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## Memorandum

To: Distribution

From: Mark Wissinger, P.E., Construction Engineer 

Date: June 9, 2006

Subject: Construction Memo – Subsection 104.02.3 Significant Change in the Character of Work

The purpose of this Construction Memo is to clarify the intent of changes made to this Subsection, and to provide guidance on its application.

Major items have been redefined (Subsection 101.03) as individual bid items having an original contract value equal to or exceeding 5 % of the total original contract amount. Previously, major items were defined as being 10 % of the total original contract amount. This change was made to recognize the major increase in average contract size we've experienced, and the possible impact of changes on items of work which did not meet the original 10 % requirement. These impacts can be significant for both the contractor and MDT.

Additionally, unit prices of non-major items of work (those items less than 5 % of the original contract amount) may now be subject to adjustment when there is a significant change (Subsection 104.02.3 C.). Previously, unit prices of non-major items were not subject to adjustment. This change was made to recognize the possible impact of changes on non-major items of work to both the contractor and MDT.

If there is a significant (more than 50 %) decrease in quantity, it may not be possible for the contractor to recover fixed overhead costs contained within the unit price of the item of work. Impacts by significant underruns can be more serious for subcontractors performing work on a single or limited number of items if fixed overhead costs are contained within the unit bid price. Fixed overhead rates obtained through a review of subcontracts, claims and sequestered bid documents have typically averaged approximately 20 % of the unit price on non-major items. This percentage is an average with the actual percentage dependant on the item of work being performed, and the manner in which the bid is structured. Typically, the percentage of fixed overhead is inversely proportional to the original item quantity; the smaller the original quantity, the larger the possible percentage of fixed overhead in the unit price.

If the final quantity of a non-major item is between 50 % and 150 % of plan quantity there will be no adjustment made. When a non-major item underruns by more than 50 %, it is now correct per specification to redistribute the un-recovered overhead on the unit price of the remaining quantity.

Likewise, when a non-major item increases by more than 50 %, the unit price of the quantity above 150 % of the plan quantity will be decreased by the percentage of fixed costs recovered in the original bid quantity. In the absence of documentation, the amount of decrease in the unit price

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is to be 20 % for that quantity in excess of 150 % of the plan quantity. The following example should help to illustrate how adjustments are to be made:

**Example 1;**

The plan quantity for clearing and grubbing (201 310 000) is 3.300 hectares, and is a non-major contract item in this example. The awarded unit price is \$5,250.00/hectare. The documented cost breakdown for this item is:

Equipment (includes maintenance & fuel) = \$2,001.25/hectare

Labor = \$1,812.50/hectare

Profit = \$465/hectare

Fixed overhead (mobilization, home office overhead, insurance, bond, etc.) = \$971.25/hectare

The actual quantity of measured clearing and grubbing is 1.500 hectares (underrun of 54.5%). The amount of fixed costs that the contractor is entitled to recover in this case is:

$3.300 - 1.500 \times \$971.25/\text{hectare} = \$1,748.25$

This amount should be redistributed over the actual quantity of work performed to arrive at the new unit price:

$\$1,748.25/1.500 + \$5,250.00 = \$6,415.50/\text{hectare}$

Had the contractor placed the overhead (\$971.25/hectare x 3.300 = \$3,205.13) in the Mobilization (192 000 000) item, and provided an initial bid price of \$4,278.75/hectare, there would be no adjustment, since the contractors fixed costs would be covered and paid within the Mobilization item. The \$4,278.75/hectare unit price would be the correct unit price for the quantity in excess of 150 % (greater than 4.950 hectares) for the \$5,250.00/hectare bid price as it is structured in this example.

Typically, fixed overhead costs constitute a lower percentage of the unit price of major contract items. Fixed overhead rates obtained through a review of subcontracts, claims and sequestered bid documents have typically averaged approximately 10 % of the unit price on major items. If the final quantity of a major item is between 75 % and 125 % of plan quantity there will be no adjustment made under any circumstance. When a major item underruns by more than 25 %, it is correct as per this specification to redistribute the un-recovered overhead on the unit price of the remaining quantity. Likewise, when a major item increases by more than 25 %, the unit price of the quantity above 125 % of the plan quantity will be decreased by the percentage of fixed overhead. In the absence of documentation, the amount of decrease in the unit price is to be 10 % for that quantity in excess of 125 % of the original plan quantity. The following example should help to illustrate how adjustments are to be made:

**Example 2;**

The plan quantity for unclassified excavation (203 100 000) is 400,000 cubic meters, and unclassified excavation is a major contract item in this example. The awarded unit price is \$5.00/cubic meter. Fixed overhead costs (mobilization, home office overhead, insurance, bond, etc.) are estimated by the contractor to be 10%, or \$.50/cubic meter, but 5%, or \$0.25/cubic meter has been placed in the Mobilization (192 000 000) item. The documented cost breakdown for this item is:

Equipment = \$1.00/cubic meter

Labor = \$1.375/cubic meter

Fuel & haul (0.5km average) = \$1.00/cubic meter

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Water, compaction & grade control = \$1.00/cubic meter

Profit = \$0.375/cubic meter

Fixed overhead (contained within the unit bid price) = \$0.25/cubic meter

During the course of the work, significant additional laybacks in cut slopes are required for slope stability. The amount of the additional excavation is 150,000 cubic meters. The project staff is able to find areas within the project limits where the excess can be disposed of, and the average haul for the excess material is 0.25km. The adjustment for that quantity that is in excess of 125% of plan quantity (50,000 cubic meters) should be:

\$5.00 - \$0.25 fixed overhead - \$1.00 water, compaction & grade control – \$0.50 fuel & haul (haul is only one-half the average) = \$3.25/cubic meter.

Labor and equipment costs arguably could be lessened by the increase in efficiency for the disposal of the excess, but this could be offset marginally by the fuel & haul calculation, which may not be a straight ratio. In this case the unit price of \$3.25/cubic meter for the 50,000 cubic meters would be acceptable.

The 20 % overhead used for non-major items, and the 10 % overhead used for major items, are averages obtained through a review of subcontracts, claims and bid documents. Actual cost impacts caused by significant increases or decreases can be greater, or less than these figures, and may be affected by costs other than fixed overhead. Historical bid prices for the item subject to adjustment should be reviewed using the DSS database query. Other documentation and tools that can be useful is subcontracts, bid documents supplied by the contractor and Estimator models, which can be acquired from the Contract Plans Bureau. If you would like additional information, or guidance on this subject, please contact this office.

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