



Technology

Digital Tools for BIM-M

Progressing the construction of masonry buildings

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Hands-free computer, controlled by voice, may be ubiquitous on jobsites in the near future.

Imagine the day a mason talks into his headset, tablet or some other device to view the plans, details, specs, installation videos or to contact a product technical representative, leaving his hands free to hold tools of the trade. Indeed, technology will progress the construction of masonry buildings. A hands-free system that fits under a hard hat will function as a phone, computer, monitor, personal safety device, GPS locator and much more.

Devices to deliver data to the field will continue to evolve. Who would have thought we'd be using smartphones and tablets on today's construction sites?

Building Information Modeling for Masonry (BIM-M) is promoting advancements in technology to make BIM software usable by all workers.

Masons and contractors in the not too distant future will be able to use BIM software with minimal interaction, not with a desktop computer as we know it today.

Increasing Speed and Efficiency Competing for speed is what general contractors, construction managers and design/build contractors demand, what architects need and what owners want. The masonry wall system has entered the race.

Material and accessory manufacturers continue to develop products enhancing productivity. Contractors eager to benefit from new technology are participating in training bricklayer crews to adapt to mobile technologies to improve project organization, wall system selection for efficiencies and cost effectiveness especially when masonry is used for *all its worth* to play more than one role, using single-source responsibility. Who knows that better than the mason contractors who develop these systems and efficiencies? They will be relied on as design-assist consultants to the design teams.

It's new. It's exciting to be part of an ever-evolving masonry industry with so much to offer.

Added value today includes speed of construction, increased production with decreased costs and workforce development with renewed emphasis on training for quality craftsmanship. BIM-M will take masonry to a whole new level incorporating lean construction principles and efficient information management in real time. Masonry is continuously reinventing itself to offer owners the highest performance competitive advantage.

Benefitting from BIM-M The masonry industries of the United States and Canada are sponsoring an initiative for Building Information Modeling for Masonry. It is well underway and has many facets. Based upon a roadmap developed by Georgia Institute of Technology, one of the eleven major projects includes education and training for masons and contractors. The goal is to raise the knowledge of digital tools among craftworkers and contractors leading up to the development and introduction of BIM-for-Masonry related software. With BIM advancing nationally and internationally, the goal of the initiative is to maintain and advance the commercial masonry industry's market share by improving project delivery methods, including BIM. Without the ability to provide BIM-specific information, the masonry industry as a whole could be left behind.

It is not only architects and engineers who benefit from BIM software; the construction team is a primary user of the information created. In fact, construction managers and general contractors are possibly the biggest promoters of BIM. Therefore, craftworkers and project management staff are a key component to successfully using BIM on projects. Their education is essential.

A BIM leader in the US construction industry is the Associated General Contractors of America (AGC) with its Building Information Modeling Education Program (BIM-EP). Noted at agc.org/cs/building_information_modeling_education_program, “AGC Certificate of Management – Building Information Modeling (CM-BIM) is the construction industry’s first and only BIM certificate program that teaches the practical application of the Building Information Modeling process for commercial construction firms.” BIM-M agrees with the AGC approach and will be working with the AGC to bring BIM to the masonry industry.

The BIM-M Executive Committee’s education program is totally voluntary, developed through industry funding and available to all. We are not saying everyone in the industry has to be a computer-genius. However, those who take

advantage of this education and training will be best prepared to benefit from the BIM-for-Masonry software that is coming.

It’s Coming The BIM-M Executive Committee supports the use of technology in advancing the masonry industry. Education is being tailored to acquaint masons and contractors with digital tools, mobile devices and basic project management so that they will be better prepared to utilize the BIM-for-Masonry software and processes when they become available. While BIM-M software for masons is being developed, the masonry industry must prepare and be technologically trained to use digital tools. Courses, seminars and webinars will introduce the BIM concept to masons and contractors.

The 5 Courses of BIM-M

Each course is intended to build on the previous, leading up to using the BIM-for-Masonry tools currently under development. The first three courses cover more general computer use, mobile apps and project management. The fourth introduces BIM and the fifth deals with BIM specific to masonry. The roadmap deals with all facets of development of BIM for masonry.

Aimed squarely at a target audience of craftworkers and constructors of masonry buildings, this program can be used by anyone interested in BIM for masonry. The goal is to give participants of any computer ability the opportunity to learn and expand their knowledge of BIM, digital tools and computing as they relate to masonry construction activities.

Rather than a single course, BIM-M recommends a compilation of several existing educational programs. Acknowledging that adult learning programs are prevalent in many communities, BIM-M suggests that participants take advantage of such courses and the opportunity to learn from an instructor in a classroom or seminar setting.

Recognizing that everyone does not have a community program available or that they may choose to go it alone, BIM-M intends to release a database of various online courses and webinars that participants can use. Many are free while others are offered for a fee. A disadvantage of these online courses is the absence of an instructor for guidance. The *for fee* courses are more likely to have a helpline or chat advisor to answer questions. The helps are an improvement, but without a strong computer aptitude, they are no substitute for the classroom or seminar setting.

Course 8.1 - Introductory Computer Course

The goal is to develop a basic knowledge of the computer and its capabilities for construction activities. Dependent upon their existing skills, participants may require very little time in reaching an introductory proficiency; others may need several weeks to achieve an adequate skill level. Participants can work on their weaknesses and at their own rate.

Recommended content should include:

1. Navigation through Windows and function within Explorer.
2. Introduction to a suite of software such as Microsoft Office (Excel, One Note, Outlook, PowerPoint and Word). Understanding the purpose of each program and basic functionality of each. Demonstrations will be provided. Participants will learn capabilities of the software.
3. Introduction to email, a tool everyone needs to use for communication.
4. Learn about the power and versatility of CAD software and how others develop drawings that masons and contractors use.

Course 8.2 – Introduction to Mobile Devices

Smartphones, tablets and other devices are prolific in our day-to-day lives. This course will provide a half-day introduction into the world of mobile devices, apps and cloud computing suited for construction activities. It can be attended in-person or through webinars. Participants will be shown current concepts of mobile devices and how contractors are gaining productivity on jobsites.

Demonstrations will include an assortment of applications (apps) for drawing storage, estimating, scheduling, measuring and more. Participants will also be shown a listing of websites that track the most current apps contractors are using.

The concept of *cloud* computing will be introduced through a demonstration of software such as Microsoft Office 365. Participants will learn how this software shifts its applications to the *cloud* so documents can be updated in real time, from any location.

Masonry institutes and contractor associations will be encouraged to offer this course in a seminar setting. BIM-M will offer these groups master copies of a participant’s workbook that highlights current applications and points to additional resources that should be used to stay current with new applications as they develop. Instructors will have access to a PowerPoint slide presentation, participant workbook and a recorded session.

Course 8.3 - Introductory Project Management with Digital Tools

Understanding what goes into project management will ultimately make BIM-M more accessible. This basic introduction will acquaint participants with digital tools used in construction management. Proposed content includes:

1. Introduction to concepts of construction estimating.
 - a. how to determine level of detail needed
 - b. examples of report content such as summaries, details, assumptions and clarifications
 - c. software applications will be shown through the use of videos.
2. Introduction to construction scheduling.
 - a. examples of how to set up the logic of a schedule and determine the level of detail necessary
 - b. how to tailor schedules to appropriate audiences
 - c. introduction to the concepts of Lean Planning which will drastically change the way scheduling is approached in the coming years.
 - d. software applications will be demonstrated

Finished products for participants include workbook highlighting current applications with additional resources that should stay current with new applications as they develop. Finished products for instructors will include a PowerPoint slide presentation, participant workbook and audio/visual recorded session.

This course can be attended in-person or through webinars. BIM-M will offer groups master copies of a participant's student work book that highlights current applications and points to additional resources that should be used to stay current. Instructors will have access to a PowerPoint slide presentation, participant workbook, and a recorded session.

Course 8.4 – Introduction to BIM For this course, an overall introduction to BIM not specific to masonry, BIM-M is partnering with the AGC. The AGC's CM-BIM program includes four units from introduction to integration:

Unit 1 : An Introduction to Building Information Modeling

Unit 2 : BIM Technology

Unit 3 : BIM Contract Negotiation and Risk Allocation

Unit 4 : BIM Process, Adoption, and Integration

BIM-M is recommending that masons and contractors take the Unit 1 introductory course as a minimum. Preferably, participants would continue through the entire four units and receive the AGC's certificate.

Following completion of Unit 1, participants will have the ability to:

- a. Recognize the importance of BIM
- b. Define common BIM terminology
- c. Discuss how BIM can be used as a communication tool and collaboration tool
- d. Explain the benefits of BIM
- e. Explain federated model process
- f. Compare examples of successful BIM usage
- g. Create a company BIM assessment.

This course would be taught by AGC-certified instructors in cooperation with the BIM-M initiative. The goal is to have masonry institutes and contractor associations sponsor the instructors and use AGC learning materials.

Course 8.5 – Building Information Modeling for Masonry Everything up until this course has been in preparation for digital tools specific to masonry. The BIM introduction in Course 8.4 gives the overview and presents specific BIM-for-masonry training.

Goals and Aspirations In the coming months we will be refining objectives and working with consultants, software vendors, developers of the National BIM Standards and other organizations to improve the construction process for the masonry industries in the US and Canada. With an optimistic timetable for the first generation of BIM-M software improvements to be released in 2017, the time to start the education is now. Therefore BIM-M is planning to roll out beta presentations in Spring 2014 and continue releasing more through the Fall. The final course will follow when first generation software improvements are completed.

Education will continue as BIM is evolving and there will be new advances to teach.

Digital tools, simple to understand, will represent information and knowledge to construct masonry buildings as efficiently, safely and cost-effectively as possible. Stay tuned and look to BIMforMasonry.org for news of educational events and course materials!



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