

## **KGB Maser Presentation Outline**

- I. Introduction of the project and team (3 screens)
  - a. Name and role of each team member
    - i. Jason Brognano – Lighting/Electrical Engineer
    - ii. Michael Gilroy – Mechanical Engineer
    - iii. Stephen Kijak – Structural Engineer
    - iv. David Maser – Construction Manager
- II. Building Overview (3 screens)
  - a. Brief overview of the general, mechanical, structural, electrical, and CM stats
  - b. General Stats
    - i. Numerical/keyword summary of Building Stats I and II
    - ii. Location – University Park, PA
    - iii. Size – 276,500 SF
    - iv. Use – Life Science and Material Science Research Complex
    - v. Architect – Rafael Viñoly Architects, LLC
    - vi. GC – Whiting Turner
    - vii. Structural Engineer – Thornton Tomasetti Engineers
    - viii. MEP Engineer – Flack and Kurtz
  - c. Mechanical Stats
    - i. Campus steam and chilled water
    - ii. All spaces supplied by various VAV AHUs
  - d. Structural Stats
    - i. Micro-pile sub structure
    - ii. Steel bay super structure in 22-foot bays
    - iii. Concrete on metal deck floor system
  - e. Electrical Stats
    - i. 12.47kV campus system stepped down to 480Y/277V for lighting
    - ii. Small step-down transformers for 208Y/120V branches
  - f. Construction Management Stats
    - i. \$230 million budgeted
    - ii. Design-Bid-Build delivery
    - iii. Real-time façade panel delivery and construction
- III. Goals of Analysis (3 screens)
  - a. BIM/IPD Goals
    - i. Use BIM technologies to achieve engineering goals
    - ii. Use BIM technologies to perform detailed cost analysis and extract in-depth information from building systems
    - iii. Use a central coordination model, directly or indirectly, to perform analysis tasks in other media

- b. Engineering Goals
        - i. Decrease energy consumption by 10% over existing design
        - ii. Decrease energy required by mechanical system and fume hoods
        - iii. Modify façade to benefit daylight delivery, structural efficiency, and mechanical system redesign
- IV. Façade Analysis (15 screens)
  - a. Existing vs. Proposed
  - b. Overhang Analysis
    - i. Electrical BIM/IPD integration
    - ii. Mechanical BIM/IPD integration
    - iii. Electrical Results
    - iv. Mechanical Results
  - c. Panel Depth Analysis
    - i. Structural BIM/IPD
    - ii. Construction BIM/IPD
    - iii. Structural Results
    - iv. CM Results
- V. Mechanical Distribution Redesign (12 screens)
  - a. Existing vs. Proposed
  - b. BIM of Chilled Beams
  - c. IPD of Chilled Beams
  - d. BIM of CFD Analysis
  - e. BIM of TRACE import (GbXML image)
  - f. CFD Movie or Images
  - g. TRACE Results
  - h. Face Velocity Results
  - i. CFD Results
- VI. Structural Redesign (9 screens)
  - a. Existing vs. Proposed
  - b. BIM/IPD of design
  - c. BIM/IPD of cellular mechanical integration
  - d. Decreased member sizes results
  - e. Decreased costs
- VII. Construction Management Ramifications (6 screens)
  - a. Original vs SIPS/Prefab Schedule
  - b. Original 4D vs SIPS 4D
- VIII. Conclusion Section (9 screens)
  - a. Cost summary
    - i. Total savings/costs of new designs by discipline/overall
    - ii. Operating costs vs. initial costs



- b. Lessons learned
  - i. BIM technology, team dynamics, etc.
  - ii. Comment on existing design quality
- c. Acknowledgements
  - i. Faculty/staff, industry professionals, project team
  - ii. Company help
- d. Questions/comments

## Sample Color Slides

*Subject to Change*

See Attached page

## Proposed Slide Layout

*Subject to Change*

Names, Roles	Image of the MSC	Names, Roles
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Mechanical Electrical	Building Stats	CM Structural
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BIM/IPD Goals	Goals of Analysis	Engineering Goals
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Existing	<b>Façade Analysis</b>	Proposed
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Electrical BIM/IPD integration	<b>Overhang Analysis</b>	Mechanical BIM/IPD integration
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Electrical Results	<b>Overhang Analysis</b>	Mechanical Results
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Structural BIM/IPD	<b>Panel Depth Analysis</b>	CM BIM/IPD
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Structural Results	<b>Panel Depth Analysis</b>	CM Results
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Existing	<b>Mechanical Distribution Resdesign</b>	Proposed
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BIM of Mech. Redesign	Chilled Beam Coord. Image of 3D Ductwork in Revit	IPD of Mech. Redesign
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BIM of CFD Analysis	BIM	BIM of GbXML Export
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BIM of CFD Analysis	CFD Movie/Images	BIM of GbXML Export
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Existing Cantilever, Floor	Structural Redesign	Proposed Column, Cellular
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BIM/IPD	Revit image of Cantilever	Cellular Mechanical Integration
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Decreased member sizes	Revit image of lighting	CM savings
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Original Schedule Duration	Revit 3D floor plan/model	SIPS/Prefab Duration
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Original 4D	Revit 3D floor plan/model	SIPS 4D
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Blank/Image	Cost Summary	Lessons Learned
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Acknowledgements	Acknowledgements	Blank/Image
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Blank/Image	Questions/Comments	Blank/Image
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Introduction	BIM/IPD Goals	Façade Redesign	Mechanical Redesign	Structural Redesign	SIPS/Prefabrication	Lessons Learned	Acknowledgements	Questions/Comments
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This rendering will be our best possible one and will extend to the ends of the building instead of being cut off.



**Jason Brognano**  
Lighting/Electrical






**David Maser**  
Construction Management




**Michael Gilroy**  
Mechanical



**Stephen Kijak**  
Structural


Introduction	BIM/IPD Goals	Façade Redesign	Mechanical Redesign	Structural Redesign	SIPS/Prefabrication	Lessons Learned	Acknowledgements	Questions/Comments
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### Lighting/Electrical BIM Process




Picture of Lighting Design in AGI

### Coordinated Designs



This image will be a cutaway of all disciplines integrated into the space. Chilled beams will be shown, lighting, structure, etc.

### Construction BIM Process



Picture of Coordinated Design in Navisworks

Introduction	IPD/BIM Goals	Façade Redesign	Distribution Redesign	Cantilever Redesign	Construction Impact	Lessons Learned	<b>Acknowledgements</b>	Questions/Comments
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## Acknowledgements

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 Chris Dolan

Thornton Tomasetti Engineers

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 Johnny Ma  
 Ruperto Sanchez

### The Leonhard Center Penn State

Penn State OPP  
 Dick Harris

Flack & Kurtz MEP Engineers

HOK  
 John Jackson

BR+A Consulting Engr.  
 Britt Ellis

### Faculty Advisors

Bob Holland  
 Andres Lepage  
 Richard Mistrick  
 Ted Dannerth

Kevin Parfitt  
 Jelena Srebric  
 John Messner  
 Moses Ling

Corey Wilkinson

Penn State Students  
 Ryan Solnosky  
 Building Stimulus IPD/BIM Team  
 BIMception IPD/BIM Team

Michael Lucas  
 Patrick Morgan

Paul Bowers

PENNSSTATE

