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

SITE NAME: RUSSELL GARDENS PH 4 — OPT 5 BED
BUILDER: GREENPARK HOMES — TYPE: MOUNTAINASH 3 — GFA: 3072 — DATE: Mar-21 — LO# 90126
WINTER NATURAL AIR CHANGE RATE 0.338 — HEAT LOSS ΔT °F. 71 — CSA-F280-12
SUMMER NATURAL AIR CHANGE RATE 0.121 — HEAT GAIN ΔT °F. 13 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC-3			BED-3			BED-4			BED-5			ENS-1			BED-2			S-ENS		
EXP. WALL			42			11			7			27			32			18			16			25			6		
CLG. HT.			9			9			9			9			9			9			9			9			9		
	FACTORS																												
GRS.WALL AREA	LOSS	GAIN	378			99			63			243			288			162			144			225			54		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN	
NORTH	19.8	14.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	138	103	0	0	0	0	0	0
EAST	19.8	37.8	0	0	0	0	0	0	18	356	680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	19.8	22.8	0	0	0	16	316	364	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	138	159
WEST	19.8	37.8	32	633	1208	0	0	0	0	0	0	0	0	0	0	0	0	16	316	364	0	0	0	16	316	604	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
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
NET EXPOSED WALL	4.1	0.8	346	1434	260	83	344	62	45	187	34	199	825	150	236	978	177	146	605	110	137	568	103	209	866	157	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
EXPOSED CLG	1.2	0.6	512	610	301	132	157	78	46	55	27	227	271	133	235	280	138	272	324	160	125	149	73	156	186	92	72	86	42
NO ATTIC EXPOSED CLG	2.6	1.3	0	0	0	0	0	0	0	0	0	25	64	31	45	115	57	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.4	0.4	0	0	0	0	0	0	42	100	18	252	597	108	51	121	22	0	0	0	24	57	10	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0			0			0		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0			0		
SUBTOTAL HT LOSS			2677			818			697			2626			2522			1246			912			1369			419		
SUB TOTAL HT GAIN				1769			504			758			2084			2357			634			290			853			237	
LEVEL FACTOR / MULTIPLIER			0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26	
AIR CHANGE HEAT LOSS			689			210			179			676			649			321			235			352			108		
AIR CHANGE HEAT GAIN				134			38			58			168			179			48			22			65			18	
DUCT LOSS			0			0			88			330			317			0			115			0			0		
DUCT GAIN				0			0			82			300			329			0			31			0			0	
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	1		240	0		0
HEAT GAIN APPLIANCES/LIGHTS					514			0			0			514			514			514			0			514			0
TOTAL HT LOSS BTU/H			3366			1028			964			3632			3488			1566			1262			1721			527		
TOTAL HT GAIN x 1.3 BTU/H				3766			705			1167			4284			4705			1867			446			2173			332	

ROOM USE			L/D			FM			K/B			L/H			LND			W/R			FOY			WOD			BAS		
EXP. WALL			30			33			35			27			31			7			18			45			178		
CLG. HT.			10			10			10			11			10			10			10			8			8		
	FACTORS																												
GRS.WALL AREA	LOSS	GAIN	300			330			350			297			310			70			180			368			1160		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN	
NORTH	19.8	14.7	0	0	0	0	0	0	0	0	0	0	0	0	8	158	118	0	0	0	0	0	0	0	0	0	3	59	44
EAST	19.8	37.8	0	0	0	0	0	0	0	0	0	40	791	1510	0	0	0	0	0	0	6	119	227	0	0	0	0	0	0
SOUTH	19.8	22.8	36	712	820	0	0	0	7	138	159	0	0	0	0	0	0	7	138	159	0	0	0	0	0	0	6	119	137
WEST	19.8	37.8	0	0	0	34	672	1284	67	1324	2530	0	0	0	0	0	0	0	0	0	0	0	0	12	237	453	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
DOORS	23.5	4.3	0	0	0	0	0	0	12	281	51	0	0	0	20	469	85	40	936	170	40	938	170	0	0	0	20	469	85
NET EXPOSED WALL	4.1	0.8	264	1094	198	296	1227	222	264	1094	198	257	1065	193	282	1169	212	23	95	17	134	556	101	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	264	883	160	264	883	160
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	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	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
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0			0			0		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0			0		
SUBTOTAL HT LOSS			1806			1899			2839			1856			1796			1172			1612			0			5261		
SUB TOTAL HT GAIN				1018			1506			2938			1703			415			347			497		1120			6780		
LEVEL FACTOR / MULTIPLIER			0.30	0.40		0.30	0.40		0.30	0.40		0.30	0.40		0.30	0.40		0.30	0.40		0.30	0.40							
AIR CHANGE HEAT LOSS			713			750			1121			733			710			463			537				613			426	
AIR CHANGE HEAT GAIN				77			114			223			129			32			26			38					0.50	1.08	
DUCT LOSS			0			0			0			0			0			0			0						8546		
DUCT GAIN				0			0			0			0			0			0			0						0	79
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0							
HEAT GAIN APPLIANCES/LIGHTS					514			514			514			514			514			514			0		0	0		0	
TOTAL HT LOSS BTU/H			2520			2649			3960			2589			2506			1635			2249			1120		0	15326		
TOTAL HT GAIN x 1.3 BTU/H				2092			2775			4776			3050			1248			465			696			797			1324	

TOTAL HEAT GAIN BTU/H: 37020 — TONS: 3.08 — LOSS DUE TO VENTILATION LOAD BTU/H: 1819 — STRUCTURAL HEAT LOSS: 52108 — TOTAL COMBINED HEAT LOSS BTU/H: 53927

CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department
AUG 25 2021
REC BY _____ DATE _____
REF'D TO _____ DATE _____

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

OPT 5 BED
TYPE: MOUNTAINASH 3
DATE: Mar-21

GFA: 3072 LO# 90126

HEATING CFM	1131	COOLING CFM	1131
TOTAL HEAT LOSS	52,108	TOTAL HEAT GAIN	36,690
AIR FLOW RATE CFM	21.7	AIR FLOW RATE CFM	30.83

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
GMEC960603BNA 60
FAN SPEED
LOW
MEDLOW
MEDIUM 928
MEDIUM HIGH 1017
HIGH 1131

AFUE = 96 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **57,600**

DESIGN CFM = **1131**
CFM @ .6 " E.S.P.

TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	8	4
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	BED-2	ENS	WIC-3	BED-3	BED-4	BED-5	ENS-1	BED-3	BED-4	MBR	S-ENS	L/D	FM	K/B	K/B	L/H	LND	W/R	FOY	MBR	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.72	1.03	0.96	1.82	1.74	1.57	1.26	1.82	1.74	1.68	0.53	2.52	2.65	1.98	1.98	2.59	2.51	1.63	2.25	1.68	4.11	4.11	4.11	4.11
CFM PER RUN HEAT	37	22	21	39	38	34	27	39	38	37	11	55	57	43	43	56	54	35	49	37	89	89	89	89
RM GAIN MBH.	2.17	0.71	1.17	2.14	2.35	1.87	0.45	2.14	2.35	1.88	0.33	2.09	2.77	2.39	2.39	3.05	1.25	0.49	0.70	1.88	0.53	0.53	0.53	0.53
CFM PER RUN COOLING	67	22	36	66	73	58	14	66	73	58	10	64	86	74	74	94	38	15	21	58	16	16	16	16
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	57	19	43	51	48	32	61	56	47	46	30	17	47	23	33	37	47	16	35	22	44	19	4	22
EQUIVALENT LENGTH	140	150	110	120	150	180	130	130	160	160	190	120	120	140	100	150	110	150	100	140	140	110	130	130
TOTAL EFFECTIVE LENGTH	197	169	153	171	198	212	191	186	207	206	220	137	167	163	133	187	157	166	135	162	184	129	134	152
ADJUSTED PRESSURE	0.09	0.1	0.11	0.1	0.09	0.08	0.09	0.09	0.08	0.08	0.08	0.13	0.1	0.11	0.13	0.09	0.11	0.1	0.13	0.11	0.09	0.13	0.12	0.11
ROUND DUCT SIZE	5	4	4	5	5	5	4	5	5	5	4	5	6	6	6	6	5	4	4	5	6	6	6	6
HEATING VELOCITY (ft/min)	272	252	241	286	279	250	310	286	279	272	126	404	291	219	219	286	398	402	562	272	454	454	454	454
COOLING VELOCITY (ft/min)	492	252	413	485	536	426	161	485	536	426	115	470	438	377	377	479	279	172	241	426	82	82	82	82
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	D	D	C	B	A	D	C	A	C	D	A	B	B	C	A	C	C	B	A	B	D	C

RUN #	
ROOM NAME	
RM LOSS MBH.	
CFM PER RUN HEAT	
RM GAIN MBH.	
CFM PER RUN COOLING	
ADJUSTED PRESSURE	
ACTUAL DUCT LGH.	
EQUIVALENT LENGTH	
TOTAL EFFECTIVE LENGTH	
ADJUSTED PRESSURE	
ROUND DUCT SIZE	
HEATING VELOCITY (ft/min)	
COOLING VELOCITY (ft/min)	
OUTLET GRILL SIZE	
TRUNK	

CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department
AUG 2 5 2021
REC BY _____ DATE _____
REF'D TO _____ DATE _____

CITY OF HAMILTON
Building Division
Permit No 20-196110-02
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
FOR CHIEF BUILDING OFFICIAL
SEP 2 8 2021
DATE

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	301	0.08	8.9	10	x	8	542	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	569	0.08	11.4	16	x	8	640	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	316	0.08	9.1	10	x	8	569	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	559	0.08	11.3	14	x	8	719	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	846	0.05	14.8	26	x	8	586
TRUNK Y	585	0.05	12.9	20	x	8	527
TRUNK Z	205	0.05	8.7	10	x	8	369
DROP	1131	0.05	16.5	24	x	10	679

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	75	130	70	70	70	380	75	100	0	0	0	0	0	0	0	161
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.	56	58	52	56	51	31	33	60	1	1	1	1	1	1	1	15
EQUIVALENT LENGTH	215	235	195	165	255	195	220	240	0	0	0	0	0	0	0	175
TOTAL EFFECTIVE LH	271	293	247	221	306	226	253	300	1	1	1	1	1	1	1	190
ADJUSTED PRESSURE	0.05	0.05	0.06	0.07	0.05	0.07	0.06	0.05	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.08
ROUND DUCT SIZE	6	7.3	5.6	5.4	5.8	10.1	5.7	6.7	0	0	0	0	0	0	0	7.1
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	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	14	14	0	0	0	0	0	0	0	14

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

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
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TYPE: MOUNTAINASH 3 LO # 90126
SITE NAME: RUSSELL GARDENS PH 4 OPT 5 BED

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

CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department
AUG 25 2021
REC BY _____ DATE
REF'D TO _____ DATE

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 9.32.3.5.

Total Ventilation Capacity	212	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	116.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE V150H Location: BSMT

95.4 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
95.4 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-1	FV-05-11VK1	50	✓	0.3
S-ENS	FV-05-11VK1	50	✓	0.3
W/R	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 @ 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 #:

CITY OF HAMILTON
Building Division
Permit No: 20 - 196117 A -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

INSTALLING CONTRACTOR

Name:

Address:

City:

Telephone #: Fax #:

These drawings and/or specifications have been reviewed by
SEP 28 2021
DATE
FOR CHIEF BUILDING OFFICIAL

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: March-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: 19669 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 / Ventiliation Calculation)

LO#: 90126 Model: MOUNTAINASH 3 Builder: GREENPARK HOMES Date: 31/03/2021

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	1378	8	11024
First	1378	10	13780
Second	1694	9	15246
Third	0	9	0
Fourth	0	9	0
		Total:	40,050.0 ft^3
		Total:	1134.1 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.338
SUMMER NATURAL AIR CHANGE RATE	0.121

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

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

0.338 x 315.02 x 39 °C x 1.2 = 5009 W

= 17092 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.121 x 315.02 x 7 °C x 1.2 = 325 W

= 1110 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

95 CFM x 71 °F x 1.08 x 0.25 = 1819 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

95 CFM x 13 °F x 1.08 x 0.25 = 330 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	17,092	7,900	1.082
2	0.3		12,981	0.395
3	0.2		13,286	0.257
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 3		OPT 5 BED	**BUILDER:**	GREENPARK HOMES
SFQT:	3072	**LO#**	90126	**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):	40050.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 53.0 ft	WIDTH: 36.0 ft	EXPOSED PERIMETER:	178.0 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

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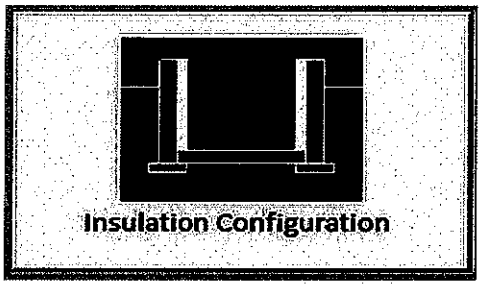
905-619-2300

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):	**16.2**	 Insulation Configuration
Floor Width (m):	**11.0**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.4**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**2.0**	
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):		**1538**

TYPE: MOUNTAINASH 3 OPT 5 BED
LO# 90126

HVAC Designs Ltd.
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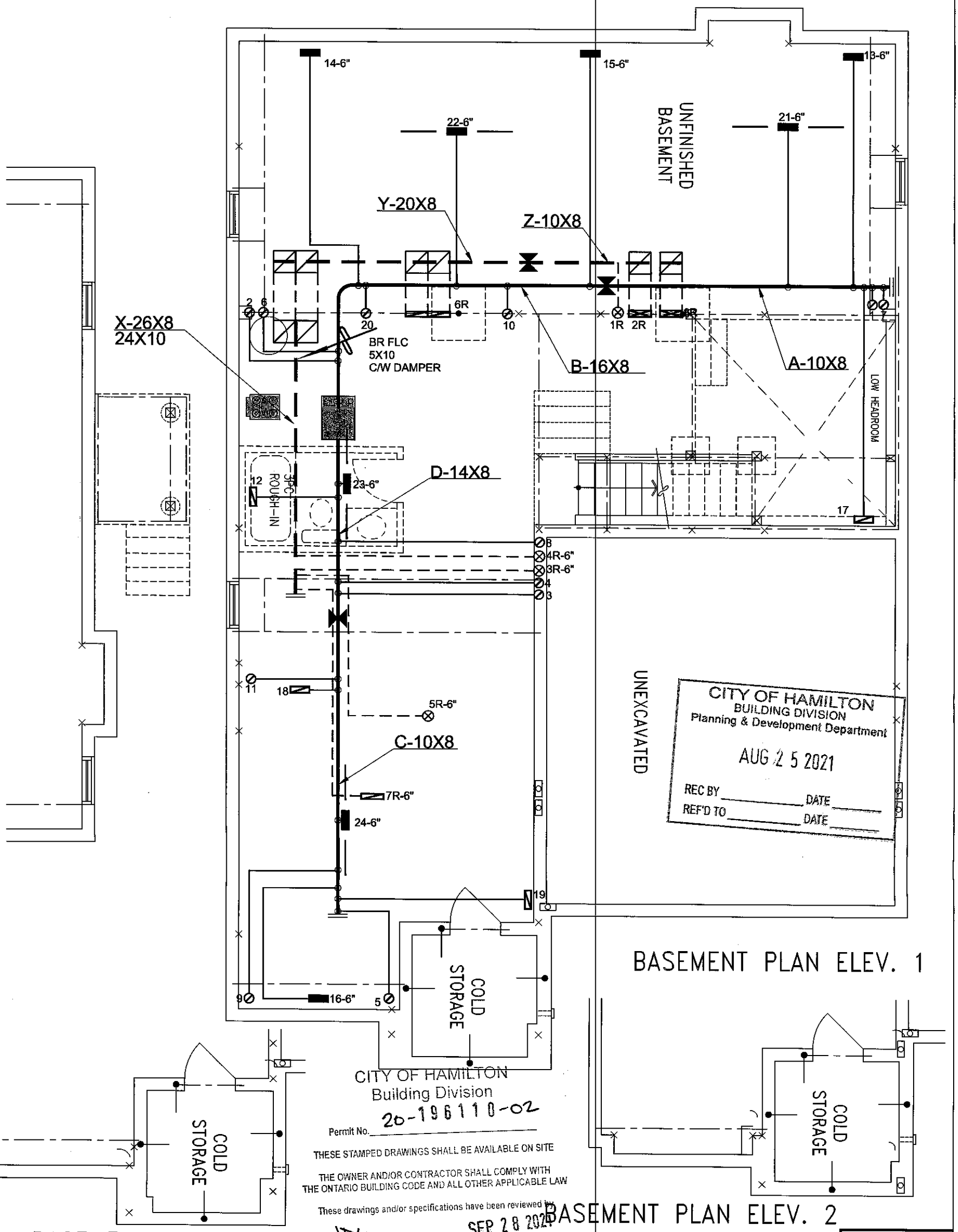
Ajax ON, L1S 2E2
905-619-2300

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):	7.62	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	1134.1	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1511.8 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):	**0.338**	
Cooling Air Leakage Rate (ACH/H):	**0.121**	

TYPE: MOUNTAINASH 3 OPT 5 BED
LO# 90126



CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department
AUG 25 2021
REC BY _____ DATE _____
REF'D TO _____ DATE _____

BASEMENT PLAN ELEV. 1

BASEMENT PLAN ELEV. 2

BASEMENT PLAN ELEV. 3

CITY OF HAMILTON
Building Division
Permit No. 20-196110-02

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 _____ DATE SEP 28 2021
FOR CHIEF BUILDING OFFICIAL

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
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

OPT 5 BED
MOUNTAINASH 3 3072 sqft

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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.

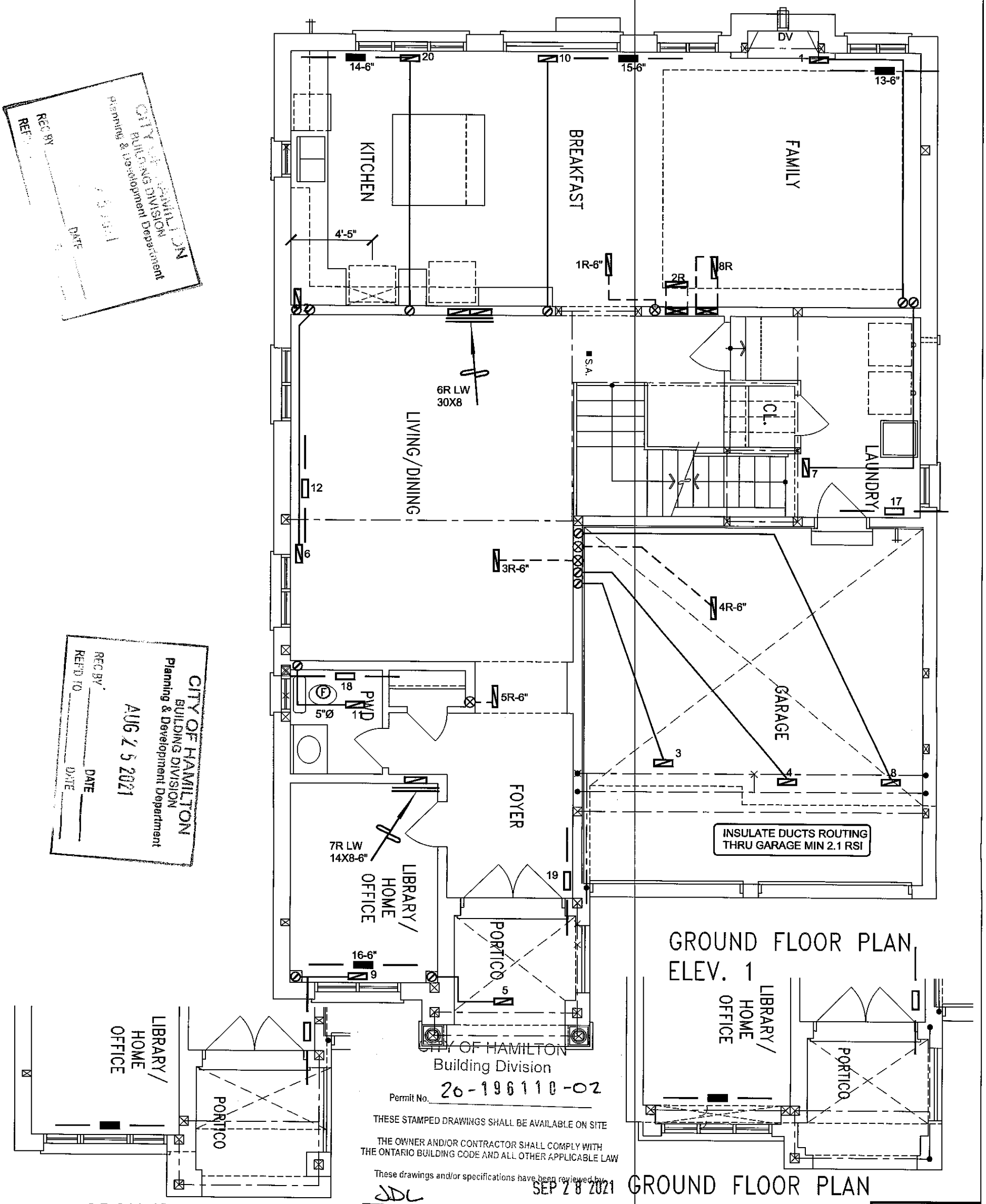
HEAT LOSS 53927 BTU/H		
UNIT DATA		
MAKE	GOODMAN	
MODEL	GMEC960603BNA	
INPUT	60	MBTU/H
OUTPUT	57.6	MBTU/H
COOLING	3.0	TONS
FAN SPEED	1131	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	6	3
1ST FLOOR	8	2	2
BASEMENT	4	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 MAR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90126



CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department
REC'D BY
REF'D TO
DATE

CITY OF HAMILTON
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AUG 2 5 2021
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CITY OF HAMILTON
Building Division
Permit No. 20-196110-02

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These drawings and/or specifications have been reviewed by
SEP 2 8 2021
FOR CHIEF BUILDING OFFICIAL — DATE

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

CSA-F280-12
PACKAGE A1

HVAC LEGEND

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Project Name
RUSSELL GARDENS PH 4
HAMILTON, ONTARIO

OPT 5 BED
MOUNTAINASH 3 3072 sqft

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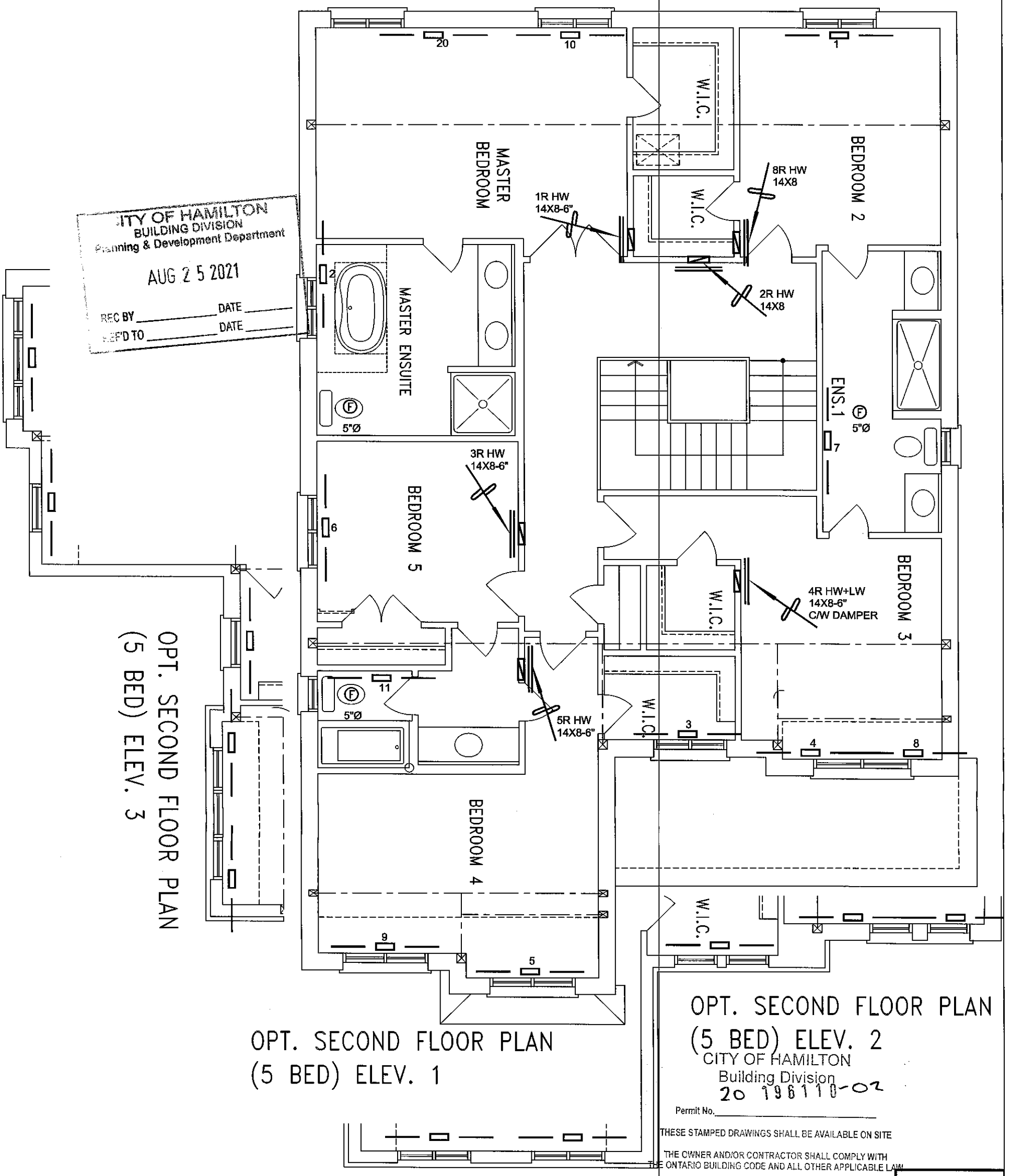
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date MAR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90126



CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department
AUG 2 5 2021
REC BY _____ DATE _____
REF'D TO _____ DATE _____

OPT. SECOND FLOOR PLAN
(5 BED) ELEV. 3

OPT. SECOND FLOOR PLAN
(5 BED) ELEV. 1

OPT. SECOND FLOOR PLAN
(5 BED) ELEV. 2

CITY OF HAMILTON
Building Division
20 196110-02
Permit No. _____

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SDL SEP 2 8 2021

FOR CHIEF BUILDING OFFICIAL DATE

CSA-F280-12

PACKAGE A1

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HVAC DESIGNS LTD.

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OPT 5 BED
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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date MAR/2021
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BCIN# 19669
LO# 90126