Project Planning & Control

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

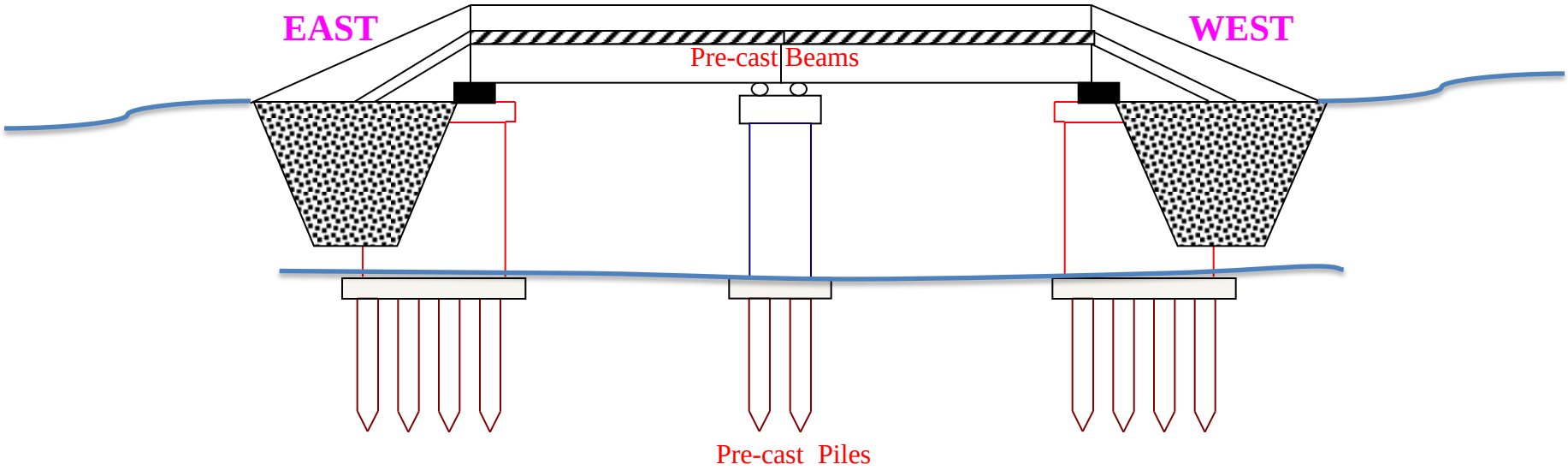
Koshy Varghese, Ph.D.
Professor
Building Technology & Construction Management
Department of Civil Engineering
I.I.T. Madras

Learning Objectives

- General activities & operations for the two-span bridge exercise
- Initial estimate of duration of activities based on operation details
- Establishing predecessor relationships

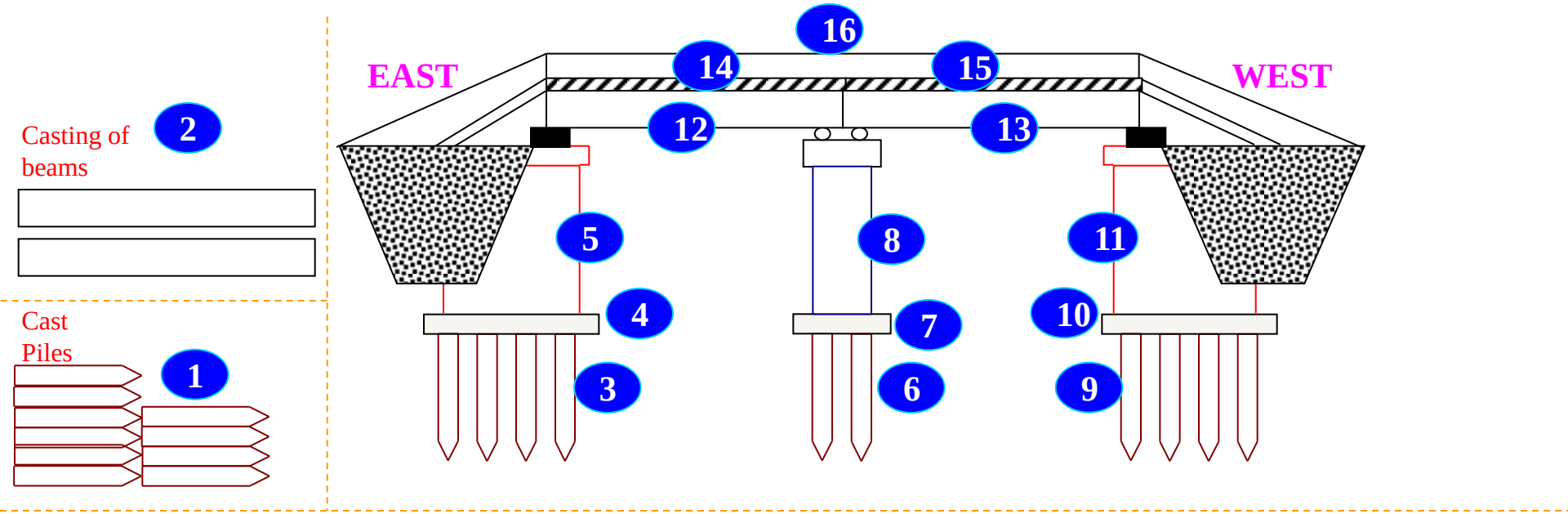
This example is only for classroom discussion
Intent is to illustrate some of the aspects to be considered for time planning.
It is not a comprehensive procedure.

Two Span Bridge- Example



Recall Discussion on Activities identified in Lecture -3

Two Span Bridge



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 ?

Casting Yard Set-up 10 days

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 ?

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 (2ndset)?