BIM Solutions That Work

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“I” Information
“IM” Information Modeling
“BI” Building Information
Information Access
Information Access

► Where is the information?
  - On drawing?
  - In spec?
  - In architects head?
  - In contractors head?

► Ease of access?
  - Software solutions
Masonry Information

► Producer
  ▪ What product?
  ▪ How many?
  ▪ When required?

► Installer
  ▪ Where do they go?
  ▪ Cuts?
  ▪ Coordination

► Architect
  ▪ Form & Function
  ▪ Color & Texture

► Engineer
  ▪ Reinforcement
  ▪ Mix design
  ▪ CJ locations
  ▪ Performance
Solving Complex Problems
Real World Solutions – Guess!
Analytical Solutions

\[ \Delta E = 0 \]

\[ mgh = \frac{1}{2} mu^2 + \frac{1}{2} I \omega^2 - F_p \cdot d \]

\[ mgh = \frac{1}{2} mu^2 + \frac{1}{2} \rho \int_0^{2\pi} \int_0^\pi \int_0^R (r \sin \theta)^2 r^2 \sin \theta \, dr \, d\theta \, d\phi \]

\[ v_{\text{min}} = \sqrt{\frac{10gh}{7}} \]
Can’t Afford to be Wrong
Kicking the Can...

► Undershoot
  ▪ Add orders
  ▪ Time delays
  ▪ Color variation
  ▪ Mold changes

► Overshoot
  ▪ Lost production time
  ▪ Site congestion
  ▪ Who owns the excess?
Who Suffers?

► Contractor
  ▪ Reputation
  ▪ Liquidated damages

► Producer
  ▪ Efficiency
  ▪ Market Share

► Industry
  ▪ Installed costs
  ▪ Time to construct
  ▪ Quality and perceived hassles
Keeping Masonry Competitive

+ 25%?
LAVC Athletic Facility
Planned Layout
Recent Examples

- **King Sooper’s**
  - 15-0052-SD-8.pdf

- **Banta Bowl**
  - 15-0019-SD-1.pdf
  - 15-0019-SD-5.pdf
  - 15-0019 R2.xls

- **Fry’s**
  - 15-0070-SD-8.pdf

- **Faubion HS**
  - 15-0067-SD-2.pdf

- **Banner ER Expansion**
  - 16-0001-SD-1.pdf
  - 16-0001-SD-6.pdf
  - 16-0001-SD-18.pdf
  - photo 2.JPG
  - photo12.JPG
Museum of Prairiefire
Museum of Prairiefire
Information That Works
Coordination & Clash Detection

- Top Course of GMU has been shaded to match beam.
- Bottom of 10" Sleeve would be 7.34" above bottom of beam WB-3B-03.
- Beam depth change will require removal of top-most coarse of GMU (= 8" including mortar bed).
Leveraging BIM

- Steel Coordination
- Beam Pockets
- Bond Beam Clash
- Modular Openings
- Penetrations
- CJ Conflicts
BIM Economics

BIM-M
Building Information Modeling for Masonry

BIM Deliverables Guide for Masonry Contractors
Return on Investment Realized through the Use of BIM

The return on investment for each company is going to depend on the level of participation. How many of the BIM deliverables are you able to incorporate into your workflows/processes? It will depend on the buy-in and the culture of your company.

There are mason contractors that have reported gains in their production in the 10% range. They are making use of all of the deliverables outlined previously. However, the increase in efficiency is an estimate because there is no way to know their level of proficiency before they were modeling. It is a certainty that “Building it Before You Build It” will eliminate downtime waiting for answers and RFI’s. Many questions will be answered before you are on the job, thereby eliminating delays and improving productivity. You can also have your layout complete and have your pieces and shapes ordered.

BIM can also provide supply chain improvements. Not only can you fine tune your ordering and reduce overages, but you can also make sure you don’t have shortages that would cause costly delays. The contractors that are participating estimate that they’re saving 3%-7% by using BIM.

In an attempt to try and show the economic potential or ROI, let’s make some simple assumptions.

Let’s begin with a project with a value of one million dollars. Assume that the labor costs are 60% or $600,000. A conservative assumption, based upon reported results, is that there could be 5% savings on the labor, or approximately $30,000.

Now, assume that the material cost is $400,000. Again, using reported results from various projects, there could be a savings through supply-chain management of 3%. That would produce a savings of $12,000.

If it took 40 hours @ $90.00/hour to create the model, that would be a cost of $3,600. If you have an investment of $1,000 in software, the total investment, excluding staff training on this project, is $4,600.

The potential savings of $42,000 against the investment of $4,600 gives a potential ROI of $37,400 or $8.13 for each dollar invested.

This theoretical example demonstrates that the potential savings could be significant and worth the investment in training and software. However, there are too many variables involved in each project, and each company’s individual work processes and costs to say these savings can be realized unequivocally.
Models in the Field

► https://cadblox1.autodesk360.com/
Harmony Gymnasium
Design Tools
Thank You!

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