23.1

CASE STUDY

Developing An Estimate

SOLUTION

1. Labor for 10" pipe = $65,000/mile x 10 miles = $650,000

    Material for 10" pipe = $73,000/mile x 10 miles = $730,000

    Add-Ons for 10" pipe = $36,000/mile x 10 miles =   <u>$360,000</u>

Pipe installation Sub-Total =	$1,740,000
Locating adjustment (AZ: +10%) =	<u>$ 174,000</u>
	$1,914,000
(2) Control Valves @ $40,000 ea. =	<u>$ 80,000</u>
	$1,994,000
Indirect Cost of 5%	<u>$ 99,700</u>
	$2,093,700
SAY:	<u>$2,100,000</u>

Assumptions:

1) Excludes hydrostatic testing
2) No isolation valves required with control valves
3) No escalation included
4) Excludes contingency
5) Estimate is for 10-mile long, 10" pipeline in Arizona
6) Right-of-way costs included
7) Engineering costs included
8) Freight and taxes included
9) Environmental costs included

There is more than one possible answer for this problem depending on the estimator's assumptions. The scope is not clearly stated in the problem statement. This is often the case in real life as well, which is why documenting the assumptions used to arrive at the estimate is so important. If we had assumed that hydrostatic testing is included and that isolation valves are required with the control valves (almost a certainty), the estimate would look like this:

Pipe installation sub-total	$1,740,000
Location adjustment	174,000
(2) Control Valves w/isolation valves	200,000
Hydro testing	<u>10,000</u>
Sub-total	$2,124,000
Indirect cost of 5%	<u>106,000</u>
	$2,230,000
SAY:	$2,200,000

2. An allowance should be made for contingency. In fact, at least a 10% allowance would have been appropriate in the response to question 1, but the assumptions indicated that contingency was excluded. Now that we know the terrain is uncertain, the contingency should be increased. While management would need to approve the amount selected, 15% would seem to be a reasonable allowance. Our two estimates (with differing assumptions) would now look like this:

	$2,093,700	$2,230,000
Contingency	314,055	334,500
	$2,407,755	$2,564,500
	SAY: $2,400,000	SAY: $2,600,000