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**Handling Unexpected
Issues on a
Construction Project**

**Three Pillars
of Conceptual BIM**

*New Dover High School — Dover, Delaware
Construction Manager & Cost Estimator:
EDiS Company*

Three Pillars of Conceptual BIM

By Julie Huval, CPSM

“Before we show the owner a rendering we want to make sure the owner can afford that rendering,” said Jeff Ratcliff, Senior Project Manager at Beck Group, said of their Methodist Mansfield Medical Center project. Being able to show a client a rendering of their building with the knowledge that the image portrayed fits within their budget is powerful. It opens up re-work discussions during conceptual and schematic phases so the client stays educated as to what their final project will entail with less likelihood of incurring change orders or value engineering discussions later. The Beck Group healthcare department utilizes conceptual modeling and estimating during project planning.

This type of project planning allows a project team to share data on all decisions as they relate to budget, schedule, and design intent. John Reich, Preconstruction Manager in healthcare at Beck Group, says, “All the designers see the estimate and question line items. Preconstruction will also question why things are drawn a certain way, too. It is a free exchange of information.” Having this open dialogue also insures that all the decisions are made for the good of the overall project. It also blurs the harsh lines of job roles and creates a unique, solidified project team. “The entire team is extremely solid,” said Denton Wilson, Vice President of Design and Construction for Methodist Hospitals. “It’s the culture and environment that allows them to grow, serve the team, and raise the bar.”

Conceptual modeling and estimating has three pillars on a project. These three pillars allow each stakeholder to be on the same page so that the project can continue to move forward through the project’s lifecycle. Those three pillars are:

1. Start on the right foot
2. Acquire trust
3. Add value with results

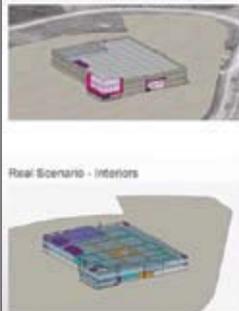
In an ideal world, each project would follow those pillars in order. However, owners have constantly jumped to “acquire trust” before even looking at the early stages of building a project. The owner wants to know that your firm can do the job. Acquiring trust may look like meeting targets and deadlines, being accurate on feasibility studies, and constant communication. “Our GMP on the Methodist medical center project was 2.48% off the original budget,” said Reich. Reich said they sent the owner monthly estimate updates so the owner could see price fluctuations.

Once an owner feels confident they can trust the design and construction professionals then they circle back to the first pillar.

Starting a project on the right foot is paramount. Sitting down with an owner and understanding their needs and wants for their project is key to successfully implementing BIM from the beginning. It opens the conversation to discuss project quality. “Quality is a word that creates a common language between the client and the builder,” said Pablo Alvarez, a real estate professional with Abilia Inmobiliaria. Quality will help determine project variables as well as expectations from all parties involved.

The third pillar is where conceptual modeling can solidify a lasting relationship with an owner. While BIM is a useful visual tool to communicate ideas, design, and construction phasing, each model holds tons of information. Sharing that information with the client is paramount to being a long-term team player. Alvarez said, “Conceptual modeling allows us to say ‘What would have happened if we had chosen different types of structures?’” They are able to explore the cost of steel versus concrete versus a combination without affecting the design but exploring cost variations. Owners want to work with firms who understand them, appreciate their standards of quality, and communicate openly.

Similar to exploring different types of structures to see how cost will be affected, owners can also see where the money is being spent during conceptual modeling. On a recent retail project, an owner wanted to see where the majority of their budget was going



	Direct Cost Summary	Cost	Cost / m2	Percent
02	Site Construction	\$1,969,855.25	\$132.16	1.53%
03	Concrete	\$46,033,928.02	\$3,098.43	25.90%
04	Masonry	\$2,982,417.42	\$200.09	2.32%
05	Metals	\$747,748.62	\$55.17	0.58%
07	Thermal and Moisture Protection	\$150,000.00	\$10.06	0.12%
08	Doors and Windows	\$4,306,652.80	\$288.93	3.35%
09	Finishes	\$23,187,581.27	\$1,535.66	18.03%
10	Specialties	\$738,250.49	\$49.53	0.57%
14	Conveying Systems	\$4,921,000.00	\$330.15	3.83%
15	Mechanical	\$22,283,363.70	\$1,435.00	17.33%
16	Electrical	\$21,271,153.60	\$1,427.09	16.54%
	Direct Cost Subtotal	\$128,591,991.17	\$8,627.27	100.00%

towards. An estimate along with models of their project was presented.

I Estimate on Original Project

Once the owner was made aware that 87.7% of their costs were going to concrete, finishes, mechanical, and electrical they wanted to explore design options to reduce some of those numbers on the second phase of their project. They were then given façade options that altered the concrete, metals, and finishes. Based on the conceptual models and estimates, the first scenario with concrete structure facades with paint is the most cost effective.

II Estimate on Phase 2

This exercise shows the owner that your team is flexible, knowledgeable, and willing to work towards the project goals. Could the estimates be done without the tie-in of the visual models? Yes, but if the owner wants to see how the changes will affect the visual appearance of the building then the side-by-side comparison is needed.

"A huge advantage of [conceptual modeling] is that it enables a project team to make intelligent design decisions before any investment has been made in design," said Tim Blood, Preconstruction Project Manager at Sundt Construction. "We can set design parameters, which the owner can carry forward into design. This ensures that the project comes in under budget, and it also eliminates re-design. When we're done, the owner can go to their architect and know what they can afford and what their building looks like."

Following the three pillars of conceptual modeling and estimating will lead to a better understanding of project expectations, goals, and open the door for discussions that go beyond an average project. They encourage knowledge sharing which leads to creating projects that are smarter.

About the author: Julie Huval joined Beck Technology to oversee the marketing and communications efforts of the software development company. One of her focuses is on educating the industry on construction technology. Julie hosts the webinar series 'Innovation in the AEC Industry' that showcases new A/E/C technology, processes, and procedures. She is also a contributing author to a number of industry publications as well as the upcoming Marketing Fundamentals book, and is a frequent public speaker on marketing, business, and construction technology. Julie earned a MBA from The University of Texas at Arlington and a Bachelor of Arts in journalism and environmental studies from Baylor University. She recently became a graduate of SMPs University Leadership Advancement Program at the University of Maryland. Additionally, she is a Certified Professional Services Marketer.

	Scenario 1 – Concrete Structure Facades with Paint		Scenario 2 – Concrete Structure Facades with Precast		Scenario 3 – Metal Structure Facades with Alpic	
	Cost	Cost / m2	Cost	Cost / m2	Cost	Cost / m2
02 Site Construction	\$127,594,341.80	\$6,249.55	\$127,594,341.80	\$6,249.55	\$127,594,341.80	\$6,249.55
03 Concrete	\$78,723,100.66	\$3,855.85	\$89,918,851.66	\$4,404.21	\$54,947,548.00	\$2,691.32
04 Masonry	\$6,426,254.90	\$305.78	\$4,656,087.84	\$228.55	\$4,656,087.84	\$228.05
05 Metals	\$9,500,194.00	\$465.32	\$9,500,194.00	\$465.32	\$41,565,500.83	\$2,035.87
07 Thermal and Moisture Protection	\$1,887,448.82	\$92.45	\$1,887,448.82	\$92.45	\$1,887,448.82	\$92.45
08 Doors and Windows	\$6,485,391.00	\$317.65	\$6,485,391.00	\$317.65	\$6,485,391.00	\$317.65
09 Finishes	\$15,758,428.05	\$771.85	\$15,465,206.00	\$757.48	\$25,328,129.50	\$1,240.57
10 Specialties	\$2,062,059.70	\$101.00	\$2,062,059.70	\$101.00	\$2,062,059.70	\$101.00
11 Equipment	\$1,460,000.00	\$71.51	\$1,460,000.00	\$71.51	\$1,460,000.00	\$71.51
13 Special Construction	\$1,500,000.00	\$73.47	\$1,500,000.00	\$73.47	\$1,500,000.00	\$73.47
14 Conveying Systems	\$7,400,000.00	\$362.45	\$7,400,000.00	\$362.45	\$7,400,000.00	\$362.45
15 Mechanical	\$32,826,595.95	\$1,607.84	\$32,826,595.95	\$1,607.84	\$32,826,595.95	\$1,607.84
16 Electrical	\$24,087,785.04	\$1,179.82	\$24,087,785.04	\$1,179.82	\$24,087,785.04	\$1,179.82
Direct Cost Subtotal	\$311,588,790.87	\$15,261.57	\$324,843,961.80	\$15,910.82	\$331,800,888.50	\$16,251.56




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