Top 10 Steps to Schedule Management

Creating, analyzing, and executing a project schedule for maximum returns

By David Brown, D. Brown Management

What if someone told you that you could save thousands of dollars on your next project before you even break ground? Would you believe such a grand statement? You should. What many contractors don’t realize is the secret to running a profitable business is all wrapped up in the project schedule, one of the most visible and shared pieces of the planning process. By learning how to analyze the project schedule and being able to negotiate for the right amount of time to efficiently manage your work, you’ll save money throughout the project — from beginning to end.

Starting with a reasonable and executable schedule is the first and most important step of keeping your job on track (see Scheduling Priorities on page C24). Geared specifically toward electrical contractors working for a general contractor (where the general contractor is producing the overall project schedule), this article focuses on techniques to help you analyze the schedule for efficient workflow and negotiate with the general contractor up-front to make necessary adjustments to the baseline schedule. Keeping your project on schedule is another topic for another day.

What is the Gantt chart? In the construction industry, the schedule format people are most familiar with is called the Gantt chart. This scientific management system focuses on breaking a process down into discrete tasks, defining a
method for doing each task, tracking the cost and time to do the task, and then refining the method until the optimum cost/time ratio is achieved for each one. The Gantt chart simply takes these tasks and organizes them on a time line. This way, you can see an entire project time line organized in a logical way (see Logic: The Smarts of the Schedule on page C28).

Figure 1 details the basic elements of the Gantt chart. Understanding what these elements are and how they relate to each other will give you the ability to read the project schedule and gain insight on how the project will come together.

Take a good look at Fig. 1, and you'll see that beyond the graphical display of bars, there's a lot of logic and planning of resources that goes on behind the scenes in a project schedule. These details, which are the real meat behind scheduling, are critical.

The work breakdown structure. Creating a schedule starts with breaking a process down logically into specific tasks, otherwise known as the work breakdown structure (WBS). The WBS can best be visualized as a tree structure, similar to an organizational chart (Fig. 2 on page C24).

The WBS begins with large breakdowns, such as site, building frame, building interior, and building skin. Next, the WBS moves on to more detail — such as Floor 1, Floor 2, Floor 3, etc. This process continues until there is a task for every discrete part of the process, such as "Rough Electrical, 1st Floor, Area A." Typically, the WBS is broken down by area to a level of 10,000 to 20,000 square feet and then by specific systems and trade disciplines.

Having a standardized WBS for your company, or for a specific type of project you build, will help make the process of moving from the estimate to the budget into schedule negotiations much easier. For each activity, you should make notes about what activities need to be completed before you can efficiently start on the task. Figure 3 on page C26 shows a typical WBS for electrical, which can be modified for your particular business.

Ten steps for better schedule management. The following 10 steps will help you analyze the general contractor's project schedule, plan your work, and negotiate for better scheduling.

1. Scope letter: Add the following clause to your terms and conditions: "Price is based on having a reasonably leveled schedule." This clause will lay the groundwork for you to negotiate on the project schedule as described below.
2. Your tasks: Begin developing a
Fig. 2. Flow chart shows the beginnings of a project work breakdown structure (WBS). The full WBS is much larger than this and may be broken down by project phase, area, building, construction discipline, or any combination, depending on the person designing the schedule.

worksheet to analyze the project schedule as provided by the general contractor. Pull all items referring to your work out of the schedule. Use the item numbers from the project schedule so you have a common point of reference when negotiating (Table 1 on page C26).

3. Details: Make notes of duration, start, and finish dates as shown on the project schedule.

4. Accuracy: Make sure that at least every piece of your WBS is represented. Having a standardized WBS for your project will make doing this analysis even easier. Often, there are activities that will be left out, or there will be minor things you’ll have to do as part of another piece of work — such as during a concrete pour. You want to make sure your list is thorough. Add items in where they will need to be inserted back into the project schedule. The example shown in the table is 33-A, B, C, and D, which breaks down the electrical rough stage of work into more detail.

5. Logic: Check to see that the logic is correct, and you’ll be able to proceed with your work efficiently. Frequently, the logic won’t be correct, activities won’t be completed, or other activities are scheduled to start while you are still in the area. Having a standard WBS that details exactly what you need to have done to perform your work efficiently will make this part of the analysis much easier.

6. Man-hours: Add in the estimated man-hours for each task. The schedule will likely be in more detail and organized differently than your budget is. This is why it’s important to understand the details behind the budget, so that the man-hours can be reorganized to roughly match the schedule tasks.

7. Resource loading: Lay out tasks with resources required over time. This can be done with pencil (make sure and use one with an eraser!), with Excel (Table 2 on page C28), or — if you have the skills and the time — with scheduling software. Start by determining the average resources you’ll need for each activity [hours ÷ duration ÷ 8 hours = average resources]. After that, fill in the timeline as shown in Table 2.

8. Total resources: You need to determine the total resources required for all tasks. This will show you what your manpower requirements look like over the course of the job. This can be done on a more expanded spreadsheet similar to the one shown in Table 2.

9. Leveling opportunities: This is where the work really begins. Start looking for ways to level out your manpower. Some areas to look at include:
   - Can you load resources across the task differently?
   - Is there any way to start the task earlier?
   - Can you use float in activity to extend duration?
   - Can a successor task start prior to you finishing 100%?
   - Can you do pre-fabrication work in

Scheduling Priorities

In the ever-changing construction industry, time is money. Here are a few points to consider when weighing the benefits of streamlining your schedule management strategy:

- Electrical contractors have relatively low project overhead costs and make money through labor efficiency. This makes a leveled schedule and efficient workflow between trades and phases of work more important than duration.

- General contractors have high project overhead costs and relatively fixed costs in terms of subcontractors and buyout. They stand to lose thousands of dollars every day the project is delayed.

This naturally puts electrical and general contractors at slight odds when it comes to schedule negotiation, so tread lightly when working to level the schedule in your favor.
periods of low resource requirements?

- Only request that the duration of the project be extended as a last resort.

10. The letter: Gather all of the notes you made as you were going through the steps above, and create a letter detailing your requests. Some ideas for the wording in your letter are as follows:

- **Intro**: Our proposal was based on having a "reasonably leveled" schedule. This schedule currently requires excessive fluctuations in our manpower that will result in inefficiencies, thereby delaying completion of the project. Please review the following recommendation.

- **New task required**: We need **two days to run raceway on the metal deck before the concrete pour starts.** We should be able to accomplish this task without extending the schedule. We request that you expand the decking/

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<table>
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<tr>
<th>TASK ID</th>
<th>TASK NAME</th>
<th>START</th>
<th>FINISH</th>
<th>DURATION</th>
<th>HRS</th>
<th>MAN LOAD</th>
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<td>12/22/05</td>
<td>12/27/05</td>
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<td>01/03/06</td>
<td>01/23/06</td>
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<td>12/06/06</td>
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Table 1. A typical project schedule that would be broken out by an electrical contractor for analysis. Note how additional task items have been added (33-A, 33-B...), so that they fall inline with the overall project schedule while being easy to tie back to your project budget.
concrete pour tasks to reflect the individual floors so this task can be entered without affecting the completion date of the schedule.

- Logic/detail: The electrical rough (33) is shown, starting with the framing. This will not allow for an efficient installation. We need to have an entire area — at least equal to half of a floor — completely framed before we start our rough. Please expand the schedule to reflect the additional detail. Overall duration for electrical rough is acceptable.

Reaping the rewards. Having the schedule leveled will result in numerous efficiencies and is something that should definitely not be ignored. Here are the benefits you’ll see from a leveled project schedule:

- Your core crew will stay on project with only minor fluctuations.
- Training time for bringing new crew members up to speed will be minimized.
- Efficiencies will be maintained by having a working foreman.
- Premium-time work will be minimized.

- The company won’t have to recruit and then layoff additional manpower, which will save money in recruiting and unemployment costs.

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Most importantly, the schedule is actually workable, and you’ll be able to meet your milestones and finish the project on time — with the quality you care about and for the price you quoted.

If this isn’t a process you normally go through on a regular basis, and if you have as many things on your plate as the average project manager, project engineer, and foreman, then you’re probably thinking this would take way too long, won’t work, isn’t worth the time, etc. Keep one thought in mind to counter this mindset — you’re in business to make money, and all decisions you make should come down to this.

- Analyzing a schedule and working to proactively manage it up-front will take about 20 man-hours — or about $1,000.
- Temporarily hiring for two months, and then laying off one employee will cost an additional $300 in state unemployment insurance taxes, depending on the state.
- The hiring procedure, including processing and drug testing, will cost a minimum of $200.
- Bringing just one new crew member up to speed on a new project basic tasks will cost a minimum of 4 hours — or about $200.
- The cost of inefficiency on a crew, when adding additional people, far exceeds the basic costs outlined above.

Now, ask yourself these two questions:

1) Have you ever had to “find” work for someone because you had to man-up to meet the schedule and then found yourself with too many people?

2) How much is it worth to free up a crew/foreman a few days early?

As you can see, the benefits of correctly analyzing your project schedule and then negotiating for the right amount of time to efficiently manage your work are enormous. Putting the 10 steps to better schedule management strategies to work for you will give you the tools you need to take control of your projects, starting today.

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