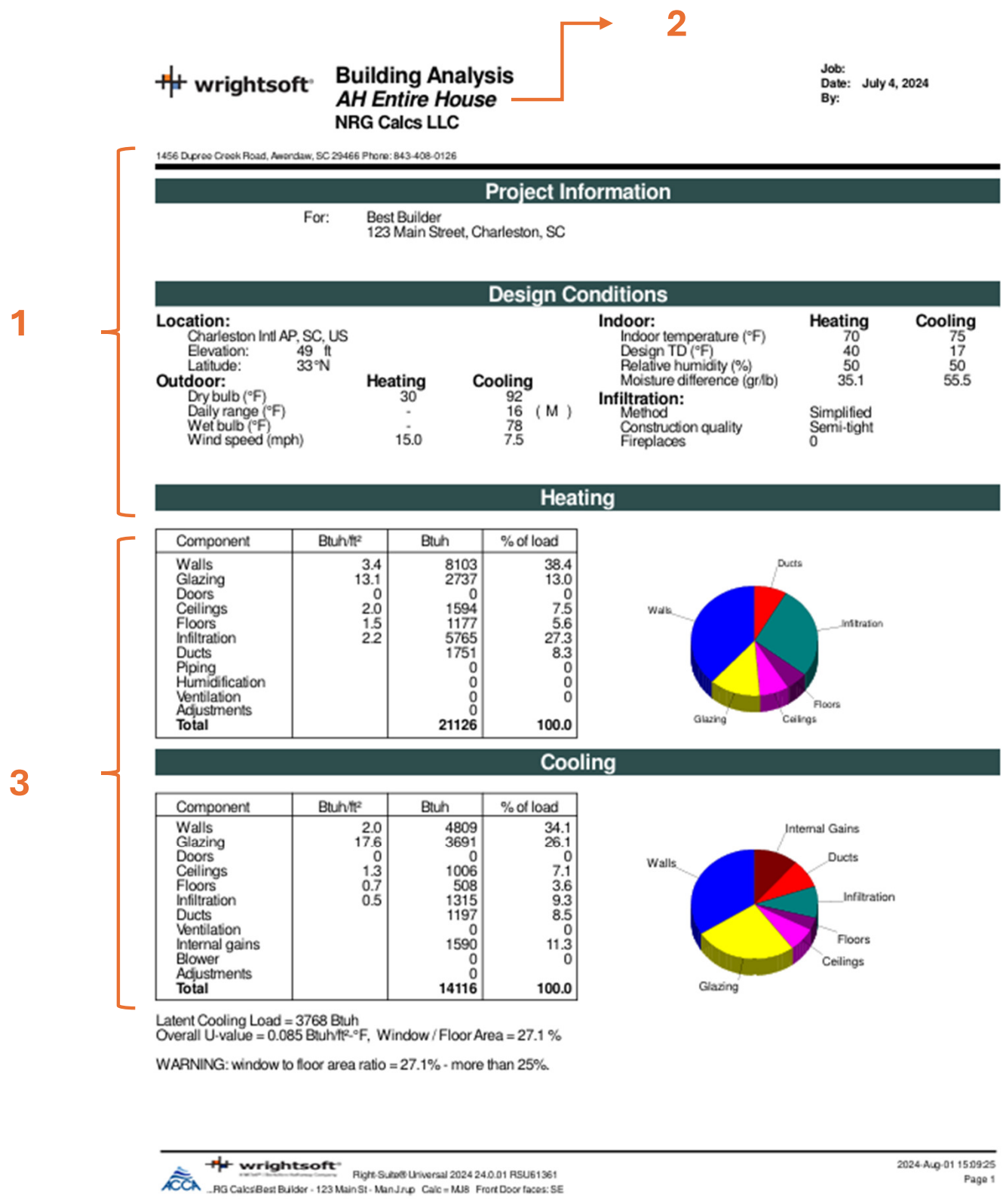

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**Building Analysis**
***AH Entire House***
**NRG Calcs LLC**

2

Job:
Date: July 4, 2024
By:

1456 Dupree Creek Road, Awendaw, SC 29466 Phone: 843-408-0126

## Project Information

For: Best Builder
123 Main Street, Charleston, SC

## Design Conditions

1

**Location:**
Charleston Intl AP, SC, US
Elevation: 49 ft
Latitude: 33°N

| **Outdoor:** | **Heating** | **Cooling** |
|---|---|---|
| Dry bulb (°F) | 30 | 92 |
| Daily range (°F) | - | 16 ( M ) |
| Wet bulb (°F) | - | 78 |
| Wind speed (mph) | 15.0 | 7.5 |

| **Indoor:** | **Heating** | **Cooling** |
|---|---|---|
| Indoor temperature (°F) | 70 | 75 |
| Design TD (°F) | 40 | 17 |
| Relative humidity (%) | 50 | 50 |
| Moisture difference (gr/lb) | 35.1 | 55.5 |

| **Infiltration:** | |
|---|---|
| Method | Simplified |
| Construction quality | Semi-tight |
| Fireplaces | 0 |

## Heating

3

| Component | Btuh/ft² | Btuh | % of load |
|---|---|---|---|
| Walls | 3.4 | 8103 | 38.4 |
| Glazing | 13.1 | 2737 | 13.0 |
| Doors | 0 | 0 | 0 |
| Ceilings | 2.0 | 1594 | 7.5 |
| Floors | 1.5 | 1177 | 5.6 |
| Infiltration | 2.2 | 5765 | 27.3 |
| Ducts | | 1751 | 8.3 |
| Piping | | 0 | 0 |
| Humidification | | 0 | 0 |
| Ventilation | | 0 | 0 |
| Adjustments | | 0 | |
| **Total** | | **21126** | **100.0** |



## Cooling

| Component | Btuh/ft² | Btuh | % of load |
|---|---|---|---|
| Walls | 2.0 | 4809 | 34.1 |
| Glazing | 17.6 | 3691 | 26.1 |
| Doors | 0 | 0 | 0 |
| Ceilings | 1.3 | 1006 | 7.1 |
| Floors | 0.7 | 508 | 3.6 |
| Infiltration | 0.5 | 1315 | 9.3 |
| Ducts | | 1197 | 8.5 |
| Ventilation | | 0 | 0 |
| Internal gains | | 1590 | 11.3 |
| Blower | | 0 | 0 |
| Adjustments | | 0 | |
| **Total** | | **14116** | **100.0** |



Latent Cooling Load = 3768 Btuh
Overall U-value = 0.085 Btuh/ft²-°F, Window / Floor Area = 27.1 %

WARNING: window to floor area ratio = 27.1% - more than 25%.



Page 1 is the Building Analysis summary page. This outlines the;
1 – project address which determines the location and design temperatures used for the HVAC system sizing
2 – Which Air Handler unit the analysis is associated with. If there are multiple Air Handler units, there will be a separate design analysis for each unit. The naming convention used would include; AH Entire House / AH 1st Floor / AH 2nd Floor / AH Master Suite ect,
3 - A summary of where the heating and cooling losses are coming from with a visual from a pie chart.

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# Component Constructions
## *AH Entire House*
**NRG Calcs LLC**

Job:
Date: July 4, 2024
By:

1456 Dupree Creek Road, Awendaw, SC 29466 Phone: 843-408-0126

## Project Information

For: Best Builder
123 Main Street, Charleston, SC

## Design Conditions

**Location:**
Charleston Intl AP, SC, US
Elevation: 49 ft
Latitude: 33 °N

| **Outdoor:** | **Heating** | **Cooling** |
|---|---|---|
| Dry bulb (°F) | 30 | 92 |
| Daily range (°F) | - | 16 ( M ) |
| Wet bulb (°F) | - | 78 |
| Wind speed (mph) | 15.0 | 7.5 |

| **Indoor:** | **Heating** | **Cooling** |
|---|---|---|
| Indoor temperature (°F) | 70 | 75 |
| Design TD (°F) | 40 | 17 |
| Relative humidity (%) | 50 | 50 |
| Moisture difference (gr/lb) | 35.1 | 55.5 |

**Infiltration:**

| | |
|---|---|
| Method | Simplified |
| Construction quality | Semi-tight |
| Fireplaces | 0 |

| **Construction descriptions** | **Or** | **Area** ft² | **U-value** Btu/hr/ft²/°F | **Insul R** hr-°F/Btu | **Htg HTM** Btu/h/ft² | **Loss** Btu/h | **Clg HTM** Btu/h/ft² | **Gain** Btu/h |
|---|---|---|---|---|---|---|---|---|
| **Walls** | | | | | | | | |
| 12D-0sw: Frm wall, wd ext, 1/2" wood shth, r-15 cav ins, 1/2" gypsum board int fnsh, 2"x6" wood frm, 16" o.c. stud | ne | 469 | 0.086 | 15.0 | 3.41 | 1598 | 2.02 | 948 |
| | se | 660 | 0.086 | 15.0 | 3.41 | 2247 | 2.02 | 1334 |
| | sw | 561 | 0.086 | 15.0 | 3.41 | 1911 | 2.02 | 1134 |
| | nw | 689 | 0.086 | 15.0 | 3.41 | 2347 | 2.02 | 1393 |
| | all | 2379 | 0.086 | 15.0 | 3.41 | 8103 | 2.02 | 4809 |
| **Partitions** | | | | | | | | |
| (none) | | | | | | | | |
| **Windows** | | | | | | | | |
| Low E - 33 SHGC - 19: Double Pane Low E, U=0.33, SHGC=0.19; NFRC rated (SHGC=0.19); 6.67 ft head ht | ne | 50 | 0.330 | 0 | 13.1 | 653 | 18.0 | 901 |
| | se | 20 | 0.330 | 0 | 13.1 | 261 | 19.6 | 392 |
| | sw | 90 | 0.330 | 0 | 13.1 | 1176 | 19.6 | 1764 |
| | nw | 10 | 0.330 | 0 | 13.1 | 131 | 18.0 | 180 |
| | all | 170 | 0.330 | 0 | 13.1 | 2222 | 19.0 | 3237 |
| Low E - 33 SHGC - 19: Double Pane Low E, U=0.33, SHGC=0.19; NFRC rated (SHGC=0.19); 6 ft overhang (6.66 ft window ht, 2 ft sep.); 6.67 ft head ht | ne | 20 | 0.330 | 0 | 13.1 | 261 | 12.6 | 252 |
| Low E - 33 SHGC - 19: Double Pane Low E, U=0.33, SHGC=0.19; NFRC rated (SHGC=0.19); 50 ft overhang (6.66 ft window ht, 2 ft sep.); 6.67 ft head ht | se | 19 | 0.330 | 0 | 13.1 | 254 | 6.68 | 130 |
| **Doors** | | | | | | | | |
| (none) | | | | | | | | |
| **Ceilings** | | | | | | | | |
| 18B-19al: Rf/clg ceiling, asphalt shingles roof mat, frm cons, 1/2" gypsum board int fnsh, 10" thkns, r-19 ceil ins | | 789 | 0.051 | 19.0 | 2.02 | 1594 | 1.27 | 1006 |
| **Floors** | | | | | | | | |
| 19A-19cvhp: Flr floor, frm flr, 8" thkns, hrd wd flr fnsh, r-19 cav ins, leaky crwl ovr | | 774 | 0.049 | 19.0 | 1.52 | 1177 | 0.66 | 508 |



Page 2 and sometimes 3 is the Component Construction summary page. This outlines the insulation and window values used for the HVAC system design. If there are multiple HVAC systems, then there would be a separate component construction page for each system.

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# Project Summary
*AH Entire House*
NRG Calcs LLC

Job:
Date: July 4, 2024
By:

1456 Dupree Creek Road, Awendaw, SC 29466 Phone: 843-408-0126

## Project Information

For: Best Builder
123 Main Street, Charleston, SC

Notes: Any changes to the insulation levels or windows could have an impact on HVAC system sizing

## Design Information

Weather: Charleston Intl AP, SC, US

### Winter Design Conditions

| | | |
|---|---|---|
| Outside db | 30 | °F |
| Inside db | 70 | °F |
| Design TD | 40 | °F |
| Ventilation Method | MJ8 | |

### Summer Design Conditions

| | | |
|---|---|---|
| Outside db | 92 | °F |
| Inside db | 75 | °F |
| Design TD | 17 | °F |
| Daily range | M | |
| Relative humidity | 50 | % |
| Moisture difference | 55 | gr/lb |

1

### Heating Summary

| | | |
|---|---|---|
| Structure | 19375 | Btuh |
| Ducts (R-8.0) | 1751 | Btuh |
| Central vent (0 cfm) | 0 | Btuh |
| Humidification | 0 | Btuh |
| Piping | 0 | Btuh |
| Equipment load | 21126 | Btuh |

### Infiltration

| | |
|---|---|
| Method | Simplified |
| Construction quality | Semi-tight |
| Fireplaces | 0 |

| | Heating | Cooling |
|---|---|---|
| Area (ft²) | 774 | 774 |
| Volume (ft³) | 15008 | 15008 |
| Air changes/hour | 0.53 | 0.28 |
| Equiv. AVF (cfm) | 133 | 70 |

### 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 | 638 | cfm |
| Air flow factor | 0.030 | cfm/Btuh |
| Static pressure | 0.50 | in H2O |
| Space thermostat | | |

### Sensible Cooling Equipment Load Sizing

| | | |
|---|---|---|
| Structure | 12919 | Btuh |
| Ducts (R-8.0) | 1197 | Btuh |
| Central vent (0 cfm) | 0 | Btuh |
| Blower | 0 | Btuh |
| Use manufacturer's data | n | |
| Rate/swing multiplier | 0.97 | |
| Equipment sensible load | 13707 | Btuh |

### Latent Cooling Equipment Load Sizing

| | | |
|---|---|---|
| Structure | 3237 | Btuh |
| Ducts | 531 | Btuh |
| Central vent (0 cfm) | 0 | Btuh |
| Equipment latent load | 3768 | Btuh |
| **Equipment Total Load (Sen+Lat)** | 17475 | Btuh |
| Req. total capacity at 0.75 SHR | 1.5 | ton |

2

### 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 | 638 | cfm |
| Air flow factor | 0.045 | cfm/Btuh |
| Static pressure | 0.50 | in H2O |
| Load sensible heat ratio | 0.79 | |

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

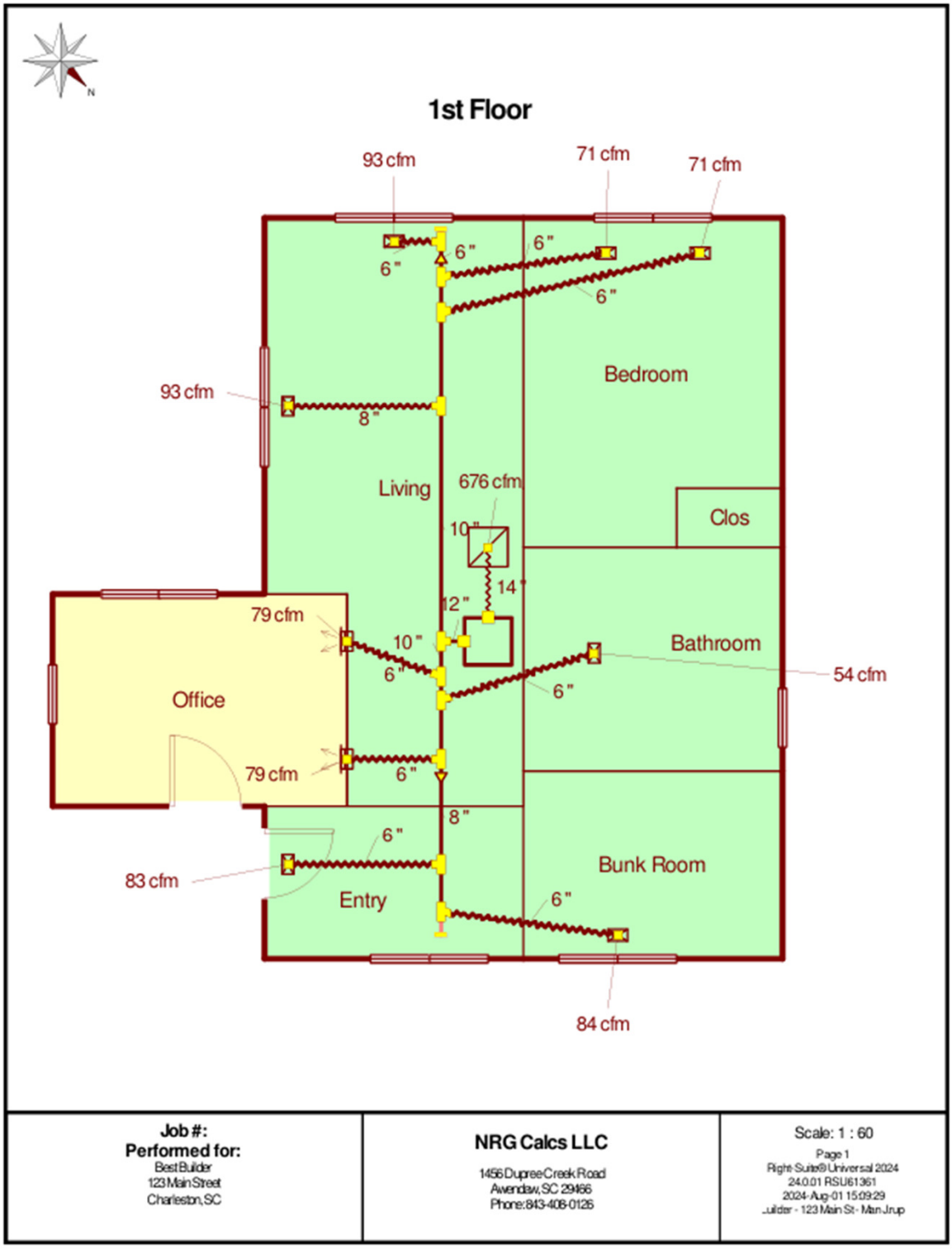


The Project Summary page provides the design heating and cooling load for the HVAC unit. This outlines the;

1 – The heating summary suggests the heating design load for the unit in Btu's / Hour

2 – The Sensible Cooling load is the amount of cooling required to drop the temperature inside the house. The Latent Cooling load determines the cooling required to remove moisture from the air. These are both combined to determine the total equipment load required from the unit. The HVAC contractor will select a unit to meet both the heating and cooling load for this system

1




The Drawing summary provides a suggested duct layout with duct sizing to each of the supply and return registers. As in any construction, field modifications with routing of ducts may be necessary. If the home has multiple levels, then there will be a separate Drawing sheet for each floor. If the home has multiple HVAC systems or multiple Zoning, then this would be represented as a different color on the drawing.

1 – The compass highlights the as designed orientation for the home.