

SITE NAME: RUSSEL GARDENS PH. 4				WUB				DATE: Apr-21				WINTER NATURAL AIR CHANGE RATE 0.310				HEAT LOSS AT °F. 71				CSA-F280-12			
BUILDER: GREENPARK HOMES				TYPE: GRANDVILLE 3				LO# 90147				SUMMER NATURAL AIR CHANGE RATE 0.111				HEAT GAIN AT °F. 13				88-12 PACKAGE A1			
ROOM USE	EXP. WALL	CLG. HT.	FACTORS	MBR	ENG	WIC	BED-2	BED-3	BED-4	ENS-2	ENS-3	BED-5	ENS-4	LB/OF	GUEST								
GRS.WALL AREA	LOSS	GAIN	378	261	72	144	306	234	0	162	144	81	276	120									
GLAZING	LOSS	GAIN	378	261	72	144	306	234	0	162	144	81	276	120									
NORTH	19.8	16.0	0	0	0	7	138	112	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	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	0	0	0	0	0	0
WEST	19.8	41.6	32	633	1330	25	484	1039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	34.8	101.5	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
NET EXPOSED WALL	4.1	0.8	348	1434	260	229	949	172	72	298	64	126	531	96	234	970	176	174	721	131	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
EXPOSED CLG	1.2	0.6	492	587	289	216	258	126	130	166	76	230	274	136	232	277	136	120	143	71	86	101	50
NO ATTIC EXPOSED CLG	2.6	1.3	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
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
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
SUBTOTAL HT LOSS			2654		1838	453	1198	3220	2370	137	1847	1119	531	1952	779								
SUB TOTAL HT GAIN			1879		1449	131	525	3404	2852	56	2311	629	272	2328	364								
LEVEL FACTOR / MULTIPLIER	0.20	0.30		0.20	0.30	0.20	0.30	0.20	0.30	0.20	0.30	0.20	0.30	0.20	0.30								
AIR CHANGE HEAT LOSS			805		567	138	363	976	719	42	660	339	161	1045	417								
AIR CHANGE HEAT GAIN			160		122	11	44	287	240	6	195	53	23	196	31								
DUCT LOSS			0		0	0	0	420	0	18	241	0	0	0	0								
DUCT GAIN			0		0	0	0	449	0	6	251	0	0	0	0								
HEAT GAIN PEOPLE	240		2	480	0	0	0	1	240	1	240	1	240	0	1	240	0	0	0	0	1	240	0
HEAT GAIN APPLANCES/LIGHTS				565		565	565	565	565		565		565		565						565		565
TOTAL HT LOSS BTU/H			3458		2396	591	1661	4816	3088	196	2648	1458	592	2988	1195								
TOTAL HT GAIN x 1.3 BTU/H			4008		2776	918	1785	6427	5065	87	3582	1932	384	4015	1569								

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	DIN	FAM	KT/BR	LIV	LAUN	G-ENS	FOY	MUD	FLEX		WUB	BAS								
GRS.WALL AREA	LOSS	GAIN	150	540	320	220	0	170	253	110	81			180	1164								
GLAZING	LOSS	GAIN	150	540	320	220	0	170	253	110	81			180	1164								
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
EAST	19.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	19.8	24.9	22	435	548	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST	19.8	41.6	0	0	0	40	781	1662	73	1443	3033	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	34.8	101.5	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
NET EXPOSED WALL	4.1	0.8	128	531	98	800	2073	376	247	1024	186	198	825	150	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
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
NO ATTIC EXPOSED CLG	2.6	1.3	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
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
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
SUBTOTAL HT LOSS			966		2864	2497	1240	185	814	1915	842	735		174	9582								
SUB TOTAL HT GAIN			644		2038	3219	672	80	234	575	163	521		1306	9313								
LEVEL FACTOR / MULTIPLIER	0.30	0.54		0.30	0.54	0.30	0.54	0.30	0.54	0.30	0.54	0.20	0.30	0.50	1.16								
AIR CHANGE HEAT LOSS			517		1533	1321	664	56	435	1025	461	223		205	12346								
AIR CHANGE HEAT GAIN			54		172	271	57	7	20	48	13	44			82								
DUCT LOSS			0		0	0	0	24	0	0	0	0			0								
DUCT GAIN			0		0	0	0	65	0	0	0	0			0								
HEAT GAIN PEOPLE	240		0	0	0	0	0	0	0	0	0	0		0	0								
HEAT GAIN APPLANCES/LIGHTS				565		565	565	565	565		565		565		565						565		565
TOTAL HT LOSS BTU/H			1482		4396	3788	1904	265	1250	2340	1293	958		1306	21659								
TOTAL HT GAIN x 1.3 BTU/H			1642		3808	5271	1682	931	330	1544	948	1468		267	1834								

TOTAL HEAT GAIN BTU/H: 52589

TONS: 4.38

LOSS DUE TO VENTILATION LOAD BTU/H: 2910

STRUCTURAL HEAT LOSS: 66137

TOTAL COMBINED HEAT LOSS BTU/H: 69047

SITE NAME: RUSSEL GARDENS PH. 4
BUILDER: GREENPARK HOMES

WUB
TYPE: GRANDVILLE 3

DATE: Apr-21

GFA: 4609 LO# 90147

HEATING CFM 1818
TOTAL HEAT LOSS 66,137
AIR FLOW RATE CFM 27.49

COOLING CFM 1818
TOTAL HEAT GAIN 52,061
AIR FLOW RATE CFM 34.92

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
GMVC961005CNA 100
FAN SPEED LOW 1360
MEDLOW 1818
MEDIUM 1870
MEDIUM HIGH 1910
HIGH 1957

AFUE = 96 %
INPUT (BTU/H) = 100,000
OUTPUT (BTU/H) = 96,000
DESIGN CFM = 1818
CFM @ .5" E.S.P.

TEMPERATURE RISE 49 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	12	7
R/A	0	0	6	4	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	BED-5	MBR	ENS-4	DIN	FAM	KT/BR	KT/BR	LIV	LAUN	G-ENS	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.73	1.20	0.59	1.56	1.54	1.54	0.20	1.32	1.46	1.73	0.69	1.48	2.20	1.89	1.89	1.90	0.26	1.25	2.94	1.29	3.28	3.28	3.28	3.28
CFM PER RUN HEAT	48	33	16	43	42	42	5	36	40	48	19	41	80	52	52	52	7	34	81	36	90	90	90	90
RM GAIN MBH.	2.00	1.39	0.92	1.79	2.14	2.53	0.09	1.79	1.93	2.00	0.38	1.64	1.80	2.64	2.64	1.68	0.93	0.33	1.54	0.95	0.30	0.30	0.30	0.30
CFM PER RUN COOLING	70	48	32	82	75	88	3	63	67	70	13	57	63	92	92	59	33	12	54	33	10	10	10	10
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	66	47	26	32	40	65	38	67	62	51	60	51	31	44	37	47	41	50	48	19	41	35	43	46
EQUIVALENT LENGTH	160	180	180	130	130	180	160	190	170	140	150	130	150	120	140	120	190	110	170	170	110	130	140	100
TOTAL EFFECTIVE LENGTH	226	227	206	162	170	245	196	257	232	191	210	181	181	184	177	167	231	160	218	189	151	165	183	146
ADJUSTED PRESSURE	0.08	0.08	0.08	0.11	0.1	0.07	0.09	0.07	0.07	0.09	0.08	0.1	0.1	0.1	0.09	0.1	0.07	0.11	0.07	0.09	0.11	0.1	0.09	0.11
ROUND DUCT SIZE	6	5	4	6	6	6	4	6	6	5	4	5	5	6	5	4	4	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	245	242	184	219	214	214	57	184	204	352	218	301	441	265	265	382	80	390	413	413	459	459	459	459
COOLING VELOCITY (ft/min)	357	352	367	316	382	449	34	321	342	514	149	419	463	469	469	433	379	138	275	379	51	51	51	51
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	B	E	E	H	E	H	B	B	H	G	A	A	A	G	B	D	G	A	A	D	A	A

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37
ROOM NAME	BAS	BAS	BAS	LB/OF	GUEST	FLEX	LB/OF	BED-3	BED-3	BED-4	ENS	ENS-3	FAM
RM LOSS MBH.	3.28	3.28	3.28	1.50	1.20	0.96	1.50	1.54	1.54	1.54	1.20	1.32	2.20
CFM PER RUN HEAT	90	90	90	41	33	26	41	42	42	42	33	36	80
RM GAIN MBH.	0.30	0.30	0.30	2.01	1.56	1.47	2.01	2.14	2.14	2.53	1.39	1.79	1.80
CFM PER RUN COOLING	10	10	10	70	54	51	70	75	75	88	48	63	63
ADJUSTED PRESSURE	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH.	17	48	45	55	13	49	62	39	46	72	32	51	32
EQUIVALENT LENGTH	120	140	160	150	110	140	130	150	170	160	130	180	120
TOTAL EFFECTIVE LENGTH	137	188	205	205	123	189	192	189	216	232	162	231	152
ADJUSTED PRESSURE	0.12	0.09	0.08	0.08	0.14	0.09	0.09	0.09	0.08	0.07	0.11	0.07	0.11
ROUND DUCT SIZE	6	6	6	6	5	5	6	6	6	6	4	6	5
HEATING VELOCITY (ft/min)	459	459	459	209	242	191	209	214	214	379	184	441	441
COOLING VELOCITY (ft/min)	51	51	51	357	396	374	357	382	382	449	551	321	463
OUTLET GRILL SIZE	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	4X10	3X10
TRUNK	D	G	G	G	D	B	G	E	E	H	E	E	D

SUPPLY AIR TRUNK SIZE

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	434	0.09	10	12	8
TRUNK B	238	0.07	8.5	10	8
TRUNK C	652	0.07	12.4	18	8
TRUNK D	307	0.09	8.7	10	8
TRUNK E	270	0.07	8.9	10	8
TRUNK F	550	0.07	11.6	16	8

RETURN AIR TRUNK SIZE

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	1818	0.05	19.7	32	12
TRUNK Y	450	0.05	11.7	16	8
TRUNK Z	0	0.05	0	0	8
DROP	1818	0.05	19.7	24	16

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	BR
AIR VOLUME	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
ACTUAL DUCT LGH.	49	54	53	69	80	85	23	54	15	57	1
EQUIVALENT LENGTH	195	270	195	255	205	245	135	230	155	255	0
TOTAL EFFECTIVE LH	244	324	248	324	285	310	158	284	170	312	1
ADJUSTED PRESSURE	0.06	0.05	0.06	0.05	0.05	0.05	0.09	0.05	0.09	0.05	0.05
ROUND DUCT SIZE	8.8	7	6	7	7	6	9.4	9.5	5.9	6	0
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	8	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	30	14	14	14	14	14	30	30	14	14	0

TYPE: GRANDVILLE 3
SITE NAME: RUSSEL GARDENS PH. 4

LO # 90147
WUB

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 @ 10.8 cfm	53 cfm
Kitchen & Bathrooms	9 @ 10.6 cfm	95.4 cfm
Other Rooms	6 @ 10.6 cfm	63.6 cfm
Table 9.32.3.A.	TOTAL	254.4 cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
8 Bedrooms		
As Per Ashrea 82.2 Dwelling- Unit Ventilation		
4.1.1 Total Ventilation Rate		
$Q_{tot} = 0.03A_{floor} + 7.5(N_{br} + 1)$		
TOTAL		190.8 cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	254.4	cfm
Less Principal Ventil. Capacity	190.8	cfm
Required Supplemental Capacity	63.6	cfm

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

PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
190.8 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-2	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	☒	3.5
G-ENS	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

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

LO#: 90147

Model: GRANDVILLE 3

Builder: GREENPARK HOMES

Date: 4/8/2021

Volume Calculation
House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2165	9	19485
First	2165	10	21650
Second	2444	9	21996
Third	0	9	0
Fourth	0	9	0
Total:			63,131.0 ft³
Total:			1787.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.310
SUMMER NATURAL AIR CHANGE RATE	0.111

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

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

0.310 x 496.58 x 39 °C x 1.2 = 7237 W

= 24692 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.111 x 496.58 x 7 °C x 1.2 = 470 W

= 1603 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

191 CFM x 71 °F x 1.08 x 0.20 = 2910 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

191 CFM x 13 °F x 1.08 x 0.20 = 528 Btu/h

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

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

Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{level})
1	0.5	24,692	10,619	1.163
2	0.3		13,839	0.535
3	0.2		16,285	0.303
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: GRANDVILLE 3	WUB	BUILDER: GREENPARK HOMES
SFQT: 4609	LO# 90147	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

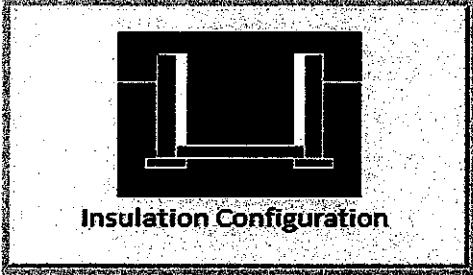
ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	63131.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	7
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 65.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	194.0 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

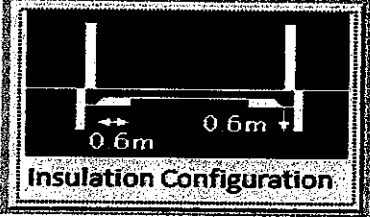
Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	19.8	 Insulation Configuration
Floor Width (m):	12.8	
Exposed Perimeter (m):	59.1	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.5	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	1929	

TYPE: GRANDVILLE 3
LO# 90147

WUB

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	
Width (m):	4.6	
Exposed Perimeter (m):	6.1	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		51

TYPE: GRANDVILLE 3
LO# 90147

WUB

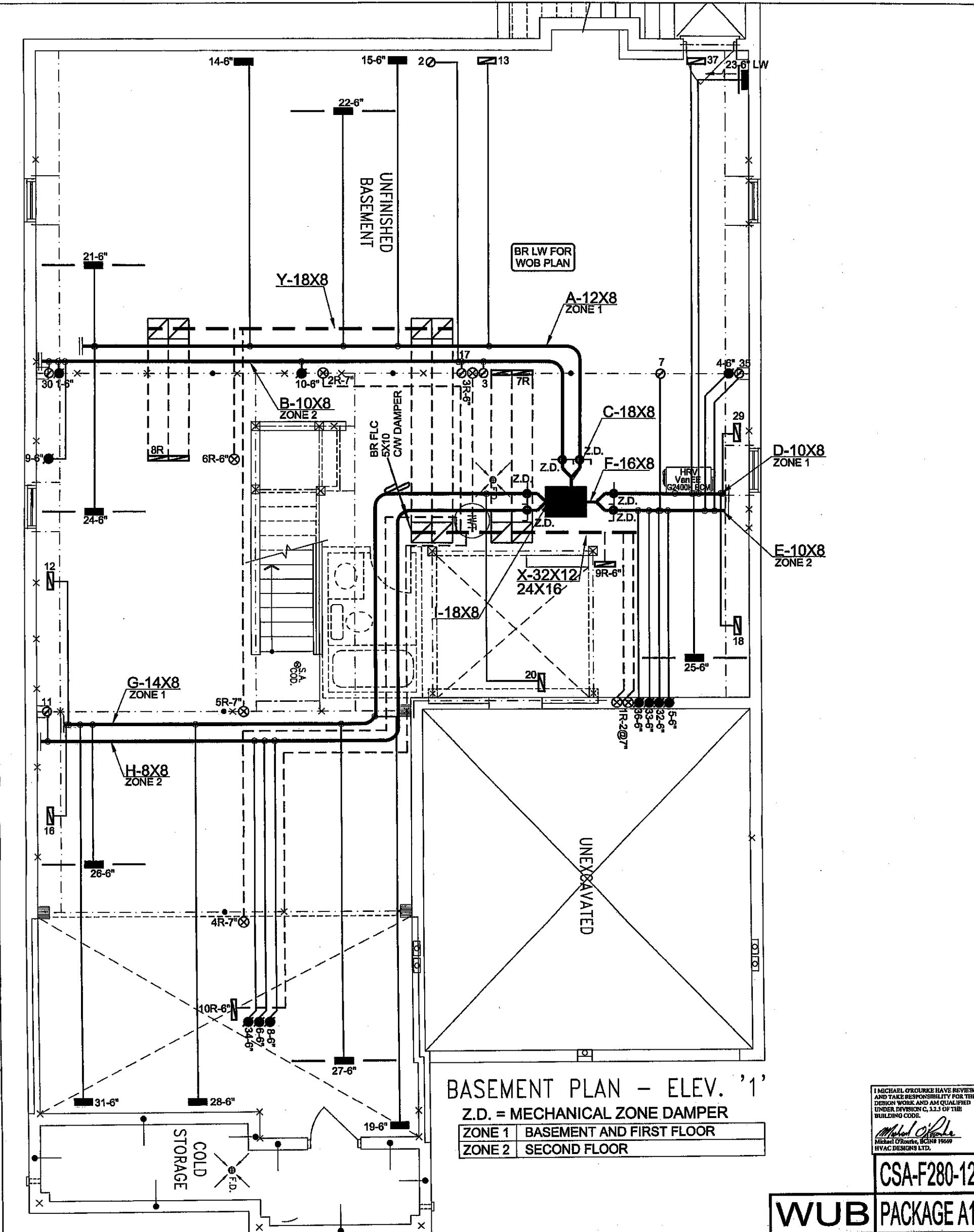
Air Infiltration Residential Load Calculator

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):	6.71		
Building Configuration			
Type:	Detached		
Number of Stories:	Two		
Foundation:	Full		
House Volume (m ³):	1787.7		
Air Leakage/Ventilation			
Air Tightness Type:	Present (1961-) (3.57 ACH)		
Custom BDT Data:	ELA @ 10 Pa.	2383.0 cm ²	
	3.57	ACH @ 50 Pa	
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust	
	90.0	90.0	
Flue Size			
Flue #:	#1	#2	#3
Diameter (mm):	0	0	0
	#4	0	
Natural Infiltration Rates			
Heating Air Leakage Rate (ACH/H):	0.310		
Cooling Air Leakage Rate (ACH/H):	0.111		

TYPE: GRANDVILLE 3
LO# 90147

WUB



I MICHAEL O'BROUKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.1 OF THE BUILDING CODE.

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

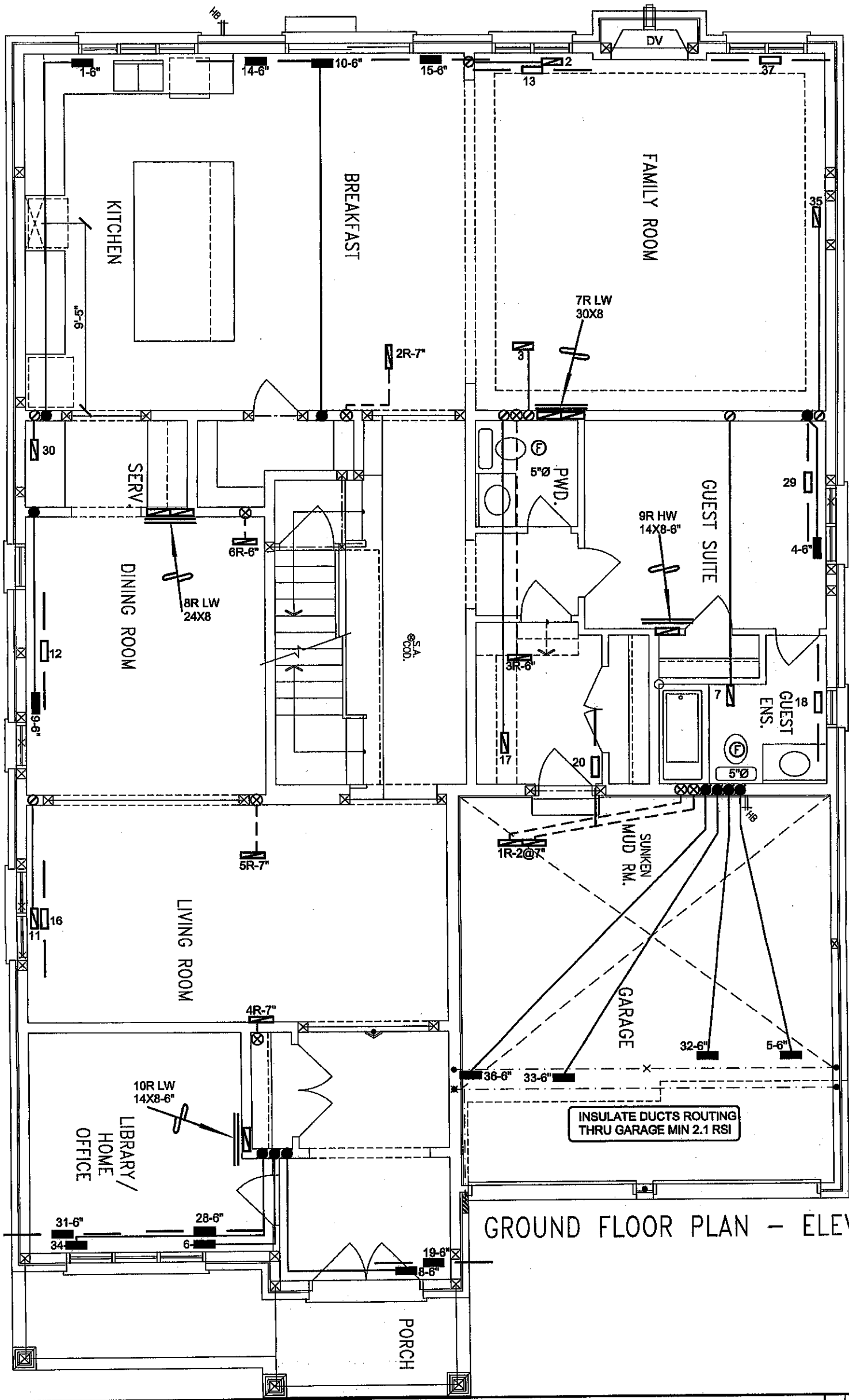
CSA-F280-12

WUB 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

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Client GREENPARK HOMES Project Name RUSSELL GARDENS PH. 4 HAMILTON, ONTARIO WUB GRANDVILLE 3 4609 sqft	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 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 69047 BTU/H UNIT DATA MAKE GOODMAN MODEL GMCE961005CNA INPUT 100 MBTU/H OUTPUT 96 MBTU/H COOLING 5.0 (2 STAGE) TONS FAN SPEED 1818 cfm @ 0.6" w.g.	# OF RUNS S/A R/A FANS 3RD FLOOR 2ND FLOOR 18 6 6 1ST FLOOR 12 4 3 BASEMENT 7 1 0 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	Sheet Title BASEMENT HEATING LAYOUT Date APR/2021 Scale 3/16" = 1'-0" BCIN# 19669 LO# 90147



GROUND FLOOR PLAN - ELEV. '1'

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.

CSA-F280-12

WUB

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

3.		
2.		
1.		
No.	Description	Date
REVISIONS		

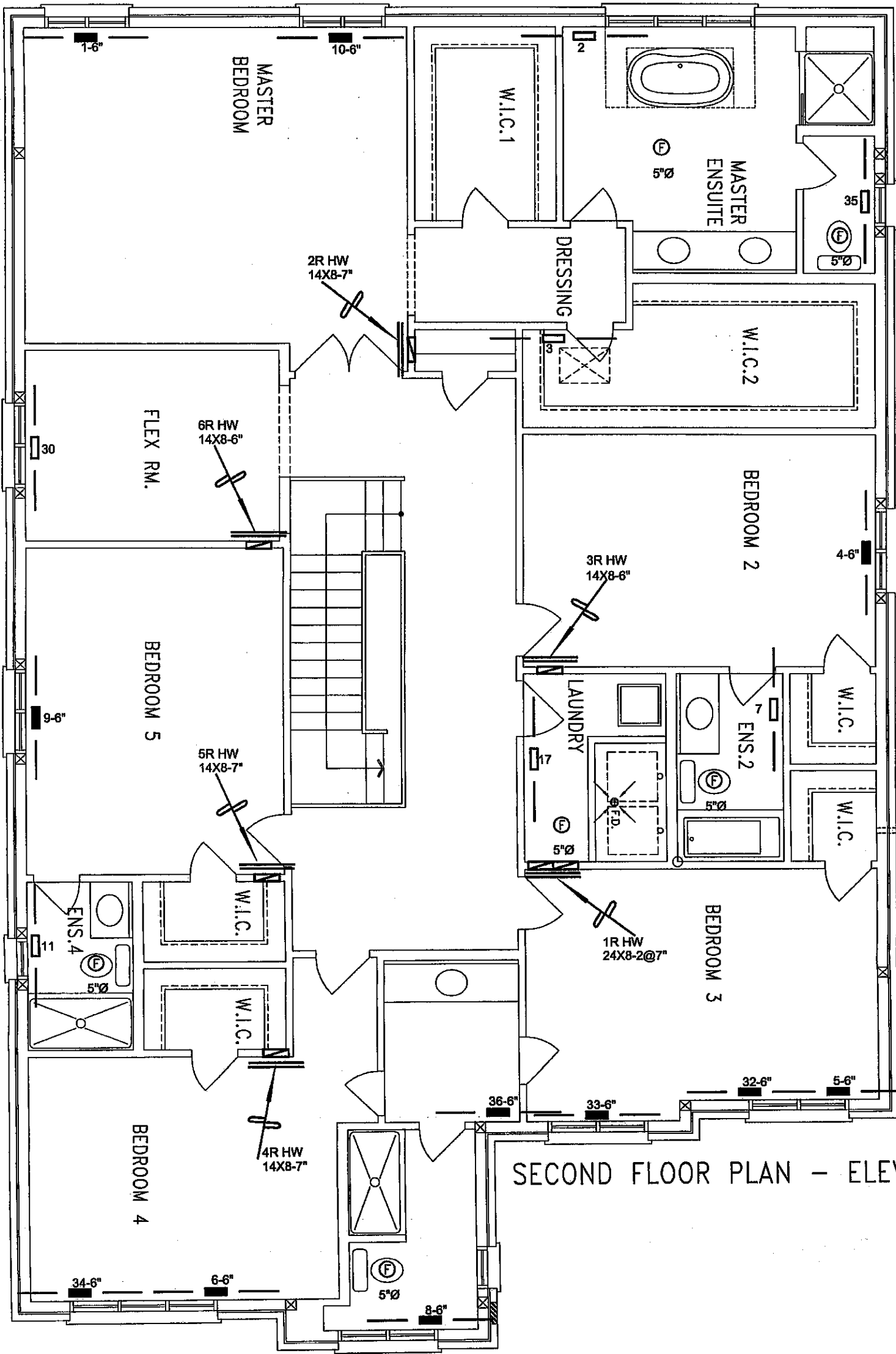
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Client
GREENPARK HOMES
Project Name
**RUSSELL GARDENS PH. 4
HAMILTON, ONTARIO**

**WUB
GRANDVILLE 3 4609 sqft**

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@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.

Sheet Title
**FIRST FLOOR
HEATING
LAYOUT**
Date
APR/2021
Scale
3/16" = 1'-0"
BCIN# 19669
LO# 90147



SECOND FLOOR PLAN - ELEV. '1'

I MICHAEL OROURKE 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, BSCM 1969
HVAC DESIGNS LTD.

CSA-F280-12

WUB

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

3.		
2.		
1.		
No.	Description	Date

REVISIONS

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Client
GREENPARK HOMES
Project Name
**RUSSELL GARDENS PH. 4
HAMILTON, ONTARIO**
**WUB
GRANDVILLE 3 4609 sqft**

HVAC DESIGNS LTD.

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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.

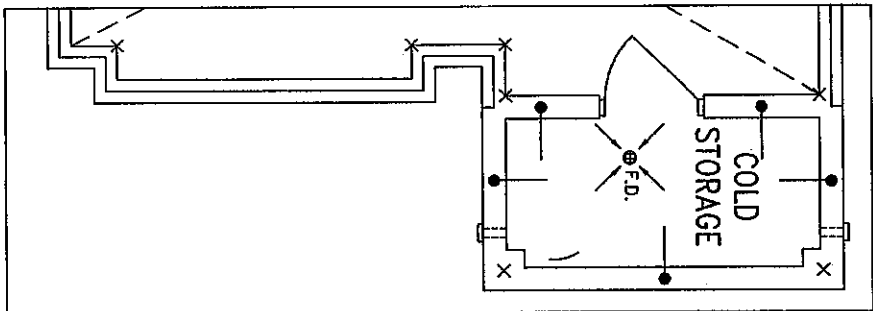
Sheet Title
**SECOND FLOOR
HEATING
LAYOUT**

Date **APR/2021**

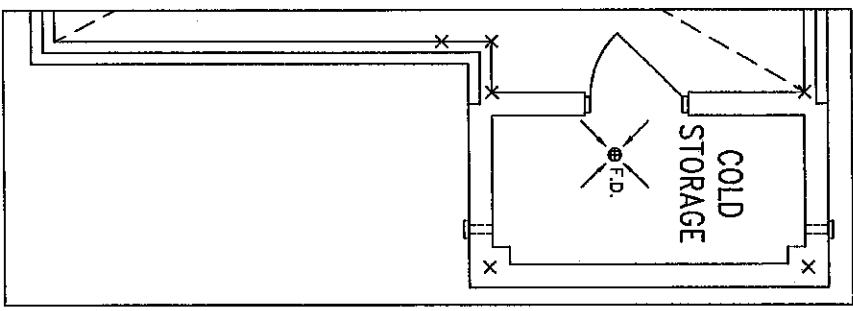
Scale **3/16" = 1'-0"**

BCIN# 19669

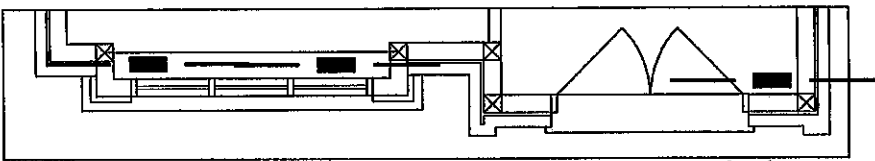
LO# **90147**



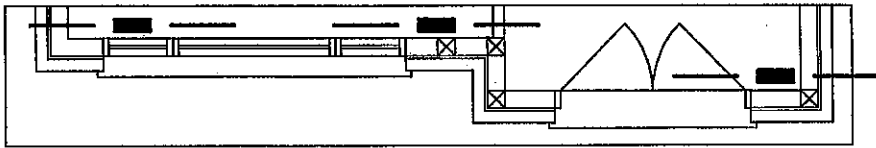
BASEMENT PLAN - ELEV. '2'



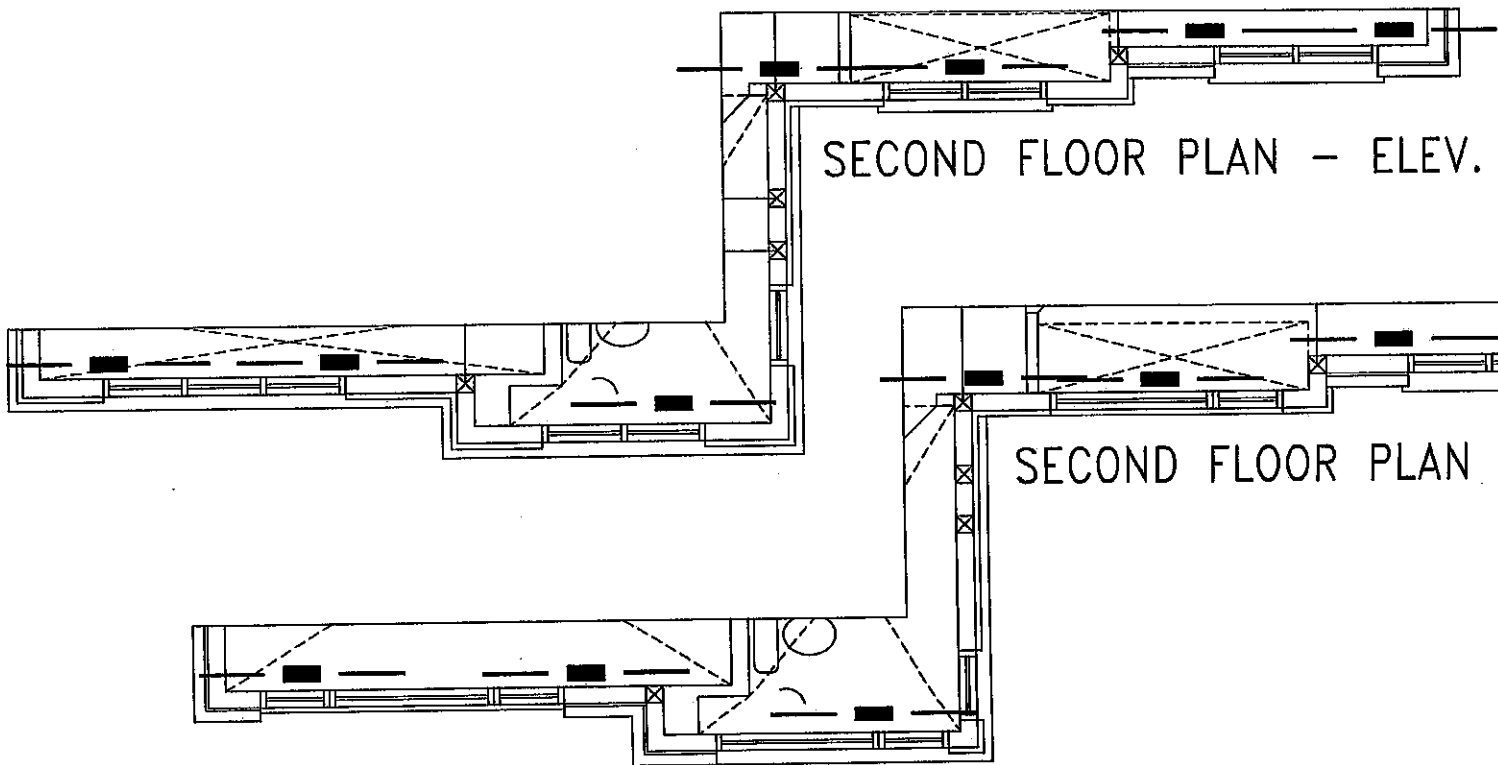
BASEMENT PLAN - ELEV. '3'



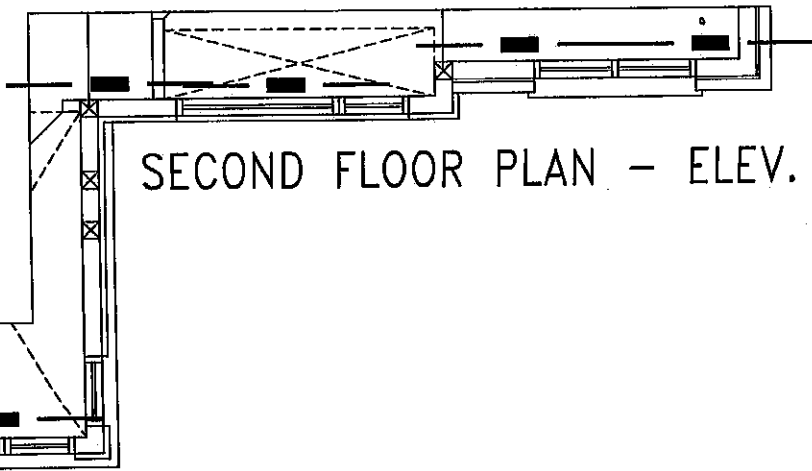
GROUND FLOOR PLAN - ELEV. '2'



GROUND FLOOR PLAN - ELEV. '3'



SECOND FLOOR PLAN - ELEV. '2'



SECOND FLOOR PLAN - ELEV. '3'

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.

CSA-F280-12

WUB

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

3.		
2.		
1.		
No.	Description	Date

REVISIONS

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Client
GREENPARK HOMES

Project Name
**RUSSELL GARDENS PH. 4
HAMILTON, ONTARIO**

**WUB
GRANDVILLE 3 4609 sqft**

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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
**THIRD FLOOR
HEATING
LAYOUT**

Date **APR/2021**

Scale **3/16" = 1'-0"**

BCIN# 19669

LO# 90147