UK Government Construction Supplier Conference
April 2011
BIM: A Blinding Flash of the Efficient
Speaker’s Perspective
38% of carbon emissions in the US are from buildings, not cars

USGBC 2007 website
30% of projects do not make schedule or budget

CMAA Industry Report 2007
92% of project owners said that architects drawings are typically not sufficient for construction

CMAA Owners Survey 2005
37% of materials used in the construction industry become waste

Movement for Innovation Industry Reports and Economist Magazine 2002
10% of the cost of a project are change orders

Construction Market Data
Constant $ of Contracts/Workhours of Hourly Workers
Sources: U.S. Dept. of Commerce, Bureau of Labor Statistics
The Industry has been derailed
Current BIM projects
And...Every Project
US BIM Adoption
Why do this?
Why BIM ... from the Contractor’s perspective

1 2 3 4
Stop Blaming Others
Clash Detection
Clash Detection ... and more
HD Laser Scanning
High Performance Building Design
Visualize ... people can't read
Driving Cost Down
Advanced Bill of Materials

100 Binney Street
CAMBRIDGE, MASSACHUSETTS

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### Advanced Bill of Materials

#### Elevation West

<table>
<thead>
<tr>
<th>Type Mark</th>
<th>Level</th>
<th>Type</th>
<th>Shading</th>
<th>Width</th>
<th>Width RT</th>
<th>Width LF</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1</td>
<td>Level 1</td>
<td>A - 2'-6&quot;</td>
<td>Yes</td>
<td>3'-8&quot;</td>
<td>26'-9&quot;</td>
<td>26'-9&quot;</td>
<td>10'-6&quot;</td>
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<tr>
<td>A.2</td>
<td>Level 2</td>
<td>A - 3'-1/2&quot;</td>
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<tr>
<td>A.3</td>
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<td>A - 4'-0&quot;</td>
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<tr>
<td>A.5</td>
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<td>26'-0&quot;</td>
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#### Elevation South

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<th>Width</th>
<th>Width RT</th>
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<th>Height</th>
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<tbody>
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<tr>
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<td>D - 3'-1/2&quot;</td>
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<td>3'-10&quot;</td>
<td>26'-0&quot;</td>
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<tr>
<td>D.3</td>
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<td>D - 4'-0&quot;</td>
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<td>3'-10&quot;</td>
<td>26'-0&quot;</td>
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<td>10'-6&quot;</td>
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<tr>
<td>D.4</td>
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<td>D - 4'-0&quot;</td>
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<td>3'-10&quot;</td>
<td>26'-0&quot;</td>
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<tr>
<td>D.5</td>
<td>Level 5</td>
<td>D - 4'-0&quot;</td>
<td>Yes</td>
<td>3'-10&quot;</td>
<td>26'-0&quot;</td>
<td>26'-0&quot;</td>
<td>10'-6&quot;</td>
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### B Shell

<table>
<thead>
<tr>
<th>B20 Exterior Enclosure - Glazed Systems (D8)</th>
<th>Sum of Count</th>
<th>Sum of Area</th>
<th>Sum of System Perimeter</th>
<th>Count of Solar Shade count</th>
<th>Count of Shade (LF )</th>
<th>Sum of Shade Bottom (SF)</th>
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</thead>
<tbody>
<tr>
<td>Tower</td>
<td>641</td>
<td>86,534</td>
<td>1,973</td>
<td>94</td>
<td>235</td>
<td>1,973</td>
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<tr>
<td>Curtainwall System</td>
<td>375</td>
<td>36,809</td>
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<td>0</td>
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<tr>
<td>Window Box System</td>
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<td>9,429</td>
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<td>83</td>
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<td>Window Panel System</td>
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<td>152</td>
<td>1,973</td>
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<td>2,559</td>
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<td>69</td>
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<td>1</td>
<td>1</td>
<td>5</td>
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<td>12</td>
<td>120</td>
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<td>3,294</td>
<td>240</td>
<td>12</td>
<td>20</td>
<td>240</td>
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</tbody>
</table>
So What Happened?

- January 2010  Estimated $ (core & shell)  159 mill
- August 2010  Estimated $  Market true up  149 mill (6.3%)
- October 2010  BIM driven RFP  133 mill (10.7%)
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Every good design deserves to be built twice ®
Modeling Safety
Modeling Safety
Modeling Safety ... delivering value
Overclad View: Pin
Comparison
Finding “invisible” design problems early
Fixing them without the drama
Direct to CNC Fabrication

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What are the benefits?

Good Stuff

not cheap though...
What are the benefits?

1. Reduce cost not profit
2. 5-15% schedule reduction
3. Offsite Prefabrication with confidence
4. Improved Safety
5. Buildings that actually work
6. Restoration of respect and repeat work
Eliminating Claims with BIM

Subcontractor Study: J.C. Cannistraro Co.

- 6 year period
- 408 Contracts for Mechanical Trades
- $558,858,974.00 Total for one trade
Delivering in less Time

- Design
- Regulatory Review
- Procurement
- Construction
Delivering in less Time

- Design
- Regulatory Review
- Procurement
- Construction
Offsite Prefabrication ... with confidence

Models and images courtesy of JC Cannistraro Mechanical Contractors
Prefabricated Utility Racks
Just-in-Time Delivery
Prefabricated Utility Rack
Installed Utility Rack
Added Metrics in process

- 25% reduction in waste and rework (25% of the 37% = 9%)
- Virtual elimination of design coordination error
- Direct fabrication from BIM: 0 errors, 12-16 week savings
- Increased investor/lender confidence
- Verified Return on Investment (ROI) range = 3:1 to 12:1
- 70% Claim reduction (so far)
Retooling our World (US Construction)
... what does it take?
What Contractors want to do...

- BIM
- Clash Detection
- GTO
- LEED
- IPD

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What they need to do...

- BIM
- Sustainability
- Collaboration
- Design Intelligence
- Interoperability
Hold your friends close and your...
Moving in with Architects
Again... and again
And architects with contractors
Field staff move in...
Subcontractors move in
Everybody’s moving in
Software and Process Training
And more... 1 on 1
Transformed Field Offices

Sutter Medical Center, California
DPR Construction
Temporary “Big Rooms”
Full Time “Big Rooms”
Constant on-site BIM
Subcontractor BIM-in-a-box

Maricopa County Court House
Gilbane Company
On-Site BIM Information Systems

Tocci Building Corp
- Firewall
- VPN Router / DMZ Support
- 1Gb/10Gb/100Gb Switch DMZ
- Wireless Access Point

Cloud
- T1 or High Speed Cable
- Caching Server
- DMZ
- Wireless Access Point

100 Binney Site
- Firewall
- DMZ
- Wireless Access Point

Pennsylvania Bentley ProjectWise Server

Dual 24 or 27" monitors (one station may use three monitor array)
- Multi Monitor stands
- 2 GB graphics card (ATI)
- Quad core CPU 3.0 GHz
- 16 GB ram
- 64-bit Operating System, Windows 7
- 250 GB Solid State Drive with 1 TB 7200 or 10,000 RPM secondary drive
- 1 GB network card
- Logitech M600 Gaming Mouse
- Individual APC UPS

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Bentley ProjectWise Caching Server
- Holding the Right Models

Lenovo W510 Thinkpad (43192NU)
- 15.6" Screen
- Intel Core i7 720QM
- 15GB DDR3 1066 RAM
- 220GB 7200 RPM Hard Drive
- NVIDIA Quadro FX 8800M
- Windows 7 Professional x64

Collaboration Source Debian

Smart Boards 600i

Dell Ultra 83315 60-inch Interactive Projector Screen

Optoma TX1080 3D600 ANSI Lumen

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History of the BIMForum

John Tocci // January 11, 2011
Secondary Benefits

Other Goodness
Integrated Project Delivery
Attracting the smart young professional

*photo shoot was their spoof on the TV Series “Madmen”
Better clients
Secondary Benefits
“Secondary” Benefits

- Real teamwork… not campfire songs
- Early, reliable and rational project outcomes
- Ability to enter into “no-change-order” contracts (IPD)
- Penetrate high barrier-to-entry markets
- Attract top quality partners
- Not looking at the back side of your competitors
- And…. 
“Secondary” Benefits

Delivering what we promise...

Priceless
From this...
To this...
To this...
and finally to this!
And ULTIMATELY to this...