Construction Planning and Scheduling

AGENG 520

Schedule Computations

Part #2

1. <u>Definition and Computation of Total and Free Floats:</u>

<u>Total Float</u> : The maximum time an activity can be delayed without delaying the completion of the project.

TF of "A"= LS of "A"- ES of "A" (or LF of "A"- EF of "A")

Free Float : The maximum time activity can be delayed without FF of "A" = Minimum ES of all immediate successors - EF of "A"

FF of "A" = Minimum{ 12, 21, 14 } - 10

= 12 - 10 = 2

Critical Path : The longest path or paths from project start to all activities with zero float belong to the critical path.

2. Interpretation of Total and Free Floats

A total float (TF) indicates the time frame in which an activity can take place without delaying the project completion while a free float indicts the time frame in which that activity can take place without delaying the start time of the immediate successors.

The best way to visualize these floats is to draw a time-phased diagram of the schedule. A time- phased diagram is a schedule display against a time scale. Let us draw the time-phased diagram of the network shown in Figure 1. ES, EF, LS, LF, TF, and FF of each activity are summarized in Table 1. The time-phased diagram in Figure 2 shows every activity starting on its early start time. The time-phased diagram shows that activities A and E and G have no float (TF=FF=0) Because any delay in these activities will result in a delay of the total project.

Activities F and H have the same total float (TF=2) because both of them can be delayed two days without delaying the project. Activity F has no free float because any delay in activity F will delay the start of activity H. Activity H has a free float equal to total float because activity H has no successors. The same thin can be said about activities C and D. Activity C and D have both a total float of 10 days. But activity C has a free float of zero.

3. <u>Schedule Computation Checks</u>

a. In the case of only one starting activity, ES and LS of the first activity must be equal.

b. Free float must be always less or equal to total float (FF <= TF).

c. All activities in the critical path must have zero free and to 1

d. When an activity has only one predecessor, the free float of that predecessor is always equal to zero (FF=0)

f. The best and most reliable check is to draw a time-phased diagram.