

LOT 34

 SITE NAME: MINNISSALE HOMES CORP
 BUILDER: GREENPARK HOMES

TYPE: MILLWOOD 2

GFA: 2654

 DATE: Aug-18
 LO# 79581

 WINTER NATURAL AIR CHANGE RATE 0.364
 SUMMER NATURAL AIR CHANGE RATE 0.115

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

 CSA-F280-12
 SB-12 PACKAGE A1

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	LOSS	GAIN	MBR	ENS	BED-2	BED-3	BED-4	BATH	ENS-2
						34	25	26	33	11	10	15
						10	9	9	10	9	9	9
GRS.WALL AREA	LOSS	GAIN				340	261	234	330	99	90	135
GLAZING	LOSS	GAIN						LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	20.8	15.5	0	0	0	0	0	0	0	0	0	0
EAST	20.8	41.0	0	0	0	0	0	20	416	821	30	623
SOUTH	20.8	24.4	0	0	0	0	0	0	0	0	12	249
WEST	20.8	41.0	32	655	1314	12	249	0	0	0	8	166
SKYLT.	36.4	100.7	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
NET EXPOSED WALL	4.4	0.5	308	1342	199	249	1085	214	932	138	87	379
NET EXPOSED BMT WALL ABOVE GR	3.5	0.5	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.5	280	351	156	204	256	165	207	92	195	244
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	40	107
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	165	411	61	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						2358	1590	1965	2282	904	744	1217
SUB TOTAL HT GAIN						1609	767	1112	1682	472	346	243
LEVEL FACTOR / MULTIPLIER	0.20	0.28				0.20	0.28	0.20	0.28	0.20	0.28	0.20
AIR CHANGE HEAT LOSS						653	440	544	632	250	206	337
AIR CHANGE HEAT GAIN						133	61	86	126	37	27	19
DUCT LOSS						0	0	251	0	0	0	155
DUCT GAIN						0	0	207	0	0	0	26
HEAT GAIN PEOPLE	240	2				480	0	1	240	1	240	0
HEAT GAIN APPLIANCES/LIGHTS						627	627	627	627	627	627	627
TOTAL HT LOSS BTUH						3010	2030	2761	2914	1154	950	1709
TOTAL HT GAIN x 1.3 BTUH						3781	1892	2957	3347	1789	1301	375

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	LOSS	GAIN	LIV	KT/FM	LAUN	WIR	FOY	MUD	WOD	BAS
						38	78	8	12	27	17	50	154
						10	10	9	11	10	11	9	9
GRS.WALL AREA	LOSS	GAIN				380	780	72	132	270	187	450	1224
GLAZING	LOSS	GAIN						LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	20.8	15.5	0	0	0	0	0	0	0	0	0	0	0
EAST	20.8	41.0	0	0	0	0	0	10	208	410	0	0	0
SOUTH	20.8	24.4	40	831	976	0	0	0	0	0	0	0	0
WEST	20.8	41.0	0	0	0	72	1496	0	0	0	0	145	287
SKYLT.	36.4	100.7	0	0	0	0	0	0	0	0	0	0	0
DOORS	24.7	3.7	0	0	0	20	493	0	0	0	40	986	146
NET EXPOSED WALL	4.4	0.5	340	1481	220	688	2998	62	270	43	132	575	85
NET EXPOSED BMT WALL ABOVE GR	3.5	0.5	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.5	0	0	0	0	0	128	160	71	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	36	97	0	0	0	0	0	0
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	128	319	47	0	0	0
BASEMENT/CRAWL HEAT LOSS						0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS						0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS						2312	1195	957	575	2087	1221	1175	6474
SUB TOTAL HT GAIN						1195	3516	569	85	637	181	440	353
LEVEL FACTOR / MULTIPLIER	0.30	0.44				0.30	0.44	0.20	0.28	0.30	0.44	0.30	0.44
AIR CHANGE HEAT LOSS						1023	2249	265	254	923	540	850	109
AIR CHANGE HEAT GAIN						95	279	45	7	43	14	0	63
DUCT LOSS						0	0	122	0	0	0	0	0
DUCT GAIN						0	0	124	0	0	0	0	0
HEAT GAIN PEOPLE	240	0				0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS						627	627	627	627	627	627	627	627
TOTAL HT LOSS BTUH						3336	7332	1344	830	3010	1761	1175	14791
TOTAL HT GAIN x 1.3 BTUH						2493	6749	1775	120	764	1069	572	540

ATTACHED NOTES ARE PART
 OF REVIEWED DRAWINGS
 ALL WORK MUST COMPLY WITH CBC
 JAN 7 2 2019
 CITY OF BRAMPTON
 BUILDING DIVISION
 REVIEWED BY: S. HANNA

TOTAL HEAT GAIN BTUH:

28751

TONS: 2.40

LOSS DUE TO VENTILATION LOAD BTUH: 1593

STRUCTURAL HEAT LOSS: 48106

TOTAL COMBINED HEAT LOSS BTUH: 49698

SITE NAME: MINNISSALE HOMES CORP
 BUILDER: GREENPARK HOMES

TYPE: MILLWOOD 2

DATE: Aug-18

GFA: 2654

LO# 79581

 HEATING CFM 1131 COOLING CFM 1131
 TOTAL HEAT LOSS 48,106 TOTAL HEAT GAIN 28,515
 AIR FLOW RATE CFM 23.51 AIR FLOW RATE CFM 39.66

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

 #GOODMAN
 GMEC90603BNA 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.

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.

 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

TEMPERATURE RISE 47 °F

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	WIR	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.51	2.03	1.38	1.46	1.15	0.95	1.38	1.46	1.51	1.71	3.34	2.44	2.44	2.44	1.34	0.83	3.01	1.76	3.99	3.99	3.99	3.99
CFM PER RUN HEAT	35	48	32	34	27	22	32	34	35	40	78	57	57	57	32	20	71	41	94	94	94	94
RM GAIN MBH	1.89	1.89	1.48	1.67	1.79	1.30	1.48	1.67	1.89	0.37	2.49	1.92	1.92	1.92	1.78	0.12	0.75	1.07	0.28	0.28	0.28	0.28
CFM PER RUN COOLING	75	75	59	66	71	52	59	66	75	15	99	76	76	76	70	5	30	42	11	11	11	11
ADJUSTED PRESSURE	0.17	0.17	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	46	33	15	37	47	47	45	38	15	48	44	49	39	39	29	32	39	39	20	10
EQUIVALENT LENGTH	190	160	140	140	160	110	140	160	150	140	120	130	110	140	130	140	90	160	150	160	110	150
TOTAL EFFECTIVE LENGTH	245	214	186	173	175	147	187	207	195	178	135	178	154	189	169	179	119	192	189	199	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	0.08	0.12	0.1
ROUND DUCT SIZE	6	6	5	5	5	4	5	5	5	4	6	5	5	5	5	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	178	245	235	250	198	252	235	250	257	459	398	419	419	419	235	229	521	470	479	479	479	479
COOLING VELOCITY (ft/min)	382	382	433	485	521	597	433	485	551	172	505	558	558	558	514	57	220	482	56	56	56	56
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	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
 JAN 22 2019
 ATTACHED NOTES ARE PART
 OF REVIEWED DRAWINGS
 ALL WORK MUST COMPLY WITH OBC

SUPPLY AIR TRUNK SIZE

TRUNK	STATIC	ROUND	RECT	VELOCITY
CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK A	0.07	10.6	14	552
TRUNK B	0.07	12.4	18	659
TRUNK C	0.08	9.1	10	560
TRUNK D	0.08	10.6	14	603
TRUNK E	0.00	0	0	0
TRUNK F	0.00	0	0	0

TRUNK	STATIC	ROUND	RECT	VELOCITY
CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK G	0.00	0	0	0
TRUNK H	0.00	0	0	0
TRUNK I	0.00	0	0	0
TRUNK J	0.00	0	0	0
TRUNK K	0.00	0	0	0
TRUNK L	0.00	0	0	0

RETURN AIR TRUNK SIZE

TRUNK	STATIC	ROUND	RECT	VELOCITY
CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK O	0.07	0	0	0
TRUNK P	0.07	0	0	0
TRUNK Q	0.07	0	0	0
TRUNK R	0.07	0	0	0
TRUNK S	0.07	0	0	0
TRUNK T	0.07	0	0	0
TRUNK U	0.07	0	0	0
TRUNK V	0.07	0	0	0
TRUNK W	0.07	0	0	0
TRUNK X	1131	0.07	15.2	30
TRUNK Y	290	0.07	9.1	10
TRUNK Z	0	0.07	0	0
DROP	1131	0.07	15.2	24

RETURN AIR #	1	2	3	4	5	6															BR
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	186
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	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	1	1	1	1	1	17
EQUIVALENT LENGTH	150	135	175	175	145	135	0	0	0	0	0	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	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	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7.2	7	6	6	6.6	8.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.3
INLET GRILL SIZE	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
INLET GRILL SIZE	X	X	X	X	X	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	0	0	0	0	0	14

TYPE: MILLWOOD 2
SITE NAME: MINNISSALE HOMES CORP

LO # 79581

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/on 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	1.06 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	☒ 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 #:	
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:	<i>Michael O'Rourke</i>
HRAI #	001620
Date:	August-18

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 79581	Model: MILLWOOD 2	Builder: GREENPARK HOMES	Date: 8/8/2018																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr><td>Bsmt</td><td>1148</td><td>9</td><td>10332</td></tr> <tr><td>First</td><td>1148</td><td>10</td><td>11480</td></tr> <tr><td>Second</td><td>1506</td><td>9</td><td>13554</td></tr> <tr><td>Third</td><td>0</td><td>9</td><td>0</td></tr> <tr><td>Fourth</td><td>0</td><td>9</td><td>0</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>35,366.0 ft³</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>1001.5 m³</td></tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1148	9	10332	First	1148	10	11480	Second	1506	9	13554	Third	0	9	0	Fourth	0	9	0	Total:			35,366.0 ft³	Total:			1001.5 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width:20%; text-align: center;">0.354</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.115</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-19</td> <td style="text-align: center;">41</td> <td style="text-align: center;">74</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">30</td> <td style="text-align: center;">6</td> <td style="text-align: center;">11</td> </tr> </table>		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
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
Bsmt	1148	9	10332																																																									
First	1148	10	11480																																																									
Second	1506	9	13554																																																									
Third	0	9	0																																																									
Fourth	0	9	0																																																									
Total:			35,366.0 ft³																																																									
Total:			1001.5 m³																																																									
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			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.354 x 278.18 x 41 °C x 1.2 = 4875 W = 16633 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ 0.115 x 278.18 x 6 °C x 1.2 = 235 W = 802 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 74 °F x 1.08 x 0.25 = 1593 Btu/h			$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 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)																																																												
$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times ((HL_{agcr} + HL_{bgcr}) + (HL_{agclevel} + HL_{bgclevel}))$ <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{level})</th> <th>Air Leakage Heat Loss Multiplier (LF x HLairbv / HL_{level})</th> </tr> </thead> <tbody> <tr><td>1</td><td>0.5</td><td rowspan="5" style="text-align: center;">16,633</td><td style="text-align: center;">7,649</td><td style="text-align: center;">1.087</td></tr> <tr><td>2</td><td>0.3</td><td style="text-align: center;">11,278</td><td style="text-align: center;">0.442</td></tr> <tr><td>3</td><td>0.2</td><td style="text-align: center;">12,017</td><td style="text-align: center;">0.277</td></tr> <tr><td>4</td><td>0</td><td style="text-align: center;">0</td><td style="text-align: center;">0.000</td></tr> <tr><td>5</td><td>0</td><td style="text-align: center;">0</td><td style="text-align: center;">0.000</td></tr> </tbody> </table>					Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{level})	1	0.5	16,633	7,649	1.087	2	0.3	11,278	0.442	3	0.2	12,017	0.277	4	0	0	0.000	5	0	0	0.000																														
Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{level})																																																								
1	0.5	16,633	7,649	1.087																																																								
2	0.3		11,278	0.442																																																								
3	0.2		12,017	0.277																																																								
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

JAN 22 2019

ATTACHED NOTES ARE PART
OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH OBC

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: MILLWOOD 2

BUILDER: GREENPARK HOMES

SFQT: 2654

LO# 79581

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):	35366.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	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:	154.0 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

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. HANNA

~~JAN 22 2019~~

ATTACHED NOTES ARE PART
OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH OBC

**Compliance Package
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	-

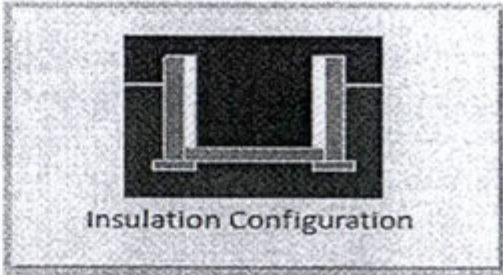
INDIVIDUAL BCIN: 19669

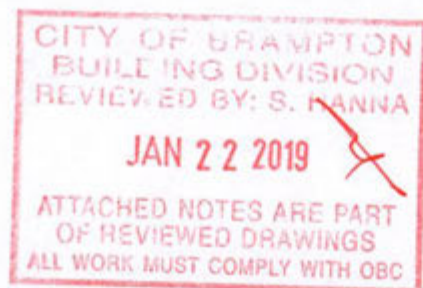
MICHAEL O'ROURKE

Michael O'Rourke

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

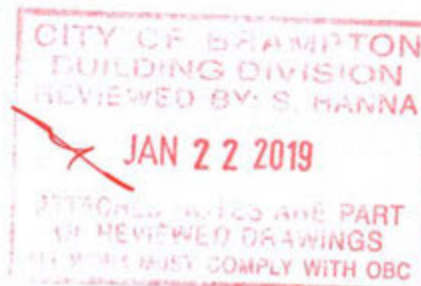
Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.0	
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.4	
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):	1537	

TYPE: MILLWOOD 2
LO# 79581

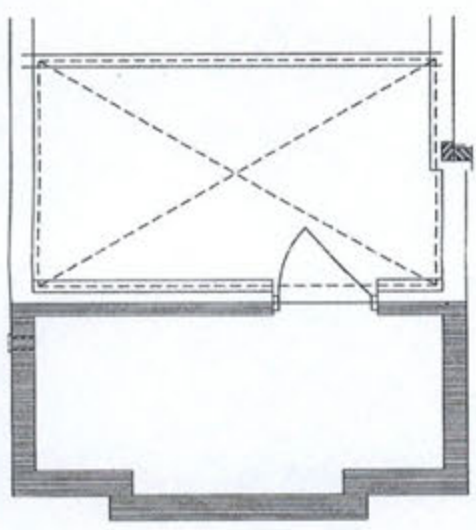
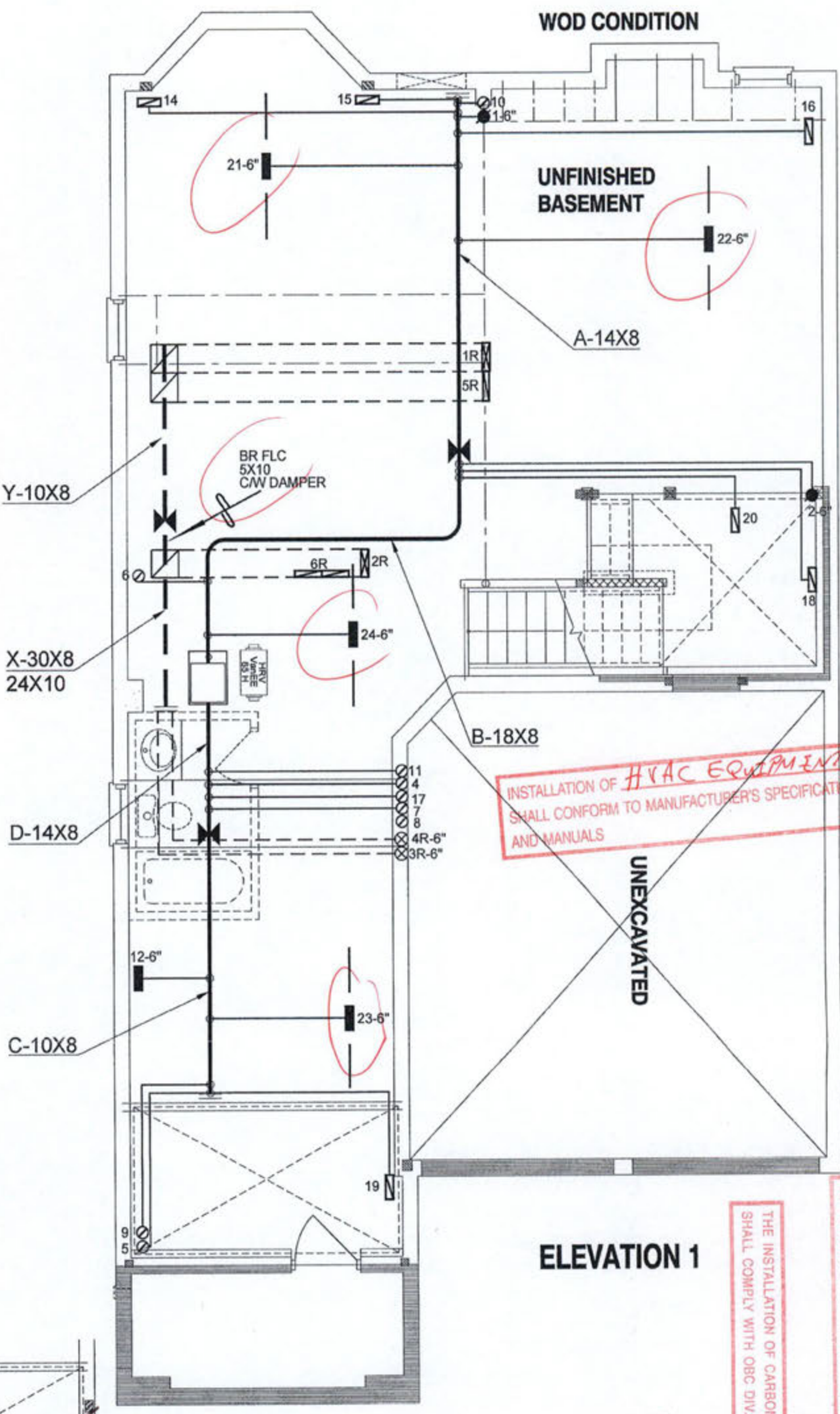
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

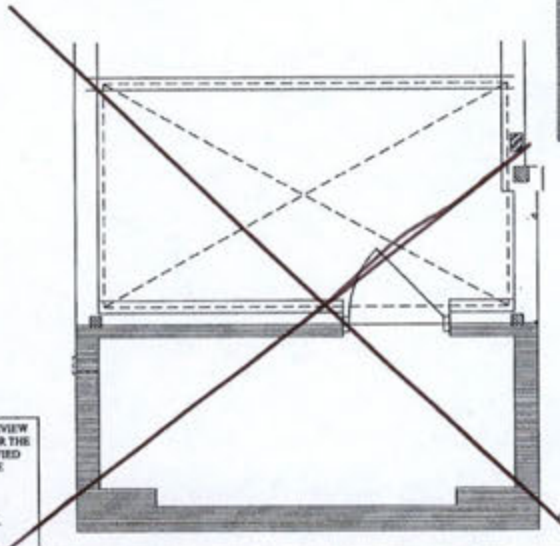
Weather Station Description			
Province:	Ontario		
Region:	Brampton		
Weather Station Location:	Open flat terrain, grass		
Anemometer height (m):	10		
Local Shielding			
Building Site:	Suburban, forest		
Walls:	Heavy		
Flue:	Heavy		
Highest Ceiling Height (m):	7.62		
Building Configuration			
Type:	Detached		
Number of Stories:	Two		
Foundation:	Full		
House Volume (m ³):	1001.5		
Air Leakage/Ventilation			
Air Tightness Type:	Present (1961-) (3.57 ACH)		
Custom BDT Data:	ELA @ 10 Pa.	1335.0 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 2
LO# 79581

ENSURE THAT MIN THERMAL PERFORMANCE OF BLDG ENVELOPE AND EQUIPMENT SHALL CONFORM TO OBC S8-12.3.1.2 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(1) REQUIREMENTS. SEAL ALL SUPPLY DUCTS LOCATED IN UNCONDITIONED 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 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).



ELEVATION 2



ELEVATION 3

ELEVATION 1

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. HANNA
JAN 22 2019
ATTACHED NOYES ARE PART
OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH OBC

THE INSTALLATION OF CARBON MONOXIDE DETECTORS 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.

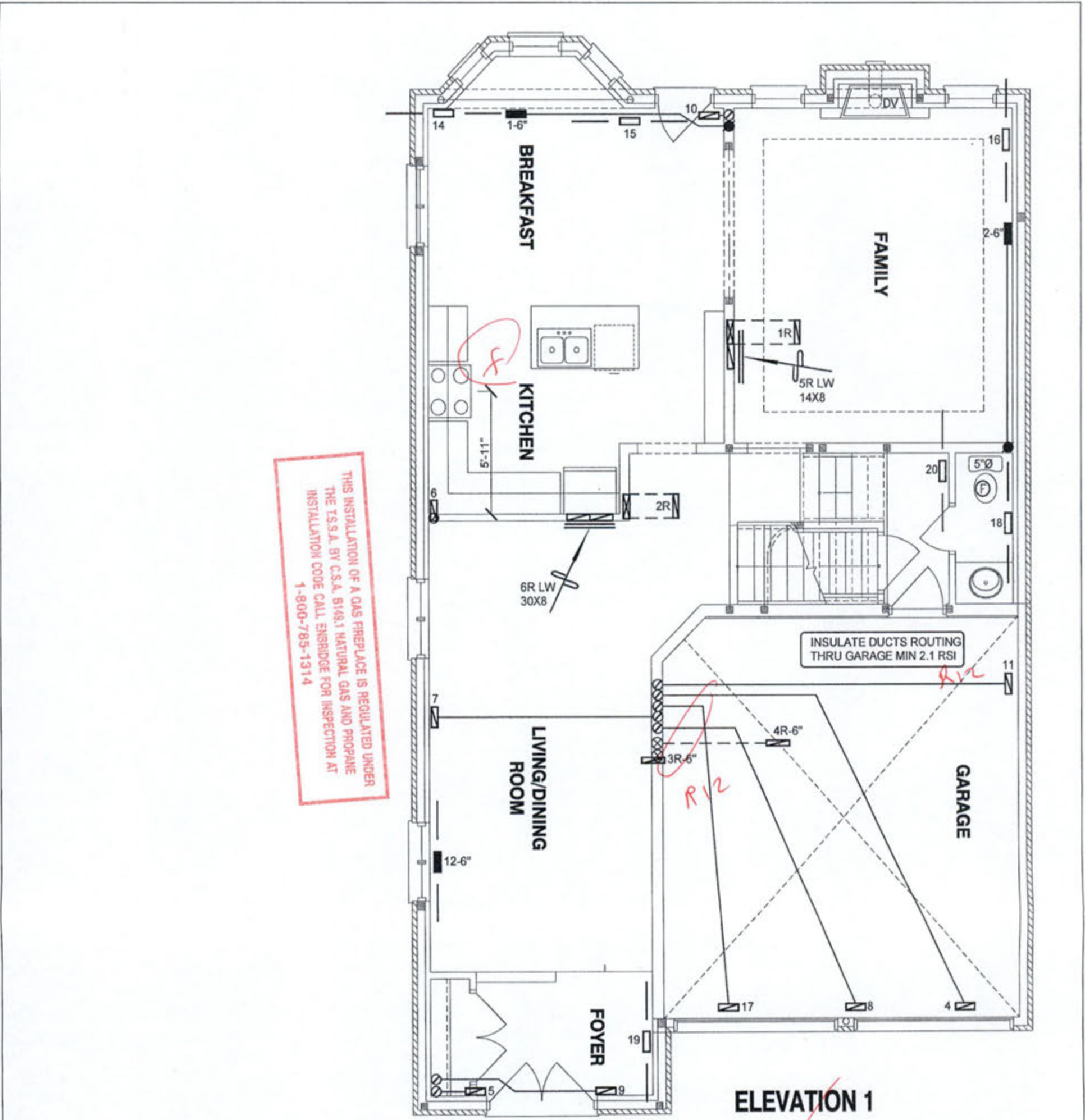
CSA-F280-12
PACKAGE A1

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 12.5 OF THE BUILDING CODE.
Michael O'Rourke, BCIN 19669
HVAC DESIGNS LTD.

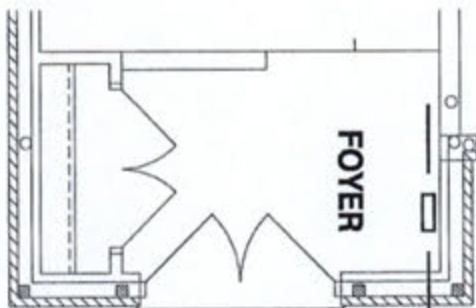
HVAC LEGEND						REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	3.	
	FLOOR SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY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

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD. AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

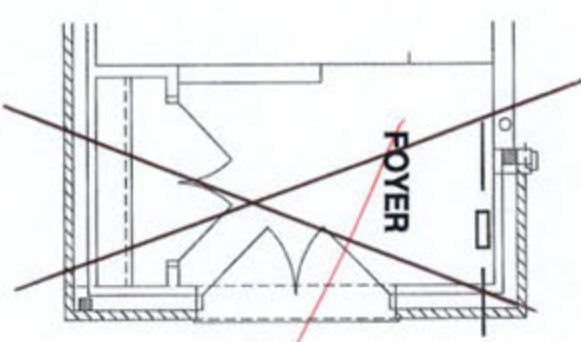
Client GREENPARK HOMES Project Name MINNISALE HOMES CORP. BRAMPTON, ONTARIO 407-34 MILLWOOD 2 2654 sqft	HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical 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 49698 BTU/H UNIT DATA MAKE GOODMAN MODEL GMEC960603BNA-60 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" 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# 79581



ELEVATION 1



ELEVATION 2



ELEVATION 3

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. HANNA
JAN 22 2019
ATTACHED NOTES ARE PART
OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH CBC

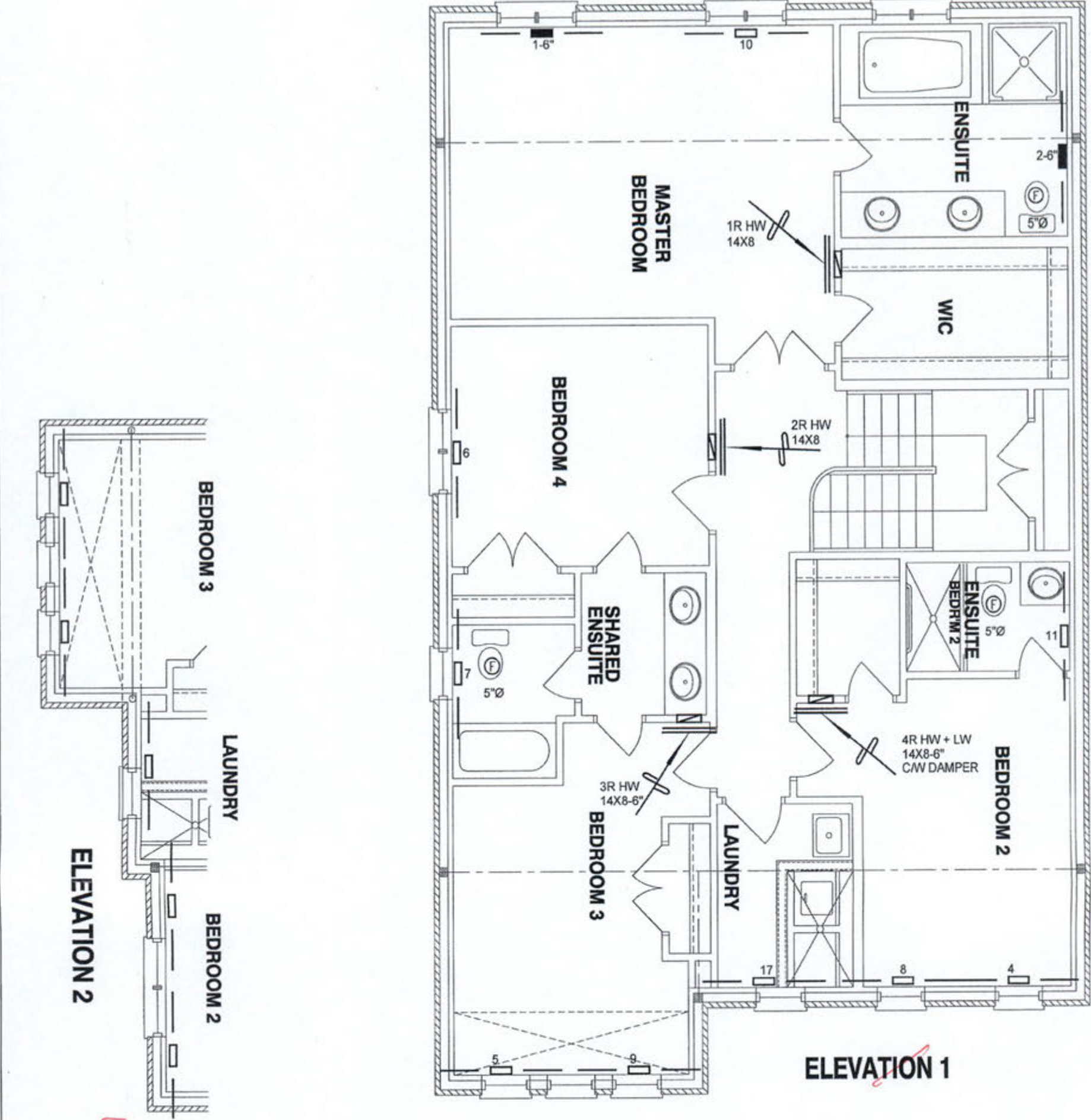
I MICHAEL OROURDE HAVE REVIEWED
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 3.2.3 OF THE
BUILDING CODE.
Michael Oroure
Michael Oroure, BCSP 1969
HVAC DESIGNS LTD.

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

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE 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 FIRST FLOOR HEATING LAYOUT	
Project Name MINNISALE HOMES CORP. BRAMPTON, ONTARIO LOT 34 MILLWOOD 2	2654 sqft		Date AUG/2018 Scale 3/16" = 1'-0" BCIN# 19669 LO# 79581	



CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. HANNA
JAN 22 2019
ATTACHED NOTES ARE PART
OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH OBC

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, 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"x6" 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.		

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD. AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND
USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE
USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE
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	Sheet Title SECOND FLOOR HEATING LAYOUT	
Project Name MINNISALE HOMES CORP. BRAMPTON, ONTARIO LOT 34 MILLWOOD 2 2654 sqft			Date AUG/2018	Scale 3/16" = 1'-0"
		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.	BCIN# 19669	
			LO#	79581