

Project Planning & Control

Lesson 4

Two-Span Bridge: Activity Identification and Duration Estimation

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3, 6 & 9. Drive Piles



Pile Driving Operation



3, 6 & 9. Drive Piles - Duration

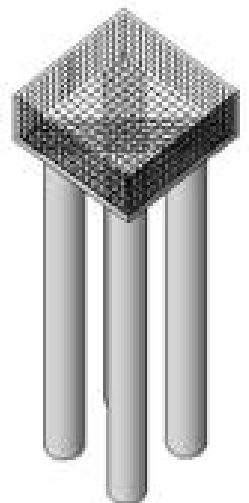
Driving Rate depends on Soil type and Rig Characteristics

Assume 1 day / pile

East & West Piles – 12 days Each Side

Center Piles – 6 days

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:

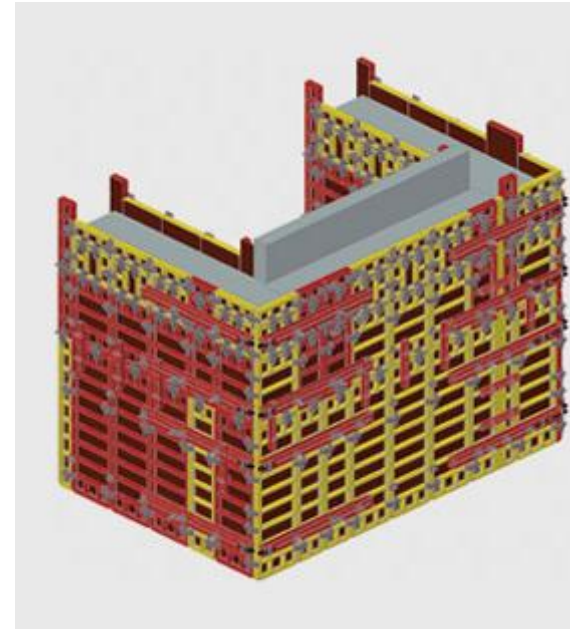
- 1.0 Excavation & PCC Bed— *1 day*
- 2.0 Chipping *1/2 day*
- 3.0 Reinforcement *1/2 day*
- 4.0 Formwork *1 day*
- 5.0 Concreting *1/2 day*
- 6.0 Form removal after *1 day*
- 7.0 Form Removal *1/2 day*
- 8.0 Backfill *1/2 day*

Curing before usage – 3 days regular curing

Total duration for

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

5 & 11. Construct Abutments



5 & 11. Construct Abutments - Duration

Assume Abutment is done in 2 stages

Operation Sequence: (Stage-1)(Lower Level)

- 1.0 Reinforcement Erection – 3 days
- 2.0 Formwork Assembly – 3 days
- 3.0 Concrete pouring – 1 day
- 4.0 Form removal after – 1 day
- 5.0 Form removal time- 2 day

Curing before next stage pour – 3 days

Operation Sequence: (Stage-2) (Higher Level)

- 1.0 Reinforcement Erection – 4 days
- 2.0 Formwork Assembly – 4 days
- 3.0 Concrete pouring – 1 day
- 4.0 Form removal after – 1 day
- 5.0 Form removal time- 2 days

Abutment cap + Bearing Pad = 7 days

Duration = 10 (Stage-1) + 12 (Stage-2) + 7 (Cap +bearing pedestal) + 7 Curing

=36 days Each Abutment

8. Construct Centre Pier



8. Construct Centre Pier - Duration

Assume Pier is done in 2 stages + Pier cap and Bearing Pedestal

Operation Sequence: (Stage-1)(Lower Level)

- 1.0 Reinforcement Erection – 1 day
- 2.0 Formwork Assembly – 2 days
- 3.0 Concrete pouring – 1 day
- 4.0 Form removal after – 1 day
- 5.0 Form removal time- 1 day

Curing before next stage pour – 3 days (?)

Operation Sequence: (Stage-2) (Higher Level)

- 1.0 Reinforcement Erection – 2 days
- 2.0 Formwork Assembly – 3 days
- 3.0 Concrete pouring – 1 day
- 4.0 Form removal after – 1 day
- 5.0 Form removal time- 1 day

Curing before Pier cap – 3 days

Pier cap + Bearing Pad – 5 days

Pier cap etc = 1 days after Stage 2 + 5 days const + 28 days before Girder Placement

Duration = 6 (Stage-1) + 8 Stage-2 upto form removal +
1 day (after stage 2) + 5 (Pier Cap Construction) + 7 days curing before loading

= 27 days

12 & 13 Place Beams



12 & 13 Place Beams- Duration

Depends on lifting & placing method & distance from fabrication yard
Assume 1 day / girder

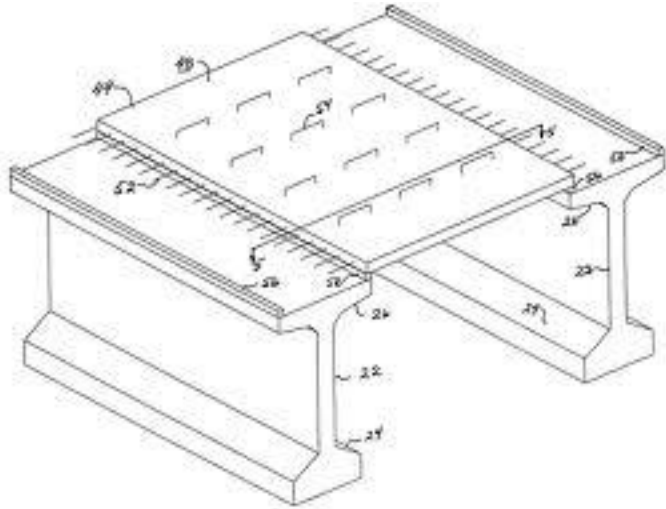
East & West girders placement – 3 days each side.

+

4 days for girder diaphragm

Total = 7 days each side.

14 & 15. Construct Deck Slab



14 & 15 Construct Deck Slab- Duration

Assume staging is done for each sides in 4 days

Operation Sequence

- 1.0 Staging - 2 day
- 2.0 Formwork Assembly– 1 day
- 3.0 Reinforcement Erection – 2 days
- 4.0 Concrete pouring – 1 day
- 5.0 Form removal after – 7 day
- 6.0 Form removal time- 2 day

Curing for 7 days

Total = 15 days Each Side

16. Lay road



16. Lay road - Duration

Operation Sequence

1.0 Earthwork (Filling/grading/rolling) 10 days (Each side)
with stone pitching revetment etc

2.0 Blacktopping – 5 days. (Full length)

Total Duration = 20 + 5 = **25 days** (No overlap is done)

Is overlap possible ? What is the saving in duration ?