ARC 226 Construction Scheduling

CHAPTER 13 LINEAR OR LINE-OF-BALANCE SCHEDULES

Introduction

- Linear schedule
  - Also known as line-of-balance schedules
  - Started in the manufacturing industry
    - Repetitive procedures
- In construction linear schedules work best with horizontal projects
  - Highways, pipelines, railroads, etc.
  - Can also work well with high rise construction
    - Repetitive

Developing a Linear Schedule

1. Identify the activities
2. Estimate activity production rates
3. Develop activity sequence
4. Create a velocity diagram for the first activity
5. Add the velocity diagram for each additional activity
6. Look for conflicts and buffers

Production Rates

- For linear schedules production rates are often listed in feet per day
  - The unit will be dependent on the type of work, project
- Activities are done in the sequence listed

Velocity Diagrams

- Chart showing productivity on the y axis and time on the x axis
  - Higher the production rate, the steeper the slope of the line
  - Production can be represented as a constant or variable
- Subsequent activities can be shown to start on successor days

Forecasting Conflicts

- If the successor activity has a higher productivity than the predecessor, there could be a potential conflict
  - The velocity diagram has intersecting lines
- The successor activity must be started days later to avoid a conflict
- This scheduling technique helps to forecast conflicts early in the project
  - The schedule can then be adjusted to avoid the conflict

Avoiding Conflicts

- If the velocity diagram has any intersections there is a conflict between activities
- The successor must be moved to a later date
  - Decide how many days after the predecessor the successor should finish
  - Draw the velocity diagram backwards from the desired finish date to the start date
- Another option would be to increase the production of the predecessor
  - More equipment, manpower, etc.
    - The successor activity could also be suspended or slowed

Buffers: Time, Space

- Time buffer
  - Amount of horizontal time between activities at any given point
- Space buffer
  - Amount of space, vertically, between activities at any given point
    - See fg 13.9 pg 157
- The closer that the two lines are together, the greater the risk
  - Production rates can be changed to alter the time and space buffers
- Bars can be added on certain days to designate special activities
  - Inspections, visitors, strikes, equipment requirements

Conclusion

- Linear or line-of-balance give a visual representation that lends itself well to certain types of projects
- Created using a six step process
- Helps eliminate conflicts and bottlenecks
- May also be a good supplement to other types of schedules