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: MINNISSALE HOMES CORP — DATE: Aug-18 — WINTER NATURAL AIR CHANGE RATE 0.382 — HEAT LOSS ΔT °F. 74 — CSA-F280-12
BUILDER: GREENPARK HOMES — TYPE: MILLWOOD 3 — GFA: 2622 — LO# 79584 — SUMMER NATURAL AIR CHANGE RATE 0.124 — HEAT GAIN ΔT °F. 11 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH						ENS-2					
EXP. WALL			37			23			8			10			24			41			8						15					
CLG. HT.			9			9			9			9			9			9			9						9					
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	333			207			72			90			216			369			72						135					
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN				
NORTH	20.8	16.5	0	0	0	0	0	0	0	0	0	8	166	124	0	0	0	0	0	0	0	0	0				0	0	0			
EAST	20.8	41.0	0	0	0	0	0	0	0	0	0	0	0	0	17	353	698	21	436	862	0	0	0				17	353	698			
SOUTH	20.8	24.4	23	478	561	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0			
WEST	20.8	41.0	34	706	1396	13	270	534	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0			
SKYLT.	36.4	100.7	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	24.7	3.7	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	4.4	0.6	276	1203	178	194	845	125	72	314	47	82	357	53	199	867	129	348	1516	225	72	314	47				116	514	76			
NET EXPOSED SKYLT WALL ABOVE GR	3.6	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0			
EXPOSED CLG	1.3	0.6	306	383	171	132	165	74	60	75	33	180	226	100	204	256	114	281	352	157	240	301	134				66	83	37			
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	16	43	19	16	43	19	0	0	0				0	0	0			
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	16	40	6	16	40	6	0	0	0				0	0	0			
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0						0					
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0						0					
SUBTOTAL HT LOSS			2770			1281			389			749			1559			2387			615						950					
SUB TOTAL HT GAIN				2306			732			80			277			966			1268			180						811				
LEVEL FACTOR / MULTIPLIER			0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32					0.20	0.32				
AIR CHANGE HEAT LOSS			883			408			124			239			497			761			196						303					
AIR CHANGE HEAT GAIN				151			48			5			18			63			83			12						53				
DUCT LOSS			0			0			0			0			206			316			81						126					
DUCT GAIN				0			0			0			0			184			216			19						86				
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0				0		0			
HEAT GAIN APPLIANCES/LIGHTS					569			0			0			569			569			569			0						0			
TOTAL HT LOSS BTU/H			3653			1689			513			988			2261			3463			892						1378					
TOTAL HT GAIN x 1.3 BTU/H				4557			1015			111			1435			2627			3089			275						1235				

ROOM USE			LIV				KIT			FAM				WR			FOY						WOB			BAS		
EXP. WALL			46				35			43				0			29						154			31		
CLG. HT.			10				10			10				10			14						9			9		
	FACTORS																											
GRS.WALL AREA	LOSS	GAIN	460				350			430				0			406						1386			140		
GLAZING			LOSS	GAIN			LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN					LOSS	GAIN		LOSS	GAIN	
NORTH	20.8	16.5	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0				64	1330	950	0	0	0
EAST	20.8	41.0	54	1122	2217		0	0	0	0	0	0		0	0	0	5	104	205				0	0	0	0	0	0
SOUTH	20.8	24.4	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0				0	0	0	3	62	73
WEST	20.8	41.0	0	0	0		57	1184	2340	33	686	1355		0	0	0	0	0	0				0	0	0	0	0	0
SKYLT.	36.4	100.7	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0				0	0	0	0	0	0
DOORS	24.7	3.7	20	493	73		8	197	29	0	0	0		0	0	0	45	1109	164				20	493	73	0	0	0
NET EXPOSED WALL	4.4	0.6	386	1682	249		285	1242	184	397	1730	256		0	0	0	356	1551	230				1302	5673	841	0	0	0
NET EXPOSED SKYLT WALL ABOVE GR	3.6	0.5	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0				0	0	0	140	490	73
EXPOSED CLG	1.3	0.6	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	2.7	1.2	0	0	0		30	81	36	10	27	12		0	0	0	0	0	0				0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	351	874	130		0	0	0	0	0	0		10	25	4	0	0	0				0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0				0			0				0			0								1482		
SLAB ON GRADE HEAT LOSS				0				0			0				0			0						2185				
SUBTOTAL HT LOSS				4171				2704			2442				25			2765						9680			2034		
SUB TOTAL HT GAIN					2669				2589			1623				4			600						1904			146
LEVEL FACTOR / MULTIPLIER			0.30	0.42			0.30	0.42		0.30	0.42			0.30	0.42		0.30	0.42								0.50	0.73		
AIR CHANGE HEAT LOSS				1762				1142			1032				11			1168									8526		
AIR CHANGE HEAT GAIN					175				169			106				0			39										134
DUCT LOSS				593				0			0				4			393									0		
DUCT GAIN					341				0			0				0			121										0
HEAT GAIN PEOPLE	240		0		0		0		0	0		0		0		0	0		0				0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					569				569			569				0			569						0			0
TOTAL HT LOSS BTU/H				6526				3846			3474				39			4326						9680			10560		
TOTAL HT GAIN x 1.3 BTU/H					4879				4325			2988				6			1727						3475			364

TOTAL HEAT GAIN BTU/H: 31345 — TONS: 2.61 — LOSS DUE TO VENTILATION LOAD BTU/H: 1593 — STRUCTURAL HEAT LOSS: 53289 — TOTAL COMBINED HEAT LOSS BTU/H: 54881

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 26 2018
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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: MINNISSALE HOMES CORP
BUILDER: GREENPARK HOMES

TYPE: MILLWOOD 3 DATE: Aug-18 GFA: 2622 LO# 79584

HEATING CFM	1131	COOLING CFM	1131
TOTAL HEAT LOSS	53,289	TOTAL HEAT GAIN	31,109
AIR FLOW RATE CFM	21.22	AIR FLOW RATE CFM	36.36

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	0.03
min adjusted pressure s/a	0.15
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
MEDIUM HIGH
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	10	7	6
R/A	0	0	4	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	10	11	12	13	14	15	16	18	19	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-4	MBR	ENS-2	LIV	LIV	KIT	KIT	FAM	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.83	1.69	0.51	0.99	2.26	1.73	0.89	1.73	1.83	1.38	3.26	3.26	1.92	1.92	3.47	0.04	4.33	3.37	3.37	3.37	3.37
CFM PER RUN HEAT	39	36	11	21	48	37	19	37	39	29	69	69	41	41	74	1	92	72	72	72	72
RM GAIN MBH.	2.28	1.01	0.11	1.44	2.63	1.54	0.27	1.54	2.28	1.24	2.44	2.44	2.16	2.16	2.99	0.01	1.73	0.47	0.47	0.47	0.47
CFM PER RUN COOLING	83	37	4	52	96	56	10	56	83	45	89	89	79	79	109	0	63	17	17	17	17
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.17	0.17	0.15	0.17	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	60	35	15	30	41	66	14	70	46	48	45	20	32	25	45	17	47	26	37	46	23
EQUIVALENT LENGTH	130	140	200	130	160	170	160	160	150	180	130	140	150	150	150	120	150	160	140	140	160
TOTAL EFFECTIVE LENGTH	190	175	215	160	201	236	174	230	196	228	175	160	182	175	195	137	197	186	177	186	183
ADJUSTED PRESSURE	0.09	0.1	0.08	0.11	0.08	0.07	0.1	0.07	0.08	0.08	0.09	0.1	0.09	0.1	0.08	0.13	0.08	0.09	0.1	0.09	0.09
ROUND DUCT SIZE	6	4	4	5	6	5	4	5	6	4	6	6	5	5	6	4	6	5	5	5	5
HEATING VELOCITY (ft/min)	199	413	126	154	245	272	218	272	199	333	352	352	301	301	377	11	469	529	529	529	529
COOLING VELOCITY (ft/min)	423	424	46	382	489	411	115	411	423	516	454	454	580	580	556	0	321	125	125	125	125
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10
TRUNK	A	B	B	D	D	C	D	C	B	C	D	D	B	B	A	D	C	B	B	A	D

RUN #	25	26
ROOM NAME	BAS	BAS
RM LOSS MBH.	3.37	3.37
CFM PER RUN HEAT	72	72
RM GAIN MBH.	0.47	0.47
CFM PER RUN COOLING	17	17
ADJUSTED PRESSURE	0.17	0.17
ACTUAL DUCT LGH.	48	31
EQUIVALENT LENGTH	150	160
TOTAL EFFECTIVE LENGTH	198	191
ADJUSTED PRESSURE	0.09	0.09
ROUND DUCT SIZE	5	5
HEATING VELOCITY (ft/min)	529	529
COOLING VELOCITY (ft/min)	125	125
OUTLET GRILL SIZE	3X10	3X10
TRUNK	C	C

CITY OF BRAMPTON
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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	185	0.08	7.5	6	x	8	555	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	497	0.08	10.8	14	x	8	639	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	339	0.07	9.7	12	x	8	509	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	638	0.07	12.3	18	x	8	638	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	1131	0.05	16.5	32	x	8	636
TRUNK Y	340	0.05	10.5	14	x	8	437
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1131	0.05	16.5	24	x	10	679

RETURN AIR #	1	2	3	4	5	6										BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	75	145	95	155	120	330	0	0	0	0	0	0	0	0	0	211
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.	49	59	52	45	42	34	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	225	185	135	180	230	175	0	0	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	274	244	187	225	272	209	1	1	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.06	0.08	0.07	0.05	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	6	7.3	5.8	7.2	7.1	9.6	0	0	0	0	0	0	0	0	0	7.6
INLET GRILL SIZE	8	8	8	8	8	8	0	0	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	0	0	0	0	0	0	0	0	0	24

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INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: MILLWOOD 3 LO # 79584
SITE NAME: MINNISSALE HOMES CORP

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	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A.		TOTAL	169.6	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 9.32.3.6.

Total Ventilation Capacity	169.6	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	90.1	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	74 F	X	1.08	X	0.25

SUPPLEMENTAL FANS PANASONIC

Location	Model	cfm	HVI	Sones
ENS	FV-05-11VK1	50	✓	0.3
BATH	FV-05-11VK1	50	✓	0.3
ENS-2	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 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 #:

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S DESAI
NOV 26 2018
ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS
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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: August-18

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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 79584 Model: MILLWOOD 3 Builder: GREENPARK HOMES Date: 8/9/2018

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	962	9	8658
First	1332	10	13320
Second	1290	9	11610
Third	0	9	0
Fourth	0	9	0
		Total:	33,588.0 ft³
		Total:	951.1 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.382
SUMMER NATURAL AIR CHANGE RATE	0.124

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-19	41	74
Summer DTDc	24	30	6	11

5.2.3.1 Heat Loss due to Air Leakage

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

0.382 x 264.20 x 41 °C x 1.2 = 4997 W

= 17051 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.124 x 264.20 x 6 °C x 1.2 = 241 W

= 821 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 74 °F x 1.08 x 0.25 = 1593 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 11 °F x 1.08 x 0.25 = 236 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	17,051	11,715	0.728
2	0.3		12,067	0.424
3	0.2		10,699	0.319
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

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 26 2018
ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH OBC

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

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: MILLWOOD 3 **BUILDER:** GREENPARK HOMES
SFQT: 2622 **LO#** 79584 **SITE:** MINNISSALE HOMES CORP

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-2	OUTDOOR DESIGN TEMP.	86
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):	33588.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^3$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	4.5 ft
LENGTH: 47.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	31.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	125.0 ft

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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

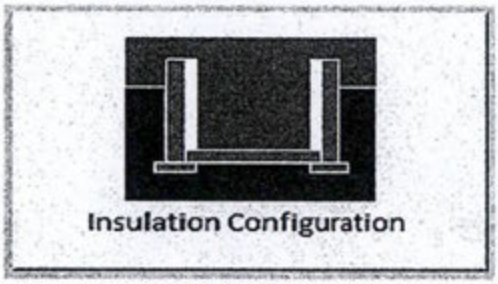
Michael O'Rourke.

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:	Brampton
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)
Foundation Dimensions	
Floor Length (m):	17.4
Floor Width (m):	9.4
Exposed Perimeter (m):	9.4
Wall Height (m):	2.7
Depth Below Grade (m):	1.28
Window Area (m^2):	0.3
Door Area (m^2):	0.0
Radiant Slab	
Heated Fraction of the Slab:	0
Fluid Temperature (°C):	33
Design Months	
Heating Month	1
Foundation Loads	
Heating Load (Watts):	**434**

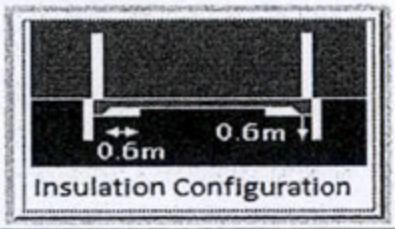

Insulation Configuration

TYPE: MILLWOOD 3
LO# 79584

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:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	14.3	 Insulation Configuration
Width (m):	9.4	
Exposed Perimeter (m):	38.1	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	**640**	

TYPE: MILLWOOD 3
LO# 79584

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:	Brampton	
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):	951.1	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1267.9 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):	**0.382**
Cooling Air Leakage Rate (ACH/H):	**0.124**

CITY OF BRAMPTON
BUILDING DIVISION
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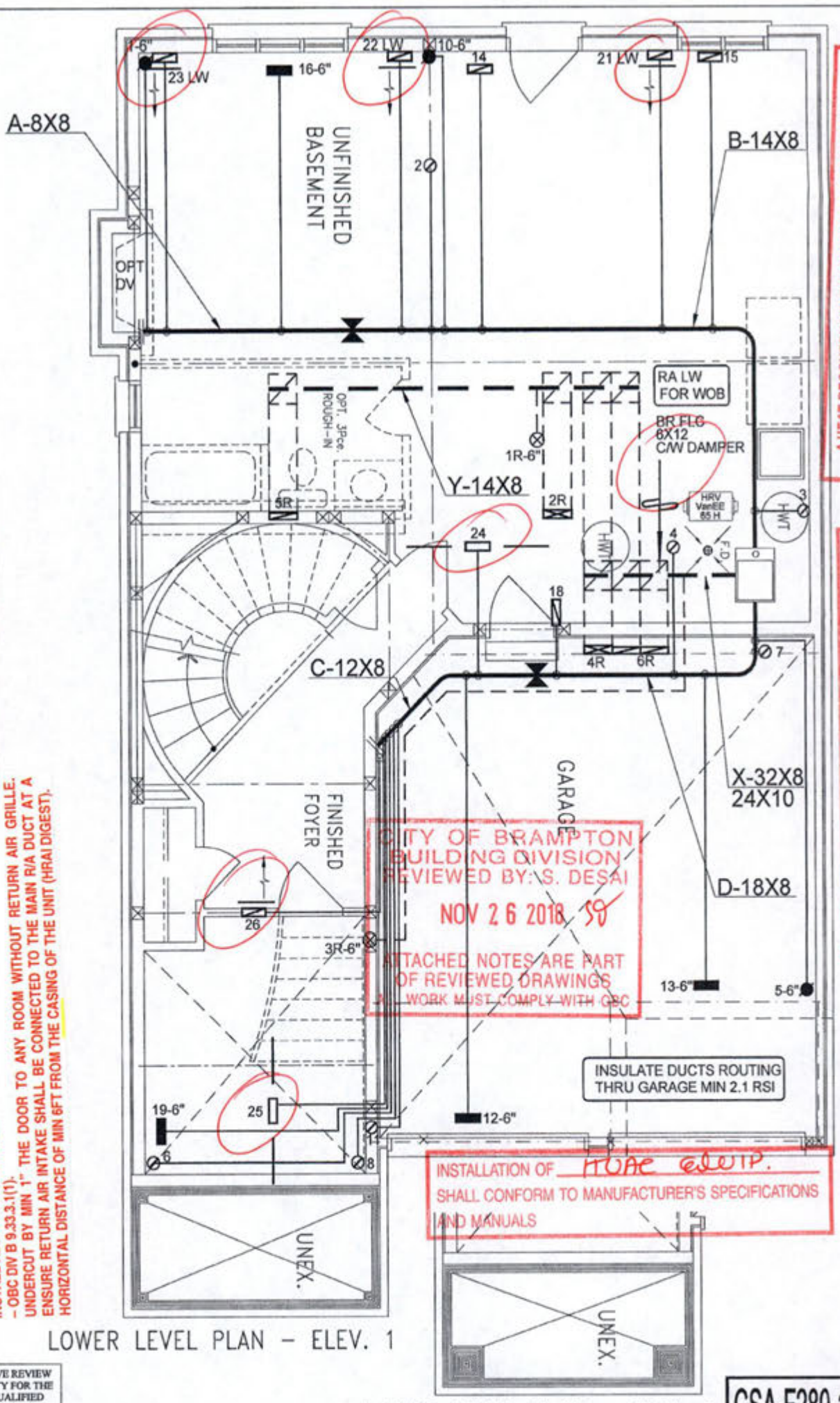
TYPE: MILLWOOD 3
LO# 79584



LOWER LEVEL PLAN – ELEV. 1

LOWER LEVEL PLAN – ELEV. 2

A HEAT RECOVERY VENTILATOR SHALL BE INSTALLED IN COMPLIANCE WITH OBC DIV. B, 6.2.1.6, 9.32.3.6(3), 9.32.3.11 AND HRAI DIGEST REQUIREMENTS.

THE INSTALLATION OF CARBON MONOXIDE DETECTOR(S) SHALL COMPLY WITH OBC DIV. B, 9.33.4 REQUIREMENTS.

MECHANICAL VENTILATION SHALL BE PROVIDED IN CONFORMANCE WITH OBC DIV. B, 9.32.3 REQUIREMENTS.

ENSURE THAT MIN THERMAL PERFORMANCE OF BLDG ENVELOPE AND EQUIPMENT SHALL CONFORM TO OBC SB-12, 3.1.1.2 TABLES REQUIREMENTS.
FURNACE SHALL BE EQUIPPED WITH BRUSHLESS DIRECT CURRENT MOTOR OBC DIV B 12.3.1.5.
SEAL ALL DUCTWORK WITHIN UNCONDITIONED SPACE or OUTDOORS PER OBC DIV B6.2.4.3(11) REQUIREMENTS. SEAL ALL SUPPLY DUCTS LOCATED IN CONDITIONED SPACE IN COMPLIANCE WITH OBC DIV B6.2.4.3(12) REQUIREMENTS.
SEPARATE ANY INTAKES FROM BUILDING ENVELOPE PENETRATIONS THAT ARE POTENTIAL SOURCES OF CONTAMINANTS (GAS VENTS, OIL FILL PIPES, etc. BY MIN 900mm (2FT 11IN) – OBC Div B 9.32.3.12.

INSTALLATION OF KITCHEN EXHAUST DUCT LARGER THAN 6"dia SHALL BE PRECEDED BY APPLICATION FOR REVISION OF DESIGN PER OBC PART 6 REQUIREMENTS.
EXHAUST FAN SHALL DISCHARGE DIRECTLY TO OUTSIDE. CLOTHES DRYER EXHAUST SYSTEM SHALL COMPLY WITH OBC DIV B 9.32.1.2, 9.32.1.3 & 9.32.3 REQ'S. BALANCE THE RETURN AIRFLOW ON THE UPPER FLOOR TO MATCH THE SUPPLY.
WHEN HRV IS USED AS PRINCIPAL EXHAUST FAN, THE CONTROLLER SHALL BE TO THE HRV UNIT AND INTERCONNECTED TO THE FURNACE FAN. THE FURNACE BLOWER MUST BE IN OPERATION WHEN THE HRV IS IN OPERATION.
INSTALL ADDITIONAL S/A REGISTER AS REQUIRED IN ORDER TO ENSURE MIN 72degF
– OBC DIV B 9.33.3.1(1).
UNDERCUT BY MIN 1" THE DOOR TO ANY ROOM WITHOUT RETURN AIR GRILLE.
ENSURE RETURN AIR INTAKE SHALL BE CONNECTED TO THE MAIN R/A DUCT AT A HORIZONTAL DISTANCE OF MIN 6FT FROM THE CASING OF THE UNIT (HRAI DIGEST).

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
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	FLOOR SUPPLY AIR GRILLE 6" BOOT	Ø	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: MINNISALE HOMES CORP.
BRAMPTON, ONTARIO

MILLWOOD 3 2622 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
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Email: info@hvacdesigns.ca
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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 54881 BTU/H	
UNIT DATA	
MAKE	GOODMAN
MODEL	GME C960803BNA-60
INPUT	60 MBTUH
OUTPUT	57.6 MBTUH
COOLING	2.5 TONS
FAN SPEED	1131 cfm @ 0.5" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	10	4	2
1ST FLOOR	7	2	2
BASEMENT	6	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

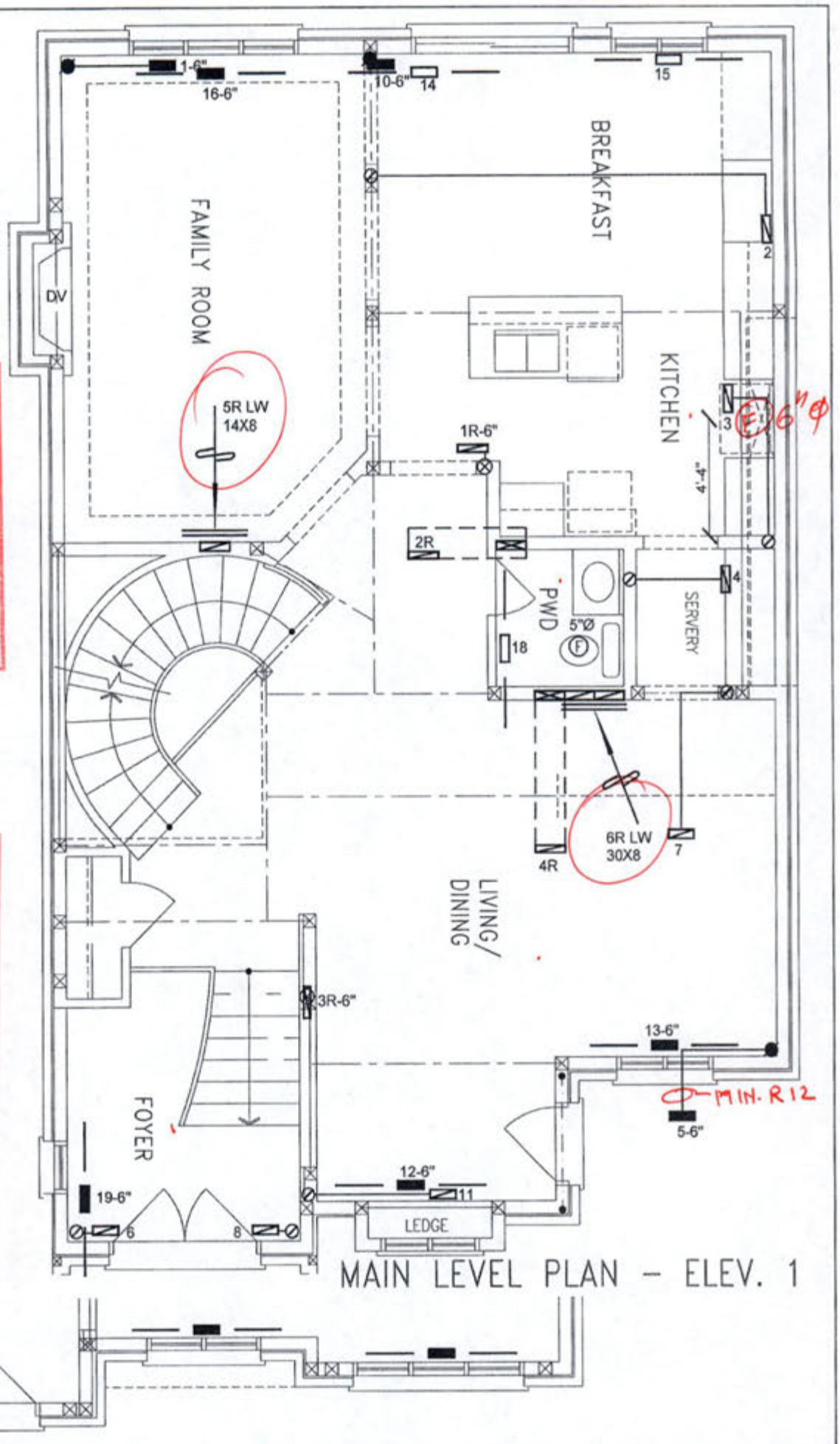
Sheet Title: BASEMENT HEATING LAYOUT

Date: AUG/2018

Scale: 3/16" = 1'-0"

BCIN# 19669

LO# 79584



MAIN LEVEL PLAN – ELEV. 1

MAIN LEVEL PLAN – ELEV. 2

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 26 2018

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THIS INSTALLATION OF A GAS FIREPLACE IS REGULATED UNDER THE T.S.S.A. BY C.S.A. B149.1 NATURAL GAS AND PROPANE INSTALLATION CODE CALL ENBRIDGE FOR INSPECTION AT 1-800-785-1314

MECHANICAL VENTILATION SHALL BE PROVIDED IN CONFORMANCE WITH OBC DIV. B, 9.32.3 REQUIREMENTS.

THE INSTALLATION OF CARBON MONOXIDE DETECTOR(S) SHALL COMPLY WITH OBC DIV. B, 9.33.4 REQUIREMENTS.

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
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	FLOOR 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
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	REVISIONS	

Client: GREENPARK HOMES

Project Name: MINNISALE HOMES CORP.
BRAMPTON, ONTARIO

MILLWOOD 3 2622 sqft

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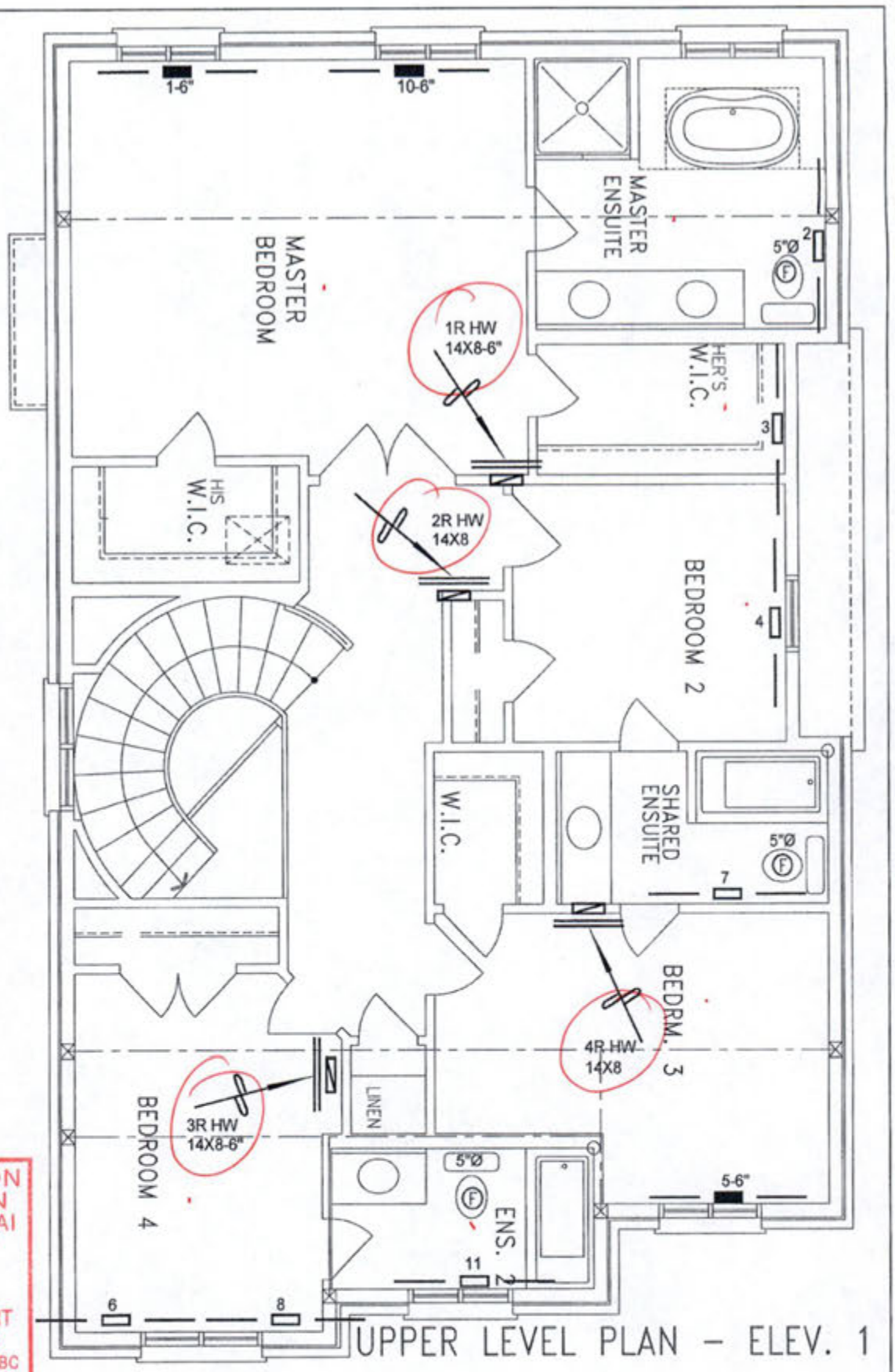
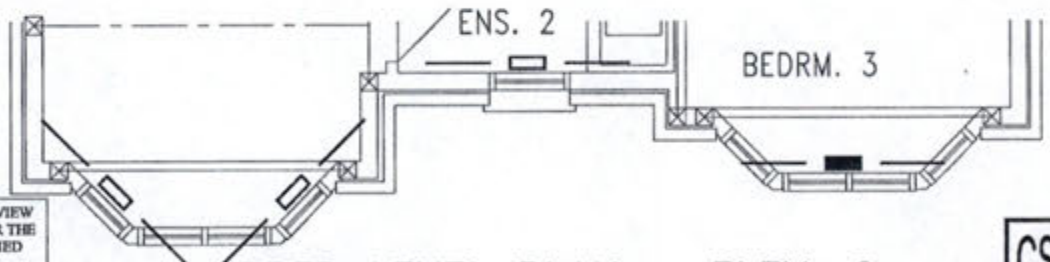
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title: FIRST FLOOR HEATING LAYOUT

Date: AUG/2018
Scale: 3/16" = 1'-0"
BCIN# 19669
LO# 79584



UPPER LEVEL PLAN – ELEV. 1



UPPER LEVEL PLAN – ELEV. 2

THE INSTALLATION OF CARBON MONOXIDE DETECTOR(S) SHALL COMPLY WITH OBC DIV. B, 9.33.4 REQUIREMENTS.

MECHANICAL VENTILATION SHALL BE PROVIDED IN CONFORMANCE WITH OBC DIV. B, 9.32.3 REQUIREMENTS.

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 2 6 2018
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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
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	FLOOR 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
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REVISIONS

Client
GREENPARK HOMES

Project Name
MINNISALE HOMES CORP.
BRAMPTON, ONTARIO

MILLWOOD 3 2622 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date AUG/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 79584