

SITE NAME: RUSSEL GARDENS PH 4				TYPE: SPRINGFIELD 3S				GFA: 3631				DATE: Apr-21				WINTER NATURAL AIR CHANGE RATE 0.338				HEAT LOSS AT °F. 71				CSA-F280-12			
BUILDER: GREENPARK HOMES								LO# 90164				SUMMER NATURAL AIR CHANGE RATE 0.121				HEAT GAIN AT °F. 13				SB-12 PACKAGE A1							
ROOM USE				MBR				BED-2				BED-3				ENS-3				FLEX				ENS-4			
EXP. WALL				42				34				37				0				20				6			
CLG. HT.				9				9				9				9				9				9			
GRS.WALL AREA	LOSS	GAIN		378				306				333				0				180				54			
GLAZING	LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	19.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	633	511	0	0	0	0	0
EAST	19.8	41.6	0	0	0	0	0	57	1127	2368	68	1344	2826	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	19.8	24.9	0	0	0	0	0	0	0	0	0	0	0	16	316	398	0	0	0	0	0	0	0	0	0	0	
WEST	19.8	41.6	32	633	1330	31	613	1288	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	138	174	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	
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	
NET EXPOSED WALL	4.1	0.8	346	1434	260	239	991	180	249	1032	187	265	1099	199	191	792	144	0	0	148	614	111	47	195	35	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	
EXPOSED CLG	1.2	0.6	346	412	203	221	263	130	262	312	164	256	306	150	365	423	209	85	101	260	310	153	120	143	71	0	0
NO ATTIC EXPOSED CLG	2.6	1.3	0	0	0	0	0	0	31	79	39	44	112	55	0	0	0	0	0	0	0	0	0	0	0	0	
EXPOSED FLOOR	2.4	0.4	0	0	0	0	0	0	293	694	126	0	0	0	0	0	0	85	201	159	377	68	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS				0				0				0								0			0				
SLAB ON GRADE HEAT LOSS				0				0				0								0			0				
SUBTOTAL HT LOSS				2479				1867				3245								0			0				
SUB TOTAL HT GAIN					1793		1598		2874		3231		1531		751		303			1933		476		280			
LEVEL FACTOR / MULTIPLIER	0.20	0.28			0.20	0.28		0.20	0.28		0.20	0.28		0.20	0.28		0.20	0.28		0.20	0.28		0.20	0.28			
AIR CHANGE HEAT LOSS				688			518		900		793		425		84					536		132		20			
AIR CHANGE HEAT GAIN				128			114		205		231		54		6					60		0		0			
DUCT LOSS				0			0		414		0		0		39					247		0		0			
DUCT GAIN				0			0		387		0		0		9					145		0		0			
HEAT GAIN PEOPLE	240		2	480		0	0		1	240		1	240		1	240		0	0	0		0		0			
HEAT GAIN APPLIANCES/LIGHTS				548			0		548		548		548		548					0		0		0			
TOTAL HT LOSS BTU/H				3167			2386		4659		3654		1956		425					2716		608		0			
TOTAL HT GAIN x 1.3 BTU/H				3834			2225		5531		5624		2070		132					2076		390					

ROOM USE				FAM				LVDN				L/H/G				LND				G-E/PD			FOY				MUD				WOD				BAS			
EXP. WALL				39				35				25				0				6			18				27				50			190				
CLG. HT.				10				10				11				9				10			11				11				9			9				
GRS.WALL AREA	LOSS	GAIN		390				390				275				0				60			198				297				450			1290				
GLAZING	LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		
NORTH	19.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EAST	19.8	41.6	0	0	0	0	0	0	0	0	0	56	1107	2327	0	0	0	0	0	0	0	7	138	291	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	19.8	24.9	0	0	0	0	0	36	712	896	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	
WEST	19.8	41.6	40	791	1862	0	0	0	0	0	0	65	1285	2791	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	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	0	0	0	0	0	
NET EXPOSED WALL	4.1	0.8	350	1451	263	314	1302	236	355	1472	267	219	908	165	0	0	0	0	53	220	40	151	626	113	269	1115	202	0	0	0	0	0	0	0	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	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
NO ATTIC EXPOSED CLG	2.6	1.3	10	26	13	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	0	0	0	
BASEMENT/CRAWL HEAT LOSS				0				0				0				0				0			0				0				0			0				
SLAB ON GRADE HEAT LOSS				0				0				0				0				0			0				0				0			0				
SUBTOTAL HT LOSS				2267				2013				2016				124				358			1703				1742											
SUB TOTAL HT GAIN					1938		1132		2958		2492		61		214							574				415												
LEVEL FACTOR / MULTIPLIER	0.30	0.48			0.30	0.48		0.30	0.48		0.30	0.48		0.20	0.28		0.30	0.48		0.30	0.48		0.30	0.48		0.30	0.48											
AIR CHANGE HEAT LOSS				1087			965		1322		966		34		172							816				836												
AIR CHANGE HEAT GAIN				138			81		212		178		4		15							41				30												
DUCT LOSS				0			0		0		0		0		0							0				0												
DUCT GAIN				0			0		0		0		0		0							0				0												
HEAT GAIN PEOPLE	240		0	0		0	0		0		0		0		0							0				0												
HEAT GAIN APPLIANCES/LIGHTS				548			548		548		548		548		548							548				548												
TOTAL HT LOSS BTU/H				3354			2979		4078		2981		158		530							2519				2578												
TOTAL HT GAIN x 1.3 BTU/H				3411			2290		4846		4495		798		298							1513				578												

TOTAL HEAT GAIN BTU/H:

42569

TONS: 3.55

LOSS DUE TO VENTILATION LOAD BTU/H: 1455

STRUCTURAL HEAT LOSS: 58574

TOTAL COMBINED HEAT LOSS BTU/H: 60028

SITE NAME: RUSSEL GARDENS PH 4
BUILDER: GREENPARK HOMES

TYPE: SPRINGFIELD 3S

DATE: Apr-21

GFA: 3631 LO# 90164

HEATING CFM 1504 COOLING CFM 1504
TOTAL HEAT LOSS 58,574 TOTAL HEAT GAIN 42,305
AIR FLOW RATE CFM 25.68 AIR FLOW RATE CFM 35.55

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

#GOODMAN
GMEC960804CNA 80
FAN SPEED LOW 868
MEDLOW 978
MEDIUM 1112
MEDIUM HIGH 1504
HIGH 1615

AFUE = 96 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 76,800
DESIGN CFM = 1504
CFM @ 6" E.S.P.
TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	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.

RUN #	1	2	3	4	5	6	7	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	ENS	BED-2	BED-3	BED-4	ENS-3	FLEX	MBR	ENS-4	FAM	LV/DN	KT/BF	KT/BF	L/H/G	LND	G-E/PD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.58	1.19	1.19	2.28	1.83	1.96	0.21	2.72	1.58	0.61	1.68	2.98	2.04	2.04	1.49	0.16	0.53	2.52	2.58	3.99	3.99	3.99	3.99
CFM PER RUN HEAT	41	31	31	59	47	50	5	70	41	16	43	76	52	52	38	4	14	65	102	102	102	102	102
RM GAIN MBH	1.92	1.11	1.11	2.77	2.76	2.07	0.07	2.08	1.92	0.39	1.71	2.29	2.42	2.42	2.25	0.80	0.30	1.51	0.58	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	68	40	40	98	98	74	2	74	68	14	61	81	86	86	80	28	11	54	21	16	16	16	16
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	64	29	32	63	49	26	38	52	48	31	40	11	35	28	36	11	26	43	42	28	18	16	16
EQUIVALENT LENGTH	150	140	170	170	150	150	170	190	160	140	160	90	100	120	130	150	100	140	130	150	110	130	100
TOTAL EFFECTIVE LENGTH	214	169	202	233	199	176	208	242	208	171	200	101	135	148	166	161	126	183	172	192	138	148	116
ADJUSTED PRESSURE	0.08	0.1	0.09	0.07	0.08	0.1	0.08	0.07	0.08	0.1	0.09	0.16	0.12	0.11	0.1	0.11	0.14	0.09	0.1	0.08	0.12	0.11	0.14
ROUND DUCT SIZE	6	4	4	6	6	6	4	8	6	4	5	6	6	6	5	4	4	5	6	6	6	6	6
HEATING VELOCITY (ft/min)	209	356	356	301	240	255	57	357	209	184	316	388	265	265	279	46	161	477	485	520	520	520	520
COOLING VELOCITY (ft/min)	347	459	459	500	500	377	23	377	347	161	448	413	438	438	587	321	126	396	154	82	82	82	82
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	E	D	C	E	D	D	A	D	A	E	B	B	C	B	D	C	A	A	B	B	E

RUN #	25	26	27	28	29	30
ROOM NAME	BAS	BED-2	BED-3	FAM	L/H/G	ENS-3
RM LOSS MBH	3.99	2.28	1.83	1.68	1.49	0.21
CFM PER RUN HEAT	102	59	47	43	38	5
RM GAIN MBH	0.46	2.77	2.76	1.71	2.25	0.07
CFM PER RUN COOLING	16	98	98	61	80	2
ADJUSTED PRESSURE	0.16	0.16	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH	34	61	53	47	37	41
EQUIVALENT LENGTH	150	150	180	140	120	130
TOTAL EFFECTIVE LENGTH	184	211	233	187	157	171
ADJUSTED PRESSURE	0.09	0.08	0.07	0.09	0.11	0.1
ROUND DUCT SIZE	6	6	6	5	5	4
HEATING VELOCITY (ft/min)	520	301	240	316	279	57
COOLING VELOCITY (ft/min)	82	500	500	448	587	23
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10	3X10
TRUNK	C	D	C	A	C	D

SUPPLY AIR TRUNK SIZE							RETURN AIR TRUNK SIZE						
TRUNK	STATIC	ROUND	RECT	VELOCITY			TRUNK	STATIC	ROUND	RECT	VELOCITY		
CFM	PRESS.	DUCT	DUCT	(ft/min)			CFM	PRESS.	DUCT	DUCT	(ft/min)		
TRUNK A	336	0.08	9.3	10	x	8	605	0	0.00	0	0	x	8
TRUNK B	679	0.08	12.1	18	x	8	679	0	0.00	0	0	x	8
TRUNK C	337	0.07	9.6	12	x	8	506	0	0.00	0	0	x	8
TRUNK D	565	0.07	11.7	18	x	8	565	0	0.00	0	0	x	8
TRUNK E	824	0.07	13.5	22	x	8	674	0	0.00	0	0	x	8
TRUNK F	0	0.00	0	0	x	8	0	0.00	0	0	0	x	8
TRUNK G	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0
TRUNK H	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0
TRUNK I	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0
TRUNK J	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0
TRUNK K	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0
TRUNK L	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0
TRUNK M	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0
TRUNK N	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0
TRUNK O	0	0.05	0	0	x	8	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0	0.05	0	0	x	8	0
TRUNK X	919	0.05	15.3	28	x	8	591	0.05	15.3	28	x	8	591
TRUNK Y	375	0.05	10.9	14	x	8	482	0.05	10.9	14	x	8	482
TRUNK Z	585	0.05	12.9	20	x	8	527	0.05	12.9	20	x	8	527
DROP	1504	0.05	18.4	24	x	14	645	0.05	18.4	24	x	14	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	0	0	0	0	0	0	0	0	0	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	57	56	54	51	62	58	46	26	44	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	245	155	195	235	195	245	245	240	220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LENGTH	302	211	249	286	257	303	291	266	264	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.06	0.05	0.05	0.06	0.06	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
ROUND DUCT SIZE	7	6	6	7	7	7	7	10.2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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: SPRINGFIELD 3S
SITE NAME: RUSSEL GARDENS PH 4

LO # 90164

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	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.			TOTAL	222.6 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	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	222.6	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	127.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY
Model: VANE G2400H ECM Location: BSMT
95.4 cfm ☒ HVI Approved
PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM	ΔT °F	FACTOR	% LOSS
95.4 CFM	71 F	1.08	0.20

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR

Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-3	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	✓	3.5
G-E/PD	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.
Model: VANE G2400H ECM
210 cfm high 50 cfm low
80 % 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 # 001820
Date: April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations
Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 90164

Model: SPRINGFIELD 3S

Builder: GREENPARK HOMES

Date: 09/04/2021

Volume Calculation
Air Change & Delta T Data
House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1547	9	13923
First	1547	10	15470
Second	2084	9	18756
Third	0	9	0
Fourth	0	9	0
Total:			48,149.0 ft³
Total:			1363.4 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 378.73 x 39 °C x 1.2 = 6022 W

= 20548 Btu/h

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

= 0.121 x 378.73 x 7 °C x 1.2 = 391 W

= 1334 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation
6.2.7 Sensible heat Gain due to Ventilation

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

95 CFM x 71 °F x 1.08 x 0.20 = 1455 Btu/h

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

95 CFM x 13 °F x 1.08 x 0.20 = 264 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)	HL _{airbv} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})
1	0.5	20,548	9,652	1.064
2	0.3		12,855	0.480
3	0.2		14,819	0.277
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_{airr} = 0

HEAT LOSS AND GAIN SUMMARY SHEET**MODEL:** SPRINGFIELD 3S**BUILDER:** GREENPARK HOMES**SFQT:** 3631**LO#** 90164**SITE:** RUSSEL GARDENS PH 4**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):	48149.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 55.0 ft	WIDTH: 40.0 ft	EXPOSED PERIMETER:	190.0 ft

2012 OBC - COMPLIANCE PACKAGE

Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	0.28	-
Skylights Maximum U-Value	0.49	-
Space Heating Equipment Minimum AFUE	96%	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

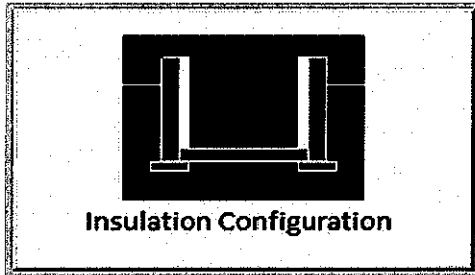
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



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):	12.2	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	2.0	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1865

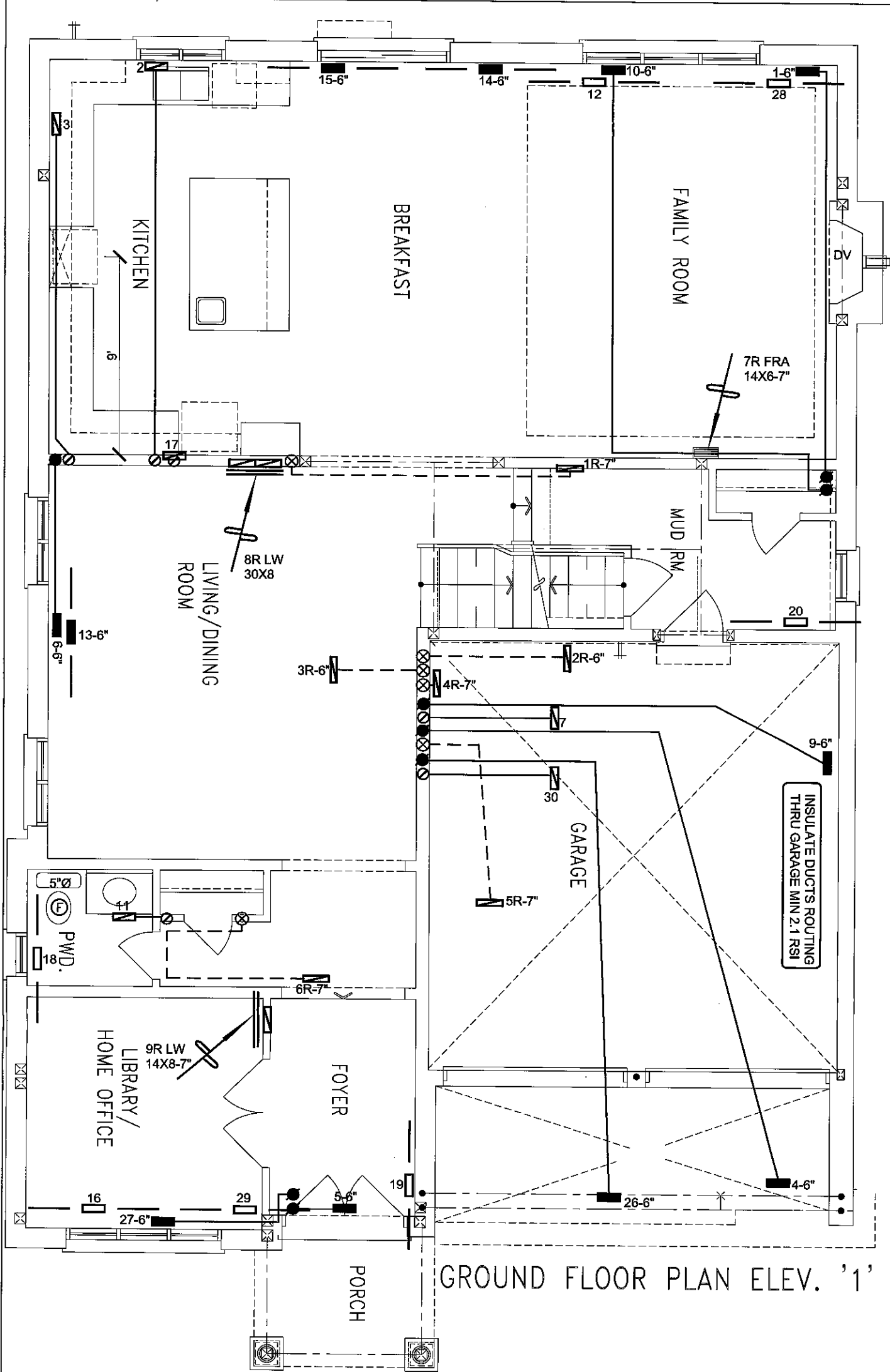
TYPE: SPRINGFIELD 3S
LO# 90164

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):	1363.4			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1817.5 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	45.0	45.0		
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: SPRINGFIELD 3S
LO# 90164



GROUND FLOOR PLAN ELEV. '1'

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.

WOD
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

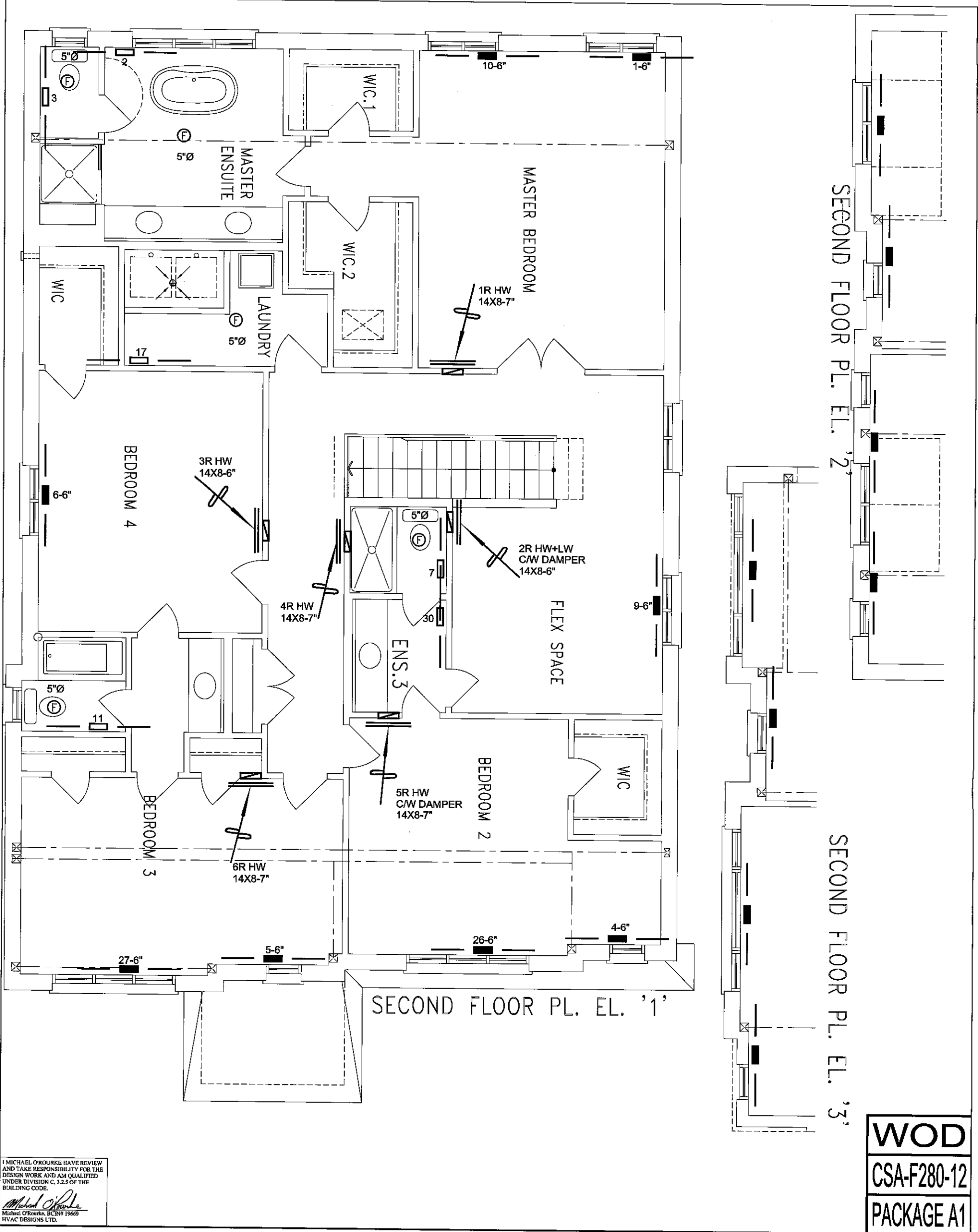
REVISIONS

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
**RUSSELL GARDENS PH 4
HAMILTON, ONTARIO**
SPRINGFIELD 3S 3631 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.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
**FIRST FLOOR
HEATING
LAYOUT**
Date
APR/2021
Scale
3/16" = 1'-0"
BCIN# 19669
LO# **90164**



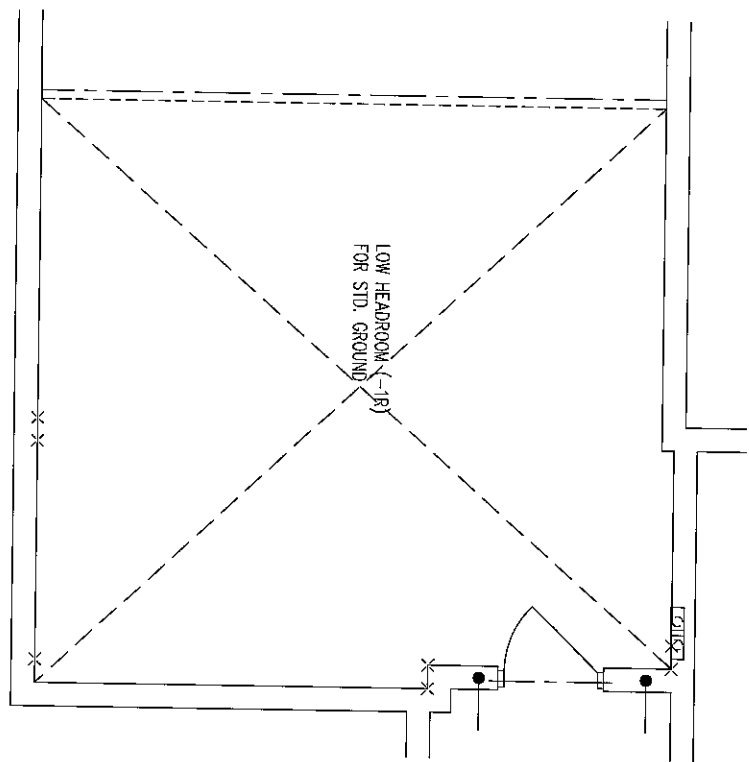
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

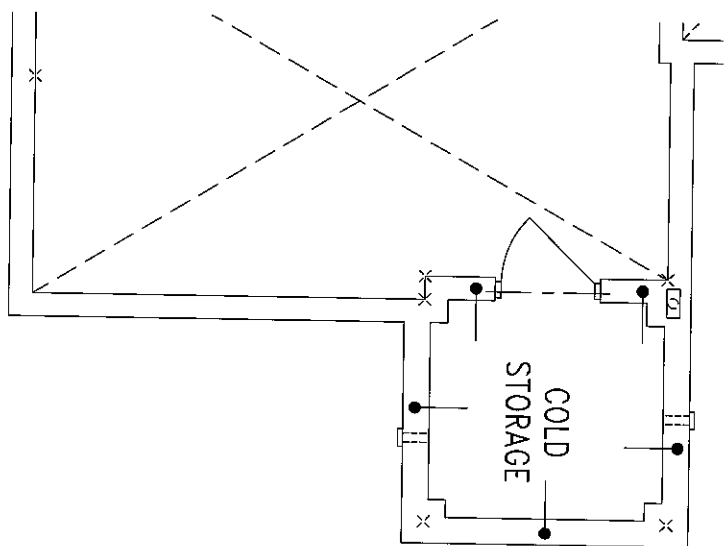
HVAC LEGEND						3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		1.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		No.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR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

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.

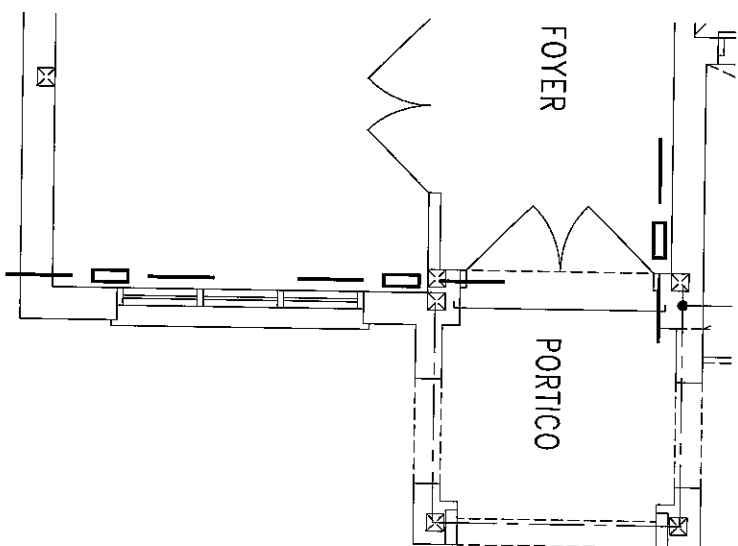
Client		HVAC DESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
GREENPARK HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name		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	
RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			APR/2021	
SPRINGFIELD 3S 3631 sqft			Scale	
			3/16" = 1'-0"	
			BCIN# 19669	
			LO# 90164	



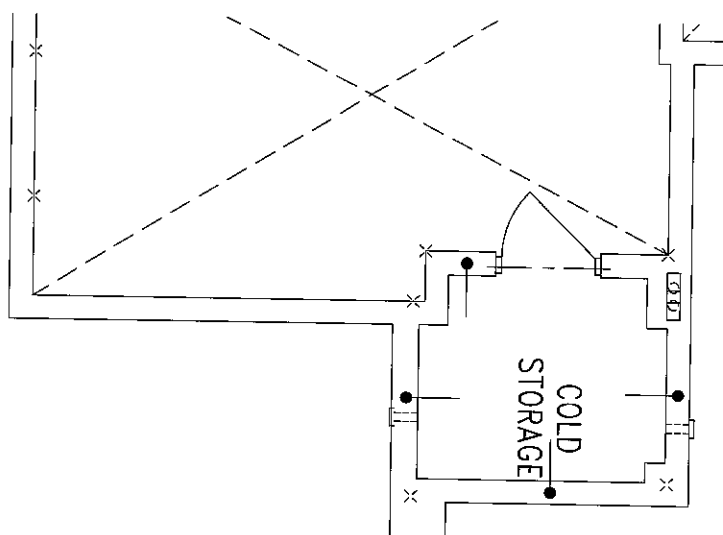
PART. BASEMENT PLAN ELEV. '1'
FOR OPT. GUEST SUITE COND.



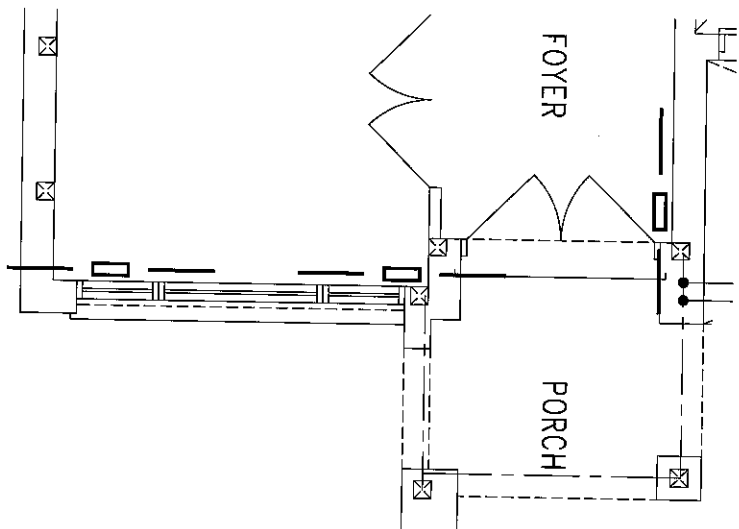
BASEMENT PLAN ELEV. '2'



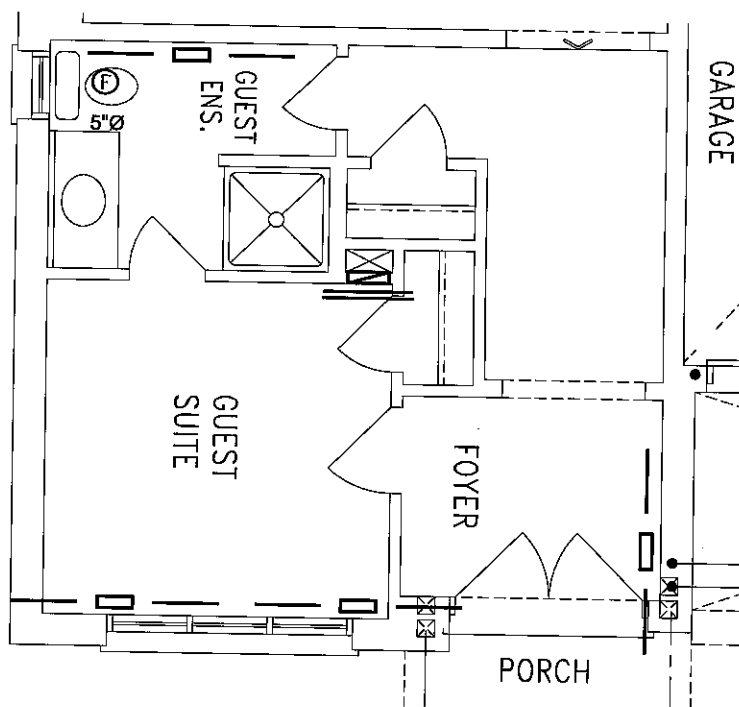
GROUND FLOOR PLAN ELEV. '2'



BASEMENT PLAN ELEV. '3'



GROUND FLOOR PLAN ELEV. '3'



PART. GROUND FLOOR PLAN -
W/ OPT. GUEST SUITE

I MICHAEL OKOURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C. 3.2.5 OF THE BUILDING CODE.
Michael Okourke
Michael Okourke, BCIN# 19669
HVAC DESIGNS LTD.

WOD
CSA-F280-12
PACKAGE A1

HVAC LEGEND							
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA - FLOOR RETURN AIR GRILLE		REDUCER

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		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 ELEVATIONS & OPT GUEST HEATING LAYOUT	
Project Name RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			Date APR/2021	
SPRINGFIELD 3S 3631 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 90164	