

Project Planning & Control

Lesson 7

Two-Span Bridge: Network Analysis

Koshy Varghese, Ph.D.

Professor

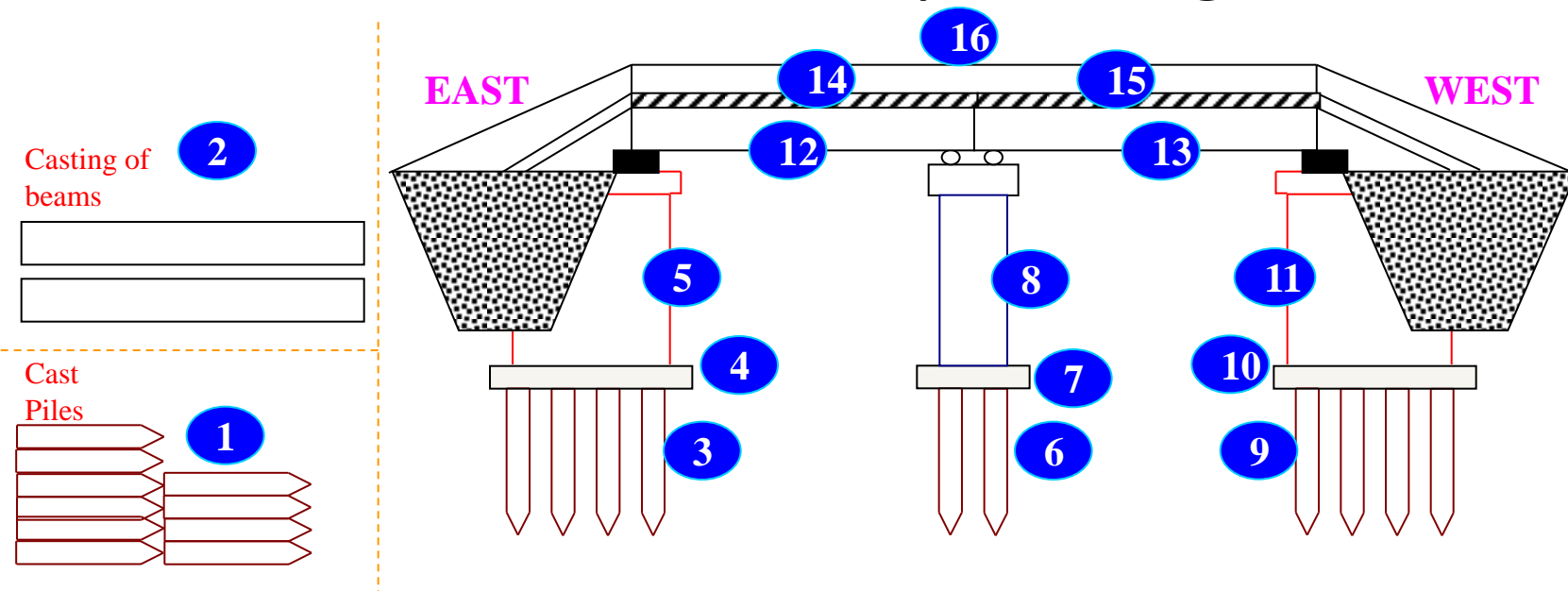
Building Technology & Construction Management

Department of Civil Engineering

I.I.T. Madras



Two Span Bridge

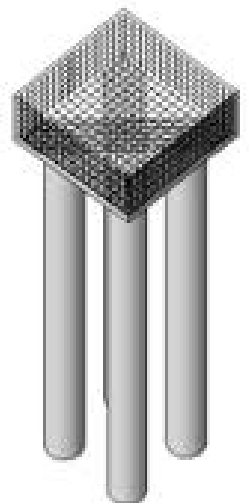


1. Order & Deliver Piles
2. Cast Beams
3. Drive Piles East
4. Const East Pile Cap
5. Const E. Abutment
6. Drive Piles Centre
7. Const Centre Pile Cap
8. Const Centre Pier

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

Duration Calculations

4, 7 & 10. Construct Pile Cap



4, 7 & 10. Construct Pile Cap - Duration

East & West Pile Cap - 12 piles

Operation Sequence:

- 1.0 Excavation & PCC Bed— *1 day*
- 2.0 Chipping *1 day*
- 3.0 Reinforcement *1 day*
- 4.0 Formwork *1 day*
- 5.0 Concreting *1 day*
- 6.0 Form removal after *1 day*
- 7.0 Form Removal *1 day*
- 8.0 Backfill *1 day*

Curing before usage – 3 days regular curing

Total duration for

East & West Pile Cap= 5days + 3days=8 days

Center Pile Cap - 6 piles

Operation Sequence:

- 1.0 Excavation & PCC Bed— *1 day*
- 2.0 Chipping *1/2 day*
- 3.0 Reinforcement *1/2 day*
- 4.0 Formwork *1 day*
- 5.0 Concreting *1/2 day*
- 6.0 Form removal after *1 day*
- 7.0 Form Removal *1/2 day*
- 8.0 Backfill *1/2 day*

Curing before usage – 3 days regular curing

Total duration for

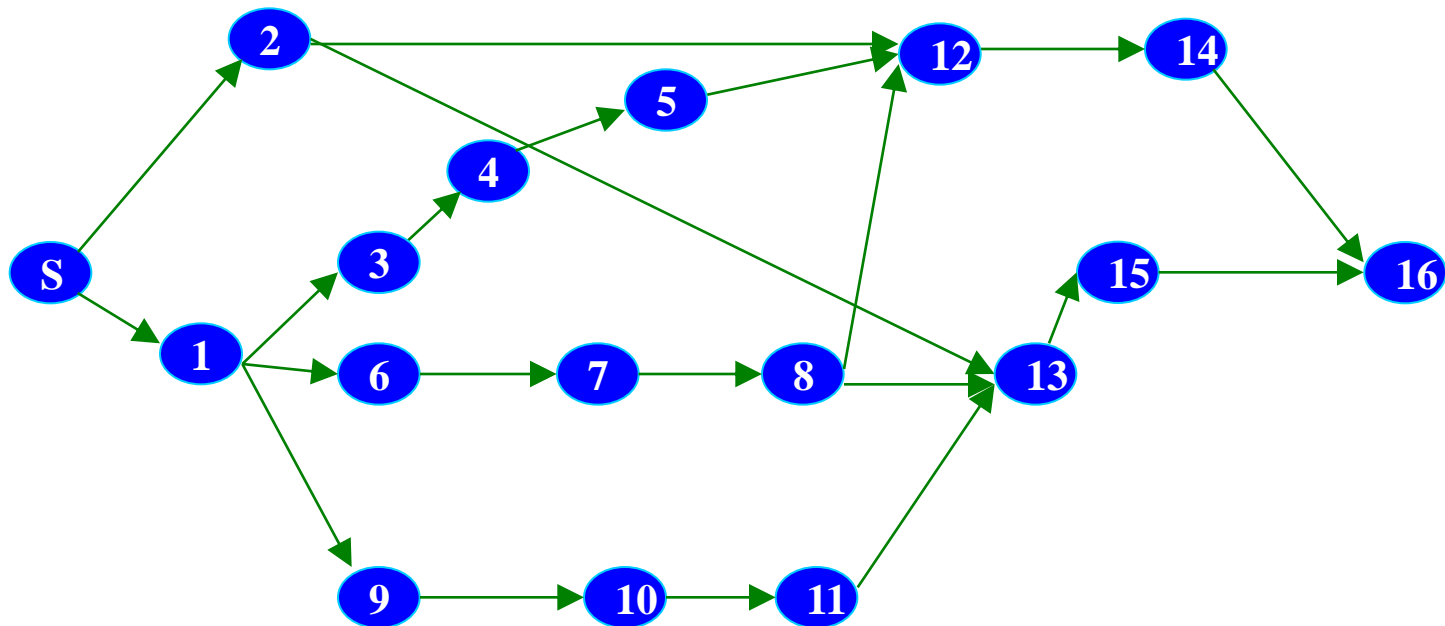
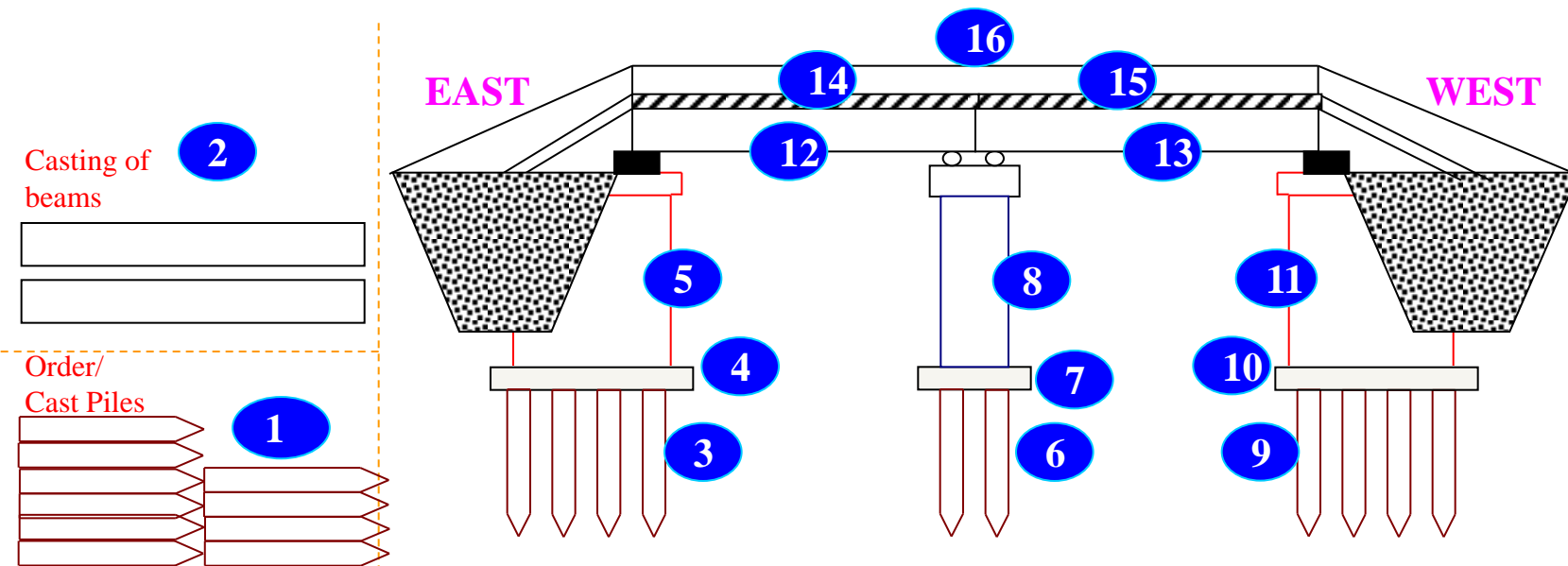
East & West Pile Cap= 4 days+ 3days=7 days

Two Span Bridge – Activity-Duration-Predecessors

No.	Activity	Duration (days)	Predecessor
1.	Order & Deliver Piles	15	Start
2.	Cast Beams	a.16 & b.20	Start
3.	Drive Piles East	12	1
4.	Const East Pile Cap	08	3
5.	Const E. Abutment	36	4
6.	Drive Piles Centre	6	1
7.	Const Centre Pile Cap	07	6
8.	Const Centre Pier	27	7
9.	Drive Piles West	12	1
10.	Const West Pile Cap	08	9
11.	Const W. Abutment	36	10
12.	Place Beams E. Span	07	2(a),5,8
13.	Place Beams W. Span	07	2(b),8,11
14.	Deck Slab East	15	12
15.	Deck Slab West	15	13
16.	Lay Roads	25	14,15

Draw Network. Do Network Analysis - Any Changes suggested ?

No Resource Constraints



Act.	Dura tion	Predec essor	Early Start	Early Finish	Late Start	Late Finish	TF	Critical	FF	INTF	INDF
1	15	s	0	15	0	15	0	Y	0	0	0
2	20	s	0	20	51	71	51	N	51	0	0
3	12	1	15	27	15	27	0	Y	0	0	0
4	8	3	27	35	27	35	0	Y	0	0	0
5	36	4	35	71	35	71	0	Y	0	0	0
6	6	1	15	21	31	37	16	N	0	16	0
7	7	6	21	28	37	44	16	N	0	16	0
8	27	7	28	55	44	71	16	N	16	0	0
9	12	1	15	27	15	27	0	Y	0	0	0
10	8	9	27	35	27	35	0	Y	0	0	0
11	36	10	35	71	35	71	0	Y	0	0	0
12	7	2,5,8	71	78	71	78	0	Y	0	0	0
13	7	2,8,11	71	78	71	78	0	Y	0	0	0
14	15	12	78	93	78	93	0	Y	0	0	0
15	15	13	78	93	78	93	0	Y	0	0	0
16	25	14,15	93	118	93	118	0	Y	0	0	0