



Snow Melting Manifold Summary

Job: 7012
Date: Jan 02, 2012
By: Morgan M. Audetat

Badger Radiant Designs

17401 Flying Cloud Dr., Eden Prairie, MN 55347 Phone: 952-944-2614 Email: morgan@badgerboilerservice.com Web: www.BadgerRadiantDesigns.com

Project Information

For: Smart Customer
Main St., AnyTown North America

Manifold name: Manifold1 Manifold location:	Loop number			
	1	2		
Name	SnowMelt1-Lp1	SnowMelt1-Lp2		
Heated area (ft ²)	216	252		
Tube spacing (in)	15.0	15.0		
Tube type/size	5/8" hePEX	5/8" hePEX		
Distance to manifold (ft)	3	3		
Loop length (ft)	192	224		
Temperature drop (°F)	25.0	25.0		
Flow (gpm)	1.20	1.40		
Head loss (ft H2O)	6.9	10.3		
Supply temperature (°F)	100	100		
Valve turns from closed	1.50	Open		

S/R tubing	3/4" hePEX	Total flow (gpm)	2.60
S/R Tubing length(ft)	0	Total panel output (Btuh)	30845
S/R Tubing head loss (ft H2O)	0	Total tubing required (ft)	415
Max loop head loss (ft H2O)	8.77	Total area (ft ²)	468
Manifold head loss (ft H2O)	1.56		
Total head loss (ft H2O)	10.34		



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Snowmelt Information

Snowfall rate (in/hr): 0.08 Wind speed (mph): 2 Design temp. (°F): 20

Area name	Sys. type	Construction type	Insul. type	P/up temp. (°F)	Resp. time (hrs)	Heating rate (Btuh/ft²)			Area (ft²)	Heat required (Btuh)
						Melt	P/up	Dsn		
SnowMelt1	Res	Concrete	Full	0	4.7	66	0	66	468	30845
Totals									468	30845

Hydronic Devices

Device Name	Device type	Load (Btuh)	Flow (gpm)	Head (ft H2O)	S/R tubing or Size, Cv	SWT Req. (°F)	SWT Spld (°F)
Manifold1	Manifold	30845	2.6	10.34	3/4" hePEX	100	100
SysPump2	System Pump	30845	2.6	10.45	3/4" COPPER	100	100
MixDevice1	Injection Pump	30845	0.6	0	1/2" COPPER	100	100
PrimPump1	Primary Pump	56517	5.8	0	3/4" COPPER	180	180





Project Summary
Entire House
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Notes: Proper heat load analysis is the first and most critical step in any space heating or snow melting project. Sample design only. Not for use in the field. Copyright 2012

Design Information

Weather: Minneapolis-St. Paul, MN, US

Winter Design Conditions

Outside db -11 °F
 Inside db 68 °F
 Design TD 79 °F

Summer Design Conditions

Outside db 88 °F
 Inside db 75 °F
 Design TD 13 °F
 Daily range M
 Relative humidity 50 %
 Moisture difference 24 gr/lb

Heating Summary

Structure 20347 Btuh
 Ducts 0 Btuh
 Central vent (0 cfm) 0 Btuh
 Humidification 0 Btuh
 Piping 5325 Btuh
 Equipment load 25672 Btuh

Sensible Cooling Equipment Load Sizing

Structure 6252 Btuh
 Ducts 0 Btuh
 Central vent (0 cfm) 0 Btuh
 Blower 0 Btuh
 Use manufacturer's data n
 Rate/swing multiplier 0.93
 Equipment sensible load 5814 Btuh

Infiltration

Method Simplified
 Construction quality Tight
 Fireplaces 0

	Heating	Cooling
Area (ft²)	2400	2400
Volume (ft³)	19200	19200
Air changes/hour	0.11	0.06
Equiv. AVF (cfm)	35	19

Latent Cooling Equipment Load Sizing

Structure 300 Btuh
 Ducts 0 Btuh
 Central vent (0 cfm) 0 Btuh
 Equipment latent load 300 Btuh
 Equipment total load 6114 Btuh
 Req. total capacity at 0.70 SHR 0.7 ton

Heating Equipment Summary

Make Generic
 Trade
 Model AFUE 95
 AHRI ref no.

Efficiency	95 AFUE
Heating input	0 Btuh
Heating output	0 Btuh
Low output baseboard	500 Btuh/ft
Total low baseboard	41 ft
High output baseboard	700 Btuh/ft
Total high baseboard	29 ft
Space thermostat	

Cooling Equipment Summary

Make
 Trade
 Cond
 Coil
 AHRI ref no.
 Efficiency 0 SEER

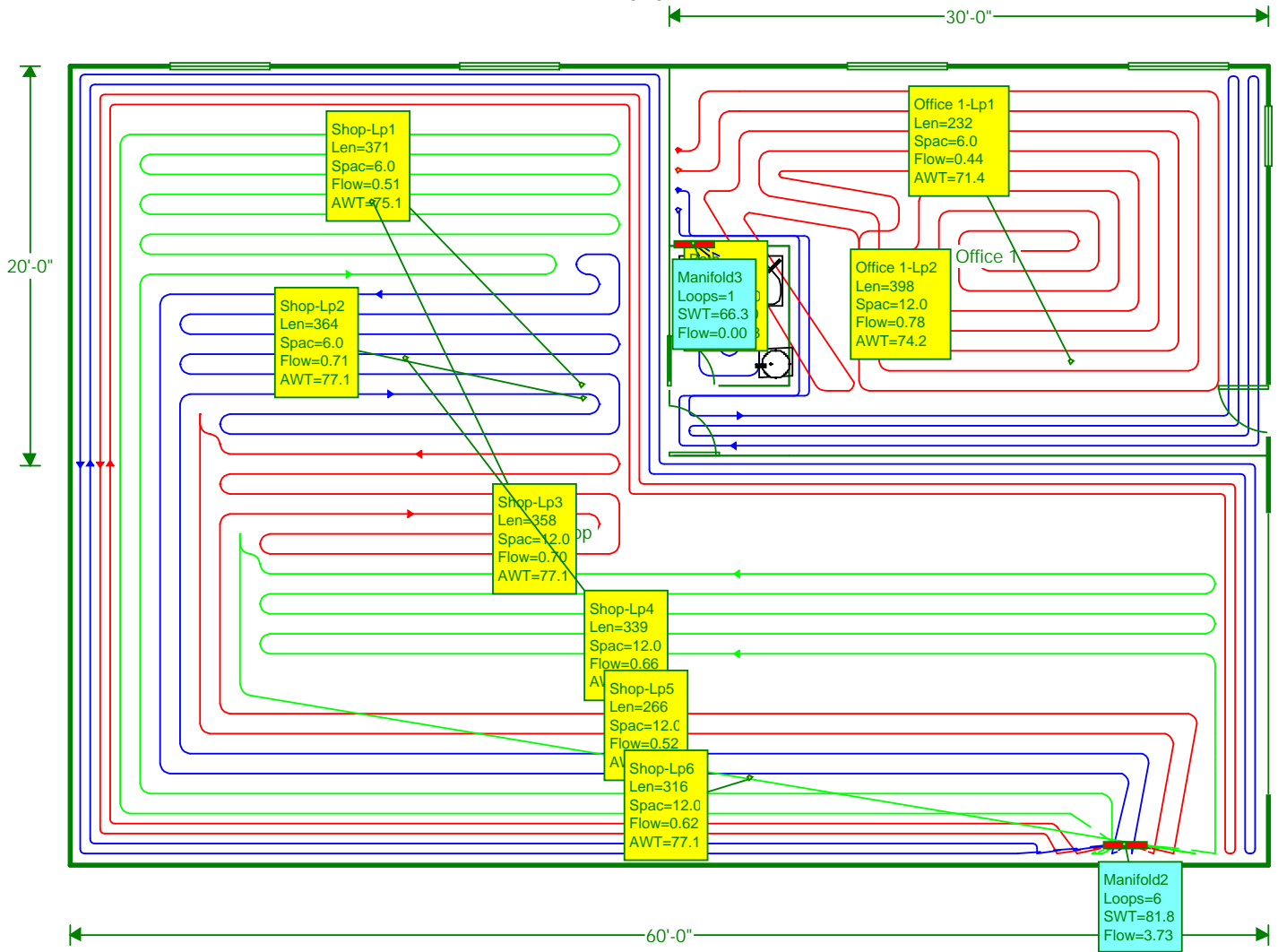
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	293 cfm
Air flow factor	0.047 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.95

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Level 1



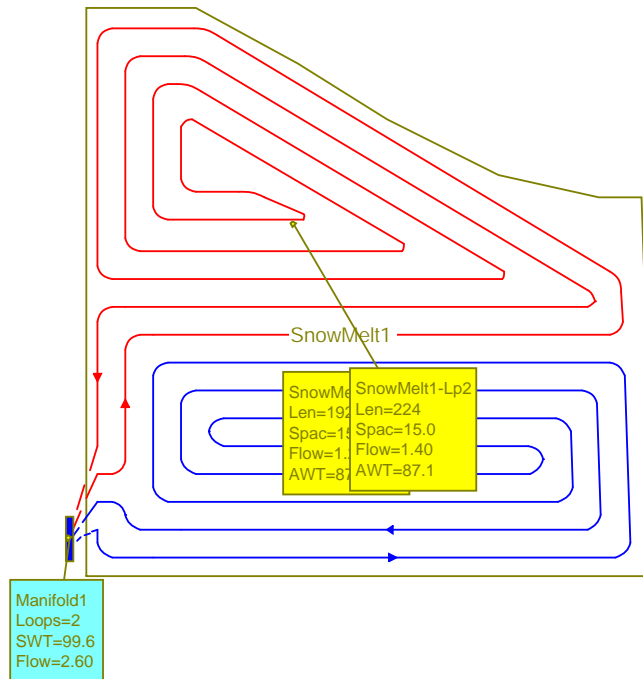
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Snowmelt



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