

If there's one component of any construction project that has the potential to either ensure a project's success or bring it crashing to a halt, it is without a doubt the schedule. The schedule is the yardstick by which a project is measured—it outlines how the work is to be performed, allocates the resources to be used, and sets up a sequence of events that will keep things running smoothly. In the best cases, the

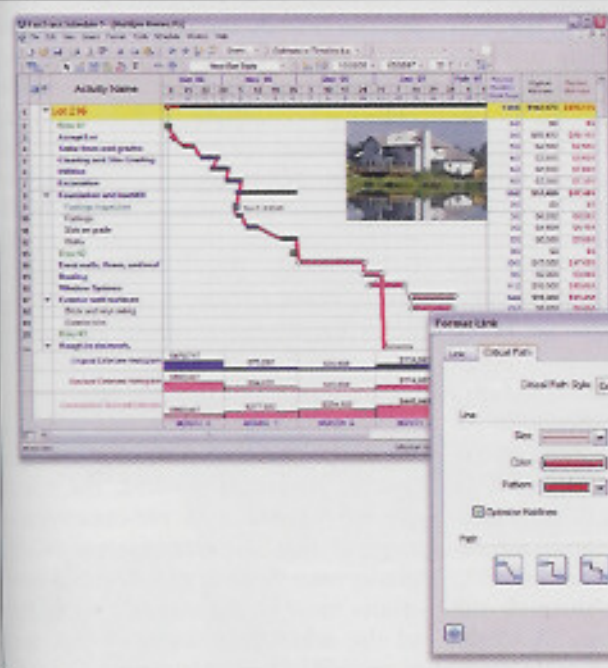
schedule becomes the yardstick against which actual progress is measured and can change based on circumstances and responses or actions defined.

Unfortunately, often too little attention is paid to this all-important tool. Far too many contractors or managers have developed the habit of passing the job of scheduling to the lowest-level person on staff who may not have the experience or understanding to put together a proper schedule. Knowledge of the latest scheduling technology and

computer software simply isn't enough. To craft a schedule that works, one must have a thorough understanding of how the structure—whether it's a bridge, building, or roadway—is built and the logical progression of the structure's construction. Not only that, this person must be able to work with other team members (the general contractor, project superintendent, and estimator) and be able to see the big picture.

The usual suspects

Lack of scheduling knowledge and experience can lead to a few common pitfalls. One of the biggest mistakes made in regard to scheduling is the inclusion of lead-lag relationships. Lead time is an overlap of two activities in a schedule, so the successor activity starts before the predecessor activity finishes. Lag time represents a delay between the completion of the predecessor activity and the start of the successor activity. While the original schedule may be perfectly operational with these types of relationships in place, these shortcuts can lead to problems when the schedule is updated for actual progress. The critical path is by definition the longest continuous chain of activities through a schedule. Therefore, lead-lag relationships are breaks in that continuous chain that can cause false critical paths. Chasing false critical paths wastes resources and can cause a loss of faith in the schedule itself.



Using scheduling software, a detailed plan can be represented with color and graphics. Photo: AEC Software

Scheduling

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Don't neglect this essential planning tool



Top: Project plans available on the job-site allow everyone involved to see the next step and the progress so far.
Bottom: When creating a plan, it is crucial to have key team members involved to ensure a logical, successful schedule.
Photos: H.R. Gray

Another common problem arising from inexperience is failure to consider the complexity of a project in creating a schedule. The estimator and project superintendent must be consulted when developing a schedule. Their input on construction sequence (logic), productivity (duration and resources), and on construction methods (resources) is essential to a well-crafted schedule. The estimator and superintendent also can identify external factors that could affect the timeline of a project—be it weather concerns, location issues, equipment needed, or other factors that can be addressed in the schedule to avoid mishaps during construction. For example, a recent project required the use of equipment that had to be shipped from overseas. The items were subject to a routine delay because of homeland security regulations, a reality the scheduler failed to anticipate. As a result, the entire schedule was set back two weeks.

Finally, and most critically, many schedules simply demonstrate a disregard for logic. Inexperienced schedulers tend to string tasks together with no regard to how each one impacts the other. The days of using ADM (Arrow Diagramming Method) or PDM (Precedence Diagramming Method) are replaced with the ability to start entering activities without going through the process of determining logic. A schedule is first and foremost a plan for doing the work. A plan is a logical, orderly progression of events. Therefore, the heart of a schedule is its logical network; its orderly progression of activities. The managers and superintendents who will actually be directing the project need to work with the scheduler to get their plan of action built into the schedule's logical network. This critical step cannot be left to an inexperienced or junior-level person. The clichéd adage is true; "People don't plan to fail, they just fail to plan." There is no substitute for "having been there" when planning and scheduling a project.

Recipe for success

Fortunately, there are measures that can be taken to ensure that scheduling is done properly and receives the attention it deserves. First and foremost, make sure your scheduler is qualified for the job—meaning that not only is he or she familiar with the software

systems required, but also has experience with or an understanding how a project fits together. Make sure they have studied the drawings and specifications. A good scheduler also should have an obsessive attention to detail, yet still be able to see the big picture.

The person developing the schedule also must be able to interface with all levels of management and be someone whose opinions will be respected by the managers and superintendents directing the project. After all, a successful schedule and a successful project can only be the result of a collaborative effort by the entire team. A schedule should go through several iterations before it is complete, and during these, it is essential for each person involved to make adjustments as necessary to produce the best plan. The schedule is the project and a project cannot be run by one person, thus one person cannot create the schedule. Everyone brings value (knowledge, expertise, experience) to a project and that value needs to be incorporated into the schedule.

Finally, a good schedule is only a useful tool if it is actually used throughout the project. Too often, the schedule is regarded as a pre-construction exercise that is never given a second glance once work begins. Internal milestones must be defined and set as part of the scheduling process—that way, changes can be implemented along the way if milestones are not being met as planned. If a schedule is used as a yardstick, then its purpose throughout the project is to be a measure of progress and an aid in identifying which "squeaky wheels" need the grease, before the "wheels fall off."

In this industry, we often hear the truism that "time is money." But more and more, it seems as if too few people realize that the saving of time (and, by extension, money) begins with proper scheduling. No matter how small a project, the lack of a schedule or a poorly planned approach can allow the project to go awry, whereas a good schedule can be the key to success. ■

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