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: MINNESALE HOMES CORP — LOT 22 — DATE: Oct-18 — WINTER NATURAL AIR CHANGE RATE 0.314 — HEAT LOSS ΔT °F. 74 — CSA-F280-12
BUILDER: GREENPARK HOMES — TYPE: MILLWOOD 2 — GFA: 2654 — LOt# 80551 — SUMMER NATURAL AIR CHANGE RATE 0.102 — HEAT GAIN ΔT °F. 11 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS				BED-2			BED-3			BED-4			BATH					ENS-2				
EXP. WALL			34			29				26			33			11			10					15				
CLG. HT.			10			9				9			10			9			9					9				
	FACTORS																											
GRS.WALL AREA	LOSS	GAIN	340			261				234			330			99			90					135				
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	0	0	0	0	0	0		20	416	821	30	623	1231	0	0	0	0	0	0			0	0	0		
SOUTH	20.8	24.4	0	0	0	10	208	244		0	0	0	0	0	0	12	249	293	8	156	195			8	166	195		
WEST	20.8	41.0	32	665	1314	12	249	493		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		
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	0.8	308	1342	199	239	1041	154		214	932	138	300	1307	194	87	379	56	82	357	53			127	553	82		
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	0.5	280	351	186	264	296	114		185	207	92	196	244	109	220	276	123	176	221	98			168	210	94		
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0		0	0	0	40	107	48	0	0	0	0	0	0			0	0	0		
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0		165	411	61	0	0	0	0	0	0	0	0	0			166	416	62		
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				2356			1784				1965			2282			904			744					1048			
SUB TOTAL HT GAIN					1689			1006				1112			1082			472			348					433		
LEVEL FACTOR / MULTIPLIER			0.20	0.23		0.20	0.23			0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23				0.20	0.23			
AIR CHANGE HEAT LOSS				541			403				451			524			208			171					310			
AIR CHANGE HEAT GAIN					111			67				74			105			31			23					29		
DUCT LOSS				0			0				242			0			0			0					165			
DUCT GAIN					0			0				205			0			0			0					46		
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240	1		240	0		0			0		0		
HEAT GAIN APPLIANCE/LIGHTS					827			827				827			827			827			827					0		
TOTAL HT LOSS BTU/H				2896			2187				2658			2806			1112			915					1824			
TOTAL HT GAIN x 1.3 BTU/H					3752			2208				2936			3320			1781			1295					660		

ROOM USE			LIV				KT/FM				LAUN			WIR			FOY			MUD					WUB			BAS		
EXP. WALL			38				78				8			12			27			17					16			138		
CLG. HT.			10				10				9			11			10			11					9			9		
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	380				780				72			132			270			187					144			828		
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	
EAST	20.8	41.0	0	0	0		0	0	0		10	208	410	0	0	0	6	125	246	0	0	0			0	0	0	0	0	0	
SOUTH	20.8	24.4	48	531	976		0	0	0		0	0	0	10	208	244	0	0	0	0	0	0			0	0	0	10	208	244	
WEST	20.8	41.0	0	0	0		72	1496	2958		0	0	0	0	0	0	0	0	0	0	0	0			5	104	206	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		20	493	73		0	0	0	0	0	0	40	986	148	20	493	73			20	493	73	20	493	73	
NET EXPOSED WALL	4.4	0.8	340	1481	220		680	2998	444		62	270	40	122	532	79	224	975	145	167	728	108			119	515	77	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			0	0	0	414	1454	216	
EXPOSED CLG	1.3	0.5	0	0	0		0	0	0		128	560	71	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		36	97	43		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		128	319	47	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							4621		
SLAB ON GRADE HEAT LOSS				0				0				0			0			0			0					126				
SUBTOTAL HT LOSS				2312				5083				957			739			2087			1221					1241			6776		
SUB TOTAL HT GAIN					1198				3816				669			323			837			191					356			533	
LEVEL FACTOR / MULTIPLIER			0.30	0.37			0.30	0.37			0.30	0.23		0.30	0.37		0.30	0.37		0.30	0.37							0.50	0.88		
AIR CHANGE HEAT LOSS				857				1884				220			274			773			452								7067		
AIR CHANGE HEAT GAIN					79				233				38			21			36			12								59	
DUCT LOSS				0				0				118			0			0			0								0		
DUCT GAIN					0				0				123			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 APPLIANCE/LIGHTS					827				827				827			0			0			827					0			0	
TOTAL HT LOSS BTU/H				3169				6967				1294			1013			2860			1673					1241			13844		
TOTAL HT GAIN x 1.3 BTU/H					2473				5689				1765			447			749			1866					482			769	

TOTAL HEAT GAIN BTU/H: 29686 — TONS: 2.47 — LOSS DUE TO VENTILATION LOAD BTU/H: 1563 — STRUCTURAL HEAT LOSS: 46432 — TOTAL COMBINED HEAT LOSS BTU/H: 48026

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: 25669 — MICHAEL O'ROURKE

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SITE NAME: MINNISALE HOMES CORP
BUILDER: GREENPARK HOMES

LOT 22
TYPE: MILLWOOD 2

DATE: Oct-18

GFA: 2654 LO# 80551

HEATING CFM	1131		COOLING CFM	1131		furnace pressure	0.6																
TOTAL HEAT LOSS	46,432		TOTAL HEAT GAIN	29,369		furnace filter	0.05																
AIR FLOW RATE CFM	24.36		AIR FLOW RATE CFM	38.51		a/c coil pressure	0.2																
						available pressure for s/a & r/a	0.35																
						plenum pressure s/a	0.18		r/a pressure	0.17													
						max s/a dif press. loss	0.02		r/a grille press. Loss	0.02													
						min adjusted pressure s/a	0.18		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 @ .8 " 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	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	LIV	KT/FM	KT/FM	KT/FM	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.45	2.16	1.33	1.40	1.11	0.91	1.33	1.40	1.45	1.82	3.17	2.32	2.32	2.32	1.29	1.01	2.86	1.67	3.77	3.77	3.77	3.77
CFM PER RUN HEAT	35	53	32	34	27	22	32	34	35	44	77	57	57	57	32	25	70	41	92	92	92	92
RM GAIN MBH.	1.88	2.21	1.47	1.66	1.78	1.30	1.47	1.66	1.88	0.66	2.47	1.90	1.90	1.90	1.76	0.45	0.74	1.07	0.31	0.31	0.31	0.31
CFM PER RUN COOLING	72	85	57	64	69	50	57	64	72	25	95	73	73	73	68	17	29	41	12	12	12	12
ADJUSTED PRESSURE	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	55	54	48	33	15	37	47	47	45	38	15	48	44	49	39	39	29	32	39	64	20	10
EQUIVALENT LENGTH	190	160	140	140	160	110	140	160	150	140	120	130	110	140	130	140	90	160	150	200	110	150
TOTAL EFFECTIVE LENGTH	245	214	186	173	175	147	187	207	195	178	135	178	154	189	169	179	119	192	189	264	130	160
ADJUSTED PRESSURE	0.07	0.08	0.09	0.1	0.1	0.12	0.09	0.08	0.09	0.1	0.12	0.1	0.11	0.09	0.1	0.1	0.14	0.09	0.09	0.06	0.12	0.1
ROUND DUCT SIZE	6	6	5	5	5	4	5	5	6	4	6	5	5	5	5	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	178	270	235	250	198	252	235	250	178	505	393	419	419	419	235	287	514	470	469	469	469	469
COOLING VELOCITY (ft/min)	367	433	419	470	507	574	419	470	367	287	484	536	536	536	499	195	213	470	61	61	61	61
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	D	C	B	D	D	C	A	D	C	A	A	A	D	B	C	B	A	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. HANNA
NOV 27 2018
ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH OBC

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	425	0.06	10.9	14	x	8	546	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	663	0.06	12.9	20	x	8	597	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	307	0.08	9	10	x	8	553	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	469	0.08	10.6	14	x	8	603	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	0.07	0	0	x	8	0
TRUNK P	0	0.07	0	0	x	8	0
TRUNK Q	0	0.07	0	0	x	8	0
TRUNK R	0	0.07	0	0	x	8	0
TRUNK S	0	0.07	0	0	x	8	0
TRUNK T	0	0.07	0	0	x	8	0
TRUNK U	0	0.07	0	0	x	8	0
TRUNK V	0	0.07	0	0	x	8	0
TRUNK W	0	0.07	0	0	x	8	0
TRUNK X	1131	0.07	15.2	30	x	8	679
TRUNK Y	295	0.07	9.2	10	x	8	531
TRUNK Z	0	0.07	0	0	x	8	0
DROP	1131	0.07	15.2	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	160	155	95	95	135	310	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.	58	43	42	48	38	15	1	1	1	1	1	1	1	1	1	17
EQUIVALENT LENGTH	150	135	175	175	145	135	0	0	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	208	178	217	223	183	150	1	1	1	1	1	1	1	1	1	162
ADJUSTED PRESSURE	0.07	0.08	0.07	0.07	0.08	0.10	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7.3	7	6	6	6.6	8.6	0	0	0	0	0	0	0	0	0	7.2
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	14

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INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: MILLWOOD 2 LO # 60551
SITE NAME: MINNISALE HOMES CORP LOT 22

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	6	@ 10.6 cfm	63.6	cfm
Table 9.32.3.A.		TOTAL	190.8	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	190.8	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	111.3	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 #

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. HANNA
NOV 27 2018
ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH OBC

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: October-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#: 80551 Model: MILLWOOD 2 Builder: GREENPARK HOMES Date: 10/31/2018

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1148	9	10332
First	1148	10	11480
Second	1506	8	12048
Third	0	9	0
Fourth	0	9	0
		Total:	33,860.0 ft³
		Total:	958.8 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.314
SUMMER NATURAL AIR CHANGE RATE	0.102

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

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

0.314 x 266.34 x 41 °C x 1.2 = 4143 W

= 14134 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.102 x 266.34 x 6 °C x 1.2 = 199 W

= 680 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)

$$HL_{air} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

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	14,134	8,018	0.881
2	0.3		11,442	0.371
3	0.2		12,313	0.230
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. HANNA
NOV 27 2018
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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 2		LOT 22	**BUILDER:**	GREENPARK HOMES
SFQT:	2654	**LO#**	80551	**SITE:**	MINNISALE 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:	SOUTH	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):	33860.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.65	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	138.0 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

HVAC Designs Ltd.
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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):	6.40	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	958.8	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1278.1 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):	**0.314**
Cooling Air Leakage Rate (ACH/H):	**0.102**

TYPE: MILLWOOD 2 LOT 22
LO# 80551

CITY OF BRAMPTON
BUILDING DIVISION
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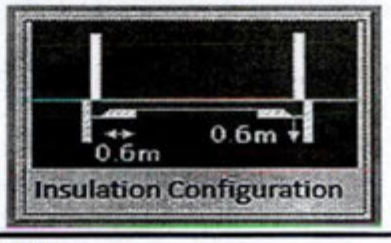
ALL WORK MUST COMPLY WITH ORC

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):	0.3	
Width (m):	4.6	
Exposed Perimeter (m):	4.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	**37**	

TYPE: MILLWOOD 2 LOT 22
LO# 80551

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375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
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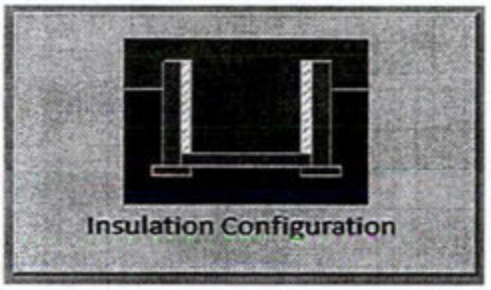
Residential Foundation Thermal Load Calculator

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):	14.0	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	42.1	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m^2):	1.4	
Door Area (m^2):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	**1354**	

TYPE: MILLWOOD 2
LO# 80551

LOT 22

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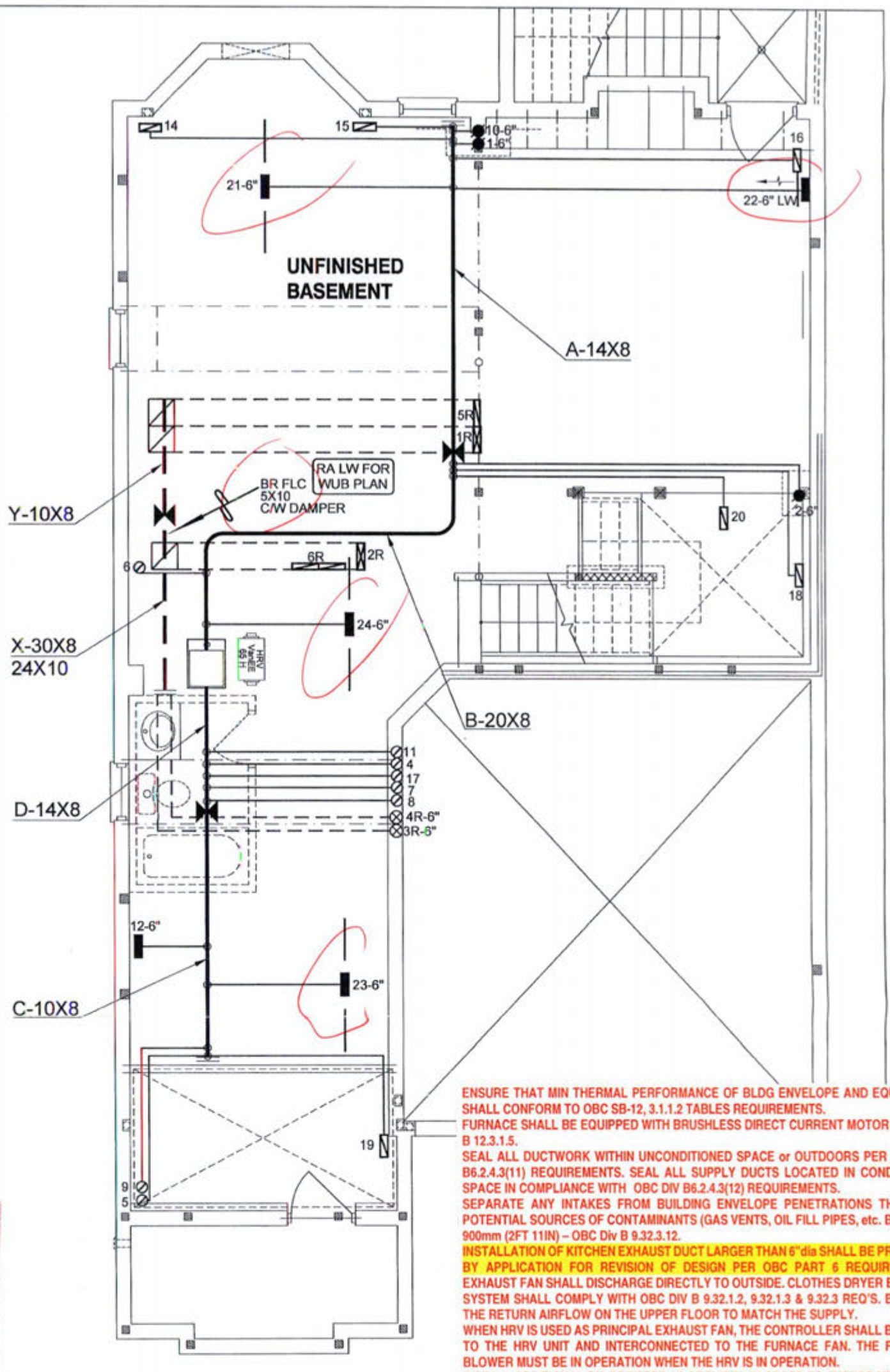

MECHANICAL VENTILATION SHALL BE PROVIDED IN CONFORMANCE WITH OBC DIV. B, 9.32.3 REQUIREMENTS.

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

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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 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).

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

I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DEVISION C, 3.2.5 OF THE BUILDING CODE.
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

WUB
CSA-F280-12
LOT 22 | 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

LOT 22
MILLWOOD 2 2654 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

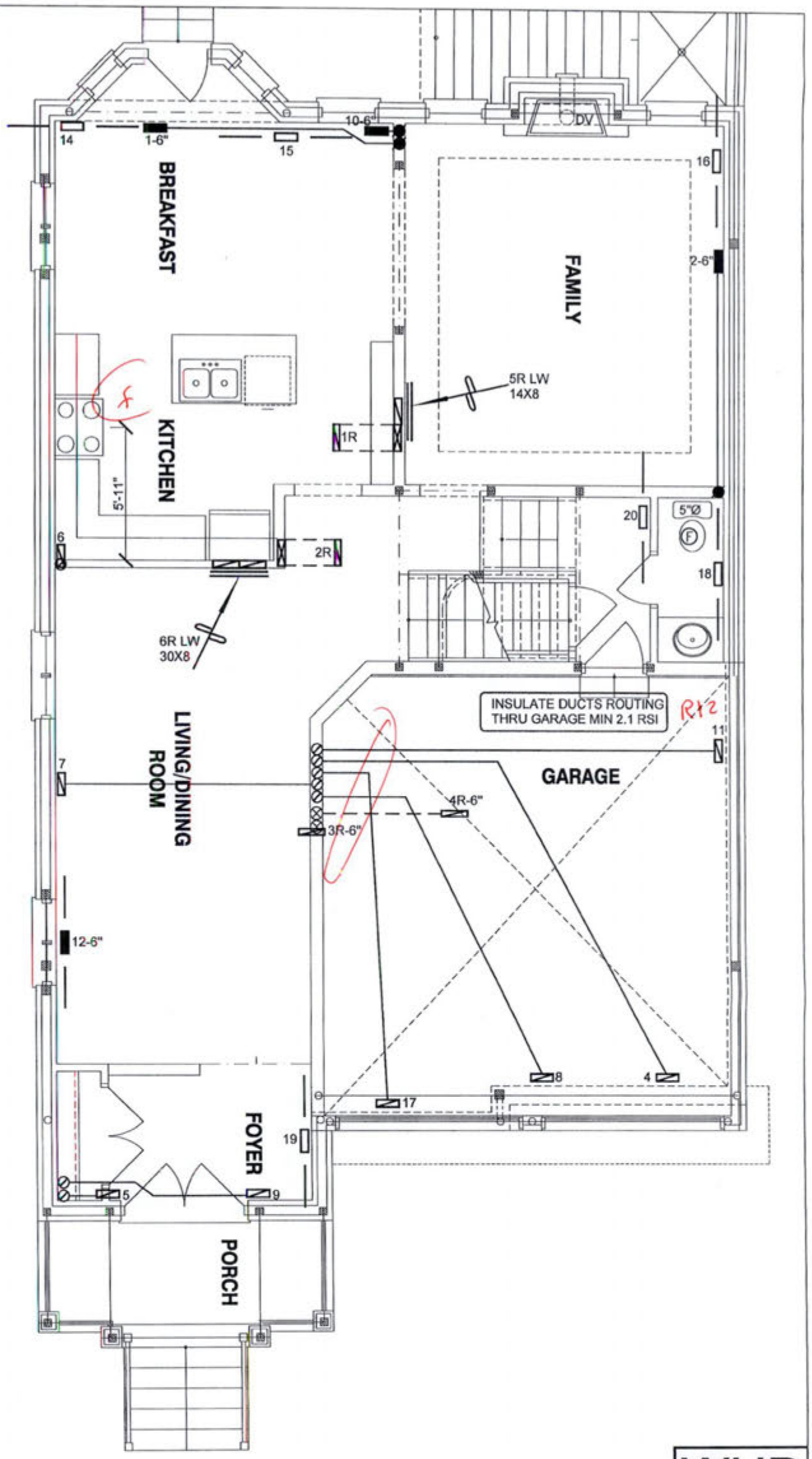
HEAT LOSS 48025 / BTU/H	
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960603BNA
INPUT	60 MBTU/H
OUTPUT	57.6 / MBTU/H
COOLING	2.5 TONS
FAN SPEED	1131 cfm @ 0.6" w.c.

# 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 OCT/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 80551



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

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Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

WUB
CSA-F280-12
LOT 22 | PACKAGE A1

HVAC LEGEND

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— ▬ —	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

LOT 22
MILLWOOD 2 2654 sqft

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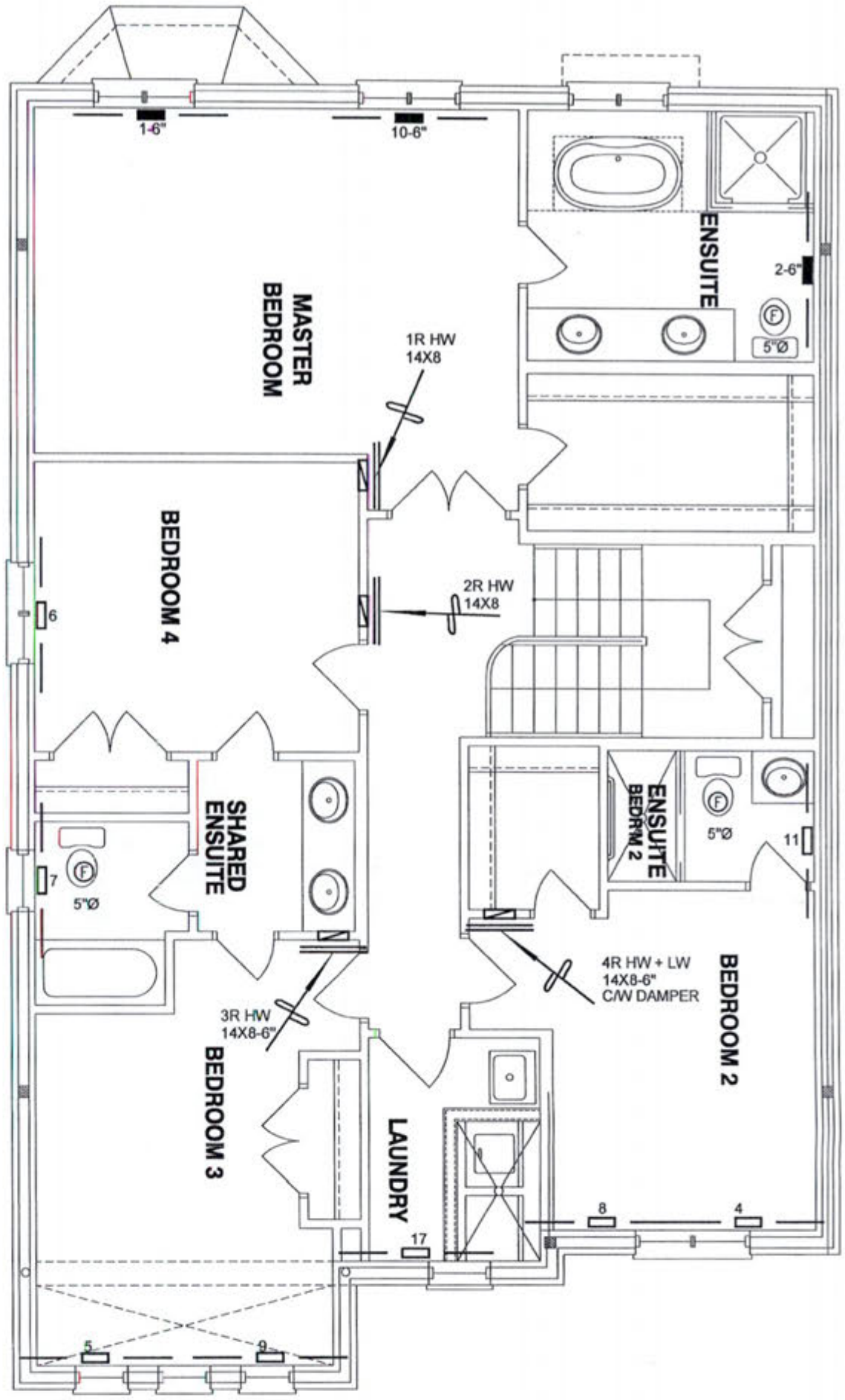
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date OCT/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 80551



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WUB
CSA-F280-12
LOT 22 | **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

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GREENPARK HOMES

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MINNISALE HOMES CORP.
BRAMPTON, ONTARIO

LOT 22
MILLWOOD 2 2654 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date OCT/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 80551