

# Abington Memorial Hospital

Abington, Pennsylvania



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Spring 2004 Senior Thesis Presentation

## Outline

- **Project Information**
- **Steel Connection Redesign**
- **Mold in Exterior Insulation Finish Systems**
- **Green Healthcare Facilities**
- **Conclusion, Questions**



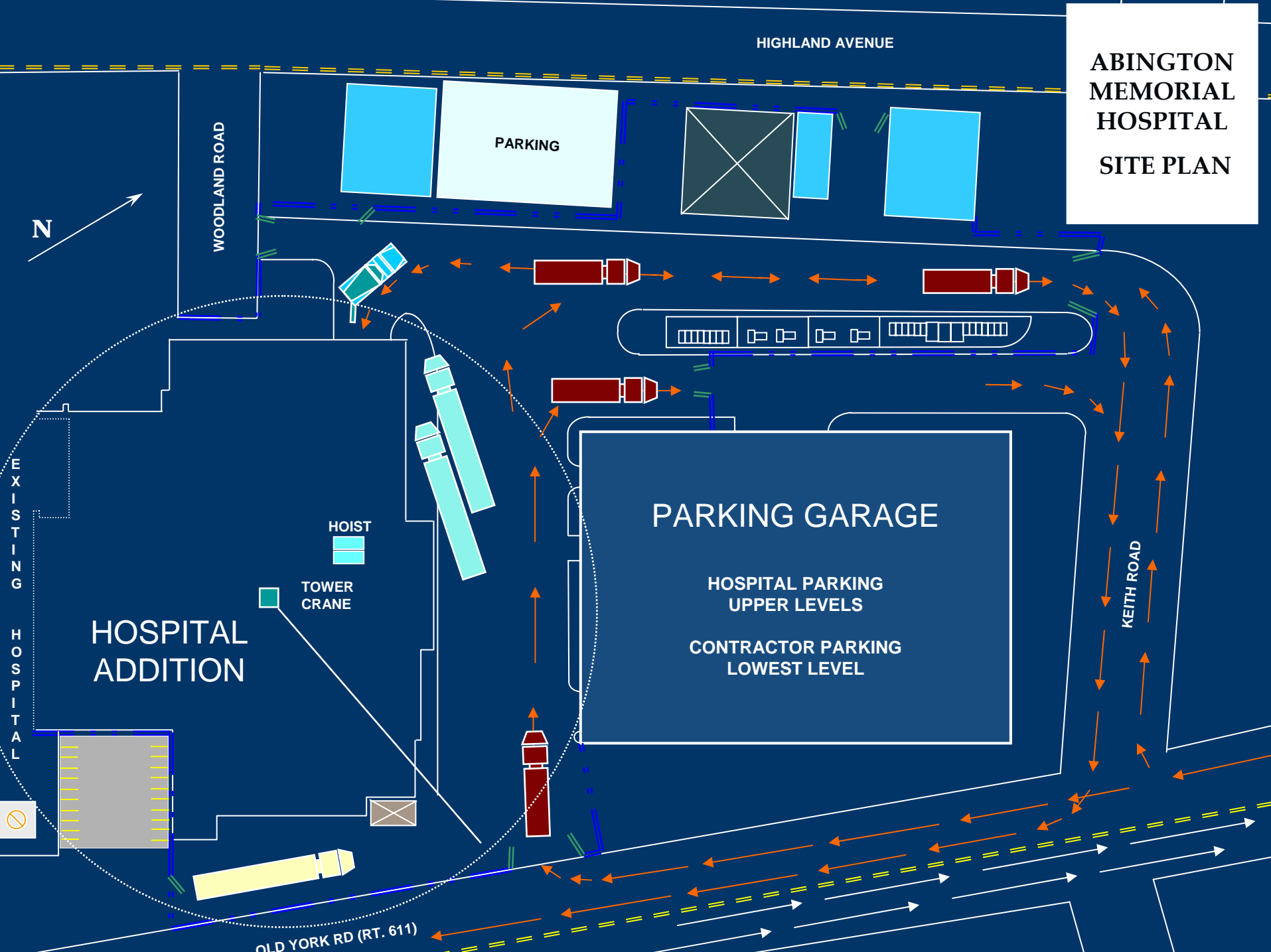
# Abington Memorial Hospital

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## Building Information

- **Building Size: 360,000 SF**
- **Construction Cost: \$98.4 million**
  - **\$94.6 million New Construction**
  - **\$3.8 million Renovations**
- **Joint Venture between Intech Construction and L.F. Driscoll Construction**

# ABINGTON MEMORIAL HOSPITAL SITE PLAN





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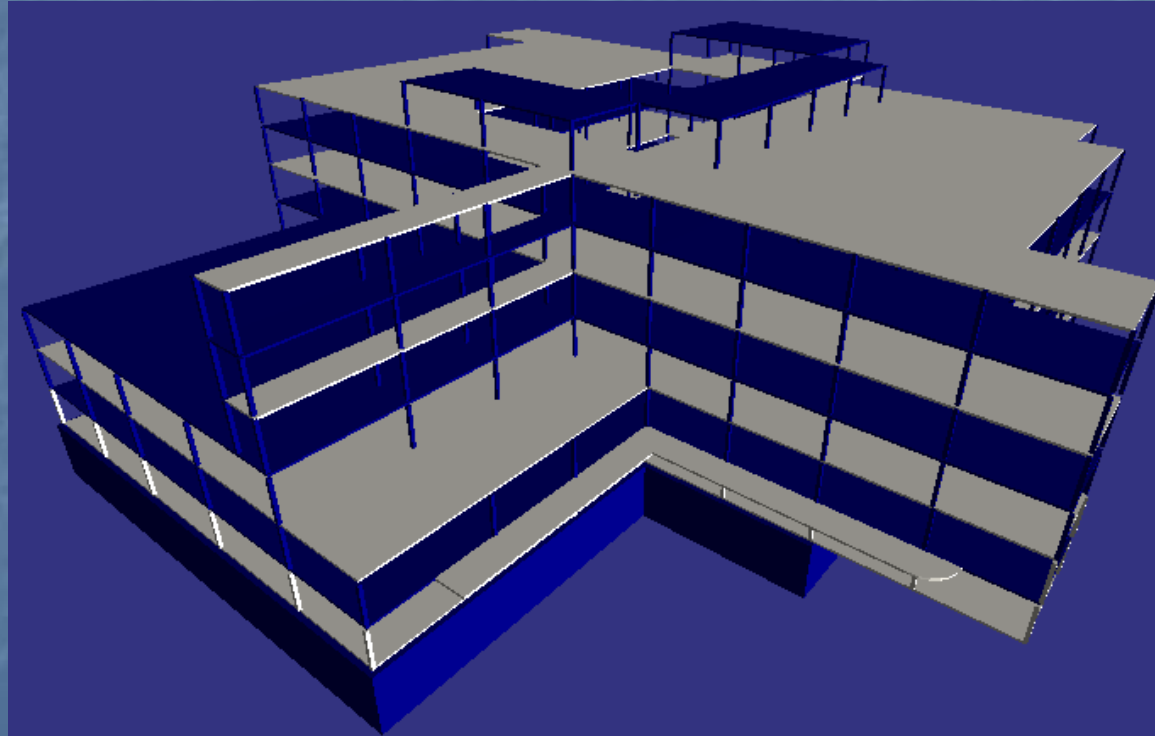
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# Steel Connection Redesign

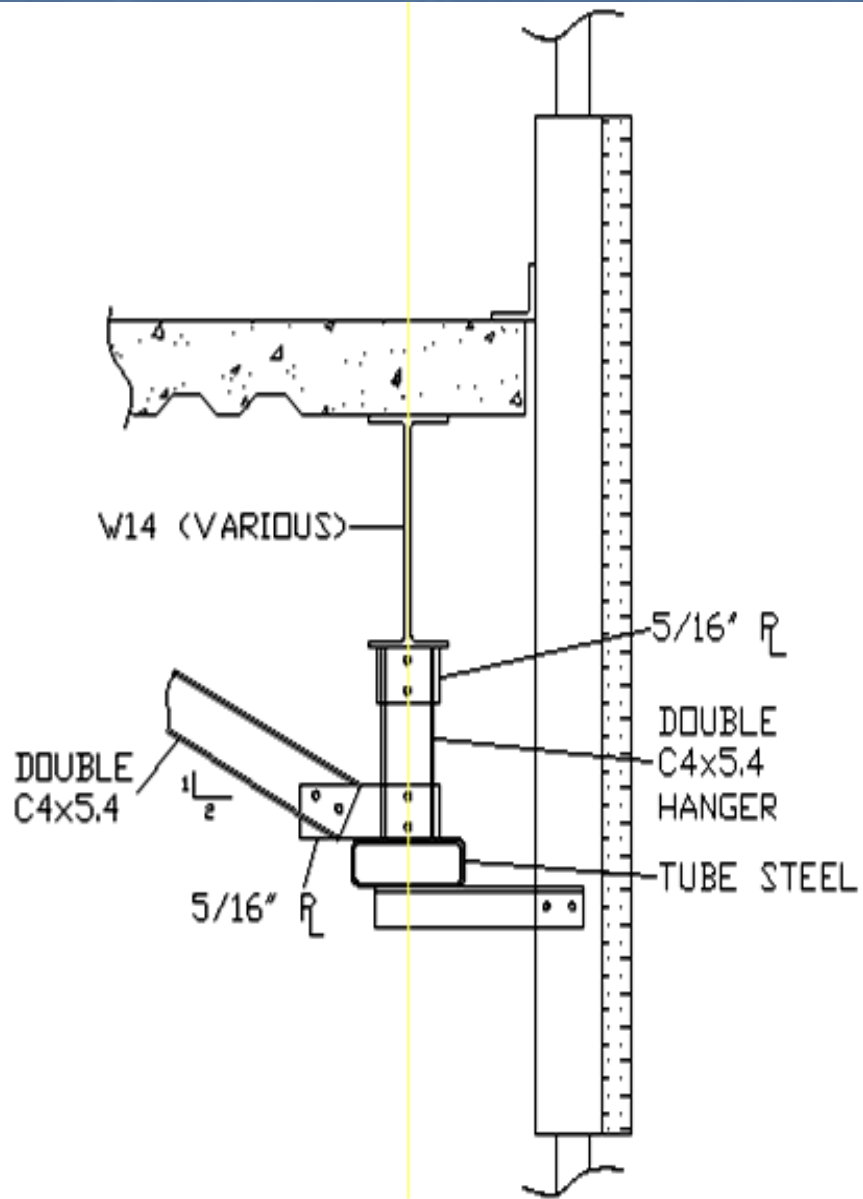
## Steel Connection Redesign

Current Steel Erection:

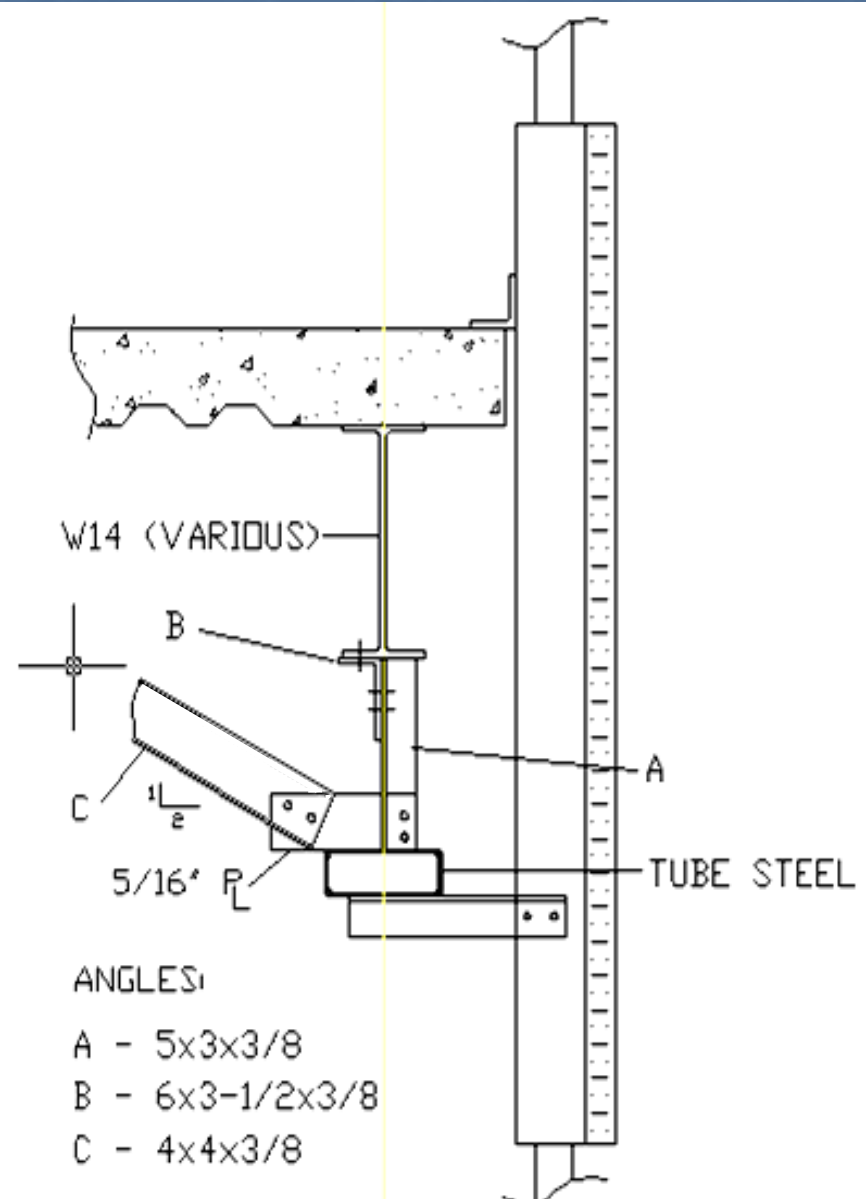
- 2200 tons of Steel
- Divided into 28 Derricks
- 83 days Duration



# Existing

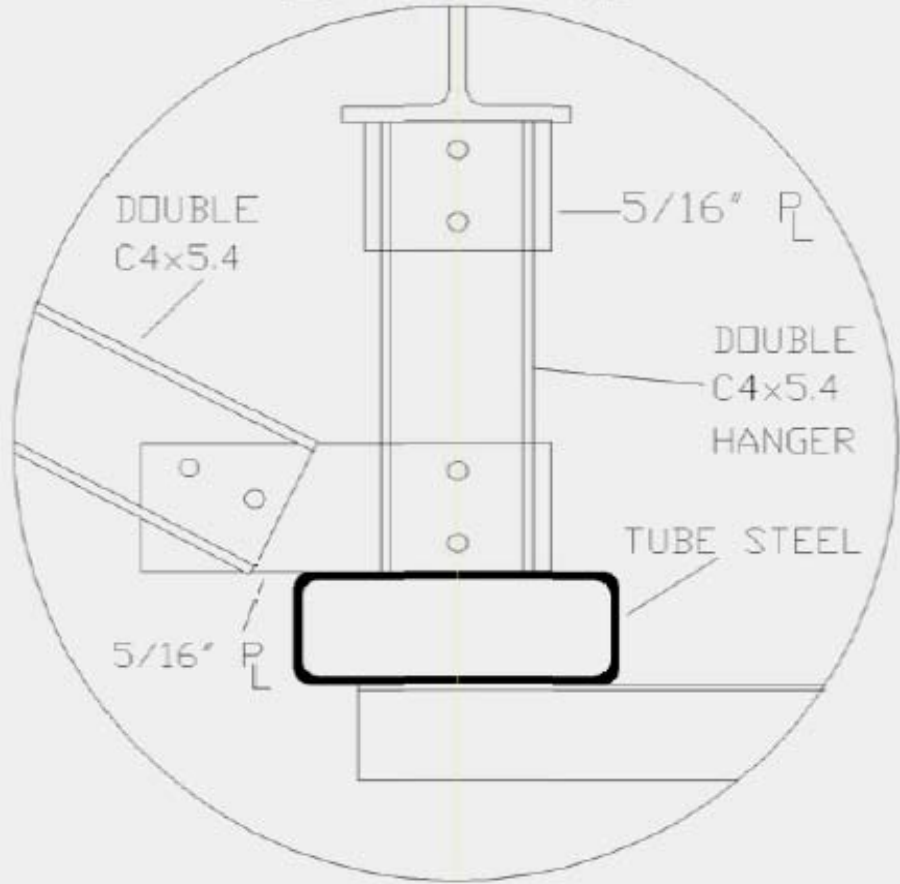


# Proposed

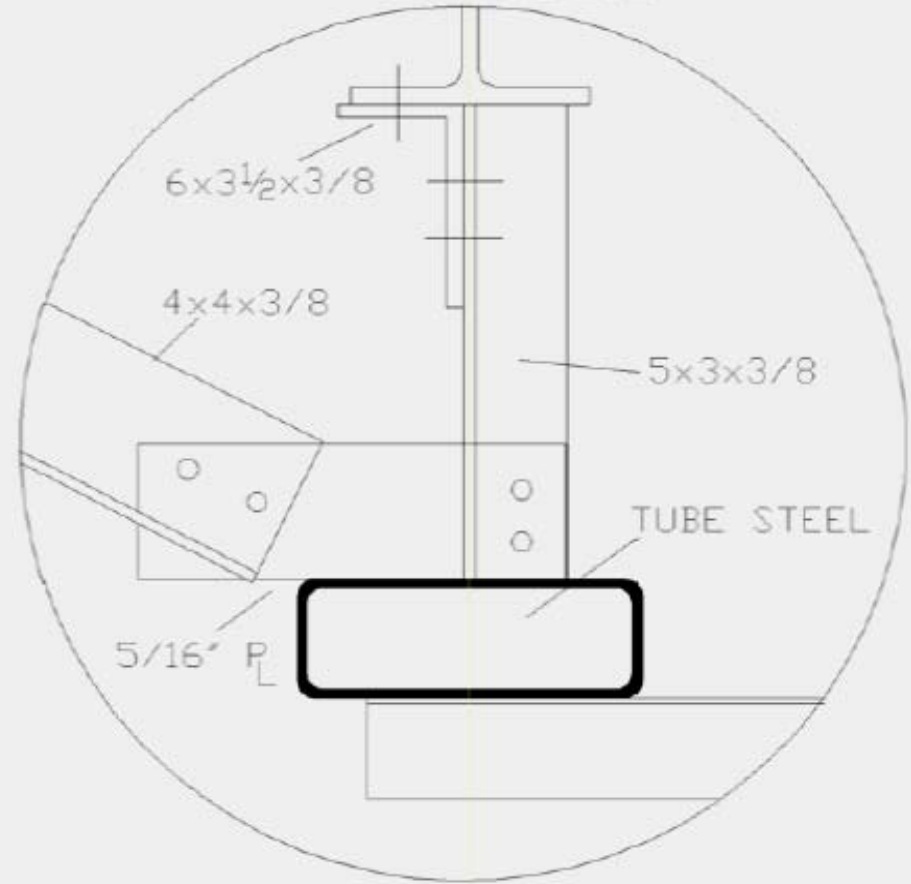




### EXISTING



### PROPOSED





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## Key Changes in Design:

- Elimination of Double Channels
- Replaced by series of angles
- Prefabrication:
  - Connection between W-shape and Tube Steel
  - Includes 5/16" plate, two angles





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## Existing

## Proposed

**Erection  
Time:**

1.9 Hours per connection  
9 Days on overall schedule

0.72 Hours per connection  
3 Days on overall schedule

**Cost:**

Labor

\$ 5,130

**6 days**

\$ 1,710

Material

\$ 8,558

\$ 7,591

Delivery

\$ 389

\$ 1,035

Prefabrication

\$ 0

\$ 3,174

\$14,077

**\$ 566**

\$13,511



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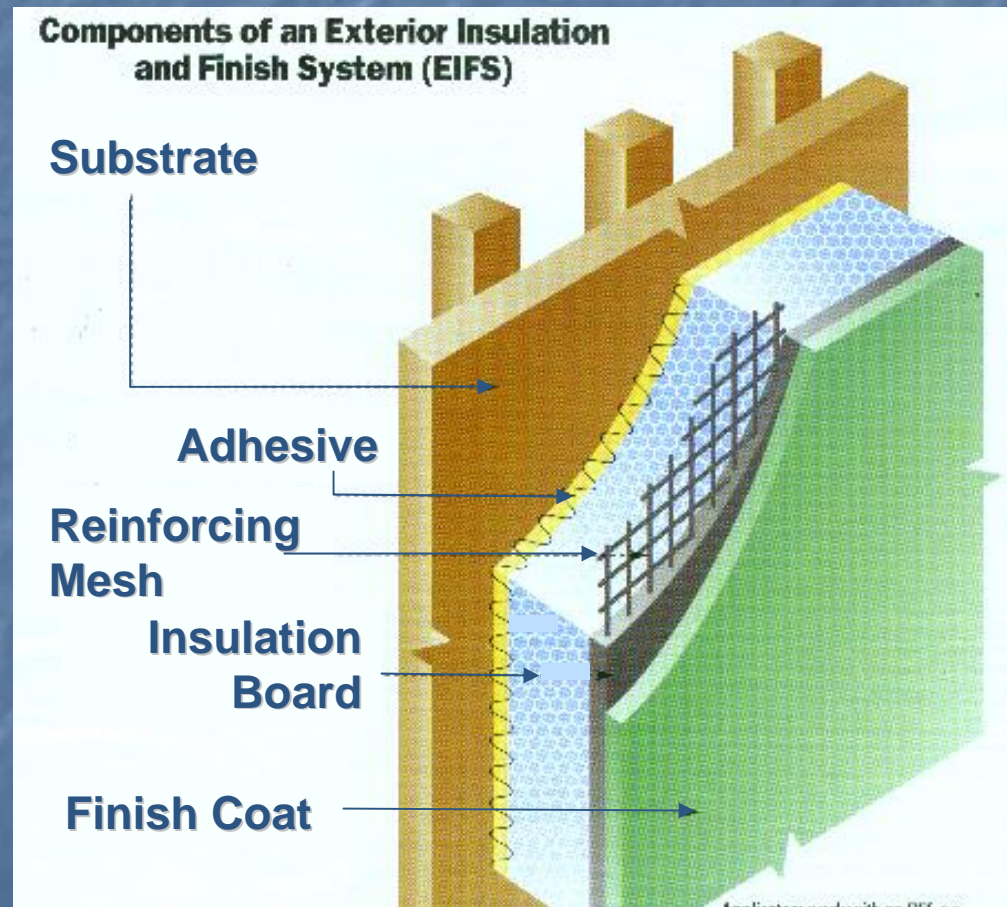
# Exterior Insulation Finish System (EIFS): Resistance to Mold

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## Exterior Insulation Finish System (EIFS)

- Insulation Board, Reinforcing Mesh, Base Coat & Finish Coat
- \$ 1.7 million EIFS Contract
- Used EIFS system to match existing hospital structure



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## Exterior Insulation Finish System (EIFS)

### ■ Advantages:

- Cheap & efficient
- Low maintenance
- Lightweight
- Ideal for renovations

### ■ Disadvantages:

- No drainage system
- Sealant failures
- Easily damaged

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## Mold

- Type of fungus which can be found where there is water or moisture
- Health problems associated with mold:
  - Respiratory Disease
  - Sneezing
  - Coughing
  - Skin Rashes

**MOLD AND HOSPITALS DON'T MIX!**

## Mold in Exterior Insulation Finish System (EIFS)

Moisture intrusion can occur in several ways:

- Improper sealing around windows, doors, roof
- Moldings, railings, vents
- Cracked or damaged surface

Lack of Drainage promotes moisture problems and mold growth

## Mold in Exterior Insulation Finish System (EIFS)

### *EIFS Do's*

- Document Review
- Inspections
- Training
- Protect EIFS from weather prior to installation

### *EIFS Don'ts*

- Leave any joint unsealed (windows, doors)
- Install without manufacturer approval





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## Mold in Exterior Insulation Finish System (EIFS)

Abington Memorial Hospital is taking an active stance on moisture protection

EIFS manufacturer offers services to prevent improper installation

- Plan Reviews
- Quality Management Program
- Pre-construction Meeting
- Third-party inspection



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## Green Healthcare Facilities





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## Healthcare Facilities

Average between 70 to 75 million square feet of construction each year

Over \$20 billion in construction costs

Hospital services:

Inpatient

Service (food, supply)

Diagnostic and treatment

Outpatient

Administrative

Research and teaching

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Healthcare facilities are highly intensive and demanding in terms of resources...

... operational 24 hours/ day

... occupies far more square feet per building than any other building type

... employs over 6.2 million people, 6% of the workforce

... creates over 5 million tons of solid waste annually

**HEALTHCARE FACILITIES ARE HIGHLY SUITABLE FOR  
SUSTAINABLE DESIGN**

## Green Building Design

Minimal effect on the environment:

- *Construction materials*
- *Construction methods*
- *Energy use*
- *Operating and Maintenance methods*



U.S. Green Building Council has established the LEED<sup>tm</sup> rating system for sustainable construction

## Greening of Healthcare Facilities Survey

A survey was created for owners, buildings, and designers with experience in sustainable healthcare construction

Goals of the survey:

- Why go for sustainable construction?
- Why aren't more healthcare facilities sustainable?
- What benefits are you attempting to achieve?



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## Green Building Design

There are many ways a building can benefit from sustainable construction:

- Reduced operating costs
- Increased productivity
- Environmentally friendly
- Marketing device
- Increased property value
- Enhanced public image
- Corporate responsibility
- Financial incentives
- ~~Enhanced well-being of occupants~~
- Improve market performance

## Increased Physician/Staff Productivity

An improvement in productivity could result in:

- *Treatment of more patients*
- *More productive procedures*
- *Higher quality treatment*

Students in sunlit classrooms scored *20-26% higher scores* and *absent 3-4 days less* than conventionally lit classrooms

U.S. Green Building Council suggests a *6-16% increase* in productivity





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## Enhanced Well-Being of Occupants

Poor Indoor Air Quality (IAQ) is one of top five environmental risks to public health, according to EPA

One of six requirements for LEED<sup>tm</sup> certification is a healthy IAQ

Healthy IAQ can lead to:

*Reduced absenteeism*

*Increased staff retention*

*Improved recruitment*

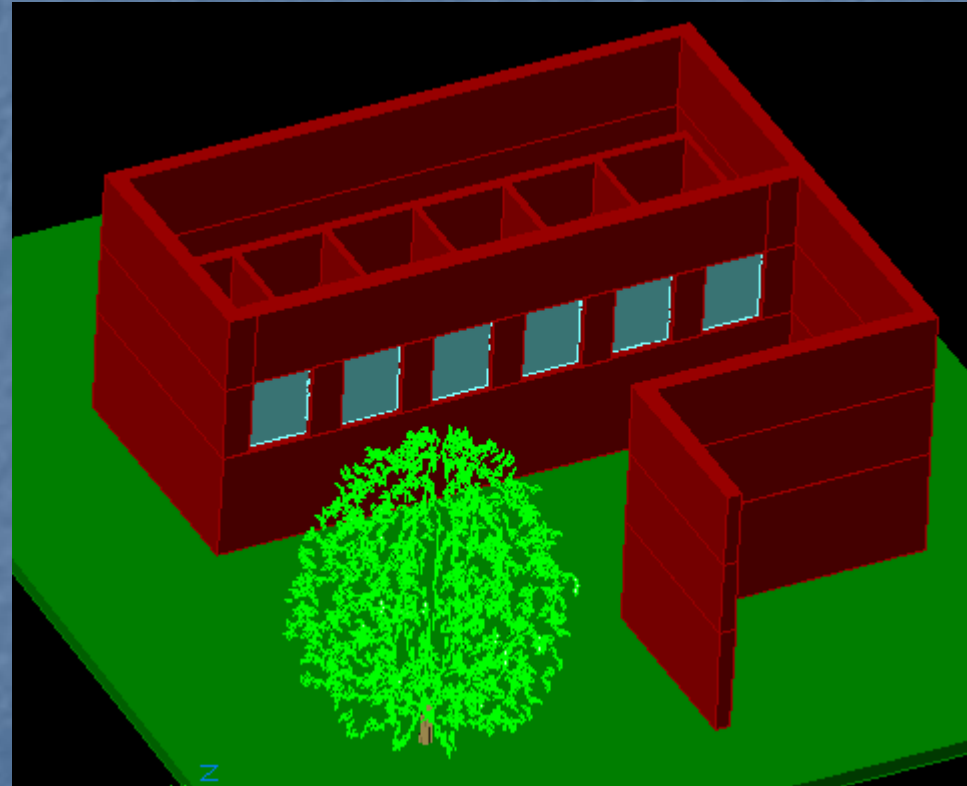
*Increased productivity*

## Enhanced Well-Being of Occupants

Study of Patients with views  
of brick wall vs. scenic view

Patients with outside view

- Shorter length of stay
- Fewer medical problems
- Required less pain medication





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## Green Guidelines for Healthcare Construction (GGHC)

LEED<sup>tm</sup> rating system is not highly applicable to healthcare facilities

American Society for Healthcare Engineering (ASHE) has developed a rating system, based on LEED<sup>tm</sup> which focuses on issues specific to healthcare facilities

109 points, as opposed to LEED<sup>tm</sup>'s 69 points



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## Green Guidelines for Healthcare Construction (GGHC)

Credits more applicable to healthcare facilities, such as

- Environmental Health Mission Statement & Program
- Building Orientation
- Medical Equipment Efficiency
- Toxin Elimination



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## Green Guidelines for Healthcare Construction (GGHC)

### Self-Certifying

#### Topics designed to:

- Support the healing environment
- Reduce energy demand
- Minimize waste
- Protect IAQ
- Maximize daylight



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## Conclusions

### Steel Connection Redesign

- Prefabrication requires less erection time
- Savings of 6 days on schedule

### EIFS Resistance to Mold

- Ensure proper installation to prevent moisture and mold growth

### Green Healthcare Facilities

- Sustainability proposes many benefits to healthcare facilities
- Improved productivity and enhanced well-being of occupants



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## Questions?