HVA DESIGNS LTD.

4 BEDROOM - WOB

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SITE NAME: RUSSELL 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: MOUNTAINASH 5 ✓ — GFA: 3298 — LO# 91958 — 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			FLEX			WIC-3			S-ENS		
EXP. WALL			33			30			7			27			37			12			6			11			6			6		
CLG. HT.			9			9			9			9			9			9			9			9			9			9		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	297			270			63			243			333			108			54			99			45			54		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	19.8	15.1	0	0	0	14	277	212	0	0	0	13	257	197	0	0	0	0	0	0	7	138	106	16	316	242	0	0	0	0	0	0
EAST	19.8	39.0	0	0	0	0	0	0	0	0	0	48	949	1873	62	1226	2419	0	0	0	0	0	0	0	0	0	9	176	351	0	0	0
SOUTH	19.8	23.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	316	376	0	0	0	0	0	0	0	0	0	7	136	164
WEST	19.8	39.0	32	633	1249	14	277	546	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
DOORS	23.5	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.1	0.8	265	1099	199	242	1003	182	63	261	47	182	755	137	271	1123	204	92	381	69	47	195	35	83	344	62	36	149	27	47	195	35
NET EXPOSED BSMT WALL ABOVE GR	3.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.2	0.6	287	342	169	221	263	130	140	167	82	236	281	139	183	218	108	180	215	106	66	79	39	220	262	129	40	48	24	72	86	42
NO ATTIC EXPOSED CLG	2.6	1.3	0	0	0	0	0	0	0	0	0	16	41	20	45	115	57	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	241	571	104	0	0	0	0	0	0	68	161	29	69	163	30	40	95	17	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			2073			1820			428			2854			2682			912			573			1086			470			419		
SUB TOTAL HT GAIN				1616			1070			130			2469			2787			551			209			494			419			242
LEVEL FACTOR / MULTIPLIER			0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29	
AIR CHANGE HEAT LOSS				599			526			124			825			775			264			166			314			136			121		
AIR CHANGE HEAT GAIN					118			78			9			180			203			48			15			34			31			18
DUCT LOSS			0			0			0			368			0			0			74			140			91			0		
DUCT GAIN					0			0			0			349			0			0			22			59			45			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					803			0			0			603			603			603			0			0			0			0
TOTAL HT LOSS BTU/H			2073			2346			552			4048			3457			1176			813			1540			686			540		
TOTAL HT GAIN x 1.3 BTU/H				3663			1493			181			4994			4984			1864			321			711			643			338

ROOM USE			FAM			L/D			K/B			L/H			LND			W/R			FOY			MUD			WOB			BAS		
EXP. WALL			36			30			37			19			12			18			18			30			46			134		
CLG. HT.			10			10			10			10			9			10			10			11			9			9		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	360			300			370			190			108			180			180			330			414			871		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	19.8	15.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	138	106	0	0	0	3	59	45
EAST	19.8	39.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	19.8	23.5	0	0	0	40	791	939	0	0	0	13	257	305	7	138	164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST	19.8	39.0	40	791	1561	0	0	0	60	1186	2341	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	119	141
SKYLT.	34.6	101.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	1562	3083	0	0	0
DOORS	23.5	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.1	0.8	320	1327	241	260	1078	195	310	1285	233	177	734	133	101	419	76	158	655	119	134	556	101	323	1339	243	0	0	0	20	469	85
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	335	1389	252	0	0	0
EXPOSED CLG	1.2	0.6	0	0	0	0	0	0	0	0	0	0	0	0	180	215	106	0	0	0	0	0	0	0	0	0	0	0	0	335	1120	203
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	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	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						2329		
SUBTOTAL HT LOSS			2117			1869			2471			991			772			1090			1612			1477			615					
SUB TOTAL HT GAIN				1801			1135			2574			438			345			977			505			349			3565			4096	
LEVEL FACTOR / MULTIPLIER			0.30	0.53		0.30	0.53		0.30	0.53		0.30	0.53		0.20	0.29		0.30	0.53		0.30	0.53		0.30	0.53							3334			474
AIR CHANGE HEAT LOSS				1112			982			1298			521			223			573			847			776						0.50	1.33	
AIR CHANGE HEAT GAIN					131			83			166			32			25			71			37			25						19181	
DUCT LOSS			0			0			0			0			0			0			0			0									278
DUCT GAIN					0			0			0			0			0			0			0									0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	
HEAT GAIN APPLIANCES/LIGHTS					603			603			603			603			603			0			0									0	
TOTAL HT LOSS BTU/H			3230			2850			3770			1611			995			1663			2459			2254			0			0		
TOTAL HT GAIN x 1.3 BTU/H				3297			2367			4375			1396			1267			1363			704			487			3565			4335			1762

TOTAL HEAT GAIN BTU/H: 40816 — TONS: 3.40 — LOSS DUE TO VENTILATION LOAD BTU/H: 1516 — STRUCTURAL HEAT LOSS: 54383 — TOTAL COMBINED HEAT LOSS BTU/H: 55898

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

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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SITE NAME: RUSSELL GARDENS PH 4
BUILDER: GREENPARK HOMES

WOB
TYPE: MOUNTAINASH 5 DATE: Jul-21 GFA: 3298 LO# 91958

HEATING CFM	1504	COOLING CFM	1504
TOTAL HEAT LOSS	54,383	TOTAL HEAT GAIN	40,541
AIR FLOW RATE CFM	27.66	AIR FLOW RATE CFM	37.1

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
r/a pressure	0.17
max s/a dif press. loss	0.03
r/a grille press. Loss	0.02
min adjusted pressure s/a	0.15
adjusted pressure r/a	0.15

#"GOODMAN
GMEC960804CNA 80
FAN SPEED
LOW 868
MEDLOW 978
MEDIUM 1112
MEDIUM HIGH 1504
HIGH 1615

AFUE = 96 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 76,800
DESIGN CFM = 1504
CFM @ .6 " E.S.P.
TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	15	8	5
R/A	0	0	6	2	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	FLEX	WIC-3	MBR	S-ENS	FAM	L/D	K/B	K/B	L/H	LND	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.34	1.17	0.55	2.02	1.73	1.18	0.81	1.54	0.67	1.34	0.54	3.23	2.85	1.88	1.88	1.51	0.99	1.66	2.46	2.25	3.57	3.57	3.57	3.57
CFM PER RUN HEAT	37	32	15	56	48	33	22	43	18	37	15	89	79	52	52	42	28	46	68	62	99	99	99	99
RM GAIN MBH.	1.83	0.75	0.18	2.50	2.49	1.86	0.32	0.71	0.64	1.83	0.34	3.30	2.37	2.19	2.19	1.40	1.27	1.36	0.70	0.49	1.22	1.22	1.22	1.22
CFM PER RUN COOLING	68	28	7	93	92	69	12	26	24	68	13	122	88	81	81	52	47	51	26	18	45	45	45	45
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.15	0.16	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.	37	56	39	59	56	34	34	51	45	39	39	22	10	40	31	27	20	33	41	44	58	19	5	31
EQUIVALENT LENGTH	190	160	150	130	170	200	220	160	110	130	150	140	130	150	160	140	180	110	90	140	120	120	140	130
TOTAL EFFECTIVE LENGTH	227	216	189	189	226	234	254	211	155	169	189	162	140	190	191	167	200	143	131	184	178	139	145	161
ADJUSTED PRESSURE	0.08	0.08	0.09	0.09	0.07	0.07	0.07	0.08	0.11	0.1	0.09	0.09	0.12	0.09	0.08	0.1	0.09	0.12	0.13	0.09	0.09	0.12	0.11	0.1
ROUND DUCT SIZE	5	4	4	6	6	6	4	5	4	5	4	6	6	6	6	5	5	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	272	367	172	286	245	168	252	316	207	272	172	454	403	265	265	308	206	528	499	455	505	505	505	505
COOLING VELOCITY (ft/min)	499	321	80	474	469	352	138	191	275	499	149	622	449	413	413	382	345	585	191	132	229	229	229	229
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	A	B	D	C	C	C	A	D	B	D	B	D	A	A	C	B	C	C	A	A	B	D	C

RUN #	25	26	27	28
ROOM NAME	BED-2	BED-3	ENS	BAS
RM LOSS MBH.	2.02	1.73	1.17	3.57
CFM PER RUN HEAT	56	48	32	99
RM GAIN MBH.	2.50	2.49	0.75	1.22
CFM PER RUN COOLING	93	92	28	45
ADJUSTED PRESSURE	0.16	0.16	0.17	0.16
ACTUAL DUCT LGH.	52	48	52	37
EQUIVALENT LENGTH	120	170	130	150
TOTAL EFFECTIVE LENGTH	172	218	182	187
ADJUSTED PRESSURE	0.09	0.07	0.09	0.09
ROUND DUCT SIZE	6	6	4	6
HEATING VELOCITY (ft/min)	286	245	367	505
COOLING VELOCITY (ft/min)	474	469	321	229
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10
TRUNK	D	C	A	B

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	372	0.08	9.7	12	x	8	558	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	776	0.08	12.8	20	x	8	698	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	406	0.07	10.3	12	x	8	609	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	729	0.07	12.9	20	x	8	656	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	x	8	0

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	1359	0.05	17.7	28	x	10	699
TRUNK Y	895	0.05	15.1	26	x	8	620
TRUNK Z	505	0.05	12.2	18	x	8	505
DROP	1504	0.05	18.4	24	x	14	645

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	145	130	145	145	130	115	410	95	0	0	0	0	0	0	0	189
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
ACTUAL DUCT LGH.	41	52	53	58	53	59	45	41	1	1	1	1	1	1	1	15
EQUIVALENT LENGTH	185	195	165	165	215	265	165	190	0	0	0	0	0	0	0	150
TOTAL EFFECTIVE LH	226	247	218	223	268	324	210	231	1	1	1	1	1	1	1	165
ADJUSTED PRESSURE	0.07	0.06	0.07	0.07	0.06	0.05	0.07	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.4	6.2	0	0	0	0	0	0	0	7.3
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
INLET GRILL SIZE	X 14	X 14	X 14	X 14	X 14	X 14	X 30	X 14	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 14

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Michael O'Rourke - INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: MOUNTAINASH 5 LO # 91958
SITE NAME: RUSSELL GARDENS PH 4 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	3 ✓	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	5 ✓	@ 10.6 cfm	53	cfm
Other Rooms	7 ✓	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	201.4 ✓	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	201.4 ✓	cfm
Less Principal Ventil. Capacity	79.5 ✓	cfm
Required Supplemental Capacity	121.9 ✓	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
ENS-2	FV-05-11VK1	50 ✓	✓	0.3
S-ENS	FV-05-11VK1	50 ✓	✓	0.3
W/R	FV-05-11VK1	50 ✓	✓	0.3

200

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE V150H

150 cfm high 35 cfm low

75 ✓ % Sensible Efficiency @ 32 deg F (0 deg C) [✓] HVI Approved

LOCATION OF INSTALLATION

Lot: Concession

Township Plan:

Address

Roll # Building Permit #

BUILDER: GREENPARK HOMES

Name:

Address:

City:

Telephone #: Fax #:

INSTALLING CONTRACTOR

Name:

Address:

City:

Telephone #: Fax #:

DESIGNER CERTIFICATION

I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.

Name: HVAC Designs Ltd.

Signature: Michael O'Rourke.

HRAI # 001820

Date: July-21

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

INDIVIDUAL BCIN: 19569 Michael O'Rourke. MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 91958 Model: MOUNTAINASH 5 Builder: GREENPARK HOMES Date: 2021-07-28

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	1452	9	13068
First	1452	10	14520
Second	1846	9	16614
Third	0	9	0
Fourth	0	9	0
		Total:	44,202.0 ft^3
		Total:	1251.7 m^3

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 347.68 x 39 °C x 1.2 = 5968 W

= 20363 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.130 x 347.68 x 7 °C x 1.2 = 387 W

= 1321 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

80 CFM x 71 °F x 1.08 x 0.25 = 1515 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h

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

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

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	20,363	7,661	1.329
2	0.3		11,628	0.525
3	0.2		14,089	0.289
4	0		0	0.000
5	0		0	0.000

*HLairbv = Air leakage heat loss + ventilation heat loss
*For a balanced or supply only ventilation system HLairve = 0

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: MOUNTAINASH 5 WOB **BUILDER:** GREENPARK HOMES
SFQT: 3298 **LO#** 91958 **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:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft^3):	44202.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.5 ft
LENGTH: 54.0 ft	WIDTH: 36.0 ft	EXPOSED PERIMETER:	134.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	46.0 ft

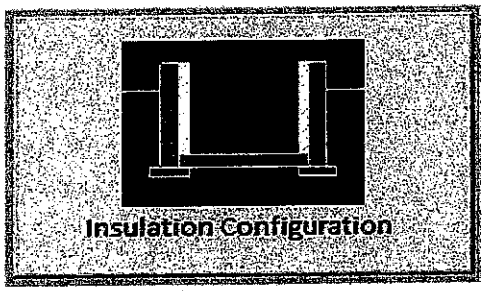
2012 OBC - COMPLIANCE PACKAGE Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls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

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

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	4.6	 Insulation Configuration
Floor Width (m):	11.0	
Exposed Perimeter (m):	40.8	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.68	
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):	**682**	

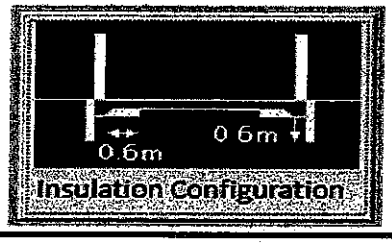
TYPE: MOUNTAINASH 5 WOB
LO# 91958

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

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):	11.0
Exposed Perimeter (m):	14.0



Radiant Slab	
Heated Fraction of the Slab:	0
Fluid Temperature (°C):	33
Design Months	
Heating Month	1
Results	
Heating Load (Watts):	**180**

TYPE: MOUNTAINASH 5 WOB
LO# 91958

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375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

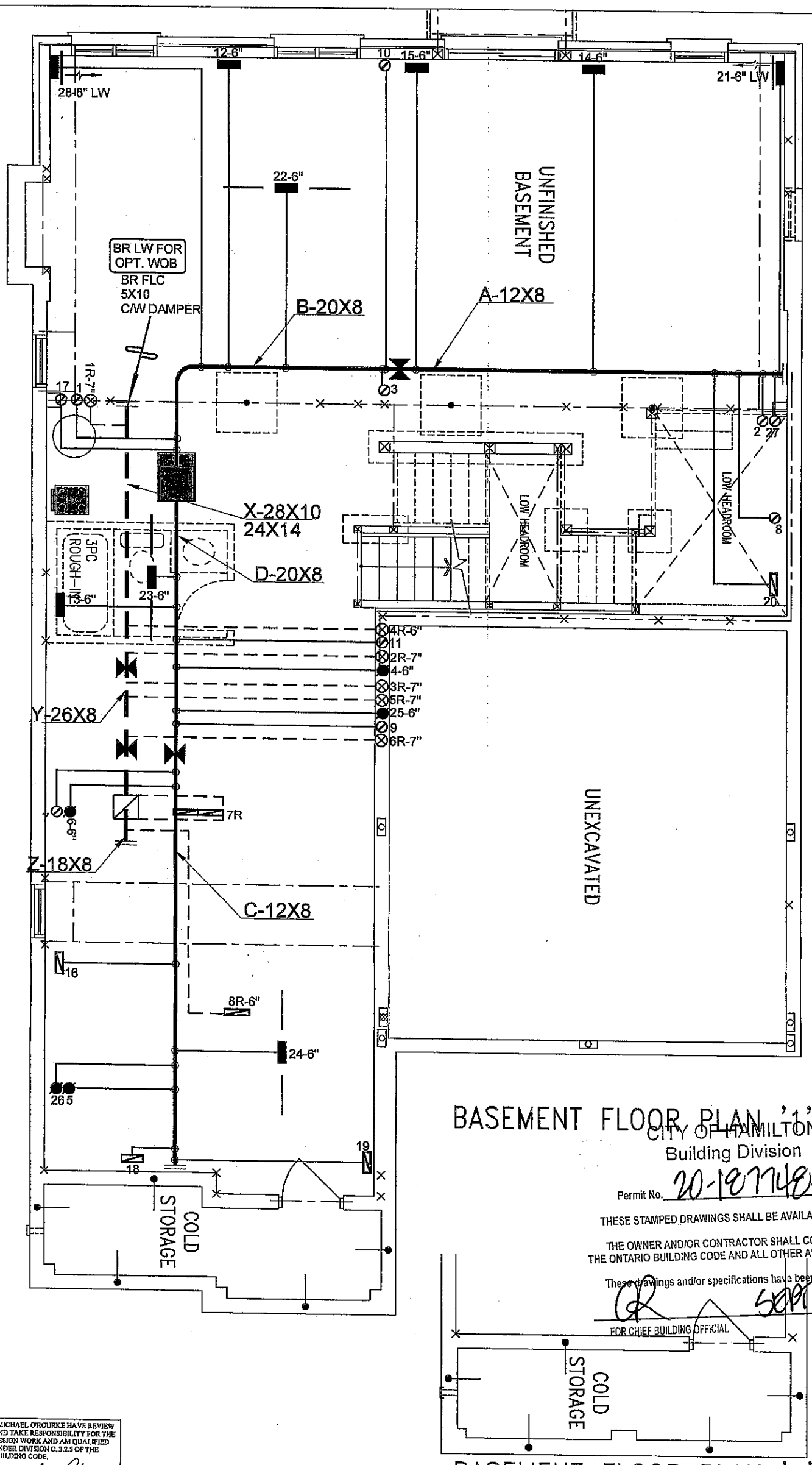
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Weather Station Location:	Open flat terrain, grass	
Anemometer height (m):	10	
Local Shielding		
Building Site:	Suburban, forest	
Walls:	Heavy	
Flue:	Heavy	
Highest Ceiling Height (m):	8.53	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	1251.7	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1668.5 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):	**0.365**	
Cooling Air Leakage Rate (ACH/H):	**0.130**	

TYPE: MOUNTAINASH 5 WOB

LO# 91958



BASEMENT FLOOR PLAN '1'

BASEMENT FLOOR PLAN '2'

PARTIAL BASEMENT PLAN W/ WALK-UP BASEMENT CONDITION

BASEMENT FLOOR PLAN '3'

CITY OF HAMILTON
Building Division
Permit No. 20-187748-02
THESE STAMPED DRAWINGS SHALL BE AVAILABLE ON SITE
THE OWNER AND/OR CONTRACTOR SHALL COMPLY WITH THE ONTARIO BUILDING CODE AND ALL OTHER APPLICABLE LAW
These drawings and/or specifications have been reviewed by
SEPT 22/21
FOR CHIEF BUILDING OFFICIAL — DATE

I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

WOB | **PACKAGE A1**

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
GREENPARK HOMES

Project Name
RUSSELL GARDENS PH 4
HAMILTON, ONTARIO

WOB
MOUNTAINASH 5 3298 sqft

HVAC DESIGNS LTD.
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L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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.

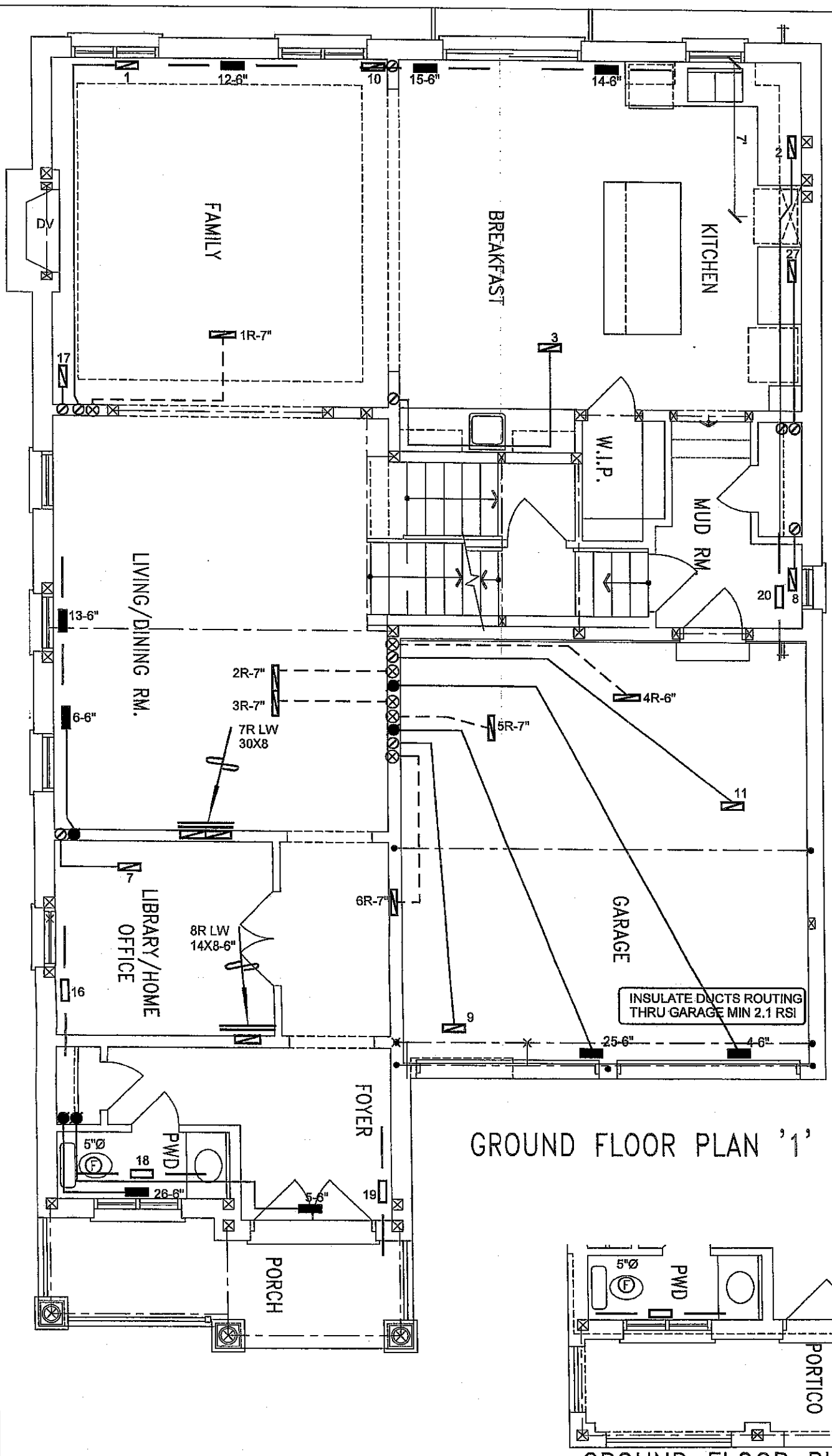
HEAT LOSS 55898 BTU/H	
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960804CNA
INPUT	80 MBTU/H
OUTPUT	76.8 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1504 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	15	6	4
1ST FLOOR	8	2	3
BASEMENT	5	1	0

ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

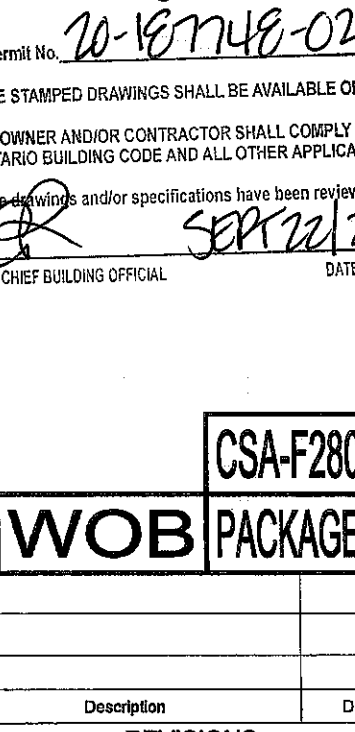
Sheet Title
BASEMENT HEATING LAYOUT

Date JULY/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91958



GROUND FLOOR PLAN '1'

GROUND FLOOR PLAN '3'



GROUND FLOOR PLAN '2'

CITY OF HAMILTON
Building Division
Permit No. 20-187148-02

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Michael O'Rourke
Michael O'Rourke, BCIN# 19669
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CSA-F280-12

WOB | PACKAGE A1

HVAC LEGEND

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HAMILTON, ONTARIO

WOB
MOUNTAINASH 5 3298 sqft

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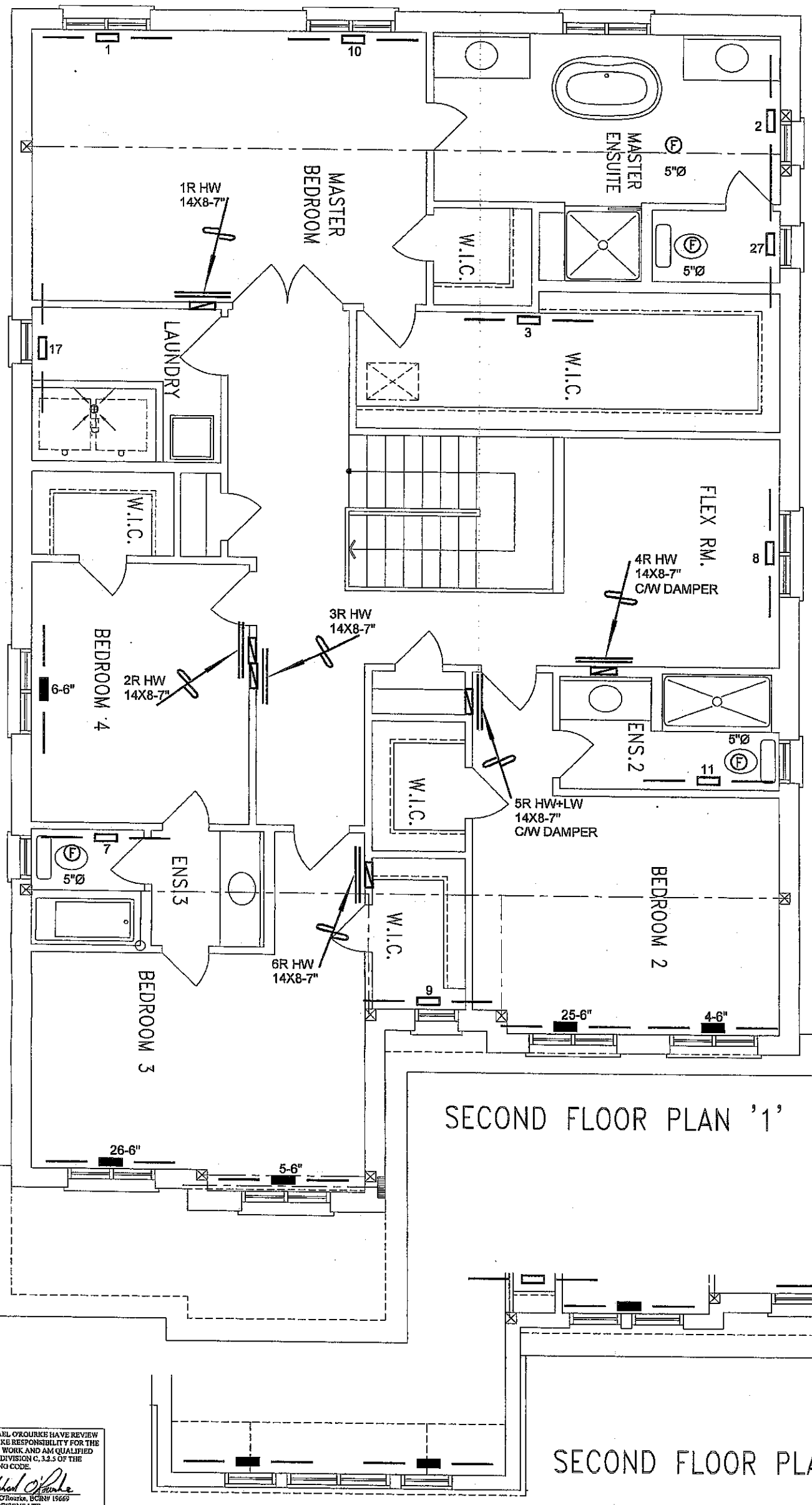
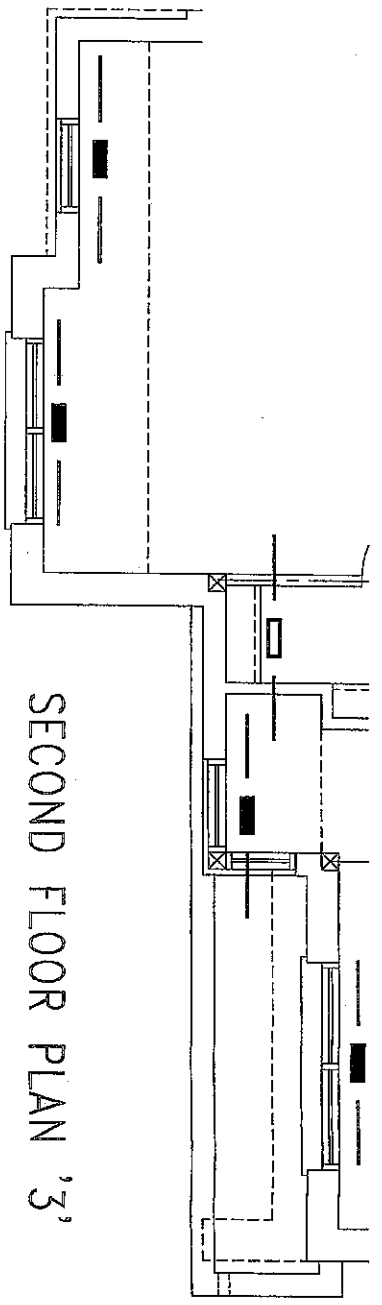
FIRST FLOOR HEATING LAYOUT

Date JULY/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91958



SECOND FLOOR PLAN '1'



SECOND FLOOR PLAN '3'

SECOND FLOOR PLAN '2'

CITY OF HAMILTON
Building Division
Permit No. 20-187748-02

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WOB PACKAGE A1

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SECOND FLOOR HEATING LAYOUT

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