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# Manual S Compliance Report

## Entire House

### Bounds Heating and Air

Job:  
Date: May 29, 2020  
By: Josh Legler

25645 West Newberry Road, Newberry, FL 32669 Phone: 352-472-2761 Fax: 352-472-1809 Email: jlegler@boundshvac.com Web: www.boundshvac.com

## Project Information

For: Bender, Lerner Luxury Properties

## Cooling Equipment

### Design Conditions

|                    |        |                    |       |      |                   |        |
|--------------------|--------|--------------------|-------|------|-------------------|--------|
| Outdoor design DB: | 92.0°F | Sensible gain:     | 11678 | Btuh | Entering coil DB: | 76.3°F |
| Outdoor design WB: | 76.0°F | Latent gain:       | 1911  | Btuh | Entering coil WB: | 63.1°F |
| Indoor design DB:  | 75.0°F | Total gain:        | 13588 | Btuh |                   |        |
| Indoor RH:         | 50%    | Estimated airflow: | 539   | cfm  |                   |        |

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

|                    |            |        |                                 |          |
|--------------------|------------|--------|---------------------------------|----------|
| Equipment type:    | Split ASHP |        |                                 |          |
| Manufacturer:      | Carrier    | Model: | 38MGRQ24C---3+(3) 40MAQB09B---3 |          |
| Actual airflow:    | 539        | cfm    |                                 |          |
| Sensible capacity: | 11309      | Btuh   | 97% of load                     |          |
| Latent capacity:   | 4847       | Btuh   | 254% of load                    |          |
| Total capacity:    | 16156      | Btuh   | 119% of load                    | SHR: 70% |



## Heating Equipment

### Design Conditions

|                    |        |            |       |      |                   |        |
|--------------------|--------|------------|-------|------|-------------------|--------|
| Outdoor design DB: | 33.0°F | Heat loss: | 17643 | Btuh | Entering coil DB: | 69.4°F |
| Indoor design DB:  | 70.0°F |            |       |      |                   |        |

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

|                             |            |        |                                 |                          |
|-----------------------------|------------|--------|---------------------------------|--------------------------|
| Equipment type:             | Split ASHP |        |                                 |                          |
| Manufacturer:               | Carrier    | Model: | 38MGRQ24C---3+(3) 40MAQB09B---3 |                          |
| Actual airflow:             | 539        | cfm    |                                 |                          |
| Output capacity:            | 16076      | Btuh   | 91% of load                     | Capacity balance: 34 °F  |
| Supplemental heat required: | 1567       | Btuh   |                                 | Economic balance: -99 °F |

|                        |            |        |              |                   |
|------------------------|------------|--------|--------------|-------------------|
| Backup equipment type: | Elec strip |        |              |                   |
| Manufacturer:          |            | Model: |              |                   |
| Actual airflow:        | 539        | cfm    |              |                   |
| Output capacity:       | 5.2        | kW     | 100% of load | Temp. rise: 50 °F |

Meets all requirements of ACCA Manual S.



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# Load Short Form

## Entire House

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## Project Information

For: Bender, Lerner Luxury Properties

## Design Information

|                             | Htg | Clg | Infiltration         |            |
|-----------------------------|-----|-----|----------------------|------------|
| Outside db (°F)             | 33  | 92  | Method               | Simplified |
| Inside db (°F)              | 70  | 75  | Construction quality | Semi-tight |
| Design TD (°F)              | 37  | 17  | Fireplaces           | 0          |
| Daily range                 | -   | M   |                      |            |
| Inside humidity (%)         | 30  | 50  |                      |            |
| Moisture difference (gr/lb) | 11  | 45  |                      |            |

### HEATING EQUIPMENT

Make Carrier  
Trade 3 zone high wall ductless mini...  
Model 38MGRQ24C---3  
AHRI ref  
Efficiency 9.1 HSPF  
Heating input  
Heating output 16076 Btuh @ 47°F  
Temperature rise 27 °F  
Actual air flow 539 cfm  
Air flow factor 0.031 cfm/Btuh  
Static pressure 0.50 in H2O  
Space thermostat  
Capacity balance point = 34 °F

Backup:

Input = 5 kW, Output = 17635 Btuh, 100 AFUE

### COOLING EQUIPMENT

Make Carrier  
Trade 3 zone high wall ductless mini...  
Cond 38MGRQ24C---3  
Coil (3) 40MAQB09B---3  
AHRI ref  
Efficiency 14.7 EER, 18 SEER  
Sensible cooling 11309 Btuh  
Latent cooling 4847 Btuh  
Total cooling 16156 Btuh  
Actual air flow 539 cfm  
Air flow factor 0.046 cfm/Btuh  
Static pressure 0.50 in H2O  
Load sensible heat ratio 0.86

| ROOM NAME    | Area (ft²) | Htg load (Btuh) | Clg load (Btuh) | Htg AVF (cfm) | Clg AVF (cfm) |
|--------------|------------|-----------------|-----------------|---------------|---------------|
| Master bath  | 132        | 0               | 0               | 0             | 0             |
| wic          | 88         | 0               | 0               | 0             | 0             |
| Master suite | 300        | 10720           | 6995            | 327           | 323           |
| Leisure room | 467        | 0               | 0               | 0             | 0             |
| Guest suite  | 176        | 6924            | 4683            | 212           | 216           |
| bath         | 64         | 0               | 0               | 0             | 0             |

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



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# Project Summary

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## Project Information

For: Bender, Lerner Luxury Properties

Notes: 3 zone high wall ductless mini split

## Design Information

Weather: Gainesville Regional AP, FL, US

### Winter Design Conditions

|            |       |
|------------|-------|
| Outside db | 33 °F |
| Inside db  | 70 °F |
| Design TD  | 37 °F |

### Summer Design Conditions

|                     |          |
|---------------------|----------|
| Outside db          | 92 °F    |
| Inside db           | 75 °F    |
| Design TD           | 17 °F    |
| Daily range         | M        |
| Relative humidity   | 50 %     |
| Moisture difference | 45 gr/lb |

### Heating Summary

|                                |            |
|--------------------------------|------------|
| Structure                      | 15527 Btuh |
| Ducts                          | 2116 Btuh  |
| Central vent (0 cfm)<br>(none) | 0 Btuh     |
| Humidification                 | 0 Btuh     |
| Piping                         | 0 Btuh     |
| Equipment load                 | 17643 Btuh |

### Sensible Cooling Equipment Load Sizing

|                                |            |
|--------------------------------|------------|
| Structure                      | 9062 Btuh  |
| Ducts                          | 2616 Btuh  |
| Central vent (0 cfm)<br>(none) | 0 Btuh     |
| Blower                         | 0 Btuh     |
| Use manufacturer's data        | n          |
| Rate/swing multiplier          | 0.97       |
| Equipment sensible load        | 11327 Btuh |

### Infiltration

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

### Latent Cooling Equipment Load Sizing

|                                |           |
|--------------------------------|-----------|
| Structure                      | 1504 Btuh |
| Ducts                          | 406 Btuh  |
| Central vent (0 cfm)<br>(none) | 0 Btuh    |
| Equipment latent load          | 1911 Btuh |

|                           | Heating | Cooling |
|---------------------------|---------|---------|
| Area (ft <sup>2</sup> )   | 1227    | 1227    |
| Volume (ft <sup>3</sup> ) | 11040   | 11040   |
| Air changes/hour          | 0.31    | 0.16    |
| Equiv. AVF (cfm)          | 57      | 29      |

|                                 |            |
|---------------------------------|------------|
| Equipment Total Load (Sen+Lat)  | 13238 Btuh |
| Req. total capacity at 0.70 SHR | 1.3 ton    |

### Heating Equipment Summary

|                                             |                                   |
|---------------------------------------------|-----------------------------------|
| Make                                        | Carrier                           |
| Trade                                       | 3 zone high wall ductless mini... |
| Model                                       | 38MGRQ24C---3                     |
| AHRI ref                                    |                                   |
| Efficiency                                  | 9.1 HSPF                          |
| Heating input                               |                                   |
| Heating output                              | 16076 Btuh @ 47°F                 |
| Temperature rise                            | 27 °F                             |
| Actual air flow                             | 539 cfm                           |
| Air flow factor                             | 0.031 cfm/Btuh                    |
| Static pressure                             | 0.50 in H2O                       |
| Space thermostat                            |                                   |
| Capacity balance point = 34 °F              |                                   |
| Backup:                                     |                                   |
| Input = 5 kW, Output = 17635 Btuh, 100 AFUE |                                   |

### Cooling Equipment Summary

|                          |                                   |
|--------------------------|-----------------------------------|
| Make                     | Carrier                           |
| Trade                    | 3 zone high wall ductless mini... |
| Cond                     | 38MGRQ24C---3                     |
| Coil                     | (3) 40MAQB09B---3                 |
| AHRI ref                 |                                   |
| Efficiency               | 14.7 EER, 18 SEER                 |
| Sensible cooling         | 11309 Btuh                        |
| Latent cooling           | 4847 Btuh                         |
| Total cooling            | 16156 Btuh                        |
| Actual air flow          | 539 cfm                           |
| Air flow factor          | 0.046 cfm/Btuh                    |
| Static pressure          | 0.50 in H2O                       |
| Load sensible heat ratio | 0.86                              |

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



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|                   |   |      |       |       |     |     |
|-------------------|---|------|-------|-------|-----|-----|
| Entire House      | d | 1227 | 17643 | 11678 | 539 | 539 |
| Other equip loads |   |      | 0     | 0     |     |     |
| Equip. @ 0.97 RSM |   |      |       | 11327 |     |     |
| Latent cooling    |   |      |       | 1911  |     |     |
| TOTALS            |   | 1227 | 17643 | 13238 | 539 | 539 |

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# Duct System Summary

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## Project Information

For: Bender, Lerner Luxury Properties

|                                    | Heating                           | Cooling                           |
|------------------------------------|-----------------------------------|-----------------------------------|
| External static pressure           | 0.50 in H <sub>2</sub> O          | 0.50 in H <sub>2</sub> O          |
| Pressure losses                    | 0.23 in H <sub>2</sub> O          | 0.23 in H <sub>2</sub> O          |
| Available static pressure          | 0.27 in H <sub>2</sub> O          | 0.27 in H <sub>2</sub> O          |
| Supply / return available pressure | 0.135 / 0.135 in H <sub>2</sub> O | 0.135 / 0.135 in H <sub>2</sub> O |
| Lowest friction rate               | 0 in/100ft                        | 0 in/100ft                        |
| Actual air flow                    | 539 cfm                           | 539 cfm                           |
| Total effective length (TEL)       | 0 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 |
|----------------|---------------|-----------|-----------|-----------|-----------|------------|-----------|----------------|-----------------|-------|
| Guest suite    | c 4683        | 212       | 216       | 0         | 0         | 0x0        | ShMt      | 0              | 0               |       |
| Master suite-A | h 6995        | 327       | 323       | 0         | 0         | 0x0        | ShMt      | 0              | 0               |       |

## Return Branch Detail Table

| Name | Grille 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              | 539       | 539       | 0        | 0         | 0           | 0         | 0x0        |                         | VIFx      |       |



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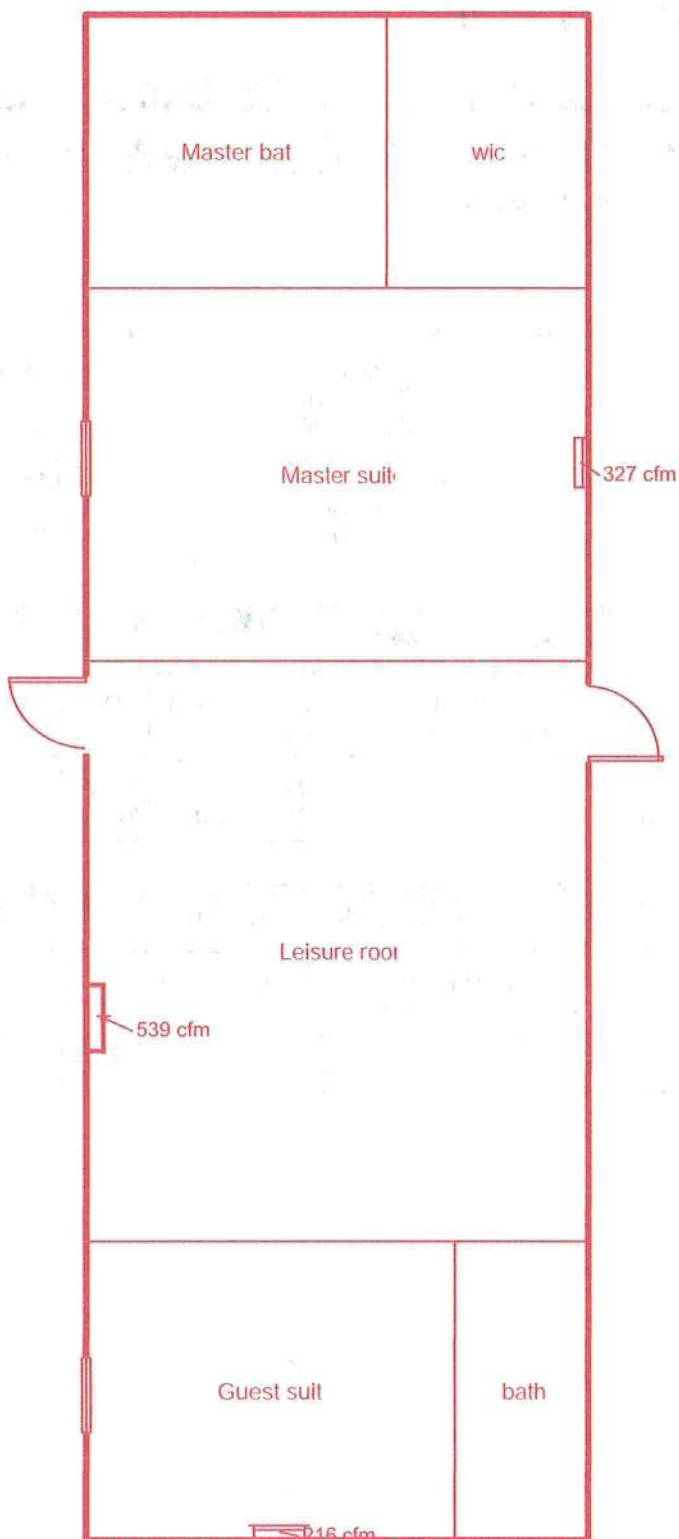
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### Level 1



**Job #:**  
**Performed by Josh Legler for:**  
Bender

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