



Radiant Heating Tubing Requirements

Job: 456
Date: October 1, 2006
By: John Contractor

Fresh Air Corporation

Project Information

For: Mr. and Ms. Smith
1 Easy Lane, Perfect, ST 12345
Phone: 555-555-5555 Fax: 555-555-5556
Email: smiths@email.com

Tubing Requirements

Roll 1: 600 ft 3/8" BPEX (Part # WX-BP3-600)	4 lengths 113 ft waste	
Living room-A: 127 ft	Living room-B: 141 ft	Hall-A: 116 ft
Hall-B: 104 ft		
Roll 2: 600 ft 3/8" BPEX (Part # WX-BP3-600)	3 lengths 118 ft waste	
Mudroom: 191 ft	Kitchen-A: 148 ft	Kitchen-B: 144 ft



Radiant Heating Design Summary

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Design Information

Total floor area:	1750 ft ²	Design temperature:	63 °F
Radiantly heated area:	555 ft ²	Maximum supply temperature:	76 °F
Total panel area:	555 ft ²	Total flow rate:	0.57 gpm
Total tubing area:	547 ft ²	Maximum head loss:	1.60 ft H ₂ O
Total room load:	1691 Btuh	Total tubing required:	970 ft
Total panel output:	622 Btuh	Number of loops:	7
Total supplemental heat:	1069 Btuh	Number of zones:	1
Total back loss:	152 Btuh	Number of manifolds:	2
Boiler output required:	1842 Btuh		

Space Heating Information

Room name	Room area (ft ²)	Air temp (°F)	Room load (Btuh)	Supp. heat (Btuh)	F/C	Panel area (ft ²)	Tubing area (ft ²)	Surf. temp. (°F)	Deliv. temp. (°F)	Panel output (Btuh /ft ²)	Back loss (Btuh /ft ²)
Living room	150	68	174	0	F	150	148	68	72	1.2	0.3
Dining	140	68	153	153							
Kitchen	165	68	202	0	F	165	163	68	76	1.2	0.3
Bedroom 1	180	68	221	221							
Hall	130	68	71	0	F	130	128	68	72	0.5	0.2
Master	240	68	182	182							
Laundry	77	68	96	96							
Bedroom 2	168	68	147	147							
Master Bath	60	68	84	84							
Office	100	68	62	62							
Room28	230	68	125	125							
Mudroom	110	68	175	0	F	110	108	69	76	1.6	0.3
Totals	1750		1691	1069		555	547				



Radiant Heating Piping Report

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Piping

Name	Tube size / type	Fluid	Num ftgs	1 Ftg EqLen	Ftg Cv	PipeLen (ft)	TotLen (ft)	Temp (°F)	Flow (gpm)	Head (ft H2O)
Living room-B	3/8" BPEX	Water	1	0	0.00	141	141	71.6	0.2	1.55

Pump Information

Make		Flow (gpm)	0.6
Model		Head (ft H2O)	1.5
Number of pumps	1 (serial) + 0 (parallel) = 1 (total)		

NOTE: All pipe sections assumed to be connected in series



Radiant Heating Manifold Summary

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Manifold name: Manifold1 Manifold location:	Loop number			
	1	2	3	4
Name	Living room-A	Living room-B	Hall-A	Hall-B
Heating zone	Entire House	Entire House	Entire House	Entire House
Heated area (ft ²)	71	79	69	61
Room temperature (°F)	68	68	68	68
Cover R (ft ² -°F/Btuh)	0.80	0.80	0.80	0.80
Surface temperature (°F)	68	68	68	68
Radiant panel CST	41B0	41B0	41B0	41B0
Radiant panel type	Omega plates	Omega plates	Omega plates	Omega plates
Tube spacing (in)	6.0	6.0	6.0	6.0
Tube type/size	3/8" BPEX	3/8" BPEX	3/8" BPEX	3/8" BPEX
Distance to manifold (ft)	1	1	1	1
Loop length (ft)	127	141	116	104
Temperature drop (°F)	1.1	1.1	4.2	4.2
Flow (gpm)	0.19	0.20	0.02	0.02
Head loss (ft H2O)	1.28	1.60	0.03	0.03
Supply temperature (°F)	72	72	72	72
Balance valve (turns from closed)				

Totals for Manifold1

Max. head loss (ft H2O)	1.60	Total flow (gpm)	0.43
Valves head in worst loop (ft H2O)		Total panel output (Btuh)	245
Max. supply temp. (°F)	72.2	Total tubing required (ft)	487

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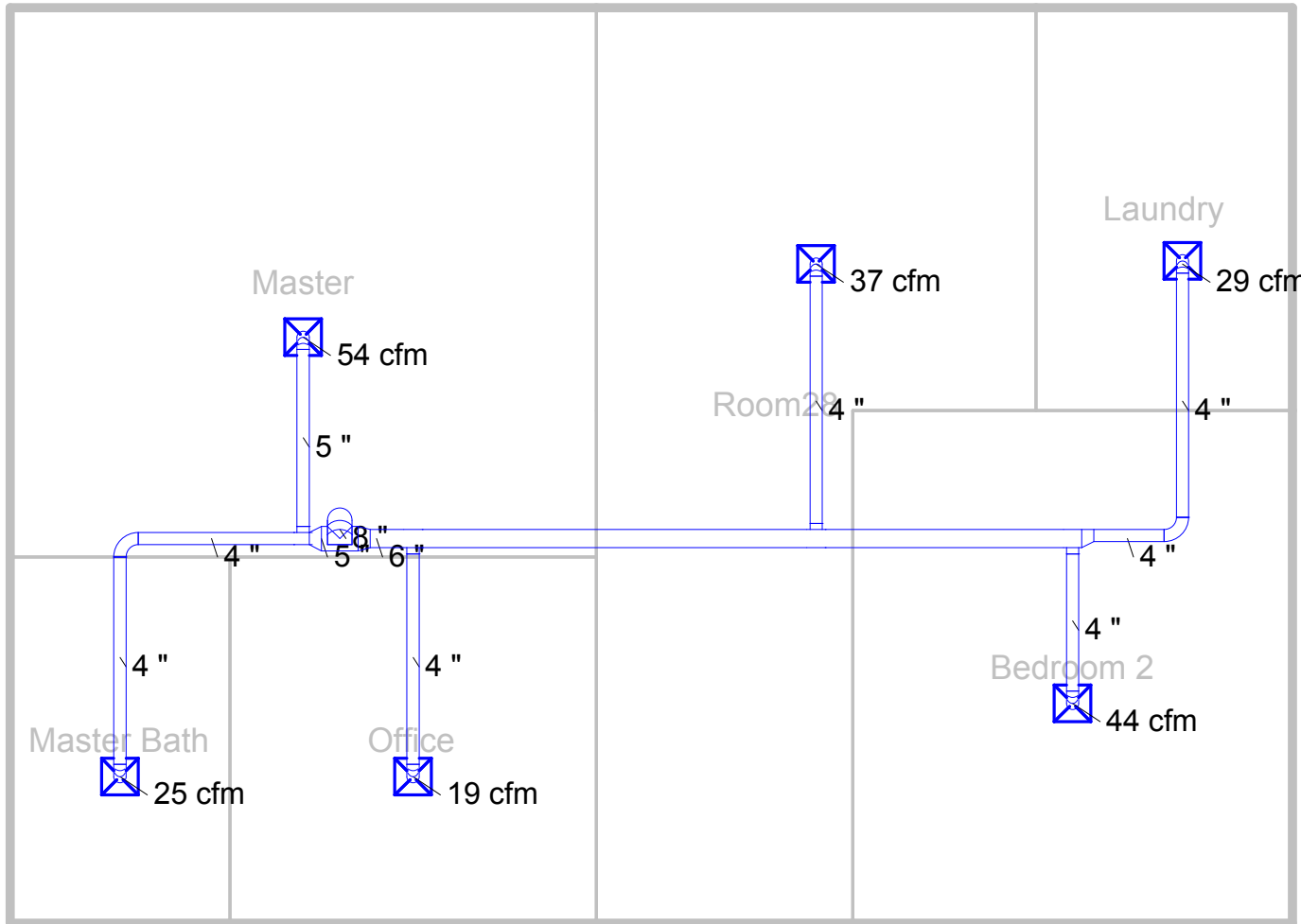
Manifold name: Manifold2
 Manifold location:

	Loop number			
	1	2	3	
Name	Mudroom	Kitchen-A	Kitchen-B	
Heating zone	Entire House	Entire House	Entire House	
Heated area (ft ²)	110	84	81	
Room temperature (°F)	68	68	68	
Cover R (ft ² -°F/Btuh)	0.80	0.80	0.80	
Surface temperature (°F)	69	68	68	
Radiant panel CST	41B0	41B0	41B0	
Radiant panel type	Omega plates	Omega plates	Omega plates	
Tube spacing (in)	6.0	6.0	6.0	
Tube type/size	3/8" BPEX	3/8" BPEX	3/8" BPEX	
Distance to manifold (ft)	1	1	1	
Loop length (ft)	191	148	144	
Temperature drop (°F)	5.8	7.6	7.6	
Flow (gpm)	0.07	0.03	0.03	
Head loss (ft H2O)	0.37	0.07	0.07	
Supply temperature (°F)	76	76	76	
Balance valve (turns from closed)				

Totals for Manifold2

Max. head loss (ft H2O)	0.37	Total flow (gpm)	0.14
Valves head in worst loop (ft H2O)		Total panel output (Btuh)	377
Max. supply temp. (°F)	75.6	Total tubing required (ft)	482

Level 2

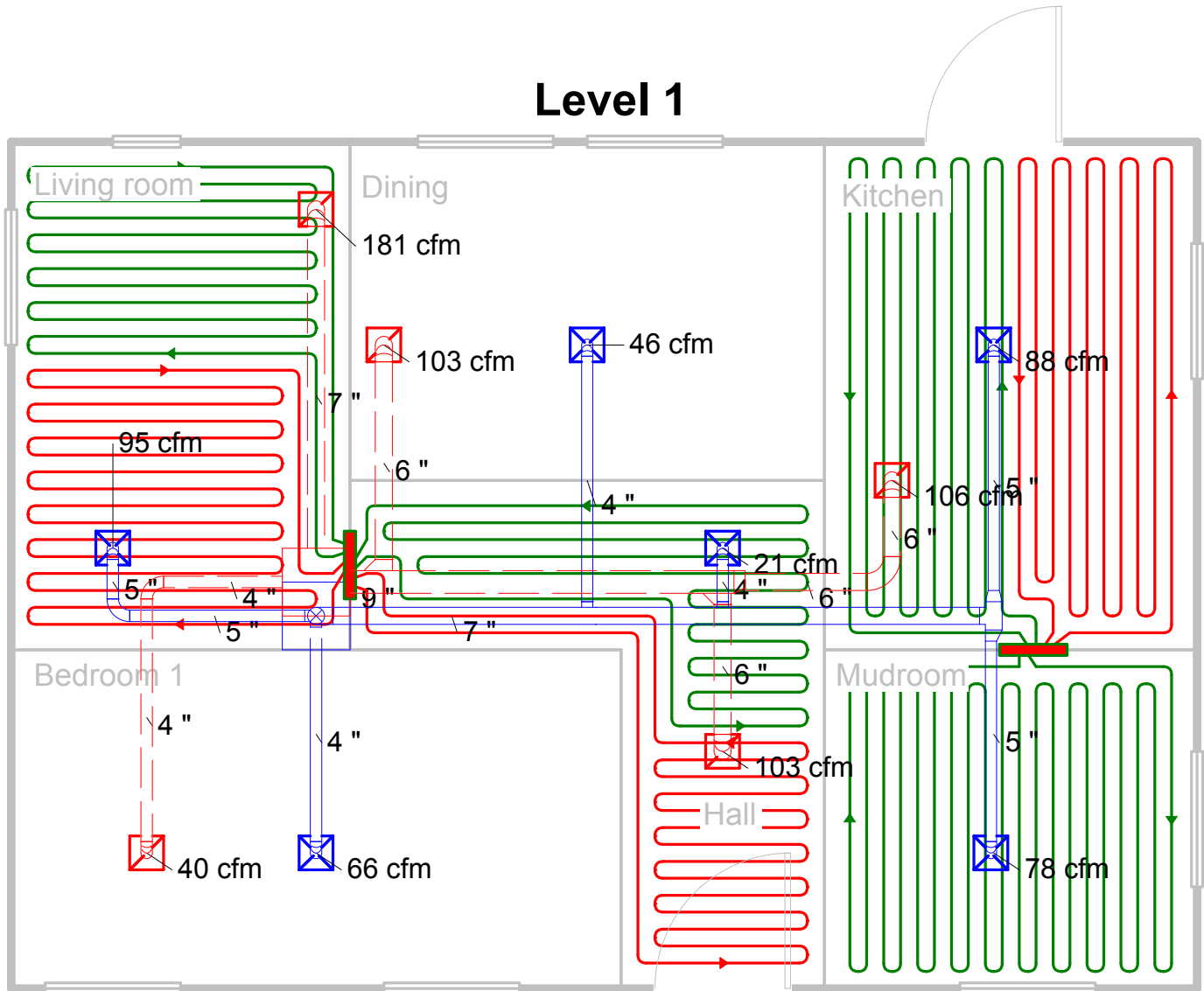


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Level 1



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