WIC	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#: 85971	Model: MOUNTAINASH 6	Builder: GREENPARK HOMES	Date: 11/05/2020																																																									
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>1486</td><td>8</td><td>11888</td></tr> <tr><td>First</td><td>1486</td><td>10</td><td>14860</td></tr> <tr><td>Second</td><td>1915</td><td>9</td><td>17235</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>43,983.0 ft³</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>1245.5 m³</td></tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1486	8	11888	First	1486	10	14860	Second	1915	9	17235	Third	0	9	0	Fourth	0	9	0	Total:			43,983.0 ft³	Total:			1245.5 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:70%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width:30%; text-align: center;">0.338</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">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>T_{in} °C</th> <th>T_{out} °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTD_h</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-17</td> <td style="text-align: center;">39</td> <td style="text-align: center;">71</td> </tr> <tr> <td>Summer DTD_c</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.338	SUMMER NATURAL AIR CHANGE RATE	0.121	Design Temperature Difference						T _{in} °C	T _{out} °C	ΔT °C	ΔT °F	Winter DTD _h	22	-17	39	71	Summer DTD _c	24	31	7	13
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
Bsmt	1486	8	11888																																																									
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Third	0	9	0																																																									
Fourth	0	9	0																																																									
Total:			43,983.0 ft³																																																									
Total:			1245.5 m³																																																									
WINTER NATURAL AIR CHANGE RATE	0.338																																																											
SUMMER NATURAL AIR CHANGE RATE	0.121																																																											
Design Temperature Difference																																																												
	T _{in} °C	T _{out} °C	ΔT °C	ΔT °F																																																								
Winter DTD _h	22	-17	39	71																																																								
Summer DTD _c	24	31	7	13																																																								
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 345.96 x 39 °C x 1.2 = 5501 W = 18770 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.121 x 345.96 x 7 °C x 1.2 = 357 W = 1219 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 71 °F x 1.08 x 0.25 = 1515 Btu/h			$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 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)	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	18,770	9,207	1.019																																																								
2	0.3		12,815	0.439																																																								
3	0.2		14,744	0.255																																																								
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																																																												

HEAT LOSS AND GAIN SUMMARY SHEET**MODEL:** MOUNTAINASH 6**BUILDER:** GREENPARK HOMES**SFQT:** 3401**LO#** 85971**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 (ft³):	43983.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	5.0 ft
LENGTH: 55.0 ft	WIDTH: 36.0 ft	EXPOSED PERIMETER:	182.0 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	-

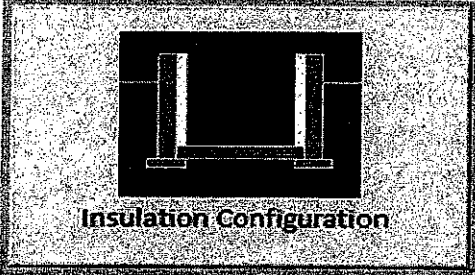
INDIVIDUAL BCIN: 19669

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):	16.8	 Insulation Configuration
Floor Width (m):	11.0	
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):		1780

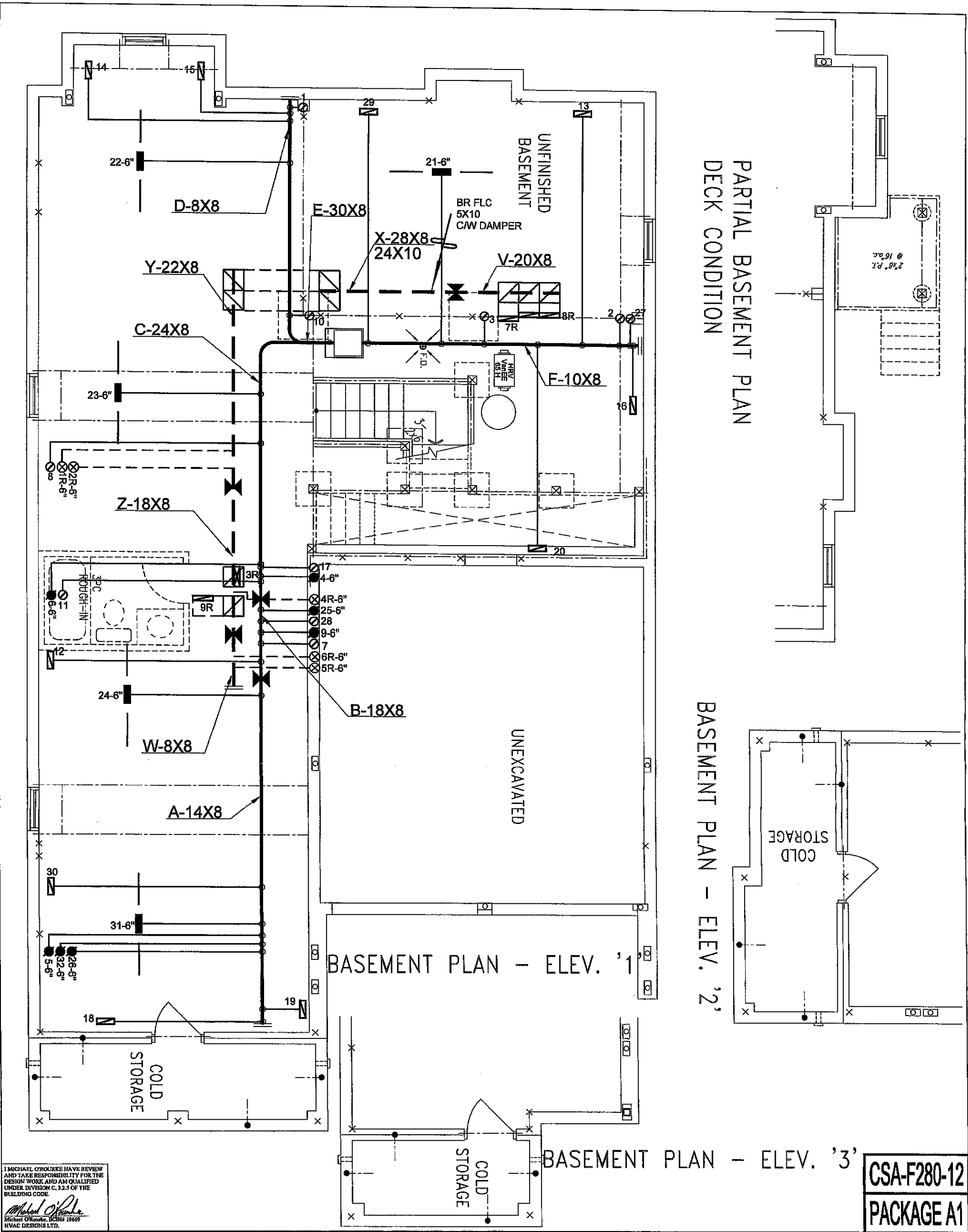
TYPE: MOUNTAINASH 6
LO# 85971

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):	1245.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1660.2 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 6
LO# 85971

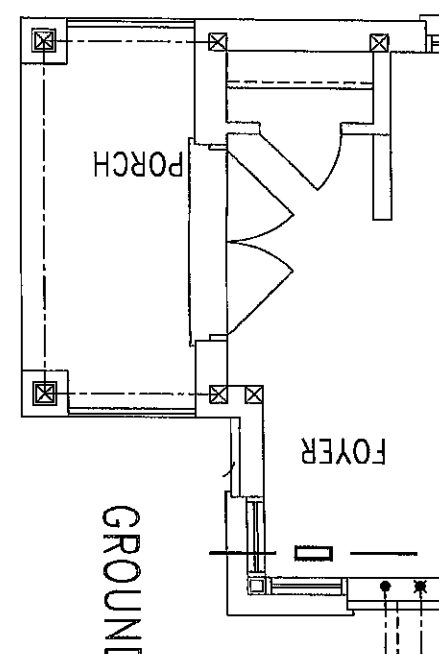
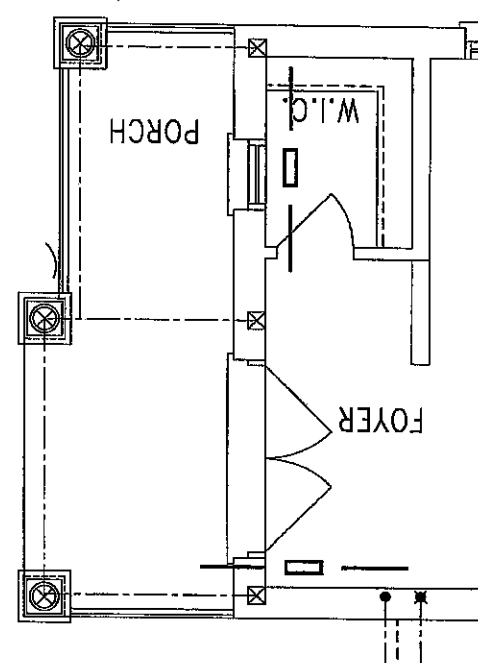
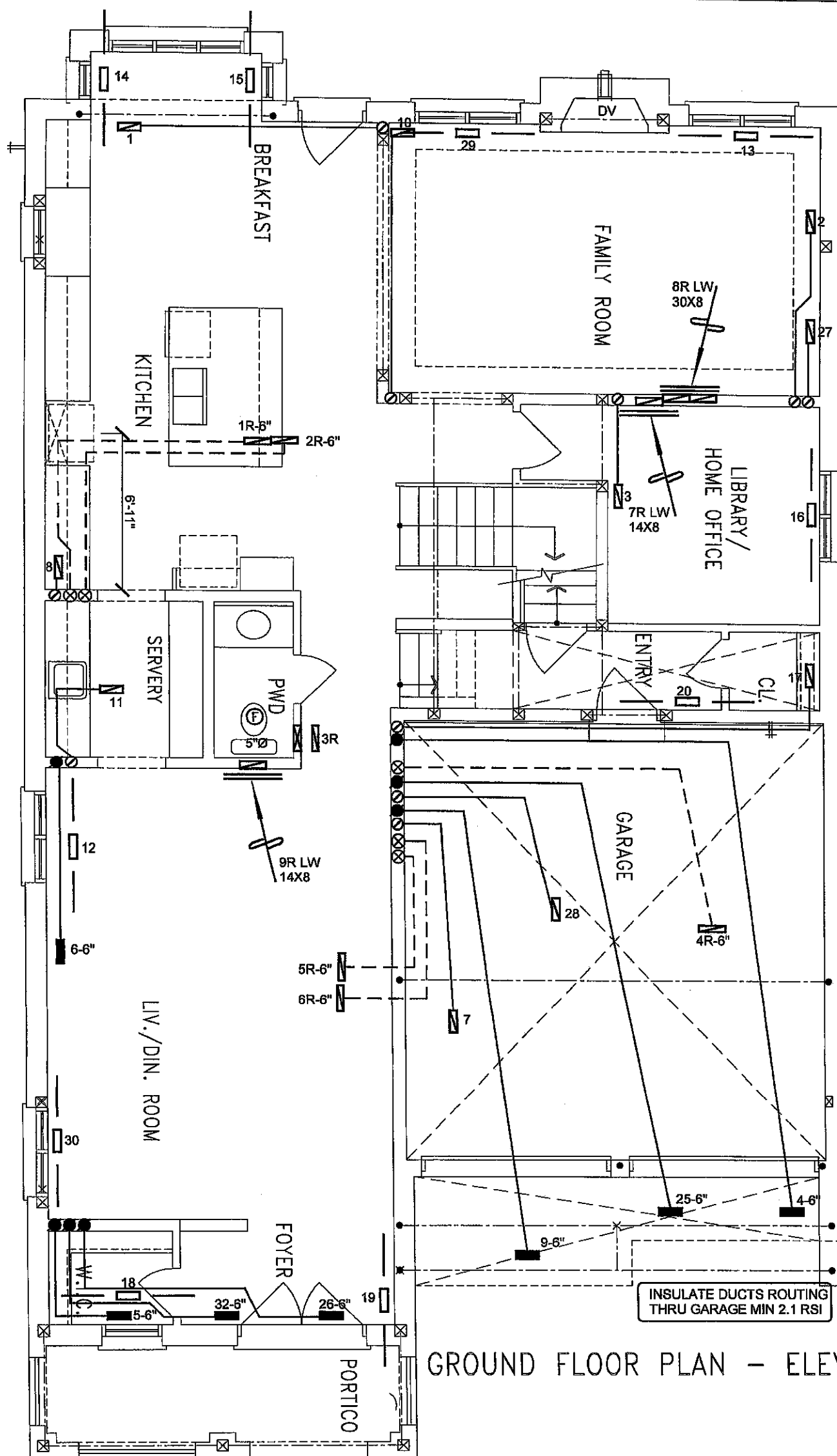


1. MICHAEL O'Rourke HAS REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.3 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND						3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		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 Project Name RUSSEL GARDENS PHASE 3 HAMILTON, ONTARIO MOUNTAINASH 6 3401 sqft	HVAC DESIGNS 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.	HEAT LOSS 57962 BTU/H UNIT DATA MAKE GOODMAN MODEL GMEC960804CNA INPUT 80 MBTU/H OUTPUT 76.8 MBTU/H COOLING 3.5 TONS FAN SPEED 1504 cfm @ 0.5" w.c.	# OF RUNS S/A R/A FANS 3RD FLOOR 2ND FLOOR 17 6 4 1ST FLOOR 10 3 2 BASEMENT 5 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 APRIL/2020 Scale 3/16" = 1'-0" BCIN# 19669 LO# 85971



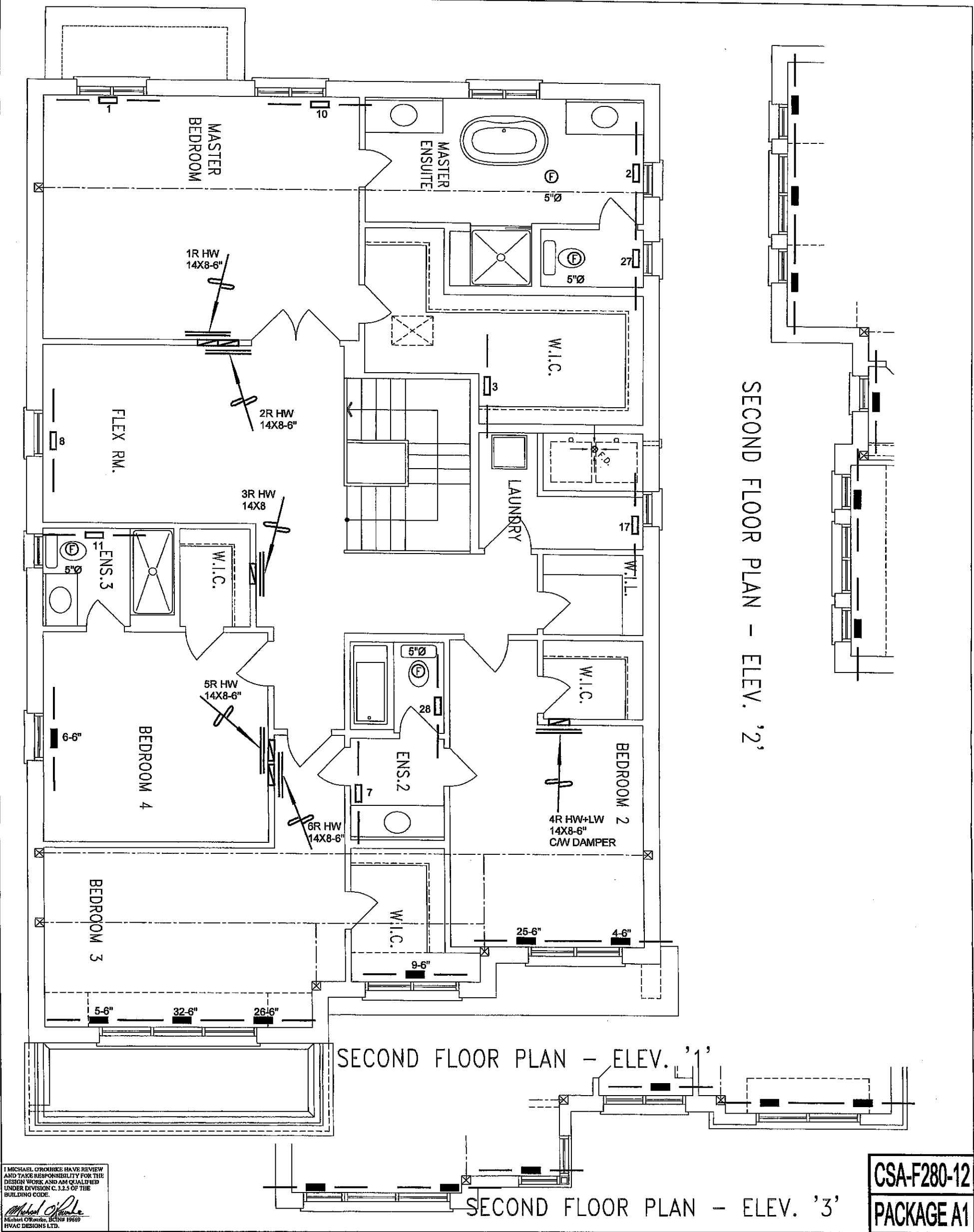
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE

Michael O'Rourke, BCIN# 19669
UMAC 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.	Description	Date
	SUPPLY AIR BOOT ABOVE		8" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

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Client	 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	
Project Name		FIRST FLOOR HEATING LAYOUT	
GREENPARK HOMES		Date	APRIL/2020
RUSSEL GARDENS PHASE 3 HAMILTON, ONTARIO		Scale	3/16" = 1'-0"
		BCIN# 19669	
MOUNTAINASH 6 3401 soft		LO#	85971



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

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

HVAC LEGEND						REVISIONS		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DATE
	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		8" 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 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 SECOND FLOOR HEATING LAYOUT	
Project Name RUSSEL GARDENS PHASE 3 HAMILTON, ONTARIO			Date APRIL/2020	
MOUNTAINASH 6 3401 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO#	85971