

SITE NAME: MINNISALE HOMES CORP
BUILDER: GREENPARK HOMES

TYPE: MILLWOOD 12 LOT 3

GFA: 2617

DATE: Nov-18
LO# 80606

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

HEAT LOSS AT °F. 74
HEAT GAIN AT °F. 11

CSA-F280-12
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	333	216	81	243	306	163	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 25 619 610	0 0 0	0 0 0	0 0 0	21 436 512	33 686 805	11 229 268	9 167 220
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 0.6 284 1237 183	200 871 129	81 353 52	243 1069 157	251 1137 189	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 0.6 284 254 158	144 180 80	108 135 60	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	2708	1364	488	1680	2384	1630	691	971
SUB TOTAL HT GAIN		1980	866	113	311	1793	1008	386
LEVEL FACTOR / MULTIPLIER	0.20 0.28	0.20 0.28	0.20 0.28	0.20 0.28	0.20 0.28	0.20 0.28	0.20 0.28	0.20 0.28
AIR CHANGE HEAT LOSS	766	392	138	475	675	433	196	275
AIR CHANGE HEAT GAIN	128	56	7	20	116	65	25	25
DUCT LOSS	0	0	0	216	306	196	0	125
DUCT GAIN	0	0	0	166	314	231	0	41
HEAT GAIN PEOPLE	240	2	480	0	1	240	1	240
HEAT GAIN APPLIANCES/LIGHTS			994	0	994	994	0	0
TOTAL HT LOSS BTU/H	3474	1776	626	2371	3364	2160	887	1370
TOTAL HT GAIN x 1.3 BTU/H	4656	1199	156	2237	4494	3299	531	688

ROOM USE	LVIDN	KT/PM	LAUN	WVR	FOY	MUD	WOB	BAS
EXP. WALL	66	69	9	13	11	13	31	135
CLG. HT.	10	10	9	10	10	10	9	9
FACTORS								
GRS.WALL AREA	660	690	81	130	110	130	279	810
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	6 125 146	0 0 0
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	20 493 73	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	253 1102 163	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	405 1423 211
EXPOSED CLG	1.3 0.6 0 0 0	0 0 0	153 192 85	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	0	2808
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	4649	4971	714	566	1390	972	313	4849
SUB TOTAL HT GAIN		3691	4725	163	84	334	483	430
LEVEL FACTOR / MULTIPLIER	0.30 0.42	0.30 0.42	0.30 0.42	0.30 0.42	0.30 0.42	0.30 0.42	0.30 0.42	0.50 1.29
AIR CHANGE HEAT LOSS	1974	2111	202	241	590	413	8880	59
AIR CHANGE HEAT GAIN	238	308	11	6	22	9	0	0
DUCT LOSS	0	0	92	0	0	0	0	0
DUCT GAIN	0	0	117	0	0	0	0	0
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS		994	994	994	994	994	0	0
TOTAL HT LOSS BTU/H	6423	7081	1008	807	1980	1385	2033	13728
TOTAL HT GAIN x 1.3 BTU/H	6400	7832	1668	116	462	199	628	626

ATTACHED NOTES ARE PART
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 JAN 21 2019
 CITY OF BRAMPTON
 BUILDING DIVISION
 REVIEWED BY: S. HANNA

TOTAL HEAT GAIN BTU/H: 36336

TONS: 2.94

LOSS DUE TO VENTILATION LOAD BTU/H: 1593

STRUCTURAL HEAT LOSS: 50673

TOTAL COMBINED HEAT LOSS BTU/H: 82246

SITE NAME: MINNISSALE HOMES CORP
BUILDER: GREENPARK HOMES

TYPE: MILLWOOD 12 LOT 3

DATE: Nov-18

GFA: 2617

LO# 80605

HEATING CFM 1131 COOLING CFM 1131
TOTAL HEAT LOSS 50,673 TOTAL HEAT GAIN 35,100
AIR FLOW RATE CFM 22.32 AIR FLOW RATE CFM 32.22

furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure for s/a & r/a 0.35

#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 @ 0.5" 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	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	WIR	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.74	1.78	0.63	2.37	1.68	2.16	0.89	1.68	1.74	1.37	3.31	3.31	2.36	2.36	2.36	1.01	0.81	1.98	1.39	3.94	3.94	3.94	3.94
CFM PER RUN HEAT	39	40	14	53	38	48	20	38	39	31	74	74	53	53	53	22	18	44	31	88	88	88	88
RM GAIN MBH	2.33	1.20	0.16	2.24	2.25	3.30	0.53	2.25	2.33	0.59	3.20	3.20	2.61	2.61	2.61	1.67	0.12	0.46	0.20	0.32	0.32	0.32	0.32
CFM PER RUN COOLING	75	39	5	72	72	106	17	72	75	19	103	103	84	84	84	54	4	15	6	10	10	10	10
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 (F/min)	286	459	161	270	194	245	229	194	286	356	377	377	270	270	270	162	207	505	358	449	449	449	449
COOLING VELOCITY (F/min)	551	447	57	367	367	540	195	367	551	218	525	525	428	428	428	396	46	172	69	51	51	51	51
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 #	1	2	3	4	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	WIR	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.74	1.78	0.63	2.37	1.68	2.16	0.89	1.68	1.74	1.37	3.31	3.31	2.36	2.36	2.36	1.01	0.81	1.98	1.39	3.94	3.94	3.94	3.94
CFM PER RUN HEAT	39	40	14	53	38	48	20	38	39	31	74	74	53	53	53	22	18	44	31	88	88	88	88
RM GAIN MBH	2.33	1.20	0.16	2.24	2.25	3.30	0.53	2.25	2.33	0.59	3.20	3.20	2.61	2.61	2.61	1.67	0.12	0.46	0.20	0.32	0.32	0.32	0.32
CFM PER RUN COOLING	75	39	5	72	72	106	17	72	75	19	103	103	84	84	84	54	4	15	6	10	10	10	10
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 (F/min)	286	459	161	270	194	245	229	194	286	356	377	377	270	270	270	162	207	505	358	449	449	449	449
COOLING VELOCITY (F/min)	551	447	57	367	367	540	195	367	551	218	525	525	428	428	428	396	46	172	69	51	51	51	51
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

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. HANNA

JAN 21 2019

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SUPPLY AIR TRUNK SIZE

TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY
CFM	PRESS.	DUCT	DUCT	(F/min)	CFM	PRESS.	DUCT	DUCT	(F/min)
TRUNK A	238	0.07	8.5	10	X	8	428		
TRUNK B	574	0.07	11.8	18	X	8	574		
TRUNK C	988	0.07	14.4	26	X	8	684		
TRUNK D	146	0.11	6.3	6	X	8	438		
TRUNK E	0	0.00	0	0	X	8	0		
TRUNK F	0	0.00	0	0	X	8	0		
TRUNK G	0	0.00	0	0	X	8	0		
TRUNK H	0	0.00	0	0	X	8	0		
TRUNK I	0	0.00	0	0	X	8	0		
TRUNK J	0	0.00	0	0	X	8	0		
TRUNK K	0	0.00	0	0	X	8	0		
TRUNK L	0	0.00	0	0	X	8	0		

RETURN AIR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	155	75	75	345	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
20	52	82	78	24	47	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
165	195	235	240	205	235	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
185	247	317	318	229	282	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0.08	0.08	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	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
7.3	7.5	8	8	10.1	7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

RETURN AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT	VELOCITY		
	CFM	PRESS.	DUCT	DUCT			(F/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

Michael O'Rourke

TYPE: MILLWOOD 12 LOT 3
SITE NAME: MINNISALE HOMES CORP

LO # 80605

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
WR	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	☒ HVI Approved	
@ 32 deg F (0 deg C)		

LOCATION OF INSTALLATION	
Lot:	Concession
Township:	Plan:
Address	
Roll #	Building Permit #

BUILDER: GREENPARK HOMES	
Name:	
Address:	
City:	
Telephone #:	

INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	November-16

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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations
Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 80605

Model: MILLWOOD 12 LOT 3

Builder: GREENPARK HOMES

Date: 11/2/2018

Volume Calculation
House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	1143	9	10287
First	1143	10	11430
Second	1474	9	13266
Third	0	9	0
Fourth	0	9	0
Total:			34,983.0 ft ³
Total:			990.6 m ³

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

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

$$0.382 \times 275.17 \times 41^\circ\text{C} \times 1.2 = 5205 \text{ W}$$

$$= 17760 \text{ Btu/h}$$

6.2.6 Sensible Gain due to Air Leakage

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

$$0.124 \times 275.17 \times 6^\circ\text{C} \times 1.2 = 251 \text{ W}$$

$$= 855 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

$$80 \text{ CFM} \times 74^\circ\text{F} \times 1.08 \times 0.25 = 1593 \text{ Btu/h}$$

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

$$80 \text{ CFM} \times 11^\circ\text{F} \times 1.08 \times 0.25 = 236 \text{ Btu/h}$$

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) + (HL_{agcleve} + HL_{bgcleve})\}$$

Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{cleve})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{cleve})
1	0.5	17,760	6,882	1.290
2	0.3		12,548	0.425
3	0.2		12,550	0.283
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 HLairbv = 0

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. HANNA

JAN 21 2019

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: MILLWOOD 12 LOT 3

BUILDER: GREENPARK HOMES

SFQT: 2617

LO# 80605

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 (ft³):	34983.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.85	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:	135.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	31.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component**

Ceiling with Attic Space Minimum RSI (R)-Value
Ceiling Without Attic Space Minimum RSI (R)-Value
Exposed Floor Minimum RSI (R)-Value
Walls Above Grade Minimum RSI (R)-Value
Basement Walls Minimum RSI (R)-Value
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
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value
Windows and Sliding Glass Doors Maximum U-Value
Skylights Maximum U-Value
Space Heating Equipment Minimum AFUE
HRV Minimum Efficiency
Domestic Hot Water Heater Minimum EF

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A1**

Nominal	Min. Eff.
60	59.22
31	27.65
31	29.80
22	17.03
20 ci	21.12
-	-
10	10
10	11.13
0.28	-
0.49	-
0.96	-
75%	-
0.8	-

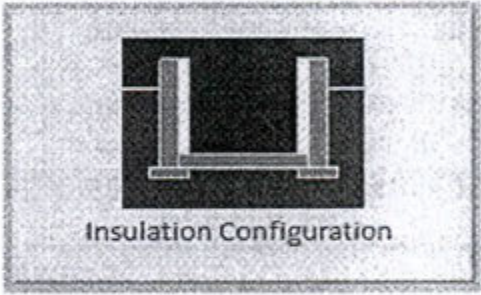
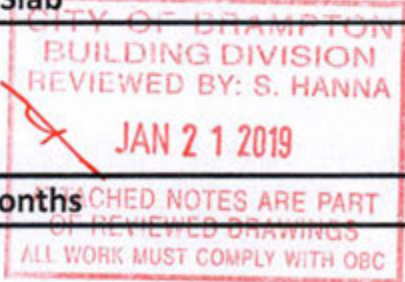
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Michael O'Rourke

Residential Foundation Thermal Load Calculator

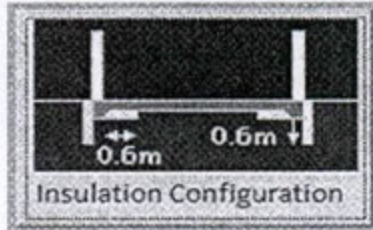
Supplemental tool for CAN/CSA-F280

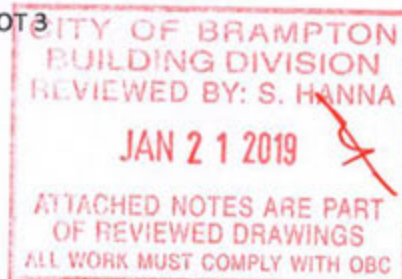
Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	5.2	 Insulation Configuration
Floor Width (m):	9.8	
Exposed Perimeter (m):	41.1	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.47	
Window Area (m ²):	0.6	
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):	822 ✓	

TYPE: MILLWOOD 12 LOT 3
LO# 80605

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

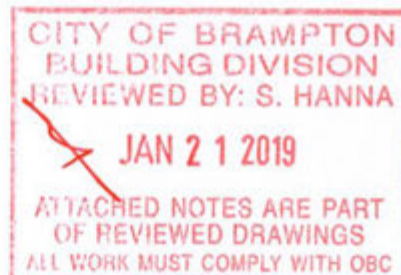
Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	2.1	
Width (m):	5.2	
Exposed Perimeter (m):	9.4	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		92 ✓

TYPE: MILLWOOD 12 LOT 3
LO# 80605

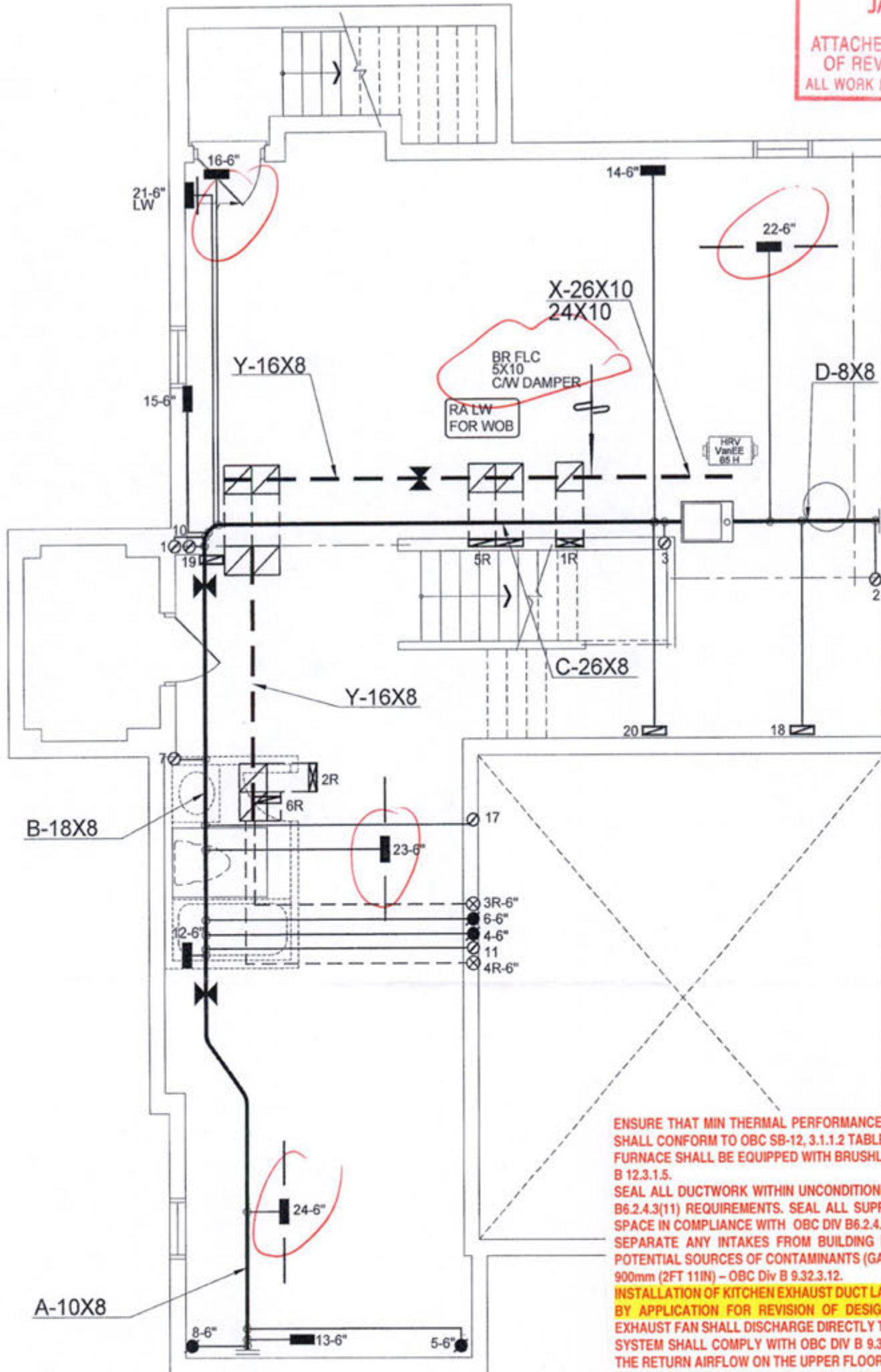
Air Infiltration Residential Load Calculator

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):	990.6			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa. 3.57	1320.5 cm ² ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply 37.5	Total Exhaust 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			

TYPE: MILLWOOD 12 LOT 3
LO# 80605

CITY OF BRAMPTON
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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.

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 DUCTWORK 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 BURTHER 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 AND 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 72deg F - 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

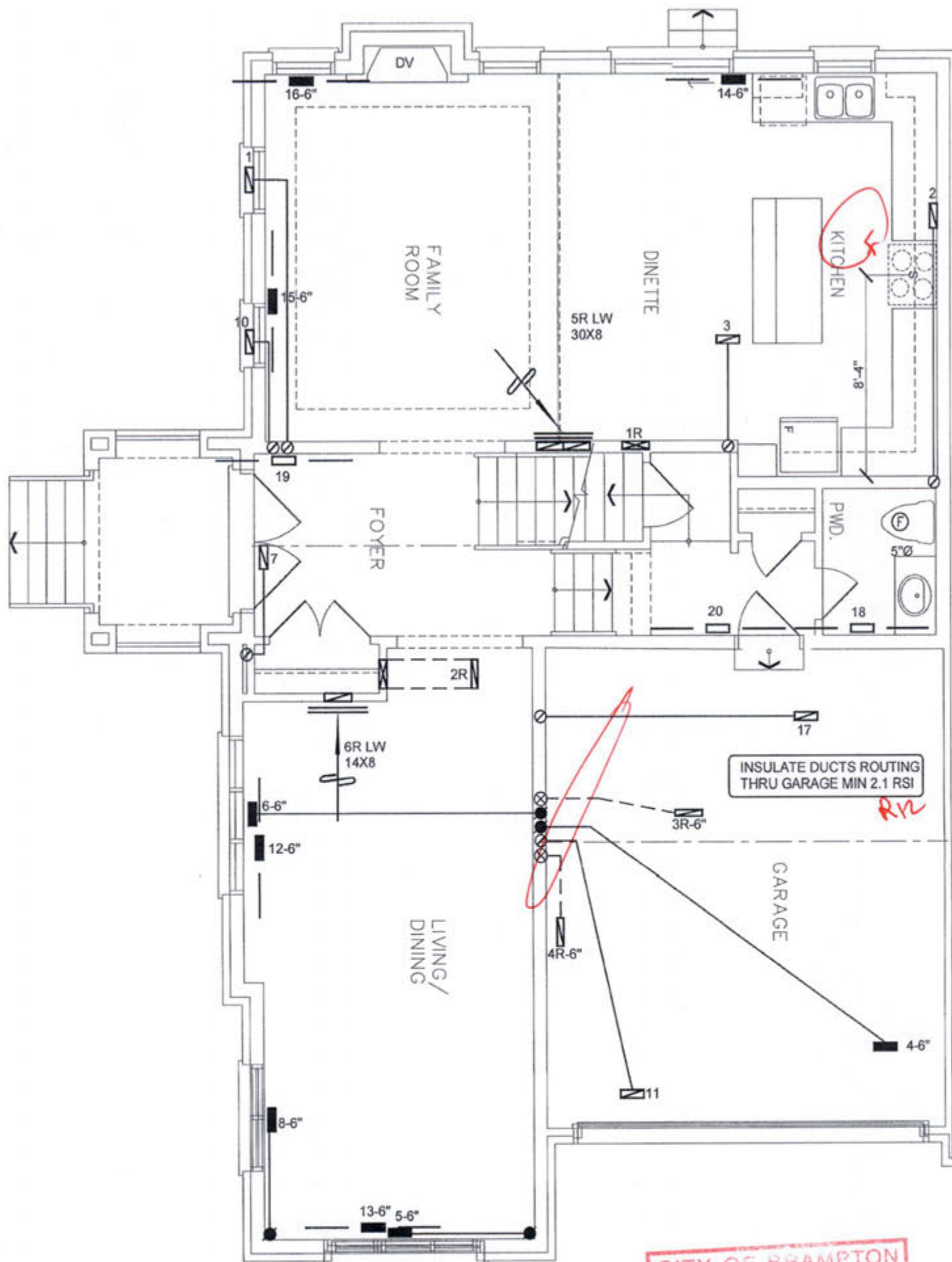
I MICHAEL OROZCO HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.3 OF THE BUILDING CODE.
Michael Orozco, P.Eng. 19669
HVAC DESIGNS LTD.

CSA-F280-12
LOT 3 PACKAGE A1

HVAC LEGEND						REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	3.	
	FLOOR SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		RETURN AIR STACK 2nd FLOOR	1.	
					REDUCER	No.	Description

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Client	HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca 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 52266 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title BASEMENT HEATING LAYOUT Date NOV/2018 Scale 3/16" = 1'-0" BCIN# 19669 LO# 80605
GREENPARK HOMES		MAKE GOODMAN	MODEL GMEC960603BNA-60	3RD FLOOR			
Project Name		INPUT 60 MBTUH	OUTPUT 57.6 MBTUH	2ND FLOOR	11	4 4	
MINNISALE HOMES CORP BRAMPTON, ONTARIO		COOLING 3.0 TONS	FAN SPEED 1131 cfm @ 0.6" w.g.	1ST FLOOR	8	2 2	
LOT 3 MILLWOOD 12 2617 sqft		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5" UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A		BASEMENT	4	1 0	



THIS INSTALLATION OF A GAS FIREPLACE IS REGULATED UNDER THE T.S.A. BY C.S.A. B149.1 NATURAL GAS AND PROPANE INSTALLATION CODE CALL ENBRIDGE FOR INSPECTION AT 1-800-765-1314

CITY OF BRAMPTON
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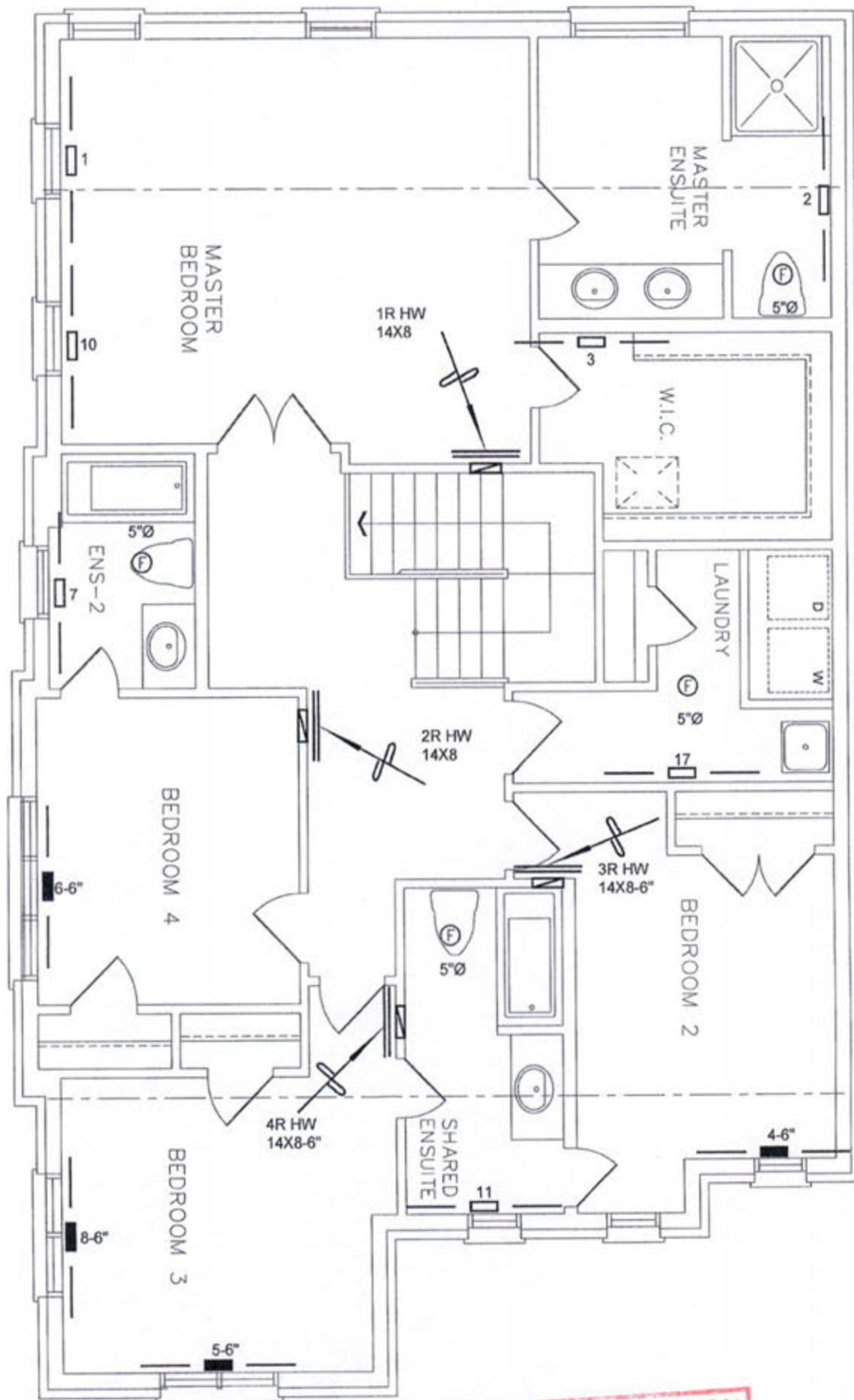
I MICHAEL OROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.3.2.3 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, O.C.D. (1969)
HVAC DESIGNS LTD.

CSA-F280-12
LOT 3 PACKAGE A1

HVAC LEGEND								REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
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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	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	1.	
								No.	Description

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Client GREENPARK HOMES		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdsgns.ca Web: www.hvacdsgns.ca 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.	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name MINNISALE HOMES CORP BRAMPTON, ONTARIO	LOT 3 MILLWOOD 12 2617 sqft		Date NOV/2018	Scale 3/16" = 1'-0"
		BCIN# 19669		LO# 80605



CITY OF BRAMPTON
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I MICHAEL OROURKE HAVE REVIEWED
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C.3.2.3 OF THE
BUILDING CODE.
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

LOT 3 PACKAGE A1

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SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
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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	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	1.	
								No.	Description
									Date

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ONTARIO BUILDING CODE.

Client GREENPARK HOMES		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca 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.	Sheet Title SECOND FLOOR HEATING LAYOUT	
Project Name MINNISALE HOMES CORP BRAMPTON, ONTARIO			Date NOV/2018	
LOT 3 MILLWOOD 12 2617 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 80605	