

SITE NAME: RUSSEL GARDENS PH 4				WOB				DATE: Jul-21				WINTER NATURAL AIR CHANGE RATE 0.365				HEAT LOSS AT °F. 71				CSA-F280-12							
BUILDER: GREENPARK HOMES				TYPE: SPRINGFIELD 4				GFA: 4076				LO# 91953				SUMMER NATURAL AIR CHANGE RATE 0.130				HEAT GAIN AT °F. 13				SB-12 PACKAGE A1			
ROOM USE				MBR		ENS		WIC		BED-2		BED-3		BED-4		ENS-2		ENS-3		FL/B-5		ENS-4		HALL			
EXP. WALL				34		31		8		37		13		14		6		9		11		6		39			
CLG. HT.				9		9		9		9		9		9		9		9		9		9		9			
FACTORS																											
GRS.WALL AREA		LOSS GAIN		306		279		72		333		117		126		54		54		99		54		351			
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	14	277	224	0	0	0	7	138	112	0	0	0	0	0	0		
EAST		19.8	41.6	0	0	0	0	0	0	0	62	1226	2576	0	0	0	0	0	0	0	0	0	0	60	1186		
SOUTH		19.8	24.9	0	0	0	0	0	0	0	0	0	0	11	217	274	11	217	274	0	0	0	7	138	174		
WEST		19.8	41.6	32	633	1330	16	316	656	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		
DOORS		23.6	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
NET EXPOSED WALL		4.1	0.8	274	1136	206	263	1090	198	72	298	54	257	1085	193	106	439	80	115	477	86	47	195	35	291	1206	
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		
EXPOSED CLG		1.2	0.6	343	409	202	228	272	134	112	134	66	202	241	119	247	294	145	252	300	148	72	86	42	90	107	
NO ATTIC EXPOSED CLG		2.6	1.3	0	0	0	0	0	0	0	0	0	28	71	35	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	230	545	99	0	0	0	0	0	0	44	104	19	0	0	
BASEMENT/CRAWL HEAT LOSS				0		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		0	
SUBTOTAL HT LOSS				2177		1678		432		3425		951		985		523		441		975		441		2589			
SUB TOTAL HT GAIN				1737		996		120		3246		489		508		208		263		473		263		2809			
LEVEL FACTOR / MULTIPLIER		0.20	0.34			0.20	0.34			0.20	0.34			0.20	0.34			0.20	0.34			0.20	0.34			0.20	0.34
AIR CHANGE HEAT LOSS		739				570		147		1163		323		338		178		150		331		150		679			
AIR CHANGE HEAT GAIN				153		88		11		286		44		45		18		23		42		23		247			
DUCT LOSS		0		0		0		0		459		0		0		70		0		0		0		0			
DUCT GAIN		0		0		0		0		463		0		0		23		0		0		0		0			
HEAT GAIN PEOPLE		240	2	480		0		0		1		240		1		240		0		0		1		240		0	
HEAT GAIN APPLIANCES/LIGHTS				754		0		0		754		754		754		754		0		0		754		0		0	
TOTAL HT LOSS BTU/H		2917				2248		579		5047		1274		1332		771		590		1305		690		3468			
TOTAL HT GAIN x 1.3 BTU/H				4052		1410		170		6472		1998		2012		324		371		1962		371		3973			

ROOM USE			FAM		LV/DN		KT/BK		LHO/G		LND		W/R		FOY		MUD						WOB		BAS			
EXP. WALL			40		28		45		10		0		6		53		25						49		166			
CLG. HT.			10		10		10		10		9		10		10		11				9		9		9			
FACTORS																												
GRS.WALL AREA	LOSS	GAIN	400		280		450		100		0		60		530		275						441		930			
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	LOSS	GAIN	LOSS	GAIN
NORTH	19.8	16.0	0	0	0	0	0	0	23	455	387	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	0	0	0	0	7	138	291	0	0	0	0	0	0	0	0	5	99
SOUTH	19.8	24.9	0	0	0	36	712	896	0	0	0	12	237	299	0	0	0	0	0	0	0	0	0	0	0	8	158	332
WEST	19.8	41.6	47	929	1953	0	0	0	52	1028	2161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	198	249
SKYLT.	34.6	101.6	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
DOORS	23.5	4.3	0	0	0	0	0	0	20	469	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.1	0.8	353	1483	265	244	1012	183	355	1472	267	88	365	66	0	0	53	220	40	483	2002	363	255	1057	192	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
EXPOSED CLG	1.2	0.6	0	0	0	0	0	0	0	0	0	0	0	0	120	143	71	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
EXPOSED FLOOR	2.4	0.4	0	0	0	0	0	0	0	0	0	0	100	237	43	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	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS				2418			1723		3423		602		380		358		3079		1526									2616
SUB TOTAL HT GAIN					2231		1080		2880		385		113		214		824		277									
LEVEL FACTOR / MULTIPLIER	0.30	0.58				0.30	0.68		0.30	0.58		0.30	0.58		0.20	0.34		0.30	0.58		0.30	0.58					0.50	1.41
AIR CHANGE HEAT LOSS				1408			1003			1993			351			129			208			1793						12741
AIR CHANGE HEAT GAIN					195		95			254			32		10		19				73			24				454
DUCT LOSS				0			0			0			51			0			0			0						0
DUCT GAIN				0			0			0			0			88			0			0						0
HEAT GAIN PEOPLE	240			0			0			0		1	240		0	0		0	0		0	0				0	0	0
HEAT GAIN APPLIANCES/LIGHTS					754		754			754			754			754			0			0						0
TOTAL HT LOSS BTU/H				3826			2726			5417			953			560			567			4872			2416			17835
TOTAL HT GAIN x 1.3 BTU/H					4135		2508			5054			1809			1255			303			1165			391			1922

TOTAL HEAT GAIN BTU/H:

47519

TONS: 3.36

LOSS DUE TO VENTILATION LOAD BTU/H: 2666

STRUCTURAL HEAT LOSS: 63252

TOTAL COMBINED HEAT LOSS BTU/H: 65918

SITE NAME: RUSSEL GARDENS PH 4
BUILDER: GREENPARK HOMES

WOB
TYPE: SPRINGFIELD 4

DATE: Jul-21

GFA: 4076 LO# 91953

HEATING CFM 1504 COOLING CFM 1504
TOTAL HEAT LOSS 63,252 TOTAL HEAT GAIN 47,036
AIR FLOW RATE CFM 23.78 AIR FLOW RATE CFM 31.98

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 @ .5" E.S.P.

TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	9	6
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	WIC	BED-2	BED-3	BED-4	ENS-2	ENS-3	FL/B-5	MBR	ENS-4	FAM	LV/DN	KT/BK	KT/BK	L/HO/G	LND	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.46	1.12	0.58	1.68	1.27	1.33	0.39	0.59	1.31	1.46	0.59	1.91	2.73	2.71	2.71	0.95	0.56	0.57	4.87	2.41	3.63	3.63	3.63	3.63
CFM PER RUN HEAT	35	27	14	40	30	32	9	14	31	35	14	45	65	64	64	23	13	13	116	57	86	86	86	86
RM GAIN MBH	2.03	0.70	0.17	2.16	2.00	2.01	0.16	0.37	1.96	2.03	0.37	2.07	2.51	2.53	2.53	1.81	1.26	0.30	1.17	0.39	1.22	1.22	1.22	1.22
CFM PER RUN COOLING	65	23	5	69	64	64	5	12	63	65	12	66	80	81	81	58	40	10	37	13	39	39	39	39
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	0.16	0.16	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	49	49	42	39	47	50	37	39	28	37	44	28	21	36	41	31	24	34	36	20	52	56	16	23
EQUIVALENT LENGTH	120	130	100	140	190	120	190	160	150	160	150	140	130	110	90	140	190	150	110	130	110	110	110	100
TOTAL EFFECTIVE LENGTH	169	179	142	179	237	170	227	199	178	197	194	168	151	146	131	171	214	184	146	150	162	166	126	123
ADJUSTED PRESSURE	0.1	0.1	0.12	0.1	0.07	0.1	0.08	0.09	0.1	0.09	0.09	0.1	0.11	0.11	0.12	0.1	0.08	0.09	0.1	0.11	0.1	0.1	0.13	0.13
ROUND DUCT SIZE	5	5	4	5	6	6	4	4	6	5	4	5	6	6	6	6	4	4	6	5	6	6	6	6
HEATING VELOCITY (ft/min)	257	198	161	294	153	163	103	161	158	257	161	330	331	326	326	117	149	149	591	419	438	438	438	438
COOLING VELOCITY (ft/min)	477	169	57	507	326	326	57	138	321	477	138	485	408	413	413	296	459	115	189	95	199	199	199	199
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	A	C	E	D	A	E	F	C	A	F	A	F	B	B	E	E	D	D	F	B	A	C	C

RUN #	25	26	27	28	29	30	31	32	33
ROOM NAME	BAS	BAS	HALL	HALL	ENS	BED-2	BED-2	FAM	ENS-2
RM LOSS MBH	3.63	3.63	1.73	1.73	1.12	1.68	1.68	1.91	0.39
CFM PER RUN HEAT	86	86	41	41	27	40	40	45	9
RM GAIN MBH	1.22	1.22	1.99	1.99	0.70	2.16	2.16	2.07	0.16
CFM PER RUN COOLING	39	39	64	64	23	69	69	66	5
ADJUSTED PRESSURE	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	31	38	50	45	43	46	52	42	37
EQUIVALENT LENGTH	110	120	180	190	110	150	170	110	210
TOTAL EFFECTIVE LENGTH	141	158	230	235	153	196	222	152	247
ADJUSTED PRESSURE	0.11	0.1	0.07	0.07	0.11	0.09	0.08	0.11	0.07
ROUND DUCT SIZE	6	6	6	6	4	5	6	5	4
HEATING VELOCITY (ft/min)	438	438	209	209	310	294	204	330	103
COOLING VELOCITY (ft/min)	199	199	326	326	264	507	352	485	57
OUTLET GRILL SIZE	4X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10
TRUNK	E	D	D	D	A	E	E	A	E

SUPPLY AIR TRUNK SIZE

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	297	0.09	8.6	10	536
TRUNK B	214	0.10	7.4	8	482
TRUNK C	763	0.09	12.3	18	763
TRUNK D	327	0.07	9.5	10	589
TRUNK E	587	0.07	11.9	16	660
TRUNK F	737	0.07	12.9	20	663

RETURN AIR TRUNK SIZE

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

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	0	0	0	0	0	0	0	
AIR VOLUME	115	155	85	115	115	115	155	310	155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	184
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.	40	41	33	51	55	60	44	42	34	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	275	155	195	235	225	265	200	195	210	0	0	0	0	0	0	0	0	0	0	0	0	0	0	225
TOTAL EFFECTIVE LH	315	196	228	286	280	325	244	237	244	1	1	1	1	1	1	1	1	1	1	1	1	1	1	244
ADJUSTED PRESSURE	0.05	0.08	0.06	0.05	0.05	0.05	0.06	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	0.06
ROUND DUCT SIZE	7	7	6	7	7	7	7.5	9.7	7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
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	8
	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	24

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	0
TRUNK P	0	0.05	0	0	0
TRUNK Q	0	0.05	0	0	0
TRUNK R	0	0.05	0	0	0
TRUNK S	0	0.05	0	0	0
TRUNK T	0	0.05	0	0	0
TRUNK U	0	0.05	0	0	0
TRUNK V	0	0.05	0	0	0
TRUNK W	270	0.05	9.7	12	405
TRUNK X	1504	0.05	18.4	32	677
TRUNK Y	500	0.05	12.2	18	500
TRUNK Z	465	0.05	11.8	16	523
DROP	1504	0.05	18.4	24	645

TYPE: SPRINGFIELD 4
SITE NAME: RUSSEL GARDENS PH 4

LO # 91953
WOB

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	6 @ 10.6 cfm	63.6 cfm
Other Rooms	6 @ 10.6 cfm	63.6 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		174.8 cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	222.6	cfm
Less Principal Ventil. Capacity	174.8	cfm
Required Supplemental Capacity	47.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE G2400H ECM
Location:	BSMT
174.8 cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
174.8 CFM	71 F	1.08	X	0.20

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR				
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	☒	3.5
W/R	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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	July-21

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

LO#: 91953

Model: SPRINGFIELD 4

Builder: GREENPARK HOMES

Date: 2021-07-28

Volume Calculation
House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1863	9	16767
First	1863	10	18630
Second	2213	9	19917
Third	0	9	0
Fourth	0	9	0
Total:			55,314.0 ft³
Total:			1566.3 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.365
SUMMER NATURAL AIR CHANGE RATE	0.130

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

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

0.365 x 435.09 x 39 °C x 1.2 = 7468 W

= 25482 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.130 x 435.09 x 7 °C x 1.2 = 484 W

= 1653 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

175 CFM x 71 °F x 1.08 x 0.20 = 2666 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

175 CFM x 13 °F x 1.08 x 0.20 = 483 Btu/h

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

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

Level	Level Factor (LF)	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	25,482	9,053	1.407
2	0.3		13,130	0.582
3	0.2		15,007	0.340
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

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: SPRINGFIELD 4	WOB	BUILDER: GREENPARK HOMES
SFQT: 4076	LO# 91953	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):	55314.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	7
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: 63.0 ft	WIDTH: 39.0 ft	EXPOSED PERIMETER:	155.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	49.0 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	-

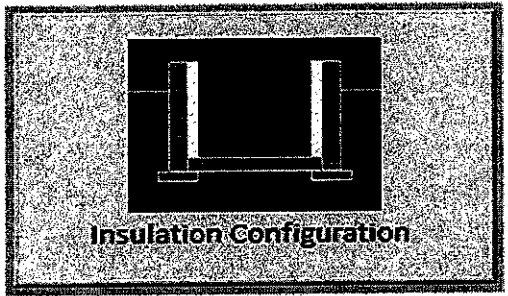
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Michael O'Rourke

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

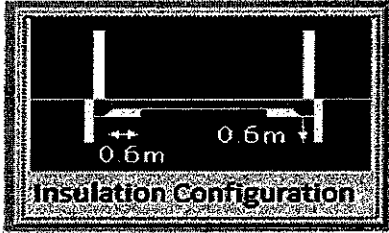
Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	4.6	 Insulation Configuration
Floor Width (m):	11.9	
Exposed Perimeter (m):	47.2	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.56	
Window Area (m ²):	2.1	
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):	766	

TYPE: SPRINGFIELD 4
LO# 91953

WOB

Residential Slab on Grade 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		
Length (m):	1.5	 Insulation Configuration
Width (m):	11.9	
Exposed Perimeter (m):	14.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	199	

TYPE: SPRINGFIELD 4
LO# 91953

WOB

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

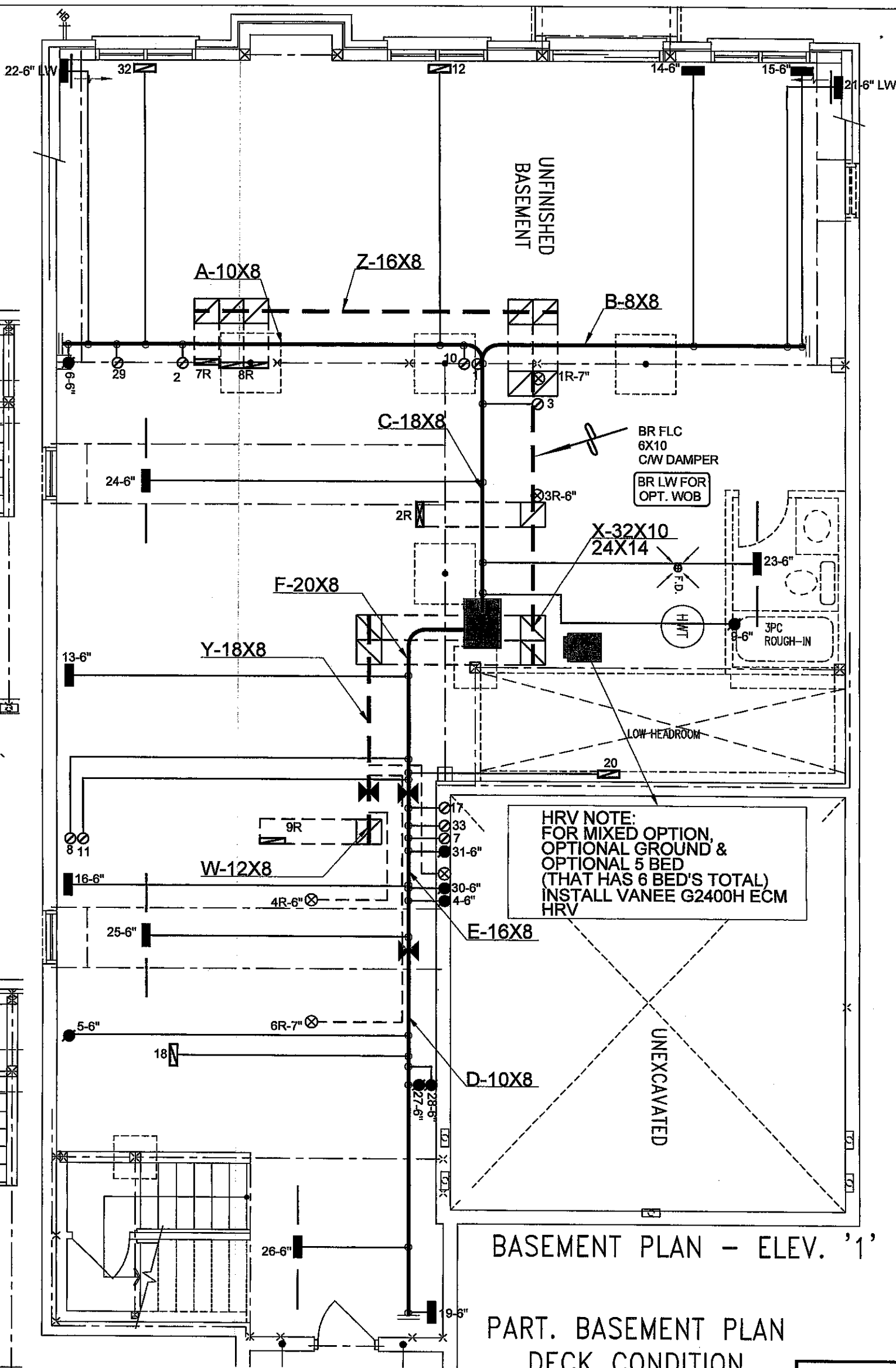
Weather Station Description				
Province:	Ontario			
Region:	Hamilton			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	8.53			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1566.3			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2088.0 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	82.5	82.5		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.365			
Cooling Air Leakage Rate (ACH/H):	0.130			

TYPE: SPRINGFIELD 4
LO# 91953

WOB

BASEMENT PLAN - ELEV. '2'

BASEMENT PLAN - ELEV. '3'



BASEMENT PLAN - ELEV. '1'

PART. BASEMENT PLAN
DECK CONDITION

WOB
CSA-F280-12
PACKAGE A1

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.

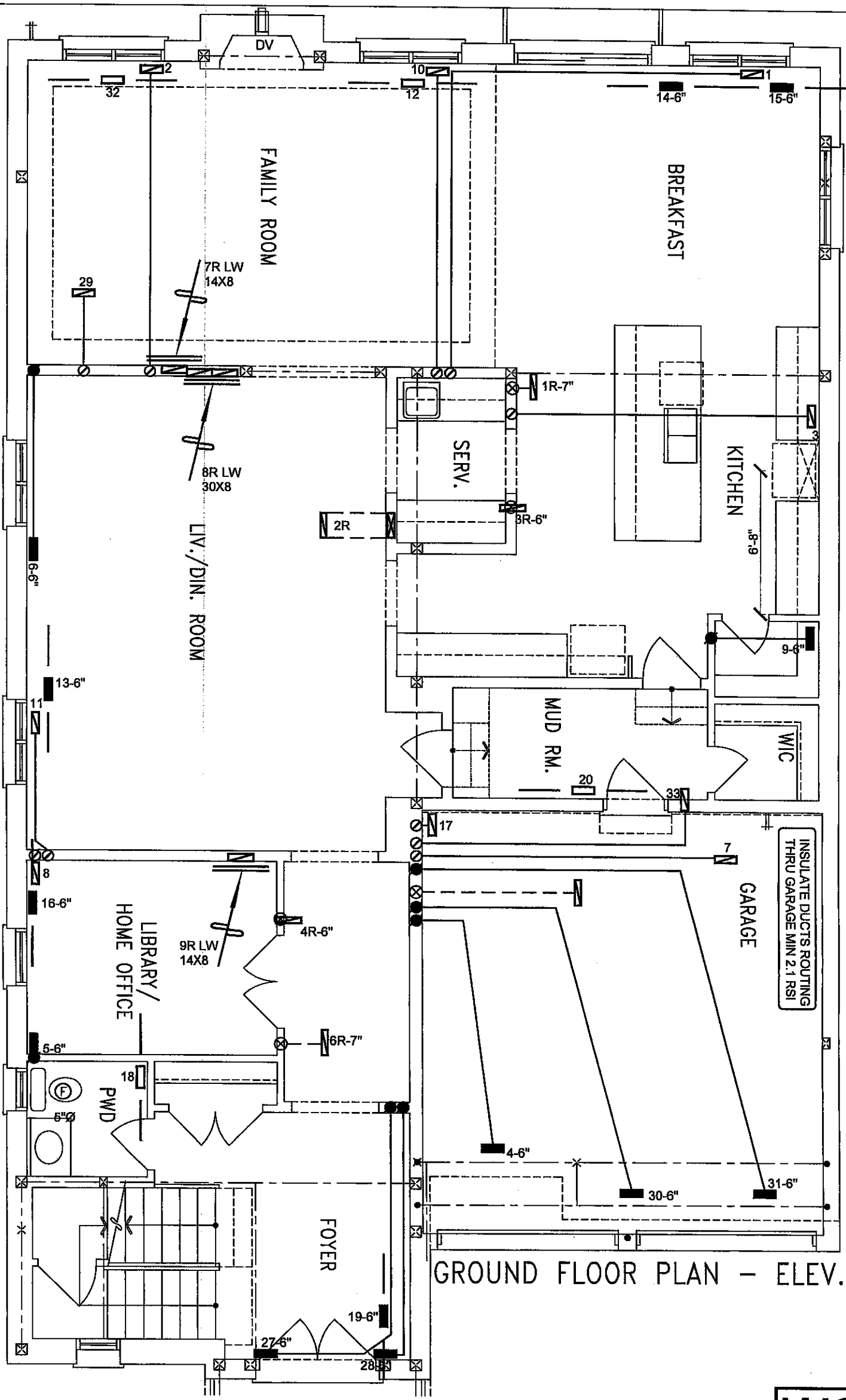
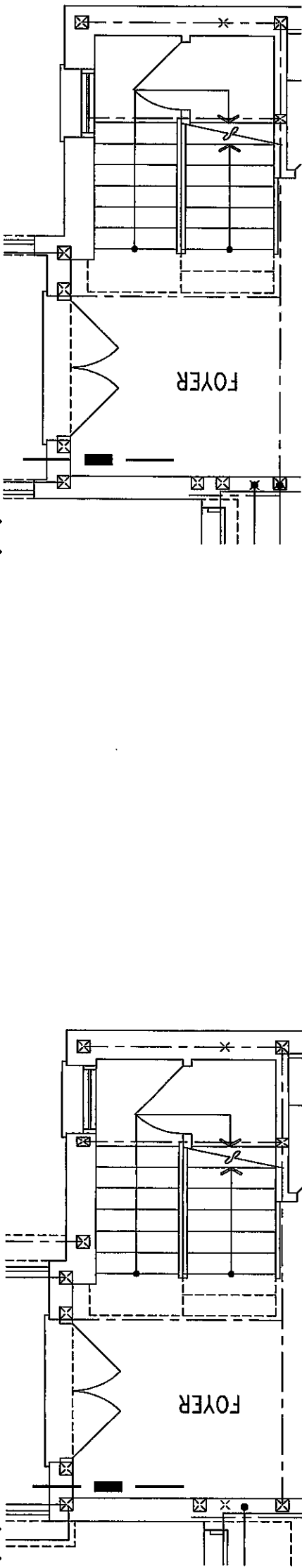
HVAC LEGEND						3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	No.	Description
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK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

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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.	HEAT LOSS 65508 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 JULY/2021	
WOB SPRINGFIELD 4 4076 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# 91953	
		COOLING 4.0 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						
		FAN SPEED 1504 cfm @ 0.6" w.c.								

GROUND FLOOR PLAN - ELEV. '2'

GROUND FLOOR PLAN - ELEV. '3'



GROUND FLOOR PLAN - ELEV. '1'

WOB
CSA-F280-12
PACKAGE A1

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.

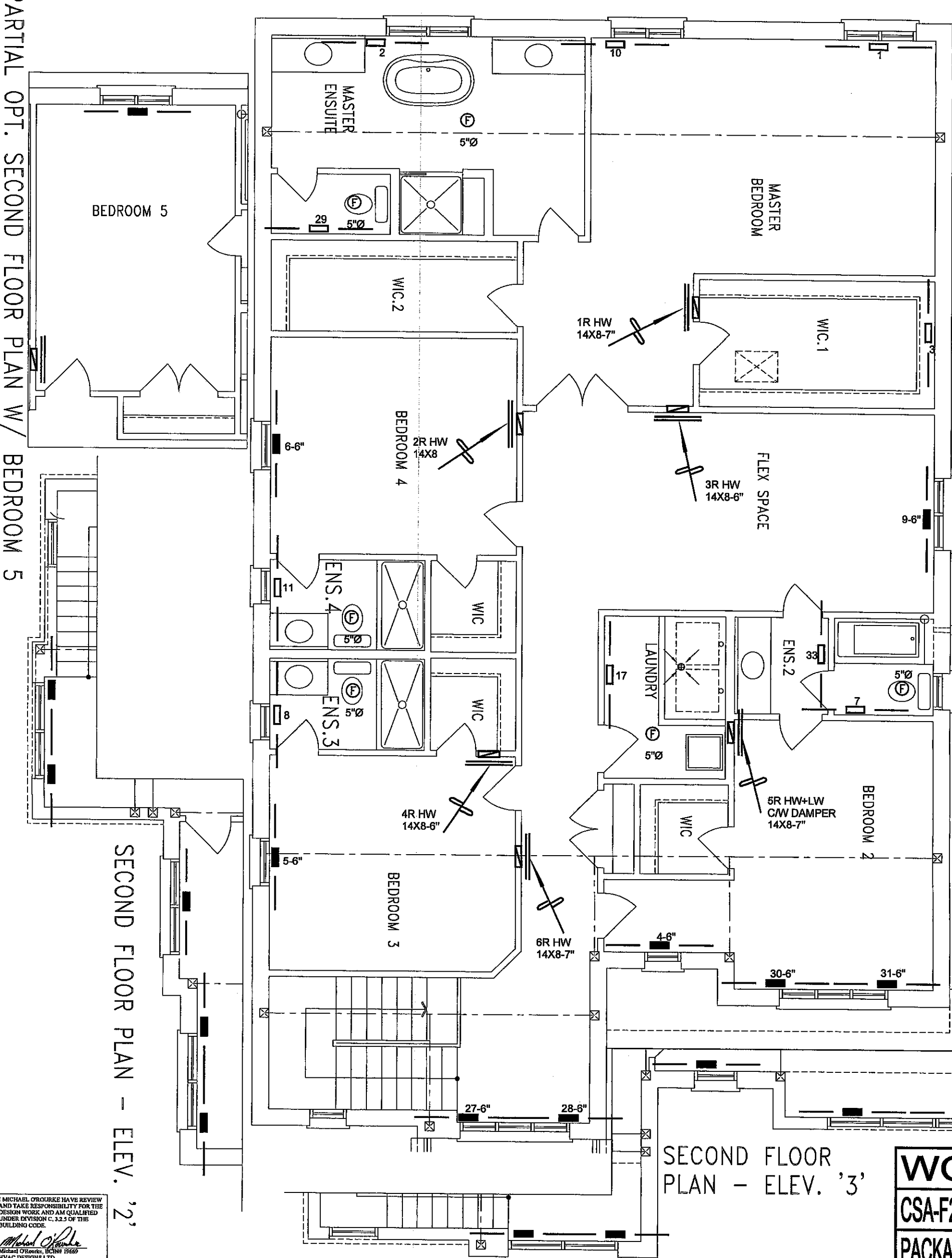
HVAC LEGEND									
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	3.	
	SUPPLY AIR GRILLE		8" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.	
	SUPPLY AIR BOOT ABOVE		8" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No.	Description
								REVISIONS	
								Date	

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Client GREENPARK HOMES Project Name RUSSELL GARDENS PH 4 HAMILTON, ONTARIO WOB SPRINGFIELD 4 4076 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@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 Date JULY/2021 Scale 3/16" = 1'-0" BCIN# 19669 LO# 91953
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SECOND FLOOR
PLAN - ELEV. '3'

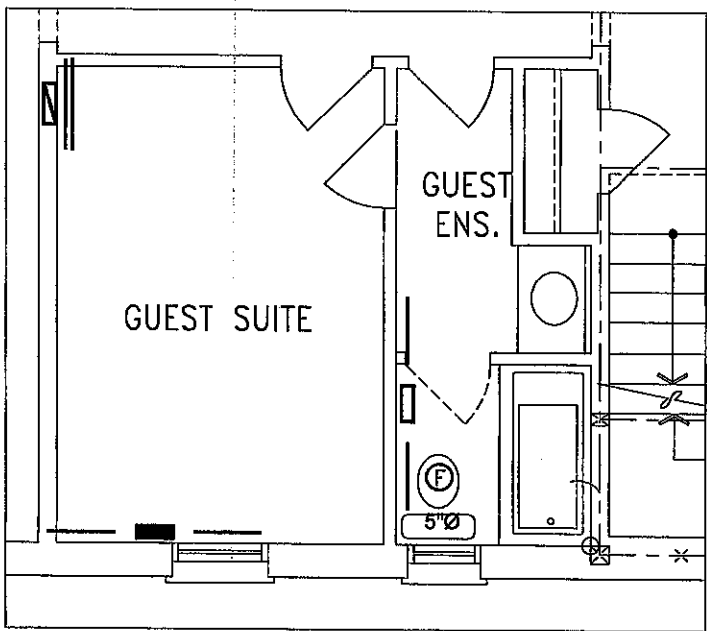
WOB
CSA-F280-12
PACKAGE A1



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"x6" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER		
								REVISIONS	

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GREENPARK HOMES		SECOND FLOOR
Project Name		HEATING LAYOUT
RUSSELL GARDENS PH 4 HAMILTON, ONTARIO		Date JULY/2021
WOB	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.	Scale 3/16" = 1'-0"
SPRINGFIELD 4 4076 sqft		BCIN# 19669
		LO# 91953



PARTIAL OPT. GROUND FLOOR PLAN W/ GUEST SUITE

WOB
CSA-F280-12
PACKAGE A1

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

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	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		

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Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@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			GUEST SUITE HEATING LAYOUT	
Project Name			Date	JULY/2021
RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			Scale	3/16" = 1'-0"
WOB SPRINGFIELD 4 4076 sqft			BCIN# 19669	
		LO#	91953	