

CE 4990 - Construction Scheduling

Lab work

March 19, 2012

Problem 1

Cost and schedule data for a small project are given below. Assume an indirect cost of \$200 per day. Develop the least cost curve for the project.

Activity	Preceded by	Crash Cost	Normal Cost	Crash Duration	Normal Duration
A	N/A	\$3,900	\$3,600	6 days	7 days
B	A	\$6,500	\$5,500	3 days	5 days
C	B	\$7,200	\$6,350	7 days	9 days
D	B	\$4,900	\$4,700	18 days	19 days
E	B	\$2,200	\$2,050	9 days	10 days
F	C	\$1,700	\$1,200	6 days	8 days
G	F	\$7,200	\$7,200	5 days	5 days
H	E	\$10,000	\$9,450	10 days	11 days
I	D,G,H	\$4,700	\$4,500	6 days	7 days

Table 1: Cost and schedule data for problem 1

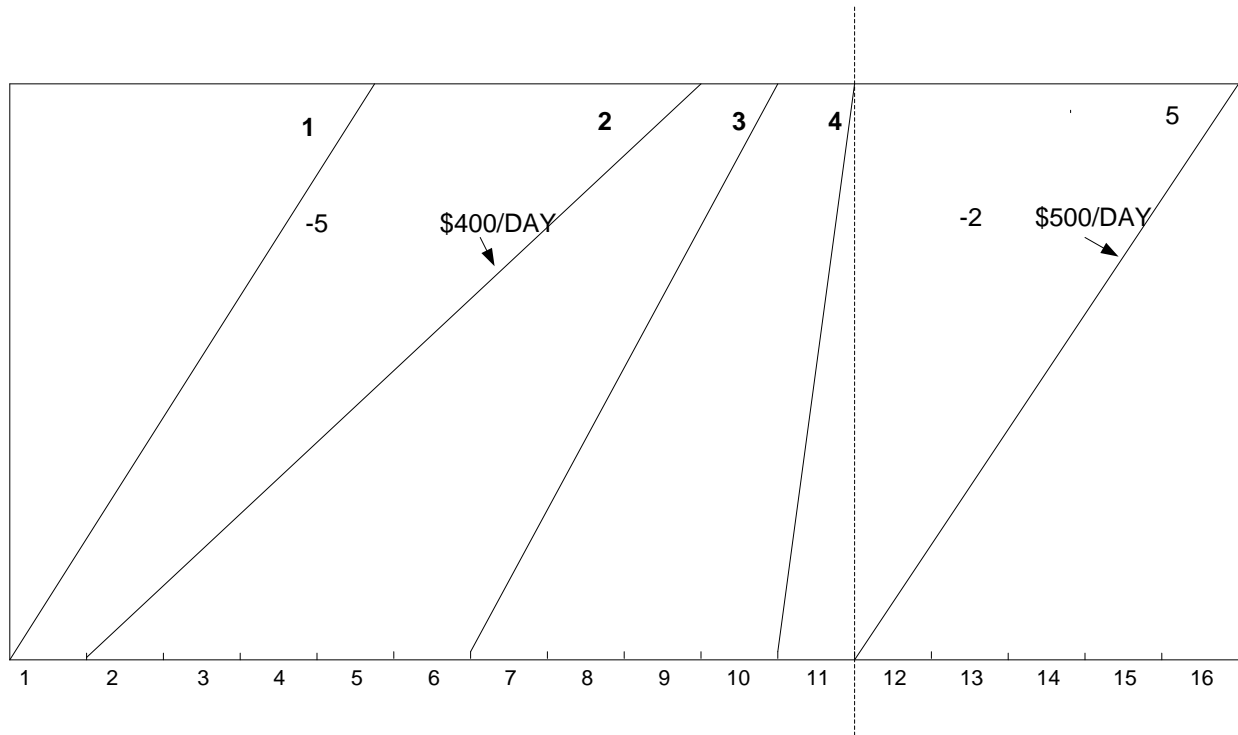


Figure 1: LSM schedule for Problem 2

Problem 2

Figure 1 shows an LSM schedule to be expedited. Activity 2 can be expedited 5 days at a cost of \$400 per day and activity 5 can be expedited at most 2 days at a cost of \$500 per day. Ensure that at least a buffer of a day is maintained in between any two activities at any time.

Problem 3

Given the information in Tables 2 and 3, do the following:

- Develop a network schedule,
- Allocate and level resources,
- Develop an S-curve (cost vs. time) for the project,
- Develop an utilization curve for each of the resources.

Activity	Resource or craft type	Number of resources	Preceded by
A	Bulldozer	16	-
B	Laborer	32	A
C	Laborer	32	A
D	Bulldozer	16	C
E	Welder	32	C
F	Bulldozer	16	B
G	Laborer	32	B
H	Welder	24	F
I	Laborer	56	E
J	Crane	8	H
K	Loader	16	G
L	Crane	8	N
M	Welder	16	N
N	Loader	8	D
O	Laborer	16	N
P	Crane	8	J
Q	Welder	32	I, M
R	Welder	8	I, M
S	Laborer	24	P
T	Laborer	40	O
U	Welder	24	L, Q
V	Laborer	32	R
W	Laborer	48	S, T, U, V

Table 2: Activity and resource requirements for Problem 3

Type of resource	Maximum available	Resource unit	Unit cost
Laborers	8	Manhour	\$8.50
Crane	1	Equip-hour	\$62.50
Bulldozers	2	Equip-hour	\$37.50
Welders	5	Manhour	\$18.00
Loaders	1	Equip-hour	\$28.00

Table 3: Resource limits for Problem 3