Seven Principles of High Performance Buildings

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Five Strategic Goals

• Guiding Principles in the Energy & Water Strategy

  – Decrease Energy waste in all systems, processes and facilities;
  – Increase energy efficiency in all new, replaced or renovated equipment or facilities;
  – Improve energy security by reducing dependence on fossil fuels and increasing production of renewable & alternative energy sources and supplies;
  – Reduce wasteful water consumption; and
  – Decrease the impact of Energy & Water use on the environment
High Performance Building Design Principles

- Eliminate Thermal Bridges
- Sealed Envelopes –
  (<.25 cfm/sqft at 0.3 iwg or 75Pa)
- High R-values (Roofing, Outer Walls, Stem Wall)
- Passive Solar & Shading/Encased Operational Windows
- Heat Transfer Intake to Exhaust
- Automated Controls on all Energy Devices
- Radiant heating/cooling
Eliminate Thermal Bridges

section of a passive house avoiding thermal bridges
7 Principles of High Performance Bldgs

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Passive Solar & Shading/Encased Operational Windows
Heat Transfer Intake to Exhaust

A diagram of a rotary heat exchanger, or "heat wheel" (From Uptime Technology BV)
Automated Controls on all Energy Devices

- +20 SYSTEM PRESS
  - 40.0 psi

- 0.0 %
  - HSSC-103
- 0.0 %
  - SWSC-104
- 90.0 %
  - HSSC-101
- 75.0 %
  - HSSC-102

- -20 SYSTEM PRESS
  - 3.0 psi

- -20 CONTROLLER
  - 50

- +20 CONTROLLER
  - 50

- LSRC-04 COMP
- CONTROL MODE
- LSRC-101

- Previous
- HOME
Radiant heating/cooling
Way Ahead

• As Industry LEADERS
  – Highlight energy reduction as an Organization imperative
  – Use leadership to change organizational actions and wasteful energy processes
  – Ensure construction standards incorporate high performance design principles
  – Support Energy Report Cards for all managers at all levels
  – Practice what you preach

• With DoD Programs
  – Support federal policy and requirements that facilitate achieving Energy & Petroleum Reduction Goals
  – Implement energy efficiency improvements in all new/remodel projects
  – Implement greater use of renewable energy sources in designs
  – Require management accountability for the use of all utilities