

Garden 1 - Elevation 3

SITE NAME: BARLASSINA										DATE: Aug-22										WINTER NATURAL AIR CHANGE RATE 0.335										HEAT LOSS ΔT °F. 72										CSA-F280-12																													
BUILDER: GREENPARK HOMES										TYPE: GARDEN 1										GFA: 2197										LO# 98636										SUMMER NATURAL AIR CHANGE RATE 0.091										HEAT GAIN ΔT °F. 9										SB-12 PACKAGE A1									
ROOM USE				MBR				ENS				WIC				BED-2				BED-3				MEDIA				BATH																																									
EXP. WALL				33				26				10				29				34				19				7																																									
CLG. HT.				9				9				9				9				9				9				9																																									
FACTORS																																																																					
GRS.WALL AREA		LOSS GAIN		297				234				90				261				306				171				63																																									
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN																																									
NORTH		20.3 15.0		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 0		0 0 0		0 0 0		0 0 0		0 0 0		0 0 0																																	
EAST		20.3 40.5		0 0 0		0 0 0		0 0 0		0 0 0		0 0 0		44 892 1784		56 1135 2270		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																																			
SOUTH		20.3 23.9		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		20 405 478		0 0 0		0 0 0		0 0 0		0 0 0		0 0 0																																			
WEST		20.3 40.5		20 405 811		14 284 568		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		0 0 0		0 0 0																																			
SKYLT.		35.5 99.8		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		0 0 0		0 0 0		0 0 0		0 0 0																																			
DOORS		19.1 2.4		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 0		0 0 0		0 0 0		0 0 0		0 0 0		0 0 0																																			
NET EXPOSED WALL		4.3 0.5		277 1178 150		220 935 119		90 383 49		217 923 117		250 1063 135		151 642 82		63 268 34																																																					
NET EXPOSED BSMT WALL ABOVE GR		3.4 0.4		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 0.5		225 275 119		153 187 81		120 147 63		204 249 107		182 223 96		228 279 120		84 103 44																																																					
NO ATTIC EXPOSED CLG		2.6 1.1		0 0 0		0 0 0		0 0 0		0 0 0		0 0 0		22 58 25		0 0 0																																																					
EXPOSED FLOOR		2.4 0.3		0 0 0		0 0 0		0 0 0		0 0 0		204 496 63		0 0 0		0 0 0										17 41 5																																											
BASEMENT/CRAWL HEAT LOSS				0		0		0		0		0		0		0										0																																											
SLAB ON GRADE HEAT LOSS				0		0		0		0		0		0		0										0																																											
SUBTOTAL HT LOSS				1858				1406				529				2560				2478				1326				412																																									
SUB TOTAL HT GAIN						1079				767				112				2072				2526				680				84																																							
LEVEL FACTOR / MULTIPLIER		0.20 0.24				0.20 0.24				0.20 0.24				0.20 0.24				0.20 0.24				0.20 0.24				0.20 0.24																																											
AIR CHANGE HEAT LOSS				438				332				125				604				584				313				97																																									
AIR CHANGE HEAT GAIN						45				32				5				87				106				28				3																																							
DUCT LOSS				0				0				0				316				0				0				51																																									
DUCT GAIN						0		0		0		0		0		327		0		0		0		0		0		9																																									
HEAT GAIN PEOPLE		240		2		480		0		0		0		1		240		1		240		0		0		0		0		0																																							
HEAT GAIN APPLIANCES/LIGHTS						867		0		0		0		0		867		1		867		0		867		867		0																																									
TOTAL HT LOSS BTU/H				2296				1738				654				3480				3063				1639				560																																									
TOTAL HT GAIN x 1.3 BTU/H						3213				1039				151				4670				4861				2048				124																																							

ROOM USE			K/B/LD			LAUN	W/R		FOY								LOD	BAS				
EXP. WALL			82			22	6		47								34	152				
CLG. HT.			10			11	10		11								8	8				
FACTORS																						
GRS.WALL AREA	LOSS	GAIN	820			242	60		517								272	862				
GLAZING			LOSS	GAIN		LOSS	GAIN	LOSS	GAIN	LOSS	GAIN						LOSS	GAIN	LOSS	GAIN		
NORTH	20.3	15.0	0	0	0	0	0	0	0	0	0						0	0	0	0		
EAST	20.3	40.5	0	0	0	0	0	0	0	30	608	1216					0	0	0	0		
SOUTH	20.3	23.9	22	446	526	0	0	8	162	191	0	0	0				0	0	5	101	119	
WEST	20.3	40.5	81	1642	3284	0	0	0	0	0	0	0	0				7	142	284	0	0	
SKYLT.	35.5	99.8	0	0	0	0	0	0	0	0	0	0	0				0	0	0	0	0	
DOORS	19.1	2.4	0	0	0	21	401	51	0	0	0	18	344	44			0	0	21	401	51	
NET EXPOSED WALL	4.3	0.5	717	3048	387	221	940	119	52	221	28	469	1994	253			0	0	0	0	0	
NET EXPOSED BSMT WALL ABOVE GR	3.4	0.4	0	0	0	0	0	0	0	0	0	0	0	0			197	675	86	354	1214	154
EXPOSED CLG	1.2	0.5	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	
NO ATTIC EXPOSED CLG	2.6	1.1	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	
EXPOSED FLOOR	2.4	0.3	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			4837		
SLAB ON GRADE HEAT LOSS			0			0			0			0					0			0		
SUBTOTAL HT LOSS			5136			1341			383			2946					817			6553		
SUB TOTAL HT GAIN				4197			170			219		1513						370			325	
LEVEL FACTOR / MULTIPLIER	0.30	0.38				0.30	0.38		0.30	0.38		0.30	0.38						0.50	0.85		
AIR CHANGE HEAT LOSS			1959			511			146			1123								6232		
AIR CHANGE HEAT GAIN				176			7			9		63									29	
DUCT LOSS			0			0			0			0								0		
DUCT GAIN				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
HEAT GAIN APPLIANCES/LIGHTS				867			867			0		0						0			867	
TOTAL HT LOSS BTU/H			7095			1852			529			4069					817			12785		
TOTAL HT GAIN x 1.3 BTU/H				6812			1358			297		2050						481			1588	

TOTAL HEAT GAIN BTU/H:

28852

TONS: 2.40

LOSS DUE TO VENTILATION LOAD BTU/H: 1243

STRUCTURAL HEAT LOSS: 40577

TOTAL COMBINED HEAT LOSS BTU/H: 41820

SITE NAME: BARLASSINA

BUILDER: GREENPARK HOMES

TYPE: GARDEN 1

DATE: Aug-22

GFA: 2197

LO# 98636

HEATING CFM 928 COOLING CFM 928
TOTAL HEAT LOSS 40,577 TOTAL HEAT GAIN 28,694
AIR FLOW RATE CFM 22.87 AIR FLOW RATE CFM 32.34

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

AFUE = 96 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 57,600

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

plenium 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

FAN SPEED LOW
MEDLOW
MEDIUM 928
MEDIUM HIGH 1017
HIGH 1131

DESIGN CFM = 928
CFM @ .6" E.S.P.

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	14	15	16	17	18	19	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	MEDIA	BATH	BED-2	BED-3	MBR	K/B/LD	K/B/LD	K/B/LD	LAUN	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.15	1.74	0.65	1.74	1.53	1.64	0.56	1.74	1.53	1.15	2.36	2.36	2.36	1.85	0.53	4.07	3.40	3.40	3.40	3.40
CFM PER RUN HEAT	26	40	15	40	35	37	13	40	35	26	54	54	54	42	12	93	78	78	78	78
RM GAIN MBH.	1.61	1.04	0.15	2.34	2.43	2.05	0.12	2.34	2.43	1.61	2.27	2.27	2.27	1.36	0.30	2.05	0.52	0.52	0.52	0.52
CFM PER RUN COOLING	52	34	5	76	79	66	4	76	79	52	73	73	73	44	10	66	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	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	35	49	44	52	61	37	34	67	64	39	20	33	19	22	40	41	23	27	17	36
EQUIVALENT LENGTH	150	170	170	150	170	160	150	170	190	120	170	130	110	130	160	110	150	140	150	170
TOTAL EFFECTIVE LENGTH	185	219	214	202	231	197	184	237	254	159	190	163	129	152	200	151	173	167	167	206
ADJUSTED PRESSURE	0.09	0.08	0.08	0.09	0.07	0.09	0.09	0.07	0.07	0.11	0.09	0.11	0.13	0.11	0.09	0.11	0.1	0.1	0.1	0.08
ROUND DUCT SIZE	5	4	4	6	6	5	4	6	6	4	5	5	5	4	4	6	5	5	5	6
HEATING VELOCITY (ft/min)	191	459	172	204	178	272	149	204	178	298	396	396	396	482	138	474	573	573	573	398
COOLING VELOCITY (ft/min)	382	390	57	388	403	485	46	388	403	597	536	536	536	505	115	337	125	125	125	87
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	C	C	B	A	A	B	B	A	A	C	C	C	C	B	A	A	C	C	C	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	1.15	26	1.61	52	0.17	35	150	185	0.09	5	191	382	3X10	C
2	ENS	1.74	40	1.04	34	0.17	49	170	219	0.08	4	459	390	3X10	C
3	WIC	0.65	15	0.15	5	0.17	44	170	214	0.08	4	172	57	3X10	B
4	BED-2	1.74	40	2.34	76	0.17	52	150	202	0.09	6	204	388	4X10	A
5	BED-3	1.53	35	2.43	79	0.17	61	170	231	0.07	6	178	403	4X10	A
6	MEDIA	1.64	37	2.05	66	0.17	37	160	197	0.09	5	272	485	3X10	B
7	BATH	0.56	13	0.12	4	0.17	34	150	184	0.09	4	149	46	3X10	B
8	BED-2	1.74	40	2.34	76	0.17	67	170	237	0.07	6	204	388	4X10	A
9	BED-3	1.53	35	2.43	79	0.17	64	190	254	0.07	6	178	403	4X10	A
10	MBR	1.15	26	1.61	52	0.17	39	120	159	0.11	4	298	597	3X10	C
14	K/B/LD	2.36	54	2.27	73	0.17	20	170	190	0.09	5	396	536	3X10	C
15	K/B/LD	2.36	54	2.27	73	0.17	33	130	163	0.11	5	396	536	3X10	C
16	K/B/LD	2.36	54	2.27	73	0.17	19	110	129	0.13	5	396	536	3X10	C
17	LAUN	1.85	42	1.36	44	0.17	22	130	152	0.11	4	482	505	3X10	B
18	W/R	0.53	12	0.30	10	0.17	40	160	200	0.09	4	138	115	3X10	A
19	FOY	4.07	93	2.05	66	0.16	41	110	151	0.11	6	474	337	4X10	A
21	BAS	3.40	78	0.52	17	0.17	23	150	173	0.1	5	573	125	3X10	C
22	BAS	3.40	78	0.52	17	0.17	27	140	167	0.1	5	573	125	3X10	C
23	BAS	3.40	78	0.52	17	0.17	17	150	167	0.1	5	573	125	3X10	C
24	BAS	3.40	78	0.52	17	0.17	36	170	206	0.08	6	398	87	4X10	A

SUPPLY AIR TRUNK SIZE															RETURN AIR TRUNK SIZE														
	TRUNK	STATIC	ROUND	RECT			VELOCITY		TRUNK	STATIC	ROUND	RECT			VELOCITY		TRUNK	STATIC	ROUND	RECT			VELOCITY						
	CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT			(ft/min)						
TRUNK A	333	0.07	9.6	10	x	8	599	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0						
TRUNK B	440	0.07	10.7	14	x	8	566	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0						
TRUNK C	488	0.08	10.7	14	x	8	627	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0						
TRUNK D	928	0.07	14.1	24	x	8	696	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																				BR
AIR VOLUME	115	115	115	115	315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	153
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	0.15
ACTUAL DUCT LGH.	68	55	61	61	35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15
EQUIVALENT LENGTH	255	240	235	215	275	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	185
TOTAL EFFECTIVE LH	323	295	296	276	310	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	200
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.05	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.07
ROUND DUCT SIZE	7	7	7	7	10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.2
INLET GRILL SIZE	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
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	X
INLET GRILL SIZE	14	14	14	14	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14

TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	928	0.05	15.3	28	x	8	597
TRUNK Y	775	0.05	14.3	24	x	8	581
TRUNK Z	230	0.05	9.1	10	x	8	414
DROP	928	0.05	15.3	24	x	10	557

TYPE: GARDEN 1
SITE NAME: BARLASSINA

LO # 98636

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	<u>2</u> @ 21.2 cfm <u>42.4</u> cfm	
Other Bedrooms	<u>2</u> @ 10.6 cfm <u>21.2</u> cfm	
Kitchen & Bathrooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Other Rooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Table 9.32.3.A.	TOTAL <u>148.4</u> 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	63.6 cfm	

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>148.4</u> cfm	
Less Principal Ventil. Capacity	<u>63.6</u> cfm	
Required Supplemental Capacity	<u>84.8</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE V150H	Location: BSMT
<u>63.6</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
63.6 CFM	X 72 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
W/R	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE V150H		
<u>150</u> cfm high	<u>35</u> cfm low	
<u>75</u> % 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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	August-22

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 98636	Model: GARDEN 1	Builder: GREENPARK HOMES	Date: 8/24/2022																																																									
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>999</td> <td>8</td> <td>7992</td> </tr> <tr> <td>First</td> <td>999</td> <td>10</td> <td>9990</td> </tr> <tr> <td>Second</td> <td>1198</td> <td>9</td> <td>10782</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>28,764.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>814.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	999	8	7992	First	999	10	9990	Second	1198	9	10782	Third	0	9	0	Fourth	0	9	0	Total:			28,764.0 ft³	Total:			814.5 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%;">0.335</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.091</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <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> </thead> <tbody> <tr> <td>Winter DTDh</td> <td>22</td> <td>-18</td> <td>40</td> <td>72</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>29</td> <td>5</td> <td>9</td> </tr> </tbody> </table>		WINTER NATURAL AIR CHANGE RATE	0.335	SUMMER NATURAL AIR CHANGE RATE	0.091	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-18	40	72	Summer DTDc	24	29	5	9
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
Bsmt	999	8	7992																																																									
First	999	10	9990																																																									
Second	1198	9	10782																																																									
Third	0	9	0																																																									
Fourth	0	9	0																																																									
Total:			28,764.0 ft³																																																									
Total:			814.5 m³																																																									
WINTER NATURAL AIR CHANGE RATE	0.335																																																											
SUMMER NATURAL AIR CHANGE RATE	0.091																																																											
Design Temperature Difference																																																												
	Tin °C	Tout °C	ΔT °C	ΔT °F																																																								
Winter DTDh	22	-18	40	72																																																								
Summer DTDc	24	29	5	9																																																								
5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.335 x 226.25 x 40 °C x 1.2 = 3653 W = 12464 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.091 x 226.25 x 5 °C x 1.2 = 127 W = 433 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 64 CFM x 72 °F x 1.08 x 0.25 = 1243 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 64 CFM x 9 °F x 1.08 x 0.25 = 158 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 / HL _{clevel})																																																								
1	0.5	12,464	7,370	0.846																																																								
2	0.3		9,806	0.381																																																								
3	0.2		10,569	0.236																																																								
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																																																												
				Michael O'Rourke BCIN# 19669 																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: GARDEN 1	BUILDER: GREENPARK HOMES
SFQT: 2197	SITE: BARLASSINA
LO# 98636	

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	0	OUTDOOR DESIGN TEMP.	84
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75
		WINDOW SHGC	0.50

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):	28764.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.90	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	5.0 ft
LENGTH: 52.0 ft	WIDTH: 24.0 ft	EXPOSED PERIMETER:	152.0 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/ERV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

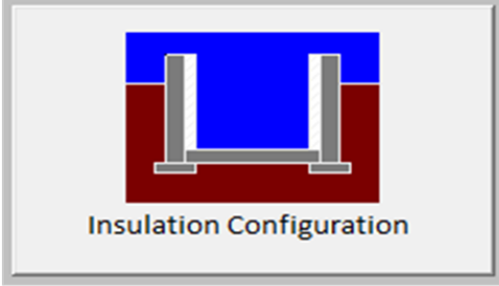
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Cambridge	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	15.8	
Floor Width (m):	7.3	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.4	
Depth Below Grade (m):	1.52	
Window Area (m ²):	1.1	
Door Area (m ²):	2.0	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1417

TYPE: GARDEN 1
LO# 98636

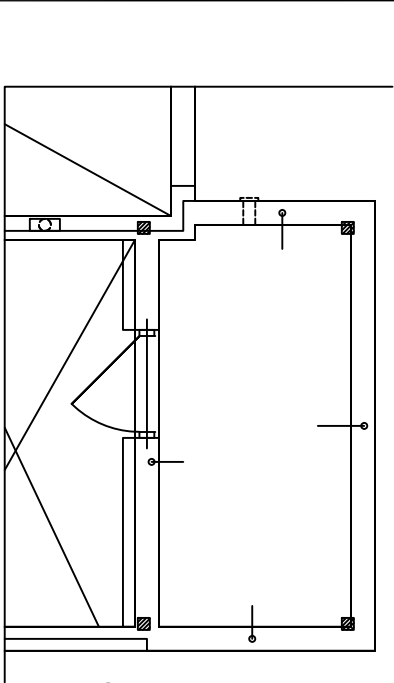
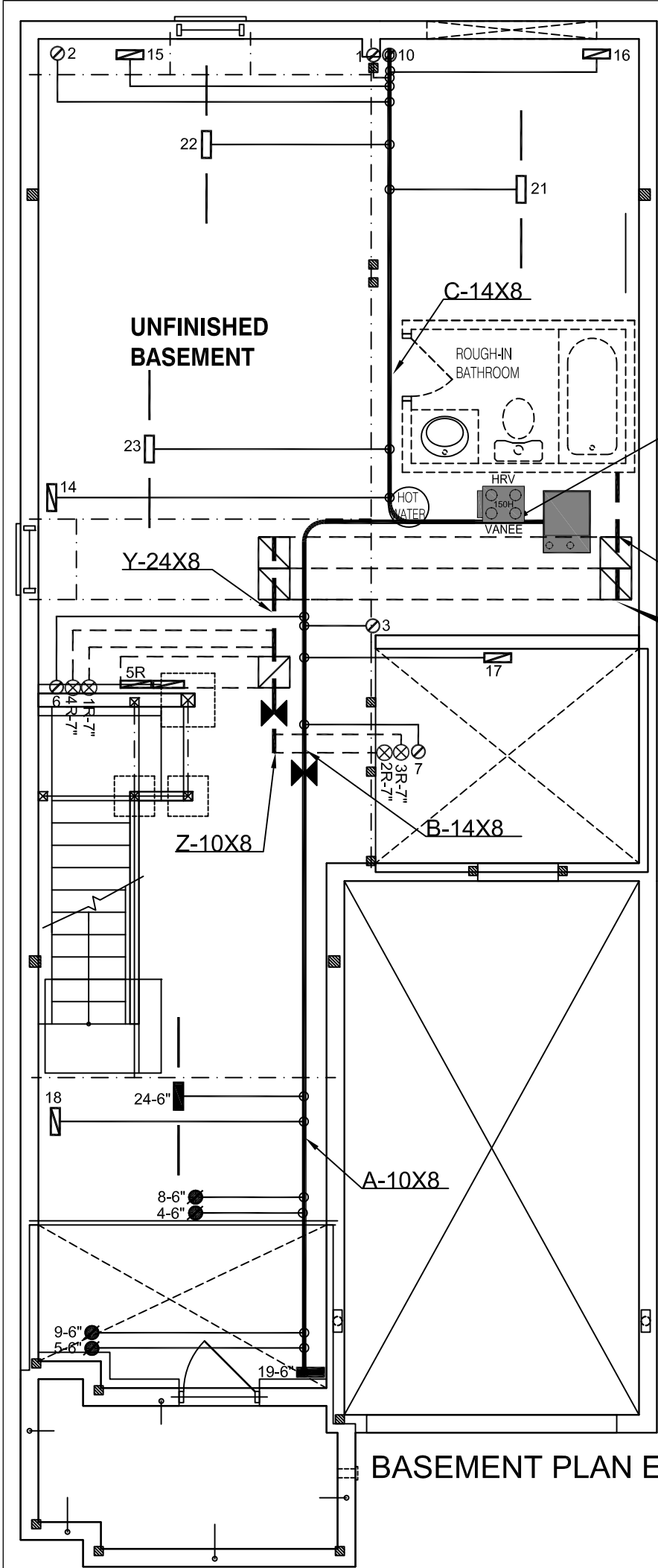
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

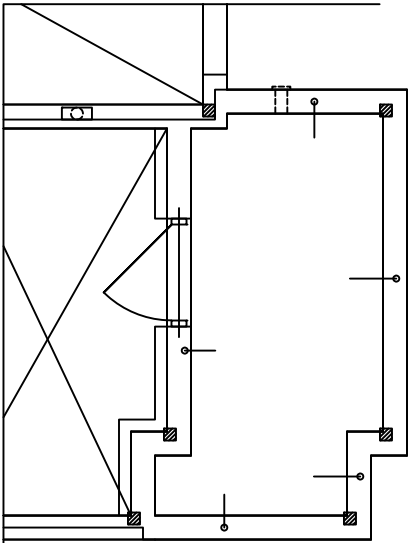
Weather Station Description				
Province:	Ontario			
Region:	Cambridge			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	7.62			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	814.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1085.8 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	30.0	30.0		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.335			
Cooling Air Leakage Rate (ACH/H):	0.091			

TYPE: GARDEN 1

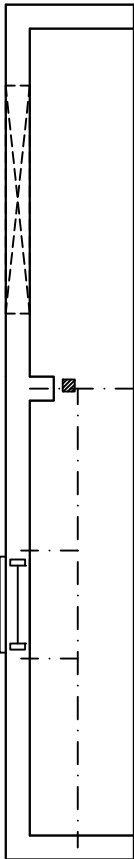
LO# 98636



BASEMENT PLAN EL-2



BASEMENT PLAN EL-3



PARTIAL BASEMENT LAYOUT
FOR DECK CONDITION EL-1 (EL-2,EL-3 SIMILAR)

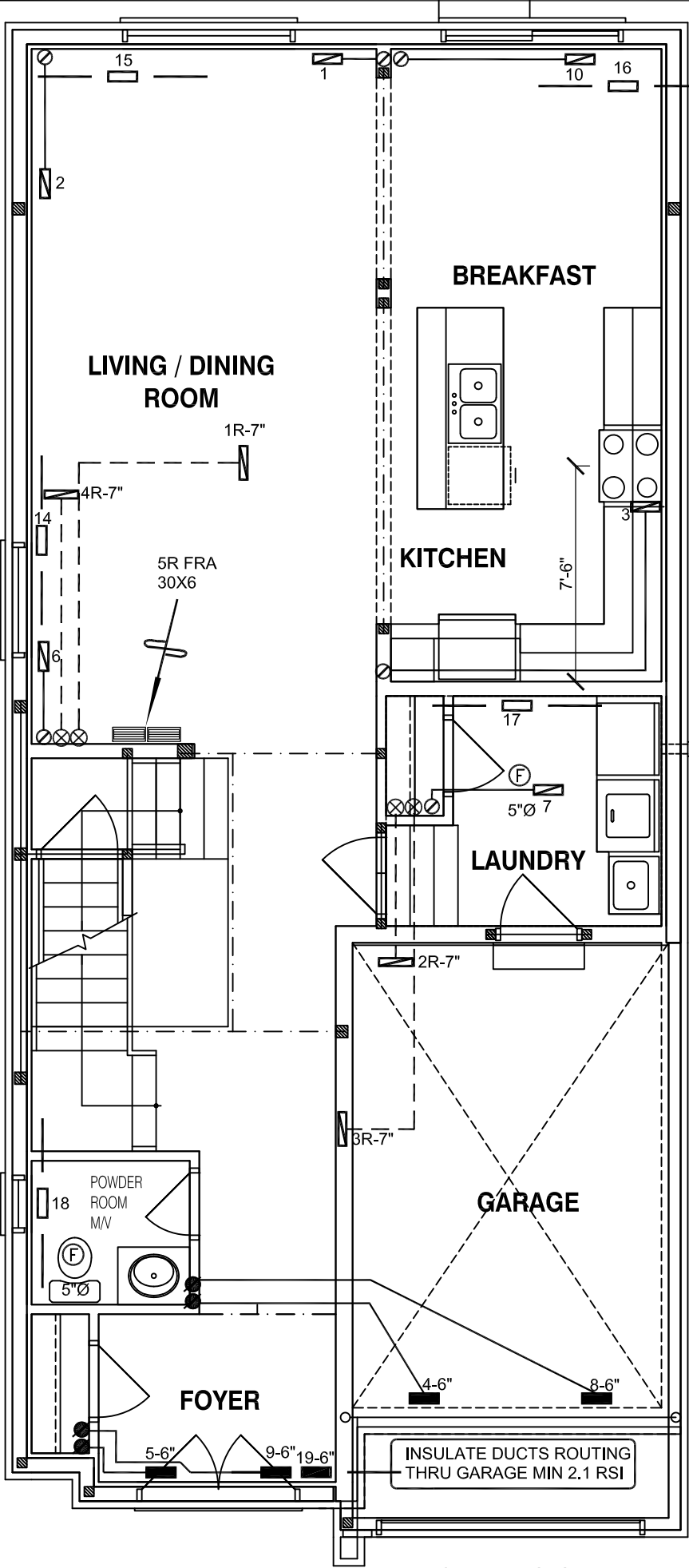
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

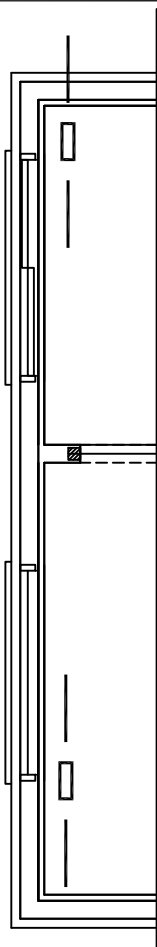
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.		
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR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

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

Client GREENPARK HOMES	Project Name BARLASSINA CAMBRIDGE, ONTARIO	Garden 1 - Elevation 3 GARDEN 1	2197 sqft	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacadesigns.ca Web: www.hvacadesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 41820 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title BASEMENT HEATING LAYOUT
					MAKE GOODMAN		3RD FLOOR				
					MODEL GMEC960603BNA		2ND FLOOR	10	4	2	Date AUG/2022
					INPUT 60 MBTU/H		1ST FLOOR	6	1	3	Scale 3/16" = 1'-0"
					OUTPUT 57.6 MBTU/H		BASEMENT	4	1	0	BCIN# 19669
					COOLING 2.5 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				LO# 98636
					FAN SPEED 928 cfm @ 0.6" w.c.						

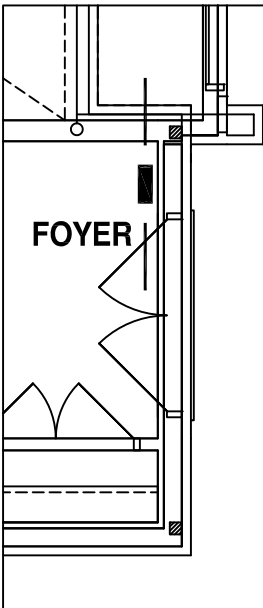


FIRST FLOOR EL-1

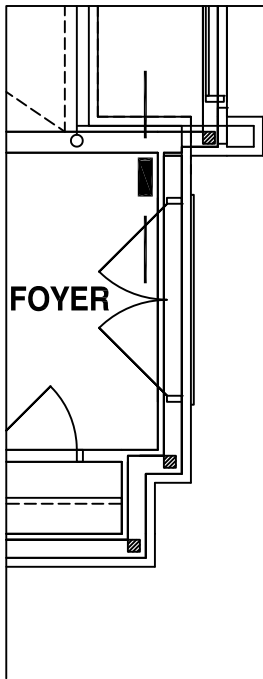


PARTIAL FIRST FLOOR LAYOUT
FOR DECK CONDITION EL-1 (EL-2,EL-3 SIMILAR)

FIRST FLOOR EL-2



FIRST FLOOR EL-3



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.

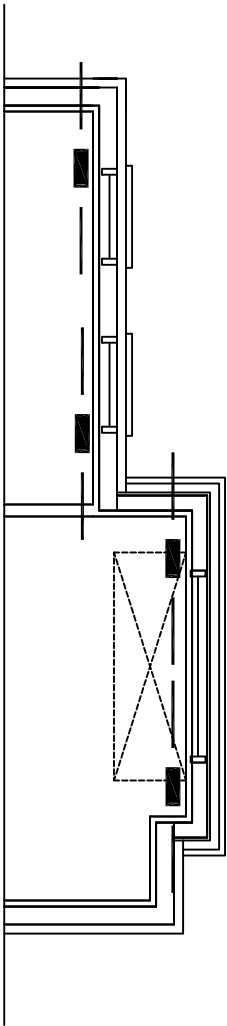
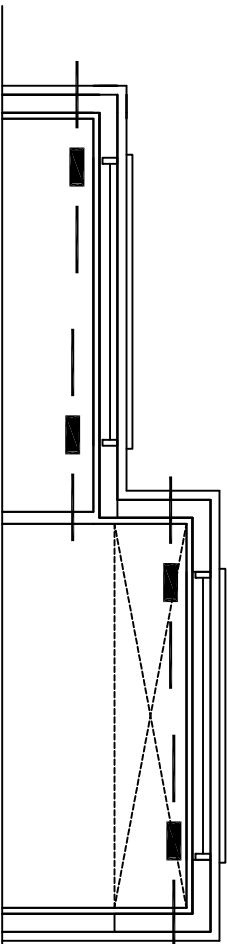
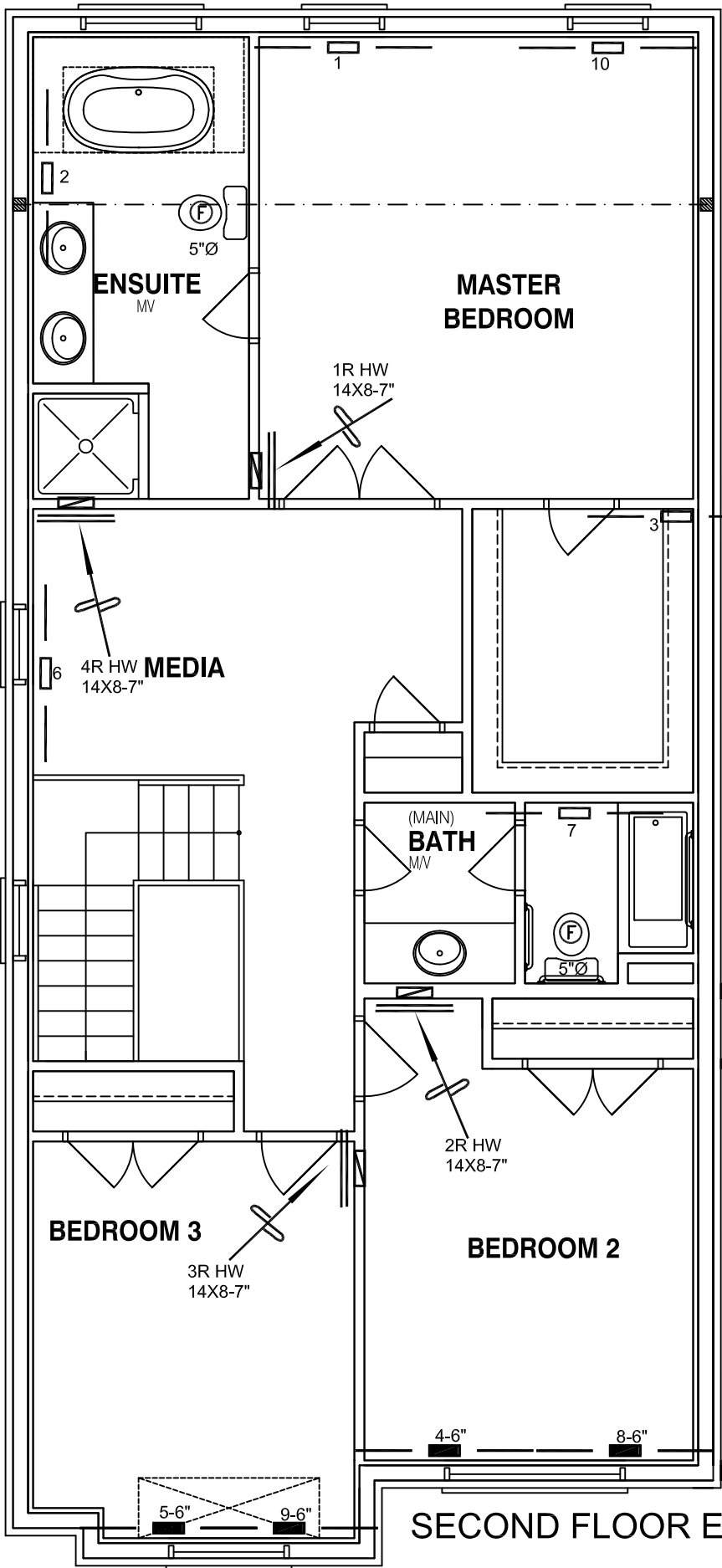
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

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		

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

Client		 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	
GREENPARK HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	AUG/2022
BARLASSINA CAMBRIDGE, ONTARIO			Scale	3/16" = 1'-0"
Garden 1 - Elevation 3			BCIN# 19669	
GARDEN 1	2197 sqft		LO#	98636



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		

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

Client GREENPARK HOMES		 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 BARLASSINA CAMBRIDGE, ONTARIO			Date AUG/2022	
Garden 1 - Elevation 3			Scale 3/16" = 1'-0"	
GARDEN 1 2197 sqft			BCIN# 19669	
			LO#	98636