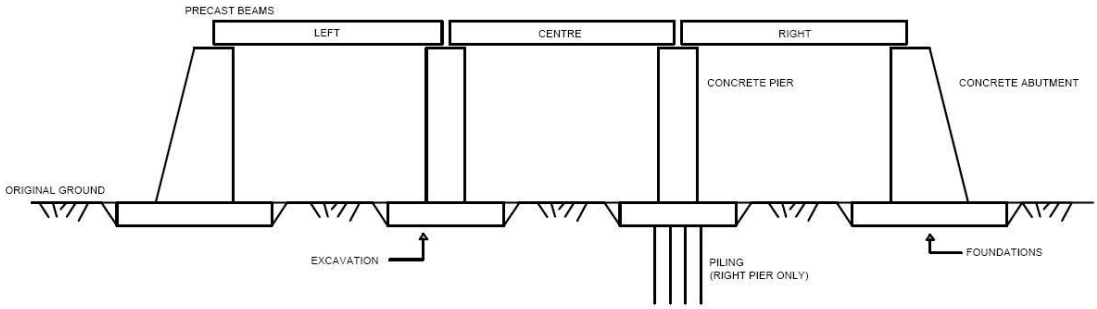
CE 332 CONSTRUCTION ENGINEERING AND MANAGEMENT

SPRING 2013

CLASSWORK

BRIDGE CONSTRUCTION EXAMPLE

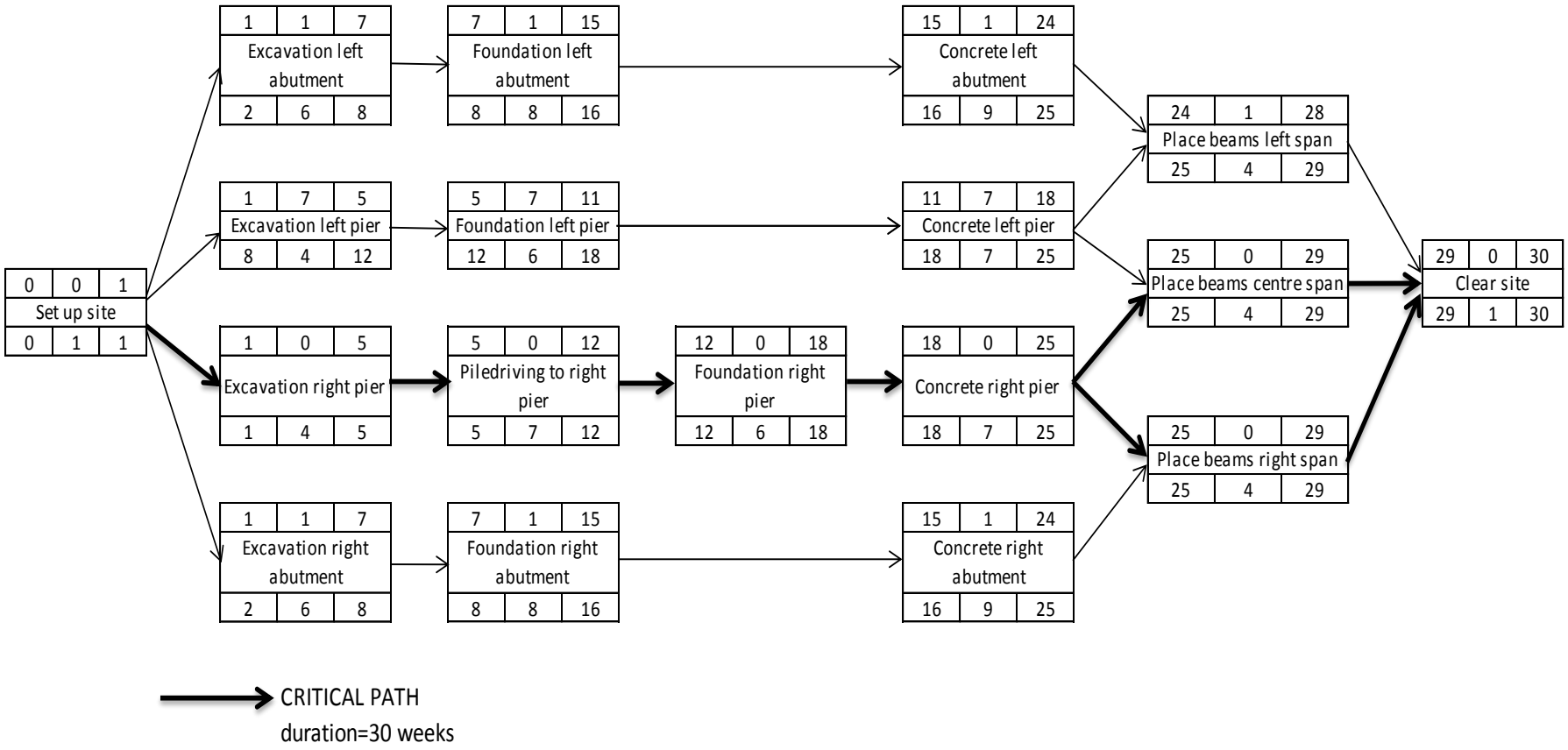


Activity Number	Activity Description	Duration (weeks)	Resource Demand
1	Set up site	1	
2	Excavate left abutment	6	Excavator
3	Excavate left pier	4	Excavator
4	Excavate right pier	4	Excavator
5	Excavate right abutment	6	Excavator
6	Piledriving to right pier	7	
7	Foundations left abutment	8	Concrete team for foundations
8	Foundations left pier	6	Concrete team for foundations
9	Foundations right pier	6	Concrete team for foundations
10	Foundations right abutment	8	Concrete team for foundations
11	Concrete left abutment	9	Concrete team for abutments and piers
12	Concrete left pier	7	Concrete team for abutments and piers
13	Concrete right pier	7	Concrete team for abutments and piers
14	Concrete right abutment	9	Concrete team for abutments and piers
15	Place beams left span	4	Crane
16	Place beams centre span	4	Crane
17	Place beams right span	4	Crane
18	Clear site	1	

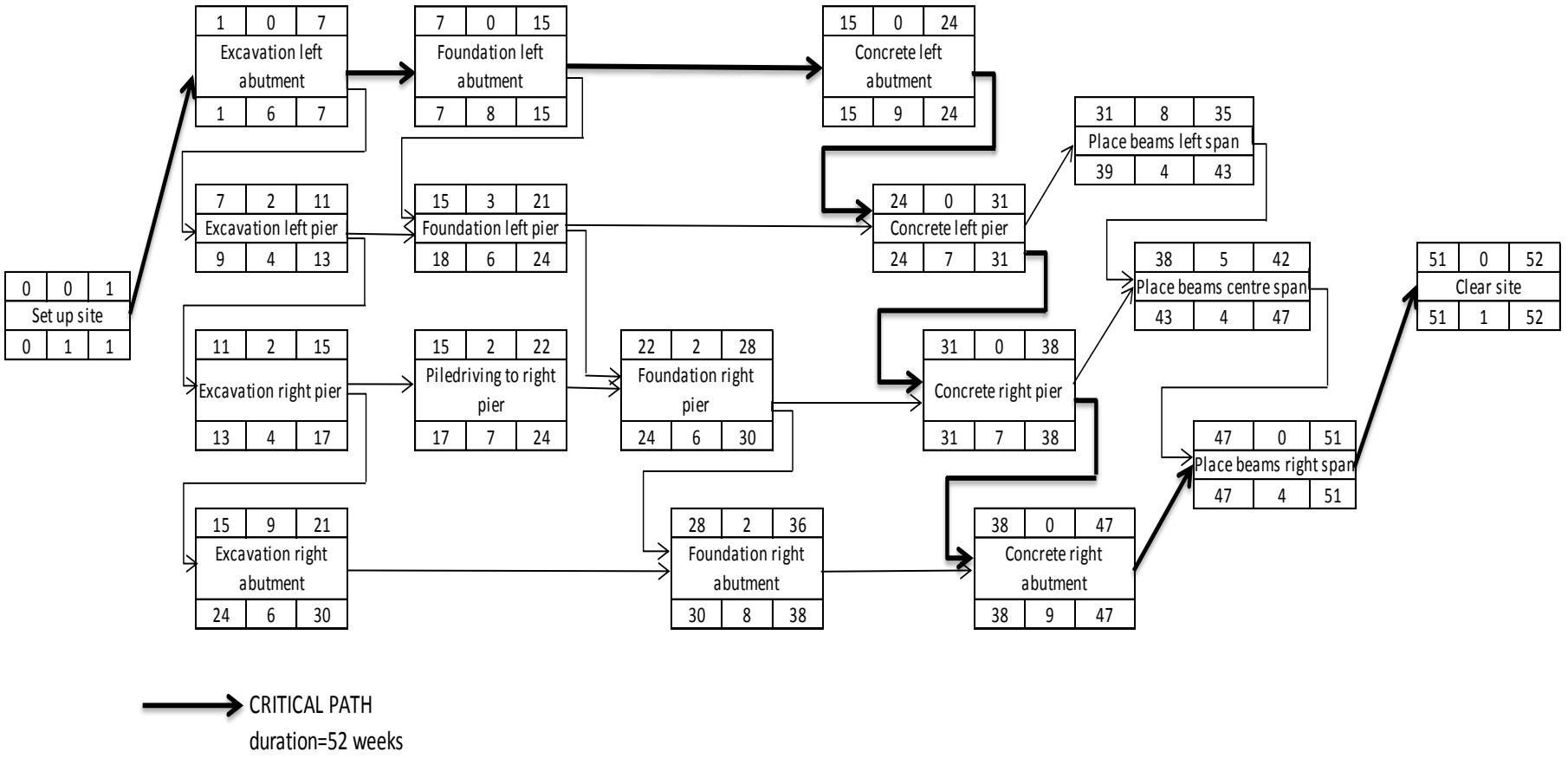
PART 1. Construct a precedence diagram for bridge contruction assuming that there are unlimited resources: 4 excavators, 4 concrete teams for foundations, 4 concrete teams for abutments and piers and 3 crane teams. Thus, most of the activities can be carried out in parallel. Make necessary network calculations, indicate the Critical Path (CP) and calculate the project duration.

PART 2. Construct a precedence diagram for bridge construction assuming that there are limited resources: 1 excavator, 1 concrete team for foundation, 1 concrete team for abutments and piers and 1 crane team. Thus, the succeeding activities should wait for completion of preceeding activities and most of the activities should be carried out in series. Make necessary network calculations, indicate the Critical Path (CP) and calculate the project duration.

PART 1.


0 0 1
Set up site
0 1 1
1 1 7
Excavation left abutment
2 6 8
1 7 5
Excavation left pier
8 4 12
1 0 5
Excavation right pier
1 4 5
1 1 7
Excavation right abutment
2 6 8
7 1 15
Foundation left abutment
8 8 16
5 7 11
Foundation left pier
12 6 18
5 0 12
Piledriving to right pier
5 7 12
7 1 15
Foundation right abutment
8 8 16
12 0 18
Foundation right pier
12 6 18
15 1 24
Concrete left abutment
16 9 25
11 7 18
Concrete left pier
18 7 25
18 0 25
Concrete right pier
18 7 25
15 1 24
Concrete right abutment
16 9 25
24 1 28
Place beams left span
25 4 29
25 0 29
Place beams centre span
25 4 29
25 0 29
Place beams right span
25 4 29
29 0 30
Clear site
29 1 30
CRITICAL PATH
duration=30 weeks

PART 2.


0 0 1
Set up site
0 1 1
1 0 7
Excavation left abutment
1 6 7
7 0 15
Foundation left abutment
7 8 15
15 0 24
Concrete left abutment
15 9 24
7 2 11
Excavation left pier
9 4 13
15 3 21
Foundation left pier
18 6 24
24 0 31
Concrete left pier
24 7 31
31 8 35
Place beams left span
39 4 43
38 5 42
Place beams centre span
43 4 47
51 0 52
Clear site
51 1 52
11 2 15
Excavation right pier
13 4 17
15 2 22
Piledriving to right pier
17 7 24
22 2 28
Foundation right pier
24 6 30
31 0 38
Concrete right pier
31 7 38
47 0 51
Place beams right span
47 4 51
15 9 21
Excavation right abutment
24 6 30
28 2 36
Foundation right abutment
30 8 38
38 0 47
Concrete right abutment
38 9 47
CRITICAL PATH
duration=52 weeks