

## Session 31

### Richard Rountree

Florida Department of Transportation

### *District 2 - Calculating Earthwork Unit Cost in LRE*

#### **Topic Description**

Addressing the issues of cost involving Earthwork in the LRE and Transport Systems. How the costs are determined and how the Project quantities are handled.

#### **Speaker Biography**

Presently working in the District 2 Estimates Office (Lake City, Florida) as a District Estimator. Started in the position in April 2004.

Prior to working with the Department, all of my career has been working in the Heavy and Highway Industry as an Estimator and/or a Chief Estimator. Worked in the Orlando area for the Hubbard Construction Company, worked in the Atlanta Georgia area for Gilbert Southern and the Couch organizations. Worked in the Lake City area for Anderson Columbia Company and in the Leesburg area for the Middlesex Corporation.

Attended the University of Florida.

## Calculating Earthwork Unit Costs in LRE and TRNS\*PORT



The use of the LRE system (Long Range Estimates) to calculate the various unit costs for earthwork on any project can be very difficult without the proper project specification information and other known resources. For anyone who has been through LRE training, it is a known fact that the LRE system works/uses information that is placed in the various earthwork formulas in the LRE system.

It is noted here that Mr. Tyrone Ware, Estimating Systems Support Coordinator from the Department's Central Office in Tallahassee, Florida, working with Ms. Dale Stanley, Estimating Systems Support Manager/Long Range Estimates Administrator, also from the Department's Central Office will state at the beginning of his "Earthwork Review of the LRE System" what is the first thing that is needed concerning a Project after the Department has given the Notice to Proceed to a Consultant and/or In-House Design, Survey Information.

It is also noted that the Earthwork Formulas in the LRE system are for:

» **New Construction**

» **Widening**

For those who have not taken the LRE training, Earthwork formulas are NOT included for "Resurfacing Projects". It is also stated in the LRE user training manual that the Resurfacing Models in the LRE system do not allow for the addition of paved shoulders.

Since right of way acquisition by the Department has become a very expensive issue here in our state, one can easily understand what the Contracting Industry faces when attempting to acquire land for borrow resources, therefore, we need to be as accurate as possible when working with the LRE system and then with TRNS\*PORT in determining quantities.

In our District we have seen numerous Projects come through our office with no pay items included for any type of earthwork, however, to accomplish the finished Project, there will be some type of amount of cost involved for earthwork if we do not provide an item for the Contractor to account for the earthwork, the costs will be in an item that cannot be tracked and certain historical information would be lost or be unfairly priced.

As Designers and Project Managers, we must recognize that the LRE system is exactly what it is labeled as, a “Long Range Estimate System”. Given the fact that the System has certain historical unit prices placed within the System, county, market and statewide, we must also look at the Project’s location and type. If these units do not apply, then the unit prices need to be adjusted to fit the actual requirements of the Project. One of the most variable pay items in our Systems, LRE and TRNS\*PORT, is embankment, which is affected by so many outside issues.

These outside issues include land acquisition, permits, clearing and grubbing, pit preparation, haul distances, shrinkage factors, “quality” of the borrow material, land restriction, land ownership, etc. At the present time, in District 2, we are working on two (2) different roadway corridors that are composed of several different projects. One of these corridors, with all of its’ Projects has approximately 4,700,000 cy of embankment and approximately 1,000,000 cy of regular excavation. Since the regular excavation is located in the retention ponds, the quality and/or potential use of this material is unknown.

Given the location of this corridor and the unlikely possibility of obtaining any borrow sources along the Right of Way, the Contractors must look for the borrow materials at locations away from the corridor.

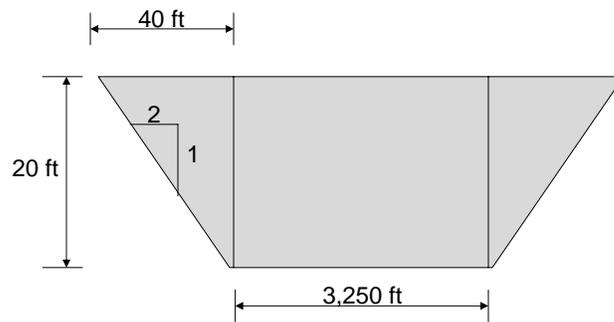
4,700,000 cy of Embankment x 1.3=7,173,374  
Bank Cubic Yards or Borrow Pit Measure

{ Based on a 30% shrinkage factor }

Using the assumption of 1,500 cy/acre/foot of depth and based on a maximum 20 foot depth, we will need approximately 239 acres of land plus the acres of land for the slopes.

A tract of land 3,250 lf x 3,250 lf will yield 242.48 acres. With a slope of 2 to 1, we will need an additional twelve (12) acres.

Figure 1



Total land required 255 acres

Assumed price per acre \$30,000.00/Acre

255 acres @ \$30,000.00/acre = \$7,650,000.00

\$7,650,000.00 / 7,173,374.00 bcy = \$1.0664/bcy

Then:

- Permits
- Clear & Grub
- Pit preparation, including rim ditching
- Haul road construction and maintenance
- Loading of material
- Haul, including ticket, tarp, pit exit, travel, dump site access, dump, dump site exit and return to borrow pit.
- Place, shape & compact material

Figure 2

