

MASSACHUSETTS GENERAL HOSPITAL

“Building for the Third Century”

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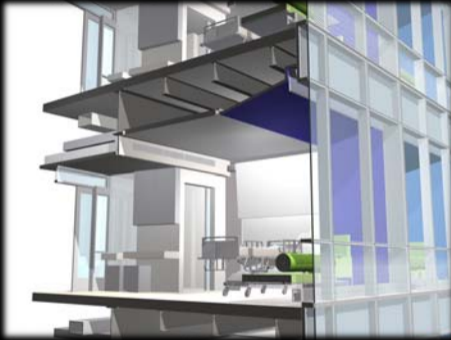
Presentation Outline

- Proposal & Objectives
 - Interstitial Floors
 - Facade Redesign
 - Mechanical Relocation
- Building Background
 - Quick facts
 - Systems
 - Features
- Proposed Interstitial Floor Solution
 - Common Solution
 - Staggered Truss Integration
 - Removable Panel Design
 - Concept
 - Design
 - Specifications
- Mechanical Relocation
 - Sizing
 - Ductwork
- Facade Design
- Construction Schedule
- Conclusion
- Acknowledgements

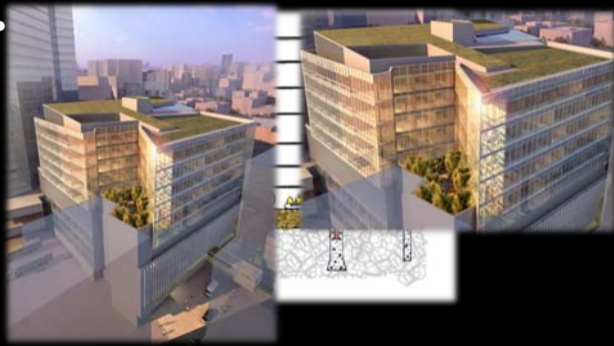


Objectives

- Develop the most effective interstitial floor design for the B3C
- Provide structural insight to the design
- Determine the effects of the new floor system on other systems of the building.
- Discover how structural systems may improve the sustainable aspects of the B3C



Existing Conditions



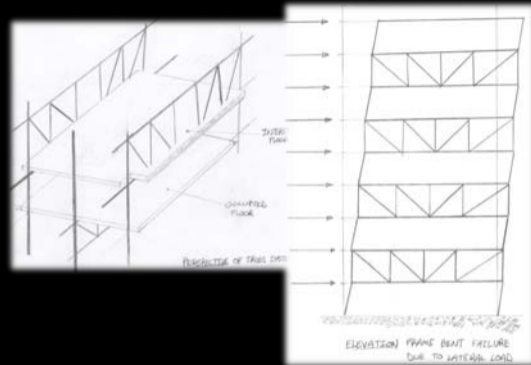
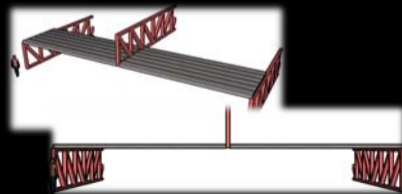
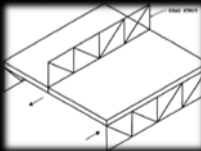
- Floor Systems
 - Composite Steel Decking
 - Lateral force transferring diaphragm
 - Precast Hollow core
 - Lower levels to allow access for crane
- Facade
 - Material types



- Commonly in laboratories and hospitals
- Lightweight concrete floors
- Low floor to floor heights
- Allows for maximum space flexibility

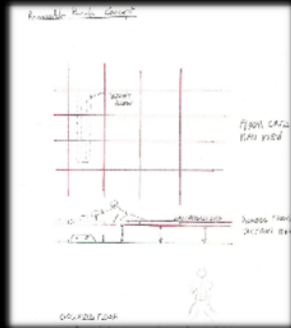
Proposed Interstitial Floor Solutions

- Staggered truss design to reduce number of moment connections
- Hide the systems of the building

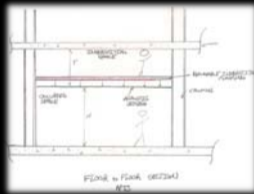


Removable Floor Panels

Concept



Refined Concept

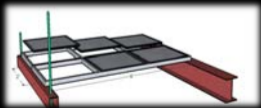


Specifications

- Steel Frame
 - Rectangular HSS members
 - Tension members
- Floor Panels
 - Concore 2x2 panels
- Benefits
 - Ease of access to ceiling plenum

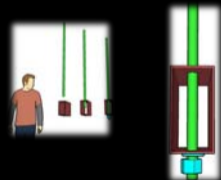
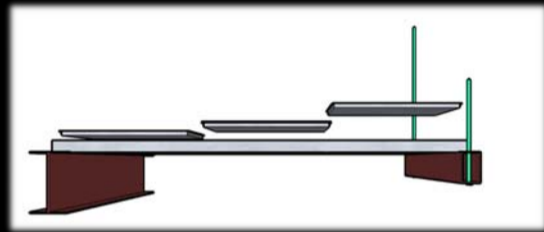
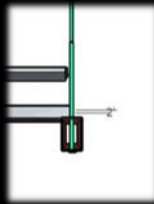


- Panel Choices
 - All Steel
 - Concore
- Rack Design
 - Supports spaced at 6 feet
 - HSS vs T shape



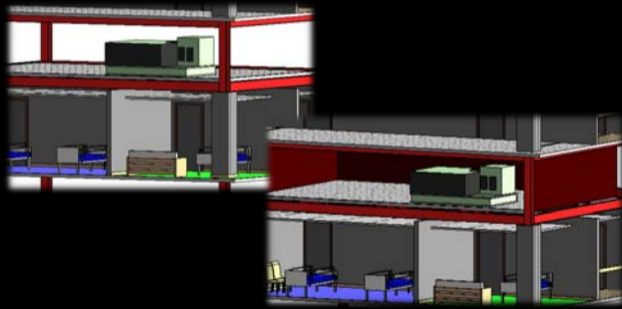
Removable Floor Panels

- Support Choices
 - Beams vs HSS
 - HSS vs T Shape
- Tension Members
 - Steel Rod vs Cable
 - Cost and flexibility



Mechanical Equipment Pad

- Space to contain larger mechanical equipment
- Isolation of air plenums



Mechanical Relocation

- Looping maintained
- Duct length decreased
- Air quality increased
- Still accessible through stairwell



Facade Redesign

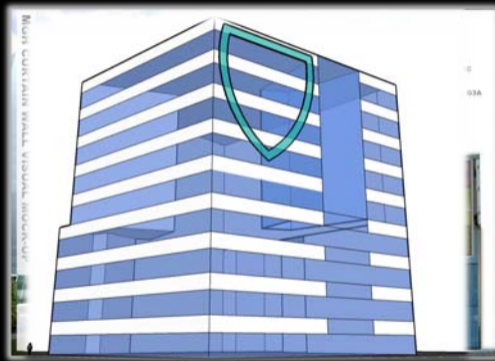
Facade Material Comparison			
System	Square Footage	Cost per Square foot (\$)	Cost
Glass Facade	160000	36.95	\$ 5,912,000.00
Glass & Metal Panel	160000		\$ 3,965,760.00
Glass	96000	36.95	\$ 3,547,200.00
Metal	64000	6.54	\$ 418,560.00

Physical characteristics

– Embedded floors

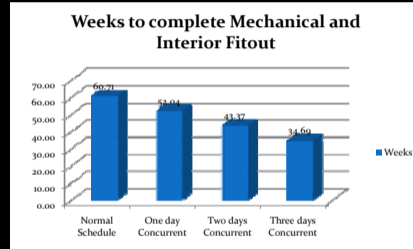
Facade Type	Total Square Footage	Weight (lb/sqft)	Total Weight (lbs)
All Glass	160000		
1/4"		3.27	523200
1/2"		6.54	1046400
Glass and Metal	160000		725120
1/2" Glass	96000	6.54	627840
Metal	64000	1.52	97280

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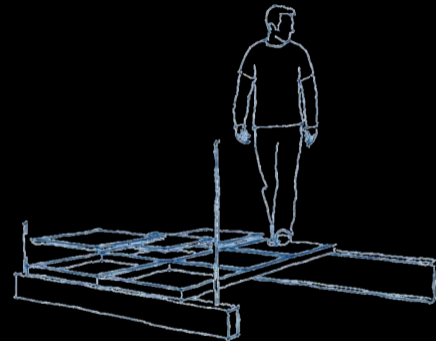
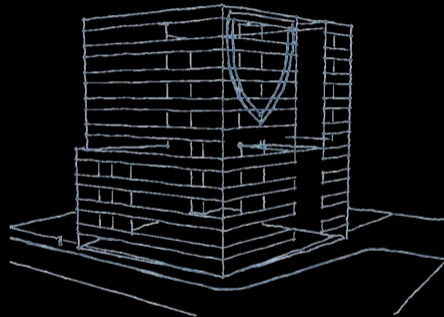
Construction Schedule

- Concurrent trade work can be achieved
- Time savings in the most time consuming portion of the schedule
- Time savings is equal to cost savings



Conclusions

- Most effective interstitial floor system for the B3C project is the removable panel system
- Mechanical and facade systems were affected by integration of interstitials
- Structural changes can make a positive impact on the sustainability of a building



Aknowldegements

Thanks go out to:

Dr. Boothby

NBBJ especially Pam Holmes

Penn State friends, AE colleagues, and 419 friends

Kate

Family for their support

Proposal & Objectives

Building Background

Interstitial Floor Solution

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Questions

