Lesson 3
Two-Span Bridge: Activity Identification and Duration Estimation (Cont.,)

Koshy Varghese, Ph.D.
Professor
Building Technology & Construction Management
Department of Civil Engineering
I.I.T. Madras
Learning Objectives

• General activities & operations for the two-span bridge exercise

• Initial estimate of duration of activities based on operation details

• Establishing predecessor relationships

This example is only for classroom discussion
Intent is to illustrate some of the aspects to be considered for time planning.
It is not a comprehensive procedure.
Two Span Bridge- Example

Pre-cast Piles

Recall Discussion on Activities identified in Lecture -3
1. Order & Deliver Piles  
2. Cast Beams  
3. Drive Piles East  
4. Const East Pile Cap  
5. Const E. Abutment  
6. Drive Piles Centre  
7. Const Centre Pile Cap  
8. Const Centre Pier  
9. Drive Piles West  
10. Const West Pile Cap  
11. Const W. Abutment  
12. Place Beams E. Span  
13. Place Beams W. Span  
14. Deck Slab East  
15. Deck Slab West  
16. Lay Roads
1. Order & Deliver Piles

Casting Operation

Stored Piles
1. Order & Deliver Piles - Duration

Standard sizes of prefabricated piles are available. No. Piles required is say East (4x3) + Center (2x3) + West (4x3) = 30

When should Order be placed? Find Lead time for delivery. (Stock availability, Delivery to location)

What if the piles were cast on site?

No. piles required (4x3) + (2x3) + (4x3)

Operation Sequence:

1.0 Reinforcement Fabrication – 1 day
2.0 Casting Pile
   2.1 Formwork Assembly – 1 day
   2.2 Concrete pouring – ½ day
   2.3 Form removal after – 1 day
   2.4 Form removal time- ½ day
Curing before usage – 21 days regular
   2 days steam curing

Production Rate vs. based on No. Forms

1. 1 pile in 3 days -> 90 days for 30 piles
2. 2 piles in 3 days -> 45 days
3. 3 piles in 3 days -> 30 days

What determines production rate?

Casting Yard Set-up 10 days
2. Cast Beams

Casting Operation

Transport
2. Cast Beams - Duration

Beams are prefabricated in casting yard set-up on site. No. Beams required is say 3 for each span- total = 6

No. beams required = 3 + 3

Operation Sequence:
1.0 Reinforcement Fabrication – 2 days
2.0 Casting Beam
  2.1 Formwork Assembly – 1 day
  2.2 Concrete pouring – 1 day
  2.3 Form removal after – 1 day
  2.4 Form removal time- 1 day
Curing before usage – 28 (14) days regular
  3 days steam curing
Assume reinforcement fabrication is done in parallel

Production Rate – based on No. Forms/Beds

No. Sets of forms

1  1 beam in 4 days -> 24 days for 6 beams
2  2 beams in 4 days -> 12 days “
3  3 beams in 4 days -> 8 days “

What production rate is required?

Assume 3 sets of forms:

Total Duration= 2 +14 (1st set); Day 6+14 (2nd set)?