



EXHIBIT

Understanding School Construction Project Costs

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By Bill Laughlin, AIA, REFP

Why budgets are easily misconstrued and how to overcome cost estimating pitfalls

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School construction budgets and costs are easily misinterpreted. Poor comparisons made by the public often cause confusion in communities. It's always frustrating and often results in fractious debates and unnecessary delay.

All this anguish can be avoided, however, by interpreting data properly, continuously communicating the project's progress, and anticipating inflation costs with a capital improvement plan.

Common Misconceptions in Estimating

Probably the biggest misconception in planning for future school projects is understanding hard and soft costs. Hard costs are building and site construction costs — literally, the bricks and mortar. Soft costs take into account the less tangible aspects of a project budget:

- Design
- Boundary and topographic surveying
- Geotechnical and materials testing
- Furniture, fixtures and equipment
- Data and communications systems
- Permitting and utility connection fees
- Code required special inspections during construction
- Environmental and hazardous materials services
- In-house project staffing costs
- Estimated project cost escalation
- Construction cost contingency
- Project scope contingency

No two projects are created equal, but hard costs typically account for approximately 75 to 80 percent of a new school's total project cost. Soft costs are typically 20 to 25 percent of the total project cost. The hard costs plus the soft costs are referred to as the total project cost.

The perceived disparity between the total project cost of one school and just the hard cost of the other was the issue in the community cited above. Undoing the damage after the local newspaper printed the incorrect data, however, was not so simple.

Market Escalation and Comparisons

To plan project budgets, estimators most often turn to historical data. Comparing costs of similar projects in the region, for example, makes sense. This data is most often compared on a cost per square foot basis. In fact, averaging and escalating historical cost data — construction bids — of similar projects is a common method used to determine a basic construction budget. Referencing available cost data sources can be helpful. However, analysts must use caution, because different data sources calculate data in different ways. A thorough understanding of the basis for the data is paramount.

Comparing similar projects doesn't always result in an equivalent comparison. For example, there are different ways to measure student capacity. Different schools systems have different philosophies regarding student-to-teacher ratios. Depending on this ratio, the square foot size and cost of a school could vary by as much as 25 percent for the same total population.

Site construction scopes and costs vary more widely than any other factor. When comparing two sites, one might have off-site utilities, off-site road improvements, a pump station and substantial rock, whereas the other site might have started with a pre-graded building pad done by a developer under a separate contract or proffer.

The challenge with using historical cost data is that market conditions can change unexpectedly and drive up project costs.

Comparing a project to a similar one bid just three years ago, for example, needs to be carefully considered. Since early 2004, the construction industry has experienced historic increases in costs relative to other parts of the economy. These increases have been caused by a number of different factors that, in combination, are having a startling impact on total project construction costs.

Ken Simonson, chief economist for the Associated General Contractors of America, notes that numerous factors have affected construction materials including:

- strong, sustained growth in the United States since 2003 following a period in which steel mills and other manufacturing declined;
- very rapid industrialization, infrastructure development, and consumer demand growth in resource-poor Asian countries;
- trade policies that kept out lower-cost steel, cement and lumber; and
- transportation bottlenecks and supply disruptions from hurricanes, tsunamis and floods.

Steel, copper, PVC, cement, #2 diesel, lumber, insulation and gypsum products were the hot commodities in 2004 and 2005. In 2006, the areas of most concern are copper and petroleum-related materials. The following materials are showing larger than expected increases over the same period just one year ago: #2 diesel, 33 percent; asphalt, 71 percent; copper and brass mill shapes, 81.5 percent; gypsum products, 23 percent.

As a result, architects and engineers are rethinking material choices. For example, copper is in such short supply and so expensive that engineers are reverting to aluminum wire, despite concerns about performance. Other data and statistics can be found at www.agc.org.

Traditional supply and demand economics are also wreaking havoc in the construction bid markets. In the last two years, contractors have become more selective and are turning down projects more often.

Some projects are only attracting one bidder, and sometimes no bidders. General contractors are also frustrated because they cannot find competition or coverage among the sub-contracting community. This reduced competition and uncertainty continues to cause construction prices to increase even further than the material increases discussed above.

The outlook for the remainder of 2006 and 2007 does not look any brighter. Many contractors' backlogs reach far into 2007, causing them to pursue even fewer projects.

Strategies for Scope and Budget Buy-In

In the community that was building the new high school, misunderstandings over soft and hard costs turned ugly.

Perception and reality were two different things. A neighboring community was planning a similar size school at the same time, so the projects were naturally compared in the local newspapers. One newspaper unknowingly compared the hard cost of one project with the total project cost (the total of the hard and soft costs) of the other. As a result, the "same" project appeared to be 20 percent more expensive — a "Taj Mahal."

Whether it is through staff reporting or letters to the editor, the local media influences perception the most. Misunderstood, inaccurate or incorrect information is difficult to rectify. This simple misunderstanding fueled a "call to arms" to derail the project. The resulting delay cost the community millions of dollars in inflation costs and another year of students in cramped conditions.

A key to heading off such problems is developing consensus early. One way to do this is to sponsor intensive, multi-day, on-site interactive planning workshops at the beginning of the design process.

Involving as many stakeholders as possible — including teachers, school officials, students, maintenance staff, neighbors, civic associations and any other interested citizens — will ensure a focus on key issues early in the decision-making process. It also ensures that the final design will be well-thought-out and cohesive.

These town meeting-style forums accomplish a lot in a short period of time. They help all the major players address issues early. They also help community members understand what can and cannot be achieved, and for what cost. Therefore, everyone knows immediately whether his or her requests are reasonable.

Strategies for Town Meetings and Consensus

Meetings with stakeholders will only be successful if they are well attended and attendees receive objective, tangible information to help them understand the overall project. It is important to time the meeting right to attract adequate numbers of attendees. Make sure it is well advertised in advance and it does not conflict with other community events, such as the community sports calendar.

- Have members of the community deliver the public presentations when possible. It adds credibility to the project.
- Provide a professional rendering or model so stakeholders can visualize the finished project.
- Deliver concise presentations with written handouts, including executive summaries, to clarify key points and avoid misunderstandings.
- If project leaders do not have answers to stakeholders' queries, offer to follow up — and then do it.
- Invite and encourage project opponents — the naysayers — to participate in the process. Keeping them informed and involved will minimize

- misperceptions, and opponents just might be turned into supporters.
- Listen to the naysayers. What they say will give you a roadmap for what key issues need to be addressed to stay on track.
 - Anticipate the hard questions so you can control the conversation proactively, not in a reactionary way.
 - Study the data the naysayers might reference, along with common industry standards and other relevant information. That way, you'll be able to provide educated answers right off the bat.
 - Offer to meet with newspaper reporters. Provide written statements and data whenever possible; verbal interviews can be misinterpreted or misprinted.
 - Pursue retractions and corrections if facts are misrepresented in the media.
 - Project Web sites have proven to be very effective. A well-designed website provides a project's chronological sequence, so that anyone can check anytime to see the project's history, why decisions were made, etc. A link from a school district's home page can increase traffic to the project website, thus making it easier to communicate your intentions.

Budgeting for the Future

A common mistake that authorities make all too often is not properly accounting for regular inflation, or escalation. When a project budget is planned years in advance, the project costs need to be adjusted upward to account for regular escalation costs. Another common mistake is not regularly updating project budgets to account for changing market conditions. During the period from 2003 to 2005, many projects came in 20 percent (or more) higher than originally planned. This historic spike in construction costs caught many people off-guard.

There are three possible responses to unanticipated market changes or escalation costs: reduce the size of the project, reduce the quality, or scramble to find more money. These are three difficult choices to implement in any project. Any of these choices can also create unanticipated delays that further increase costs. In school construction, a month delay late in the process could result in opening the school a whole year later.

In the end, project delays add significant costs. The key is to get the budget right the first time, years in advance, then update it regularly in order to achieve the community's vision.

Simple formulas and "just plugging in numbers" is a recipe for headaches and frustration in years to come. Consulting a professional cost estimator or an architect can mitigate the potential heartache. While no one has a crystal ball to determine market conditions, school officials can use skillful planning to overcome cost estimating and project scope pitfalls in order to keep the project on track.

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