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SITE NAME: RUSSEL GARDENS PH 4 — OPT 5 BED — DATE: Apr-21
BUILDER: GREENPARK HOMES — TYPE: SPRINGFIELD 3S — GFA: 3631 — LO# 90155
WINTER NATURAL AIR CHANGE RATE 0.338 — HEAT LOSS ΔT °F. 71 — CSA-F280-12
SUMMER NATURAL AIR CHANGE RATE 0.121 — HEAT GAIN ΔT °F. 13 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC-2			BED-2			BED-3			BED-4			ENS-3						BED-5			ENS-4					
EXP. WALL			42			30			13			34			37			23			0						20			6					
CLG. HT.			9			9			9			9			9			9			9						9			9					
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	378			270			117			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	10	198	416	47	929	1953	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			
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			
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	991	180	107	444	80	259	1074	195	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	328	391	193	221	263	130	42	50	25	262	312	154	256	305	150	337	402	198	85	101	50				260	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	56	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			2468			1867			691			3088			2860			1510			303						1933			476					
SUB TOTAL HT GAIN				1782			1598			521			2466			3231			740			85					843			280				
LEVEL FACTOR / MULTIPLIER			0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27					0.20	0.27		0.20	0.27				
AIR CHANGE HEAT LOSS			660			501			186			829			768			405			81						519			128					
AIR CHANGE HEAT GAIN				144			129			42			199			260			60			7					68			23					
DUCT LOSS			0			0			0			392			0			0			38						245			0					
DUCT GAIN				0			0			0			341			0			0			9					166			0					
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0			1		240	0		0			
HEAT GAIN APPLIANCES/LIGHTS					506			0			0			506			506			506			0					506			0			
TOTAL HT LOSS BTU/H			3118			2368			877			4309			3628			1915			422						2697			604					
TOTAL HT GAIN x 1.3 BTU/H				3785			2244			731			4878			5508			2909			134					2370			394					

ROOM USE			FAM			LV/DN			KT/BF			L/H/G			LND			G-E/PD			FOY			MUD						WOD			BAS		
EXP. WALL			39			35			42			25			0			6			18			27						50			190		
CLG. HT.			10			10			10			11			9			10			11			11						9			9		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	390			350			420			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	
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	8	158	128	0	0	0	5	99	80			
EAST	19.8	41.6	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	7	138	174	0	0	0	0	0	0	0	0	0	10	198	249			
WEST	19.8	41.6	40	791	1662	0	0	0	55	1087	2285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	138	291			
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			
DOORS	23.5	4.3	0	0	0	0	0	0	10	235	43	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	53	220	40	151	626	113	269	1115	202	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	20	459	85			
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			
NO ATTIC EXPOSED CLG	2.6	1.3	10	26	13	0	0	0	0	0	0	0	0	0	104	124	61	0	0	0	0	0	0	0	0	0	0	0	0	293	979	178	420	1404	255
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			2793			2015			124			358			1703			1742						1118			8534		
SUB TOTAL HT GAIN				1938			1132			2595			2492			61			214			574			415						468			668	
LEVEL FACTOR / MULTIPLIER			0.30	0.48		0.30	0.48		0.30	0.48		0.30	0.48		0.20	0.27		0.30	0.48		0.30	0.48		0.30	0.48								0.50	1.06	
AIR CHANGE HEAT LOSS			1084			963			1336			963			33			171			814			833									10274		
AIR CHANGE HEAT GAIN				156			91			209			201			5			17			46			33									92	
DUCT LOSS			0			0			0			0			0			0			0			0									0		
DUCT GAIN				0			0			0			0			0			0			0			0									0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	1		240	0		0	0		0	0		0	0		0				0		0			0
HEAT GAIN APPLIANCES/LIGHTS					506			506			506			506			506			506			506									506		
TOTAL HT LOSS BTU/H			3351			2976			4129			2978			157			529			2517			2576						1118			18808		
TOTAL HT GAIN x 1.3 BTU/H				3360			2248			4302			4469			743			301			1465			1241						609			1646	

TOTAL HEAT GAIN BTU/H: 42902 — TONS: 3.58 — LOSS DUE TO VENTILATION LOAD BTU/H: 2461 — STRUCTURAL HEAT LOSS: 59078 — TOTAL COMBINED HEAT LOSS BTU/H: 61539

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

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SITE NAME: RUSSEL GARDENS PH 4
BUILDER: GREENPARK HOMES

OPT 5 BED
TYPE: SPRINGFIELD 3S

DATE: Apr-21

GFA: 3631 LO# 90165

HEATING CFM	1504	COOLING CFM	1504
TOTAL HEAT LOSS	59,078	TOTAL HEAT GAIN	42,456
AIR FLOW RATE CFM	25.46	AIR FLOW RATE CFM	35.43

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 @ .6 " E.S.P.

TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	15	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	WIC-2	BED-3	BED-4	ENS-3	BED-2	BED-5	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.	1.56	1.18	1.18	0.88	1.81	1.92	0.21	2.15	2.70	1.56	0.60	1.68	2.98	2.06	2.06	1.49	0.16	0.53	2.52	2.58	3.99	3.99	3.99	3.99
CFM PER RUN HEAT	40	30	30	22	46	49	5	55	69	40	15	43	76	53	53	38	4	13	64	66	101	101	101	101
RM GAIN MBH.	1.89	1.12	1.12	0.73	2.75	2.01	0.07	2.44	2.37	1.89	0.39	1.69	2.25	2.15	2.15	2.23	0.74	0.30	1.46	1.24	0.45	0.45	0.45	0.45
CFM PER RUN COOLING	67	40	40	26	98	71	2	86	84	67	14	60	80	76	76	79	26	11	52	44	16	16	16	16
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	64	29	32	63	49	26	38	57	52	48	31	40	11	35	28	36	11	26	43	42	42	28	18	16
EQUIVALENT LENGTH	150	140	170	170	150	150	170	140	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	197	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	0.08	0.07	0.08	0.1	0.09	0.17	0.13	0.12	0.1	0.11	0.14	0.09	0.1	0.08	0.12	0.11	0.14
ROUND DUCT SIZE	**6**	**4**	**4**	**4**	**6**	**6**	**4**	**6**	**6**	**6**	4	5	**6**	**6**	**6**	5	**4**	**4**	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	204	344	344	252	235	250	57	280	352	204	172	316	388	270	270	279	46	149	470	485	515	515	515	515
COOLING VELOCITY (ft/min)	342	459	459	298	500	362	23	438	428	342	161	441	408	388	388	580	298	126	382	323	82	82	82	82
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	4X10	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	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	2.15	1.81	1.68	1.49	0.21
CFM PER RUN HEAT	101	55	46	43	38	5
RM GAIN MBH.	0.45	2.44	2.75	1.69	2.23	0.07
CFM PER RUN COOLING	16	86	98	60	79	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)	515	280	235	316	279	57
COOLING VELOCITY (ft/min)	82	438	500	441	580	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 CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	333	0.08	9.3	10	x	8	599	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	675	0.08	12.1	18	x	8	675	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	333	0.07	9.6	14	x	8	428	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	572	0.07	11.8	18	x	8	572	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	828	0.07	13.5	22	x	8	677	TRUNK K	0	0.00	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

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	909	0.05	15.2	26	x	8	629
TRUNK Y	375	0.05	10.9	14	x	8	482
TRUNK Z	595	0.05	13	20	x	8	536
DROP	1504	0.05	18.4	24	x	14	645

RETURN AIR #	1	2	3	4	5	6	7	8	9								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	105	95	115	130	115	115	365	130	0	0	0	0	0	0	0	219
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
ACTUAL DUCT LGH.	57	56	54	51	62	58	46	26	44	1	1	1	1	1	1	1	20
EQUIVALENT LENGTH	245	155	195	235	195	245	245	240	220	0	0	0	0	0	0	0	265
TOTAL EFFECTIVE LH	302	211	249	286	257	303	291	266	264	1	1	1	1	1	1	1	285
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	0.05
ROUND DUCT SIZE	7	6.2	6.2	7	7	7	7	10.3	7	0	0	0	0	0	0	0	8.9
INLET GRILL SIZE	8	8	8	8	8	8	6	8	8	0	0	0	0	0	0	0	8
	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	30

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

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TYPE: SPRINGFIELD 3S LO # 90165
SITE NAME: RUSSEL GARDENS PH 4 OPT 5 BED

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	5	@ 10.6 cfm	53	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	222.6	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

6 Bedrooms

As Per Ashrea 62.2 Dwelling- Unit Ventilation

4.1.1 Total Ventilation Rate

$Q\_tot=0.03A\_floor+7.5(N\_br+1)$

TOTAL 161.4 cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	222.6	cfm
Less Principal Ventil. Capacity	161.4	cfm
Required Supplemental Capacity	61.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE G2400H ECM Location: BSMT

161.4 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
161.4 CFM	X	71 F	X	1.08	X	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 @ 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

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

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

Michael O'Rourke.

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 90165 Model: SPRINGFIELD 3S Builder: GREENPARK HOMES Date: 09/04/2021

Volume Calculation

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

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 x 378.73 x 39 °C x 1.2 = 6022 W

= 20548 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 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

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

161 CFM x 71 °F x 1.08 x 0.20 = 2461 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

161 CFM x 13 °F x 1.08 x 0.20 = 446 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 / HLlevel)
1	0.5	20,548	9,652	1.064
2	0.3		12,892	0.478
3	0.2		15,311	0.268
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: SPRINGFIELD 3S OPT 5 BED **BUILDER:** GREENPARK HOMES
SFQT: 3631 **LO#** 90165 **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 (ft^3):	48149.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	7
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	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

Michael O'Rourke

HVAC Designs Ltd.
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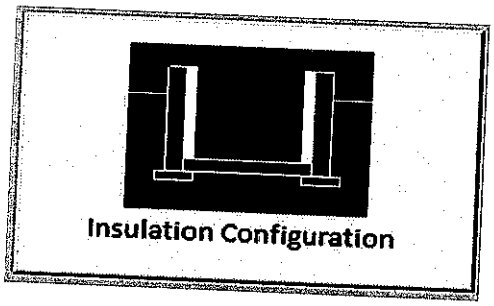
Ajax ON, L1S 2E2
905-619-2300

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
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**



Insulation Configuration

TYPE: SPRINGFIELD 3S OPT 5 BED
LO# 90165

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

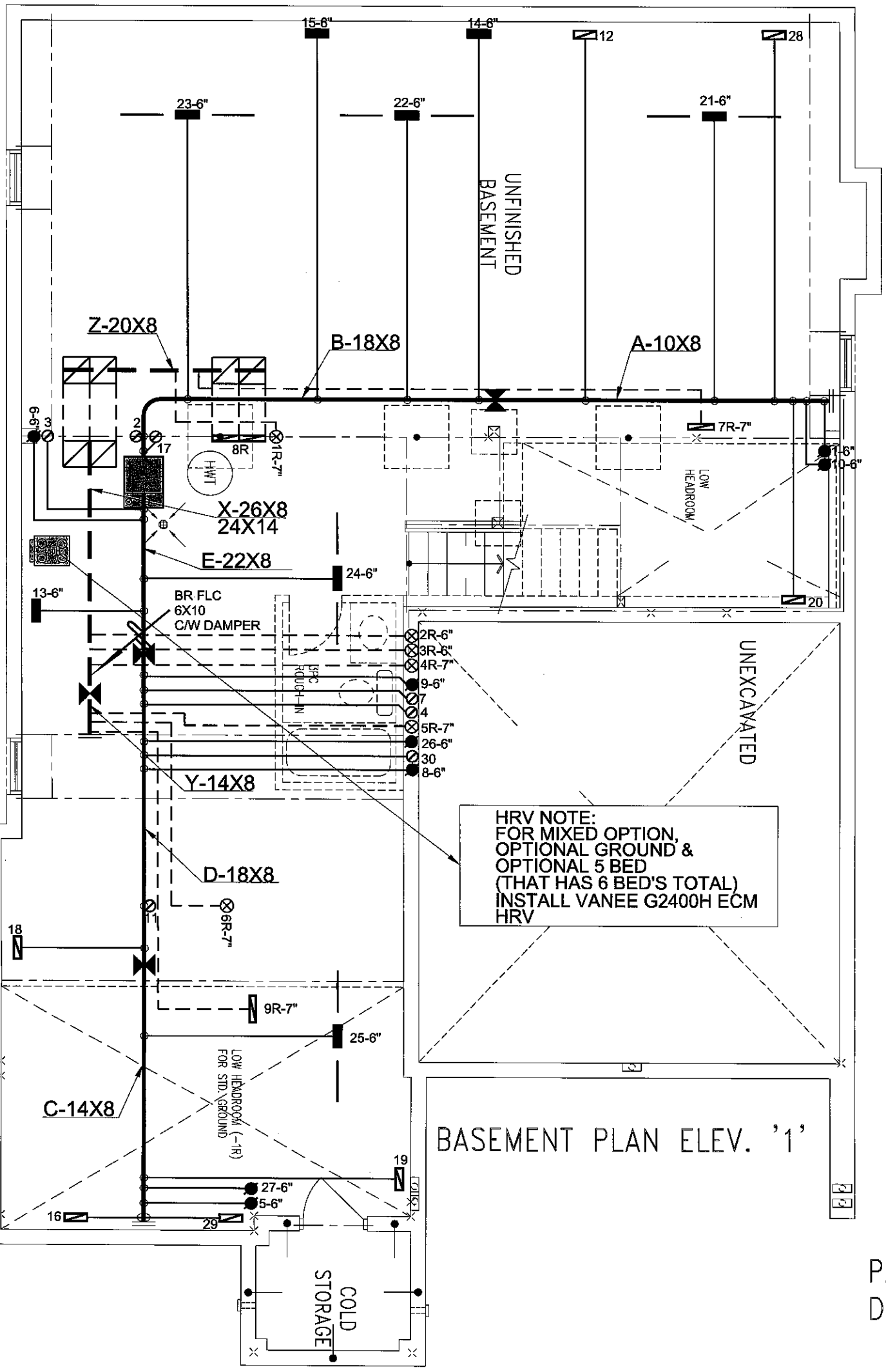
Air Infiltration Residential Load Calculator

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	
	76.2			76.2	
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 OPT 5 BED

LO# 90165



BASEMENT PLAN ELEV. '1'

PARTIAL BASEMENT PLAN
DECK CONDITION

I MICHAEL O'ROURKE HAVE REVIEW 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.

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

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client

GREENPARK HOMES

Project Name

RUSSELL GARDENS PH 4
HAMILTON, ONTARIO

OPT 5 BED
SPRINGFIELD 3S 3631 sqft

HVAC DESIGNS LTD.
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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.

HEAT LOSS 61539 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 @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	15	6	5
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

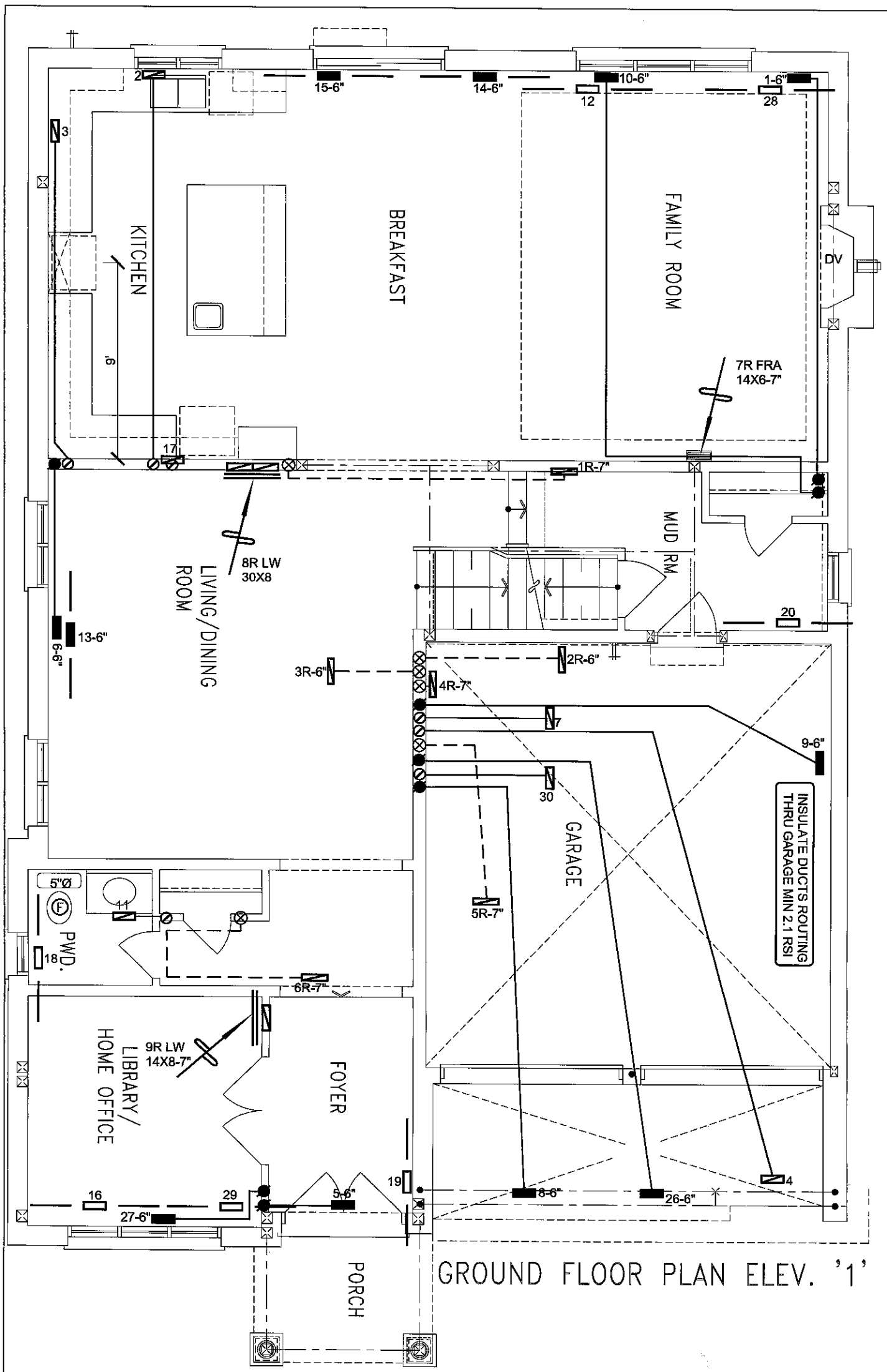
BASEMENT HEATING LAYOUT

Date APR/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 90165



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WOD
CSA-F280-12
PACKAGE A1

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HAMILTON, ONTARIO

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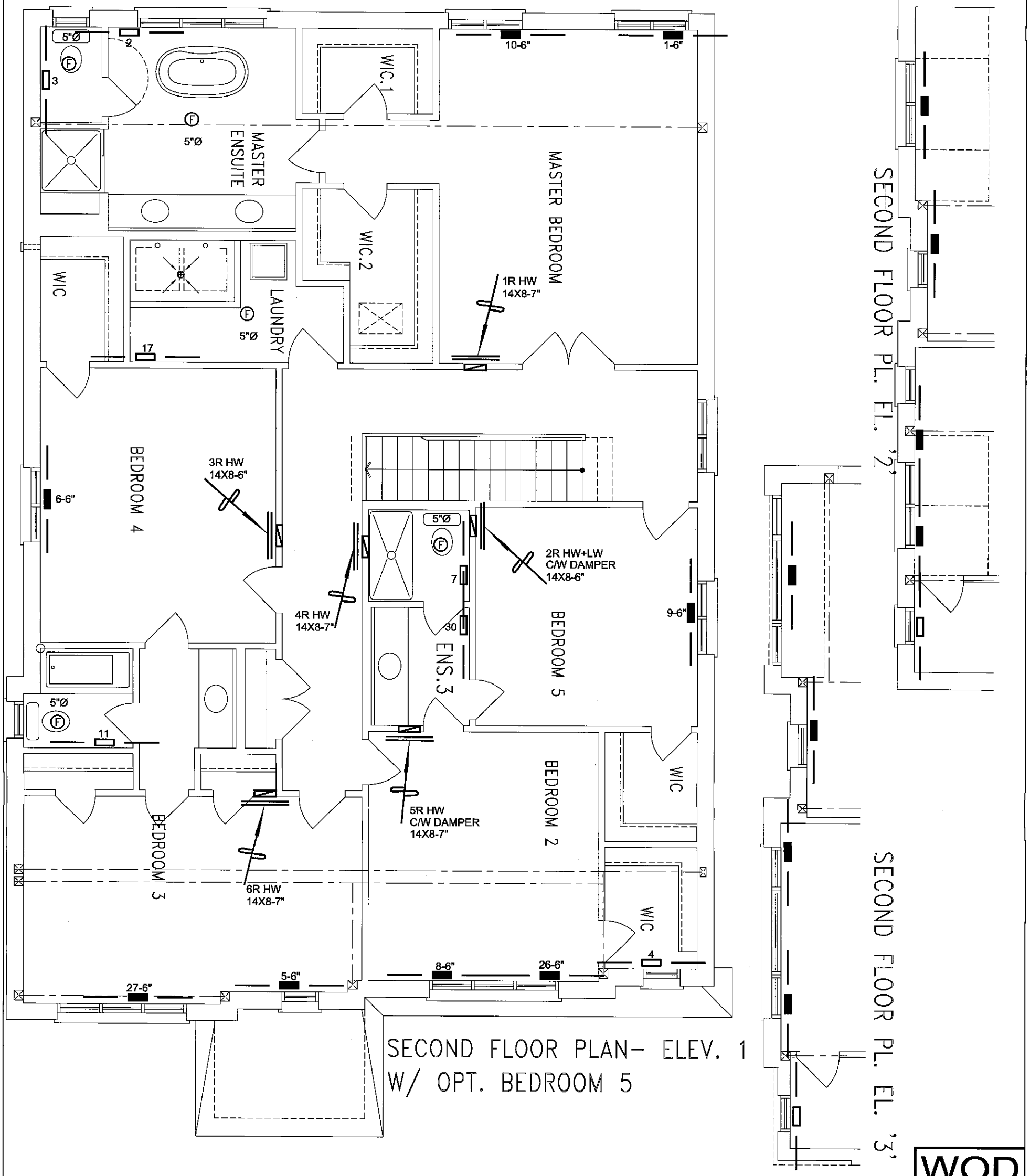
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date APR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90165



SECOND FLOOR PLAN- ELEV. 1
W/ OPT. BEDROOM 5

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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
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No.	Description	Date
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REVISIONS

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Project Name
RUSSELL GARDENS PH 4
HAMILTON, ONTARIO

OPT 5 BED
SPRINGFIELD 3S 3631 sqft

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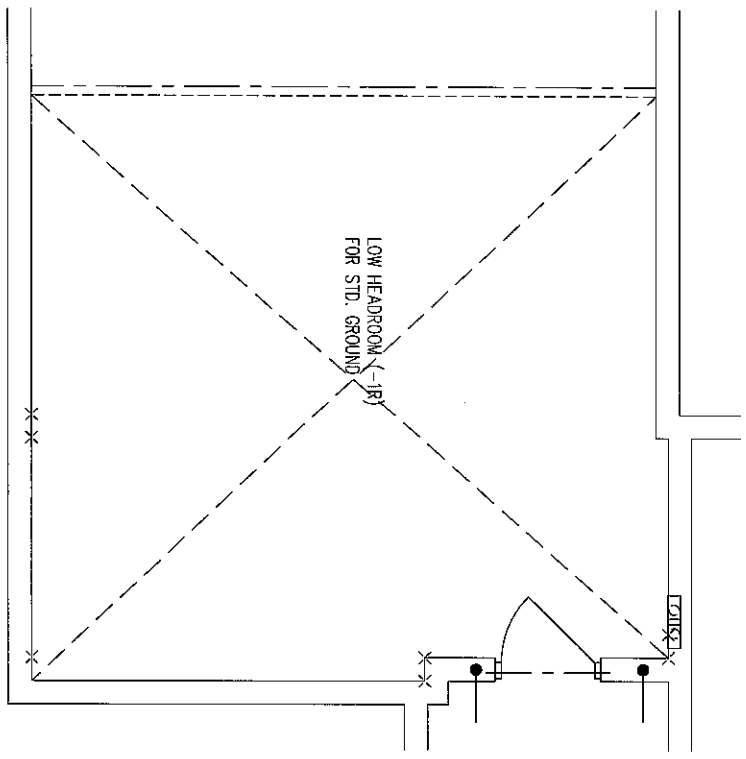
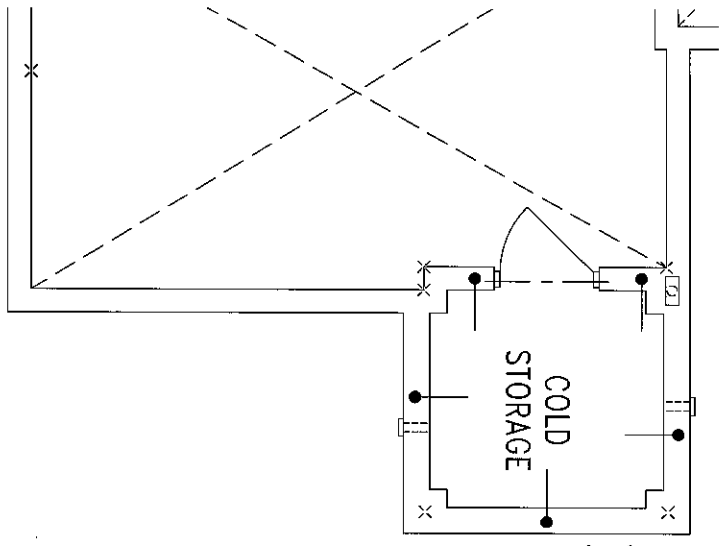
Sheet Title
SECOND FLOOR HEATING LAYOUT

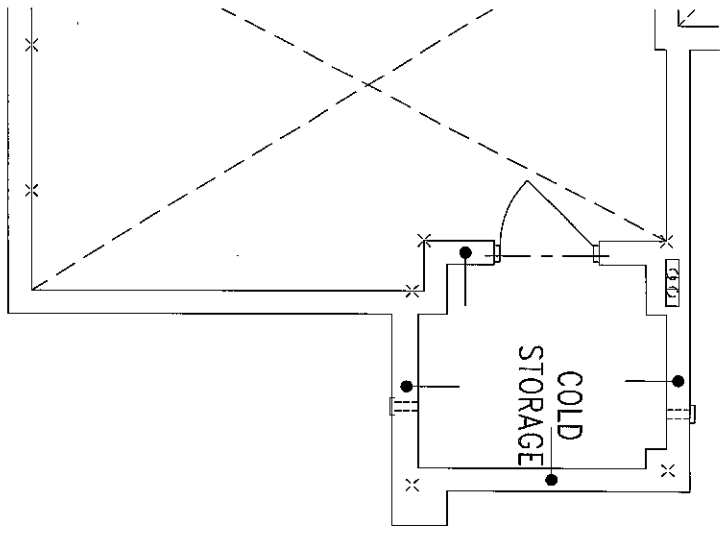
Date APR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90165



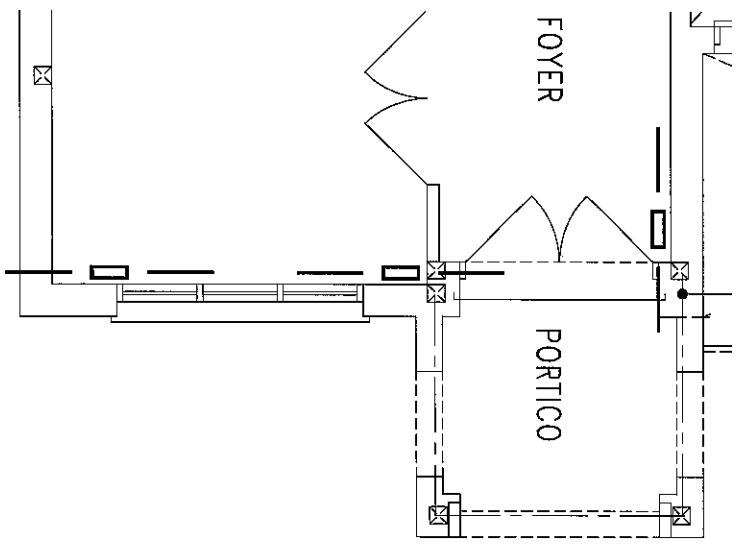
PART. BASEMENT PLAN ELEV. '1'
FOR OPT. GUEST SUITE COND.



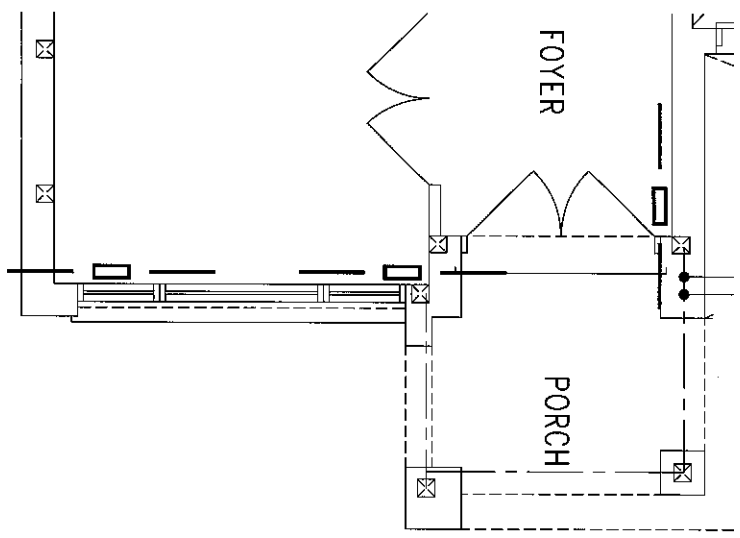
BASEMENT PLAN ELEV. '2'



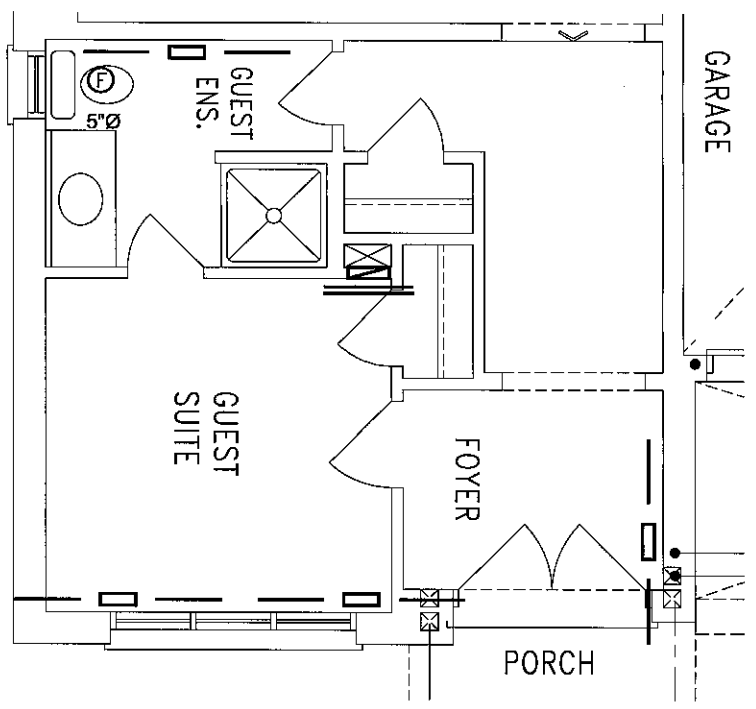
BASEMENT PLAN ELEV. '3'



GROUND FLOOR PLAN ELEV. '2'



GROUND FLOOR PLAN ELEV. '3'



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

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HVAC DESIGNS LTD.

WOD
CSA-F280-12
PACKAGE A1

HVAC LEGEND

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— ■ —	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
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REVISIONS

Client
GREENPARK HOMES

Project Name
RUSSELL GARDENS PH 4
HAMILTON, ONTARIO

OPT 5 BED
SPRINGFIELD 3S 3631 sqft

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Sheet Title
ELEVATIONS & OPT GUEST
HEATING
LAYOUT

Date APR/2021
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BCIN# 19669
LO# 90165