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 HOME LTD | DATE: Jan-17 | WINTER NATURAL AIR CHANGE RATE 0.330 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GREENPARK HOMES | TYPE: BRIDGEFORD 1 | GFA: 2289 | LO# 71730 | 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			BED-4			BATH						ENS-2					
EXP. WALL			33			27			10			26			31			19			10						6					
CLG. HT.			10			9			9			10			10			9			9						9					
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	330			243			90			260			310			171			90						54					
GLAZING				LOSS	GAIN		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				0	0	0			
EAST	21.3	42.4	0	0	0	0	0	0	0	0	0	25	532	1060	27	575	1145	0	0	0	0	0	0				0	0	0			
SOUTH	21.3	25.7	0	0	0	12	255	309	0	0	0	0	0	0	0	0	0	36	766	927	6	128	154				0	0	0			
WEST	21.3	42.4	36	766	1526	18	383	763	0	0	0	0	0	0	0	0	0	0	0	0	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				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				0	0	0			
NET EXPOSED WALL	4.5	0.9	294	1312	273	213	951	198	90	402	83	235	1049	218	283	1263	263	135	602	125	84	375	78				54	241	50			
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				0	0	0			
EXPOSED CLG	1.3	0.6	272	349	174	162	208	103	100	128	64	115	148	73	72	92	46	117	150	75	130	167	83				60	77	38			
NO ATTIC EXPOSED CLG	2.7	1.4	0	0	0	0	0	0	0	0	0	45	124	62	45	124	62	0	0	0	0	0	0				0	0	0			
EXPOSED FLOOR	2.6	0.5	0	0	0	0	0	0	0	0	0	160	408	85	0	0	0	0	0	0	22	56	12				10	26	5			
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0						0				
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0						0				
SUBTOTAL HT LOSS				2427			1797			530			2260			2054			1519			725						343				
SUB TOTAL HT GAIN					1972			1373			147			1498			1515			1127			327						94			
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					0.20	0.24				
AIR CHANGE HEAT LOSS				582			431			127			542			492			364			174						82				
AIR CHANGE HEAT GAIN					213			148			16			162			164			122			35						10			
DUCT LOSS				0			0			0			280			0			0			90						43				
DUCT GAIN					0			0			0			243			0			0			89						10			
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0				0		0			
HEAT GAIN APPLIANCES/LIGHTS					531			0			0			531			531			531			531						0			
TOTAL HT LOSS BTU/H				3009			2228			657			3082			2546			1883			989						468				
TOTAL HT GAIN x 1.3 BTU/H					4155			1978			212			3475			3184			2625			1277						148			

ROOM USE			LV/DN				KT/FM				LAUN			W/R			FOY						WOD			BAS		
EXP. WALL			34				73				22			4			32						24			160		
CLG. HT.			10				10				11			10			10						9			9		
	FACTORS																											
GRS.WALL AREA	LOSS	GAIN	340				730				242			40			320						216			1032		
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		0	0	0		0	0	0	0	0	0	6	128	254				0	0	0	0	0	0
SOUTH	21.3	25.7	26	553	669		0	0	0		0	0	0	8	170	206	0	0	0				0	0	0	0	0	0
WEST	21.3	42.4	0	0	0		86	1830	3646		0	0	0	0	0	0	0	0	0				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	40	1010	210				0	0	0	20	505	105
NET EXPOSED WALL	4.5	0.9	314	1401	291		644	2874	597		222	991	206	32	143	30	274	1223	254				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				139	500	104	408	1468	305
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		0	0	0		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								5223	
SLAB ON GRADE HEAT LOSS				0				0				0			0			0					0				
SUBTOTAL HT LOSS				1955				4704				1496			313			2360					607			7409		
SUB TOTAL HT GAIN					961				4243				311			236			719						188			578
LEVEL FACTOR / MULTIPLIER			0.30	0.39			0.30	0.39			0.30	0.39		0.30	0.39		0.30	0.39								0.50	0.87	
AIR CHANGE HEAT LOSS				756				1820				579			121			913									6984	
AIR CHANGE HEAT GAIN					104				458				34			25			78									83
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					531				531				531			0			0						0			0
TOTAL HT LOSS BTU/H				2711				6525				2075			434			3274					607			14393		
TOTAL HT GAIN x 1.3 BTU/H					2386				7114				1138			339			1035						244			860

TOTAL HEAT GAIN BTU/H: 30763 | TONS: 2.56 | LOSS DUE TO VENTILATION LOAD BTU/H: 2852 | STRUCTURAL HEAT LOSS: 44879 | TOTAL COMBINED HEAT LOSS BTU/H: 47731

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 HOME LTD
BUILDER: GREENPARK HOMES

TYPE: BRIDGEFORD 1 | DATE: Jan-17 | GFA: 2289 | LO# 71730

HEATING CFM	1131	COOLING CFM	1131
TOTAL HEAT LOSS	44,879	TOTAL HEAT GAIN	30,170
AIR FLOW RATE CFM	25.2	AIR FLOW RATE CFM	37.49

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	0.02
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

#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	11	8	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	11	12	13	14	15	16	17	18	19	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-3	BED-2	MBR	ENS-2	LV/DN	LV/DN	KT/FM	KT/FM	KT/FM	LAUN	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.50	2.23	0.66	1.54	1.27	1.88	0.99	1.27	1.54	1.50	0.47	1.36	1.36	2.17	2.17	2.17	2.07	0.43	3.27	3.75	3.75	3.75	3.75
CFM PER RUN HEAT	38	56	17	39	32	47	25	32	39	38	12	34	34	55	55	55	52	11	83	94	94	94	94
RM GAIN MBH.	2.08	1.98	0.21	1.74	1.59	2.62	1.28	1.59	1.74	2.08	0.15	1.19	1.19	2.37	2.37	2.37	1.14	0.34	1.04	0.28	0.28	0.28	0.28
CFM PER RUN COOLING	78	74	8	65	60	98	48	60	65	78	6	45	45	89	89	89	43	13	39	10	10	10	10
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.16	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	38	47	39	58	68	77	57	74	64	39	54	36	44	31	22	31	31	49	51	30	20	29	49
EQUIVALENT LENGTH	130	180	190	180	160	190	190	150	170	150	190	150	140	130	150	150	150	190	140	180	190	160	140
TOTAL EFFECTIVE LENGTH	168	227	229	238	228	267	247	224	234	189	244	186	184	161	172	181	181	239	191	210	210	189	189
ADJUSTED PRESSURE	0.1	0.08	0.08	0.07	0.08	0.06	0.07	0.08	0.07	0.09	0.07	0.09	0.09	0.1	0.09	0.09	0.1	0.07	0.08	0.08	0.08	0.09	0.09
ROUND DUCT SIZE	5	5	4	5	5	6	5	5	5	5	4	4	4	5	6	6	4	4	6	6	6	6	6
HEATING VELOCITY (ft/min)	279	411	195	286	235	240	184	235	286	279	138	390	390	404	280	280	597	126	423	479	479	479	479
COOLING VELOCITY (ft/min)	573	543	92	477	441	500	352	441	477	573	69	516	516	653	454	454	493	149	199	51	51	51	51
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10
TRUNK	A	A	C	B	B	B	B	B	B	A	C	C	C	A	A	A	C	B	B	A	C	C	B

RUN #	
ROOM NAME	
RM LOSS MBH.	
CFM PER RUN HEAT	
RM GAIN MBH.	
CFM PER RUN COOLING	
ADJUSTED PRESSURE	
ACTUAL DUCT LGH.	
EQUIVALENT LENGTH	
TOTAL EFFECTIVE LENGTH	
ADJUSTED PRESSURE	
ROUND DUCT SIZE	
HEATING VELOCITY (ft/min)	
COOLING VELOCITY (ft/min)	
OUTLET GRILL SIZE	
TRUNK	

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	391	0.08	9.9	12	x	8	587	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	402	0.06	10.7	14	x	8	517	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	739	0.06	13.5	22	x	8	605	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	1131	0.06	15.8	28	x	8	727	TRUNK J	0	0.00	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 F	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										BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	120	115	115	300	115	185	0	0	0	0	0	0	0	0	0	181
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.	48	80	74	38	78	13	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	185	220	220	225	225	135	0	0	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	233	300	294	263	303	148	1	1	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.06	0.05	0.05	0.06	0.05	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	6.8	7	7	9.6	7	7	0	0	0	0	0	0	0	0	0	7.2
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	30	14	14	0	0	0	0	0	0	0	0	0	14

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	765	0.05	14.3	24	x	8	574
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1131	0.05	16.5	24	x	10	679

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[signature] INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: BRIDGEFORD 1 LO # 71730
SITE NAME: STAR TIME HOME LTD

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	4	@ 10.6 cfm	42.4	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**	**79.5**	**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
BATH	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 1 **BUILDER:** GREENPARK HOMES
SFQT: 2289 **LO#** 71730 **SITE:** STAR TIME HOME 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:	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 (ft^3):	31141.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 56.0 ft	WIDTH: 24.0 ft	EXPOSED PERIMETER:	160.0 ft

2012 OBC - COMPLIANCE PACKAGE	**Compliance Package A1**	
Component	**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
MICHAEL O'ROURKE

Michael O'Rourke

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 71730 Model: BRIDGEFORD 1 Builder: GREENPARK HOMES Date: 1/12/2017

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1054	9	9486
First	1054	10	10540
Second	1235	9	11115
Third	0	9	0
Fourth	0	9	0
		Total:	31,141.0 ft³
		Total:	881.8 m³

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 244.95 x 42 °C x 1.2 = 4094 W

= 13968 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 244.95 x 9 °C x 1.2 = 310 W

= 1059 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	13,968	8,015	0.871
2	0.3		10,828	0.387
3	0.2		11,655	0.240
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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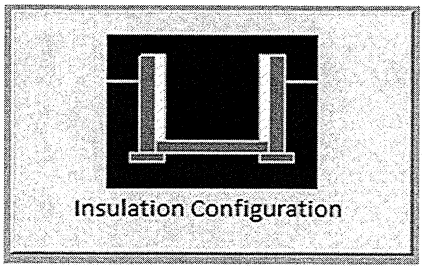
Residential Foundation Thermal Load Calculator

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):	**17.1**	 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):	**1530**	

TYPE: BRIDGEFORD 1
LO# 71730

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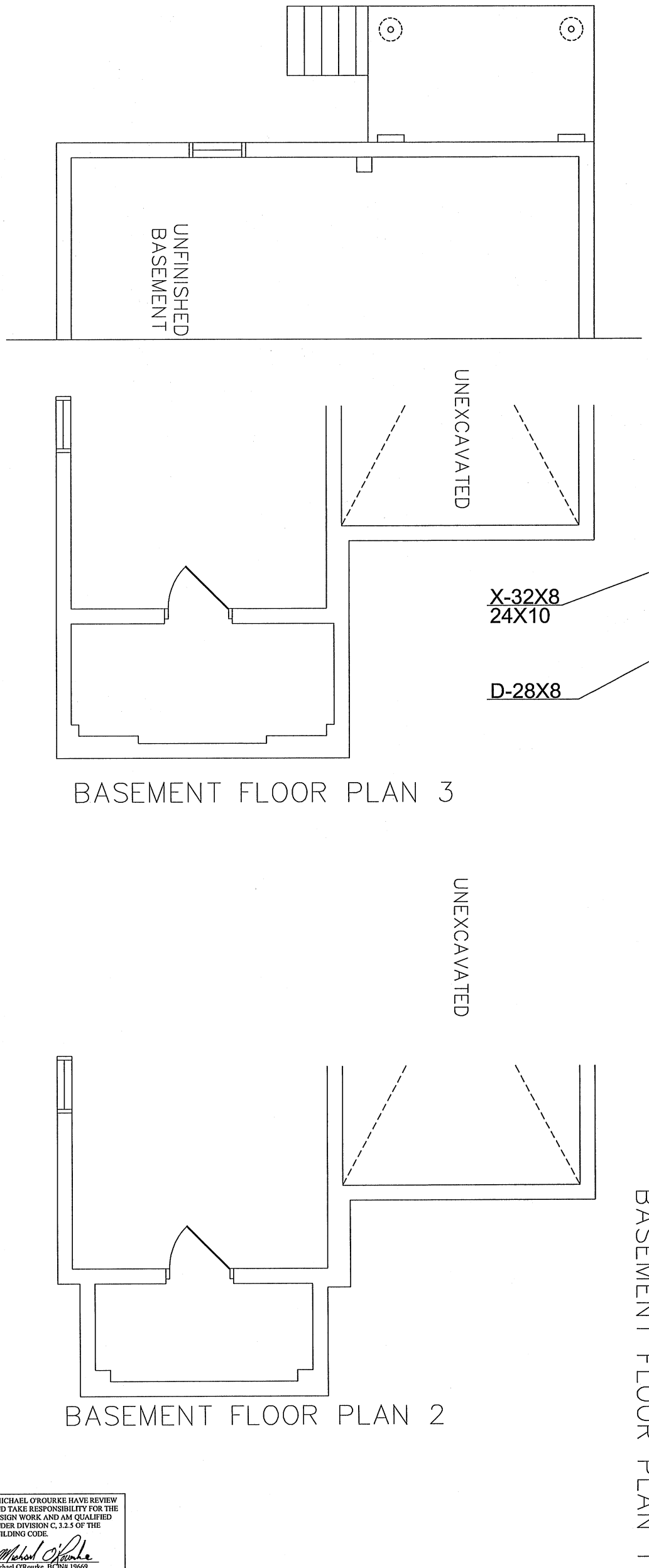
Air Infiltration Residential Load Calculator

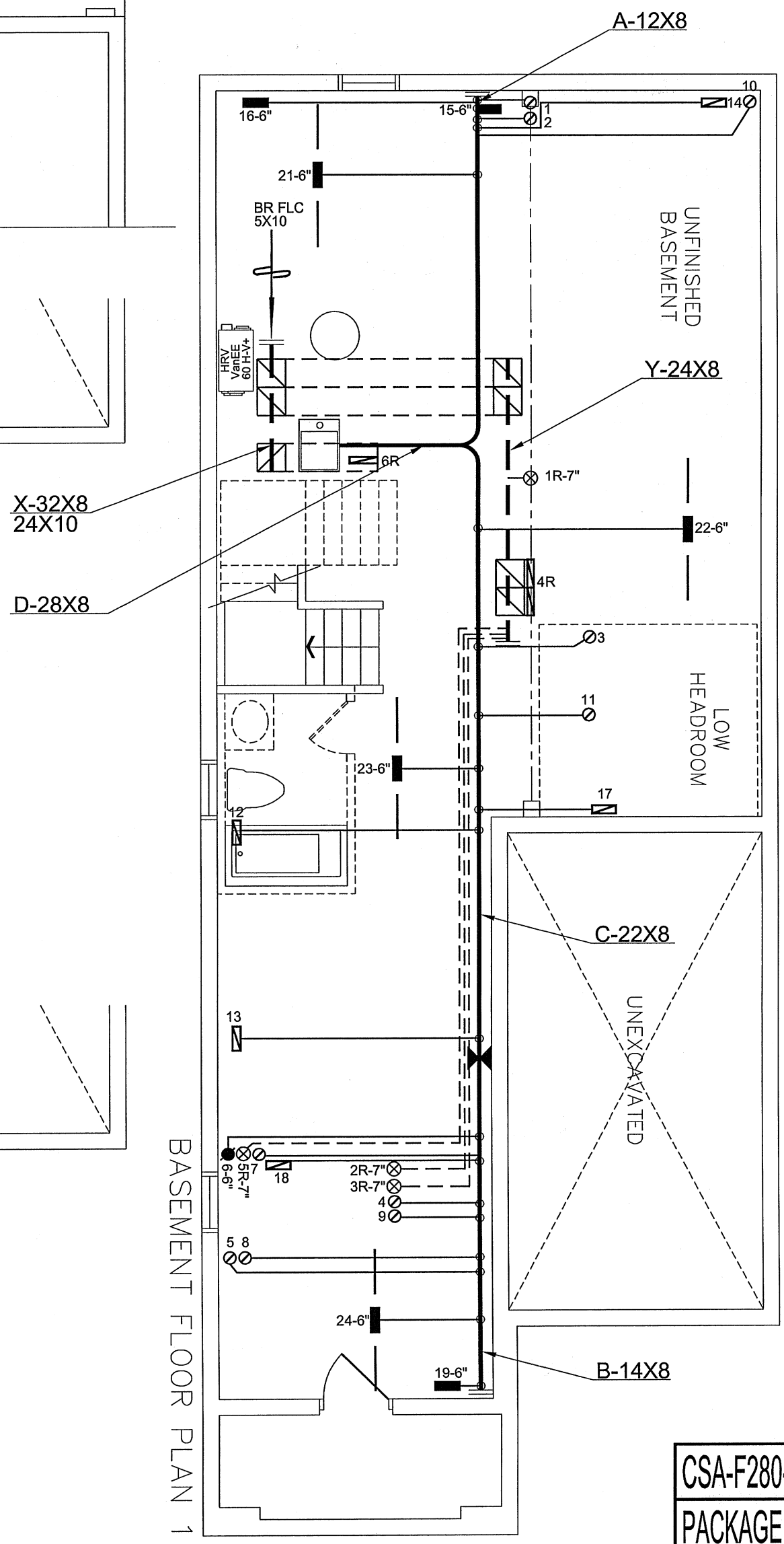
Supplemental tool for CAN/CSA-F280

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):	881.8	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1175.5 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 1
LO# 71730

PARTIAL BASEMENT FLOOR PLAN 1,2,3 W.O.D. CONDITION





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, BCIN# 19669
HVAC DESIGNS LTD.

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

BRIDGEFORD 1 2289 sqft

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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.

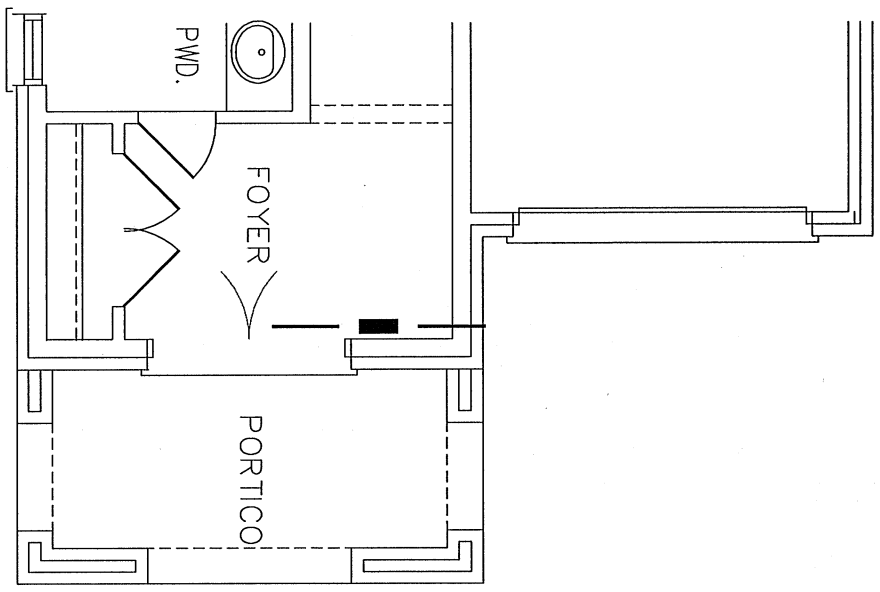
HEAT LOSS 47731 BTU/H		
UNIT DATA		
MAKE	AMANA	
MODEL	AMEC960603BNA-60	
INPUT	60	MBTU/H
OUTPUT	57.6	MBTU/H
COOLING	2.5	TONS
FAN SPEED	1131	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	11	4	3
1ST FLOOR	8	2	3
BASEMENT	4	1	0

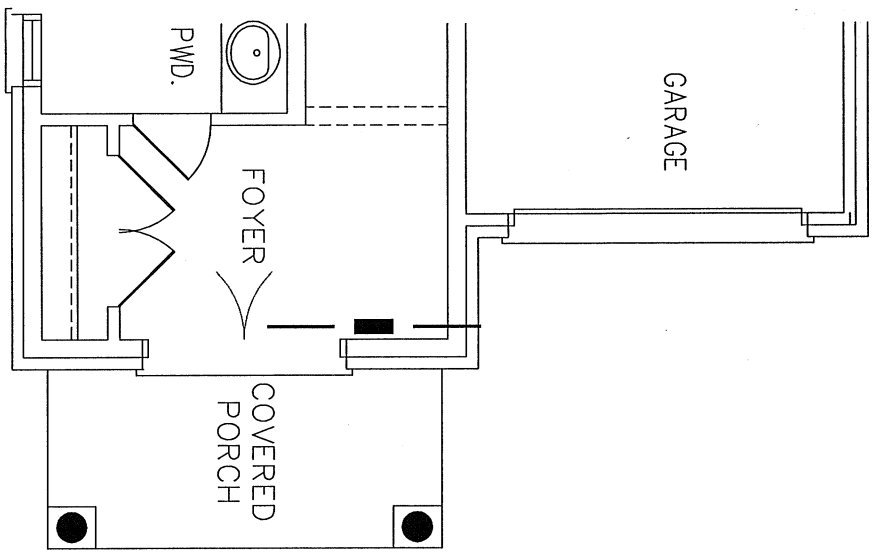
ALL S/A DIFFUSERS 4"x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

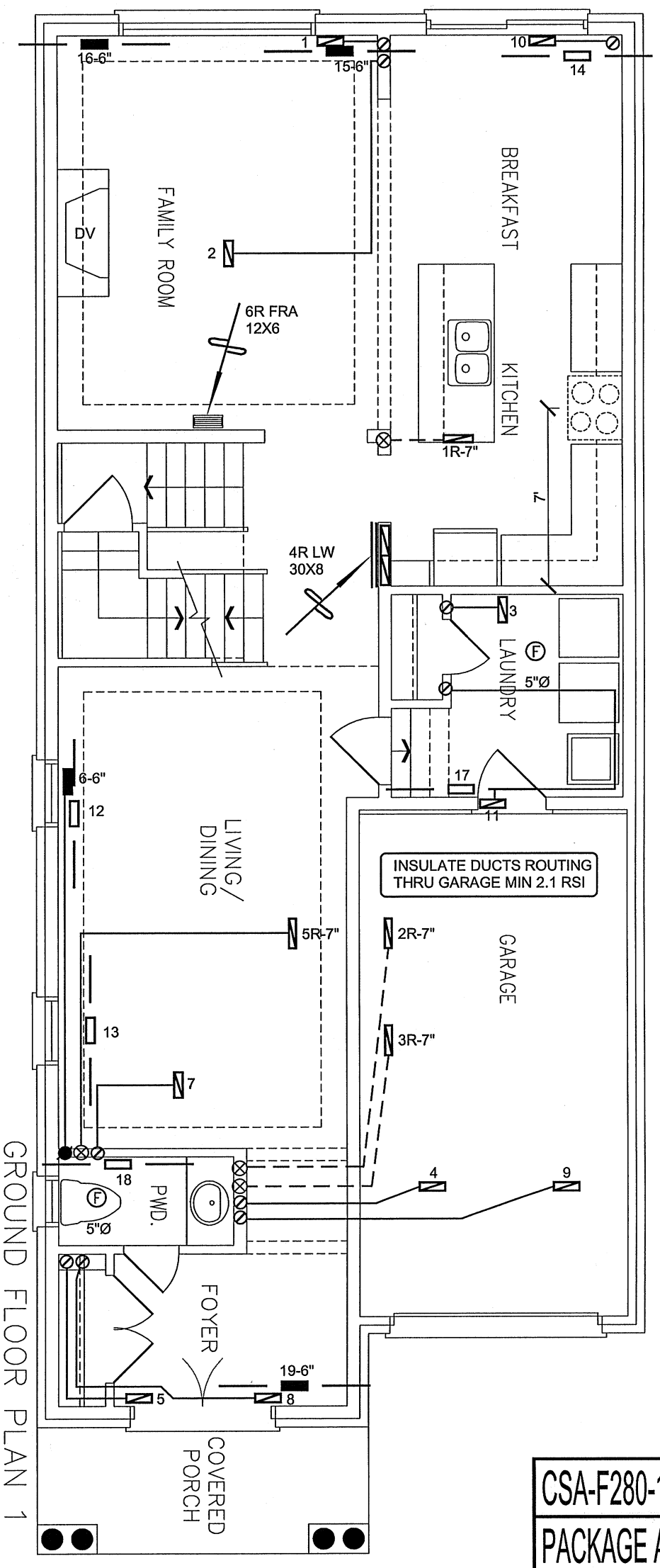
Date JAN/2017
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 71730



GROUND FLOOR PLAN 3



GROUND FLOOR PLAN 2



GROUND FLOOR PLAN 1

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CSA-F280-12

PACKAGE A1

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Sheet Title

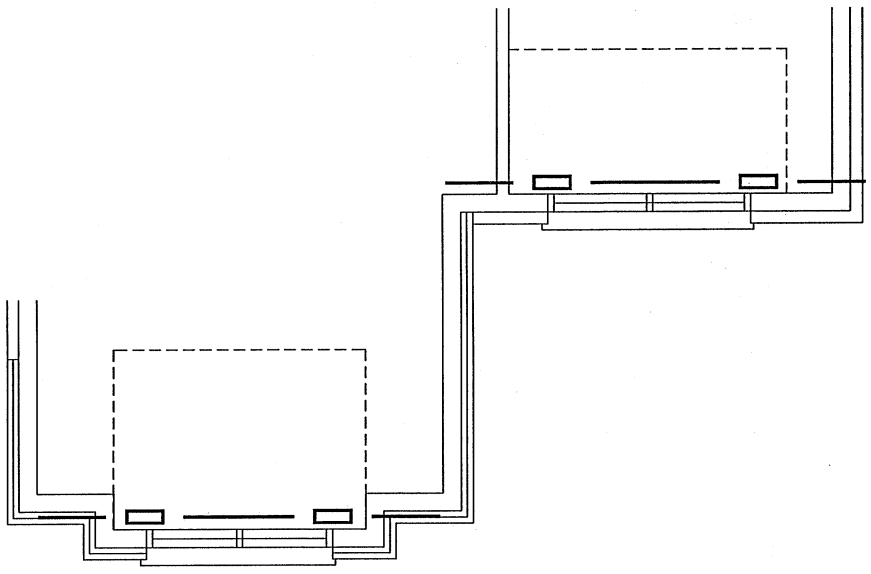
FIRST FLOOR HEATING LAYOUT

Date JAN/2017

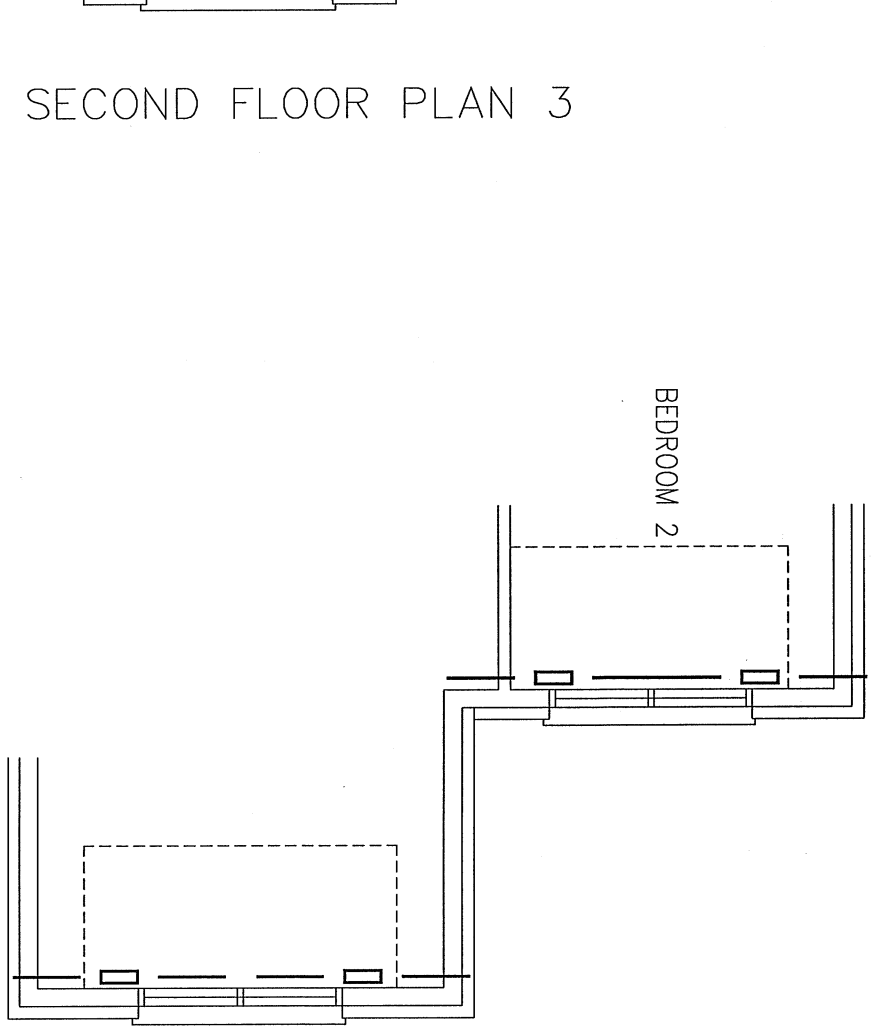
Scale 3/16" = 1'-0"

BCIN# 19669

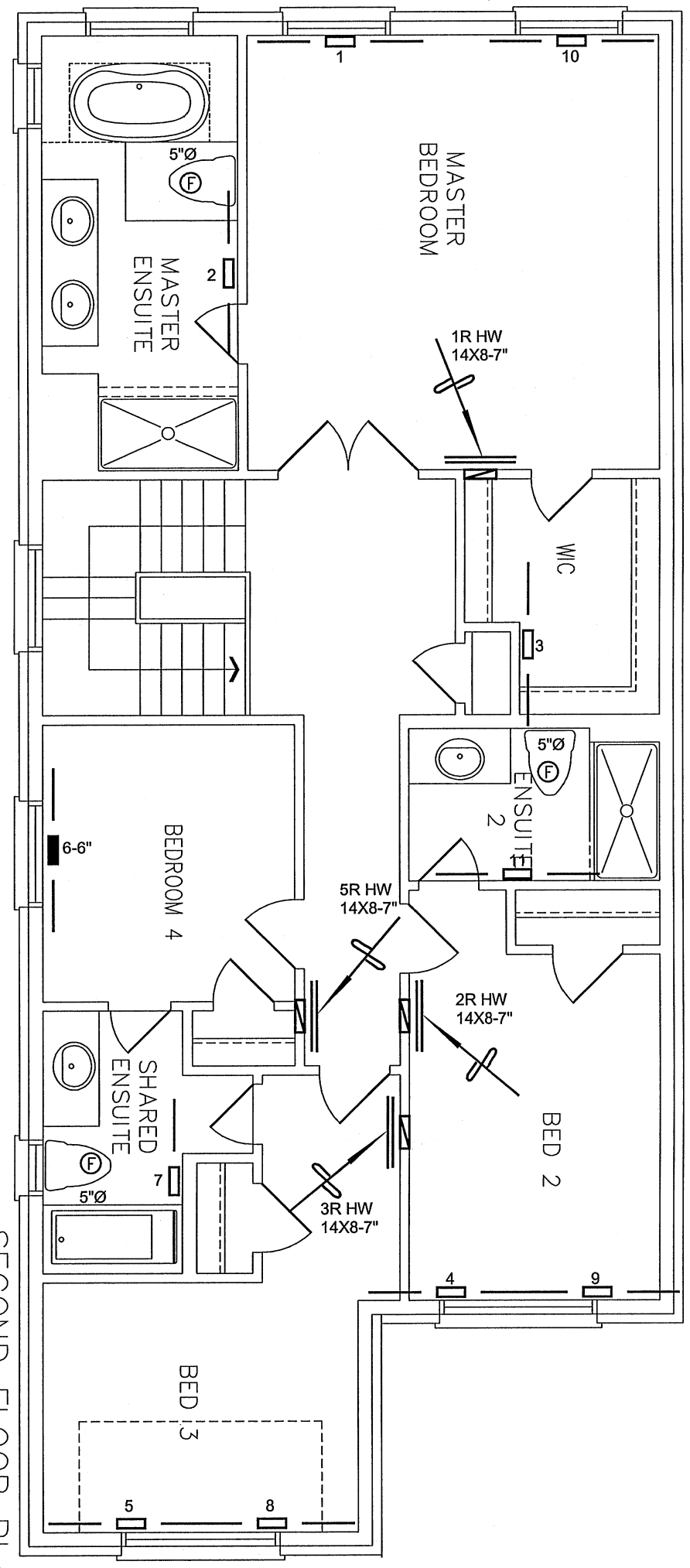
LO# 71730



SECOND FLOOR PLAN 3



SECOND FLOOR PLAN 2



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CSA-F280-12

PACKAGE A1

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SECOND FLOOR HEATING LAYOUT

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