Measurement Science Needs for Advancing Infrastructure Delivery Workshop

Cross-cutting and Common Themes

Bruce Strupp
May 19, 2010
Themes

- Infrastructure at CH2MILL
- Standardization – Data, Design, Function
- Sustainability
- Modularization, Prefabrication
- Regulatory Compliance, Permitting Interface
- Energy Management
- Productivity Measurement
CH2M HILL Maintains a Diverse Business Portfolio
Balance of People, Process and Tools is Essential for Deployment and use of Technology
Standardization

- Data Standards for project lifecycle
  - ISO 15926  PCA/FIATECH
  - AEX Equipment attributes
  - BIM National Institute of Building Sciences

- Design Standards
  - Codes, Specifications, Practices

- Best Practices – Construction Industry Institute
Where Are We Now?

Islands of Automation in Construction

After the ice period 10,000 years ago the land is still slowly rising and exposing new terrain never before stepped on by man. The challenge is to build bridges between the islands while new islands are constantly appearing.

1 Nov 1998 © Matti Hannus
http://www.vtt.fi/cio/hannus/islands.html
Where We Want It To Be
Sustainability

- Integrate sustainability values into design
- Implement sustainability approaches in site, building envelope, facilities, materials, wastes, energy, water, ecosystems, and life cycle
- Implement sustainability practices in logistics, site management – RFI Tagging
- Implement sustainability practices in O & M – Smart Sensors
- Implement sustainability objectives throughout the supply chain
Sustainability
Optimizing Key Processes is Essential to Minimize and Enhance Sustainability Outcomes
Sustainability

Implementing Sustainability Practices in Construction

• Integrate sustainability vision/ values into construction
• Implement sustainability objectives, measurement system, and sustainability framework
• Implement sustainability approaches in
  – Logistics
  – Site Management
  – Equipment
  – Materials selection/ specification
  – Work Methods
  – Waste minimization
  – Energy systems
  – Water systems
  – Environmental Management
  – Commissioning
Modularization & Prefabrication

• Zone identification
• Modular breakdown
• Module design/build process
• Sub-assemblies
• Parts identification
Modularization & Prefabrication

Manufacturing

Advantages

- Weather independent
- Quality
- Productivity
- Safety
- Ability to use automation/robotics
Regulatory Compliance & Permitting

- Streamline permitting and licensing
- Electronic submittal of plans and specifications
- FIATECH studies on revamping permitting practices
- Codes and Standards review and alignment (Domestic and International)
- Public awareness and communications
Energy Management

- Building Systems
- Alternative fuels usage
- Real time sensors and corrective actions
- Simulations and analysis
Productivity Measurement

- Advanced PCMS
  - CII RT 244

- KPI – Key Performance Indicators
  - RS-220  Leading Indicators during Project Execution

- Information Manager Role
  - Position to manage information flow through Project Life Cycle

- Performance Metrics for Intelligent Systems (PerMIS'10)
  - NIST Workshops
Questions

Next, Breakout Outlines for Work Groups