



Air System Design

Air System Options by Bldg Type



What you will Learn in this Lesson



- Spaces and their systems
- System selection criteria
- Building types
- Options available by type

Start with the Space



- It all starts with the enclosed space
- It is the space that matters and how air is provided and distributed around the space
- Most spaces we design are intended exclusively for human protection and comfort
- These spaces have normal conditions and normal internal loads that are associated with the function of the space

Form Follows Function



Space functions have evolved over the years since air conditioning was introduced into defining the normally accepted methods of conditioning the space using specific equipment which has been custom designed for that space function

Baseboard convectors or Radiation



Used in cold climates to:

- 1) Allow the air handler to shut down at night and
- 2) To offset radiation heat loss at the windows

Application Features that Fix a Sound Problem



- Unit Ventilator above acoustic tile
- Ducted supply and return
- Special low sound design of UV fan
- Duct lining
- Unit sized to run in low speed

Central Systems



If a piece of in-space terminal equipment doesn't lend itself well to the owners wishes then the designer turns to the trusty diffuser and grill solution.

Once the choice is made to use diffusers and return grills the possibilities to supply air to that diffuser are many and varied.

System Choices



- There are lots of choices for systems
- The designer is responsible for selecting one or two to meet the project goals
- Goals need to be set by the owner and selection criteria prioritized

System Selection Criteria



- Space conditions
- Process'
- Local building codes
- Redundancy requirements
- Local climate
- Costs: first, operating, life cycle, environmental
- Income: owners income due to the process in the space

System Selection Criteria



- Constraints
 - Tight space environmental conditions
 - Available utility capacity
 - Available space
 - Architecture: floor-to-floor height, ceiling height
 - Constructability: additions, renovation, lay-down space
 - Budget
 - Schedule
 - Phasing
 - Lead time



Building Types

- Religious facilities
- Apartments/condos
- Public buildings
- Industrial
- Research labs
- Office
- Retail



Building Types

- Hospitality
- Higher education
- K-12 education
- Health care
 - Long term care
 - Clinic
 - Hospital

Typical Office



To the guy (or gal) sitting at a desk,
it doesn't matter how the air gets
there. [It just better be clean, cool,
and slow]



End of Lesson

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