

LOT 376

SITE NAME: MBRNASSALE HOMES CORP
BUILDER: GREENPARK HOMES

OPT BED 4
TYPE: HEMLOCK 3

GFA: 1928

DATE: Aug-18
LO# 79573

WINTER NATURAL AIR CHANGE RATE 0.367
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	MBR	ENS	BED-2	BED-3	BED-4	BATH
EXP. WALL	28	23	22	44	13	11
CLG. HT.	9	9	9	9	9	9
FACTORS						
GRS.WALL AREA	252	207	198	396	117	99
GLAZING	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 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
EAST	20.8 41.9 0 0 0 0 0 0 0	0 0 0 0 0 0 0	18 374 739 30 623 1231 0 0 0 0 0 0	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 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	26 540 634 16 332 390 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
WEST	20.8 41.9 18 374 739 14 291 575 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 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 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
DOORS	34.7 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 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
NET EXPOSED WALL	4.4 0.6 234 1020 151 193 841 125	180 784 116 366 1595 236 91 396 59 83 362 54	0 0 0 0 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 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 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
EXPOSED CLG	1.3 0.6 210 263 117 112 140 62	100 125 56 183 229 102 169 212 94 105 132 59	0 0 0 0 0 0 0	0 0 0 0 0 0 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 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 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 FLOOR	2.5 0.4 0 0 0 0 0 0 0	84 209 31 0 0 0 0 0 0 12 30 4	0 0 0 0 0 0 0	0 0 0 0 0 0 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 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	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	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
SUBTOTAL HT LOSS	1657	1272	1693	2576	1148	855
SUB TOTAL HT GAIN		1007	942	1627	787	507
LEVEL FACTOR / MULTIPLIER	0.20 0.29	0.20 0.29	0.20 0.29	0.20 0.29	0.20 0.29	0.20 0.29
AIR CHANGE HEAT LOSS	463	371	435	751	335	249
AIR CHANGE HEAT GAIN		65	61	106	51	33
DUCT LOSS	0	0	193	0	0	110
DUCT GAIN	0	0	177	0	0	54
HEAT GAIN PEOPLE	240	2	480	0	0	0
HEAT GAIN APPLIANCES/LIGHTS		524	0	0	0	0
TOTAL HT LOSS BTUH	2139	1643	2120	3327	1483	1215
TOTAL HT GAIN x 1.3 BTUH	2699	1055	2527	3246	2083	772

ROOM USE	LIV	KT/FM	WIR	FOY	WOD	BAS
EXP. WALL	60	51	11	12	36	132
CLG. HT.	10	10	10	10	9	9
FACTORS						
GRS.WALL AREA	600	510	110	120	324	1008
GLAZING	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 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
EAST	20.8 41.9 26 540 1067 0 0 0 0 0 0 0	50 1039 2052 0 0 0 0 0 0 0	0 0 0 0 0 0 0	3 62 123 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 21 436 512 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
WEST	20.8 41.9 0 0 0 0 0 0 0	46 956 1888 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	6 125 246 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 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
DOORS	34.7 3.7 0 0 0 0 0 0 0	20 493 73 20 493 73 0 0 0 0 0 0	0 0 0 0 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 0.6 553 2409 357 394 1717 254	190 392 58 97 423 63 20 493 73 20 493 73	0 0 0 0 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 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 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
EXPOSED CLG	1.3 0.6 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 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 0 0 0 0	55 148 66 0 0 0 0 0 0	0 0 0 0 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 FLOOR	2.5 0.4 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 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 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	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	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
SUBTOTAL HT LOSS	3386	4352	885	978	862	5756
SUB TOTAL HT GAIN		1937	131	259	356	362
LEVEL FACTOR / MULTIPLIER	0.30 0.41	0.30 0.41	0.30 0.41	0.30 0.41	0.50 0.99	0.50 0.99
AIR CHANGE HEAT LOSS	1388	1784	363	401	6558	47
AIR CHANGE HEAT GAIN		126	9	17	0	0
DUCT LOSS	0	0	0	0	0	0
DUCT GAIN	0	0	0	0	0	0
HEAT GAIN PEOPLE	240	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS		524	0	0	0	524
TOTAL HT LOSS BTUH	4774	6135	1248	1379	862	12314
TOTAL HT GAIN x 1.3 BTUH	3362	5681	182	358	462	1212

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

TOTAL HEAT GAIN BTUH: 24874

TONS: 2.07

LOSS DUE TO VENTILATION LOAD BTUH: 1593

STRUCTURAL HEAT LOSS: 38640

TOTAL COMBINED HEAT LOSS BTUH: 40232

Michael O'Rourke

SITE NAME: MINNISSALE HOMES CORP
 BUILDER: GREENPARK HOMES

 TYPE: HEMLOCK 3
 OPT BED 4

DATE: Aug-18

GFA: 1928 LO# 79573

 HEATING CFM 1131 COOLING CFM 1131
 TOTAL HEAT LOSS 38,640 TOTAL HEAT GAIN 24,638
 AIR FLOW RATE CFM 29.27 AIR FLOW RATE CFM 45.9

 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 @ 5" E.S.P.

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	9	7	4
R/A	0	0	3	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 diff 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	10	12	13	14	15	16	17	18	19	21	22	23	24
ROOM NAME	MBR	ENS	BED-2	BED-3	BED-2	BATH	BED-3	MBR	LIV	LIV	KT/FM	KT/FM	KT/FM	BED-4	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH	1.07	1.64	1.06	1.66	1.06	1.22	1.66	1.07	2.39	2.39	2.05	2.05	2.05	1.48	1.25	1.38	3.29	3.29	3.29	3.29
CFM PER RUN HEAT	31	48	31	49	31	36	49	31	70	70	60	60	60	43	37	40	96	96	96	96
RM GAIN MBH	1.35	1.05	1.26	1.62	1.26	0.77	1.62	1.35	1.68	1.68	2.23	2.23	2.23	2.08	0.18	0.36	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	62	48	58	74	58	35	74	62	77	77	102	102	102	96	8	16	19	19	19	19
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	30	47	36	63	39	24	56	35	38	50	38	31	22	50	25	48	26	15	45	28
EQUIVALENT LENGTH	120	190	150	180	150	140	180	160	90	150	140	170	110	130	140	160	150	110	150	150
TOTAL EFFECTIVE LENGTH	150	237	186	243	189	164	236	195	128	200	178	201	132	180	165	208	176	125	195	178
ADJUSTED PRESSURE	0.11	0.07	0.09	0.07	0.09	0.1	0.07	0.09	0.13	0.09	0.09	0.08	0.12	0.09	0.1	0.08	0.09	0.13	0.08	0.09
ROUND DUCT SIZE	5	5	5	5	5	4	5	5	5	5	6	6	6	6	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	228	352	228	360	228	413	360	228	514	514	306	306	306	219	424	459	489	489	489	489
COOLING VELOCITY (ft/min)	455	352	426	543	426	402	543	455	565	565	520	520	520	489	92	184	97	97	97	97
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	B	D	A	D	D	A	D	B	A	C	C	D	B	B	A	C	D	A	B

RUN #	1	2	4	5	6	7	8	10	12	13	14	15	16	17	18	19	21	22	23	24
ROOM NAME	MBR	ENS	BED-2	BED-3	BED-2	BATH	BED-3	MBR	LIV	LIV	KT/FM	KT/FM	KT/FM	BED-4	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH	1.07	1.64	1.06	1.66	1.06	1.22	1.66	1.07	2.39	2.39	2.05	2.05	2.05	1.48	1.25	1.38	3.29	3.29	3.29	3.29
CFM PER RUN HEAT	31	48	31	49	31	36	49	31	70	70	60	60	60	43	37	40	96	96	96	96
RM GAIN MBH	1.35	1.05	1.26	1.62	1.26	0.77	1.62	1.35	1.68	1.68	2.23	2.23	2.23	2.08	0.18	0.36	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	62	48	58	74	58	35	74	62	77	77	102	102	102	96	8	16	19	19	19	19
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	30	47	36	63	39	24	56	35	38	50	38	31	22	50	25	48	26	15	45	28
EQUIVALENT LENGTH	120	190	150	180	150	140	180	160	90	150	140	170	110	130	140	160	150	110	150	150
TOTAL EFFECTIVE LENGTH	150	237	186	243	189	164	236	195	128	200	178	201	132	180	165	208	176	125	195	178
ADJUSTED PRESSURE	0.11	0.07	0.09	0.07	0.09	0.1	0.07	0.09	0.13	0.09	0.09	0.08	0.12	0.09	0.1	0.08	0.09	0.13	0.08	0.09
ROUND DUCT SIZE	5	5	5	5	5	4	5	5	5	5	6	6	6	6	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	228	352	228	360	228	413	360	228	514	514	306	306	306	219	424	459	489	489	489	489
COOLING VELOCITY (ft/min)	455	352	426	543	426	402	543	455	565	565	520	520	520	489	92	184	97	97	97	97
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	B	D	A	D	D	A	D	B	A	C	C	D	B	B	A	C	D	A	B

 CITY OF BRAMPTON
 BUILDING DIVISION
 REVIEWED BY: S. HANNA

JAN 22 2019

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SUPPLY AIR TRUNK SIZE

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	304	0.07	9.3	10	547
TRUNK B	598	0.07	12	16	673
TRUNK C	216	0.08	7.9	8	486
TRUNK D	1130	0.07	15.2	26	782
TRUNK E	0	0.00	0	0	0
TRUNK F	0	0.00	0	0	0

RETURN AIR TRUNK SIZE

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK G	0	0.00	0	0	0
TRUNK H	0	0.00	0	0	0
TRUNK I	0	0.00	0	0	0
TRUNK J	0	0.00	0	0	0
TRUNK K	0	0.00	0	0	0
TRUNK L	0	0.00	0	0	0
TRUNK O	0	0.05	0	0	8
TRUNK P	0	0.05	0	0	8
TRUNK Q	0	0.05	0	0	8
TRUNK R	0	0.05	0	0	8
TRUNK S	0	0.05	0	0	8
TRUNK T	0	0.05	0	0	8
TRUNK U	0	0.05	0	0	8
TRUNK V	0	0.05	0	0	8
TRUNK W	0	0.05	0	0	8
TRUNK X	1131	0.05	16.5	30	679
TRUNK Y	0	0.05	0	0	8
TRUNK Z	0	0.05	0	0	8
DROP	1131	0.05	16.5	24	679

RETURN AIR

RUN #	1	2	3	4	5	6	7	8	10	12	13	14	15	16	17	18	19	21	22	23	24
AIR VOLUME	115	125	125	345	240	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
ACTUAL DUCT LGH	46	51	70	12	42	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	260	215	175	145	255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LENGTH	306	266	245	157	297	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.06	0.06	0.09	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
ROUND DUCT SIZE	7	6.9	6.9	9.1	9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: HEMLOCK 3
SITE NAME: MINNISALE HOMES CORP

LO # 79573
OPT BED 4

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY
COMBUSTION APPLIANCES 9.32.3.1(1)
a) ☐ Direct vent (sealed combustion) only
b) ☐ Positive venting induced draft (except fireplaces)
c) ☐ Natural draft, B-vent or induced draft gas fireplace
d) ☐ Solid Fuel (including fireplaces)
e) ☐ No Combustion Appliances

HEATING SYSTEM
☒ Forced Air ☐ Non Forced Air
☐ Electric Space Heat

HOUSE TYPE 9.32.1(2)
☐ I Type a) or b) appliance only, no solid fuel
☐ II Type I except with solid fuel (including fireplaces)
☐ III Any Type c) appliance
☐ IV Type I, or II with electric space heat
☐ Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.
☐ 1 Exhaust only/Forced Air System
☐ 2 HRV with Ducting/Forced Air System
☒ 3 HRV Simplified/connected to forced air system
☐ 4 HRV with Ducting/non forced air system
☐ Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	4	@ 10.6 cfm	42.4	cfm
Other Rooms	3	@ 10.6 cfm	31.8	cfm
Table 9.32.3.A.		TOTAL	148.4	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	148.4	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	68.9	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	74 F	1.08	0.25

SUPPLEMENTAL FANS PANASONIC

Location	Model	cfm	HVI	Sones
ENS	FV-05-11VK1	50	✓	0.3
BATH	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 #: Fax #:

INSTALLING CONTRACTOR
Name:
Address:
City:
Telephone #: Fax #:
CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. HANNA
JAN 22 2019
ATTACHED NOTES ARE PART OF THE REVIEWED DRAWINGS
IN ACCORDANCE WITH OBC
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: August-18

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.8 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#: 79573

Model: HEMLOCK 3

Builder: GREENPARK HOMES

Date: 8/3/2018

Volume Calculation
House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	969	9	8721
First	959	10	9590
Second	959	9	8631
Third	0	9	0
Fourth	0	9	0
Total:			26,942.0 ft ³
Total:			762.9 m ³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.367
SUMMER NATURAL AIR CHANGE RATE	0.115

Design Temperature Difference				
	T _{in} °C	T _{out} °C	ΔT °C	ΔT °F
Winter DTD _h	22	-19	41	74
Summer DTD _c	24	30	6	11

5.2.3.1 Heat Loss due to Air Leakage

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

0.367 x 211.92 x 41 °C x 1.2 = 3844 W

= 13116 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.115 x 211.92 x 6 °C x 1.2 = 179 W

= 609 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 CFM x 74 °F x 1.08 x 0.25 = 1593 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

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)

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

Level	Level Factor (LF)	HL _{airbv} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})
1	0.5	13,116	6,618	0.991
2	0.3		9,601	0.410
3	0.2		9,001	0.291
4	0		0	0.000
5	0		0	0.000

*HL_{airbv} = Air leakage heat loss + ventilation heat loss

*For a balanced or supply only ventilation system HL_{airve} = 0

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: HEMLOCK 3	OPT BED 4	BUILDER: GREENPARK HOMES
SFQT: 1928	LO# 79573	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:	ATTACHED	# 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):	26942.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 50.0 ft	WIDTH: 26.0 ft	EXPOSED PERIMETER:	132.0 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
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**Compliance Package
 A1**

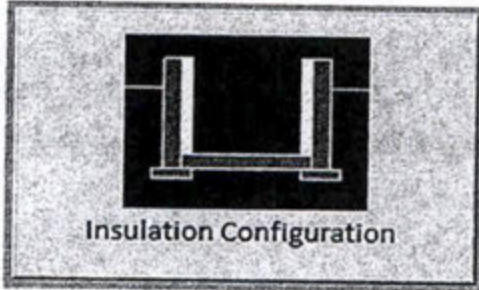
Nominal	Min. Eff.
60	59.22
31	27.65
31	29.80
22	17.03
20 ci	21.12
-	-
10	10
10	11.13
0.28	-
0.49	-
0.96	-
75%	-
0.8	-

INDIVIDUAL BCIN: 19669
 MICHAEL O'ROURKE

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):	15.2	 Insulation Configuration
Floor Width (m):	7.9	
Exposed Perimeter (m):	40.2	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.3	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	1308 ✓	

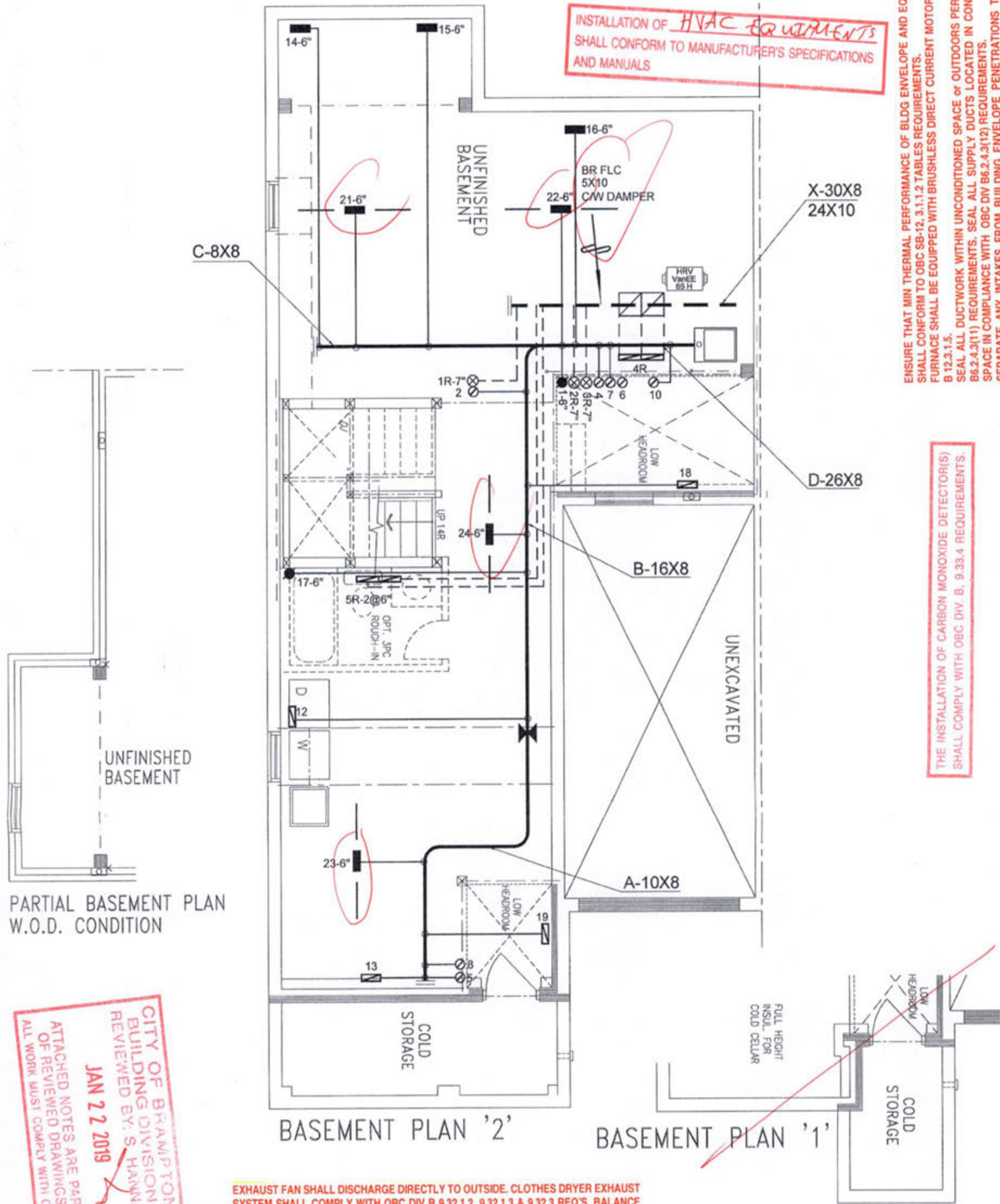
TYPE: HEMLOCK 3
LO# 79573

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:	Semi			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	762.9			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH) ✓			
Custom BDT Data:	ELA @ 10 Pa. 3.57	1017.0 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):	0.367 ✓			
Cooling Air Leakage Rate (ACH/H):	0.115			

TYPE: HEMLOCK 3
LO# 79573



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

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.

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

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

CITY OF BRAMPTON
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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 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 (HRAIDIGEST).

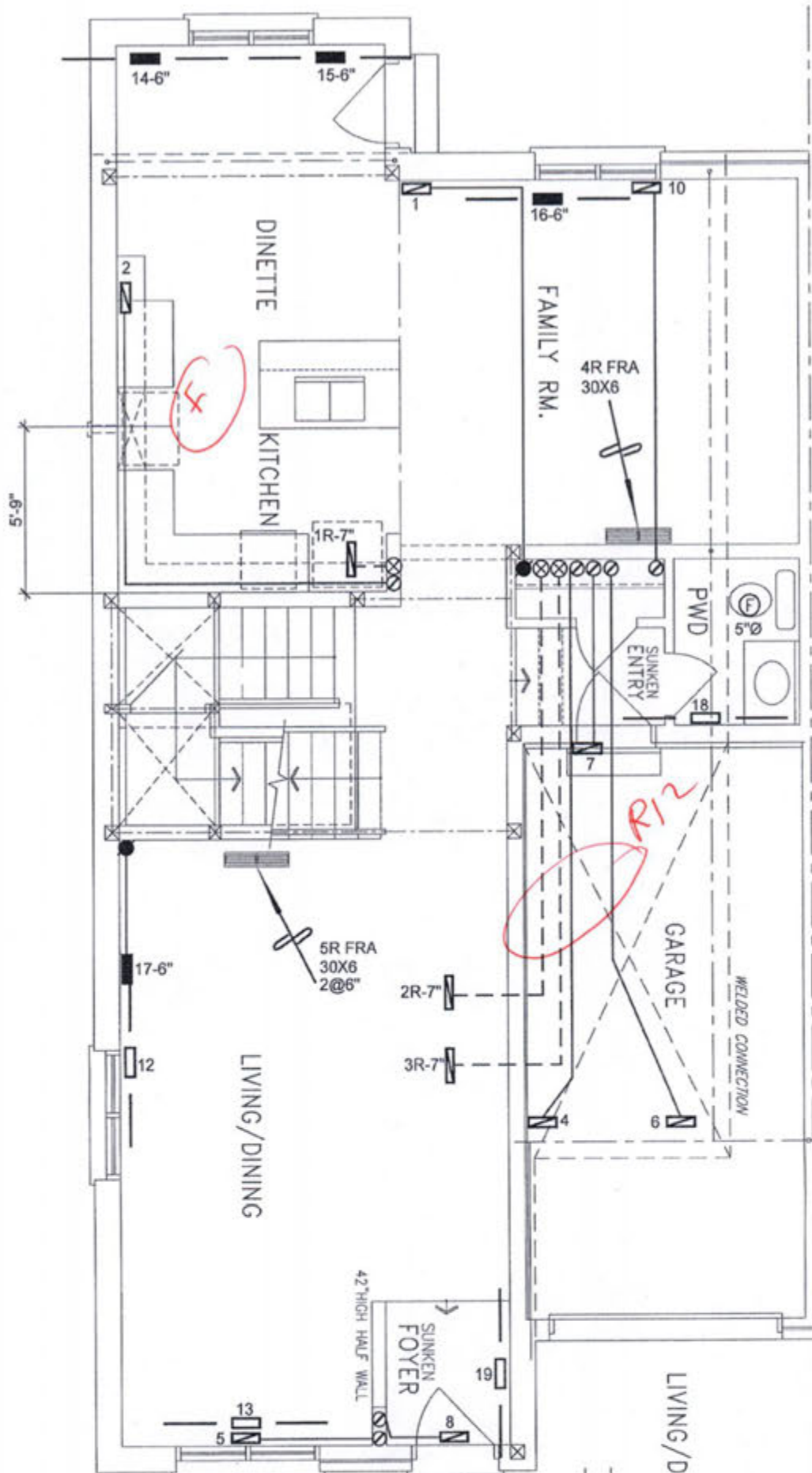
CSA-F280-12
PACKAGE A1

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

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.		
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"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		

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	HEAT LOSS 40232 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title BASEMENT HEATING LAYOUT	
Project Name MINNISALE HOMES CORP BRAMPTON, ONTARIO LOT 374 OPT 4 BED HEMLOCK 3 1928 sqft			MAKE GOODMAN	MODEL GMEC90603BNA-60	3RD FLOOR				Date AUG/2018
		INPUT 60 MBTUH	OUTPUT 57.6 MBTUH	2ND FLOOR	9	3	2	Scale 3/16" = 1'-0"	
		COOLING 2.0 TONS	FAN SPEED 1131 cfm @ 0.5" w.c.	1ST FLOOR	7	2	2	BCIN# 19669	
				BASEMENT	4	1	0	LO# 79573	
		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.							



GROUND FLOOR PLAN '2'

~~GROUND FLOOR PLAN '1'~~

CITY OF BRAMPTON
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JAN 22 2019

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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

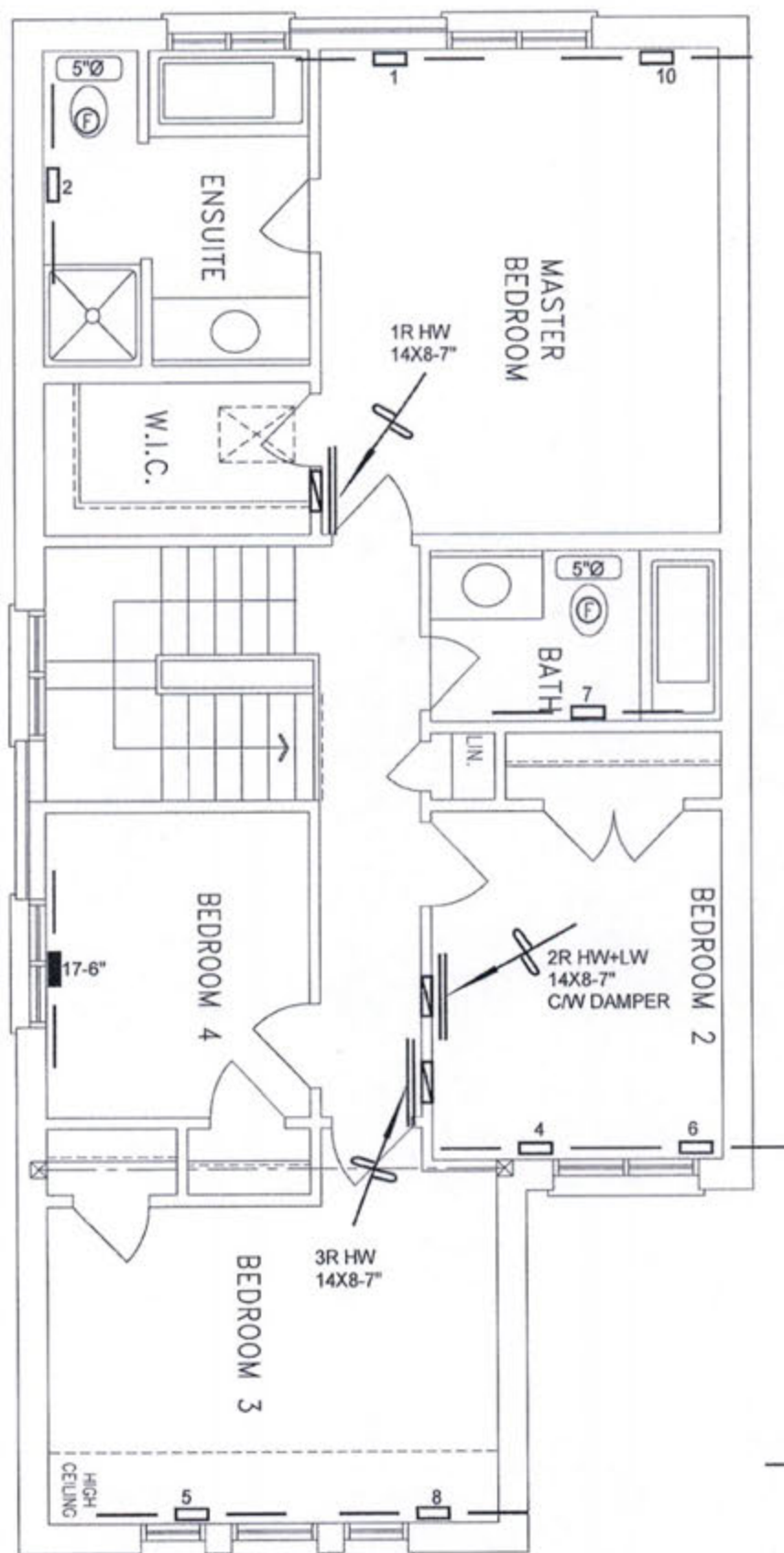
I MICHAEL O'ROURKE HAVE REVIEWED
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 5.2.3 OF THE
BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12
PACKAGE A1

HVAC LEGEND								3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"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 LOT 374 OPT 4 BED HEMLOCK 3 1928 sqft			Date AUG/2018 Scale 3/16" = 1'-0" BCIN# 19669 LO# 79573	



OPTIONAL SECOND FLOOR PLAN '2'
(4 BEDROOM)

OPTIONAL SECOND FLOOR PLAN '1'
(4 BEDROOM)

CITY OF BRAMPTON
BUILDING DIVISION
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I MICHAEL O'BROCKE HAVE REVIEWED
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C.3.2.1 OF THE
BUILDING CODE.
Michael O'Brocke
MICHAEL O'BROCKE, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12
PACKAGE A1

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	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 Lot 374 OPT 4 BED HEMLOCK 3 1928 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#	79573