Maintaining Margins on a Fast Track Job

Good Scheduling Techniques Are The Key To Good Profits

How can you get the most out of a CPM schedule when “Fast Tracking” interior building projects? Does CPM really work with fast track?

According to one specialist in the organization, scheduling and performance of construction work, there are a number of important points that all parties involved in the interior construction project must be aware (and adhere to) throughout the course of construction for the fast track project to be ultimately successful.

“One of the keys to this success,” said Dr. William Y.L. Ma, Ph.D., P.E., “is to use the CPM schedule as a functional tool in fast track to manage the total interiors program . . . including design work . . . and not just the construction/finishing activities!

By recognizing these five critical points, Dr. Ma has cited, many of the interiors building team members will save themselves headaches, time and big dollars . . . by seeing their fast track project completed on schedule, within budget and with a minimum of aggravation and problems along the way.

Design Considerations critical...

“Many construction professionals resist the idea of applying CPM principles to the design phases—and this could be a costly mistake when fast tracking.

To help interior general contractors and subs functioning as primes, Dr. Ma has formulated five points to follow in applying a CPM schedule to a fast track project. “Interior construction,” said Dr. Ma, “has been traditionally viewed as only one segment of a total construction project. In reality . . . when viewed from the perspective of an entity within itself (e.g. a major rehabilitation of an existing structure) . . . all of the principals of CPM scheduling and fast track procedures on free-standing building construction are equally applicable to a major interiors job.”

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About the Author: Dr. Ma is President of Ma & Greenberg, Inc. (M&G), a construction claims management and construction consulting firm, based in Jericho, NY. M&G has over 40 years of engineering and construction experience and has provided clients with a variety of services on over 130 building projects totalling over $1.7 billion worth of construction.

A recognized project management expert, Dr. Ma has assisted a host of construction firms and governmental agencies in presenting and analyzing construction claims and in managing construction projects.
tant to treat the work of each design/professional group as an activity within the CPM schedule. The advertising and award of the contract should also be treated as an activity.

### Interim Milestones . . .

Each phased contract of a fast track interiors project can not be considered an ‘island unto itself’—although each phase is complete by itself and may or may not have a separate sub contractor responsible for the various finishing work.

If one preceding phase is delayed, it will have a time impact rippling effect throughout the entire project . . . and in construction *lost time is lost money!*

This time interrelationship between the phases is why it is so necessary to establish and conform to interim milestone dates. These “time guides” signify the importance of the dependence between the phased work.

This time interrelationship factor between the trades is sometimes observed and sometimes very obvious, depending upon the nature of the interior work involved. For example, a painting subcontractor (or your own painters) can’t complete their work if the sheetrock man isn’t finished. On smaller interiors work this time delay factor may not be significant; but on larger interior projects, it can be devastating to overall schedules.

### Scheduling The Design . . .

“Design professionals as whole are not accustomed to the discipline of quantifying their design work,” Ma explained. “They consider their work to be ‘creative’ and to contain a high degree of engineering or architectural sophistication. As such, it is believed to be extremely difficult, if not impossible, to quantify their work products . . . but it can be done. The scheduler has to be very patient and methodic in order to assist the design professional in this process . . . especially in the area of interiors.

Phased design may be broken down into broad categories of activity, such as Conceptual Design, Design Calculations, Design Layouts, Specifications, Design Drawings and Coordination with Other Related Designs. The
scheduler and design professional can then further divide each of these broad categories until a meaningful level of details evolves.

For example, the mechanical design to replace an existing heating, cooling or air conditioning system may represent many drawings. After the number of drawings is identified, the scheduler should ask the design professional how much time will be necessary to complete each of the drawings. Time calculations for the completion of each drawing should be based on how many man-hours each drawing will take to produce, and the design skill level (engineer, draftsmen) it will require to do the work.

With the activities defined and activity durations estimated, the work can be planned accordingly and placed on the CPM schedule.

To make a CPM diagram a truly useful, significant and functional tool
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for an interior construction project, three criteria must be successfully met. These criteria are (1) the full participation and commitment of all those who will be involved in the performance of a contract (or your own people who will execute various segments of work) . . . and not some half-hearted effort or just to fulfill CPM requirements stipulated in the contract, (2) comprehensive consideration of all project activities and (3) a realistic allocation of available resources such as time, manpower, materials, equipment and dollar expenditures.

Full Participation and Commitment: The schedule is an important management tool that will establish the sequence of activities, plan the allocation of resources, highlight potential problem areas, provide information for claims analysis and provide data for future use, said Dr. Ma.

If a CPM Schedule is to be useful, it requires the commitment of the project manager, estimator, purchasing agents, design professionals, subcontractors, comptroller or financial agents and any others in a supervisory capacity intimately involved with the work. All personnel involved must be made to understand how important management believes the schedule is; that it will be an invaluable aid to effective project management which will make everyone’s work easier and more enjoyable. They must also understand that it will be used for tracking of the job progress . . . or it simply will not work, because people don’t expect it to work!

Comprehensive Consideration of All Important Project Activities: Space limitations prevents the listing of all the most important project activities to be considered when preparing a CPM schedule. However, beyond those activities already discussed (e.g. milestone dates, etc.) five key points in summary are (1) permits, (2) procurement, fabrication, delivery, installation and test
activities for major materials and equipment, (3) availability and access to work areas, (4) interfaces and dependencies with preceding, concurrent and follow-up independent contractors (and their subs, if any) and (5) contingency plans for critical events.

**Realistic Allocation of Available Resources:** A realistic time period should be assigned to each activity predicated on experience and not wishful thinking! Due consideration must be given to the degree of difficulty involved in performing the activity and the availability of skilled design professionals and field labor. Access variations, the possibility of increasing crew sizes or instituting premium time procedures must also receive attention. Above all, the cash flow requirement based on the schedule should be carefully studied.

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**Tracking Work In Progress...**

“It’s been said that good management practice is based on inspection, not expectation,” Dr. Ma noted, “and
this holds true for interior as well as free-standing building construction. It follows, therefore, that the tracking of work progress is an essential part of a good construction management practice. The tracking system should be capable of (1) updating, (2) forecasting and (3) bringing a delayed phased contract back on schedule.

Updating: The design and construction of an interior construction project can be a dynamic process and many changes occur, including revisions, postponements, additions, and deletions and changes in the sequencing of activities. When originally planned activities are disrupted, the network diagram must be periodically updated to reflect these changes, and the reasons for these changes should be specifically recorded.

Design work progress should be tracked and recorded on a weekly basis; construction work progress on a daily basis. At the project's outset, a unit-of-work base for each activity should be established for tracking purposes. The unit base should take into consideration the degree of difficulty in performing each of the work components.

Another type of tracking method involves the use of a construction drawing on which the planned progress is marked off and compared with actual daily progress. The daily work progress should be marked with different colored pens on the drawing and the date recorded. In this way, the difference between the planned work progress and the actual progress will be instantly evident.

Forecasting: If one phase of the interior work is delayed due to unanticipated factors, the actual work productivity must be used in forecasting the completion date of that phase work.

For example, in a 12-week phase contract, the first three weeks' work progress indicates that the work has been delayed by one week due to lower than anticipated work productivity in the field. This does not mean that the entire phase contract will be delayed by one week, but that the construction period is more likely to extend an additional four weeks, since the actual work productivity is only 66-2/3% of that used in the original plan.

Bringing the Project Back on Schedule: There are a number of options, or any combination thereof, to bring a delayed phase work back to schedule. Some of these options are overtime, increased manpower, increased shifts, improving construction methods and changing the sequence of the work.

Once the various options are identified, it is prudent to conduct a value analysis. In essence, the Project Manager or his assistant should estimate the cost involved and the savings in construction time associated with each of the options. A graph can then be plotted as a visual aid for management to take appropriate action, Dr. Ma suggested.