## **Earned Value Problem**

Calculate earned value for each month of the pavement project used in the previous homework (Unit Price Bid Problem). Use the unit prices given in Table 1 below. Notice that the project has been simplified to the items shown in Tables 1 and 2 below. The actual performance data is given in Table 3. The work schedule network is given in Figure 1.

Make a graph of BCWS, ACWP, BCWP (vertical axis) versus time (horizontal axis) in months of total project duration (3 lines in one chart).

#### Table 1 – Unit prices:

Pay Items	Quantity	Unit	\$/Unit	Labor hr
Detour	1	LS	62,000	
Install Base	8,000	CY	79.00	5,000
Topping	36,000	SY	35.00	9,000

#### Table 2 – Estimated costs:

Cost Item	Quantity	Unit	Material	Equip.	Labor	Sub	Duration
Detour	1	EA	\$14,000	\$24,000	16,000		15 Install
							10 Remove
Concrete plant(for	1	EA		\$60,000			20 Deliver
topping)							
Install base	12,000	CY@	\$14	\$15	\$13		30
Concrete topping	8,000	CY@	\$60	\$25	\$34		30
Quality control (1/2 for	1	EA				40,000	
base and <sup>1</sup> / <sub>2</sub> for topping)							
Variable overhead(\$/day)			\$120	\$250	\$280		
Fixed overhead	\$250,000						
Profit markup	\$150,000						

### **Table 3 – Actual performance on project:** Month = 20 working days

Day refers to 6:00 pm (end of day)

Month	1	2	3	4	5
Detour in	Started day 3, finished day 16				
Detour out	Started day 94, finished day 98				
Concrete plant	Delivere	d day 19			
Install base Start/Finish	23/59	3,800 CY	4,500 CY		
Labor hours		2,760	2,740		
Place topping	59/92		1,000 SY	20,000 SY	15,000 SY
Labor hours			700	6,300	3,500

#### **Change Orders:**

Install base	Change order = $+$ \$2.00/CY and U <sub>p</sub> = $+$ 500 CY (during 2 <sup>nd</sup> month)
Place topping	Increase thickness by 2 inch
	And Change order = $+$ \$4.00/SY (during 2 <sup>nd</sup> month)

# Figure 1: CPM Schedule

