

WHAT IS AN INDIRECT COST & WHY DOES IT AFFECT YOUR PROJECT?

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Bioprocessing technology startup companies and developers can overlook or significantly underestimate the “indirect cost” portion of total installed cost (TIC) project estimates. These indirect costs, if properly estimated, are typically between 30 to 45% of TIC and average approximately 40% of TIC.

The sizable percentage of indirect costs have surprised and disheartened many eager bioprocessing project leaders.

AACE International Guide 21R offers the following definitions for the two types of project costs (direct and indirect):

- **“DIRECT COSTS** are those that are readily or directly attributable to or become part of the final [project]”. In simplest terms, they remain with the final project!
- **“INDIRECT COSTS** are all cost that cannot be attributed readily to the final [project]”. In simplest terms, they do NOT remain with the final project!

To further clarify the two types of costs, the following exercise is helpful. Review the two construction photos and attempt to name some examples of direct costs and indirect costs.

Direct Cost Examples (remain with project):

- Concrete
- Steel
- Pipe
- Skid/Module
- Equipment
- Conduit
- Wire
- Anchor bolts
- Craft labor (fruits of labor remain with facility)
- Permanent fencing
- Spare parts purchased with equipment (usually considered to be direct)

Indirect Cost Examples (do NOT remain with project):

- Construction equipment (crane)
- Vendor on-site support
- Construction tools (spreader bar)
- Temporary construction fencing
- Construction vehicles (pickup truck)
- Mobilization and demobilization cost
- Construction management
- Startup team and start up spares
- Construction management staff
- Temporary power, water
- Permit fees
- Contractor OHP, profit, contractor markups
- Scaffolding
- Contractor's home office support
- Construction temporary building & structures (trailers, portable bathroom, etc.)
- Insurances and performance bonds



The following items appear to be in the “gray” area, but are almost always considered indirect cost:

- Sales taxes (rarely included in price of direct equipment)
- Per diem (unless built-in to wage rates)
- Overtime premium (unless built-in to wage rates)
- Consumables such as welding rods (99% of the time are indirect costs)
- Employee benefits unless part of all-in-wage, then considered direct
- Freight unless embedded in purchase price of equipment (most equipment quotes will be FOB jobsite) (easy to show as 3-4% if broken out as indirect)
- Engineering – engineering is difficult to apply to specific plant area breakdowns; the figure 1 estimate summary example shows as indirect cost. Engineering is typically considered indirect cost

Directs
(Remain with the project)

Indirects
(Do not remain with project)

Overall Project Summary - Key Qty Basis									
Account	Key Qty	Unit	MH	Wage	Rate	Labor Cost	Unit	Matl	Total
								Cost	Cost
(2) Equipment	194	ITEM(S)	77.3	14,995	70.57	1,058,260	137,472	26,669,485	27,727,744
(3) UG Pipe	190	FEET	1.00	189	70.74	13,399	69.51	13,208	26,607
(3) AG Pipe	41,086	FEET	2.1	85,011	75.67	6,432,338	113.14	4,648,477	11,080,815
(4) Roads / RR	2	LS		734	59.36	43,570		34,711	78,281
(4) Piling	256	EACH	5.3	1,360	65.02	88,448	1,190	304,533	392,981
(4) Concrete	4,932	CY	6.8	33,682	63.59	2,141,701	236.77	1,167,677	3,309,378
(4) Grout	0.4	CY	175.8	63	59.12	3,741	3,708	1,335	5,076
(4) Bldg - Arch	3	LS		79,135	65.49	5,182,689		3,335,127	8,517,816
(5) Steel	17.9	TONS	70.3	1,257	68.94	86,654	7,978	142,560	229,213
(6) Instrumentation	958	EACH	43.6	41,812	74.97	3,134,538	7,966	7,631,595	10,766,133
(7) UG Electrical	17,560	FEET	0.30	5,233	66.91	350,132	12.21	214,478	564,610
(7) AG Electrical	134,031	FEET	0.17	22,483	73.32	1,648,588	41.15	5,515,542	7,164,129
(8) Pipe Insulation	32,795	FEET	0.39	12,659	68.42	866,082	14.37	471,334	1,337,417
(8) Equip Insulation	27,866	SF	0.38	10,563	67.12	708,961	8.63	240,564	949,524
(9) Paint	23,640	SF	0.08	2,006	57.51	115,379	0.77	18,193	133,571
Direct Totals				311,184		21,874,478		50,408,818	72,283,296
Const Equip & Indirects									6,599,041
Const Mgt, Staff, Supv				74,015					8,842,498
Freight									2,921,700
Taxes and Permits									1,415,800
Engineering						83,899			11,405,786
Other Project Costs						13,727			14,822,251
Indirect Totals						171,641			46,007,076
Project Totals:						482,825		50,408,818	118,290,372

Figure 1 TIC Estimate Summary Example

The bioprocessing project TIC estimate summary example in figure 1 shows how indirect and direct costs are segregated. A more detailed look at indirect cost is shown in Figure 2:

Many project aspects affect the range of overall indirect cost. Here are some aspects to consider:

- Project types affect the percentage of indirect cost, e.g., equipment intensive process projects with customized equipment or complex material requirements will increase the direct cost percentage and lower the indirect percentage.
- Contracting approaches affect indirect percentages, e.g., an EPCM not-at-risk contracting approach tends to reduce markup's and contract costs relative to full Design-Build, at-risk, approach.
- First of a kind or new technology projects tend to have higher engineering cost which could be considered indirect costs.

In summary, many early conceptual estimates can overlook the substantial indirect cost which can make or break the economics of a project. A good understanding of the difference between direct and indirect cost and how they apply to your project is an important success factor when evaluating or developing a project.

Indirect and Non-Field Summary - Total Project						
Indirect Account Group	Acct No.	Account Name	MH	Indirect WageRate	Total	
(1) Const Equip & Indirects						
	13	CONSUMABLES, SMALL TOOLS			656,200	
	14	MISC. (INSURANCE, ETC)			437,500	
	15	SCAFFOLDING, PLATFORMS			566,700	
	16	EQUIPMENT RENTAL			2,068,700	
	17	VENDOR REPRESENTATIVES			159,003	
	18	FIELD SERVICES			656,200	
	19	TEMP. CONST., UTILITIES			284,400	
	20	MOBILIZATION, DEMOBILIZE			656,200	
	22	TRAVEL			109,400	
	24	PREFORMANCE BOND			1,004,738	
					6,599,041	
(2) Const Mgt, Staff, Supv						
	85	FIELD CONST. SUPERVISION	67,415	117.55	7,924,585	
	86	START-UP, COMMISSIONING	6,600	139.08	917,913	
			74,015		8,842,498	
(3) Freight						
	51	DOMESTIC FREIGHT			2,921,700	
					2,921,700	
(4) Taxes and Permits						
	62	MATERIALS TAXES			1,415,800	
					1,415,800	
(5) Engineering						
	71	BASIC ENGINEERING	22,000	136.36	2,999,995	
	72	DETAIL ENGINEERING	52,000	134.62	7,000,346	
	73	MATERIAL PROCUREMENT		9,809	141.98	1,405,445
			83,899		11,405,786	
(6) Other Project Costs						
	81	HOME OFFICE CONST. SUPP.	13,727	112.97	1,550,800	
	90	G AND A OVERHEADS			4,020,861	
	91	CONTRACT FEE			9,250,590	

Figure 2 Indirect Cost Project Breakdown Example