

# ARC 226 Construction Scheduling

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## Chapter 11 Reviewing and Analyzing the Schedule

# Introduction

- The schedule should be reviewed and analyzed before reports are created
  - Complete
  - Reasonable
  - Meets primary goals
  - Satisfies contractual requirements
- Don't rely on issuing a scheduling addendum

# Physical Relationships

- Are the physical relationships valid?
  - You can not place the rebar after the footings are poured
- Use two questions:
  - Does the activity really need to be done before each successor can start?
  - What other activities should take place before the activity can start?
    - Using these two questions can eliminate most logic problems

# Safety Relationships

- Are certain activities unsafe because they are running concurrently with other activities?
  - Common with activities that are working above and below one another
    - Shelf angle welding, bricklayers working below
- If unsafe conditions are noted, the logic diagram must be changed to eliminate those conditions
  - Select the activity that is less critical to be the successor activity

# Quality Relationships

- Activities must be in the proper sequence to allow for the optimal quality
  - Double check the sequence to ensure that there are no quality problems with the order
    - Windows installed before insulation

# Cost Relationships

- Does the schedule logic create excessive costs?
  - Too many people working in one are at the same time
  - Two activities in a FS relationship that should be concurrent
- Especially important to examine the critical path
- Do all the durations seem reasonable based on previous experience with the subs?

# Contractual Requirements

- Does the completion date meet contractual requirements?
  - The completion date must meet the owner's and the management team's requirements
- Decreasing the project duration will decrease the cost of overhead
- Does the project's total duration seem reasonable?
  - Based on past experience

# Compressing the Schedule

- Original schedule is too long
- Or, as the schedule is updated it goes past the contract completion date
- Compressing
  - Also called crashing or shortening
  - May result in higher costs, lower quality, less safe work environment
- What is the best method to compress the schedule and not adversely affect the project?
  - Or at least keep adverse effects to a minimum



# Activity Durations

- Change the durations of the critical or near critical activities
  - Activities with low amounts of float may need to be changed as well
- Increases resource demands
  - Labor, equipment, materials
  - Overtime, multiple shifts
- May also decrease safety and quality

# Changing the Calendar

- The project calendar can be changed to work on weekends or holidays
  - Increased overtime costs
  - Not as much of a quality and safety problem
- Work hour adjustments
  - 3 – 11.5 hour days, two crews, 80 work hours per week
  - Work hour adjustments typically adversely affect productivity

# Revising Schedule Logic

- Revise the schedule logic to have more or longer lags
  - Make more critical activities concurrent
  - Not usually the first choice for planning the schedule
- May be the best choice for decreasing the project duration
- May create crowded conditions on the jobsite
- Lag between activities can be changed
  - Increase the overlap for activities

# Expanding the Schedule

- There may be situations in which it is desirable to have the project finish later
- Use techniques similar to compressing the schedule, but in reverse
  - Decreases congestion
  - Increased quality and safety
- Non-critical activities will have more float
  - Allows for better resource leveling
- In general, decreases critical activities
  - Allows for less risk on the project

# Location of the Critical Path

- Is the critical path where experience says it should be?
- The critical path should not come as a surprise, but should be in a logical location
- The near critical activities should be where you would expect them also
  - Near critical- small amount of float
- Don't rely exclusively on the computer to generate a logical schedule
  - The schedule should also follow from common sense

# Milestones

- Milestones
  - Major achievements of the project
- Milestones should be where you expect them
  - The project durations should be about right to have the project progress at an expected pace
  - Are the durations between milestones about what you expect they should be?

# Procurement

- Does the schedule include procurement of items?
  - Many items have a long lead time that can not be ignored
  - Has procurement created a problem on past projects?
  - Especially important for critical path activities
  - Materials should not be delivered to the jobsite too early either
    - Damage, storage, insurance
- Procurement activities should not consume all of the float for a string
  - The path would then become critical

# Time of Year

- Does the weather/time of year conflict with the completion of an activity?
  - May necessitate temporary shelters or heat
- Some activities may need to be accelerated in order to keep other activities from being affected by the time of year



# Float Paths

- Is the amount of float for a particular activity accurate?
  - Does the activity need to be completed before others?
  - Do you want to show that much float?
- Float can be shared between a number of activities by increasing the individual activity durations
  - It is still a good idea to save some of the shared float

# Organization

- Organize the schedule in order to simplify it and make communication easier
  - List all activities for an area together
  - Schedule activities from the top to the bottom
    - Roofing on top, footing on bottom
- Make the schedule easy to understand and communicate

# Color Coding

- Color coding activities can make the schedule easier to read and understand
- Color code by:
  - Trade
  - Activities that require specific equipment (forklift, crane)
  - Personnel
  - Inspections
  - Unusual circumstances for the activity

# Conclusion

- The schedule should be reviewed for obvious errors or problems
  - Does the activity need to be done before any others can start?
  - What other activities need to be done before this activity can take place?
- Review the logical relationships
  - Safety and quality are important
  - Costs need to be kept to a minimum
- The schedule can be compressed or lengthened depending on the job requirements
- Many problems on a project can be attributed to poor planning
  - Examine and revise the schedule to eliminate planning problems