

Building Materials

Step1: Plan the cost per mile. The following materials are listed below with a price per unit. You are also provided with the number of units that will be needed per mile of road for each item. Calculate out how much it will cost per item to build a mile of road. After you have the individual costs, you will need to add the totals together to calculate the total material cost per mile of road.

Building Supplies:

Lime Mortar=25 cents per ton (you need 20 tons per mile)

\$.25 cents per ton x 20 tons per mile = \$ 5.00 cost of lime per mile.

Stones=20 cents per ton (you need 25 tons per mile)

\$.20 cents per ton x 25 tons per mile= \$5.00 cost of stones per mile.

Mortar=\$1.00 per ton (you need 10 tons per mile)

\$1.00 per ton x 10 tons per mile = \$10.00 cost of mortar per mile.

Concrete=75 cents per ton (you need 20 tons per mile)

\$.75 cents per ton x 20 tons per mile = \$15.00 cost of concrete per mile.

Broken Pottery=40 cents per ton (you need 20 tons per mile)

\$.40 cents per ton x 20 tons per mile = \$8.00 cost of broken pottery per mile.

Stone Blocks=1 cent each (you need 24,099 blocks per mile)

\$.01 per stone block x 24,099 blocks needed per mile = \$240.99 cost of stone blocks per mile.

Now, add all of the individual costs together to calculate the total cost per mile of road:

\$5.00 lime mortar + \$5.00 stones + \$10.00 mortar + \$15.00 concrete + \$8.00 broken pottery + \$240.99 stone blocks = \$283.99 cost per mile of road.

Extras:

Bridges=Add \$250 to your cost for each bridge needed

Step 2: There are four different road routes that can be built. They each include different terrain, bridges, and lengths. Using your cost per mile road information, and the additional information provided below, calculate the cost to build each road.

Route A: This route is 150 miles long and will need 2 bridges.

$\$283.99 \text{ mile of road} \times 150 \text{ miles} = \$42,598.50$; $\$42,598.50 + \$500 \text{ bridge} = \$43,098.50$.

Route B: This route is 100 miles long, will need 3 bridges, 20 miles of mountains, and 30 miles of desert.

$\$283.99 \text{ mile of road} \times 100 \text{ miles} = \$28,399.00$; $\$28,399 + \$1500 (\$500 \text{ per bridge} \times 3 \text{ bridges}) \text{ bridges} = \$29,899.00$.

Route C: This route is 125 miles long, will need 10 miles of mountains, and 5 bridges.

$\$283.99 \text{ mile of road} \times 125 \text{ miles} = \$35,498.75$; $\$35,498.75 + \$2500 (\$500 \text{ per bridge} \times 5 \text{ bridges}) \text{ bridges} = \$37,998.75$.

Route D: This route is 175 miles long and will need 1 bridge.

$\$283.99 \text{ per mile of road} \times 175 \text{ miles} = \$49,698.25$; $\$49,698.25 + \$500 (1 \text{ bridge}) = \$50,198.25$.