

Click here bring up the project information sheet

File Edit View Show Drawing Proposal Options Window Library Help

Project wizard  
Draw  
Multizone tree  
Zone information  
Load meter  
Equipment  
Duct  
Print preview

**Project Information**

**Customer**

Name: John Doe  
Company: Worlds Best Builder  
Address:   
City:   
State/Province: ZIP/Postal code:   
Phone: Fax:   
Email:   
Web:

**Designer**

Name: Great Designs  
Company:   
Address:   
City:   
State/Province: ZIP/Postal code:   
Phone: Fax:   
Email:   
Web:   
License #:

**Site**

☒ Same as Customer  
Address:   
City:   
State/Province: ZIP/Postal code:   
Phone: County:   
Lot info:

**Job**

Number:   
Date/Prep.By:

Design  
Presentation  
Manage Sales  
Setup

Enter the information. This will help the plan review personnel.

This would be for a custom home. We will show you later for worst case direction for a production home.

Design date would be nice but not required.

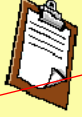
Model home plan number or custom home.

Add any special notes here for the plan review personnel. Indicating the whole house ventilation system is very helpful.

Not all locations are in the data base. Choose the location that is reasonably close to the actual location. The example is Amarillo, TX.

| Job                |             |
|--------------------|-------------|
| Number             |             |
| Date/Prep.By       |             |
| Orientation        | House Front |
| Plan #             |             |
| Jurisdiction       |             |
| faces:             | South       |
| Number of bedrooms | 2           |

| Notes                                                                             |                                                                         |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|  | <p>Adds helpfull notes here:</p> <p>Exhaust Only Ventilation system</p> |

| Location                                 |                                    |
|------------------------------------------|------------------------------------|
| Library                                  | (none)                             |
| Weather location                         | Amarillo Rick Husband Intl, TX, US |
| Elevation                                | [ 3604 ] ft                        |
| Latitude                                 | [ 35.23 ] °N                       |
| Longitude                                | [ 101.70 ] °W                      |
| Time zone                                | [ -6.0 ]                           |
| Weather and shielding factor             | [ 0.68 ]                           |
| Bin data city                            | Amarillo Rick Husband Intl, TX, US |
| Earth temperature city                   | Fort Worth                         |
| Mean earth temperature                   | [ 68 ] °F                          |
| Annual surface earth temperature swing   | [ 21 ] °F                          |
| Day of minimum earth surface temperature | [ 34 ] day                         |

Bin data shows the number of days at a temperature range for an average weather year.

**Location** Library (none) ...

Weather location [Amarillo Rick Husband Intl, TX, US] ...

Elevation [ 3604 ] ft Latitude [ 35.23 ] °N

Longitude [101.70] °W Time zone [ -6.0 ]

Weather and shielding factor [ 0.68 ]

Bin data city Amarillo Rick Husband Intl, TX, US ...

Earth temperature city Fort Worth ...

Mean earth temperature [ 68 ] °F

Annual surface earth temperature swing [ 21 ] °F

Day of minimum earth surface temperature [ 34 ] day

Bin Temperature Data

Location: Amarillo Rick Husband Intl, TX, US

| Temp Range | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 110 to 114 | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
| 105 to 109 | 2    | 0   | 0   | 0   | 0   | 0   | 2   | 0   | 0   | 0   | 0   | 0   | 0   |
| 100 to 104 | 23   | 0   | 0   | 0   | 0   | 1   | 10  | 7   | 4   | 1   | 0   | 0   | 0   |
| 95 to 99   | 100  | 0   | 0   | 0   | 0   | 8   | 24  | 37  | 24  | 7   | 0   | 0   | 0   |
| 90 to 94   | 252  | 0   | 0   | 0   | 2   | 23  | 53  | 79  | 71  | 22  | 2   | 0   | 0   |
| 85 to 89   | 372  | 0   | 0   | 3   | 12  | 37  | 71  | 103 | 89  | 45  | 12  | 0   | 0   |
| 80 to 84   | 469  | 0   | 1   | 8   | 24  | 55  | 88  | 102 | 93  | 67  | 28  | 3   | 0   |
| 75 to 79   | 602  | 1   | 3   | 19  | 43  | 71  | 104 | 120 | 111 | 81  | 37  | 11  | 1   |
| 70 to 74   | 768  | 5   | 12  | 32  | 53  | 86  | 117 | 133 | 142 | 105 | 58  | 21  | 4   |
| 65 to 69   | 875  | 13  | 19  | 44  | 68  | 104 | 117 | 119 | 141 | 131 | 75  | 32  | 12  |
| 60 to 64   | 796  | 21  | 31  | 55  | 88  | 118 | 90  | 39  | 58  | 120 | 108 | 46  | 22  |
| 55 to 59   | 685  | 35  | 41  | 75  | 94  | 105 | 34  | 5   | 10  | 73  | 113 | 64  | 36  |
| 50 to 54   | 687  | 54  | 56  | 93  | 103 | 75  | 9   | 0   | 1   | 43  | 117 | 87  | 49  |
| 45 to 49   | 633  | 69  | 71  | 93  | 91  | 37  | 1   | 0   | 0   | 18  | 86  | 98  | 69  |
| 40 to 44   | 612  | 83  | 84  | 95  | 69  | 18  | 0   | 0   | 0   | 5   | 56  | 109 | 93  |
| 35 to 39   | 574  | 102 | 98  | 95  | 40  | 5   | 0   | 0   | 0   | 2   | 31  | 95  | 106 |
| 30 to 34   | 557  | 128 | 108 | 72  | 23  | 1   | 0   | 0   | 0   | 0   | 14  | 76  | 135 |
| 25 to 29   | 377  | 108 | 72  | 33  | 9   | 0   | 0   | 0   | 0   | 0   | 4   | 46  | 105 |
| 20 to 24   | 210  | 69  | 40  | 16  | 1   | 0   | 0   | 0   | 0   | 0   | 2   | 22  | 60  |
| 15 to 19   | 98   | 36  | 18  | 7   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 8   | 28  |
| 10 to 14   | 38   | 13  | 8   | 2   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 13  |
| 5 to 9     | 20   | 6   | 6   | 2   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 6   |
| 0 to 4     | 8    | 1   | 3   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 4   |
| -5 to -1   | 2    | 0   | 1   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   |
| -10 to -6  | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
| Totals     | 8760 | 744 | 672 | 744 | 720 | 744 | 720 | 744 | 744 | 720 | 744 | 720 | 744 |

Close

Based on the bin data the 99% (meaning that only 1% of the hours in a year is it colder) winter design temperature. If the jurisdiction has an adopted design temperature. then place the cursor over the cell and left click. Then press the F8 key and enter the adopted temperature.

**Conditions**

**Heating**  
 Dry bulb [ 16 ] °F  
 Wind speed [ 15.0 ] mph

**Cooling** Annual  
 Wind speed [ 7.5 ] mph

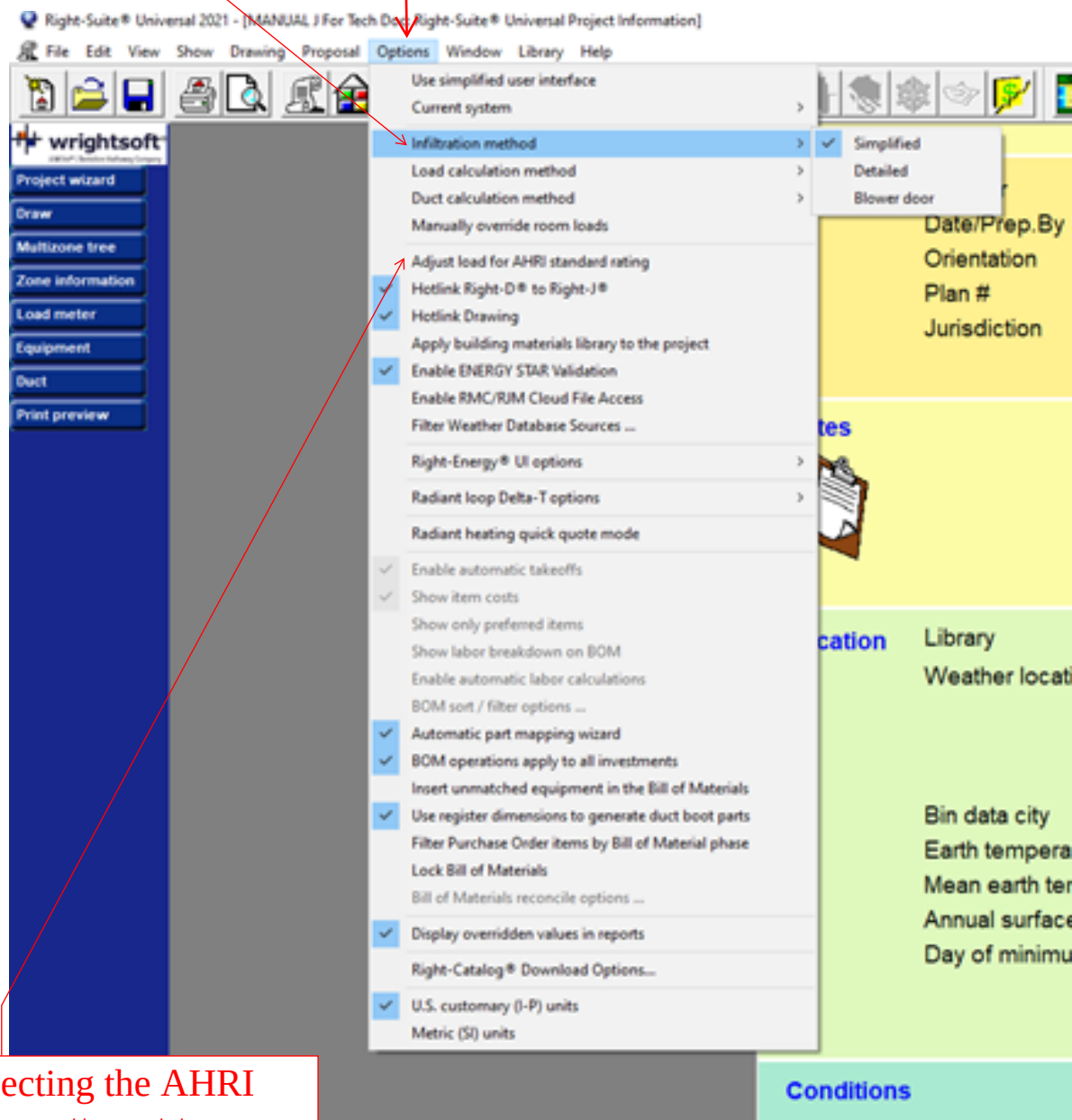
|                          | Month        | DB<br>( °F ) | Daily<br>range ( °F ) | WB<br>( °F ) | RH (%) | Daylight<br>saving                  |
|--------------------------|--------------|--------------|-----------------------|--------------|--------|-------------------------------------|
|                          | Annual (Jul) | 95.8         | 24.5                  | 65.8         | 21     | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | January      | 65.6         | 25.5                  | 45.2         | 18     | <input type="checkbox"/>            |
| <input type="checkbox"/> | February     | 70.4         | 26.3                  | 48.3         | 18     | <input type="checkbox"/>            |
| <input type="checkbox"/> | March        | 77.9         | 27.7                  | 51.7         | 15     | <input type="checkbox"/>            |
| <input type="checkbox"/> | April        | 84.4         | 27.8                  | 54.7         | 13     | <input type="checkbox"/>            |
| <input type="checkbox"/> | May          | 92.8         | 26.5                  | 59.8         | 14     | <input type="checkbox"/>            |
| <input type="checkbox"/> | June         | 98.6         | 25.7                  | 63.7         | 14     | <input type="checkbox"/>            |
| <input type="checkbox"/> | July         | 97.7         | 24.5                  | 67.0         | 21     | <input type="checkbox"/>            |
| <input type="checkbox"/> | August       | 96.5         | 23.9                  | 66.7         | 22     | <input type="checkbox"/>            |
| <input type="checkbox"/> | September    | 92.5         | 24.6                  | 64.4         | 23     | <input type="checkbox"/>            |
| <input type="checkbox"/> | October      | 84.2         | 26.2                  | 58.9         | 22     | <input type="checkbox"/>            |
| <input type="checkbox"/> | November     | 74.4         | 25.8                  | 52.2         | 22     | <input type="checkbox"/>            |
| <input type="checkbox"/> | December     | 65.3         | 24.2                  | 46.0         | 21     | <input type="checkbox"/>            |

No Need to change the default for wind speed.

Based on the bin data the 1% (meaning that 99% of the hours in a year it is colder) summer design temperature. If the jurisdiction has an adopted design temperature. Then place the cursor over the cell and left click. Then press the F8 key and enter the adopted temperature.

Most designers will use the simplified infiltration method. Will show later the settings.

I know sorry for the blurry picture

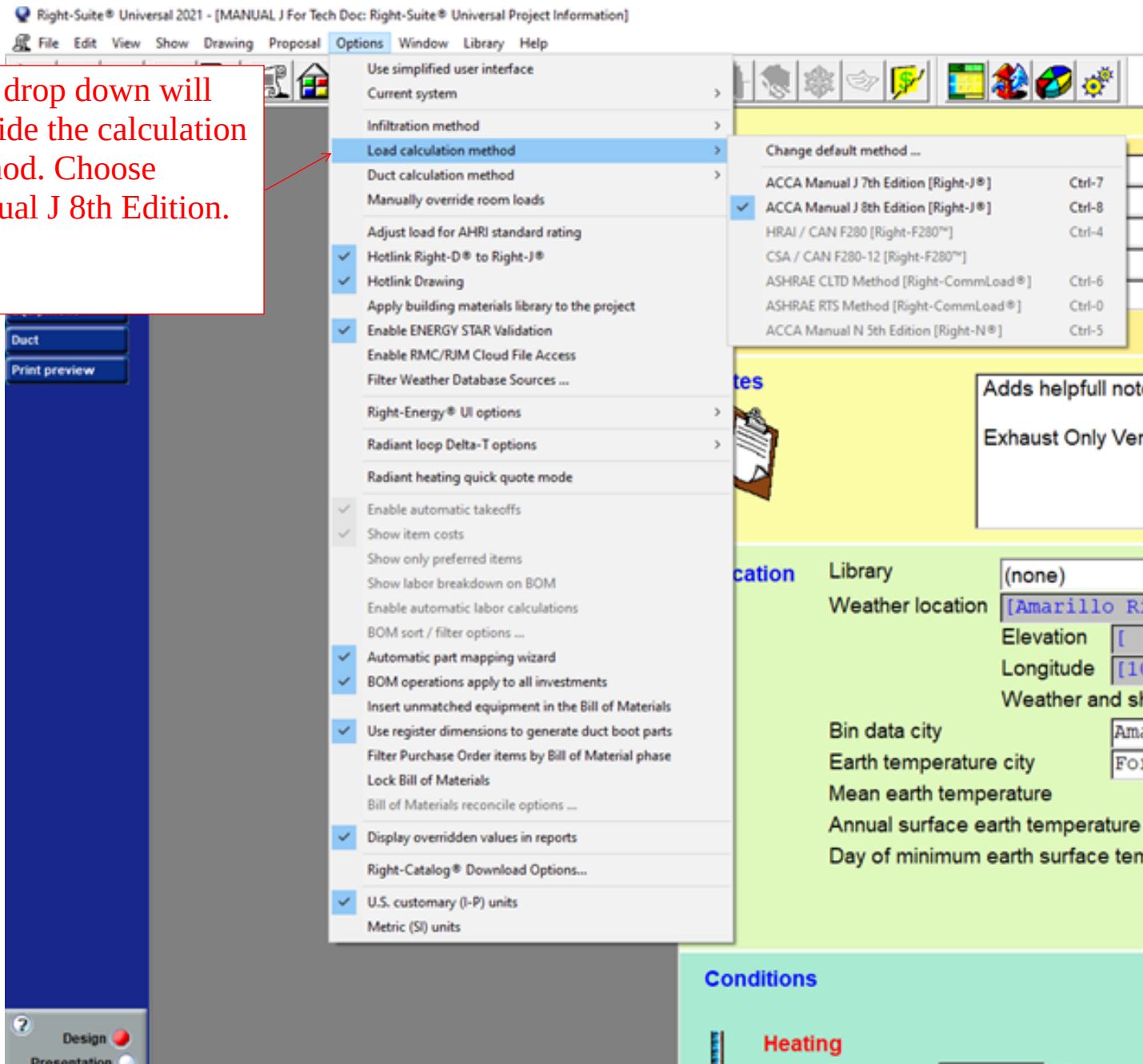


Recommend not selecting the AHRI adjustment. This is an attempt to provide air conditioning appliance size.

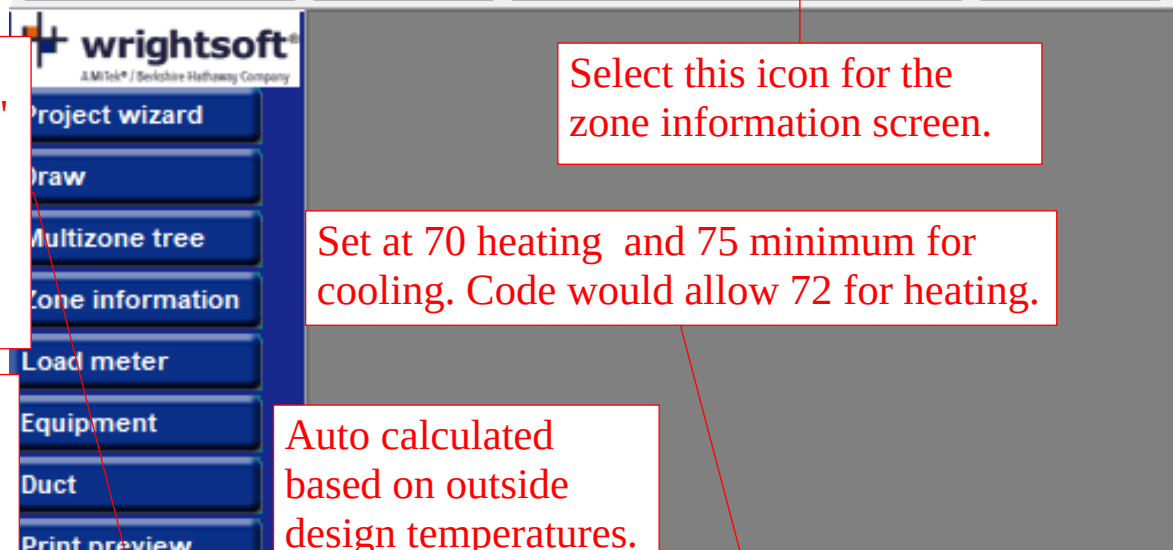
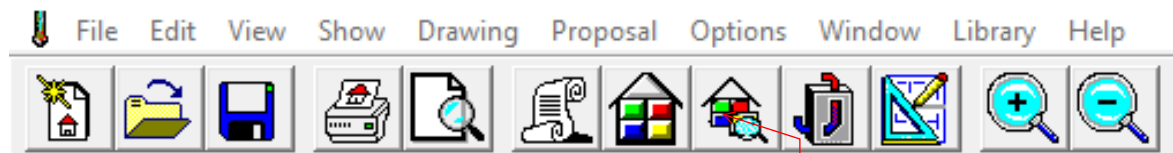
There are NO softwares that have a Manual S capability. The heating and cooling appliance selection must be done by the designer.

I know sorry for the blurry picture

This drop down will provide the calculation method. Choose Manual J 8th Edition.







Select this icon for the zone information screen.

Set at 70 heating and 75 minimum for cooling. Code would allow 72 for heating.

Auto calculated based on outside design temperatures.

### Zone Information for Entire House

#### Indoor Conditions

70/75/50

#### Heating

#### Cooling

Design temperature

70 °F

75 °F

Design TD

54 °F

21 °F

Relative humidity

30 %

50 %

Moisture difference

[ 26.2 ] gr/lb

[ -13.2 ] gr/lb

#### System Characteristics

#### Heating

#### Cooling

Atmospheric combustion

☒ 40000 Btuh

Humidification

☐

Room vent type

...

None

None

Central vent type

...

None

None

Blower power

...

Hot water piping

...

0 ft

#### Ventilation

MJ8

Number of bedrooms < 2 >

#### Heating

(cfm)

Room vent supply AVF

0

Central vent supply AVF

Exhaust AVF

< 40 >

< 40 >

Imbalance

-40

-40

Check this box if you wish to add blower heat for the air conditioning load.

Use this icon for the pop up screens.

Several choices for ventilation. None would be if a exhaust only ventilation system is proposed.

If an Heat Recovery Ventilator or Energy Recovery Ventilator is used. Enter the efficiency found in the manufacturers data.

**Zone Information for Entire House**

**Indoor Conditions** 70/75/50 ...

|                     | Heating        | Cooling         |
|---------------------|----------------|-----------------|
| Design temperature  | 70 °F          | 75 °F           |
| Design TD           | 54 °F          | 21 °F           |
| Relative humidity   | 30 %           | 50 %            |
| Moisture difference | [ 26.2 ] gr/lb | [ -13.2 ] gr/lb |

**System Characteristics**

|                        | Heating                                        | Cooling |
|------------------------|------------------------------------------------|---------|
| Atmospheric combustion | <input checked="" type="checkbox"/> 40000 Btuh |         |
| Humidification         | <input type="checkbox"/>                       |         |
| Room vent type         | ...                                            | None    |
| Central vent type      | ...                                            | None    |
| Blower power           |                                                |         |
| Hot water pipe         |                                                |         |

**Ventilation**

MJ8

Number of bedrooms

Room vent size

Central vent size

Exhaust AVF

Imbalance

**Central Vent System Details for Entire House**

|                        | Heating | Cooling |
|------------------------|---------|---------|
| Type                   | (none)  | (none)  |
| Recovery effectiveness |         |         |
| Sensible (SER)         |         | 0 %     |
| Latent (LER)           | 0 %     | 0 %     |
| Leaving air state      |         |         |
| Dry bulb temperature   | 0 °F    | 0 °F    |
| Humidity ratio         | 0 gr/lb | 0 gr/lb |

Help OK Cancel

**Central Vent System Details for Entire House**

|                        | Heating         | Cooling       |
|------------------------|-----------------|---------------|
| Type                   | Heat recovery   | Heat recovery |
| Device Model           | Really good HRV |               |
| Recovery effectiveness |                 |               |
| Sensible (SER)         | 85 %            | 85 %          |
| Latent (LER)           | 0 %             | 0 %           |
| Leaving air state      |                 |               |
| Dry bulb temperature   | 62 °F           | 78 °F         |
| Humidity ratio         | 11.2 gr/lb      | 61 gr/lb      |

Help OK Cancel



### Zone Information for Entire House

#### Indoor Conditions

Outside air would be for a ventilation system that has an outside air duct connected to the return air ductwork.

#### System Characteristics

There are several calculations that the software performs for the cfm. Combustion air required, number of people and a 0.35 ACH. The software will use the highest number. If your actual ventilation rate is different you can override using the F8 key.

Central Vent System Details for Entire House

|                        | Heating     | Cooling     |
|------------------------|-------------|-------------|
| Type                   | Outside air | Outside air |
| Device Model           |             |             |
| Recovery effectiveness |             |             |
| Sensible (SER)         | 0 %         | 0 %         |
| Latent (LER)           | 0 %         | 0 %         |
| Leaving air state      |             |             |
| Dry bulb temperature   | 16 °F       | 96 °F       |
| Humidity ratio         | 11.2 gr/lb  | 61 gr/lb    |

Help OK Cancel

Atmospheric conditions

Humidification

Room vent type

Central vent type ... OA OA

Blower power ☒ 500 W

Hot water piping ... 0 ft

MJ8

Number of bedrooms < 2 >

|                         | Heating (cfm) | Cooling (cfm) |
|-------------------------|---------------|---------------|
| Room vent supply AVF    | 0             | 0             |
| Central vent supply AVF | [ 36 ]        | [ 36 ]        |
| Exhaust AVF             | [ 36 ]        | [ 36 ]        |
| Imbalance               | 0             | 0             |

#### Ventilation

The code does not include the ASHRAE ventilation standard. Some jurisdictions may allow or require.

MJ8

MJ8

ASHRAE 62.2-2019

ASHRAE 62.2-2016

ASHRAE 62.2-2013

ASHRAE 62.2-2010

Exhaust AVF

Imbalance

|                         | Heating (cfm) | Cooling (cfm) |
|-------------------------|---------------|---------------|
| Room vent supply AVF    | 0             | 0             |
| Central vent supply AVF | [ 36 ]        | [ 36 ]        |
| Exhaust AVF             | [ 36 ]        | [ 36 ]        |
| Imbalance               | 0             | 0             |

### Zone Information for Entire House

#### Indoor Conditions

Design temperature  
Design TD  
Relative humidity  
Moisture difference

When an exhaust only system is proposed then use the "None" option.

#### System Characteristics

Atmospheric condensation  
Humidification  
Room vent type  
Central vent type  
Blower power  
Hot water piping

Room Vent System Details for Entire House

|                        | Heating | Cooling |
|------------------------|---------|---------|
| Type                   | (none)  | (none)  |
| Recovery effectiveness |         |         |
| Sensible (SER)         | 0 %     | 0 %     |
| Latent (LER)           | 0 %     | 0 %     |
| Leaving air state      |         |         |
| Dry bulb temperature   | 0 °F    | 0 °F    |
| Humidity ratio         | 0 gr/lb | 0 gr/lb |

Help OK Cancel

None None  
500 W  
0 ft

#### Ventilation

MJ8  
Number of bedrooms < 2 >  
Room vent supply AVF 0 0  
Central vent supply AVF  
Exhaust AVF < 36 > < 36 >  
Imbalance -36 -36

Heating (cfm) Cooling (cfm)

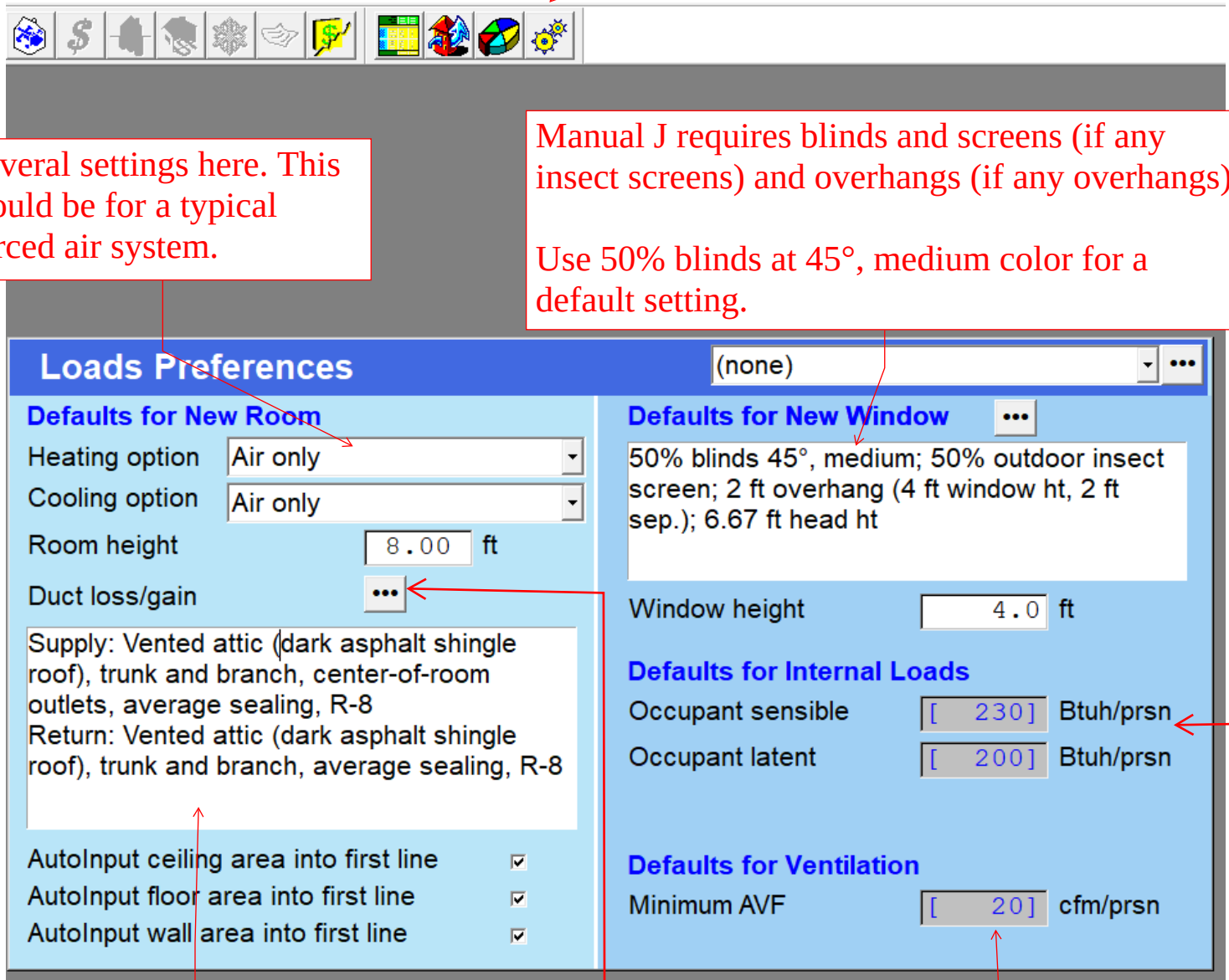
Use the F8 key to enter the proposed exhaust ventilation CFM. The software will calculate as infiltration.

This icon will take you to the load preferences.

Several settings here. This would be for a typical forced air system.

Manual J requires blinds and screens (if any insect screens) and overhangs (if any overhangs)

Use 50% blinds at 45°, medium color for a default setting.



**Loads Preferences** (none)

**Defaults for New Room**

Heating option: Air only

Cooling option: Air only

Room height: 8.00 ft

Duct loss/gain: ...

Supply: Vented attic (dark asphalt shingle roof), trunk and branch, center-of-room outlets, average sealing, R-8

Return: Vented attic (dark asphalt shingle roof), trunk and branch, average sealing, R-8

AutoInput ceiling area into first line ☒

AutoInput floor area into first line ☒

AutoInput wall area into first line ☒

**Defaults for New Window** ...

50% blinds 45°, medium; 50% outdoor insect screen; 2 ft overhang (4 ft window ht, 2 ft sep.); 6.67 ft head ht

Window height: 4.0 ft

**Defaults for Internal Loads**

Occupant sensible: [ 230 ] Btuh/prsn

Occupant latent: [ 200 ] Btuh/prsn

**Defaults for Ventilation**

Minimum AVF: [ 20 ] cfm/prsn

Use this icon to set the default duct loss and gain. This project is set for a vented attic with R-8 insulated ducts.

Default loads and ventilation cfm for each person. We have found no reason to change.

This icon will take you to the infiltration screen.



You have choices. Tight, Semi-Tight, Average, Semi-Loose and Loose. For new homes never use Semi-Loose or Loose. Using average as a starting place for new homes is acceptable. As your designer gets comfortable with consistent blower door test results, many will use Semi-Tight and Tight.

### Simplified Method Infiltration for Entire House

#### Conditions

☐ Isolated zone



Construction quality

Average

Number of above grade stories

1

Exposures

☐ 1 or 2

☒ 3 or 4

Number of fireplaces

0

Fireplace quality

Average

#### Summary

Conditioned floor area

#### Heating

[ 1808 ] ft<sup>2</sup>

Above grade volume

[ 14464 ] ft<sup>3</sup>

Air change rate

[ 0.380 ] ach

Unadjusted AVF

[ 92 ] cfm

Vent adjustment

0 cfm

Net AVF

92 cfm

#### Cooling

[ 1808 ] ft<sup>2</sup>

[ 14464 ] ft<sup>3</sup>

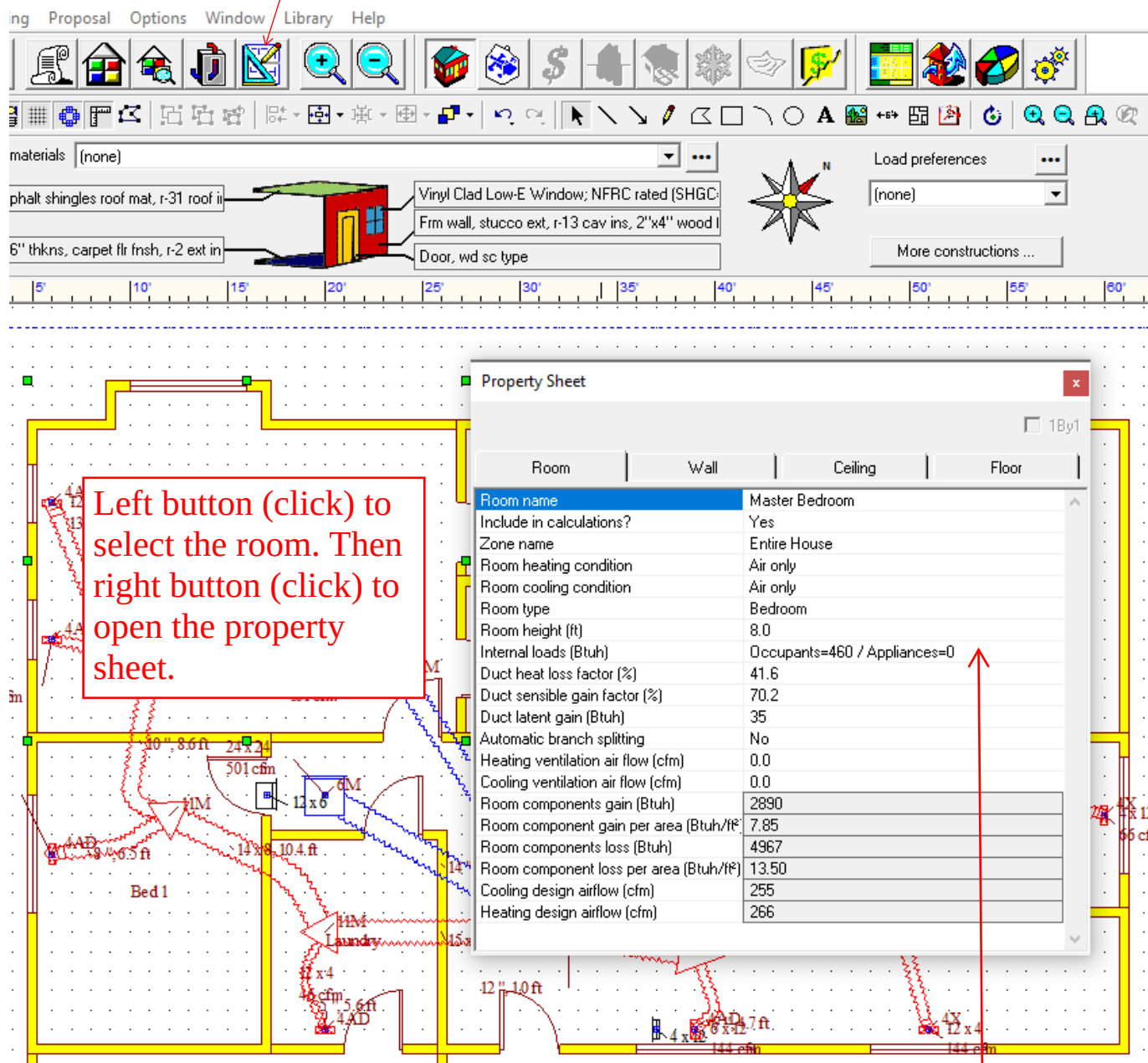
[ 0.200 ] ach

[ 48 ] cfm

0 cfm

48 cfm

This icon will open the draw screen.



The screenshot shows the Writsoft Manual J software interface. The top menu bar includes 'File', 'Proposal', 'Options', 'Window', 'Library', and 'Help'. Below the menu is a toolbar with various icons for drawing and editing. A red arrow points from the text 'This icon will open the draw screen.' to the 'Draw' icon in the toolbar. The main window displays a floor plan with rooms labeled 'Bed 1' and 'Laundry'. A 'Property Sheet' window is open, showing details for the 'Master Bedroom'.

**Property Sheet**

| Room                                    | Wall                         | Ceiling | Floor |
|-----------------------------------------|------------------------------|---------|-------|
| Room name                               | Master Bedroom               |         |       |
| Include in calculations?                | Yes                          |         |       |
| Zone name                               | Entire House                 |         |       |
| Room heating condition                  | Air only                     |         |       |
| Room cooling condition                  | Air only                     |         |       |
| Room type                               | Bedroom                      |         |       |
| Room height (ft)                        | 8.0                          |         |       |
| Internal loads (Btuh)                   | Occupants=460 / Appliances=0 |         |       |
| Duct heat loss factor (%)               | 41.6                         |         |       |
| Duct sensible gain factor (%)           | 70.2                         |         |       |
| Duct latent gain (Btuh)                 | 35                           |         |       |
| Automatic branch splitting              | No                           |         |       |
| Heating ventilation air flow (cfm)      | 0.0                          |         |       |
| Cooling ventilation air flow (cfm)      | 0.0                          |         |       |
| Room components gain (Btuh)             | 2890                         |         |       |
| Room component gain per area (Btuh/ft²) | 7.85                         |         |       |
| Room components loss (Btuh)             | 4967                         |         |       |
| Room component loss per area (Btuh/ft²) | 13.50                        |         |       |
| Cooling design airflow (cfm)            | 255                          |         |       |
| Heating design airflow (cfm)            | 266                          |         |       |

Left button (click) to select the room. Then right button (click) to open the property sheet.

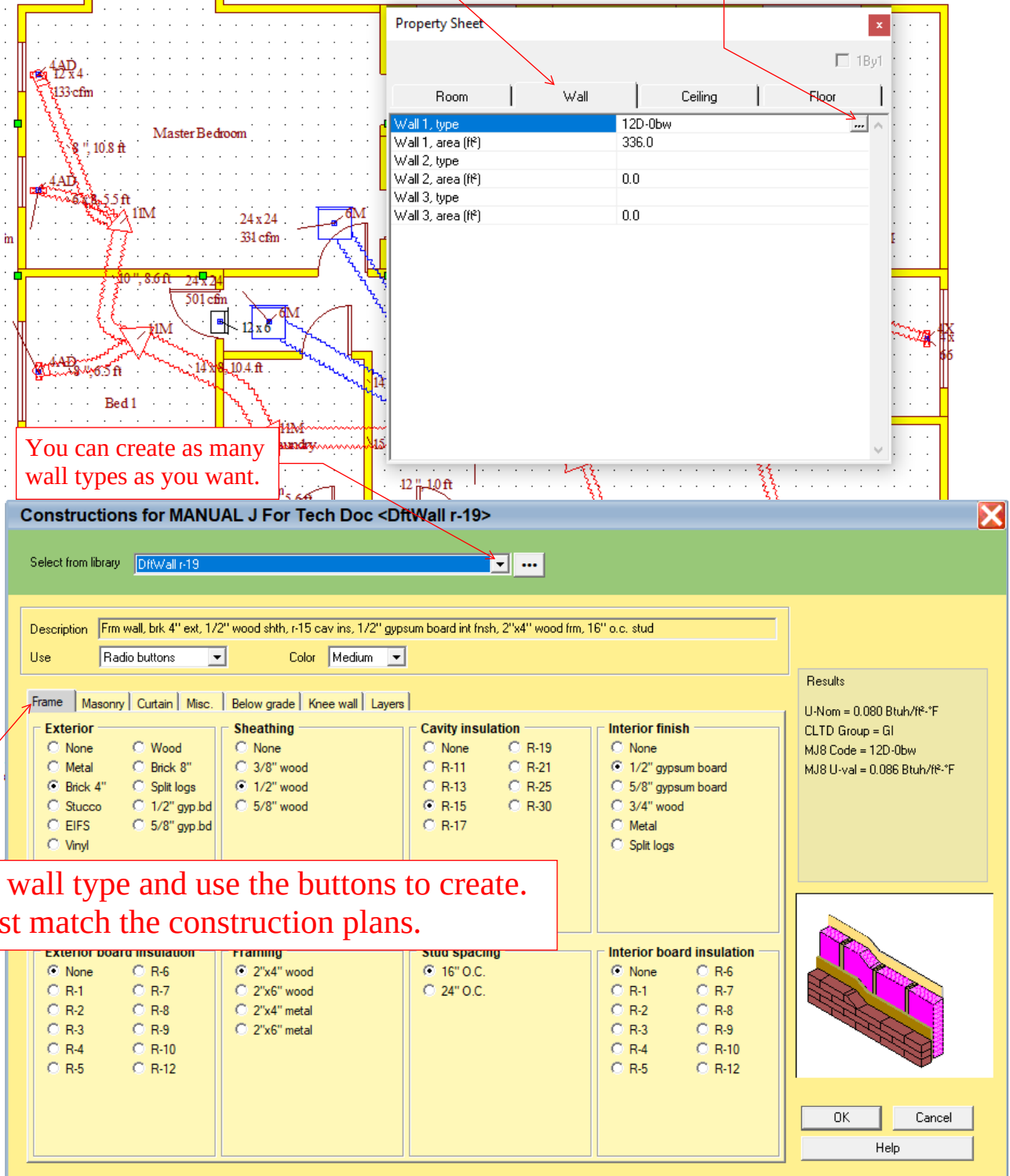
Click on each area that needs to be updated. Most will fill in automatically. The number of occupants is entered here.

Select the wall tab.

This icon will open the wall construction choices. This will be the same when the ceiling and floor tab are used.

You can create as many wall types as you want.

Select the wall type and use the buttons to create. These must match the construction plans.



**Property Sheet**

| Room               | Wall    | Ceiling | Floor |
|--------------------|---------|---------|-------|
| Wall 1, type       | 12D-0bw |         |       |
| Wall 1, area (ft²) | 336.0   |         |       |
| Wall 2, type       |         |         |       |
| Wall 2, area (ft²) | 0.0     |         |       |
| Wall 3, type       |         |         |       |
| Wall 3, area (ft²) | 0.0     |         |       |

**Constructions for MANUAL J For Tech Doc <DfWall r-19>**

Select from library: **DfWall r-19**

Description: **Frm wall, brk 4" ext, 1/2" wood shth, r-15 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud**

Use: **Radio buttons** Color: **Medium**

**Frame** | Masonry | Curtain | Misc. | Below grade | Knee wall | Layers

**Exterior**

- ☐ None
- ☐ Metal
- ☒ Brick 4"
- ☐ Stucco
- ☐ EIFS
- ☐ Vinyl
- ☐ Wood
- ☐ Brick 8"
- ☐ Split logs
- ☐ 1/2" gyp.bd
- ☐ 5/8" gyp.bd

**Sheathing**

- ☐ None
- ☐ 3/8" wood
- ☒ 1/2" wood
- ☐ 5/8" wood

**Cavity insulation**

- ☐ None
- ☐ R-11
- ☐ R-13
- ☒ R-15
- ☐ R-17
- ☐ R-21
- ☐ R-25
- ☐ R-30

**Interior finish**

- ☐ None
- ☒ 1/2" gypsum board
- ☐ 5/8" gypsum board
- ☐ 3/4" wood
- ☐ Metal
- ☐ Split logs

**Exterior board insulation**

- ☒ None
- ☐ R-1
- ☐ R-2
- ☐ R-3
- ☐ R-4
- ☐ R-5
- ☐ R-6
- ☐ R-7
- ☐ R-8
- ☐ R-9
- ☐ R-10
- ☐ R-12

**Framing**

- ☒ 2"x4" wood
- ☐ 2"x6" wood
- ☐ 2"x4" metal
- ☐ 2"x6" metal

**Stud spacing**

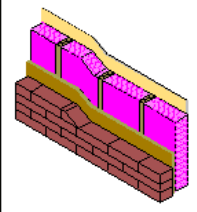
- ☒ 16" O.C.
- ☐ 24" O.C.

**Interior board insulation**

- ☒ None
- ☐ R-1
- ☐ R-2
- ☐ R-3
- ☐ R-4
- ☐ R-5
- ☐ R-6
- ☐ R-7
- ☐ R-8
- ☐ R-9
- ☐ R-10
- ☐ R-12

**Results**

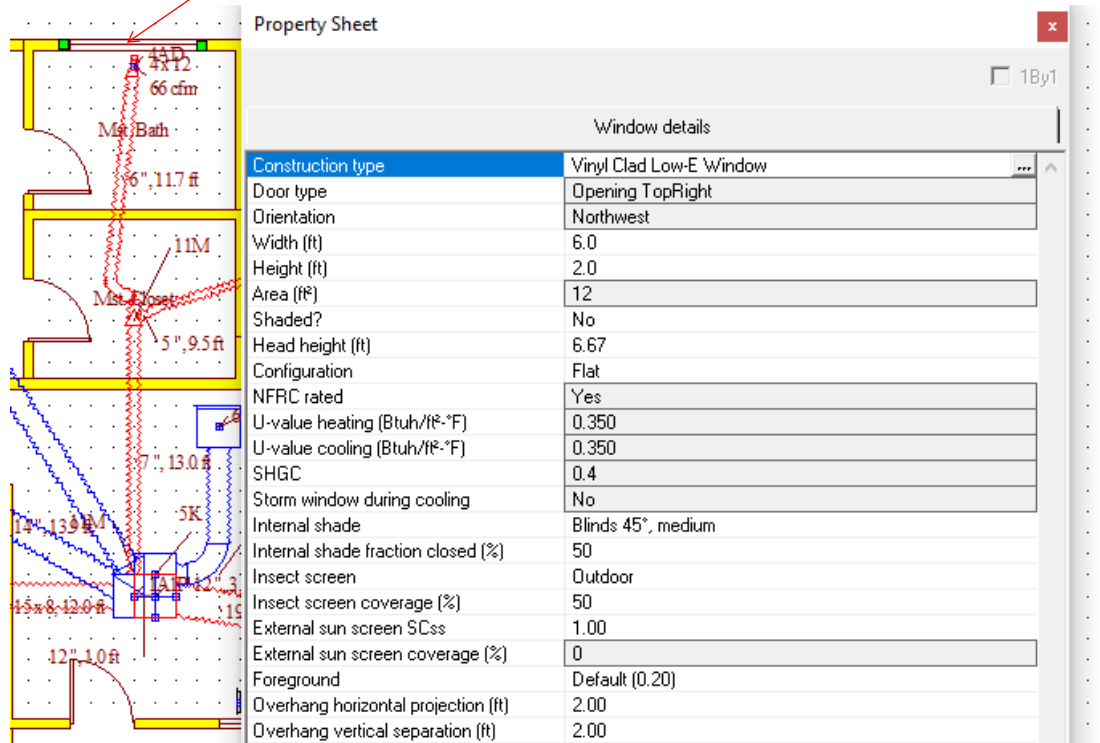
U-Nom = 0.080 Btuh/ft²·F  
CLTD Group = G1  
MJ8 Code = 12D-0bw  
MJ8 U-val = 0.086 Btuh/ft²·F



OK Cancel Help



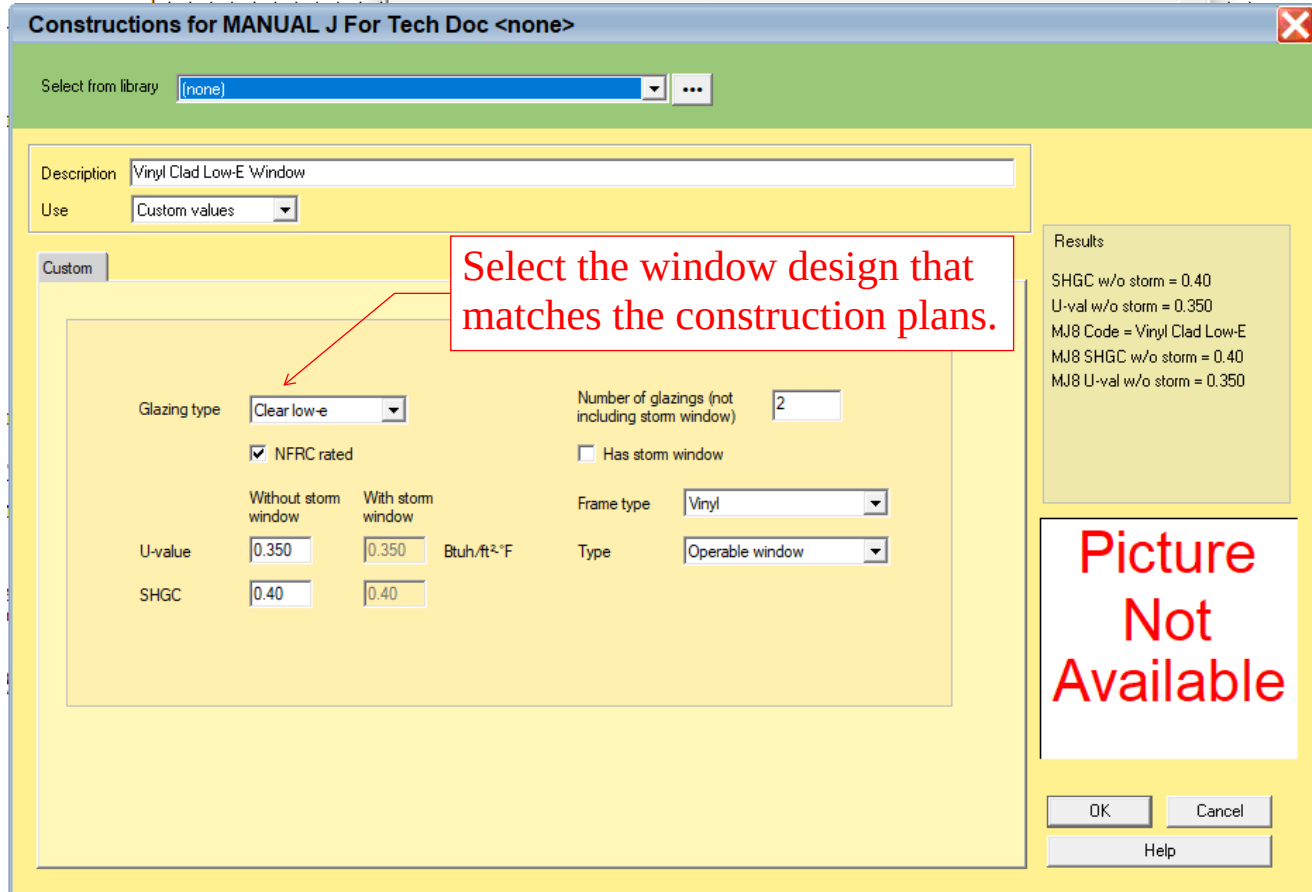
Select a window for window properties.



Property Sheet

Window details

|                                     |                         |
|-------------------------------------|-------------------------|
| Construction type                   | Vinyl Clad Low-E Window |
| Door type                           | Opening TopRight        |
| Orientation                         | Northwest               |
| Width (ft)                          | 6.0                     |
| Height (ft)                         | 2.0                     |
| Area (ft²)                          | 12                      |
| Shaded?                             | No                      |
| Head height (ft)                    | 6.67                    |
| Configuration                       | Flat                    |
| NFRC rated                          | Yes                     |
| U-value heating (Btu/h/ft²·°F)      | 0.350                   |
| U-value cooling (Btu/h/ft²·°F)      | 0.350                   |
| SHGC                                | 0.4                     |
| Storm window during cooling         | No                      |
| Internal shade                      | Blinds 45°, medium      |
| Internal shade fraction closed (%)  | 50                      |
| Insect screen                       | Outdoor                 |
| Insect screen coverage (%)          | 50                      |
| External sun screen SCss            | 1.00                    |
| External sun screen coverage (%)    | 0                       |
| Foreground                          | Default (0.20)          |
| Overhang horizontal projection (ft) | 2.00                    |
| Overhang vertical separation (ft)   | 2.00                    |



Constructions for MANUAL J For Tech Doc <none>

Select from library: (none)

Description: Vinyl Clad Low-E Window

Use: Custom values

Custom

Glazing type: Clear low-e

Number of glazings (not including storm window): 2

☒ NFRC rated

☐ Has storm window

Without storm window: U-value: 0.350, SHGC: 0.40

With storm window: U-value: 0.350, SHGC: 0.40

Frame type: Vinyl

Type: Operable window

Results

SHGC w/o storm = 0.40  
U-val w/o storm = 0.350  
MJ8 Code = Vinyl Clad Low-E  
MJ8 SHGC w/o storm = 0.40  
MJ8 U-val w/o storm = 0.350

Picture Not Available

OK Cancel Help

Select the window design that matches the construction plans.

This icon will open the equipment screen.

The software will have 1,000's of choices. We used a Carrier heat pump for this example.

The software only has AHRI data. The designer must enter the capacities at the design temperatures.

Equipment for Entire House: Base System (Split ASHP)

System Type | Data | Features | Split ASHP | Elec strip | Gas WH | Perf

Type: Split ASHP

Manufacturer: **Carrier**

Trade name: COMFORT 15 SEER2 HP

Condenser model / PN: 25SCA536A00300

Coil model / PN: FJ4DNXB36L

AHRI ref.: 209690258

Target Capacities (Btuh)

|                  |       |
|------------------|-------|
| Heating          | 35582 |
| Cooling sensible | 25698 |
| Cooling latent   | 150   |

Air Distribution

☐ Heating=Cooling

Estimated AVF (cfm): 1350

Design AVF: [1350] cfm

Static pressure: 0.70 in H2O

Heating: [1350] cfm

Cooling: [1350] cfm

Detailed Performance

☐ 2 stage

|                           | Stage 1 |       | Stage 2 |      |
|---------------------------|---------|-------|---------|------|
| Heating (Btuh, COP)       |         |       |         |      |
| 17°F                      | 21060   | 2.54  | 0       | 0.00 |
| 35°F                      | 25704   | 2.95  | 0       | 0.00 |
| 47°F                      | 34090   | 3.70  | 0       | 0.00 |
| 62°F                      |         |       |         |      |
| Fan (cfm, W)              | 1350    | 416   | 0       | 0    |
| Cooling (Btuh, Sens, EER) |         |       |         |      |
| 67°F                      |         |       |         |      |
| 82°F                      | 37011   | 33680 | 15.0    | 0.00 |
| 95°F                      | 32380   | 29466 | 12.0    | 0.00 |
| Fan (cfm, W)              | 1350    | 416   | 0       | 0    |
| Cont fan (cfm, W)         | 456     | 125   |         |      |

Controls

Low temp off/on (°F): -99 / -99

Backup: BU cycles

Capacity balance (°F): 24.0

Economic balance: -99.0

Ratings

☒ SEER2 Ratings

HSPF2: 7.50

EER2: 12.00 SEER2: 14.30

SHR: 0.9100 Sound: 0

Select Equip | Generic Equip | OK | Cancel | Apply | Help

Used these values from the manufacturers expanded performance data.

### DETAILED COOLING CAPACITIES# (Continued)

| EVAPORATOR AIR                                               |               | CONDENSER ENTERING AIR TEMPERATURES °F (°C) |       |                 |                |       |                 |                |       |                 |                |       |                 |
|--------------------------------------------------------------|---------------|---------------------------------------------|-------|-----------------|----------------|-------|-----------------|----------------|-------|-----------------|----------------|-------|-----------------|
|                                                              |               | 75.0 (23.9)                                 |       |                 | 85.0 (29.4)    |       |                 | 95.0 (35.0)    |       |                 | 105.0 (40.6)   |       |                 |
| CFM                                                          | EWB           | Capacity MBtuh                              |       | Total Sys. KW** | Capacity MBtuh |       | Total Sys. KW** | Capacity MBtuh |       | Total Sys. KW** | Capacity MBtuh |       | Total Sys. KW** |
|                                                              |               | Total                                       | Sens† |                 | Total          | Sens† |                 | Total          | Sens† |                 | Total          | Sens† |                 |
| 25SCA536A003 Outdoor Section With FJ4DNXB36L* Indoor Section |               |                                             |       |                 |                |       |                 |                |       |                 |                |       |                 |
| 1060                                                         | 72.0 (22.2)   | 41.65                                       | 21.37 | 2.29            | 39.73          | 20.65 | 2.56            | 37.70          | 19.88 | 2.81            | 35.53          | 19.08 | 3.10            |
|                                                              | 67.0 (19.4)   | 37.84                                       | 26.35 | 2.33            | 36.07          | 25.61 | 2.59            | 34.20          | 24.83 | 2.85            | 32.20          | 24.01 | 3.14            |
|                                                              | 63.0 (17.2)†† | 35.05                                       | 25.33 | 2.34            | 33.41          | 24.59 | 2.61            | 31.65          | 23.80 | 2.87            | 29.77          | 22.97 | 3.15            |
|                                                              | 62.0 (16.7)   | 34.43                                       | 31.15 | 2.34            | 32.85          | 30.37 | 2.61            | 31.16          | 29.52 | 2.87            | 29.40          | 28.59 | 3.15            |
|                                                              | 57.0 (13.9)   | 33.21                                       | 33.21 | 2.34            | 31.95          | 31.95 | 2.61            | 30.59          | 30.59 | 2.87            | 29.12          | 29.12 | 3.15            |
| 1200                                                         | 72.0 (22.2)   | 42.35                                       | 22.32 | 2.33            | 40.36          | 21.58 | 2.59            | 38.26          | 20.80 | 2.84            | 36.01          | 19.99 | 3.13            |
|                                                              | 67.0 (19.4)   | 38.52                                       | 27.88 | 2.36            | 36.73          | 27.17 | 2.63            | 34.73          | 26.33 | 2.89            | 32.65          | 25.53 | 3.17            |
|                                                              | 63.0 (17.2)†† | 35.69                                       | 26.76 | 2.38            | 33.97          | 25.98 | 2.65            | 32.15          | 25.22 | 2.91            | 30.21          | 24.37 | 3.19            |
|                                                              | 62.0 (16.7)   | 35.17                                       | 33.16 | 2.38            | 33.55          | 32.30 | 2.65            | 31.96          | 31.04 | 2.91            | 30.19          | 30.19 | 3.19            |
|                                                              | 57.0 (13.9)   | 34.46                                       | 34.46 | 2.38            | 33.13          | 33.13 | 2.65            | 31.69          | 31.69 | 2.91            | 30.14          | 30.14 | 3.19            |
| 1350                                                         | 72.0 (22.2)   | 42.92                                       | 23.27 | 2.36            | 40.87          | 22.52 | 2.62            | 38.70          | 21.74 | 2.88            | 36.39          | 20.92 | 3.17            |
|                                                              | 67.0 (19.4)   | 39.04                                       | 29.46 | 2.41            | 37.15          | 28.70 | 2.67            | 35.15          | 27.89 | 2.93            | 33.03          | 27.01 | 3.22            |
|                                                              | 63.0 (17.2)†† | 36.22                                       | 28.22 | 2.42            | 34.43          | 27.45 | 2.69            | 32.38          | 26.55 | 2.95            | 30.58          | 25.76 | 3.23            |
|                                                              | 62.0 (16.7)   | 35.86                                       | 35.05 | 2.42            | 34.24          | 34.24 | 2.69            | 32.73          | 32.73 | 2.95            | 31.07          | 31.07 | 3.23            |
|                                                              | 57.0 (13.9)   | 35.60                                       | 35.60 | 2.43            | 34.18          | 34.18 | 2.69            | 32.67          | 32.67 | 2.95            | 31.03          | 31.03 | 3.23            |
| 25SCA542A003 Outdoor Section With FJ4DNXC42L* Indoor Section |               |                                             |       |                 |                |       |                 |                |       |                 |                |       |                 |

### HEAT PUMP HEATING PERFORMANCE

| INDOOR AIR                                                   |      | OUTDOOR COIL ENTERING AIR TEMPERATURES °F (°C) |        |                |                |        |                |                |        |                |                |        |                |                |        |                |                |        |                |
|--------------------------------------------------------------|------|------------------------------------------------|--------|----------------|----------------|--------|----------------|----------------|--------|----------------|----------------|--------|----------------|----------------|--------|----------------|----------------|--------|----------------|
| EDB                                                          | CFM  | -3.0 (-19.4)                                   |        |                | 7.0 (-13.9)    |        |                | 17.0 (-8.3)    |        |                | 27.0 (-2.8)    |        |                | 37.0 (2.8)     |        |                | 47.0 (8.3)     |        |                |
|                                                              |      | Capacity MBtuh                                 |        | Total Sys. KW† | Capacity MBtuh |        | Total Sys. KW† | Capacity MBtuh |        | Total Sys. KW† | Capacity MBtuh |        | Total Sys. KW† | Capacity MBtuh |        | Total Sys. KW† | Capacity MBtuh |        | Total Sys. KW† |
|                                                              |      | Total                                          | Integ* |                | Total          | Integ* |                | Total          | Integ* |                | Total          | Integ* |                | Total          | Integ* |                | Total          | Integ* |                |
| 25SCA536A003 Outdoor Section With FJ4DNXB36L* Indoor Section |      |                                                |        |                |                |        |                |                |        |                |                |        |                |                |        |                |                |        |                |
| 65.0 (18.3)                                                  | 1060 | 13.57                                          | 12.48  | 2.18           | 17.01          | 15.63  | 2.19           | 21.01          | 19.16  | 2.26           | 25.84          | 22.95  | 2.39           | 30.04          | 27.34  | 2.49           | 34.58          | 34.58  | 2.60           |
|                                                              | 1200 | 13.82                                          | 12.71  | 2.20           | 17.30          | 15.90  | 2.20           | 21.35          | 19.47  | 2.27           | 26.14          | 23.22  | 2.38           | 30.41          | 27.67  | 2.48           | 35.06          | 35.06  | 2.58           |
|                                                              | 1350 | 14.06                                          | 12.93  | 2.23           | 17.57          | 16.14  | 2.22           | 21.65          | 19.74  | 2.28           | 26.43          | 23.48  | 2.39           | 30.76          | 27.99  | 2.48           | 35.49          | 35.49  | 2.57           |
| 70.0 (21.1)                                                  | 1060 | 12.97                                          | 11.93  | 2.28           | 16.42          | 15.09  | 2.29           | 20.40          | 18.60  | 2.35           | 25.37          | 22.54  | 2.48           | 29.53          | 26.87  | 2.59           | 34.00          | 34.00  | 2.69           |
|                                                              | 1200 | 13.24                                          | 12.18  | 2.31           | 16.72          | 15.36  | 2.31           | 20.74          | 18.91  | 2.37           | 25.71          | 22.84  | 2.48           | 29.91          | 27.22  | 2.58           | 34.47          | 34.47  | 2.68           |
|                                                              | 1350 | 13.47                                          | 12.39  | 2.34           | 16.99          | 15.61  | 2.33           | 21.06          | 19.20  | 2.39           | 26.01          | 23.10  | 2.49           | 30.27          | 27.55  | 2.58           | 34.90          | 34.90  | 2.67           |
| 75.0 (23.9)                                                  | 1060 | 12.31                                          | 11.32  | 2.36           | 15.76          | 14.48  | 2.37           | 19.74          | 18.00  | 2.44           | 24.24          | 21.53  | 2.55           | 29.02          | 26.41  | 2.68           | 33.42          | 33.42  | 2.79           |
|                                                              | 1200 | 12.56                                          | 11.55  | 2.39           | 16.05          | 14.75  | 2.39           | 20.08          | 18.31  | 2.45           | 24.77          | 22.00  | 2.56           | 29.40          | 26.75  | 2.67           | 33.88          | 33.88  | 2.78           |
|                                                              | 1350 | 12.81                                          | 11.78  | 2.43           | 16.34          | 15.01  | 2.42           | 20.40          | 18.60  | 2.47           | 25.51          | 22.66  | 2.59           | 29.74          | 27.06  | 2.68           | 34.30          | 34.30  | 2.77           |

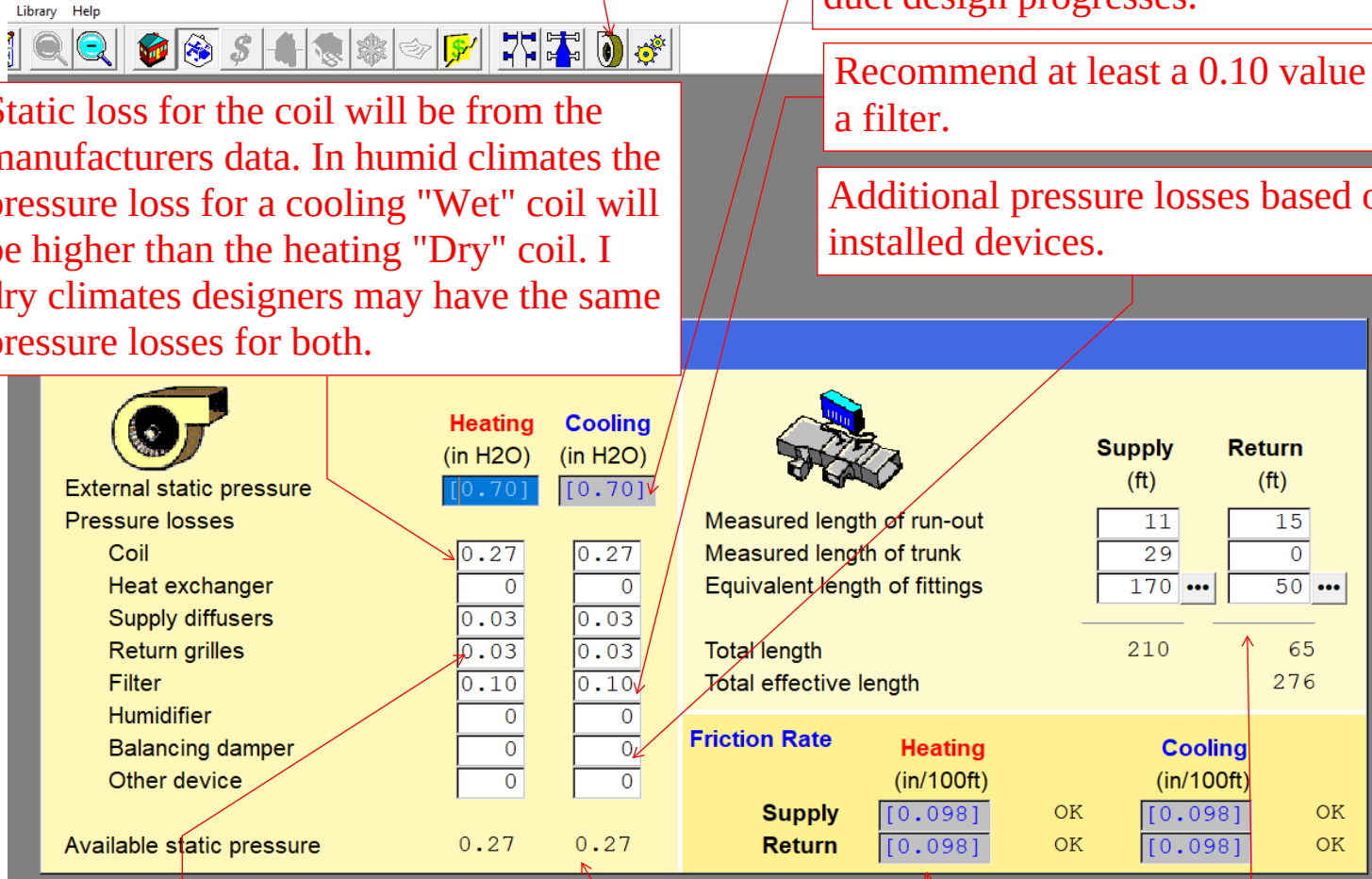
This icon will open the blower information screen.

The starting external static pressure will be the designers best educated guess. This can be adjusted as the duct design progresses.

Static loss for the coil will be from the manufacturers data. In humid climates the pressure loss for a cooling "Wet" coil will be higher than the heating "Dry" coil. In dry climates designers may have the same pressure losses for both.

Recommend at least a 0.10 value for a filter.

Additional pressure losses based on installed devices.



The screenshot shows the Writasoft Manual J software interface. The top menu bar includes 'Library' and 'Help'. The main window is divided into several sections:

- External static pressure:** A field with a blower icon and a value of [0.70].
- Pressure losses:** A table with columns for Heating (in H2O) and Cooling (in H2O).
 

|                  | Heating (in H2O) | Cooling (in H2O) |
|------------------|------------------|------------------|
| Coil             | 0.27             | 0.27             |
| Heat exchanger   | 0                | 0                |
| Supply diffusers | 0.03             | 0.03             |
| Return grilles   | 0.03             | 0.03             |
| Filter           | 0.10             | 0.10             |
| Humidifier       | 0                | 0                |
| Balancing damper | 0                | 0                |
| Other device     | 0                | 0                |
- Available static pressure:** Fields for Heating and Cooling, both showing 0.27.
- Measured length of run-out:** 11 ft (Supply) and 15 ft (Return).
- Measured length of trunk:** 29 ft (Supply) and 0 ft (Return).
- Equivalent length of fittings:** 170 ft (Supply) and 50 ft (Return).
- Total length:** 210 ft (Supply) and 65 ft (Return).
- Total effective length:** 276 ft (Return).
- Friction Rate:** A table with columns for Heating (in/100ft) and Cooling (in/100ft).
 

|        | Heating (in/100ft) | Cooling (in/100ft) |
|--------|--------------------|--------------------|
| Supply | [0.098] OK         | [0.098] OK         |
| Return | [0.098] OK         | [0.098] OK         |

Manual T can be used for the pressure loss for registers and grilles. A reasonable value of 0.03 can be used.

This is the available static pressure for the duct design.

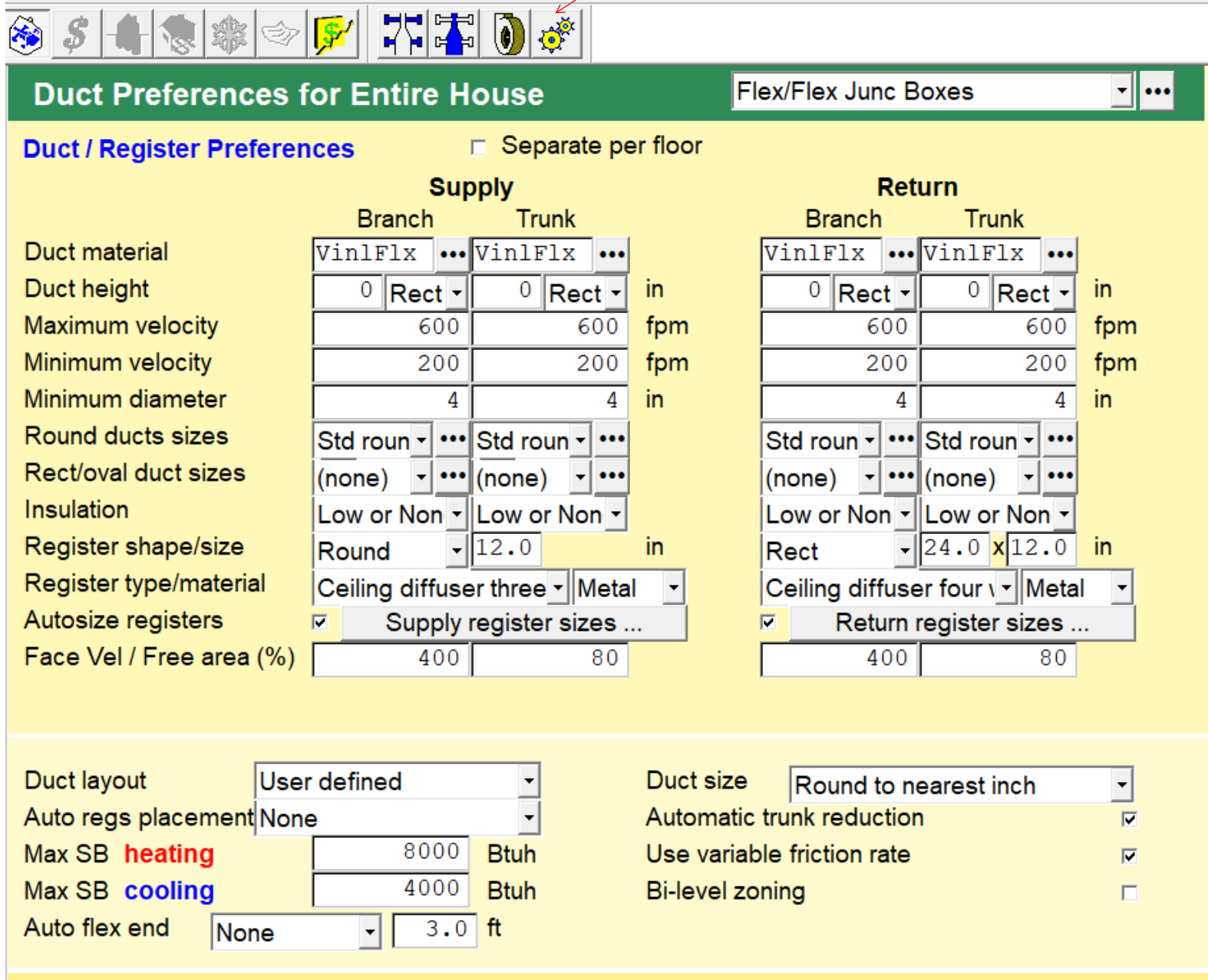
The lengths will be calculated from the duct design.

The friction rate is the relationship between the blower and the ductwork. The design friction rate must be between a 0.06 and 0.18.

Available static pressure \* 100 / Total equivalent length = Friction Rate

$$0.27 * 100 / 276 = 0.098$$

This icon will open the duct preferences information screen.



**Duct Preferences for Entire House** Flex/Flex Junc Boxes

**Duct / Register Preferences** ☐ Separate per floor

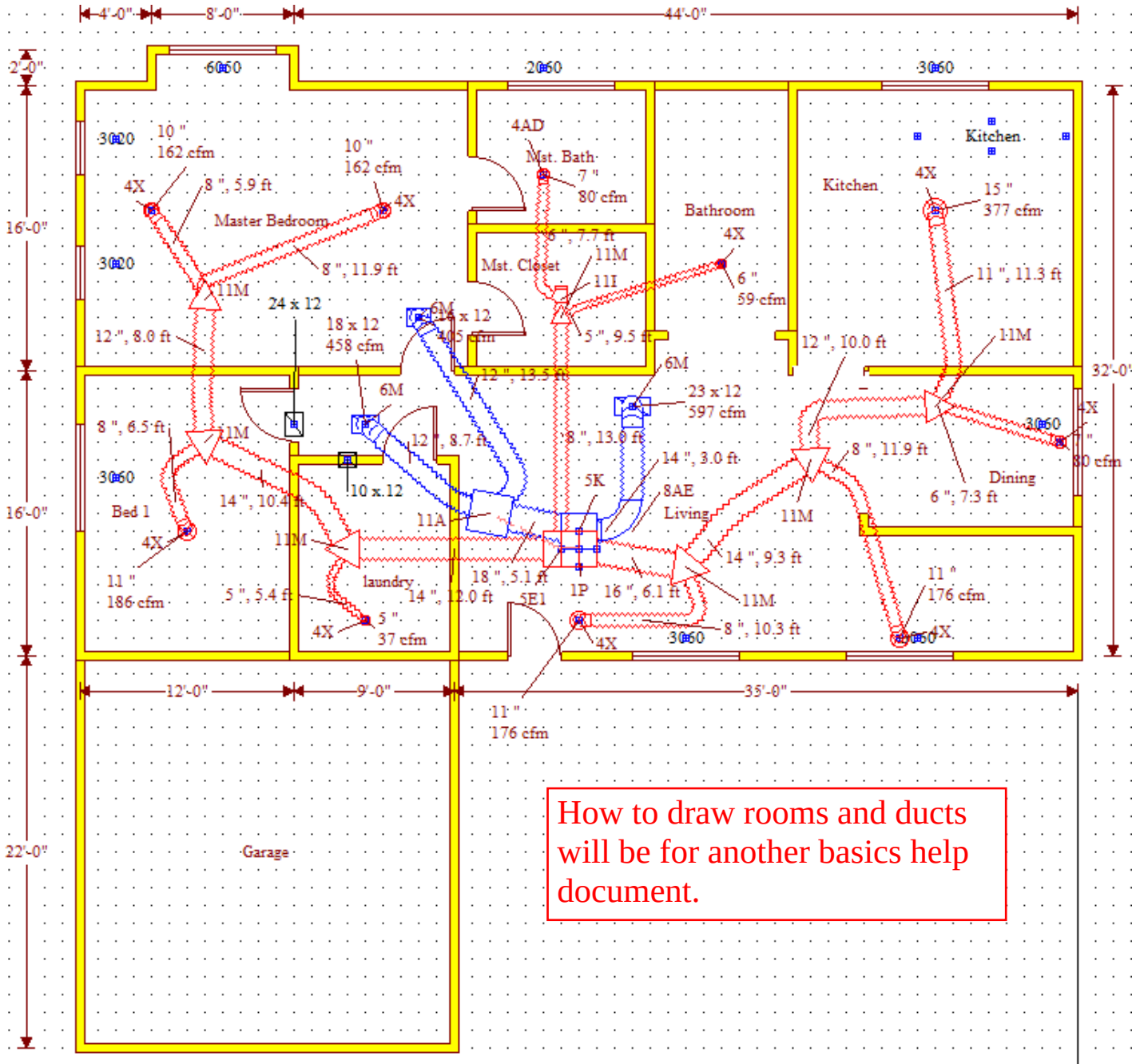
|                          | Supply                                                        |              | Return                                                        |                |     |
|--------------------------|---------------------------------------------------------------|--------------|---------------------------------------------------------------|----------------|-----|
|                          | Branch                                                        | Trunk        | Branch                                                        | Trunk          |     |
| Duct material            | VinlFlx ...                                                   | VinlFlx ...  | VinlFlx ...                                                   | VinlFlx ...    |     |
| Duct height              | 0 Rect                                                        | 0 Rect       | 0 Rect                                                        | 0 Rect         | in  |
| Maximum velocity         | 600                                                           | 600          | 600                                                           | 600            | fpm |
| Minimum velocity         | 200                                                           | 200          | 200                                                           | 200            | fpm |
| Minimum diameter         | 4                                                             | 4            | 4                                                             | 4              | in  |
| Round ducts sizes        | Std roun ...                                                  | Std roun ... | Std roun ...                                                  | Std roun ...   |     |
| Rect/oval duct sizes     | (none) ...                                                    | (none) ...   | (none) ...                                                    | (none) ...     |     |
| Insulation               | Low or Non                                                    | Low or Non   | Low or Non                                                    | Low or Non     |     |
| Register shape/size      | Round                                                         | 12.0 in      | Rect                                                          | 24.0 x 12.0 in |     |
| Register type/material   | Ceiling diffuser three                                        | Metal        | Ceiling diffuser four                                         | Metal          |     |
| Autosize registers       | <input checked="" type="checkbox"/> Supply register sizes ... |              | <input checked="" type="checkbox"/> Return register sizes ... |                |     |
| Face Vel / Free area (%) | 400                                                           | 80           | 400                                                           | 80             |     |

|                     |              |                            |                                     |
|---------------------|--------------|----------------------------|-------------------------------------|
| Duct layout         | User defined | Duct size                  | Round to nearest inch               |
| Auto regs placement | None         | Automatic trunk reduction  | <input checked="" type="checkbox"/> |
| Max SB heating      | 8000 Btuh    | Use variable friction rate | <input checked="" type="checkbox"/> |
| Max SB cooling      | 4000 Btuh    | Bi-level zoning            | <input type="checkbox"/>            |
| Auto flex end       | None 3.0 ft  |                            |                                     |

The designer has many choices for duct design. This has been set up for a flex duct system that will be located in the attic.

This icon will open the draw screen.



How to draw rooms and ducts will be for another basics help document.