



• August 15-18, 2010 • Dallas, Texas •
• Dallas Convention Center •



DOE/NREL Research Support Facilities
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Research Support Facilities

Net Zero Energy

- Background/Project Goals/Site information
- How did we get here?
 - Strategies
 - Low Energy Building
 - » Drive Down Energy Use
 - Augment with PV
 - Project Delivery Method
 - Building
 - » Design-Build Acquisition
 - » DBIA Best Practices
 - » Best Value Procurement
 - » Performance Specifications
 - What the Building Needs to Do
 - Not What it Looks Like
 - » Award Fee Program
 - Energy saving Features

Project Goals

- 800 people in DOE office space on NREL's campus
- 200,000 ft²
- Design/Build Process with required energy goals
 - 25 kBtu/ft²
 - 50% energy savings
 - LEED Platinum
- Replicable
 - Process
 - Technologies
 - Cost
- Net zero with PV on-site
 - Includes plug loads and datacenter
- Occupy by July 23, 2010



NREL South Table Mountain Site



RSF Project Site

NREL South Table Mountain Site



Strategies for a Net Zero Energy Office Building

- Maximize Efficiency Strategies in Architecture
 - Daylighting
 - Natural Ventilation
 - The first DOE building with operable windows
 - Shading and Orientation
 - Transpired solar collector
- Design focus on passive and climate specific systems
- Put absolute energy use requirements into RFP
 - Require substantiation through energy model at Final Completion
 - Force integrated design to reach energy goals on a FFP
- On-Site PV w/ PPA to offset all energy use
 - Reduce First Costs



Project Delivery Method

•Design-Build Acquisition

- Planned Traditional D-B
 - Risk Transfer at Contract Award
- Actual Acquisition Method
 - Two Phase Approach
 - Award Preliminary Design w/ Risk Sharing
 - Approval
 - Award Final Design and Construction
 - Required for Complex/Unique Projects

•Use of D-B Services Implementation Subcontractors (Criteria Consultants)

- Aid owner with RFP Development
 - Part 1 - Procedures
 - Part 2 – Program
 - Part 3 – Performance Specifications
- D-B Implementation Services
- Provided NREL owners representative services

DBIA Best Practices

- Prequalification – RFQ's
- Short-List To Three
- Draft RFP Review by D-B
- Conduct Interim Interviews During Competition
- Payment of Stipends to Unsuccessful Offerors
- Award Fee Incentive Program

Best Value Procurement

Use of a Project Objectives Checklist to Communicate the Mission Critical, Highly Desirable, and If Possible scope items in the RFP document. Items within each category are prioritized by the NREL.

Use of Weighted Technical Evaluation Criteria and cost.

NREL had more scope than funding for the RSF which resulted in the competition being focused on amount of scope that can be provided for the money available.

RSF Mission Critical Objectives

- **Safety**
 - Safe Work Performance
 - Safe Design Practices
- **LEED™ Platinum**
- **Energy Star**
 - Unless Other System Out Performs

Highly Desirable Objectives

- 800 Staff Capacity
- 25 kBTU/sf/yr
- Architectural Integrity
- Honor Future Staff Needs
- Measurable ASHRAE 90.1 >50%
- Support Cultural and Amenities
- Expandable Building
- Ergonomics
- Flexible Workspace
- Support Future Technologies
- “How To” Manual
- “Real-Time PR” Campaign
- Secure Collaboration with Outsiders
- Building Information Modeling
- Substantial Completion by July 2010

If Possible Objectives

- Net Zero Design Approach
- Most Energy Efficient Building in the World
- LEED™ Platinum Plus
- ASHRAE 90.1 +50%
- Visual Displays of Current Energy Efficiency
- Support Public Tours
- National and Global Recognition and Awards
- Support Reduction Personnel Turnover

Subcontract

- Part 1 – Procedures
- Part 2 - Program
- Part 3 – Performance Specifications
 - What the Building Needs to Do
 - Organized in Uniformat
 - Facility Performance
 - Substructure
 - Shell
 - Interiors
 - Accessory Fixtures
 - etc...
 - » Performance
 - » Products
 - » Substantiation

Solicitation Process

Request for Qualifications:

- General Evaluation Criteria
 - Resumes of Key Personnel
 - Experience of Design-Build Team
 - Past Performance
 - Safety

Request for Proposals:

- Project Specific Weighted Technical Criteria
 - Demonstrated experience for all Mission Critical Items
 - Demonstrated experience in Performance Based Design-Build
 - Demonstrated experience in Energy Efficient Building Designs

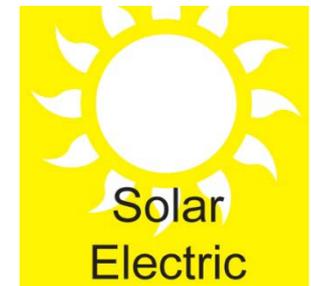
Award Fee Program

Award Fee must be large enough to motivate the Design-Build team. Normally 2 – 3% of total subcontract value.

- Motivates/modifies subcontractor behavior
- Guarantees NREL will have a “voice” during the design/construction
- NREL determines the amount of award fee earned by the subcontractor
- Award Fee Program is at NREL’s sole discretion
- Award Fee Evaluation Criteria is established by NREL
 - Shared With D-B

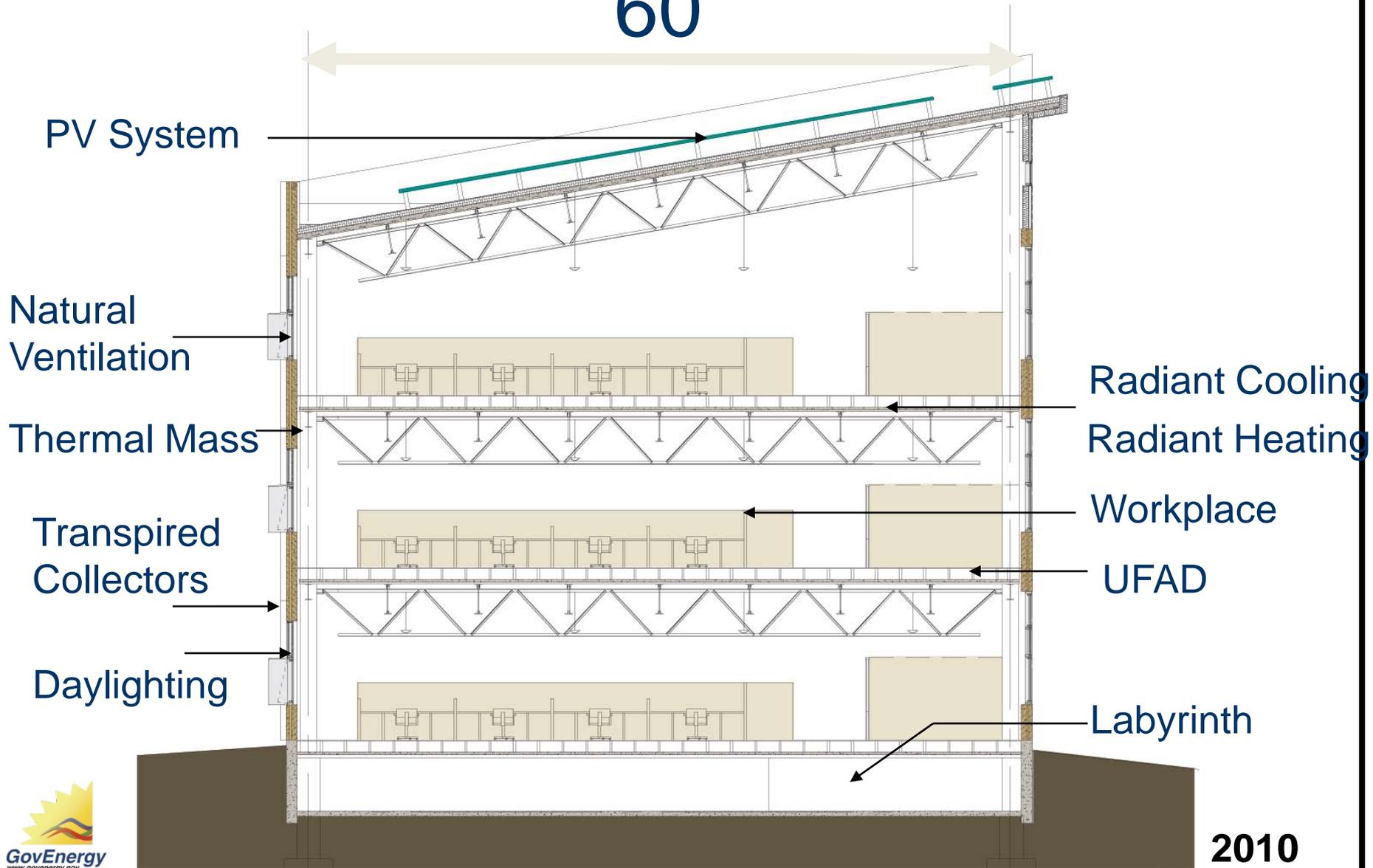
Sustainable Strategies TM

| | | | |
|--------------------------------|-------------------------------------|-------------------------------------|--------------------------------------|
| DL Daylight | SD Shading | NV Natural Ventilation | TC Transpired Collector |
| UF Underfloor Air | LL Low Energy Lighting | RS Radiant Slabs | EV Evaporative Cooling |
| TM Thermal Mass | NP Night Purge | WP Wind Protection | GI Green IT |



The Section

60'



Sustainable Strategies

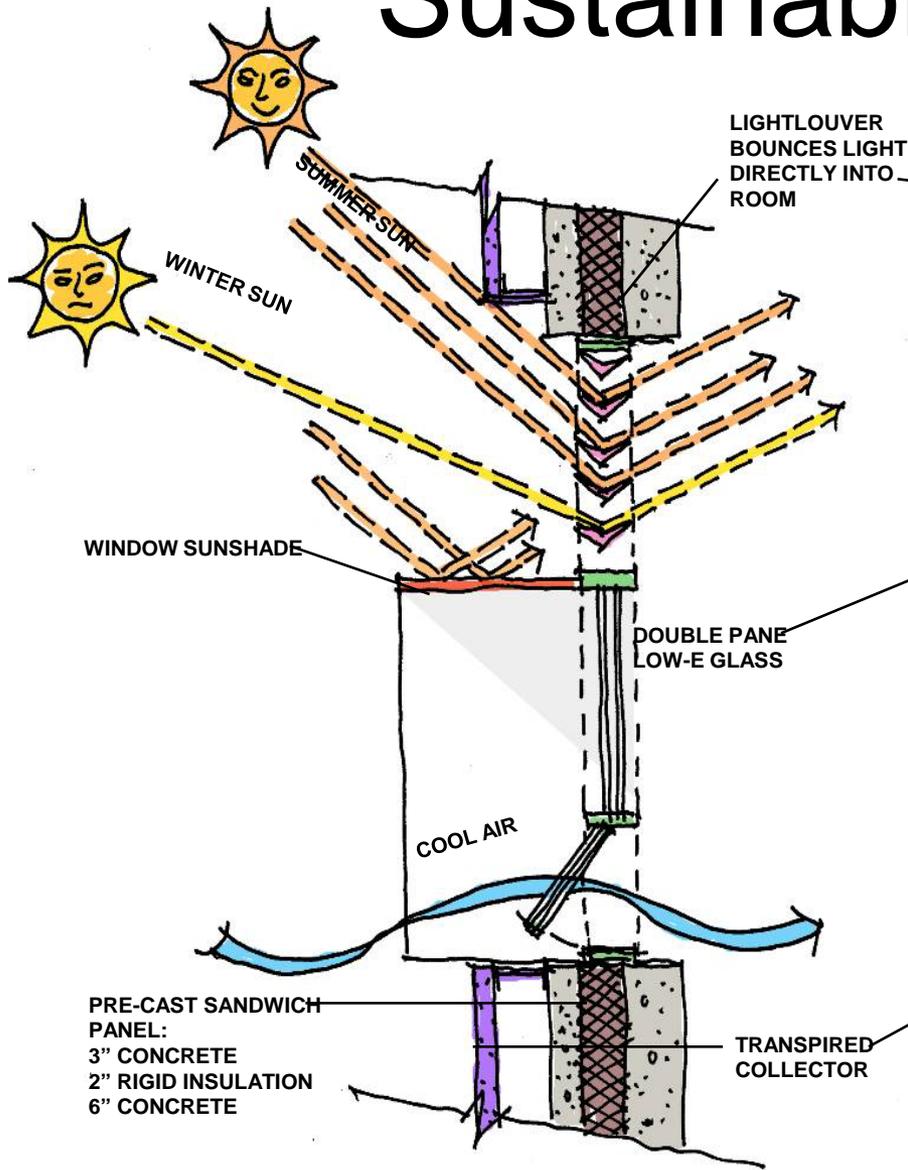
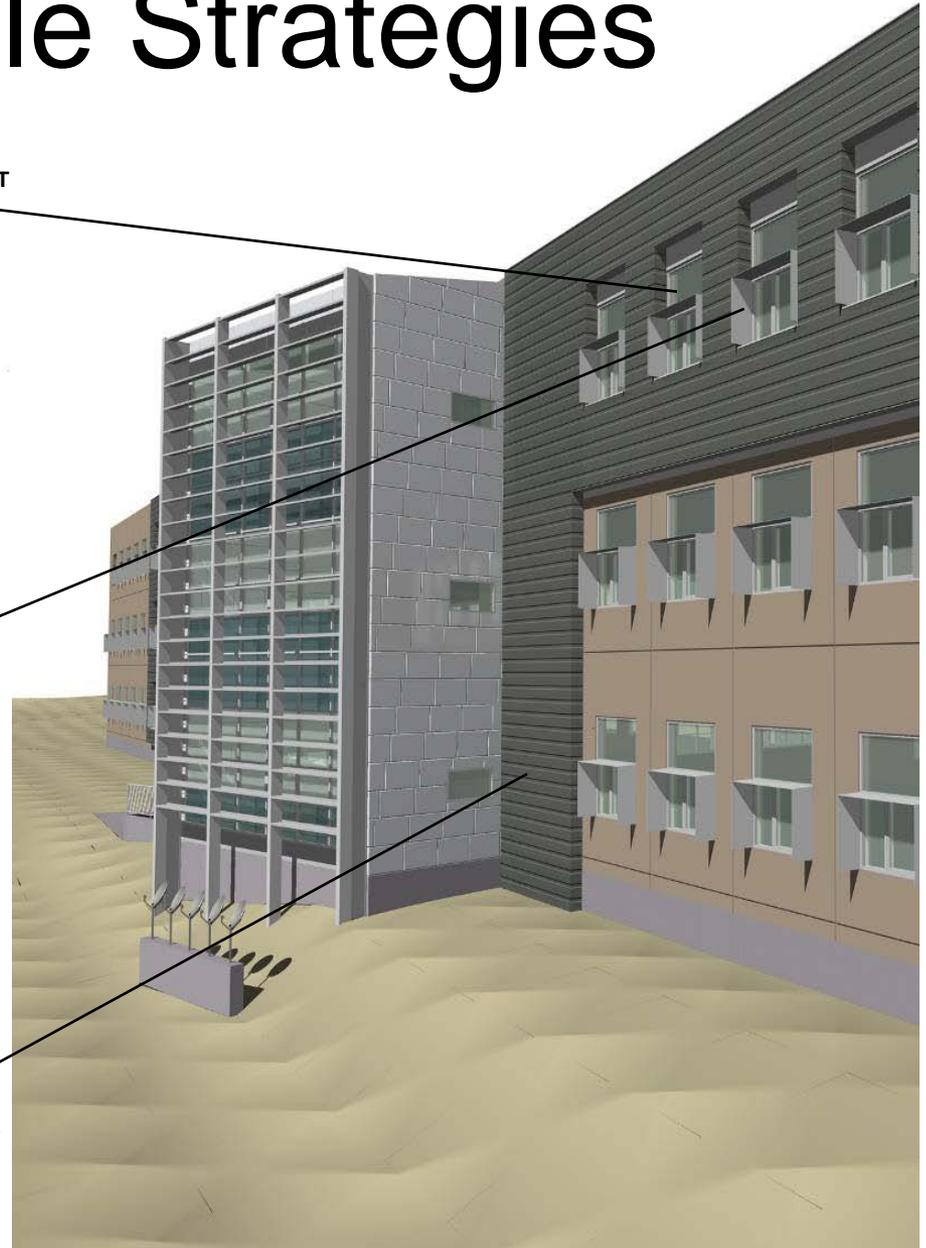
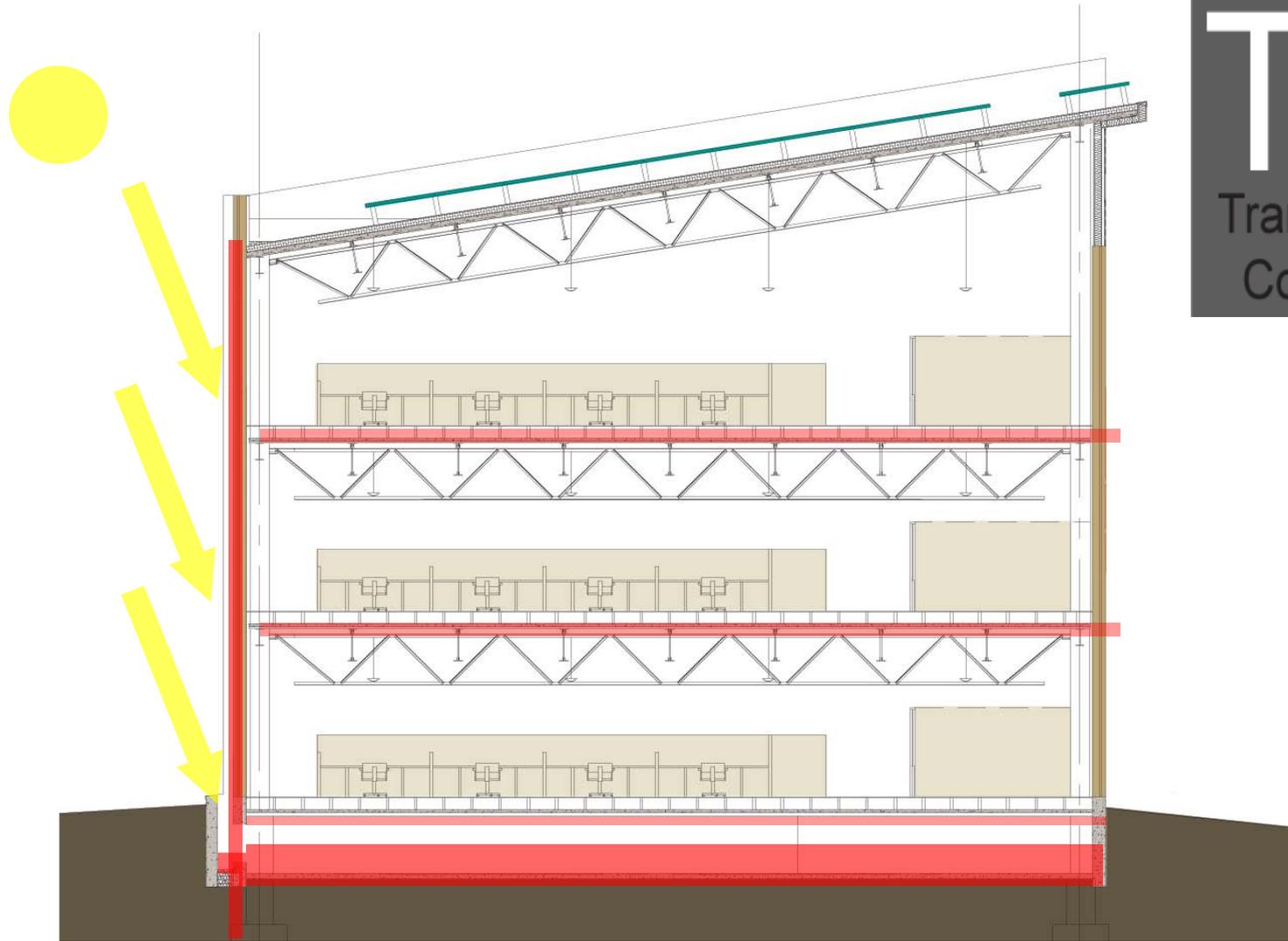


FIGURE #1
NREL

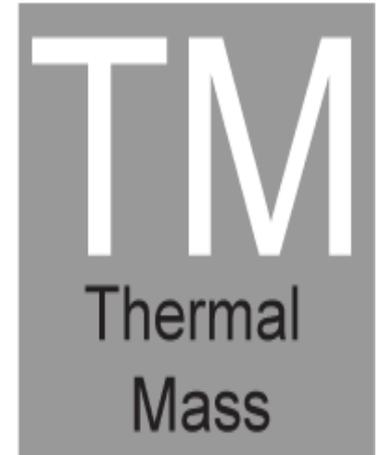
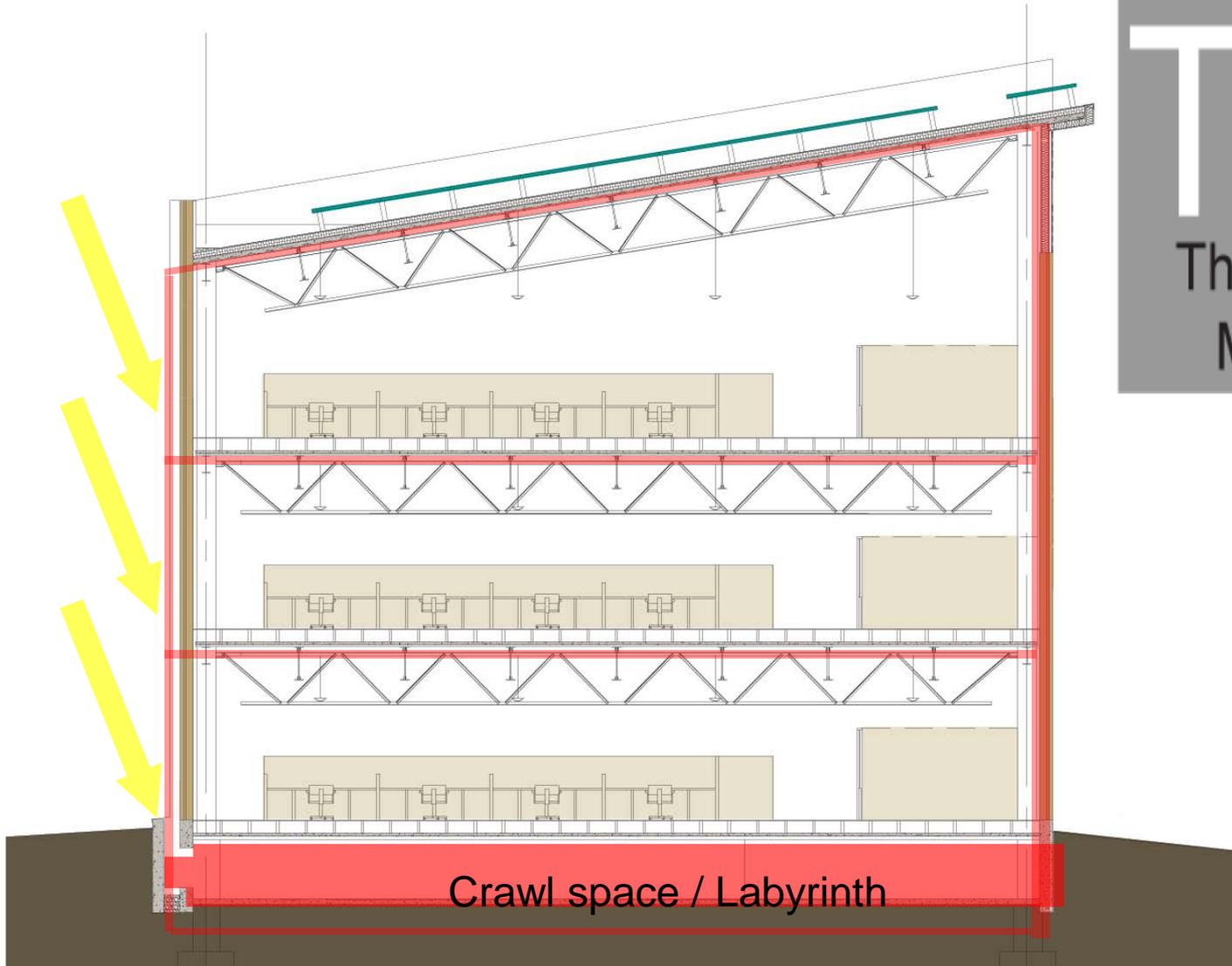


The Section – Transpired Collector

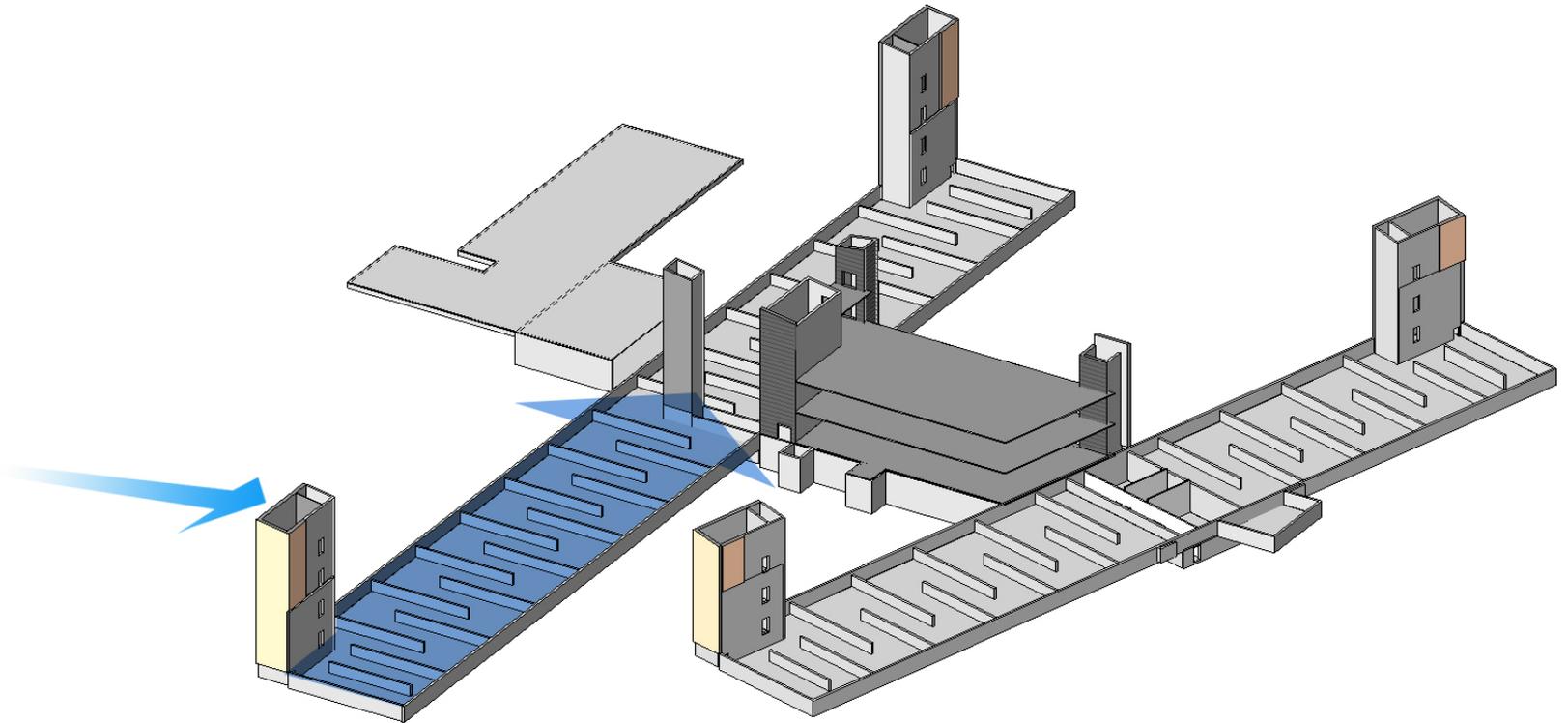


TC
Transpired
Collector

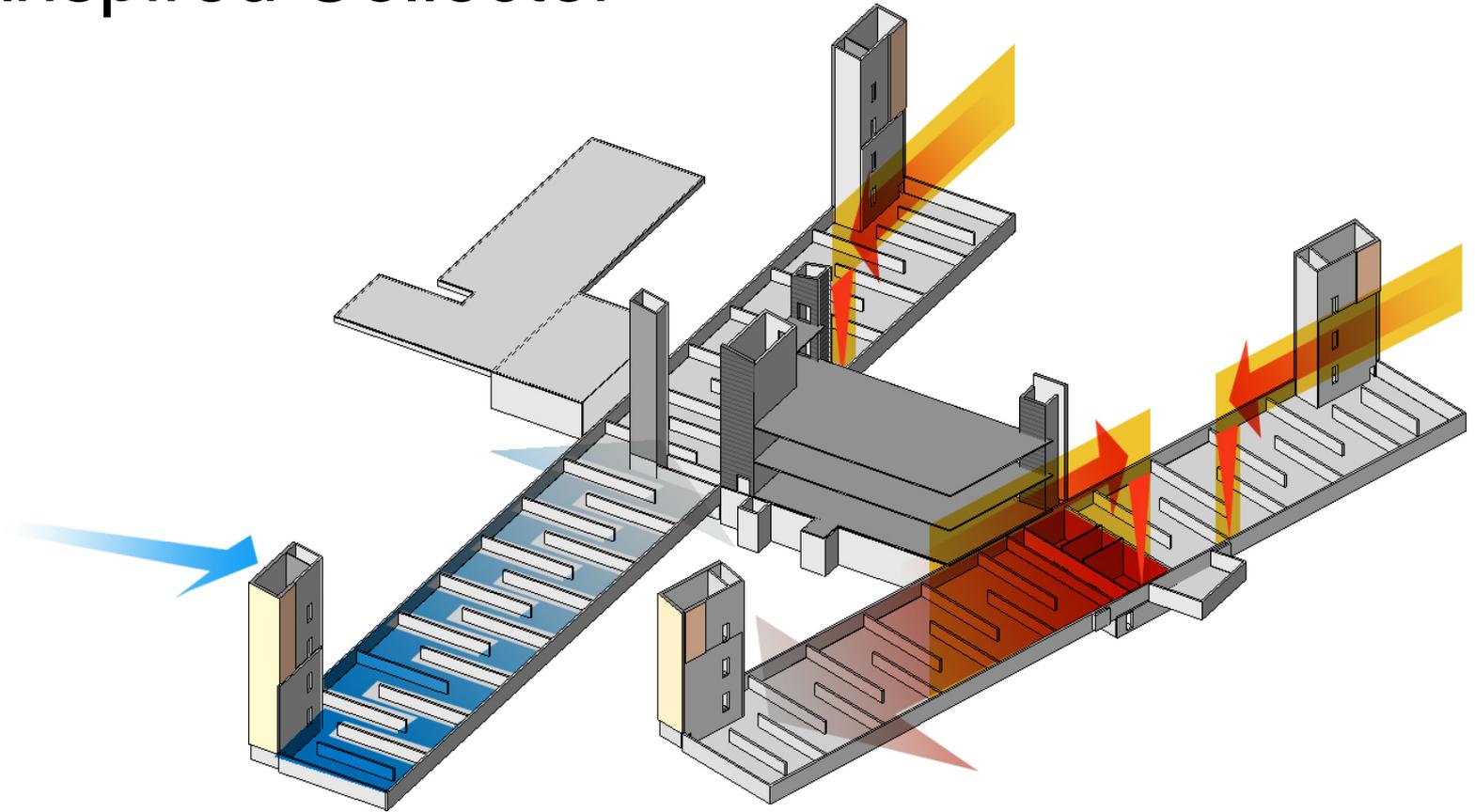
The Section – Thermal Mass



Labyrinth



Transpired Collector



Questions

D-B Acquisition

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Information

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