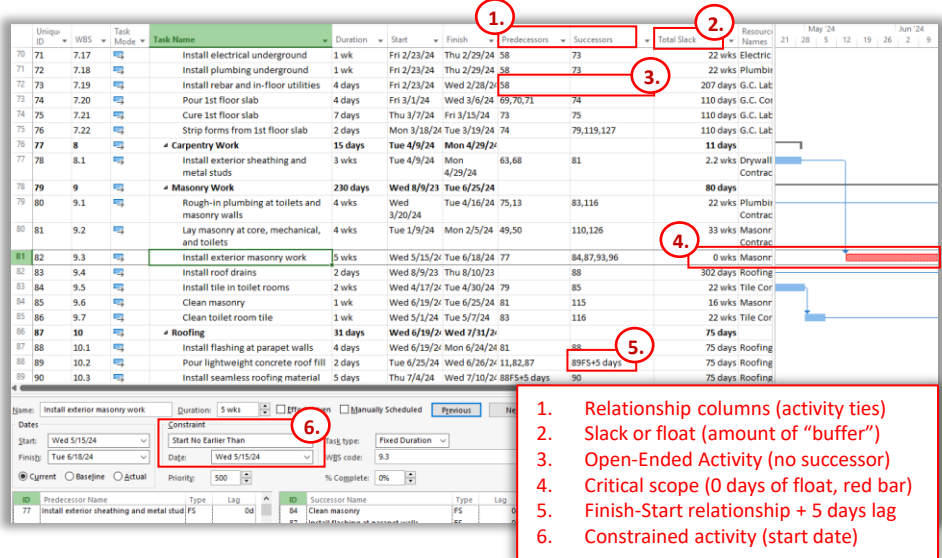# Project Scheduling and Controls – Course 201

Intro to Common Scheduling Software Programs

1. Microsoft Project → Readily available, easily accessible, user-friendly, limited analytical capabilities
2. Primavera P6 → Industry standard, steeper learning curve, advanced analytical capabilities

Advanced Schedule Concepts

Activity Relationships & Logic:
1. Start to Start (SS) Relationship
2. Finish to Finish (FF) Relationship
3. Finish to Start (FS) Relationship

- Lag may be used as a gap between activities to reflect actual timing.
- Open-ended activities are missing predecessors or successors.
- Constrained activities are set to start or finish on a certain date.

1. Relationship columns (activity ties)
2. Slack or float (amount of "buffer")
3. Open-Ended Activity (no successor)
4. Critical scope (0 days of float, red bar)
5. Finish-Start relationship + 5 days lag
6. Constrained activity (start date)

Schedule Development Best Practices

1. **Activity Durations**
   a) Divide scope of work into discrete tasks and areas
   b) Avoid long-duration activities (see Specifications)
   c) Assess reasonableness of durations considering shifts, resources and calendars

2. **Activity Relationships, Logic Ties & Lag**
   a) Ensure all activities have predecessors / successors
   b) Avoid using negative lag in activity relationships
   c) Identify and monitor "out of sequence" activity ties
   d) Eliminate redundant or unnecessary logic ties

3. **Schedule Constraints & Float**
   a) Avoid negative float caused by constraints
   b) Avoid high float caused by missing logic ties to key milestones
   c) Final Completion milestone should be critical

4. **Critical Path Analytics**
   a) Identify critical path and assess reasonableness
   b) Identify sub-critical paths and assess reasonableness / amount of float

Schedule Analysis Methods

*It's important to identify **critical & sub-critical paths** to key milestones and the amount of float for each path.*

A **Schedule Fragnet** is a subset of a schedule representing the added or changed work, which is used to demonstrate the impact of its delay on the overall schedule.

Failure to submit a **Change Order Fragnet Schedule** within the notice requirements specified in the Contract Documents for requesting a change to the Contract Time shall forfeit the right of the Contractor to an extension of the Contract Time.
(Design-Build Specifications)

Driver	Description of Scope	Total Float
1	Foundations & Superstructure	0
2	Civil & MEP Fitout	4
3	Curtain Wall Installation	7

Identifying the Cause of Delay:
1. Analyze schedule variances (start, finish, & durations).
2. Review critical activities with finish dates that slipped.
3. Understand the cause of variance for those activities:
   a) Extended activity duration
   b) Late start due to predecessor activity
   c) Changes in logic or sequencing
   d) Late start due to added scope
4. Trace predecessors to identify root cause of variance.
5. Trace successors to identify potential impact of delay.

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