



Enser Consulting, LLC
(303) 725-8836
info@EC-Denver.com

Load Short Form

Entire House

SMC Construction Inc.

Job:
Date: Mar 29, 2016
By:
Plan: Lot 1

17219 E. Easter Ave, Foxfield, CO 80016 Phone: 303-766-2004 Email: confrank@comcast.net Web: smcconstructioninc.com

Project Information

For: Lot 1 Net Zero Home 1
16036 E. 10th Place, Aurora, CO 80016

Design Information

	Htg	Clg	Method	Infiltration	Simplified
Outside db (°F)	1	91			
Inside db (°F)	70	75	Construction quality		Tight
Design TD (°F)	69	16	Fireplaces		
Daily range	-	H			
Inside humidity (%)	50	50			
Moisture difference (gr/lb)	61	-19			

HEATING EQUIPMENT

Make	ClimateMaster	
Trade	Trilogy 45 Q-Mode (QE)	
Model	QE0930	
AHRI ref		
Efficiency	3.6 COP	
Heating input	8.8	kW
Heating output	30000	Btuh
Temperature rise	33	°F
Actual air flow	1000	cfm
Air flow factor	0.058	cfm/Btuh
Static pressure	0.60	in H2O
Space thermostat		

COOLING EQUIPMENT

Make	ClimateMaster	
Trade	Trilogy 45 Q-Mode (QE)	
Cond	QE0930	
Coil	QE0930	
AHRI ref		
Efficiency	24.3 EER	
Sensible cooling	20400	Btuh
Latent cooling	3600	Btuh
Total cooling	24000	Btuh
Actual air flow	1000	cfm
Air flow factor	0.077	cfm/Btuh
Static pressure	0.60	in H2O
Load sensible heat ratio	1.00	

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Basement	1904	6012	1743	347	134
Bath	80	420	167	24	13
Bedroom #1	182	1373	1245	79	96
Bedroom #2	110	751	1064	43	82
Great/Kitchen	725	4038	5187	233	399
Hallway	146	754	307	44	24
Laundry	133	1599	743	92	57
Master Bath	146	981	792	57	61
Master Bedroom	234	1399	1741	81	134
Master Closet	72	0	0	0	0
Stairs	76	0	0	0	0

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



Entire House	3808	17326	12989	1000	1000
Other equip loads		2249	522		
Equip. @ 1.00 RSM			13511		
Latent cooling			0		
TOTALS	3808	19575	13511	1000	1000

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

Project Information

For: Lot 1 Net Zero Home 1
 16036 E. 10th Place, Aurora, CO 80016

Design Conditions

Location:

Denver, CO, US
 Elevation: 5331 ft
 Latitude: 40°N

Outdoor:

Dry bulb (°F)
 Daily range (°F)
 Wet bulb (°F)
 Wind speed (mph)

Heating

1
 -
 -
 15.0

Cooling

91
 27 (H)
 63
 7.5

Indoor:

Indoor temperature (°F)
 Design TD (°F)
 Relative humidity (%)
 Moisture difference (gr/lb)

Heating

70
 69
 50
 61.2

Cooling

75
 16
 50
 -18.7

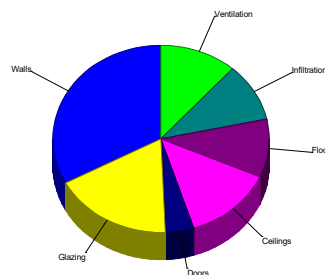
Infiltration:

Method
 Construction quality
 Fireplaces

Simplified
 Tight
 0

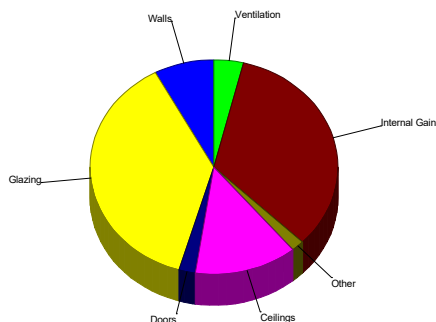
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	2.2	6415	32.8
Glazing	14.5	3493	17.8
Doors	20.0	840	4.3
Ceilings	1.4	2628	13.4
Floors	1.0	1971	10.1
Infiltration	1.1	1979	10.1
Ducts		0	0
Piping		0	0
Humidification		0	0
Ventilation		2249	11.5
Adjustments		0	0
Total		19575	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	0.4	1060	7.8
Glazing	21.1	5076	37.6
Doors	7.0	293	2.2
Ceilings	1.0	1811	13.4
Floors	0	0	0
Infiltration	0.1	229	1.7
Ducts		0	0
Ventilation		522	3.9
Internal gains		4520	33.5
Blower		0	0
Adjustments		0	0
Total		13511	100.0



Latent Cooling Load = 0 Btuh
 Overall U-value = 0.031 Btuh/ft²-°F

Data entries checked.



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Component Constructions

Entire House

SMC Construction Inc.

Job:
Date: Mar 29, 2016
By:
Plan: Lot 1

17219 E. Easter Ave, Foxfield, CO 80016 Phone: 303-766-2004 Email: confrank@comcast.net Web: smcconstructioninc.com

Project Information

For: Lot 1 Net Zero Home 1
16036 E. 10th Place, Aurora, CO 80016

Design Conditions

Location:	Denver, CO, US	Indoor:	Indoor temperature (°F)	70	Heating	75
Elevation:	5331 ft	Design TD (°F)	69	69	16	
Latitude:	40°N	Relative humidity (%)	50	50	50	
Outdoor:		Moisture difference (gr/lb)	61.2	61.2	-18.7	
Heating		Infiltration:				
Dry bulb (°F)	1	Method	Simplified			
Daily range (°F)	-	Construction quality	Tight			
Wet bulb (°F)	-	Fireplaces	0			
Wind speed (mph)	15.0					
Cooling						
	91					
	27 (H)					
	63					
	7.5					

Construction descriptions

Walls

BG ICF R-26: BG Wall, R-26

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
BG ICF R-26: BG Wall, R-26	n	504	0.026	26.0	1.87	942	0.08	39
	e	306	0.026	26.0	1.87	572	0.08	24
	s	456	0.026	26.0	1.80	821	0.01	6
	w	286	0.026	26.0	1.82	522	0.03	10
	all	1552	0.026	26.0	1.84	2858	0.05	78
ICF Wall R26: ICF Wall - R-26	n	431	0.037	26.0	2.53	1092	0.70	302
	e	243	0.037	26.0	2.53	615	0.70	170
	s	434	0.037	26.0	2.53	1099	0.70	303
	w	297	0.037	26.0	2.53	751	0.70	207
	all	1405	0.037	26.0	2.53	3558	0.70	982

Partitions

(none)

Windows

1F-c3ov: 3 glazing, clr low-e outr, 1/2" gap, insulated vinyl frm mat, clr mid, argon gas, 1/8" thk, clr low-e innr; NFRC rated (SHGC=0.34); 6.67 ft head ht

1F-c3ov: 3 glazing, clr low-e outr, 1/2" gap, insulated vinyl frm mat, clr mid, argon gas, 1/8" thk, clr low-e innr; NFRC rated (SHGC=0.34); 6.67 ft head ht	n	52	0.210	0	14.5	749	9.94	514
	e	42	0.210	0	14.5	609	35.5	1489
	s	48	0.210	0	14.5	696	17.2	827
	s	70	0.210	0	14.5	1014	17.2	1206
	w	20	0.210	0	14.5	290	35.5	709
	w	9	0.210	0	14.5	135	35.5	331
	all	241	0.210	0	14.5	3493	21.1	5076

Doors

Door U 029: Solid Door U=0.29

Door U 029: Solid Door U=0.29	n	21	0.290	3.4	20.0	420	6.97	146
	e	21	0.290	3.4	20.0	420	6.97	146
	all	42	0.290	3.4	20.0	840	6.97	293

Ceilings

16B-50ad: Attic ceiling, asphalt shingles roof mat, r-50 ceil ins, 1/2" gypsum board int fnsh

16B-50ad: Attic ceiling, asphalt shingles roof mat, r-50 ceil ins, 1/2" gypsum board int fnsh	1904	0.020	50.0	1.38	2628	0.95	1811
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Uponor System Design Software 17.0.03 RSU06034

...lients\Con Frank\Christian's Lot 1 Manual J.rup Calc = MJ8 Front Door faces: N

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Floors

21B-28t: Bg floor, light dry soil, prm ext ins cov, 6.5' depth, r-8 ins

1904

0.015

3.0

1.03

1971

0

0





Project Information

For: Lot 1 Net Zero Home 1
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Notes: - Ventilation based on ASHRAE 62.2-2013 & use of HRV (75% sensible efficiency)
- Geothermal equipment sized for heating load (will run @ lower speed/capacity for cooling)

Design Information

Weather: Denver, CO, US

Winter Design Conditions

Outside db	1 °F
Inside db	70 °F
Design TD	69 °F

Summer Design Conditions

Outside db	91 °F
Inside db	75 °F
Design TD	16 °F
Daily range	H
Relative humidity	50 %
Moisture difference	-19 gr/lb

Heating Summary

Structure	17326 Btuh
Ducts	0 Btuh
Central vent (144 cfm)	2249 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	19575 Btuh

Sensible Cooling Equipment Load Sizing

Structure	12989 Btuh
Ducts	0 Btuh
Central vent (144 cfm)	522 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	13511 Btuh

Infiltration

Method	Simplified	
Construction quality	Tight	
Fireplaces	0	
	Heating	Cooling
Area (ft ²)	3808	3808
Volume (ft ³)	19040	19040
Air changes/hour	0.10	0.05
Equiv. AVF (cfm)	32	16

Latent Cooling Equipment Load Sizing

Structure	634 Btuh
Ducts	0 Btuh
Central vent (144 cfm)	-1509 Btuh
Equipment latent load	0 Btuh
Equipment total load	13511 Btuh
Req. total capacity at 0.85 SHR	1.3 ton

Heating Equipment Summary

Make	Climatemaster	
Trade	Trilogy 45 Q-Mode (QE)	
Model	QE0930	
AHRI ref		
Efficiency	3.6 COP	
Heating input	8.8 kW	
Heating output	30000 Btuh	
Temperature rise	33 °F	
Actual air flow	1000 cfm	
Air flow factor	0.058 cfm/Btuh	
Static pressure	0.60 in H2O	
Space thermostat		

Cooling Equipment Summary

Make	Climatemaster	
Trade	Trilogy 45 Q-Mode (QE)	
Cond	QE0930	
Coil	QE0930	
AHRI ref		
Efficiency	24.3 EER	
Sensible cooling	20400 Btuh	
Latent cooling	3600 Btuh	
Total cooling	24000 Btuh	
Actual air flow	1000 cfm	
Air flow factor	0.077 cfm/Btuh	
Static pressure	0.60 in H2O	
Load sensible heat ratio	1.00	

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



Right-J® Worksheet

Entire House

SMC Construction Inc.

Job:
 Date: Mar 29, 2016
 By:
 Plan: Lot 1

17219 E. Easter Ave, Foxfield, CO 80016 Phone: 303-766-2004 Email: confrank@comcast.net Web: smcconstructioninc.com

1 Room name		Entire House						Basement						
2 Exposed wall		360.0 ft						180.0 ft						
3 Room height		9.0 ft						9.0 ft						
4 Room dimensions								56.0 x 34.0 ft						
5 Room area		3808.0 ft²						1904.0 ft²						
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	BG ICF R-26	0.037	n	1.87	0.08	504	504	942	39	504	504	942	39
	W	ICF Wall R26	0.037	n	2.53	0.70	504	431	1092	302	0	0	0	0
	G	1F-c3ov	0.210	n	14.49	9.94	52	0	749	514	0	0	0	0
	D	Door U 029	0.290	n	20.01	6.97	21	21	420	146	0	0	0	0
11	W	BG ICF R-26	0.037	e	1.87	0.08	306	306	572	24	306	306	572	24
	W	ICF Wall R26	0.037	e	2.53	0.70	306	243	615	170	0	0	0	0
	G	1F-c3ovd	0.210	e	14.49	35.46	42	0	609	1489	0	0	0	0
	D	Door U 029	0.290	e	20.01	6.97	21	21	420	146	0	0	0	0
	W	BG ICF R-26	0.037	s	1.80	0.01	504	456	821	6	504	456	821	6
	G	1F-c3ov	0.210	s	14.49	17.23	48	0	696	827	48	0	696	827
	W	ICF Wall R26	0.037	s	2.53	0.70	504	434	1099	303	0	0	0	0
	G	1F-c3ov	0.210	s	14.49	17.23	70	0	1014	1206	0	0	0	0
	W	BG ICF R-26	0.037	w	1.82	0.03	306	286	522	10	306	286	522	10
	G	1F-c3ov	0.210	w	14.49	35.46	20	0	290	709	20	0	290	709
	W	ICF Wall R26	0.037	w	2.53	0.70	306	297	751	207	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	9	0	135	331	0	0	0	0
	C	16B-50ad	0.020	-	1.38	0.95	1904	1904	2628	1811	0	0	0	0
	F	21B-28t	0.015	-	1.03	0.00	1904	1904	1971	0	1904	1904	1971	0
6	c) AED excursion									0				106
	Envelope loss/gain								15347	8240			5814	1720
12	a) Infiltration								1979	229			198	23
	b) Room ventilation								0	0			0	0
13	Internal gains:		Occupants @	230		4				920	0			0
			Appliances/other							3600				0
	Subtotal (lines 6 to 13)								17326	12989			6012	1743
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			0	0
14	Subtotal								17326	12989			6012	1743
15	Duct loads								0	0	-0%	0%	0	0
	Total room load								17326	12989			6012	1743
	Air required (cfm)								1000	1000			347	134

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Right-J® Worksheet

Entire House

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1 Room name				Bath		Bedroom #1								
2 Exposed wall				8.0 ft		27.0 ft								
3 Room height				9.0 ft		9.0 ft								
4 Room dimensions				8.0 x 10.0 ft		13.0 x 14.0 ft								
5 Room area				80.0 ft²		182.0 ft²								
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	BG ICF R-26	0.037	n	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	n	2.53	0.70	72	68	172	48	117	97	246	68
	G	1F-c3ov	0.210	n	14.49	9.94	4	0	58	40	20	0	290	199
	D	Door U 029	0.290	n	20.01	6.97	0	0	0	0	0	0	0	0
11	W	BG ICF R-26	0.037	e	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	e	2.53	0.70	0	0	0	0	0	0	0	0
	G	1F-c3ovd	0.210	e	14.49	35.46	0	0	0	0	0	0	0	0
	D	Door U 029	0.290	e	20.01	6.97	0	0	0	0	0	0	0	0
	W	BG ICF R-26	0.037	s	1.80	0.01	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	s	2.53	0.70	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	0	0	0	0
	W	BG ICF R-26	0.037	w	1.82	0.03	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	w	2.53	0.70	0	0	0	0	126	126	319	88
	G	1F-c3ov	0.210	w	14.49	35.46	0	0	0	0	0	0	0	0
	C	16B-50ad	0.020	-	1.38	0.95	80	80	110	76	182	182	251	173
	F	21B-28t	0.015	-	1.03	0.00	0	0	0	0	0	0	0	0
6	c) AED excursion													-44
	Envelope loss/gain								341	158			1106	484
12	a) Infiltration								79	9			267	31
	b) Room ventilation								0	0			0	0
13	Internal gains:		Occupants @	230			0			0	1			230
			Appliances/other							0				500
	Subtotal (lines 6 to 13)								420	167			1373	1245
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			0	0
14	Subtotal								420	167			1373	1245
15	Duct loads								0	0			0	0
	Total room load								420	167			1373	1245
	Air required (cfm)								24	13			79	96

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1 Room name				Bedroom #2 11.0 ft				Great/Kitchen 56.0 ft						
2 Exposed wall				9.0 ft heat/cool				9.0 ft heat/cool						
3 Room height				11.0 x 10.0 ft				1.0 x 725.0 ft						
4 Room dimensions				110.0 ft²				725.0 ft²						
5 Room area														
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	BG ICF R-26	0.037	n	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	n	2.53	0.70	99	79	200	55	0	0	0	0
	G	1F-c3ov	0.210	n	14.49	9.94	20	0	290	199	0	0	0	0
	D	Door U 029	0.290	n	20.01	6.97	0	0	0	0	0	0	0	0
11	W	BG ICF R-26	0.037	e	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	e	2.53	0.70	0	0	0	0	207	165	418	115
	G	1F-c3ovd	0.210	e	14.49	35.46	0	0	0	0	42	0	609	1489
	D	Door U 029	0.290	e	20.01	6.97	0	0	0	0	0	0	0	0
	W	BG ICF R-26	0.037	s	1.80	0.01	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	s	2.53	0.70	0	0	0	0	297	247	625	173
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	50	0	724	861
	W	BG ICF R-26	0.037	w	1.82	0.03	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	w	2.53	0.70	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	0	0	0	0	0	0	0	0
	C	16B-50ad	0.020	-	1.38	0.95	110	110	152	105	725	725	1000	689
	F	21B-28t	0.015	-	1.03	0.00	0	0	0	0	0	0	0	0
6	c) AED excursion													-180
	Envelope loss/gain								642	321			3377	3148
12	a) Infiltration								109	13			554	64
	b) Room ventilation								0	0			0	0
13	Internal gains:		Occupants @	230	1					230	1			230
			Appliances/other							500				1700
	Subtotal (lines 6 to 13)								751	1064			3931	5142
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			107	45
14	Subtotal								751	1064			4038	5187
15	Duct loads								0	0			0	0
	Total room load								751	1064			4038	5187
	Air required (cfm)								43	82			233	399

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

Right-J® Worksheet

Entire House

SMC Construction Inc.

Job:
 Date: Mar 29, 2016
 By:
 Plan: Lot 1

17219 E. Easter Ave, Foxfield, CO 80016 Phone: 303-766-2004 Email: confrank@comcast.net Web: smcconstructioninc.com

1 Room name				Hallway 5.0 ft				Laundry 26.0 ft						
2 Exposed wall				9.0 ft 1.0 x 146.0 ft heat/cool				9.0 ft 19.0 x 7.0 ft heat/cool						
3 Room height				146.0 ft ²				133.0 ft ²						
4 Room dimensions														
5 Room area														
	Ty	Construction number	U-value (Btuh/ft ² ·°F)	Or	HTM (Btuh/ft ²)		Area (ft ²) or perimeter (ft)		Load (Btuh)		Area (ft ²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	BG ICF R-26	0.037	n	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	n	2.53	0.70	45	24	61	17	171	163	414	114
	G	1F-c3ov	0.210	n	14.49	9.94	0	0	0	0	8	0	112	77
	D	Door U 029	0.290	n	20.01	6.97	21	21	420	146	0	0	0	0
11	W	BG ICF R-26	0.037	e	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	e	2.53	0.70	0	0	0	0	63	42	106	29
	G	1F-c3ovd	0.210	e	14.49	35.46	0	0	0	0	0	0	0	0
	D	Door U 029	0.290	e	20.01	6.97	0	0	0	0	21	21	420	146
	W	BG ICF R-26	0.037	s	1.80	0.01	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	s	2.53	0.70	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	0	0	0	0
	W	BG ICF R-26	0.037	w	1.82	0.03	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	w	2.53	0.70	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	0	0	0	0	0	0	0	0
	C	16B-50ad	0.020	-	1.38	0.95	146	146	201	139	133	133	184	126
	F	21B-28t	0.015	-	1.03	0.00	0	0	0	0	0	0	0	0
6	c) AED excursion													-24
	Envelope loss/gain								682	292			1235	469
12	a) Infiltration								49	6			257	30
	b) Room ventilation								0	0			0	0
13	Internal gains:		Occupants @	230			0			0	0			0
			Appliances/other							0				200
	Subtotal (lines 6 to 13)								732	297			1493	699
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								22	9			107	45
14	Subtotal								754	307			1599	743
15	Duct loads								0	0			0	0
	Total room load								754	307			1599	743
	Air required (cfm)								44	24			92	57

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



Enser Consulting, LLC
 (303) 725-8836
 info@EC-Denver.com

Right-J® Worksheet

Entire House

SMC Construction Inc.

Job:
 Date: Mar 29, 2016
 By:
 Plan: Lot 1

17219 E. Easter Ave, Foxfield, CO 80016 Phone: 303-766-2004 Email: confrank@comcast.net Web: smcconstructioninc.com

1 Room name				Master Bath 11.0 ft				Master Bedroom 15.0 ft						
2 Exposed wall				9.0 ft heat/cool				9.0 ft heat/cool						
3 Room height				1.0 x 146.0 ft				1.0 x 234.0 ft						
4 Room dimensions				146.0 ft²				234.0 ft²						
5 Room area														
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	BG ICF R-26	0.037	n	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	n	2.53	0.70	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	n	14.49	9.94	0	0	0	0	0	0	0	0
	D	Door U 029	0.290	n	20.01	6.97	0	0	0	0	0	0	0	0
11	W	BG ICF R-26	0.037	e	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	e	2.53	0.70	0	0	0	0	0	0	0	0
	G	1F-c3ovd	0.210	e	14.49	35.46	0	0	0	0	0	0	0	0
	D	Door U 029	0.290	e	20.01	6.97	0	0	0	0	0	0	0	0
	W	BG ICF R-26	0.037	s	1.80	0.01	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	s	2.53	0.70	0	0	0	0	135	115	291	80
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	20	0	290	345
	W	BG ICF R-26	0.037	w	1.82	0.03	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	w	2.53	0.70	99	90	227	63	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	9	0	135	331	0	0	0	0
	C	16B-50ad	0.020	-	1.38	0.95	146	146	201	139	234	234	323	223
	F	21B-28t	0.015	-	1.03	0.00	0	0	0	0	0	0	0	0
6	c) AED excursion									158				47
	Envelope loss/gain								564	691			904	694
12	a) Infiltration								109	13			148	17
	b) Room ventilation								0	0			0	0
13	Internal gains:		Occupants @	230		0				0	1			230
			Appliances/other							0				700
	Subtotal (lines 6 to 13)								673	703			1052	1642
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								308	89			347	100
14	Subtotal								981	792			1399	1741
15	Duct loads								0	0	-0%	0%	0	0
	Total room load								981	792			1399	1741
	Air required (cfm)								57	61			81	134

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



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Uponor System Design Software 17.0.03 RSU06034

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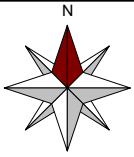
Right-J® Worksheet
Entire House
SMC Construction Inc.

Job:
Date: Mar 29, 2016
By:
Plan: Lot 1

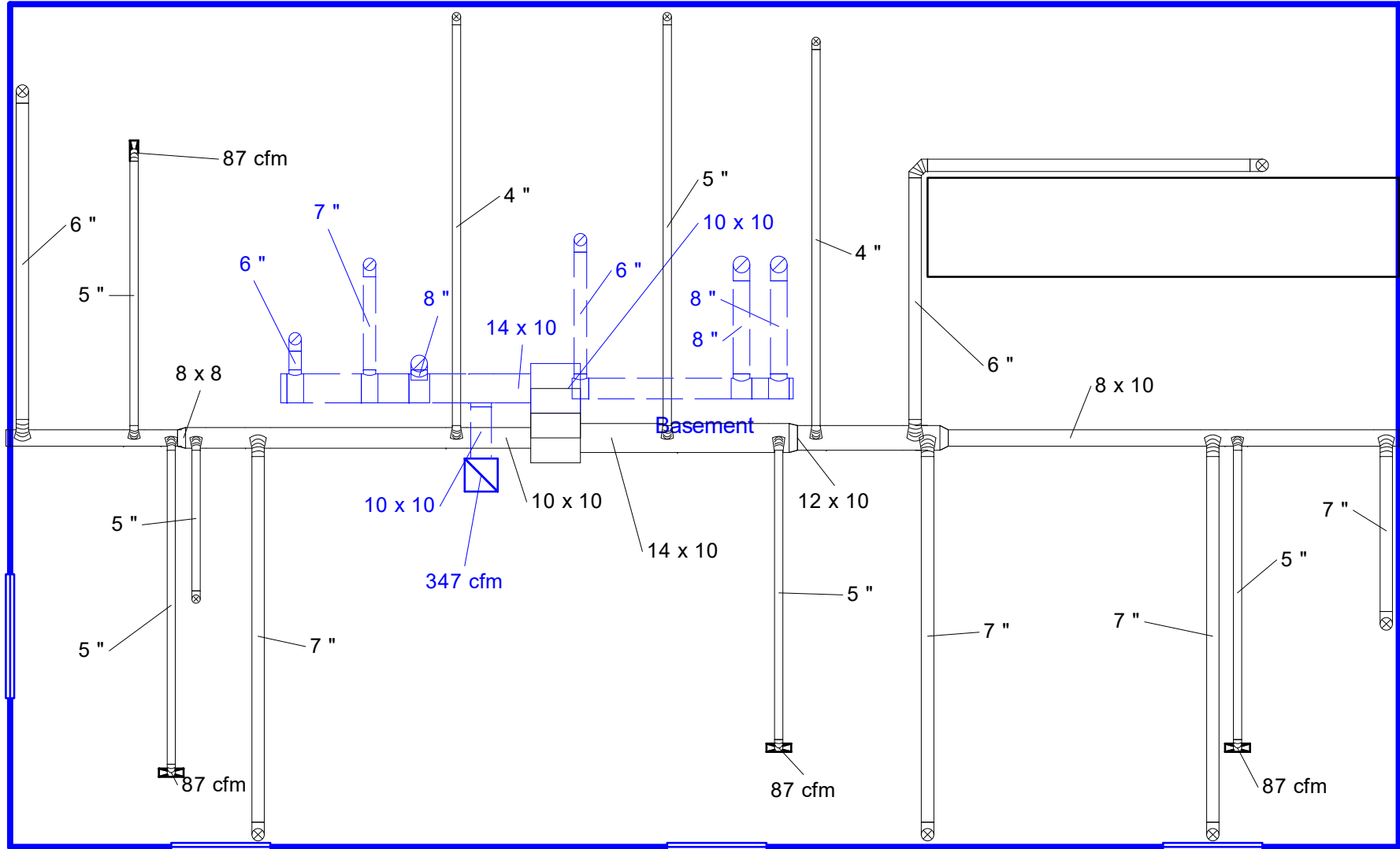
17219 E. Easter Ave, Foxfield, CO 80016 Phone: 303-766-2004 Email: confrank@comcast.net Web: smcconstructioninc.com

1 Room name				Master Closet 17.0 ft 9.0 ft heat/cool				Stairs 4.0 ft 9.0 ft heat/cool						
2 Exposed wall				8.0 x 9.0 ft				19.0 x 4.0 ft						
3 Room height				72.0 ft²				76.0 ft²						
4 Room dimensions														
5 Room area														
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	BG ICF R-26	0.037	n	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	n	2.53	0.70	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	n	14.49	9.94	0	0	0	0	0	0	0	0
	D	Door U 029	0.290	n	20.01	6.97	0	0	0	0	0	0	0	0
11	W	BG ICF R-26	0.037	e	1.87	0.08	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	e	2.53	0.70	0	0	0	0	36	36	91	25
	G	1F-c3ovd	0.210	e	14.49	35.46	0	0	0	0	0	0	0	0
	D	Door U 029	0.290	e	20.01	6.97	0	0	0	0	0	0	0	0
	W	BG ICF R-26	0.037	s	1.80	0.01	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	s	2.53	0.70	72	72	182	50	0	0	0	0
	G	1F-c3ov	0.210	s	14.49	17.23	0	0	0	0	0	0	0	0
	W	BG ICF R-26	0.037	w	1.82	0.03	0	0	0	0	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	0	0	0	0	0	0	0	0
	W	ICF Wall R26	0.037	w	2.53	0.70	81	81	205	57	0	0	0	0
	G	1F-c3ov	0.210	w	14.49	35.46	0	0	0	0	0	0	0	0
	C	16B-50ad	0.020	-	1.38	0.95	72	72	99	68	76	76	105	72
	F	21B-28t	0.015	-	1.03	0.00	0	0	0	0	0	0	0	0
6	c) AED excursion									-7				-3
	Envelope loss/gain								487	169			196	94
12	a) Infiltration								168	20			40	5
	b) Room ventilation								0	0			0	0
13	Internal gains:		Occupants @	230			0			0	0			0
			Appliances/other							0				0
	Subtotal (lines 6 to 13)								655	188			236	99
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								-655	-188			-236	-99
14	Subtotal								0	0			0	0
15	Duct loads								-0%	0%			0	0
	Total room load								0	0			0	0
	Air required (cfm)								0	0			0	0

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



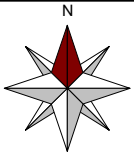
Basement Lot 1



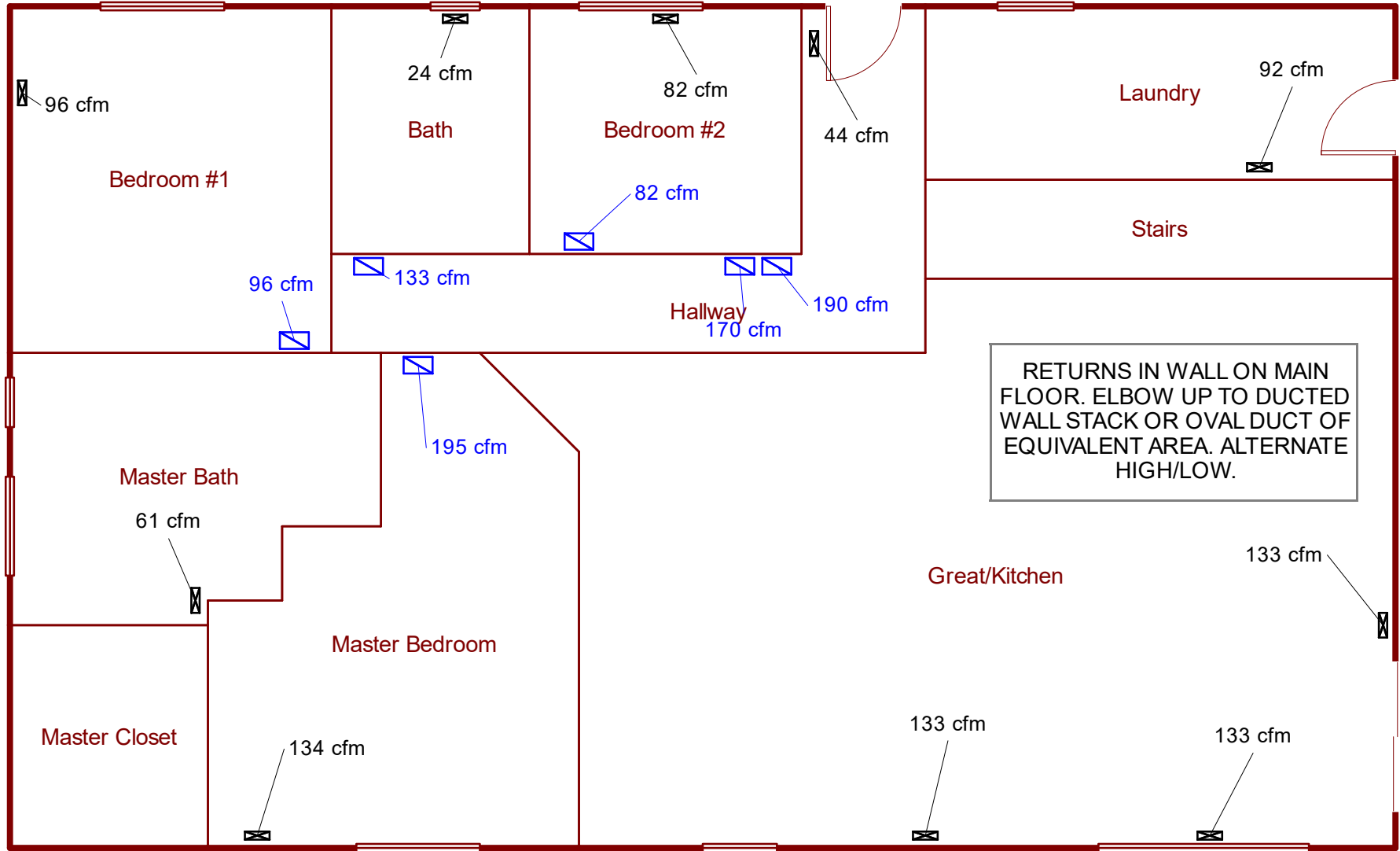
Job #:
Performed for:
Lot 1 Net Zero Home 1
16036 E. 10th Place
Aurora, CO 80016

SMC Construction Inc.
17219 E. Easter Ave
Foxfield, CO 80016
Phone: 303-766-2004
smcconstructioninc.com confrank@comcast.net

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Main Floor



RETURNS IN WALL ON MAIN FLOOR. ELBOW UP TO DUCTED WALL STACK OR OVAL DUCT OF EQUIVALENT AREA. ALTERNATE HIGH/LOW.

Job #:
Performed for:
Lot 1 Net Zero Home 1
16036 E. 10th Place
Aurora, CO 80016

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17219 E. Easter Ave
Foxfield, CO 80016
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Enser Consulting, LLC
 (303) 725-8836
 info@EC-Denver.com

Duct System Summary

Entire House

SMC Construction Inc.

Job:
 Date: Mar 29, 2016
 By:
 Plan: Lot 1

17219 E. Easter Ave, Foxfield, CO 80016 Phone: 303-766-2004 Email: confrank@comcast.net Web: smcconstructioninc.com

Project Information

For: Lot 1 Net Zero Home 1
 16036 E. 10th Place, Aurora, CO 80016

	Heating	Cooling
External static pressure	0.60 in H2O	0.60 in H2O
Pressure losses	0.06 in H2O	0.06 in H2O
Available static pressure	0.54 in H2O	0.54 in H2O
Supply / return available pressure	0.238 / 0.302 in H2O	0.238 / 0.302 in H2O
Lowest friction rate	0.079 in/100ft	0.079 in/100ft
Actual air flow	1000 cfm	1000 cfm
Total effective length (TEL)	680 ft	

Supply Branch Detail Table

Name	Design (Btuh)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
Basement	h 1503	87	34	0.107	5.0	0x0	ShMt	21.5	200.0	st1
Basement-A	h 1503	87	34	0.094	5.0	0x0	ShMt	29.0	225.0	st2A
Basement-B	h 1503	87	34	0.088	5.0	0x0	ShMt	40.0	230.0	st1B
Basement-C	h 1503	87	34	0.089	5.0	0x0	ShMt	28.5	240.0	st2A
Bath	h 420	24	13	0.101	4.0	0x0	ShMt	21.0	215.0	st2
Bedroom #1	c 1245	79	96	0.090	6.0	0x0	ShMt	35.5	230.0	st2A
Bedroom #2	c 1064	43	82	0.103	5.0	0x0	ShMt	21.5	210.0	st1
Great/Kitchen	c 1729	78	133	0.099	7.0	0x0	ShMt	31.0	210.0	st1A
Great/Kitchen-A	c 1729	78	133	0.086	7.0	0x0	ShMt	42.5	235.0	st1B
Great/Kitchen-B	c 1729	78	133	0.085	7.0	0x0	ShMt	41.0	240.0	st1B
Hallway	h 754	44	24	0.088	4.0	0x0	ShMt	26.5	245.0	st1A
Laundry	h 1599	92	57	0.079	6.0	0x0	ShMt	39.5	260.0	st1A
Master Bath	c 792	57	61	0.108	5.0	0x0	ShMt	21.0	200.0	st2
Master Bedroom	c 1741	81	134	0.100	7.0	0x0	ShMt	28.0	210.0	st2

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st2	Peak AVF	414	371	0.089	597	10.2	10 x 10	ShtMetl	
st2A	Peak AVF	253	163	0.089	569	8.4	8 x 8	ShtMetl	st2
st1B	Peak AVF	242	300	0.085	540	9.1	10 x 8	ShtMetl	st1A
st1A	Peak AVF	456	514	0.079	616	11.2	10 x 12	ShtMetl	st1
st1	Peak AVF	586	629	0.079	647	12.1	10 x 14	ShtMetl	

Return Branch Detail Table

Name	Grill Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb1	0x0	79	96	380.5	0.079	488	6.0	0x 0		ShMt	rt2
rb2	0x0	347	134	191.5	0.158	500	8.5	10x 10		ShMt	rt2
rb3	0x0	43	82	205.0	0.147	417	6.0	0x 0		ShMt	rt1
rb4	0x0	137	195	264.5	0.114	559	8.0	0x 0		ShMt	rt2
rb5	0x0	145	170	255.5	0.118	486	8.0	0x 0		ShMt	rt1
rb6	0x0	170	190	342.0	0.088	545	8.0	0x 0		ShMt	rt1
rb7	0x0	78	133	315.5	0.096	498	7.0	0x 0		ShMt	rt2

Return Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
rt1	Peak AVF	359	442	0.088	636	10.4	10 x 10	ShtMetl	
rt2	Peak AVF	641	558	0.079	660	12.2	10 x 14	ShtMetl	