Cost Control Problem

Calculate contractor cost variances and gross income variances for Install Base and Topping for the second and third weeks of month 3 (at end of day 50 and day 55) of the pavement project used in the previous homework (Earned Value Problem). (Note: The actual start and finish dates of Place Topping has been changed from the previous problem, so it overlaps with Install Base.) Use the unit prices and budgeted labor hours given in Table 1 below. The actual performance data is given in Table 3. The contractor's cost control data is shown in the attached Table 4.

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
	Quantity	em	material	Equip.	Lucor	540	(work days)
Detour	1	EA	\$14,000	\$24,000	\$16,000		15 Install
							10 Remove
Concrete plant (for topping)	1	EA		\$60,000			20 Deliver
Install base	12,000	CY@	\$14	\$15	\$13		30
Concrete topping	8,000	CY@	\$60	\$25	\$34		30
Quality control (1/2 for base	1	EA				\$40,000	
and $1/2$ for topping)							
Variable overhead (\$/day)			\$120	\$250	\$280		
Fixed overhead	\$250,000						
Profit markup	\$150.000						

Table 3	Actual	nerformance	on	nroiec	t
	Actual	periormance	on	projec	ι.

Month = 20 working days. Day refers to 6:00 pm (end of day)

Detour in	Started day 3, finished day 16
Detour out	Started day 94, finished day 98
Concrete plant	Delivered day 19
Install base	Started day 23, finished day 59
Place topping	Started day 44, finished day 78

Change Orders:

Install base	Change order = $+$ \$2.00/CY and U_p = $+$ 500 CY (during 2 nd month)
Place topping	Increase thickness by 2 inches
	and change order = $+$ \$4.00/SY (during 2^{nd} month)

			Mont	h 2			Mont	h 3			Mont	h 4	
	Day =	25	30	35	40	45	50	55	60	65	70	75	80
	Pay CY	100	1220	1230	1250	1200	1340	1230	730				
	Projected	8,000	8,000	8,000	8,500	8,500	8,500	8,500	8,500				
Install base	Contr. CY	138	1654	1651	1659	1548	1721	1633	945				
	Labor hr	192	888	864	816	735	792	801	412				
	Labor \$	\$6,629	\$30,660	\$29,846	\$28,449	\$25,635	\$27,706	\$27,769	\$14,289				
	Pay SY					1,150	5,560	5,750	5,660	5,630	5,370	5,420	1,460
	Projected					36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000
Place topping	Contr. CY					314	1,592	1,547	1,685	1,688	1,585	1,558	347
	Labor hr					396	1,709	1,574	1,703	1,663	1,571	1,515	369
	Labor \$					\$11,719	\$50,602	\$46,200	\$57,301	\$55,337	\$52,110	\$50,879	\$12,402