

Rehabs & Renovations How to Spot Trouble

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The Building Process From Idea to Reality

- Owners idea / need
- Select Design Professional(s)
- Develop Building Concept
- Feasibility Study
- Assemble Design & Engineering Team

The Building Process From Idea to Reality

(cont.)

- Develop Contract Documents
- Building Official(s) Compliance Review
- Contractor Selection
- Subcontractor and Supplier Selection
- Begin Construction
- Compliance Inspections

Selection Considerations for Building Materials

- Suitability
- Availability
- Cost
- Appearance
- Preference

Building Constraints

- Physical Limitations
- Budget
- Legal Restrictions, etc.
- Building Materials

Who Has Primary Responsibility for Building Material Selection?

- Depends on Contractual Arrangements, often
- Designer/Architect,
 - with input from the
 - Owner
 - Contractor

Who is Primarily Responsible for Construction Methods?

The *contractor* shall be solely responsible for and have control over means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the contract (*unless instructed otherwise*)

Zoning Ordinances

- Generally Imposed by Local Authorities
- Govern Property Use

Building Codes

Purpose

“... establish minimum construction standards for the protection of life, health, and welfare of the public.”

Building Codes

- **Model Codes** (standardized codes)
 - International Building Code (IBC)
 - Uniform Building Code (UBC)
 - BOCA Building Code (BOCA)
 - Standard Building Code (SBC)

Code Revision & Interpretation

- Why Hasn't Everyone Adopted the IBC?
- Revisions - Automatically Enforced?
- Is Interpretation Consistent?

Material Information Resources

- American Society for Testing and Materials (ASTM)
- American National Standards Institute
- US Bureau of Standards
- Construction Trade & Professional Associations (Technical specifications often incorporated by 'reference')

Building System Choices

- Required functional performance?
- Desired aesthetics / appearance?
- Legally possible (building regulations)?
- Most economical? (1st cost, life cycle)
- What is best for environment?

Sustainability

- "...meeting the needs of the present generation without compromising the ability of future generations to meet their needs."

Sustainable Design & Construction Green Building

- Sustainable Design & Construction Actions
- Sustainability - Addressed on a Life Cycle basis

Sustainability Considerations when Selecting Materials

- Origin & Manufacture of Building Materials
- Construction of the Building
- Building Maintenance
- Demolition

Performance Vs. Construction

- Design & Performance Issues
- Construction Issues

Rehabilitation

Etymology: Medieval Latin *rehabilitatus*, past participle of *rehabilitare*, from Latin *re-* + *habilitare* to habilitate

- **1 a** : to restore to a former capacity
- **1 b** : to restore to good repute : reestablish the good name of
- **2 a** : to restore to a former state (as of efficiency, good management, or solvency) <*rehabilitate* slum areas
- **2 b** : to restore or bring to a condition of health or useful and constructive activity

Rehabilitation & Renovation How to spot trouble

- Understanding History
 - materials and function
- Defining Problem
 - examining the effects of constraints
 - application of ideas of renovation types

Rehabilitation & Renovation Restrictions

- Structural Design Considerations
- Architectural Design Considerations
- Material Considerations

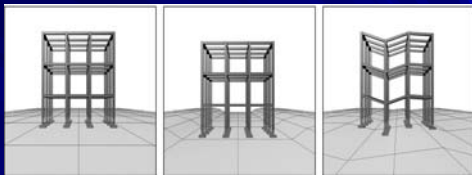
Structural Design Considerations

- Why do firefighters wear red suspenders?
- Foundations
- Static and Dynamic Loads

Foundation Requirements

- Safe Against Structural Failure
- Settlement Not Impairing Function
- Technically & Economically Feasible

Types of Settlement



No Settlement

Uniform

Differential

The Leaning Tower of Pisa

One of the Most Famous
Examples of
Differential Settlement



Differential Settlement
Next to
A Building Column



Differential Settlement
Between an
Areaway & Sidewalk



Architectural Design & Material Considerations

- Construction
 - Wood
 - Concrete
 - Masonry

Exterior Finishes

- Structural Framing & Sheathing
- Roofing
- Exterior openings and siding windows & Doors
- Coatings. Finishes water and solvent based

Interior Finishes

- Partition framing
- Rough ins & equipment
- Thermal insulation
- Ceilings and walls
- Floors
- Millwork and finishes
- MEP fixtures, devices and appliances

How to Spot Trouble

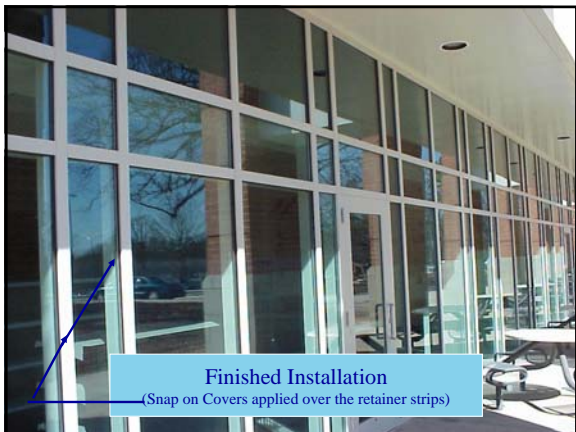
- Investigation
- Assumptions
- Sources

How to Spot Trouble

■ Testing

- Non-destructive
- Destructive





Five Forces Moving Water thru Cladding

- Gravity
- Momentum
- Surface Tension
- Capillary Action
- Wind Currents

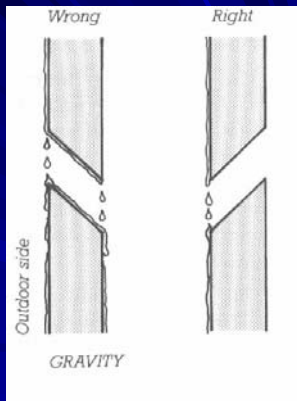
Gravity

Problem:

The Forces of Gravity cause water to enter the cladding

Solution:

Slope joints/openings to the outside



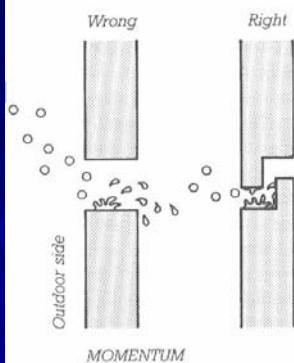
Momentum

■ Problem:

- The momentum from rain falling at an angle carries the water into the cladding

■ Solution:

- Joint cover
- Labyrinth (maze)



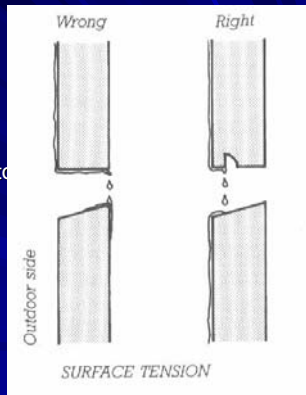
Surface Tension

Problem:

- Water adheres to joint & is drawn into the cladding

Solution:

- Drip groove



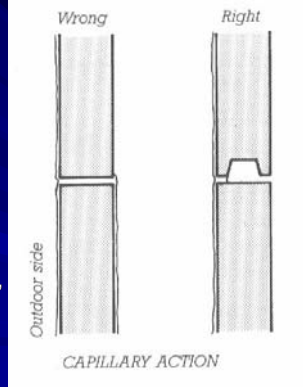
Capillary Action

Problem:

- Water pulled into the cladding

Solution:

- Opening larger than a drop of water can bridge, or install a capillary break
- Capillary break



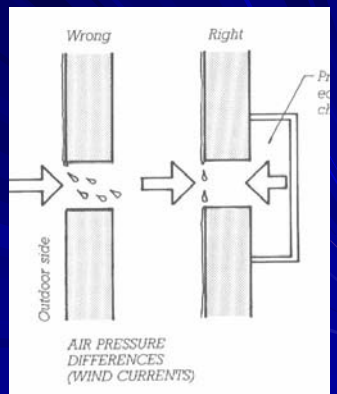
Air Pressure

Problem:

- Differences in air pressure push, or pull water into cladding

Solution:

- Pressure Equalization Chamber



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Project Management

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