



Load Short Form

Entire House

Gil Rossmiller

Job:
Date:
By: Gil Rossmiller

Project Information

For: Colorado ED Inst. March 2012

Design Information

	Htg	Clg	Infiltration	
Outside db (°F)	-3	90	Method	Simplified
Inside db (°F)	70	75	Construction quality	Average
Design TD (°F)	73	15	Fireplaces	0
Daily range	-	H		
Inside humidity (%)	30	50		
Moisture difference (gr/lb)	35	-36		

HEATING EQUIPMENT

Make Carrier
Trade Carrier
Model 58MCB040-12x
AHRI ref no. 144278

Efficiency 92.1 AFUE
Heating input 40000 Btuh
Heating output 33156 Btuh
Temperature rise 44 °F
Actual air flow 830 cfm
Air flow factor 0.031 cfm/Btuh
Static pressure 0.70 in H2O
Space thermostat

COOLING EQUIPMENT

Make Carrier
Trade Base 13 Puron AC
Cond 24ABA324A30
Coil CAP**2414A***+TDR
AHRI ref no. 738723

Efficiency 11.6 EER, 13 SEER
Sensible cooling 18148 Btuh
Latent cooling 3203 Btuh
Total cooling 21350 Btuh
Actual air flow 995 cfm
Air flow factor 0.067 cfm/Btuh
Static pressure 0.70 in H2O
Load sensible heat ratio 1.00

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Living	513	4858	2437	150	162
Dining	108	1087	498	34	33
Kitchen	256	3143	3303	97	220
Laundry	99	611	262	19	17
Bed 1	192	2128	1333	66	89
Garage	462	0	0	0	0
Mst. Closet	80	0	0	0	0
Mst. Bath	80	1223	618	38	41
Stair well	112	0	0	0	0
Recreation	896	5277	2541	163	169
Storage/Furnace	336	1177	0	36	0
Bed 4	224	1517	701	47	47
Bed 3	224	1670	829	52	55
Master Bedroom	368	4162	2432	129	162
Stairs	112	0	0	0	0

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



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Entire House	4062	26853	14954	830	995
Other equip loads		4213	877		
Equip. @ 1.00 RSM			15832		
Latent cooling			0		
TOTALS	4062	31066	15832	830	995

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



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Project Information

For: Colorado ED Inst. March 2012

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

-3
 -
 -
 15.0

Cooling

90
 27 (H)
 59
 7.5

Indoor:

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

Heating

70
 73
 30
 35.3

Cooling

75
 15
 50
 -35.9

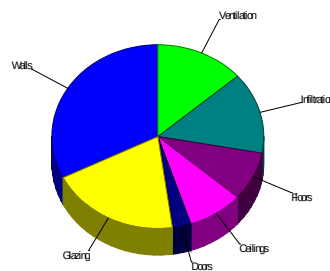
Infiltration:

Method
 Construction quality
 Fireplaces

Simplified
 Average
 0

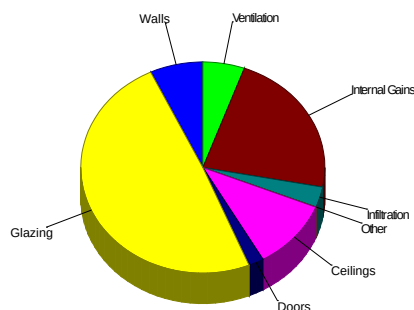
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	3.8	10053	32.4
Glazing	23.4	6167	19.9
Doors	21.0	882	2.8
Ceilings	1.2	2640	8.5
Floors	1.2	2657	8.6
Infiltration	3.5	4454	14.3
Ducts		0	0
Piping		0	0
Humidification		0	0
Ventilation		4213	13.6
Adjustments		0	
Total		31066	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	0.4	1115	7.0
Glazing	29.5	7779	49.1
Doors	7.6	319	2.0
Ceilings	0.7	1690	10.7
Floors	0.0	4	0.0
Infiltration	0.4	497	3.1
Ducts		0	0
Ventilation		877	5.5
Internal gains		3550	22.4
Blower		0	0
Adjustments		0	
Total		15832	100.0



Latent Cooling Load = 0 Btuh
 Overall U-value = 0.077 Btuh/ft²-°F

Data entries checked.

Project Information

For: Colorado ED Inst. March 2012

Design Conditions

Location:		Indoor:		Heating	Cooling
Denver, CO, US		Indoor temperature (°F)		70	75
Elevation: 5331 ft		Design TD (°F)		73	15
Latitude: 40°N		Relative humidity (%)		30	50
		Moisture difference (gr/lb)		35.3	-35.9
Outdoor:	Heating	Cooling			
Dry bulb (°F)	-3	90			
Daily range (°F)	-	27 (H)			
Wet bulb (°F)	-	59			
Wind speed (mph)	15.0	7.5			
		Infiltration:			
		Method	Simplified		
		Construction quality	Average		
		Fireplaces	0		

Construction descriptions

	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
Walls								
12F-0sw: Frm wall, wd ext, 1/2" wood shth, r-21 cav ins, 1/2" gypsum board int fnsh, 2"x6" wood frm	ne	254	0.065	21.0	4.74	1205	0.78	199
	se	223	0.065	21.0	4.74	1058	0.78	175
	sw	242	0.065	21.0	4.74	1148	0.78	190
	nw	388	0.065	21.0	4.74	1841	0.78	304
	all	1107	0.065	21.0	4.74	5253	0.78	867
15B13-0wc-8: Bg wall, light dry soil, 2"x4" wood int frm, concrete wall, r-13 cav ins, 8" thk, 1/2" gypsum board int fnsh	ne	236	0.049	13.0	3.30	780	0	0
	se	448	0.049	13.0	3.58	1602	0	0
	sw	216	0.049	13.0	2.98	644	0	0
	nw	388	0.049	13.0	3.08	1195	0	0
	all	1288	0.049	13.0	3.28	4222	0	0
Partitions								
12E-0sw: Frm wall, wd ext, 1/2" wood shth, r-19 cav ins, 1/2" gypsum board int fnsh, 2"x6" wood frm		243	0.068	19.0	2.38	578	1.02	248
Windows								
Low E u 32 SHGC 40: 1 glazing, clr glz, mtl no brk frm mat, 1/8" thk; NFRC rated (SHGC=0.40); 50% blinds 45°, medium; 50% outdoor insect screen; 2 ft overhang (3 ft window ht, 2 ft sep.)	ne	18	0.320	0	23.4	420	21.4	386
	se	36	0.320	0	23.4	841	23.4	844
	sw	18	0.320	0	23.4	420	23.4	422
	nw	18	0.320	0	23.4	420	21.4	386
	all	90	0.320	0	23.4	2102	22.6	2037
Low E u 32 SHGC 40: 1 glazing, clr glz, mtl no brk frm mat, 1/8" thk; NFRC rated (SHGC=0.40); 50% blinds 45°, medium; 50% outdoor insect screen	ne	20	0.320	0	23.4	467	21.4	429
	sw	40	0.320	0	23.4	934	26.3	1052
	nw	60	0.320	0	23.4	1402	21.4	1286
	all	120	0.320	0	23.4	2803	23.1	2766
Low E u 32 SHGC 40: 1 glazing, clr glz, mtl no brk frm mat, 1/8" thk; NFRC rated (SHGC=0.40); 50% blinds 45°, medium; 50% outdoor insect screen; 2 ft overhang (2 ft window ht, 2 ft sep.)	sw	12	0.320	0	23.4	280	22.0	264
	nw	12	0.320	0	23.4	280	21.4	257
	all	24	0.320	0	23.4	561	21.7	521
Low E u 32 SHGC 40: 1 glazing, clr glz, mtl no brk frm mat, 1/8" thk; NFRC rated (SHGC=0.40); 50% blinds 45°, medium; 50% outdoor insect screen; 2 ft overhang (5 ft window ht, 2 ft sep.)	nw	30	0.320	0	23.4	701	21.4	643
Doors								
11N0: Door, mtl eps core type	se	21	0.350	8.7	25.5	537	8.14	171

11A0: Door, wd hc type	n	21	0.470	0	16.5	345	7.05	148
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Ceilings

16B-50ad: Attic ceiling, asphalt shingles roof mat, r-50 ceil ins, 1/2" gypsum board int fnsh		2270	0.020	50.0	1.16	2640	0.74	1690
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Floors

20P-0t: Flr floor, 80 lb/ft³ concrete flr, 5" thkns, gar ovr		462	0.521	0	0	0	0	0
20P-30c: Flr floor, frm flr, 12" thkns, carpet flr fnsh, r-30 cav ins, amb ovr		16	0.035	30.0	2.56	41	0.24	4
21A-32c: Bg floor, light dry soil, 8' depth, carpet flr fnsh		560	0.020	0	1.46	818	0	0
		896	0.020	0	1.46	1308	0	0
	all	1456	0.020	0	1.46	2126	0	0
21A-32v: Bg floor, light dry soil, 8' depth, vinyl flr fnsh		336	0.020	0	1.46	491	0	0





Project Summary

Entire House
Gil Rossmiller

Job:
Date:
By: Gil Rossmiller

Project Information

For: Colorado ED Inst. March 2012

Notes:

Design Information

Weather: Denver, CO, US

Winter Design Conditions

Outside db	-3 °F
Inside db	70 °F
Design TD	73 °F

Summer Design Conditions

Outside db	90 °F
Inside db	75 °F
Design TD	15 °F
Daily range	H
Relative humidity	50 %
Moisture difference	-36 gr/lb

Heating Summary

Structure	26853 Btuh
Ducts	0 Btuh
Central vent (64 cfm)	4213 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	31066 Btuh

Sensible Cooling Equipment Load Sizing

Structure	14954 Btuh
Ducts	0 Btuh
Central vent (64 cfm)	877 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	15832 Btuh

Infiltration

Method	Simplified
Construction quality	Average
Fireplaces	0

	Heating	Cooling
Area (ft ²)	3600	3600
Volume (ft ³)	14464	14464
Air changes/hour	0.28	0.15
Equiv. AVF (cfm)	67	36

Latent Cooling Equipment Load Sizing

Structure	274 Btuh
Ducts	0 Btuh
Central vent (64 cfm)	-1281 Btuh
Equipment latent load	0 Btuh
Equipment total load	15832 Btuh
Req. total capacity at 0.85 SHR	1.6 ton

Heating Equipment Summary

Make	Carrier
Trade	Carrier
Model	58MCB040-12x
AHRI ref no.	144278

Efficiency	92.1 AFUE
Heating input	40000 Btuh
Heating output	33156 Btuh
Temperature rise	44 °F
Actual air flow	830 cfm
Air flow factor	0.031 cfm/Btuh
Static pressure	0.70 in H2O
Space thermostat	

Cooling Equipment Summary

Make	Carrier
Trade	Base 13 Puron AC
Cond	24ABA324A30
Coil	CAP**2414A***TDR
AHRI ref no.	738723
Efficiency	11.6 EER, 13 SEER
Sensible cooling	18148 Btuh
Latent cooling	3203 Btuh
Total cooling	21350 Btuh
Actual air flow	995 cfm
Air flow factor	0.067 cfm/Btuh
Static pressure	0.70 in H2O
Load sensible heat ratio	1.00

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



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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

-3
 -
 -
 15.0

Cooling

90
 27 (H)
 59
 7.5

Indoor:

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

Heating

70
 73
 30
 35.3

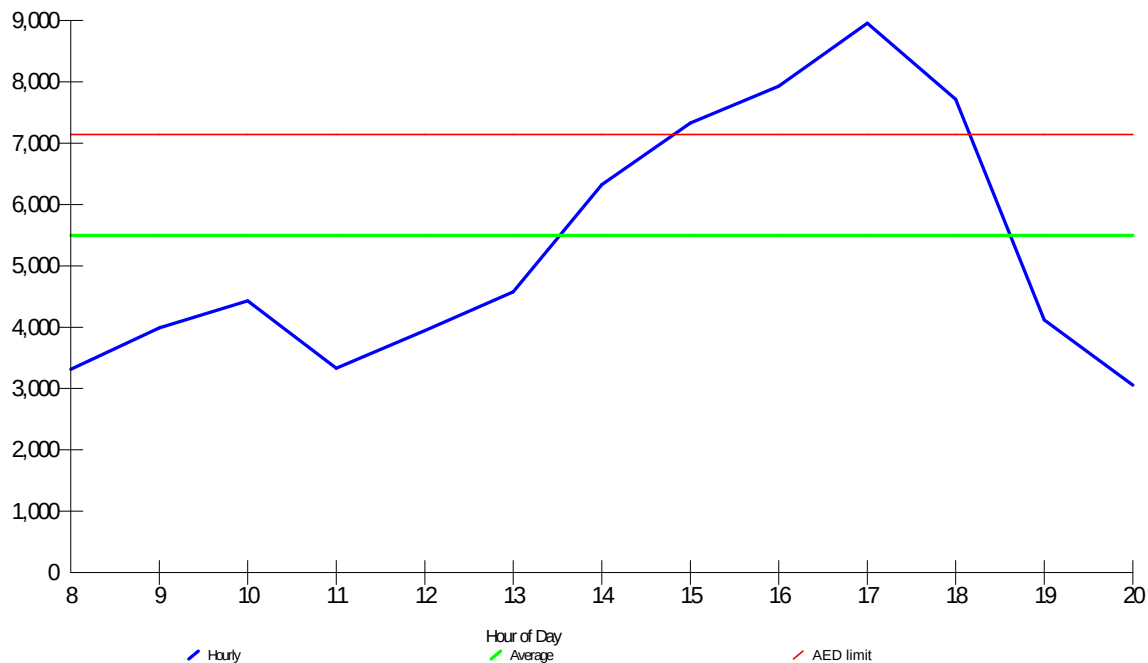
Cooling

75
 15
 50
 -35.9

Infiltration:

Test for Adequate Exposure Diversity

Hourly Glazing Load



Maximum hourly glazing load exceeds average by 63.0%.

House does not have adequate exposure diversity (AED), based on AED limit of 30%.

AED excursion: 1812 Btuh (PFG - 1.3*AFG)

1	Room name					Entire House					Living			
2	Exposed wall					400.0 ft					42.0 ft			
3	Ceiling height					8.0 ft					8.0 ft			
4	Room dimensions					8.0 ft					1.0 x 513.0 ft			
5	Room area					4062.0 ft²					513.0 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	12F-0sw	0.065	ne	4.74	0.78	272	254	1205	199	56	56	266	44
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	18	0	420	386	0	0	0	0
	W	15B13-0wc-8	0.093	ne	3.30	0.00	256	236	780	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	20	0	467	429	0	0	0	0
11	W	12F-0sw	0.065	se	4.74	0.78	280	223	1058	175	280	223	1058	175
	G	Low E u 32 SHGC 40	0.320	se	23.36	23.43	36	12	841	844	36	6	841	844
	D	11N0	0.350	se	25.55	8.14	21	21	537	171	21	21	537	171
	W	15B13-0wc-8	0.093	se	3.58	0.00	448	448	1602	0	0	0	0	0
	W	12F-0sw	0.065	sw	4.74	0.78	272	242	1148	190	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	sw	23.36	22.00	12	6	280	264	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	sw	23.36	23.43	18	6	420	422	0	0	0	0
	W	15B13-0wc-8	0.093	sw	2.98	0.00	256	216	644	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	sw	23.36	26.30	40	0	934	1052	0	0	0	0
	W	12F-0sw	0.065	nw	4.74	0.78	448	388	1841	304	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	12	0	280	257	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	18	0	420	386	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	30	0	701	643	0	0	0	0
	W	15B13-0wc-8	0.093	nw	3.08	0.00	448	388	1195	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	60	0	1402	1286	0	0	0	0
	R	12E-0sw	0.068	-	2.38	1.02	264	243	578	248	0	0	0	0
	D	11A0	0.470	n	16.45	7.05	21	21	345	148	0	0	0	0
	C	16B-50ad	0.020	-	1.16	0.74	2270	2270	2640	1690	513	513	749	480
	F	20P-0t	0.521	-	0.00	0.00	462	462	0	0	0	0	0	0
	F	20P-30c	0.035	-	2.56	0.24	16	16	41	4	0	0	0	0
	F	21A-32c	0.020	-	1.46	0.00	560	560	818	0	0	0	0	0
	F	21A-32c	0.020	-	1.46	0.00	896	896	1308	0	0	0	0	0
	F	21A-32v	0.020	-	1.46	0.00	336	336	491	0	0	0	0	0
														</

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

1	Room name					Dining					Kitchen				
2	Exposed wall					9.0 ft					32.0 ft				
3	Ceiling height					heat/cool					heat/cool				
4	Room dimensions					8.0 ft 12.0 x 9.0 ft					8.0 ft 16.0 x 16.0 ft				
5	Room area					108.0 ft²					256.0 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	12F-0sw	0.065	ne	4.74	0.78	72	54	256	42	128	128	607	100	
11	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	18	0	420	386	0	0	0	0	
	W	15B13-0wc-8	0.093	ne	3.30	0.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0	
	W	12F-0sw	0.065	se	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	se	23.36	23.43	0	0	0	0	0	0	0	0	
	D	11N0	0.350	se	25.55	8.14	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	se	3.58	0.00	0	0	0	0	0	0	0	0	
	W	12F-0sw	0.065	sw	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	22.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	23.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	sw	2.98	0.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	26.30	0	0	0	0	0	0	0	0	
	W	12F-0sw	0.065	nw	4.74	0.78	0	0	0	0	128	110	522	86	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	18	0	420	386	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	nw	3.08	0.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	R	12E-0sw	0.068	-	2.38	1.02	0	0	0	0	0	0	0	0	
	D	11A0	0.470	n	16.45	7.05	0	0	0	0	0	0	0	0	
C	16B-50ad	0.020	-	1.16	0.74	108	108	158	101	256	256	374	239		
F	20P-0t	0.521	-	0.00	0.00	0	0	0	0	0	0	0	0		
F	20P-30c	0.035	-	2.56	0.24	0	0	0	0	0	0	0	0		
F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0		
F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0		
F	21A-32v	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0		

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1	Room name					Laundry					Bed 1				
2	Exposed wall					0 ft					16.0 ft				
3	Ceiling height					8.0 ft					8.0 ft				
4	Room dimensions					9.0 x 11.0 ft					12.0 x 16.0 ft				
5	Room area					99.0 ft²					192.0 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	12F-0sw	0.065	ne	4.74	0.78	0	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0	0
	W	15B13-0wc-8	0.093	ne	3.30	0.00	0	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0	0
11	W	12F-0sw	0.065	se	4.74	0.78	0	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	se	23.36	23.43	0	0	0	0	0	0	0	0	0
	D	11N0	0.350	se	25.55	8.14	0	0	0	0	0	0	0	0	0
	W	15B13-0wc-8	0.093	se	3.58	0.00	0	0	0	0	0	0	0	0	0
	W	12F-0sw	0.065	sw	4.74	0.78	0	0	0	0	128	110	522	86	0
	G	Low E u 32 SHGC 40	0.320	sw	23.36	22.00	0	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	sw	23.36	23.43	0	0	0	0	18	3	420	422	0
	W	15B13-0wc-8	0.093	sw	2.98	0.00	0	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	sw	23.36	26.30	0	0	0	0	0	0	0	0	0
	W	12F-0sw	0.065	nw	4.74	0.78	0	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	0
	W	15B13-0wc-8	0.093	nw	3.08	0.00	0	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	0
	R	12E-0sw	0.068	-	2.38	1.02	72	51	121	52	192	192	457	196	0
	D	11A0	0.470	n	16.45	7.05	21	21	345	148	0	0	0	0	0
	C	16B-50ad	0.020	-	1.16	0.74	99	99	145	93	192	192	280	180	0
	F	20P-0t	0.521	-	0.00	0.00	0	0	0	0	0	0	0	0	0
	F	20P-30c	0.035	-	2.56	0.24	0	0	0	0	0	0	0	0	0
	F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0	0
	F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0	0
	F	21A-32v	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0	0
6	c) AED excursion									-31					170
	Envelope loss/gain								611	262			1680	1053	
12	a) Infiltration								0	0			448	50	
	b) Room ventilation								0	0			0	0	
13	Internal gains: Occupants @ 230						0			0	1			230	0
	Appliances/other									0				0	
	Subtotal (lines 6 to 13)								611	262			2128	1333	
	Less external load								0	0			0	0	
	Less transfer								0	0			0	0	
	Redistribution								0	0			0	0	
14	Subtotal								611	262			2128	1333	
15	Duct loads						-0%	0%	0	0		-0%	0%	0	0
	Total room load								611	262			2128	1333	
	Air required (cfm)								19	17			66	89	

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

1	Room name					Garage 65.0 ft				Mst. Closet 0 ft				
2	Exposed wall					8.0 ft				8.0 ft				
3	Ceiling height					uncondit.				heat/cool				
4	Room dimensions					21.0 x 22.0 ft				10.0 x 8.0 ft				
5	Room area					462.0 ft²				80.0 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	12F-0sw	0.065	ne	4.74	0.78	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0
	W	15B13-0wc-8	0.093	ne	3.30	0.00	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0
11	W	12F-0sw	0.065	se	4.74	0.78	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	se	23.36	23.43	0	0	0	0	0	0	0	0
	D	11N0	0.350	se	25.55	8.14	0	0	0	0	0	0	0	0
	W	15B13-0wc-8	0.093	se	3.58	0.00	0	0	0	0	0	0	0	0
	W	12F-0sw	0.065	sw	4.74	0.78	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	sw	23.36	22.00	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	sw	23.36	23.43	0	0	0	0	0	0	0	0
	W	15B13-0wc-8	0.093	sw	2.98	0.00	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	sw	23.36	26.30	0	0	0	0	0	0	0	0
	W	12F-0sw	0.065	nw	4.74	0.78	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0
	W	15B13-0wc-8	0.093	nw	3.08	0.00	0	0	0	0	0	0	0	0
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0
	R	12E-0sw	0.068	-	2.38	1.02	0	0	0	0	0	0	0	0
	D	11A0	0.470	n	16.45	7.05	0	0	0	0	0	0	0	0
	C	16B-50ad	0.020	-	1.16	0.74	462	462	0	0	80	80	117	75
	F	20P-0t	0.521	-	0.00	0.00	462	462	0	0	0	0	0	0
	F	20P-30c	0.035	-	2.56	0.24	0	0	0	0	0	0	0	0
	F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0
	F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0
	F	21A-32v	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0

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

1	Room name					Mst. Bath 10.0 ft					Stair well 8.0 ft				
2	Exposed wall					8.0 ft					8.0 ft				
3	Ceiling height					heat/cool					heat/cool				
4	Room dimensions					10.0 x 8.0 ft					8.0 x 14.0 ft				
5	Room area					80.0 ft²					112.0 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	12F-0sw	0.065	ne	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	ne	3.30	0.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0	
11	W	12F-0sw	0.065	se	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	se	23.36	23.43	0	0	0	0	0	0	0	0	
	D	11N0	0.350	se	25.55	8.14	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	se	3.58	0.00	0	0	0	0	0	0	0	0	
	W	12F-0sw	0.065	sw	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	22.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	23.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	sw	2.98	0.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	26.30	0	0	0	0	0	0	0	0	
	W	12F-0sw	0.065	nw	4.74	0.78	80	68	323	53	64	64	304	50	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	12	0	280	257	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	nw	3.08	0.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	R	12E-0sw	0.068	-	2.38	1.02	0	0	0	0	0	0	0	0	
	D	11A0	0.470	n	16.45	7.05	0	0	0	0	0	0	0	0	
	C	16B-50ad	0.020	-	1.16	0.74	80	80	117	75	112	112	164	105	
	F	20P-0t	0.521	-	0.00	0.00	0	0	0	0	0	0	0	0	
	F	20P-30c	0.035	-	2.56	0.24	0	0	0	0	0	0	0	0	
	F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0	
	F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0	
	F	21A-32v	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0	

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

1	Room name					Recreation 84.0 ft					Storage/Furnace 24.0 ft				
2	Exposed wall					8.0 ft 1.0 x 896.0 ft heat/cool					8.0 ft 24.0 x 14.0 ft heat/cool				
3	Ceiling height														
4	Room dimensions														
5	Room area					896.0 ft²					336.0 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	12F-0sw	0.065	ne	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	ne	3.30	0.00	32	32	114	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0	
11	W	12F-0sw	0.065	se	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	se	23.36	23.43	0	0	0	0	0	0	0	0	
	D	11N0	0.350	se	25.55	8.14	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	se	3.58	0.00	128	128	458	0	192	192	687	0	
	W	12F-0sw	0.065	sw	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	22.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	23.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	sw	2.98	0.00	256	216	644	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	26.30	40	0	934	1052	0	0	0	0	
	W	12F-0sw	0.065	nw	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	nw	3.08	0.00	256	216	644	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	40	0	934	857	0	0	0	0	
	R	12E-0sw	0.068	-	2.38	1.02	0	0	0	0	0	0	0	0	
	D	11A0	0.470	n	16.45	7.05	0	0	0	0	0	0	0	0	
	C	16B-50ad	0.020	-	1.16	0.74	0	0	0	0	0	0	0	0	
	F	20P-0t	0.521	-	0.00	0.00	0	0	0	0	0	0	0	0	
	F	20P-30c	0.035	-	2.56	0.24	0	0	0	0	0	0	0	0	
	F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0	
	F	21A-32c	0.020	-	1.46	0.00	896	896	1308	0	0	0	0	0	
	F	21A-32v	0.020	-	1.46	0.00	0	0	0	0	336	336	491	0	
											</				

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

1	Room name					Bed 4 30.0 ft 8.0 ft 16.0 x 14.0 ft heat/cool 224.0 ft²					Bed 3 30.0 ft 8.0 ft 16.0 x 14.0 ft heat/cool 224.0 ft²				
2	Exposed wall														
3	Ceiling height														
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 . . . 11 .															

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

1	Room name					Master Bedroom					Stairs				
2	Exposed wall					42.0 ft					8.0 ft				
3	Ceiling height					8.0 ft					8.0 ft				
4	Room dimensions					1.0 x 368.0 ft					8.0 x 14.0 ft				
5	Room area					368.0 ft²					112.0 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	12F-0sw	0.065	ne	4.74	0.78	16	16	76	13	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	ne	3.30	0.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	ne	23.36	21.43	0	0	0	0	0	0	0	0	
11	W	12F-0sw	0.065	se	4.74	0.78	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	se	23.36	23.43	0	0	0	0	0	0	0	0	
	D	11N0	0.350	se	25.55	8.14	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	se	3.58	0.00	0	0	0	0	0	0	0	0	
	W	12F-0sw	0.065	sw	4.74	0.78	144	132	626	103	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	22.00	12	3	280	264	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	23.43	0	0	0	0	0	0	0	0	
	W	15B13-0wc-8	0.093	sw	2.98	0.00	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	sw	23.36	26.30	0	0	0	0	0	0	0	0	
	W	12F-0sw	0.065	nw	4.74	0.78	176	146	693	114	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	30	0	701	643	0	0	0	0	
	W	15B13-0wc-8	0.093	nw	3.08	0.00	0	0	0	0	64	64	229	0	
	G	Low E u 32 SHGC 40	0.320	nw	23.36	21.43	0	0	0	0	0	0	0	0	
	R	12E-0sw	0.068	-	2.38	1.02	0	0	0	0	0	0	0	0	
	D	11A0	0.470	n	16.45	7.05	0	0	0	0	0	0	0	0	
	C	16B-50ad	0.020	-	1.16	0.74	368	368	537	344	0	0	0	0	
	F	20P-0t	0.521	-	0.00	0.00	0	0	0	0	0	0	0	0	
	F	20P-30c	0.035	-	2.56	0.24	16	16	41	4	0	0	0	0	
	F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	112	112	164	0	
	F	21A-32c	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0	
	F	21A-32v	0.020	-	1.46	0.00	0	0	0	0	0	0	0	0	

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

Project Information

For: Colorado ED Inst. March 2012

Design Conditions

Location:

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

Indoor:

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

Heating

70
 73
 30
 35.3

Cooling

75
 15
 50
 -35.9

Outdoor:

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

Heating

-3
 -
 -
 15.0

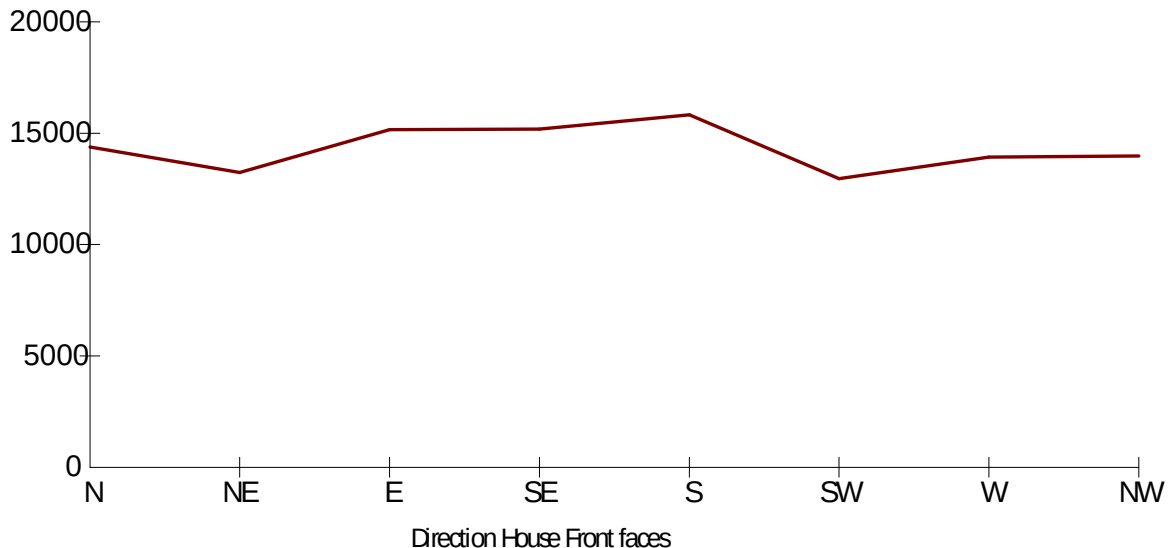
Cooling

90
 27 (H)
 59
 7.5

Infiltration:

House Front	North	Northeast	East	Southeast	South	Southwest	West	Northwest
Sensible Load (Btuh)	14385	13243	15156	15192	15832	12963	13933	13976
Latent Load (Btuh)	0	0	0	0	0	0	0	0
Total Load (Btuh)	14385	13243	15156	15192	15832	12963	13933	13976
Heating AVF (cfm)	830	830	830	830	830	830	830	830
Cooling AVF (cfm)	995	995	995	995	995	995	995	995

Building Orientation Cooling Load

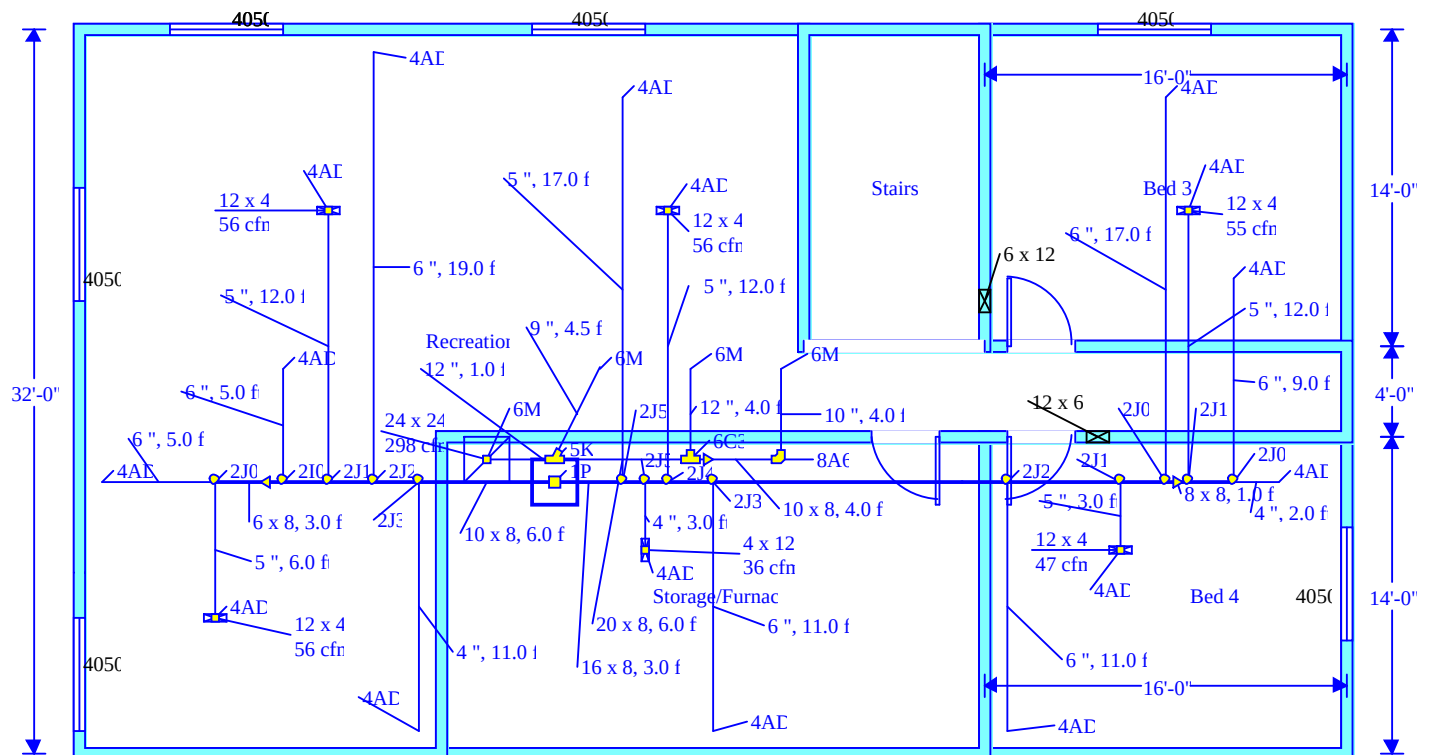


Current Orientation: House Front faces South
 Highest Cooling Load: House Front faces South

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



Basement



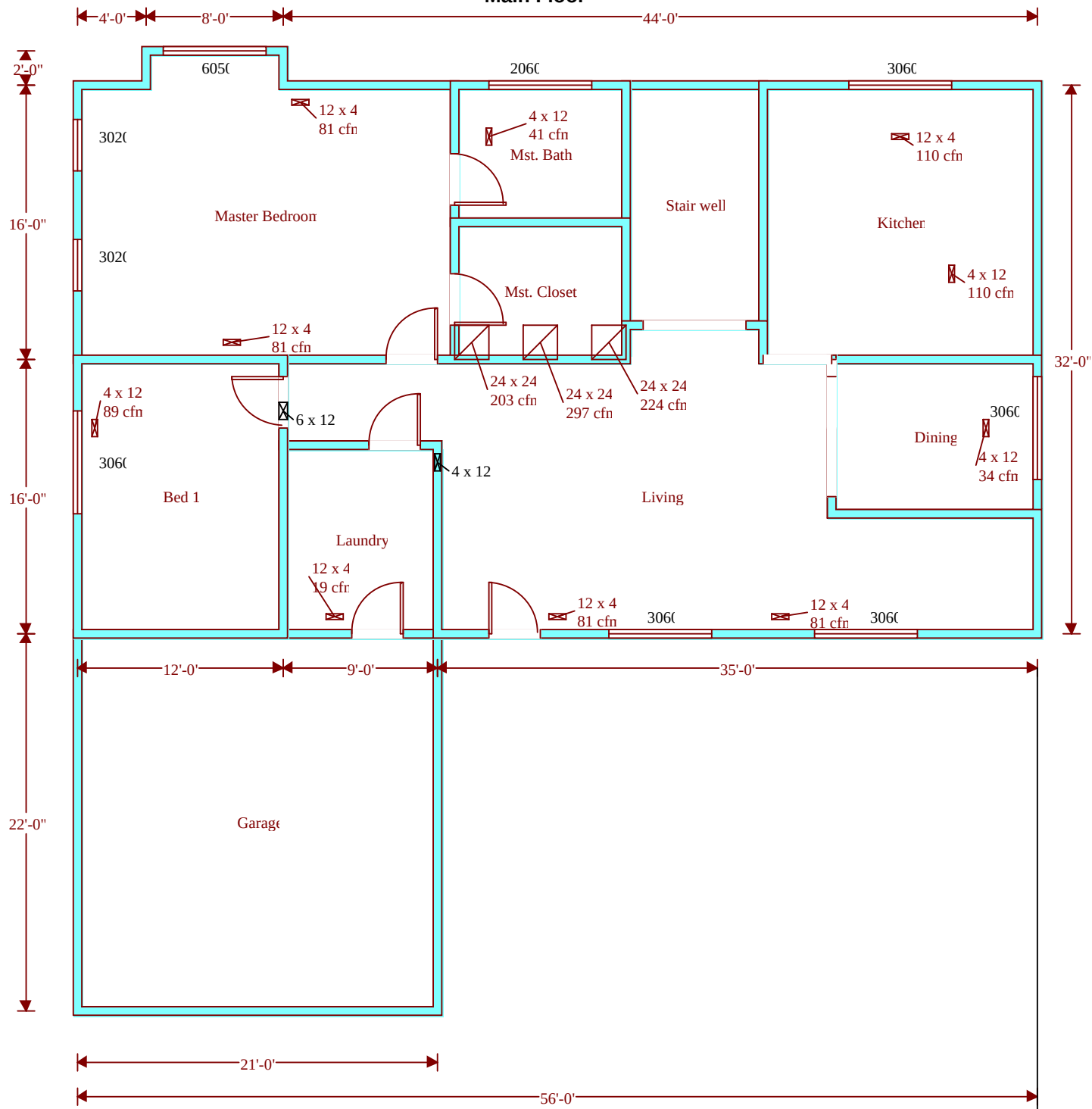
Job #:
Performed by Gil Rossmiller for:
Colorado ED Inst. March 2012

Gil Rossmiller

Scale: 1 : 102
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Main Floor



Job #:
Performed by Gil Rossmiller for:
Colorado ED Inst. March 2012

Gil Rossmiller

Scale: 1 : 102
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Duct System Summary

Entire House

Gil Rossmiller

Job:
Date:
By: Gil Rossmiller

Project Information

For: Colorado ED Inst. March 2012

	Heating	Cooling
External static pressure	0.70 in H ₂ O	0.70 in H ₂ O
Pressure losses	0.41 in H ₂ O	0.41 in H ₂ O
Available static pressure	0.29 in H ₂ O	0.29 in H ₂ O
Supply / return available pressure	0.18 / 0.11 in H ₂ O	0.18 / 0.11 in H ₂ O
Lowest friction rate	0.095 in/100ft	0.095 in/100ft
Actual air flow	830 cfm	995 cfm
Total effective length (TEL)	305 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
Bed 1-A	c 1333	66	89	0.100	6.0	0x0	ShMt	20.0	160.0	st1A
Bed 3	c 829	52	55	0.095	5.0	0x0	ShMt	40.0	150.0	st2A
Bed 4	h 1517	47	47	0.108	5.0	0x0	ShMt	28.0	140.0	st2
Dining	h 1087	34	33	0.105	4.0	0x0	ShMt	32.0	140.0	st2A
Kitchen	c 1652	49	110	0.104	6.0	0x0	ShMt	44.0	130.0	st2
Kitchen-A	c 1652	49	110	0.101	6.0	0x0	ShMt	39.0	140.0	st2A
Laundry	h 611	19	17	0.108	4.0	0x0	ShMt	17.0	150.0	st1
Living-A	c 1219	75	81	0.108	6.0	0x0	ShMt	18.0	150.0	st2
Living-B	c 1219	75	81	0.103	6.0	0x0	ShMt	31.0	145.0	st2
Master Bedroom	c 1216	64	81	0.105	6.0	0x0	ShMt	27.0	145.0	st1
Master Bedroom-A	c 1216	64	81	0.112	6.0	0x0	ShMt	17.0	145.0	st1
Mst. Bath	c 618	38	41	0.100	5.0	0x0	ShMt	20.0	160.0	st2
Recreation	c 847	54	56	0.112	5.0	0x0	ShMt	22.0	140.0	st1
Recreation-A	c 847	54	56	0.105	5.0	0x0	ShMt	17.0	155.0	st2
Recreation-B	c 847	54	56	0.100	5.0	0x0	ShMt	21.0	160.0	st1A
Storage/Furnace	h 1177	36	0	0.108	4.0	0x0	ShMt	7.0	160.0	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	508	614	0.095	691	11.6	8 x 16	ShtMetl	st2 st1
st1	Peak AVF	322	381	0.100	685	9.6	8 x 10	ShtMetl	
st2A	Peak AVF	134	198	0.095	446	7.6	8 x 8	ShtMetl	
st1A	Peak AVF	120	145	0.100	435	6.7	8 x 6	ShtMetl	



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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
rb6	0x 0	157	224	109.0	0.100	411	10.0	0x 0		ShMt	rt1A
rb5	0x 0	208	297	115.0	0.095	378	12.0	0x 0		ShMt	rt1
rb1	0x 0	298	271	33.0	0.331	379	12.0	0x 0		ShMt	
rb3	0x 0	166	203	34.5	0.317	459	9.0	0x 0		ShMt	

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	366	521	0.095	469	10.9	8 x 20	ShtMetl	
rt1A	Peak AVF	157	224	0.100	403	7.9	8 x 10	ShtMetl	rt1