CEE 4333 – Estimating Planning and Control

Fall 2005
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Homework 5: MERL Lab and Homework
Due 10/20/05

October 6, 2005

You are an entry level engineer working for a civil engineering consulting firm on a project for the Houghton County Road Commission. The project is a small rural project located on Paradise Road in Portage Township (south of Houghton) and involves removal and replacement of four culverts under Paradise Road. One of the culverts is a 10 inch diameter steel culvert the other three culverts are 24 inch diameter steel culverts which will be replaced by a 36 inch diameter reinforced concrete culvert and 24 inch diameter reinforced concrete culverts, respectively. The new culverts will be placed by open cutting the pavement to remove the existing culverts, then placing the new culverts back in the same location as the culverts they replace. The project will involve removing some trees that are too close to the culverts as well as replacing the pavement above the replaced culverts.

Your boss gives you the following information:

Project to be bid under 2003 MDOT Specifications
Project Engineer: Your Name Here
Project Number: CE4333
State Project Number: STP 0582 (032)
Federal Item Number: HH 4173
Control Section Number: STU 82457
Project Type : Miscellaneous
Project Status: No Federal Funds
Work Type: Rural Grading and Drainage Structure
Contract Year 2005
Location: Paradise Road, Houghton MI, STA 1+037 to STA 1+301

Pay Item Quantity Takeoff:

Description	Units	Qty
Mobilization, Max.$5,000	LS	1
Tree, Rem, 19 inch to 36 inch	Ea	2
Culv, Rem, 24 inch to 48 inch	Ea	3
Culv End Sect, Conc, 36 inch	Ea	2
Granular Material, Cl II	Cyd	60
Aggregate Base, 8 inch	Syd	360
Shoulder, Cl I, 4 inch	Syd	95
HMA, 13A	Ton	135
Topsoil Surface, Salv, 4 inch	Syd	160
Seeding, Mixture TUF	Lb	75
Fertilizer, Chemical Nutrient, Cl A	Lb	50

Mulch	Syd	160
Culv, Rem, Less than 24 inch	Ea	1
Culv, Cl A, 24 inch	Ft	120
Culv, Cl A, 36 inch	Ft	40
Culv End Sect, Conc, 24 inch	Ea	4

Assignment

Set up a MERL contract using the information provided. Create an engineer's opinion of costs using the historical bid information. Estimate pay item costs assuming that the project will be bid in the first quarter in the superior region. Several user entered costs are also provided to help estimate costs. Estimate items more heavily based on jobs with similar quantity and time of year bid. Provide justification for why you chose each cost - Do not simply pick a previously estimated figure unless it matches the project identically. (Example - I use $50/ton for "Bit Mix" because the Superior region average was $44 for large quantity jobs and a similar small quantity job resulted in cost of $52/ton).

NOTE: MERL stores your contract files centrally on each workstation computer, so when you work on the lab computers at the end of the day you will need to export your contract and save it in a personal folder under your account or on a jump drive. Once you have exported your contract and are done working for the day DELET the version of the contract on the lab computer, otherwise someone else will be able to see and modify your work. When you come back to make changes to the project import the contract file from your jump drive or personal folder to begin work. Students who leave estimates on the workstation computers will have a 20% penalty applied to their homework grade if discovered.

Deliverables   *(15 + 10 = 25 points)*

- Print An Engineer's Opinion Of Costs for the project.
- Print a Blank Bid Form. Group items by pay item code.

Answer the following questions   *(5 x 3 = 15 points)*

1. If you were giving this Opinion of Costs to a client who is not familiar with transportation projects for an initial project estimate, what two things should you explain to them.

2. Explain how and why unit costs can be influenced by the following:
    o Time of year bid
    o Pay item quantity (large quantity vs. small)
    o Urban project vs. Rural project
    o Location within the state

3. Should this project include the pay item "Culv, Rem, Less than 24 inch" ? Justify your answer citing the specification section and page number.