

## **5-1. PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS**

### **GENERAL**

#### **Summary**

This section applies to asphalt contained in materials for pavement structural sections and pavement surface treatments such as hot mix asphalt (HMA), tack coat, asphaltic emulsions, bituminous seals, asphalt binders, and modified asphalt binders placed in the work. This section does not apply if you opted out of payment adjustment for price index fluctuations at the time of bid.

The Engineer adjusts payment if the California Statewide Crude Oil Price Index for the month the material is placed is more than 5 percent higher or lower than the price index at the time of bid.

The California Statewide Crude Oil Price Index is determined each month on or about the 1st business day of the month by the Department using the average of the posted prices in effect for the previous month as posted by Chevron, ExxonMobil, and ConocoPhillips for the Buena Vista, Huntington Beach, and Midway Sunset fields.

If a company discontinues posting its prices for a field, the Department determines the index from the remaining posted prices. The Department may include additional fields to determine the index.

For the California Statewide Crude Oil Price Index, go to:

<http://www.dot.ca.gov/hq/construc/crudeoilindex/>

If the adjustment is a decrease in payment, the Department deducts the amount from the monthly progress payment.

The Department includes payment adjustments for price index fluctuations when making adjustments under Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications.

If you do not complete the work within the contract time, payment adjustments during the overrun period are determined using the California Statewide Crude Oil Price Index in effect for the month in which the overrun period began.

If the price index at the time of placement increases:

1. 50 percent or more over the price index at bid opening, notify the Engineer.
2. 100 percent or more over the price index at bid opening, do not furnish material containing asphalt until the Engineer authorizes you to proceed with that work. The Department may decrease Bid item quantities, eliminate Bid items, or terminate the contract.

#### **Submittals**

Before placing material containing asphalt, submit the current sales and use tax rate in effect in the tax jurisdiction where the material is to be placed.

Submit certified weight slips for HMA, tack coat, asphaltic emulsions, and modified asphalt binders, including those materials not paid for by weight, as specified in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications. For slurry seals, submit certified weight slips separately for the asphaltic emulsion.

### **ASPHALT QUANTITIES**

#### **General**

Interpret the term "ton" as "tonne" for projects using metric units.

#### **Hot Mix Asphalt**

The Engineer calculates the quantity of asphalt in HMA using the following formula:

$$Q_h = HMATT \times [X_a / (100 + X_a)]$$

where:

$Q_h$  = quantity in tons of asphalt used in HMA  
 $HMATT$  = HMA total tons placed  
 $X_a$  = theoretical asphalt content from job mix formula expressed as percentage of the weight of dry aggregate

### **Rubberized Hot Mix Asphalt**

The Engineer calculates the quantity of asphalt in rubberized HMA (RHMA) using the following formula:

$$Q_{rh} = RHMATT \times 0.80 \times [X_{arb} / (100 + X_{arb})]$$

where:

$Q_{rh}$  = quantity in tons of asphalt in asphalt rubber binder used in RHMA  
 $RHMATT$  = RHMA total tons placed  
 $X_{arb}$  = theoretical asphalt rubber binder content from the job mix formula expressed as percentage of the weight of dry aggregate

### **Modified Asphalt Binder in Hot Mix Asphalt**

The Engineer calculates the quantity of asphalt in modified asphalt binder using the following formula:

$$Q_{mh} = MHMATT \times [(100 - X_{am}) / 100] \times [X_{mab} / (100 + X_{mab})]$$

where:

$Q_{mh}$  = quantity in tons of asphalt in modified asphalt binder used in HMA  
 $MHMATT$  = modified asphalt binder HMA total tons placed  
 $X_{am}$  = specified percentage of asphalt modifier  
 $X_{mab}$  = theoretical modified asphalt binder content from the job mix formula expressed as percentage of the weight of dry aggregate

### **Hot Mix Asphalt Containing Reclaimed Asphalt Pavement (RAP)**

The Engineer calculates the quantity of asphalt in HMA containing RAP using the following formulas:

$$Q_{rap} = HMATT \times [X_{aa} / (100 + X_{aa})]$$

where:

$$X_{aa} = X_{ta} - [(100 - X_{new}) \times (X_{ra} / 100)]$$

and

$Q_{rap}$  = quantity in tons of asphalt used in HMA containing RAP  
 $HMATT$  = HMA total tons placed  
 $X_{aa}$  = asphalt content of HMA adjusted to account for the asphalt content in RAP expressed as percentage of the weight of dry aggregate  
 $X_{ta}$  = total asphalt content of HMA expressed as percentage of the weight of dry aggregate  
 $X_{new}$  = theoretical percentage of new aggregate in the HMA containing RAP determined from RAP percentage in the job mix formula  
 $X_{ra}$  = asphalt content of RAP expressed as percentage

## **Tack Coat**

The Engineer calculates the quantity of asphalt in tack coat (Q<sub>tc</sub>) as either:

1. Asphalt binder using the asphalt binder total tons placed as tack coat
2. Asphaltic emulsion by applying the formula in "Asphaltic Emulsion" to the asphaltic emulsion total tons placed as tack coat

## **Asphaltic Emulsion**

The Engineer calculates the quantity of asphalt in asphaltic emulsions, including fog seals and tack coat, using the following formula:

$$Q_e = AETT \times (X_e / 100)$$

where:

- Q<sub>e</sub> = quantity in tons of asphalt used in asphaltic emulsions
- AETT = undiluted asphaltic emulsions total tons placed
- X<sub>e</sub> = minimum percent residue specified in Section 94, "Asphaltic Emulsions," of the Standard Specifications based on the type of emulsion used

You may, as an option, determine "X<sub>e</sub>" by submitting actual daily test results for asphalt residue for the asphaltic emulsion used. If you choose this option, you must:

1. Take 1 sample every 200 tons but not less than 1 sample per day in the presence of the Engineer from the delivery truck, at midload from a sampling tap or thief, and in the following order:
  - 1.1. Draw and discard the 1st gallon
  - 1.2. Take two separate 1/2-gallon samples
2. Submit 1st sample at the time of sampling
3. Provide 2nd sample within 3 business days of sampling to an independent testing laboratory that participates in the AASHTO Proficiency Sample Program
4. Submit test results from independent testing laboratory within 10 business days of sample date

## **Slurry Seal**

The Engineer calculates the quantity of asphalt in slurry seals (Q<sub>ss</sub>) by applying the formula in "Asphaltic Emulsion" to the actual quantity of asphaltic emulsion used in producing the slurry seal mix.

## **Modified Asphalt Binder**

The Engineer calculates the quantity of asphalt in modified asphalt binder using the following formula:

$$Q_{mab} = MABTT \times [(100 - X_{am}) / 100]$$

where:

- Q<sub>mab</sub> = quantity in tons of asphalt used in modified asphalt binder
- MABTT = modified asphalt binder total tons placed
- X<sub>am</sub> = specified percentage of asphalt modifier

## Other Materials

For other materials containing asphalt not covered above, the Engineer determines the quantity of asphalt (Qo).

### PAYMENT ADJUSTMENTS

The Engineer includes payment adjustments for price index fluctuations in progress pay estimates. If material containing asphalt is placed within 2 months during 1 estimate period, the Engineer calculates 2 separate adjustments. Each adjustment is calculated using the price index for the month in which the quantity of material containing asphalt subject to adjustment is placed in the work. The sum of the 2 adjustments is used for increasing or decreasing payment in the progress pay estimate.

The Engineer calculates each payment adjustment as follows:

$$PA = Q_t \times A$$

where:

PA = Payment adjustment in dollars for asphalt contained in materials placed in the work for a given month.

Q<sub>t</sub> = Sum of all quantities of asphalt-contained materials in pavement structural sections and pavement surface treatments placed (Q<sub>h</sub> + Q<sub>rh</sub> + Q<sub>mh</sub> + Q<sub>rap</sub> + Q<sub>tc</sub> + Q<sub>e</sub> + Q<sub>ss</sub> + Q<sub>mab</sub> + Q<sub>o</sub>).

A = Adjustment in dollars per ton of asphalt used to produce materials placed in the work rounded to the nearest \$0.01.

For US Customary projects, use:

$A = [(I_u / I_b) - 1.05] \times I_b \times [1 + (T / 100)]$  for an increase in the crude oil price index exceeding 5 percent

$A = [(I_u / I_b) - 0.95] \times I_b \times [1 + (T / 100)]$  for a decrease in the crude oil price index exceeding 5 percent

For metric projects, use:

$A = 1.1023 \times [(I_u / I_b) - 1.05] \times I_b \times [1 + (T / 100)]$  for an increase in the crude oil price index exceeding 5 percent

$A = 1.1023 \times [(I_u / I_b) - 0.95] \times I_b \times [1 + (T / 100)]$  for a decrease in the crude oil price index exceeding 5 percent

I<sub>u</sub> = California Statewide Crude Oil Price Index for the month in which the quantity of asphalt subject to adjustment was placed in the work.

I<sub>b</sub> = California Statewide Crude Oil Price Index for the month in which the bid opening for the project occurred

T = Sales and use tax rate, expressed as a percent, currently in effect in the tax jurisdiction where the material is placed. If the tax rate information is not submitted timely, the statewide sales and use tax rate is used in the payment adjustment calculations until the tax rate information is submitted.