

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 4				GFA: 3190				LOW #1956				SUMMER NATURAL AIR CHANGE RATE 0.130				HEAT GAIN AT °F. 13				SB-12 PACKAGE A1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
ROOM USE				MBR				ENS				FLEX				BED-2				BED-3				BED-4				ENS-3				S-ENS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
EXP. WALL				40				28				44				14				30				13				6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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GRS.WALL AREA				360				252				396				126				270				117				64				54				84																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
GLAZING				LOSS				GAIN				LOSS				GAIN				LOSS				GAIN				LOSS				GAIN				LOSS				GAIN																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
NORTH				19.8	15.1	0	0	0	14	277	212	0	0	0	16	316	242	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ROOM USE	EXP. WALL		CLG. HT.		FAM		L/D		K/B		L/H		LND		W/R		FOY		WOB		BAS	
	34		10		340		240		370		180		72		288		420		46		130	
	10				10				10		9		11		10				9		9	
GRS.WALL AREA	FACTORS		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN	
GLAZING	19.8		15.1		8		158		121		0		0		0		0		0		0	
NORTH	19.8		39.0		0		0		0		0		0		0		0		0		0	
EAST	19.8		23.5		0		0		0		33		652		775		0		0		0	
SOUTH	19.8		39.0		40		791		1561		0		0		0		60		1186		2341	
WEST	34.6		101.5		0		0		0		0		0		0		0		0		0	
SKYL.T.	23.5		4.3		0		0		0		0		0		0		12		281		51	
DOORS	4.1		0.8		292		1211		219		207		858		156		288		1235		224	
NET EXPOSED WALL	3.3		0.8		0		0		0		0		0		0		0		0		0	
NET EXPOSED BSMT WALL ABOVE GR	1.2		0.6		0		0		0		0		0		0		0		0		0	
EXPOSED CLG	2.6		1.3		0		0		0		0		0		0		0		0		0	
NO ATTIC EXPOSED CLG	2.4		0.4		0		0		0		0		0		0		0		0		0	
EXPOSED FLOOR	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	
SLAB ON GRADE HEAT LOSS	0		0		0		0		0		0		0		0		0		0		0	
SUBTOTAL HT LOSS	2169				1510				2703		934		551		1681		2507		615		3690	
SUB TOTAL HT GAIN	0.30		0.51		0.30		0.51		0.30		0.51		0.30		0.51		0.30		0.51		0.50	
LEVEL FACTOR / MULTIPLIER	1099				135				66		186		29		20		27		49		314	
AIR CHANGE HEAT LOSS	0		0		0		0		0		0		0		0		0		0		0	
AIR CHANGE HEAT GAIN	0		0		0		0		0		0		0		0		0		0		0	
DUCT LOSS	0		0		0		0		0		0		0		0		0		0		0	
DUCT GAIN	240				626				626		626		626		626		0		0		626	
HEAT GAIN PEOPLE	3268				2279				4078		1409		705		2537		3934		3680		14338	
HEAT GAIN APPLIANCES/LIGHTS	3481				2109				4456		1381		1208		537		954		4733		2237	
TOTAL HT LOSS BTU/H																						
TOTAL HT GAIN x 1.3 BTU/H																						

REC'D BY

DATE

REF'D TO

DATE

SEP 14 2021

CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department

TOTAL HEAT GAIN BTU/H: 42368

TONS: 3.53

LOSS DUE TO VENTILATION LOAD BTU/H: 1616

STRUCTURAL HEAT LOSS: 54497

TOTAL COMBINED HEAT LOSS BTU/H: 56013

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.

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

SITE NAME: RUSSELL GARDENS PH 4
 BUILDER: GREENPARK HOMES

 WOB
 TYPE: MOUNTAINASH 4

DATE: Jul-21

GFA: 3190 LO# 91956

 HEATING CFM 1504 COOLING CFM 1504
 TOTAL HEAT LOSS 54,497 TOTAL HEAT GAIN 42,093
 AIR FLOW RATE CFM 27.6 AIR FLOW RATE CFM 35.73

 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
 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 @ .5" E.S.P.

TEMPERATURE RISE 47 °F

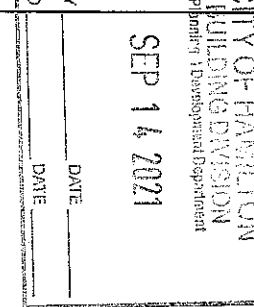
RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	7	5
R/A	0	0	5	2	1

All S/A diffusers 4"x10" unless noted otherwise on layout.

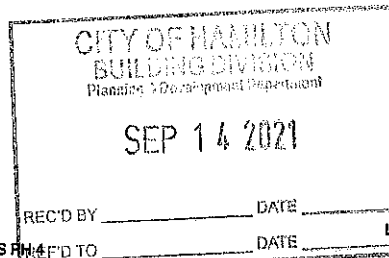
All S/A runs 5"x10" unless noted otherwise on layout.

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24
ROOM NAME	MBR	ENS	FLEX	BED-2	BED-3	BED-4	ENS-3	FLEX	BED-3	MBR	S-ENS	FAM	L/D	K/B	K/B	L/H	LND	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH	1.57	2.19	2.19	1.74	1.98	1.25	0.57	2.19	1.98	1.57	0.52	3.26	2.28	2.04	2.04	1.41	0.71	2.54	3.93	3.61	3.61	3.61	3.61
CFM PER RUN HEAT	43	60	61	48	55	34	16	61	55	43	14	90	63	58	56	39	19	70	109	100	100	100	100
RM GAIN MBH	1.92	1.45	2.91	2.01	2.62	1.92	0.36	2.91	2.62	1.92	0.20	3.46	2.11	2.23	2.23	1.38	1.21	0.54	0.95	1.39	1.39	1.39	1.39
CFM PER RUN COOLING	68	52	104	72	94	69	13	104	94	68	7	124	75	80	80	49	43	19	34	50	50	50	50
ADJUSTED PRESSURE	0.17	0.17	0.16	0.17	0.16	0.17	0.17	0.16	0.16	0.17	0.17	0.15	0.17	0.17	0.17	0.17	0.17	0.17	0.15	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	32	63	51	56	61	46	49	58	49	38	46	28	25	38	44	40	23	47	48	55	34	24	41
EQUIVALENT LENGTH	130	150	160	140	100	210	200	130	190	100	130	130	140	120	120	140	160	130	110	150	100	130	130
TOTAL EFFECTIVE LENGTH	162	213	211	186	161	256	249	188	239	138	176	156	165	158	164	180	183	177	158	205	134	154	171
ADJUSTED PRESSURE	0.11	0.08	0.08	0.09	0.1	0.07	0.07	0.09	0.07	0.12	0.1	0.1	0.1	0.11	0.1	0.1	0.09	0.1	0.1	0.08	0.12	0.11	0.09
ROUND DUCT SIZE	5	5	6	6	6	6	4	6	6	5	4	6	5	5	5	4	4	5	6	6	6	6	6
HEATING VELOCITY (ft/min)	316	441	311	245	280	173	184	311	280	316	161	459	463	411	411	447	218	514	556	510	510	510	510
COOLING VELOCITY (ft/min)	499	382	530	367	479	352	149	530	479	499	80	632	551	587	587	562	493	140	173	255	255	255	255
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10
TRUNK	C	A	D	A	E	D	D	D	D	C	E	C	E	B	B	D	C	A	D	B	C	E	D

RUN #	25	26
ROOM NAME	S-ENS	BAS
RM LOSS MBH	0.52	3.61
CFM PER RUN HEAT	14	100
RM GAIN MBH	0.20	1.39
CFM PER RUN COOLING	7	50
ADJUSTED PRESSURE	0.17	0.16
ACTUAL DUCT LGH	46	35
EQUIVALENT LENGTH	140	130
TOTAL EFFECTIVE LENGTH	186	165
ADJUSTED PRESSURE	0.09	0.1
ROUND DUCT SIZE	4	6
HEATING VELOCITY (ft/min)	161	510
COOLING VELOCITY (ft/min)	80	255
OUTLET GRILL SIZE	3X10	4X10
TRUNK	E	A



SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE															
	TRUNK	STATIC	ROUND	RECT			VELOCITY			TRUNK	STATIC	ROUND	RECT			VELOCITY	TRUNK	STATIC	ROUND	RECT			VELOCITY		
	CFM	PRESS.	DUCT	DUCT			(ft/min)			CFM	PRESS.	DUCT	DUCT			(ft/min)	CFM	PRESS.	DUCT	DUCT			(ft/min)		
TRUNK A	278	0.08	8.7	10	x	8	500	TRUNK G	0	0.00	0	0	x	8	0	0	TRUNK O	0	0.05	0	0	x	8	0	
TRUNK B	212	0.08	7.8	8	x	8	477	TRUNK H	0	0.00	0	0	x	8	0	0	TRUNK P	0	0.05	0	0	x	8	0	
TRUNK C	785	0.08	12.8	20	x	8	707	TRUNK I	0	0.00	0	0	x	8	0	0	TRUNK Q	0	0.05	0	0	x	8	0	
TRUNK D	475	0.07	11	14	x	8	611	TRUNK J	0	0.00	0	0	x	8	0	0	TRUNK R	0	0.05	0	0	x	8	0	
TRUNK E	721	0.07	12.8	20	x	8	649	TRUNK K	0	0.00	0	0	x	8	0	0	TRUNK S	0	0.05	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	0	TRUNK T	0	0.05	0	0	x	8	0	
RETURN AIR #	1	2	3	4	5	6	7									BR	TRUNK U	0	0.05	0	0	x	8	0	
AIR VOLUME	135	150	150	135	120	400	175	0	0	0	0	0	0	0	0	0	239	TRUNK V	0	0.05	0	0	x	8	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	TRUNK W	0	0.05	0	0	x	8	0
ACTUAL DUCT LGH.	51	42	51	53	63	26	26	1	1	1	1	1	1	1	1	1	15	TRUNK X	1099	0.05	16.3	30	x	8	659
EQUIVALENT LENGTH	205	165	155	205	210	185	190	0	0	0	0	0	0	0	0	0	185	TRUNK Y	575	0.05	12.8	20	x	8	518
TOTAL EFFECTIVE LH	256	207	206	258	273	211	216	1	1	1	1	1	1	1	1	1	200	TRUNK Z	0	0.05	0	0	x	8	0
ADJUSTED PRESSURE	0.06	0.07	0.07	0.06	0.05	0.07	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.07	DROP	1504	0.05	18.4	24	x	14	645
ROUND DUCT SIZE	7.1	7.1	7.1	7.1	7.1	10.3	7.5	0	0	0	0	0	0	0	0	0	8.5								
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	8								
INLET GRILL SIZE	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	14	0	0	0	0	0	0	0	0	0	24								


 TYPE: MOUNTAINASH 4 REC'D BY: DATE: LG # 91956
 SITE NAME: RUSSELL GARDENS PHASE 1 DATED TO: DATE: 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	8	@ 10.6 cfm	84.8	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	79.5	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	212	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	132.5	cfm

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

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM	ΔT °F	FACTOR	% LOSS
79.5 CFM	71 F	1.08	0.25

SUPPLEMENTAL FANS PANASONIC

Location	Model	cfm	HVI	Sones
ENS	FV-05-11VK1	50	✓	0.3
ENS-3	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: VANEV V150H
 160 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

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

LO#: 91956

Model: MOUNTAINASH 4

Builder: GREENPARK HOMES

Date: 2021-07-29

Volume Calculation
House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	1398	9	12582
First	1398	10	13980
Second	1792	9	16128
Third	0	9	0
Fourth	0	9	0
Total:			42,690.0 ft ³
Total:			1208.8 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

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

$$0.365 \times 335.79 \times 39^\circ\text{C} \times 1.2 = 5764 \text{ W}$$

$$= 19666 \text{ Btu/h}$$

6.2.6 Sensible Gain due to Air Leakage

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

$$0.130 \times 335.79 \times 7^\circ\text{C} \times 1.2 = 374 \text{ W}$$

$$= 1276 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

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

6.2.7 Sensible heat Gain due to Ventilation

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

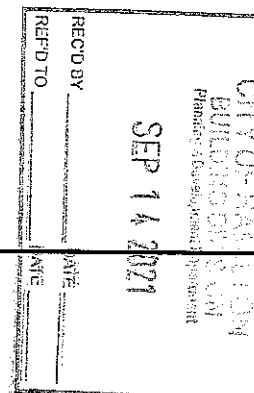
$$80 \text{ CFM} \times 13^\circ\text{F} \times 1.08 \times 0.25 = 275 \text{ Btu/h}$$

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

$$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{ager} + HL_{bger}) \div (HL_{agcleve} + HL_{bgcleve})\}$$

Level	Level Factor (LF)	HL _{airb} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})
1	0.5	19,666	8,195	1.200
2	0.3		11,595	0.509
3	0.2		14,029	0.280
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_{airv} = 0


HEAT LOSS AND GAIN SUMMARY SHEET

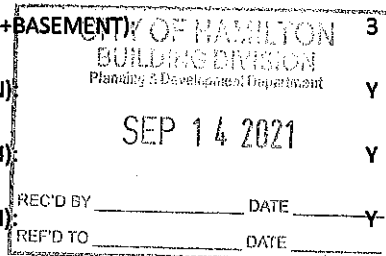
MODEL: MOUNTAINASH 4	WOB	BUILDER: GREENPARK HOMES
SFQT: 3190	LO# 91956	SITE: RUSSELL GARDENS PH 4

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 (ft³):	42690.0	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: 52.0 ft	WIDTH: 36.0 ft	EXPOSED PERIMETER:	130.0 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

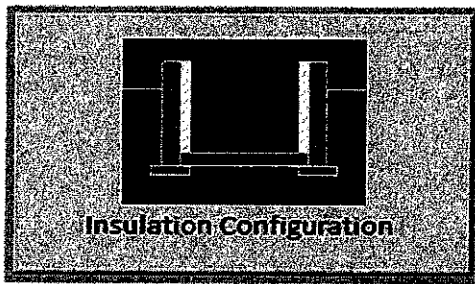
MICHAEL O'ROURKE

SEP 14 2021

REC'D BY _____ DATE _____
REF'D TO _____ DATE _____HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

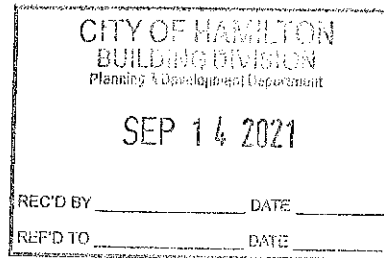
Residential Foundation Thermal Load Calculator

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	
Floor Width (m):	11.0	
Exposed Perimeter (m):	39.6	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.55	
Window Area (m ²):	1.5	
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):	708	

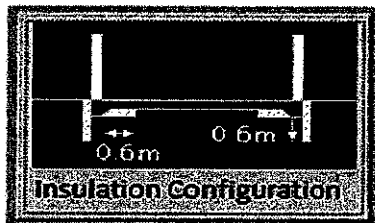
TYPE: MOUNTAINASH 4
LO# 91956

WOB



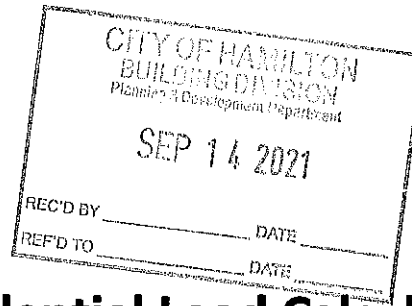
Residential Slab on Grade Thermal Load Calculator

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):	11.0	
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 4
LO# 91956

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):	1208.8		
Air Leakage/Ventilation			
Air Tightness Type:	Present (1961-) (3.57 ACH)		
Custom BDT Data:	ELA @ 10 Pa.	1611.4 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):	0.365		
Cooling Air Leakage Rate (ACH/H):	0.130		

TYPE: MOUNTAINASH 4
LO# 91956

WOB

PARTIAL BASEMENT PLAN
W/ WALK-UP BASEMENT CONDITION

BASEMENT PLAN - ELEV. '3'

BASEMENT PLAN - ELEV. '1'

BASEMENT PLAN - ELEV. '2'

CSA-F280-12

WOB

PACKAGE A1

CITY OF HAMILTON
Building Division

Permit No. 20-187707-02

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 DATE

I MICHAEL O'Rourke HAVE REVIEWED
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.

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.		

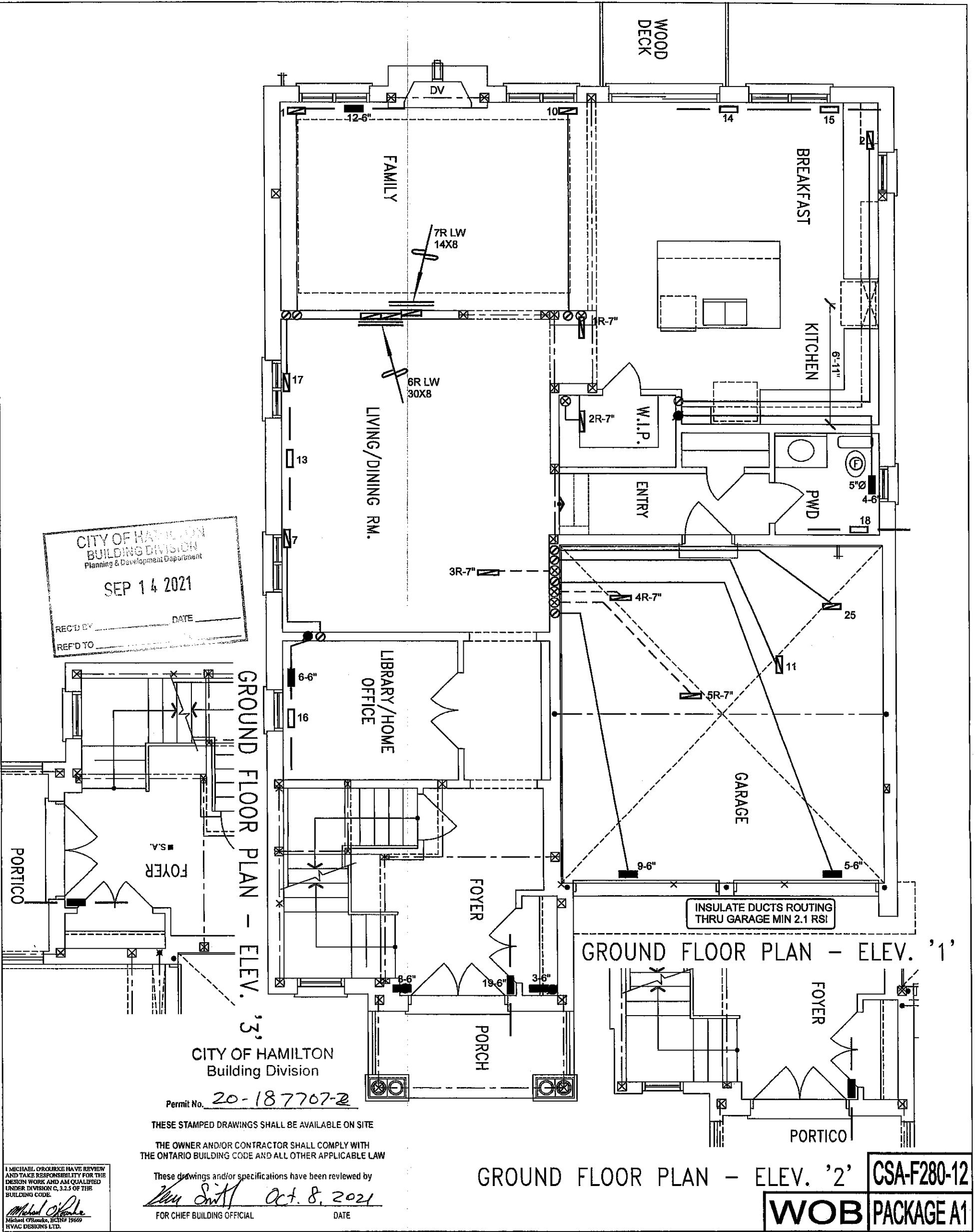
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Client
GREENPARK HOMES
Project Name
**RUSSELL GARDENS PH 4
HAMILTON, ONTARIO**
WOB
MOUNTAINASH 4 3190 sqft

HVACDESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@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.

HEAT LOSS 56013 BTU/H UNIT DATA	# OF RUNS S/A R/A FANS
MAKE GOODMAN	3RD FLOOR
MODEL GMEC960804CNA	2ND FLOOR 13 5 3
INPUT 80 MBTU/H	1ST FLOOR 7 2 2
OUTPUT 76.8 MBTU/H	BASEMENT 5 1 0
COOLING 3.5 TONS	ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5" UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A
FAN SPEED 1504 cfm @ 0.8" w.g.	

Sheet Title
**BASEMENT
HEATING
LAYOUT**
Date JULY/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91956



I MICHAEL O'BROCKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

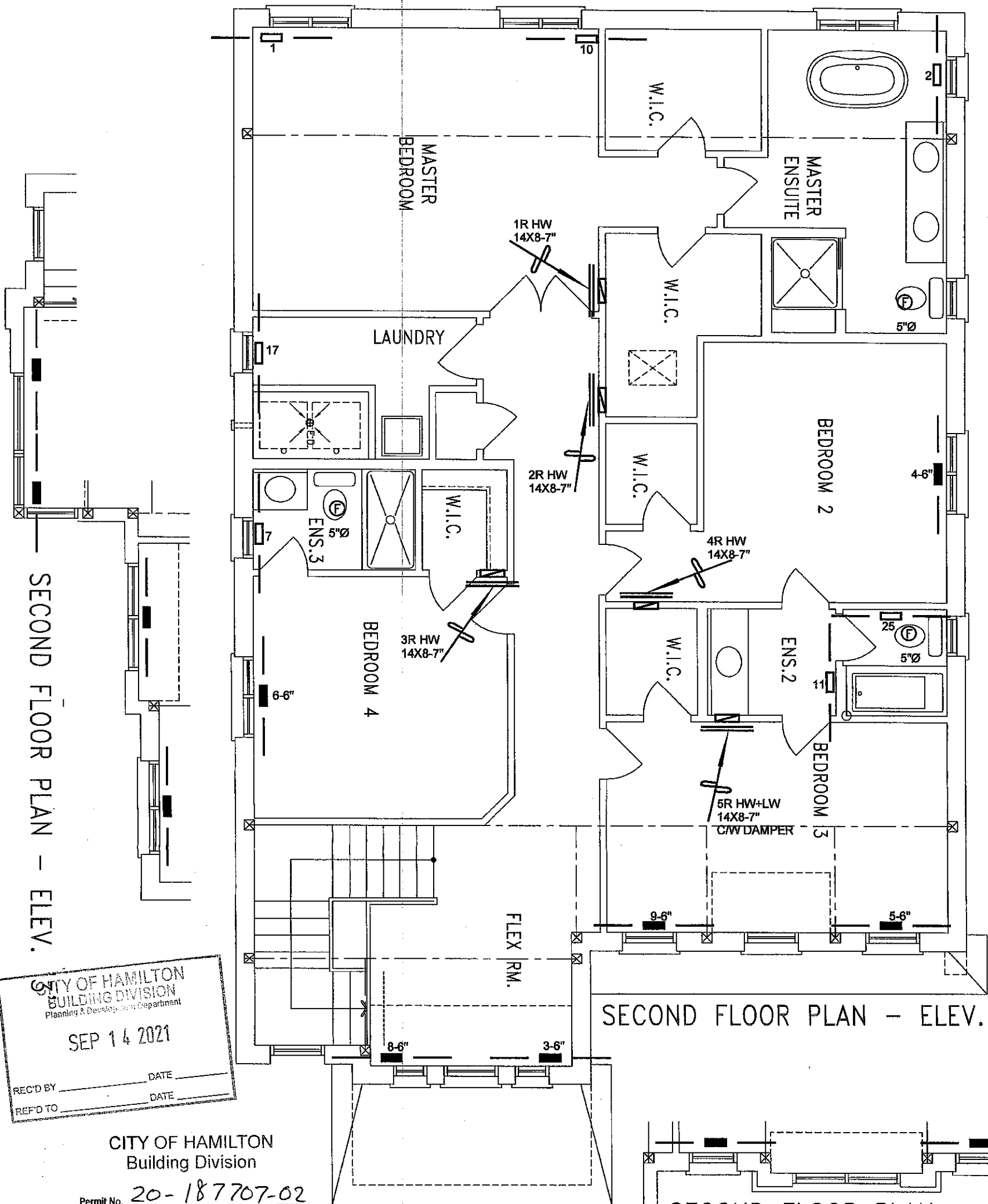
Michael O'Brocke, B.C.R.P. 19669

HVAC DESIGNS LTD.

HVAC LEGEND							
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION		
	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		8" SUPPLY AIR STACK 2nd FLOOR		RETURN AIR STACK ABOVE	1.	
					RETURN AIR STACK 2nd FLOOR	No.	Description
					FRA- FLOOR RETURN AIR GRILLE		Date
					REDUCER		
						REVISIONS	

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Client		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	Sheet Title	
GREENPARK HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name		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.	Date	
RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			JULY/2021	
WOB			Scale	
MOUNTAINASH 4 3190 sqft			3/16" = 1'-0"	
			BCIN# 19669	
			LO# 91956	



SECOND FLOOR PLAN - ELEV.

SECOND FLOOR PLAN - ELEV. '1'

SECOND FLOOR PLAN
ELEV. '2'

CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department
SEP 14 2021
REC'D BY _____ DATE _____
REF'D TO _____ DATE _____

CITY OF HAMILTON
Building Division

Permit No. 20-187707-02

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

[Signature] Oct. 8, 2021
FOR CHIEF BUILDING OFFICIAL DATE

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

CSA-F280-12
WOB PACKAGE A1

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

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Client
GREENPARK HOMES
Project Name
RUSSELL GARDENS PH 4
HAMILTON, ONTARIO
WOB
MOUNTAINASH 4 3190 sqft

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Sheet Title
SECOND FLOOR
HEATING
LAYOUT
Date JULY/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91956