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

LOT 4

SITE NAME: MINNISSALE HOMES CORP | OPT 4 BED | DATE: Aug-18 | WINTER NATURAL AIR CHANGE RATE 0.354 | HEAT LOSS ΔT °F, 74 | CSA-F280-12
BUILDER: GREENPARK HOMES | TYPE: MILLWOOD 1 | GFA: 2194 | LO# 79582 | 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		
EXP. WALL			29			7			10			38			26			26			6		
CLG. HT.			10			9			9			9			9			10			9		
	FACTORS																						
GRS.WALL AREA	LOSS	GAIN	290			63			90			342			234			260			54		
GLAZING				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
EAST	20.8	41.0	32	665	1314	0	0	0	0	0	0	16	332	657	0	0	0	0	0	0	0	0	0
SOUTH	20.8	24.4	0	0	0	0	0	0	0	0	0	0	0	0	18	374	439	0	0	0	0	0	0
WEST	20.8	41.0	0	0	0	0	0	0	10	208	410	0	0	0	20	416	821	46	966	1888	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	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	258	1124	167	63	274	41	80	349	52	326	1420	211	196	854	127	214	932	138	54	235	35
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
EXPOSED CLG	1.3	0.6	208	261	116	133	167	74	35	44	20	352	441	196	168	210	94	120	150	67	78	98	43
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	81	36	0	0	0
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0	35	87	13	0	0	0	154	383	57	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				2050			441			687			2194			2237			2119			333	
SUB TOTAL HT GAIN					1596			116			495			1063			1537			2129			78
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	
AIR CHANGE HEAT LOSS				552			119			185			591			603			571			90	
AIR CHANGE HEAT GAIN					105			8			33			70			101			141			5
DUCT LOSS				0			0			87			0			284			0			0	
DUCT GAIN					0			0			53			0			270			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0
HEAT GAIN APPLIANCES/LIGHTS					819			0			0			819			819			819			0
TOTAL HT LOSS BTU/H				2602			560			960			2785			3124			2690			423	
TOTAL HT GAIN x 1.3 BTU/H					3901			159			754			2851			3858			4328			109

ROOM USE			LV/DN				KT/FM				LAUN			WIR			FOY				WOD			BAS		
EXP. WALL			37				68				0			29			20				36			152		
CLG. HT.			10				10				9			11			11				9			9		
	FACTORS																									
GRS.WALL AREA	LOSS	GAIN	370				680				0			319			220				324			1128		
GLAZING				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	3	62	46
EAST	20.8	41.0	0	0	0		80	1662	3284		0	0	0	0	0	0	0	0	0		7	145	287	0	0	0
SOUTH	20.8	24.4	0	0	0		0	0	0		0	0	0	8	166	195	0	0	0		0	0	0	0	0	0
WEST	20.8	41.0	27	561	1108		0	0	0		0	0	0	0	0	0	6	125	246		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	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	343	1494	222		600	2614	388		0	0	0	20	493	73	40	986	146		0	0	0	20	493	73
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5	0	0	0		0	0	0		0	0	0	291	1268	188	174	758	112		0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0		209	734	109	240	843	125
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0		0	0	0		64	105	47	0	0	0	0	0	0		0	0	0	0	0	0
EXPOSED FLOOR	2.5	0.4	0	0	0		0	0	0		0	0	0	0	0	0	50	134	60		0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0				0			77	192	28	0	0	0	0	0	0		0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS				0				0				0			0			0						5170		
SUBTOTAL HT LOSS				0				0				0			0			0				0				
SUB TOTAL HT GAIN				2055				4303				297			1927			2003				880			6559	
LEVEL FACTOR / MULTIPLIER					1339				3683				75			456			565				396			244
AIR CHANGE HEAT LOSS			0.30	0.41			0.30	0.41			0.20	0.27		0.30	0.41		0.30	0.41						0.50	0.94	
AIR CHANGE HEAT GAIN				836				1751				80			784			815							6976	
DUCT LOSS					88				243				5			30			37							42
DUCT GAIN				0				0				38			0			0						0		
HEAT GAIN PEOPLE	240		0		0		0		0		0		90	0		0	0		0		0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					819				819				0			0			0				0			0
TOTAL HT LOSS BTU/H				2892				6054				415			2711			2818				880			13545	
TOTAL HT GAIN x 1.3 BTU/H					2968				6169				1286			632			782				515			373

TOTAL HEAT GAIN BTU/H: 28861 | TONS: 2.41 | LOSS DUE TO VENTILATION LOAD BTU/H: 1593 | STRUCTURAL HEAT LOSS: 42456 | TOTAL COMBINED HEAT LOSS BTU/H: 44049

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

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 23 2018
ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS
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SITE NAME: MINNISSALE HOMES CORP
BUILDER: GREENPARK HOMES

TYPE: OPT 4 BED MILLWOOD 1

DATE: Aug-18

GFA: 2194 LO# 79582

HEATING CFM	1131	COOLING CFM	1131
TOTAL HEAT LOSS	42,456	TOTAL HEAT GAIN	28,625
AIR FLOW RATE CFM	26.64	AIR FLOW RATE CFM	39.51

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	11	7	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	5	6	7	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24
ROOM NAME	MBR	MBR	ENS	BED-3	BED-4	BED-3	WIC	BED-4	BED-2	LAUN	LV/DN	LV/DN	KT/FM	KT/FM	KT/FM	BATH	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.30	1.30	0.56	1.56	1.34	1.56	0.96	1.34	2.78	0.41	1.45	1.45	2.02	2.02	2.02	0.42	2.71	2.82	3.61	3.61	3.61	3.61
CFM PER RUN HEAT	35	35	15	42	36	42	26	36	74	11	39	39	54	54	54	11	72	75	96	96	96	96
RM GAIN MBH.	1.95	1.95	0.16	1.93	2.16	1.93	0.75	2.16	2.85	1.29	1.45	1.45	2.06	2.06	2.06	0.11	0.63	0.78	0.22	0.22	0.22	0.22
CFM PER RUN COOLING	77	77	6	76	85	76	30	85	113	51	57	57	81	81	81	4	25	31	9	9	9	9
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.16	0.15	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	36	35	34	29	42	37	31	38	51	21	20	23	19	28	31	31	31	25	30	26	10	17
EQUIVALENT LENGTH	150	150	190	130	170	140	150	140	130	160	150	160	130	120	140	190	130	120	140	140	140	170
TOTAL EFFECTIVE LENGTH	186	185	224	159	212	177	181	178	181	181	170	183	149	148	171	221	161	145	170	166	150	187
ADJUSTED PRESSURE	0.09	0.09	0.08	0.11	0.08	0.1	0.1	0.09	0.08	0.1	0.1	0.09	0.11	0.11	0.09	0.08	0.11	0.12	0.1	0.1	0.11	0.09
ROUND DUCT SIZE	5	5	4	5	6	5	4	6	6	4	5	5	5	5	5	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	257	257	172	308	184	308	298	184	377	126	286	286	396	396	396	126	529	551	489	489	489	489
COOLING VELOCITY (ft/min)	565	565	69	558	433	558	344	433	576	585	419	419	595	595	595	46	184	228	46	46	46	46
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	A	A	C	B	C	B	B	D	C	C	B	D	D	A	A	D	B	D	A	C	B

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	

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 2 3 2018
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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	246	0.08	8.3	8	x	8	554	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	308	0.08	9	10	x	8	554	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	538	0.08	11.1	14	x	8	692	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	350	0.08	9.5	10	x	8	630	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	784	0.08	12.8	20	x	8	706	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	0.06	0	0	x	8	0
TRUNK P	0	0.06	0	0	x	8	0
TRUNK Q	0	0.06	0	0	x	8	0
TRUNK R	0	0.06	0	0	x	8	0
TRUNK S	0	0.06	0	0	x	8	0
TRUNK T	0	0.06	0	0	x	8	0
TRUNK U	0	0.06	0	0	x	8	0
TRUNK V	0	0.06	0	0	x	8	0
TRUNK W	0	0.06	0	0	x	8	0
TRUNK X	1131	0.06	15.8	30	x	8	679
TRUNK Y	795	0.06	13.8	22	x	8	650
TRUNK Z	0	0.06	0	0	x	8	0
DROP	1131	0.06	15.8	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	145	95	130	85	310	175	0	0	0	0	0	0	0	0	0	191
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.	43	58	47	57	25	24	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	175	160	190	185	190	185	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	218	218	237	242	215	209	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.07	0.07	0.06	0.06	0.07	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7	6	7	6	9.4	7.5	0	0	0	0	0	0	0	0	0	7.1
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

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INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: MILLWOOD 1 LO # 79582
SITE NAME: MINNISSALE HOMES CORP OPT 4 BED

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	4	@ 10.6 cfm	42.4	cfm
Other Rooms	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A		TOTAL	159.0	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	79.5	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	159	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	79.5	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	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
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 23 2018
ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS
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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 # 001620

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#: 79582 Model: MILLWOOD 1 Builder: GREENPARK HOMES Date: 8/8/2018

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	992	9	8928
First	992	10	9920
Second	1202	9	10818
Third	0	9	0
Fourth	0	9	0
		Total:	29,666.0 ft^3
		Total:	840.0 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 233.35 x 41 °C x 1.2 = 4089 W

= 13952 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 233.35 x 6 °C x 1.2 = 197 W

= 672 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_{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	13,952	7,480	0.933
2	0.3		10,289	0.407
3	0.2		10,358	0.269
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 23 2018 ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS ALL WORK MUST COMPLY WITH OBC

HVAC DESIGNS LTD.

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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 1		OPT 4 BED	**BUILDER:**	GREENPARK HOMES
SFQT:	2194	**LO#**	79582	**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):	29666.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.80	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 44.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	152.0 ft

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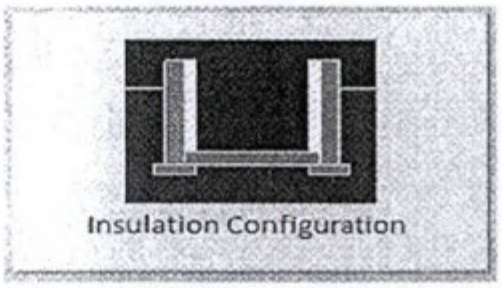
2012 OBC - COMPLIANCE PACKAGE Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls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

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):	13.4	 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):	0.3	
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):	**1527**	

TYPE: MILLWOOD 1 OPT 4 BED
LO# 79582

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):	840.0				
Air Leakage/Ventilation					
Air Tightness Type:	Present (1961-) (3.57 ACH)				
Custom BDT Data:	ELA @ 10 Pa.				1119.8 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**				

CITY OF BRAMPTON
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NOV 2 3 2016
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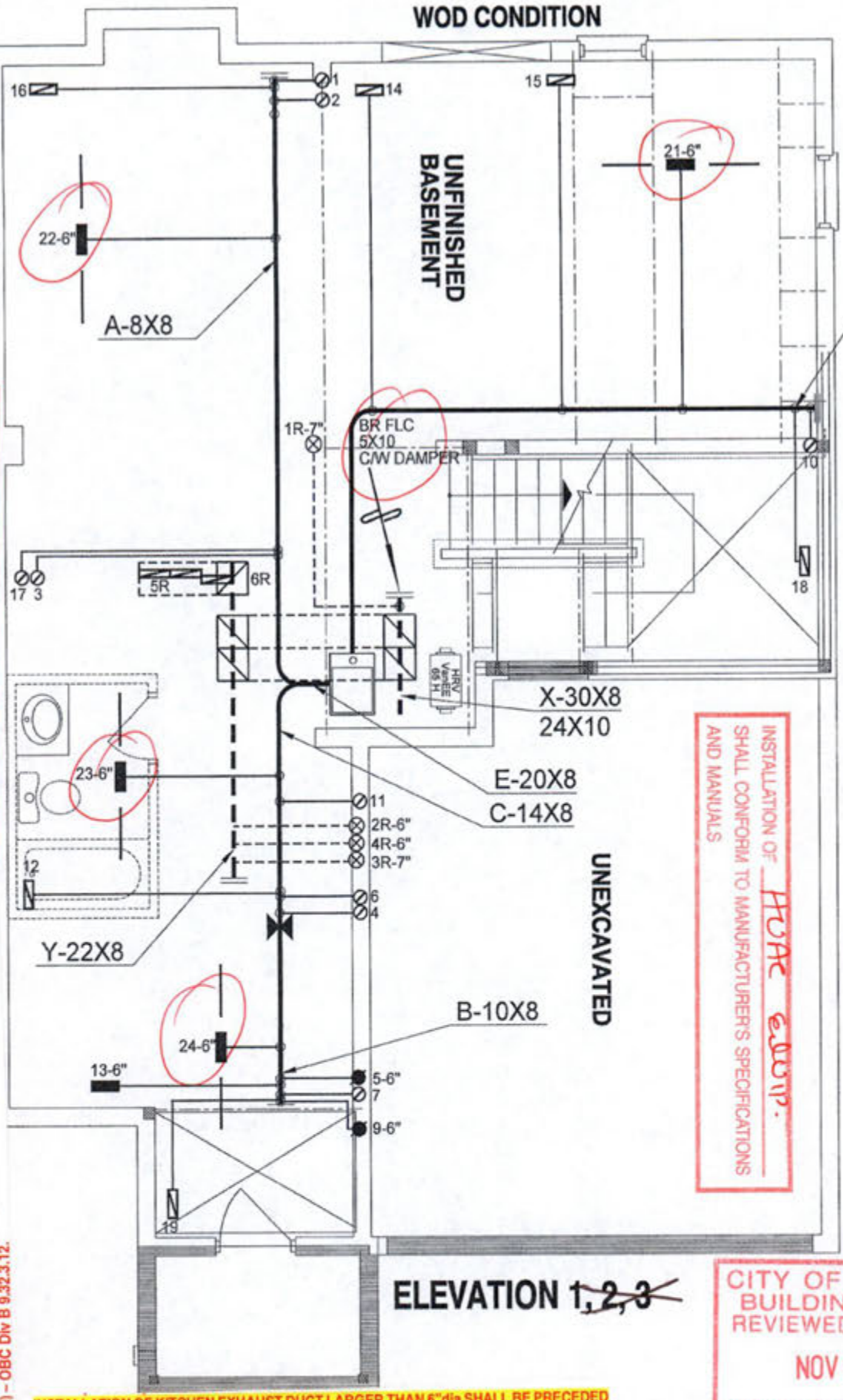
TYPE: MILLWOOD 1 OPT 4 BED
LO# 79582

WOD CONDITION



ELEVATION 1, 2, 3

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.

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.

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

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.

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).

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18-333285 000 00 RR

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# 29689
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 8" 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

LOT 4
OPT 4 BED
MILLWOOD 1 2194 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.

HEAT LOSS	44049 BTU/H
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960603BNA
INPUT	60 MBTUH
OUTPUT	57.6 MBTUH
COOLING	2.5 TONS
FAN SPEED	1131 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	11	4	3
1ST FLOOR	7	2	2
BASEMENT	4	1	0

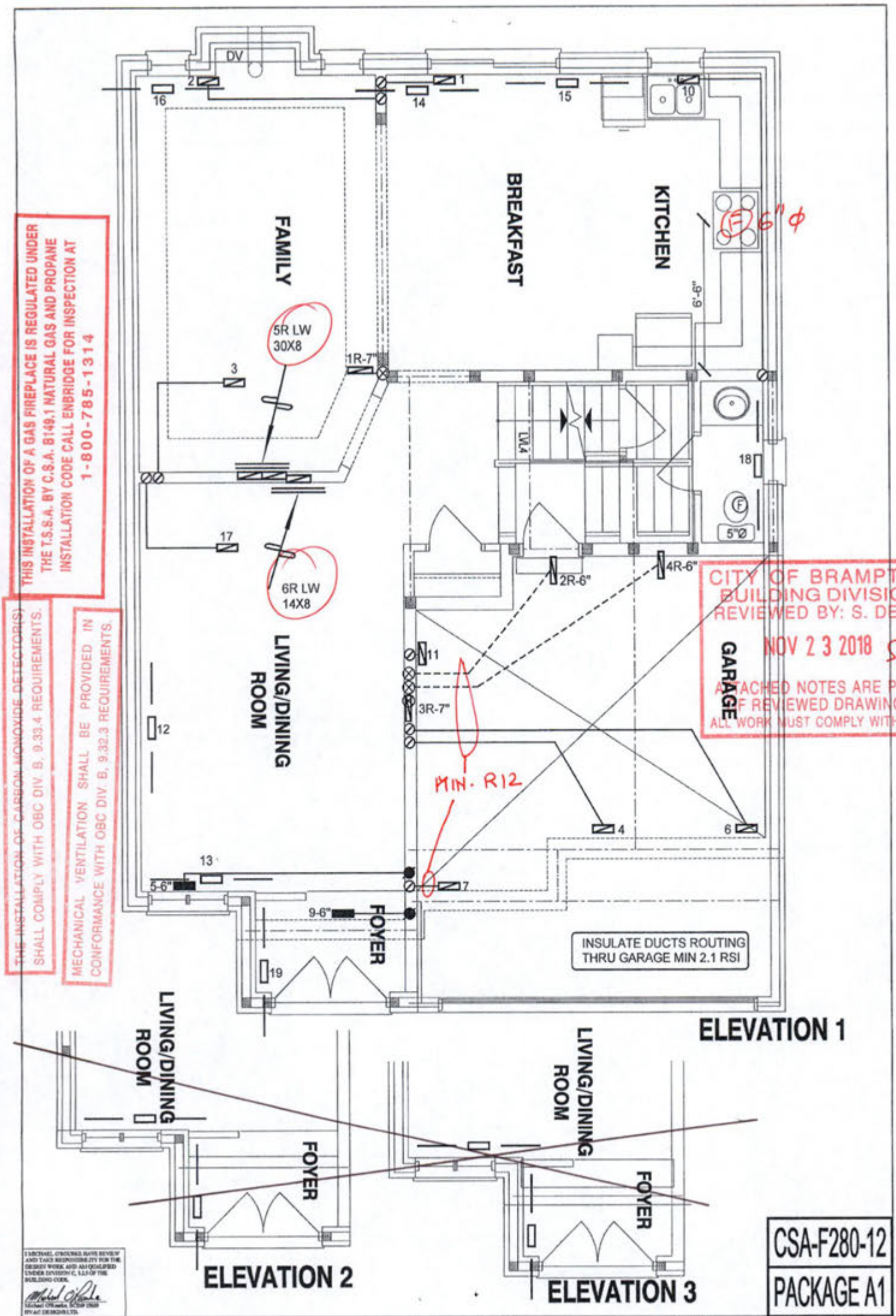
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title: BASEMENT HEATING LAYOUT
Date: AUG/2018
Scale: 3/16" = 1'-0"
BCIN# 19669
LO# 79582

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

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
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I MICHAEL O'HOURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
Michael O'Hourke, 90369
HVAC DESIGNS LTD.

CSA-F280-12
PACKAGE A1

HVAC LEGEND

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REVISIONS

Client
GREENPARK HOMES

Project Name
MINNISALE HOMES CORP.
BRAMPTON, ONTARIO

OPT 4 BED LOT 4
MILLWOOD 1 2194 sqft

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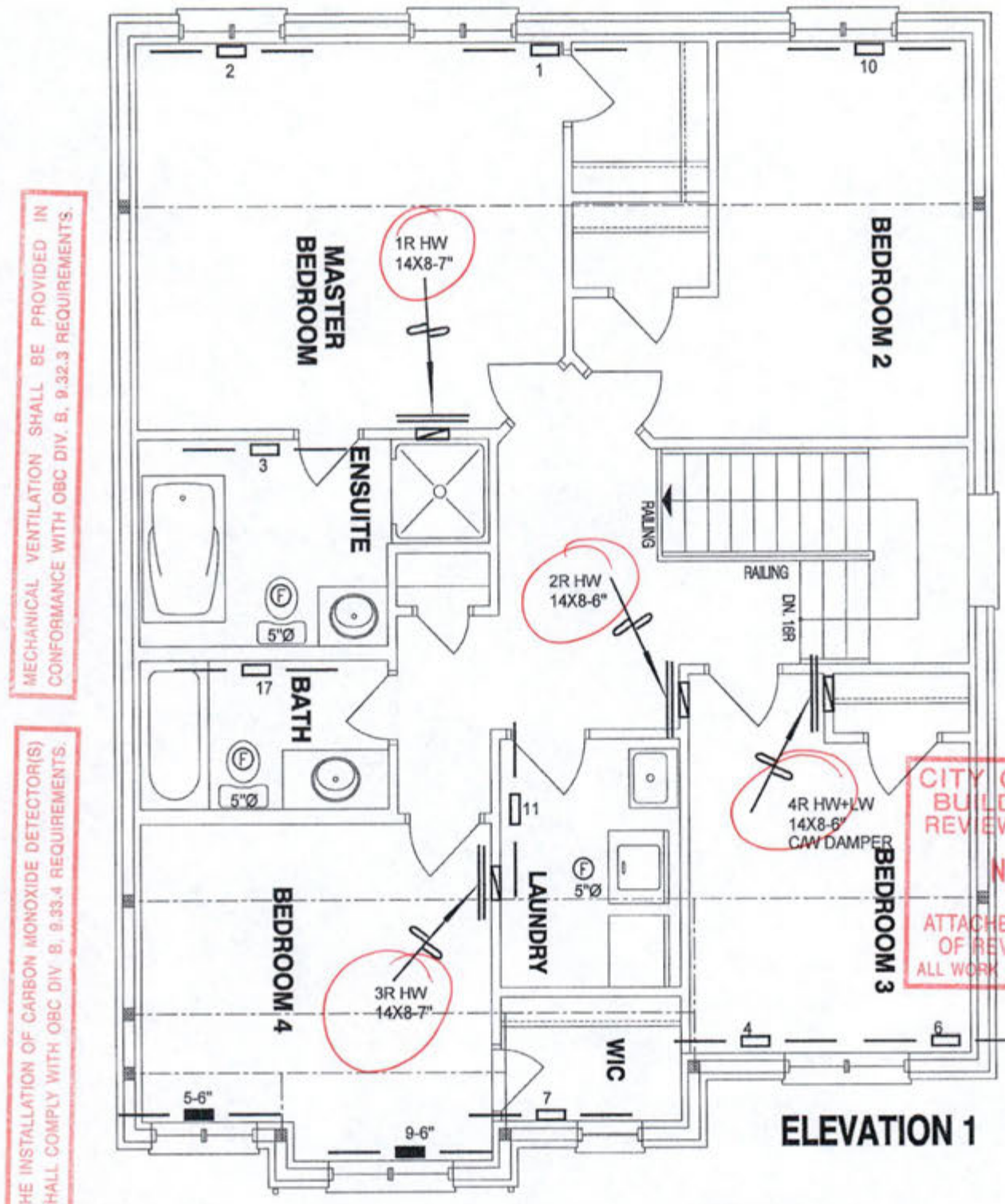
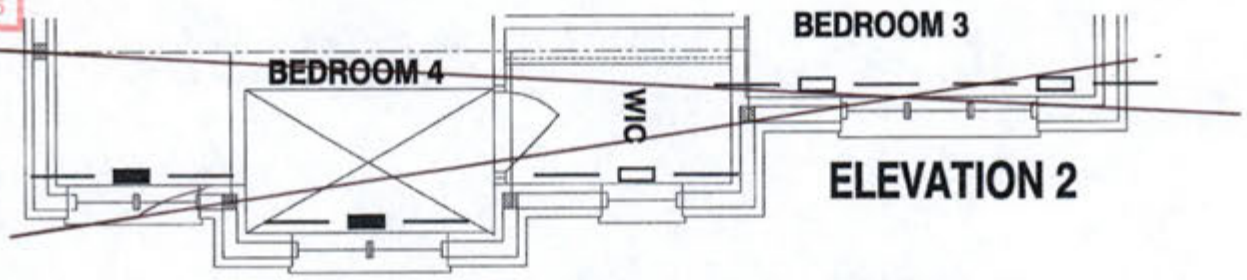
Sheet Title
FIRST FLOOR HEATING LAYOUT

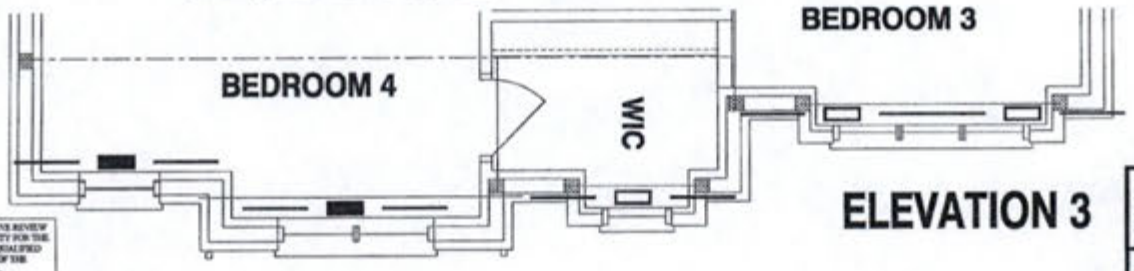
Date AUG/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 79582



ELEVATION 1



ELEVATION 2



ELEVATION 3

CSA-F280-12

PACKAGE A1

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.

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
NOV 2 3 2018
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Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
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Project Name
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OPT 4 BED
MILLWOOD 1 2194 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date AUG/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 79582