



# Construction Management & Technology in the Electronic Age

**UNDERSTANDING THE RISKS & REWARDS**

Falls Church, VA

ReedSmith &

**McDONOUGH BOLYARD PECK**  
CONSTRUCTION ENGINEERING

April 25, 2007

# CM Technology - Agenda

- **Background**
  - Typical Issues
  - Typical Problems
- **Areas of Focus**
  - Typical Issues
  - Typical Problems
- **Tools**
  - Schedules/Software
  - Electronic Plans
  - MIS Systems

# CM Technology - Agenda

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- **Potential & Pitfalls**
  - Webcams
  - Constructware Type Systems
  - Day to Day Tasks
  - Scheduling Software
  - Email
  - Handhelds
- **Recommendations**

# Background

# Typical Issues

- **Project Controls**
  - Managing Quality, Time and Costs of Construction
  - Predicting with reasonable accuracy
    - Costs
    - Time
    - Risks/Mitigations

# Typical Issues – Looking Back

- **CPM Scheduling**
  - PC based software not widely available
  - Limited distribution of CPM software
- **Cost Estimating**
  - Spreadsheets in wide use
  - Estimating software in its infancy
- **Project Management**
  - Accounting software emerging
  - Job Cost accounting primarily by Spreadsheet
- **Graphics**
  - Largely manual

# Typical Issues – Today

- **CPM Scheduling**
  - Software/computers readily available
  - Enterprise versions of software = multiple users/shared data
- **Cost Estimating**
  - Auto take-off electronic designs
  - Integration/communication with Scheduling software
  - Widely distributed Cost databases
- **Project Management**
  - Job Cost accounting & GL linked
  - Risk Management
  - Additional Emphasis on EVM

# Typical Issues – Looking Ahead

- Integration of design CPM, Estimating, Earned Value into overall project controls software.
  - Graphics/Animations
  - 3D, 4D, 5D design/costs/scheduling
  - BIM (Building Information Modeling)

# Tools

# Schedules/Software

- Everyone knows you need a Schedule, but why?
  - Manage Time, Resources and Cost
  - Integrate Multiple Parties
  - Convey Information
  - Resolve Disputes

# Schedules/Software

- Time Is An Expiring Commodity...
  - You can't get it back.
  - You can make changes to manage.

# Potential & Pitfalls

# WebCams



- Regular Intervals
- Standard Positions
- Record
  - Working Conditions
  - Progress
  - Problems
- Identification
  - Date
  - Where
  - What
  - Whom

**MBP J9627.012 VDOT IVHS-060, C502, B603**

***Description: Pier No. 2 footing formwork***

***View Orientation: Southeast***

***Date: August 21, 1998***

***Photo No. 1***

***D. Sawyer***

# Constructware Type Systems

## ■ Management Information Systems (MIS)

- General correspondence
- Periodic Reports of activity performance
- Drawing schedules
- Submittals
- Transmittals
- Change requests and authorizations
- Weather conditions
- Procurement
- Material control
- Meeting minutes
- Oral instructions/field directives
- Controlled inspections
- Nonconforming work
- Scheduling records
- Progress photos

# Constructware Type Systems

- Why a Management Information System (MIS)?
  - Status and forecast compared to plan
  - Basis for managing, identifying and evaluating problem areas and variances
  - Address information needs, data sources and control elements for time/cost/quality control
  - Accommodate continuing input of data
  - Efficient communication tool for all Stakeholders

# Constructware Type Systems

- Factors Governing Cost Changes During Construction
  - Once agreed that a change order is required, the following are necessary:
    - determine fair and reasonable adjustment to cost (and time)
    - have a thorough understanding of the scope of the changed work
    - obtain supporting documentation as proof of additional costs

# Constructware Type Systems

- **Issues Book**
  - Keep All Documentation Related to That Issue Together in One Place
  - Use Notebooks With Numbered Tabs and Index
  - Copy Documents to the Numbered Issues as You Go

# Constructware Type Systems


- **Issues Book must include:**
  - Correspondence
  - Notes
  - Meeting Minutes
  - Diary Pages
  - Photos
  - Contract Details
  - Specifications
  - Submittals
  - Etc.

# Constructware Type Systems


0064-131-F11 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://www.mbprojectweb.com/



## I-64/Battlefield Blvd.



Home  
Meeting Minutes  
Weekly Schedule  
Submittal Log  
RFI Log  
CCR Log  
Project Schedule  
Meetings Calendar

### Our Mission

To provide responsive, innovative, quality solutions in collaboration with Virginia Department of Transportation. The purpose of this site is to improve project communications by providing a shared virtual a correspondence. Unless otherwise determined, responses to requests or directives should be made in accordance with [Memorandum No. 2004-01](#). See the "[How-to-Guide](#)" for answers to Frequently Asked Questions.

General Information/Webmaster: [jmachner@mbpce.com](mailto:jmachner@mbpce.com)

Send mail to [jmachner@mbpce.com](mailto:jmachner@mbpce.com)  
Last modified: 10/18/06

### RFI Log summary

ID	Subject	DateReceived	ActionDue	B. I. C.	Status
0001	Bridge 652 CrossFrame Connectors	3/6/2006			Closed
0002	Bridge 652 Bearing Pad Elevation Pier1Column1	3/7/2006			Closed
0003	B652 Elevations	3/20/2006			Closed
0004	C.M.P. Shield At B650 & B652	3/26/2006			Closed
0005	Phase 1 Single face parapets on Battlefield Blvd	3/26/2006			Closed
0006	Abutment B Radial Line				Closed
0007	B637 Dyanmic Piles Test Abutment A & Peir 1	4/10/2006			Closed
0008	Prebored Holes in Test Piles Driving	4/10/2006			Closed
0009	Allowable Soil Bearing Pressure at MSE Walls	4/13/2006			Closed
0010	Waste Area for Unsuitable Material	4/13/2006			Closed
0011	MSE Moment Slab	4/13/2006			Closed
0012	Sign Structure #8 Foundation	4/18/2006			Closed
0013	Skipped				
0014	Sign Structure #32	4/19/2006			Closed
0015	Sign Structure #20	4/19/2006			Closed
0016	Sewer line relocation and SSMH A	4/19/2006			Closed
0017	36" Pipe Insrction into Box Culvert	4/10/2006			Closed
0018	C-26 Hanger Issues	4/21/2006	5/5/2006		Closed
0019	Sound Wall Station Number inquiries	4/21/2006	4/28/2006		Closed
0020	SSMH A RFI, Sanitary Sewer & power pole Conflict	4/24/2006	4/25/2006		Closed

Monday, November 06, 2006

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Route: Interstate - 64  
Project:0064-131-F11,C504,B637,B650,B651,B652,B653  
FHWA: NH-064-3(429)

MINUTES 10/31/06 9:00 AM

MEETING CALLED BY	MBP
TYPE OF MEETING	Bi-Weekly Coordination Meeting
FACILITATOR	Mike Prezioso
NOTE TAKER	Rob Berry
ATTENDEES	Kris Austin, Rob Berry, Tom Bettcher, Joe Bordt, Rob E Osenbaugh, Mike Prezioso, Justin Stowall, Charles Tho

\*Not all Deadlines were discussed during this meeting, the dates shown with (

*Blue/italics = carried over from previous meeting*

### Agenda topics

#### 1. SAFETY

*Pipe installation underway. Be aware of trench safety.*

*Jacked Pipe operations ongoing.*

*MSE wall construction ongoing.*

*Be aware of 20" gas main near I-464. EVW to protect and co-ordinate with*

# Scheduling Software

- To be useful, Schedule must address:
  - Agree on Progress
  - Plug-In Information
  - Look at Results
  - Modify as Necessary
  - Report
  - Discuss
  - Implement

# Scheduling Software

- **No. 1 – Do Updates**
  - Agree on Progress
  - Plug-In Information
  - Look at Results
  - Modify as Necessary
  - Report
  - Discuss
  - Implement

# Day to Day Tasks

- How to Document:
  - Remember **F.A.T.**
    - ☐ Factual
    - ☐ Accurate
    - ☐ Timely

# Day to Day Tasks

- **Factual**
  - Stick to the Facts
  - Don't Editorialize
  - Let the Facts Speak for Themselves
  - Try to Be Objective
  - Why Is It Important to Be Factual?

# Day to Day Tasks

- **Actual**
  - If Your Documentation Is Not Accurate, It's Not Credible
  - Verify Facts (Don't Guess or Assume)
  - Don't Rely on 3rd-hand Information
  - Quote Source of Information

# Day to Day Tasks

- **Timely**
  - Memory Fades With Time
  - Record & Document as You Go
  - Follow-up Oral Agreements & Directives

# Recommendations