CE 479 - Construction Planning, Scheduling and Control

Lecture # 13

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Today…

- Project Scheduling
  - Steps Required to Schedule a Project

Steps Required to Schedule a Project

1. Break down the project into work activities

- Any project, no matter how large or small, must be divided into smaller entities, called activities, or tasks. An activity is a unique, definable element of work.
- In this step, there is no absolutely correct or incorrect way to break down the project into work activities. You may give the same project to 10 schedulers, and they may devise 10 different breakdowns, with some breakdowns being significantly different.

Steps Required to Schedule a Project

2. Determine activities' durations

- Techniques for estimating activity duration vary from one situation to another, depending on the type of work, the estimator, and other factors. Most activity durations can be estimated as follows.
- For example, for 10,000 CY (cubic yards) of excavation and a crew that averages
- 800 CY per day, the following is true:
- Duration = 10, 000 CY/800 CY per day = 12.5 days ≈ 13 days

Steps Required to Schedule a Project

2. Determine activities' durations (cont'd)

- This information could come from the project team (project manager, project superintendent), who receives feedback from field crew leaders; from the estimating department; or from other sources (e.g., subcontractors).
- It is given to the scheduler with the project manager's approval.
- Durations are by no means carved in stone. They are based on previous experiences, with adjustments made for current job conditions, such as weather conditions, design complexity, soil type, and so forth.
- Durations are also subject to the crew size and the number of crews, if there is more than one crew.

The scheduler should never unilaterally assign durations to activities without consultation with and getting an approval from the project manager and the technical teams' leaders.

Steps Required to Schedule a Project

3. Determine logical relationships

- Again, this step is a technical matter.
- The scheduler should obtain this information from the project managers and technical team leaders.
- Logical relationships should not be confused with constraints.

Steps Required to Schedule a Project

3. Determine logical relationships (cont'd)

- A logical relationship exists between two activities when the start of one activity(or finish) depends physically on the finish (or start) of another activity.
- For example, you cannot place the concrete until the formwork and reinforcement are erected. You cannot hang the drywall until framing is done.

Steps Required to Schedule a Project

3. Determine logical relationships (cont'd)

- A resource constraint (or restriction) is when you can theoretically do two tasks at the same time but you schedule one as a predecessor of the other because of resource (labor, equipment) limitations.

Steps Required to Schedule a Project

4. Draw the logic network, and perform the CPM calculations

- If you are using a computer program, it will perform these functions for you, provided that you have input the correct data. In this step, you will obtain the calculated finish date of the project, the critical path, and the available float for all noncritical activities.
- It is important to check the input and the output and not to rely totally on the computer.

Steps Required to Schedule a Project

4. Determine logical relationships (cont'd)

- In most construction projects, subcontractors are involved, and their input regarding the schedule is important. The schedule is typically one topic discussed in preconstruction meetings with the owner, the general contractor (GC), and major subcontractors.
- Often, the GC provides an opportunity for the major subcontractors to supply him or her with schedules for work so that he or she can incorporate them into the master schedule.
- Alternatively, the GC may create the overall schedule based on feedback from subcontractors and other involved parties.

Examples of Schedule Restrictions or Constrains

- Time and contractual restrictions.
- Safety restrictions.
- Productivity restrictions.
- Financial restrictions.
- Regulatory restrictions.