Simply Preconstruction Estimating, or Is It?

How to Estimate the Cost of Solar Water Heaters

Bidding Mistakes – Part 3

Annual Summit
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**CONTENTS**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASPE National President</td>
<td>3</td>
</tr>
<tr>
<td>Simply Preconstruction Estimating, or is it?</td>
<td>4</td>
</tr>
<tr>
<td>New CPE's + AEP's</td>
<td>6</td>
</tr>
<tr>
<td>New Members</td>
<td>7</td>
</tr>
<tr>
<td>Bidding Mistakes – Part 3</td>
<td>8</td>
</tr>
<tr>
<td>Faces of ASPE: Trip McGrath, CPE</td>
<td>9</td>
</tr>
<tr>
<td>ConsensusDocs 305- New Tool to Contract for Lean Projects</td>
<td>10</td>
</tr>
<tr>
<td>HTETCO Solar Water Heaters</td>
<td>14</td>
</tr>
<tr>
<td>ASPE Kansas City Summit</td>
<td>24</td>
</tr>
<tr>
<td>Specifications and Estimating: A New Vision for Better Outcomes</td>
<td>26</td>
</tr>
<tr>
<td>Faces of ASPE: Estel Taylor</td>
<td>31</td>
</tr>
<tr>
<td>Kalwall</td>
<td>32</td>
</tr>
<tr>
<td>Critical Calendar</td>
<td>35</td>
</tr>
<tr>
<td>Chapter Meetings</td>
<td>36</td>
</tr>
</tbody>
</table>

**CONTACT THE ASPE BUSINESS OFFICE**

2525 Perimeter Place Drive, Suite 103  
Nashville, Tennessee 37214  
615.316.9200 • ASPEnational.org

Tina Cooke  
tina@ASPEnational.org • Standards Committee • Website • Accounting

Cinder McDonald  
cinder@ASPEnational.org • Certification Committee & Program
This is the last time I will write an article as President of ASPE. In the past three years, we have worked diligently and invested in building a strong foundation for growth of the organization. We updated our Core Values and Purpose and completed a strategic plan. We ensured that the Society was properly incorporated, insured, and has the appropriate non-profit tax exemptions. We invested in staff to support the membership and the mission of the Society. We returned to printed and delivered editions of *Estimating Today* and the Membership Directory. We have developed Corporate Memberships and the Associate Estimating Professional (AEP) program.

With this foundation in place, we are now poised for growth. At this point, we need the input of our membership. We have made investments to ensure that the Society is solid, but have not yet seen growth in membership. Less than seven percent of our members voted in the recent Board election. Fewer than half of the Chapters have registered a representative for this year’s Summit in Kansas City. So, my question for you as a member is “does this Society need to exist; and if so, what does the Society need to provide to make it relevant and attractive for you as a member?”

My belief is that the Society needs to exist for the good of the construction industry. No other organization is concerned with the development of estimators at exactly the time when the industry is relying more on estimators to be an integral part of the preconstruction process. However, if the Society does not have revenue from dues, Certification, educational programs, Summit, and sponsorships, ASPE will be unable to develop and produce the educational programs that are needed. Like all organizations, ASPE can only provide programs if resources are available. We are ready to launch an online learning system and a mentoring program, but current resources do not allow for implementation.

I encourage you to think about why you are a member of ASPE. What do you value in your membership? What would cause you to encourage your coworkers, employers, employees, and colleagues to join ASPE and be involved?

Help us shape the industry and live up to the Society’s purpose of being the construction industry’s leader and recognized authority in professional estimating through excellence in education, certification, and standardization.

Marcene N. Taylor, CPE

ASPE National President
2016-2019

Connect at:
mtaylor@mticost.com
Marcene Taylor Inc.
Chapter 90 – NW MAL
The perspective of many is that Preconstruction is simply estimating, the quantity take-off of a drawing and reaching out to subcontractors for bids to finalize the estimate. Today, preconstruction estimating, services, planning, etc. is much more than just quantity take-offs. The range of possible tasks runs the gamut of typical estimating to the unthinkable type of tasks requested by any agency associated with the owner or design team. Gransberg and Shane (2010) concluded that preconstruction tasks consists of four main types of services – design, cost, schedule, and administrative. Table 1 below lists the main types of services. The list is only the common tasks required and not inclusive of the full gamut where expectations of a preconstruction estimator extends to “filling in the blanks, defining the scopes of work, assessing alternative materials, systems or methods, and managing the intent of the design team and desires of the owner” (Kuhn 2007). How do we keep up?

Table 1: Preconstruction Services (adapted from Gransberg and Shane 2010)

**Design Related:**
- Validate Agency / Consultant Design
- Assist / Input to Agency / Consultant Design
- Design Reviews
- Design Charrettes
- Constructability Reviews
- Operability Reviews
- Regulatory Reviews
- Market Surveys for Design Decisions
- Verify Take-Off Quantities
- Assistance Shaping Scope of Work
- Feasibility Studies
- Encourage Innovation

**Cost Related:**
- Validate Agency / Consultant Estimates
- Prepare Project Estimates
- Cost Engineering Review
- Early Award of Critical Bid Packages
- Life Cycle Cost Analysis
- Value Analysis / Engineering
- Material Cost Forecasting
- Cost Risk Analysis
- Cash Flow Projections / Cost Control
- Shape the Project Scope to Meet the Budget

**Schedule Related:**
- Validate Agency / Consultant Schedules
- Prepare Project Schedules
- Develop Sequence of Design Work
- Construction Phasing
- Schedule Risk Analysis / Control

**Administrative Related:**
- Coordinate Contract Documents
- Coordinate with 3rd Party Stakeholders
- Public Information / Public Relations
- Attend Public Meetings
- Bid-Ability Reviews
- Subcontractor Bid Packaging
- Prequalifying Subcontractors
- Assist in Right-Of Way Acquisition
- Assist in Permitting Actions
- Study Labor Availability / Conditions
- Prepare Sustainability Certification Application
- Follow Environmental Commitments
- Follow Terms of Federal Grant
- Coordinate Site Visits for Subcontractors
- Teamwork / Partnering Meetings / Sessions

As construction has evolved to rapidly escalating cost of construction, lack of resources, saturated market, subcontractor manpower, preconstruction planning is a vital part of the construction process and has been claimed to be a determinant for project success (Laufer et al. 1993; Douglas 2004). During the preconstruction process, the production phase is planned to achieve a smooth transition from inception to completion. Project success can be achieved by calculating risks that may occur in the project and how to approach risks during the project lifetime (Mintzberg 1981). Preconstruction planning is also where the budget and the schedule is developed (Hendrickson 1998). By planning in the early phases of construction, contractors can account for uncertainties and situations, where one is able to be proactive rather than reactive to hurdles in the construction phase (Award et al. 2010). Four variables, that should be taken into consideration when planning a project is time, cost, quality and scope.

The role of the preconstruction estimator is to evaluate those four variables with the help of their designated project teams. Once drawings are established, there are different phases of design in which the preconstruction process begins. However, there are different project delivery methods.
General Contractors are bound to that determine the approach of preconstruction services. Three basic project delivery methods used are the Design Bid Build (DBB), Design Build (DB), and the Construction Manager / General Contractor (CMGC or GCCM).

Understanding the different delivery methods determines the approach for preconstruction planning and services. The DBB delivery method is established by the owner completing a project design with an in-house designer or consultant. The owner is responsible for any errors and omissions in the design due to the “Spearin Doctrine” (Mitchell 2008). An Invitation to Bid (ITB) is issued after the completion of the design, and award of the project is presented on a low-bid basis. Two separate contracts for the designer and general contractor are maintained by the owner, where the designer and builder have no contractual relationship and only the common interest of delivering a successful project.

This method provides the owner prior insight to the cost of the project before construction begins and can base award selection on lowest bidder to complete the project. However, the best method of award selection is not solely based on low-bid estimates. It is based upon capabilities, experience, and qualifications. Eight major problems were identified by Thomsen (2006) with the DBB delivery method: specialization, inaccessible technical knowledge, waste effort, long schedules, unpredictable costs, chaotic and “un-businesslike” procurement, conflict, and industrialization. Specialization is established for designers to divide into specialized division such as, architectural, mechanical, and electrical, etc. The divided divisions could lead to uncoordinated drawings that conflict. As drawings are developed and issued for ITB’s, there is inaccessible technical knowledge since designers do not have interactions with general contractors to assist in identifying conflicts prior to a completed design. In addition, the absent interactions between designer and general contractor lead to the designer identifying manufacturers, models, and designs created in the drawings rather than collaborating. Shop drawings are then submitted from the manufacturer replacing construction drawings. Dependent on the completion of the drawings from the design team, the schedule is linear and could take longer than expected. Without collaboration early in design, unpredictable costs occur as prior estimates are not established to understand inflations and current market conditions. As general contractors are in competition for the project, Bid Day is inevitable. A method of sending out sending ITB’s to as many subcontractor trades to get quotes until the last minute of bidding can be viewed as chaotic and “un-businesslike” from the rush and last-minute details inserted into the bid. Inevitably the lack of collaboration between designer and contractor could lead to flawed plans and specifications, leading to confusion and overrun budgets. The pressure for the design to be flawless without assistance of the general contractor and expert manufacturers can be attributed to industrialization, where manufacturers are the experts of their products and can teach, advise, and collaborate with the design team to prevent conflicts in design.

The DB delivery method is when the owner retains services and maintains a single contract with a design-builder. According to Gransberg and Shane (2010), the design-builder is a “single, legal entity” that both designs and builds the project. This method allows the designer and builder to work together under a contractual relationship leading to design and construction taking place at the same time. However, the owner may relinquish certain aspects of the design. Whereas with the DBB method, the owner has more control over the design details.

In the CMGC delivery method, the owner contracts separately with the designer and contractor (similar to the DBB method). The general contractor is contracted for preconstruction services and is a trusted partner advising and acting like a construction manager thus improving communication between both parties. At the discretion of the owner, a separate contract for construction with the same general contractor can be issued. The difference between the DBB method and the CMGC method is the general contractor is contracted at the design phase, which is a benefit that can lead to design input, optimized schedules, greater protection of the owner’s investment, and innovations to construction. Such responsibility leads the general contractor to be “at risk for the final cost and time of construction” (Gransberg and Shane 2010).

In summary, the relative involvement of preconstruction services required is dependent on the delivery method. The DBB delivery method is a limited amount of time required of the preconstruction team with an intense, chaotic bid day evaluating multiple bids and is awarded based on lowest bidder. The DB and CMGC delivery methods require a longer process with preconstruction from beginning to end allowing more collaboration and a smoother transition from preconstruction to production. Design milestones are targeted when preconstruction is brought on earlier in design to identify cost, time, quality, and scope. The key stages of development require collaboration between design team and contractor to target the four variables of planning. Design development stages can go by many terms, but the ones used here are explained.

- **Conceptual:** At the conceptual stage, a basic sketch of the building including number of floors, usable or rentable square footage, preliminary layout, etc., and hand sketches may be available to clarify the design intent. Preconstruction relies on experience, historical data, and knowledge of the type of project presented. In certain situations, bringing in key subcontractors such as mechanical, electrical, and plumbing may be beneficial to identify grey areas in the MEP design.
Simply Preconstruction Estimating, or Is It? ... Continued

- **Schematic:** At the schematic document (SD) stage, it is common to have single line scaled drawings of typical floor layouts. Sometimes a narrative description of the major structural and mechanical design is described. Initiating key subcontractors and vendors is ideal if certain descriptions and manufacturers are established.

- **Design Development:** At this Design Development (DD) point, the design of the project is further developed and plans for all disciplines such as civil, architectural, structural, mechanical and electrical are included. Subcontractor and vendor relationships should be utilized to check current market value and lead times based on the plans.

- **Construction Documents:** Although an owner can theoretically be offered a Guaranteed Maximum Price (GMP) at any point in the design process, the desire to minimize allowances, contingencies and changes will usually dictate that the GMP be established based upon Design Development or later documents.

At each design milestone, communication between the design team and preconstruction leads to design input where each phase of drawings is provided with more detail. It provides comfort to the owner to know where each dollar is spent with each progression of design. Each design development progression leads to little or no contingency as the risk factors are mitigated with improved drawings, where long leads are identified and costly materials busting the budget are value engineered. Records of estimates are tracked and can be presented in various forms such as variance reports or value engineered options to understand how changes were made throughout the preconstruction process. It is the duty of the preconstruction estimator and team to “fill in the blanks, define the scopes of work, assess alternative materials, systems or methods, and manage the intent of the design team and desires of the owner” (Kuhn 2007) as previously stated so with each design milestone drawings are improved upon and grey areas are filled leading to design input, optimized schedules, greater protection of the owner’s investment, and innovations to construction.

References:


Congratulations to New CPEs + AEPs (Feb & Mar)

<table>
<thead>
<tr>
<th>NAME</th>
<th>COMPANY</th>
<th>CHAPTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitchell Garner, CPE</td>
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<td>New Orleans</td>
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<td>Tyler Swanson, AEP</td>
<td>Flint Builders</td>
<td>Sacramento</td>
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<td>Phoenix Engineering</td>
<td>Baltimore</td>
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<td>Garden State</td>
</tr>
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<td>Dallas/Ft. Worth</td>
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</tr>
</tbody>
</table>
Welcome to Our New Members (Feb & Mar)

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<th>COMPANY</th>
<th>CHAPTER</th>
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Membership Classification Count

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The phone call from the project architect put you into panic mode. The Architect and Contracting Authority had indicated that you were “significantly lower,” and they were not willing to tell you how low. That’s understandable; their wanting to maintain the integrity of the entire bidding process.

After considerable investigation and searching for your “error,” you discovered that you had inadvertently entered $190,000 into the bid spreadsheet, when the price should have been $910,000. This adjustment would put your revised bid at $6,220,000.00. As a closed bid, you were not privy to the other bidders’ prices so you have no way of knowing where your new number stands in relationship to the other bidders.

You possibly could withdraw your bid, but you and your team spent several weeks working on this project; and your Company really needs the work. By withdrawing the bid, all we avoid is the Owner benefiting from a bad bargain. Hopefully the revised bid is closer to, but does not exceed, the next lowest bidder.

Courts and “reasonable Owners” should look for four primary elements to allow the bidder to either withdraw or modify its bid.

- Notification must occur quickly, not weeks or months after the project has bid.
- The error must have been made is good faith. In this case, someone typed in the numbers incorrectly, not intentionally.
- There is clear and convincing evidence that the numbers entered were not correct. In the case, the subcontractor proposal was very clear that the price was $910,000, not $190,000.
- The modified bid is still lower than the next lowest bidder.

For the sake of argument, let’s look at where the bid prices came out. The initial bid breakdown was as follows.

<table>
<thead>
<tr>
<th>Your Bid:</th>
<th>Crumbliss Construction</th>
<th>$5,500,000.00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cochran Construction</td>
<td>$6,390,000.00</td>
</tr>
<tr>
<td></td>
<td>Cooke Construction</td>
<td>$6,410,000.00</td>
</tr>
</tbody>
</table>

The revised Bid Breakdown is as follows.

<table>
<thead>
<tr>
<th>Your Bid:</th>
<th>Crumbliss Construction</th>
<th>$6,220,000.00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cochran Construction</td>
<td>$6,390,000.00</td>
</tr>
<tr>
<td></td>
<td>Cooke Construction</td>
<td>$6,410,000.00</td>
</tr>
</tbody>
</table>

With your initial bid being $890,000 lower than the next lowest bidder on an approximately $6,000,000 project, it would be more than appropriate for the project owner to inquire regarding the significant price difference.

After correction, your bid is still lowest and you have not displaced the second lowest bidder by your “error” modification.

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FACES OF ASPE: Trip McGrath, CPE
Chapter 53 – Old Pueblo – Chapter President
Compusult Inc.
Contact: tripm@compusult.com

Best advice I ever received
Nothing worthwhile comes easy.

Best advice I share with young (and not so young) estimators
The harder you work, the luckier you get.

Chapter goal for 2019
Finding new and young talent to help revive a Chapter.

If I wasn’t doing this, I would
Be a custom furniture builder.
ConsensusDocs 305 – New Tool to Contract for Lean Projects

By: Joel W. Darrington on behalf of the ConsensusDocs Coalition

As the awareness and embrace of Lean Construction continues to expand in the construction industry, ever-increasing numbers of projects grapple with the question of how to address Lean Construction principles and methods in their design and construction contracts. Project owners have taken primarily three approaches on this.

- Seeking the highest level of Lean performance, owners have used Integrated Project Delivery (IPD) agreements, such as the ConsensusDocs 300, sometimes called integrated forms of agreement (IFOAs).
- When they or their team are not willing or able to use an IPD agreement, other owners have used legal counsel to custom-draft design and construction contracts under more conventional project delivery models such as CM-at-Risk, to address Lean design and construction methodologies.
- Other owners will seek to promote Lean behaviors among the project team independent of what is in the design and construction contracts.

Now, project teams have a new option for contracting for a Lean project when they cannot implement an IPD Agreement. In 2018, ConsensusDocs published the ConsensusDocs 305 Lean Construction Addendum (CD305). For the first time, we have a non-IPD contract document available to the whole industry that provides for a wide spectrum of Lean design and construction practices.

With the CD305, an Owner can use either an industry standard form front-end contract or its own standard contract and add to it a Lean Construction Addendum that reflects the best thinking in the industry around Lean design and construction.

What is the CD305?

Let’s be clear right up front. The CD305 is not a complete contract. It has no compensation terms, no schedule, no project scope. Instead, the CD305 is a document you add to a project contract to provide for selected Lean project features.

In the graphic above, the bi-directional arrows show the contracts for the project. There are separate contracts between the owner and each of the design professional and general contractor and also separate lower-tier subcontracts or design contracts. The CD305 gets added to each of those contracts as an addendum. Note, however, that the CD305 is not intended for use on design-build projects (a future ConsensusDocs document on Lean Construction is under development for design-build projects).

The CD305 does not change the compensation or liability of the parties under the contracts it gets attached. Its exclusive focus is providing clear terms for the parties to agree on how they will incorporate Lean design and construction methods into their project.
Using the CD305

Because the CD305 is attached to both the design professional (architect or engineer) and constructor (general contractor or construction manager) agreements with the owner, it requires a joint negotiation between the owner, design professional and constructor and ideally their key design consultants and trades. Once the CD305 is finalized among the parties, then it gets separately attached and incorporated into each party’s contract, binding everyone to the same set of Lean Construction provisions. Also, the CD305 provides that it governs over any contrary provisions in the front-end agreement, so that project teams can be assured that their implementation of the Lean methods in the Addendum will not trigger a breach of their main contracts.

ConsensusDocs recommends finalizing the CD305 as early in the project as the owner can accommodate. Certain Lean project features are for the conceptualization and design phases, so a team loses the benefit of those features by waiting until later in the project. However, there is still value in implementing Lean only during the construction phase, so if that is your project’s situation, you can still use the CD305.

The CD305 was designed to be flexible so that it can be adapted to a variety of project contexts and Lean deployments. It uses a check-the-box approach to allow project teams to select the Lean features that will apply to their project. The CD305 allows teams to selectively address one or more of the following Lean practices during the design and pre-construction phases simply by checking the applicable boxes.

- **Joint Worksite Investigation**: the project team evaluates what site information is needed, comes up with options for different levels of site investigations, aligns on the appropriate level of investigation and reports the investigation’s findings and recommendations.
- **Evaluation of the Owner’s Program**
- **Validation Study**: the project team validates whether the owner’s program for the project can be designed and constructed within the owner’s maximum budget. A conceptual (or schematic) level of design and cost estimating is done to give an early check on whether the owner’s business case for the project is viable.
- **Construction Team Cost Modeling**
- **Target Value Design**: Section 6.5 describes an integrated design process featuring Target Value Design (TVD). TVD is one of the key Lean design and construction methods for achieving greater project value. It requires intense collaboration of the designers and constructors and a disciplined approach to value determinations and decision-making.
- **Risk Identification & Management Planning**: the project team conducts a risk workshop to identify and evaluate risks, then prepares a risk register to describe key risks and who is responsible for monitoring and leading team efforts at managing that risk. A risk management plan is developed to put in place contingency plans for addressing specific risks.

General Lean Principles & Methods

The CD305 also has standard provisions that apply to any Lean Construction project. Article 3 of the CD305 starts by laying out the major objectives of Lean Project Delivery:

1. collaborating throughout the Project with all members of the design and construction team;
2. planning and managing the Project as a network of commitments;
3. optimizing the Project as a whole, rather than optimizing particular pieces; and
4. tightly coupling learning with action, which promotes continuous improvement throughout the life of the Project.

Article 3 also describes the principle of making reliable commitments and keeping them, which is fundamental to reliable workflow and the process of planning and managing the Project as a network of commitments.

The CD305 provides for a collaborative leadership structure by forming a Core Group. Article 4 describes the Core Group’s role and operations. Each of the owner, design professional and constructor appoint a Core Group representative empowered to direct and coordinate its company’s work. The Core Group together manages the work using Lean methods for the best interest of the project. They are responsible for the project’s key decisions, and they make consensus decisions. They are also responsible for regular team performance evaluations to foster continuous improvement.

If the Core Group cannot come to a unanimous decision, the owner may issue directions it believes to be in the best interest of the project, but that will be subject to any further dispute resolution provisions of the contract to which the Addendum is attached.
Article 5 of the CD305 requires the Project team to use a pull scheduling approach to planning and scheduling the work. The CD305 describes features of the planning system that the team must incorporate, all of which would be satisfied by a full implementation of the Last Planner System® promulgated by the Lean Construction Institute (LCI).

Construction Phase Lean Methods
The last article of the Lean Construction Addendum provides for construction phase Lean methods.

Section 7.1 provides for a Lean approach to quality. To avoid addressing quality through re-work, it provides for the team to develop and implement a “Built-In Quality Plan” that addresses standardized work, agreed levels of quality, good hand-offs of work between trades, and continuous improvement.

Section 7.1 also provides for the construction team to develop an operations quality plan using the Lean principles of “5S”: sort, set in order, shine, standardize and sustain.

Under Section 7.2, the constructor develops a materials logistics plan that promotes just-in-time delivery of material to the worksite consistent with the current pull-planning work plans.

In Sections 7.3 and 7.4, the CD305 provides for a Lean approach to submittals and requests for information. The basic idea is that the team member needing information directly contacts the team member who can provide the information, figuring out the resolution together, and then documenting the resolution for the benefit of the entire project team.

Finally, Section 7.5 requires the team to develop a phase plan specific to closing out the project so that everyone is aligned as to what needs to be done to satisfy the project stakeholders without needing a long process of inspections and re-inspections for reaching substantial completion.

Conclusion
ConsensusDocs has provided a great resource to the construction industry with its recent publication of the CD305 Lean Construction Addendum. For the many projects that are not able or ready to utilize an IPD Agreement, now there is an industry standard form that can be added to a project’s design and construction contracts to provide for a wide range of Lean design and construction practices without triggering violation of the front-end contract’s provisions. For helpful resources visit: https://www.consensusdocs.org/lean_webinar and https://bit.ly/2Rbv2sp.

About the Author: Joel W. Darrington is the Contracting Counsel at DPR Construction and a member of the Lean Construction Institute. He has published and presented widely on Integrated Project Delivery, Lean Construction and contract incentives for improved project outcomes.
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1-866-627-6246
HTETCO Solar Water Heaters

Paul DuQuesnay, CPE
Chapter 49 – Gold Coast
paulduqu@gmail.com

TABLE OF CONTENTS

Section 1: Introduction
Section 2: Types and Methods of Measurements
Section 3: Specific Factors Affecting Take-Off & Pricing
Section 4: Overview of Labor, Material, Equipment, Indirect Costs, and Markups
Section 5: Special Risk Considerations
Section 6: Ratios and Analysis
Section 7: Miscellaneous Pertinent Information
Section 8: Sample Sketches
Section 9: Glossary / Terminology
Section 10: References
SECTION 1: INTRODUCTION

Brief Description

A solar thermal system, also known as solar thermal collector, is an assembly used to absorb sunlight as a source of energy to produce heat. This system is not to be mistaken with solar cell or photovoltaic cell technology that converts the energy of light directly into electricity in solar panels. A solar thermal collector or solar water heater efficiently captures solar radiation from infrared and ultraviolet wavelengths and converts it to heat. The solar thermal system employs flat-plate collectors or evacuated tube collectors, sealed panels covered in glass to collect heat. The combination of the hot air trapped in the collector through the greenhouse effect and the fact that the black panels and tubes absorb solar energy can produce temperatures above 200 degrees Fahrenheit.

Although the technology of solar water heating dates back hundreds of years, development of the current system occurred in the early 1900s when rooftop collectors and a well-insulated tank to retain heat were implemented. More efficient advancements were made in the 1970s due to an oil crisis, declining production costs, and the use of solar energy in the space program. Modern systems implement the use of parabolic mirrors to concentrate sunlight, heat transfer fluids, and copper heat exchanger pipes for efficiency. This method of producing hot water has increased in use in certain regions given reductions in the payback period due to decreasing initial costs, government incentives, and increasing electricity costs. In the United States, HVAC systems account for approximately 30% of energy costs in commercial buildings and close to 50% in residential buildings. Solar heating technologies should be used to offset a portion of this cost while helping the environment by decreasing the amount of carbon dioxide and air pollution.

Although labor and material are important factors in estimating the cost of solar water heaters, equipment costs are a major factor. The number of collectors needed and the amount of water storage required for the system will have a direct correlation on the price of the overall system. In the planned solar water heater system shown on page 12, (ten) 4’x 8’ flat-plate collectors along with (two) 264-gallon hot water storage tanks are to be installed at a laundromat to supply (26) washers with hot water. The quantities and pricing sheet on page 13 represent the means for which the final estimate was done for the proposed solar water heating system shown on page 12.

SECTION 2: TYPES AND METHODS OF MEASUREMENTS

Labor, material, and equipment are typically quantified by units of measure which are specified on the architectural and structural drawings. Using the critical path method of construction, take-off of the number of flat-plate collectors and their square footage should be first. This is followed by the size and number of water storage tanks. Depending on the location of the storage tanks, the quantity of copper tubing, copper fittings, and heat transfer fluid can be calculated.

The four most commonly used units of measure in estimating are square footage, linear footage, weight, and volume. Flat-plate collectors are measured by square footage (length x width) and the amount of collectors used are counted. The amount of water that is to be held in storage tanks is calculated by volume. The cylindrical tank volume is calculated with the equation \( V = \pi r^2 h \). The cubic volume is then divided by 231 in order to find the number of gallons the tank will hold. A gallon of water weighs 8.34 pounds, therefore a 120-gallon tank will weigh approximately 1,000 pounds. Gallons of water...
to be heated or hot water demand in gallons per day can be used for conceptual estimating when design drawings are in their early stages.

SECTION 3: PROJECT SPECIFIC FACTORS TO CONSIDER IN TAKEOFF AND PRICING

For solar projects, initial costs can be significantly impacted by government incentives. Tax credits, rebates, and other incentives to support energy efficiency and reduce pollution are offered by government agencies, utilities, and other organizations. Specific state incentives differ across the United States, but all of them have some form of financial incentive to encourage the installation of solar energy systems. Cost savings for larger projects applies given increases in labor productivity and discounted costs of materials. Initial costs to install the solar water heating system will be dependent on the complexity of the system. Other factors affecting pricing and take-off include material, site conditions, geographic location of the project, labor rates, and seasonal effects.

The most important factor affecting material pricing is the supply and demand of copper and the type of solar collector used at the project. For example, an evacuated tube collector system can cost around 30% more than a flat-plate collector system. Although this is true, an evacuated tube collector system will perform more efficiently in colder climates. Copper tubing is estimated using linear footage, and pricing will depend on pipe size / wall thickness. Type L copper tubing is most commonly used for solar water heaters and typically costs 25% to 30% more than Type M. Type L copper piping has a slightly larger wall thickness than Type M; consequently, the Type L copper pipe will retain and conduct heat more efficiently than Type M. A nominal 1” diameter Type L tube has a wall thickness of 0.050”, while the same size Type M tube has a wall thickness of just 0.0350”. Average waste factors for copper tubing material will range from 10% to 15% and fittings must also be accounted for. The amount of copper tubing that is used will correlate with the location of the water storage tanks relative to the solar flat-plates collectors. If the distance from the solar collectors to the storage tanks can be minimized, less copper tubing can be used; and heat retention can be maximized in the system.

Site conditions will affect two important cost factors, installation and equipment time. Depending on the size, weight, and how high the solar collectors / water storage tanks are installed, a crane will need to be employed for lifting. In general, the higher the product is installed, the greater the cost will be to move it into position. Factors that affect hoisting equipment rates vary by crane size, location, number of mobilizations, and time of use. Ease of project access and the ability to acquire or rent suitable hoisting equipment is crucial.

The geographic location of the project and local government regulations will affect the overall costs of the project. Solar thermal collectors pricing may be more strongly impacted by transportation costs than other assemblies. Solar water heaters are commonly used in locations that may be off the electrical grid. In this case, generators or other sources of electrical power may need to be used during the installation process. Generally, the farther the project is from a populated area, the more expensive overall costs will be. A project located in a rural area may be more costly than the same project located in a populated due to these factors.

Labor rates may have a greater effect on project costs and are commonly more affected by project location and government regulations than materials used. Solar water heating systems may be less labor intensive than other assemblies, but there is still a need for skilled labor to complete the project as it is a specialized industry. Labor factors affecting pricing include the following: union versus open shop, experience factors such as the learning curve, turnover, crew size, site access, governmental or regulatory requirements such as the Davis Bacon Act, and proximity to transportation and logistics.

Seasonal effects such as weather conditions may also affect estimating. Lost days for bad weather are hard to predict and may be accounted for with a contingency. Heavy rain, snow, or wind can cause significant safety issues, delays, and the need for additional equipment. A project may have to be interrupted or postponed due to snow in colder climates. These conditions should be accounted for or excluded from the estimate.

SECTION 4: OVERVIEW OF LABOR, MATERIAL, EQUIPMENT, INDIRECT COSTS AND APPROACH TO MARKUPS

Labor rates can be difficult to predict as they are affected by many project specific factors and market conditions that are hard to forecast. Three main elements drive labor rates: supply, demand, and the construction schedule. In the short term, supply and demand of labor can be accurately predicted by studying market conditions. In a longer time horizon, including escalation in the estimate may be necessary. The construction schedule can have a significant impact on labor rates due to overtime. The scenario of a shortage of labor with an accelerated construction schedule will increase labor costs considerably.

An accurate labor rate should include an acceptable and calculated labor burden. The labor burden includes costs paid aside from salary: which are taxes, pensions, vacation, health insurance, social security, workers compensation, liability insurance, and any other benefit provided by the company to its employees. Labor burden rates should
be applied in the amount of 1.30% to 1.45% times the hourly rate. Although labor rates may be hard to determine, accurate man-hours may be easier to forecast using historical cost data. Historical labor costs on similar projects can be adjusted to account for specific project conditions, location, and size. For example, if a car wash was built in Charlotte, NC one year ago with total hot water demand of 1,000 gallons per day, 10 each 7.5’ x 6.5’ evacuated tube collectors, and 2 each 264-gallon solar water heater storage tanks with a cost of $20,000 after rebates and tax incentives, the project can be used as historical data and pricing / estimating of future projects. Given this cost data, the car wash solar water heater project cost $20.00 per GPD, $41.03 per SF of evacuated tube collector, and $37.88 per gallon of water storage. Given this historical cost data, it can be derived that a similar project in Raleigh, NC with a total hot water demand of 1,500 gallons per day, employing 15 each collectors, and 3 each SWHs, it can be calculated that the project will be close to $30,000. This assumes comparable rebates and incentives being that the project is in the same state. Adjusting this number by 2.5% for escalation and 3.5% for market conditions it can be concluded that the project in Raleigh, NC will cost $30,000 x 1.06% x 1.03% = $31,800.00

Material prices for a project can be accurately determined given a complete set of plans, specifications, and the correct quantities. Material prices should include all applicable delivery charges, surcharges, and sales tax. Economies of scale, demand, and supply will affect the price of materials. In the case of solar water heaters, material prices are affected by the amount of rebates and tax incentives that are available. According to solarpowerrocks.com, the states with the best solar energy incentives are Massachusetts, Rhode Island, and New Jersey. Copper is a commodity that trades on the London Metals Exchange. Although the option exists, most construction materials are not hedged in the financial markets during a typical project. Fortunately, most suppliers are willing to guarantee pricing for 6 months or for the project duration. If this is not negotiated, a certain percentage of escalation should be used in estimating materials. While a risk to price fluctuations in copper and other materials may exist, the majority of total project costs for SWH systems will be spent on labor and equipment to put the solar collectors and water storage tanks in place.

The solar water heater storage tanks, solar collectors, and the equipment necessary to install the product will account for approximately half the total cost of the project, but will be dependent upon the amount of rebates and various tax incentives that are received. A 264-gallon solar heater tank costs approx. $5,000 while an evacuated tube collector cost approx. $1,250 before any rebates or tax incentives are accounted for. Hoisting equipment costs should also include an hourly or daily rate for an operator with the appropriate labor burden. If the product is installed on the roof of a structure, safety measures and site constraints such as overhead power lines will need to be assessed. If the project site conditions are unobstructed adding these additional costs to the estimate is not necessary.

Major indirect project costs include shop drawings, mobilization, parking, office facilities, accounting and office staff, administrative, supervision, bonding if required, and insurance. These costs are usually estimated as a percentage of total costs. Markup or overhead and profit is typically a percentage of total project cost which is adjusted based on the total cost of the contract and the desire to win the contract.

SECTION 5: SPECIAL RISK CONSIDERATIONS

A potential risk to consider in evaluating the cost of a solar water heater system is efficiency and price after tax incentives and rebates. Depending on the project location, the efficiency of the product and the price can greatly affect the return on investment / payback period. Rebates, tax credits, performance payments, sales tax exemptions, and property tax exemption vary state to state. For example, Oklahoma offers very poor incentives to use solar energy while neighboring state Colorado encourages it with some of the best incentives in the country. In a situation of little incentives and low electricity prices, solar simply may not be a good choice due to the high initial cost of the system. In order to qualify for these various incentives, the product must be Buy American Compliant and SRCC Certified. The type of solar collector used and the amount of sunlight the system can absorb will affect the efficiency and payback period of the assembly. A flat-plate collector will lose efficiency more rapidly than an evacuated tube collector on a partially cloudy day. In cooler climates, the evacuated tube collector also performs better because the vacuum that surrounds the tube reduces heat loss. Evacuated tube collectors do cost more than flat-plate collectors and the technology may actually be less productive in warm climates. It is important to have a solar engineer design and implement a plan for a solar water heater system to maximize efficiency and reduce the payback period. Optimum collector tilt position is also crucial for solar panels. They should always face true south if you are in the northern hemisphere, and the amount of tilt is dependent upon the site latitude.

Qualifications, allowances, and contingencies are typical ways to mitigate risk. Qualifications should be addressed for items that are not completely defined or are contradicting in the plans and specifications. A solar water heater system estimate may include flat-plate collectors as a qualification if the type of solar collector is not defined. An allowance can be included in an estimate to protect against known but undefined cost. Given an incomplete set of drawings, an allowance for roof clamps or copper tubing could be used that are standard for the system and location of the project. A contingency is another way to
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mitigate risk by simply adding the item to the estimate for conditions or circumstances that most likely will result in additional project costs. The amount of the contingency is typically based on past experience and project uncertainties.

SECTION 6: RATIOS AND ANALYSIS - TESTING THE BID
Checking and testing the figures in an estimate using ratio analysis can confirm the quantities and pricing used to develop the final estimate. Unit costs and total system costs on past projects should correlate with future projects. Although pricing and the location of the project may differ, historical estimates can be adjusted to reflect the current market environment assuming that the same type of SWH system is used. Ratios are very effectively used for conceptual and schematic drawings when plans are incomplete and the product is still in the early design stages. Utilizing available historical cost data along with these ratios can be very beneficial during preconstruction and planning stages of the project to produce budget numbers. For a typical SWH system the following ratios would be used.

Collector Gross Surface Area: The total size of the surface of the collectors.
Collector Net Aperture Area: Includes only the glazed or glass covered area for flat-plate collectors. Includes the cross-sectional surface area of the outer glass tube measured using the internal diameter for evacuated tubes.
Collector Absorber Area: Includes only the size of the black absorber surface inside the glass cover for flat-plate collectors. Includes the cross-sectional area of the inner tube using the outside diameter for evacuated tube collectors.
Storage Tank Volume in Gallons: \( \frac{\pi r^2 h}{231} \)

SECTION 7: OTHER PERTINENT INFORMATION
Any other information that may affect the scope of work is relevant to the estimate. This may include responses to RFIs, clarifications, assumptions, and addendums. The project schedule is also of considerable importance as a change in the schedule could significantly affect labor rates. An accelerated schedule typically results in more overtime for labor and additional supervision. Federal and state tax credits, rebates, and exemptions for solar water heaters vary from state to state and may change over time.

SECTION 8: SAMPLE SKETCHES
HTETCO Solar Water Heaters ... continued

Drawing of Proposed Laundromat

5 Each
Flat-Plate Collectors
4’ x 8’

2 Each Storage Tanks
264 Gallon Capacity

5 Each
Flat-Plate Collectors
4’ x 8’
## SECTION 9: SAMPLE TAKEOFF AND PRICING

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<th>Labor Total</th>
<th>Material Price</th>
<th>Material Total</th>
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<th>Equip. Total</th>
<th>Total Amount</th>
<th>Total Cost / Unit</th>
<th>% of Total</th>
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* Potential Savings from Rebates and Incentives are not included
SECTION 10: GLOSSARY AND TERMINOLOGY

Absorber: The part of the collector that actively absorbs sunlight / solar radiation. Measured as the cross-sectional area of the inner tube using the outside diameter for evacuated tube collectors.

Addendum: Written or graphic instruments issued prior to the date for opening of bids which may interpret or modify the bidding documents by additions, deletions, clarification, or corrections.

Allowances: Resources included in estimates to cover the cost of known but undefined requirements.

Aperture: The part of the collector through which light enters. Measured as the cross-sectional surface area of the outer glass tube using the internal diameter for evacuated tube collectors.

Bid Bond: A bond that guarantees the bidder will enter into a contract on the basis of the bid.

BTU: British Thermal Units, the unit of measurement for heat.

Buy American Compliant: Conforms to the Buy American Act and American Recovery & Reinvestment Act.

Performance Bond: A bond which secures the performance and fulfillment of all the undertakings, covenants, terms, conditions, and agreements contained in the contract.

Conceptual Estimate: An estimate made without the benefit of detailed engineering data.

Contingency: An amount added to an estimate to allow for items, conditions, or events for which the occurrence is uncertain and experience shows will likely result in additional costs.

Cost Estimate: A prediction of quantities, cost, and price of resources required by the scope of work, activity, or project. As a prediction, an estimate must address risks and uncertainties.

Efficiency: Measured as a percentage of gross area, aperture area, and absorber area.

Escalation: The provision for an increase in the cost of equipment, material, labor, etc., over that specified in the contract due to continuing price level changes over time.

Indirect Cost: Costs which do not become a final part of the installation, but which are required for the completion of the installation including field administration, direct supervision, capital tools, startup costs, contractor’s fees, and insurance.

Insolation: The amount of solar radiation that reaches the earth’s surface.

Labor Burden: Benefits plus taxes & insurances the employer is required to pay by law based on labor payroll.

Markup: Includes such percentage applications as general overhead, profit, and other indirect costs.

Open Shop: A project condition where either union or non-union contractors or individuals may be working.

Qualification and Assumptions: Items that are not completely defined in the project documents for which the estimator was required to use judgment in developing the estimate.

Quantification: To translate project scope information into resource quantities suitable for costing.

Scope: All that is contractually committed to be performed or delivered.

SRCC Certified: Certified according to guidelines of the Solar Rating & Certification Corporation

SECTION 11: REFERENCES

https://solarpowerrocks.com
https://www.renewableenergyhub.co.uk/, Gibilisco
What is your next career goal?

Consider earning your CPE or AEP designation ... both Programs will set you apart!

The Certified Professional Estimator (CPE) and Associate Estimating Professional (AEP) designations acknowledge that you have met, and continue to meet, the criteria established by the American Society of Professional Estimators, recognizing the estimating proficiency and ethical awareness of the individual. These nationally recognized Programs attest that a construction estimator has met the necessary education requirements and has the capabilities necessary of the profession.

The Certified Professional Estimator (CPE) designation is the highest form of professional recognition an estimator may earn and celebrates the years of experience needed to pass the rigorous requirements of this CESB accredited Program. 5+ Years of Experience Required!

The new Associate Estimating Professional (AEP) designation offers recognition of the education and general estimating knowledge required to be part of this exciting and growing field of construction industry professionals. Education in a Construction Related Field is the Key!

Each ASPE Program is offered in an open cycle format that allows candidates to progress at a self-guided pace while successfully completing the following steps.

Steps to earning your CPE designation ...
- 5-Years of Estimating Experience
- General Estimating Knowledge (GEK) Exam
- Discipline Specific Test (DST) Exam
- Submit a 2,500+ Word Technical Paper

Steps to earning your AEP designation ...
- General Estimating Knowledge (GEK) Exam

Both the CPE and AEP Programs require annual renewal, including the earning of Professional Development Unit (PDU) credits. This ensures that the Estimator keeps abreast of construction industry changes and is motivated to personal growth through continuing education and interaction with others in the field.

Learn more at ASPEnational.org / Certification
2019 Summit

Kansas City

Rocking the Roles - The Evolution of Preconstruction

16 Professional Development Units Awarded
Technology • Professional Development • ASPE Business

Wednesday, June 19 - Saturday, June 22, DoubleTree by Hilton Kansas City

For more information or to register, please visit us at ASPEnational.org

Thursday, June 20
Awards Dinner
DoubleTree by Hilton

Celebrating ASPE!
Society and Industry Awards
Presented after Dinner

Friday, June 21 • President’s Party
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<th>Time</th>
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<tr>
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<td></td>
<td><strong>REGISTRATION • WEDNESDAY • JUNE 19</strong></td>
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<td>8:00 – 9:00</td>
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<td>9:00 – 10:00</td>
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<td>The Growing Role of Estimating in BIM: Magnus Therkildsen</td>
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<td>An Owner's Perspective: Mike Dell’Isola</td>
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<td>2:30 – 3:30</td>
<td>Going from What to How: Magnus Therkildsen</td>
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<td>3:30 – 4:00</td>
<td>Exhibit Hall: Connect + Engage (Refreshments Served)</td>
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<td>6:00 – 7:00</td>
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<td>7:00 – 9:00</td>
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<td>1:00 – 1:30</td>
<td>Kicking Off Your Tech Journey: On Center Software by ConstructConnect</td>
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<td>2:00 – 3:00</td>
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<td>Construction Cost Forecasting for Capital Projects: James Vermeulen</td>
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<td>10:15 – 11:45</td>
<td>Specifications and Estimating: David Stutzman, Ujjval Vyas</td>
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<td>12:00 – 12:30</td>
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<td>1:30 – 3:00</td>
<td>Best Practices in Chapter Development + Leadership / Regional Breakouts</td>
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“The writing of architects’ specifications is a task approached by many with trepidation, by some with the careless confidence of ignorance and by a few with the studious determination to succeed.”

By Goldwin Goldsmith, Ph.B., FAIA, Architects’ Specifications – How to Write Them, 1948, quoting the opening of a 1918 lecture series

Not much has changed in the last 100 years. Estimators must make do with whatever specifications they are handed, including those that are obviously cobbled together at the end of the project. Producing well-written specifications, like estimating, takes time, care, and skill. A recent national study, in which this author consulted and participated, showed that specifications get very little attention, especially compared to drawings. Of the survey respondents, 60% indicate less than 5% of design fees are used for specifications, and 17% of respondents indicate less than 1% of design fees are used for specifications. This means contractors are paying far more for porta-potties than architects pay to produce specifications for the same project. Is it any wonder that “studious determination to succeed” is clearly in the minority for specifications writing?

The drawings identify the relationships and quantitative aspects of the project, everything that can be counted and measured, requiring the estimator’s takeoff skill. The specifications include administrative procedures and the qualitative aspects of the project – what products are required, how the products are installed, generally where the products are installed, and what performance must result – requiring the estimator’s care. Combining the estimator and specifier’s time, care, and skill will give owners a new confidence that project expectations will be met.

Despite the common notion held by architects that the contractor does not read the specs, estimators do read the specs - no, must read the specs because the importance of missing one significant word can mean the difference between success and failure. The result is that estimators know the spec content far better than most project architects do. Estimators must know the content to assemble the correct team, define the crews, and parse the scopes of work without missing or duplicating anything in the process. Because estimates and specifications are so intertwined, it is only natural that estimators and specifiers be joined at the hip, always working together.

A Brief History of Construction Specification:

MasterFormat® was originally introduced in the 1960s as a 5digit, 16division organization as a radical new idea. Then about 40 years later, in 2004, morphed to the current document. Full adoption of the newer format lagged about 10 years. Today’s CSI 3Part Format construction specifications are organized with 6digit section numbers and titles in 50 divisions according to MasterFormat. According to the current MasterFormat, specifications describe work results – what the contractor must build to satisfy the contract.

How do estimators have a part in this history?

In 1993 ASTM published, ASTM E1557 UNIFORMAT II, an organizational structure for building elements, created by estimators and economists to describe buildings by systems and assemblies. This organization allowed estimators to develop costs of complete building elements for comparative analysis of alternative elements early during the design process. The advantage was to enable informed decisions about building elements considering aesthetics, performance, and cost all with respect to the owner’s budget.

Shortly afterward, CSI introduced the concept of Preliminary Project Description (PPD), relying on UNIFORMAT II organization, to describe a project during concept and schematic design phases. CSI introduced its own version of UniFormat that included an introduction to collect information that applies to a project as a whole such as program data, code requirements, and design criteria. For the remainder of this paper, the term Uniformat will be used to represent both the ASTM and CSI documents, collectively.
Well-structured data is powerful. The notion of preliminary project description persisted and was formalized in PPDFormat\[vii\] that showed how to organize project data in a consistently structured way to describe elements by performance, design criteria, and individual components. The ASTM E06.81 Building Economics subcommittee\[viii\] responsible for ASTM E1557 praised the PPD concept from the beginning and continuously recommended its use in conjunction with preliminary cost estimates. Today estimators use Uniformat organization for early project estimates\[ix\]. Unfortunately, design teams rarely use PPDs, favoring informal, unstructured design narratives, instead.

Meanwhile, at the turn of this century, USGBC introduced LEED and building commissioning\[x\]. Commissioning necessitated developing Owner Project Requirements (OPR) as the basis for performing building commissioning. OPR is a formalization of a project program to document design criteria and building performance.

Now, the industry uses MasterFormat, Uniformat, design narratives, and OPR to document project requirements. The disparate systems lead to gaps in both specifications and estimates, where all too often critical information goes missing. These gaps are difficult to identify and nearly impossible to close because they exist at the intersection of the multiple different systems.

What comprises specifications today evolved from prior thinking about specifications and attempts to effectively organize data for construction contracts. And so too, today’s specifications will evolve to better suit the industry needs. This paper will explore the idea of applying existing concepts and documents in a new way to produce a better result for the owners – those that bear all the risk of design and construction.

The Future of Specifications and Estimates:
The next evolution in specifications will leverage all the existing organizational formats and resulting documents including OPR, PPD, Uniformat, and MasterFormat, but use them in a new way. When starting a new project, begin with Uniformat specifications to describe OPR and the building elements. Plug in MasterFormat construction specifications to define materials and installation needed to get the project built. Then name both Uniformat and MasterFormat specifications as contract documents to incorporate the complete project qualitative requirements.

Uniformat Project Approach
Specifications and Estimating: A New Vision for Better Outcomes .. continued

Uniformat Project Approach

Estimators recognized Uniformat’s usefulness during the early design phases\[xii]. CSI recognized its usefulness as the structure for PPDs to collect OPR and document design criteria before the design is actually started. Uniformat’s value is greater. Therefore, Uniformat must be the overarching document that extends over the complete life cycle of design and the resulting building.

Day one, when the owner decides a building is needed, start the data collection. Invite the entire project team to participate - owner, designer, SPECIFIER AND ESTIMATOR, contractor, installer, and supplier to leverage all available expertise. (As specifier, I want to bring an estimator with me. What I write affects cost, and costs inform design decisions I document. It is far better to know the cost implications as decisions are made rather than after the fact. Call me selfish. I want to avoid Value Engineering and massive rework, later.) Make the entire specification process transparent by inviting questions from the team and openly soliciting input, and resolving the questions as the process happens.

Say what you know, when you know it. Develop the estimate and specification detail consistent with the design progress. Describe the work results in short, concise statements that paint a mental picture of each building element so everyone understands. With the picture, estimators will know what will be required even without drawing details. At schematic design, estimators can easily price descriptions such as this description with only a plan and elevation drawing to set quantities.

B2010 - Exterior Wall
Description: Terra cotta clad continuously insulated rain screen wall with air barrier, sheathing and framed structural back up at podium level.

Use the process to identify and analyze viable options rather than including placeholders for cost purposes. Verify compliance with the owner’s project requirements and the budget. Discuss pros and cons, and obtain the owner’s informed consent for the optimal solution before committing significant design documentation resources. This process can be accomplished with minimal drawings and with Uniformat specifications only.

When it is time to bid, buy subcontracts, and get something built, the MasterFormat construction specifications will be written to identify component technical requirements. This allows the contractor to purchase and install the correct products required for each Uniformat specified element. For instance, Uniformat specs will describe the interior partition as a whole with all its...
components including the studs, gypsum board, acoustic insulation, and acoustic sealant making up the partition. The Master-Format spec will set the gypsum board product quality standard, the submittal requirements, the installation requirements, and other technical requirements not included in the Uniformat specifications.

Maintain the Uniformat specification throughout the design process. Update and augment the data as more is learned about the design and the project requirements. Record the design process, including decisions affecting the design along with the rationale. Document design and performance criteria necessary to commission and ultimately operate the building successfully to achieve the predicted performance.

Leverage transparency and cooperation. Stakeholders, given the opportunity, will make the project better by protecting their own interests and lending their expertise. Contractors want effective sequencing to simplify logistics. Subcontractors need easily buildable designs. Material suppliers want their products to be used correctly. Given the opportunity to participate, many if not all, requests for information and change orders may be eliminated, minimizing risk, while improving profitability for all.

Uniformat specifications must be delivered as record documents for the owner’s use. Since MasterFormat specifications do not represent what was actually installed, they will be of little value. Because Uniformat specifications contain design and performance criteria, they will prove invaluable to the facility operations, maintenance, and future modification.

With this new project approach starting early and remaining active throughout the design process, estimators, joined with specifiers, can actually make a difference. We can allow owners to explore options and make informed decisions about what is important to them rather than reluctantly accepting value engineering cost reductions after the fact.

Avoiding VE will minimize the massive amounts of rework and coordination gaps the rework creates when design documentation is revised. Avoiding VE will improve profitability for all stakeholders. Making informed decisions will allow design to proceed with confidence that the design will meet the owner’s project requirements, including budget. With this confidence will come improved cooperation among the project team to make the project a success.

Imagine the future when the owner actually gets what is expected and all stakeholders are profitable.

Read more about the Conspectus Approach at https://www.conspectusinc.com/

[i] Independent specifier Beth Stroshane the Managing Partner at Applied Building Information LLC first used the cost comparison between porta-potties and specifications.

[ii] “SectionFormat Structure,” in SectionFormat™ / PageFormat™ The Recommended Format for Construction Specifications Sections (The Construction Specifications Institute Construction Specifications Canada, 2008) This format prescribes the standard arrangement known as the 3-Part format using Part 1 – General, Part 2 – Products, and Part 3 – Execution. The format also includes standard article titles within each part for a consistent order of information within each specification.

[iii] MasterFormat® 2016 Update- Master List of Numbers and Titles for the Construction Industry (The Construction Specifications Institute Construction Specifications Canada, 2016). This standard includes nearly 9,000 numbers and titles used for construction specifications, detailed estimating, relating drawing notations to the specifications, and data filing. See http://www.masterformat.com. CSI membership or a recent purchase of MasterFormat is required for access.

[iv] Standard Classification for Building Elements and Related Sitework—UNIFORMAT II (ASTM International, ASTM E1557, 2009 Reapproved 2015). The original UNIFORMAT was developed jointly by the General Services Administration (GSA) and the American Institute of Architects (AIA) in 1972 for estimating and design cost analysis. UNIFORMAT II was first published in 1993 and enhanced the original, especially for the mechanical, electrical, plumbing, and fire protection elements. See http://www.uniformat.com for document background and application discussion.

[v] “Fundamentals and Formats Chapter FF/180 Preliminary Project Description (PPD),” in CSI Manual of Practice (The Construction Specifications Institute, 1996) PPDs are prepared to describe the scope and relationships of major project elements and are organized in terms of building elements and components.
UniFormat™ A Uniform Classification of Construction Systems and Assemblies (The Construction Specifications Institute Construction Specifications Canada, 2010). This is a system for arrangement of construction information based on physical parts of a facility called functional elements, otherwise known as systems and assemblies.

PPDFormat™ A Guide for Developing Preliminary Project Descriptions (The Construction Specifications Institute, 2010). This is a guideline document for preparing and using Preliminary Project Descriptions (PPD). PPDFormat provides detailed information on preparing written documents to accompany Schematic Design phase drawings as contract deliverables and suggestions for other uses during early phases of the design of a facility. This author was responsible, in part, for developing PPDFormat.

ASTM E06.81 Building Economics Subcommittee previously chaired by Harold E. Marshall economist with National Institute of Science and Technology (NIST) and with the staunch UNIFORMAT II proponent and estimator Robert P. Charette, PE, CVS, PQS. This subcommittee developed standards to help evaluate building projects and reduce costs throughout the life cycle. This author acted as the CSI liaison to the ASTM committee relative to developments involving UNIFORMAT II and UniFormat.

Use of Uniformat estimates is evidenced by current project estimates for notable projects such as the Obama Presidential Library where three separate estimators furnished Uniformat estimates at the end of Schematic Design.

“EA Prerequisite: Fundamental Commissioning and Verification,” in LEED v4 for Building Design and Construction (U.S. Green Building Council, 2016) When LEED was first introduced required fundamental commissioning as a prerequisite. This commissioning initially required a Basis of Design document to establish the criteria by which the building energy systems were commissioned. Today LEED requires Owner Project Requirements in addition to the Basis of Design as documentation to support commissioning.


Specifications and Estimating: A New Vision for Better Outcomes .. continued
If I wasn’t doing this, I would

FACES OF ASPE: Estel Taylor

Chapter 75 – Delaware – Chapter President
Albireo Energy
Contact: etaylor@albireoenergy.com

Best advice I ever received
Do the job right the first time, and you won’t have to do it again.

Best advice I share with young (and not so young) estimators
Commit to reviewing all the Specifications and Bid Documents. You never know when something will be hidden in an obscure spec section or drawing.

Chapter goal for 2019
To increase monthly Chapter Meeting and annual Golf Outing attendance so we have the ability to distribute more college scholarships.

If I wasn’t doing this, I would

Be a cabinetmaker/woodworker.
Project Report

St. Louis Abbey Priory Chapel

St. Louis, Missouri

Architect: Gyo Obata of HOK
Engineer: Pier Luigi Nervi
St. Louis Abbey Priory Chapel

This half-century-old daylighting design, commemorated for character and effectiveness and the roll it has played, is more than a mere chapel on a school campus but is a spiritual beacon, which serves the mission of the monastic community and those who work with them.

April 26, 2012 was a very special day in Missouri as the 50th Anniversary of the iconic Saint Louis Abbey (Priory Chapel) was commemorated. The day’s program included comments from the famed architect Gyo Obata, FAIA, whose revolutionary design is as dramatic today as it was 50 years ago. According to Obata, “Kalwall was then a fledgling company willing to take a risk with us.”

Kalwall’s unique translucent sandwich panel is a composite of two translucent fiberglass face sheets bonded to a structural grid core. The system is highly insulating yet transmits controlled natural daylight. “I designed the exterior to be black, but the strength of the sunlight allows the interior to be soft white light,” said Obata.

To quote the Saint Louis Abbey guide to the church, “The distinctive atmosphere of the interior is created by the quality of light admitted by the (Kalwall) windows and by the simplicity of the materials used. The chapel’s window-walls are formed of insulated fiberglass polyester material (Kalwall), which in daylight appears black from the outside but from the inside has the translucency of alabaster.

This material excludes ninety-four percent of the outside light, but its area is so great that the total effect is one of serenity and brightness. The architect and the artists have strengthened this atmosphere of serenity by their self-restraint in limiting themselves to a few simple and strong materials for the church interior and appointments. The ceramic floor and white translucent walls blend with the Georgia granite of the altars and the red oak of the ambo and pews. The total effect is one of calmness and strength, suitable for a monastery church.

The architectural form of the church is also its structural frame.

This building was the first thin-shelled concrete structure of its type to have been built in North America. It consists of two sets of thin concrete parabolic shells on two levels, set in twenty identical bays tapering toward the center of the circular plan. The shells spring from V-shaped rib beams on radii which span upward through a clerestory ring beam and meet at the crown against a smaller ring. Above the shell is a 32-foot-high bell tower of concrete. The ribs together form a cage acting as a dome, 40-feet-high inside and 134 feet in diameter. The upper ring of the arches serves to define the inner worship area where the liturgy is celebrated. The central skylight under the bell tower gives light and emphasis to the altar.”

One monk commenting on the impact of the translucent Kalwall mentioned, “Very late in the day we almost get a red glow from the low sun. And when the geese fly by, we can see their silhouette through the panels.”

At the culmination of the program, the Benedictine monks chanted to demonstrate The Chapel’s amazing acoustics created by the design and materials.

Designed by Gyo Obata of Hellmuth, Obata and Kassabaum (HOK), with the Italian architect and engineer Pier Luigi Nervi serving as consultant, the Abbey Church was an important landmark and name-making project for HOK, who is one of the largest U.S. based architecture-engineering firms in the world.
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(844) 617-2478
2019 ASPE Critical Calendar: May - August

MAY
1  Begin contacting Scholarship Winners announcing award (to Winners only)
1  2019 Summit - Regular Registration Begins
6  Deadline: Chapters to submit Chapter elections result form to Society Business Office
7  Education Committee Meeting via Conference Call
8  Certification Committee Meeting via Conference Call
23  Deadline: Chapter Reports to Governors for Annual Meeting Reports
27  2019 Summit - Regular Registration Closes
29  Deadline: July/August Estimating Today articles to Society Business Office
29  Committee and Technical Committee Chairs progress reports due to their respective Vice President and Society Business Office

JUNE
6  Annual Board Reports due to Society Business Office for Annual Meeting Books
6  2019 Summit - Late Registration Closes
12  Certification Committee Meeting via Conference Call
12  Education Committee Pre-Summit Meeting
19-22  2019 Annual Summit - Kansas City / Overland Park, Kansas
19  Board of Directors Meeting
19  Certification Committee Meeting
19  Standards Committee Meeting
19  Education Committee Meeting
19  Joint Technical Committee Meeting
20  2019 - 2020 Board of Directors take Office during Awards Dinner

JULY
10  Certification Committee Meeting via Conference Call
10  Education Committee Meeting via Conference Call
16  Standards Committee Meeting via Conference Call

AUGUST
7  Education Committee Meeting via Conference Call
10  Board of Directors Meeting via Video Conference
13  Standards Committee Meeting via Conference Call
14  Certification Committee Meeting via Conference Call
# ASPE Chapter Meetings

## Arizona

**Arizona #6**
- **Where:** Aunt Chilada’s
- **Address:** 7330 North Dreamy Draw Drive
- **Location:** Phoenix - 85020
- **Date:** 2nd Tuesday; **Time:** 5:30 PM
- **Meeting Contact:** Gene Plum
gplum@mccarthy.com

**Old Pueblo #53**
- **Where:** To Be Determined
- **Location:** Tucson
- **Date:** 1st Wednesday; **Time:** 5:30 PM
- **Meeting Contact:** Trip McGrath, CPE
tripm@compusultinc.com

## Colorado

**Denver #5**
- **Where:** To Be Determined
- **Location:** Denver
- **Date:** 2nd Tuesday; **Time:** 5:00 PM
- **Meeting Contact:** Paul Jones
pjones@gtc1.net

## Arkansas

**Arkansas #33**
- **Where:** Baldwin & Shell
- **Address:** 1000 West Capital Avenue
- **Location:** Little Rock - 72201
- **Date:** 3rd Friday; **Time:** 12:00 PM
- **Meeting Contact:** Chuck Garrett, CPE
cgarrett@baldwinshell.com

**NW Arkansas #79**
- **Where:** To Be Determined
- **Location:** Bentonville
- **Date:** TBD; **Time:** TBD
- **Meeting Contact:** Carrie Morones, CPE
aspe.cam@gmail.com

## California

**Los Angeles #1**
- **Where:** The Barkley Restaurant
- **Address:** 1400 Huntington Drive
- **Location:** South Pasadena - 91910
- **Date:** 4th Wednesday, Jan. - Oct.; **Time:** 6:00 PM Social Hour
- **Meeting Contact:** Bruce Danielson
lalofaspe@outlook.com

**Golden Gate #2**
- **Where:** AIA East Bay
- **Address:** 1405 Clay Street
- **Location:** Oakland - 94612
- **Date:** 3rd Wednesday; **Time:** 6:00 PM
- **Meeting Contact:** Jeremiah Newens
jnewens@southlandind.com

**Orange County #3**
- **Where:** Ayres Hotel
- **Address:** 325 Bristol Avenue
- **Location:** Costa Mesa - 92626
- **Date:** 2nd Wednesday; **Time:** 5:30 PM
- **Meeting Contact:** Kevin Murphy
president@aspe-oc3.org

**San Diego #4**
- **Where:** To Be Determined
- **Location:** San Diego
- **Date:** 3rd Tuesday; **Time:** 5:30 PM
- **Meeting Contact:** Lisa Thibodeaux
Lisa@constructionclasses.com

**Sacramento #11**
- **Where:** Rancho Cordova City Hall
- **Address:** 2729 Prospect Park Drive
- **Location:** Rancho Cordova - 95670
- **Date:** 2nd Friday; **Time:** 12:00 PM
- **Meeting Contact:** Bryan Hall
bryan.hall@vanir.com

**Silicon Valley #55**
- **Where:** To Be Determined
- **Location:** To Be Determined
- **Date:** Varies; **Time:** Varies
- **Meeting Contact:** Alan Jacobs, CPE
alan.jacobs@blach.com

## Connecticut

**Nutmeg #60**
- **Where:** Back Nine Tavern
- **Address:** 245 Hartford Road
- **Location:** New Britain - 06053
- **Date:** Varies; **Time:** 6:00 PM
- **Meeting Contact:** Harrison Levy
klevy@petraconstruction.com

**Yankee #15**
- **Where:** To Be Determined
- **Location:** Stratford, CT
- **Date:** TBD; **Time:** TBD
- **Meeting Contact:** Gregory Williamson, CPE
gwilliamson@bondbrothers.com

## Delaware

**Delaware #75**
- **Where:** To Be Determined
- **Location:** Wilmington
- **Date:** 2nd Wednesday; **Time:** 5:30 PM
- **Meeting Contact:** Estel Taylor
etaylor@albireoenergy.com

## District of Columbia

**Greater D.C. #23**
- **Where:** Jacobs
- **Address:** 1100 North Glebe Road, Suite #12
- **Location:** Washington, DC
- **Date:** 3rd Thursday; **Time:** Varies
- **Meeting Contact:** Maurice Touzard, CPE
mtouzard@gmail.com
FLORIDA
Tampa Bay #48
Where: Mission BBQ
5602 West Water Avenue
Tampa - 33634
Date: 3rd Tuesday; Time: 5:30 PM
Meeting Contact:
Jim Cummings
jim.cummings@edunn.com

INDIANA
Central Indiana #59
Where: To Be Determined
Indianapolis
Date: 3rd Thursday; Time: Varies
Meeting Contact:
Matt Burrell
mburrell@performanceservices.com

GEORGIA
Atlanta #14
Where: Sage Woodfire Tavern
4505 Ashford Dunwoody Road
Atlanta - 30346
Date: 2nd Monday; Time: 11:30 AM
Meeting Contact:
Clinton Aldridge
clinton.aldridge@skansa.com

IOWA
Quad Cities #71
Where: To Be Determined
Davenport
Date: Varies; Time: Varies
Meeting Contact:
Keith Parker, CPE
keithparker@circlebco.com

LOUISIANA
New Orleans #9
Where: To Be Determined
New Orleans
Date: TBD; Time: TBD
Meeting Contact:
Carri Morones, CPE
aspe.carm@gmail.com

MAINE
Maine #37
Where: Woodard & Curran
41 Hutchins Drive
Portland - 04112
Date: 1st Wednesday; Time: Varies
Meeting Contact:
John Brockington, CPE
jbrockington@woodwardcurran.com

MARYLAND
Baltimore #21
Where: Varies
Baltimore
Date: Varies; Time: Varies
Meeting Contact:
Clint Townshend
townshend@phoenix-eng.com

MASSACHUSETTS
Boston #25
Where: Maggiano’s Little Italy
4 Columbus Avenue
Boston - 02116
Date: 3rd Wednesday; Time: Varies
Meeting Contact:
Erick Vargas
evargas@garlandboston.com

MICHIGAN
Detroit #17
Where: Visit www.aspe17.org
To Be Determined
Detroit
Date: 3rd Tuesday; Time: 5:15 PM
Meeting Contact:
Gerald McClelland
gmcclelland@auchconstruction.com

ORLANDO
Orlando #50
Where: Black & Veatch Offices
201 S Orange Avenue, Suite 500
Orlando - 32801
Date: 3rd Tuesday; Time: 6:00 PM
Meeting Contact:
Danny Chadwick, CPE
dckchadwick@bellsouth.net

OLD FORGE
Old Fort #65
Where: Varies
Fort Wayne
Date: Last Thursday; Time: Varies
Meeting Contact:
Phillip Salisbury, CPE
psalisbury@blundall.com

WEST INDIA
Central Indiana #359
Where: To Be Determined
Indianapolis
Date: 3rd Thursday; Time: Varies
Meeting Contact:
Matt Burrell
mburrell@performanceservices.com

NEW ORLEANS
Greater Des Moines #73
Where: Varies
Des Moines
Date: 1st Thursday; Time: Varies
Meeting Contact:
Ray Conway
aspe.ia.73@gmail.com

WITNESN WICHIGAN
Western Michigan #77
Where: Varies
Grand Rapids
Date: Varies; Time: Varies
Meeting Contact:
Mike Alsgaard, CPE
maalsgaard@ftch.com

IOWA
Quad Cities #71
Where: To Be Determined
Davenport
Date: Varies; Time: Varies
Meeting Contact:
Keith Parker, CPE
keithparker@circlebco.com

LOUISIANA
New Orleans #9
Where: To Be Determined
New Orleans
Date: TBD; Time: TBD
Meeting Contact:
Carri Morones, CPE
aspe.carm@gmail.com

MAINE
Maine #37
Where: Woodard & Curran
41 Hutchins Drive
Portland - 04112
Date: 1st Wednesday; Time: Varies
Meeting Contact:
John Brockington, CPE
jbrockington@woodwardcurran.com

MARYLAND
Baltimore #21
Where: Varies
Baltimore
Date: Varies; Time: Varies
Meeting Contact:
Clint Townshend
townshend@phoenix-eng.com

MASSACHUSETTS
Boston #25
Where: Maggiano’s Little Italy
4 Columbus Avenue
Boston - 02116
Date: 3rd Wednesday; Time: Varies
Meeting Contact:
Erick Vargas
evargas@garlandboston.com

MICHIGAN
Detroit #17
Where: Visit www.aspe17.org
To Be Determined
Detroit
Date: 3rd Tuesday; Time: 5:15 PM
Meeting Contact:
Gerald McClelland
gmcclelland@auchconstruction.com

ORLANDO
Orlando #50
Where: Black & Veatch Offices
201 S Orange Avenue, Suite 500
Orlando - 32801
Date: 3rd Tuesday; Time: 6:00 PM
Meeting Contact:
Danny Chadwick, CPE
dckchadwick@bellsouth.net

OLD FORGE
Old Fort #65
Where: Varies
Fort Wayne
Date: Last Thursday; Time: Varies
Meeting Contact:
Phillip Salisbury, CPE
psalisbury@blundall.com

WEST INDIA
Central Indiana #359
Where: To Be Determined
Indianapolis
Date: 3rd Thursday; Time: Varies
Meeting Contact:
Matt Burrell
mburrell@performanceservices.com

NEW ORLEANS
Greater Des Moines #73
Where: Varies
Des Moines
Date: 1st Thursday; Time: Varies
Meeting Contact:
Ray Conway
aspe.ia.73@gmail.com

WITNESN WICHIGAN
Western Michigan #77
Where: Varies
Grand Rapids
Date: Varies; Time: Varies
Meeting Contact:
Mike Alsgaard, CPE
maalsgaard@ftch.com
MINNESOTA
Viking #39
Where: Varies
To Be Determined
St. Paul
Date: Varies; Time: Varies
Meeting Contact: Keith Parker, CPE
keithparker@circlebco.com

MISSOURI
St. Louis Metro #19
Where: Varies
To Be Determined
St. Louis
Date: 3rd Friday; Time: 7:30 AM
Meeting Contact: Keith Parker, CPE
keithparker@circlebco.com

NEVADA (CONTINUED)
Las Vegas #72
Where: Varies
To Be Determined
Las Vegas
Date: 2nd Thursday; Time: Varies
Meeting Contact: Chuck James, CPE
wqj@clarkcountynv.gov

NEW JERSEY
Garden State #26
Where: The Appian Way Restaurant
619 Langdon Street
Orange - 07050
Date: 1st Wednesday; Time: 5:30 PM
Meeting Contact: Jimmy Sample, CPE
jimmy.sample@bixbyelectric.com

NEW MEXICO
Roadrunner #47
Where: Fiestas Restaurant
4400 Carlisle Boulevard NE
Albuquerque - 87107
Date: 1st Wednesday; Time: 11:30 AM
Meeting Contact: Phyllis Battle
pbattle@preconstructionservices.com

NEW YORK
New York #10
Where: Ingrid’s Kitchen
3701 North Young Boulevard
Oklahoma City - 73112
Date: 1st Wednesday; Time: 11:30 AM
Meeting Contact: Phyllis Battle
pbattle@preconstructionservices.com

NEVADA
Las Vegas #72
Where: Varies
To Be Determined
Las Vegas
Date: 2nd Thursday; Time: Varies
Meeting Contact: Chuck James, CPE
wqj@clarkcountynv.gov

NEW YORK (CONTINUED)
Western NY #77
Where: To Be Determined
To Be Determined
Rochester
Date: TBD; Time: TBD
Meeting Contact: Gregory Williamson, CPE
gwilliamson@bondbrothers.com

OHIO
Buckeye #27
Where: Varies
To Be Determined
Columbus
Date: Varies; Time: Varies
Meeting Contact: Keith Parker, CPE
keithparker@circlebco.com

OREGON
Columbia-Pacific #54
Where: University Place
310 W. Lincoln Street
Portland - 97201
Date: 3rd Tuesday; Time: 5:30 PM
Meeting Contact: Craig Welburn
cwellburn@cherrycityelectric.com

Heartland #32
Where: Uncle Buck’s Grill or
Bass Pro Shops
See Meeting Contact
Date: 3rd Thursday; Time: 5:30 PM
Meeting Contact: Gregory Wienberg, CPE
gmwfam5@gmail.com

Nevada #23
Where: Varies
To Be Determined
Reno
Date: Varies; Time: Varies
Meeting Contact: Stacie Flynn
staciewflynn@gmail.com

NEW YORK (CONTINUED)
Western NY #77
Where: To Be Determined
To Be Determined
Rochester
Date: TBD; Time: TBD
Meeting Contact: Gregory Williamson, CPE
gwilliamson@bondbrothers.com

NEVADA
Las Vegas #72
Where: Varies
To Be Determined
Las Vegas
Date: 2nd Thursday; Time: Varies
Meeting Contact: Chuck James, CPE
wqj@clarkcountynv.gov

NEW MEXICO
Roadrunner #47
Where: Fiestas Restaurant
4400 Carlisle Boulevard NE
Albuquerque - 87107
Date: 1st Wednesday; Time: 5:30 PM
Meeting Contact: Jimmy Sample, CPE
jimmy.sample@bixbyelectric.com

NEW YORK
New York #10
Where: To Be Determined
To Be Determined
New York City
Date: Varies; Time: Varies
Meeting Contact: Bruce Schlesier, CPE
bruce_schlesier@msn.com

NEBRASKA
Great Plains #35
Where: To Be Determined
To Be Determined
Omaha
Date: Varies; Time: Varies
Meeting Contact: Keith Parker, CPE
gmwfam5@gmail.com

NEW YORK
New York #10
Where: To Be Determined
To Be Determined
New York City
Date: Varies; Time: Varies
Meeting Contact: Bruce Schlesier, CPE
bruce_schlesier@msn.com

NEVADA
Las Vegas #72
Where: Varies
To Be Determined
Las Vegas
Date: 2nd Thursday; Time: Varies
Meeting Contact: Chuck James, CPE
wqj@clarkcountynv.gov

NEW MEXICO
Roadrunner #47
Where: Fiestas Restaurant
4400 Carlisle Boulevard NE
Albuquerque - 87107
Date: 1st Wednesday; Time: 5:30 PM
Meeting Contact: Jimmy Sample, CPE
jimmy.sample@bixbyelectric.com

NEW YORK
New York #10
Where: To Be Determined
To Be Determined
New York City
Date: Varies; Time: Varies
Meeting Contact: Bruce Schlesier, CPE
bruce_schlesier@msn.com

NEVADA
Las Vegas #72
Where: Varies
To Be Determined
Las Vegas
Date: 2nd Thursday; Time: Varies
Meeting Contact: Chuck James, CPE
wqj@clarkcountynv.gov

NEW MEXICO
Roadrunner #47
Where: Fiestas Restaurant
4400 Carlisle Boulevard NE
Albuquerque - 87107
Date: 1st Wednesday; Time: 5:30 PM
Meeting Contact: Jimmy Sample, CPE
jimmy.sample@bixbyelectric.com

NEW YORK
New York #10
Where: To Be Determined
To Be Determined
New York City
Date: Varies; Time: Varies
Meeting Contact: Bruce Schlesier, CPE
bruce_schlesier@msn.com

NEVADA
Las Vegas #72
Where: Varies
To Be Determined
Las Vegas
Date: 2nd Thursday; Time: Varies
Meeting Contact: Chuck James, CPE
wqj@clarkcountynv.gov

NEW MEXICO
Roadrunner #47
Where: Fiestas Restaurant
4400 Carlisle Boulevard NE
Albuquerque - 87107
Date: 1st Wednesday; Time: 5:30 PM
Meeting Contact: Jimmy Sample, CPE
jimmy.sample@bixbyelectric.com

NEW YORK
New York #10
Where: To Be Determined
To Be Determined
New York City
Date: Varies; Time: Varies
Meeting Contact: Bruce Schlesier, CPE
bruce_schlesier@msn.com

NEVADA
Las Vegas #72
Where: Varies
To Be Determined
Las Vegas
Date: 2nd Thursday; Time: Varies
Meeting Contact: Chuck James, CPE
wqj@clarkcountynv.gov

NEW MEXICO
Roadrunner #47
Where: Fiestas Restaurant
4400 Carlisle Boulevard NE
Albuquerque - 87107
Date: 1st Wednesday; Time: 5:30 PM
Meeting Contact: Jimmy Sample, CPE
jimmy.sample@bixbyelectric.com
ASPE CHAPTER MEETINGS (CONTINUED)

PENNSYLVANIA
Greater Lehigh Valley #41
Where: D’Huy Engineering Office
1 E. Broad Street
Bethlehem
Date: Varies; Time: Varies
Meeting Contact:
Ron Trawinski, CPE
trawinski@ptd.net

Three Rivers #44
Where: To Be Determined
To Be Determined
Pittsburgh
Date: TBD; Time: TBD
Meeting Contact:
Kevin Sheahan
kevin.sheahan@aecom.com

Philadelphia #61
Where: To Be Determined
To Be Determined
Philadelphia
Date: 3rd Wednesday; Time: Varies
Meeting Contact:
Jay Kellogg, CPE
jaykellogg@kel-con.com

Central Pennsylvania #76
Where: Loxley’s Resturant
500 Centerville Road
Lancaster - 17601
Date: 2nd Wed; Time: 6:00 PM
Meeting Contact:
Dan Dennis, CPE
dd@EGSConstruction.com

TEXAS
Houston #18
Where: Spaghetti Westerns
1608 North Shepherd
Houston - 77007
Date: 2nd Monday; Time: 6:00 pm
Meeting Contact:
Dennis Pyland
dennis.pyland@gmail.com

Rio Grande #40
Where: Ray’s at Pershing Inn
2909 Pershing Drive
El Paso - 79903
Date: 1st Thursday; Time: 6:00 PM
Meeting Contact:
Rodolfo Barba, CPE
rodolfobarba1@gmail.com

Dallas/ Ft.Worth #43
Where: See Chapter Website
To Be Determined
Variety: N. Dallas/Mid-Cities/Grapevine
Date: Varies; Time: Varies
Meeting Contact:
Rick Wyly, CPE
rick@buildcostcontrol.com

UTAH
Great Salt Lake #51
Where: Varies
To Be Determined
Salt Lake City
Date: 3rd Thursday; Time: Varies
Meeting Contact:
Phil Capell, CPE
president@aspe51.org

VIRGINIA
Richmond #82
Where: Baskervill
101 South 15th Street, Suite #200
Richmond - 23219
Date: 4th Wednesday; Time: 5:00 PM
Meeting Contact:
TK Farleigh
tfarleigh@baskervill.com

Please Note: Information is subject to change. Report changes in your Chapter’s information with an email to Tina@ASPEnational.org
ASPE CORE VALUES

EDUCATION:
ASPE educates and mentors professional estimators for the sustainability of the construction industry.

PROFESSIONALISM:
ASPE promotes the lifelong pursuit of excellence and credibility in professional estimating.

FELLOWSHIP:
ASPE develops a fellowship of professional estimators that connects and leads the construction industry.