

The trash removal corporation Waste Management hires you as a consultant. Since the large expansion of their recycling program, they want you to reevaluate some aspects of their commercial trash removal services.

Commercial Service



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Many of the 400 gallon dumpsters for small businesses are starting to weather and need to be replaced. The company decides to open a division to make their own dumpsters. They would like to build a rectangular based dumpster with a top that meets the front with an angle of 100° , so that the customers can easily throw their trash inside. It must also be strong enough to hold one week's worth of garbage. Your research assistant determines that the cost for the sides, back and front are to be made from 12-gauge (0.1046 inch thick) steel sheets, which cost \$0.80 per square foot (including any required cuts or bends). The base is to be made from 10-gauge (0.1345 inch thick) steel sheets, which costs \$0.90 per square foot. The plastic lid will cost approximately \$50.00, regardless of dimensions. Welding costs approximately \$2 per foot for material and labor combined.

1. Assuming the thickness of the steel is negligible to the dimensions and the welding costs, what should the dimensions of the dumpster be to minimize the construction costs? (Hint: How many cubic feet is 400 gallons?)
2. What is the cost of the dumpster?
3. Your research assistant tells you the welding costs came from the Ironworkers Local Union, but that if you looked for a non-union contract, you could find a cheaper deal. How does the welding costs affect the total container cost? Be specific in your write up to the company.

¹"Waste Management - Home Page", accessed 16 Apr. 2008; available from <http://www.wm.com/index.asp>

²"Waste Management of Orange County - Temporary", accessed 16 Apr. 2008; available from <http://www.wmorangecounty.com/services/temporary.asp>