

**Exercise 2 (Student and Instructor)
100 Yard Pipe Estimate**

Scenario:

You are working on the construction of a chemical processing facility and arrive at work to find there was an oversight on the drawings. The drawings omitted a 100 yard pipe run between two of the buildings on the site. The pipe runs under an existing parking lot. The pipe has a 10 inch inner diameter and is 1 inch thick. You are asked to provide an estimate for the changed work. You see a sketch showing the pipe bottom will be 3 feet below grade. It will rest on a 6 inch base of class 6 aggregate.

Aggregate is sold in 5 CY loads for \$200 a load. Clean fill is required around the pipe. The site is in a remote area and fill will be hauled in at \$75 dollars for a 5 CY load. Disposal of mixed fill is \$30-\$40 a yard. A common laborer can place the fill at a rate of 10-15 yards per hour. This is a light use lot and there is a 3" asphalt wear course over top 4" of the same aggregate that is used under the pipe. Asphalt is subcontracted and the sub can deliver and install for \$100/CY, including all taxes. But asphalt is only sold in 5 CY lots.

The pipe is a special process piping alloy of molybdenum that is only sold in 12 yard lengths, each length sells for \$2,000. The pipe will be welded. Each weld will be done in the trench and will take a welder 1 to 1.5 hours per weld. The welding rig will need to be rented. They are only rented on a per day basis in this area. They rent for \$300 a day. Backhoe is on the same basis for \$500 a day. Local labor requirements prohibit overtime on the site, only 8 hour per day can be worked. Due to the difficult soil conditions in this area the backhoe can only excavate 75 CY of material a day.

A common laborer using a vibratory compactor (rental fee \$150 per day) can compact 20 square yards of aggregate per hour.

The contractor has DCAA audited field office overhead rate of 18% and home office overhead rate of 14%. This is a high risk job due to the location and urgency and weighted guidelines have shown a 10% profit on prior work at this location. However, you know that your agency will only agree to pay 10%, 6% and 3% for field OH, Profit and Home office overhead respectively. Local sales tax is 6% on all material and rentals.

Construction Wage Rates (Davis Bacon) for this locality are:

Wage class	Base Pay	Fringes
Laborer 1	\$13.48	\$4.31
Equipment Operator	\$45.42	\$11.58
Welder II	\$68.32	\$14.37
Backhoe Operator	\$39.21	\$9.06

Assignment:

- Provide an estimate for the changed work.
- Odd number teams estimate the cost of the change from the contractor perspective.
- Even number teams estimate the cost of the change from the government perspective.
- Prepare to brief and defend your estimate.