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## FR23 BIM and Green Design in Small Firms

Friday, May 4, 8:15 – 9:15 am

1.5 Learning Units

### Learning Objectives

1. Identify best practices for implementing BIM in a small firm.
2. Describe how small firms can use BIM to provide affordable green design services and effectively compete on larger projects.
3. Develop a plan for implementing BIM in your own practice.

### Speakers

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### Session Overview

The architectural profession's growing adoption of building information modeling (BIM) and increased emphasis on green design and high performance buildings are changing the competitive landscape for small firms. Within this new context, entrepreneurial small practices are discovering they can more effectively compete on larger projects because of the cost savings gained from implementing the process change to BIM.

Moving to BIM is often easier for the small firm since decisions can be made more quickly and implementation does not require complex schemes for rolling out new technology across multiple offices. Cultural resistance to change is less of an obstacle and once the new paradigm is adopted, firms find that they can compete on larger projects than their staff could previously support. Often such firms find they can provide added value by leveraging technology to provide expanded in-house services, such as green design, that



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improve their bottom line and better serve their clients. On the other hand, small firms also face their own set of challenges in implementing new technology.

This session offers a practical framework for implementing BIM and green design in a small practice, with case studies from three very different small firms who are realizing success from this approach on diverse project types.

## Theoretical Framework

Today, architects can perform Green Analysis with BIM for:

- Design optimization
- Visualization
- Daylighting
- Energy analysis
- Materials computation / quantification
- Specification integration
- Waste reduction

To trace the evolution of Green Design Technology, the following concepts are useful:

- **Technology:** The means by which design information is created
- **Scale:** The primary focus of sustainable design effort
- **Representation:** The medium of design information
- **Content:** The medium and means of transmission of building components and products that comprise the design
- **Analysis:** The approach and mechanisms by which sustainable characteristics are established
- **Validation:** The means and methods of submitting and evaluating design intent for certification (e.g., LEED, BREEAM)

Green Design Technology is evolving from paper to models to integration:

	Paper	Models	Integration
Technology	Electronic Drafting	BIM	Integrated Modeling
Scale	Building → Product	Product → Building	Global
Representation	Paper	Design Models	Lifecycle Modeling
Content	Paper, Content Catalogs via the Web	Models, Content Libraries & Characteristics	Integrated Models with Content Behaviors
Analysis	Anecdotal Applications with Limited Interoperability	Core Model Data to Analysis Engines	Simultaneous, Parallel Feedback
Validation	Analog Forms, Checklists, and Notebooks	Published Templates	Analytical Interaction with Published Models

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## CASE STUDY I: ONYX ARCHITECTS

### Best Practices for Implementing Green Design

- Education
  - Know the Issues both Global and Local
  - Learn about Green Design Methods and Materials
  - Attend Green Seminars
- Implementation
  - Expand the A&E services to be green
  - Promote Inner Office Seminars – Share what you know
  - Develop tools (BIM) to aid in Design, Analysis and Communication
- Practice
  - Promote Common Sense Green Design on ALL Projects
  - Practice Early Modeling and Analysis
  - Set Project Goals AFTER considering Green Implications
  - Partner with Industry Colleagues for Companion Services
- Communication
  - Share information with Entire Project Team
  - Partner with Contractors and Others who are Forward Thinking
  - Involve the Client in the Entire Process
  - Validate Results: LEED, other methods

### Student Residential Project Summary

- Early Analysis
- Timely Information for Good Decisions
- Setting Project Goals After Environmental Analysis
- Continuous Services through Each Phase - *Promote seamless Process through Each Phase of Service*
- Developing Accurate and Information Rich BIM Models
- Reduce Risk and Waste
- Facilities Management – *Provide Accurate BIM Model to the Client for their extended use*

## CASE STUDY II: LOTT + BARBER ARCHITECTS

### Best Practices for Using BIM for Sustainable Design

- Model early to aid stakeholder understanding and involvement.
- Use model to track sustainability issues early and to provide validation.
- Develop schedules to provide real time feedback as design changes.
- Use software features creatively to increase productivity and information. (example: roads defined using “wall” feature)
- Attach non-physical data to model elements (example: affordable vs. market rate housing units)



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## Project Summary for Sustainable Fellwood

- Mixed Use, Mixed Finance Development
- Housing Authority/City/Private Collaboration
- LEED Neighborhood Development Pilot and Earthcraft Housing
- Significant Existing Tree Canopy
- Smart Growth Drives Density and Diversity

## CASE STUDY III: HIP ARCHITECTS

### Best Practices for Using BIM for Sustainable Design

- Sustainable Design
  - Develop a workable value statement
  - Develop workable benchmarks to measure your value statement
  - Develop a Sustainable Design Strategy that is tailored to **each** project
  - Conduct in-office workshops
- Sustainable Design + BIM
  - Focus on Buildings not Drawings
  - Strive to use BIM to lead to better understanding of the design
  - Measure Productivity Gains by direct hours spent and the size of the projects
  - Share improvements and identify areas of improved building accuracy

### Project Summary

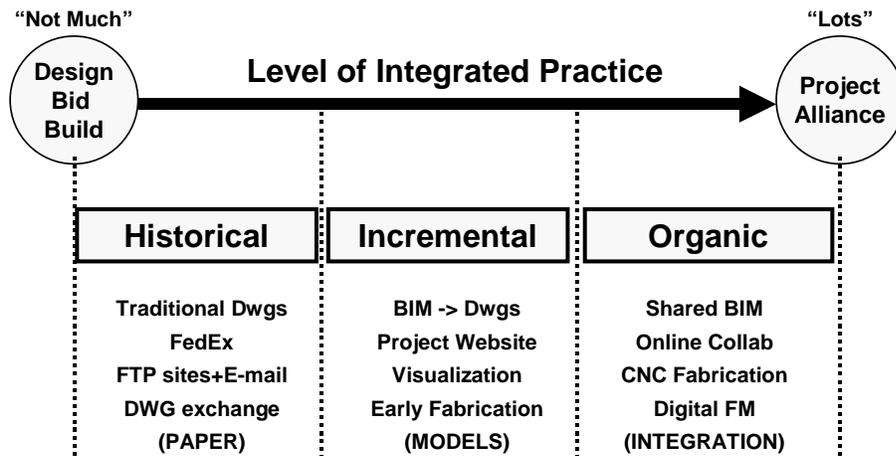
- Mountain Homes
  - Early establishment of a solid Sustainable Design Strategy
  - Regional issues affect the solution – environmental, economical and social
  - Save time by utilizing file-to-factory-to-field – a simple approach
- Shaw Discover Auditorium
  - Complex building form explored using BIM
  - Complexities of working within and close to cardiac research hospital
  - Integration of specialists – “Form fits Function”
  - Save time by utilizing file-to-factory-to-field – a more complex approach
- NEXUS6
  - Exploring possible negative impacts as positive ones in the design – utilizing the wind
  - Integrated Design Process – SMEP influencing design
  - Utilizing software – such as IES to save time and resources in the office
  - Simple modeling to determine correct placement of glazing and walls

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## SUMMARY

Currently, we are moving on a trajectory from the traditional "Design / Bid / Build" paradigm to fully integrated project delivery systems such as the "Project Alliance" model. Degrees of digital practice, enabling green design both in small and large firms, are also in transition from our historical approach to a more organic model:

## Degrees of Digital Practice



## BIM and Green Design in Small Firms

