



Products, BIM, and MasterFormat

Thomas Smith, RA, CCS, CSI, SCIP

Introduction

To understand how BIM (Building Information Model) will ultimately relate to how products are specified, selected, and ultimately incorporated into a building or improvement to real property is a topic worthy of serious exploration, evaluation and discussion by all participants involved in the design and construction process. The purpose of this article is to facilitate discussion as to how BIM will ultimately impact the present process either for the good or as a detriment to those involved. BIM has the potential of improving the design and construction so long as it does not undermine the current fundamental process. Although there have been many advancement in construction technology in the past decades, the basic legal roles and relationship of the participants have basically remained unchanged since established by the 1918 Landmark Spearin Case known as the Spearin Doctrine even with the advent of design-build, construction management and integrated project delivery.

The basic process of design and construction can best be defined as the incorporation of tangible personal property (i.e. building products) into real property. This process involves many participants, each performing being responsible for a specific defined role

Building Products and Participants

The role of the *architect* in the capacity of design professional in responsible charge is to facilitate, on behalf of an *owner* an assemblage of *building products* combined into multi-*systems and assemblies* forming a legal *facility* consisting of functional *spaces* located on an identifiable contiguous parcel of *real property*. The architect is also legally charged with creating and assembling the documentation required for the process which culminates into signed and sealed documents consisting of *plans and specifications (contract documents)*

Once signed and sealed, the contract documents are then submitted and subjected to a review process by an *enforcement authority* charged with indicating any deficiencies and requiring correction prior to issuing a building permit to a licensed contractor to construct or build based upon reviewed documents signed by the building official.

When the building products are selected and incorporated into the facility or the Work is executed in accordance with the requirements established in the reviewed documents by a lawfully licensed contractor, a compliant facility will result to the

extent that the documents prepared by the design professional and determined to be compliant by the construction code enforcement authority i.e. building official.

If the plan is successfully created and properly executed, the *owner* will become the beneficiary of a facility which has utilized the above process. The degree to which this process is successful will be the degree to which the owner's expectations of obtaining a quality facility on time, and within budget will be realized.

Building Products Defined - Traditionally

After writing an article for the Memphis PerSpective a few years ago titled "Product Confusion – Understanding and Using Part 2 Products", an article in which I attempted to define different categories of products. In the article I went on to identify and define the following five basic types of underlying building products so as to enable a specifier to prepare better specifications.

- Field assembled products
- Shop assembled / fabricated products
- Manufactured products or systems
- Pre-engineered shop assembled/fabricated products
- Pre-engineered systems.

However after completing the article I had a sudden realization that as a specifier, each time I prepared a specification section what I was actually providing was a contractual definition of a building product.

A second realization with respect to defining a product came when provided with five different roof warranties by Carl Drennan, a respected roofing subcontractor. Each warranty defined the same basic assemblage of roofing components differently. This caused me to realize that although the specifier defined a product in the specifications, the manufacturer defined a product by the manufacturer's warranty and product literature.

In a subsequent discussion with Carl I remarked that a problem in construction is that these two definitions are hardly, if ever the same. Upon which Carl replied that as a subcontractor, he was actually the facilitator between the manufacturer and the specifier who had to somehow to reconcile the two different definitions (clean version). This exchange provided both of us with a completely different perspective on the purpose of the submittal process.

It also made me realize the importance of the building product manufacturer in both the design and construction process. Without the manufacturer providing warranties for their products, as well as the testing of products for regulatory compliance and compliance with accepted industry standards.

Building Products Defined by BIM

With the advent of BIM and three dimensional building modeling computer programs such as Revit, the way building products are being defined is being fundamentally altered. Now instead of building products being defined by the specifications, they are being defined to a much greater extent by the manufacturer's and third party vendors of content to be incorporated into a Revit model. A visit to websites such as Arcat, SmartBim by Reed Data Services, AutoDesk and others will provide access to many three dimensional objects for inclusion into the documents. These products may be either manufacturer specific or they may be generic depending upon how provided. Will this trend usher in a new era as to how products will be selected? Will product selection become the exclusive domain of the designer with little input from the contractor? Will the need for the submittal process be eliminated? Will these run afoul with professional registration laws? These are all legitimate questions which will eventually require answers and will more than likely rely on the court system to provide the answers.

Means of Communication and BIM

It appears that BIM may be redefining the various roles of the design and construction professionals how communications occur between design and building professionals. Will communications between the Architect and Owner as well as the communications between the Owner and Contractor be significantly changed? Will construction documents in the future be a virtual model of the building or continue to be tangible legal documents? Will the creativity of the design professional be relegated to nothing more than assembling a group of pre-prepared objects into a virtual model? One must ponder the following question, does the architect wish to create tangible architecture or virtual architecture only accessible by the use of a computer. Had Frank Lloyd Wright allowed Mr. Kauffman to stifle his creativity, arguable the world greatest piece of architecture would have nothing more than a well designed residence with the view of an obscure waterfall.

A fundamental truth I learned years ago with regard to computer programming is that a computer program cannot be designed to balance a check book until first the programmer can balance a check book manually. The same principal applies to a building information model the product information contained within a BIM will be no better than the product information available from the manufacturers in a non-BIM environment. **Construction documents as presently defined are the current BIM.** Until products as defined by manufacturers can be communicated in a clearly and concisely by manufacturer's manually this information cannot be effectively incorporated into a building information model. The drawings and specifications *indicate* the results. To paraphrase "what you see is what you get" what is indicated is what the owner gets - nothing more or nothing less. Not the intended

results, not the tested results, or not the wished for results. The design professional has a responsibility as a professional to ascertain the aesthetic, functional, and operational requirements of the owner as well as the regulatory requirements for a facility and translating those requirements into construction documents.

It is from the drawings and specifications that the contractor and building material suppliers extract the information needed to construct a building. There are literally thousands of products available for inclusion into a project. The completed drawings and specifications will indicate requirements for hundreds of products which may be selected by the contractor for inclusion into to completed facility. However the completed facility will only contain a small fraction of those available. **The purpose of the process – whether by the current traditional process or by BIM - is to have the most cost effective products of the highest quality incorporated into the facility in the shortest period of time.** The question, will BIM ultimately be more efficient than the current process?

MasterFormat and BIM

It was reported this past August at the Gulf States Region Conference in Little Rock that the reason for CSI to cease support of MasterFormat 95 was because that MasterFormat 04 was better suited for BIM. This assertion I find somewhat puzzling since MasterFormat 95 basic structure was based up and organizational structure for products and activities whereas the fundamental structure of MasterFormat 04 is based upon an internationally concept of "work results" not recognized by legal precedent in the United States.

It is proposed by OmniClass that building products be defined by a separate table for products which would be different from work results. Revit families are based on neither MasterFormat 95 or 04 but rather the organizational elemental structure of UniFormat. To use work result as the basis for BIM seem to belie the current trend of manufacturer's providing warranted products into a built facility.

Conclusion

In conclusion the entire design and construction industry may need to think long and hard before moving head long into a new untried and untested process. The entire industry needs to view this new technology through the prism of how the current process can be improved, not altering the current process or the traditional roles of the designer, owner, constructor, and material suppliers. It appears that BIM may be redefining the various roles of the design and construction professionals how communications. Unless BIM is approached cautiously and in a very deliberate manner the profession benefiting most from BIM may not be the design and construction but rather the legal profession. Today tools such a MasterFormat may not work for the future.

This topic will be discussed at the February 4th SpecQuest luncheon. Contact Tommy Smith at (901) 387-1006 or tsmithacs@bellsouth.net to sign up.