

SITE NAME: MINNISALE HOMES CORP				LOT 27				DATE: Oct-18				WINTER NATURAL AIR CHANGE RATE 0.325				HEAT LOSS AT °F. 74				CSA-F280-12							
BUILDER: GREENPARK HOMES				TYPE: MILLWOOD 2				GFA: 2654				LO# 80382				SUMMER NATURAL AIR CHANGE RATE 0.106				HEAT GAIN AT °F. 11				SS-12 PACKAGE A1			
ROOM USE		MBR		ENS		WIC		BED-2		BED-3		BED-4		BATH		WIC-2		ENS-2									
EXP. WALL		34		22		10		26		33		11		10		8		10									
CLG. HT.		10		9		9		9		10		9		9		9		9									
FACTORS																											
GRS.WALL AREA		340		198		90		234		330		99		90		0		90									
GLAZING		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN									
NORTH		28.8	15.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
EAST		28.8	41.0	0	0	0	0	0	0	29	416	821	30	623	1231	0	0	0	0	0	0	0					
SOUTH		28.8	24.4	0	0	0	10	206	244	0	0	0	0	0	12	249	293	8	166	195	0	0					
WEST		28.8	41.0	32	685	1314	12	249	483	0	0	0	0	0	0	0	0	0	0	0	0	0					
SKYLT.		36.4	106.7	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					
NET EXPOSED WALL		4.4	8.6	308	1342	199	176	767	114	90	392	58	214	932	138	300	1367	194	87	379	56	82	357	53			
NET EXPOSED BENT WALL ABOVE GR		2.5	8.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
EXPOSED CLG		1.3	8.6	280	351	156	128	150	67	120	150	67	165	207	92	135	169	75	220	276	123	178	221	98			
NO ATTIC EXPOSED CLG		2.7	1.2	0	0	0	0	0	0	0	0	0	60	161	72	0	0	0	0	0	0	0	0	0			
EXPOSED FLOOR		2.5	8.4	0	0	0	0	0	0	0	0	0	165	411	61	0	0	0	0	0	0	60	149	22			
BASEMENT/CRANKL HEAT LOSS		0		0		0		0		0		0		0		0		0		0		0		0			
SLAB ON GRADE HEAT LOSS		0		0		0		0		0		0		0		0		0		0		0		0			
SUBTOTAL HT LOSS		2358		1374		642		1966		2261		904		744		225		823									
SUB TOTAL HT GAIN		1669		917		125		1112		1572		472		246		94		322									
LEVEL FACTOR / MULTIPLIER		0.20 0.25		0.20 0.25		0.20 0.25		0.20 0.25		0.20 0.25		0.20 0.25		0.20 0.25		0.20 0.25		0.20 0.25									
AIR CHANGE HEAT LOSS		591		345		136		493		567		227		187		56		206									
AIR CHANGE HEAT GAIN		117		64		9		78		110		33		24		4		23									
DUCT LOSS		0		0		0		246		0		0		0		28		103									
DUCT GAIN		0		0		0		221		0		0		0		8		34									
HEAT GAIN PEOPLE		240	2	480	0	0	0	1	240	1	240	1	240	0	0	0	0	0	0	0	0	0	0	0			
HEAT GAIN APPLIANCES/LIGHTS		784		0		0		784		784		784		784		0		0									
TOTAL HT LOSS BTU/H		2349		1719		679		2794		2828		1131		931		309		1132									
TOTAL HT GAIN x 1.3 BTU/H		3965		1276		174		3568		3618		1987		482		85		492									

ROOM USE	LIV	KT/PM	LAUN	WIR	FOY	MUD	WUB	BAS
EXP. WALL	38	78	8	12	27	17	25	125
CLG. HT.	10	10	9	11	10	11	9	9
GRS.WALL AREA	380	780	72	132	270	187	225	774
GLAZING	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN
NORTH	28.8 55.5 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	28.8 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	28.8 24.4 40 821 976	0 0 0	0 0 0	10 208 244	0 0 0	0 0 0	0 0 0	10 208 244
WEST	28.8 41.0 0 0 0	72 1496 2565	0 0 0	0 0 0	0 0 0	0 0 0	0 104 205	0 0 0
SKYL.T.	36.4 199.7 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	40 986 146	20 493 73	33 493 73	20 453 73
NET EXPOSED WALL	4.4 0.6 342 1681 220	688 2998 444	62 270 40	122 532 79	224 976 145	147 728 108	206 871 129	0 0 0
NET EXPOSED ROOF 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	187 1360 202
EXPOSED CLG.	1.3 0.6 0 0 0	0 0 0	128 180 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	0	4320
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	227	6380
SUBTOTAL HT LOSS	2312	5063	957	738	2047	5221	1695	519
SUB TOTAL HT GAIN	1195	3516	569	323	537	185	408	8.50 0.94
LEVEL FACTOR / MULTIPLIER	0.30 0.40	0.30 0.40	0.20 0.25	0.30 0.40	0.30 0.40	0.30 0.40	0.30 0.40	7622
AIR CHANGE HEAT LOSS	934	2032	240	295	834	488	0	65
AIR CHANGE HEAT GAIN	84	247	40	23	38	13	0	0
DUCT LOSS	0	0	120	0	0	0	0	0
DUCT GAIN	0	0	120	0	0	0	0	0
HEAT GAIN PEOPLE	280	0	0	0	0	0	0	784
HEAT GAIN APPLIANCES/LIGHTS	784	784	784	784	784	784	784	784
TOTAL HT LOSS BTU/H	3237	7115	1317	905	2021	5708	1695	14002
TOTAL HT GAIN x 1.3 BTU/H	2632	5951	1092	449	747	252	530	1777

ATTACHED NOTES ARE PART
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 NOV 27 2018
 CITY OF BRAMPTON
 BUILDING DIVISION
 REVIEWED BY: S. HANNA

TOTAL HEAT GAIN BTU/H: 29723 TONS: 2.48

LOSS DUE TO VENTILATION LOAD BTUH: 1583

STRUCTURAL HEAT LOSS: 47410

TOTAL COMBINED HEAT LOSS BTU/H: 49003

SITE NAME: MINNISALE HOMES CORP
 BUILDER: GREENPARK HOMES

 LOT 27
 TYPE: MILLWOOD 2

DATE: Oct-18

GFA: 2654 LO# 80392

 HEATING CFM 1131 COOLING CFM 1131
 TOTAL HEAT LOSS 47,410 TOTAL HEAT GAIN 29,487
 AIR FLOW RATE CFM 23.86 AIR FLOW RATE CFM 38.36

 furnace pressure 0.8
 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

 AFUE = 96 %
 INPUT (BTU/H) = 60,000
 OUTPUT (BTU/H) = 57,600

 DESIGN CFM = 1131
 CFM @ .8" E.S.P.

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	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 r/a pressure 0.17
 max s/a diff press. loss 0.02 r/a grille press. Loss 0.02
 min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

RUN #	1	2	3	4	5	6	7	8	9	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-2	BED-3	MBR	ENS-2	LIV	WIC-2	KT/FM	KT/FM	KT/FM	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.47	1.72	0.68	1.35	1.41	1.13	0.93	1.35	1.41	1.47	1.13	3.24	0.31	2.37	2.37	2.37	1.32	1.03	2.92	1.71	3.92	3.92	3.92	3.92
CFM PER RUN HEAT	35	41	16	32	34	27	22	32	34	35	27	77	7	57	57	57	31	25	70	41	94	94	94	94
RM GAIN MBH	1.98	1.28	0.17	1.58	1.76	1.99	0.48	1.58	1.76	1.98	0.49	2.68	0.09	1.97	1.97	1.97	1.99	0.45	0.75	0.25	0.58	0.58	0.58	0.58
CFM PER RUN COOLING	76	49	7	61	67	76	18	61	67	76	19	103	3	76	76	76	76	17	29	10	22	22	22	22
ADJUSTED PRESSURE	0.17	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	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	55	54	40	46	33	15	37	47	47	45	38	15	30	48	44	49	39	39	29	32	39	47	20	10
EQUIVALENT LENGTH	190	170	130	140	180	160	110	140	190	150	140	120	170	130	110	140	130	150	140	170	150	170	110	160
TOTAL EFFECTIVE LENGTH	245	224	170	186	213	175	147	187	237	195	178	135	200	178	154	189	169	189	169	202	189	217	130	170
ADJUSTED PRESSURE	0.07	0.08	0.1	0.09	0.08	0.1	0.12	0.09	0.07	0.09	0.1	0.12	0.09	0.1	0.11	0.09	0.1	0.09	0.1	0.09	0.09	0.07	0.12	0.1
ROUND DUCT SIZE	5	5	4	5	5	5	4	5	5	5	4	6	4	5	5	5	5	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	257	301	184	235	250	198	252	235	250	257	310	393	80	419	419	419	228	287	514	470	479	479	479	479
COOLING VELOCITY (ft/min)	558	360	80	448	492	558	207	448	492	558	218	525	34	558	558	558	558	195	213	115	112	112	112	112
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	D	C	B	D	D	C	A	D	C	D	A	A	A	A	D	B	C	B	A	C	B

RUN #	1	2	3	4	5	6	7	8	9	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-2	BED-3	MBR	ENS-2	LIV	WIC-2	KT/FM	KT/FM	KT/FM	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.47	1.72	0.68	1.35	1.41	1.13	0.93	1.35	1.41	1.47	1.13	3.24	0.31	2.37	2.37	2.37	1.32	1.03	2.92	1.71	3.92	3.92	3.92	3.92
CFM PER RUN HEAT	35	41	16	32	34	27	22	32	34	35	27	77	7	57	57	57	31	25	70	41	94	94	94	94
RM GAIN MBH	1.98	1.28	0.17	1.58	1.76	1.99	0.48	1.58	1.76	1.98	0.49	2.68	0.09	1.97	1.97	1.97	1.99	0.45	0.75	0.25	0.58	0.58	0.58	0.58
CFM PER RUN COOLING	76	49	7	61	67	76	18	61	67	76	19	103	3	76	76	76	76	17	29	10	22	22	22	22
ADJUSTED PRESSURE	0.17	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	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	55	54	40	46	33	15	37	47	47	45	38	15	30	48	44	49	39	39	29	32	39	47	20	10
EQUIVALENT LENGTH	190	170	130	140	180	160	110	140	190	150	140	120	170	130	110	140	130	150	140	170	150	170	110	160
TOTAL EFFECTIVE LENGTH	245	224	170	186	213	175	147	187	237	195	178	135	200	178	154	189	169	189	169	202	189	217	130	170
ADJUSTED PRESSURE	0.07	0.08	0.1	0.09	0.08	0.1	0.12	0.09	0.07	0.09	0.1	0.12	0.09	0.1	0.11	0.09	0.1	0.09	0.1	0.09	0.09	0.07	0.12	0.1
ROUND DUCT SIZE	5	5	4	5	5	5	4	5	5	5	4	6	4	5	5	5	5	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	257	301	184	235	250	198	252	235	250	257	310	393	80	419	419	419	228	287	514	470	479	479	479	479
COOLING VELOCITY (ft/min)	558	360	80	448	492	558	207	448	492	558	218	525	34	558	558	558	558	195	213	115	112	112	112	112
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	D	C	B	D	D	C	A	D	C	D	A	A	A	A	D	B	C	B	A	C	B

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SUPPLY AIR TRUNK SIZE														RETURN AIR TRUNK SIZE									
TRUNK	STATIC	ROUND	RECT	VELOCITY				TRUNK	STATIC	ROUND	RECT	VELOCITY				TRUNK	STATIC	ROUND	RECT	VELOCITY			
CFM	PRESS.	DUCT	DUCT	CFM	FT/MIN	FT/MIN	FT/MIN	CFM	PRESS.	DUCT	DUCT	CFM	FT/MIN	FT/MIN	FT/MIN	CFM	PRESS.	DUCT	DUCT	CFM	FT/MIN	FT/MIN	FT/MIN
TRUNK A	429	0.07	10.6	14	X	8	552	TRUNK G	0	0.00	0	0	X	8	0	TRUNK O	0	0.07	0	0	X	8	0
TRUNK B	673	0.07	12.5	18	X	8	673	TRUNK H	0	0.00	0	0	X	8	0	TRUNK P	0	0.07	0	0	X	8	0
TRUNK C	309	0.07	9.3	10	X	8	556	TRUNK I	0	0.00	0	0	X	8	0	TRUNK Q	0	0.07	0	0	X	8	0
TRUNK D	460	0.07	10.8	16	X	8	518	TRUNK J	0	0.00	0	0	X	8	0	TRUNK R	0	0.07	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 S	0	0.07	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	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	300	0.07	9.2	10	X	8	540
																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	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	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	1	1	1	1
EQUIVALENT LENGTH	150	135	175	175	145	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	208	178	217	223	183	150	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	7	7	6	6	7	8.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	14	14	14	14	14	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: MILLWOOD 2
SITE NAME: MINNISALE HOMES CORP

LO # 80392
LOT 27

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	5 @ 10.6 cfm	53.0 cfm
Table 9.32.3.A.	TOTAL	180.2 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		9.32.3.6.
Total Ventilation Capacity	180.2	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	100.7	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
ENS	FV-05-11VK1	50
BATH	FV-05-11VK1	50
ENS-2	FV-05-11VK1	50
W/R	FV-05-11VK1	50

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:	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

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

LO#: 80392

Model: MILLWOOD 2

Builder: GREENPARK HOMES

Date: 19/10/2018

Volume Calculation

House Volume			
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

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.325
SUMMER NATURAL AIR CHANGE RATE	0.106

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

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

0.325 x 278.18 x 41 °C x 1.2 = 4468 W

= 15244 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

0.106 x 278.18 x 6 °C x 1.2 = 215 W

= 734 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

80 CFM x 74 °F x 1.08 x 0.25 = 1593 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

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)

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

Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{clevel})
1	0.5	15,244	8,075	0.944
2	0.3		11,442	0.400
3	0.2		12,153	0.251
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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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: MILLWOOD 2	LOT 27	BUILDER: GREENPARK HOMES
SFQT: 2654	LO# 80392	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:	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:	129.0 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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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	-

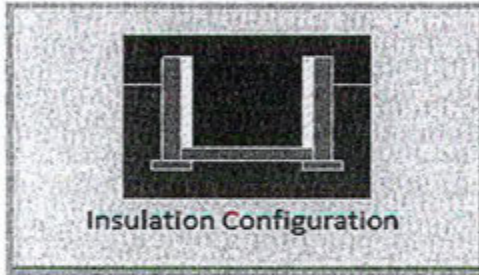
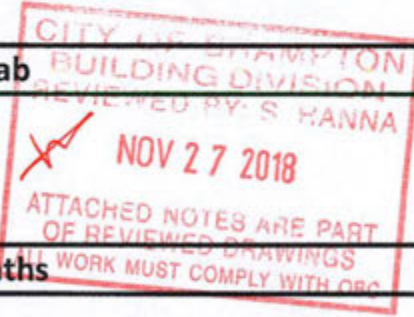
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



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):	39.3	
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):	1266 ✓	

TYPE: MILLWOOD 2
LO# 80392

LOT 27

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):	6.71			
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. 3.57	1335.0 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):		0.325 ✓		
Cooling Air Leakage Rate (ACH/H):		0.106		

TYPE: MILLWOOD 2

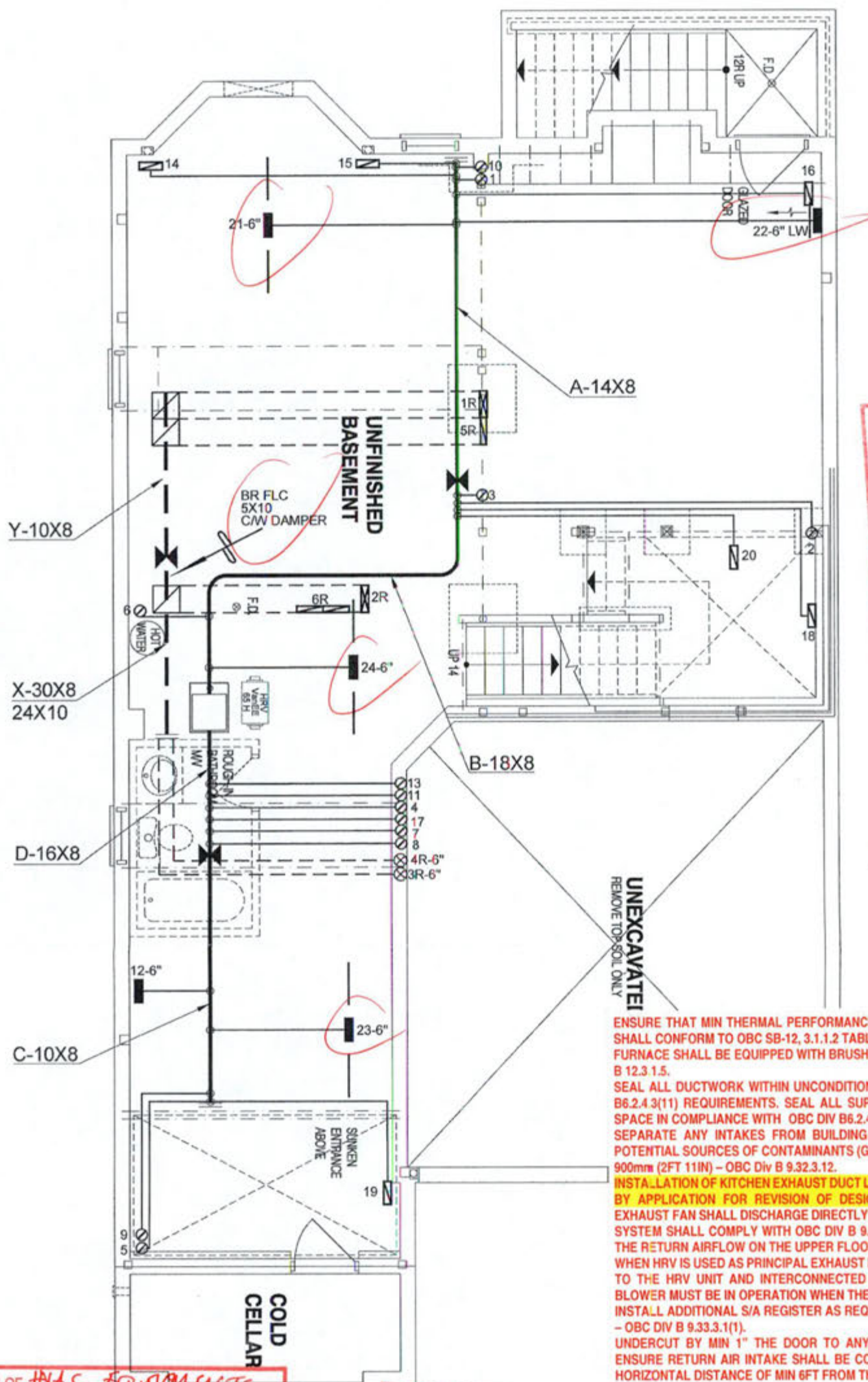
LOT 27

LO# 80392

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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.

UNEXCAVATE!
REMOVE TOP SOIL ONLY

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

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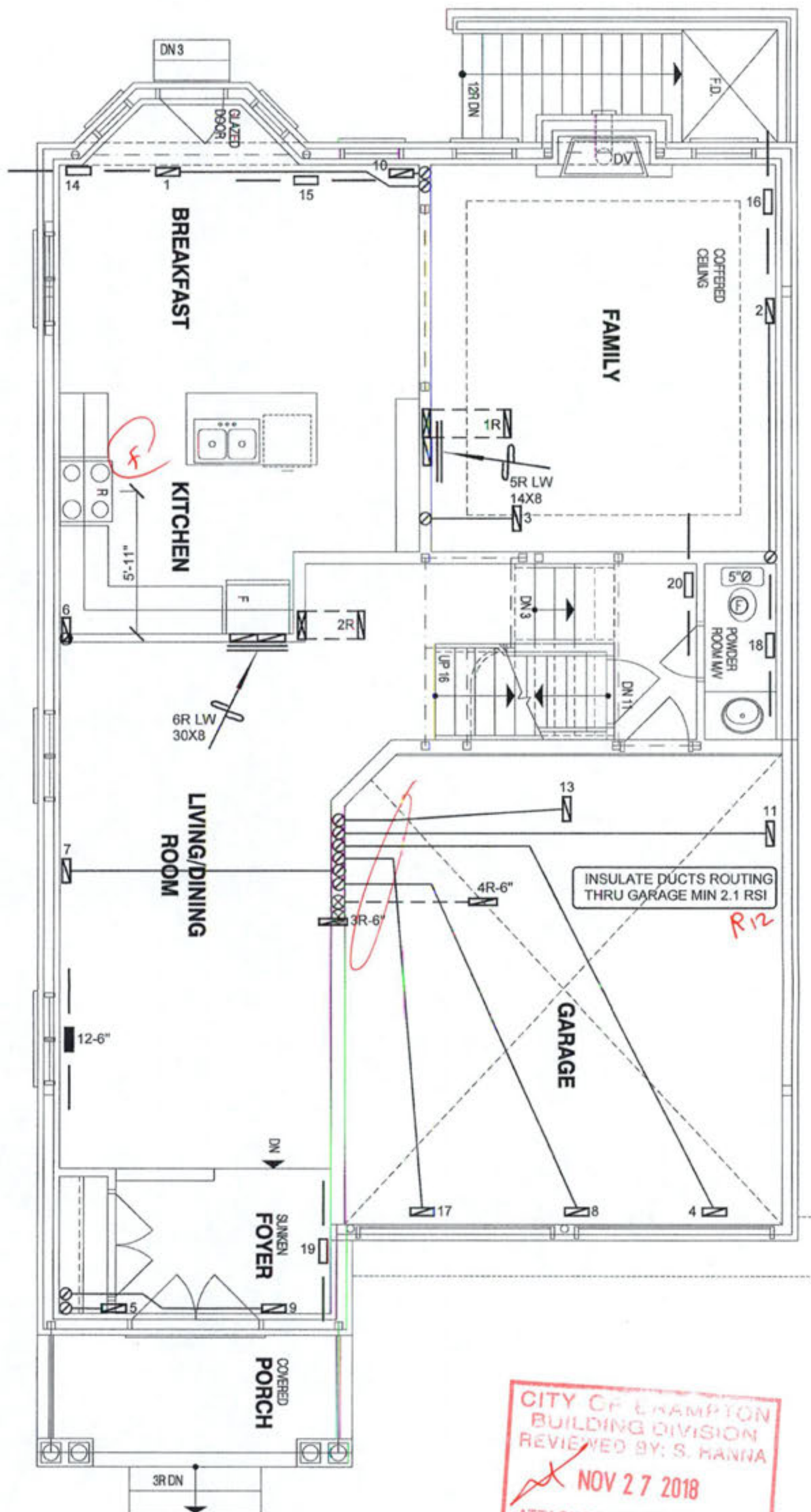
LOT 27
CSA-F280-12
PACKAGE A1

I MICHAEL O'BROUKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.3.5 OF THE BUILDING CODE.
Michael O'Brooke
Michael O'Brooke, BSCM 1969
HVAC DESIGNS LTD.

HVAC LEGEND						REVISIONS		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Description	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"x6" RETURN AIR GRILLE	2.		
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA - FLOOR RETURN AIR GRILLE	1.		
					REDUCER			

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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 49003 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title				
GREENPARK HOMES		MAKE GOODMAN	MODEL GMEC960603BNA	INPUT 60 MBTUH	OUTPUT 57.6 MBTUH	COOLING 2.5 TONS	FAN SPEED 1131 cfm @ 0.6" w.c.	3RD FLOOR			BASEMENT HEATING LAYOUT	
Project Name MINNISALE HOMES CORP. BRAMPTON, ONTARIO								2ND FLOOR	13	4		3
								1ST FLOOR	7	2		2
								BASEMENT	4	1		0
LOT 27 MILLWOOD 2 2654 sqft								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				Date OCT/2018
												Scale 3/16" = 1'-0"
											BCIN# 19669	
											LO# 80392	



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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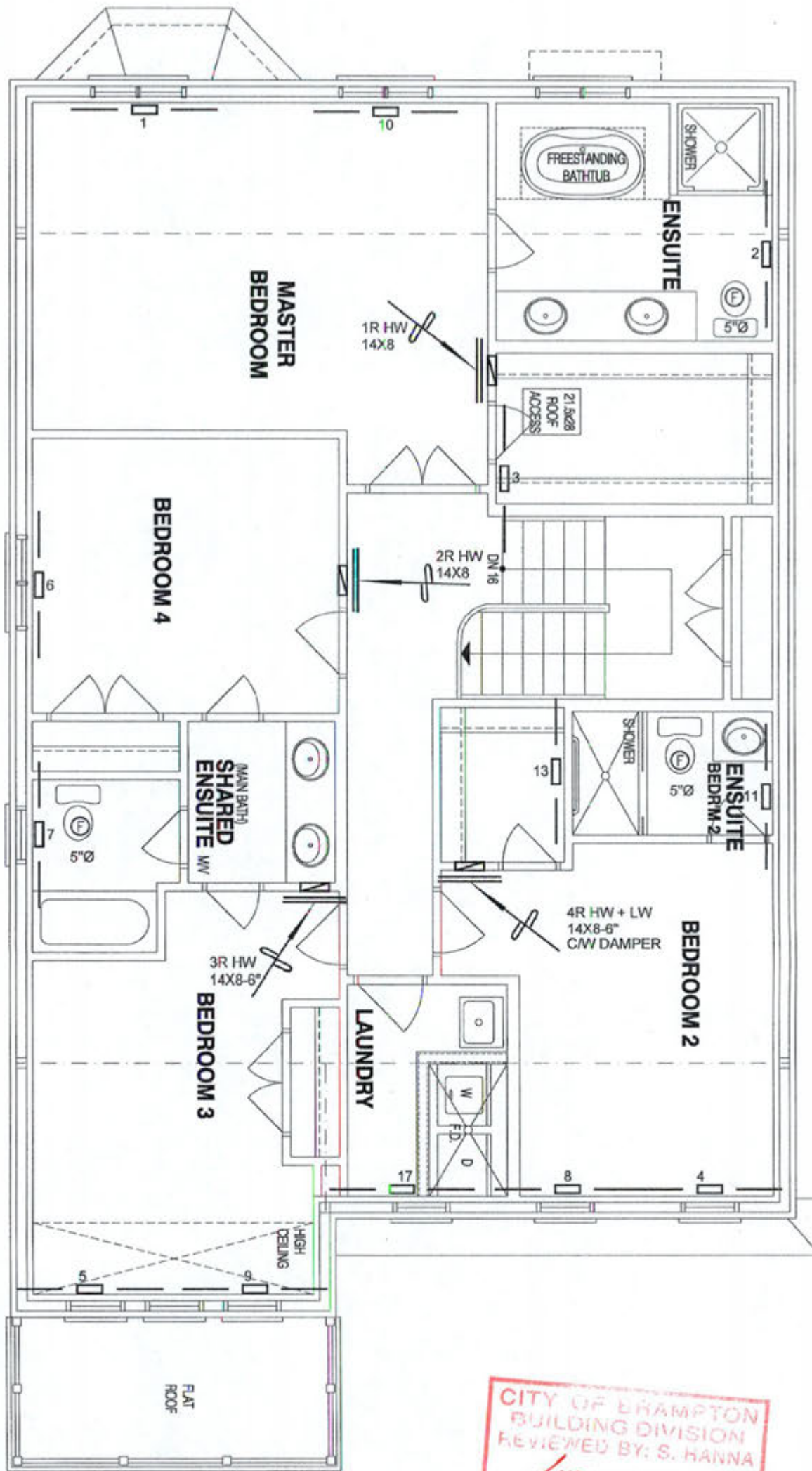
LOT 27
CSA-F280-12
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Michael O'Rourke, OCTM 19669
HVAC DESIGNS LTD.

HVAC LEGEND						REVISIONS		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Description	Date
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"X18" 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			

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Client GREENPARK HOMES		 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 27 MILLWOOD 2		Date OCT/2018	Scale 3/16" = 1'-0"
2654 sqft		BCIN# 19669		LO# 80392



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LOT 27
CSA-F280-12
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AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 3.2.3 OF THE
BUILDING CODE.
Michael O'Brooke
Michael O'Brooke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND								3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	FLOOR SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		37"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS	

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Project Name MINNISALE HOMES CORP. BRAMPTON, ONTARIO			Date OCT/2018	
LOT 27 MILLWOOD 2	2654 sqft		Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 80392	