

HVAC LOAD CALCULATIONS AND THE ENERGY RATER

RESNET 2006

Dennis J Stroer

CALCS-PLUS

Venice Florida

BUBBA'S PERFESSIONAL HVAC LOAD CALCULATION

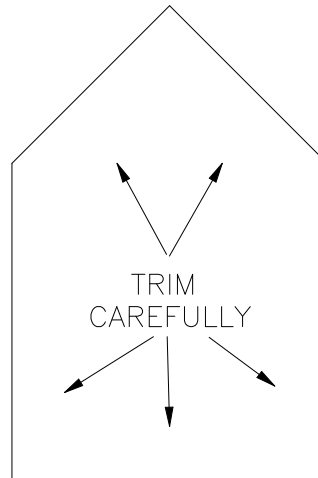
SIZING CHART

AIR CONDITIONING OR HEAT PUMP

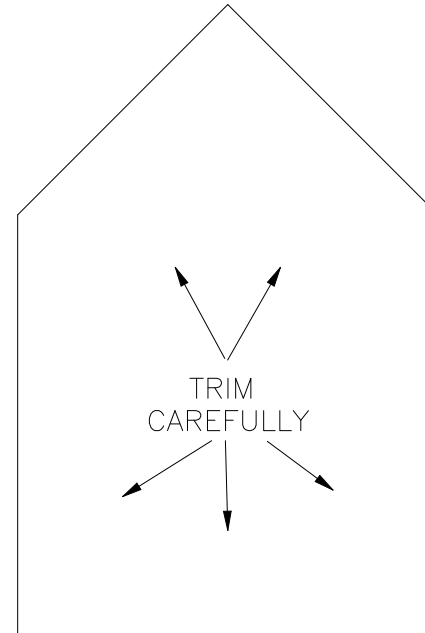
TRIM OUT VERY CAREFULLY ON BLACK LINES, THEN FOLLOW INSTRUCTIONS BELOW



1.5 TO
2-TON



2.5 TO
3.5-TON



4 TO
5-TON

INSTRUCTIONS:

Stand on the curb and look through Sizing Holes,
what ever Hole the house fits into that's the size unit to use.
(For larger homes and or zoning use multiple Sizing Holes.)

HVAC Load Calculations.

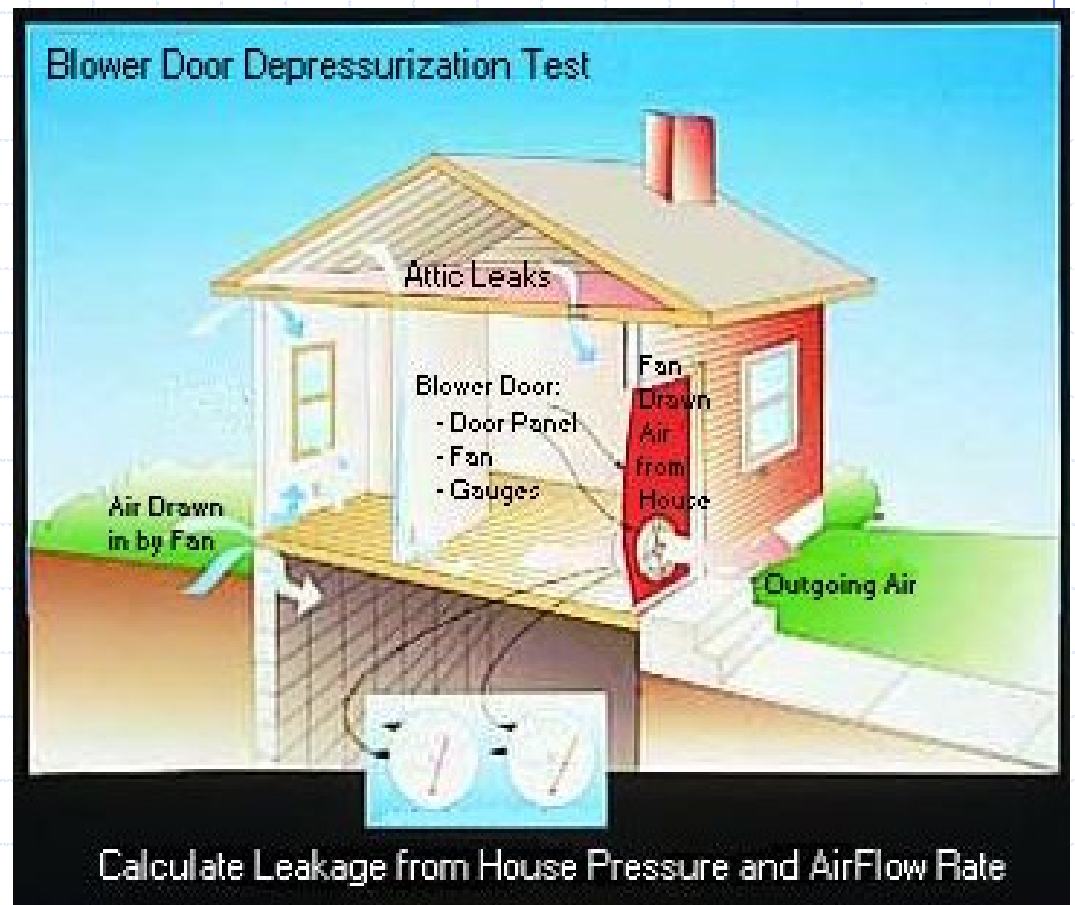
- ◆ Why should an Energy Rater perform HVAC Load Calculations?
- ◆ What is meant by a Room x Room calculation?
- ◆ Why use ACCA Manual J Version 8?
- ◆ MJ8 Sensitivities.
- ◆ How can an Energy Rater benefit?

Energy Raters and Air Flow

Energy raters are already familiar with airflow. We use air flow as a tool to do energy ratings.



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Two types of Airflow.

With respect to residential and commercial construction there are two kinds of airflow.

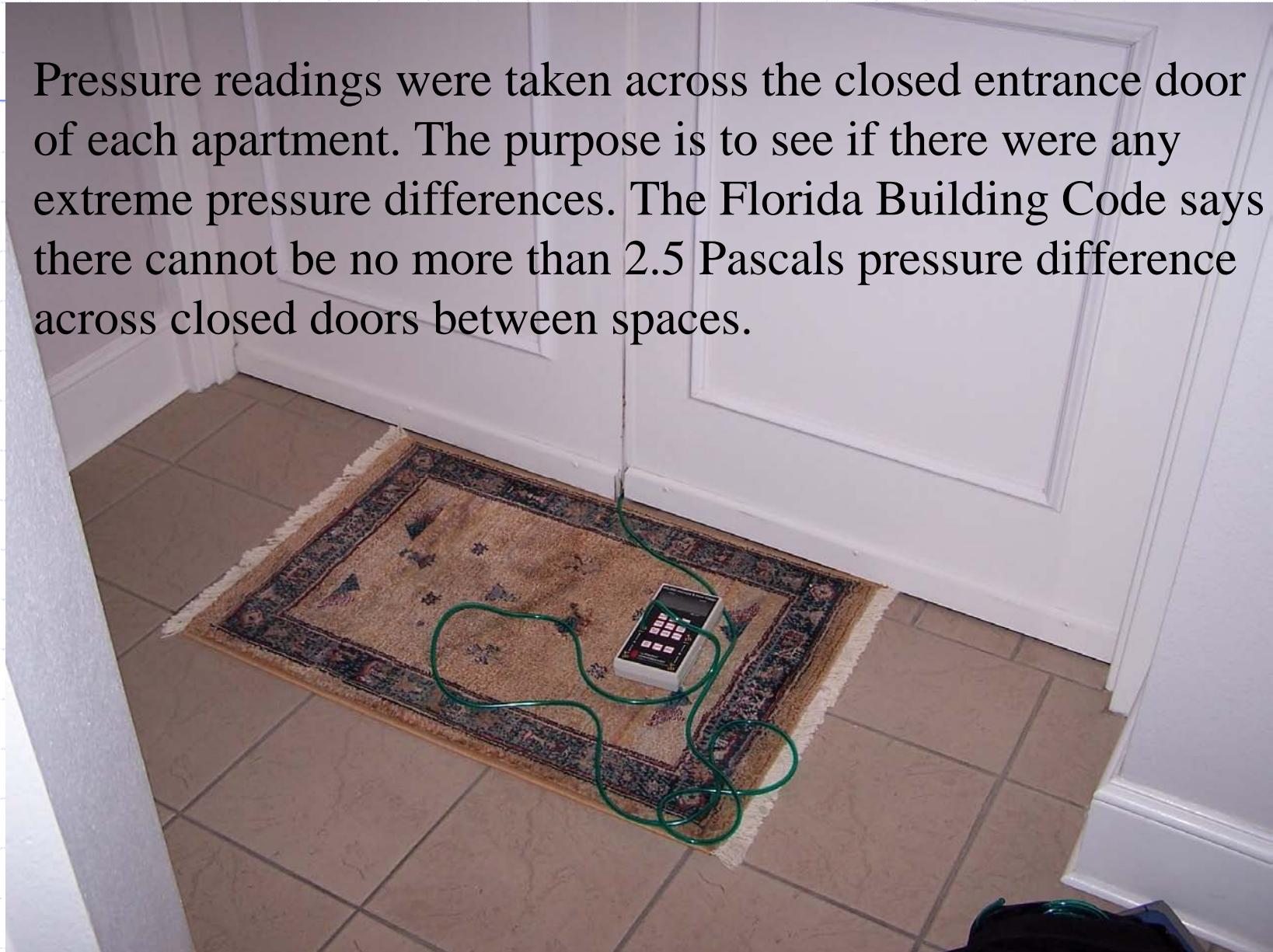
Controlled and Uncontrolled



Energy Raters use controlled airflow to estimate the amount of uncontrolled airflow.

Uncontrolled Airflow

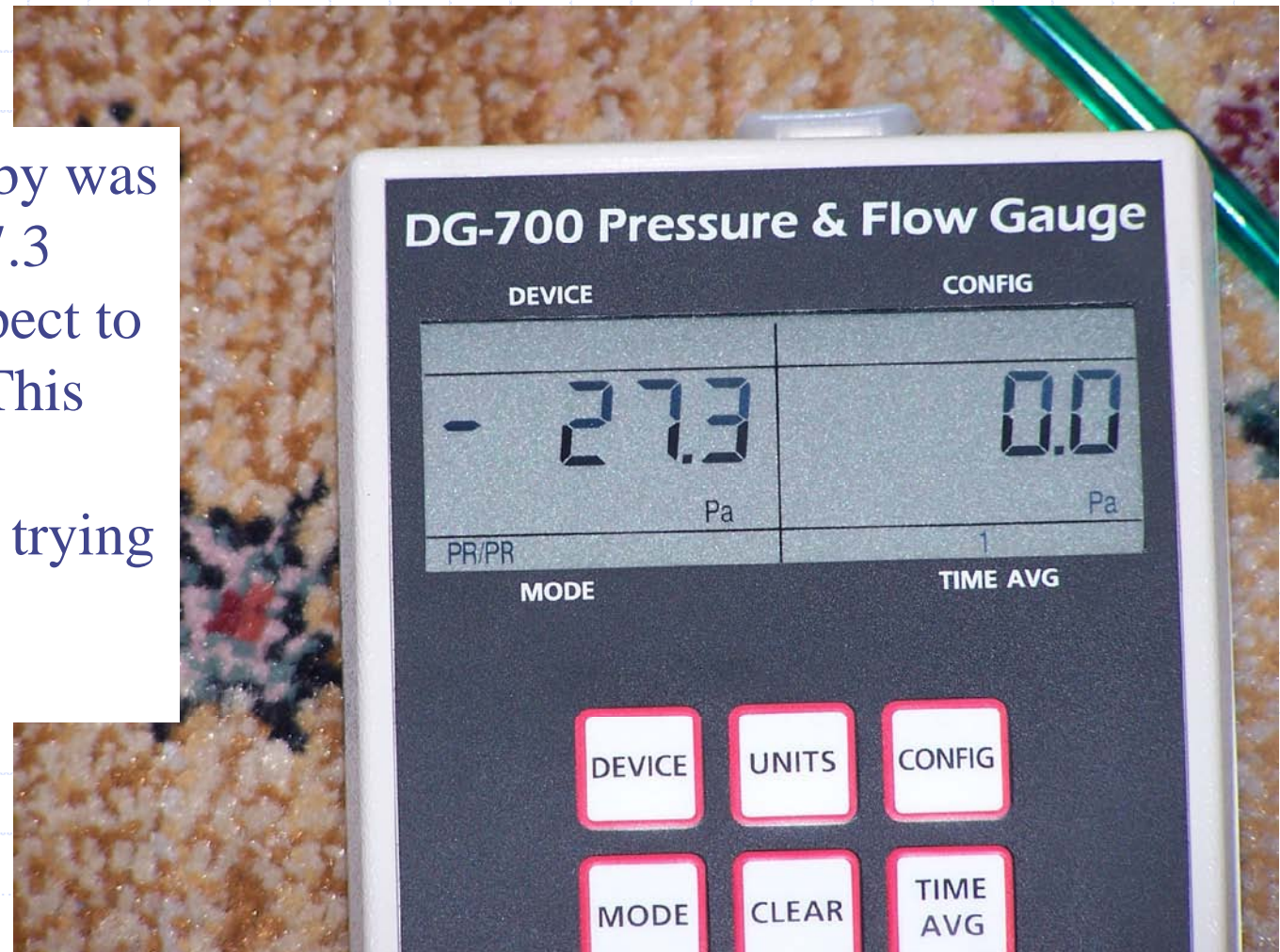
Pressure readings were taken across the closed entrance door of each apartment. The purpose is to see if there were any extreme pressure differences. The Florida Building Code says there cannot be no more than 2.5 Pascals pressure difference across closed doors between spaces.



Uncontrolled Airflow

The elevator lobby was found to be a -27.3 Pascals with respect to the apartments. This means air in the elevator lobby is trying to go into the apartment.

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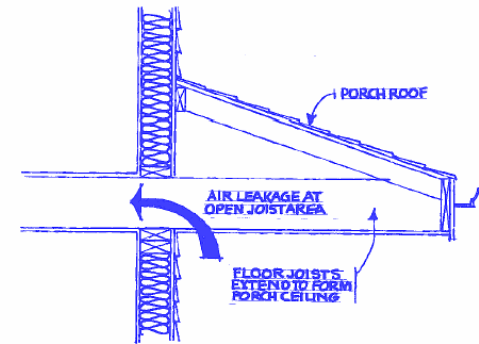


Uncontrolled Airflow

Leaky buildings

Leaky Duct Systems

Unbalanced building pressures.



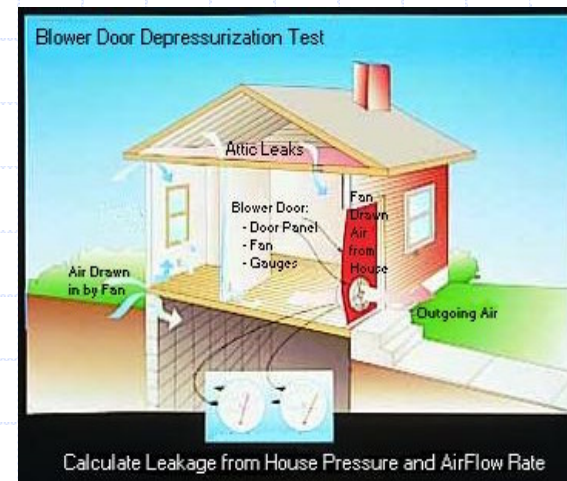
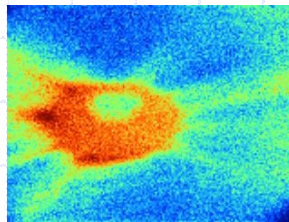
Uncontrolled Airflow = Infiltration

Infiltration influences how the building reacts in terms of health, safety, durability, comfort, and energy efficiency.

- Can be estimated with a high degree of accuracy.
- Can be tested with a high degree of accuracy.
- Can be eliminated or controlled.



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Duct Leakage

Influences how the building reacts in terms of health, safety, durability, comfort, and energy efficiency.

- Can be estimated with a high degree of accuracy.
- Can be tested with a high degree of accuracy.
- Can be eliminated.



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But,
as Energy Raters we
understand uncontrolled
airflow.

So lets talk about controlled airflow.

Controlled Airflow

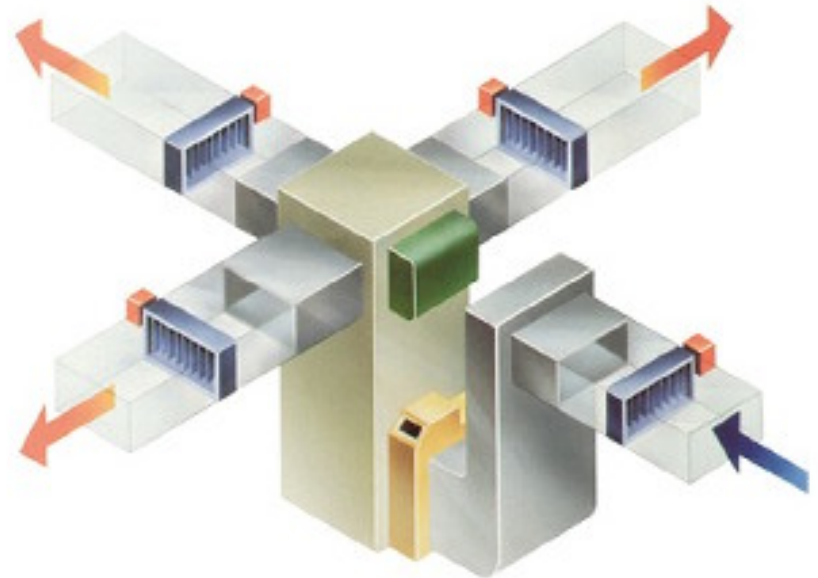
Open and closing windows

Table fan

Air conditioning systems.



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Room Airflow

Determined by the estimated Heat Gain/Loss; Cooling or heating which ever has been chosen to dominate the system design.

HVAC Load calculations performed on a Room x Room basis.

Based on the Heat Loss/Gain through the building envelope relative to each room.

Room x Room Loads

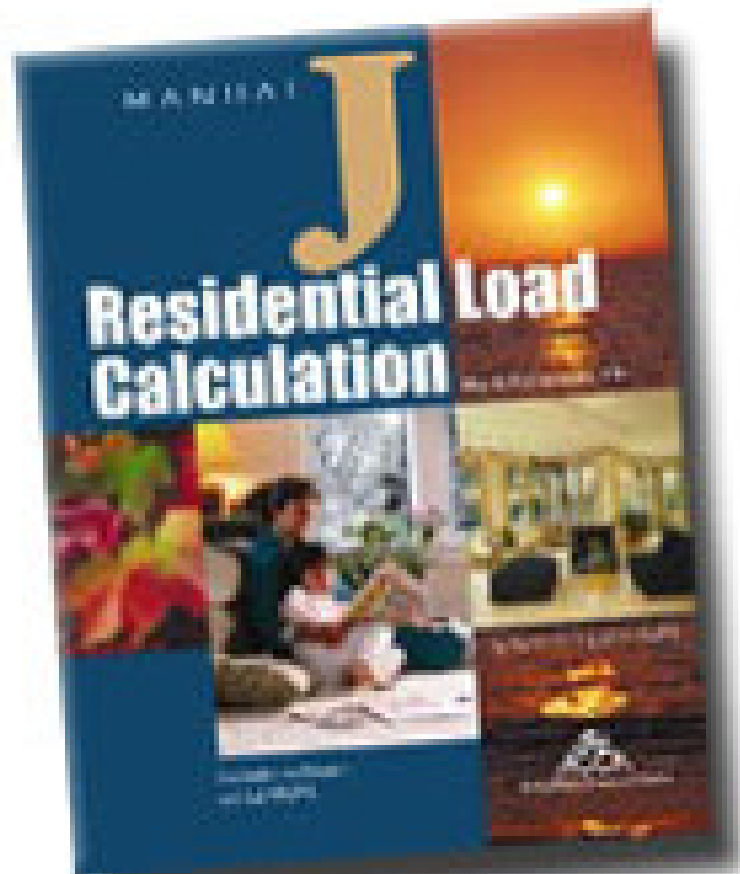
If the HVAC system is the backbone of the house as a system. The HVAC load calculation is the backbone of the HVAC system

- ◆ Required to determine supply CFM for each room
- ◆ Required to select Supply Outlets
- ◆ Required to select Return Inlets
- ◆ Required to design a Duct System
- ◆ Required to diagnose comfort problems

Estimating Required Room Airflow

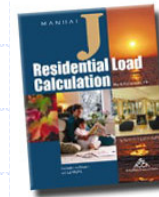
Perform a Room x Room HVAC load calculation using procedures as determined by a recognized industry standard determined by local code or the EPA.

ACCA Manual J_{v8}



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Why Use MJ8

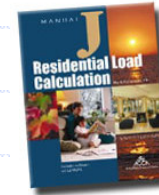


The heating and cooling load estimates affect every aspect of the system design procedure

- From system selection
- To equipment selection procedures
- To placement and selection of air distribution hardware
- To duct routing and airway sizing or pipe layout and sizing

Because of this the load calculation must be as accurate as possible

Value of Manual J



- ◆ Eliminate Under-sizing of Heating & Cooling Equipment
- ◆ Eliminate Over-sizing of Heating & Cooling Equipment
- ◆ Humidity Control During the Cooling Season
- ◆ Eliminate Comfort Problems

Under Sizing Equipment

The obvious problem with undersized equipment is that it will not maintain the desired temperature. However, slightly undersized cooling equipment (by a margin of 10% or less) may actually provide more comfort at a lower cost.



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Oversized Equipment Causes

- ◆ short-cycles
- ◆ marginalized temperature control
- ◆ pockets of stagnate air
- ◆ degrades humidity control during the cooling season
- ◆ requires larger duct runs



Oversized Equipment Causes

- ◆ increases the installed cost
- ◆ increases the operating cost
- ◆ increases the demand on our utilities
- ◆ adds unnecessary stress on equipment



Humidity Control

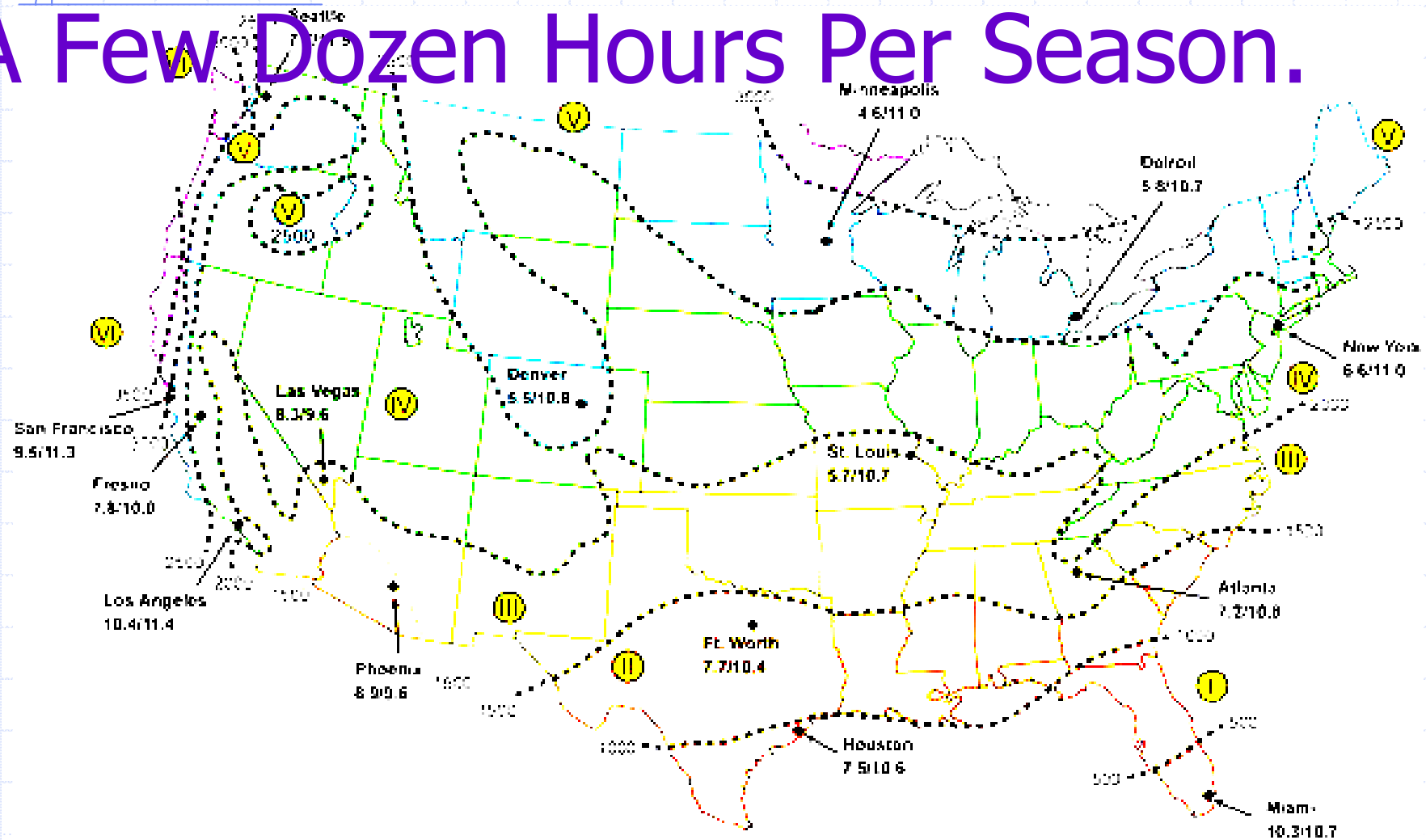


The next subdivision

Humidity Control During The Cooling Season

- ◆ Sensible and latent cooling loads are imposed on buildings located in hot humid climates. When the summer design condition occurs, properly sized equipment will operate continuously or almost continuously, both loads will be neutralized, and the occupants will be comfortable.

BUT,
Design Conditions Only Occur For
A Few Dozen Hours Per Season.

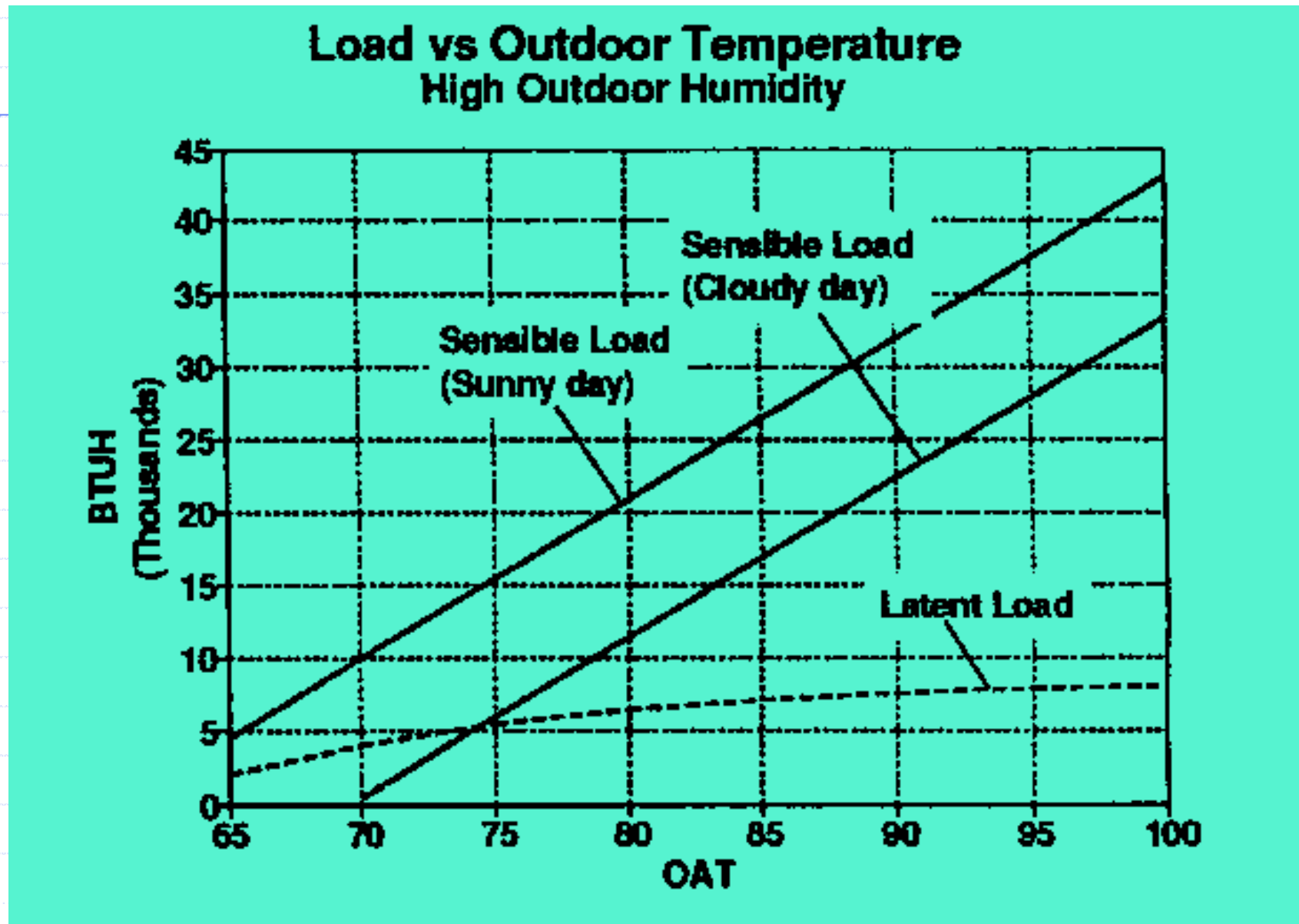


Design Conditions

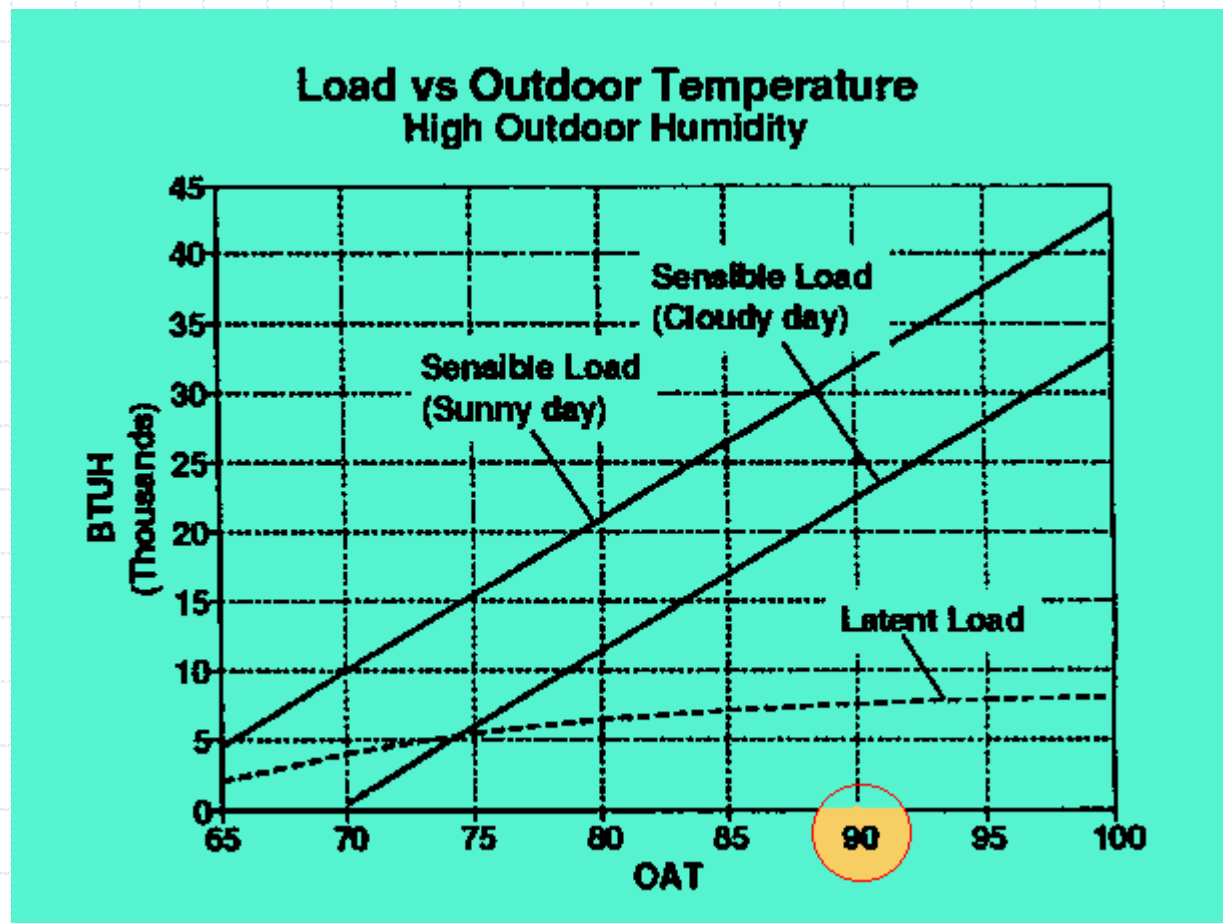
Table 1A
Outdoor Design Conditions For the United States and Canada

| Location | Elevation Feet | Latitude Degrees North | Winter | Summer | | | | | |
|----------------------|-------------------|---------------------------|----------------------------|---------------------------|------------------------|----------------------------|----------------------------|----------------------------|------------------------|
| | | | Heating 99% Dry Bulb | Cooling 1% Dry Bulb | Coincident Wet Bulb | Design Grains 55% RH | Design Grains 50% RH | Design Grains 45% RH | Daily Range (DR) |
| St. Augustine | 10 | 29 | 35 | 89 | 78 | 59 | 66 | 72 | M |
| St. Petersburg | 11 | 28 | 47 | 93 | 79 | 59 | 66 | 72 | M |
| Sanford | 55 | 28 | 38 | 93 | 76 | 39 | 46 | 52 | M |
| Sarasota/Bradenton | 30 | 27 | 43 | 92 | 79 | 61 | 68 | 74 | M |
| Tallahassee AP | 55 | 30 | 28 | 93 | 76 | 39 | 46 | 52 | M |
| Tampa AP | 19 | 28 | 40 | 91 | 77 | 49 | 56 | 62 | M |
| Valpariso, Eglin AFB | 85 | 30 | 33 | 90 | 78 | 57 | 64 | 70 | M |
| Vero Beach | 13 | 27 | 43 | 90 | 78 | 57 | 64 | 70 | M |
| West Palm Beach AP | 15 | 26 | 47 | 90 | 78 | 57 | 64 | 70 | M |

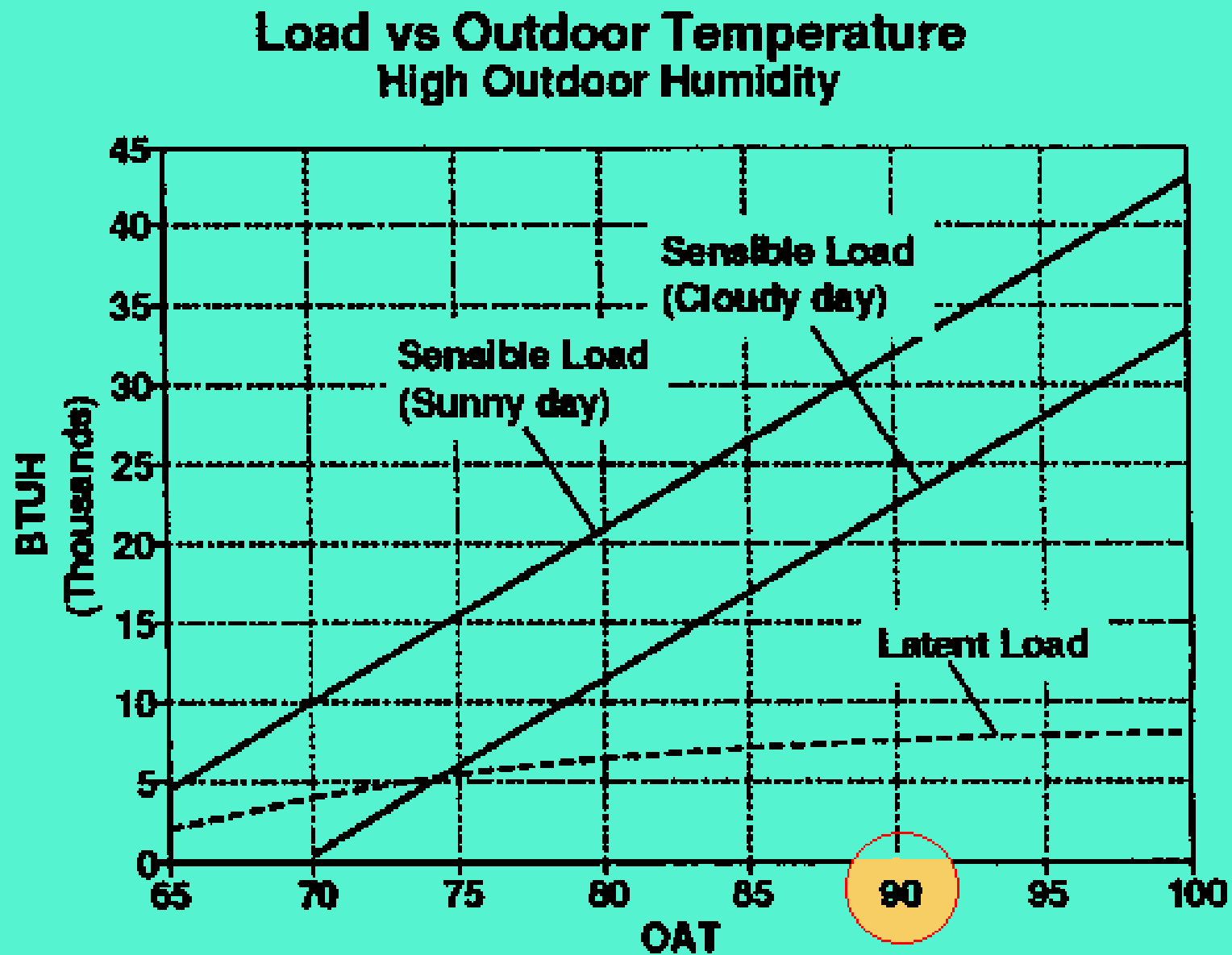
Load vs Outdoor Temperature



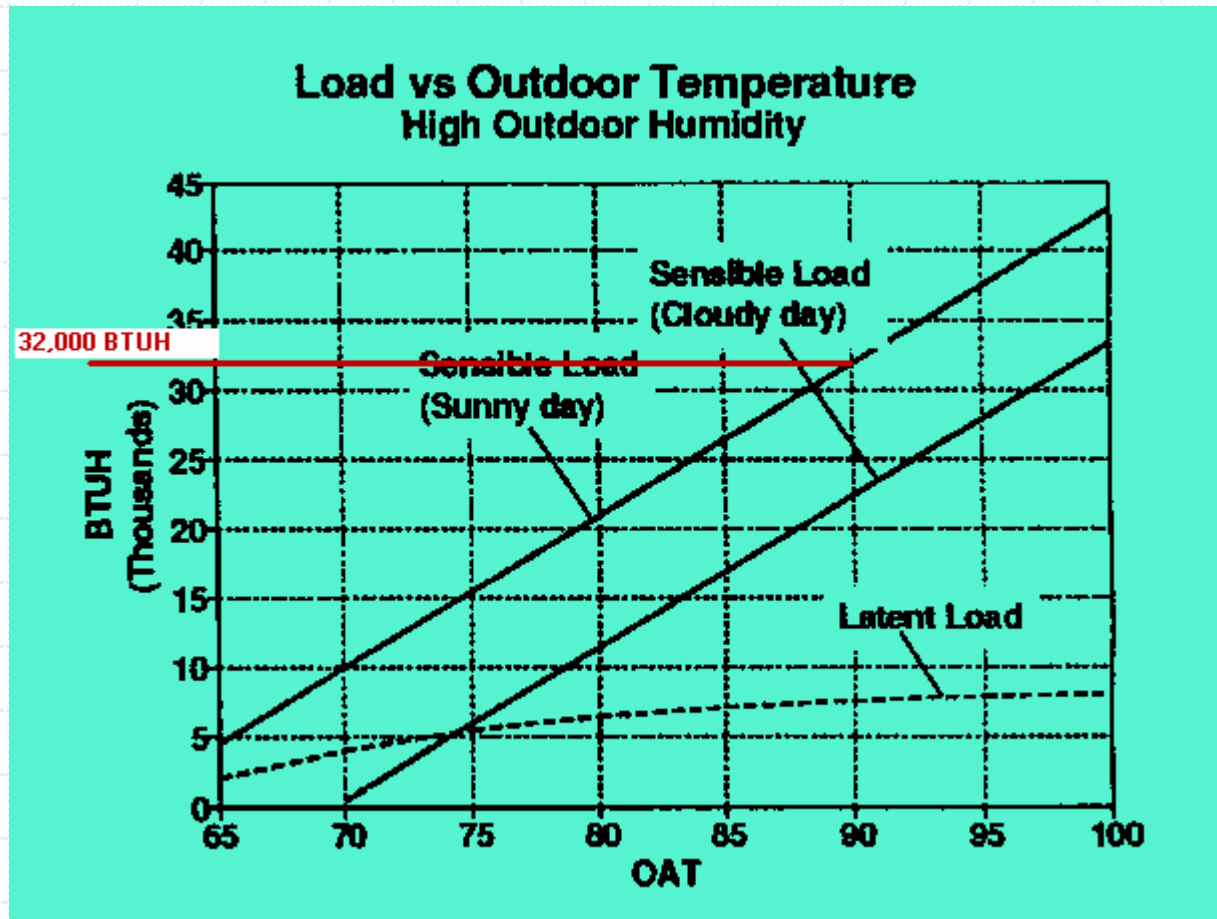
Using table 1 from ACCA Manual J for West Palm Beach the summer outdoor dry bulb temperature is 90°



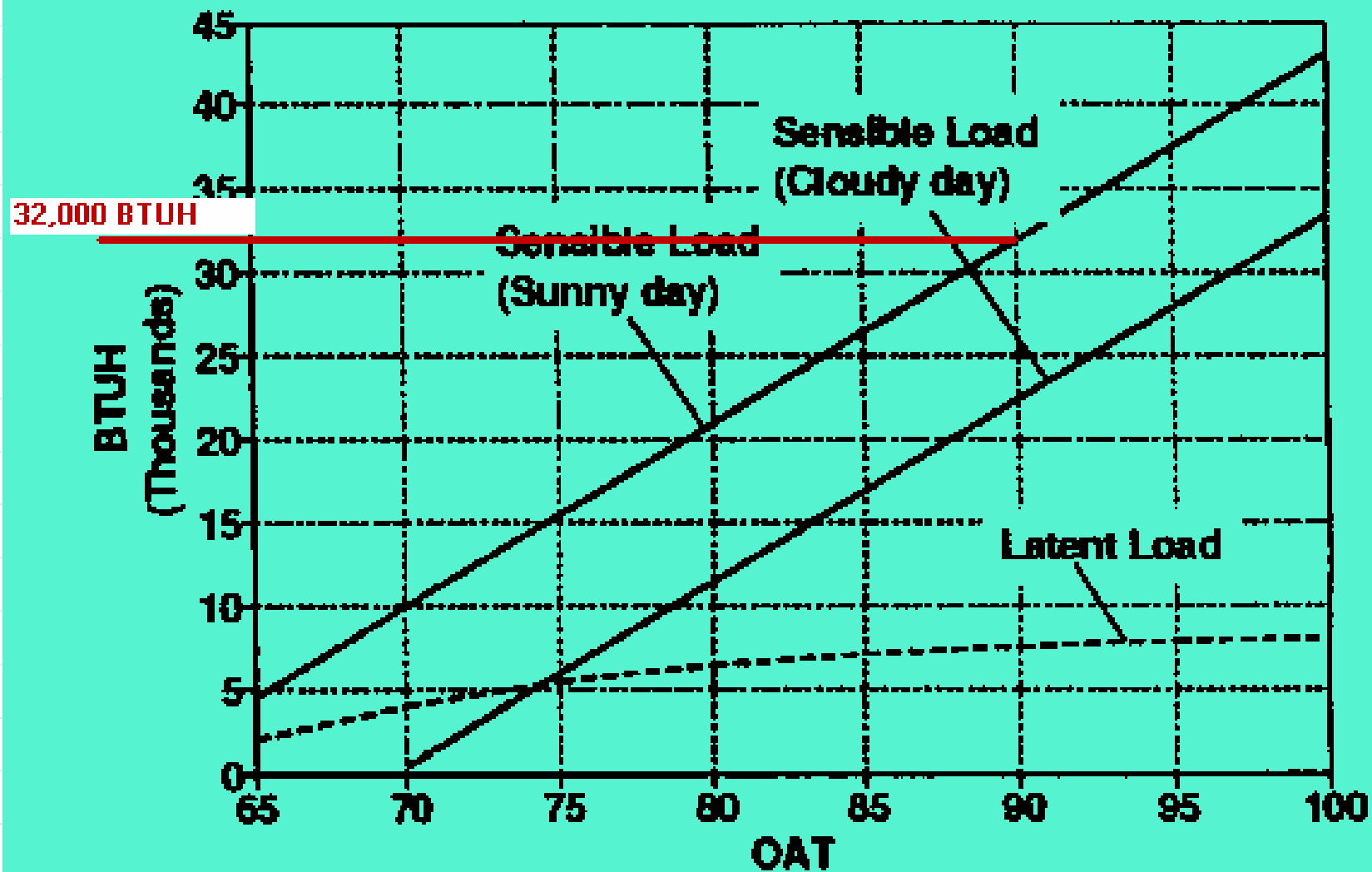
90° Outdoor Air Temperature on a Sunny Day



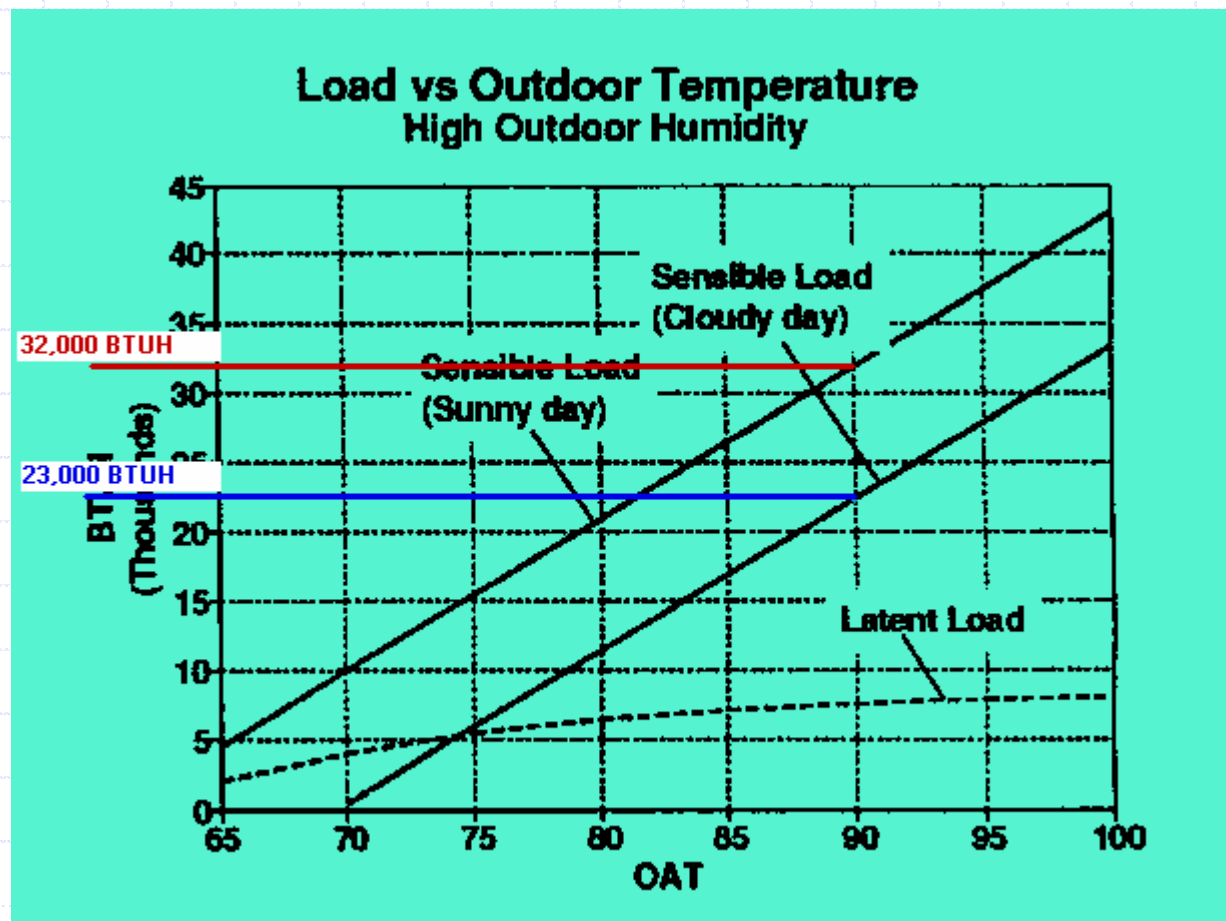
At peak load conditions the building demand is about 32,000 BTUH total



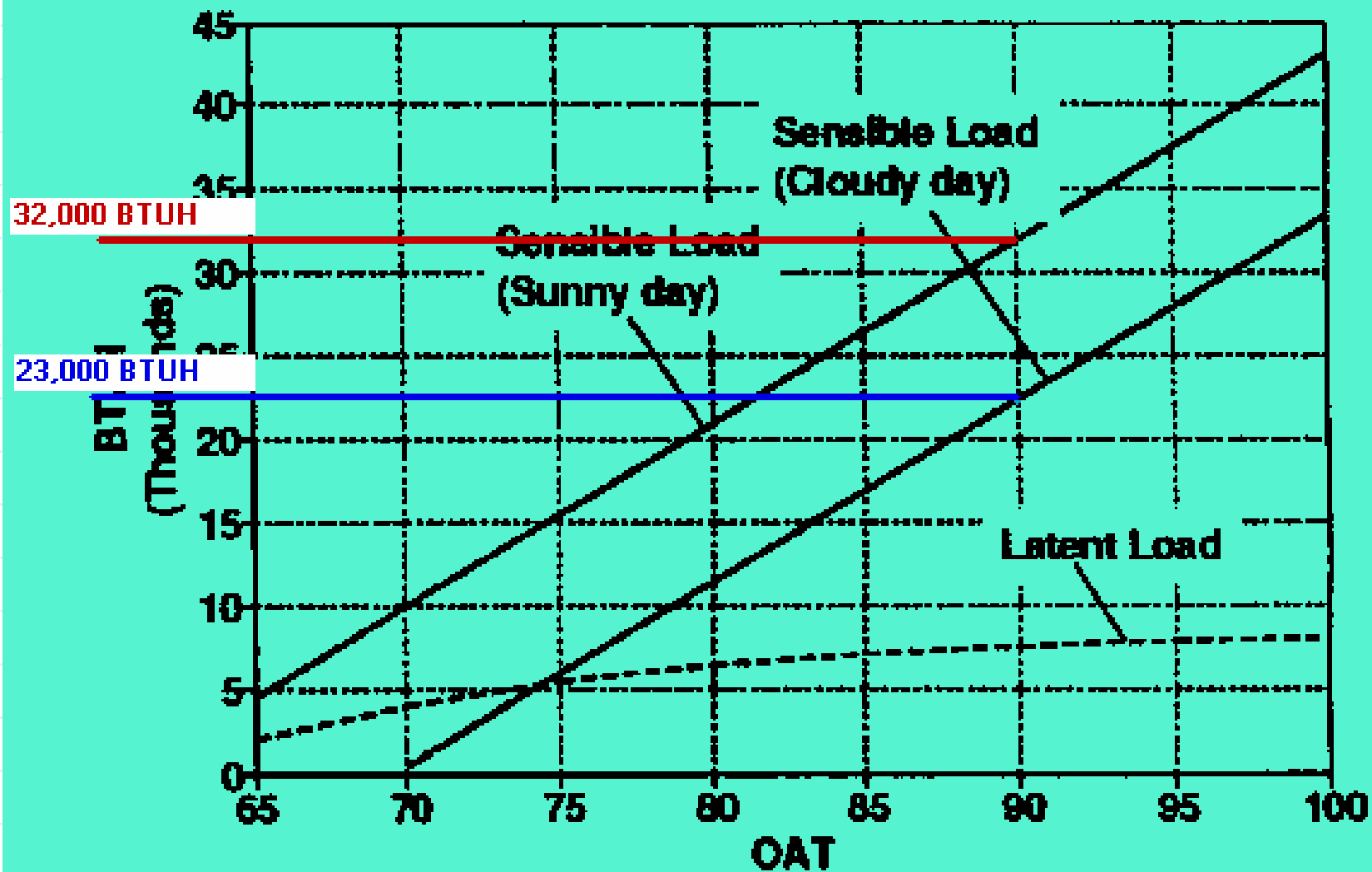
Load vs Outdoor Temperature High Outdoor Humidity



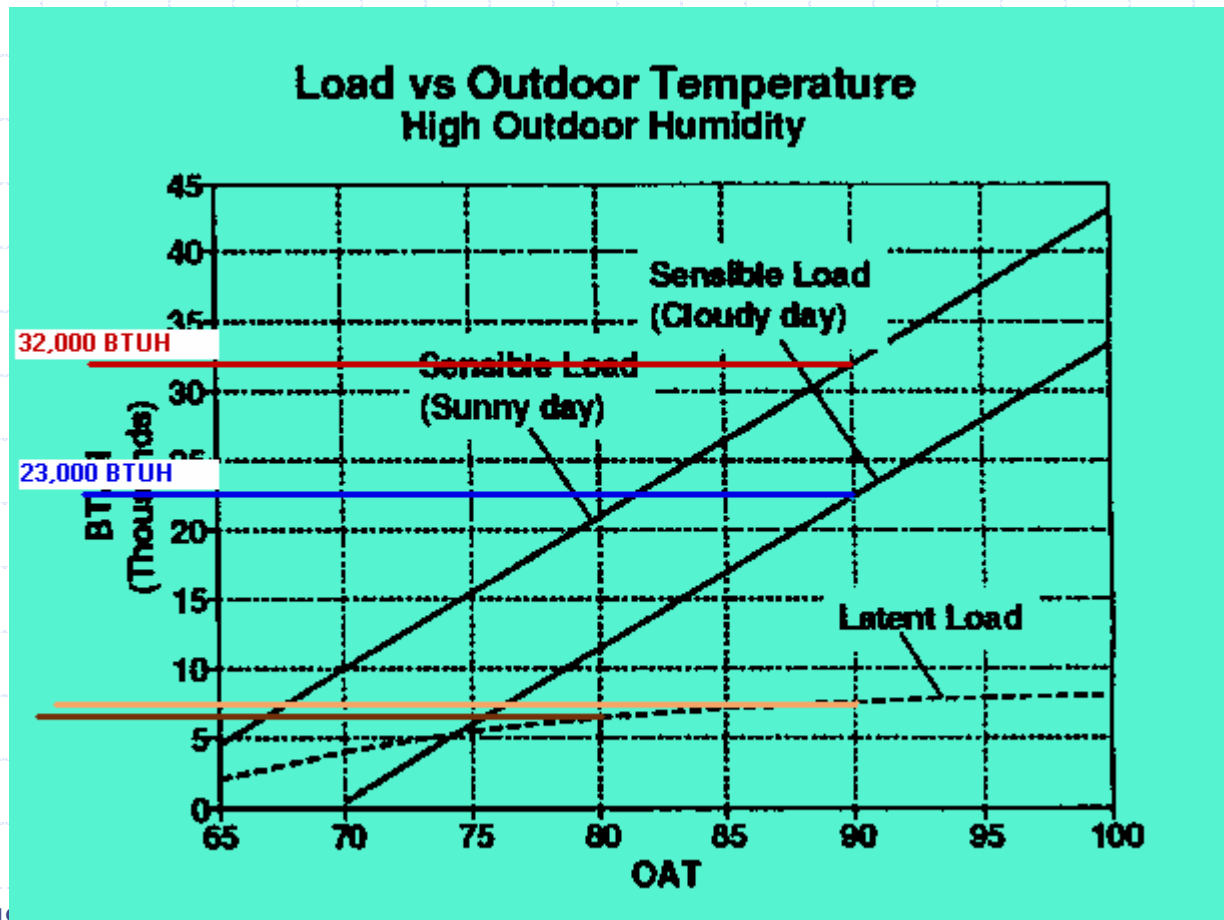
50% of the time our temperatures range in the moderate temperature zone



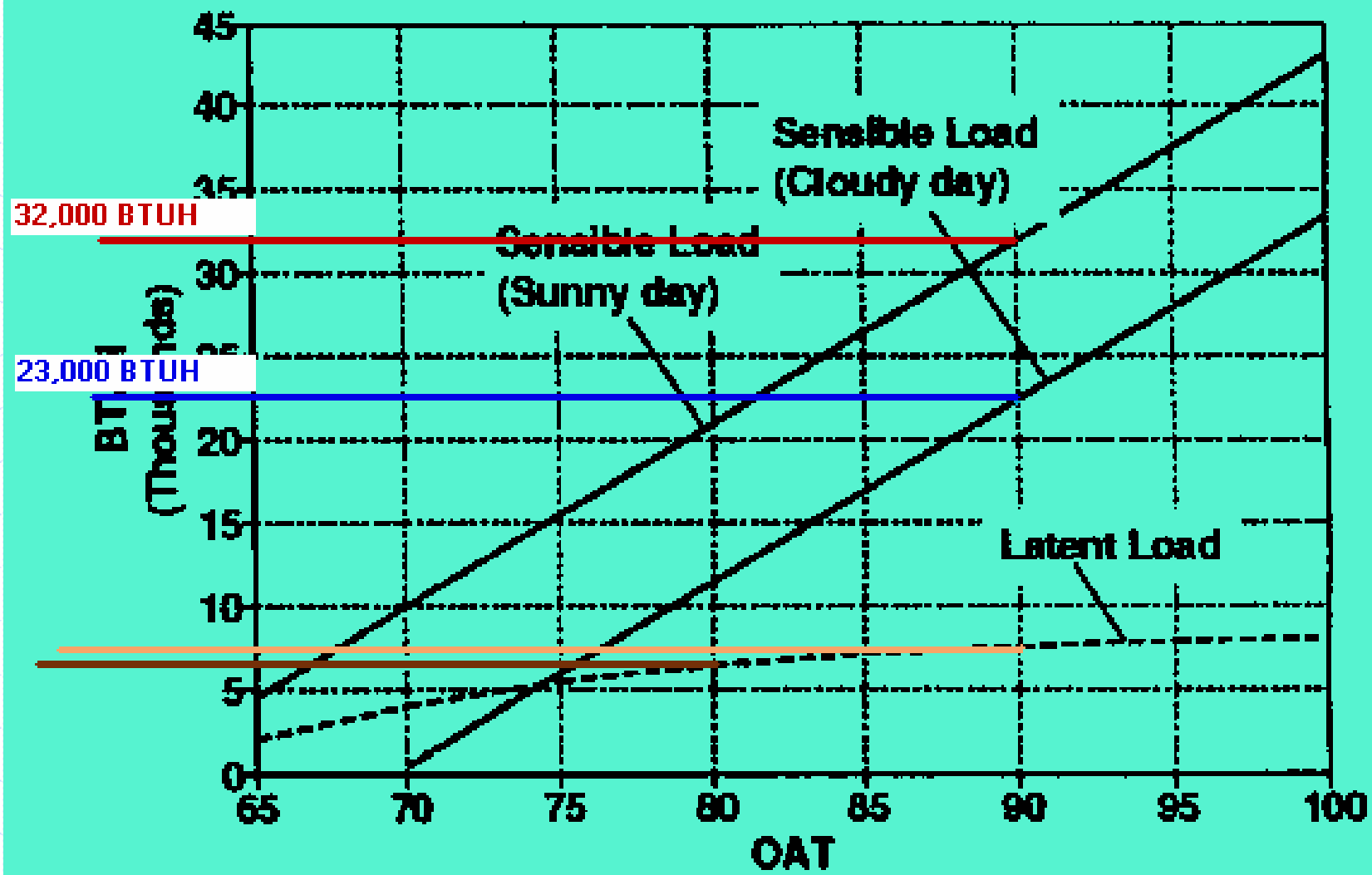
Load vs Outdoor Temperature High Outdoor Humidity



Sensible load variation shows a difference of 9000 BTUH while our latent difference is barely 500 BTUH

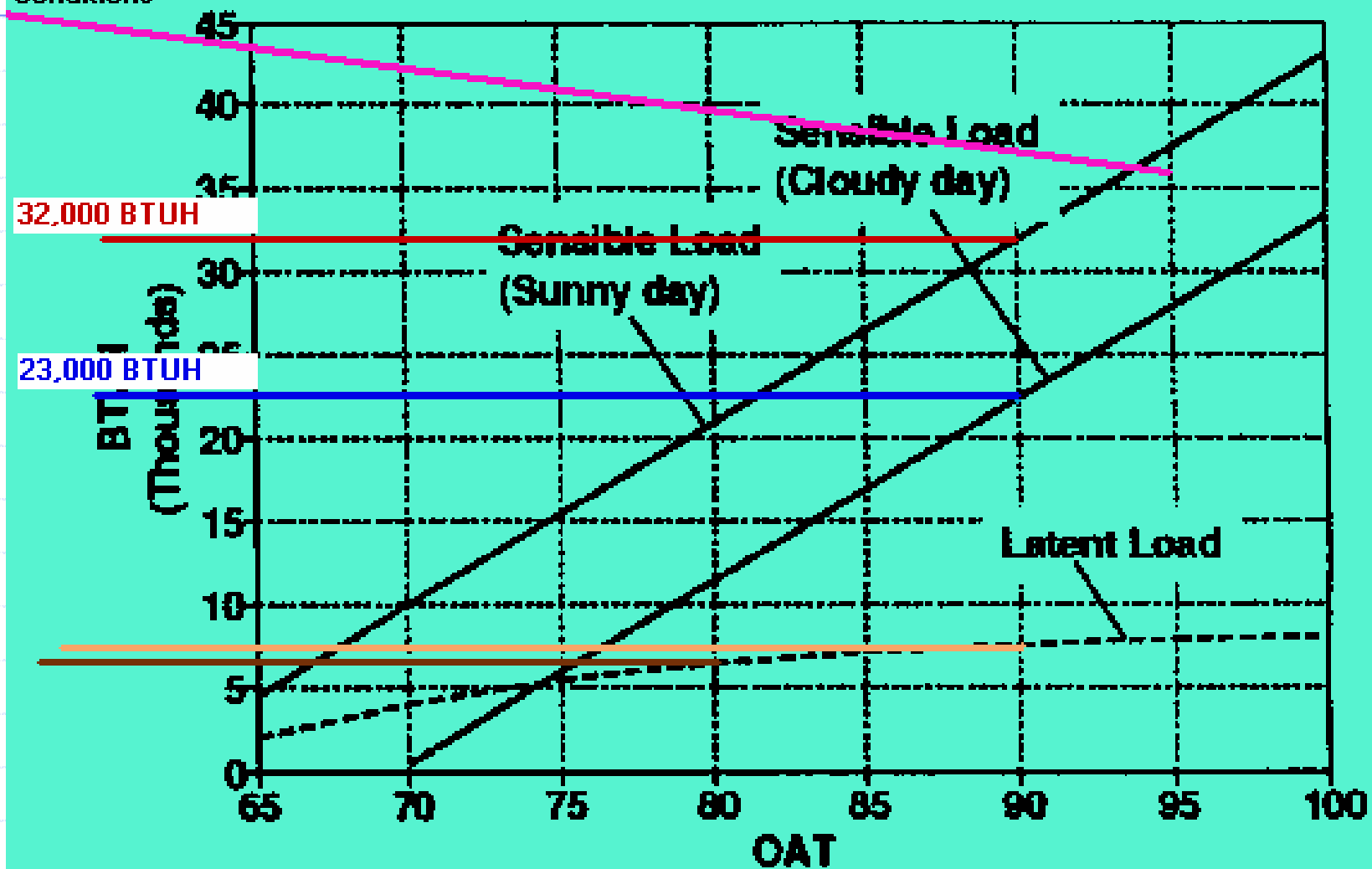


Load vs Outdoor Temperature High Outdoor Humidity



36,000 BTUH System at
ARI conditions of 95 F
can be as much as 50%
oversized during
moderate temperature
conditions

Load vs Outdoor Temperature High Outdoor Humidity



MJ8 Sensitivities

Design conditions

Building tightness

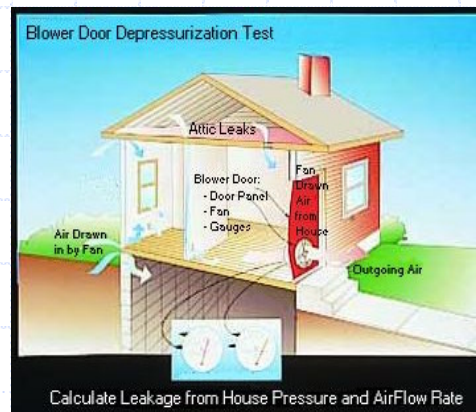
Fenestration

Air system design & installation



Table 1A
Outdoor Design Conditions For the United States and Canada

| Location | Elevation | Latitude | Winter | | Summer | | | | |
|---------------------|-----------|---------------|----------------------|---------------------|---------------------|----------------------|----------------------|----------------------|------------------|
| | Feet | Degrees North | Heating 99% Dry Bulb | Cooling 1% Dry Bulb | Coincident Wet Bulb | Design Grains 55% RH | Design Grains 50% RH | Design Grains 45% RH | Daily Range (DR) |
| St. Augustine | 10 | 29 | 35 | 89 | 76 | 59 | 66 | 72 | M |
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| Sarasota/Bradenton | 30 | 27 | 43 | 92 | 79 | 61 | 68 | 74 | M |
| Tallahassee AP | 55 | 30 | 23 | 93 | 76 | 39 | 46 | 52 | M |
| Tampa AP | 19 | 28 | 40 | 91 | 77 | 49 | 56 | 62 | M |
| Valpariso, EglinAFB | 85 | 30 | 33 | 90 | 78 | 57 | 64 | 70 | M |
| Vero Beach | -3 | 27 | 43 | 90 | 78 | 57 | 64 | 70 | M |
| West Palm Beach AP | -5 | 26 | 47 | 90 | 78 | 57 | 64 | 70 | M |



Guidelines

- ◆ Use outdoor design conditions recommended by Table 1 Manual J.
- ◆ Use the default indoor design conditions recommended by Manual J.
- ◆ Take full credit for all internal shading devices and external overhangs.
- ◆ Use internal shading devices that are compatible with the type of room.

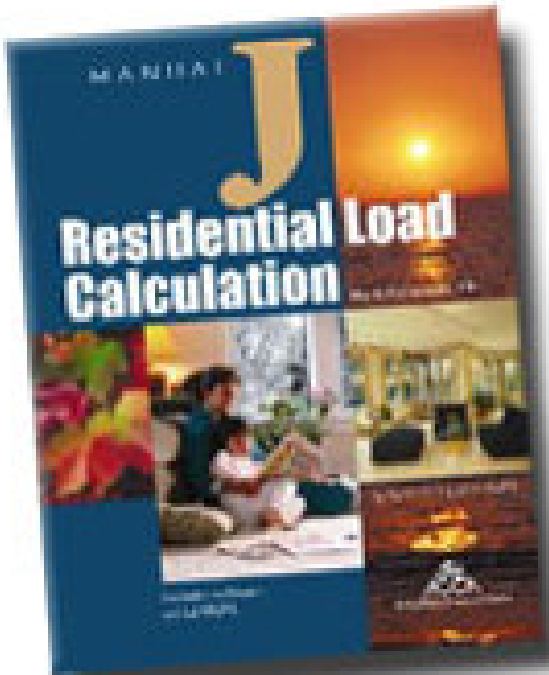
Guidelines

- ◆ Do not use internal shade if the room is specifically used for day lighting.
- ◆ Use the tested performance coefficients when known.
- ◆ Take full credit for all insulation & sealing efforts.
- ◆ Take full credit for insulated & sealed duct runs located in unconditioned space.

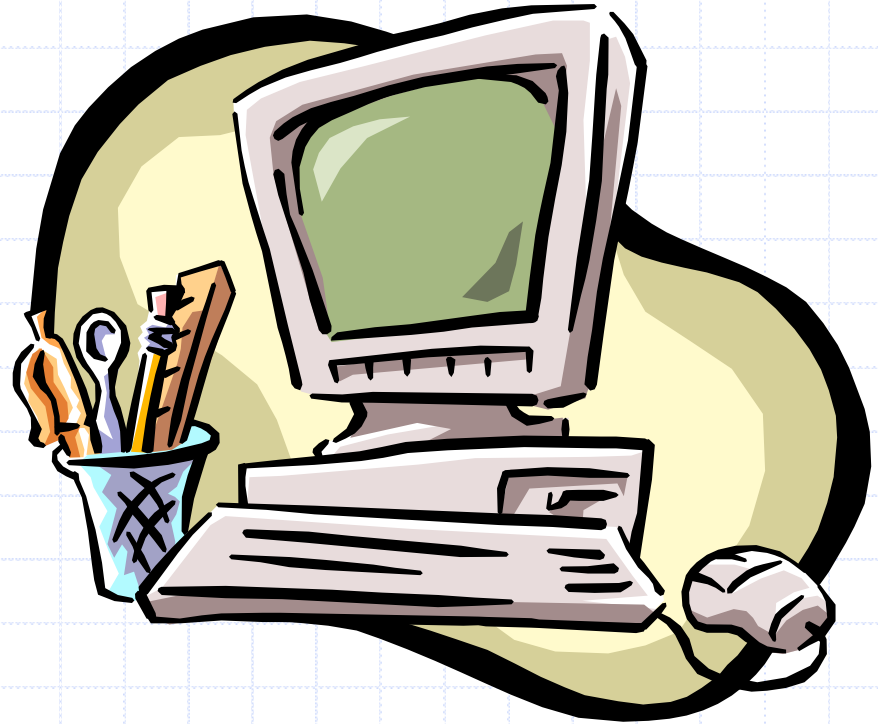
Guidelines

- ◆ Take full credit for load factors and diversity when estimating internal loads.
- ◆ Take full credit for diversity when estimating the cooling load on central equipment.

ACCA Manual J^{v8}



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A Computer Only Procedure

From "Addendum B" from ACCA Manual J®

Addendum B to

ACCA Manual J®
**Residential Load
Calculation**
Eighth Edition

ANSI/ACCA Man J 2-2004

ISBN# 1-892765-27-6

This addendum updates Version 1.10 of Manual J Eighth Edition (MJ8[®]) and addresses AED Protocol Revisions to the MJ8[®] procedures.

Executive Summary

Now that the industry and software houses have had time to work with the Eighth Edition of *Manual J*®, ACCA has determined that AED simplifications would ease implementation by third-party software vendors and improve the understanding and use of MJ8 by practitioners. This addendum revises the adequate exposure diversity (AED) approach on window/glass exposures in the following manners:

- a) MJ8 shall become a computer-only procedure. (Note: A shorter, abridged version of MJ8 is under development that supports a hand calculation procedure aimed at single-family, detached dwellings with single-zone, constant-volume systems).
- b) A computer-only, hourly fenestration gain (HFG) procedure shall be used for all application scenarios.
- c) Calculations shall be made for midsummer, unless southerly-facing fenestration causes a peak gain in the fall.
- d) Hand calculation procedures for applications other than single family detached dwellings served by a single zone, constant volume system shall be abandoned in favor of computerized solutions.

Forms & Worksheets

| | | | | | | | | | | | | | | | | | | | |
|---|---|-------------|------|------|----------------|---------|----------|--------|----------------|--------------|----------|--------|--|--|--|--|--|--|--|
| 1 Name of Room | | | | | | | | | | Entire House | | | | | | | | | |
| 2 Running Feet of Exposed Wall | | | | | | | | | | | | | | | | | | | |
| 3 Ceiling Height At Walls (Ft) and Gross Wall Area (SqFt) | | | | | | | | | | | | | | | | | | | |
| 4 Room Dimensions LxW (Ft) and Floor Plan Area (SqFt) | | | | | | | | | | | | | | | | | | | |
| 5 Ceiling Slope (Degrees) and Gross Ceiling Area (SqFt) | | | | | | | | | | | | | | | | | | | |
| Type of Exposure | Const. Number | Panel Faces | HTM | | Area or Length | Btuh | | | Area or Length | Btuh | | | | | | | | | |
| | | | Htg. | Cig. | | Heating | Sensible | Latent | | Heating | Sensible | Latent | | | | | | | |
| 6a Windows and Glass Doors | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
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| | h | | | | | | | | | | | | | | | | | | |
| | i | | | | | | | | | | | | | | | | | | |
| 6b Skylights | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| | c | | | | | | | | | | | | | | | | | | |
| 7 Wood and Metal Doors | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| | c | | | | | | | | | | | | | | | | | | |
| 8 Above Grade Walls and Partitions | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| | c | | | | | | | | | | | | | | | | | | |
| | d | | | | | | | | | | | | | | | | | | |
| | e | | | | | | | | | | | | | | | | | | |
| 9 Below Grade Walls | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| | c | | | | | | | | | | | | | | | | | | |
| 10 Ceilings | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| 11a Passive Floors | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| 11b Radiant Floors | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| 12 Infiltration | Heat Loss | | | | Btuh | WAR | | | | WAR | | | | | | | | | |
| | Sensible Gain | | | | Btuh | | | | | | | | | | | | | | |
| | Latent Gain | | | | Btuh | | | | | | | | | | | | | | |
| 13 Internal | a Occupants at 230 and 200 Btuh | | | | # | | | | | | | # | | | | | | | |
| | b Scenario Number | | | | | | | | | | | | | | | | | | |
| | c Default Adjustments | | | | | | | | | | | | | | | | | | |
| | d Individual Appliances | | | | | | | | | | | | | | | | | | |
| | e Plants | | | | | | | | | | | | | | | | | | |
| 14 Subtotals | Sum lines 6 through 11a + line 12 + line 13 | | | | | | | | | | | | | | | | | | |
| 15 Duct Loads | ELF-Loss and ELF-Gain | | | | | | | | | | | | | | | | | | |
| | Latent Gain | | | | | | | | | | | | | | | | | | |
| 16 Ventilation Loads | Vent CFM | | | | | | | | | | | | | | | | | | |
| | Exh | | | | | | | | | | | | | | | | | | |
| 17 Winter Humidification load | Gal / Day | | | | | | | | | | | | | | | | | | |
| 18 Piping Load | | | | | | | | | | | | | | | | | | | |
| 19 Blower Heat | | | | | | | | | | | | | | | | | | | |
| 20 Total Load | Sum line 11b + lines 14 through 19 | | | | | | | | | | | | | | | | | | |

Form J1
Residential Heat Loss and Heat Gain Estimate
Manual J, Eighth Edition

Load Procedure, Single Zone System
Generic Fenestration

Project Name: _____
Address: _____
Phone: _____

State: _____
Indr: _____
Tr: _____

Worksheet E
Average Load Procedure

Supporting Detail For The Average Load Procedure

Job ID: _____

Table 1 Conditions, Heating: DB = _____
99% DB = _____
Design Temperature Differences

Indoor Conditions, Heating: DB = _____
99% DB = _____
Design Temperature Differences

Worksheet A
Average Load Procedure, Multi Zone System
NFRC Rated Fenestration

Supporting Detail For The Average Load Procedure

Job ID: _____

Location and Design Conditions

Indoor Conditions, Cooling: DB = _____
Grains Difference = _____

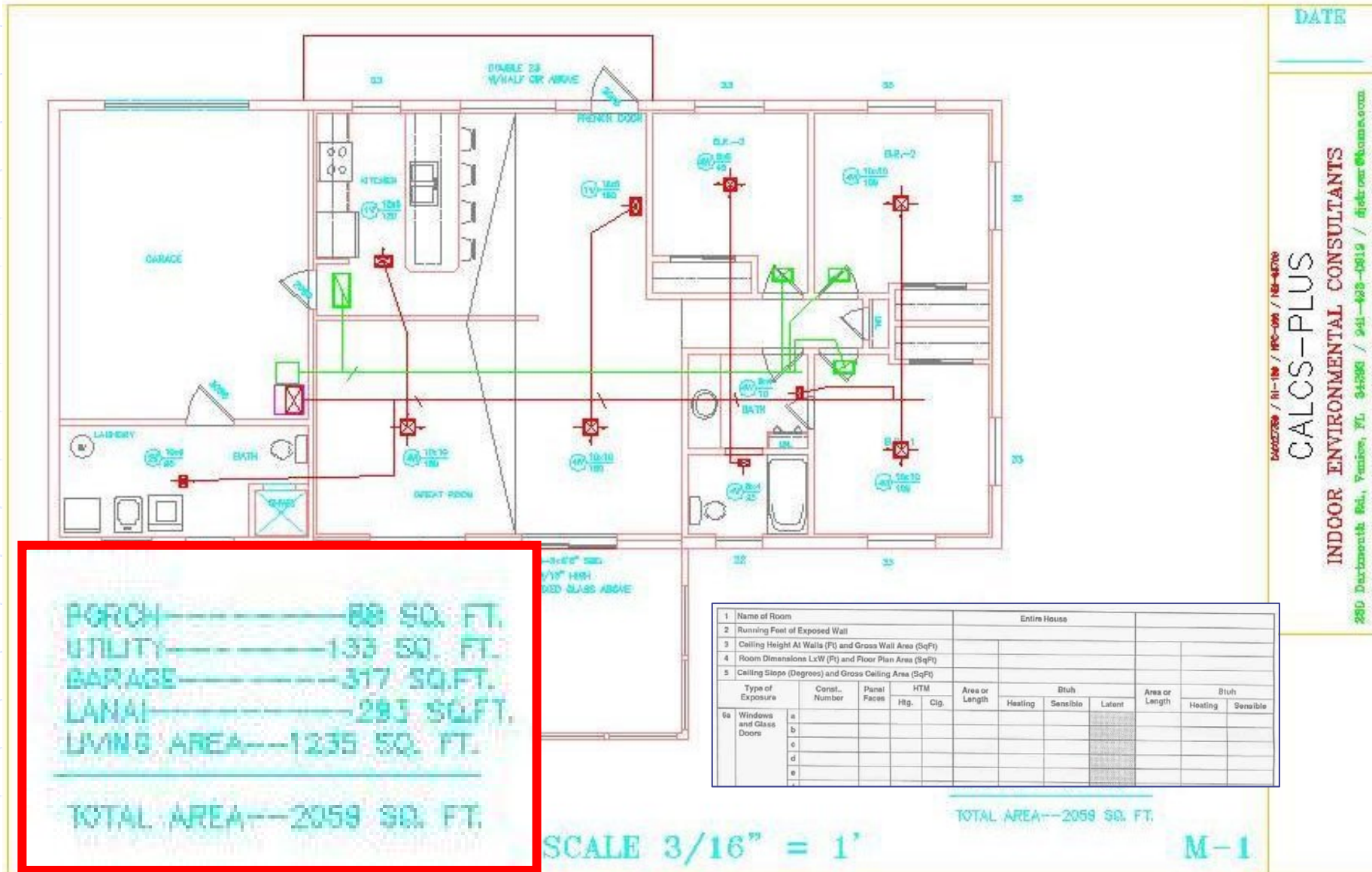
Worksheet B
Average HTM For Windows and Glass Doors

Generic Fenestration

Heat HTM = _____
Cool HTM = _____
HTM = _____

Lat = _____
Type of Panel = _____

Floor Plan Required.

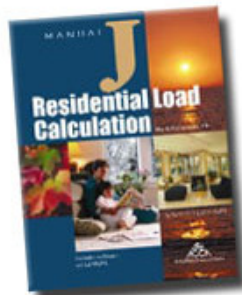


Room x Room Entry

| 1 Name of Room | | | | | | | | | | Entire House | | | | | | | | | |
|---|---|-------------|-----|------|------|----------------|---------|----------|--------|----------------|---------|----------|--|--|--|--|--|--|--|
| 2 Running Feet of Exposed Wall | | | | | | | | | | | | | | | | | | | |
| 3 Ceiling Height At Walls (Ft) and Gross Wall Area (SqFt) | | | | | | | | | | | | | | | | | | | |
| 4 Room Dimensions LxW (Ft) and Floor Plan Area (SqFt) | | | | | | | | | | | | | | | | | | | |
| 5 Ceiling Slope (Degrees) and Gross Ceiling Area (SqFt) | | | | | | | | | | | | | | | | | | | |
| Type of Exposure | Const. Number | Panel Faces | HTM | Htg. | Cig. | Area or Length | Btuh | | | Area or Length | Btuh | | | | | | | | |
| | | | | | | | Heating | Sensible | Latent | | Heating | Sensible | | | | | | | |
| 6a Windows and Glass Doors | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
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| | j | | | | | | | | | | | | | | | | | | |
| 6b Skylights | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| | c | | | | | | | | | | | | | | | | | | |
| 7 Wood and Metal Doors | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| | c | | | | | | | | | | | | | | | | | | |
| 8 Above Grade Walls and Partitions | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| | c | | | | | | | | | | | | | | | | | | |
| | d | | | | | | | | | | | | | | | | | | |
| | e | | | | | | | | | | | | | | | | | | |
| 9 Below Grade Walls | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| | c | | | | | | | | | | | | | | | | | | |
| 10 Ceilings | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| 11a Passive Floors | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| 11b Radiant Floors | a | | | | | | | | | | | | | | | | | | |
| | b | | | | | | | | | | | | | | | | | | |
| 12 Infiltration | Heat Loss | | | | | | | | | | | | | | | | | | |
| | Sensible Gain | | | | | | | | | | | | | | | | | | |
| | Latent Gain | | | | | | | | | | | | | | | | | | |
| 13 Internal | a Occupants at 230 and 200 Btuh | | | | | | | | | | | | | | | | | | |
| | b Scenario Number | | | | | | | | | | | | | | | | | | |
| | c Default Adjustments | | | | | | | | | | | | | | | | | | |
| | d Individual Appliances | | | | | | | | | | | | | | | | | | |
| | e Plants | | | | | | | | | | | | | | | | | | |
| 14 Subtotals | Sum lines 6 through 11a + line 12 + line 13 | | | | | | | | | | | | | | | | | | |
| 15 Duct Loads | ELF-Loss and ELF-Gain | | | | | | | | | | | | | | | | | | |
| | Latent Gain | | | | | | | | | | | | | | | | | | |
| 16 Ventilation Loads | Vent CFM | | | | | | | | | | | | | | | | | | |
| 17 Winter Humidification load | Gal / Day | | | | | | | | | | | | | | | | | | |
| 18 Piping Load | | | | | | | | | | | | | | | | | | | |
| 19 Blower Heat | | | | | | | | | | | | | | | | | | | |
| 20 Total Load | Sum line 11b + lines 14 through 19 | | | | | | | | | | | | | | | | | | |

From Part of Section 1-16 ACCA Manual J 8th Edition

- ◆ Computerized method calculates load by month of year and time of day associated with each room load and with the equipment sizing load.
- ◆ Computer can generate solutions for 288 scenarios (12 month year and 24 hour day)



+



CALCS-PLU

General Information

Help

General Project Data

Project Client Company Design Duct

Project Title:

Designed By:

Date:

Units: ▼

Comment:

☐ Include this comment on reports.

The Design Tab

The Data that is automatically filled in comes from Table 1A in ACCA Manual J 8th edition.

Outdoor Design Conditions For the United States and Canada.

The screenshot shows a software window titled "General Project Data" with a blue header bar and standard Windows window controls. Below the header is a tabbed interface with five tabs: "Project", "Client", "Company", "Design" (which is selected), and "Duct". The "Design" tab contains a form with the following fields and values:

| | | | |
|-----------------------|--------------------------|--------|---------|
| Reference City: | West Palm Beach, Florida | | |
| Daily Range: | Medium | | |
| Latitude: | 26 | | |
| Elevation: | 15 | | |
| Elev. Derating: | Sensible | Total | Heating |
| | | | |
| Dry Bulb Temperature: | Winter | Summer | |
| | 45 | 91 | |
| Wet Bulb Temperature: | | 78 | |
| People Loads: | Sensible | Latent | |
| | | | |

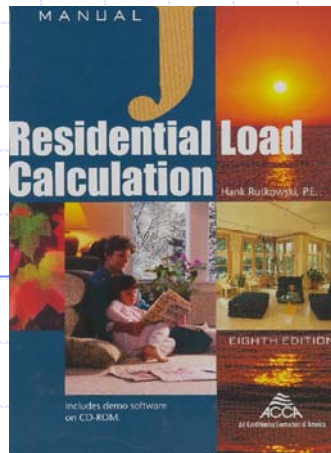


Table 1A

RHVAC weather data base comes directly from ACCA Manual J version 8 Table 1A & 1B(micro climates).

Table 1A
Outdoor Design Conditions For the United States and Canada

| Location | Elevation Feet | Latitude Degrees North | Winter | Summer | | | | | |
|----------------------|-------------------|---------------------------|----------------------------|---------------------------|------------------------|----------------------------|----------------------------|----------------------------|------------------------|
| | | | Heating 99% Dry Bulb | Cooling 1% Dry Bulb | Coincident Wet Bulb | Design Grains 55% RH | Design Grains 50% RH | Design Grains 45% RH | Daily Range (DR) |
| St. Augustine | 10 | 29 | 35 | 89 | 78 | 59 | 66 | 72 | M |
| St. Petersburg | 11 | 28 | 47 | 93 | 79 | 59 | 66 | 72 | M |
| Sanford | 55 | 28 | 38 | 93 | 76 | 39 | 46 | 52 | M |
| Sarasota/Bradenton | 30 | 27 | 43 | 92 | 79 | 61 | 68 | 74 | M |
| Tallahassee AP | 55 | 30 | 28 | 93 | 76 | 39 | 46 | 52 | M |
| Tampa AP | 19 | 28 | 40 | 91 | 77 | 49 | 56 | 62 | M |
| Valpariso, Eglin AFB | 85 | 30 | 33 | 90 | 78 | 57 | 64 | 70 | M |
| Vero Beach | 13 | 27 | 43 | 90 | 78 | 57 | 64 | 70 | M |
| West Palm Beach AP | 15 | 26 | 47 | 90 | 78 | 57 | 64 | 70 | M |

Default Room Data

Default Room Data

| No. | Name | System | Zone | Width | Length | Height | Check Errors |
|-----|--------------|--------|------|-------|--------|--------|--------------|
| n/a | Default Room | 1 | 1 | 0 | 0 | 8 | n/a |

Floor Material

| 1 | Material | U-Value | Width | Length | Perimeter |
|---|----------|---------|-------|--------|-----------|
| 1 | 19A-11p | 0.073 | 0 | 0 | 0 |

Over enclosed unconditioned crawl space, No insulation on exposed walls, sealed or vented space, passive, R-11 blanket, carpet covering

Roof Material

| 1 | Material | U-Value | Width | Length | Direction |
|---|----------|---------|-------|--------|-----------|
| 1 | 16B-19 | 0.049 | 0 | 0 | UP |

Under attic or knee wall, Vented Attic, No Radiant Barrier, Dark Asphalt Shingles or Dark Metal, Tar and Gravel or Membrane, R-19 insulation

Wall Material

| 1 | Material | U-Value | Length | Height | Dir | STD | WTD |
|---|----------|---------|--------|--------|-----|-----|-----|
| 1 | 13A-5ocs | 0.125 | 0 | 8 | N | 0 | 0 |

Block, board insulation only, R-5 board insulation, open core, siding finish

Glass Material

| 1 | Material | U-Value | SHGC | Width | Height | Ref | Occ. | O.Proj | O.Off |
|---|----------|---------|------|-------|--------|-----|------|--------|-------|
| 1 | 1A-cb-o | 1.08 | 0.75 | 0 | 0 | 1 | 1 | 0 | 0 |

Single pane, operable window, clear, metal frame with break, outdoor insect screen with 50% coverage, white or reflective color drapes with tight weave with 50% coverage

Door Material

| 1 | Material | U-Value | Width | Height | Ref |
|---|----------|---------|-------|--------|-----|
| 1 | 11P | 0.29 | 0 | 0 | 0 |

Polyurethane Core

People & Equip.

Ppl: 0

S.Eq: 0

L.Eq: 0

Other

Regs: 0

Infil: 0

Vent: 0

Light: 0

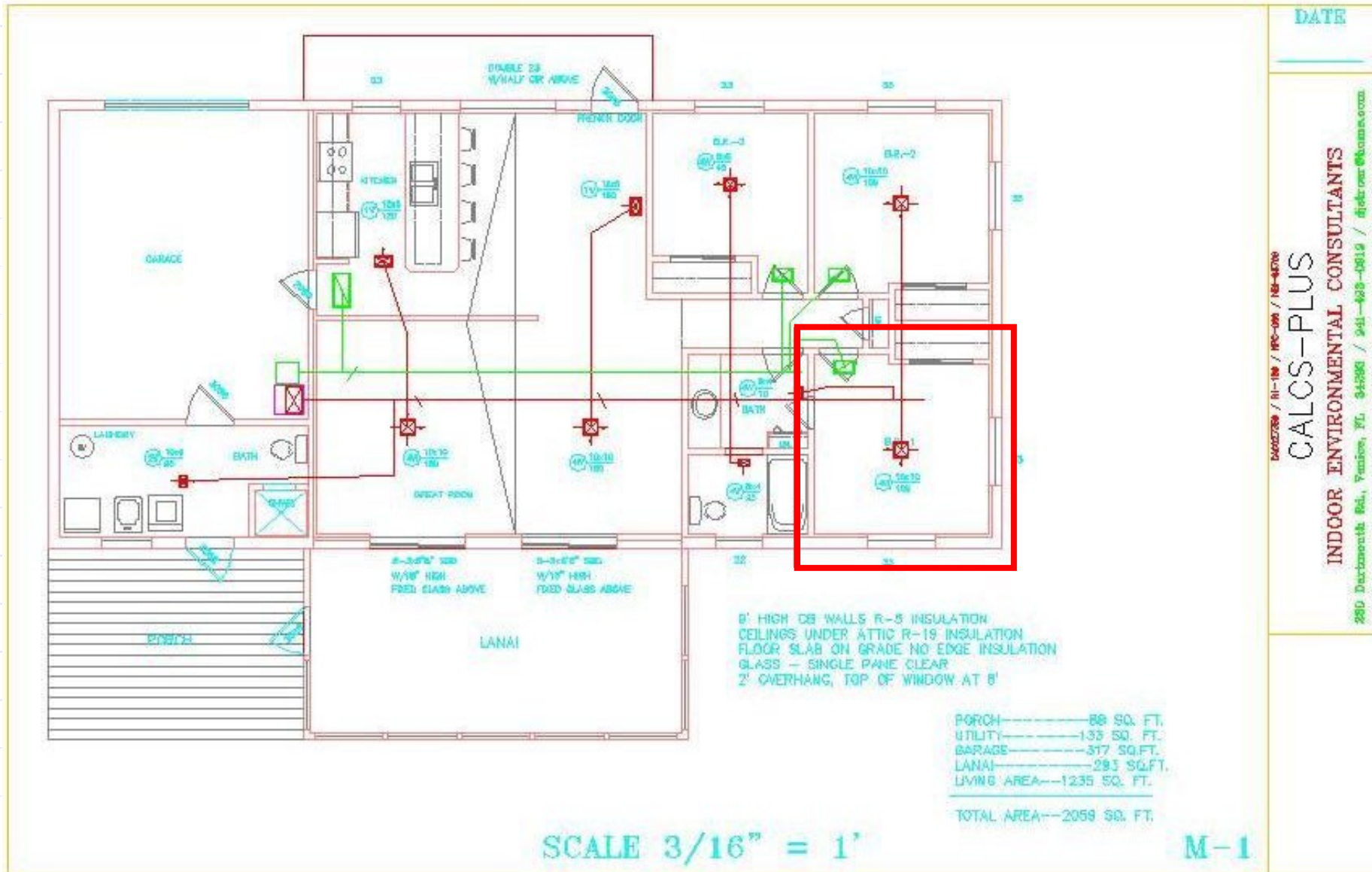
Occ: 1

Mode: Both

Rad.F: 0

Set up default data so you don't have to do repetitive inputs.

From the Floor Plan



Room Entry Data

Room Data - Room 1 of 1

<< >>

| No. | Name | System Zone | Width |
|-----|-----------|-------------|-------|
| 1 | Bedroom 1 | 1 | 11.5 |

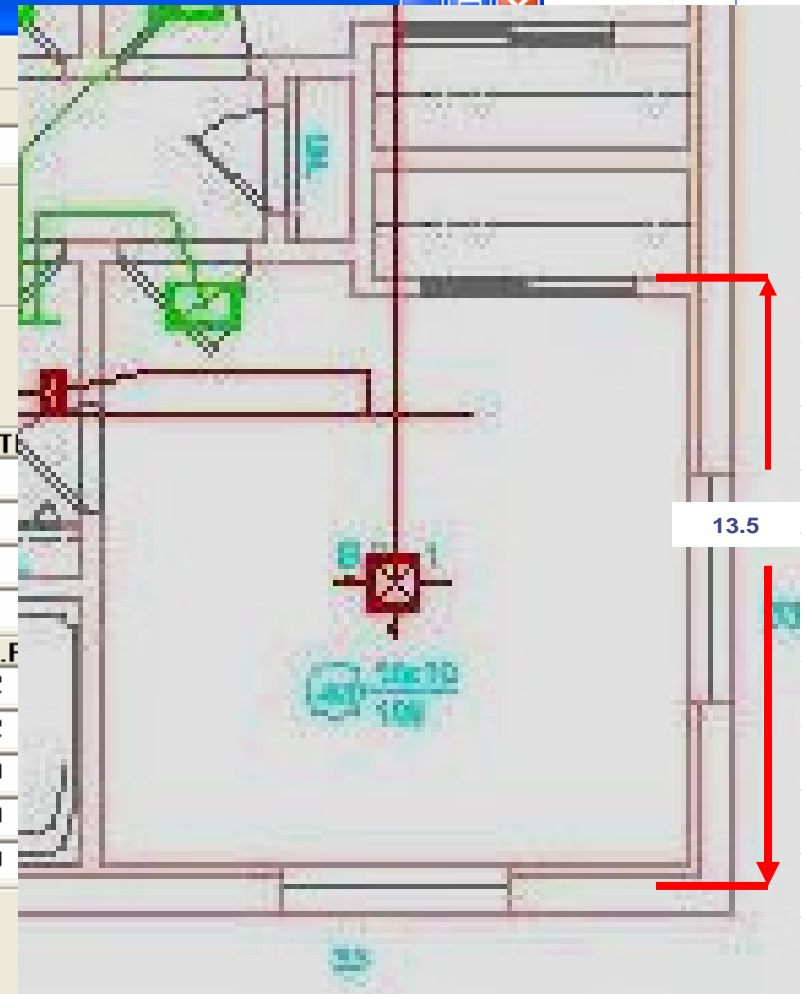
| Floor Material | | U-Value | Width | Length | Perimeter |
|----------------|--------|---------|-------|--------|-----------|
| 1 | 22A-ph | 1.358 | 11.5 | 13.5 | 25 |
| 2 | | 0 | 0 | 0 | 0 |

| Roof Material | | U-Value | Width | Length | Direction |
|---------------|--------|---------|-------|--------|-----------|
| 1 | 16B-19 | 0.049 | 11.5 | 13.5 | UP |
| 2 | | 0 | 0 | 0 | UP |

| Wall Material | | U-Value | Length | Height | Dir | STD | WT |
|---------------|----------|---------|--------|--------|-----|-----|----|
| 1 | 13A-5ocs | 0.125 | 11.5 | 9 | S | 0 | 0 |
| 2 | 13A-5ocs | 0.125 | 13.5 | 9 | E | 0 | 0 |
| 3 | | 0 | 0 | 0 | N | 0 | 0 |
| 4 | | 0 | 0 | 0 | N | 0 | 0 |

| Glass Material | | U-Value | SHGC | Width | Height | Ref | Occ. | O.F |
|----------------|---------|---------|------|-------|--------|-----|------|-----|
| 1 | 1A-cb-o | 1.08 | 0.75 | 4.4 | 3.2 | 1 | 1 | 2 |
| 2 | 1A-cb-o | 1.08 | 0.75 | 4.4 | 3.2 | 1 | 1 | 2 |
| 3 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 5 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| Door Material | | U-Value | Width | Height | Ref |
|---------------|--|---------|-------|--------|-----|
| 1 | | 0 | 0 | 0 | 0 |
| 2 | | 0 | 0 | 0 | 0 |



System Information

System Data - System 1 of 1

No: 1 Name: System 1

Design Equipment

System Design Conditions

| | Winter | Summer | | |
|---------------------|--------|--------|-----------------------|--------|
| Indoor Temperature: | 70 | 75 | Do Winter Humid.: | No |
| Relative Humidity: | 50 | 50 | System Air Type: | Fixed |
| Lvg. Coil-Rm DT: | 70 | 20 | System CFM: | 675 |
| Infiltration: | 0 | 0 | Pct. Sens. Capacity: | 75 |
| Ventilation: | 42.46 | 42.46 | Radiator Btuh/ft.: | 0 |
| Exhaust: | 0 | 0 | Radiator Text Option: | Foot |
| Do Heat Recovery: | No | No | Duct Load Factors: | (None) |
| Heat Recovery SER: | 60 | 60 | | |
| Blower Power: | | 0 | | |
| Hot Water Piping: | 0 | | | |

- ◆ Design Conditions
- ◆ Infiltration
- ◆ Ventilation
- ◆ Airflow

MJ8 & Infiltration For Winter

Winter Infiltration

3 or 4 Exposures (free standing structure) | 1 or 2 Exposures (attached structure)

Select the number of exposures that this system has by clicking the changes per hour option based on the quality of the envelope the appropriate fireplace option based on the construction quality number of fireplaces. To read descriptions of exactly what is in the Rhvac Help window and click the link for the "Construction Quality" window.

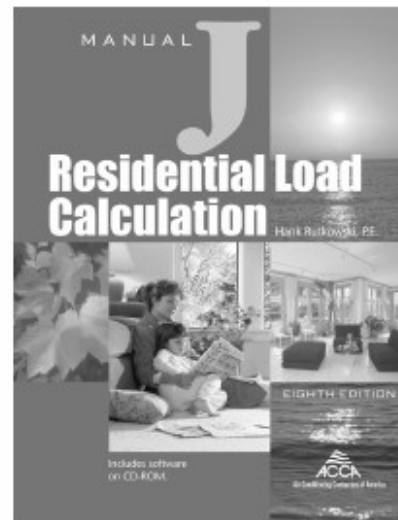
Conditioned Space (Square feet)

| Construction | 900 or Less | 901 to 1500 | 1501 to 2000 | 2001 to 2500 | 2501 to 3000 | 3001 to 3500 | 3501 to 4000 | 4001 to 4500 | 4501 to 5000 | 5001 to 5500 | 5501 to 6000 | 6001 to 6500 | 6501 to 7000 | 7001 to 7500 | 7501 to 8000 | 8001 to 8500 | 8501 to 9000 | 9001 to 9500 | 9501 to 10000 |
|--------------|----------------------------|---------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Tight | <input type="radio"/> 0.21 | <input type="radio"/> 0.16 | <input type="radio"/> 0.1 | <input type="radio"/> 0.08 | <input type="radio"/> 0.07 | <input type="radio"/> 0.06 | <input type="radio"/> 0.05 | <input type="radio"/> 0.04 | <input type="radio"/> 0.03 | <input type="radio"/> 0.02 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 |
| Semi-Tight | <input type="radio"/> 0.41 | <input type="radio"/> 0.31 | <input type="radio"/> 0.2 | <input type="radio"/> 0.15 | <input type="radio"/> 0.12 | <input type="radio"/> 0.1 | <input type="radio"/> 0.08 | <input type="radio"/> 0.07 | <input type="radio"/> 0.06 | <input type="radio"/> 0.05 | <input type="radio"/> 0.04 | <input type="radio"/> 0.03 | <input type="radio"/> 0.02 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 |
| Average | <input type="radio"/> 0.61 | <input type="radio"/> 0.45 | <input type="radio"/> 0.3 | <input type="radio"/> 0.22 | <input type="radio"/> 0.18 | <input type="radio"/> 0.15 | <input type="radio"/> 0.12 | <input type="radio"/> 0.1 | <input type="radio"/> 0.08 | <input type="radio"/> 0.07 | <input type="radio"/> 0.06 | <input type="radio"/> 0.05 | <input type="radio"/> 0.04 | <input type="radio"/> 0.03 | <input type="radio"/> 0.02 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 | <input type="radio"/> 0.01 |
| Semi-Loose | <input type="radio"/> 0.95 | <input type="radio"/> 0.70 | <input type="radio"/> 0.59 | <input type="radio"/> 0.49 | <input type="radio"/> 0.43 | <input type="radio"/> 0.37 | <input type="radio"/> 0.31 | <input type="radio"/> 0.27 | <input type="radio"/> 0.23 | <input type="radio"/> 0.2 | <input type="radio"/> 0.17 | <input type="radio"/> 0.15 | <input type="radio"/> 0.13 | <input type="radio"/> 0.11 | <input type="radio"/> 0.09 | <input type="radio"/> 0.08 | <input type="radio"/> 0.07 | <input type="radio"/> 0.06 | <input type="radio"/> 0.05 |
| Loose | <input type="radio"/> 1.29 | <input checked="" type="radio"/> 0.94 | <input type="radio"/> 0.80 | <input type="radio"/> 0.66 | <input type="radio"/> 0.58 | <input type="radio"/> 0.5 | <input type="radio"/> 0.43 | <input type="radio"/> 0.37 | <input type="radio"/> 0.31 | <input type="radio"/> 0.27 | <input type="radio"/> 0.23 | <input type="radio"/> 0.2 | <input type="radio"/> 0.17 | <input type="radio"/> 0.15 | <input type="radio"/> 0.13 | <input type="radio"/> 0.11 | <input type="radio"/> 0.09 | <input type="radio"/> 0.08 | <input type="radio"/> 0.07 |

Number of Fireplaces: Fireplace CFM (added to AC/hr):

Infiltration Air Changes per Hour:

OK Cancel



Addendum D to

ACCA Manual J® Residential Load Calculation Eighth Edition

ANSI/ACCA Man J 2-2004

ISBN# 1-892765-27-6

This addendum updates Version 1.10 of Manual J Eighth Edition (MJ8™) and addresses *Infiltration Gain / Loss Revisions* to the MJ8 procedures.

MJ8 & Infiltration For Summer Loose Construction

Summer Infiltration

3 or 4 Exposures (free standing structure) | 1 or 2 Exposures (townhome, condo, apartment)

Select the number of exposures that this system has by clicking the appropriate tab above. Then select the the air changes per hour option based on the quality of the envelope construction and the area of the building. To read descriptions of exactly what is meant by "Tight," "Semi-Tight," etc., press F1 to open the Rhvac Help window and click the link for the "Construction Tightness" topic.

**Conditioned Floor Area
(Square feet) of Building**

| <u>Construction</u> | <u>900 or Less</u> | <u>901 to 1500</u> | <u>1501 to 2000</u> | <u>2001 to 3000</u> | <u>More than 3000</u> |
|---------------------|----------------------------|---------------------------------------|----------------------------|----------------------------|----------------------------|
| Tight | <input type="radio"/> 0.11 | <input type="radio"/> 0.08 | <input type="radio"/> 0.07 | <input type="radio"/> 0.06 | <input type="radio"/> 0.05 |
| Semi-Tight | <input type="radio"/> 0.22 | <input type="radio"/> 0.16 | <input type="radio"/> 0.14 | <input type="radio"/> 0.11 | <input type="radio"/> 0.10 |
| Average | <input type="radio"/> 0.32 | <input type="radio"/> 0.23 | <input type="radio"/> 0.20 | <input type="radio"/> 0.16 | <input type="radio"/> 0.15 |
| Semi-Loose | <input type="radio"/> 0.50 | <input type="radio"/> 0.36 | <input type="radio"/> 0.31 | <input type="radio"/> 0.25 | <input type="radio"/> 0.23 |
| Loose | <input type="radio"/> 0.67 | <input checked="" type="radio"/> 0.49 | <input type="radio"/> 0.42 | <input type="radio"/> 0.34 | <input type="radio"/> 0.30 |

Infiltration Air Changes per Hour:

OK Cancel

MJ8 & Infiltration

System Data - System 1 of 1

No: 1 Name: System 1

Design Equipment

System Design Conditions

| | Winter | Summer | | |
|----------------------|-------------|-------------|-----------------------|--------|
| Indoor Temperature: | 70 | 75 | Do Winter Humid.: | No |
| Relative Humidity: | 50 | 50 | System Air Type: | Fixed |
| Lvg. Coil Fm BTU: | 78 | 28 | System CFM: | 940 |
| Infiltration: | 0.94 | 0.49 | Fct. Sens. Capacity: | 75 |
| Ventilation: | 0 | 0 | Radiator Btuh/ft.: | 0 |
| Exhaust: | 0 | 0 | Radiator Text Option: | Foot |
| Do Heat Recovery: | No | No | Duct Load Factors: | (Data) |
| Heat Recovery SER: | 60 | 60 | | |
| Blower Power: | | 0 | | |
| Hot Water Piping: | 0 | | | |

5,739 BTUH gain
from a loosely
built building by
today's standards

| | | | | | |
|---|---|---------------|--------------|---------------|---------------|
| Subtotals for structure: | | 17,491 | 0 | 11,924 | 11,924 |
| People: | 4 | | 800 | 920 | 1,720 |
| Equipment: | | | 800 | 1,600 | 2,400 |
| Lighting: | 0 | | | 0 | 0 |
| Ductwork: | | 5,660 | 999 | 5,162 | 6,161 |
| Infiltration: Winter CFM: 190, Summer CFM: 99 | | 5,222 | 3,998 | 1,741 | 5,739 |
| Ventilation: Winter CFM: 0, Summer CFM: 0 | | 0 | 0 | 0 | 0 |
| Total Building Load Totals: | | 28,373 | 6,597 | 21,347 | 27,944 |

Check Figures

| | | | |
|------------------------------|--------|-------------------------------|-------|
| Total Building Supply CFM: | 940 | CFM Per Square ft.: | 0.754 |
| Square ft. of Room Area: | 1,246 | Square ft. Per Ton: | 525 |
| Volume (ft³) of Cond. Space: | 12,124 | Air Turnover Rate (per hour): | 4.7 |

Building Loads

MJ8 & Infiltration For Summer Tight Construction

Summer Infiltration

3 or 4 Exposures (free standing structure) | 1 or 2 Exposures (townhome, condo, apartment)

Select the number of exposures that this system has by clicking the appropriate tab above. Then select the air changes per hour option based on the quality of the envelope construction and the area of the building. To read descriptions of exactly what is meant by "Tight," "Semi-Tight," etc., press F1 to open the Rhvac Help window and click the link for the "Construction Tightness" topic.

**Conditioned Floor Area
(Square feet) of Building**

| | 900 or Less | 901 to 1500 | 1501 to 2000 | 2001 to 3000 | More than 3000 |
|---------------------|----------------------------|---------------------------------------|----------------------------|----------------------------|----------------------------|
| Construction | | | | | |
| Tight | <input type="radio"/> 0.11 | <input checked="" type="radio"/> 0.08 | <input type="radio"/> 0.07 | <input type="radio"/> 0.06 | <input type="radio"/> 0.05 |
| Semi-Tight | <input type="radio"/> 0.22 | <input type="radio"/> 0.18 | <input type="radio"/> 0.14 | <input type="radio"/> 0.11 | <input type="radio"/> 0.10 |
| Average | <input type="radio"/> 0.32 | <input type="radio"/> 0.23 | <input type="radio"/> 0.20 | <input type="radio"/> 0.16 | <input type="radio"/> 0.15 |
| Semi-Loose | <input type="radio"/> 0.50 | <input type="radio"/> 0.36 | <input type="radio"/> 0.31 | <input type="radio"/> 0.25 | <input type="radio"/> 0.23 |
| Loose | <input type="radio"/> 0.67 | <input type="radio"/> 0.49 | <input type="radio"/> 0.42 | <input type="radio"/> 0.34 | <input type="radio"/> 0.30 |

Infiltration Air Changes per Hour:

OK Cancel

MJ8 & Infiltration

System Data - System 1 of 1

No: 1 Name: System 1

Design Equipment

System Design Conditions

| | Winter | Summer | | |
|---------------------|--------|--------|-----------------------|--------|
| Indoor Temperature: | 70 | 75 | Do Winter Humid.: | No |
| Relative Humidity: | 50 | 50 | System Air Type: | Fixed |
| Log. Coil Rm. DT: | 70 | 20 | System CFM: | 940 |
| Infiltration: | 0.16 | 0.08 | Pct. Sens. Capacity: | 75 |
| Ventilation: | 0 | 0 | Radiator Btuh/ft.: | 0 |
| Exhaust: | 0 | 0 | Radiator Text Option: | Foot |
| Do Heat Recovery: | No | No | Duct Load Factors: | [Data] |
| Heat Recovery SER: | 60 | 60 | | |
| Blower Power: | | 0 | | |
| Hot Water Piping: | 0 | | | |

939 BTUH gain
from a loosely
built building by
today's standards

| | | | | | |
|--|---|--------|-------|--------|--------|
| People: | 4 | 17,491 | 0 | 11,924 | 11,924 |
| Equipment: | | | 800 | 920 | 1,720 |
| Lighting: | 0 | | 800 | 1,600 | 2,400 |
| Ductwork: | | 5,682 | 1,223 | 5,234 | 6,457 |
| Infiltration: Winter CFM: 32, Summer CFM: 16 | | 888 | 654 | 285 | 939 |
| Ventilation: Winter CFM: 0, Summer CFM: 0 | | 0 | 0 | 0 | 0 |
| Total Building Load Totals: | | 24,061 | 3,477 | 19,963 | 23,440 |

Check Figures

Infiltration Sensitivity

901 to 1500

☒ 0.08

☐ 0.16

☐ 0.23

☐ 0.36

☐ 0.49

TIGHT

LOOSE

Loose Construction

Summer Infiltration

3 or 4 Exposures (free standing structure) | 1 or 2 Exposures (townhome, condo, apartment)

Select the number of exposures that this system has by clicking the appropriate tab above. Then select the air changes per hour option based on the quality of the envelope construction and the area of the building. To read descriptions of exactly what is meant by "Tight," "Semi-Tight," etc., press F1 to open the Rhvac Help window and click the link for the "Construction Tightness" topic.

Conditioned Floor Area (Square feet) of Building

| Construction | 900 or Less | 901 to 1500 | 1501 to 2000 | 2001 to 3000 | More than 3000 |
|--------------|----------------------------|---------------------------------------|----------------------------|----------------------------|----------------------------|
| Tight | <input type="radio"/> 0.11 | <input checked="" type="radio"/> 0.08 | <input type="radio"/> 0.07 | <input type="radio"/> 0.06 | <input type="radio"/> 0.05 |
| Semi-Tight | <input type="radio"/> 0.22 | <input type="radio"/> 0.16 | <input type="radio"/> 0.14 | <input type="radio"/> 0.11 | <input type="radio"/> 0.10 |
| Average | <input type="radio"/> 0.32 | <input type="radio"/> 0.23 | <input type="radio"/> 0.20 | <input type="radio"/> 0.16 | <input type="radio"/> 0.15 |
| Semi-Loose | <input type="radio"/> 0.50 | <input type="radio"/> 0.36 | <input type="radio"/> 0.31 | <input type="radio"/> 0.25 | <input type="radio"/> 0.23 |
| Loose | <input type="radio"/> 0.67 | <input type="radio"/> 0.49 | <input type="radio"/> 0.42 | <input type="radio"/> 0.34 | <input type="radio"/> 0.30 |

Infiltration Air Changes per Hour: 0.08

OK Cancel

Infiltration: Winter CFM: 190, Summer CFM: 99

5,222

3,998

1,741

5,739

Tight Construction

Ductwork:

Infiltration: Winter CFM: 32, Summer CFM: 16

5,002

888

1,220

654

5,204

285

5,707

939

CALCS-PLUS

MJ8 & Duct Leakage



MJ8 & Duct Design

| Load Preview | | | | | | | | | | | | | | |
|------------------------|-----|---------|---------|----------------------|-------|--------|--------|----------|--------|-------|-------|---------|--------|--|
| Scope | AED | Net.Ton | Rec.Ton | ft ³ /Ton | Area | S.Gain | L.Gain | Net.Gain | S.Loss | W.CFM | S.CFM | Sys.CFM | D.Size | |
| Building | | 2.11 | 2.28 | 546 | 1,246 | 20,534 | 4,794 | 25,327 | 24,566 | 227 | 900 | 940 | | |
| System 1 | Yes | 2.11 | 2.28 | 546 | 1,246 | 20,534 | 4,794 | 25,327 | 24,566 | 227 | 900 | 940 | 0" | |
| Ventilation | | | | | | 747 | 1,715 | 2,462 | 1,167 | | | | | |
| Duct Loads | | | | | | 5,343 | 1,479 | 6,822 | 5,908 | | | | | |
| Zone 1 | | | | | 1,246 | 14,444 | 1,600 | 16,044 | 17,491 | 227 | 900 | 940 | | |
| 1-Bedroom 1 | | | | | 155 | 1,392 | 0 | 1,392 | 2,414 | 31 | 87 | 91 | 1-6 | |
| 2-Bedroom 2 | | | | | 155 | 1,392 | 0 | 1,392 | 2,414 | 31 | 87 | 91 | 1-6 | |
| 3-Bedroom 3 | | | | | 120 | 783 | 0 | 783 | 1,213 | 16 | 49 | 51 | 1-4 | |
| 4-Bathroom Powder A... | | | | | 48 | 121 | 0 | 121 | 59 | 1 | 8 | 8 | 1-4 | |
| 5-Bathroom Tub Area | | | | | 43 | 378 | 0 | 378 | 702 | 9 | 24 | 25 | 1-4 | |
| 6-Great Room | | | | | 329 | 4,838 | 400 | 5,238 | 4,196 | 55 | 301 | 315 | 1-10 | |
| 7-Kitchen / Dining | | | | | 276 | 3,240 | 1,200 | 4,440 | 3,462 | 45 | 202 | 211 | 1-9 | |
| 8-Laundry | | | | | 120 | 2,300 | 0 | 2,300 | 3,031 | 39 | 143 | 150 | 1-7 | |

Design room CFM (airflow)

Duct Loads

Addendum C to

ACCA Manual J® Residential Load Calculation Eighth Edition

ANSI/ACCA Man J 2-2004

ISBN# 1-892765-27-6

This addendum updates Version 1.10 of Manual J Eighth Edition (MJ8™) and addresses *Duct Gain / Loss Revisions* to the MJ8 procedures.

Ducts located in the unconditioned space also have a heat gain that adds to the cooling load of the building.

CALCS-PLUS

Duct Load Factors - Location Scenario 1 of 5

Duct Properties

| | Supply | Return |
|--------------------------|--------|--------|
| Duct Location: | Attic | Attic |
| Attic Ceiling Type: | 16B | 16B |
| Duct Leakage Rate: | 0.12 | 0.24 |
| Duct Insulation R-Value: | 6 | 6 |
| Duct Surface Area: | 0 | 0 |



Results

| | System 1 Duct Load | Percent of Total Load |
|----------------|-----------------------|--------------------------|
| Sensible Loss: | 0 | 0% |
| Sensible Gain: | 0 | 0% |
| Latent Gain: | 0 | 0% |

Multiple Duct Scenarios (Optional)

If the ducts in this system are in more than one location or have other properties that differ, you can change the Duct Scenario Number below and enter "Duct Properties" data for additional scenarios (up to 5 total).

Duct Scenario No.: 1 Desc.: Main

<< >>  

| | Supply | Return |
|---------------------------------------|--------|--------|
| Total Duct Surface Area for System 1: | 0 | 0 |
| Scenario 1 Percentage: | 0% | 0% |

Calculate Duct Loads

Duct Load Factors - Location Scenario 1 of 5

Duct Properties

| | Supply | Return |
|--------------------------|--------|--------|
| Duct Location: | Attic | Attic |
| Attic Ceiling Type: | 16B | 16B |
| Duct Leakage Rate: | 0.06 | 0.06 |
| Duct Insulation R-Value: | 6 | 6 |
| Duct Surface Area: | 336 | 249 |



Results

| | System 1 Duct Load | Percent of Total Load |
|----------------|-----------------------|--------------------------|
| Sensible Loss: | 4,350 | 18% |
| Sensible Gain: | 4,700 | 24% |
| Latent Gain: | 629 | 18% |

Multiple Duct Scenarios (Optional)

If the ducts in this system are in more than one location or have other properties that differ, you can change the Duct Scenario Number below and enter "Duct Properties" data for additional scenarios (up to 5 total).

Duct Scenario No.: 1 Desc.: Main

<< >>  

| | Supply | Return |
|---------------------------------------|--------|--------|
| Total Duct Surface Area for System 1: | 336 | 249 |
| Scenario 1 Percentage: | 100% | 100% |

The Sensible Loss, Sensible Gain, and the Latent Gain are calculated for the duct system.

What If?

Duct Load Factors - Location Scenario 1 of 5

Duct Properties

| | Supply | Return |
|--------------------------|--------|--------|
| Duct Location: | Attic | Attic |
| Attic Ceiling Type: | 168 | 168 |
| Duct Leakage Rate: | 0.06 | 0.06 |
| Duct Insulation R-Value: | 6 | 6 |
| Duct Surface Area: | 336 | 249 |

Results

Calculate

| | System 1 Duct Load | Percent of Total Load |
|----------------|--------------------|-----------------------|
| Sensible Loss: | 4,350 | 18% |
| Sensible Gain: | 4,700 | 24% |
| Latent Gain: | 629 | 18% |

Multiple Duct Scenarios (Optional)

Duct Scenario No. 1 Desc. Main

<< >> [Icons]

| | Supply | Return |
|---------------------------------------|--------|--------|
| Total Duct Surface Area for System 1: | 336 | 249 |
| Scenario 1 Percentage: | 100% | 100% |

OK Cancel

Extremely sealed (seal shall be verified by leakage test)

Duct Load Factors - Location Scenario 1 of 5

Duct Properties

| | Supply | Return |
|--------------------------|--------|--------|
| Duct Location: | Attic | Attic |
| Attic Ceiling Type: | 168 | 168 |
| Duct Leakage Rate: | 0.12 | 0.06 |
| Duct Insulation R-Value: | 6 | 6 |
| Duct Surface Area: | 336 | 249 |

Results

Calculate

| | System 1 Duct Load | Percent of Total Load |
|----------------|--------------------|-----------------------|
| Sensible Loss: | 5,624 | 23% |
| Sensible Gain: | 5,195 | 26% |
| Latent Gain: | 1,117 | 28% |

Multiple Duct Scenarios (Optional)

If the ducts in properties that below and enter 5 total).

Duct Scenario No. 1 Desc. Main

<< >> [Icons]

| | Supply | Return |
|---------------------------------------|--------|--------|
| Total Duct Surface Area for System 1: | 336 | 249 |
| Scenario 1 Percentage: | 100% | 100% |

OK Cancel

Average sealed system (MJ8 default)

MJ8 & the Energy Rater

The information you gather to do a energy rating is the same as required for an HVAC Load Calculation.

Do it to set yourself apart from your competition.

Do it to become a better Energy Rater.

Do it to provide another avenue for income.

Larger Customer Base

AC Contractors know or at least had to have learned load calculations if they carry a license or certification.

AC contractors are busy running a company and don't have time to do room x room calculations.

If they were provided room x room calculations they would use them as a design tool.

Diagnostic Tool

Start every diagnostic investigation with a room x room HVAC load calculation.

You will understand the construction of the building much better.

You will have a better understanding of the results of all the data gathered.

A Plug for MJ8

The possibility for experiencing comfort problems at part load conditions can be minimized by observing the guidelines set forth in Manual J.

The Manual J calculation should take full advantage of legitimate opportunities to minimize the size of the estimated loads.



Thank You

Questions?