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MESSAGE FROM THE PRESIDENT

Marcene N. Taylor, CPE
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Estimators tend to be good planners. We help plan the costs for projects while they are in design and develop costs that lead to procurement plans and work plans during construction. While we are good at planning work as it relates to construction, we are not necessarily the right people to develop a comprehensive marketing plan for a non-profit professional trade organization. While going through the Strategic Planning process in the past year, we have come to the following realizations – we need a comprehensive marketing plan for the Society and we are not the ones to develop it.

Since the 2008-2009 fiscal year, the ASPE membership has dropped steadily. Some of the decline can be attributed to the construction market downturn but as the market has recovered, our membership numbers have not. This leads us to believe that we are not providing an appropriate value proposition to our current and potential members and/or that we are not doing a good job of informing people what the value of belonging to the organization is. We have defined our Core Values, Mission, and Vision and have rebranded the ASPE image through a new logo. Now we need to let people know about the organization and get them involved. The Board asked for help in developing a plan from a marketing professional and approved the plan on November 14, 2016. The plan involves modifying our existing website so it can be used not just to be a good tool for existing members looking for specific data, but also to explain the value of membership and provide interesting and relevant content. The look and content will be updated on a regular basis. The plan also involves developing a theme and booking speakers for the Summit in July. We intend for the Summit to be the capstone of the year. It will be a great event packed with educational and fellowship opportunities of value to members and non-members alike. The plan includes marketing the Summit to existing and potential members with a target on the local market. We will push content and information out about all that ASPE is doing through social media platforms. We will also develop plans to market the CPE (Certified Professional Estimator), AEP (Associate Estimating Professional), and PIE (Proficiency in Estimating) exams. We believe all of this information will add value to your membership and attract new members. Since members are the reason for the organization, this will make us more dynamic.

Look for the website to have a new look in the middle of January. You’ll also get communication from us regarding signing up to follow us on social media platforms and “save the date” information for the Summit. As always, the Board and I value your ideas regarding marketing and adding value to your membership. Please contact me with feedback.
Congratulations for having the entrepreneurial spirit. Most people wish they could work for themselves, it’s in the spirit of us all to call our own shots, choose the hours we will work, bank all of our profit. In the words of Walt Disney “The way to get started is to quit talking and begin doing.”

Well before you get to “doing”, I would like to share some information that may be of benefit to you before taking the road to starting your own “Estimating Consultancy Business”.

I recently closed my business after 5 years, it was quite an adventure and I am proud that I lasted 5 years in a business that the majority of the construction industry does not even know exists.
When I started my business, the industry was still in the throngs of our last recession. The construction industry was one of the most hard hit and the commercial general contracting firm that I was employed with was starting to lay off superintendents & project managers. As the lead estimator I started to see less projects coming through the door, even though the business development team was doing all it could to generate leads and working hard to bring in projects that we all hoped would be good fits for the company. Every business had to be very lean to obtain even a fair profit. Don’t know if that will change in the immediate future.

It has always been a dream of mine to return to the world of the self-employed, after all I was once a self-employed contractor when I was younger and not only did I learn tons of information about being in business.

I also had fun working with my hands, heart and mentoring fellow carpenters. I was able to be around home more often to help raise my terrific sons, as my wife was employed as well. There were times that the income of another person in the household was a tremendous asset due to late paying customers or slow times that happen in the construction industry.

When I went to the next chapter of my career as an estimator, I was always intrigued by the thoughts, “I wonder if the industry would pay for outside estimating services?” “Could I make a living assisting with cost estimating & doing takeoffs?”

The thought of it was always with me during my estimating tenure as an employee. Now that I had another set of skills developed not only from the twenty-one years of estimating as a self-employed contractor, but I also had the plus 10 years of leading the estimating department for a few commercial GC’s, along with joining & being active in the American Society of Professional Estimators (ASPE) & earning my certification.

I felt I was in the perfect position to try this new adventure in case anything needed to happen. Well it did happen 5 years ago when I was laid off due to the economy in the area where I was employed. They were taking the direction that the PM’s would do their own estimating. No need for estimators as far as they were concerned. Perfect, a great time to start the new business, no more going to work for anyone else. I was going to start an Estimating Services Business.

I had been researching estimating firms in the evening while working on my business plan…they were out there. Only a few in my region and they specialized in Site & MP&E scopes. I decided to take the architectural route. There was also the beginning of the organization called Consulting Estimators Round Table (CERT) that I was fortunate to find. A great organization of peers that I was lucky to be involved with in the beginning stages of becoming an association.

Now I will be surrounded by established firms that could offer advice and assistance when needed. I was happy to see that the majority of these members were fellow ASPE members and most of them were Certified Professional Estimators (CPE’s) like myself, this was setting up nice and it was time.

OK, what did I need to do to get busy and official?

GET A NAME & GET INCORPORATED:

You need to have this to be legit and for the benefits of tax write offs for your new business but also for your liabilities (more on that later)…besides having INC, LLC or CO. behind your name or company name is more professional. You will also need a Federal ID number. Your new clients will require this when they send you their W9 forms or you will not get paid.

MARKETING:

Business cards, perhaps a brochure describing your services at the beginning because you will need to get out and start shaking the bushes, marketing yourself and attend every industry event you can…. even in the evening and times even when you are tired. You need to get your business name & your talents out there and you will find that many times you will need to be explaining what it is you do, why you do it and why would they even need your services?

Be ready with your seven second elevator speech because this may be all the time you have before they lose interest. Write down every question that you can think of being asked because you will be asked, believe me. Get your answers down to memory. Have some friends or family ask you some questions, they’re good sources.

GET A WEBSITE, this is so important. We are all involved in the Internet and do all of our research, purchasing, and pleasure seeking no other way. Your future clients also use the Internet to find assistance. This is your resume posted out there for all to see, it’s what you do, how you do it, & why you do it.

Social media is also key…you need to embrace these outlets of marketing and maintain them such as Linked In and others. This will cost money and the more money spent on your website including the additional funding required to get your companies information to the top of a search engine will pay off much more than not having one. Also, you will need to get an email address to match up with your company name. You need to look professional and capable.

CLIENTS:

You may be fortunate and get a couple of clients out the door based on your reputation & contacts, but, you will need to keep your marketing going just as strong. Having a couple of clients will only go so far, they will inadvertently find ways of frustrating you including financially. The old adage of “don’t put all your eggs in one basket” holds so true here.

You must remember that although you may think that they will keep you plenty busy (and at times they will), they will also have some slow times, or more work than they can handle so they may need to pull back on using your services.

During my time in business I had many clients that were jammed up due to the company’s in–house estimators being very busy. Their big need was in takeoffs so they can handle some slow times, or more work than they can handle so they may need to pull back on using your services.

Let me repeat this line, “many clients were jammed up due to the companies in-house estimators being very busy.”

This does not happen very often so you may only get them as a client for a few projects or maybe even one. The boss may not have the need to hire another estimator just now…

“let’s get through this crunch with an outside service for now…I may start looking for another estimator if this keeps up”

This is a reality. Be ready to have as many clients as you can handle professionally. I was always able to manage no more than five without being stressed and overworked.

Now, you may be able to handle more if you specialize in one, two or three particular trades, but that will be something that only you will be able to determine as you progress. Architects & developers are good clients especially if they realize that they do what they do best and have enough in their budget to afford your business for project costing. Those are tough to find. I respect so much the firms that have the client base of architects, they have worked very long & very hard for those
clients. Subcontractors are good clients also, but they are very much the same as GC’s, they will contact you when they are busy.

New to the business, subcontractors make good clients also. Their goal is to be successful enough that they can have their own estimators, so ride that wave when you can get it. Other estimating firms are good sources of work, but they are in the same boat as you hope to be in some day...too busy to do some of the work themselves so they need some help... Their goal much like yours, is to bring in as much work and money as they can handle professionally without paying out anymore than required. This is basically business “priority number one.” If they don’t have the work to spread out neither will you.

But do not let this deter you from this alliance, it can be a good source of income at times and the comradeship of working and talking with someone else in your line of work is a tremendous opportunity to continue your education and build your company name.

**Tools of the Trade**

You will need to invest in a good computer with as much memory as you can afford, software to do your takeoffs (there are so many that I have used and experimented with and more are being developed it seems almost yearly). They can be expensive but they will be needed. Find what’s in your budget, but make sure it can do all that you may be required to do for your clients.

Two or more monitors are a big plus, and you will need software to write proposals, invoices, and enter your calculations. Many cloud based programs can be utilized to run a professional business such as FTP sites & storage sites. But as your business grows you may need to go beyond the free storage they offer to newbies and pay more for the additional storage.

**Money & Freedom:**

This is why you want to be an entrepreneur right? Good, be ready for the mountains & valleys that are associated with your goals. Making money that allows you to pay your bills and maintain your lifestyle is the ultimate goal. Perhaps you have been accustomed to your employer providing a steady paycheck during your estimating career; this will change, be ready.

You will have many “tire kickers” that will call on you to pick your brain about what your fees are and what you may charge based on their description of the project that they hopefully provide clearly for your fee. What about your fee? This is something that you will need to have in place almost immediately. What and how you charge will need to be defined. By the hour, or by the page, is a common way to set your fee.

Another way is to review the drawings and specs and provide a “not to exceed fee” based on your experience and gut feeling. If you go over that time you will not usually get the additional compensation.

Be warned there is more competition now than there was 5 years ago when I first opened my doors. There are many companies out there vying for the position of providing takeoffs to your potential client. Many of them are now in the market from other areas of the world especially the Asian countries. I don’t need to tell you that they charge much less than what is fair here in the U.S.

The increased competition can be attributed to many more takeoff software companies providing takeoff software for less money which allows more estimating services the ability to provide takeoffs. The economy is a global one now and I believe will not change so therefore, you will now have increased competition for your services from all over the world. I am not saying that they will or will not perform the quality of work that you provide, but the opportunities for your client to shop a bit more for a better rate is there.

Creating some samples of your takeoff services to submit along with your proposal is a good idea to show the quality of your work. If your goal is to make as much as you were making with your employer this will take time. Have some financial reserves to fall back on, I would recommend at least 6 months’ worth. Having a partner in your life that contributes to the household finances is a huge plus while you build your business and clientele.

Unless the client is someone you have a history with and will pay you your full fee within 30 days, you should have in your proposal/contract the amount required as a retainer or down payment. If they like your sample work and your credentials, they should have no problem paying this up front. You can request the balance to be paid upon completion and sometimes you will get this, but the construction industry revolves around the 30-60 and sometimes 90 day pay cycles. You may need to prepare for this. You may not get paid for a while.

A thorough contract/proposal needs to be developed to protect you. Have a lawyer assist you with this, it is a very important necessity. There will be some clients clear across to the other side of the country, much harder to drive to and pick up a check. You may have to take credit cards or start a PayPal account to be able to get that retainer in quickly, especially if they are in a jam and need your work back quickly.

Now, there are those that I call “kitchen table estimators” that work from home during the times they are not working for their employer during the day and getting that steady paycheck and benefits. These sources are very tough to compete with. Much like the plumbing company that has to compete against a fireman that does plumbing when he is not fighting fires. Overhead is just not there & the profit motive is not as important! Why should it be? They have a steady check with benefits. They can afford to stay just busy enough to make a little extra scratch.

If this is your goal, it is not the same as working full-time in your business. You can certainly try that angle, but when your client calls on you to assist them in a project that needs to be done by noon tomorrow and you have a bid due with your employer the next day, this already puts you at a disadvantage and you may have just lost this client for good.

I would also advise against calling on these “kitchen table” estimators to assist you when you get busy. I tried this when my business was starting to pick up and came to regret it. When I needed to know something submitted from this source and I got a “Hey can I call you back? My boss needs me to get an estimate done today” is not what I needed to hear. You have your client that needs some clarification right away on the scope that estimate done today” is not what I needed to hear. You have your

Other money matters that need to be considered:

**Support:** Accounting services, legal services, industry memberships.

If a portion of your services is providing estimated costs along with your takeoffs, you will have to invest in outside cost data bases or maintain constant updates on materials and labor rates for the area you may have to assist with. Have a source for this in case you are asked to help out in another state.

**Taxes:** This cannot be avoided, both federal & state. Set aside at least 25 to 30 % of your earnings for this.

**Health Benefits:** If this is with a significant other you have an advantage over others, if not, this is a big ticket item that will be due every month.
Retirement / Savings: This is not always on the front of your mind but you need to eventually address this or all your hard work will not amount to much other than paying the bills.

Office Supplies: Computer and cloud based storage systems for all your files & client work.

Workspace: Will you be working from home or are you planning on leasing office space? This will be something you may need to adapt to. Not everyone can concentrate in their home environment.

Freedom: Will be a lot different than you may be currently used to. There will be times when you will work late into the evening or on weekends. Scheduling vacations or holidays can be a bit of a challenge. Remember the great paying client that gives you a lot of work may be calling on you at the last minute to assist them.

The client is your bread and butter. Telling them that you are leaving for a few days with the family for holiday just may jeopardize you ever getting another job with this client. You may be able to take your laptop with you and do the work on the getaway, but you just lost that freedom that you thought you were gaining by working for yourself.

In summary: I am not discouraging anyone from starting an estimating business, go for it if your life is lined up to do so. There are many successful estimating firms out there.

I had a great 5 years of being in my estimating business and will never regret it. I learned so much and interacted with so many great companies, associations & individuals.

The increased competition with lower rates, the up and down economy, and this time in my life when I need to get very serious about my retirement have all played major roles in my decision to go back to work for a solid company with a steady check & benefits.

I take this experience with me and don’t regret it...I wish you luck and success if you decide to take this career path...you will need it.

About the Author: Carl Cathcart CPE and has been in the construction & estimating fields since 1977. He currently works for Fiorilli Construction Inc. in Medina Ohio as the Chief Estimator. He welcomes anyone thinking of being an independent estimating consultant to contact him at ccisinaz@me.com if you would like to discuss his experiences.
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“HOW TO ESTIMATE THE COST OF A GENERAL EDUCATION CLASSROOM BUILDING ON A FOUR-YEAR UNIVERSITY CAMPUS AT THE CONCEPTUAL STAGE – INCLUDING DIRECT, INDIRECT, AND OWNER COSTS FOR A TOTAL PROGRAM BUDGET”

By: Greg Ellis, CPE
Southeast MAL #93

Introduction -
This paper will outline the process and issues to consider when preparing a Conceptual Program Estimate of a general education classroom building on a four-year university campus. A Conceptual Program Estimate for a classroom building will typically include Direct Cost spanning the CSI Divisions of work.

While limited design information may be available to prepare the estimate, it is recommended to approach the preparation of the estimate as if you were “building this building in your mind.” Additionally, to prepare a comprehensive program estimate you will need to consider the appropriate Indirect Costs associated with the project. The Indirect Costs applicable to this type of project may vary with each University but typically include Design Fees, Testing Fees, Furniture Fixture & Equipment Costs, Technology, Security Systems, and other consultant or professional services that may be required to fully deliver the total program of the project.

The logical thought process of working through each CSI Division, and applicable Indirect Costs, will clearly identify cost, develop accurate assumptions, and clarify the complete scope of the project to the Design Team, and most importantly the University.

A. Main CSI Division:
Division One (1.4) General Construction Estimating

B. Specific Sub-Division:
Divisions 1-33

C. Brief Description:
For the purpose of this paper the Conceptual Program Estimate is best described as the first evaluation of cost prepared when beginning a new classroom building project. The Conceptual Program Estimate should be as detailed as possible and identify major categories of cost per the CSI structure as related to Direct Construction Cost. Direct Construction Cost will be essentially the “bricks & mortar” cost for this building. The Indirect Cost will be all other related and applicable costs required to complete the Conceptual Program Estimate not directly attributable to “bricks & mortar.” This paper is written from the Program Manager/Owner’s Representative perspective, and is intended to represent the overall Conceptual Program Cost Estimate that a University Administrator will typically request when evaluating the merit of a potential new classroom building on campus. It must be noted that the Conceptual Program Estimate is only one component of the information required of the Program Manager by the University in order to approve a new campus classroom building. Finally, it must be noted that the Conceptual Program Estimate is one of the most important, if not the most important, documents that will be produced throughout the course of the project. This is the first time that the University will evaluate the total program costs associated with the project and ultimately the Conceptual Program Estimate is the document that all future estimates and decisions will be compared against.

Types and Methods of Measurement -
Assumptions & Information Provided:
The key to the Conceptual Program Estimate is the level and detail of information that has been provided to prepare the estimate. The information may come from several sources including the Architect, Engineers, and the University. It is imperative to take time to fully read all information provided, and to cross reference information to insure that there is sufficient data available to prepare a concise and accurate Conceptual Program Estimate.

For this paper it is assumed that the Architect has provided artistic renderings of the proposed classroom building, a program document identifying the size and function of spaces within the building, preliminary floor plans, preliminary site layout plan, and written narratives of the proposed structural, mechanical, plumbing, and electrical systems. The University has provided a manual of campus architectural and system standards which outline the acceptable materials, and requirements for new capital construction projects. Finally, it is assumed that the University has provided a listing of the applicable Indirect Costs that will be included in the total Capital Investment by the University when evaluating this project.

This project will be located on a major four-year university campus in the Southeast United States, with a strong tradition of Georgian architecture. The University has a desire to pursue sustainable design elements and construction practices, but has no formal policy regarding LEED certification. The chosen site is located within the campus limits with all required utility infrastructure immediately available to the project site.

Measurements:
Based on the information provided by the Architect, Engineers, and the University; it is unlikely to assume that quantity takeoff for all components of the building will be possible to performed. It is realistic however, to expect that several key measurements will be derived from the information provided that will assist in the evaluation and pricing of
The following key measurements of the building and site will need to be identified:

1. Gross Square Footage of the Building
2. Building Perimeter
3. Floor to Floor Height
4. Square Footage of Elevated Floor Slabs
5. Square footage of Slab on Grade
6. Lineal Feet of Exterior Walls
7. Lineal Feet of Interior Walls (Rated & Non-Rated)
8. Square footage of floor area for each interior space
9. Interior perimeter of floor area for each interior space
10. Roof Area
11. Count quantities of interior and exterior doors and entrances
12. Counts of specialty items (toilet partitions, hand-dryers, marker boards, projection screens, etc.)
13. Lineal feet of built-in casework/millwork items
14. Total area and perimeter of disturbed site
15. Total area and perimeter of parking
16. Total area of hardscapes (sidewalks, patios, site walls, etc.)
17. Total area of landscaped areas
18. Lineal feet of utility services (domestic water, fire water, natural gas, sanitary sewer, storm sewer, electrical primary)
19. Count quantities of assumed utility structures (manholes, light poles and bases, catch basins and/or storm structures)
20. Lineal feet and square feet of site retaining walls

Estimating Direct Costs of the Project:

The recommended way to prepare the Direct Costs of the Conceptual Program Estimate is to approach the estimate as if the project is being “built” in your mind. Approaching each CSI Division of work will allow for review of the information available and establish the logic for assumptions and further clarification of pricing.

Division 3 Concrete:

For this project, the primary scope of work included in Division 3 Concrete will consist of Foundation systems, Slab on Grade systems, Elevated slabs on metal deck, and Architectural Precast Concrete. No detailed structural information available with the exception of the knowledge that shallow foundations will be acceptable given a preliminary investigation of subsurface soil conditions, and that the recommended structural system will be structural steel column/beam/bar joist/metal form deck. Based on review of the exterior renderings provided by the architect and review of the University Design guidelines, it can be determined that all Architectural elements above the second floor will be architectural precast concrete systems.

Shallow Foundations:

The foundation system of the building will be shallow spread foundations. Based on local construction practice knowledge, the spread footings will be earth formed and will not require man-made plywood forms. The size of the footings are not known but will be assumed as an overall 8'-0" x 8'-0" x 1'-6" in all locations. The size of footings is relatively arbitrary at this point in the design, but based on experience with this type of building construction and historical reference to other similar projects using this standard size for all spread footings will allow for changes up and down in size of footings as the design evolves. Review of the floor plans will locate footings at all exterior column locations (30 EA), building corners (27 EA), around the central rotunda space (15 EA), and then spaced throughout the interior areas of the building to allow for sufficient load distribution while not interfering with the room layout (26 EA). The total number of foundations (98 EA) quantified will be multiplied by a unit price of $1200/EA for an 8'x8'x1'-6" footing to include all concrete, rebar, pouring, and finishing.

Review of the plans and building section identify two tiered classroom spaces. To accommodate the grade change required for the tiered classroom and sloped slab on grade, a section of cast in place concrete retaining wall will need to be included. This retaining wall will need to accommodate a grade change of approximately 2'-0" beginning at the rear of the classrooms and running south to the building corner and east along the front wall of the two classrooms. The retaining wall can be assumed to be 1'-0" wide with a 3'-0" x 1'-0" footing.

For new classroom buildings with relatively simple foundation systems a good rule of thumb to check the footing layout is that the total cost of shallow foundation systems should be approximately $2.00 - $3.00 per GSF of the building. For this project, given the assumptions for footings, retaining walls, and pits the overall foundation system is $2.29 per GSF which fits within the acceptable range for shallow foundation systems for a new classroom building.

Elevated Concrete Slab on Metal Deck:

At the second floor, third floor, and mechanical mezzanine there will be concrete slabs pumped into place and finished on the metal deck. As with the slab on grade systems, the quantities should be derived digitally. For this project the elevated slab on metal deck with be estimated based on an assembly of 5'-12" deep 4000PSI concrete fill with 6x6/10GSWWF and 1.5 lbs. of rebar for floor openings and at beam locations. The quantities digitized from the second, third, and mezzanine levels yield a total SF of elevated slab on metal deck of 47,031 SF. An important consideration in the unit cost will be the height the elevated concrete will be placed. In this market, and given the building is less than 4 stories tall, it is typical to pump the concrete up to the elevated slabs and therefore the unit cost should reflect the cost for pumping. The composite metal deck material and installation will be priced in Division.
The stairs for this project and most classroom buildings will be metal pan stairs that will require concrete fill in the treads and landings. A simple square foot quantity can be calculated digitally for the treads and landings from the floor plans provided. The stair pans will typically require a 2” concrete fill and a reasonable assembly price is approximately $6.30/SF of tread and landing surface.

Architectural Precast Concrete:
For this project the architect has chosen to use architectural precast concrete to create the shapes and desired Georgian architectural elements above the second floor. The use of architectural precast is largely due to the consistency of fabrication of intricate forms and shapes, as well as the reduction in cost versus natural stone for intricate shapes.

Due to the limited information available at the Conceptual stage and the review of the exterior renderings it is important to carefully evaluate this system. The complexity of these elements should be taken into consideration when beginning to quantify the precast concrete. Many of the upper elements will be intricate in the profile sections and may require that the architect provide a sketch of the cross-section profile so that they may be accurately priced. Some of the lesser complex elements may be noted and qualified in the body of the estimate to identify each piece. In general, it is recommended that the architectural precast be priced by individual element if possible, and that the pricing be broken down to material cost for each element, and then an erection price be applied for the system as a whole.

The architectural precast can be broken down by element (cornice, caves, arches, banding, etc.) and priced individually for material cost. The best way to estimate the material cost is to quantify each element by linear foot or by each as applicable to the individual element. Once this quantity is determined then each element can be multiplied by the cross-sectional area to determine the volume in cubic feet. Most architectural precast concrete elements can be then priced using an allowance of $70-90/CF for material. It should be noted that the more complex and intricate the individual element is designed that the cost for material and fabrication should reflect the upper end of this acceptable range.

On this particular project a good example of this method can be seen in the upper cornice and light shelf architectural precast element. In reviewing the renderings and plans the total linear feet of this element can be quantified to be approximately 565 LF. By reviewing a simple section of this element the cross-sectional area is determined to be 5.75 SF thus yielding a total of 3,248.75 CF, or 5.75 CF/LF. For this individual element the material cost per LF will be assumed at the midpoint of the acceptable range $80/CF. In the estimate this is then converted into a cost per LF of the element for clarity and noted with the assumed material cost per CF. This same method for calculating each individual architectural precast concrete element is utilized throughout the estimate to accurately represent the anticipated cost of the material.

Once the material cost for each individual element has been determined the erection and installation must be priced. This will be done in a much more general format, and will account for crane and hoisting costs, labor, etc.

Typically for most architectural precast systems the rule of thumb on precast erection is that the cost is equivalent to 30-40% of the total material cost for precast elements. Additional consideration for erection cost should be the complexity of the elements, height from ground level, and space to stage and erect on site. For this project it is determined that the complexity of elements, height from the ground, and site layout restrictions will cause the erection to be priced at the upper end of the acceptable range therefore the factor of 40% of material cost is applied.

Division 4 - Masonry:
On many new classroom buildings masonry construction can be a significant portion of the cost. In this region, and on this project, it is typical that architects will design masonry exterior facades to include brick, stone, concrete masonry units, etc. For this given project the masonry scope of work, while significant, is largely made up of exterior systems. The only interior masonry construction will be for the concrete masonry (CMU) at the elevator shaft walls.

All other masonry work will be at the exterior of the building for brick and natural stone.

Concrete Masonry Units:
On most classroom buildings there will be some components at the interior of the building that will be built using CMU walls. Because of the architect has identified that the building structural system will be structural steel the amount of interior masonry construction is reduced significantly. For this project the only area of the building using CMU construction will be at the elevator shaft wall. By reviewing the architectural narrative and floor plans, the quantity of CMU walls can be measured by taking the perimeter of the elevator pit (8'-0"x8'-0") yielding a perimeter quantity of 32 LF. The narrative identifies that the elevator will extend to the mezzanine level to allow for access to mechanical equipment therefore by using the combined floor to floor heights in the preliminary quantities derived for the project (42 VLF) plus an additional 10 VLF at the mezzanine level, it can easily be determined that the total SF of CMU wall required for the elevator shaft is 1664 SF. It should be noted that this does not take out SF of wall surface for elevator shaft openings for elevator doors, as typically this will be ignored in the early calculation of the CMU construction to allow for a small built in contingency. In this region the CMU wall construction will typically cost $10-15/ SF for the total and in this application it has been priced at $13.60/SF.

Exterior Brick:
In this region, and on most four year college campuses, the character and image of the buildings on campus is considered sacred. By reviewing the University Design guidelines it can easily be determined that exterior brick will typically be specified both in color, size, and acceptable patterns for the architects to design new buildings. Additionally, many times universities will have specific brick material cost allowances identified in the design standard guidelines as well. On this particular project review of the design standard reveals that the exterior brick should be a reddish brown color of common face dimensions (4”x2-2/3”x8” units) and installed in a running bond pattern. This knowledge will make the pricing of exterior brick much easier and reduce the potential for later cost impacts if elaborate brick patterns or detailing is reflected as design evolves and full exterior elevations are prepared. If this information in not available then it is recommended that questions and or investigation of other newly constructed campus buildings be referenced as a benchmark for basis of the cost estimate assumptions for exterior brick.

On this project it is relatively easy to identify the areas on exterior skin that will be brick construction; however, the exterior rendering and conceptual elevation should not be solely used to determine quantity of exterior brick. Due to the layout and nature of the perimeter of this classroom building it will be necessary to use the floor plans at each level along with the exterior elevations to accurately quantify the exterior brick. This can be done by measuring at each level the building perimeter and then using the corresponding elevation to determine the height of the brick. Once gathered these two interim quantities will be multiplied and will yield the exterior surface SF of brick. On this project that process yields a total of 13,335 SF for exterior brick. To price this system it is necessary to know how the exterior brick will be attached and supported to the exterior wall of the building. The exterior backup wall system will be light gauge metal stud with exterior sheathing therefore the exterior brick assembly price will need to include ties and reinforcing back the supporting walls and allowances for steel angles for brick ledges. Additionally, because the new building will be multi-story the assembly cost should include staging, scaffolding, and should account for productivity rate. On this project in particular there is a large amount of natural stone architectural precast concrete and exterior window/door openings that will impede a masonry contractor from having a high rate of productivity. In general most classroom building with less ornate exterior elevations and simplistic brick patterns will allow for a greater productivity on the brick and a reasonable assembly cost would be $18-20/SF of brick. On this project in particular, due to the factors listed above low productivity, intricate elevation, etc. the assembly cost for exterior brick is priced at $28/SF. It is recommended to also inquire with local masonry subcontractors to validate assumptions on productivity, complexity of the project, and other concerns that may not be immediately obvious based on the information available at this early stage.

Natural Stone:
As outlined in the previous section on Architectural Precast Concrete, Natural Stone is another system that is difficult to quantify and price at the conceptual design stage. Much like the precast system it is recommended to break the various individual elements down as much as practical given the information available to allow for clarity in assumptions and also provide greater accuracy in the costing of this system.

For most new classroom buildings, the exterior skin will rely heavily on the character and image design criteria dictated for a given campus. A close review of the campus design standards will typically outline the acceptable exterior materials that may be utilized by the architect in the design. For this project in particular, the university campus design standard has clarified that all exterior stone-like materials used at first floor exterior conditions, as well as columns (engaged to exterior wall, or independent of exterior wall) will be required to be of natural stone materials such as limestone. As such, consideration should be given to the availability of natural stone, distance from quarry to production facility, distance to jobsite, as well as the inherent location on the building exterior. It is also recommended to request the architect to provide additional information regarding anticipated stone selections, color variances, and any other applicable details that will assist in the evaluation of this system.

In the same general manner that the architectural precast concrete is broken down into individual elements to allow for pricing, natural stone will also be evaluated by volume where possible with regard to the material pricing. For this region it is typical to obtain natural limestone material in the range of $130/CF to $160/CF in most cases. Premium costs for curved elements may yield a higher fabricated material cost and therefore should be taken into account when pricing individual elements.

On this project the natural can be broken down by element (curved panels, rusticated panels, engaged columns, and independent columns) and priced individually for material cost. An example of this method can be seen in the rusticated natural stone panels at the ground level. In reviewing the renderings and plans the total square footage of this element can be quantified to be approximately 8,550 SF. Additionally, by reviewing a simple section of this element, the cross-sectional area is determined to be 5’ typically thus yielding a total of 3,591 CF, or .42 CF/SF. For this individual element the material cost per CF will be assumed at the midpoint of the acceptable range $155/CF. In the estimate this material cost is then converted into a cost per SF of the element for clarity and noted with the assumed material cost per SF. This same method for calculating each individual natural stone element is utilized throughout the estimate to accurately represent the anticipated cost of the material.

Once the material cost for each individual element has been determined the erection and installation must be priced. This will be done in a much more general format, and will account for crane/hoisting costs, labor, etc. Typically for most natural stone systems the rule of thumb on erection is that the cost is equivalent to 40-50% of the total material cost for natural stone elements. Additional consideration for erections should be the complexity of the elements, height from ground level, and space to stage and erect on site. For this project the complexity of elements and prominence to main entry areas will cause the erection to be priced at the upper end of the acceptable range therefore the rate of 50% of material cost will be applied for erection.

Division 5 Metals:
Division 5 Metals will typically be broken down into Structural Steel, and Miscellaneous Metals. This breakdown allows for separation of primary elements of a building related to structure to be quantified and priced according to the intended procurement of materials and installation. For most projects the structural steel will be procured from a steel fabricator that specializes in structural shapes, metal deck, and open web joists. All other metal fabrications (railing, angles, etc.) are typically provided by a second metal fabrication provider and are therefore segregated in the estimate for clarity.

Structural Steel:
On this project the conceptual design narrative provided by the design team has identified the primary structural system for the classroom building to be structural steel. While there are no structural design layouts available, the architect and structural engineer have identified that the steel frame of the building will likely be approximately 10 lbs. per GSF. This information can be used to quickly determine the total tonnage of structural steel that will be required for the project. It is recommended however to double check this information by utilizing the basic quantities that have been determined for the project. On most typical classroom project that utilize a structural steel frame the elevated floors will typically range from 8-15 lbs. per SF of floor area. Additionally, the roof steel framing will typically be lighter per SF in this region and can be in a range of 7-10 lbs per SF. As such, a quick exercise to verify the architect’s information will be beneficial. The total SF of floor area at the second floor, third floor, and mezzanine level yields 47,031 SF. Using a weight of 10 lbs per SF for these areas it can be determined that a total of 470,310 lbs of structural steel will be required for these areas. Using the roof areas previously determined (21,942 SF for flat and sloped roof conditions) and a weight of 8 lbs per SF, it can be determined that a total of 175,536 lbs. of structural steel will be required. The total combined weight of structural steel for this project is 645,846 lbs or 323 tons. This information can then be divided by the total GSF for the building to yield an average weight of 10.46 lbs per GSF which is very close to the architect and engineers recommendation.

Once the average weight per GSF is verified sufficiently the structural steel can be priced in Tons. In this region structural steel material and fabrication is typically priced separate from the erection. As such an acceptable range for structural steel material is typically $2,400/Ton - $3,100/Ton pending the complexity of the project. It is recommended to verify current market rates for structural steel with local or regional suppliers if possible before finalizing the estimate. Additional consideration should be given to availability of material, current or projected price increases, and lead times for material. To price the erection for the project the calculated tonnage for structural steel is also used.

Erection in this market may be packaged with the same vendor that is supplying the material or may be procured independently. Erection prices will vary based on the complexity of the building, layout and work area available, requirements for crane or hoisting of materials, and availability of certified erectors in the area. For this market most standard steel erection costs range between $1100/Ton for simple buildings and $1500/Ton for very complex projects.

It is common for the metal deck to be quantified, priced and procured as part of the total structural steel system. Metal deck is not included in the tonnage calculation for material or erection therefore metal deck should be quantified and priced according to applicable areas of the building. In this project there are two areas that will require metal deck. Composite metal deck will be utilized at the elevated slabs for the second floor, third floor, and mezzanine level. Metal roof deck will be used at the roof areas, but will be separated by flat and sloped roof areas to account for increased labor to install decking on a sloped roof. In this marketplace metal decking is priced per SF and reasonable assembly costs are as follows: composite deck is $2.45/SF; flat metal roof deck is $2.00/SF; and sloped metal roof deck is $2.15/SF.

Miscellaneous Metals:
At the conceptual level it is very difficult to identify and price all of the applicable miscellaneous metals that will be required for a project. For most classroom buildings it is reasonable to identify metal pan stairs by flight, metal railing assemblies by LF, and any other overtly miscellaneous metal fabrication that are possible to quantify. Once the initial review of the documents is complete, it is typical to provide an estimate allowance for miscellaneous metals using historical cost/GSF method. Depending on the number of classrooms, the function of spaces, exterior cladding systems, and other potentially unique characteristics it is reasonable to allow between $0.35/GSF and $0.75/GSF to account for miscellaneous metal items that will be defined at a later point in the design process.

Division 6 Woods & Plastics:
Division 6 Woods and Plastics is typically broken down into two primary cost categories Rough Carpentry, and Finish Carpentry. Additionally finish carpentry can be broken down even further but for this project will generally be described as Millwork.

Rough Carpentry:
Depending on the structural and exterior skin systems for a new classroom building the amount of Rough carpentry will vary greatly. In general, most
classroom buildings will be structural steel frame or concrete frame therefore the amount of rough carpentry will be significantly less than in other building types. The exterior skin of a classroom building will also dictate the amount of rough carpentry required for a new building. This project is comprised of a structural steel frame and masonry, stone, and precast exterior skin will greatly reduce the amount of rough carpentry required. The majority of the rough carpentry cost will be found in miscellaneous roof and exterior skin opening blocking, as well as interior blocking at millwork locations. At the conceptual design level it is not likely that sufficient detail is available to develop accurate quantities for the rough carpentry. In most cases it is acceptable to provide an estimate allowance for rough carpentry using historical pricing on a cost/SGF basis. In most classroom projects similar to this project, an allowance of $0.50/SGF will be sufficient to provide roof blocking, interior blocking and exterior skin blocking until sufficient detail is provided.

Millwork:
For a new classroom building interior finish carpentry and millwork are typically laid out early in the design to allow for input by the End User. This allows for reasonable quantities to be extracted even though specific details of the millwork and finish carpentry may not be available. By reviewing the floor plans it can be easily determined basic LF quantities for individual millwork elements. Typically the conceptual design narrative will identify the intended finish quality for millwork as well. Using this information it is reasonable to include LF allowances for all identifiable millwork in the estimate. For most general classroom buildings it is common for millwork to be constructed of plastic laminate finish on the main body of the pieces, and typically the tops will be constructed using a plastic laminate finish as well. A good unit price for material and installation is $200/LF for base cabinets and tops. Special consideration should be given to high profile areas such as entry vestibules, executive offices, conference rooms, etc. and unit prices should reflect the quality of the space where millwork is to be included.

Division 7 Thermal Moisture Protection:
For a new classroom building there is no typical standard for thermal moisture systems. It is imperative given the critical nature of water-tightness, and impacts on the mechanical loading to be sure that the thermal moisture systems on any building are clearly understood. At the conceptual level of design there is very little information to rely upon so it is important to clearly identify any assumptions made in the estimate.

Waterproofing:
For this project the majority of the building is constructed above grade therefore there is relatively little exposure to water intrusion below grade. waterproofing for the below grade areas will be included for the elevator pit walls and at the retaining walls at the sloped classroom. In these areas the SF of surface area for the walls can be used from previous takeoff items. For this region a good assembly cost for below grade waterproofing is $3.25.

Caulking and Sealants:
At the conceptual design stage it is recommended to include an allowance for interior and exterior caulking and sealants for dissimilar material connections. In this market much of the interior caulking and sealants will be provided by the painting trade contractor and will be included in the assembly costs for that trade identified in Division 9. It is generally acceptable to include an allowance of $1.00 to $1.50 per SF to cover additional costs related to caulking and sealants that may not ultimately be included in Division 9 Painting.

Roofing:
Based on review of the conceptual design narrative, rendering, and the campus architectural standard there will be several different roofing conditions. Basic square footage quantities can be taken off digitally for each respective area. In a detailed review of the project it should be noted that a pedestal paver system and waterproofing substrate will be used at the second floor over the south entry. This system will consist of a waterproofing layer applied directly over the concrete slab on metal deck. This system will be flashed as needed to meet the roof drains that will be provided and installed by the plumbing contractor. Typically this system will be measured in SF and a good unit price to include waterproofing membrane, flashings, pedestal system, and paver system is approximately $24.00 per SF of roof area. At the majority of the main roof a low slope modified bitumen roofing system will be utilized. A quantity for the flat roof areas can be easily quantified by digital takeoff. Consideration must be given for turning the low slope roofing system up the interior sides of the perimeter parapet walls. In some projects the parapet walls will only extend 18-24” above the roof surface and can be accounted for in the unit price of the system in lieu of specifically quantifying the actual SF of additional surface area. For this project the parapets do not extend significantly above the roof level and therefore the unit price will be adjusted to account for this portion of the system. In this market a reliable assembly price for a modified bitumen roof is $10.50 per SF of low slope roof.

At the sloped roof condition the intended roofing application will be a simulated slate synthetic shingle roof. This system is very similar in appearance to a traditional slate roof; however, it is often preferred for reduction in cost, lighter roof loading, and enhanced architectural appearance. This system will require that a vented nail base be installed over the metal roof deck to allow for proper venting and anchorage of the simulated slate shingles. Additionally this market typically requires the installation of an ice and water shield membrane to be installed over the vented nail base as well. The nail base will be priced typically on a SF basis and in this market a good unit cost is $3.50 per SF of sloped roof for material and installation. The simulated slate roof will also typically be priced on a SF basis and in this market a good unit cost is $9.35 per SF of sloped roof for material and installation.

Appropriate roof drainage and roof accessories must also be considered when preparing the conceptual estimate. Typically at the conceptual design stage the architect often does not identify the gutters, downspouts, or scuppers required in the final design. For this reason, experience will typically be the basis for including the appropriate allowances in the estimate for these items. Understanding the likely flow of water from different roof levels will help in determining quantities. Most gutters will be determined in linear feet (approximately $15.00 per LF), and downspouts will be determined in vertical linear feet (approximately $12.00 per VLF). Finally, thru-wall scuppers will be typically located at the low sloped roof areas and may be determined per each (approximately $55.00 per each location).

Division 8 Openings:
At the Conceptual design stage there is very little information to rely upon when evaluating Division 8 Openings. As the design progresses the Architect will begin to formalize door and window schedules, and coordinate the drawings with the specifications to better identify and mark the intended assemblies to be included in the final design. For this project it is necessary to separate the openings into several categories to clarify assumptions on materials and size of openings. It is imperative to clearly break down the openings by size, function, material type, etc. in order to have a reliable benchmark as the design goes forward.

Additionally, it is useful to review the campus design standard and conceptual design narratives to determine if there are standard systems that the architect or University will require for the project.

Doors, Frames, and Hardware:
On most new classroom buildings interior door frames will be hollow metal frames, and doors will be solid core wood doors. Most single interior door openings will be 3’0”x7’0”, and double door openings will be 6’0”x7’0”. Exterior openings will fall into two typical categories on a classroom building, utility openings and entry openings. For most utility openings the size will generally be consistent as with the interior openings (single 3’0”x7’0”; double 6’0”x7’0”) and the door frames and door leaf will both be hollow metal. Exterior Entry openings will typically be aluminum frame with glass and are procured as part of a storefront system and will be discussed later.

There are several ways to quantify door openings, either by assembly (frame, door leaf, and hardware combined) or by individual component. For this estimate it is recommended to break the openings down into individual component to allow for future flexibility in revising the estimate when the architect modifies the opening assembly components. Following this method, some discretion will be necessary to determine which openings will be in rated walls assemblies thus requiring rated doors, and which openings will likely be non-rated wall assemblies requiring non-rated door assemblies. Additional review will identify a count quantity for interior doors versus exterior doors and an assembly cost calculation based on this quantity will be included for the respective interior vs. exterior hardware assemblies. For this market most single hollow metal frames will cost approximately $175.00 each; double hollow metal frames will cost approximately $250.00 each; non-rated solid core wood doors will cost approximately $250.00 each; rated solid core wood doors will cost approximately $400.00 each. The hardware assembly costs
are typically $550.00 per each for interior door hardware, and $850.00 per each for exterior door hardware. One additional hardware assembly that is typical for classroom buildings will be a “panic hardware” designation which is required in corridor and exterior exiting conditions. In this market panic hardware assembly cost is approximately $1,000.00 per each.

Storefront, Curtainwall, Glass & Glazing:

Several factors will determine the most appropriate glass and glazing system for a new classroom building. Those factors may include structural system of the building, exterior appearance, height of the building and individual openings. In this project the architect is required to use glass and glazing systems that will be in keeping with the Georgian architectural style used throughout the campus. Additionally, the building height and opening height is generally conducive to the use of a storefront system. The storefront system will allow for an architectural frame profile in keeping with campus design standards, and will also work well with the masonry detailing. A general rule of thumb is that for openings up to 12'-0” in height the use of storefront systems is much more economical to curtainwall systems. In most cases curtainwall systems will be used in cases where multi-story window heights are desired by the architect. Storefront systems at the conceptual stage are generally priced by SF of surface area. It is important to note that not all exterior storefront openings will be seen in the conceptual elevations provided so cross-checking with floor plans is recommended to verify that all openings are accounted for in the estimate. Several factors will affect the cost of the storefront system including glazing type (coatings, thickness, color, tinting, etc.) as well as the depth of the framing system, color of the framing system, and equipment required for multi-story installation. Assembly costs may vary greatly for storefront systems depending on these factors. Very simplistic storefront systems cost can be as low as $28 per SF, ranging to $100 per SF for very complex and ornate systems. It is recommended to consult with local glass & glazing specialty contractors to verify anticipated costs for a given storefront system. On this project the use of an architectural framing system style, coating requirements and multi-story installation the approximate cost of the storefront assembly has been priced at $65.00 per SF.

The exterior aluminum entry door openings are also considered part of the storefront system. The aluminum entry doors will be required to have the same architectural frame style as the storefront system. Most aluminum entry doors will be priced as either single or pair assemblies and will include the doors, frames, glazing, and hardware as part of the assembly cost. On this project the cost for the entry door openings will be increased due to the unique architectural style required. Single entry openings will be approximately $3,500.00 per each, and double entry openings will be approximately $6,800 per pair.

Other items that should be included for new classroom buildings will be allowances for mirrors at restrooms, as well as glazing for door view lites, and view windows at interior walls. In classroom buildings that have office space for faculty, most universities will require either sidelite windows flanking office doors, or view lites to be included in the doors. This is generally required to eliminate spaces where multi-story window heights are desired by the architect. Storefront systems at the conceptual stage are generally priced by SF of surface area. It is important to note that not all exterior storefront openings will be seen in the conceptual elevations provided so cross-checking with floor plans is recommended to verify that all openings are accounted for in the estimate. Several factors will affect the cost of the storefront system including glazing type (coatings, thickness, color, tinting, etc.) as well as the depth of the framing system, color of the framing system, and equipment required for multi-story installation. Assembly costs may vary greatly for storefront systems depending on these factors. Very simplistic storefront systems cost can be as low as $28 per SF, ranging to $100 per SF for very complex and ornate systems. It is recommended to consult with local glass & glazing specialty contractors to verify anticipated costs for a given storefront system. On this project the use of an architectural framing system style, coating requirements and multi-story installation the approximate cost of the storefront assembly has been priced at $65.00 per SF.

The exterior aluminum entry door openings are also considered part of the storefront system. The aluminum entry doors will be required to have the same architectural frame style as the storefront system. Most aluminum entry doors will be priced as either single or pair assemblies and will include the doors, frames, glazing, and hardware as part of the assembly cost. On this project the cost for the entry door openings will be increased due to the unique architectural style required. Single entry openings will be approximately $3,500.00 per each, and double entry openings will be approximately $6,800 per pair.

Other items that should be included for new classroom buildings will be allowances for mirrors at restrooms, as well as glazing for door view lites, and view windows at interior walls. In classroom buildings that have office space for faculty, most universities will require either sidelite windows flanking office doors, or view lites to be included in the doors. This is generally required to eliminate spaces where multi-story window heights are desired by the architect. Storefront systems at the conceptual stage are generally priced by SF of surface area. It is important to note that not all exterior storefront openings will be seen in the conceptual elevations provided so cross-checking with floor plans is recommended to verify that all openings are accounted for in the estimate. Several factors will affect the cost of the storefront system including glazing type (coatings, thickness, color, tinting, etc.) as well as the depth of the framing system, color of the framing system, and equipment required for multi-story installation. Assembly costs may vary greatly for storefront systems depending on these factors. Very simplistic storefront systems cost can be as low as $28 per SF, ranging to $100 per SF for very complex and ornate systems. It is recommended to consult with local glass & glazing specialty contractors to verify anticipated costs for a given storefront system. On this project the use of an architectural framing system style, coating requirements and multi-story installation the approximate cost of the storefront assembly has been priced at $65.00 per SF.

The exterior aluminum entry door openings are also considered part of the storefront system. The aluminum entry doors will be required to have the same architectural frame style as the storefront system. Most aluminum entry doors will be priced as either single or pair assemblies and will include the doors, frames, glazing, and hardware as part of the assembly cost. On this project the cost for the entry door openings will be increased due to the unique architectural style required. Single entry openings will be approximately $3,500.00 per each, and double entry openings will be approximately $6,800 per pair.

Drywall and Metal Stud Assemblies:

On this project the structural system is defined to be structural steel, and the architect has identified that the exterior and interior walls will be constructed with light gauge metal stud assemblies. In this market the drywall subcontractor will typically provide light gauge metal stud framing, hanging of drywall and sheathing, as well as finishing of all drywall in preparation for wall finish applications. In some markets a separate framing contractor will frame walls and hang drywall to be followed by a painting contractor that will finish the drywall surfaces and paint all applicable surfaces. It is important to have a knowledge of the local marketplace and the typical construction methods in order to accurately price metal stud assemblies. For this project the metal stud assemblies will be broken down into two primary categories for pricing, exterior assemblies and interior assemblies.

Exterior Metal Stud Assemblies:

Exterior stud assemblies can be quantified either by lineal foot or by square foot; however, square foot is recommended to insure that the height of walls is considered in the unit pricing. It should be noted that the square foot calculation will be for one side of the wall assembly and not for both sides. On this project the exterior wall quantities can be easily extracted from the key measurements. Each individual level is measured at the perimeter and then multiplied by floor-to-floor height for the respective level. This will yield the total square feet of exterior metal stud assembly required for the project. The exterior metal stud assembly will generally consist of 6” 20 ga. metal stud members, thermal insulation, interior drywall, and exterior sheathing. Depth of the studs, insulation type, interior drywall type, and exterior sheathing type will all be factors for variances in pricing based on requirement of the given architect or University. Based on the architectural narrative the architect has given general instruction on exterior wall assembly makeup, and a good assembly cost is $7.20 per square foot. Consideration should also be given to the number and size of exterior openings shown in renderings or elevations. Unless the exterior openings make up a significant percentage of the overall exterior skin it is generally acceptable to ignore the exterior openings at the conceptual stage.

Another component to the exterior metal stud assemblies is light gauge metal roof trusses. On many classroom buildings the sloped roof will be design for light gauge roof trusses. These roof trusses are assembled offsite with light gauge metal studs and shipped to the jobsite for erection. Most simple roof trusses can be priced by square foot of sloped roof area; however, at times a more complex roof may require pricing by individual truss. Consultation with a truss manufacturer or drywall contractor will help in confirming assumptions on complexity of truss fabrication and erection costs. In this market the drywall contractor will usually be requested to procure and install the roof trusses because of the similarities to light gauge wall assembly construction. Consideration to the slope, intricacy of framing, height off the ground should all be factors in the cost for fabrication and erection. On this project the sloped roof is relatively simple and the trusses can be erected with relative ease as well. The cost for most light gauge metal roof trusses will range from $6.00 per SF to $10.00 per SF and this project will be priced at $7.50 per SF.

Interior Metal Stud Assemblies:

Much like exterior metal stud assemblies, Interior metal stud assemblies may be quantified by either lineal foot or by square foot. Again it is recommended to quantify the interior metal stud assemblies by square foot in order to account for height of walls, vertical drops from the underside of structure, etc. In classroom buildings, interior metal stud assemblies should be broken down according to ratings. Most corridor, mechanical, electrical, and stairwell spaces will generally have a minimum 1 hour wall rating requiring that the wall extend to the underside of the structure above and be caulked and sealed accordingly. For most non-rated wall assemblies the height of wall will not be known at the conceptual level and in most cases it is acceptable to assume that the walls will also extend to the underside of the structure above. This will essentially allow for a built in waste factor and allow for flexibility in the design and layout of interior walls as the project goes forward. Additionally, unless there is a significant amount of door or interior window openings in the interior walls, it is generally acceptable at conceptual design stage to ignore the door openings in the calculation of the interior metal stud assembly quantity. Depending on location within the building most interior stud assemblies will consist of top and bottom track, 3-5/8” metal stud members, sound insulation, and one layer of drywall on either side of the stud assembly. In areas of high traffic such as corridors or entry vestibules some Universities will require the use of abuse resistant or high impact drywall to be installed. Additionally in some lecture halls a university may also require a higher STC rating for the wall assembly to avoid noise transfer to adjacent spaces due to the usage of amplified sound systems. For this project the basic quantities are derived for interior metal stud assemblies by quantifying the lineal footage of wall type (rated vs. non-rated) on each level, then all walls are assumed to extend to
the underside of metal deck above. For rated wall assembly a good unit price is $10.00/UF, and for non rated walls a good assembly unit price is $4.50. It should be noted that again the square footage calculation is for one side of the wall assembly only.

Drywall Ceilings and Miscellaneous Assemblies:

On most classroom and University buildings ceiling assemblies will typically be acoustic tile systems however for security reasons most universities will require that public restroom spaces will have drywall ceiling assemblies. Similar to wall assemblies a ceiling assembly will need to include the light gauge framing members as well as the drywall. Additionally for many classroom buildings the main entry spaces and corridors will have some amount of drywall ceiling assemblies. Depending on the complexity of the ceiling design and height of ceiling the cost of the assembly will be higher if the design is more complex. At the conceptual level of design there is usually very little information relating to the ceiling configuration so experience with similar projects will typically be a basis for assumptions. Drywall ceiling assemblies should be quantified on a square foot of surface area basis. On a standard restroom and small space ceiling such as a corridor a good assembly unit price is $4.25 per SF.

In conjunction to drywall ceiling assemblies, it is typical for architectural to change ceiling heights to accent areas of the building, lower height of lighting to allow for accent, or to accommodate special elements architecturally or structurally within the building. This can be an area of the estimate that is often missed but can have significant impact on the cost of a project going forward. It is best to review ceiling layout and ceiling heights with the architect if possible which will allow for better assumptions on ceiling drops and bulkheads. For most conditions a ceiling drop or bulkhead can be quantified in square foot of surface area. The condition should be measured in vertical distance from the structure above and horizontal distance across the condition to derive the square foot of surface area. A good assembly cost for most ceiling drops and bulkheads will be $7.25 per SF.

Once exterior wall assemblies, interior wall assemblies, ceilings, and drops have been included in the estimate it is recommended to review the project for special or miscellaneous conditions that do not fall into one of these categories. Most new classroom buildings on a university campus are an opportunity for the architect to make a design statement either into the building or exterior to the building. On this project the main entry rotunda is a good example of this type of architectural statement. At the conceptual level the architect has given no information regarding the way the rotunda ceiling will be constructed; therefore, an allowance should be included for the rotunda ceiling. For conditions unique to a given project it is good practice to consult with the architect to gain a better understanding of how the ceiling will be constructed. It is also acceptable to include a general cost allowance for the condition and obtain agreement from the architect that the allowance is sufficient. For this project the architect has suggested and agreed to an allowance of $32,000.00 for the rotunda ceiling.

Hard Tile:

Hard tile is used in classroom buildings typically in wet areas, corridors, or in some instances entry areas due to the high durability of the materials. Most often hard tile will not be used in elevated levels of the building with the exception of restrooms. For this project the architect has identified in the conceptual narrative that all walls and floors in the restroom will be porcelain and ceramic tile, and the floors in the main rotunda entry will be terrazzo as well as the treads and risers for the main stairwell to the second floor. For the restroom floors the ceramic tile will be quantified by square foot of floor area and the unit cost will be $8.50 per SF installed in a thin set method. For the restroom walls the porcelain tile will be quantified by square foot of wall area (to assumed ceiling height of 9'-0") and the unit cost will be $8.50 per square foot. A consideration for most ceramic or porcelain tile floor and wall applications will be the pattern of actual tile type that the architect or interior design consultant will ultimately select. It is often helpful at the conceptual design stage to clarify the material cost allowance that is assumed for hard tile in order to provide a basis for comparison as the design evolves.

The rotunda floor has been identified to be a terrazzo floor surface. Terrazzo is a composite material that can be poured in place or precast for areas such as stair treads or risers. Terrazzo typically consists of various forms of aggregate materials (marble, glass, granite, quartz) that is then mixed with a cement based or chemical based compound and poured in the applied area. Often elaborate patterns can be achieved in floor and wall applications and it is commonly utilized in highly visible spaces of a classroom building. Depending on the material composition, patterns, and size of the space the cost for installing terrazzo can vary widely. Most applications are quantified by square foot of floor or wall space and then by linear foot of treads and risers and base. On this project the floor application will be priced at $22.00 per SF, and the treads and riser at $150 per LF, and the terrazzo base will be priced at $25.00 per LF.

A good assembly cost for most ceiling drops and bulkheads will be $7.25 per SF. Consideration to size of tile (either 2x4 or 2x2), tile type and style, sound rating, and in some conditions water resistance will all be factors in the pricing of acoustic tile.

Resilient Flooring:

As noted earlier most classroom interior finishes are selected for long term durability and ease of maintenance. Resilient flooring (vinyl composite tile, carpeting, sheet vinyl, wood flooring, rubber flooring, etc.) will often be used in different areas of a classroom building based on space function. Vinyl Composite Tile (VCT) will often be utilized in corridors, classroom spaces, and small spaces due to the low cost and ease of maintenance. Elaborate patterns in VCT floor will typically be used in corridor spaces to add color an emphasis to the space but can also aid in directional organization of the building. Most classroom spaces will be limited to one or two simple colors or patterns to eliminate distractions to students. For most standard areas such as classrooms a good unit cost is $1.75 per SF, for corridor areas with elaborate patterns a good unit cost is $4.50 per SF.

For office areas, conference rooms, study rooms and other spaces where noise transfer is a significant concern it is typical that carpet is specified. For most classroom buildings it is typical to utilize carpet tile which can allow for some design flexibility and be applied in patterns as dictated by the architect. In addition the use of carpet tile will often allow for easier removal and replacement when damage occurs. Carpet tile pricing can vary significantly based on patterns, material, installation methods, and size of space to be applied. Carpet will typically be quantified in square yards and it is recommended to provide a material cost allowance to clarify the grade of carpet tile assumed in the conceptual design. For this project a material allowance of $35.00 per SY has been identified and a total assembly unit cost of $38.00 per SY has been included.

In specialty classroom areas or laboratory classrooms it is common to have flooring systems that are extremely durable such as heat welded vinyl. This type of resilient flooring system is common in nursing or "wet" classroom or laboratory conditions. It is useful due to high resistance to water or liquids, and the ability to sterilize the floor regularly without damaging the floor system. This type of floor system is not typical to most classroom buildings and will likely be identified in the conceptual design narrative. The heat welded sheet vinyl flooring is typically quantified in square yards of floor and the quantity should include the underside of metal deck above. For rated wall assembly a good unit price is $10.00/UF, and for non rated walls a good assembly unit price is $4.50. It should be noted that again the square footage calculation is for one side of the wall assembly only.

Acoustic Ceilings:

Most classroom buildings will have a large portion of the ceilings designated as acoustic tile ceilings. This system is a relatively inexpensive alternative to framed drywall ceilings. In a university settling the ability to easily access mechanical, plumbing, electrical, and data components also makes the use of acoustical ceiling more common. Acoustical ceilings may be quantified by square foot of surface area of ceiling. For simple ceilings with no elevation changes or for larger spaces the cost for acoustic ceilings can be as low as $2.00 per square foot. In smaller spaces or more complex spaces where multiple ceiling height changes are present the cost can exceed $4.00 per SF. Consideration to size of tile (either 2x4 or 2x2), tile type and style, sound rating, and in some conditions water resistance will all be factors in the pricing of acoustic tile.

For office areas, conference rooms, study rooms and other spaces where noise transfer is a significant concern it is typical that carpet is specified. For most classroom buildings it is typical to utilize carpet tile which can allow for some design flexibility and be applied in patterns as dictated by the architect. In addition the use of carpet tile will often allow for easier removal and replacement when damage occurs. Carpet tile pricing can vary significantly based on patterns, material, installation methods, and size of space to be applied. Carpet will typically be quantified in square yards and it is recommended to provide a material cost allowance to clarify the grade of carpet tile assumed in the conceptual design. For this project a material allowance of $35.00 per SY has been identified and a total assembly unit cost of $38.00 per SY has been included.

The final component to include with resilient floor systems is the base condition. In areas of high traffic it is not uncommon to see metal base systems or hard plastic base systems. For most classrooms bulding applications it is most common to see either 4" or 6" rubber base applied for durability and low cost. In most cases rubber base will be applied at all floor to wall connections and will be priced by the linear foot. At the conceptual level it is reasonable to multiply the interior wall linear footage by two in order to account for both sides of wall, and add the linear footage of exterior wall to determine the total linear feet of rubber base. Consideration should be taken for integral base applications such as noted above for the heat welded sheet vinyl flooring or for terrazzo or other hard tile base
Division 10 Specialties:
Division 10 Specialties will cover a broad category of components such as bathroom toilet compartments and accessories, code related room and directional signage, fire extinguishers and cabinets, classroom accessories, acoustic wall panels, and operable wall partitions. Due to the wide variety of elements covered in this division there are multiple ways to quantify the individual components. Most items will be count items; however, some items such as operable wall partitions will be quantified per square feet of wall system. Most conceptual design documents and narratives will not identify the full scope of Division 10 items required for construction therefore experience with similar projects and historical knowledge will be the primary basis for inclusion in the estimate. For most universities there are campus design standard which will outline the preferred type of toilet compartments, fire extinguishers and cabinets, signage standards, and also standards for classroom accessories. Other items such as acoustic wall panels and operable wall partitions will be unique to the given project and may not be identified in any of the information available. Most toilet compartments and accessories can be segregated in the estimate by standard stalls and accessible stalls. Pricing will differ between standard and accessible stalls, and will also depend on factors such as floor versus ceiling mounted, compartment wall materials (plastic laminate, stainless steel, solid polymer, etc.). For this project the university design standard requires ceiling mounted solid polymer toilet compartments and the unit price for standard compartments is $1,500.00 per each, and the unit price for accessible compartments is $1,625.00 per each. Toilet accessories can be quantified by individual component (grab bars, toilet paper holder, coat hook, soap dispenser, etc.) or rather by an allowance per toilet compartment until the required toilet accessories are better defined. For this project an allowance of $250.00 per each standard compartment is acceptable, and an allowance of $400.00 per each accessible compartment should be sufficient. Some universities will have campus wide procurement agreements in place to purchase new and replacement toilet accessories in bulk and will ultimately provide those items to the contractor for installation during construction. This information should be considered during preparation of the estimate if possible to better reflect the actual procurement that will happen during construction.

Most universities will also outline general guidelines for classroom accessories such as marker boards, bulletin boards, room signage, and projection screen mounts based on classroom type and function. Specialty classrooms and laboratory classroom will have unique requirements based on function. All of these items will be quantified by count and should be included in the estimate individually. In this project the nursing lab classrooms at the second floor indicate that curtain tracks and curtains will be required as a specialty classroom accessory. These will be quantified per lineal foot of track and a good unit price for this item is $12.00 per lineal foot.

Lecture halls and large classroom spaces that will employ the use of sound systems will often require acoustic wall panels to dampen the noise inside the classroom and also limit sound transfer out of the classroom. Though these are not identified in the information available it is acceptable to include an allowance for these items until more information regarding location and type of acoustic panel is available. For this project an allowance of $10,000.00 has been included.

In large classroom spaces it is also sometimes desirable to include operable wall partitions to allow for temporary division of the space into smaller areas. This can be accomplished with simple accordion type partitions or by segmented wall partitions with integral pass-thru doors depending on the space. Operable wall partitions will vary greatly in cost depending on the specific type of partition ultimately selected. Operable walls will generally be supported by miscellaneous steel framing suspended from the structure above. This assembly is typically included in Division 5 Miscellaneous metals and only the actual wall panel system will be accounted for in Division 10. For this project a segmented operable wall panel system will be included in lieu of an accordion type and the unit cost for this system is approximately $55.00 per square foot of wall. This quantity is derived from the length of wall fully extended multiplied by the height to support beam above.

Division 11 Equipment:
Division 11 Equipment can also include a wide variety of components. It is important to ask the architect and the University what equipment will be procured in the Direct Construction Estimate and what equipment items will be considered Indirect cost. For this project the only equipment required to be included in the Direct Construction Cost will be the various appliances for the break room spaces. At this stage of design the actual appliance equipment selections will not be available so a lump sum allowance for appliances will often be acceptable. For this project there are two spaces identified on the third floor where appliances will likely be included later in the design and therefore an allowance of $10,000.00 has been included.

Division 14 Conveying Systems:
All classroom buildings exceeding one story will require that an elevator be included in the estimate. Typically for most classroom buildings under 4 stories the most economical type of elevator will be hydraulic. In building over four stories traction elevators are typically required. Some universities will have specific maintenance and operating requirements which will limit some elevator manufacturers from the ability to provide conveying systems on a given campus. Consideration of the primary usage of the elevator (passenger, freight, or both), loading requirements (varying from 1500 lbs to 5000 lbs), vertical travel rate (varying from 50 feet per minute to 200 feet per minute) and total vertical travel distance will be factors in the total cost of the hydraulic elevator. Elevators are typically quantified by number of stops or floors that will be services by the elevator. In this project the elevator will service all three main occupancy floors plus service the mezzanine level for mechanical equipment access. Consultation with local elevator manufacturer representative will allow for more consistent pricing but in general a good rule of thumb is that the reasonable elevator cost per stop will be approximately $25,000.00. Additional cost considerations will be upgraded elevator cab finishes, upgraded elevator doors and surrounds, and upgraded elevator controls or other accessories. Because most classroom buildings will be used primarily by a large volume of student on a daily basis it is typical that elevator cab finishes, doors and surrounds, and controls will be basic and very durable materials to withstand the usage.

Division 21 Fire Suppression:
Fire suppression systems for new classroom buildings will often be a wet system unless there are areas of the building that will require a specialty system that cannot be subject to water exposure. In general the fire suppression system cost is a function of the density of sprinkler head spacing. In most classroom buildings the standard distribution is 130 SF of building space per sprinkler head. In some laboratory classrooms or more hazardous areas the density of sprinkler heads may be increased. For most
classroom buildings with a standard density requirement the total system cost will be approximately $3.00-$4.00 per GSF. On this project there are no spaces assumed to require a greater density of head spacing therefore a unit cost of $3.25 has been applied in the estimate. Water pressure should be considered in the cost of a fire suppression system. In some areas the available water pressure may not be sufficient to provide water to the system therefore a fire pump may be required to boost available pressure to the building. Consultation with the mechanical and civil engineers will often uncover concerns about water pressure and the potential cost premium for a fire pump.

Division 22 Plumbing Systems:
Most plumbing systems for new classroom buildings will be relatively simple. The majority of plumbing will be for restrooms, breakrooms, and roof and floor drainage therefore it is possible to quantify the plumbing systems by fixture count and apply assembly unit prices to account for fixture, supply and waste piping, and other plumbing equipment. At the conceptual level of design there will be little information available to develop full takeoff and pricing of all required components of the system. By performing a simple count quantity it can be determined that there are 61 internal plumbing fixtures of varying types (toilets, urinals, sinks, drinking fountains), in addition it is assumed that there will be 1 roof drain every 400 SF of low slope roof areas yielding approximately 40 roof drains. By applying a unit cost of $4,500.00 for internal plumbing fixtures, and $3,500.00 for each roof drain a total plumbing system cost of $414,500.00 (approximately $6.71 per GSF) is determined for this project. On most classroom building the plumbing system cost may also be evaluated on a historical cost per gross square foot basis. An acceptable range for most classroom buildings is $5.00 per GSF and $10.00 per GSF in this marketplace assuming that there are no wet or chemical laboratories requiring natural gas, acid waste piping or other specialty systems. Use of a good historical database along with consultation with local plumbing trade contractors is recommended to verify the conceptual pricing assumptions.

Division 23 HVAC Systems:
The HVAC system for this building is much more complex than the plumbing systems; however the conceptual narrative gives quite a bit of good information that will be useful in preparing the estimate. Many new university classroom buildings the HVAC system will consist of a 4 pipe variable air volume system. On this project the classroom building will be broken down into three air handler zones (first floor, second floor, and third floor) and the air handlers will be mounted in the mechanical penthouse. The building will be provided with an air cooled chiller with a screw compressor mounted in the adjacent mechanical yard. Hot water for heating will be provided by a gas fired, copper fin, atmospheric boiler located in the mechanical penthouse. The chilled water piping will be schedule 40 steel pipe with welded fittings and the hot water piping will be either Type L copper or schedule 40 steel pipes. The VAV boxes will be provided with hot water coils for external and internal spaces. Each classroom will be provided with a thermostat and other areas of the building small rooms and offices will be grouped together on a single thermostat determined by use and exterior exposure. In the larger rooms and conference rooms there will be a single thermostat for control. A direct digital control (DDC) system will be provided for the building operations management per the University Design guideline. The mechanical system will also include energy recovery units (ERU) to preheat outside air prior to introducing it into the return air stream at each air handler. These ERU’s will also be located in the mechanical mezzanine. The ductwork will be galvanized sheet metal and the space above the ceilings will be utilized as a return air plenum to reduce the quantity of ductwork required for the project. While this is all useful information to work with it is often difficult to translate this information into accurate pricing.

At the conceptual level this system has been described well by the design engineer but no sizing information for mechanical equipment or loading requirements are known. As a result it is useful to use a general rule of thumb for classroom building that for every Ton of HVAC system required there will be a corresponding square footage of the building served by that system. In most general classroom buildings a variable air volume systems will service approximately 200-300 SF per Ton. For this building it is assumed that the mechanical system will service approximately 250 SF per Ton requiring approximately 250 tons total mechanical system. A good unit cost for this type of system is between $480.00 and $650.00 per Ton. Because the University has chosen specific providers for the DDC controls system it can be assumed that pricing for that system will be generally higher than normal market rates due to little competition. Generally DDC Controls will range from $2.00-$2.50 per GSF but given this closed spec condition an allowance of $2.95 per SF has been included. Because of the complexity of most HVAC systems it is recommended to consult local HVAC trade contractors to verify all assumption on current market pricing.

Division 26 Electrical:
This division of work will consist of the components required for the electrical service and internal power distribution, emergency power, grounding and lightning protection system, and interior light fixtures. All exterior site lighting and primary underground electrical service to the building, along with communication systems, safety or security systems will be discussed in later sections. For most classroom buildings lighting and emergency power are the primary concerns for a University. As such it is often useful to break out the costs for these components of the electrical system in order to better clarify the cost for the University. Unfortunately most projects at the conceptual stage will have almost no information regarding the electrical system. At most it can be expected that information will be available regarding the desired foot candles for lighting in respective spaces throughout the building as well as information regarding what spaces within the building will be required to be services from an emergency generator during a power outage. Most universities will identify what type of emergency generator will be required (diesel, natural gas). Due to the volatile nature of copper pricing it is good practice to consult local electrical trade contractors to verify any pricing assumptions. At the conceptual level breaking down the electrical system pricing into extreme detail will be difficult given the amount of information available and lack of knowledge regarding loading requirements, etc. In most cases the primary service and power distribution throughout a classroom building can be priced by square foot of building area. In a typical classroom building the cost for primary service and power distribution will be between $15.00 and $20.00 per SF. Lightening protections systems are required for most Universities to protect against electrical system damage during storm events. When required this system is typically $0.10 to $0.20 per SF. The type of emergency generator required, building systems it will support, and size of generator required will all have a significant affect on the emergency power for the building. On this project a natural gas engine generator will be required by the University. A good rule of thumb for natural gas generators is $25,000.00 for every 50 KW required. Consultation with the electrical engineer will provide the approximate sizing of the emergency generator. Finally lighting fixtures will vary greatly in cost based on the spaces within a classroom building. For the majority of the classroom, office, and corridor spaces fluorescent lighting will typically be acceptable with some level of accent or down lighting as well. In mechanical, storage or open areas fluorescent strip lighting will typically be acceptable. The significant portion of cost in the lighting fixtures will occur in the main entry and high visibility spaces. These spaces will typically include chandeliers, wall sconces, and other decorative fixtures as defined by the architect through the course of design. As a result of these variables it is recommended and acceptable to propose a lighting fixture allowance as a lump sum at the conceptual stage and request agreement from the University and Architect that all lighting will be selected to fit within that allowance as the design evolves. On this project an allowance of $300,000.00 was included for all interior lighting fixtures. Once these breakout costs have been determined for the building electrical systems it is good practice to check the total electrical system pricing against historical cost per SF for other classroom projects. In this market the electrical systems should cost approximately $20.00 to $25.00 per SF.

Will be Continued in January Issue of ET
The Industry Awareness Committee’s mission is to:

“Represent the role of the estimator to the industry and disperse information on new technologies and developments in the industry to the ASPE membership.”

With one of our committee’s roles being to disperse information on new technologies within ASPE, I am authoring this article. A fairly new P.O.E. [Power over Ethernet or Digital Ceiling], lighting technology is gaining momentum. Electrical contractors in our group have seen 25% cost savings over standard conventional lightings 277 Volt 2x4 lighting troffers.

A Diagram has been authorized by one of the company’s involved www.platformatics.com on this page. To recap the ease of installation and savings:

- No conduit for the low voltage Ethernet cable is required.
- Each light fixture has its own Ethernet cable and IP address like a computer.
- Energy savings at 48 Volts with LED fixtures are clear.

Once retrofitted or installed during new construction, each light can be energized on or off and dimmed individually. Many companies like Platformatics, Lutron, Cisco, Phillips lighting etc., are offering controls and integration to add to a comprehensive Smart Building system.

To completely understand this huge advance in Building automation and more watch the following video: https://www.youtube.com/watch?v=QcBQDt1MbLc

There are many more technologies incorporated in this Project and they can be searched by the key words “Amsterdam the edge building”.
A Diagram is shown below on how this Digital Ceiling Technology works:

Costs are compared for 277 LED Lighting vs P.O.E. below:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Description</th>
<th>Unit</th>
<th>Mat.</th>
<th>Inst.</th>
<th>Total</th>
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<tr>
<td>1 Square feet</td>
<td>Interior LED fixtures, troffer, recess mounted, 4800 Lumens, 2’ x 4’, replaces three T8 lamp, incl lamps, mounting hardware and connections</td>
<td>S.F.</td>
<td>7.00</td>
<td>9.00</td>
<td>16.00</td>
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<tr>
<td></td>
<td>Assume 20 2 x 4 Fixtures per 1000 Square Feet</td>
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<td></td>
<td>POE subtract 25% from total 277V Lighting costs including conduit and conductors per square foot</td>
<td>S.F.</td>
<td>5.00</td>
<td>7.00</td>
<td>12.00</td>
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A typical 50,000 square foot floor x 5 stories = 1 million Dollar cost savings plus continued Energy Savings and flexibility

The continued savings in Electrical usage through both direct reduction in Lighting and the subsequent HVAC load reduction will continue for the life of the Building.

Respectfully submitted,
Brian Wright
C.P.E., Chief Estimator, M.E., Sr. P.M. JLL INTEL North America
A.S.P.E. – Chair, Industry Awareness Committee
A.S.P.E. Member S.W. Region
ASU Faculty Associate
**Chapter Meetings**

**ARIZONA**

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<tr>
<td><strong>Where:</strong> Double Tree Hotel 320 N 44th Street Phoenix, -85008</td>
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<tr>
<td><strong>Time:</strong> 5:30 Social Hour Starts</td>
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<tr>
<td><strong>Meeting Contact:</strong> Tom Norton, CPE aspen <a href="mailto:treasurer@gmail.com">treasurer@gmail.com</a></td>
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<tr>
<td><strong>Meeting Contact:</strong> Trip McGrath, CPE <a href="mailto:tripm@aol.com">tripm@aol.com</a></td>
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**ARKANSAS**

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<tr>
<td><strong>Where:</strong> Baldwin &amp; Shell - Main Office 1000 West Capital Ave. Little Rock - 72201</td>
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<td><strong>Date:</strong> 3rd Friday</td>
</tr>
<tr>
<td><strong>Time:</strong> 12:00 Noon Social Hour Starts</td>
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<tr>
<td><strong>Meeting Contact:</strong> Mickey Perez <a href="mailto:mpererez@baldwinshell.com">mpererez@baldwinshell.com</a></td>
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<tr>
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<tr>
<td><strong>Meeting Contact:</strong> Thom Thibodeau <a href="mailto:thom.thibodeau@cox.net">thom.thibodeau@cox.net</a></td>
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**CALIFORNIA**

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<tr>
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<tr>
<td><strong>Meeting Contact:</strong> Joe Miller, CPE <a href="mailto:njpemiller@yahoo.com">njpemiller@yahoo.com</a></td>
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<tr>
<td><strong>Meeting Contact:</strong> Gustav Choto <a href="mailto:gcchoto@buildingpointpacific.com">gcchoto@buildingpointpacific.com</a></td>
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**CONNECTICUT**

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<tr>
<td><strong>Contact:</strong> Northeast Governor James Hanna, CPE - <a href="mailto:jh@dhuy.com">jh@dhuy.com</a></td>
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**DELAWARE**

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<tr>
<td><strong>Meeting Contact:</strong> Jason Gordon <a href="mailto:jgordon@penlighting.com">jgordon@penlighting.com</a></td>
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<td><strong>Time:</strong> Varies</td>
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<tr>
<td><strong>Meeting Contact:</strong> Tom Smithson <a href="mailto:tomsmithson@gmail.com">tomsmithson@gmail.com</a></td>
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**DISTRICT OF COLUMBIA**

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<tr>
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<td><strong>Time:</strong> Varies</td>
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<tr>
<td><strong>Meeting Contact:</strong> Maurice Touzard, CPE <a href="mailto:mtouzard@gmail.com">mtouzard@gmail.com</a></td>
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**FLORIDA**

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<tr>
<td><strong>Meeting Contact:</strong> Bob Nidzgorski, CPE <a href="mailto:bobb.nidzgorski@skanska.com">bobb.nidzgorski@skanska.com</a></td>
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</tr>
<tr>
<td><strong>Contact:</strong> Southeast Governor Chuck Hesselbein, CPE - <a href="mailto:cchestelbein@baldwinshell.com">cchestelbein@baldwinshell.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Orlando #50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where:</strong> TBD</td>
</tr>
<tr>
<td><strong>Date:</strong> TBD</td>
</tr>
<tr>
<td><strong>Time:</strong> TBD</td>
</tr>
<tr>
<td><strong>Meeting Contact:</strong> Danny Chadwick, CPE <a href="mailto:dkchadwick@bellsouth.net">dkchadwick@bellsouth.net</a></td>
</tr>
</tbody>
</table>

**GEORGIA**

<table>
<thead>
<tr>
<th>Atlanta #14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where:</strong> Sage Woodfire Tavern-Perimeter 4505 Ashford Dunwoody Rd Atlanta - 30346</td>
</tr>
<tr>
<td><strong>Date:</strong> 3rd Monday</td>
</tr>
<tr>
<td><strong>Time:</strong> 11:30am Social Hour Starts</td>
</tr>
<tr>
<td><strong>Meeting Contact:</strong> Clinton Aldridge <a href="mailto:clinton.aldrige@skanska.com">clinton.aldrige@skanska.com</a></td>
</tr>
</tbody>
</table>

**ILLINOIS**

<table>
<thead>
<tr>
<th>Chicago # 7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where:</strong> Babakuya Tacos &amp; Tequila 1341 Butterfield Rd Downers Grove - 60515</td>
</tr>
<tr>
<td><strong>Date:</strong> 3rd Thursday</td>
</tr>
<tr>
<td><strong>Time:</strong> 6:00pm Social Hour Starts</td>
</tr>
<tr>
<td><strong>Meeting Contact:</strong> Bob Svoboda, CPE <a href="mailto:bsvoboda@ccsdifference.com">bsvoboda@ccsdifference.com</a></td>
</tr>
</tbody>
</table>

**INDIANA**

<table>
<thead>
<tr>
<th>Central Indiana #59</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where:</strong> Varies</td>
</tr>
<tr>
<td><strong>Date:</strong> 3rd Thursday</td>
</tr>
<tr>
<td><strong>Time:</strong> Varies</td>
</tr>
<tr>
<td><strong>Meeting Contact:</strong> Jeremy Adkins, CPE <a href="mailto:jadkins@theadkinsgroup.net">jadkins@theadkinsgroup.net</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Old Fort # 65</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information not submitted at this time</strong></td>
</tr>
<tr>
<td><strong>Contact:</strong> Central Plains Governor Dave Westfall, CPE - <a href="mailto:dwwestfall@aspengroup.com">dwwestfall@aspengroup.com</a></td>
</tr>
</tbody>
</table>

**IOWA**

<table>
<thead>
<tr>
<th>Quad Cities #71</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where:</strong> Granite City Food &amp; Brewery 5270 Utica Ridge Rd Davenport - 52807</td>
</tr>
<tr>
<td><strong>Date:</strong> 4th Tuesday</td>
</tr>
<tr>
<td><strong>Time:</strong> Varies</td>
</tr>
<tr>
<td><strong>Meeting Contact:</strong> Ryan Andresen <a href="mailto:randresen@russellico.com">randresen@russellico.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Greater Des Moines #73</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where:</strong> Varies</td>
</tr>
<tr>
<td><strong>Date:</strong> 3rd Thursday</td>
</tr>
<tr>
<td><strong>Time:</strong> Varies</td>
</tr>
<tr>
<td><strong>Meeting Contact:</strong> Ryan Haaaland <a href="mailto:haaaland@eliteglassandmetal.com">haaaland@eliteglassandmetal.com</a></td>
</tr>
</tbody>
</table>

**LOUISIANA**

<table>
<thead>
<tr>
<th>New Orleans # 9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information not submitted at this time</strong></td>
</tr>
<tr>
<td><strong>Contact:</strong> Southeast Governor Chuck Hesselbein, CPE - <a href="mailto:cchestelbein@baldwinshell.com">cchestelbein@baldwinshell.com</a></td>
</tr>
</tbody>
</table>

**MAINE**

<table>
<thead>
<tr>
<th>Maine # 37</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where:</strong> Woodard &amp; Curran 41 Hutchesons Drive Portland - 04102</td>
</tr>
<tr>
<td><strong>Date:</strong> 1st Wednesday</td>
</tr>
<tr>
<td><strong>Time:</strong> Varies</td>
</tr>
<tr>
<td><strong>Meeting Contact:</strong> Ryan Andresen <a href="mailto:randresen@russellico.com">randresen@russellico.com</a></td>
</tr>
</tbody>
</table>

**MARYLAND**

<table>
<thead>
<tr>
<th>Baltimore # 21</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where:</strong> Varies</td>
</tr>
<tr>
<td><strong>Date:</strong> 2nd Thursday</td>
</tr>
<tr>
<td><strong>Time:</strong> 6:00pm Social Hour Starts</td>
</tr>
<tr>
<td><strong>Meeting Contact:</strong> Steve Krell, CPE <a href="mailto:skrell@oakcontracting.com">skrell@oakcontracting.com</a></td>
</tr>
</tbody>
</table>
### Massachusettts
- **Boston # 25**
  - Where: Courtyard by Marriott Boston Cambridge Hotel
  - 777 Memorial Drive
  - Cambridge: 02139
  - Date: 3rd Wednesday
  - Time: Varies
  - Meeting Contact: Ryan Dogi
  - rdogi@selectdemoservices.com

### Michigan
- **Detroit # 17**
  - Where: Varies - visit [www.aspe17.org](http://www.aspe17.org)
  - Date: Varies
  - Time: Varies
  - Meeting Contact: Patrick Todd, CPE
  - patrick.todd@aspe17.org

### Minnesota
- **Viking # 39**
  - Information not submitted at this time
  - Contact: Central Plains Governor
  - Dave Westfall, CPE - dwestfall@aspengroup.com

### Missouri
- **St. Louis Metro # 19**
  - Where: Varies
  - Date: 4th Thursday
  - Time: 6:00pm Social Hour Starts
  - Meeting Contact: Jerry Dorhauer, Sr.
  - jerry.dorhauer@bellelectrical.com

### Nevada
- **Reno # 12**
  - Where: TBD
  - Date: TBD
  - Time: TBD
  - Meeting Contact: David Evans, CPE
  - daveevans@charter.net

### New Jersey
- **Garden State # 26**
  - Where: The Apian Way
  - 619 Langdon Street
  - Orange: 07050
  - Date: 4th Tuesday
  - Time: Varies
  - Meeting Contact: Jeffrey Senholzi
  - costhaw@pdl.net

### New Mexico
- **Roadrunner # 47**
  - Where: Fiestas Restaurant
  - 4400 Carlisle NE
  - Albuquerque: 87107
  - Date: 1st Wednesday
  - Time: 5:30 Social Hour Starts
  - Meeting Contact: Judisah Crooker-Flint, CPE
  - jpsbc@aulinc.net

### New York
- **New York City # 10**
  - Not Active

### Ohio
- **Buckeye # 27**
  - Information not submitted at this time
  - Contact: Central Plains Governor
  - Dave Westfall, CPE - dwestfall@aspengroup.com

### Oklahoma
- **Landrun- OK City # 80**
  - Where: Ingrid’s Kitchen
  - 3701 N. Young Blvd
  - Oklahoma City: 73112
  - Date: 1st Wednesday
  - Time: 11:30 am Social Hour Starts
  - Meeting Contact: Ed Harris
  - ed.harris@dormakaba.com

### Oregon
- **Columbia-Pacific # 54**
  - Information not submitted at this time
  - Contact: Northeast Governor
  - James Hanna, CPE - jgh@dhuy.com

### Pennsylvania
- **Greater Lehigh Valley # 41**
  - Information not submitted at this time
  - Contact: Northeast Governor
  - James Hanna, CPE - jgh@dhuy.com

### Tennessee
- **Middle Tennessee # 34**
  - Where: Adventure Science Center
  - 800 Fort Negley Blvd.
  - Nashville: 37203
  - Date: 1st Friday
  - Time: Varies
  - Meeting Contact: Ricky Sanford
  - rsanford7159@hotmail.com

### Texas
- **Houston # 18**
  - Where: Spaghetti Western’s
  - 1608 N Shepard
  - Houston: 77007
  - Date: 2nd Monday
  - Time: 6:00pm Social Hour Starts
  - Meeting Contact: Kenneth Barnes
  - kabarnes@valerus.com

### Utah
- **Salt Lake City # 51**
  - Where: TBD
  - Meeting Contact: John Shampton
  - jshampton@aspenational.org

### Virginia
- **Richmond # 82**
  - Where: Baskerville
  - 101 South 15th Street Ste. 200
  - Richmond: 23219
  - Date: 4th Wednesday
  - Time: Varies
  - Meeting Contact: Jacob Dyer
  - jacob@gulfseaboard.com

### Washington
- **Puget Sound # 45**
  - Where: Hales Ales
  - 3rd Tuesday
  - Time: Varies
  - Meeting Contact: Michael Booth, CPE
  - electricbooth@msn.com

### Wisconsin
- **Brew City # 78**
  - Where: Varies
  - Date: 2nd Tuesday
  - Time: 5:30pm Social Hour Starts
  - Meeting Contact: Chris Rozof, CPE
  - crrozof@berghammer.com

### Please NOTE:
Meeting information is subject to change. If you need to make any changes to your chapters information please email [jennifer@aspenational.org](mailto:jennifer@aspenational.org)
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Happy Holidays to each of you! I hope you are enjoying the start of the holiday season and not being so rushed you cannot relax and enjoy. This time of year we always look forward to when we have family and friends around and lots of festivities. As you enjoy the holidays, however you celebrate them, the ASPE staff wishes you the very best this year and always.

We're thinking of you this time of year.
Wishing you happiness, joy, and cheer.
May all your days be warm and bright.
And your nights enhanced by holiday light.

Enjoy your delectable holiday foods
As parties and gifts create holiday moods.
Favorite people play a meaningful part.
While treasured rituals warm your heart.

You are special to us in many ways
So we wish you Happy Holidays!
New Members

Member
Jeffery Lewis
Carlos Ramires
Georgina Salgado
Patrick Slattery
Karine Anderson
Eric Steinmetz
Christopher Gould
Sidhesh Kakodkar
Brian Keaton
Seth Russell
Wallace Stine
Ricardo Lopez
Scott McGraw
John Kindler
David Hamlin
Romena Jonas
David Nelson
Stephen Zaffiri
Paul Roltgen
Joe Janowicz

Company
Corix Water Products US
Chicago Waterproof Co.
Faithful + Gould
Earth Tech, LLC
Primus Builders
Sachse Construction and Development Company LLC
Durotech, Inc.
G William Group
H&R Electric
Stine & Associates, LLC
Banes General Contractors, Inc.
JHKelly, LLC
Restocon Corporation
David Boland, Inc.
Pari & Gershon Incorporated
Electric Plus, Inc.
IPS
American Transmission Company, LLC
American Transmission Company, LLC

Chapter
Los Angeles #1
Orange County #3
Chicago #7
Chicago #7
Atlanta #14
Atlanta #14
Detroit #17
Houston #18
Garden State #26
Buckeye #27
Heartland #32
Rio Grande #40
Puget Sound #45
Tampa Bay #48
Orlando #50
Silicon Valley #55
Central Indiana #59
Philadelphia #61
Brew City #78
CP-MAL #92

New Members

Member
Ryan Craven, CPE
Thomas James, CPE
Eric Frey, CPE
Brian Masters, CPE

Company
HL Construction Management
Nelson Engineering
Mattcon General Contractors, Inc.
Nabholz Construction Services

Chapter
Orange County #03
Orlando #50
Central Indiana #59
NW Arkansas #79

Non-Member
Mark Cleverly, CPE

Company
McCarthy Building Companies Inc.
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SAVE THE DATE
JULY 12-15, 2017

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