



# THE BAY DIMENSION

thenewsletteroftbdconsultants - edition 10, 2nd qtr 2008



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General Contractors [GC], subcontractors and consultants who are experienced in the particular type of project to be undertaken is recommended.



## ESTIMATING

An important part of estimating is establishing a realistic budget for the project as early as possible. Then as the design develops new estimates should be created at pre-determined intervals and measured against the original budget. This allows the project team to control scope and keep the project within budget.

Usually the budget and subsequent estimates are broken down by building element allowing analysis of the individual pieces of the project's design. An industry standard and well-documented format such as UNIFORMAT II is recommended to ensure the whole project team has the same understanding of the cost breakdown. The elemental format is recommended by the CSI for estimates at the early design stages, as it facilitates value engineering.

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## Preconstruction Services Part 1

Matt Craske

*This article is the first in a series looking at the Negotiated Guaranteed Maximum Price [GMP] delivery method.*

Preconstruction services are an important part of any successful construction project and help ensure that the owner's expectations are met. Enlisting the services of

As the design becomes more complete, the rigor or effort put into the estimate should increase. The rigor of an estimate is directly related to the accuracy of an estimate. Having two independent estimating teams also helps to increase the accuracy of the estimating process since the reconciliation process ensures a thorough re-examination of the scope.

Once the project reaches buy-out, a baseline estimate should be established, broken down by buy-out package or trade. This document is essential for successful construction execution as it will form the basis for monthly reporting, progress payments, and change order review.

### SCHEDULING

This is one of the most important aspects of preconstruction as it feeds into almost every other area of a construction project. The project schedule is an important tool for accurate estimating, timely procurement, risk mitigation, construction phasing and change order review.

Sufficient resources are needed to logically build, independently analyze and consistently progress a schedule for it to be a useful tool to the project team and input should be solicited from users, designers, subcontractors, authorities and vendors. Without this effort the project schedule often becomes little more than a historical record of what has happened.

With a good scheduling team in place and the schedule built the project team can perform the following activities with confidence: -

- Explore “what if” scenarios
- Accurately assign costs for lost productivity, overtime, 2nd shift, escalation, site supervision, site requirements and phasing
- Create a detailed procurement plan, highlighting long lead items
- Identify items on the “critical path”
- Manage resources effectively
- Evaluate extension of time claims
- Mitigate risks through planning
- Measure construction progress

In the next edition we will look at Constructability Reviews, Value Engineering, Risk Management and more.

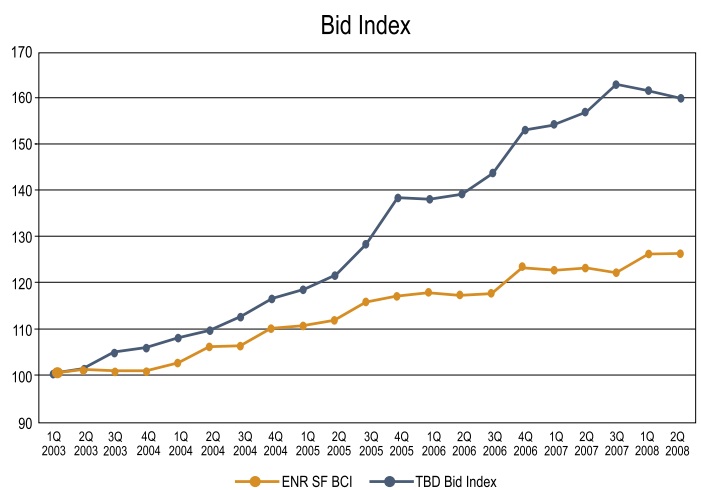
## Market Forecast: Variable

Oliver Fox

There has been much press given to the housing market slump in recent months and speculation as to the ramifications on the construction market. There is certainly a downturn in the housing market in most regions of California which will last for some time, and this means that subcontractors and their labor force from the housing sector will be available for other projects, and consequently more competition can be anticipated in those sectors.

We have seen signs of this happening in various sectors and on certain sizes of projects, e.g. small to mid-size projects have seen a much greater response from contractors and subcontractors. Some smaller projects are currently being bid at below the market of six months ago - profit margins are being squeezed and the owners have the benefit of increased competition.

The following chart shows how we see bids on school buildings having gone in recent years, compared to the ENR San Francisco BCI, with bid prices starting to drop from the high of last year.



The larger more complicated building types (e.g. hospitals and laboratories) have not had the benefits accruing as some other sectors have. The Medical sector in particular has a limited number of General and Subcontractors that are available and interested, especially for OSHPD work, and

all of these parties remain at or above capacity in the work they are willing to contract for. We have not seen much sign in this sector of more competition or interest from the major subcontractors looking for work. It appears that the major subcontractors will be able to demand a high rate of return and a pricing level that ensures significant profit margins, and any perceived risk will carry a heavy weighting. The strategy of enlisting a design assist approach from the major subcontractors remains a viable delivery method in these areas. This ensures a participation and certainty that is absent if a traditional deign/bid/build delivery is relied upon.

With labor rate increases in the 5-6% range and labor shortages continuing in non-residential markets, we forecast that the Medical sector escalation could be up in the 6% - 8% per annum range going forward for the next year or so. Thereafter we expect there will be a possible retreat from this level of escalation, although it is difficult to see significant competition in this sector any time soon. There are still market pressures to maintain a conservative approach to escalation and bidding contingency factors, especially for these larger projects. On the other hand, this could be a good time to bid the relatively smaller projects.

## Photovoltaics

It has been estimated that covering half of Texas with photovoltaics with an efficiency of 20% (which is now a commercial reality) would provide for all of the world's energy needs.

Photovoltaics (PVs) were first developed by Bell Labs in 1954, and initially had an efficiency of about 6%. The technology was also very expensive and was initially only really affordable to the military and space programs.

In space, PVs can generate almost twenty times as much power as Earth-bound PVs can, because day/night cycles, clouds or atmospheric absorption do not hamper them. The idea of large space based PV energy stations beaming power back to earth have been around since the late 1960s. So far those ideas have been prohibitively expensive, and may ultimately prove to be unnecessary as

the Earth-bound versions continue to provide more of the power-generation needs.

Silicon (which PVs have traditionally been made of) has a theoretical efficiency limit of 30% for use in PVs, while other materials may approach 75% efficiency. These alternative materials are normally more expensive, but that is offset by the improved efficiency.



Another way of improving the cost-efficiency is with thin-film cells that have a semiconductor compound sprayed on a flexible substrate, using as little as 1% of the materials required by regular PVs, and can give efficiencies up to almost 20%. That efficiency is not great, but the cells are cheap. Plastic PVs (using two-layers of polymer) is another technology, with less than 10% efficiency but being very cheap, becomes a competitive option.

Yet another method of improving efficiency is to use lenses and/or reflectors to increase the amount of light reaching the PV material, and combined with thin-film technology is looking very promising. Also, methods have been devised to split sunlight into separate wavelengths and then use specialist PVs appropriate to the different wavelengths, so that more effective use is made of the available light. As a result of these innovations, energy conversion efficiency is now over 40%, with 50% expected soon.

Currently, without tax benefits or utility credits, the payback on PVs can be decades or never. However, with energy costs increasing, and the costs of PVs coming down, in a few years PVs should be able to compete with other energy sources even without subsidies, and in some areas they already do.

In the meantime, the need to attack the global warming issues has resulted in subsidies and grants that are aimed at encouraging PV use. The Federal tax incentive for PVs has been increased from 10% to 30% until end of 2008, and the California Solar Initiative provides \$2.8 billion in cash incentives to encourage PV installations, with the goal of having 3 gigawatts of capacity by 2016.

## Geoff's IT Gems Get a Second Life

Is video conferencing becoming passé? Instead of sitting in a conference room watching other people on a large monitor screen, why not sit at your computer and have your avatar interact these other people's avatars?

Second Life is an online virtual world where you "become" a virtual person, or avatar, that can wander around, even fly around if you feel like it, and interact with other avatars, just as though you were meeting other people in the street. But this is not just another online game. Companies are starting to make use of Second Life or similar "virtual worlds" to do business in.

Cisco Systems (as reported in the Oakland Tribune, Oct 15, 2007) has four islands on Second Life that are used for product demonstrations, training and meetings, and is making virtual workrooms available for its staff. UC Berkeley uses Second Life to make available some lectures and courses.

Sun Microsystems has a virtual building, MPK20, to complement its physical campuses, which is a boon for its employees that work remotely, because it provides a way for them to get the interaction that telecommuters often miss out on (which is one of the reasons telecommuting hasn't taken off the way people expected it to).

Virtual meetings are starting to be used by businesses, but it could be a few years before they become mainstream. The technology behind the 3-D Internet (as IBM calls it) is still relatively new, and it places a fairly heaving load on computers, even compared to many other multimedia

applications. But the steady, or geometrically increasing, growth in computational power should rapidly reduce that drawback.

Getting users comfortable with the concept might be a bigger problem; even though Second Life is a well-known application, it has attracted relatively few visitors compared to many other Web 2.0 applications.

Second Life is the best known virtual world, but others are also available, and some are aimed directly at the business community. Unisfair is one that provides virtual conferencing, trade shows, seminars, etc., and which can be used for such things as marketing and recruitment. Now you have to decide what suit your avatar should wear for your virtual job interview.

The appeal of virtual worlds goes beyond the "green" reasons for video conferencing (i.e. cutting down on pollution by not traveling) because it adds an element, albeit a virtual one, of person-to-person interaction into the encounter. It is as easy to form separate breakout workgroups as it is in a regular meeting, which is not so easy to do with video conferencing. Virtual worlds can also appear to get you out of the normal office environs: for instance, the virtual workspaces that IBM makes available to its employees might be around a campfire, with a waterfall in the background. Let's meet on the virtual putting green!

