

### Project Information

For: Christensen Bath House  
 38625 Rolling Hills Lane, Steamboat Springs/Routt County, CO 80487

### Design Information

|                             | Htg | Clg | Infiltration         |            |
|-----------------------------|-----|-----|----------------------|------------|
| Outside db (°F)             | -15 | 85  | Method               | Simplified |
| Inside db (°F)              | 70  | 75  | Construction quality | Tight      |
| Design TD (°F)              | 85  | 10  | Fireplaces           | 0          |
| Daily range                 | -   | H   |                      |            |
| Inside humidity (%)         | 30  | 50  |                      |            |
| Moisture difference (gr/lb) | 40  | -44 |                      |            |

### HEATING EQUIPMENT

Make  
 Trade  
 Model  
 AHRI ref n/a

Efficiency 100 EFF  
 Heating input 0 Btuh  
 Heating output 6387 Btuh  
 Temperature rise 0 °F  
 Actual air flow 0 cfm  
 Air flow factor 0 cfm/Btuh  
 Static pressure 0 in H2O  
 Space thermostat

### COOLING EQUIPMENT

Make n/a  
 Trade n/a  
 Cond n/a  
 Coil n/a  
 AHRI ref n/a

Efficiency n/a  
 Sensible cooling 0 Btuh  
 Latent cooling 0 Btuh  
 Total cooling 0 Btuh  
 Actual air flow 0 cfm  
 Air flow factor 0 cfm/Btuh  
 Static pressure 0 in H2O  
 Load sensible heat ratio 0

| ROOM NAME         | Area (ft²) | Htg load (Btuh) | Clg load (Btuh) | Htg AVF (cfm) | Clg AVF (cfm) |
|-------------------|------------|-----------------|-----------------|---------------|---------------|
| Mech              | 69         | 2358            | 0               | 0             | 0             |
| Bath 2            | 63         | 1720            | 0               | 0             | 0             |
| Bath 1            | 63         | 2308            | 0               | 0             | 0             |
| Entire House      | 196        | 6387            | 0               | 0             | 0             |
| Other equip loads |            | 0               | 0               |               |               |
| Equip. @ 0.90 RSM |            |                 | 0               |               |               |
| Latent cooling    |            |                 | 0               |               |               |
| TOTALS            | 196        | 6387            | 0               | 0             | 0             |

*Bold/italic values have been manually overridden*

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

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### Design Conditions

#### Location:

Craig, CO, US  
 Elevation: 7000 ft  
 Latitude: 41°N

#### Outdoor:

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

#### Heating

-15  
 -  
 -  
 15.0

#### Cooling

85  
 36 ( H )  
 56  
 7.5

#### Indoor:

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

#### Heating

70  
 85  
 30  
 39.9

#### Cooling

75  
 10  
 50  
 -43.7

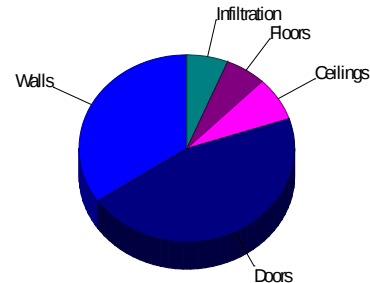
#### Infiltration:

Method  
 Construction quality  
 Fireplaces

Simplified  
 Tight  
 0

### Heating

| Component      | Btuh/ft² | Btuh        | % of load    |
|----------------|----------|-------------|--------------|
| Walls          | 5.5      | 2204        | 34.5         |
| Glazing        | 0        | 0           | 0            |
| Doors          | 51.0     | 2916        | 45.6         |
| Ceilings       | 2.5      | 482         | 7.5          |
| Floors         | 2.0      | 391         | 6.1          |
| Infiltration   | 0.9      | 395         | 6.2          |
| Ducts          |          | 0           | 0            |
| Piping         |          | 0           | 0            |
| Humidification |          | 0           | 0            |
| Ventilation    |          | 0           | 0            |
| Adjustments    |          | 0           | 0            |
| <b>Total</b>   |          | <b>6387</b> | <b>100.0</b> |



### Cooling

| Component      | Btuh/ft² | Btuh     | % of load |
|----------------|----------|----------|-----------|
| Walls          | 0        | 0        | 0         |
| Glazing        | 0        | 0        | 0         |
| Doors          | 0        | 0        | 0         |
| Ceilings       | 0        | 0        | 0         |
| Floors         | 0        | 0        | 0         |
| Infiltration   | 0        | 0        | 0         |
| Ducts          |          | 0        | 0         |
| Ventilation    |          | 0        | 0         |
| Internal gains |          | 0        | 0         |
| Blower         |          | 0        | 0         |
| Adjustments    |          | 0        | 0         |
| <b>Total</b>   |          | <b>0</b> | <b>0</b>  |

Latent Cooling Load = 0 Btuh  
 Overall U-value = 0.101 Btuh/ft²-°F

WARNING: window to floor area ratio = 0.0% - less than 5%.

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### Design Conditions

|                  |                |                             |                                              |                          |                |
|------------------|----------------|-----------------------------|----------------------------------------------|--------------------------|----------------|
| <b>Location:</b> |                | <b>Indoor:</b>              |                                              | <b>Heating</b>           | <b>Cooling</b> |
| Craig, CO, US    |                | Indoor temperature (°F)     |                                              | 70                       | 75             |
| Elevation:       | 7000 ft        | Design TD (°F)              |                                              | 85                       | 10             |
| Latitude:        | 41°N           | Relative humidity (%)       |                                              | 30                       | 50             |
| <b>Outdoor:</b>  |                | Moisture difference (gr/lb) |                                              | 39.9                     | -43.7          |
| <b>Heating</b>   | <b>Cooling</b> | <b>Infiltration:</b>        |                                              |                          |                |
| Drybulb (°F)     | -15            | 85                          | Method<br>Construction quality<br>Fireplaces | Simplified<br>Tight<br>0 |                |
| Daily range (°F) | -              | 36 ( H )                    |                                              |                          |                |
| Wet bulb (°F)    | -              | 56                          |                                              |                          |                |
| Wind speed (mph) | 15.0           | 7.5                         |                                              |                          |                |

### Construction descriptions

|                                                                                                                                              | Or  | Area<br>ft² | U-value<br>Btuh/ft²-°F | Insul R<br>ft²-°F/Btuh | Htg HTM<br>Btuh/ft² | Loss<br>Btuh | Clg HTM<br>Btuh/ft² | Gain<br>Btuh |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------|------------------------|------------------------|---------------------|--------------|---------------------|--------------|
| <b>Walls</b>                                                                                                                                 |     |             |                        |                        |                     |              |                     |              |
| Exterior Wall - R25 foam wood ext: Frm wall, wd ext, 1/2" wood shth, r-25 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud | n   | 136         | 0.065                  | 25.0                   | 5.52                | 751          | 0                   | 0            |
|                                                                                                                                              | e   | 73          | 0.065                  | 25.0                   | 5.52                | 405          | 0                   | 0            |
|                                                                                                                                              | s   | 98          | 0.065                  | 25.0                   | 5.52                | 539          | 0                   | 0            |
|                                                                                                                                              | w   | 92          | 0.065                  | 25.0                   | 5.52                | 508          | 0                   | 0            |
|                                                                                                                                              | all | 399         | 0.065                  | 25.0                   | 5.53                | 2204         | 0                   | 0            |

### Partitions

(none)

### Windows

(none)

### Doors

|                            |     |    |       |     |      |      |   |   |
|----------------------------|-----|----|-------|-----|------|------|---|---|
| 11J0: Door, mtl fbrgl type | e   | 19 | 0.600 | 6.3 | 51.0 | 952  | 0 | 0 |
|                            | s   | 39 | 0.600 | 6.3 | 51.0 | 1964 | 0 | 0 |
|                            | all | 57 | 0.600 | 6.3 | 51.0 | 2916 | 0 | 0 |

### Ceilings

|                                                                                                       |  |     |       |      |      |     |   |   |
|-------------------------------------------------------------------------------------------------------|--|-----|-------|------|------|-----|---|---|
| 18A-38md: Rf/clg ceiling, mtl roof mat, frm cons, 1/2" gypsum board int fnsh, 8" thkns, r-38 ceil ins |  | 196 | 0.029 | 38.0 | 2.46 | 482 | 0 | 0 |
|-------------------------------------------------------------------------------------------------------|--|-----|-------|------|------|-----|---|---|

### Floors

|                                                                                                                                                  |  |     |       |      |      |     |   |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-------|------|------|-----|---|---|
| On grade Concrete Floor Slab - R10 Draped 48 and below slab: Bg floor, light dry soil, full ext ins cov, on grade depth, r-10 edge ins, r-10 ins |  | 196 | 0.100 | 10.0 | 2.00 | 391 | 0 | 0 |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-------|------|------|-----|---|---|

### Project Information

For: Christensen Bath House  
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Notes:

### Design Information

Weather: Craig, CO, US

#### Winter Design Conditions

Outside db -15 °F  
 Inside db 70 °F  
 Design TD 85 °F

#### Summer Design Conditions

Outside db 85 °F  
 Inside db 75 °F  
 Design TD 10 °F  
 Daily range H  
 Relative humidity 50 %  
 Moisture difference -44 gr/lb

#### Heating Summary

Structure 6387 Btuh  
 Ducts 0 Btuh  
 Central vent (0 cfm)  
 (none) 0 Btuh  
 Humidification 0 Btuh  
 Piping 0 Btuh  
 Equipment load 6387 Btuh

#### Sensible Cooling Equipment Load Sizing

Structure 0 Btuh  
 Ducts 0 Btuh  
 Central vent (0 cfm)  
 (none) 0 Btuh  
 Blower 0 Btuh  
 Use manufacturer's data n  
 Rate/swing multiplier 0.90  
 Equipment sensible load 0 Btuh

#### Infiltration

Method Simplified  
 Construction quality Tight  
 Fireplaces 0

#### Latent Cooling Equipment Load Sizing

Structure 0 Btuh  
 Ducts 0 Btuh  
 Central vent (0 cfm)  
 (none) 0 Btuh  
 Equipment latent load 0 Btuh

|                           | Heating | Cooling |
|---------------------------|---------|---------|
| Area (ft <sup>2</sup> )   | 196     | 0       |
| Volume (ft <sup>3</sup> ) | 1564    | 0       |
| Air changes/hour          | 0.21    | 0.11    |
| Equiv. AVF (cfm)          | 5       | 0       |

**Equipment Total Load (Sen+Lat)** 0 Btuh  
 Req. total capacity at 0.70 SHR 0 ton

#### Heating Equipment Summary

Make  
 Trade  
 Model  
 AHRI ref n/a

Efficiency 100 EFF  
 Heating input 0 Btuh  
 Heating output 6387 Btuh  
 Temperature rise 0 °F  
 Actual air flow 0 cfm  
 Air flow factor 0 cfm/Btuh  
 Static pressure 0 in H2O  
 Space thermostat

#### Cooling Equipment Summary

Make n/a  
 Trade n/a  
 Cond n/a  
 Coil n/a  
 AHRI ref n/a

Efficiency n/a  
 Sensible cooling 0 Btuh  
 Latent cooling 0 Btuh  
 Total cooling 0 Btuh  
 Actual air flow 0 cfm  
 Air flow factor 0 cfm/Btuh  
 Static pressure 0 in H2O  
 Load sensible heat ratio 0

*Bold/italic values have been manually overridden*

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

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# Level 1



Job #: Christensen Bath House - Heating  
Performed by VOR for:

Christensen Bath House  
38625 Rollins Hills Lane  
Steamboat Springs/Routt County, CO 80487

Scale: 1 : 28

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### Project Information

For: Christensen Bath House  
38625 Rolling Hills Lane, Steamboat Springs/Routt County, CO 80487

### Cooling Equipment

#### Design Conditions

|                    |        |                    |        |                   |     |
|--------------------|--------|--------------------|--------|-------------------|-----|
| Outdoor design DB: | 85.0°F | Sensible gain:     | 0 Btuh | Entering coil DB: | 0°F |
| Outdoor design WB: | 56.0°F | Latent gain:       | 0 Btuh | Entering coil WB: | 0°F |
| Indoor design DB:  | 75.0°F | Total gain:        | 0 Btuh |                   |     |
| Indoor RH:         | 50%    | Estimated airflow: | 0 cfm  |                   |     |

#### Manufacturer's Performance Data at Actual Design Conditions

|                    |        |            |      |    |  |
|--------------------|--------|------------|------|----|--|
| Equipment type:    |        |            |      |    |  |
| Manufacturer:      |        | Model:     |      |    |  |
| Actual airflow:    | 0 cfm  |            |      |    |  |
| Sensible capacity: | 0 Btuh | 0% of load |      |    |  |
| Latent capacity:   | 0 Btuh | 0% of load |      |    |  |
| Total capacity:    | 0 Btuh | 0% of load | SHR: | 0% |  |

### Heating Equipment

#### Design Conditions

|                    |        |            |           |                   |     |
|--------------------|--------|------------|-----------|-------------------|-----|
| Outdoor design DB: | -15°F  | Heat loss: | 6387 Btuh | Entering coil DB: | 0°F |
| Indoor design DB:  | 70.0°F |            |           |                   |     |

#### Manufacturer's Performance Data at Actual Design Conditions

|                  |                |              |             |      |  |
|------------------|----------------|--------------|-------------|------|--|
| Equipment type:  | Elec baseboard |              |             |      |  |
| Manufacturer:    |                | Model:       |             |      |  |
| Actual airflow:  | 0 cfm          |              |             |      |  |
| Output capacity: | 6387 Btuh      | 100% of load | Temp. rise: | 0 °F |  |

Meets all requirements of ACCA Manual S.