

BUILDER: GREENPARK HOMES

TYPE: HEMLOCK 4

GFA: 1960

DATE: Aug-18

LOS 79574

WINTER NATURAL AIR CHANGE RATE 0.367

SUMMER NATURAL AIR CHANGE RATE 0.115

HEAT LOSS ΔT °F. 74 ✓HEAT GAIN ΔT °F. 11

CSA-F280-12

SB-12 PACKAGE A1

ROOM USE			MBR		ENS		WIC		BED-2		BED-3		BED-4		BATH		SUMMER NATURAL AIR CHANGE RATE 0.115		HEAT GAIN ΔT °F. 11		SB-12 PACKAGE 1		
EXP. WALL			29		20		5		29		32		16		8								
CLG. HT.			9		9		9		9		9		9		9								
FACTORS																							
GRS.WALL AREA			261		180		45		261		288		144		72								
GLAZING			LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN								
NORTH			20.8	15.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EAST			20.8	41.0	0	0	0	0	0	0	18	374	739	21	436	862	10	208	410	0	0	0	
SOUTH			20.8	24.4	0	0	0	0	0	0	0	0	0	10	208	244	7	145	171	0	0	0	
WEST			20.8	41.0	18	374	739	14	291	575	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	
DOORS			24.7	3.7	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	243	1069	157	166	723	107	45	196	29	243	1069	157	267	1163	172	124	540	80	65
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	
EXPOSED CLG			1.3	0.6	208	261	116	100	125	66	50	63	28	220	276	123	124	155	89	110	138	61	104
NO ATTIC EXPOSED CLG			2.7	1.2	0	0	0	0	0	0	0	0	0	48	129	57	0	0	0	0	0	0	
EXPOSED FLOOR			2.5	0.4	0	0	0	0	0	0	136	339	50	0	0	0	0	0	0	0	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					1693			1139		259			2047			1884			1094			569	
SUB TOTAL HT GAIN					1012			738		57			1069			1161			796			271	
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					487			328		74			589			542			314			161	
AIR CHANGE HEAT GAIN					66			48		4			70			76			52			18	
DUCT LOSS					0			0		264			0			0			0			0	
DUCT GAIN					0			0		179			0			0			0			0	
HEAT GAIN PEOPLE			240	2	480	0	0	0	0	1	240	1	240	1	240	1	240	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS					411			0		0			411			411			411			0	
TOTAL HT LOSS BTU/H					2180			1467		333			2899			2425			1408			720	
TOTAL HT GAIN x 1.3 BTU/H					2560			1022		79			2560			2455			1949			375	

ATTACHED NOTES ARE PART
OF REVIEWED DRAWINGS
ALL WORK MUST COMPLY WITH U.S.
MAR 05 2019
CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI

ROOM USE	LIV		DIN		KT/PM		LAUN		WIR		FOY		MUD		WOOD		BAS	
EXP. WALL	39		21		47		7		5		11		8		26		102	
CLG. HT.	10		10		10		9		10		11		11		9		9	
FACTORS																		
GRS.WALL AREA	LOSS	GAIN	371		200		447		63		121		88		234		768	
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
EAST	20.8	41.0	34	706	1396	0	0	0	0	0	3	62	123	0	0	0	0	0
SOUTH	20.8	24.4	0	0	0	23	478	661	0	0	0	0	0	0	0	0	0	0
WEST	20.8	41.0	0	0	0	0	0	81	1683	3325	10	208	244	0	0	0	8	166
SKYLT.	36.4	100.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	195
DOORS	24.7	3.7	0	0	0	0	0	18	444	66	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.4	0.5	337	1466	217	177	769	114	348	1514	224	20	493	73	20	493	73	20
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
EXPOSED CLG	1.3	0.6	0	0	0	0	0	48	60	27	88	383	57	68	296	44	124	436
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	91	114	51	20	25	11	0	0
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS																		
SLAB ON GRADE HEAT LOSS																		
SUBTOTAL HT LOSS			2173		1247		3701		536		243		1147		789		0	3368
SUB TOTAL HT GAIN				1613		675		3642		305		43		497		117		4555
LEVEL FACTOR / MULTIPLIER	0.30	0.43			0.30	0.43		0.30	0.43		0.30	0.43		0.30	0.43		0.50	1.15
AIR CHANGE HEAT LOSS			928		533		1681		154		104		490		337			6621
AIR CHANGE HEAT GAIN				106		44		239		20		3		33		8		64
DUCT LOSS			0		0		0		0		0		0		0			0
DUCT GAIN			0		0		0		0		0		0		0			0
HEAT GAIN PEOPLE	240		0		0		0		0		0		0		0			0
HEAT GAIN APPLIANCES/LIGHTS			411		411		411		411		0		0		411			0
TOTAL HT LOSS BTU/H			3101		1780		5282		690		347		1636		1126		1178	11175
TOTAL HT GAIN x 1.3 BTU/H			2769		1470		5580		958		60		689		697		819	534

TOTAL HEAT GAIN BTU/H:

24812

TONS: 2.07

LOSS DUE TO VENTILATION LOAD BTUH: 1593 ✓

STRUCTURAL HEAT LOSS: 37747

TOTAL COMBINED HEAT LOSS BTU/H: 39340

SITE NAME: MINNISSALE HOMES CORP
BUILDER: GREENPARK HOMES

TYPE: HEMLOCK 4

DATE: Aug-18

GFA: 1960 LO# 79574

HEATING CFM 1131 COOLING CFM 1131
TOTAL HEAT LOSS 37,747 TOTAL HEAT GAIN 24,576
AIR FLOW RATE CFM 29.96 AIR FLOW RATE CFM 46.02

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

plenum pressure s/a 0.18
max s/a diff press. loss 0.03
min adjusted pressure s/a 0.15

r/a pressure 0.17
r/a grille press. loss 0.02
adjusted pressure r/a 0.15

#GOODMAN
GMEC960603BNA 60
FAN SPEED LOW
MEDLOW
MEDIUM
MEDIUM HIGH
HIGH 1131

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

DESIGN CFM = 1131
CFM @ 5" E.S.P.

TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	10	9	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-2	MBR	MUD	LIV	DIN	LIV	KT/FM	KT/FM	LAUN	W/R	FOY	KT/FM	BAS	BAS	BAS	BAS
RM LOSS MBH	1.09	1.47	0.33	1.45	2.43	1.41	0.72	1.45	1.09	1.13	1.55	1.78	1.55	1.76	1.76	0.69	0.35	1.64	1.76	3.09	3.09	3.09	3.09
CFM PER RUN HEAT	33	44	10	43	73	42	22	43	33	34	46	53	46	53	53	21	10	49	53	93	93	93	93
RM GAIN MBH	1.28	1.02	0.08	1.28	2.46	1.95	0.38	1.28	1.28	0.70	1.38	1.47	1.38	1.86	1.86	0.96	0.06	0.69	1.86	0.34	0.34	0.34	0.34
CFM PER RUN COOLING	59	47	4	59	113	90	17	59	59	32	64	68	64	86	86	44	3	32	86	16	16	16	16
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.15	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	46	57	52	27	35	32	29	5	53	38	29	10	30	34	42	20	38	19	37	25	42	11	24
EQUIVALENT LENGTH	120	130	120	150	160	170	180	160	150	150	180	170	190	140	140	190	120	180	150	150	130	170	170
TOTAL EFFECTIVE LENGTH	166	187	172	177	195	202	209	165	203	188	209	180	220	174	182	210	158	199	187	175	192	141	194
ADJUSTED PRESSURE	0.1	0.09	0.1	0.1	0.08	0.08	0.08	0.1	0.08	0.09	0.08	0.1	0.08	0.09	0.09	0.08	0.11	0.09	0.09	0.09	0.08	0.11	0.08
ROUND DUCT SIZE	5	4	4	5	6	6	4	5	5	4	5	5	5	6	6	4	4	4	6	6	6	6	6
HEATING VELOCITY (ft/min)	242	505	115	316	372	214	252	316	242	390	338	389	338	270	270	241	115	562	270	474	474	474	474
COOLING VELOCITY (ft/min)	433	539	46	433	576	459	195	433	433	367	470	499	470	438	438	505	34	367	438	82	82	82	82
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	E	D	D	E	E	A	B	D	E	D	A	B	E	B	D	B	A	B	E	D

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
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SUPPLY AIR TRUNK SIZE

TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY
CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK A	212	0.08	7.8	8	X	8	477		
TRUNK B	297	0.08	8.9	10	X	8	535		
TRUNK C	509	0.08	10.9	14	X	8	654		
TRUNK D	349	0.08	9.5	12	X	8	524		
TRUNK E	624	0.08	11.8	16	X	8	702		
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
AIR VOLUME	135	95	95	155	375	95	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	45	37	49	23	21	46	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	140	175	135	235	225	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	185	212	184	258	246	221	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.08	0.07	0.08	0.06	0.06	0.07	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	6.6	6	5.8	7.5	10.4	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	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			(ft/min)
TRUNK O	0	0.06	0	0	X	8	0
TRUNK P	0	0.06	0	0	X	8	0
TRUNK Q	0	0.06	0	0	X	8	0
TRUNK R	0	0.06	0	0	X	8	0
TRUNK S	0	0.06	0	0	X	8	0
TRUNK T	0	0.06	0	0	X	8	0
TRUNK U	0	0.06	0	0	X	8	0
TRUNK V	0	0.06	0	0	X	8	0
TRUNK W	0	0.06	0	0	X	8	0
TRUNK X	1131	0.06	15.8	30	X	8	679
TRUNK Y	285	0.06	9.4	10	X	8	513
TRUNK Z	0	0.06	0	0	X	8	0
DROP	1131	0.06	15.8	24	X	10	679

TYPE: HEMLOCK 4
SITE NAME: MINNISALE HOMES CORP

LO # 79574

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	5	@ 10.6 cfm	53.0	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	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 @ 32 deg F (0 deg C) ☒ HVI Approved

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

BUILDER: GREENPARK HOMES
Name:
Address:
City:
Telephone #: Fax #:
CITY OF BRAMPTON BUILDING DIVISION REVIEWED BY: S. DESH MAR 05 2019
INSTALLING CONTRACTOR
Name:
Address:
City:
Telephone #: Fax #:
ATTACHED NOTES ARE PART OF REVIEWED DRAWINGS ALL WORK MUST COMPLY WITH O.C.
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

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

LO#: 79574

Model: HEMLOCK 4

Builder: GREENPARK HOMES

Date: 8/7/2018

Volume Calculation
Air Change & Delta T Data
House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	956	9	8604
First	956	10	9560
Second	1004	9	9036
Third	0	9	0
Fourth	0	9	0
Total:			27,200.0 ft ³
Total:			770.2 m ³

WINTER NATURAL AIR CHANGE RATE	0.367
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

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

0.367 x 213.95 x 41 °C x 1.2 = 3881 W

= 13241 Btu/h

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

= 0.115 x 213.95 x 6 °C x 1.2 = 180 W

= 615 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)

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

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	13,241	5,733	1.155
2	0.3		9,299	0.427
3	0.2		9,211	0.288
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

ATTACHED NOTES ARE PART
 OF REVIEWED DRAWINGS.
 ALL WORK MUST COMPLY WITH THE
 CITY OF BRAMPTON
 BUILDING DIVISION
 REVIEWED BY: DESAI
 MAR 05 2019

HEAT LOSS AND GAIN SUMMARY SHEET**MODEL:** HEMLOCK 4
SFQT: 1960**LO#** 79574**BUILDER:** GREENPARK HOMES
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):	27200.0	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:	102.0 ft

CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI
MAR 05 2019
ALL WORK MUST COMPLY WITH O.C.

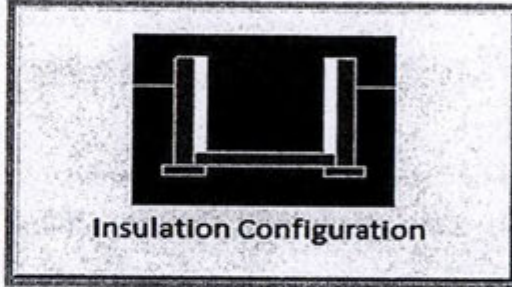
2012 OBC - COMPLIANCE PACKAGE**Component****Compliance Package
A1****Nominal Min. Eff.**

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	0.28	-
Skylights Maximum U-Value	0.49	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE*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):	31.1	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.9	
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):		988

TYPE: HEMLOCK 4
LO# 79574

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):	770.2		
Air Leakage/Ventilation			
Air Tightness Type:	Present (1961-) (3.57 ACH)		
Custom BDT Data:	ELA @ 10 Pa.	1026.7 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
Diameter (mm):	0	0	0
	#4	0	
Natural Infiltration Rates			
Heating Air Leakage Rate (ACH/H):	0.367		
Cooling Air Leakage Rate (ACH/H):	0.115		

CITY OF BRAMPTON
BUILDING DIVISION
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ATTACHED NOTES ARE PART
OF REVIEWED DRAWINGS
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TYPE: HEMLOCK 4
LO# 79574

CITY OF BRAMPTON
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MAR 05 2019

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A-8X8

X-30X8
24X10

Y-10X8

UNFINISHED
BASEMENT

PARTIAL BASEMENT PLAN
W.O.D. CONDITION

I MICHAEL O'ROURKE HAVE REVIEW
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 3.2.5 OF THE
BUILDING CODE.

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

GREENPARK HOMES

Project Name
MINNISALE HOMES CORP.
BRAMPTON, ONTARIO

HEMLOCK 4

1960 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 39340 BTUH
UNIT DATA

MAKE
GOODMAN

MODEL
GMEC960603BNA-60

INPUT
60 MBTUH

OUTPUT
57.6 MBTUH

COOLING
2.0 TONS

FAN SPEED
1131 cfm @ 0.5" w.g.

OF RUNS S/A R/A FANS

3RD FLOOR

2ND FLOOR

1ST FLOOR

BASEMENT

ALL S/A DIFFUSERS 4 "x10"
UNLESS NOTED OTHERWISE
ON LAYOUT. ALL S/A RUNS 5"Ø
UNLESS NOTED OTHERWISE
ON LAYOUT. UNDERCUT
DOORS 1" min. FOR R/A

Sheet Title

BASEMENT
HEATING
LAYOUT

Date

AUG/2018

Scale

3/16" = 1'-0"

BCIN# 19669

LO#

79574

UNFINISHED
BASEMENT
A HEAT RECOVERY VENTILATOR SHALL BE INSTALLED IN
COMPLIANCE WITH OBC DIV. B, 6.2.1.6, 9.32.3.6(3), 9.32.3.11
AND HRAI DIGEST REQUIREMENTS.

BR FLC
5X10
C/W DAMPER

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

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

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).

BASEMENT PLAN
ELEV. '1' & '2'

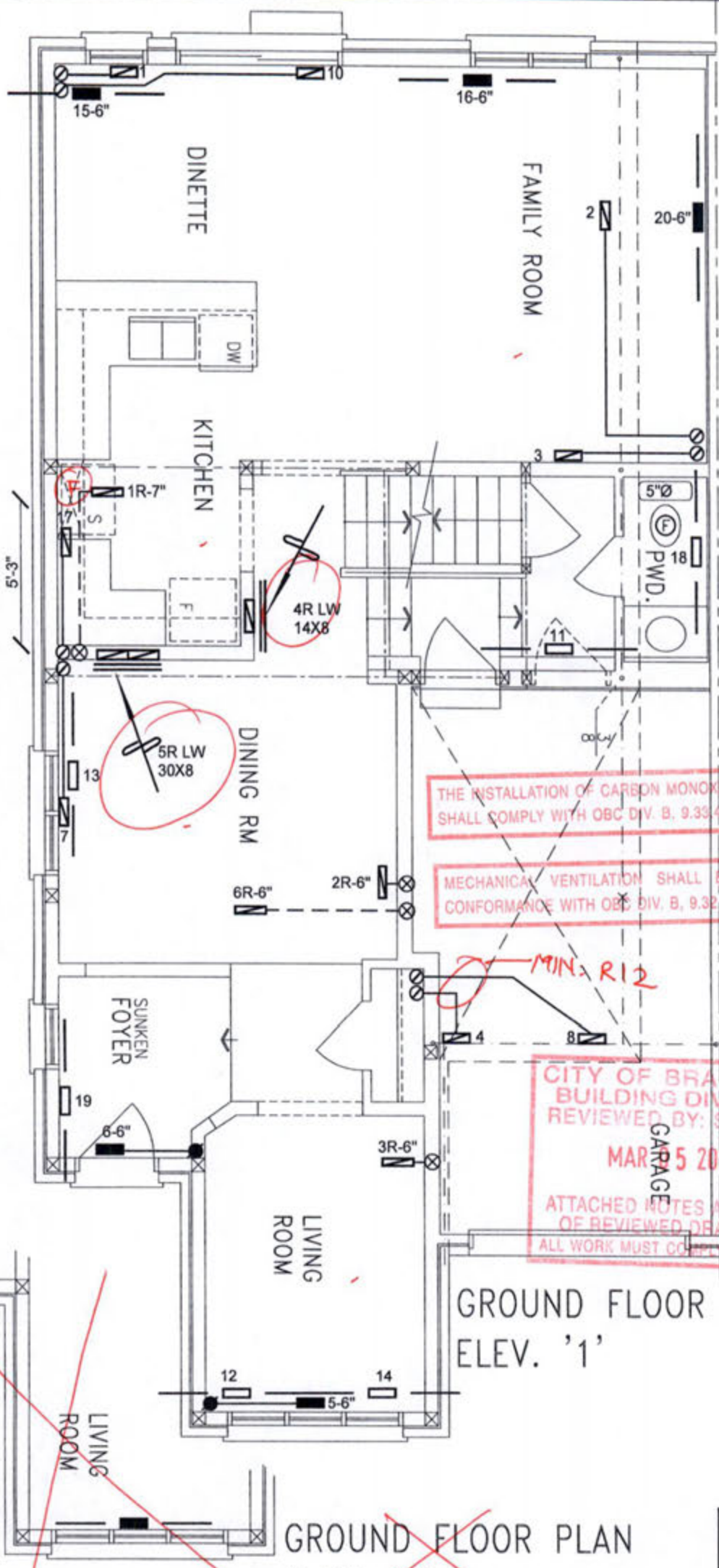
CSA-F280-12
PACKAGE A1

HVAC LEGEND							
	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		HVAC DESIGNS LTD.		HEAT LOSS 39340 BTUH UNIT DATA		# OF RUNS S/A R/A FANS		Sheet Title	
GREENPARK HOMES		375 Finley Ave. Suite 202 - Ajax, Ontario		MAKE GOODMAN		3RD FLOOR		BASEMENT HEATING LAYOUT	
Project Name MINNISALE HOMES CORP. BRAMPTON, ONTARIO		L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375		MODEL GMEC960603BNA-60		2ND FLOOR		Date	
		Email: info@hvacdesigns.ca		INPUT 60 MBTUH		1ST FLOOR		Scale	
		Web: www.hvacdesigns.ca		OUTPUT 57.6 MBTUH		BASEMENT		3/16" = 1'-0"	
		Specializing in Residential Mechanical Design Services		COOLING 2.0 TONS				BCIN# 19669	
				FAN SPEED 1131 cfm @ 0.5" w.g.				LO# 79574	

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.



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
BUILDING DIVISION
REVIEWED BY: S. DESAI
MAR 5 2019
GARAGE
ATTACHED NOTES ARE PART
OF REVIEWED DRAWINGS
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GROUND FLOOR PLAN
ELEV. '1'

GROUND FLOOR PLAN
ELEV. '2'

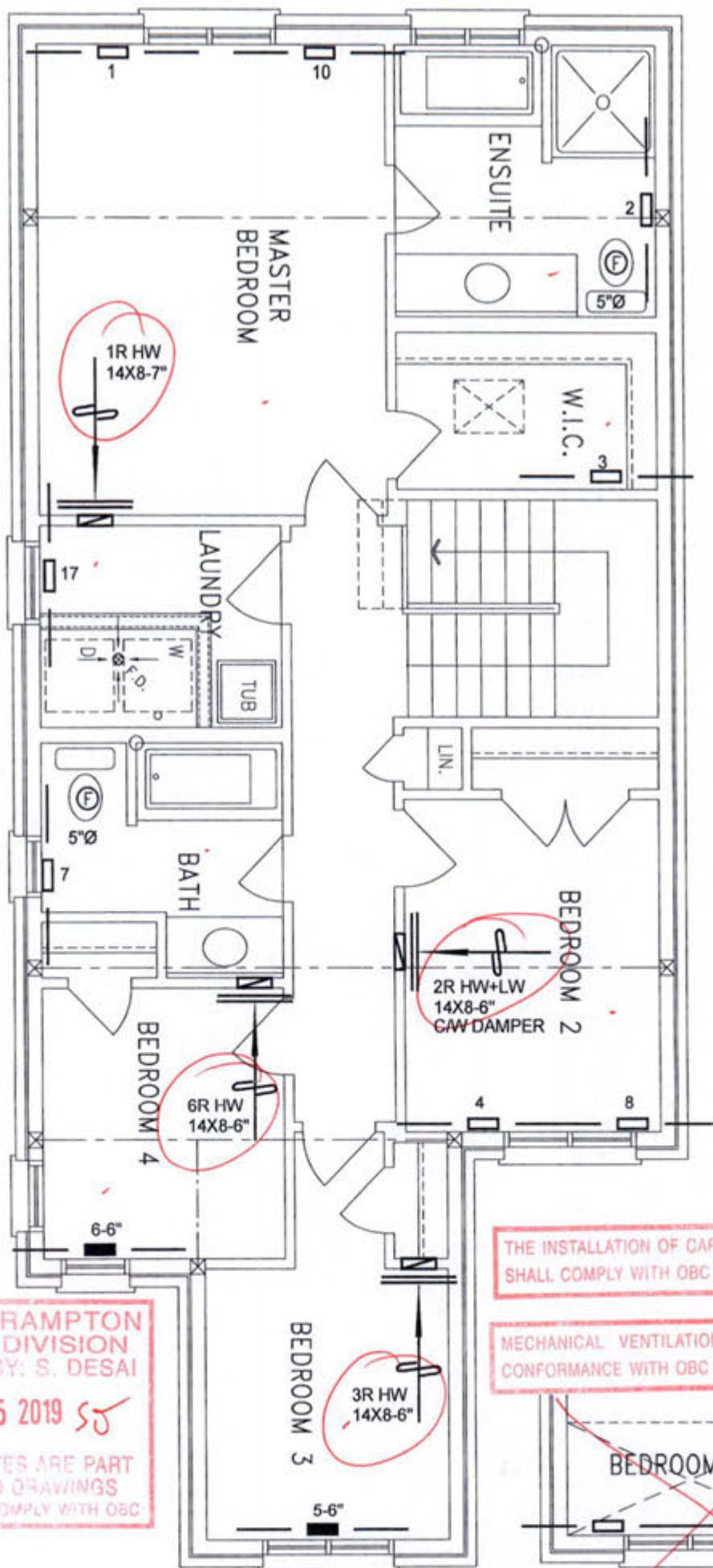
I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12
PACKAGE A1

HVAC LEGEND							
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	FLOOR SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

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Client GREENPARK HOMES		HVAC DESIGNS LTD. 375 Finlay Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacadesigns.ca Web: www.hvacadesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name MINNISALE HOMES CORP. BRAMPTON, ONTARIO			Date AUG/2018	Scale 3/16" = 1'-0"
HEMLOCK 4 1960 sqft		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# 79574	



**CITY OF BRAMPTON
BUILDING DIVISION
REVIEWED BY: S. DESAI**

MAR 05 2019 *SD*

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OF REVIEWED DRAWINGS
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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.

**SECOND FLOOR PLAN
ELEV. '1'**

**SECOND FLOOR PLAN
ELEV. '2'**

**CSA-F280-12
PACKAGE A1**

I MICHAEL O'ROURKE HAVE REVIEW
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 3.2.5 OF THE
BUILDING CODE.

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

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

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 SECOND FLOOR HEATING LAYOUT	
Project Name MINNISALE HOMES CORP. BRAMPTON, ONTARIO			Date AUG/2018	
HEMLOCK 4 1960 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
		LO#	79574	