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 0.264 | HEAT LOSS ΔT °F. 74 | CSA-F280-12
BUILDER: GREENPARK HOMES | TYPE: MILLWOOD 12 | GFA: 2642 | LO# 79586 | SUMMER NATURAL AIR CHANGE RATE 0.115 | 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			24			9			27			34			17			9						8					
CLG. HT.			9			9			9			9			9			9			9						9					
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	333			216			81			243			306			153			81						72					
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN			
NORTH	20.8	15.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0			
EAST	20.8	41.0	0	0	0	0	0	0	0	0	0	0	0	0	24	499	985	0	0	0	0	0	0				0	0	0			
SOUTH	20.8	24.4	33	686	805	0	0	0	0	0	0	0	0	0	21	436	512	33	686	805	11	229	268				9	187	220			
WEST	20.8	41.0	24	499	985	16	332	657	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	200	871	129	81	353	52	243	1059	157	261	1137	169	120	523	78	70	305	45				63	274	41			
NET EXPOSED BSMT WALL ABOVE GR	3.5	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	0.8	284	366	158	144	180	80	108	135	59	166	208	93	157	197	87	132	165	74	126	158	70				136	170	76			
NO ATTIC EXPOSED CLG	2.7	1.2	36	97	43	0	0	0	0	0	0	0	0	0	28	75	33	36	97	43	0	0	0				0	0	0			
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0	0	0	0	166	413	61	16	40	6	24	60	9	0	0	0				136	339	50			
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				2839			1364			488			1680			2384			1530			691						971				
SUB TOTAL HT GAIN					2170			866			113			311			1793			1308			384						386			
LEVEL FACTOR / MULTIPLIER			0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26		0.20	0.26					0.20	0.26				
AIR CHANGE HEAT LOSS				742			362			128			439			623			400			181						254				
AIR CHANGE HEAT GAIN					133			53			7			19			110			62			23						24			
DUCT LOSS				0			0			0			212			301			193			0						122				
DUCT GAIN					0			0			0			152			309			226			0						41			
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0				0		0			
HEAT GAIN APPLIANCES/LIGHTS					947			0			0			947			947			947			0						0			
TOTAL HT LOSS BTU/H				3581			1746			616			2331			3307			2123			872						1346				
TOTAL HT GAIN x 1.3 BTU/H					4848			1195			155			2168			4417			3226			529						586			

ROOM USE			LV/DN				KT/FM				LAUN			WIR			FOY			MUD						WOD			BAS		
EXP. WALL			66				69				9			13			11			13						38			166		
CLG. HT.			10				10				9			10			10			10						9			9		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	660				690				81			130			110			130						324			1212		
GLAZING				LOSS	GAIN			LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN		LOSS	GAIN	
NORTH	20.8	15.5	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
EAST	20.8	41.0	42	873	1724		0	0	0		0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
SOUTH	20.8	24.4	66	1371	1610		30	623	732		0	0	0	0	0	0	6	125	146	0	0	0				0	0	0	6	125	146
WEST	20.8	41.0	0	0	0		88	1828	3612		0	0	0	0	0	0	0	0	0	0	0	0				6	125	246	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	40	986	146	20	493	73				0	0	0	20	493	73
NET EXPOSED WALL	4.4	0.6	552	2405	357		572	2492	369		81	353	52	130	566	84	64	279	41	110	479	71				0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0	0	0	0				210	738	109	282	991	147
EXPOSED CLG	1.3	0.8	0	0	0		0	0	0		153	192	86	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		10	27	12		0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
EXPOSED FLOOR	2.5	0.4	0	0	0		0	0	0		68	169	25	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							5733			
SLAB ON GRADE HEAT LOSS				0				0				0			0			0			0						0				
SUBTOTAL HT LOSS				4649				4971				714			566			1390			972						862			7341		
SUB TOTAL HT GAIN					3691				4725				163			84			334			144						366			366
LEVEL FACTOR / MULTIPLIER			0.30	0.40			0.30	0.40			0.20	0.26		0.30	0.40		0.30	0.40		0.30	0.40								0.50	1.01		
AIR CHANGE HEAT LOSS				1841				1968				186			224			550			385									8282		
AIR CHANGE HEAT GAIN					226				289				10			5			20			9										44
DUCT LOSS				0				0				90			0			0			0									0		
DUCT GAIN					0				0				112			0			0			0										0
HEAT GAIN PEOPLE	240		0		0		0		0		0		0	0		0	0		0	0		0				0		0	0			0
HEAT GAIN APPLIANCES/LIGHTS					947				947				947			0			0			0						0				0
TOTAL HT LOSS BTU/H				6490				6939				990			791			1940			1357						862			15623		
TOTAL HT GAIN x 1.3 BTU/H					6322				7750				1650			116			461			199						462			534	

TOTAL HEAT GAIN BTU/H: 34805 | TONS: 2.90 | LOSS DUE TO VENTILATION LOAD BTU/H: 1593 | STRUCTURAL HEAT LOSS: ~~50914~~ 51372 | TOTAL COMBINED HEAT LOSS BTU/H: ~~52507~~ 52965

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

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 28 2018
ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH OBC

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SITE NAME: MINNISSALE HOMES CORP
BUILDER: GREENPARK HOMES

TYPE: MILLWOOD 12 DATE: Aug-18 GFA: 2642 LO# 79588

HEATING CFM	1131 (51372)	COOLING CFM	1131
TOTAL HEAT LOSS	50,914	TOTAL HEAT GAIN	34,569
AIR FLOW RATE CFM	22.21	AIR FLOW RATE CFM	32.72

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

#GOODMAN
GMEC960603BNA 60
FAN SPEED
LOW
MEDLOW
MEDIUM
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	11	8	4
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 (2 79)	5	6	7	8	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	BATH	BED-3	MBR	ENS-2	LV/DN	LV/DN	KT/FM	KT/FM	KT/FM	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.79	1.75	0.62	2.33 (62)	1.65	2.12	0.87	1.65	1.79	1.35	3.24	3.24	2.31	2.31	2.31	0.99	0.79	1.94	1.36	4.12	4.12	4.12	4.12
CFM PER RUN HEAT	40	39	14	52	37	47	19	37	40	30	72	72	51	51	51	22	18	43	30	92	92	92	92
RM GAIN MBH.	2.42	1.20	0.16	2.17	2.21	3.23	0.53	2.21	2.42	0.59	3.16	3.16	2.58	2.58	2.58	1.60	0.12	0.46	0.20	0.25	0.25	0.25	0.25
CFM PER RUN COOLING	79	39	5	71	72	108	17	72	79	19	103	103	85	85	85	52	4	15	7	8	8	8	8
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	46	32	15	77	82	73	45	78	38	74	42	60	16	31	45	69	13	25	11	29	13	45	52
EQUIVALENT LENGTH	150	120	190	170	160	150	200	170	140	170	150	160	190	150	190	180	140	140	170	190	140	190	170
TOTAL EFFECTIVE LENGTH	196	152	205	247	242	223	245	248	178	244	192	220	206	181	235	249	153	165	181	219	153	235	222
ADJUSTED PRESSURE	0.09	0.11	0.08	0.07	0.07	0.07	0.07	0.07	0.1	0.07	0.08	0.07	0.08	0.09	0.07	0.07	0.11	0.1	0.1	0.07	0.11	0.07	0.07
ROUND DUCT SIZE	5	4	4	6	6	6	4	6	5	4	6	6	6	6	6	5	4	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	294	447	161	265	189	240	218	189	294	344	367	367	260	260	260	162	207	493	344	469	469	469	469
COOLING VELOCITY (ft/min)	580	447	57	362	367	540	195	367	580	218	525	525	433	433	433	382	46	172	80	41	41	41	41
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	D	C	B	A	B	B	A	C	B	B	A	C	C	C	B	D	C	C	C	D	B	A

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	238	0.07	8.5	10	x	8	428	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	572	0.07	11.8	18	x	8	572	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	984	0.07	14.4	26	x	8	681	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	149	0.11	6.3	6	x	8	447	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	26	x	10	626
TRUNK Y	440	0.05	11.6	16	x	8	495
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	175	155	75	75	335	135	0	0	0	0	0	0	0	0	0	181
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.	20	52	82	78	24	47	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	165	195	235	240	205	235	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	185	247	317	318	229	282	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.08	0.06	0.05	0.05	0.06	0.05	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7.3	7.5	6	6	10	7.5	0	0	0	0	0	0	0	0	0	7
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	30	14	0	0	0	0	0	0	0	0	0	14

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 28 2018
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Michael O'Rourke. INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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TYPE: MILLWOOD 12 LO # 79588
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 9.32.3.5.

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
WIR	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 #:

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 28 2018
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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#: 79588 Model: MILLWOOD 12 Builder: GREENPARK HOMES Date: 8/9/2018

Volume Calculation

House Volume			
Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	1144	9	10296
First	1144	10	11440
Second	1498	9	13482
Third	0	9	0
Fourth	0	9	0
		Total:	35,218.0 ft^3
		Total:	997.3 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.354
SUMMER NATURAL AIR CHANGE RATE	0.115

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

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

0.354 x 277.02 x 41 °C x 1.2 = 4854 W

= 16563 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.115 x 277.02 x 6 °C x 1.2 = 234 W

= 798 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 heatGain 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 HeatLoss 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	16,563	8,203	1.010
2	0.3		12,548	0.396
3	0.2		12,682	0.261
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: MILLWOOD 12 **BUILDER:** GREENPARK HOMES
SFQT: 2642 **LO#** 79588 **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):	35218.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.75	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 51.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	166.0 ft

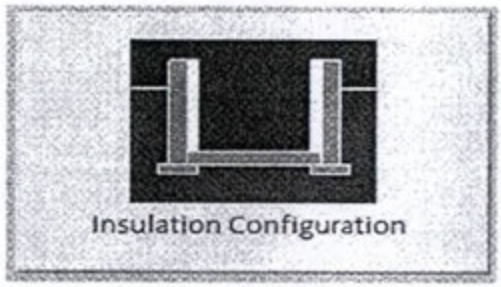
2012 OBC - COMPLIANCE PACKAGE Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls 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

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):	15.5	 Insulation Configuration
Floor Width (m):	9.8	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m^2):	1.1	
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):	**1680**	

TYPE: MILLWOOD 12
LO# 79588

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

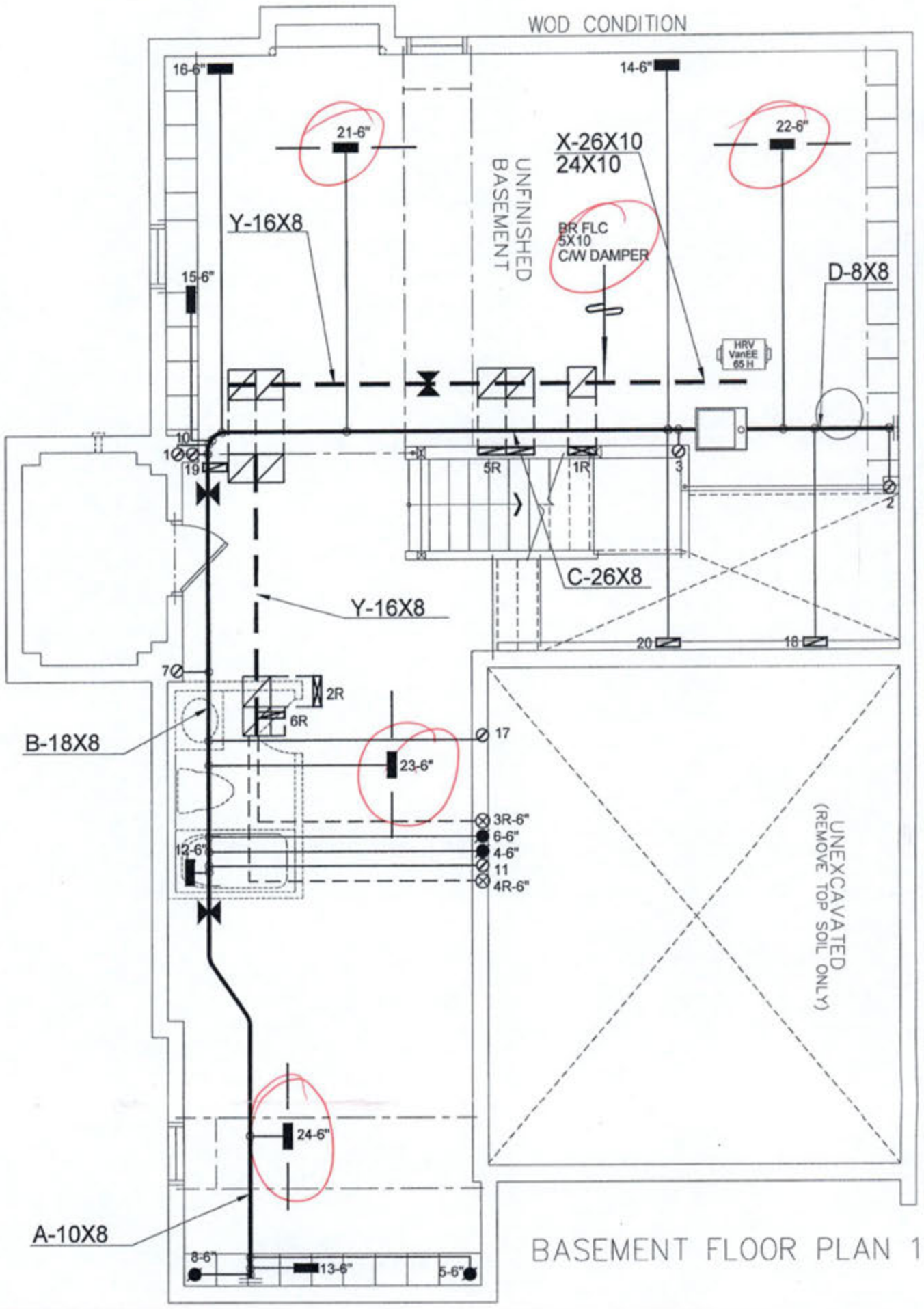
Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Weather Station Location:	Open flat terrain, grass	
Anemometer height (m):	10	
Local Shielding		
Building Site:	Suburban, forest	
Walls:	Heavy	
Flue:	Heavy	
Highest Ceiling Height (m):	7.62	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	997.3	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1329.4 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):	**0.354**	
Cooling Air Leakage Rate (ACH/H):	**0.115**	

TYPE: MILLWOOD 12
LO# 79588

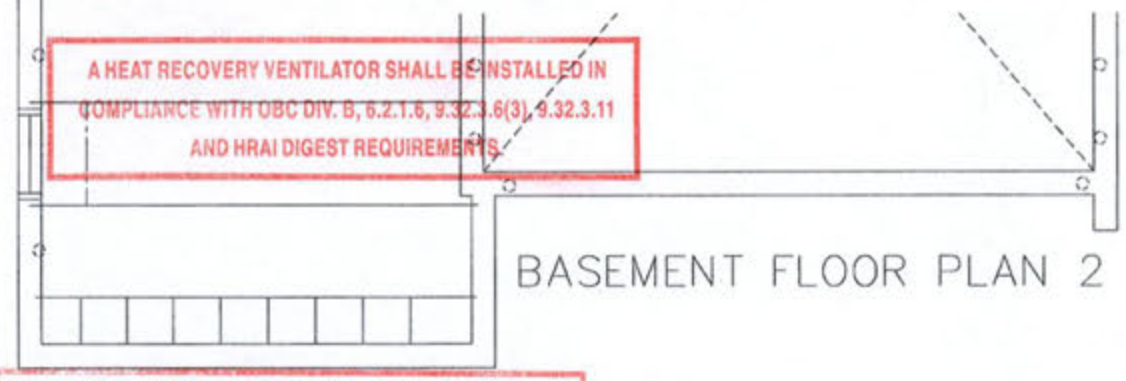
CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 28 2018
ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH OBC

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 WIRED 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).

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.



BASEMENT FLOOR PLAN 1



BASEMENT FLOOR PLAN 2

INSTALLATION OF HVAC EQUIP. SHALL CONFORM TO MANUFACTURER'S SPECIFICATIONS AND MANUALS

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

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.

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 28 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
3.		
2.		
1.		

REVISIONS

Client
GREENPARK HOMES

Project Name
MINNISALE HOMES CORP
BRAMPTON, ONTARIO

MILLWOOD 12 2642 sqft

HVAC DESIGNS LTD.
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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.

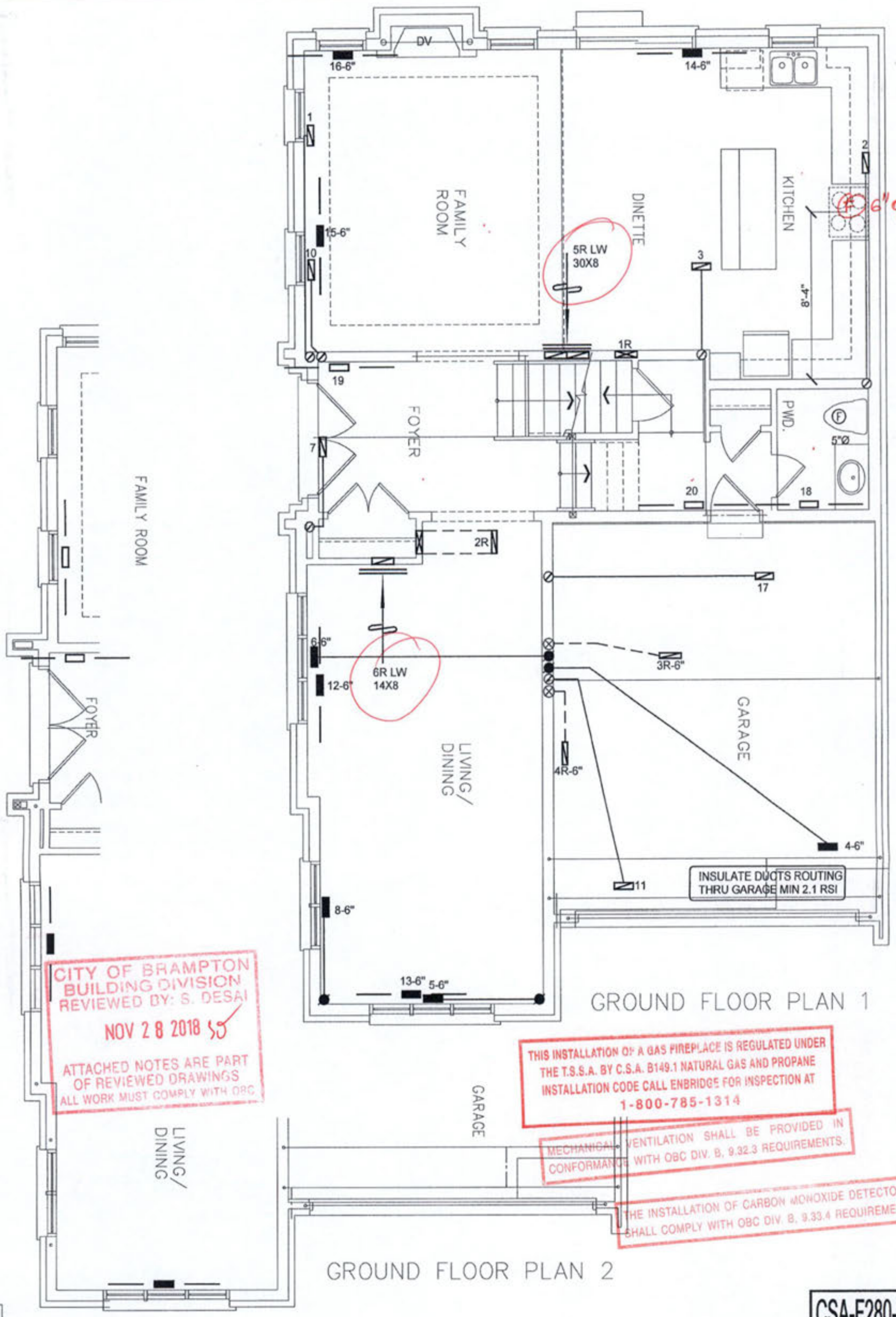
HEAT LOSS 52507 BTU/H	
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960603BNA-60
INPUT	60 MBTU/H
OUTPUT	57.6 MBTU/H
COOLING	3.0 TONS
FAN SPEED	1131 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	11	4	4
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 AUG/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 79588



GROUND FLOOR PLAN 1

GROUND FLOOR PLAN 2

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 28 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.
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PACKAGE A1

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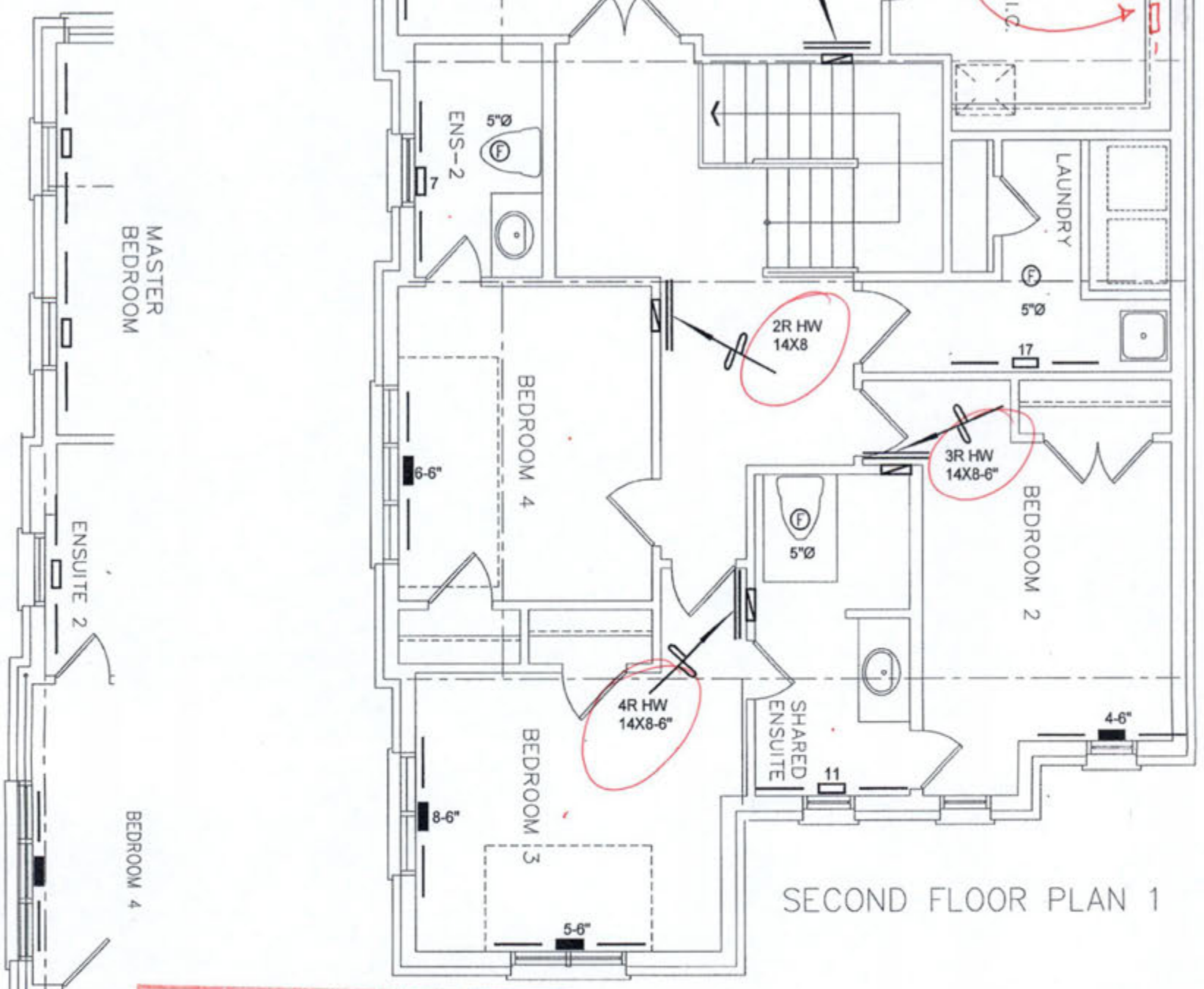
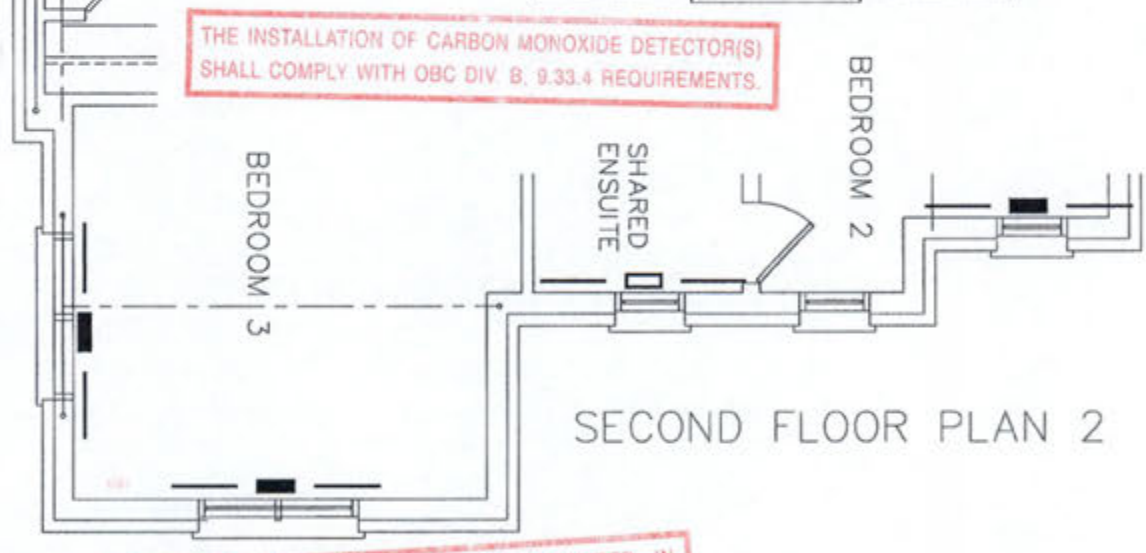
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date AUG/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 79588



SECOND FLOOR PLAN 1



SECOND FLOOR PLAN 2

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

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 2 8 2018
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MECHANICAL VENTILATION SHALL BE PROVIDED IN CONFORMANCE WITH OBC DIV. B, 9.32.3 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

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Project Name
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MILLWOOD 12 2642 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date AUG/2018
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LO# 79588