I am so excited about this year’s A Mile High Summit in Denver. The plans for the Summit embody our Core Values.

We care passionately about...

**Education**: Educating and mentoring the next generation of professional estimators.

**Professionalism**: Promoting professional estimating as a lifelong pursuit of excellence and credibility.

**Fellowship**: Developing a network of industry leaders and peers to which belonging is worthwhile.

In years past, the focus of our Annual Meeting and Estimating Summit was on the internal Society business. This is the first year under our new bylaws and our attention can be spent truly dedicated to the Core Values.

The theme of this year's Summit is the Art and Science of Estimating. This theme recognizes that being an estimator requires not just technical skills, such as knowledge of software trends and estimate analysis, but also personal skills such as team building and presentations. The educational lineup at this year's Summit is top notch. Not only will you earn Professional Development Units toward your CPE renewal, but you will also be taught relevant skills that will help you individually in your work as a professional estimator.

In addition to the educational offerings, the Summit is our opportunity to renew relationships and develop new ones with our peers throughout the country. This year's Summit has been professionally planned to provide opportunities for fellowship with sponsors and other estimators. We are also excited about the opportunity to spend some time away from the host hotel in the City of Denver.

I encourage you to look at the agenda for the Summit and seriously consider attending this year. It will be valuable to you as an individual for professional development. This is our first year of the new Summit and just the beginning of what we are planning to offer in upcoming years. I believe that we will sell out the available slots this year, so register early; and I look forward to seeing you in Denver!
President’s Message

Member Project Profile

HTETCO New Air Condition System To An Existing Storage Warehouse

The Reality of 5D BIM

Executive Director Corner

A Mile High Summit: The Arts and Science of Estimating

Chapter Meetings

Libbie Mill Library
Contractor: Gulf Seaboard General Contractors, Inc.
Owner: Henrico County – Department of General Services
Architect: BCWH

Size: 3-Story / 60,000 sf
Disturbed acreage: 3.3 acres.
Construction Cost: $15,050,000
Construction Time: Summer 2014 – Fall 2015
Delivery Method: Design-Bid-Build
Project Description: Gulf Seaboard with a team comprised of two generations of family members and field personnel; had the responsibility of managing over 35 subcontractors and coordinating efforts with the land developer Gumenick Properties effectively towards project completion. Libbie Mill Library is strategically placed with lakefront views in the middle of a larger urban mixed-use development called Libbie Mill Midtown. This project embodies all elements of complexity in design and construction which include robust concrete footings, massive interconnecting steel framed/ joist/ deck structure and in a few locations cantilevered overhangs, casework, wood panelling, waterproofing, air barriers, metal wall panels, high performance concrete wall panels, terra cotta wall panels, fiber-reinforced cementitious wall panels, PVC roofing, sophisticated MEP systems, and high tech communication systems. Many of the functions for the Libbie Mill Library will be to provide a welcome zone, public meeting rooms, periodical area, children/teen/adult areas, group study rooms, and a digital media lab with 3D printers. Another notable feature of the building requiring considerable coordination in construction is the “Heritage Wall”; which is an interactive digital display that provides an entertaining way of teaching the history of Henrico County. Along with this library seeking LEED Silver certification, this is a building on the cutting edge of building construction and we at Gulf Seaboard are proud to be part of its success.

Member Project Profile

Gulf Seaboard General Contractors, Inc.

Quality Construction Since 1982

Contact Us

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ONLINE CLASSES
PCE EXAM
MERCHANDISE

Chapter Meetings
Doug Henson, CPE -- Jester, Mentor & Friend

Words can hardly do justice to the memories and gratitude I owe this gentleman. I have had the privilege of knowing Doug since 1997. Working together with Doug at Baldwin & Shell was a life changing experience. He had a quick wit and was quite the practical joker, but when it came to work he was a ferocious lion. He was awesome with clients, stern with employees but fair as anyone could be. If you chose to pay attention, you could learn a lot from Doug. He exemplified the leadership qualities that one would hope to emulate.

I am indebted to him for getting me involved in ASPE. His encouragement and motivation helped me attain by personal best and led me into the leadership roles not only locally but nationally as well. I had the honor of having Doug attend our Annual Meeting in Indianapolis and install the ASPE officers the year I took over the helm as President. Receiving my Fellow in his presence meant the world to me. I was very emotional and I will cherish for a lifetime that I was able to share those days with my long time mentor in the industry.

I learned so much from Doug. He and his lovely wife Vicki are the true definition of friendship. They both always looked out for others and put those needs above their own. Life passes oh so quickly. We need to take time to cherish friendships and make an extra effort to hold on to them in our lives. Kelly and I had just recently talked about going to visit Doug and Vicki and we regret not making that journey earlier. ASPE has lost a dear friend and lifetime advocate for our Society. Doug always was an encourager to individuals in the industry to get involved and he truly believed in our Mission. He was excited about our new direction. I will miss my practical joker, my friend and my mentor, but he and Vicki will forever hold a special place in my heart and with anyone that had the privilege of knowing them.

Rest in Peace my Friend!

By: Doyle T. Phillips, FCPE

In Memory

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Section 2  Types of Methods of Measurements
Section 3  Project Specific Factors to Consider in Takeoff and Pricing
Section 4  Overview of Labor, Material, Equipment, Indirect Costs and Approach to Markups
Section 5  Special Risk Considerations
Section 6  Ratios and Analysis – Testing the Bid
Section 7  Other Pertinent Information
Section 8  Sample Plan for an Existing Warehouse
Section 9  Sample New Floor Plan
Section 10  Sample Estimate – Takeoff and Pricing Sheets
Section 12  Terminology-Glossary

By: Isam Ghandour, CPE
Arizona Chapter 6

HTETCO New Air Condition System To An Existing Storage Warehouse
Section 1 Introduction
The use of many storage warehouses in city centers is being adapted to office or manufacturing use. There is a high demand for office space and many industrial areas near downtown are being transformed to office space. This paper provides the understanding of the challenges on adding an air-conditioning system to single story ambient warehouse storage to be used as an occupied space. This adaptive reuse has many factors to be considered for construction estimators and developers. Existing roof conditions, insulation, optimum air-conditioning system selection, available electrical power, are all factors that need to be addressed by the estimator along with the design team.

Main CSI (Construction Specifications Institute 2016 MasterFormat) Subdivision 01 31 00 Project Management and Coordination

Main CSI (Construction Specifications Institute 2016 MasterFormat) Division 06 Wood, Plastics, and Composites

Main CSI (Construction Specifications Institute 2016 MasterFormat) Division 07 00 00 Rough Carpentry

Main CSI (Construction Specifications Institute 2016 MasterFormat) Division 07 07 00 Roofing

Main CSI (Construction Specifications Institute 2016 MasterFormat) Division 09 Finishes

Main CSI (Construction Specifications Institute 2016 MasterFormat) Subdivision 09 20 00 Plaster and Gypsum Board

Main CSI (Construction Specifications Institute 2016 MasterFormat) Division 23 Heating, Ventilation and Air Conditioning (HVAC)

Main CSI (Construction Specifications Institute 2016 MasterFormat) Subdivision 23 74 00 Packaged Outdoor HVAC Equipment

Main CSI (Construction Specifications Institute 2016 MasterFormat) Subdivision 26 05 00 Common Work Results for Electrical

Main CSI (Construction Specifications Institute 2016 MasterFormat) Subdivision 26 05 00 Common Work Results for Electrical

Section 2 Types of Methods of Measurements

Quantity takeoffs for interior improvements are measured in several ways including: air conditioning units by Each (EA), roof deck insulation by Square Feet (SF), wall insulation, by SF, roof structure supports by EA, roof patching by EA, metal studs and drywall by SF, condensate drains by Linear Feet (LF), electrical circuits by EA, and subcontractors pricing by Lump Sum (LS).

There are many takeoffs tools to be used, from the traditional drawing takeoffs, two dimensional takeoffs (2-D) software, or three dimensional takeoffs (3-D) also known as Building Information Modeling (BIM). With the advancements in computer technologies, estimating software is very common in the market. One of the leading software in 2-D is On-Screen Takeoff (OST) or On-Center Software. BIM estimating is used on larger and more complex projects throughout the lifecycle of the project. Whatever tool is used, the role of the estimator is still very important when transferring data on his estimate sheet as estimating is both an art and a science.

Items that are measured by EA, should be separated by types. If the air conditioning units (AC Units) are different in size, each size should have a separate condition. Wall insulation should be separated from deck insulation, and wall types should have separate conditions considering types and heights. Waste factors should be considered by the estimators for materials when finishing his takeoffs or assigning unit costs. An insulated wall with many bends, corners and varying heights will have more waste compared to a straight full height separation wall. For deck insulation, the existing roof structure will affect the amount of cutting and waste to make sure all areas between purlins and trusses are being filled with insulation.

Electrical circuits could be measured by EA to simplify the average cost of each circuit including conduit, wiring, breakers, disconnects and electrical hook-up. A subcontractor will breakdown the cost of the circuit to more details for exact takeoffs of the wiring and conduits in LF including horizontal and vertical runs, quantities by EA for breakers, disconnects and all fittings.

Contractor general conditions and supervision will be time driven, and will be measured by Weeks (WKS) or Month (MO).

Section 3 Project Specific Factors to Consider in Takeoff and Pricing

Small Quantities vs. Large Quantities
A larger warehouse will help reduce the unit costs assigned to the unit measure. For the mechanical scope, the cost of the installation crane is a fixed cost and will usually be a minimum trip charge of one day regardless of the number of AC units being installed. Scissor lifts and other equipment will also have fixed delivery and pick up charges that would be spread over many units to reduce the cost per unit. The learning curve for labor will improve as they do more of the same task.

Geographic Location
Location of the project will have a significant impact on the project cost. Union labor rates vs non union labor rates is a major cost factor. In downtown areas, many metropolitan city centers have regulations and agreements with certain labor union groups especially for carpentry, plumbing, mechanical and electrical. The AC units will have the longest lead time for order, fabrication and delivery. The location of the project site in relationship to the AC unit manufacturer factory location will affect delivery time and should be incorporated into the project schedule.

Seasonal Effect on Work
Cost of labor and materials is affected by the season the project is being constructed. In the summer, many schools have major projects during school recess and this will result in labor shortage. The contractor should understand the current market conditions to forecast availability of materials and labor. A boom in residential construction or multi family projects will affect commercial construction. AC unit delivery and fabrication times will also be affected due to higher demand, and manufacturers will have bigger
ET 2017

changing the building occupancy and use from industrial to office use will require many modifications and new calculations to be done to obtain occupancy change and a building permit. Since office use will have more occupancy, the drawings should show that the fire exits, number of restrooms, number of parking spaces are all adequate for the new occupancy. Suite accessibility should also be reviewed by the design team. Current building codes and ADA (American with Disabilities Act) requirements will trigger additional improvements.

Another building code that the team will need to satisfy, is the mechanical energy codes. New mechanical units should be energy efficient, and provide for outside air. The building envelope that the air conditioning system is to be installed, should have the proper thermal insulation to prevent energy loss. Insulation of roof deck and exterior walls are always associated with new mechanical system installation. R-Value for roof deck insulation should be a minimum of R-38 and exterior walls should be R-19. Existing roofing system might have an insulation value that would help reduce the R-Value for the new deck insulation. The mechanical engineer will run his calculations to determine if the existing exterior wall system has an established R-Value to reduce the insulation requirement for the exterior walls.

Although contractors are not responsible for the design, they should be aware of the current building codes and bring any potential issues to the owner and design team to help avoid any surprises during construction. After reviewing the existing site conditions with subcontractors, the contractors should provide the owner and design team all his concerns and questions to be addressed before the start of the construction. Any stoppage by the building officials and city inspectors during construction, will cause delays and increase the project cost for all parties. Contractors are now being used in many projects in a design assist role and their professional knowledge is a key factor to the success of every project.

Section 4

Overview of Labor, Material, Equipment, and Indirect Costs and Approach to Markups

The contractor will start the estimate by calculating his/her percentage of the employee's salary to cover the payroll taxes, insurance, vacation, company truck, gas, phone, and fringes. The percentage is based on historical accounting data of the company and the benefits provided by the company to its employees. For this project 40% will be added to the project team weekly rates.

The project duration is a key factor for calculating site supervision, project management, and general conditions. The estimator, with the help of the subcontractors, will need to come up with the optimum project duration taking into considerations material delivery, lead time, field installation, and proper inspections. Since the AC units have the longest lead time for fabrication, the mechanical work will be part of the critical path when developing the project schedule. The estimator will calculate the durations for activities before and after the installation of the AC units to come up with the project overall duration. Average lead time for fabrication and delivery of AC units is 6 weeks. The estimated project duration for this installation is 8 weeks.

Job site general conditions will be included to cover safety supplies and signage, progress clean up, final clean-up, temporary toilets, dumpsters/trash removal, and small tools. The extent of general conditions for an interior improvement project is much less compared to a new ground up construction. For this project the estimated supervision and general conditions are per Table 1.

Table 1

<table>
<thead>
<tr>
<th>Description</th>
<th>QTY</th>
<th>Unit Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager</td>
<td>1</td>
<td>$1,600.00</td>
<td>$1,600.00</td>
</tr>
<tr>
<td>Superintendent</td>
<td>1</td>
<td>$1,200.00</td>
<td>$1,200.00</td>
</tr>
<tr>
<td>Project Engineer</td>
<td>1</td>
<td>$1,400.00</td>
<td>$1,400.00</td>
</tr>
<tr>
<td>Insulation and Ceiling</td>
<td>1</td>
<td>$1,800.00</td>
<td>$1,800.00</td>
</tr>
<tr>
<td>Drywall and Finishing</td>
<td>1</td>
<td>$2,000.00</td>
<td>$2,000.00</td>
</tr>
<tr>
<td>Plumbing and Electrical</td>
<td>1</td>
<td>$2,200.00</td>
<td>$2,200.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$7,800.00</td>
</tr>
</tbody>
</table>

Direct costs from subcontractors will be requested via bid solicitations from multiple subcontractors. After the initial review of the construction documents by the estimator, he/she will make a list of trades that will be required to complete the project. For this project we will need mechanical, electrical, drywall, insulation, rough carpentry, and roofing subcontractors. Since the mechanical scope is the biggest line item in the project, it is recommended to send bid solicitations to more than five mechanical subcontractors. All subcontractor will provide lump sum proposals and the estimator will review their bids to verify they are complete.
and per plans and specifications.

Once all direct costs are calculated, the estimator will finalize indirect expenses including insurances, overhead, profit and taxes. Contractor liability insurance is required and the estimator will confirm if he current liability coverage is adequate for the project or if should buy additional coverage for the project. Builder’s risk insurance will also need to be addressed if it is provided by the owner or contractor. The estimator should be aware of the tax laws for the project location to confirm if he is responsible for the taxes as the prime contractor, or material taxes are to be paid at the point of sale for all materials purchased for the project. If the subcontractors are responsible for the taxes, this should be reviewed when doing scope reviews for all subcontractors’ bid proposals.

Section 5 Special Risk Considerations

Older warehouses that are used for storage have relatively higher roof clearances to allow for storage racking and forklift operations. Installation of rooftop mounted heat pump package units on high roofs will expose workers to the risk of fall injuries due to the roof penetrations. According to OSHA, falling is the most prevalent cause of fatal accidents in construction. Anyone working on the roof should be tied off and access to the roof should be limited to construction workers. Many older buildings have no parapets and that will increase the fall hazards. Contractors should anticipate and enforce the use of proper personal protection equipment (PPE).

In some cases these remodels will be done in an occupied space that is expanding its office area. Doing construction in occupied spaces will be very challenging to insure the public protection. Barricades and signage should be provided and continuous communications about the project progress and areas of construction should be conducted on daily basis with the tenants. Electrical shut downs will need to be scheduled off-hours to avoid business interruptions.

Section 6 Ratios and Analysis – Testing the Bid

Although the subcontractors will provide bids for their specialty trades, the estimator should understand the basis for the subcontractors’ estimate calculations and how they are developed to enable him/her to review and ask questions. The estimator should actually complete his own estimate before receiving subcontractor bids and compare both estimates to insure complete scope. For the mechanical scope, the mechanical subcontractor will solicit supplier’s quotes for the AC units, provide installation labor, fabricate duct drops with sheet metal, purchase copper piping for the condensate drains, and use rental equipment rates for cranes and scissor lifts. For this project there are total of eleven (11) 6.5-ton AC units. There are no registers, diffusers, main ducts or any ductwork distribution as this project doesn’t include the tenant built-out package. The general contractor preliminary estimate for the mechanical scope is per Table 2. A similar exercise will be done for other sub trades to come up with unit rates. The estimator will develop unit cost rates for each sub trade to complete the overall project cost.

Table 2

<table>
<thead>
<tr>
<th>Description</th>
<th>QTY</th>
<th>Unit</th>
<th>Unit Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical AC Units (FOB)</td>
<td>11</td>
<td>EA</td>
<td>$4.150</td>
<td>$45,650.00</td>
</tr>
<tr>
<td>AC roof curbs</td>
<td>11</td>
<td>EA</td>
<td>$54.00</td>
<td>$584.00</td>
</tr>
<tr>
<td>Duct Drops</td>
<td>11</td>
<td>EA</td>
<td>$420.00</td>
<td>$4,620.00</td>
</tr>
<tr>
<td>Condensate Drains</td>
<td>11</td>
<td>EA</td>
<td>$600.00</td>
<td>$6,600.00</td>
</tr>
<tr>
<td>Labor</td>
<td>294</td>
<td>HR</td>
<td>$48</td>
<td>$13,776.00</td>
</tr>
<tr>
<td>Scissor Lift</td>
<td>2</td>
<td>MO</td>
<td>$750.00</td>
<td>$1,500.00</td>
</tr>
<tr>
<td>Crane</td>
<td>1</td>
<td>LS</td>
<td>$1,100.00</td>
<td>$1,100.00</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td></td>
<td></td>
<td>$75,672.00</td>
</tr>
<tr>
<td>Overhead at 10%</td>
<td></td>
<td></td>
<td></td>
<td>$7,667.20</td>
</tr>
<tr>
<td>Profit at 8%</td>
<td></td>
<td></td>
<td></td>
<td>$6,316.96</td>
</tr>
<tr>
<td>Total Mechanical Estimate:</td>
<td></td>
<td></td>
<td></td>
<td>$83,175.16</td>
</tr>
</tbody>
</table>

Unit cost for Each AC unit delivered and installed. $8,470.47

Another calculation that will be helpful on future projects, is to get the ratio of air-conditioning tonnage in relationship with the warehouse square footage. In this project there are 11x6.5-ton AC units for a total of 71.5 tons of cooling. The warehouse area is approximately 18,260 SF, and this will make the ratio approximately 255 SF per ton of cooling. If the estimator is doing a budget for a similar project, this ratio will help in calculating how many AC units are required for cooling an existing warehouse.

Section 7 Other Pertinent Information

The general contractor estimator must think about the constructability of the project and all the means and methods for execution of the work. Installing new AC units might require the demolition and restoration of an existing ceiling. New interior drywall furring might affect existing electrical outlets that would need to be adjusted. Documenting all existing site conditions during a pre-bid job walk will help resolve future claims and disputes. The roofing system in an older building might have leaks that had not been noticed. The roofing subcontractor should make a quick survey of the existing roof conditions to insure there are not leaks or unacceptable roof patches from previous improvements. If the roofing system is still under warranty from the manufacturer, then an approved applicator by the roofing manufacture should be used to perform the new roof patches and to maintain the long term warranty. The estimator should also be aware of mechanical screening requirements in the jurisdiction of the project. Some municipalities require mechanical units on the roof to be screened by a parapet or new mechanical screens. Low profile AC units may also be used.

The estimator must send bid solicitations to multiple subcontractors. Due to construction industry market conditions, certain subcontractors might get very busy and would not have enough manpower to perform all their projects on time. A low subcontractor on one project doesn’t mean they would be low on another project. Having at least three subcontractors’ bids will make the general contractor estimate very competitive.

Section 8 Sample plan for an Existing Industrial Warehouse.
As-Built drawing for an existing warehouse in a distribution center. The suite is empty and the owner of the property would like to change the use of the warehouse from storage to office space. There is a high demand for office spaces near the city center and once the space occupancy is changed by adding air conditioning and insulation, the owner will find a tenant to lease the space.

Section 9 Sample New Floor Plan

Figure 2
Floor plan of the construction drawings showing new insulated full height separation wall, insulated drywall furring, and 11 new 6.5-ton rooftop package AC units.

Section 10 Sample Estimate – Takeoff and Pricing Sheets

Figure 3
Floor plan of the construction drawings showing new insulated full height separation wall, insulated drywall furring, and 11 new 6.5-ton rooftop package AC units.

The takeoff plan and table developed by On Screen Takeoff (OST) will help the estimator get quantities for materials and measurements needed. Based on the table the following quantities/measurements will be used in the estimate:

- **06 10 00 Rough Carpentry**
  - 11 EA Roof framing for 11 AC Units.

- **07 21 00 Thermal Insulation**
  - 18,260 SF Insulate Underside Deck - R-38 Wired w/Scrim

- **07 50 00 Membrane Roofing**
  - 11 EA Roof patches for 11 new AC units.

- **09 20 00 Master and Gypsum Board**
  - 3,932 SF Full Height separation wall 6” 20ga 16” oc 5/8 drywall 2 side 24’
  - 7,694 SF Full Height drywall furring 24’

- **23 74 00 Packaged Outdoor HVAC Equipment**
  - 11 EA 6.5 Ton Package RTU’s AC Unit

Detailed Estimate page 1

Section 11 Glossary/Terminology

**MasterFormat**

MasterFormat is a standard for organizing specifications and other written information for commercial and institutional building projects in the U.S. The purpose of this format is to assist the user to organize information into distinct groups when creating contract documents, and to assist the user searching for specific information in consistent locations. Information contained in MasterFormat is organized in a standardized outline format within 50 Divisions (16 Divisions pre-2004). Each Division is subdivided into a number of Sections.

**R-Value:** An R-value is a unit of thermal resistance for a particular material or assembly of materials (such as an insulation panel). The term is used in the building and construction industry. The R-value depends on a solid material’s resistance to conductive heat transfer. The higher the value of R, the better the building insulation’s theoretical effectiveness.

**Drywall Furring:**

Furring are thin strips of Metal to level or raise surfaces of another material to make space for insulation, or to level and resurface ceilings or walls. Metal furring strips can be used for commercial projects. Often called “hat channels” to describe the profile (cross section), they consist of two flanges on each side of a trapezoid shape, 7/8” thick.
The use of building information modeling (BIM) in construction continues to grow. In fact, 34 percent of contractors expect the number of projects involving BIM to increase in the coming year, according to the 2017 Construction Hiring and Business Outlook report conducted by the Associated General Contractors (AGC) of America and Sage.

For estimators, electronic models are not likely to totally replace 2D drawings anytime soon. However, model-based estimating (also known as 5D BIM) is gaining momentum as a way to improve efficiency and provide greater project cost savings and predictability.

"5-D BIM is being adopted on all fronts," says Kevin Miller, construction management professor at Brigham Young University, who specializes in estimating from building models. "Where you have a relationship between the contractor and the designer—more of a design-build approach—we see bigger strides being made than the traditional design-bid-build delivery method. But all fronts are advancing, just at different paces."

5D BIM Possibilities

The McKinsey Institute, a global management consulting firm, lists 5D BIM as one of the "five big ideas" that can help the construction industry transform itself over the next five years.

Many estimators see the same possibility.

Stuart Lange, preconstruction and VDC manager with Clark Construction Group, has long embraced the use of models in his estimating work. "It's how my head works," he explains. "I like being able to visualize things. It's exciting to see the industry ramp up and realize that this is the future."

Lange first used models to do structural steel and concrete takeoffs. Later he moved on to performing takeoff for all parts of the building. BIM, he says, is especially helpful for better understanding a project. He often uses models as a checklist to make sure nothing is left out of the estimate. "Even if it's a tiny speck on the drawing, it will have its own line item categorized in the model's selection tree so it can be found easier."

Especially on complicated projects, models can tell estimators things that 2D plans often can't. Lange describes how a model lets him visually see that a wall is slanted, where there are soffits, and other ins and outs that aren't apparent on 2D plans. "You can understand if something could be difficult to build so you can account for that in your estimate," he says.

Lange prefers to start his estimates with a model not only for visualization purposes, but to take off as much information from the model as possible. When dealing with bid projects that have very developed models he says he can get enough information to outline his entire estimate.

Models also facilitate collaboration, giving estimators the ability to provide valuable cost-saving feedback earlier in the planning process. In the future, Lange hopes to see models progressing to a point where even very early sketch-up models could provide the information estimators need.
Lange admits that models pose some estimating challenges. For example, certain information is rarely, if ever, modeled. Flashing and sheet metal, waterproofing, door hardware, and floor and wall finishes are just some of things that he hasn’t been able to get from a model. Also, some models are not as developed as others, again restricting the amount of information estimators can rely on.

Miller agrees. He sees the difference in the quality of estimating information coming from models as one of the biggest challenges to achieving the benefits of 5D BIM. “We’re going through a transitional period where some designers are advanced at using BIM and some are still learning it,” he explains, “so the amount of estimating-related information included in a model can vary greatly.” As a result, estimators have to refer to 2D drawings to get details that are often missing from the model.

Many 3D modeling tools will generate 2D information from the model, including floor plans, specifications and notes. However, the workflow to extract that 2D information from the model for full-blown production estimates isn’t an easy process. “It’s much quicker for estimators to use the 2D takeoff tools they’re used to,” he says. Consequently, estimators currently have to use multiple, unconnected 2D and 3D takeoff systems, complicating the process and increasing the chances for error.

In addition to technology advances, strides are being made to create industry standards that will further push 5D BIM into mainstream use. The BIMForum, for example, is helping to specify and communicate the content and reliability of building information models at various stages in the design and construction process. The specification allows model authors to define models for specific information exchange, milestones in a design work plan, and deliverables for specific functions. Quantity takeoff is one of those functions.

Models are rich with information that can be used effectively by estimators today, with even greater possibilities for tomorrow. “We’re knocking at the door (of 5D BIM),” says Lange. “There’s some really good things happening. And it’s going to keep progressing.”

For estimators, that door promises to open up a better understanding of planned projects, earlier cost feedback into the design process, and more cost-effective ways to complete construction.

The ability to link construction objects in a model to assemblies in a customized estimating database is also now possible, providing the estimator with the specification variables that are often missing in models.

The need for standards

In addition to technology advances, strides are being made to create industry standards that will further push 5D BIM into mainstream use. The BIMForum, for example, is helping to specify and communicate the content and reliability of building information models at various stages in the design and construction process. The specification allows model authors to define models for specific information exchange, milestones in a design work plan, and deliverables for specific functions. Quantity takeoff is one of those functions.

Conclusion

Models are rich with information that can be used effectively by estimators today, with even greater possibilities for tomorrow. “We’re knocking at the door (of 5D BIM),” says Lange. “There’s some really good things happening. And it’s going to keep progressing.”

For estimators, that door promises to open up a better understanding of planned projects, earlier cost feedback into the design process, and more cost-effective ways to complete construction.

Authors:

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Website: autodesk.com

Curtis Peltz is CEO of eTakeoff, a leading provider of construction quantity takeoff software, including technology that tightly integrates the 2D/BIM takeoff and cost estimating process. Email: curtisp@etakeoff.com
Website: etakeoff.com

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Meet the speakers...

This year’s list of speakers is sure to keep you on the edge of your seats.

Andy is noted for his precision in the planning and design phases of projects. He uses his technical experience to assist project managers during the preconstruction phase of a project, focusing on design, budgeting and value engineering. Andy specializes in evaluating the aesthetic and functional, as well as the schedule and cost implications of all design options a customer may be considering. He knows listening to the customer and establishing clear goals and expectations early in the process will allow him to make the most impact on the overall success of a project.

Read more about our speakers at: www.aspenational.org/2017Summit

ARE YOU ON THE RIGHT PATH?

Don’t miss out on early registration!
Catch a brief glimpse at everything there is to look forward to at this year’s annual summit.

### Summit Agenda 2017

**Wednesday July 12, 2017**
- 03:00 – 08:00: Registration
- 08:00 – 09:00: Welcome Reception

**Thursday July 13, 2017**
- 08:30 – 10:00: Two Concrete Things That Accelerate Transformation
- 10:15 – 11:45: The Leadership Advantage - How to Connect, Communicate & Influence Different Personas
- 12:00 – 12:30: Demonstration
- 12:30 – 02:00: Keynote Lunch
- 02:00 – 02:30: Workshop
- 02:30 – 04:00: Leveraging Historical Costs to Maximize Cost Intelligence
- 04:15 – 05:45: Microsoft Excel Skills For Estimators

**Friday July 14, 2017**
- 08:30 – 10:00: BIM Case Study
- 10:15 – 11:45: BIM Expert Panel Discussion
- 12:00 – 12:30: Demonstration
- 12:30 – 02:00: Lunch
- 02:00 – 02:30: Workshop
- 02:30 – 04:00: It’s Not Actually Worse Than Death: Surviving (and THRIVING) as a BIM Manager
- 04:15 – 05:45: Creating Time Efficiency & Managing Multiple Priorities
- 07:00 – 10:00: Awards Dinner

**Saturday July 15, 2017**
- 08:00 – 09:30: State of the Society Address and Q&A
- 09:45 – 10:45: Higher Education Panel Discussion
- 11:00 – 12:00: Estimating Textbook Discussion (Invitation Only)
- 12:30 – 01:30: Regional Breakouts
- 02:00 – 04:30: Rock Bottom Brewery Experience
- 06:00 – 10:00: President’s Dinner at the Denver Art Museum

### Special discounted pricing for undergrad and graduate level students

**Fun Filled events sure to keep you busy during the entire weekend!**

This year’s conference isn’t just educational because we’re turning up the fun! With social events ranging from a downtown Denver brewery visit, to a private function at the Denver Art Museum, and a diverse exhibit fair to meet expert companies delivering solutions and applications for estimators, every moment will be packed with fun, fellowship, and educational advantages.

**Can’t wait to see you in July!**

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**Meet some of our Speakers**

**Josh Bone, BIM Services Manager, JBKNOWLEDGE**

For more than a decade Josh Bone has been implementing, training and presenting construction technology solutions to AECO (Architecture, Engineering, Construction, Owners) professionals. Having worked with some of the top technology leaders in the industry, Josh specializes in identifying best practices and methodologies for integrating BIM and mobile applications into everyday workflows. Josh started his career working with design teams, then transitioned into helping construction professionals leverage technology in both the preconstruction and construction phases.

**Nora Burns, Speaker & Hiring Consultant**

Since stepping into the world of human resources more than two decades ago, Nora A Burns, SPHR has interviewed and on-boarded thousands of candidates and new hires for positions ranging from file clerk to executive vice president. Along the way, she decided to study and evaluate the hiring process from a different perspective, by participating in job interviews across the country. She did this not in her usual role of interviewer or hiring consultant, but as a candidate for administrative, supervisory and managerial roles. As The Undercover Candidate™, Nora has participated in over a hundred interviews to gain insight into the hiring process from the candidate’s perspective.

**Kenyon Salo, The James Bond of Speaking and Engagements**

Kenyon Salo is one of the top trainers, facilitators and keynote speakers in his field of adventure, leadership, team building, sales, inspiration and motivation. One of only six members on the Denver Broncos Thunderstorm Skydive Team he is seen each week flying into Sports Authority Field at 60 mph, exiting with a soft tip-toe landing on the ten yard line. He brings to the stage over 20+ years of successful audience engagement through humor, awe-inspiring moments, prolific storytelling and edge-of-the-seat content. His goal is to deliver high caliber, powerful and heart touching content to each person in the room.

**Don Henrich, President and CEO, Assemble**

Don Henrich is an accomplished technology veteran in both the MCAD and the AEC industries. As President and CEO of Assemble he brings an distinguished track record of innovation, winning strategies, team building, and the ability to quickly grow revenue and market share. Don and his wife Noel have three children, reside in Marblehead, MA and spend as much time as possible sailing on Massachusetts Bay.
ASPE’s Annual Summit will focus on continued education in the world of Estimating

Having found many of the best experts in these fields and more to offer insight and practical implementation to support and enhance an estimator’s skillset, we invite you to join us in Denver for an exciting and engaging conference.

Some of the things you’ll learn in Denver:

- Two unique leadership models that focus on building innovative and competitive systems and processes to bolster organizational success, and culture building within an organization from a leadership perspective.
- As a leader and team member, learn how to understand your strengths and weaknesses in a workplace situation in order to build better working relationships and team workplace dynamics.
- Ever feel like your to-do list constantly grows but time continues to run out? Hear from a leading expert on time efficiency and workplace productivity while learning practical tools you can use in your daily work to increase productivity and decrease stress.
- Everyone wants to know more about BIM and that’s exactly what we’re bringing to the table this year. We’ll hear from an expert panel on the use of BIM in construction and estimating that is specifically geared to address what estimators want to know more about.
- Learn from a leading construction company that searched, found, and implemented the answer to leveraging historical costs for current and future projects.
- Do you use Microsoft Excel in your daily work? Join us for an engaging high-level Excel training and presentation built specifically to address how estimators can maximize their understanding and use of Excel in estimating.
- Learn from one of the best to communicate and present work projects and presentations in an engaging and informative manner that will impress your peers, leaders, and future clients, and ultimately add value to your career.

LEARNING HAPPENS EVERYWHERE

Welcome new member S!

Name
Derek Kirkbride
Dan Dougherty
Jim Arcara
Mark Tarver
Raj Sayal
Steven Lott
Matthew Miles
John Morse
Steve Knotts
Christopher Schmeelk
Trevon Gaston
Mike Morwin
Scott Cartica
Sonia Douglass
Joseph E Gray

Company
TIS Construction
RK Steel
Ragnar Benson Construction, LLC
The Rinaldi Group, LLC
VI Associates
California High Speed Rail Program
Indiana State University
Trussway Manufacturing Inc.
KAI/Square Up
Jacobs Construction
Ballard Architectural Studio
Mechanical Testing, Inc.
Holman Inc
Johnson Mellor
Joseph E Gray Inc

Chapter
Los Angeles 1
Denver 5
Chicago 7
New York 10
New York 10
Sacramento 11
Detroit 17
Houston 18
St. Louis Metro 19
Greater D.C. 23
Southwestern Ohio 38
Empire State 43
Tampa Bay 48
Central Indiana 59
Nutmeg 60

Book your room today! Before its too late!

Book your stay under the ASPE room block at the Embassy Suites Downtown Denver by June 22, 2017. Book online at ASPE’s Group Webpage.

Wednesday, July 12, 2017 @ 6pm - Saturday, July 15, 2017 @ 10pm

Book by phone by calling 1 (800) 774-1500 for the Embassy Suites Denver Downtown Convention Center, or DENES, and mention the group code “ASP” to receive the ASPE room block rate.

www.aspenational.org/2017summit

Office Tel: 615.316.9200  (Mon-fri 9am – 6pm)

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