
 <p>PINNACLEONE The cornerstone of confidence™</p>	<p>June 2003</p>	
<p>The following is a series of articles addressing the cost of construction projects.</p>	<p>Article 2 of 4</p>	
<p>PinnacleOne Institute Custom, In-house Training and National Seminar Series</p> <p>Program & Project Management</p> <p>Dispute Avoidance & Resolution</p> <p>Real Property Advisory Services</p> <p>Headquartered in Phoenix, PinnacleOne regional operations are located in Irvine, Los Angeles, Sacramento, and Hartford, CT.</p> <p>To view a specific back-issue of this newsletter, please <Click Here></p>	<div data-bbox="409 386 1444 440" style="border: 1px solid black; padding: 5px;"> <p>WHAT WILL MY PROJECT COST?</p> </div> <p>This is a question that it is asked on all construction projects from project inception until the writing of the last check. One measure of your project's success will be the accuracy of the answer. This series of articles offers practical advice on ways to control and manage project costs in design, construction and closeout to achieve the best value, at the least cost with the fewest surprises as possible.</p> <hr/> <p style="text-align: center;">Make a Difference When You Can – Control Costs During Design</p> <p style="text-align: center;">Why? Consider the following two famous quotes:</p> <p style="text-align: center;">"The physician can bury his mistakes, but the architect can only advise his clients to plant vines." Frank Lloyd Wright, in the <u>New York Times Magazine</u>, October 4, 1953</p> <p style="text-align: center;">"Necessity never made a good bargain." Benjamin Franklin, <u>Poor Richard's Almanack</u>, 1737</p> <p>As design team members increase the amount of time that they invest in their documents, they become increasingly less willing to accept ideas or revisions suggested by others and make worthwhile changes. As a result, good ideas when they come late can come to naught, add design costs or cause delays in the design. The opportunity to influence project costs without affecting project scope diminishes with time.</p> <p>When it comes to correcting errors in the plans and specifications, we've all observed a phenomenon that I've seen somewhere called the "1-10-100-1000 Effect." This concept states that it usually takes a draftsman, who finds his/her own mistake, one time-unit to</p>	 <p>Mr. Lee Schumacher, P.E., Director of Construction Claims for PinnacleOne's Northeast operations is a specialist in the evaluation and resolution of construction disputes. During his twenty- five year career, Mr. Schumacher has worked as a consultant to design professionals, owners, contractors, insurance companies and sureties, and has testified as an expert witness in construction related cases on behalf of owners and contractors. Mr. Schumacher has provided expert testimony in court and arbitration proceedings, and has lectured and published numerous articles on a wide range of claims related topics.</p> <p>Mr. Schumacher is located in PinnacleOne's</p>

correct it; the same correction may take ten time-units if the designer finds the error, 100 time-units if it is found by the contractor and 1000 time-units if lawyers get involved. The 1-10-100-1000 Effect applies equally to the impacts of owner-directed changes or correcting contractor mistakes.

Quality Based Selection – Cost control in design begins with QBS, "Quality Based Selection" of the design team. This means owners ask for trouble if they do not use QBS and instead, choose their design professional primarily due to price without consideration of the designer's reputation for quality and demonstrable focus on quality assurance and quality control (QA/QC). While an inadequate fee or an unreasonable time frame to complete the design are not justifiable excuses for excessive errors and mistakes, it is rare that owners receive a quality design when they do not pay their designers fairly or give them enough time for their work.

Establish Design Priorities – At project conception, budgets are often set by the availability of funds. At this stage, budgets by their very nature are goals not estimates. The actual cost of the project will subsequently be determined by decisions in design regarding project program, quality and schedule. In design, end-user needs drive programs; both aesthetic and life cycle value considerations define the project quality. Project scope and the costs of shortening the project duration usually determine design and construction completion dates.

On most projects, trade-off's between these competing project considerations need to be made in the design. In these cases, should the design sacrifice program, quality or schedule to maintain budget or should the budget be increased? Designers – do not assume that the owner will tolerate budget growth to accomplish their other project goals. When trade-off's are necessary, involve your client and document the reasoning behind them. Owners – do not send mixed messages to your design team and make sure your priorities are clear.

Interdisciplinary Plan Checks and Constructibility Reviews – Given the complexities of design and construction, even the best designs will not be error-free. In addition, mistakes can happen because most architects and engineers have not competitively bid or built projects as contractors. It is also not uncommon for architects not to completely understand or be intimidated by the other discipline drawings. By keeping a focus on QA/QC during the design, specifically by using interdisciplinary plan checks and constructibility reviews at key points in the design process, it is usually possible to eliminate a high majority of these mistakes prior to bid.

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When done right, plan checks and constructibility reviews identify discrepancies in the plans and specifications, ambiguities in the contract documents, potential problems with phasing or sequencing, site constraints or other factors that could add costs to the contractor's bids or result in change orders during construction. To be most effective, plan checks should be done at key points in the design evolution and be formal, structured, and fully documented processes conducted by someone other than the person actually doing the design. For obvious reasons, constructors or other professionals with experience from a builder's perspective typically provide the most value to constructibility reviews.

Value Engineering – Value engineering is an excellent way to control costs during design and generally maximizes the value of your project. The value engineering process, correctly used, always pays more dividends than it costs. Historically, we have found that prudent value engineering can increase the value received for each dollar spent or reduce costs by 5 to 15 per cent without reducing scope or quality. To make value engineering most cost-effective, employ it early, not late in design.

Try to start value engineering at the conceptual design phase when building systems are being considered and decisions can have large cost-benefit consequences. If possible, do it again when the design is between 65 and 75 complete and it is still possible to make changes at relatively little cost. Unfortunately, on many projects value engineering is not done until late in the design, sometimes after bids are received, when it becomes apparent that the design can not be built within the budget. In these cases, "value engineering" often is a misnomer and is instead a fancy way of saying "scope reduction."

To achieve the most value, make the value engineering effort a formal process that includes as many of the project stakeholders, particularly the end-user, as possible. Consider using an independent third party, be it an owner's representative or a certified value engineer, to bring an independent view of alternatives and to facilitate the process. Finally, document each decision made during the value engineering effort.

Independent Cost Estimates and Contingencies – Accurate cost estimates made during design are extremely important. Simply put, you need them to make informed decisions and to avoid surprises at bid time. Obviously, they improve as the design progresses but cost estimates, by their nature and particularly early in the design, are never exact. With that said, it is generally possible to achieve certainty in the budget by using identifiable contingencies reflecting the status of the design. You should then manage the use of this

design contingency to achieve the best value for your project. Because they are so important, consider getting an independent cost estimate from a third party to validate the estimates provided by your design professional and the adequacy of your project budget.

Even with realistic cost estimates and contingencies, the cost of your project will not be certain until you write the last check. However, owners and designers can make a big difference during the design. Otherwise, it may necessary to settle for planting vines or more likely, you may fall victim to the 1-10-100-1000 Effect and have to make difficult and very costly decisions during construction or more often these days, litigation after. Remember Ben Franklin's words, "Necessity never made a good bargain."

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