

الفصل الثالث عشر
تحليل السيولة وفقاً لبرنامج العمل

	:	-
(Cash Flow)	.	-
	.	-
(Contract Provisions that Impact Cash Flow)		
(Payment Method and Schedule)		- -
(Retainage)		- -
(Materials)		- -
(Mobilization)		- -
(Monthly Payments)		- -
(Final Payments)		- -
(Cash-Flow Analysis)		-
(Present Worth of Cash Flow)		-
	.	-
(Cash Flow Projection Examples)		
	.	-
(Cash Flow Cases in Construction Projects)		
%	:	- -
(Balanced Bidding With 20% Profit)	. %	
	:	- -
(Front Loading the initial 50% Duration)	.	
-	:	- -
	.	
(Front Loading Plus Pricing - The 2nd Half 20% below cost and Front Load Into the 1st Half)		

(Bidding Without Profit)

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:(Cash Flow)

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(The time value of money)

(Interest Rates)

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(Contract Provisions that Impact Cash Flow)

(Payment Method and Schedule) :

) (Unit Rate)

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(Mobilization)

.(Demobilization)

(Lump Sum Contracts)

:(Retainage)

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(Retainage)

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:(Materials)

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(Long Lead Items)

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:(Mobilization)

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:(Monthly Payments)

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:(Final Payments)

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(Final Completion)

: (Cash-Flow Analysis)

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(Net Cash Flow)

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"S Curve"

: (Present Worth of Cash Flow)

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(Cash Flow Projection Examples)

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(Cost Plus Fixed Fee)

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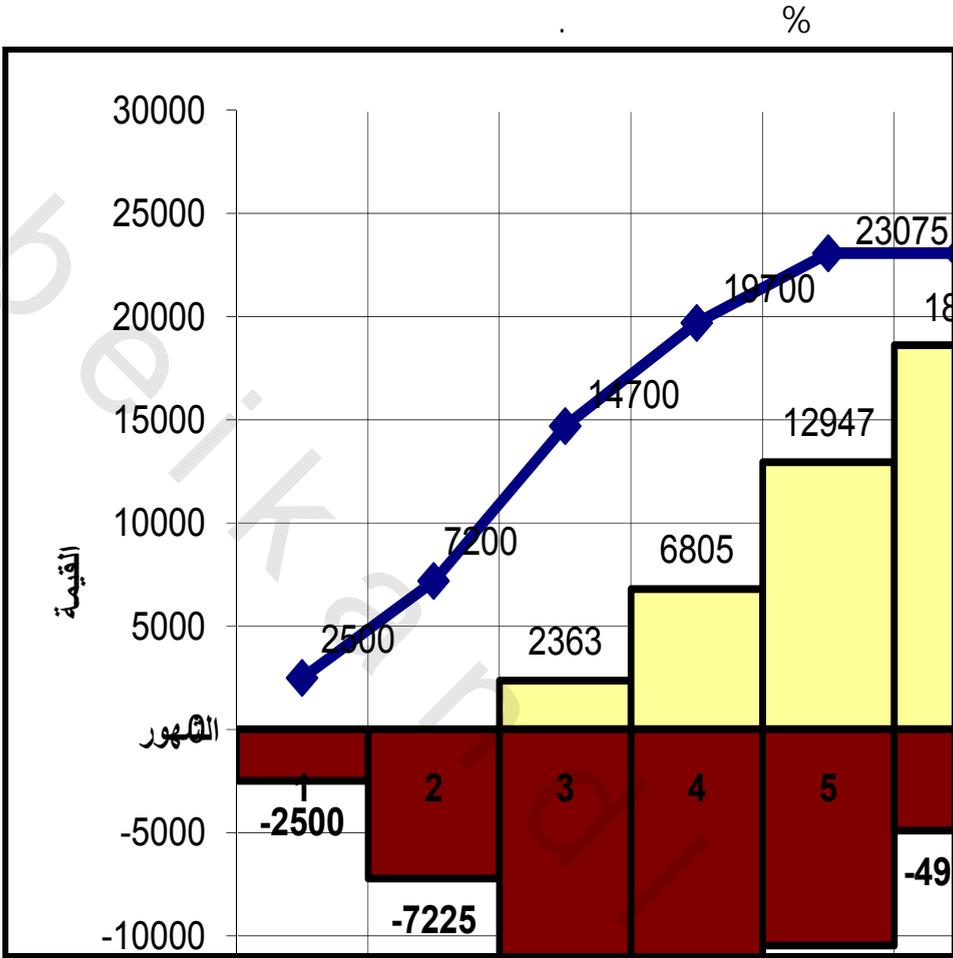
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حسابات التدفق النقدي

Act. No.	Activity Description		الشهور Months							Total	
			١	٢	٣	٤	٥	٦	٧		
١	Mobilization	تجهيز الموقع	٢٠٠٠								٢٠٠٠
٢	Surveying	أعمال المساحة		١٢٠٠							١٢٠٠
٣	Trenching	الحفر		٣٠٠٠	٦٠٠٠						٩٠٠٠
٤	Laying Pipe	أعمال تمديد الأنابيب				٣٠٠٠					٣٠٠٠
٥	Concrete	الخرسانات				٥٠٠	٥٠٠				١٠٠٠
٦	Backfilling	الردم					٥٠٠				٥٠٠
٧	Fixing Valves	تنقيت الصمامات			١٠٠٠						١٠٠٠
٨	Completing Valves	إكمال الصمامات				١٠٠٠					١٠٠٠
٩	Testing	الاختبار						١٥٠٠			١٥٠٠
١٠	Demobilization	إزالة تجهيزات الموقع						٥٠٠			٥٠٠
١١	Direct Cost	التكاليف المباشرة الشهرية	٢٠٠٠	٤٢٠٠	٧٠٠٠	٤٥٠٠	٣٠٠٠				٢٠٧٠٠
١٢	Indirect Cost	التكاليف الشهرية الغير مباشرة	٥٠٠	٥٠٠	٥٠٠	٥٠٠	٣٧٥				٢٣٧٥
١٣	Total Cost	إجمالي التكاليف الشهرية	٢٥٠٠	٤٧٠٠	٧٥٠٠	٥٠٠٠	٣٣٧٥				٢٣٠٧٥
١٤	Mark-Up (5%)	هامش الربح الشهري	١٢٥	٢٣٥	٣٧٥	٢٥٠	١٦٩	٠	٠		١١٥٤
١٥	Total Worth	إجمالي المستحق شهريا	٢٦٢٥	٤٩٣٥	٧٨٧٥	٥٢٥٠	٣٥٤٤	٠	٠		٢٤٢٢٩
١٦	Retainage (10%)	محتجز الضمان	٢٦٢٠	٤٩٤٠	٧٨٨٠	٥٢٥٠	٣٥٤٠	٠	٠		٢٤٢٢٠
١٧	Payment due (Worth-Ret)	الدفعات المستحقة	٢٣٦٣	٤٤٤٢	٧٠٨٨	٤٧٢٥	٣١٨٩	٠	٠		٢١٨٠٦
١٨	Payment Received	الدفعات الشهرية المستلمة	٠	٠	٢٣٦٣	٤٤٤٢	٦١٤٢	٥٦٧٠	٥٦١٤		٢٤٢٣١
١٩	Cum. Total Cost	إجمالي التكاليف التراكمية	٢٥٠٠	٧٢٠٠	١٤٧٠٠	١٩٧٠٠	٢٣٠٧٥	٢٣٠٧٥	٢٣٠٧٥		٢٣٠٧٥
٢٠	Cum. Rec. Payments	الدفعات المستلمة التراكمية	٠	٠	٢٣٦٣	٦٨٠٥	١٢٩٤٧	١٨٦١٧	٢٤٢٣١		٢٤٢٣١
٢١	Cum. (Cost-Pay)	الصافي التراكمي	٢٥٠٠	٧٢٠٠	١٢٣٣٧	١٢٨٩٥	١٠١٢٨	٤٤٥٨	١١٥٦		١١٥٦
٢٢	Cum. Interest	الفائدة التراكمية	٢	٢٥	٩٧	٢٢٠	٣٤٩	٤٥١	٤٩٥		٤٩٥
٢٣	Overdraft	التحويل البنكي المطلوب	٢٥٠٠	٧٢٢٥	١٢٤٣٤	١٣١١٥	١٠٤٧٧	٤٩٠٩	٦٦١		٦٦١

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شكل ١٣-١

التدفق النقدي - بدون دفعة مقدمة

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(Cash Flow Cases in Construction Projects)

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(Cost At Completion)

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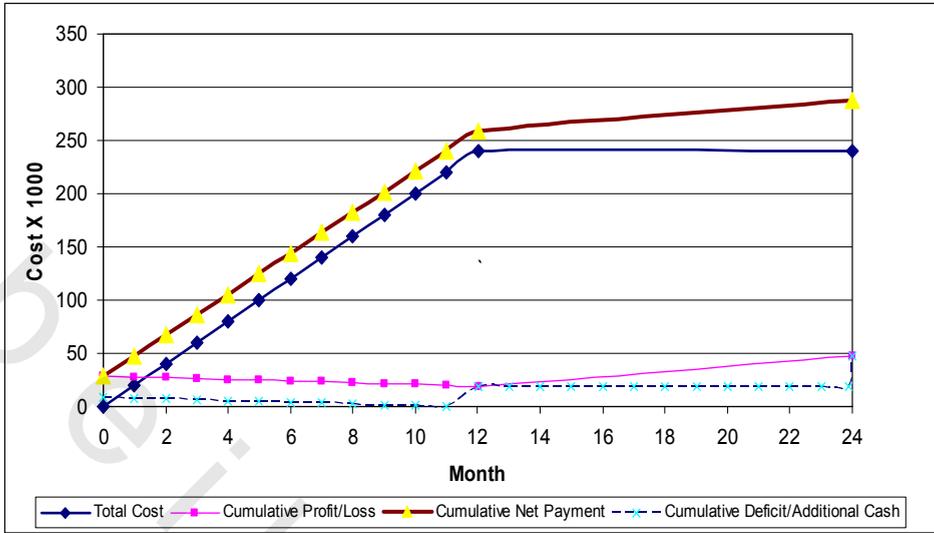
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(Balanced Bidding With 20% Profit)

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Case 1: Balanced Bidding With 20% Profit									
Month	Cost	Total Cost	Profit	Gross Monthly Payment	Monthly Net Payment	Gross Cumulative Monthly Payment	Cumulative Cash Flow	Monthly Deficit/Additional Cash	Cumulative Deficit/Additional Cash
	(A)	(B)	(C)	(D)	(F)=(D)*80%	(G)	(H)=(G)-(B)	(F)-(A)	/ ()
0	0	0	0	0	28,800	28,800	28,800	8,800	8,800
1	20,000	20,000	4,000	24,000	19,200	48,000	28,000	(0,800)	8,000
2	20,000	40,000	4,000	24,000	19,200	67,200	27,200	(0,800)	7,200
3	20,000	60,000	4,000	24,000	19,200	86,400	26,400	(0,800)	6,400
4	20,000	80,000	4,000	24,000	19,200	105,600	25,600	(0,800)	5,600
5	20,000	100,000	4,000	24,000	19,200	124,800	24,800	(0,800)	4,800
6	20,000	120,000	4,000	24,000	19,200	144,000	24,000	(0,800)	4,000
7	20,000	140,000	4,000	24,000	19,200	163,200	23,200	(0,800)	3,200
8	20,000	160,000	4,000	24,000	19,200	182,400	22,400	(0,800)	2,400
9	20,000	180,000	4,000	24,000	19,200	201,600	21,600	(0,800)	1,600
10	20,000	200,000	4,000	24,000	19,200	220,800	20,800	(0,800)	0,800
11	20,000	220,000	4,000	24,000	19,200	240,000	20,000	(0,800)	0.0
12	20,000	240,000	4,000	24,000	19,200	259,200	19,200	19,200	19,200
24	0	240,000	0	0	28,800	288,000	48,000	28,800	48,000
Total	240,000		48,000	288,000	288,000				48,000



شكل ١٣-٣

أسعار المقاول متزنة مع وجود دفعة مقدمة ١٠٪ وجامش ربح ٢٠٪

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حالة ١: المتوفر عند رب العمل عند نهاية الشهر السادس:

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الاحتياطات التي يجب أن يتخذها رب العمل لتفادي هذا الموقف:

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(Front Loading the Initial 50% Duration)

Case 2: Front Loading the Initial 50% Duration									
Month	Cost	Total Cost	Profit	Gross Monthly Payment	Net. Monthly Payment	Gross Cumulative Monthly Payment	Cumulative Cash Flow	Monthly (Deficit/Additional Cash	Cumulative Deficit/Additional Cash
								()/	/ ()
0	0	0	0	0	28,800	28,800	28,800	8,800	8,800
1	20,000	20,000	8,000	28,000	22,400	51,200	31,200	2,400	11,200
2	20,000	40,000	8,000	28,000	22,400	73,600	33,600	2,400	13,600
3	20,000	60,000	8,000	28,000	22,400	96,000	36,000	2,400	16,000
4	20,000	80,000	8,000	28,000	22,400	118,400	38,400	2,400	18,400
5	20,000	100,000	8,000	28,000	22,400	140,800	40,800	2,400	20,800
6	20,000	120,000	8,000	28,000	22,400	163,200	43,200	2,400	23,200
7	20,000	140,000	0	20,000	16,000	179,200	39,200	(4,000)	19,200
8	20,000	160,000	0	20,000	16,000	195,200	35,200	(4,000)	15,200
9	20,000	180,000	0	20,000	16,000	211,200	31,200	(4,000)	11,200
10	20,000	200,000	0	20,000	16,000	227,200	27,200	(4,000)	7,200
11	20,000	220,000	0	20,000	16,000	243,200	23,200	(4,000)	3,200
12	20,000	240,000	0	20,000	16,000	259,200	19,200	16,000	19,200
24	0	240,000	0		28,800	288,000	48,000	28,800	48,000
Total	240,000		48,000	288,000	288,000				48,000

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(Front Loading Plus Pricing - The 2nd Half 20% below Cost and Front load Into the 1st Half)

Case 3: Plus Pricing the 2nd half 20% below cost and Front Loaded into the 1st half

Month	Cost	Total Cost	Profit	Gross Monthly Payment	Net Monthly Payment	Gross Cumulative Monthly Payment	Cumulative Cash Flow	Monthly (Deficit/Additional cash)	Cumulative Deficit/Additional Cash
)/ (/) (
0	0	0	0	0	28,800	28,800	28,800	8,800	8,800
1	20,000	20,000	12,000	32,000	25,600	54,400	34,400	5,600	14,400
2	20,000	40,000	12,000	32,000	25,600	80,000	40,000	5,600	20,000
3	20,000	60,000	12,000	32,000	25,600	105,600	45,600	5,600	25,600
4	20,000	80,000	12,000	32,000	25,600	131,200	51,200	5,600	31,200
5	20,000	100,000	12,000	32,000	25,600	156,800	56,800	5,600	36,800
6	20,000	120,000	12,000	32,000	25,600	182,400	62,400	5,600	42,400
7	20,000	140,000	-4,000	16,000	12,800	195,200	55,200	-7,200	35,200
8	20,000	160,000	-4,000	16,000	12,800	208,000	48,000	-7,200	28,000
9	20,000	180,000	-4,000	16,000	12,800	22,800	4,800	-7,200	2,800
10	20,000	200,000	-4,000	16,000	12,800	233,600	33,600	-7,200	13,600
11	20,000	220,000	-4,000	16,000	12,800	246,400	26,400	-7,200	6,400
12	20,000	240,000	-4,000	16,000	12,800	259,200	19,200	12,800	19,200
24	0	240,000	0		28,800	288,000	48,000	28,800	48,000
Total	240,000		48,000	288,000	288,000				48,000

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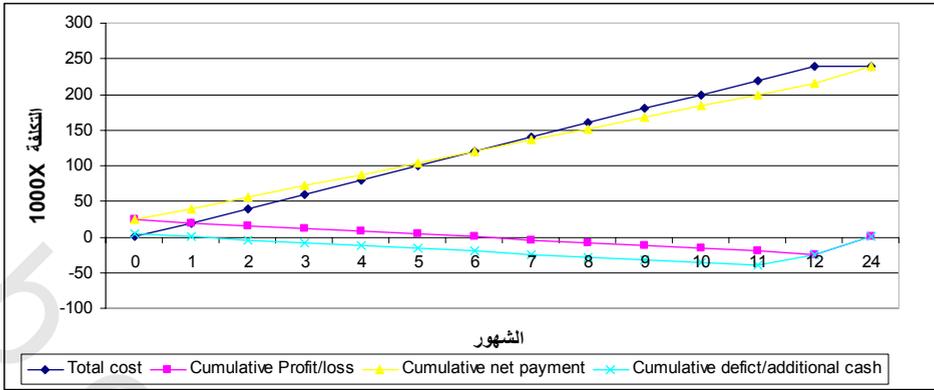
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(Bidding Without Profit)

Case 4: Balanced Bidding Without Profit

Month	Cost	Total Cost	Profit	Gross Monthly Payment	Net Monthly Payment	Gross Cumulative Monthly Payment	Cumulative Cash Flow	Monthly (Deficit/Additional Cash	Cumulative Deficit/Additional Cash
)/ () (
0	0	0	0	0	24,000	24,000	24,000	4,000	4,000
1	20,000	20,000	0	20,000	16,000	40,000	20,000	-4,000	0
2	20,000	40,000	0	20,000	16,000	56,000	16,000	-4,000	-4,000
3	20,000	60,000	0	20,000	16,000	72,000	12,000	-4,000	-8,000
04	20,000	80,000	0	20,000	16,000	88,000	8,000	-4,000	-12,000
5	20,000	100,000	0	20,000	16,000	104,000	4,000	-4,000	-16,000
6	20,000	120,000	0	20,000	16,000	120,000	0	-4,000	-20,000
7	20,000	140,000	0	20,000	16,000	136,000	-4,000	-4,000	-24,000
8	20,000	160,000	0	20,000	16,000	152,000	-8,000	-4,000	-28,000
9	20,000	180,000	0	20,000	16,000	168,000	-12,000	-4,000	-32,000
10	20,000	200,000	0	20,000	16,000	184,000	-16,000	-4,000	-36,000
11	20,000	220,000	0	20,000	16,000	200,000	-20,000	-4,000	-40,000
12	20,000	240,000	0	20,000	16,000	216,000	-24,000	16,000	-24,000
24	0	240,000	0		24,000	240,000	0	24,000	0
Total	240,000		0	240,000	240,000			0	



شكل ١٣-٥ الحصول على العقد بسعر التكلفة بدون هامش ربح

حالة ٤ : الموقف عند نهاية الشهر السادس :

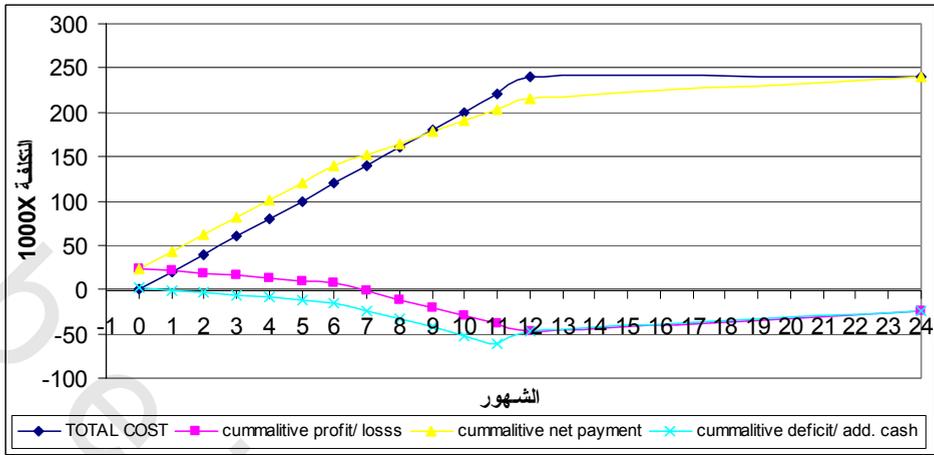
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Month	Cost	Total Cost	Profit	Gross Monthly Payment	Net Monthly Payment	Gross Cumulative Monthly Payment	Cumulative Cash Flow	Monthly Deficit/Additional Cash	Cumulative Deficit/Additional Cash
0	0	0	0	0	24.000	24.000	24.000	4.000	4.000
1	20.000	20.000	4.000	24.000	19.200	43.200	23.200	-0.800	3.200
2	20.000	40.000	4.000	24.000	19.200	62.400	22.400	-0.800	2.400
3	20.000	60.000	4.000	24.000	19.200	81.600	21.600	-0.800	1.600
4	20.000	80.000	4.000	24.000	19.200	100.800	20.800	-0.800	0.800
5	20.000	100.000	4.000	24.000	19.200	120.000	20.000	-0.800	0.00
6	20.000	120.000	4.000	24.000	19.200	139.200	19.200	-0.800	-0.800
7	20.000	140.000	-4.000	16.000	12.800	152.000	12.000	-7.200	-8.000
8	20.000	160.000	-4.000	16.000	12.800	164.800	4.800	-7.200	-15.200
9	20.000	180.000	-4.000	16.000	12.800	177.600	-2.400	-7.200	-22.400
10	20.000	200.000	-4.000	16.000	12.800	190.400	-9.600	-7.200	-29.600
11	20.000	220.000	-4.000	16.000	12.800	203.200	-16.800	-7.200	-36.800
12	20.000	240.000	-4.000	16.000	12.800	216.000	-24.000	12.800	-24.000
24	0	240.000			24.000	240.000	0	24.000	0
Total	240.000		0	240.000	240.000				

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Month	Cost	Actual Cost	Total Cost	Profit	Gross Monthly Payment	Net Monthly Payment	Gross Cumulative Monthly Payment	Cumulative Cash Flow	Monthly (Deficit/Additional Cash	Cumulative Deficit/Additional Cash
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0	0	0	0			24,000	24,000	24,000	2,000	2,000
1	20,000	22,000	22,000	0	20,000	16,000	40,000	18,000	-6,000	-4,000
2	20,000	22,000	44,000	0	20,000	16,000	56,000	12,000	-6,000	-10,000
3	20,000	22,000	66,000	0	20,000	16,000	72,000	6,000	-6,000	-16,000
4	20,000	22,000	88,000	0	20,000	16,000	88,000	0	-6,000	-22,000
5	20,000	22,000	110,000	0	20,000	16,000	104,000	-6,000	-6,000	-28,000
6	20,000	22,000	132,000	0	20,000	16,000	120,000	-12,000	-6,000	-34,000
7	20,000	22,000	154,000	0	20,000	16,000	136,000	-18,000	-6,000	-40,000
8	20,000	22,000	176,000	0	20,000	16,000	152,000	-24,000	-6,000	-46,000
9	20,000	22,000	198,000	0	20,000	16,000	168,000	-30,000	-6,000	-52,000
10	20,000	22,000	220,000	0	20,000	16,000	184,000	-36,000	-6,000	-58,000
11	20,000	22,000	242,000	0	20,000	16,000	200,000	-42,000	-6,000	-64,000
12	20,000	22,000	264,000	0	20,000	16,000	216,000	-48,000	16,000	-48,000
24			264,000			24,000	240,000	-24,000	24,000	-24,000
	240,000	264,000			240,000	240,000				-24,000



شكل ١٣-٧

وجود خطأ في التسعير والسعر المقترح أدنى من التكلفة الحقيقية

بمقدار ١٠٪

حالة ٦ : موقف الدفع عند نهاية الشهر السادس:

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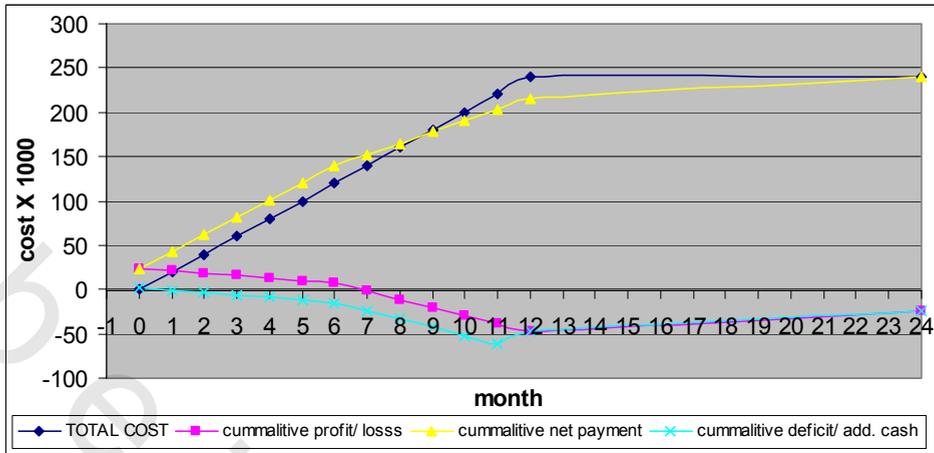
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(No Profit Plus Front Loading the 2nd half By Pricing 20% Below Cost and Front Load It into the 1st Half Plus 10% increase in Pricing)

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Month	Cost	Actual Cost	Total Cost	Profit	Gross Monthly Payment	Net Monthly Payment	Gross Cumulative Monthly Payment	Cumulative Cash Flow	Monthly (Deficit/Additional Cash	Cumulative Deficit/Additional Cash
									() /	/ ()
0	0		0		0	24,000	24,000	24,000	2,000	2,000
1	20,000	22,000	22,000	4,000	24,000	19,200	43,200	21,200	-2,800	-800
2	20,000	22,000	44,000	4,000	24,000	19,200	62,400	18,400	-2,800	-3,600
3	20,000	22,000	66,000	4,000	24,000	19,200	81,600	15,600	-2,800	-6,400
4	20,000	22,000	88,000	4,000	24,000	19,200	10,800	12,800	-2,800	-9,200
5	20,000	22,000	110,000	4,000	24,000	19,200	120,000	10,000	-2,800	-12,000
6	20,000	22,000	132,000	4,000	24,000	19,200	139,200	7,200	-2,800	-14,800
7	20,000	22,000	154,000	-4,000	16,000	12,800	152,000	-2,000	-9,200	-24,000
8	20,000	22,000	176,000	-4,000	16,000	12,800	164,800	-11,200	-9,200	-33,200
9	20,000	22,000	198,000	-4,000	16,000	12,800	177,600	-20,400	-9,200	-42,400
10	20,000	22,000	220,000	-4,000	16,000	12,800	190,400	-29,600	-9,200	-51,600
11	20,000	22,000	242,000	-4,000	16,000	12,800	203,200	-38,800	-9,200	-6,800
12	20,000	22,000	264,000	-4,000	16,000	12,800	216,000	-48,000	12,800	-48,000
24						24,000	240,000	-24,000	24,000	-24,000
Total	240,000	264,000			240,000	240,000			-24,000	



شكل ١٣-٨

وجود خطأ في التسعير والسعر المقترح أدنى من التكلفة الحقيقية بمقدار ١٠٪ ويوجد تحميل أمامي لأعمال نصف المدة التعاقدية الأولى حالة ٧: موقف الدفع عند نهاية الشهر السادس:

$$\begin{aligned}
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 & \cdot \quad = \quad + \quad - \quad = \\
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 \end{aligned}$$