# Load Short Form
## *Entire House*
**Retrotec**

**Job:**
**Date:** Jun 07, 2019
**By:**

591 E. Cabarrus St., Raleigh, NC 27601 Phone: 919-922-3987 Email: sam@retrotec.com Web: www.retrotec.com

## Project Information

For: Ben Walker, Retrotec

## Design Information

| | Htg | Clg |
|---|---|---|
| Outside db (°F) | 24 | 76 |
| Inside db (°F) | 70 | 75 |
| Design TD (°F) | 46 | 1 |
| Daily range | - | M |
| Inside humidity (%) | 50 | 50 |
| Moisture difference (gr/lb) | 41 | 4 |

**Infiltration**

| | |
|---|---|
| Method | Blower door |
| Shielding / stories | 3 (partial) / 2 |
| Pressure / AVF | 50 Pa / 1040 cfm |

### HEATING EQUIPMENT

| | | |
|---|---|---|
| Make | | |
| Trade | | |
| Model | | |
| AHRI ref | | |
| Efficiency | 80 AFUE | |
| Heating input | 0 | Btuh |
| Heating output | 0 | Btuh |
| Temperature rise | 0 | °F |
| Actual air flow | 467 | cfm |
| Air flow factor | 0.022 | cfm/Btuh |
| Static pressure | 0 | in H2O |
| Space thermostat | | |

### COOLING EQUIPMENT

| | | |
|---|---|---|
| Make | | |
| Trade | | |
| Cond | | |
| Coil | | |
| AHRI ref | | |
| Efficiency | 0 SEER | |
| Sensible cooling | 0 | Btuh |
| Latent cooling | 0 | Btuh |
| Total cooling | 0 | Btuh |
| Actual air flow | 467 | cfm |
| Air flow factor | 0.043 | cfm/Btuh |
| Static pressure | 0 | in H2O |
| Load sensible heat ratio | 0.91 | |

| ROOM NAME | Area (ft²) | Htg load (Btuh) | Clg load (Btuh) | Htg AVF (cfm) | Clg AVF (cfm) |
|---|---|---|---|---|---|
| Room3 | 770 | 9518 | 3402 | 212 | 148 |
| Room4 | 176 | 2545 | 1440 | 57 | 63 |
| Room5 | 176 | 2545 | 2395 | 57 | 104 |
| Room6 | 418 | 6342 | 3515 | 141 | 153 |
| Entire House d | 1540 | 20951 | 10752 | 467 | 467 |
| Other equip loads | | 0 | 0 | | |
| Equip. @ 0.81 RSM | | | 8710 | | |
| Latent cooling | | | 1082 | | |
| TOTALS | 1540 | 20951 | 9792 | 467 | 467 |

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

# Building Analysis
## *Entire House*
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## Project Information

For: Ben Walker, Retrotec

## Design Conditions

**Location:**
Bellingham Intl, WA, US
Elevation: 151 ft
Latitude: 49°N

| **Outdoor:** | **Heating** | **Cooling** |
|---|---|---|
| Dry bulb (°F) | 24 | 76 |
| Daily range (°F) | - | 17 ( M ) |
| Wet bulb (°F) | - | 64 |
| Wind speed (mph) | 15.0 | 7.5 |

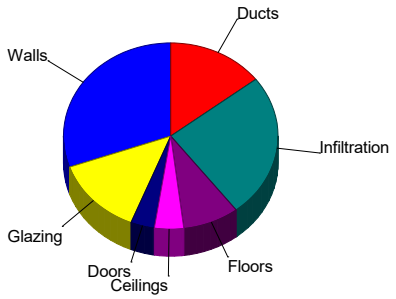
| **Indoor:** | **Heating** | **Cooling** |
|---|---|---|
| Indoor temperature (°F) | 70 | 75 |
| Design TD (°F) | 46 | 1 |
| Relative humidity (%) | 50 | 50 |
| Moisture difference (gr/lb) | 40.5 | 4.4 |

**Infiltration:**

| | |
|---|---|
| Method | Blower door |
| Shielding / stories | 3 (partial) / 2 |
| Pressure / AVF | 50 Pa / 1040 cfm |

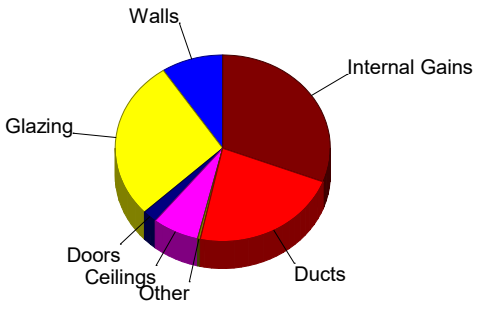
## Heating

| Component | Btuh/ft² | Btuh | % of load |
|---|---|---|---|
| Walls | 4.0 | 6367 | 30.4 |
| Glazing | 16.1 | 2840 | 13.6 |
| Doors | 18.0 | 755 | 3.6 |
| Ceilings | 1.2 | 923 | 4.4 |
| Floors | 2.3 | 1775 | 8.5 |
| Infiltration | 2.9 | 5240 | 25.0 |
| Ducts | | 3051 | 14.6 |
| Piping | | 0 | 0 |
| Humidification | | 0 | 0 |
| Ventilation | | 0 | 0 |
| Adjustments | | 0 | |
| **Total** | | **20951** | **100.0** |




## Cooling

| Component | Btuh/ft² | Btuh | % of load |
|---|---|---|---|
| Walls | 0.6 | 1001 | 9.3 |
| Glazing | 16.9 | 2980 | 27.7 |
| Doors | 5.6 | 233 | 2.2 |
| Ceilings | 1.0 | 756 | 7.0 |
| Floors | 0 | 0 | 0 |
| Infiltration | 0.0 | 45 | 0.4 |
| Ducts | | 2417 | 22.5 |
| Ventilation | | 0 | 0 |
| Internal gains | | 3320 | 30.9 |
| Blower | | 0 | 0 |
| Adjustments | | 0 | |
| **Total** | | **10752** | **100.0** |




Latent Cooling Load = 1082 Btuh
Overall U-value = 0.082 Btuh/ft²-°F

Data entries checked.

# Component Constructions
## *Entire House*
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## Project Information

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## Design Conditions

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Elevation: 151 ft
Latitude: 49°N

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|---|---|---|
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| Daily range (°F) | - | 17 ( M ) |
| Wet bulb (°F) | - | 64 |
| Wind speed (mph) | 15.0 | 7.5 |

| **Indoor:** | **Heating** | **Cooling** |
|---|---|---|
| Indoor temperature (°F) | 70 | 75 |
| Design TD (°F) | 46 | 1 |
| Relative humidity (%) | 50 | 50 |
| Moisture difference (gr/lb) | 40.5 | 4.4 |

**Infiltration:**

| | |
|---|---|
| Method | Blower door |
| Shielding / stories | 3 (partial) / 2 |
| Pressure / AVF | 50 Pa / 1040 cfm |

| **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** | | | | | | | | |
| 12D-0sw: Frm wall, wd ext, 3/8" wood shth, r-15 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud | n | 483 | 0.086 | 15.0 | 3.96 | 1915 | 0.62 | 301 |
| | e | 320 | 0.086 | 15.0 | 3.96 | 1269 | 0.62 | 200 |
| | s | 483 | 0.086 | 15.0 | 3.96 | 1915 | 0.62 | 301 |
| | w | 320 | 0.086 | 15.0 | 3.96 | 1269 | 0.62 | 200 |
| | all | 1606 | 0.086 | 15.0 | 3.96 | 6367 | 0.62 | 1001 |
| **Partitions** | | | | | | | | |
| (none) | | | | | | | | |
| **Windows** | | | | | | | | |
| 1 glazing, clr glz, mtl no brk frm mat, 1/8" thk: 1 glazing, clr glz, mtl no brk frm mat, 1/8" thk; NFRC rated (SHGC=0.30); 6.67 ft head ht | n | 56 | 0.350 | 0 | 16.1 | 904 | 5.82 | 326 |
| | e | 32 | 0.350 | 0 | 16.1 | 516 | 28.0 | 895 |
| | s | 56 | 0.350 | 0 | 16.1 | 904 | 15.4 | 864 |
| | w | 32 | 0.350 | 0 | 16.1 | 516 | 28.0 | 895 |
| | all | 176 | 0.350 | 0 | 16.1 | 2840 | 16.9 | 2980 |
| **Doors** | | | | | | | | |
| 11D0: Door, wd sc type | n | 21 | 0.390 | 0 | 18.0 | 378 | 5.56 | 117 |
| | s | 21 | 0.390 | 0 | 18.0 | 378 | 5.56 | 117 |
| | all | 42 | 0.390 | 0 | 18.0 | 755 | 5.56 | 233 |
| **Ceilings** | | | | | | | | |
| 16B-38ad: Attic ceiling, asphalt shingles roof mat, r-38 ceil ins, 1/2" gypsum board int fnsh | | 770 | 0.026 | 38.0 | 1.20 | 923 | 0.98 | 756 |
| **Floors** | | | | | | | | |
| 20P-19c: Flr floor, frm flr, 6" thkns, carpet flr fnsh, r-19 cav ins, amb ovr | | 770 | 0.050 | 19.0 | 2.31 | 1775 | 0 | 0 |

# Project Summary
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## Project Information

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Notes:

## Design Information

Weather: Bellingham Intl, WA, US

### Winter Design Conditions

| | | |
|---|---|---|
| Outside db | 24 | °F |
| Inside db | 70 | °F |
| Design TD | 46 | °F |

### Summer Design Conditions

| | | |
|---|---|---|
| Outside db | 76 | °F |
| Inside db | 75 | °F |
| Design TD | 1 | °F |
| Daily range | M | |
| Relative humidity | 50 | % |
| Moisture difference | 4 | gr/lb |

### Heating Summary

| | | |
|---|---|---|
| Structure | 17900 | Btuh |
| Ducts | 3051 | Btuh |
| Central vent (0 cfm) (none) | 0 | Btuh |
| Humidification | 0 | Btuh |
| Piping | 0 | Btuh |
| Equipment load | 20951 | Btuh |

### Sensible Cooling Equipment Load Sizing

| | | |
|---|---|---|
| Structure | 8335 | Btuh |
| Ducts | 2417 | Btuh |
| Central vent (0 cfm) (none) | 0 | Btuh |
| Blower | 0 | Btuh |
| Use manufacturer's data | n | |
| Rate/swing multiplier | 0.81 | |
| Equipment sensible load | 8710 | Btuh |

### Infiltration

| | |
|---|---|
| Method | Blower door |
| Shielding / stories | 3 (partial) / 2 |
| Pressure / AVF | 50 Pa / 1040 cfm |

| | Heating | Cooling |
|---|---|---|
| Area (ft²) | 1540 | 1540 |
| Volume (ft³) | 12320 | 12320 |
| Air changes/hour | 0.51 | 0.20 |
| Equiv. AVF (cfm) | 104 | 41 |

### Latent Cooling Equipment Load Sizing

| | | |
|---|---|---|
| Structure | 921 | Btuh |
| Ducts | 161 | Btuh |
| Central vent (0 cfm) (none) | 0 | Btuh |
| Equipment latent load | 1082 | Btuh |
| **Equipment Total Load (Sen+Lat)** | 9792 | Btuh |
| Req. total capacity at 0.70 SHR | 1.0 | ton |

### Heating Equipment Summary

| | | |
|---|---|---|
| Make | | |
| Trade | | |
| Model | | |
| AHRI ref | | |
| Efficiency | 80 | AFUE |
| Heating input | 0 | Btuh |
| Heating output | 0 | Btuh |
| Temperature rise | 0 | °F |
| Actual air flow | 467 | cfm |
| Air flow factor | 0.022 | cfm/Btuh |
| Static pressure | 0 | in H2O |
| Space thermostat | | |

### Cooling Equipment Summary

| | | |
|---|---|---|
| Make | | |
| Trade | | |
| Cond | | |
| Coil | | |
| AHRI ref | | |
| Efficiency | 0 | SEER |
| Sensible cooling | 0 | Btuh |
| Latent cooling | 0 | Btuh |
| Total cooling | 0 | Btuh |
| Actual air flow | 467 | cfm |
| Air flow factor | 0.043 | cfm/Btuh |
| Static pressure | 0 | in H2O |
| Load sensible heat ratio | 0.91 | |

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