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: RUSSEL GARDENS PHASE 3 | LOT 277 | DATE: Nov-20 | WINTER NATURAL AIR CHANGE RATE 0.319 | HEAT LOSS ΔT °F. 71 | CSA-F280-12
BUILDER: GREENPARK HOMES | TYPE: MOUNTAINASH 6 | GFA: 3360 | LO# 88387 | SUMMER NATURAL AIR CHANGE RATE 0.114 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			S-ENS			BED-5			WIC-3			ENS-3					
EXP. WALL			33			29			8			34			33			28			0			11			8			6					
CLG. HT.			9			9			9			9			9			9			9			9			9			9					
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	297			261			72			306			297			234			0			99			72			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	16.0	0	0	0	0	0	0	0	0	0	0	0	0	14	277	224	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
EAST	19.8	41.5	0	0	0	0	0	0	0	0	0	45	890	1870	64	1255	2659	0	0	0	0	0	0	0	0	0	32	633	1330	0	0	0			
SOUTH	19.8	24.9	0	0	0	7	138	174	0	0	0	0	0	0	0	0	0	11	217	274	0	0	0	11	217	274	0	0	0	7	138	174			
WEST	19.8	41.6	32	633	1330	14	277	582	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	240	995	180	72	298	54	261	1082	196	219	908	165	223	924	168	0	0	0	88	365	66	40	166	30	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	285	340	167	204	243	120	130	155	76	272	324	160	198	236	116	180	215	106	123	147	72	209	249	123	46	55	27	102	122	60			
NO ATTIC EXPOSED CLG	2.6	1.3	0	0	0	0	0	0	0	0	0	0	0	0	30	77	38	0	0	0	0	0	0	0	0	0	10	26	13	0	0	0			
EXPOSED FLOOR	2.4	0.4	0	0	0	0	0	0	0	0	0	286	678	123	30	71	13	0	0	0	123	291	53	0	0	0	56	133	24	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				2071			1653			453			2973			2834			1357			438			831			1011			455				
SUB TOTAL HT GAIN					1696			1056			131			2349			3215			547			125			463			1423			270			
LEVEL FACTOR / MULTIPLIER			0.20	0.25		0.20	0.25		0.20	0.25		0.20	0.25		0.20	0.25		0.20	0.25		0.20	0.25		0.20	0.25		0.20	0.25		0.20	0.25				
AIR CHANGE HEAT LOSS				516			412			113			741			706			338			109			207			252			113					
AIR CHANGE HEAT GAIN					122			76			9			169			232			39			9			33			103			19			
DUCT LOSS				0			0			0			371			354			0			55			0			126			0				
DUCT GAIN					0			0			0			319			411			0			56			0			196			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					428			428			428			428			428			428			428			428			428			428			
TOTAL HT LOSS BTU/H				2587			2065			567			4086			3894			1695			602			1039			1390			568				
TOTAL HT GAIN x 1.3 BTU/H					3544			2928			738			4558			5883			1631			804			1201			2794			932			

ROOM USE			L/D			FAM			K/B			L/H			LND				FOY			MUD					WUB			BAS					
EXP. WALL			50			35			44			10			7				28			24					26			156					
CLG. HT.			11			11			11			11			9				12			12					8			8					
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	550			385			484			110			63				336			288					208			780					
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN		LOSS		GAIN	LOSS		GAIN			LOSS		GAIN	LOSS		GAIN			
NORTH	19.8	16.0	0	0	0	0	0	0	8	158	128	18	356	288	7	138	112		14	277	224	0	0	0			0	0	0	5	99	80			
EAST	19.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		14	277	582	0	0	0			0	0	0	0	0	0			
SOUTH	19.8	24.9	36	712	886	0	0	0	16	316	396	0	0	0	0	0	0		0	0	0	0	0	0			0	0	0	10	198	249			
WEST	19.8	41.6	0	0	0	46	909	1911	33	662	1371	0	0	0	0	0	0		0	0	0	0	0	0			5	99	208	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	20	469	85	0	0	0	0	0	0		40	938	170	20	469	85			20	469	85	20	469	85			
NET EXPOSED WALL	4.1	0.8	514	2131	386	339	1405	255	467	1687	306	92	381	69	56	232	42		268	1111	201	268	1111	201			183	759	138	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			0	0	0	468	1564	284			
EXPOSED CLG	1.2	0.6	0	0	0	0	0	0	29	35	17	0	0	0	126	150	74		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							5139					
SLAB ON GRADE HEAT LOSS				0			0			0			0			0				0			0					233							
SUBTOTAL HT LOSS				2842			2315			3318			737			521				2603			1580					1560			7469				
SUB TOTAL HT GAIN					1283			2166			2305			357			228					1177			286					430			698		
LEVEL FACTOR / MULTIPLIER			0.30	0.41		0.30	0.41		0.30	0.41		0.30	0.41		0.20	0.25			0.30	0.41		0.30	0.41							0.50	1.01				
AIR CHANGE HEAT LOSS				1158			943			1352			300			130				1061			644								9098				
AIR CHANGE HEAT GAIN					92			158			166			26			16					85			21								81		
DUCT LOSS				0			0			0			0			0				0			0								0				
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			
HEAT GAIN APPLIANCES/LIGHTS					428			428			428			428			428					0			428					0				428	
TOTAL HT LOSS BTU/H				4001			3258			4670			1038			651				3663			2224					1560			16568				
TOTAL HT GAIN x 1.3 BTU/H					2344			3575			3769			1053			874					1640			956					559			1569		

TOTAL HEAT GAIN BTU/H: 40728 | TONS: 3.39 | LOSS DUE TO VENTILATION LOAD BTU/H: 1515 | STRUCTURAL HEAT LOSS: 56125 | TOTAL COMBINED HEAT LOSS BTU/H: 57641

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: RUSSEL GARDENS PHASE 3 — LOT 277
BUILDER: GREENPARK HOMES — TYPE: MOUNTAINASH 6 — DATE: Nov-20 — GFA: 3360 — LO# 88387

HEATING CFM 1504 — COOLING CFM 1504
TOTAL HEAT LOSS 56,125 — TOTAL HEAT GAIN 40,453
AIR FLOW RATE CFM 26.8 — AIR FLOW RATE CFM 37.18

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	0.02
r/a grille press. Loss	0.02
min adjusted pressure s/a	0.16
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	17	10	5
R/A	0	0	6	3	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	S-ENS	BED-5	WIC-3	MBR	ENS-3	L/D	FAM	K/B	K/B	L/H	LND	FOY	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.29	1.03	0.57	2.04	1.30	1.69	0.30	1.04	1.39	1.29	0.57	2.00	1.63	2.33	2.33	1.04	0.65	1.83	1.83	2.22	3.63	3.63	3.63	3.63
CFM PER RUN HEAT	35	28	15	55	35	45	8	28	37	35	15	54	44	63	63	28	17	49	49	60	97	97	97	97
RM GAIN MBH.	1.77	1.01	0.74	2.28	1.96	1.63	0.40	1.20	2.79	1.77	0.93	1.17	1.79	1.88	1.88	1.05	0.87	0.82	0.82	0.96	0.43	0.43	0.43	0.43
CFM PER RUN COOLING	66	38	27	85	73	61	15	45	104	66	35	44	66	70	70	39	32	30	30	36	16	16	16	16
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	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	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	36	48	22	65	67	49	44	34	56	26	45	35	26	31	24	19	49	53	46	23	42	22	33	33
EQUIVALENT LENGTH	100	170	160	150	200	190	170	150	160	170	180	120	110	140	130	100	180	140	130	120	100	120	120	180
TOTAL EFFECTIVE LENGTH	136	218	182	215	267	239	214	184	216	196	225	155	136	171	154	119	229	193	176	143	142	142	153	213
ADJUSTED PRESSURE	0.13	0.08	0.09	0.08	0.06	0.07	0.08	0.09	0.08	0.09	0.08	0.11	0.13	0.1	0.11	0.14	0.08	0.09	0.1	0.12	0.11	0.11	0.11	0.08
ROUND DUCT SIZE	5	4	4	6	6	6	4	6	6	5	4	5	5	5	5	4	4	5	4	5	6	6	6	6
HEATING VELOCITY (ft/min)	257	321	172	280	178	229	92	143	189	257	172	396	323	463	463	321	195	360	562	441	495	495	495	495
COOLING VELOCITY (ft/min)	485	436	310	433	372	311	172	229	530	485	402	323	485	514	514	447	367	220	344	264	82	82	82	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	F	C	F	C	A	C	B	C	B	F	C	B	F	D	D	F	C	A	A	F	F	D	C	A

RUN #	25	26	27	28	29	30	31	32
ROOM NAME	BED-2	BED-3	ENS	S-ENS	FAM	L/D	BAS	BED-3
RM LOSS MBH.	2.04	1.30	1.03	0.30	1.63	2.00	3.63	1.30
CFM PER RUN HEAT	55	35	28	8	44	54	97	35
RM GAIN MBH.	2.28	1.96	1.01	0.40	1.79	1.17	0.43	1.96
CFM PER RUN COOLING	85	73	38	15	66	44	16	73
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17
ACTUAL DUCT LGH.	60	74	44	40	14	49	46	70
EQUIVALENT LENGTH	180	200	180	180	150	170	160	200
TOTAL EFFECTIVE LENGTH	240	274	224	220	164	219	206	270
ADJUSTED PRESSURE	0.07	0.06	0.08	0.08	0.1	0.08	0.08	0.06
ROUND DUCT SIZE	6	6	4	4	5	5	6	6
HEATING VELOCITY (ft/min)	280	178	321	92	323	396	495	178
COOLING VELOCITY (ft/min)	433	372	436	172	485	323	82	372
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10
TRUNK	B	A	C	B	F	A	A	A

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	451	0.06	11.2	14	x	8	580	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	613	0.06	12.5	18	x	8	613	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	926	0.06	14.6	24	x	8	695	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	223	0.10	7.6	10	x	8	401	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1149	0.06	15.9	30	x	8	689	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	358	0.09	9.3	10	x	8	644	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	585	0.05	12.9	20	x	8	527
TRUNK W	150	0.05	7.8	8	x	8	338
TRUNK X	919	0.05	15.3	28	x	8	591
TRUNK Y	685	0.05	13.7	22	x	8	560
TRUNK Z	535	0.05	12.5	18	x	8	535
DROP	1504	0.05	18.4	24	x	14	645

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	75	75	135	115	75	75	185	400	135	0	0	0	0	0	0	234
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.	71	68	57	74	67	69	21	23	38	1	1	1	1	1	1	17
EQUIVALENT LENGTH	245	235	215	235	220	215	155	160	285	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	316	303	272	309	287	284	176	183	323	1	1	1	1	1	1	162
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.08	0.05	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	6	6	7.5	7	6	6	7.5	9.9	7.5	0	0	0	0	0	0	7.9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	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	14	14	30	14	0	0	0	0	0	0	24

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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TYPE: MOUNTAINASH 6 LO # 88387
SITE NAME: RUSSEL GARDENS PHASE 3 LOT 277

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	9	@ 10.6 cfm	95.4	cfm
Table 9.32.3.A.		TOTAL	222.6	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	222.6	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	143.1	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

79.5 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS PANASONIC

Location	Model	cfm	HVI	Sones
ENS	FV-05-11VK1	50	✓	0.3
S-ENS	FV-05-11VK1	50	✓	0.3
ENS-3	FV-05-11VK1	50	✓	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 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: November-20

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#: 88387 Model: MOUNTAINASH 6 Builder: GREENPARK HOMES Date: 30/11/2020

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	1480	8	11840
First	1480	11	16280
Second	1890	9	17010
Third	0	9	0
Fourth	0	9	0
		Total:	45,130.0 ft^3
		Total:	1277.9 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.319
SUMMER NATURAL AIR CHANGE RATE	0.114

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

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

0.319 x 354.98 x 39 °C x 1.2 = 5333 W

= 18197 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.114 x 354.98 x 7 °C x 1.2 = 346 W

= 1181 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	18,197	9,029	1.008
2	0.3		13,395	0.408
3	0.2		14,598	0.249
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 6 LOT 277 **BUILDER:** GREENPARK HOMES
SFQT: 3360 **LO#** 88387 **SITE:** RUSSEL GARDENS PHASE 3

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):	45130.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	5.0 ft
LENGTH: 55.0 ft	WIDTH: 36.0 ft	EXPOSED PERIMETER:	156.0 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

Michael O'Rourke

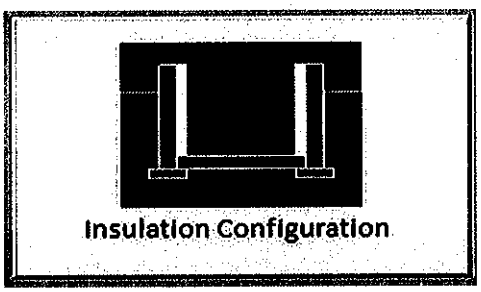
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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):	16.8	
Floor Width (m):	11.0	
Exposed Perimeter (m):	47.5	
Wall Height (m):	2.4	
Depth Below Grade (m):	1.52	
Window Area (m^2):	1.9	
Door Area (m^2):	3.7	


Insulation Configuration

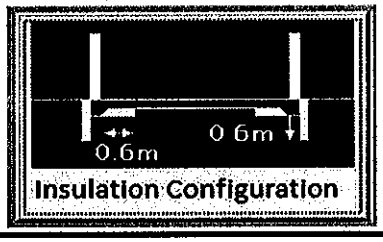
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	**1506**	

TYPE: MOUNTAINASH 6 LOT 277
LO# 88387

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):	4.9	
Exposed Perimeter (m):	7.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	**68**	

TYPE: MOUNTAINASH 6 LOT 277
LO# 88387

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

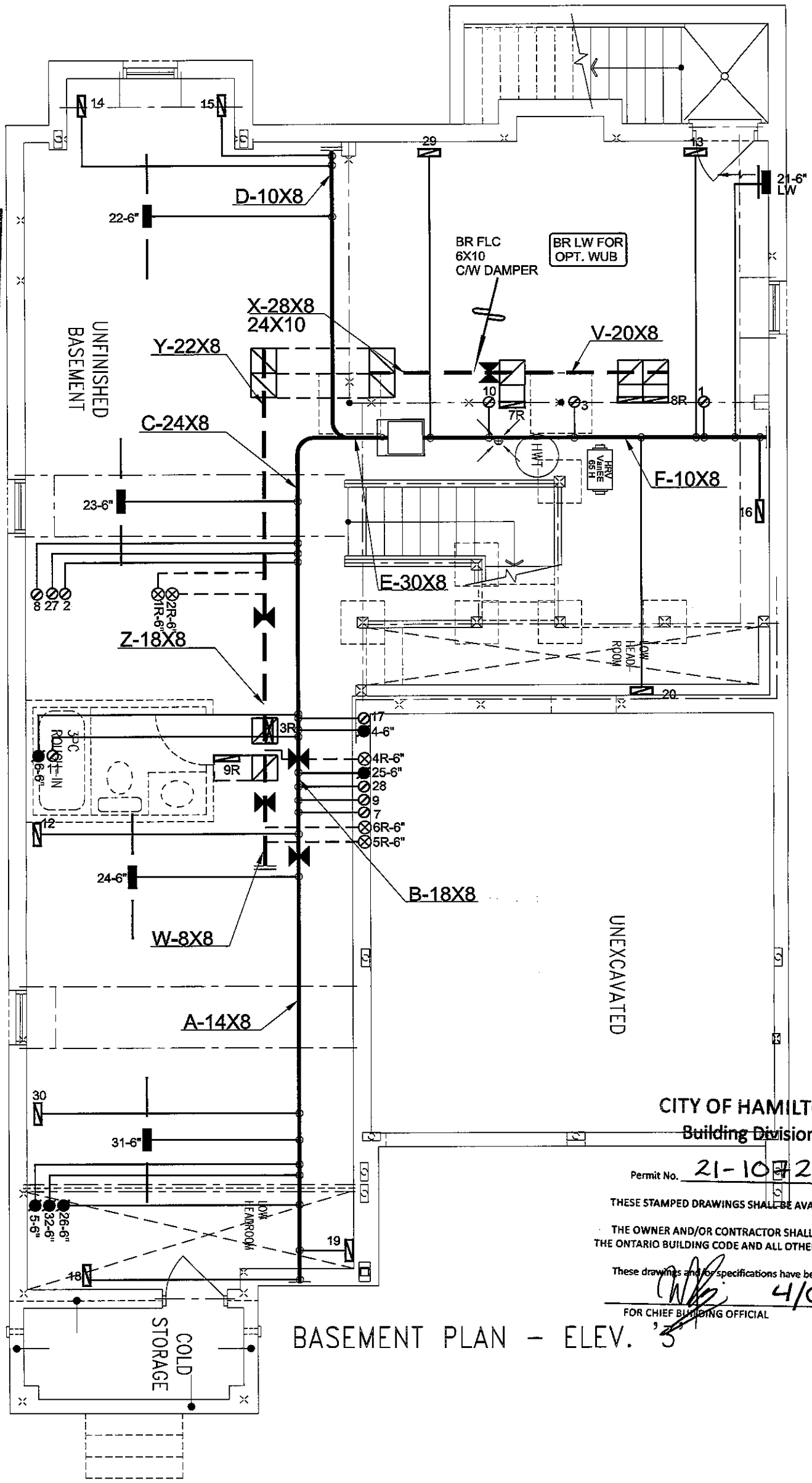
Air Infiltration Residential Load Calculator

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):	7.01	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	1277.9	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1703.5 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):	**0.319**	
Cooling Air Leakage Rate (ACH/H):	**0.114**	

TYPE: MOUNTAINASH 6 LOT 277

LO# 88387



BASEMENT PLAN – ELEV. '5'

CITY OF HAMILTON
Building Division
Permit No. 21-107204
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
4/01/21
DATE

LOT 277
WUB
CSA-F280-12
PACKAGE A1

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.

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
RUSSEL GARDENS PHASE 3
HAMILTON, ONTARIO

LOT 277
MOUNTAINASH 6 3360 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.

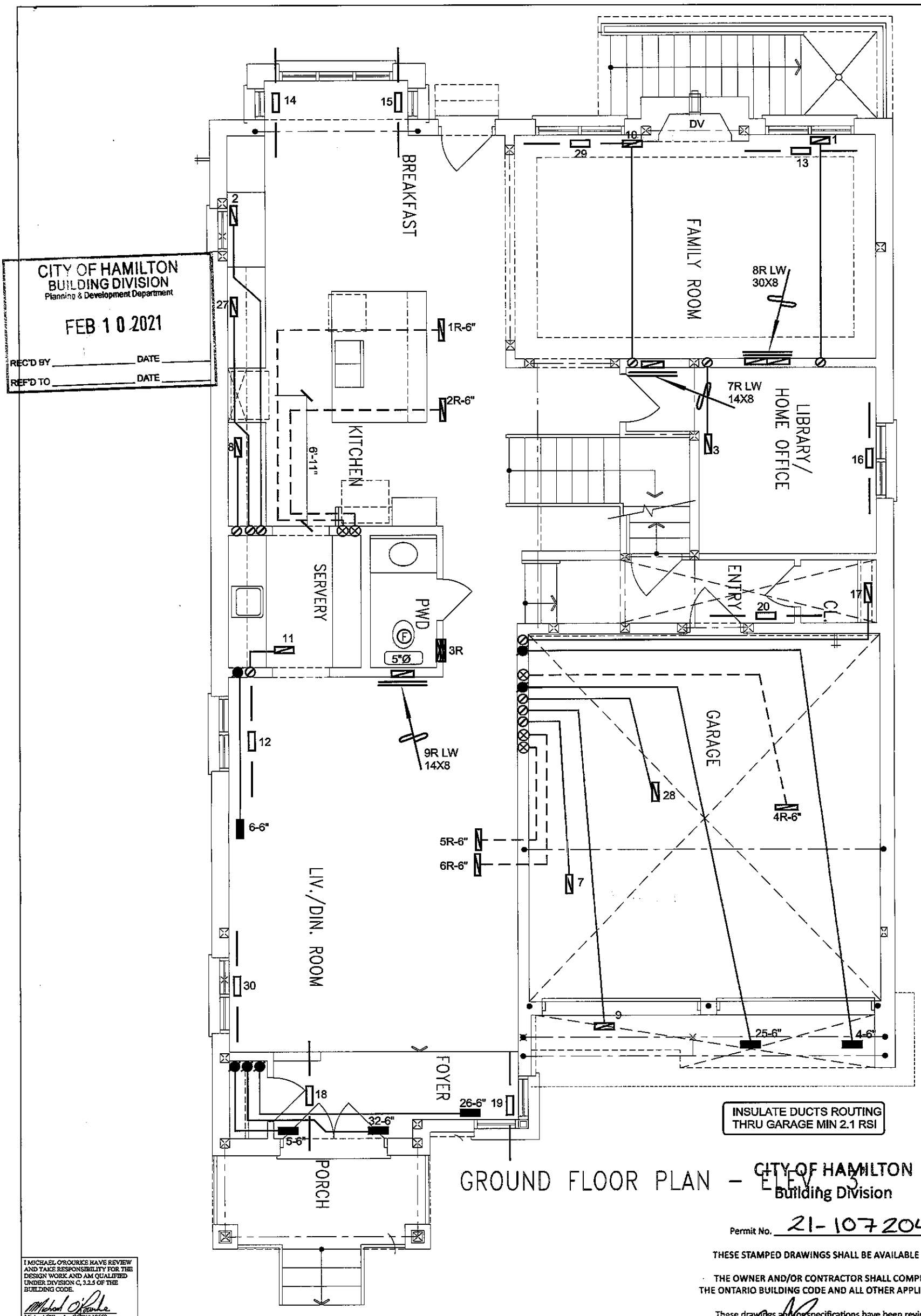
HEAT LOSS 57641 BTU/H	
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960804CNA
INPUT	80 MBTU/H
OUTPUT	76.8 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1504 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	17	6	4
1ST FLOOR	10	3	2
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 NOV/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 88387



CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department
FEB 10 2021
REC'D BY _____ DATE _____
REF'D TO _____ DATE _____

INSULATE DUCTS ROUTING THRU GARAGE MIN 2.1 RSI

GROUND FLOOR PLAN – ELEV. 3

CITY OF HAMILTON
Building Division
Permit No. 21-107204

THESE STAMPED DRAWINGS SHALL BE AVAILABLE ON SITE

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4/01/21
DATE

LOT 277
WUB
CSA-F280-12
PACKAGE A1

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No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
GREENPARK HOMES

Project Name
RUSSEL GARDENS PHASE 3
HAMILTON, ONTARIO

LOT 277
MOUNTAINASH 6 3360 sqft

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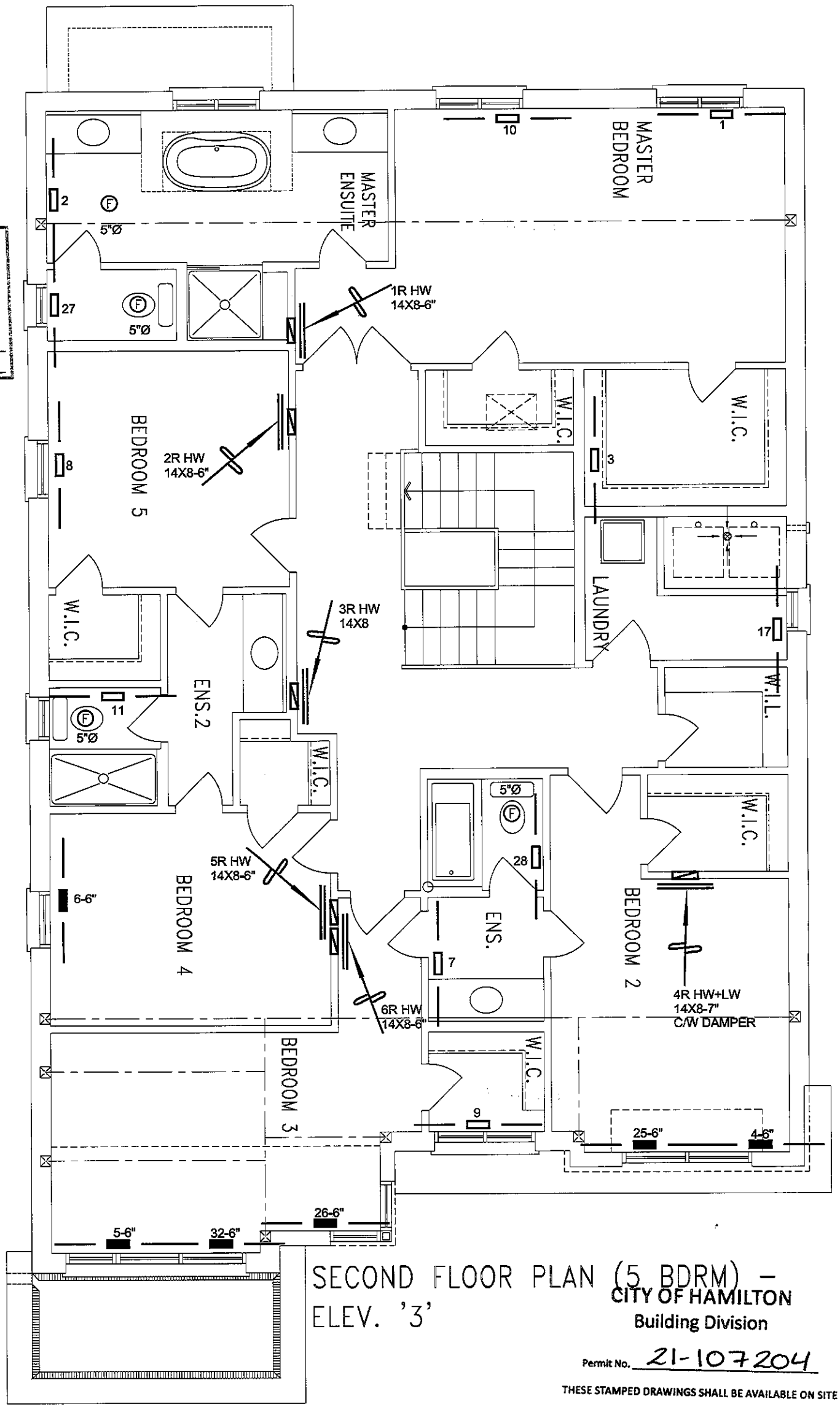
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date NOV/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 88387



SECOND FLOOR PLAN (5 BDRM) – ELEV. '3'

CITY OF HAMILTON
BUILDING DIVISION
Planning & Development Department
FEB 10 2021
REC'D BY _____ DATE _____
REF'D TO _____ DATE _____

CITY OF HAMILTON
Building Division
Permit No. 21-107204

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These drawings and/or specifications have been reviewed by _____ FOR CHIEF BUILDING OFFICIAL
3. 4/01/21 DATE
2. DATE
1.

No.	Description	Date
	REVISIONS	

LOT 277
WUB
CSA-F280-12
PACKAGE A1

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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

Client
GREENPARK HOMES

Project Name
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HAMILTON, ONTARIO

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MOUNTAINASH 6 3360 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date NOV/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 88387