

SITE NAME: RUSSEL GARDENS PH 4			OPT GROUND - WOB			DATE: Jul-21			WINTER NATURAL AIR CHANGE RATE 0.366			HEAT LOSS AT °F. 71			CSA-F280-12		
BUILDER: GREENPARK HOMES			TYPE: SPRINGFIELD 1S			LO# 81960			SUMMER NATURAL AIR CHANGE RATE 0.130			HEAT GAIN AT °F. 13			8B-12 PACKAGE A1		
ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-2	FLEX		ENS-3	LIV				
FACTORS			37	29	12	11	30	33	6	11		10	22				
GRS.WALL AREA	LOSS	GAIN	9	9	9	9	9	9	9	9		9	11				
GLAZING																	
NORTH	19.8	16.0	0	0	0	0	0	0	0	0		0	0				
EAST	19.8	41.6	32	833	1330	14	277	582	0	0		0	0				
SOUTH	19.8	24.9	0	0	0	7	136	174	0	0		0	0				
WEST	19.8	41.6	0	0	0	0	0	0	16	316	398	0	0				
SKYLT.	34.6	101.5	0	0	0	0	0	0	49	969	2036	42	839	1745			
DOORS	23.6	4.3	0	0	0	0	0	0	0	0		0	0				
NET EXPOSED WALL	4.1	0.6	301	1248	226	240	995	180	108	448	81	83	344	62			
NET EXPOSED BSMT WALL ABOVE GR	3.3	0.6	0	0	0	0	0	0	0	0		0	0				
EXPOSED CLG	1.2	0.6	355	423	209	193	230	113	80	95	47	234	278	138			
NO ATTIC EXPOSED CLG	2.6	1.3	0	0	0	0	0	0	0	0		40	102	50			
EXPOSED FLOOR	2.4	0.4	0	0	0	0	0	0	0	0		0	0				
BASEMENT/CRAWL HEAT LOSS			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				
SUBTOTAL HT LOSS			2304		1640	643		1494	2782								
SUB TOTAL HT GAIN				1765		1050		128	699		2464		2188	2085		417	621
LEVEL FACTOR / MULTIPLIER			0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32	549
AIR CHANGE HEAT LOSS			726		517		171		471		870		0.20	0.32		131	259
AIR CHANGE HEAT GAIN				126		74		9	49		174					18	38
DUCT LOSS			0		0		0		186		363					58	0
DUCT GAIN			0		0		0		150		339					27	0
HEAT GAIN PEOPLE	240		2	480	0	0	0	1	240		516					0	0
HEAT GAIN APPLIANCES/LIGHTS				516	0	0	0	1	240		516					0	0
TOTAL HT LOSS BTUH			3029		2167		714		2181		3898					1342	0
TOTAL HT GAIN x 1.3 BTUH				3781		1481		176	2151		4854					2582	516

ROOM USE	EXP. WALL	CLG. HT.	DIN	FAM	KT/BR	GUEST	LAUN		FOY	MUD							
FACTORS			26	35	37	10	0		21	13							
GRS.WALL AREA	LOSS	GAIN	10	10	10	10	0		11	11							
GLAZING																	
NORTH	19.8	16.0	21	415	335	0	0		0	0							
EAST	19.8	41.6	0	0	0	40	791	1682	73	1443	3033	0	0				
SOUTH	19.8	24.9	0	0	0	0	0	0	0	0		16	316	398			
WEST	19.8	41.6	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				
DOORS	23.6	4.3	0	0	0	0	0	0	0	0		0	0				
NET EXPOSED WALL	4.1	0.6	239	991	180	310	1285	233	297	1231	223	84	348	63			
NET EXPOSED BSMT WALL ABOVE GR	3.3	0.6	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				
NO ATTIC EXPOSED CLG	2.6	1.3	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				
BASEMENT/CRAWL HEAT LOSS			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				
SUBTOTAL HT LOSS			1406		2076		2674		885								
SUB TOTAL HT GAIN				515		1895		3257	462		44						
LEVEL FACTOR / MULTIPLIER			0.30	0.56		0.30	0.56		0.30	0.56		0.20	0.32		0.30	0.56	
AIR CHANGE HEAT LOSS			782		1154		1487		370		28						
AIR CHANGE HEAT GAIN				36		134		230	33		3						
DUCT LOSS			0		0		0		0		12						
DUCT GAIN			0		0		0		0		68						
HEAT GAIN PEOPLE	240		0	0	0	0	0	1	240		0						
HEAT GAIN APPLIANCES/LIGHTS				516		516		516	516		516						
TOTAL HT LOSS BTUH			2168		3230		4161		1094		130						
TOTAL HT GAIN x 1.3 BTUH				1398		3309		5204	1628		806						

TOTAL HEAT GAIN BTUH:

42876

TONS: 3.57

LOSS DUE TO VENTILATION LOAD BTUH: 1455

STRUCTURAL HEAT LOSS: 53972

TOTAL COMBINED HEAT LOSS BTUH: 55427

SITE NAME: RUSSEL GARDENS PH 4
 BUILDER: GREENPARK HOMES

 OPT GROUND - WOB
 TYPE: SPRINGFIELD 1S

DATE: Jul-21

GFA: 3392 LO# 91950

 HEATING CFM 1504 COOLING CFM 1504
 TOTAL HEAT LOSS 53,972 TOTAL HEAT GAIN 42,615
 AIR FLOW RATE CFM 27.87 AIR FLOW RATE CFM 35.29

 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

 AFUE = 96 %
 INPUT (BTU/H) = 80,000
 OUTPUT (BTU/H) = 78,800

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	3	1

 plenum pressure s/a 0.18 r/a pressure 0.17
 max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
 min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

 FAN SPEED
 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	ENS-2	FLEX	ENS	MBR	ENS-3	DIN	FAM	KT/BR	KT/BR	GUEST	LAUN	FAM	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.51	1.08	0.71	2.18	2.00	1.44	0.60	1.08	1.08	1.51	1.34	2.19	1.62	2.08	2.08	1.03	0.13	1.62	2.84	1.52	3.67	3.67	3.67	3.67
CFM PER RUN HEAT	42	30	20	60	56	40	17	30	30	42	37	61	45	58	58	29	4	45	79	42	102	102	102	102
RM GAIN MBH	1.88	0.73	0.18	2.15	2.43	1.94	0.38	1.42	0.73	1.88	2.01	1.39	1.65	2.60	2.80	1.63	0.81	1.65	0.78	0.25	1.17	1.17	1.17	1.17
CFM PER RUN COOLING	66	26	6	76	86	69	14	50	26	66	71	49	58	92	92	57	28	58	27	9	41	41	41	41
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	42	64	34	44	51	39	44	60	60	55	43	8	48	33	42	55	32	57	35	50	44	68	52	13
EQUIVALENT LENGTH	200	180	180	140	120	160	180	140	150	160	210	110	130	130	120	140	140	140	100	140	140	160	160	140
TOTAL EFFECTIVE LENGTH	242	244	214	184	171	199	204	200	210	215	253	118	178	183	182	195	172	197	175	150	184	208	212	153
ADJUSTED PRESSURE	0.07	0.07	0.08	0.09	0.09	0.09	0.08	0.09	0.08	0.08	0.07	0.15	0.1	0.1	0.1	0.09	0.1	0.09	0.1	0.11	0.09	0.08	0.08	0.11
ROUND DUCT SIZE	6	4	4	6	6	6	4	6	4	6	8	5	5	6	6	5	4	5	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	214	344	229	306	286	204	195	153	344	214	189	448	330	296	296	213	46	330	580	482	520	520	520	520
COOLING VELOCITY (ft/min)	337	298	69	388	438	352	161	255	298	337	362	360	426	469	469	419	321	426	198	103	209	209	209	209
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	A	B	D	D	C	D	A	A	B	C	D	B	B	B	A	D	A	C	B	B	A	A	D

RUN #	25	26	27	28	29
ROOM NAME	BAS	BED-3	BED-4	LIV	LIV
RM LOSS MBH	3.67	2.00	1.44	1.29	1.29
CFM PER RUN HEAT	102	56	40	36	36
RM GAIN MBH	1.17	2.43	1.94	1.65	1.65
CFM PER RUN COOLING	41	86	69	58	58
ADJUSTED PRESSURE	0.16	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH.	28	47	44	23	24
EQUIVALENT LENGTH	130	110	190	120	120
TOTAL EFFECTIVE LENGTH	158	157	234	143	144
ADJUSTED PRESSURE	0.1	0.1	0.07	0.12	0.12
ROUND DUCT SIZE	6	6	6	5	5
HEATING VELOCITY (ft/min)	520	286	204	264	264
COOLING VELOCITY (ft/min)	209	438	352	426	426
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10
TRUNK	C	D	C	C	C

SUPPLY AIR TRUNK SIZE

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	368	0.07	10	12	8
TRUNK B	777	0.07	13.2	20	8
TRUNK C	370	0.07	10	12	8
TRUNK D	726	0.07	12.9	20	8
TRUNK E	0	0.00	0	0	0
TRUNK F	0	0.00	0	0	0

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

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
AIR VOLUME	130	145	130	130	115	380	190	85	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.	94	51	55	45	72	19	51	60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	175	155	195	200	255	135	240	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	239	206	250	245	327	154	291	235	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.07	0.06	0.06	0.05	0.10	0.05	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	14.80	14.80
ROUND DUCT SIZE	7	7	7	7	7	9	8.5	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	6	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	14	14	14	14	30	24	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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
AIR VOLUME	130	145	130	130	115	380	190	85	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.	94	51	55	45	72	19	51	60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	175	155	195	200	255	135	240	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	239	206	250	245	327	154	291	235	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.07	0.06	0.06	0.05	0.10	0.05	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	14.80	14.80
ROUND DUCT SIZE	7	7	7	7	7	9	8.5	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	6	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	14	14	14	14	30	24	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: SPRINGFIELD 1S
SITE NAME: RUSSEL GARDENS PH 4

LO # 91950
OPT GROUND - 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	4 @ 10.6 cfm	42.4 cfm
Kitchen & Bathrooms	5 @ 10.6 cfm	53 cfm
Other Rooms	7 @ 10.6 cfm	74.2 cfm
Table 9.32.3.A.	TOTAL	212.0 cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		95.4 cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.6
Total Ventilation Capacity	212	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	116.6	cfm

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

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 CFM	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-3	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#: 91950

Model: SPRINGFIELD 1S

Builder: GREENPARK HOMES

Date: 2021-07-27

Volume Calculation
House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	1487	9	13383
First	1487	10	14870
Second	1905	9	17145
Third	0	9	0
Fourth	0	9	0
Total:			45,398.0 ft ³
Total:			1285.5 m ³

Air Change & Delta T Data

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

Design Temperature Difference				
	T _{in} °C	T _{out} °C	ΔT °C	ΔT °F
Winter DTD _h	22	-17	39	71
Summer DTD _c	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 357.09 x 39 °C x 1.2 = 6130 W

= 20914 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.130 x 357.09 x 7 °C x 1.2 = 398 W

= 1357 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

95 CFM x 71 °F x 1.08 x 0.20 = 1455 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

95 CFM x 13 °F x 1.08 x 0.20 = 264 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)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{cleve})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})
1	0.5	20,914	7,871	1.329
2	0.3		11,283	0.556
3	0.2		13,279	0.315
4	0		0	0.000
5	0		0	0.000

*HL_{airbv} = Air leakage heat loss + ventilation heat loss

*For a balanced or supply only ventilation system HL_{airve} = 0

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: SPRINGFIELD 1S	OPT GROUND - WOB	BUILDER: GREENPARK HOMES
SFQT: 3392	LO# 91950	SITE: RUSSEL GARDENS PH 4

DESIGN ASSUMPTIONS

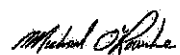
HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	1	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

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):	45398.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 53.0 ft	WIDTH: 38.0 ft	EXPOSED PERIMETER:	162.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	20.0 ft

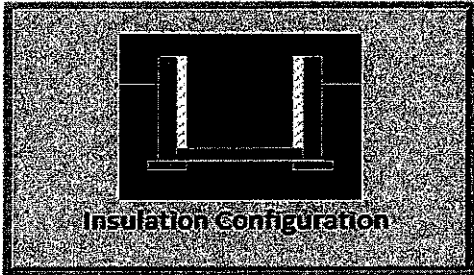
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		A1	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.65
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		22	17.03
Basement 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

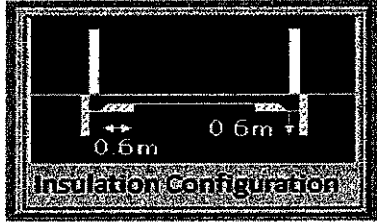
Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	4.6	 Insulation Configuration
Floor Width (m):	11.6	
Exposed Perimeter (m):	49.4	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.56	
Window Area (m ²):	0.8	
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):		899

TYPE: SPRINGFIELD 1S
LO# 91950

OPT GROUND - 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	
Width (m):	11.6	
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):		80

TYPE: SPRINGFIELD 1S
LO# 91950

OPT GROUND - WOB

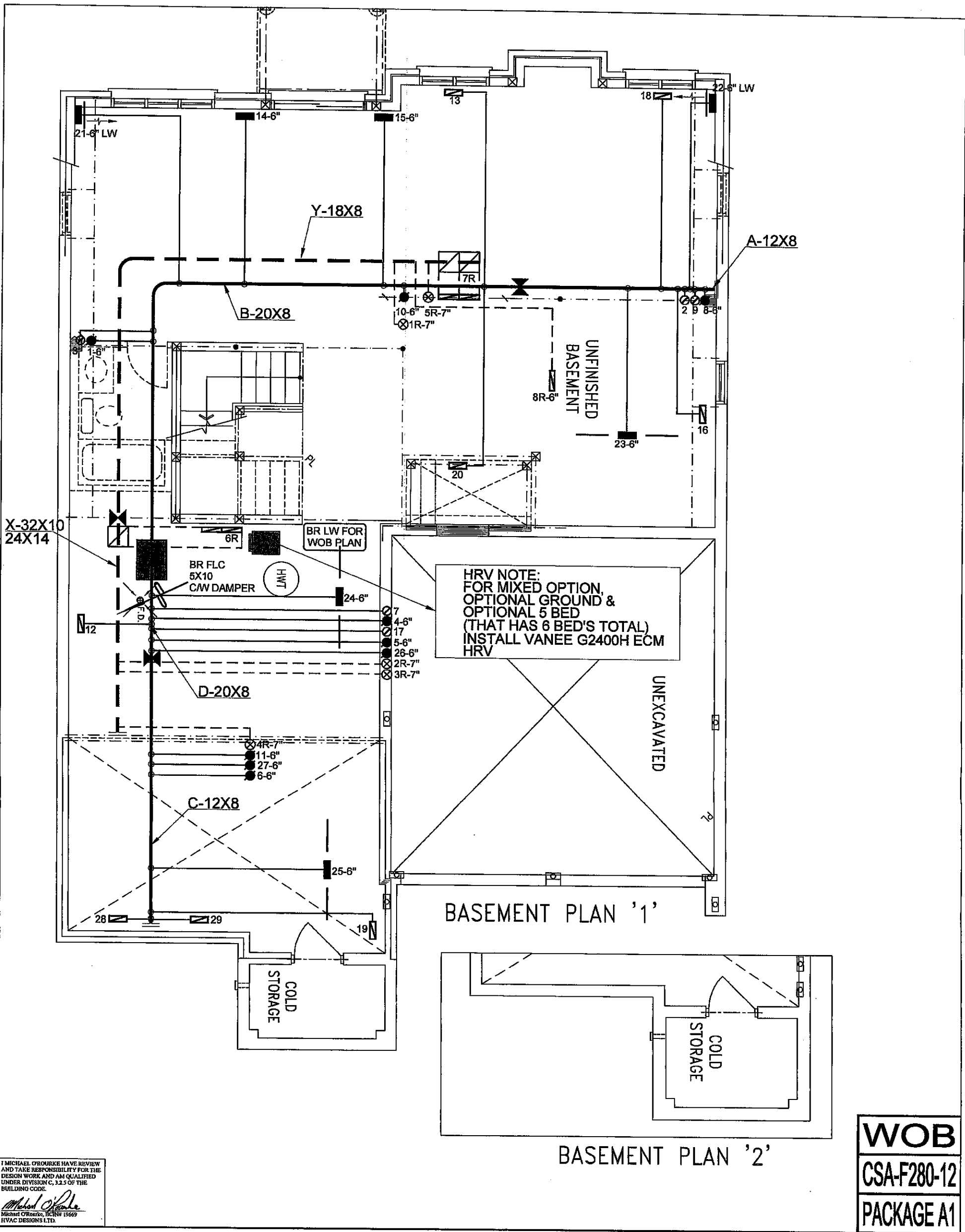
Air Infiltration Residential Load Calculator

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):	1285.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1713.6 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	45.0	45.0		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.365			
Cooling Air Leakage Rate (ACH/H):	0.130			

TYPE: SPRINGFIELD 1S
LO# 91950

OPT GROUND - WOB



I MICHAEL O'BROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 32.5 OF THE BUILDING CODE.

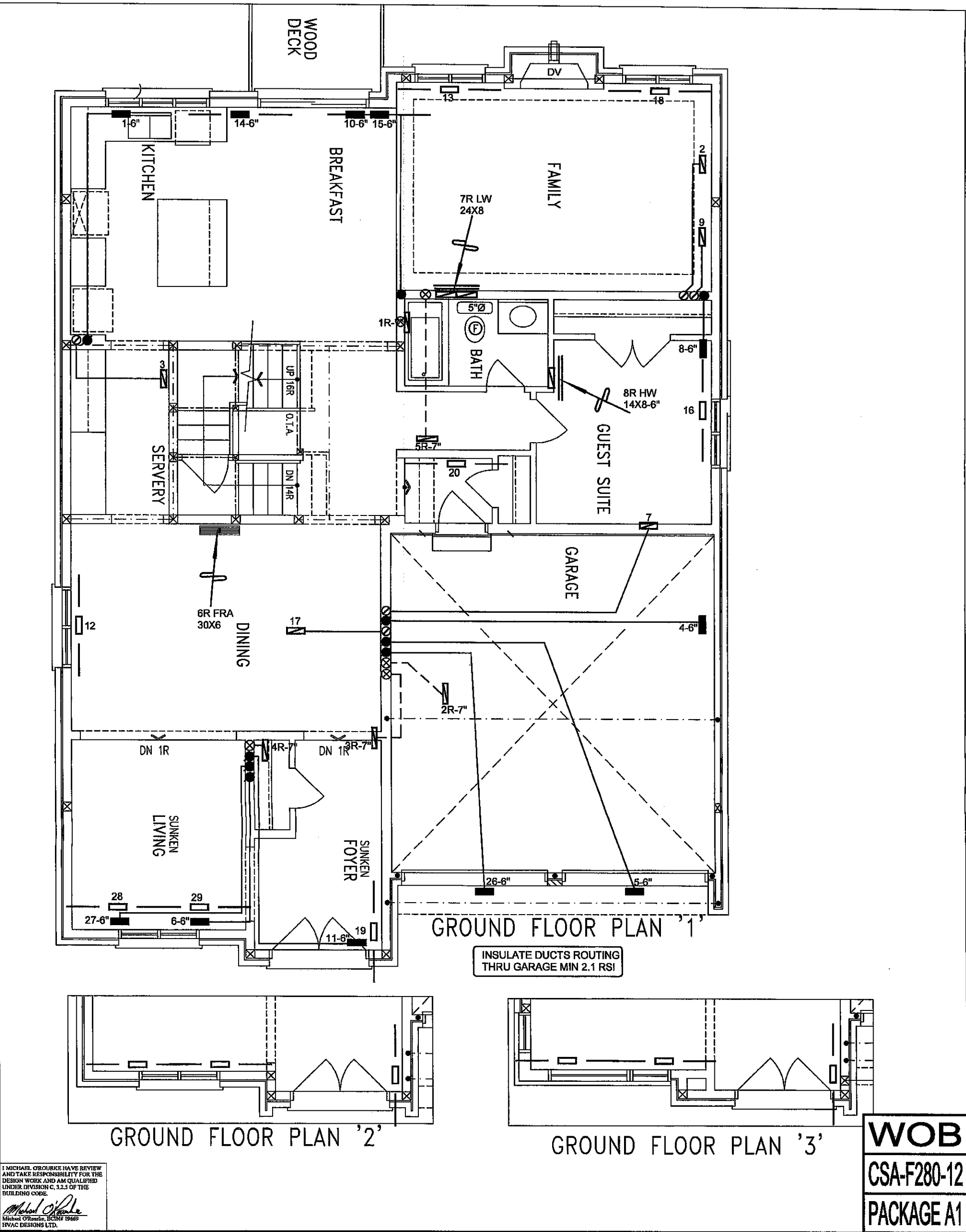
Michael O'Brourke
Michael O'Brourke, BCIN# 19669
HVAC DESIGNS LTD.

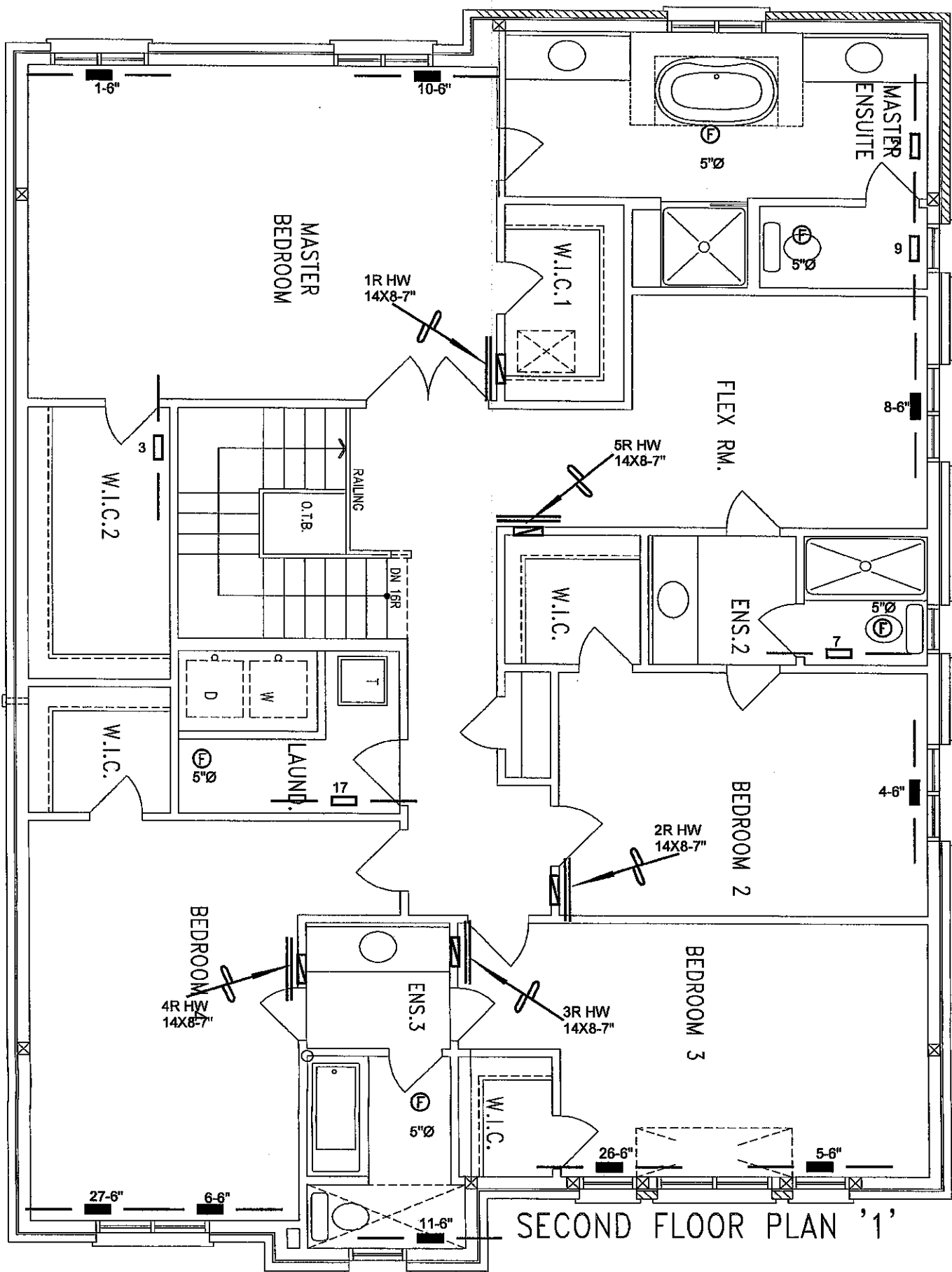
WOB
CSA-F280-12
PACKAGE A1

HVAC LEGEND						REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
	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		

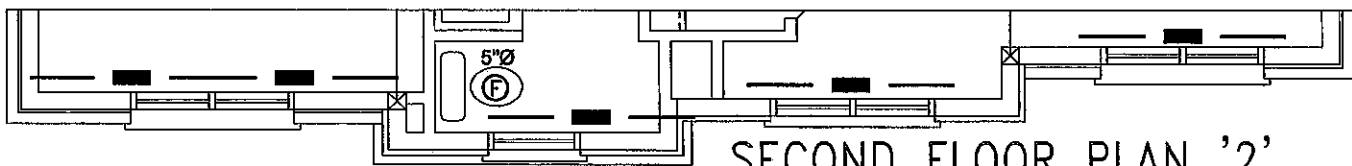
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Client GREENPARK HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 55427 BTU/H 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		
OPT GROUND - WOB SPRINGFIELD 1S 3392 sqft		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.	MODEL GMEC960804CNA		2ND FLOOR 14 5 5		Date JULY/2021
			INPUT 80 MBTU/H		1ST FLOOR 10 3 2		
			OUTPUT 76.8 MBTU/H		BASEMENT 5 1 0		Scale 3/16" = 1'-0"
			COOLING 3.5 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.				BCIN# 19669
							LO# 91950

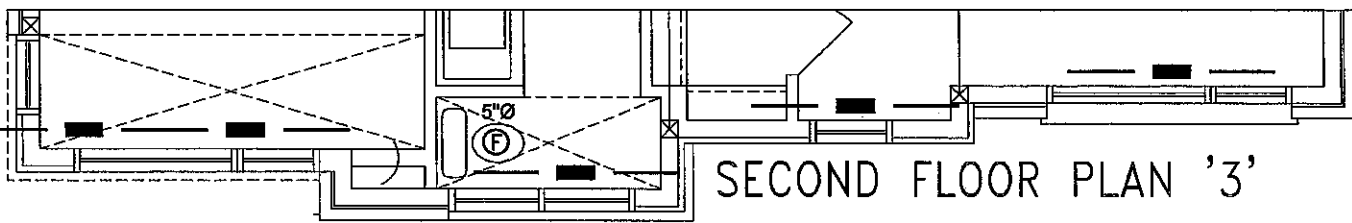




SECOND FLOOR PLAN '1'



SECOND FLOOR PLAN '2'



SECOND FLOOR PLAN '3'

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.32.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND						REVISIONS		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Description	Date
	SUPPLY AIR GRILLE		8" 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.		

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Client
GREENPARK HOMES
Project Name
**RUSSELL GARDENS PH 4
HAMILTON, ONTARIO**
**OPT GROUND - WOB
SPRINGFIELD 1S 3392 sqft**

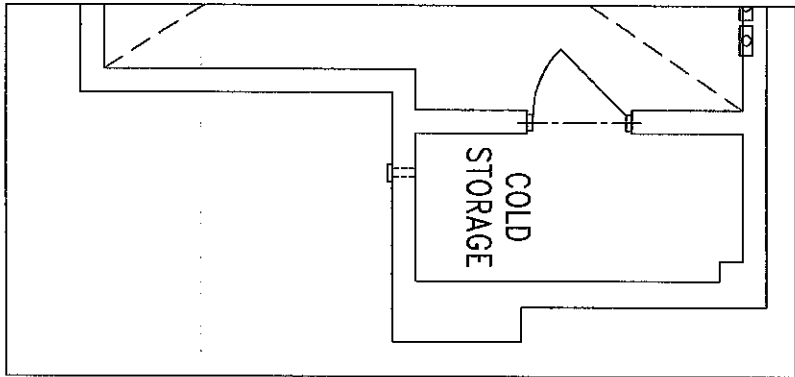
HVACDESIGNS LTD.

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

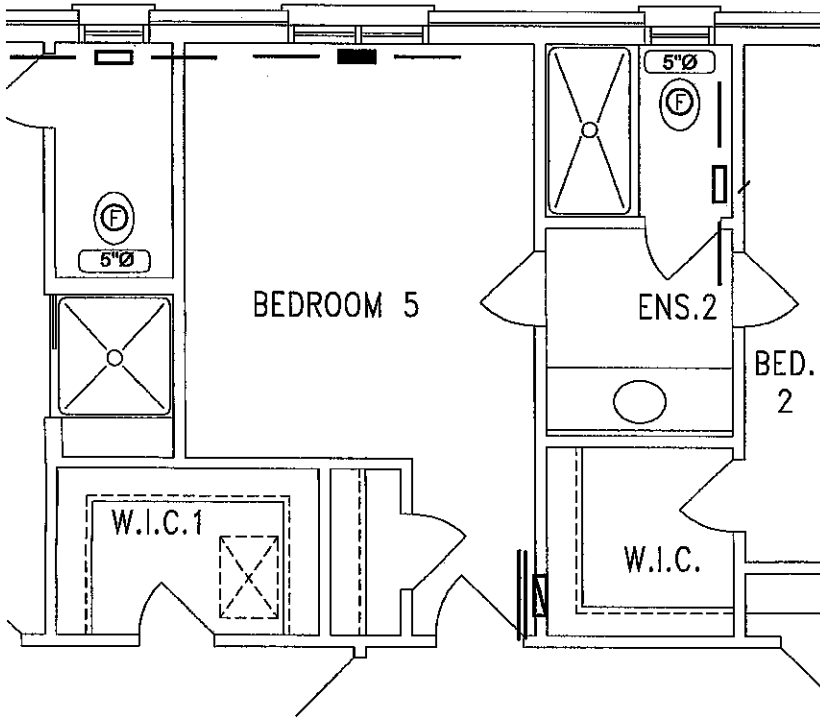
Specializing in Residential Mechanical Design Services

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
**SECOND FLOOR
HEATING
LAYOUT**
Date
JULY/2021
Scale
3/16" = 1'-0"
BCIN# 19669
LO# 91950



BASEMENT PLAN '3'



PARTIAL SECOND FLOOR PLAN '1'
W/ OPTIONAL 5 BEDROOM

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.

WOB
CSA-F280-12
PACKAGE A1

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

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Project Name RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			Date JULY/2021	
OPT GROUND - WOB SPRINGFIELD 1S 3392 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 91950	