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 229 | DATE: Nov-20 | WINTER NATURAL AIR CHANGE RATE 0.343 | HEAT LOSS ΔT °F. 71 | CSA-F280-12
BUILDER: GREENPARK HOMES | TYPE: MOUNTAINASH 3 | GFA: 3049 | LO# 88162 | SUMMER NATURAL AIR CHANGE RATE 0.123 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC-3			BED-3			BED-4			FLEX			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	44	870	1661	52	1028	1963	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	16	316	364	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	0	0	0	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	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27	
AIR CHANGE HEAT LOSS				711			217			185			697			670			331			242			363			111	
AIR CHANGE HEAT GAIN					134			38			58			158			179			48			22			65			18
DUCT LOSS				0			0			88			332			319			0			115			0			0	
DUCT GAIN					0			0			32			299			329			0			31			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	0		0	0		0	1		240	0		0
HEAT GAIN APPLIANCES/LIGHTS					511			0			0			511			511			511			0			511			0
TOTAL HT LOSS BTU/H				3388			1035			970			3656			3511			1577			1270			1732			530	
TOTAL HT GAIN x 1.3 BTU/H					3763			705			1167			4280			4701			1551			446			2169			331

ROOM USE			L/D			FM			K/B			L/H			LND			W/R			FOY						WOD			BAS		
EXP. WALL			30			33			35			27			31			7			15						46			178		
CLG. HT.			11			11			11			12			11			11			11						8			8		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	318			350			371			313			329			74			491						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	5	99	74
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	10	198	228
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				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
DOORS	23.5	4.3	0	0	0	0	0	0	12	281	51	0	0	0	20	469	85	40	938	170	40	938	170				0	0	0	20	469	85
NET EXPOSED WALL	4.1	0.8	282	1169	212	316	1309	237	285	1182	214	273	1133	205	301	1246	226	27	113	20	145	600	109				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				276	923	167	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							5279		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0						0			
SUBTOTAL HT LOSS				1881			1981			2926			1923			1873			1189			1657						923			6927	
SUB TOTAL HT GAIN					1032			1521			2954			1716			429			350			505						167			545
LEVEL FACTOR / MULTIPLIER			0.30	0.39		0.30	0.39		0.30	0.39		0.30	0.39		0.30	0.39		0.30	0.39		0.30	0.39								0.50	1.12	
AIR CHANGE HEAT LOSS				741			781			1163			758			738			469			653									8819	
AIR CHANGE HEAT GAIN					78			115			224			130			33			27			38										54
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					511			511			511			511			511			0			0						0			511
TOTAL HT LOSS BTU/H				2622			2762			4078			2681			2611			1658			2310						923			15745	
TOTAL HT GAIN x 1.3 BTU/H					2107			2792			4796			3064			1264			489			707						217			1445

TOTAL HEAT GAIN BTU/H: 36272 | TONS: 3.02 | LOSS DUE TO VENTILATION LOAD BTU/H: 1515 | STRUCTURAL HEAT LOSS: 53059 | TOTAL COMBINED HEAT LOSS BTU/H: 54574

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

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SITE NAME: RUSSEL GARDENS PHASE 3 LOT 229
BUILDER: GREENPARK HOMES TYPE: MOUNTAINASH 3 DATE: Nov-20 GFA: 3049 LO# 88162

HEATING CFM	1131	COOLING CFM	1131	furnace pressure	0.6		
TOTAL HEAT LOSS	53,059	TOTAL HEAT GAIN	35,997	furnace filter	0.05	#GOODMAN	AFUE = 96 %
AIR FLOW RATE CFM	21.32	AIR FLOW RATE CFM	31.42	a/c coil pressure	0.2	GMEC960603BNA 60	INPUT (BTU/H) = 60,000
				available pressure for s/a & r/a	0.35	FAN SPEED	OUTPUT (BTU/H) = 57,600

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	8	4
R/A	0	0	6	2	1

plenum pressure s/a	0.18	r/a pressure	0.17	LOW		
max s/a dif press. loss	0.02	r/a grille press. Loss	0.02	MEDLOW		DESIGN CFM = 1131
min adjusted pressure s/a	0.16	adjusted pressure r/a	0.15	MEDIUM	928	CFM @ .6 " E.S.P.
				MEDIUM HIGH	1017	
				HIGH	1131	TEMPERATURE RISE 47 °F

All S/A diffusers 4"x10" unless noted otherwise on layout.
All S/A runs 5"Ø unless noted otherwise on layout.

RUN #	1	2	3	4	5	6	7	8	9	10	11	12
ROOM NAME	BED-2	ENS	WIC-3	BED-3	BED-4	FLEX	ENS-1	BED-3	BED-4	MBR	S-ENS	L/D
RM LOSS MBH.	1.73	1.03	0.97	1.83	1.76	1.58	1.27	1.83	1.76	1.69	0.53	2.62
CFM PER RUN HEAT	37	22	21	39	37	34	27	39	37	36	11	56
RM GAIN MBH.	2.17	0.71	1.17	2.14	2.35	1.55	0.45	2.14	2.35	1.88	0.33	2.11
CFM PER RUN COOLING	68	22	37	67	74	49	14	67	74	59	10	66
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
ACTUAL DUCT LGH.	57	19	43	51	48	32	61	56	47	46	30	17
EQUIVALENT LENGTH	140	150	110	120	150	180	130	130	160	160	190	120
TOTAL EFFECTIVE LENGTH	197	169	153	171	198	212	191	186	207	206	220	137
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
ROUND DUCT SIZE	5	4	4	5	5	5	4	5	5	5	4	5
HEATING VELOCITY (ft/min)	272	252	241	286	272	250	310	286	272	264	126	411
COOLING VELOCITY (ft/min)	499	252	424	492	543	360	161	492	543	433	115	485
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	B	D	D	C	B	A	D	C	A	C	D

RUN #	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	FM	K/B	K/B	L/H	LND	W/R	FOY	MBR	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.76	2.04	2.04	2.68	2.61	1.66	2.31	1.69	4.17	4.17	4.17	4.17
CFM PER RUN HEAT	59	43	43	57	56	35	49	36	89	89	89	89
RM GAIN MBH.	2.79	2.40	2.40	3.06	1.26	0.49	0.71	1.88	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	88	75	75	96	40	15	22	59	13	13	13	13
ADJUSTED PRESSURE	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.	47	23	33	37	47	16	35	22	44	19	4	22
EQUIVALENT LENGTH	120	140	100	150	110	150	100	140	140	110	130	130
TOTAL EFFECTIVE LENGTH	167	163	133	187	157	166	135	162	184	129	134	152
ADJUSTED PRESSURE	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	6	6	6	6	5	4	4	5	6	6	6	6
HEATING VELOCITY (ft/min)	301	219	219	291	411	402	562	264	454	454	454	454
COOLING VELOCITY (ft/min)	449	382	382	489	294	172	252	433	66	66	66	66
OUTLET GRILL SIZE	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	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	

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	304	0.08	9	10	x	8	547	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	571	0.08	11.4	16	x	8	642	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	315	0.08	9.1	10	x	8	567	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.

[signature] INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: MOUNTAINASH 3 LO # 88162
SITE NAME: RUSSEL GARDENS PHASE 3 LOT 229

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4 ~~5~~	@ 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

222.6

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	212	cfm
Less Principal Ventil. Capacity	95.4	~~79.5~~	cfm
Required Supplemental Capacity	127.2	~~132.5~~	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
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 65H

155 cfm high 84 cfm low

76 % 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 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

Michael O'Rourke 95.4

HVAC DESIGNS LTD.

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 88162 | Model: MOUNTAINASH 3 | Builder: GREENPARK HOMES | Date: 09/11/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1378	8	11024
First	1378	11	14606.8
Second	1671	9	15039
Third	0	9	0
Fourth	0	9	0
		Total:	40,669.8 ft³
		Total:	1151.6 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.343
SUMMER NATURAL AIR CHANGE RATE	0.123

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

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

0.343 x 319.90 x 39 °C x 1.2 = 5169 W

= 17637 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.123 x 319.90 x 7 °C x 1.2 = 336 W

= 1145 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	17,637	7,849	1.124
2	0.3		13,431	0.394
3	0.2		13,286	0.266
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 LOT 229 **BUILDER:** GREENPARK HOMES
SFQT: 3049 **LO#** 88162 **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):	40669.8	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:	6.0 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

Michael O'Rourke

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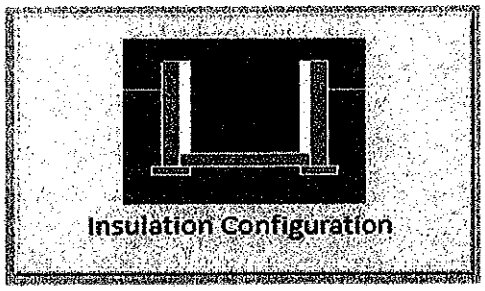
Residential Foundation Thermal Load Calculator

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):	**1.4**	
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):		**1547**

TYPE: MOUNTAINASH 3 LOT 229
LO# 88162

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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):	7.80				
Building Configuration					
Type:	Detached				
Number of Stories:	Two				
Foundation:	Full				
House Volume (m^3):	1151.6				
Air Leakage/Ventilation					
Air Tightness Type:	Present (1961-) (3.57 ACH)				
Custom BDT Data:	ELA @ 10 Pa.				1535.2 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):	**0.343**				
Cooling Air Leakage Rate (ACH/H):	**0.123**				

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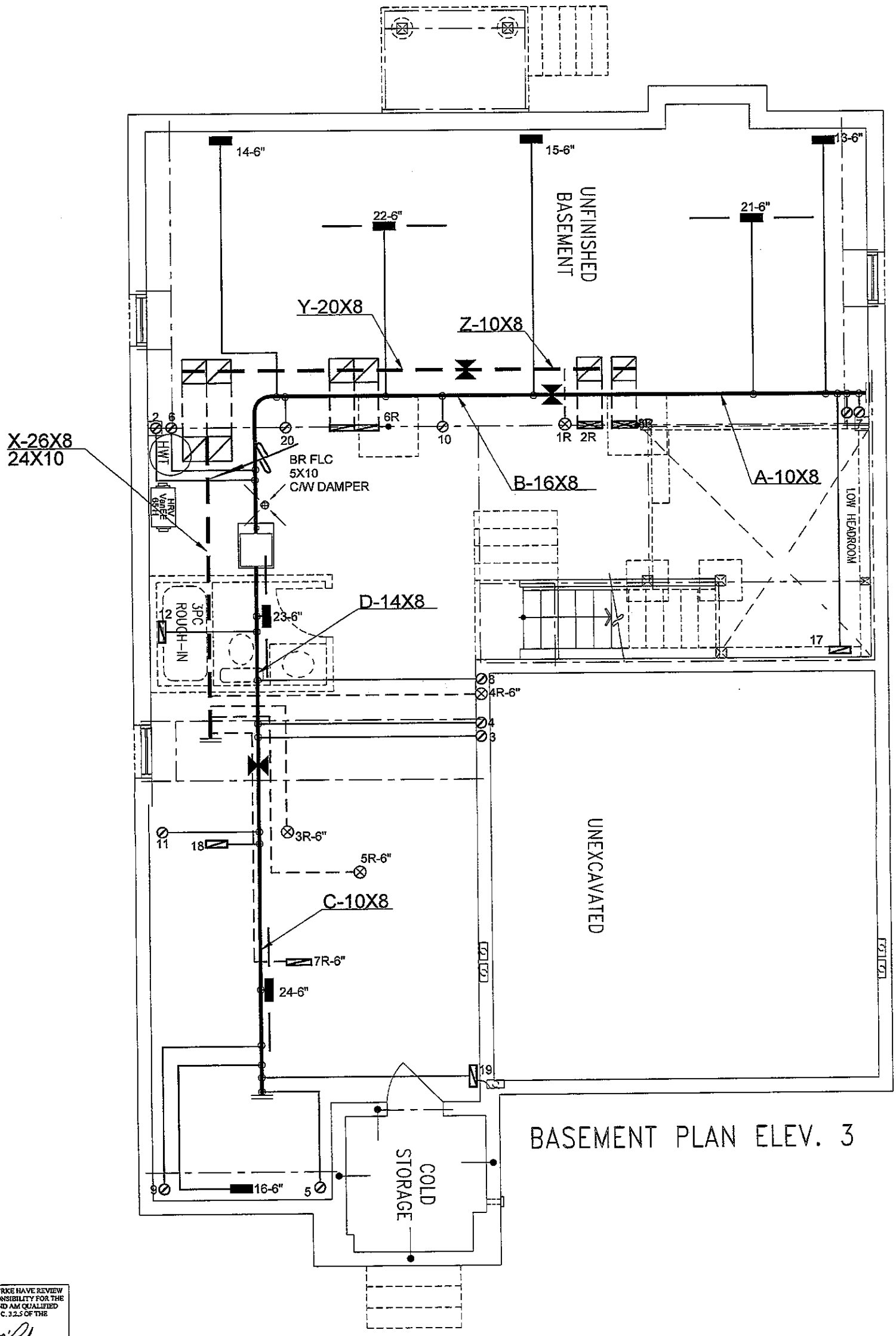

LOT 229
CSA-F280-12
PACKAGE A1

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"x6" 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 229
MOUNTAINASH 3 3049 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 54574 BTU/H

UNIT DATA

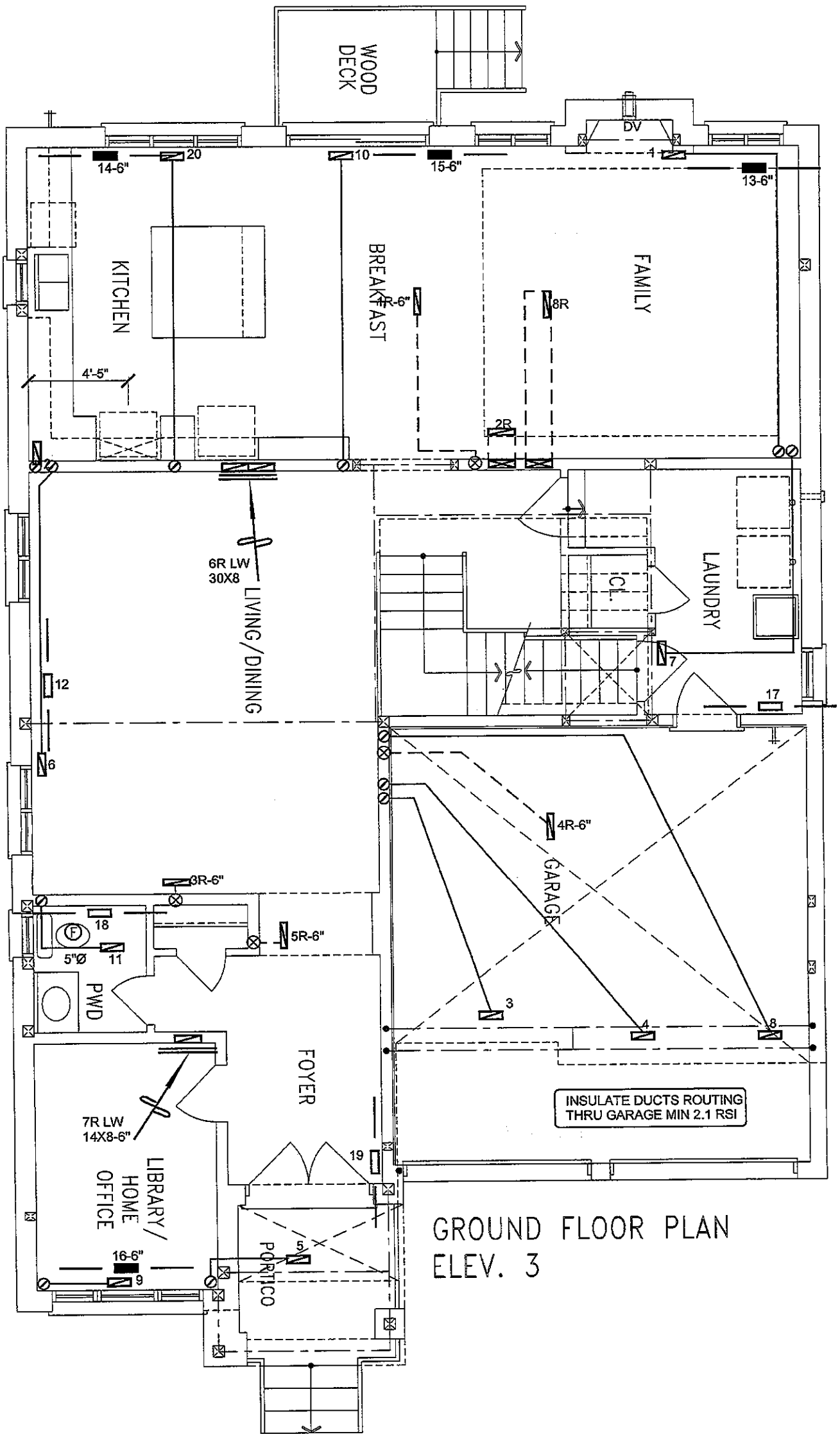
MAKE	GOODMAN	
MODEL	GMEC960603BNA	
INPUT	60	MBTU/H
OUTPUT	57.6	MBTU/H
COOLING	3.0	TONS
FAN SPEED	1131	cfm @ 0.5" w.c.

# 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 NOV/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 88162



GROUND FLOOR PLAN
ELEV. 3

LOT 229
CSA-F280-12
PACKAGE A1

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HVAC LEGEND

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▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▭	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

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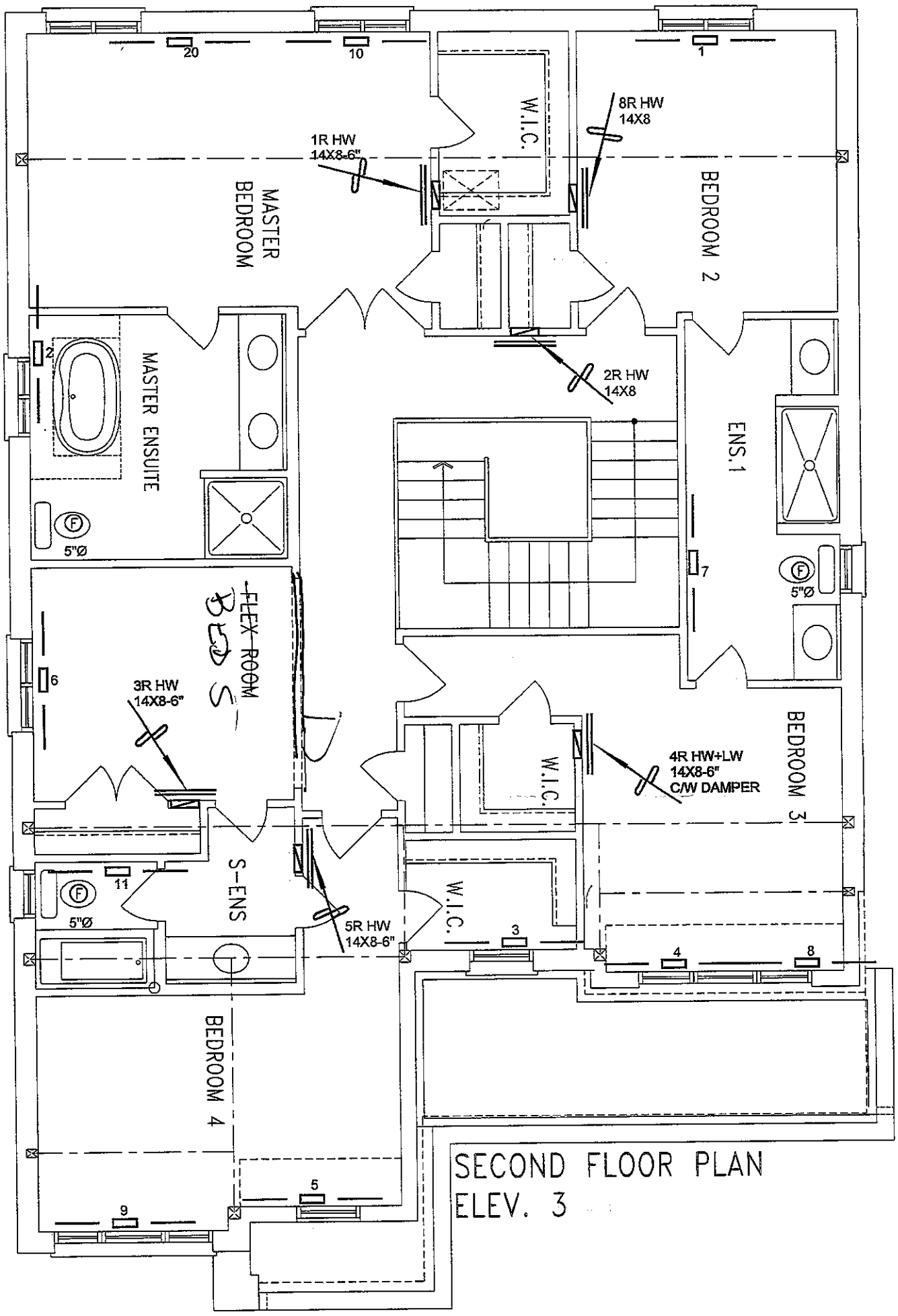
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date NOV/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 88162



SECOND FLOOR PLAN
ELEV. 3

LOT 229
CSA-F280-12
PACKAGE A1

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HVAC LEGEND

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SECOND FLOOR HEATING LAYOUT

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