

Phase II – Project 4 – Tasks 1-7



BIM-M

Building Information Modeling
for Masonry

Phase II Final Report

BIM-M 2015 Symposium - St. Louis, MO

April 9, 2015

Phase II - Project 4 - Tasks 1-7

Contractor Input

- **Project Manager: Fred A. Kinateder**
 - Kinateder Consulting, Waukesha, WI
 - Former owner of Fred Kinateder Masonry
 - Past Co-chair of the International Masonry Institute
 - Assisted by: **Darrell W. McMillian, P.E.**
 - Technical Director, Masonry Institute of St. Louis
 - BIM-M Executive Committee (TMS)
 - Phase I Construction Activities Work Group Leader

Phase II - Project 4 - Tasks 1-7

Contractor Input

- **Tasks 1, 3, 4, 7**

- Roadmap Charging Paragraph: *“Document current work processes and current use of software”*

- (Tasks 1, 4, 7)**

- *“Identify areas where general contractors desire interaction with their models”* **(Task 3)**

- **Task 2**

- Identify best practices of BIM use in other non-masonry subcontractor areas.

Phase II - Project 4 – Tasks 1-7

Contractor Input

- **Tasks 5 & 6**

- Prepare detailed “scenarios of use” in the areas of safety, planning, material procurement, quantity take off, cost estimating, wall bracing, etc. that can be used to gage the potential for BIM implementation in those areas. **(Task 5)**
- Present these “scenarios of use” to mason contractors and validate/revise. **(Task 6)**

Contractor Outreach Activities

- Developed the Survey Matrix
- Attended BIM Forum
- IMI C4J Meetings
- Developed and Sent out Surveys S1-S7
- Attended Regional Contractor Meetings
- Attended World of Masonry
- E-mail contact with Working Group

CIWG Participation

- Increased the Contractor Input Working Group (CIWG) Size from 30 to 150
- Broader Base Contractor Participation
- Increased BIM, BIM-M Awareness
- Better Survey Participation
- Outline of Contractor Needs Through Increased Participation

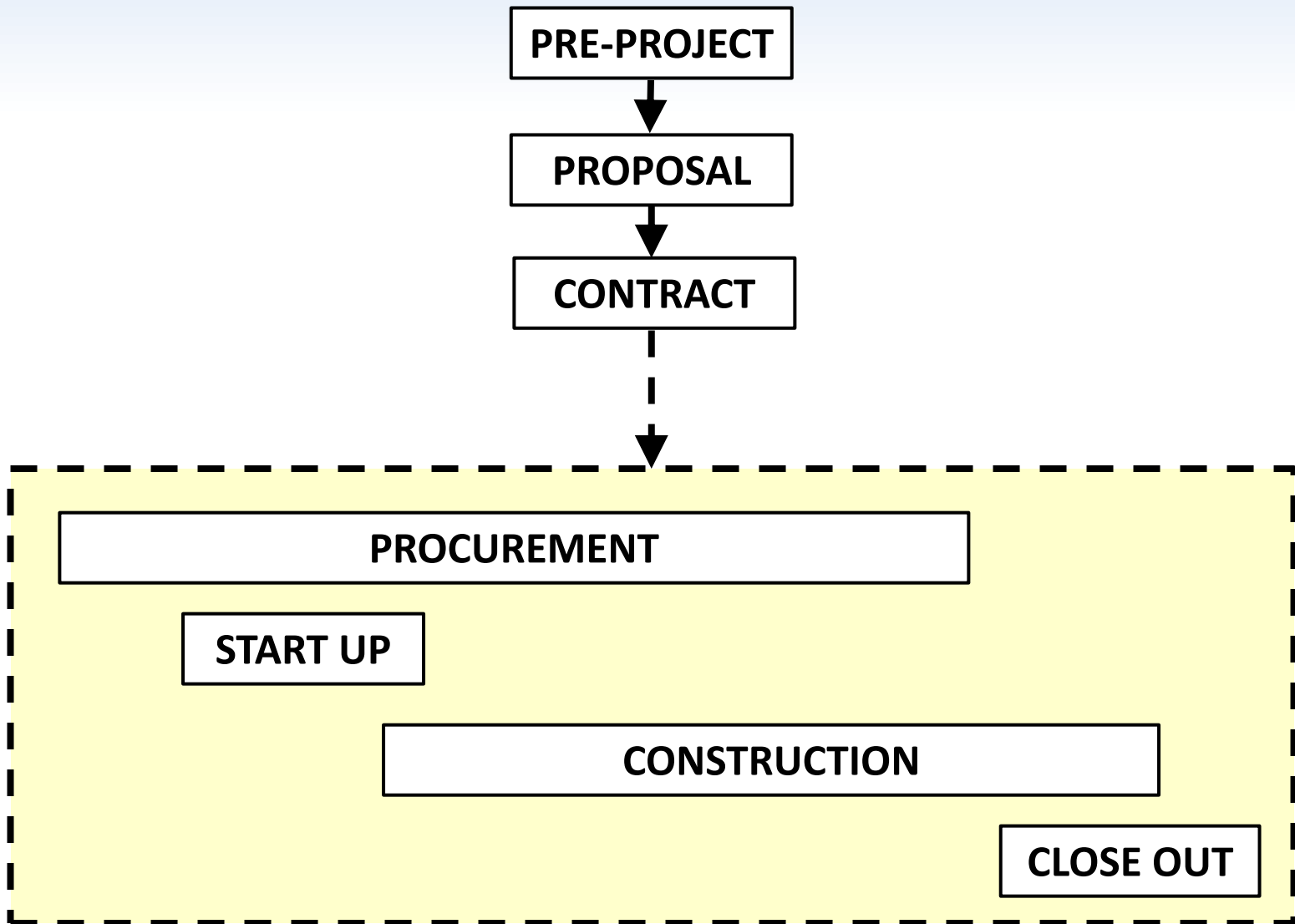
BIM-M Roadmap Update

- Attended Georgia Tech Roadmap Update
- Reviewed Progress Phase I & II
- Reviewed Goals for Project III
- Developed Plan on How to Achieve Phase III Goals Moving Forward

Phase II Project Tasks

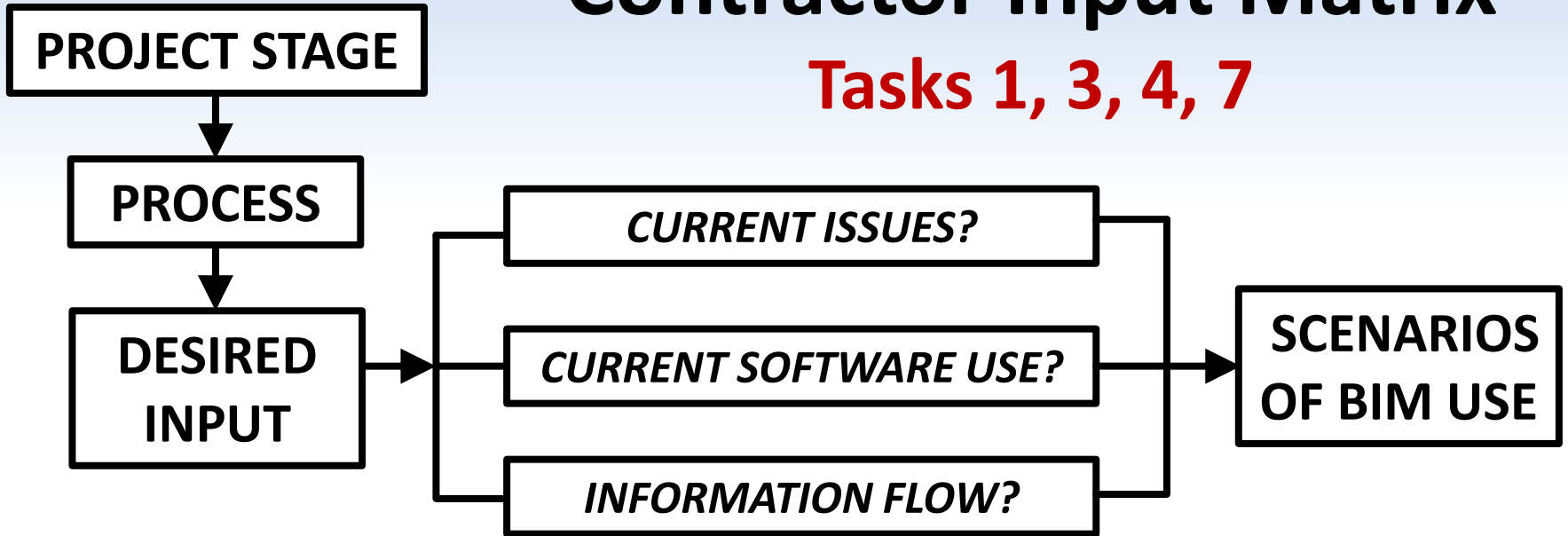
- Released Surveys S1-S6 to CIWG
- Identified Best Practices of BIM use Non-masonry Subcontractors
- Solicited GC/CM Input Regarding BIM-M
- Met with Mason Contractors
- Worked on developing BIM Scenarios of Use

Identified Masonry Project Stages



Contractor Input Matrix

Tasks 1, 3, 4, 7



CIWG ONLINE SURVEY S4

** Indicates required response*

Name *

First Last

Email *

Part A - Bidding Phase:

A1) Besides material take off, what information would be helpful during the bidding phase? *

A2) Conflict resolution, scheduling, and safety, these are the three main areas that our customers (GC/CM) use BIM. Are you having issues with any of these? *

**CIWG
Survey Data
Excerpts**

Survey Data Excerpts

Are you aware of the technology, Building Information Modeling, known as BIM?

Yes 66%

No 34%

S3A – Q1

Have you worked on a project where BIM was utilized?

Yes 57%

No 43%

S3A – Q3

Survey Data Excerpts

Who created the model?

| | |
|---------------|-----|
| In-house | 20% |
| GM/GC | 40% |
| 3rd party sub | 13% |
| Other | 20% |
| Not sure | 7% |

S3A – Q5

Survey Data Excerpts

Would a 3D project model be helpful for...

Site logistics?

| | | |
|---------|-------|---------|
| Yes | 81.5% | |
| No | 14.8% | |
| Unknown | 3.7% | S4 – A3 |

Project Schedule?

| | | |
|---------|-------|---------|
| Yes | 88.9% | |
| No | 3.7% | |
| Unknown | 7.4% | S4 – A4 |

Survey Data Excerpts

Would a 3D project model be helpful for...

Site specific safety?

| | | |
|---------|-------|---------|
| Yes | 63.0% | |
| No | 11.1% | |
| Unknown | 25.9% | S4 – A5 |

Procuring more work?

| | | |
|---------|-------|---------|
| Yes | 33.3% | |
| No | 18.5% | |
| Unknown | 48.1% | S4 – A6 |

Survey Data Excerpts

Would a 3D project model be helpful for...

Improving profitability?

| | | |
|---------|-------|---------|
| Yes | 81.5% | |
| No | 0.0% | |
| Unknown | 18.5% | S4 – A7 |

Managing/anticipating manpower needs?

| | | |
|---------|-------|---------|
| Yes | 81.8% | |
| No | 0.0% | |
| Unknown | 18.2% | S4 – B1 |

Survey Data Excerpts

Would a 3D project model be helpful for...

Managing scaffolding/equipment more efficiently?

| | | |
|---------|-------|---------|
| Yes | 70.4% | |
| No | 18.5% | |
| Unknown | 11.1% | S4 – B2 |

Managing material purchases better?

| | | |
|---------|-------|---------|
| Yes | 77.8% | |
| No | 7.4% | |
| Unknown | 14.8% | S4 – B3 |

Survey Data Excerpts

Would you be interested in modeling if you could use it to create virtual mock ups?

| | | |
|---------|-------|---------|
| Yes | 81.5% | |
| No | 0.0% | |
| Unknown | 18.5% | S4 – C2 |

Would it be helpful for the model to have the capability to produce field drawings for each masonry wall to be constructed?

| | | |
|---------|-------|---------|
| Yes | 88.0% | |
| No | 0.0% | |
| Unknown | 12.0% | S4 – C4 |

Survey Data Excerpts

If the model have the capability to provide information to help you track your production would this be beneficial?

| | | |
|---------|-------|---------|
| Yes | 91.3% | |
| No | 0.0% | |
| Unknown | 8.7% | S5 – C1 |

If the model could provide up to date progress schedule information for all trades showing conflicts and impacts would this be helpful?

| | | |
|---------|-------|---------|
| Yes | 91.3% | |
| No | 0.0% | |
| Unknown | 8.7% | S5 – C2 |

Survey Data Excerpts

If the model had the capability to replace “as built drawings” would you find this helpful?

| | | |
|---------|-------|---------|
| Yes | 82.6% | |
| No | 4.3% | |
| Unknown | 13.1% | S5 – D1 |

If the punch list could be generated by the model and completion could be incorporated into the model would this speed up the close out process?

| | | |
|---------|-------|---------|
| Yes | 52.2% | |
| No | 8.7% | |
| Unknown | 39.1% | S5 – D2 |

Survey Data Excerpts

Do you currently use Excel spreadsheets for construction operations?

| | | |
|-----|-------|---------|
| Yes | 87.1% | |
| No | 12.9% | S6 – E1 |

Do you currently use Tradesmen's for construction operations?

| | | |
|-----|-------|---------|
| Yes | 61.3% | |
| No | 38.7% | S6 – E2 |

Do you currently use CAD for construction operations?

| | | |
|-----|-------|---------|
| Yes | 61.3% | |
| No | 38.7% | S6 – E3 |

Survey Data Excerpts

Do you currently use REVIT for construction operations?

| | | |
|-----|-------|---------|
| Yes | 22.6% | |
| No | 77.4% | S6 – E4 |

Do you currently use SketchUp for construction operations?

| | | |
|-----|-------|---------|
| Yes | 22.6% | |
| No | 77.4% | S6 – E5 |

All Identified Software

Sage

MS Project

TUT

Timberline

Win Estimator

Builders Exchange

Plan Swift

REVIT

Office 360 SharePoint

Tradesmen's

Navisworks

Acrobat

Nuance Draftsman

SketchUp

ComputerEase

PC Draft

Insite

Project Doc Control

Autocad

Carlson Software

JobPower

Bluebeam

Access

A Few Comment Examples

“It should be painful to generate a punchlist rather than easy”

S5 – Part E

“The main thing I would like to see in a standardized software would be the ability to utilize a vectored model issued by the project Architect / Engineer that could be utilized by various competing software offerings without becoming a proprietary isolated model.”

S6 – Part F

“Looking to have a standardized color codes for different masonry materials. Example: 4" CMU = Green, 6" CMU = Purple, 8" CMU = Yellow...Modular size brick = Red, Utility Size = Orange. This way you can look at a plan and tell what materials go where.”

S6 – Part F

Contractor Wish List by Phase

- Bidding Phase
 - a) Material Take Off
 - b) Site Logistics
 - c) Schedule
 - d) Equipment Requirements
 - e) Manpower Requirements
 - f) Proposed Schedule

Contractor Wish List by Phase cont'd

- Procurement Phase
 - a) Generate Submittals
 - b) Generate Shop Drawings
 - c) Generate Material Purchase Orders
 - d) Create Virtual Mock Ups
 - e) Create Site Specific Safety Plan

Contractor Wish List by Phase cont'd

- Start Up Phase
 - a) Overall Preconstruction Schedule
 - b) Durations by Model Area
 - c) Manpower Requirements
 - d) Equipment Requirements
 - e) Scaffold Requirements
 - f) Site Logistics/ Lay Down Area
 - g) Quality Assurance Plan

Contractor Wish List by Phase cont'd

- Construction Phase
 - a) Progress Schedule
 - b) LOD 450
 - c) Masonry Lift/ Setting Drawings
 - d) Clash Detection
 - e) Manpower Requirements
 - f) Schedule of Material Deliveries
 - g) RFI/CB
 - h) Production Tracking
 - i) Ability to Track Indirect Costs

Contractor Wish List by Phase cont'd

- Close Out
 - a) Create As Built Drawings
 - b) Generate Punch List
 - c) Document Completion of Punch List

Phase III Tasks

1. Contractor Outreach
 - a) Continue Surveys with CIWG
 - b) Meet with Mason Contractor Groups
2. Identify Best Practices Non-Masonry Subs
 - a) BIM Forum review individual case studies
3. Solicit input from CM/GC's
 - a) BIM Forum review individual case studies
 - b) Individual interviews with CM/GC's

Phase III cont'd

4. Meet with Mason Contractors

- a) Attend regional IMI, MCAA meetings
- b) Attend MCAA Mid-year meeting

5. Prepare Detailed “Scenarios of Use” of BIM

- a) Develop Wish List for presentation to Software and App. Providers
- b) Maintain communications with Software and App providers to insure implementation of Wish List

Phase III cont'd

6. Validate Scenarios of Use with Mason Contractors

- a) Present Survey Results for Discussion/ Feedback
 - i. Online Survey
 - ii. Email discussion
 - iii. Conference calls
 - iv. Presentation/ Discussion at Regional Meetings

Phase III cont'd

7. Prepare Detailed Report Phase III

a) Phase III Project 4 Tasks 1-7

- i. Overall Summary of Contractor Input and Feedback regarding workflows
- ii. Develop Work Process/ Work Flow Model

8. Develop Educational Series for Contractors

- a) Seminars
- b) Webinars

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Final Report

Questions / Discussion

