

SITE NAME: RUSSEL GARDENS PH 4

BUILDER: GREENPARK HOMES

TYPE: SPRINGFIELD 3

GFA: 3744

DATE: Apr-21

LO# 90160

WINTER NATURAL AIR CHANGE RATE 0.338

HEAT LOSS AT °F. 71

CSA-F280-12

SUMMER NATURAL AIR CHANGE RATE 0.121

HEAT GAIN AT °F. 13

SB-12 PACKAGE A1

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	BED-2	BED-3	BED-4	ENS-3	FLEX	ENS-4	
			42	30	34	37	23	0	20	6	
			9	9	9	9	9	9	9	9	
GRS.WALL AREA	FACTORS		378	270	306	333	207	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 0	0 0 0	32 633 511	0 0 0	
EAST	19.8 41.6	0 0 0	0 0 0	0 0 0	57 1127 2368	68 1344 2826	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 0	0 0 0	16 316 398	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 0	0 0 0	7 138 174	
SKYL.T.	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	
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	
NET EXPOSED WALL	4.1 0.8	346 1434 260	239 981 180	0 0 0	249 1032 187	265 1099 199	191 792 144	0 0 0	148 614 111	47 195 35	
NET EXPOSED BSMT WALL ABOVE GR	3.3 0.6	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	
EXPOSED CLG	1.2 0.6	388 474 234	221 263 130	0 0 0	262 312 164	266 306 160	355 423 209	85 101 50	280 310 153	120 143 71	
NO ATTIC EXPOSED CLG	2.6 1.3	0 0 0	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	0 0 0	293 694 126	0 0 0	0 0 0	85 201 37	159 377 68	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		2541	1867		3245	2860	1531	303	1933	476	
SUB TOTAL HT GAIN			1824	1598		2874	3231	751		843	280
LEVEL FACTOR / MULTIPLIER	0.20 0.29		0.20 0.29		0.20 0.29	0.20 0.29	0.20 0.29	0.20 0.29	0.20 0.29	0.20 0.29	
AIR CHANGE HEAT LOSS		726	533		926	817	437	86	552	136	
AIR CHANGE HEAT GAIN			134	117		211	237	55		62	21
DUCT LOSS		0	0		417	0	0	39		248	0
DUCT GAIN		0	0			389	0	9		147	0
HEAT GAIN PEOPLE	240	2	480	0	1	240	1	240	0	0	0
HEAT GAIN APPLIANCES/LIGHTS			666	0		566		566		566	0
TOTAL HT LOSS BTU/H		3267	2400		4588	3677	1969	428	2733	612	
TOTAL HT GAIN x 1.3 BTU/H			3905	2229		5565	6556	2096	2105	391	

ROOM USE	EXP. WALL	CLG. HT.	FAM	LV/DN	KT/BF	L/H/G	LND	G-EPD	FOY	MUD	WOD	BAS
			39	35	42	25	0	6	18	27	50	190
			10	10	10	11	9	10	11		9	9
GRS.WALL AREA	FACTORS		390	350	420	276	0	60	108	135	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
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	5 99 80
EAST	19.8 41.6	0 0 0	0 0 0	0 0 0	0 0 0	56 1107 2327	0 0 0	0 0 0	7 138 291	0 0 0	0 0 0	0 0 0
SOUTH	19.8 24.9	0 0 0	36 712 896	0 0 0	0 0 0	0 0 0	0 0 0	7 138 174	0 0 0	0 0 0	10 198 249	0 0 0
WEST	19.8 41.6	40 791 1662	0 0 0	65 1285 2701	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	7 138 291	0 0 0
SKYL.T.	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
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
NET EXPOSED WALL	4.1 0.8	350 1451 263	314 1302 236	355 1472 257	219 908 165	0 0 0	53 220 133	220 133 113	40 170 70	20 469 85	0 0 0	20 469 85
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
EXPOSED CLG	1.2 0.6	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	104 124 61	0 0 0	0 0 0	0 0 0	293 979 178	420 1404 265
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
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
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS		2267	2013	2757	2015	124	358	214	1703	1742	1118	8534
SUB TOTAL HT GAIN			1938	1132	2958	2492	61			415	468	668
LEVEL FACTOR / MULTIPLIER	0.36 0.50		0.30 0.50	0.30 0.50	0.30 0.50	0.20 0.29	0.30 0.50	0.30 0.50	0.30 0.50	0.30 0.50	0.50 1.10	10621
AIR CHANGE HEAT LOSS		1124	998	1367	999	35	178	16	844	864		83
AIR CHANGE HEAT GAIN			142	83	218	183	4		42	30		0
DUCT LOSS		0	0	0	0	0	0	0	0	0		0
DUCT GAIN		0	0	0	0	0	0	0	0	0		0
HEAT GAIN PEOPLE	240	0	0	0	0	1	240	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS			666	566	566	566	566	0	0	0	0	566
TOTAL HT LOSS BTU/H		3391	3011	4123	3014	159	536	2647	2606	579	1118	19155
TOTAL HT GAIN x 1.3 BTU/H			3440	2316	4877	4525	822	299	1638	579	609	1714

TOTAL HEAT GAIN BTU/H:

42960

TONS: 3.58

LOSS DUE TO VENTILATION LOAD BTU/H: 1455

STRUCTURAL HEAT LOSS: 59334

TOTAL COMBINED HEAT LOSS BTU/H: 60789

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

SITE NAME: RUSSEL GARDENS PH 4
BUILDER: GREENPARK HOMES

TYPE: SPRINGFIELD 3

DATE: Apr-21

GFA: 3744 LO# 90160

HEATING CFM 1504 COOLING CFM 1504
TOTAL HEAT LOSS 59,334 TOTAL HEAT GAIN 42,897
AIR FLOW RATE CFM 25.35 AIR FLOW RATE CFM 35.23

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

plenum 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

#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 @ 1.5" 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	8	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	BAS
RM LOSS MBH	1.63	1.20	1.20	2.29	1.84	1.97	0.21	2.73	1.63	0.61	1.70	3.01	2.06	2.06	1.51	0.16	0.54	2.55	2.61	4.05	4.05	4.05	4.05	4.05
CFM PER RUN HEAT	41	30	30	58	47	50	5	69	41	16	43	76	52	52	38	4	14	65	66	103	103	103	103	103
RM GAIN MBH	1.95	1.11	1.11	2.78	2.78	2.10	0.07	2.10	1.95	0.39	1.72	2.32	2.44	2.44	2.26	0.82	0.30	1.54	0.58	0.46	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	69	39	39	98	98	74	2	74	69	14	61	82	86	86	80	29	11	54	20	16	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	0.17	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	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	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	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	0.14
ROUND DUCT SIZE	6	4	4	6	5	4	4	6	6	4	5	6	6	6	5	4	4	5	5	6	6	6	6	6
HEATING VELOCITY (ft/min)	209	344	344	296	240	367	57	352	209	184	316	388	265	265	279	46	161	477	485	525	525	525	525	525
COOLING VELOCITY (ft/min)	352	447	447	500	500	543	23	377	352	161	448	418	438	438	587	333	126	396	147	82	82	82	82	82
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10
TRUNK	A	B	E	D	C	E	D	D	A	D	A	E	B	C	B	C	D	C	A	A	B	B	E	E

RUN #	25	26	27	28	29	30
ROOM NAME	BAS	BED-2	BED-3	FAM	L/H/G	ENS-3
RM LOSS MBH	4.05	2.29	1.84	1.70	1.51	0.21
CFM PER RUN HEAT	103	58	47	43	38	5
RM GAIN MBH	0.46	2.78	2.78	1.72	2.26	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)	525	296	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

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	337	0.08	9.3	10	8
TRUNK B	681	0.08	12.1	18	8
TRUNK C	338	0.07	9.7	14	8
TRUNK D	563	0.07	11.7	18	8
TRUNK E	822	0.07	13.5	22	8
TRUNK F	0	0.00	0	0	8

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK G	0	0.00	0	0	8
TRUNK H	0	0.00	0	0	8
TRUNK I	0	0.00	0	0	8
TRUNK J	0	0.00	0	0	8
TRUNK K	0	0.00	0	0	8
TRUNK L	0	0.00	0	0	8

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	115	95	85	115	130	115	115	350	130	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	55	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 LH	302	211	249	286	257	300	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	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
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

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	8
TRUNK P	0	0.05	0	0	8
TRUNK Q	0	0.05	0	0	8
TRUNK R	0	0.05	0	0	8
TRUNK S	0	0.05	0	0	8
TRUNK T	0	0.05	0	0	8
TRUNK U	0	0.05	0	0	8
TRUNK V	0	0.05	0	0	8
TRUNK W	0	0.05	0	0	8
TRUNK X	924	0.05	15.3	28	8
TRUNK Y	375	0.05	10.9	14	8
TRUNK Z	580	0.05	12.9	20	8
DROP	1504	0.05	18.4	24	14

TYPE: SPRINGFIELD 3
SITE NAME: RUSSEL GARDENS PH 4

LO # 90160

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:	VANEE 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:	VANEE G2400H ECM	
210 cfm high	50 cfm low	
80 % 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:	April-21

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: 19869

MICHAEL O'ROURKE

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

LO#: 90160

Model: SPRINGFIELD 3

Builder: GREENPARK HOMES

Date: 08/04/2021

Volume Calculation
House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	1608	9	14472
First	1608	10	16080
Second	2136	9	19224
Third	0	9	0
Fourth	0	9	0
Total:			49,776.0 ft ³
Total:			1409.5 m ³

Air Change & Delta T Data

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

5.2.3.1 Heat Loss due to Air Leakage

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

$$0.338 \times 391.53 \times 39^\circ\text{C} \times 1.2 = 6226 \text{ W}$$

$$= 21242 \text{ Btu/h}$$

6.2.6 Sensible Gain due to Air Leakage

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

$$= 0.121 \times 391.53 \times 7^\circ\text{C} \times 1.2 = 404 \text{ W}$$

$$= 1379 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

$$95 \text{ CFM} \times 71^\circ\text{F} \times 1.08 \times 0.20 = 1455 \text{ Btu/h}$$

6.2.7 Sensible heat Gain due to Ventilation

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

$$95 \text{ CFM} \times 13^\circ\text{F} \times 1.08 \times 0.20 = 264 \text{ Btu/h}$$

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agcleve} + HL_{bgcleve})\}$$

Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{cleve})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{cleve})
1	0.5	21,242	9,652	1.100
2	0.3		12,855	0.496
3	0.2		14,881	0.286
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 HLairv = 0

HEAT LOSS AND GAIN SUMMARY SHEET**MODEL:** SPRINGFIELD 3**BUILDER:** GREENPARK HOMES**SFQT:** 3744**LO#** 90160**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):	49776.0	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	-

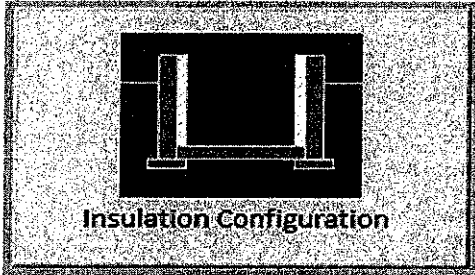
INDIVIDUAL BCIN: 19669

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 3
LO# 90160

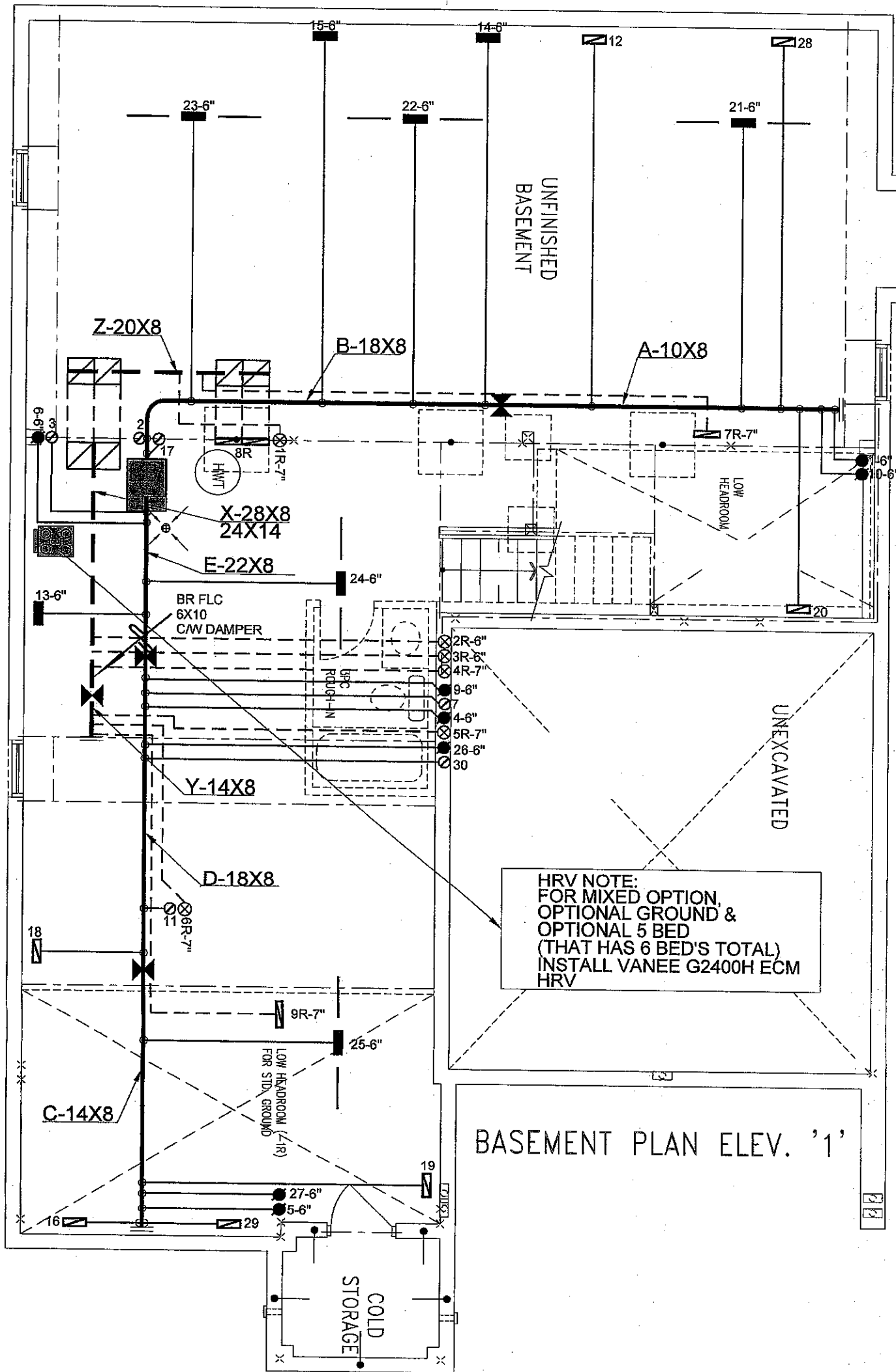
Air Infiltration Residential Load Calculator

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):	1409.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1878.9 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 3

LO# 90160



BASEMENT PLAN ELEV. '1'

PARTIAL BASEMENT PLAN
DECK CONDITION

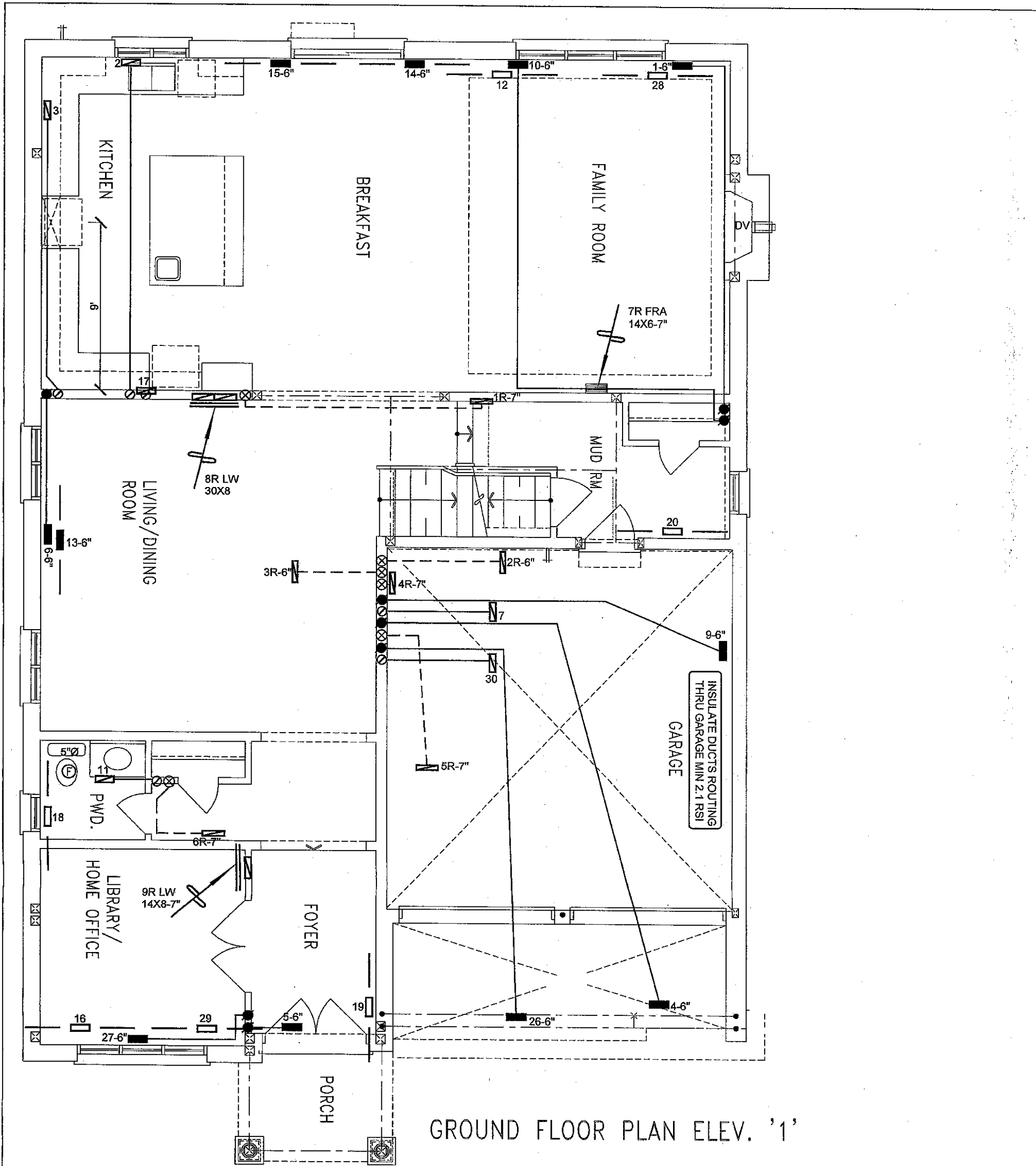
I MICHAEL O'Rourke HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.32.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

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
	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@hvacadesigns.ca Web: www.hvacadesigns.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 60789 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title BASEMENT HEATING LAYOUT	
Project Name RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			MAKE GOODMAN		3RD FLOOR				Date APR/2021	
SPRINGFIELD 3 3744 sqft			MODEL GMEC960804CNA		2ND FLOOR				Scale 3/16" = 1'-0"	
			INPUT 80 MBTU/H		1ST FLOOR				BCIN# 19669	
			OUTPUT 76.8 MBTU/H		BASEMENT				LO# 90160	
		COOLING 3.5 TONS		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5" UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A						
		FAN SPEED 1504 cfm @ 0.6" w.c.								



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.

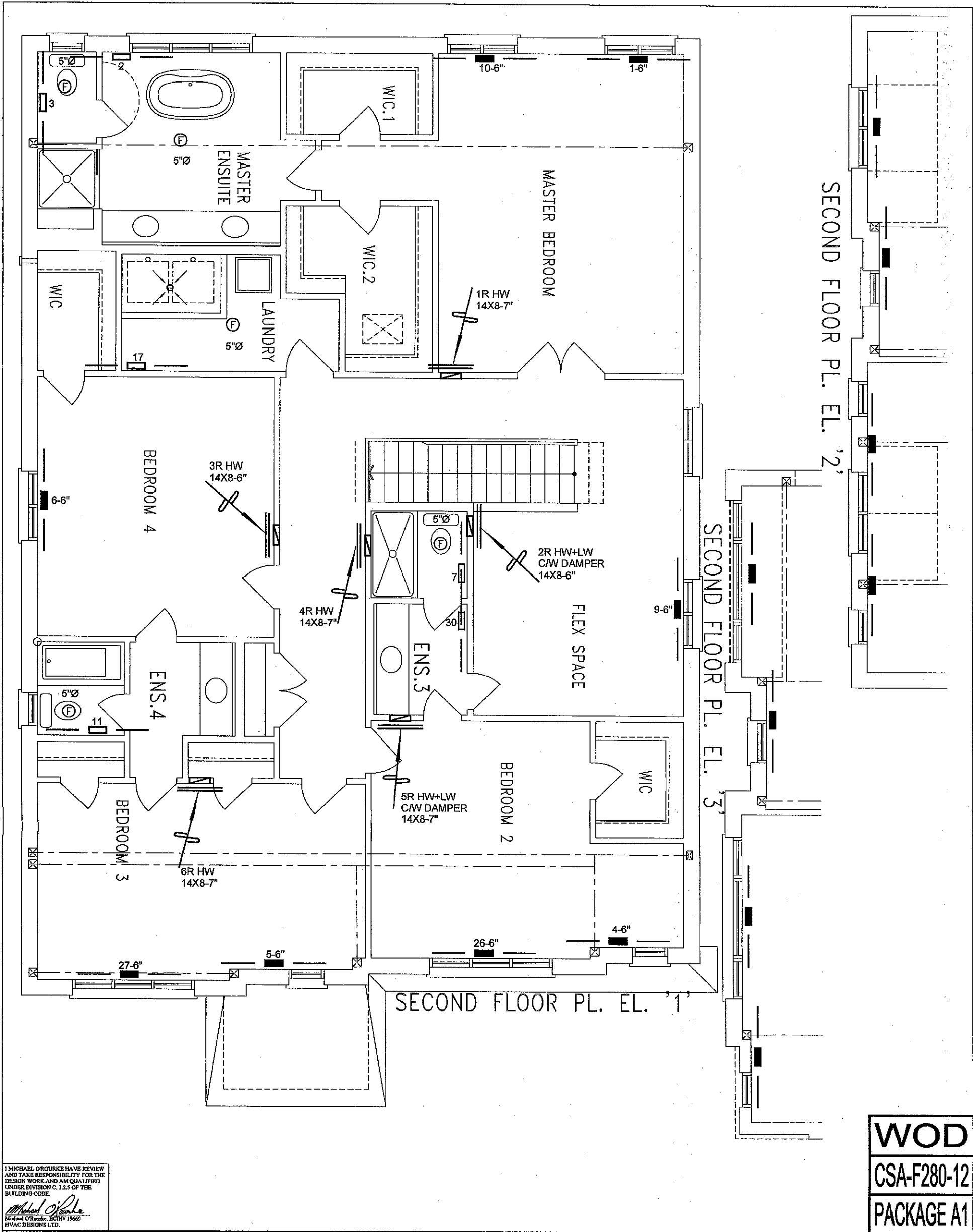
WOD
CSA-F280-12
PACKAGE A1

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
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER
						No.	Description
							Date

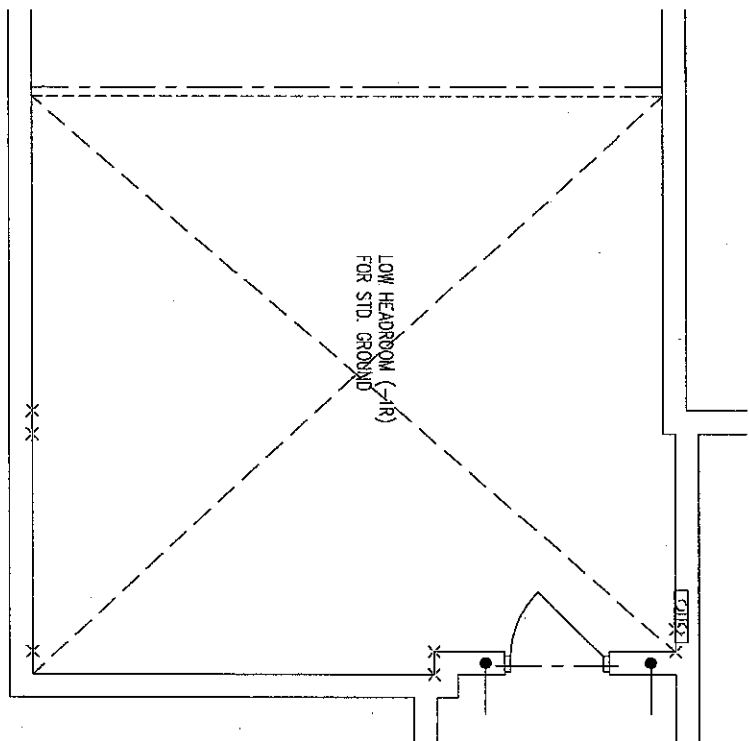
REVISIONS

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.

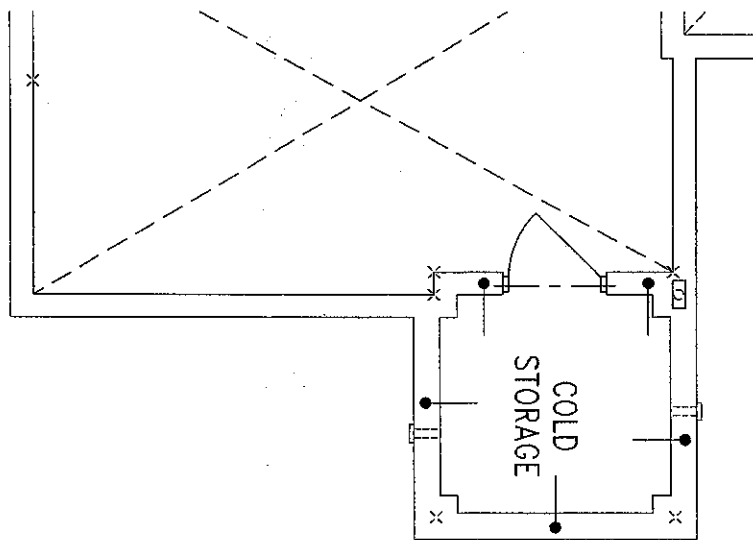
Client GREENPARK HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply 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 FIRST FLOOR HEATING LAYOUT	
Project Name RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			Date APR/2021	
SPRINGFIELD 3 3744 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 90160	



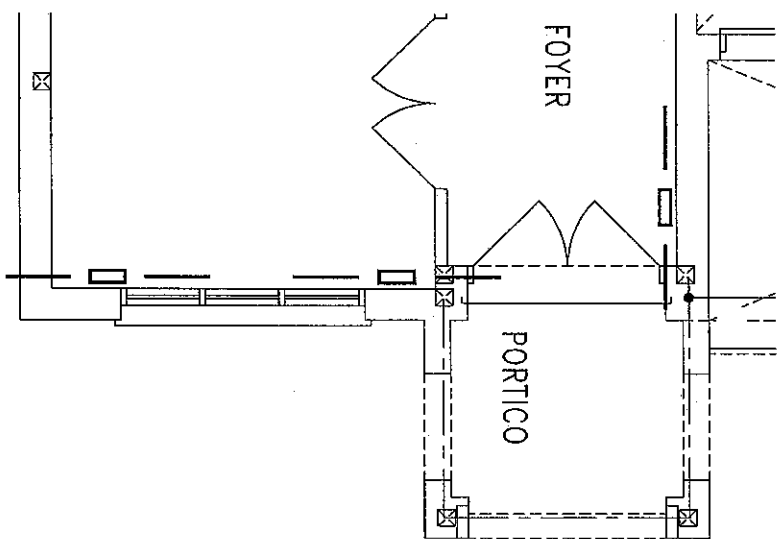
HVAC LEGEND								3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 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 RUSSELL GARDENS PH 4 HAMILTON, ONTARIO						Date APR/2021			
SPRINGFIELD 3 3744 sqft						Scale 3/16" = 1'-0"			
						BCIN# 19669			
						LO# 90160			



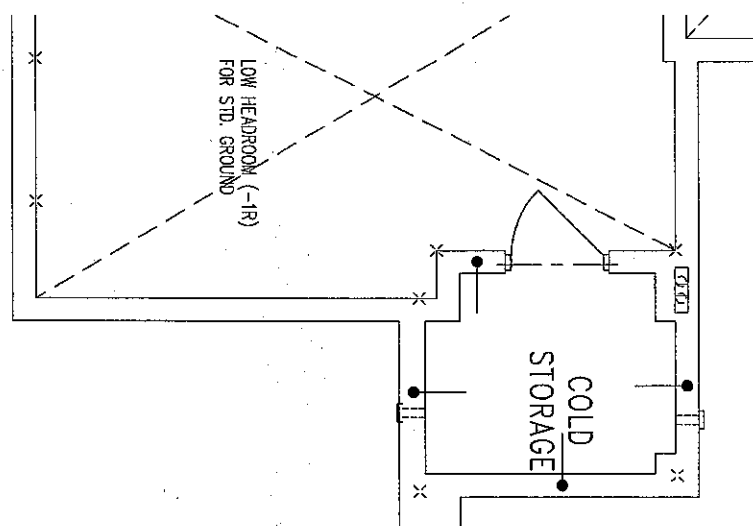
PART. BASEMENT PLAN ELEV. '1'
FOR OPT. GUEST SUITE COND.



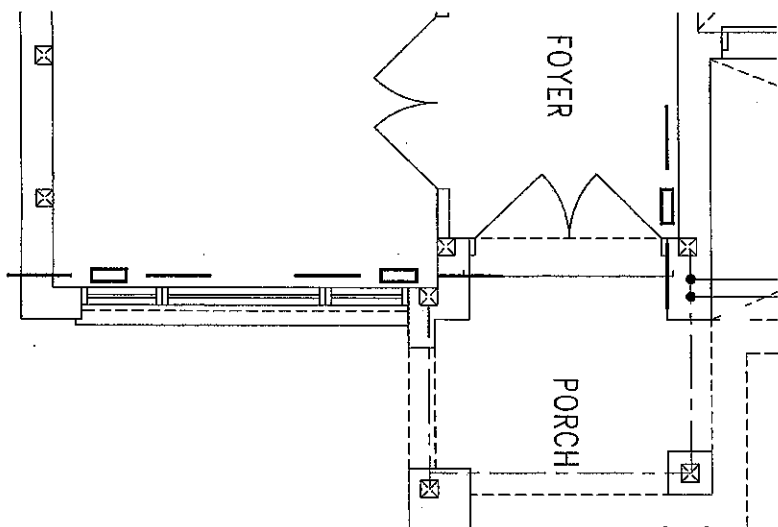
BASEMENT PLAN ELEV. '2'



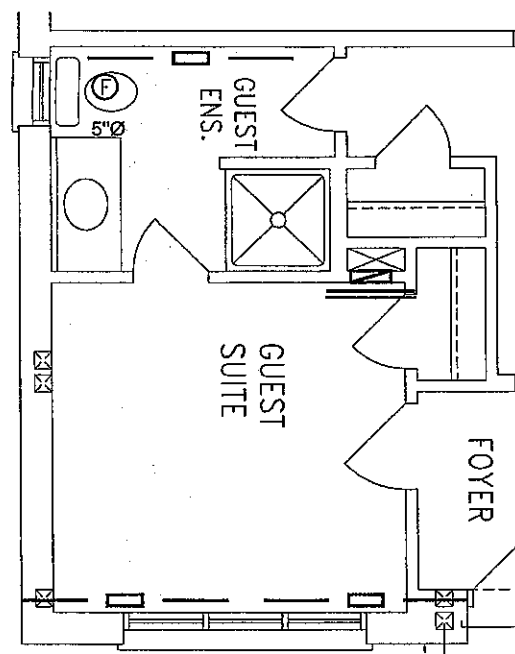
GROUND FLOOR PLAN ELEV. '2'



BASEMENT PLAN ELEV. '3'



GROUND FLOOR PLAN ELEV. '3'



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

WOD
CSA-F280-12
PACKAGE A1

I MICHAEL O'Rourke HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 32.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		8" 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
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA-FLOOR RETURN AIR GRILLE		REDUCER		Date

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 ELEVATIONS & OPT GUEST HEATING LAYOUT	
Project Name RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			Date APR/2021	
SPRINGFIELD 3 3744 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO#	90160