

## Presentation Outline

1. **Title Slide (2 screen / 6 Slides)**
  - 1.1. Introduce myself, my advisor, my project name, and project location (1 screen / 3 slides)
  - 1.2. Introduce the project outline and criteria for evaluation (1 screen / 3 slides)
2. **Project Background (1 screen / 3 slides)**
  - 2.1. Basic project information, owner information, GC information
3. **Analysis 1 – Mobile Technology Integration (4 screen / 12 slides)**
  - 3.1. Problem identification, goals, and background information (1 screen / 3 slides)
  - 3.2. Mobile tech / PC tablet logistics and constructability (1 screen / 3 slides)
  - 3.3. Schedule Impact (1 screen / 3 slides)
  - 3.4. Cost Impact (1 screen / 3 slides)
4. **Analysis 2 – Bathroom Modularization (4 screen / 12 slides)**
  - 4.1. Problem identification, goals, and background information (1 screen / 3 slides)
  - 4.2. Module unit constructability and logistics (1 screen / 3 slides)
  - 4.3. Schedule Impact (1 screen / 3 slides)
  - 4.4. Cost Impact (1 screen / 3 slides)
5. **Analysis 3 – Façade Prefabrication (5 screen / 15 slides)**
  - 5.1. Problem identification, goals, and existing façade background information (1 screen / 3 slides)
  - 5.2. Prefabricated façade design (1 screen / 3 slides)
  - 5.3. Proposed system and design load calculations - **Structural Breadth** (1 screen / 3 slides)
  - 5.4. Schedule Comparison (1 screen / 3 slides)
  - 5.5. Cost Comparison (1 screen / 3 slides)
6. **Analysis 4 – Greater Sustainable Design (6 screen / 18 slides)**
  - 6.1. Problem identification, goals, and current LEED rating (1 screen / 3 slides)
  - 6.2. Proposed sustainable design features (1 screen / 3 slides)
  - 6.3. Grey water recapture system – **Mechanical Breadth** (1 screen / 3 slides)
  - 6.4. LEED impact (1 screen / 3 slides)
  - 6.5. Schedule Impact (1 screen / 3 slides)
  - 6.6. Cost Impact (1 screen / 3 slides)
7. **Summary of Conclusions & Acknowledgements (2 screen / 6 slides)**
  - 7.1. Summary of analysis conclusions (1 screen / 3 slides)
  - 7.2. Acknowledgments & Questions (1 screen / 3 slides)

**Total: 24 Screens / 72 Slides**



## **MULTI USE HIGH RISE | WASHINGTON D.C. AREA**

PENN STATE ARCHITECTURAL ENGINEERING 2014 SENIOR THESIS

RYAN MACNICHOL | CONSTRUCTION OPTION

RAY SOWERS | FACILITY ADVISOR

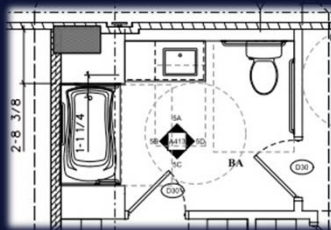
## Presentation Outline

- i. Project Introduction
- ii. Analysis 1: Mobile Technology Integration
- iii. Analysis 2: Bathroom Modularization
- iv. Analysis 3: Façade Prefabrication
  - i. Structural Breadth
- v. Analysis 4: Greater Sustainable Design
  - i. Mechanical Breadth
- vi. Summary of Conclusions & Acknowledgements



## Presentation Outline

- i. Project Background
- ii. Mobile Technology Integration
- iii. **Bathroom Modularization**
- iv. Façade Prefabrication
- v. Greater Sustainable Design
- vi. Summary of Conclusions & Acknowledgements



## Problem Identification

- Compressed Schedule
- Busy Site

## Goals

- Generate Schedule Savings
- Reduce Project Cost
- Reduce Congestion Onsite

## Background

- 208 Total Units
- Typical Bathroom Layout
  - Shower Stall
  - Water Closet
  - Vanity Area

## Presentation Outline

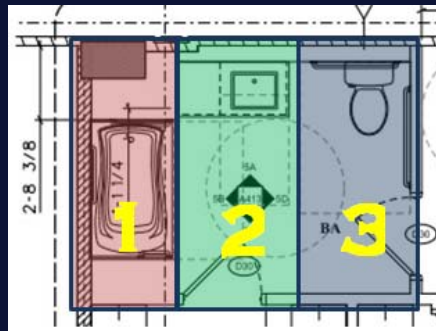
- i. Project Background
- ii. Mobile Technology Integration
- iii. **Bathroom Modularization**
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## Module Constraints

- Fit on Truck
- Fit Through Unfinished Corridors
- Handled & Moved Easily
- Easy Installation

## Constructability

- Coordination with Stick Built Construction



## 3 Modules

## Logistics

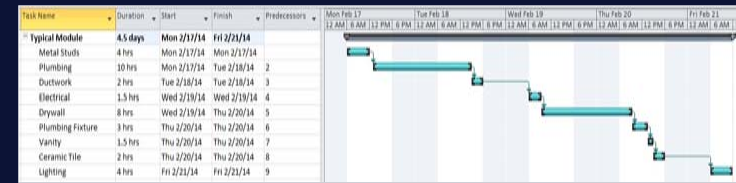
- Production Warehouse
  - 7.5 Miles away (25 Minute Drive)
  - ~9,000 SF
- Transported by Truck
- Lifted by Material Hoist

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- i. Project Background
- ii. Mobile Technology Integration
- iii. **Bathroom Modularization**
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## Schedule

- Typical Module: 4.5 days
- Typical Stick Built: 11.56 days
- Transportation/Installation – 2 Days



	Single Unit		Typical Floor (36 units)	
	<i>Modularized</i>	<i>Stick Built</i>	<i>Modularized</i>	<i>Stick Built</i>
<b>Duration (days)</b>	4.50	11.56	30.00	83.66
<b>Savings (days)</b>		7.06		53.66