

# Project Planning & Control

## *Lesson 2*

### *PDM network representation and its issues, Network Calculation*

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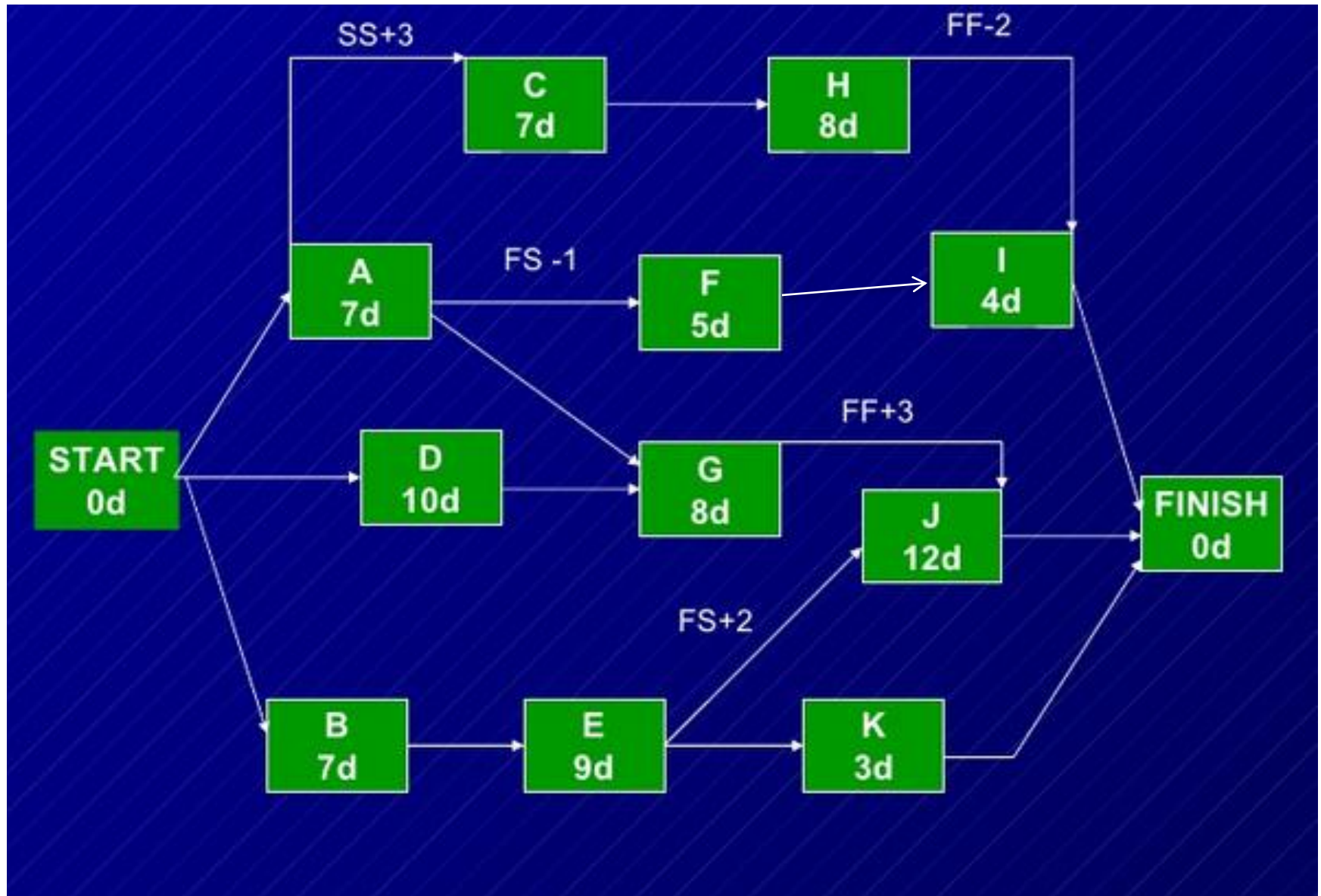
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# PDM Network Representation



# PDM Representation Issues

- Draw a PDM to Represent the Following Situation

Task 1. Excavating Trench (Duration = 12 Days ).

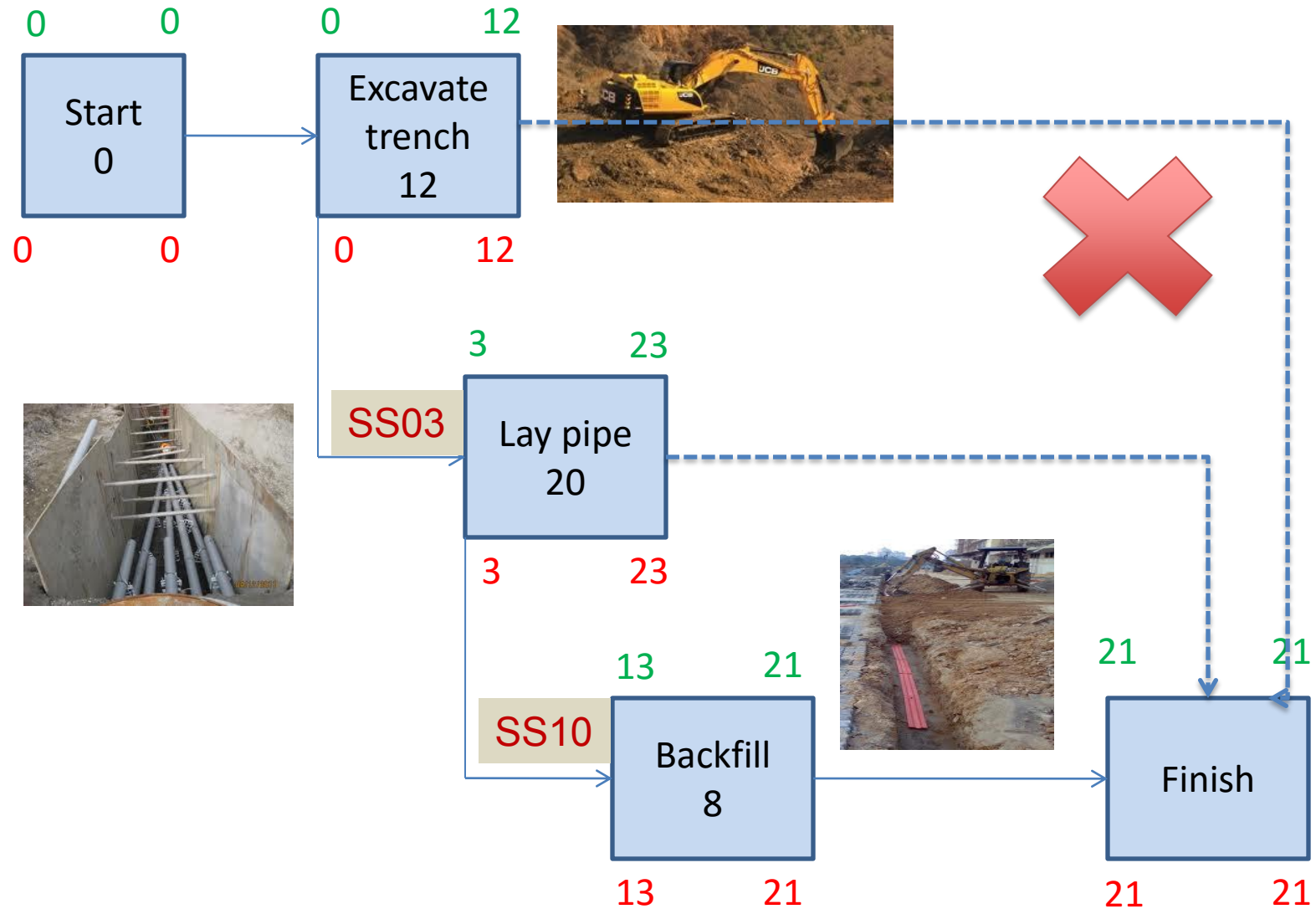
Task 2. Laying of Pipe (Duration = 20 Days)  
(Can start 3 days after Task 1 Starts)

Task 3. Back Filling of Trench (Duration = 8 Days)  
(Can start 10 days after Task 2 Starts)

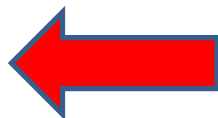
Any other information ..?

# Solution : Alternative 1

FORWARD PASS

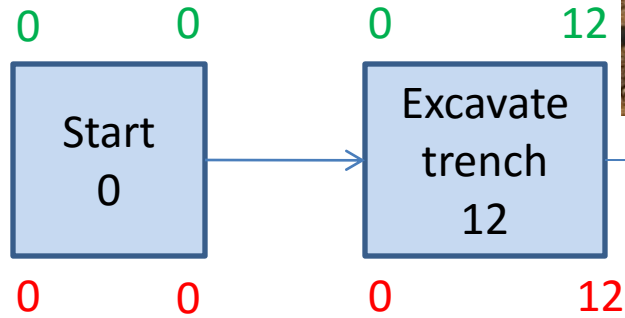


BACKWARD PASS

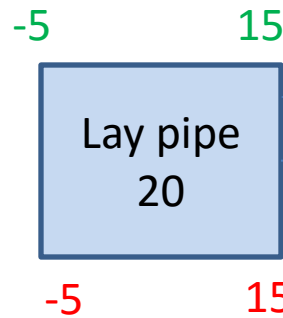
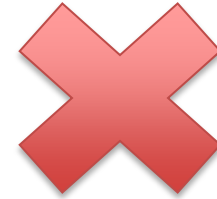


# Solution : Alternative 2

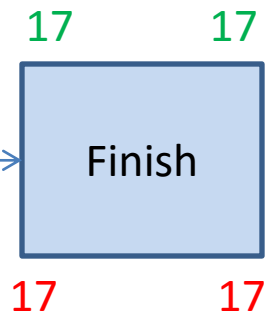
FORWARD PASS



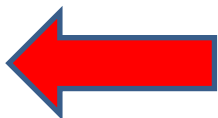
FF3



FF2

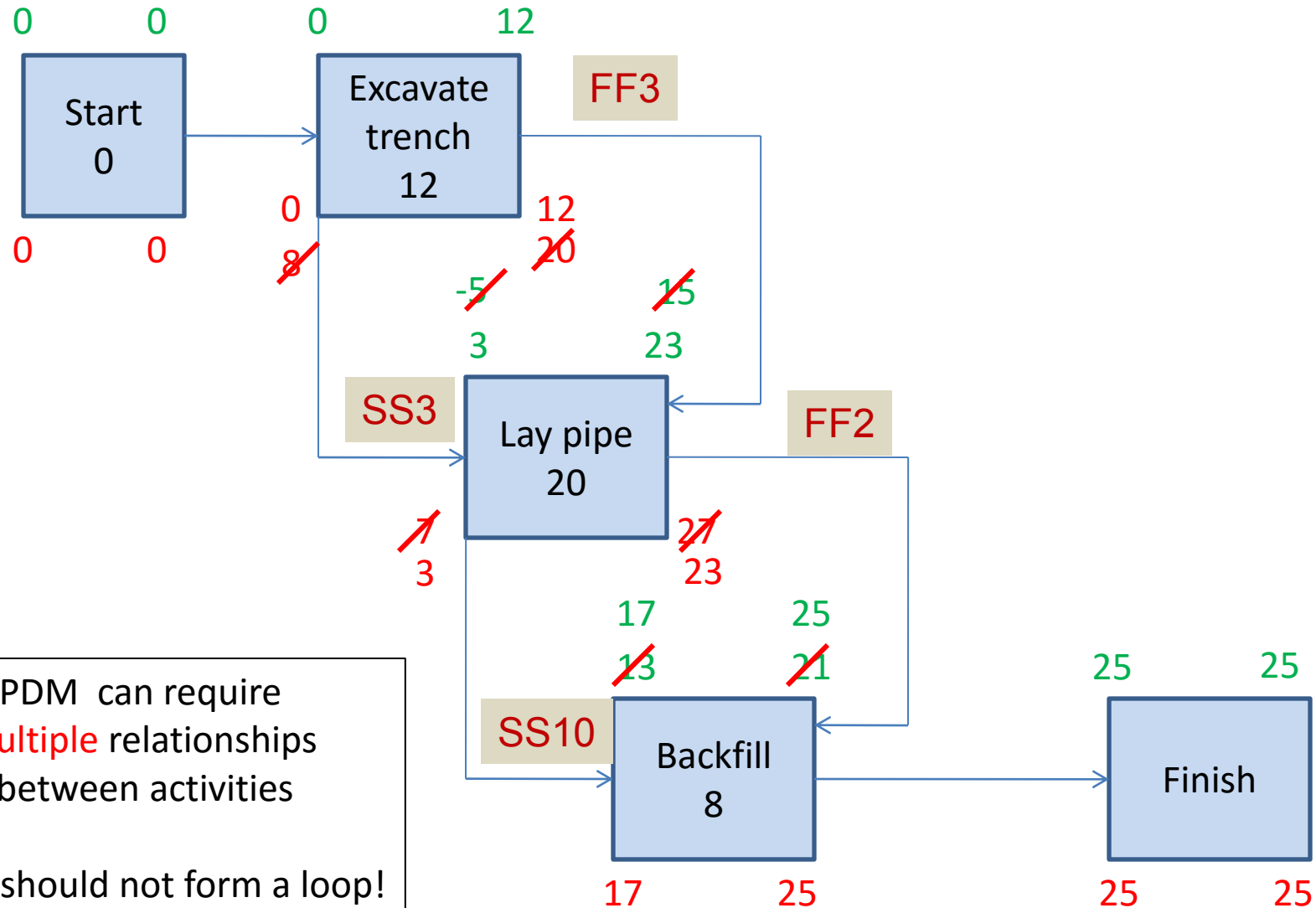


BACKWARD PASS



# Solution: Alternative 3

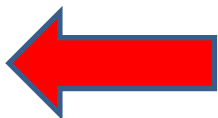
FORWARD PASS



PDM can require  
**multiple** relationships  
between activities

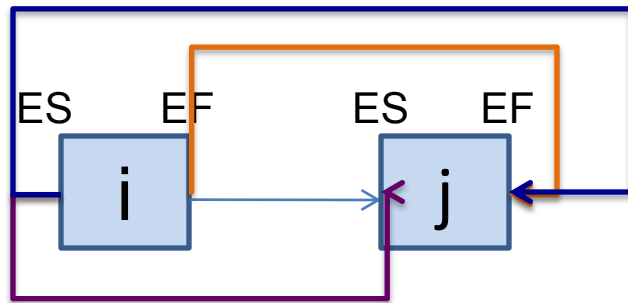
These should not form a loop!

BACKWARD PASS



# NETWORK CALCULATIONS

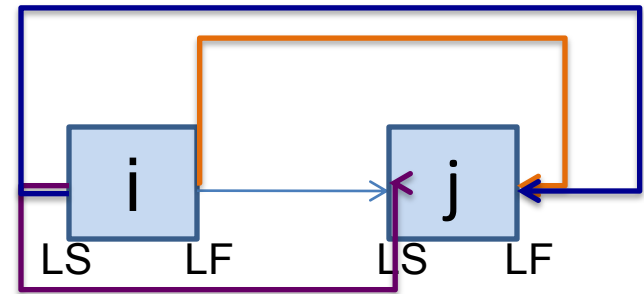
## Forward pass



Lead/Lag

- $ES_j = \text{Max} \begin{cases} EF_i + FS_{ij} \\ ES_i + SS_{ij} \\ EF_i + FF_{ij} - D_j \\ ES_i + SF_{ij} - D_j \end{cases}$
- $EF_j = \text{Max } ES_j + D_j \text{ (1\&2)}$

## Backward pass



Lead/Lag

- $LF_i = \text{Min} \begin{cases} LS_j - FS_{ij} \\ LF_j - FF_{ij} \\ LS_j - SS_{ij} + D_i \\ LF_j - SF_{ij} + D_i \end{cases}$
- $LS_i = LF_i - D_i \text{ (1\&2)}$

Assume activity has to be done continuously –Less flexibility