HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: STAR TIME LTD | OPT 2ND | DATE: Jan-17 | WINTER NATURAL AIR CHANGE RATE 0.330 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GREENPARK HOMES | TYPE: BRIDGEFORD 3 | GFA: 2215 | LO# 71733 | SUMMER NATURAL AIR CHANGE RATE 0.120 | HEAT GAIN ΔT °F. 16 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3						ENS-3						ENS-2					
EXP. WALL			38			26			5			33			43						11						6					
CLG. HT.			10			9			9			9			10						9						9					
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	380			234			45			297			430						99						54					
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN					LOSS	GAIN			
NORTH	21.3	16.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0				0	0	0			
EAST	21.3	42.4	36	766	1526	16	340	678	0	0	0	0	0	0	0	0	0				0	0	0				0	0	0			
SOUTH	21.3	25.7	0	0	0	11	234	283	0	0	0	18	383	463	0	0	0				0	0	0				11	234	283			
WEST	21.3	42.4	0	0	0	0	0	0	0	0	0	28	596	1187	25	532	1060				0	0	0				0	0	0			
SKYLT.	37.2	103.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0				0	0	0			
DOORS	25.2	5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0				0	0	0			
NET EXPOSED WALL	4.5	0.9	344	1535	319	207	924	192	45	201	42	251	1120	233	405	1807	376				99	442	92				43	192	40			
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	325	417	207	136	175	87	42	54	27	201	258	128	222	285	142				160	205	102				49	63	31			
NO ATTIC EXPOSED CLG	2.7	1.4	0	0	0	0	0	0	0	0	0	28	77	38	40	110	55				0	0	0				0	0	0			
EXPOSED FLOOR	2.6	0.5	0	0	0	0	0	0	0	0	0	168	428	89	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			2718			1673			255			2862			2734						647						489					
SUB TOTAL HT GAIN					2053			1240			69			2139			1632					194						354				
LEVEL FACTOR / MULTIPLIER			0.20	0.24		0.20	0.24		0.20	0.24		0.20	0.24		0.20	0.24					0.20	0.24					0.20	0.24				
AIR CHANGE HEAT LOSS				646			398			61			681			650						154						116				
AIR CHANGE HEAT GAIN					254			153			8			265			202					24						44				
DUCT LOSS				0			0			0			354			0						0						0				
DUCT GAIN					0			0			0			321			0					0						0				
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240				0		0				0		0			
HEAT GAIN APPLIANCES/LIGHTS					567			0			0			567			567					567						567				
TOTAL HT LOSS BTU/H				3365			2071			315			3897			3384						801						605				
TOTAL HT GAIN x 1.3 BTU/H					4359			1812			100			4590			3433					1020						1254				

ROOM USE			LV/DN						KT/FM						LAUN			W/R			FOY								WOD			BAS		
EXP. WALL			26						81						20			6			35								32			158		
CLG. HT.			10						10						11			10			10								9			9		
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	260						810						220			60			350								288			1044		
GLAZING				LOSS	GAIN					LOSS	GAIN					LOSS	GAIN		LOSS	GAIN		LOSS	GAIN						LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.8	0	0	0				0	0	0				0	0	0	0	0	0	0	0	0						5	106	84	10	213	168
EAST	21.3	42.4	0	0	0				26	553	1102				0	0	0	0	0	0	0	0	0						0	0	0	0	0	0
SOUTH	21.3	25.7	0	0	0				10	213	257				10	213	257	0	0	0	0	0	0						0	0	0	0	0	0
WEST	21.3	42.4	28	596	1187				0	0	0				0	0	0	0	0	0	3	64	127						0	0	0	0	0	0
SKYLT.	37.2	103.0	0	0	0				0	0	0				0	0	0	0	0	0	0	0	0						0	0	0	0	0	0
DOORS	25.2	5.2	0	0	0				0	0	0				20	505	105	0	0	0	20	505	105						0	0	0	20	505	105
NET EXPOSED WALL	4.5	0.9	232	1035	215				774	3454	718				190	848	176	60	268	56	327	1459	303						0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0				0	0	0				0	0	0	0	0	0	0	0	0						187	673	140	378	1360	283
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
NO ATTIC EXPOSED CLG	2.7	1.4	0	0	0				10	27	14				0	0	0	0	0	0	0	0	0						0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.5	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											5150		
SLAB ON GRADE HEAT LOSS			0						0						0			0			0								0					
SUBTOTAL HT LOSS			1631						4248						1566			268			2028								779			7228		
SUB TOTAL HT GAIN					1402						2091						539			56			536							224			556
LEVEL FACTOR / MULTIPLIER			0.30	0.42					0.30	0.42					0.30	0.42		0.30	0.42		0.30	0.42										0.50	0.84	
AIR CHANGE HEAT LOSS				680						1770						652			112			845											6765		
AIR CHANGE HEAT GAIN					173						259						67			7			66											96
DUCT LOSS				0						0						0			0			0											0		
DUCT GAIN					0						0						0			0			0											0
HEAT GAIN PEOPLE	240		1		240				1		240				0		0	0		0	0		0						0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					567						567						567			567			567							0				0
TOTAL HT LOSS BTU/H				2311						6018						2218			379			2873							779			13993		
TOTAL HT GAIN x 1.3 BTU/H					3097						4104						1524			818			1519								291			848

TOTAL HEAT GAIN BTU/H: 29362 TONS: 2.45 LOSS DUE TO VENTILATION LOAD BTU/H: 2852 STRUCTURAL HEAT LOSS: 43011 TOTAL COMBINED HEAT LOSS BTU/H: 45863

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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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SITE NAME: STAR TIME LTD
BUILDER: GREENPARK HOMES

OPT 2ND
TYPE: BRIDGEFORD 3

DATE: Jan-17

GFA: 2215 LO# 71733

HEATING CFM	1131	COOLING CFM	1131
TOTAL HEAT LOSS	43,011	TOTAL HEAT GAIN	28,769
AIR FLOW RATE CFM	26.3	AIR FLOW RATE CFM	39.31

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 dif 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

#AMANA
AMEC960603BNA 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 @ .6 " E.S.P.

TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	10	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.

RUN #	1	2	3	4	5	6	7	8	9	10	12	14	15	16	17	18	19	21	22	23	24
ROOM NAME	MBR	ENS	WIC	ENS-2	BED-2	BED-2	ENS-3	BED-3	BED-3	MBR	LV/DN	KT/FM	KT/FM	KT/FM	LAUN	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.68	2.07	0.32	0.61	1.95	1.95	0.80	1.69	1.69	1.68	2.31	2.01	2.01	2.01	2.22	0.38	2.87	3.69	3.69	3.69	3.69
CFM PER RUN HEAT	44	54	8	16	51	51	21	45	45	44	61	53	53	53	58	10	76	97	97	97	97
RM GAIN MBH.	2.18	1.81	0.10	1.25	2.30	2.30	1.02	1.72	1.72	2.18	3.10	1.37	1.37	1.37	1.52	0.82	1.52	0.28	0.28	0.28	0.28
CFM PER RUN COOLING	86	71	4	49	90	90	40	67	67	86	122	54	54	54	60	32	60	11	11	11	11
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.16	0.15	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	62	47	47	40	36	46	34	38	35	56	17	55	44	52	20	27	28	48	44	31	19
EQUIVALENT LENGTH	160	200	150	150	160	170	190	150	130	130	130	180	150	150	190	180	120	150	160	140	160
TOTAL EFFECTIVE LENGTH	222	247	197	190	196	216	224	188	165	186	147	235	194	202	210	207	148	198	204	171	179
ADJUSTED PRESSURE	0.07	0.07	0.09	0.09	0.08	0.08	0.08	0.09	0.1	0.09	0.1	0.07	0.09	0.09	0.08	0.08	0.12	0.08	0.08	0.09	0.09
ROUND DUCT SIZE	6	5	4	4	6	6	4	5	5	5	6	5	5	5	5	4	5	6	6	6	6
HEATING VELOCITY (ft/min)	224	396	92	184	260	260	241	330	330	323	311	389	389	389	426	115	558	495	495	495	495
COOLING VELOCITY (ft/min)	438	521	46	562	459	459	459	492	492	631	622	396	396	396	441	367	441	56	56	56	56
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	A	B	B	C	C	B	C	C	A	C	A	A	A	B	B	C	A	A	B	C

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	

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	495	0.07	11.1	14	x	8	636
TRUNK B	705	0.07	12.7	18	x	8	705
TRUNK C	426	0.08	10.2	12	x	8	639
TRUNK D	0	0.00	0	0	x	8	0
TRUNK E	0	0.00	0	0	x	8	0
TRUNK F	0	0.00	0	0	x	8	0
TRUNK G	0	0.00	0	0	x	8	0
TRUNK H	0	0.00	0	0	x	8	0
TRUNK I	0	0.00	0	0	x	8	0
TRUNK J	0	0.00	0	0	x	8	0
TRUNK K	0	0.00	0	0	x	8	0
TRUNK L	0	0.00	0	0	x	8	0

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	1131	0.05	16.5	32	x	8	636
TRUNK Y	545	0.05	12.6	18	x	8	545
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1131	0.05	16.5	24	x	10	679

RETURN AIR #	1	2	3	4	5	6										BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	120	120	120	310	160	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
ACTUAL DUCT LGH.	66	42	47	49	36	12	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	225	185	185	175	230	135	0	0	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	291	227	232	224	266	147	1	1	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.07	0.06	0.10	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	6.6	6.8	6.6	9.7	6.7	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	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	14

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[signature] INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: BRIDGEFORD 3 LO # 71733
SITE NAME: STAR TIME LTD OPT 2ND

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	2	@ 10.6 cfm	21.2	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	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
More than 5 - Part 6	**TOTAL**	**63.6**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	169.6	cfm
Less Principal Ventil. Capacity	139	cfm
Required Supplemental Capacity	30.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 60H-V+ Location: BSMT

139.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
139.0 CFM	X	76 F	X	1.08	X	0.25

SUPPLEMENTAL FANS

NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-3	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
W/R	QTXEN050C	50	✓	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 60H-V+

139 cfm high 50 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 #:

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: Michael O'Rourke.

HRAI # 001820

Date: January-17

I REVIEW AND TAKE RESPONIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

INDIVIDUAL BCIN: 19669 Michael O'Rourke. MICHAEL O'ROURKE

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL:	BRIDGEFORD 3		OPT 2ND	**BUILDER:**	GREENPARK HOMES
SFQT:	2215	**LO#**	71733	**SITE:**	STAR TIME LTD

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	72

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	WEST	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 (ft^3):	30165.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.75	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 55.0 ft	WIDTH: 24.0 ft	EXPOSED PERIMETER:	158.0 ft

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	29.8
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	11.13
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
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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 71733 Model: BRIDGEFORD 3 Builder: GREENPARK HOMES OPT 2ND Date: 1/12/2017

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	1023	9	9207
First	1023	10	10230
Second	1192	9	10728
Third	0	9	0
Fourth	0	9	0
		Total:	30,165.0 ft^3
		Total:	854.2 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.330
SUMMER NATURAL AIR CHANGE RATE	0.120

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	22	31	9	16

5.2.3.1 Heat Loss due to Air Leakage

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

0.330 x 237.27 x 42 °C x 1.2 = 3965 W

= 13530 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.120 x 237.27 x 9 °C x 1.2 = 301 W

= 1026 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

139 CFM x 76 °F x 1.08 x 0.25 = 2852 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

139 CFM x 16 °F x 1.08 x 0.25 = 593 Btu/h

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

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

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	13,530	8,008	0.845
2	0.3		9,740	0.417
3	0.2		11,379	0.238
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

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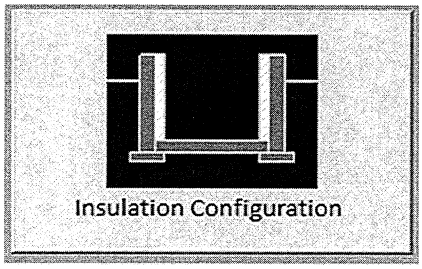
Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Site Description	
Soil Conductivity:	Normal conductivity: dry dand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**16.8**	 Insulation Configuration
Floor Width (m):	**7.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.8**	
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):	**1509**	

TYPE: BRIDGEFORD 3 OPT 2ND
LO# 71733

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Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
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):	854.2	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1138.6 cm^2
	3.57	ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust
	65.6	65.6
Flue Size		
Flue #:	#1 #2 #3 #4	
Diameter (mm):	0 0 0 0	
Natural Infiltration Rates		
Heating Air Leakage Rate (ACH/H):	**0.330**	
Cooling Air Leakage Rate (ACH/H):	**0.120**	

TYPE: BRIDGEFORD 3 OPT 2ND

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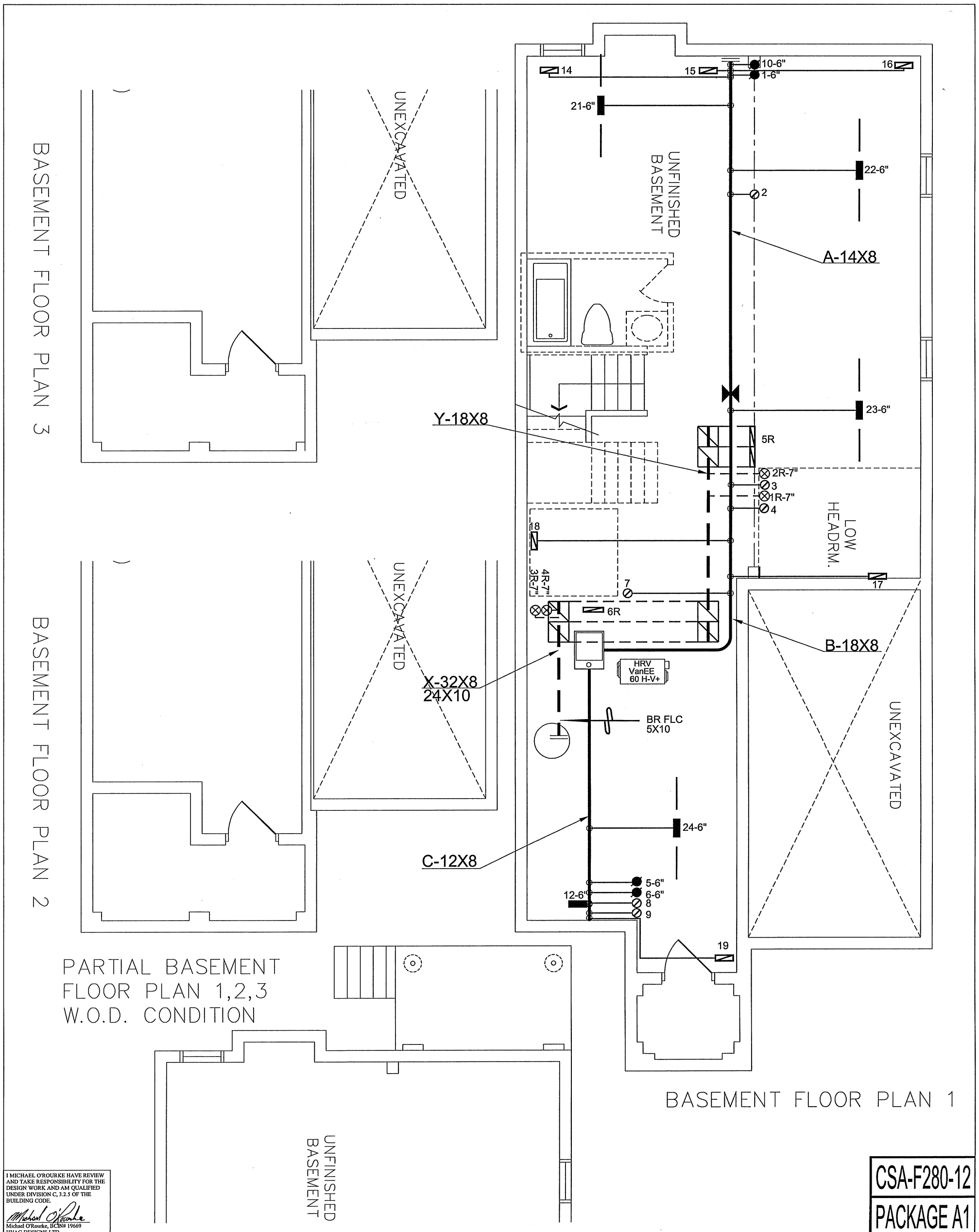

I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke, 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"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

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
GREENPARK HOMES

Project Name
STARTIME HOME LTD
VAUGHAN, ONTARIO

OPT 2ND
BRIDGEFORD 3 2215 sqft

HVAC DESIGNS LTD.
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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.

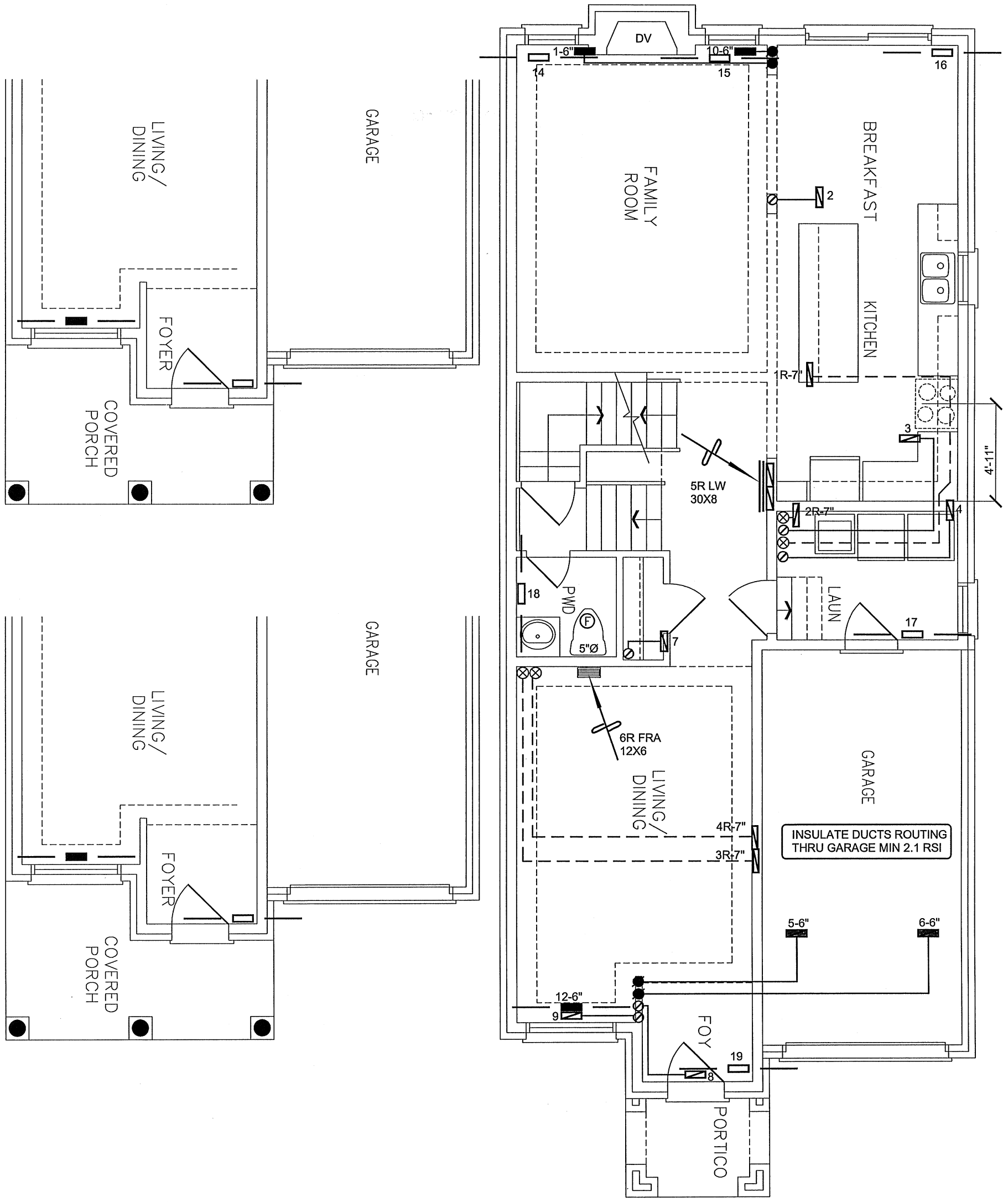
HEAT LOSS 45863 BTU/H		
UNIT DATA		
MAKE	AMANA	
MODEL	AMEC960603BNA-60	
INPUT	60	MBTU/H
OUTPUT	57.6	MBTU/H
COOLING	2.5	TONS
FAN SPEED	1131	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	10	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"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

Date JAN/2017
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 71733



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▱	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▤	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

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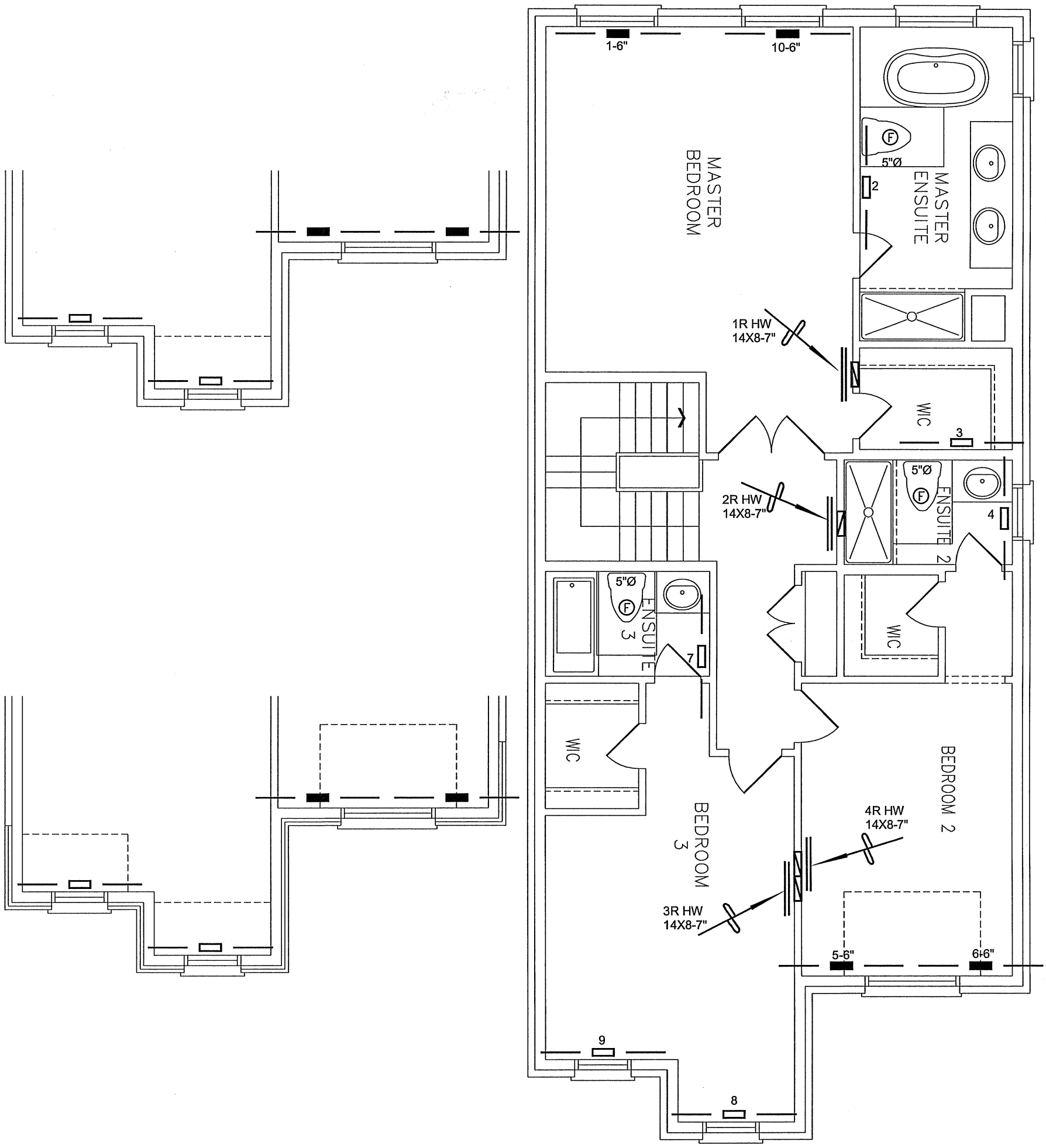
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date JAN/2017
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 71733

SECOND FLOOR PLAN 3

SECOND FLOOR PLAN 2



SECOND FLOOR PLAN 1
3 BEDROOM OPTION

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