



Montana Department of Transportation
PO Box 201001
Helena, MT 59620-1001

Construction Memorandum

To: District Construction Engineers

From: Paul Jagoda, P.E. *PJ*
Construction Engineering Services Engineer

Date: December 11, 2003

Subject: Process for Estimating Earthwork Quantities For Progress Estimates

This Construction Memo develops a uniform process for the estimating of pay quantities for earthwork quantities to be used in the monthly estimates.

To provide uniformity follow these guidelines, in order of preference:

Unclassified - Excavation

1. Calculate a percentage of the earthwork using the computer earthwork run.
2. Load counts.
3. Average widths and depths of the earthwork.
4. Using the earthwork balances and mass diagrams (percentage of plan).

Reference the following specifications:

109.06 & Supplemental Specification
109.08 & Supplemental Specification
203.04.5 & Supplemental Specification
Construction Manual Page 2-39

Borrow Measured in Borrow Area

1. Survey of borrow pit each month.
2. Calculate a percentage of the earthwork using the computer run.
3. Load Counts.
4. Average widths and depths of the earthwork.
5. Using the earthwork balances and mass diagrams (percentage of plan).

Reference the following specifications:

109.06 & Supplemental Specification
109.08 & Supplemental Specification
203.03.1E

Borrow Measured In Place)

1. Computer Runs, i.e. Typical Transition And Vertical Alignment Program
Cross Sections and/or width and depth measurements to be used as final records.
2. Load Counts.

Using the earthwork balances and mass diagrams (percentage of plan).

Reference the following specifications:

109.06 & Supplemental Specification

109.08 & Supplement Specification

Embankment In Place

1. Calculate a percentage of the earthwork using the computer earthwork run.
2. Load counts.
3. Average widths and depths of the earthwork.

Reference the following specifications:

109.06 & Supplemental Specification

109.08 & Supplemental Specification

203.04.3 & Supplemental Specification

203.04.5

Muck Excavation & Sub – Excavation

Cross Section.

2. Average Width and depth.
3. Load count.

Reference the following specifications:

109.06 & Supplemental Specification

109.08 & Supplemental Specification

203.01.1E

203.01.1F

Notes:

The process used is project specific and to be determined by the EPM.

A combination of the above items may be used dependant on contractor's operation.

The process used is to be clear and well documented and be easily followed by others.

The total quantity of earthwork is not to be paid for until all the work involved in that type of earthwork is completed, to include sloping, finishing, ditches, topsoil placement, etc. Therefore, a typical rate of 5% of earthwork quantity should not be placed on the estimate until all the earthwork is completed according to the specifications and plans.

- It is recognized that compaction testing/summaries may be performed after the section has been paid if the area had to be reworked due to weather, winter maintenance, truck damage, etc.

As items near completion, estimated quantities need to be computed in final pay documentation in order to avoid overpayment.

**Once the entire earthwork is completed and the quantities finalized and checked, overpayments/underpayments will be paid/modified on the next estimate.
Reference 109.10.**

PJ/JH/jh

CC:	Mark Wissinger, PE	Joel Marshik, PE	Jim Walther, PE	Paul Ferry, PE
	Lisa Durbin, PE	CES Bureau	EPMs	DAs
	District Office Engineers	Dennis Sheehy	FHWA Op. Eng.	Ted Burch, FHWA