



# Energy Efficient Design Fundamentals

(2009 Session-3: Mar 10-13, 2009, Rochester, NY)

## Energy Efficient Design

1. Paradigms (1-hr)
2. What the Big Deal about Comfort? (1-hr)
3. Joe's Favorite Design Strategies for better Energy Efficiency:
  - A. Chiller Strategies: (8-hrs)
    - 1) Condenser Water: Flow Rate
    - 2) Condenser Water: Entering Temperature
    - 3) Evaporator Water: Flow Rate
    - 4) Evaporator Water Temperatures
    - 5) Single Chillers vs. Multiple Chillers
    - 6) Technology Diversification
    - 7) Free Cooling
    - 8) Chiller Life Expectancy
    - 9) Air Cooled vs. Water Cooled
  - B. Airside Strategies: (7-hrs)
    - 1) VAV (2-hrs)
    - 2) Low Temp Air & Ice Storage: The Perfect Marriage
    - 3) CDQ
  - C. System Control Strategies: (7-hrs)
    - 1) Enthalpy Airside Economizer Control
    - 2) Ventilation Optimization
    - 3) Duct Pressure Optimization
    - 4) Chiller-Tower Optimization
    - 5) Variable Flow Pump Pressure Optimization

**Purpose:** The majority of buildings designed over the past two decades have HVAC mechanical systems optimized using rules of thumbs that were optimal in 1937. On average, these buildings could be using 10%-30% less HVAC energy if the designers were more aware of powerful paradigm shifts that have taken place since the 1980's. Anyone who attends this course will be given a number of effective strategies that will surely improve their very next design.