

SITE NAME: RUSSELL GARDENS PH 4				WUB				DATE: JUL-21				WINTER NATURAL AIR CHANGE RATE 0.310				HEAT LOSS AT °F. 71				CSA-F280-12														
BUILDER: GREENPARK HOMES				TYPE: MOUNTAINASH 12				GFA: 3136				LO# 91960				SUMMER NATURAL AIR CHANGE RATE 0.111				HEAT GAIN AT °F. 13				SS-12 PACKAGE A1										
ROOM USE		EXP. WALL		CLG. HT.		MBR		ENS		WIC		BED-2		BED-3		BED-4		S-ENS		WIC-3		FLEX		ENS-3										
						42		25		8		10		26		29		8		5		16		5										
						9		9		9		9		9		9		9		9		9		9										
FACTORS		LOSS		GAIN		378		225		72		90		234		261		54		45		144		45										
GLAZING						LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN										
NORTH		19.8	16.0	0	0	0	0	0	0	0	0	0	16	358	268	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	7	138	112	0	0	0	0	0	0	0	0						
SOUTH		19.8	24.9	0	0	0	0	27	534	672	0	0	0	45	890	1870	30	593	1247	0	0	0	10	198	416	0	0	0	0					
WEST		19.8	41.6	42	830	1746	24	474	997	0	0	0	0	0	0	0	13	257	324	0	0	0	42	830	1046	12	237	299						
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						
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						
NET EXPOSED WALL		4.1	0.8	336	1393	253	174	721	131	72	296	54	72	298	54	188	784	142	218	904	164	47	195	35	35	145	26	102	423	77	33	137	25	
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		
EXPOSED CLG		1.2	0.6	348	415	204	150	179	86	105	125	62	210	250	123	165	185	91	180	215	105	111	132	65	46	55	27	235	280	138	47	58	28	
NO ATTIC EXPOSED CLG		2.6	1.3	0	0	0	0	0	0	0	0	0	0	0	0	16	41	20	26	71	35	0	0	0	0	0	36	89	44	8	20	10		
EXPOSED FLOOR		2.4	0.4	0	0	0	0	0	0	0	0	0	79	187	34	171	405	73	0	0	0	111	263	48	46	109	20	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS																																		
SLAB ON GRADE HEAT LOSS																																		
SUBTOTAL HT LOSS							2638		1908		424		1092		2304		2040		729		507		1623		450									
SUB TOTAL HT GAIN								2202		1888		116		499		2197		1875		260		499		1305		361								
LEVEL FACTOR / MULTIPLIER				0.20	0.24					0.20	0.24		0.20	0.24		0.20	0.24		0.20	0.24		0.20	0.24		0.20	0.24		0.20	0.24					
AIR CHANGE HEAT LOSS						630			455		101		281		550		487		174		121		397		108									
AIR CHANGE HEAT GAIN							133			114		7		30		133		114		16		30		79		22								
DUCT LOSS						0			0		0		135		285		0		90		63		0		0									
DUCT GAIN						0			0		0		139		319		0		90		63		0		0									
HEAT GAIN PEOPLE		240		2		480		0		0		0	1		240		1		240		1		240		0		0		0		0		0	
HEAT GAIN APPLIANCES/LIGHTS						617			0		0		617		617		617		617		617		617		617		617		617		617		617	
TOTAL HT LOSS BTU/H						3268			2364		525		1488		3138		2827		993		690		2010		558									
TOTAL HT GAIN x 1.3 BTU/H						4482			2604		160		1982		4507		3699		384		741		2601		488									

ROOM USE	EXP. WALL	CLG. HT.	FAM	DIN	K/D	L/H	LND	WR	FOY										
			36	19	37	28	9	40	21										
			10	10	10	10	9	11	10										
FACTORS		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN	
GRS.WALL AREA		360		180		370		280		0		440		210					
GLAZING		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
EAST	19.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	19.8	24.9	32	633	797	58	1147	1444	0	0	0	0	0	0	0	0	0	0	0
WEST	19.8	41.6	28	554	1163	0	0	0	0	0	0	0	0	0	0	0	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
DOORS	23.5	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.1	0.8	300	1244	225	132	547	99	297	1231	223	208	862	166	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
EXPOSED CLG	1.2	0.6	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
EXPOSED FLOOR	2.4	0.4	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
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			2430		1684		2674		1852		87		2320		1737				
SUB TOTAL HT GAIN				2186		1543		3257		2081		43		607		443			
LEVEL FACTOR / MULTIPLIER	0.30	0.39			0.30	0.39			0.30	0.39			0.30	0.39					
AIR CHANGE HEAT LOSS			937		653		1032		753		21		895		670				
AIR CHANGE HEAT GAIN				132		93		197		126		3		31		27			
DUCT LOSS			0		0		0		0		0		0		0				
DUCT GAIN			0		0		0		0		0		0		0				
HEAT GAIN PEOPLE	240		0		0		0		0		0		0		0				
HEAT GAIN APPLIANCES/LIGHTS					617		617		617		617		617		617				
TOTAL HT LOSS BTU/H			3367		2347		3708		2704		108		3215		2407				
TOTAL HT GAIN x 1.3 BTU/H			3816		2930		5292		3671		861		689		610				

TOTAL HEAT GAIN BTU/H:

41937

TONS: 3.48

LOSS DUE TO VENTILATION LOAD BTU/H: 1915

STRUCTURAL HEAT LOSS: 52384

TOTAL COMBINED HEAT LOSS BTU/H: 63880

SITE NAME: RUSSELL GARDENS PH 4
BUILDER: GREENPARK HOMES

WUB
TYPE: MOUNTAINASH 12

DATE: Jul-21

GFA: 3135 LO# 91960

HEATING CFM 1504 COOLING CFM 1504
TOTAL HEAT LOSS 52,364 TOTAL HEAT GAIN 41,682
AIR FLOW RATE CFM 28.72 AIR FLOW RATE CFM 36.1

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

AFUE = 96 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 76,800

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	15	9	5
R/A	0	0	6	2	1

plenum pressure s/a 0.18 r/a pressure 0.17
max s/a dlf press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.18 adjusted pressure r/a 0.15

LOW 868
MEDLOW 978
MEDIUM 1112
MEDIUM HIGH 1504
HIGH 1615

DESIGN CFM = 1504
CFM @ .6" E.S.P.

TEMPERATURE RISE 47 °F

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	S-ENS	WIC-3	FLEX	MBR	ENS-3	FAM	DIN	K/D	K/D	L/H	LND	W/R	FOY	L/H	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.63	2.36	0.52	1.49	1.57	1.26	0.50	0.69	2.01	1.63	0.58	1.68	2.35	1.85	1.85	1.35	0.11	3.21	2.41	1.35	3.39	3.39	3.39	3.39
CFM PER RUN HEAT	47	68	15	43	45	36	14	20	58	47	16	48	67	53	53	39	3	92	69	39	97	97	97	97
RM GAIN MBH.	2.23	2.60	0.16	1.98	2.28	1.85	0.20	0.74	2.60	2.23	0.50	1.91	2.93	2.65	2.65	1.84	0.86	0.70	0.61	1.84	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	81	94	6	72	82	67	7	27	94	81	18	69	106	98	98	86	31	25	22	66	15	15	15	15
ADJUSTED PRESSURE	0.16	0.16	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	37	41	31	31	54	57	46	48	41	28	57	32	30	23	16	49	19	19	42	35	20	46	31	35
EQUIVALENT LENGTH	170	120	190	190	140	180	170	130	150	120	210	140	130	120	110	130	110	160	180	130	130	140	150	180
TOTAL EFFECTIVE LENGTH	207	161	221	221	194	237	216	178	191	148	267	172	160	143	126	179	129	179	222	165	150	186	181	215
ADJUSTED PRESSURE	0.08	0.1	0.08	0.08	0.08	0.07	0.08	0.1	0.08	0.11	0.08	0.1	0.1	0.11	0.13	0.1	0.13	0.09	0.08	0.1	0.11	0.09	0.09	0.08
ROUND DUCT SIZE	6	6	4	5	8	6	4	4	6	6	4	5	6	8	6	5	4	6	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	240	347	172	316	229	184	161	229	296	240	184	352	342	270	270	286	34	469	507	286	495	495	495	495
COOLING VELOCITY (ft/min)	413	479	69	529	418	342	80	310	479	413	207	507	540	489	489	485	356	127	162	485	76	76	76	76
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	C	C	B	B	A	B	B	C	D	A	C	C	D	D	A	E	B	A	A	D	C	C	A

RUN #	25	26	27	28	29
ROOM NAME	BAS	BED-3	BED-4	S-ENS	FAM
RM LOSS MBH.	3.39	1.57	1.26	0.50	1.68
CFM PER RUN HEAT	97	45	36	14	48
RM GAIN MBH.	0.42	2.28	1.85	0.20	1.91
CFM PER RUN COOLING	15	82	67	7	69
ADJUSTED PRESSURE	0.16	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH.	45	49	55	46	29
EQUIVALENT LENGTH	120	170	200	110	150
TOTAL EFFECTIVE LENGTH	165	219	255	156	179
ADJUSTED PRESSURE	0.1	0.07	0.07	0.11	0.1
ROUND DUCT SIZE	6	6	6	4	5
HEATING VELOCITY (ft/min)	495	229	184	161	352
COOLING VELOCITY (ft/min)	76	418	342	80	507
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10
TRUNK	A	B	A	B	C

SUPPLY AIR TRUNK SIZE								RETURN 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	429	0.06	11	14	x	8	552	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	702	0.06	13.2	20	x	8	632	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	498	0.08	10.8	14	x	8	640	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	297	0.08	8.9	10	x	8	535	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	798	0.08	12.9	20	x	8	718	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 #	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	105	260	85	75	75	85	155	435	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	34	49	56	57	63	64	33	31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	155	225	175	220	215	195	200	195	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	189	274	231	277	278	259	233	226	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.08	0.05	0.06	0.05	0.05	0.06	0.06	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	8	9.5	6	6	6	6	7.5	10.6	0	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	0	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	30	14	14	14	14	14	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: MOUNTAINASH 12
SITE NAME: RUSSELL GARDENS PH 4

LO # 91860
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	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	6	@ 10.6 cfm	63.6	cfm
Table 9.32.3.A	TOTAL		190.8	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		79.5	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5		
Total Ventilation Capacity	190.8	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	111.3	cfm

PRINCIPAL EXHAUST FAN CAPACITY			
Model:	VANEE V150H	Location:	BSMT
79.5	cfm	3.0	sones
☒ HVI Approved			

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
79.5 CFM	X 71 F	X 1.08	X	0.25

SUPPLEMENTAL FANS PANASONIC				
Location	Model	cfm	HVI	Sones
ENS	FV-05-11VK1	50	☒	0.3
S-ENS	FV-05-11VK1	50	☒	0.3
ENS-3	FV-05-11VK1	50	☒	0.3
WR	FV-05-11VK1	50	☒	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11			
Model:	VANEE V150H		
150	cfm high	35	cfm low
75	% 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:	July-21

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

LO#: 91960

Model: MOUNTAINASH 12

Builder: GREENPARK HOMES

Date: 2021-07-28

Volume Calculation
House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1390	9	12510
First	1390	10	13900
Second	1744	9	15696
Third	0	9	0
Fourth	0	9	0
Total:			42,106.0 ft³
Total:			1192.3 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

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

$$0.310 \times 331.20 \times 39^\circ\text{C} \times 1.2 = 4827 \text{ W}$$

$$= 16469 \text{ Btu/h}$$

6.2.6 Sensible Gain due to Air Leakage

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

$$0.111 \times 331.20 \times 7^\circ\text{C} \times 1.2 = 313 \text{ W}$$

$$= 1069 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

$$80 \text{ CFM} \times 71^\circ\text{F} \times 1.08 \times 0.25 = 1515 \text{ Btu/h}$$

6.2.7 Sensible heat Gain due to Ventilation

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

$$80 \text{ CFM} \times 13^\circ\text{F} \times 1.08 \times 0.25 = 275 \text{ Btu/h}$$

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: (HLlevel)	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	16,469	8,716	0.945
2	0.3		12,806	0.386
3	0.2		13,801	0.239
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: MOUNTAINASH 12	WUB	BUILDER: GREENPARK HOMES
SFQT: 3135	LO# 91960	SITE: RUSSELL 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:	SOUTH	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):	42106.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
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: 51.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	149.0 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	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

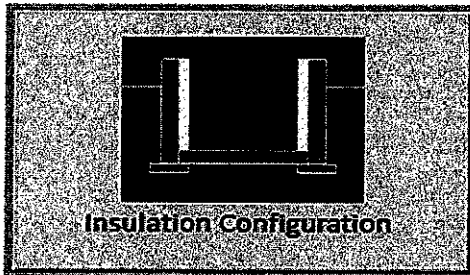
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

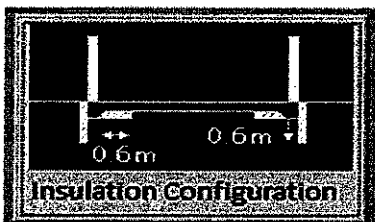
Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	15.5	 Insulation Configuration
Floor Width (m):	11.3	
Exposed Perimeter (m):	45.4	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.1	
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):	1430	

TYPE: MOUNTAINASH 12
LO# 91960

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):	1.8	 Insulation Configuration
Width (m):	4.6	
Exposed Perimeter (m):	8.2	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	70	

TYPE: MOUNTAINASH 12
LO# 91960

WUB

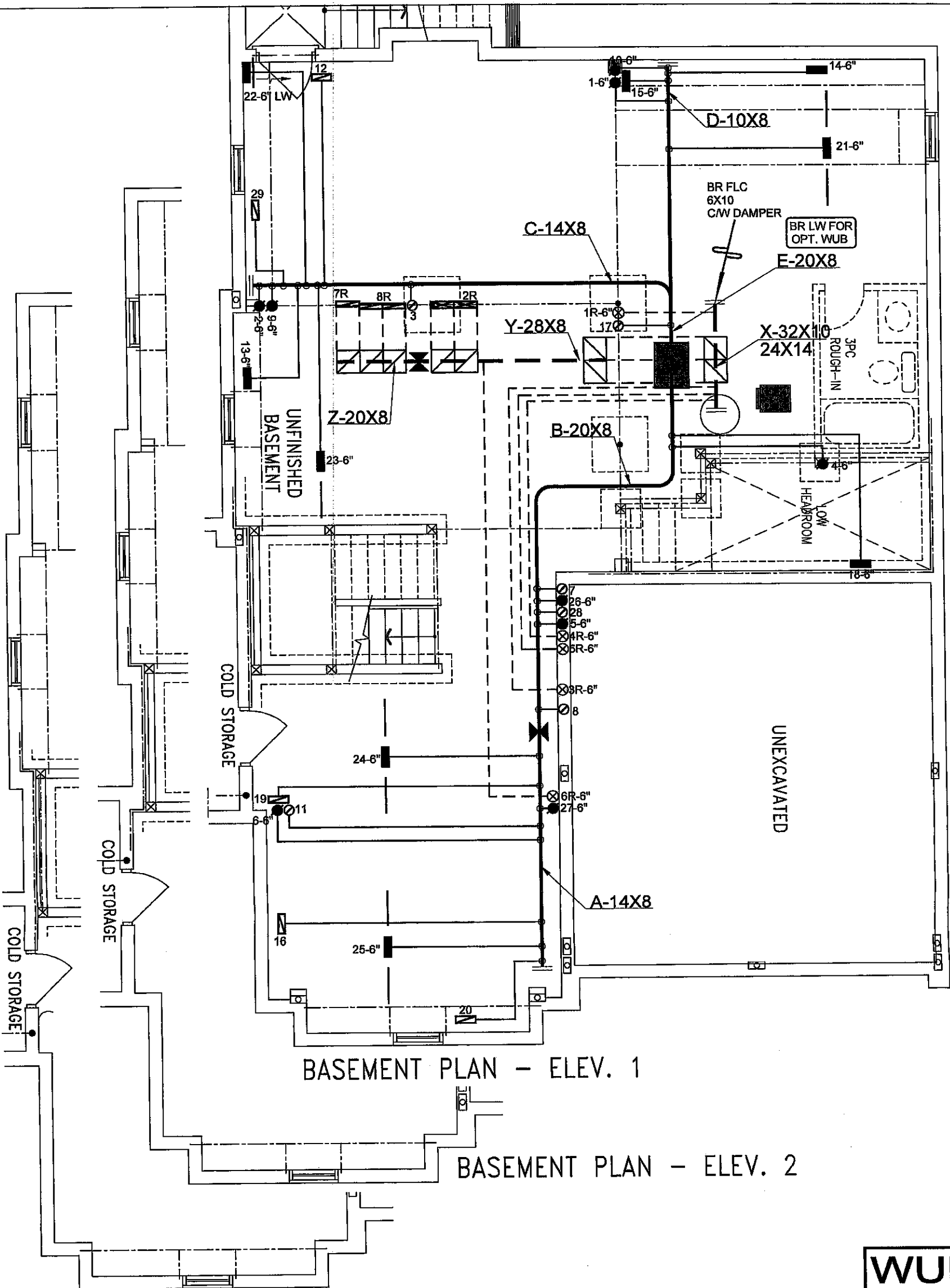
Air Infiltration Residential Load Calculator

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):	1192.3		
Air Leakage/Ventilation			
Air Tightness Type:	Present (1961-) (3.57 ACH)		
Custom BDT Data:	ELA @ 10 Pa.	1589.4 cm ²	
	3.57	ACH @ 50 Pa	
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust	
	37.5	37.5	
Flue Size			
Flue #:	#1	#2	#3 #4
Diameter (mm):	0	0	0 0
Natural Infiltration Rates			
Heating Air Leakage Rate (ACH/H):	0.310		
Cooling Air Leakage Rate (ACH/H):	0.111		

TYPE: MOUNTAINASH 12
LO# 91960

WUB



BASEMENT PLAN - ELEV. 1

BASEMENT PLAN - ELEV. 2

BASEMENT PLAN - ELEV. 3

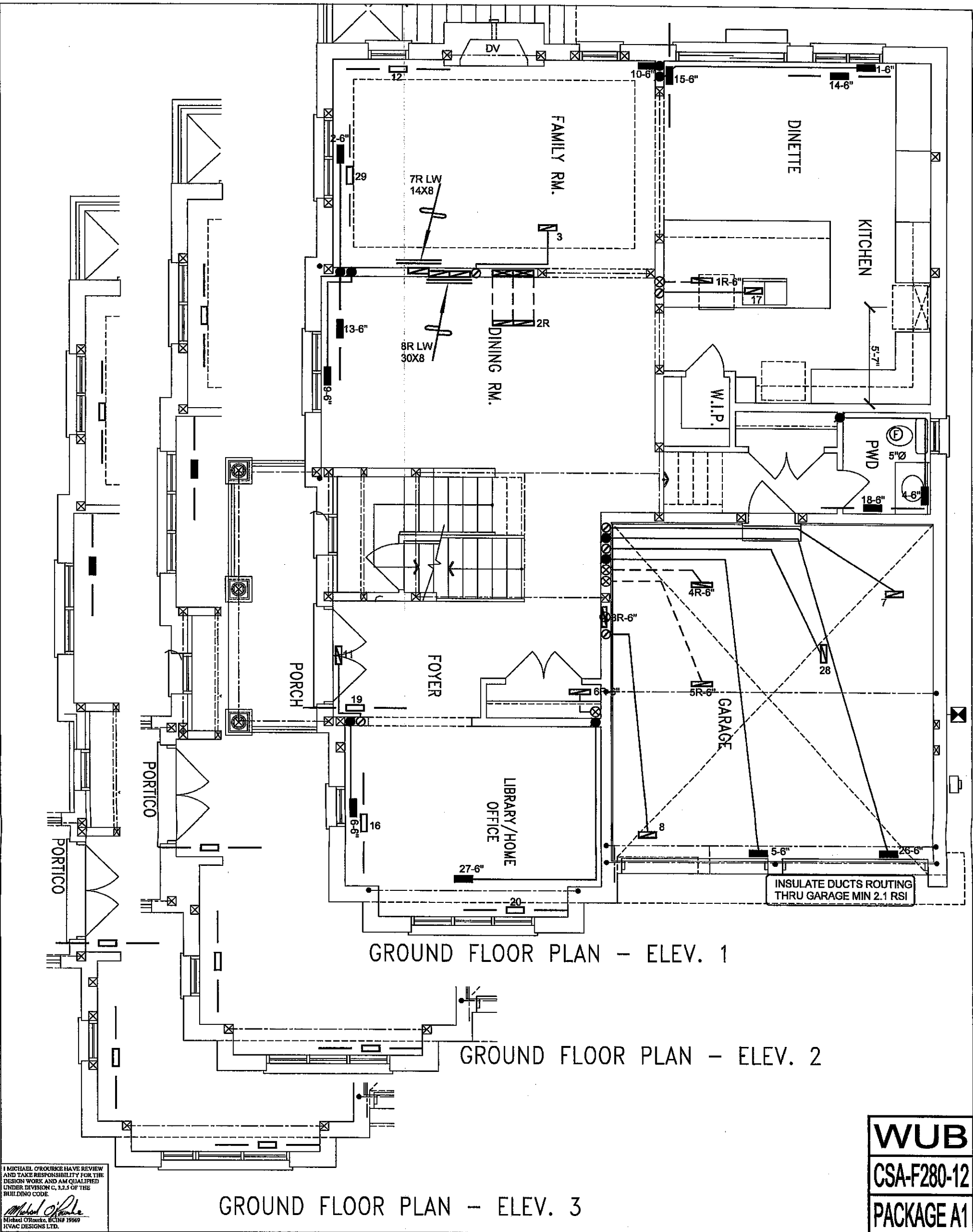
WUB
CSA-F280-12
PACKAGE A1

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 2.2.5 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
	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
						REVISIONS	
						No.	Description
							Date

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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.	HEAT LOSS 53880 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title BASEMENT HEATING LAYOUT	
GREENPARK HOMES		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.
		3RD FLOOR					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		
		2ND FLOOR		15	6	4			
		1ST FLOOR		9	2	2			
		BASEMENT		5	1	0			
Project Name	RUSSEL GARDENS PH 4 HAMILTON, ONTARIO		WUB MOUNTAINASH 12 3135 sqft		Date JULY/2021		Scale 3/16" = 1'-0"	BCIN# 19669	LO# 91960



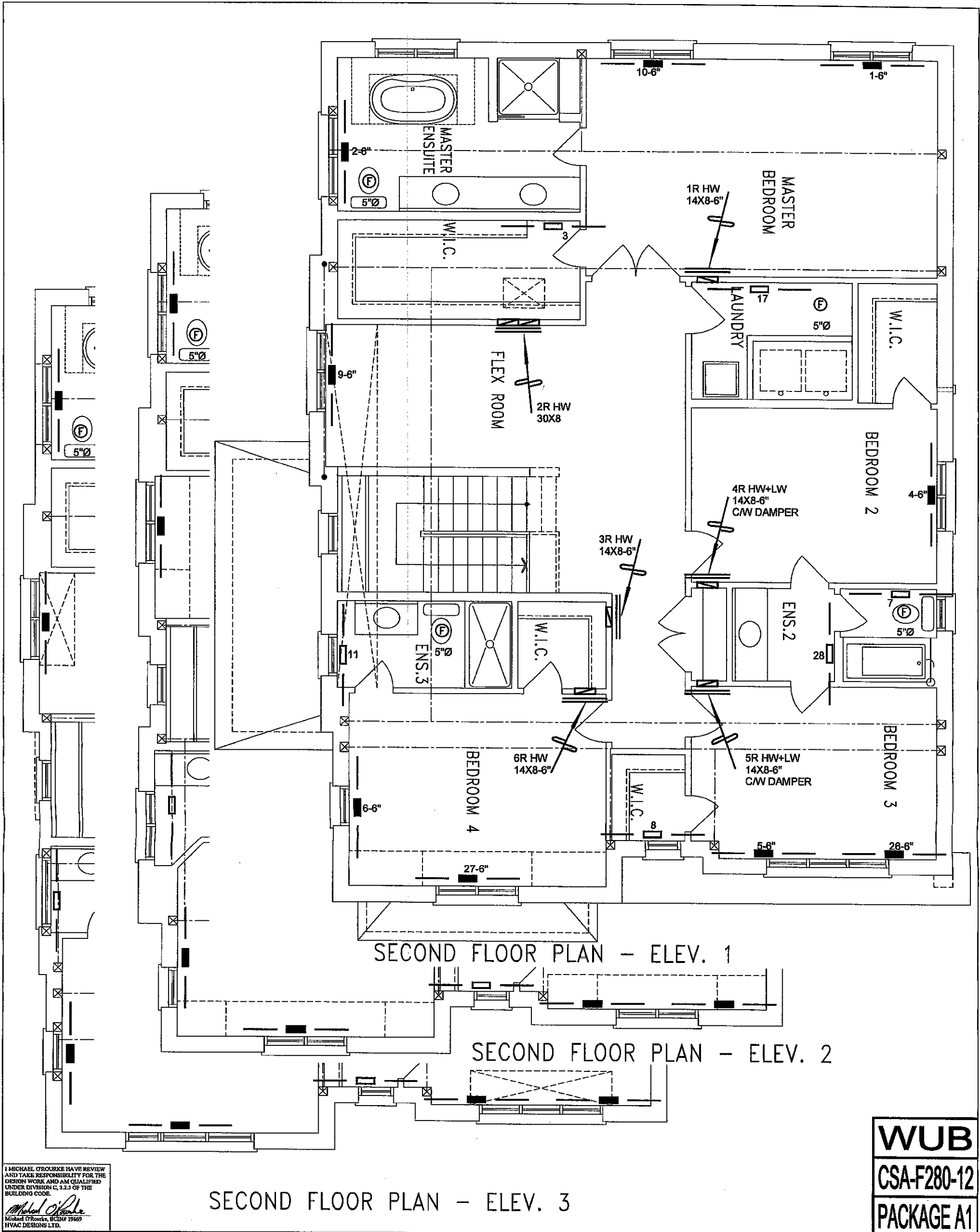
I MICHAEL O'Rourke HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.3 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

WUB
CSA-F280-12
PACKAGE A1

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

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Client GREENPARK HOMES Project Name RUSSEL GARDENS PH 4 HAMILTON, ONTARIO WUB MOUNTAINASH 12 3135 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@hvacdsgns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title FIRST FLOOR HEATING LAYOUT Date JULY/2021 Scale 3/16" = 1'-0" BCIN# 19669 LO# 91960
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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		8" 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@hvacdsgns.ca Web: www.hvacdsgns.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							SECOND FLOOR HEATING LAYOUT			
Project Name		WUB MOUNTAINASH 12 3135 sqft					Date			
RUSSEL GARDENS PH 4 HAMILTON, ONTARIO							JULY/2021			
							Scale			
							3/16" = 1'-0"			
							BCIN# 19669			
							LO#			
							91960			