

## **CHAPTER 9**

### **ASPHALTIC CONCRETE PRODUCTION, OPTIONAL BASE, AND PLACEMENT RECORDS**

#### **9.1 PURPOSE**

The purpose of this procedure is to establish uniform and decisive instructions for keeping accurate records of final Asphalt Pay Items with liquid included, and Optional Base Pay Items.

#### **9.2 SCOPE**

This procedure provides explanation of the forms used to document the quantities of bituminous material in the daily production of asphaltic concrete mixes for the Department's construction projects. It also establishes guidelines to control asphalt plant operations that relate to the daily measurement and documentation of bituminous quantities. Also included, are instructions for assessing Composite Pay Factor (CPF) adjustments.

#### **9.3 ASPHALT PLANT OPERATIONS**

The specifications include the requirements for the asphalt plant operation. This procedure reiterates and expands on some of these, especially those that have a bearing on the measurement and recording of final pay quantities.

All asphalt plants shall have electronic weight systems with automatic ticket printouts.

All asphalt plants must be equipped with one of the following 3 electronic weigh systems capable of automatically printing a delivery ticket:

(See [Attachment 9-1](#))

- (1) **Automatic batch plant with printout** (see ~~Subarticle~~ **Section 320-2** of the **Specifications**).
- (2) **Electronic weight system on hopper beneath a surge or storage bin.**
- (3) **Electronic weigh system on the truck scales.**

The following information shall be included on the printed delivery tickets:

- Sequential load number
- Financial Project ID Number
- Date
- Name and location of plant
- Type of mix
- Place for hand recording mix temperature
- Truck number
- Gross, tare, and net weights (as applicable)
- Accumulated total of mix\*
- Tons

\*In the event of a malfunction of the automatic printer, when the plant is equipped with an electronic display a contractor blank automatic ticket may be written by a Department representative from the electronic display until the printer can be repaired. This period is not to exceed 48 hours.

## 9.4 AUTOMATED PLANTS WITH BATCH WEIGHT PRINTER SYSTEM

Plants of this type are set up to automatically control the batching operations, and have an automatic printer system. The system will print the individual or accumulative weights of aggregate and liquid asphalt delivered to the pugmill and the total weight of the batches contained in a truck load.

### 9.4.1 Operating Without Storage Bins

There are two methods of maintaining proper pay records for this type plant:

- (A) The weight of asphalt shown on the automatically printed tickets for the material used on the project is accepted.

**NOTE:** These automatically printed tickets are acceptable, and the total weight of mix shown may be used as the tonnage, if the following conditions are fulfilled:

- (1) The printer ticket weights must be checked across certified truck scales and be within the 0.4% tolerance allowed by the **Specifications**.
- (2) There must be an original and at least three (3) clear copies. The original is retained by the Contractor's Quality Control (CQC) Plant Technician, and becomes part of the **Lot Submittal Package**, one

copy is retained by the producer at the plant, one copy goes to the CQC Road Technician, and one copy goes to the paving contractor.

- (3) Preprinted ticket numbers do not normally occur without breaks in order, as they cause excessive "page order" messages on the computer output listing. To avoid this problem, the plant assigned numbers shall be in sequence regardless of the numerical order of the preprinted number on the ticket.
  - (4) The **original weight tickets**, tapes, or digital records shall become the property of the Department. Regardless of the method of documentation the records of all project mixes furnished during production runs for the Department shall be included.
  - (5) Preprinted tickets shall be bound in sets for each day's run. A cover sheet shall be prepared for each set ([See Attachment 9-4a](#)) showing the Financial Project ID Number, pay item numbers, date, book number, design mix number, type of material, ticket numbers included, and total quantity. Material of different types, pay items, waste, or private work for each day's run shall be identified. These packets shall be available, for review by the Department's Verification Technician one day after production and shall become part of the **Lot Submittal Package**. ([See Attachments 9-4 and 9-4a thru 9-4ef](#)).
  - (6) Unless the number of weight tickets justifies the use of the computer to summarize the material, a manual summary shall be made by weight ticket totals in the **Final Estimates Computation Book**.
  - (7) When the computer is used, the output shall be included as part of the estimate computations and shall be cross-referenced in the computation book.
  - (8) A complete tabulation, as packing list, of all weight tickets for each type of material or each different pay item shall be shown in the transmittal data when the final estimates package is submitted.
- (B) For those plants with the automatic printer system, (if all Department tickets used are properly numbered in sequence by the plant inspector including all void and waste tickets), it will be necessary for the contractor to furnish the Department only those tickets showing production when printed weights are accepted and converted to volume for pay purposes.

#### 9.4.2 Operation with Storage Bins

The record keeping procedures for this type of plant are similar to an automated plant without a printer system, and using storage bins:

- (A) Record the exact weight of all material placed in storage bins.
- (B) Record the exact weight of all material used out of the storage bins and at the end of the day or run. Calculate the amount of mix remaining in the bins. If the producer elects to use any of the mix remaining in the storage bin after the Department completes its work for this date, the tonnage used must be recorded under Department supervision and deducted in order to establish the tonnage in storage at the beginning of the next day's work.

### 9.5 REQUIREMENTS FOR ACCURACY CONDITIONS AND TOLERANCE

The following requirements relate to asphalt plant operations:

- (A) Truck scales shall be recertified every six months.
- (B) Batch scales and the accuracy of the automatic printer shall be certified at least once every six months.
- (C) The accuracy of the batch scales and the printer system shall be checked at the commencement of production and thereafter at least once a week during production for the Department.
- (D) The maximum permissible deviation is 8 pounds per ton of load. (See Subarticle Section 320-2 of the **Specifications**)

### 9.6 METHOD OF MEASUREMENT

#### 9.6.1 Tonnage Items (Bit Included)

Automatic printer tickets showing weights along with the cover sheet, will become part of the **Lot Submittal Package**, and shall be submitted with the final estimate for each job on the contract.

### 9.6.2 Square Yard Items (Bit Included) (Optional Base Only)

When the pavement is to be paid for on an area basis, the area to be paid for shall be Plan Quantity subject to the provisions of ~~Subarticle~~ Section **9-3** of the **Specifications**, omitting any areas not allowed for payment under the provisions of ~~Subarticle~~ Section **330-12** of the **Specifications** and adjusted as follows:

- (A) The pay area shall not exceed 105% of the surface area.
- (B) There will be no adjustment of the pay area on the basis of thickness for base courses constructed utilizing mixed-in-place operations.
- (C) If plan quantity is changed, automatic printer tickets showing weights, field records, and measurements, shall be submitted with the final estimate for each job on the contract along with the **Lot Submittal Package**. (See Attachments 9-4 & 9-4a thru 9-4ed).

**NOTE:** If a plan quantity error exceeds the limitations established in **Article 9-3** of the **Specifications**, then record documentation in field books, computer forms, or computation book forms.

### 9.6.3 Surface Deficiencies

Deficiencies are determined by the Engineer with a 15-foot rolling straightedge. Deviations from the straightedge in excess of 3/16 of an inch shall be corrected in accordance with ~~Subarticle~~ Section **330-12.5** of the **Specifications** unless such corrections are waived by the District Construction Engineer (DCE). Deficient areas where the Engineer has waived corrections will be deducted as follows:

#### (A) Friction Course: Tonnage Item

The Department will base the reduction under ~~Subarticle~~ Section **330-12.5.2** of the **Specifications** when the standard reduction is based on removing a quantity of material that is determined by multiplying the length (L) in feet by the lane width (w) in feet by the layer thickness (t) in inches by the Maximum Specific Gravity (Gmm) of the design mix by a constant (0.0024) derived by the Materials Office ( 43.3 Lbs/SY divided by 9 SF/SY divided by 2000 Lbs/Ton) to equal out in tons (since friction Course is paid in Tons) as determined through the following equation:

$$\text{Quantity (tons)} = L \times w \times t \times Gmm \times 0.0024$$

The total length (L) is the deficient length that is extended 50 Ft. on each side of the

deficiency, per Specifications.

**EXAMPLE:**

For this example the deficiency is 10 Ft., and the total length will be 110 Ft. The width is 12 Ft., the thickness is 1.5 In., the Gmm is 2.417, and the constant is 0.0024. The equation is as follows:

$$110 \times 12 \times 2.417 \times 0.0024 = 11.48 = 11.5 \text{ Tons Deduct}$$

Another situation could occur where the minimum extension is less than 50 Ft. This could occur at the beginning or ending of the project limits, or beginning of a bridge approach slab, etc. For example: if the deficient length is 5 Ft., and one side of the extension is 50 Ft and the other is 30 Ft., the total deficient length is 85 feet. The equation would be as follows:

$$85 \times 12 \times 1.5 \times 2.417 \times 0.0024 = 8.88 = 8.9 \text{ Tons Deduct}$$

For Friction Course, FC 5 (Open Graded Friction Course), the Department will base the reduction on the area that the Contractor would have removed; the length by the width multiplied by a spread rate of 80#/SY. However, since Friction Course is paid by the Tons, the equation is divided by 9 Square Ft/SY and divided by 2000 Lbs/Ton. This generates a constant of 0.0044. Hence the equation to use for FC 5 will be the length (L) multiplied by the width (w) multiplied by 0.0044 (the total length will also be the length of the deficiency plus the 50 Ft. extensions on either side if applicable), as determined below:

$$\text{Quantity (Tons)} = L \times w \times 0.0044$$

Example::

Deficient length is 10 Ft. Total deficient length = 110, road width = 12 Ft.

$$110 \times 12 \times 0.0044 = 5.81 = 5.8 \text{ Tons deduct}$$

**(B) Other Than Friction Course:**

- (1) Where the Engineer elects to waive a correction, and the finished pavement surface is other than friction course, the appropriate pay quantity for asphaltic concrete shall be reduced by the equivalent quantity of materials, which would have been removed and replaced if the correction had been made.
- (2) Same as in **Section 9.6.3 (A)** above, and example.

#### 9.6.4. Rejected Surface

Defective surface will be rejected and will be replaced with a satisfactory surface at no compensation for the replaced area in accordance with **Article 330-12** of the **Specifications**.

Should the rejected surface area not be corrected to the satisfaction of the Project Engineer (PE) or Project Administrator (PA), no pay for the rejected area should be made in accordance with ~~Subarticle~~ Section **9-5.3** of the **Specifications**.

**Note:** No corrections are needed for previous payments of Fuel & Bituminous Adjustments on the asphalt being removed. Replacement is at No Cost to the Department.

### 9.7 ~~CORE OUT ADJUSTMENTS~~ (OPTIONAL BASE ONLY)

Adjustments in accordance to Specifications and Special Provisions:

#### 9.7.1 Square Yard Items (Bit Included)

When the pavement is to be paid for on an area basis, the area to be paid for shall be Plan Quantity subject to the provisions of ~~Subarticle~~ Section **9-3.2** of the **Specifications**, adjusted as follows:

##### **(A) Core Out Adjustments (Optional Base)**

The volume of pavement represented by the difference between the average thickness (determined as specified in **Article 285-7 or 200-9** of the **Standard Specifications**), and specified thickness shall be converted to equivalent square yards (SY) of pavement of specified thickness and the quantity thereby obtained shall be added to, or deducted, from the pay areas as appropriate.

The maximum average thickness of pavement, upon which payment will be made, shall be limited as follows:

#### Example Core-Out Adjustment

Type Limerock	7.00"
Plan Quantity	8,000 SY

Specifications allow 1/2" per ~~Subarticle~~ Section 285-7

Actual core out = 7.50"

$$\text{Therefore} = \frac{7.50" - 7.00"}{7.00"} = .071428571 \times 100 = 7.1428571 \% > 5\%^*$$

\*Optional Base shall not exceed 105% of the surface area per **Article 285-8** of the **Specifications**.

Therefore:  $0.05 \times 8,000 \text{ SY} = 400 \text{ SY}$  Thickness Adjustment

400 SY will need to be shown as a line item adjustment.

#### (B) Spread Rate Adjustments

Superpave Base shall be adjusted based on the spread of the mixture. The payarea shall be based on the project average spread rate divided by the specified rate. The adjustment shall not exceed 105%. This is calculated using the following equation:

$$\text{Pay Area} = \text{Surface Area (SY)} \times \frac{\text{Project Average Spread rate}}{\text{Specified Spread Rate for Total Thickness}}$$

However, the Project Average Spread Rate is calculated by totaling the arithmetic mean of the average daily spread rate value for each layer. The daily spread rate for each individual layer shall be established by the Engineer. The minimum layer spread rate shall be calculated by multiplying 43.3 Lbs/SY by the Maximum Specific Gravity (Gmm) of the mix (shown on the mix design) for every inch of desired thickness, as described using the following formula:

$$43.3 \text{ Lbs/SY} \times \text{Gmm} \times t$$

The Specified Spread Rate for the Total Thickness is based upon the plan thickness converted to Spread Rate.

Example: **To calculate the Project Spread Rate:**

A project with Superpave Base Asphalt, Type B 12.5, Group 15 (pay Item 285-715) that is 9" thick.

Plan Quantity Area	= 46,800 SY
Unit Price	= \$10.08 per SY
Design Thickness	= 9"



The Contractor will lay the 9" in 3 courses; 3" each course  
The Specified Spread Rate = Gmm X 43.3 X 9  
(Gmm from Design mix = 2.540)

The Specified Spread Rate =  $2.540 \times 43.3 \times 9 = 989.84 = 990 \text{ Lbs/SY}$

Target Spread Rate set at 330 Lbs/SY per layer (based on the Design mix.)  
The Spread Rate for each layer (from the QC Report) will be summarized for the overall Spread for each layer as shown below:

► Layer 1

Day 1	341.17 Lbs/SY
Day 2	338.33 Lbs/SY
Day 3	359.60 Lbs/SY
Day 4	<u>359.11 Lbs/SY</u>
Total	= 1398.21 Lbs/SY

The Average mean =  $1398.21 \div 4 = 349.55 = 350 \text{ Lbs/SY}$

► Layer 2

Day 3	343.22 Lbs/SY
Day 4	339.13 Lbs/SY
Day 5	337.45 Lbs/SY
Day 6	<u>359.23 Lbs/SY</u>
Total	= 1379.03 Lbs/SY

The Average Mean =  $1379.03 \div 4 = 344.76 = 345 \text{ Lbs/SY}$

► Layer 3

Day 5	352.31 Lbs/SY
Day 6	332.11 Lbs/SY
Day 7	321.35 Lbs/SY
Day 8	<u>362.22 Lbs/SY</u>
	1367.99 Lbs/SY

The Average Mean =  $1367.99 \div 4 = 341.998 = 342 \text{ Lbs/SY}$

Total Average Mean =	350
	+ 345
	<u>+ 342</u>
Total Average Mean =	1037 Lbs/SY

**Reminder:** Maximum spread rate will not exceed 105%:  $990 \times 1.05 = 1039.5$  Lbs/SY maximum we can pay. However, in the above example the Contractor will receive payment for all asphalt produced and accepted due to the spread rate not exceeding 105% per **Specifications**.

**Project Average Spread Rate = 1037 Lbs/SY**

**The Project Specified Rate for Total Thickness = 990 Lbs/SY**

The equation, per **Specifications**:

Pay Area = Surface Area (SY) X  $\frac{\text{Project Average Spread rate}}{\text{(Specified Spread Rate for Total Thickness)}}$

Plan Quantity total area = 46,800 SY, so Pay Area =

$$= 46,800 \times \frac{(1037)}{(990)} = 49,022 \text{ SY}$$

And

49,022
– 46,800 (Plan Quantity)
2,222 SY Spread Rate Adjustment

2,222 SY will need to be shown as a line item adjustment in SiteManager  
And  $2,222 \text{ SY} \times \$10.08 = \$22,397.76$  is the amount the Contractor will receive based on the Specifications for the Spread Rate Adjustment.

**(C)Note: — Plan Quantity Vs Road Report:**

In some instances, the CQC road report will show more or less square yards than plan quantity. The contractor should use due care when reporting square yards to accurately report the length and width of area being placed. Should the square yards not match plan quantity, the yardage will be adjusted to pay plan quantity and paid on the last composite pay factor adjustment. The PA shall use reasonable investigation to see if plan quantity is in error and warrants an adjustment. This needs to be shown as a line item adjustment.

**(DC) Composite Base:**

Composite base is a combination of granular material and asphalt. The Subbase (granular) will be cored prior to placing asphalt. All areas over 1/2" or under 1/4" will be corrected prior to placing asphalt. The asphalt is based on a spread converting inches to pounds according to **Article 234-8** of the **Specifications** and will be controlled within +/-5% of the specified spread rate. The average spread rate of the asphalt shall be converted back to inches by reversing the

formula specified in **Article 234-8.1** of the **Specifications** and added to the average thickness of the Subbase. The thickness adjustment will then be applied for the composite base pay item limited to a maximum 105% of the surface area, as specified in **Article 285-8**. (See attached example below.) For Bituminous Adjustments on Composite base, refer to **Chapter 6, Section 6-8** of this **Manual**. **Section 234** of the **Specifications, Basis of Payment**, refers to **Section 334** of the **Specifications**, which determines requirements of mixture, and CPF.

**Example: Thickness Adjustment**

Composite base = 4" Limerock and 4" Type B-12.5 asphalt

Convert 4" of asphalt to Lbs/SY by the following formula as specified in **Article 234-8.1** of the **Specifications**.

$$43.3 \times \text{X inches} \times \text{Gmm}^{**}$$

\*43.3 is a constant derived by the State Materials Office.

\*\*Gmm is taken from the approved design mix for the specified project.

\*\*Gmm (maximum specific gravity) = 2.358

$$43.3 \times 4 \times 2.358 = 408 \text{ Lbs/SY}$$

Core-out report for Limerock = 4.25"

Average spread rate for asphalt = 426 Lbs/SY\*\*\*

Plan Quantity = 10,000 SY

\*\*\*Convert lbs to inches based on reverse formula in **Article 234-8.1**

$$426 \div 43.3 \div 2.358 = 4.17"$$

4.25" (Limerock) + 4.17" (Asphalt) = 8.42" average thickness for composite base.

$$\text{Thickness adjustment} = \frac{(8.42" - 8.00")}{8.00"} = .053^{****} (>5\%) \times \text{Surface Area}$$

\*\*\*\* Pay will be limited to a maximum of 105% X Surface Area (the area exceeded the 105%, in this case)

Therefore: Thickness Adjustment = 0.05 X Surface Area

0.05 X 10,000 SY = 500 SY Thickness Adjustment, and

500 SY will need to be shown as a line item adjustment

## 9.8 SALVAGE OF MATERIALS

When material is salvaged from the project and delivered to a Maintenance yard, a signed **"Receipt of Goods from Vendor"** must be submitted with the final estimate. The "vendor" is actually the Construction Office from which the materials were received and the vendor number is the Financial Project ID Number. ([See Attachment 9-2](#))

## 9.9 SUPERIOR PERFORMING ASPHALT PAVEMENT (SUPERPAVE)

Description (**Section 334** of the **Specifications**) (Each contract shall be reviewed for the governing Specification).

Superpave Asphalt Concrete shall be constructed using the type of mixture specified in the contract, or when offered as alternates, as selected. Superpave mixes are identified as Type SP-9.5, Type SP-12.5, or Type SP-19.0.

Superpave Design Mixes shall meet the requirements of **Section 320 of the Specifications** for plant and equipment and the general construction requirements of **Section 330** of the **Specifications**, with the exception of the density requirements as per ~~Subarticle~~ **Section 334-5** of the **Specifications**.

The Superpave mixes are categorized as either "coarse" or "fine", depending on the overall gradation of the mixture. Coarse mixes are defined as having a gradation that passes below the restricted zone, as defined in ~~Subarticle~~ **Section 334-2** of the **Specifications**. Fine mixes are defined as having a gradation that passes above the restricted zone.

### 9.9.1 Compensation

Tonnage Item: Compensation shall be by automatic printer tickets showing weights, along with the **Lot Submittal Package** shall be submitted with the Final Estimate for each job on the contract.

## 9.10 ASPHALTIC CONCRETE FRICTION COURSE (105% ADJUSTMENT)

### 9.10.1 Thickness of Friction Courses (**Article 337-8**)

The thickness of the friction courses will be plan thickness as shown in the contract documents. For construction purposes, the plan thickness will be converted to a spread rate as defined below for various mixes.

### 9.10.2 Spread Rate for FC-5 (*Article 337-8*)

Original plan quantities will be based on a spread rate of 80 Lbs/SY. Construction spread rates will be calculated by multiplying the plan thickness by the bulk specific gravity of the mix being placed and then multiply by 40.5 Lbs/SY. ([See Attachment 9-66](#)).

**Note:** 40.5 Lbs/SY is a constant derived by the State Materials Office.

**Note:** Per *Article 337-11* of the *Specifications*, the pay quantity of Friction Course will be based on the average spread rate for the project, limited to 105% of the spread rate set by the Engineer in accordance with *Article 337-8* of the *Specifications*. However, under *Article 337-8* of the *Specifications*; for FC12.5, FC-9.5 and FC-5; it states that the thickness of friction course layer will be the plan thickness as shown in the contract documents, and that for construction purposes, the plan thickness will be converted to spread rate.

For construction purposes, the plan thickness is converted to an average spread rate and documented. However, for pay purposes, the average of the two design mixes should be taken and then multiplied by 1.05% or 5% to come up with the maximum pay limited to 105%.

Example: Design mix 1 = 80 Lbs/SY; Design Mix 2 = 82 Lbs/SY

Average Design Mix = 81 Lbs/SY

81 Lbs/SY X 1.05 = 85 Lbs/SY (Maximum thickness that can be paid)

### 9.10.3 Spread Rate for FC-9.5 and FC-12.5 (*Article 337-8*)

Original plan quantities will be based on a spread rate of 110 Lbs/SY-in. as defined in *Article 334-1* of the *Specifications*. Construction spread rates will be calculated by multiplying the plan thickness by the maximum specific gravity of the mix being placed and then multiplied by 43.3 Lbs/SY. ([See Attachment 9-77](#)).

**Note:** 43.3 Lbs/SY is a constant derived by the State Materials Office.

### 9.10.4 Method of Measurement (*Article 337-11*)

The quantity to be paid for will be the weight, in tons, as determined in accordance with *Article 320-2* of the *Specifications* (including provisions for the automatic recordation system). The pay quantity will be based on the average spread rate for the project, limited to a maximum of 105% of the construction

spread rate calculated by the above formulas in accordance with **Article 337-8** of the **Specifications**.

**Note:** The spread rate should be monitored during production and placement to ensure the Contractor is within 5%. After all asphalt for friction course has been placed and the average spread rate exceeds 5% as allowed by the **Specifications**, a deduction for the overage will be applied at the original bid price. A note will be added in remarks explaining that this deduction has been applied due to exceeding the spread rate by more than 5% allowed by the **Specifications**.

Example:

Total TES for contract shows = 14,523.5 Tons  
Total TES for contract shows = 173,622 SY

Design Spread Rate = 167.3 Lbs/SY

The Specifications shows that Friction Course gets a maximum of 105% from design spread rate.

$167.3 \times 1.05 = 175.7 \text{ Lbs/SY}$

However, 15,281.2 Tons are total tons placed by the Contractor on the road, and maximum tons that could be placed should be calculated as follows:

$(175.7 \text{ Lbs/SY} \times 173,622 \text{ SY}) \div 2000 \text{ Lbs/Ton} = 15,252.7 \text{ Tons}$  maximum that could be placed

The Department can only pay up to 105% maximum tonnage and since the Contractor placed more tonnage than the maximum allowed, there will be a deduction. The deduction is calculated as follows:

$15,252.7 - 15,281.2 = - 28.5 \text{ Tons}$  to be deducted

And  $28.5 \text{ Tons} \times \$ 75.00 = \$ 2,137.50$  amount deducted

The deduction under this contract will be from the original contract amount and unit price at 100%.

Also, if there is a CPF Adjustment, there is either a deduction or addition (depending on the factor) from the last CPF adjustment.

Example: If the last CPF = 102% (or 0.02) and the unit price = \$ 75.00;

$0.02 \times \$ 75.00 = + \$ 1.50$  (new unit price)

$(- 28.5) \times (+\$1.50) = \$ - 42.75$  deduct.

## 9.11 MISCELLANEOUS ASPHALT

### 9.11.1 Method of Measurement (*Article 339-7*)

The quantity to be paid for will be the weight in tons determined by weighing in trucks on scales meeting the requirements of *Article 320-2.2* of the **Specifications** of the or from the total weight of batches placed in trucks as determined by an automatic printer system meeting the requirements of *Article 320-4* of the **Specifications**. The pay quantity will be based on the average spread rate or dimensions for the project, limited to a maximum of 105%. For calculation, a weight of 100 Lbs/SY per inch thickness of asphalt will be used.

### 9.11.2 Basis of Payment (*Article 339-8*)

Price and payment will be full compensation for all work specified in this section, including shaping and compacting the foundation, soil sterilization treatment, furnishing of the bituminous material used in the mixture, and shaping of the adjacent earth surfaces.

#### Example:

Original Square Yards = 800  
Original Tons = 80.00  
Final Square Yards = 800  
Final Tons = 90.50  
 $90.50 \times 2,000 = 181,000 \text{ LBS.}$   
 $181,000 \text{ Lbs} \div 800 \text{ SY} = 226.25 \text{ Lbs/SY}$   
 $226.25 \text{ Lbs.} \div *200 \text{ Lbs.} \times 100 = 113 \%$   
 $113 \% > 105 \%$   
 $200 \text{ Lbs/SY} \times 1.05 = 210 \text{ Lbs/SY maximum Lbs/SY payable}$   
 $210 \text{ Lbs} \times 800 \text{ SY} \div 2,000 = 84 \text{ Tons Final Pay Quantity}$   
  
 $* 2" \times 100 \text{ Lbs/SY} = 200 \text{ Lbs/SY}$

**NOTE:** There will be no adjustment for CPF on Miscellaneous Asphalt.

## 9.12 CONTRACTOR'S QUALITY CONTROL (CQC)

### 9.12.1 Contractor Responsibility for all Asphalt Produced and Accepted



The Contractor will be responsible for all asphalt produced and accepted. The Contractor is responsible for quality control at the plant and on the roadway. The Contractor or Sub-Contractor will run asphalt content and gradation tests at the plant and density tests on the roadway. The contractor or Sub-Contractor is responsible for determining quantities of asphalt produced and recording tack measurements placed on the roadway. The Department has developed a Powerpoint presentation labeled “**Asphalt Construction Information for CQC Specifications**”. It is recommended that Project Administrators inform Contractors and Sub-Contractors at the Preconstruction Conference that this presentation is available. It is recommended that all personnel responsible for asphalt production, reporting, and documentation view the presentation. It is also recommended that all Department personnel responsible for asphalt inspection view this presentation. The presentation is available for viewing or downloading at the following URL:

<http://www.dot.state.fl.us/statematerialsoffice/quality/programs/qualitycontrol/guidelines/contractor/asphaltoutline/asphaltconstructioninfo.pdf>

## **9-12.2 Quality Control Documentation Verification**

The Engineer, or designee, is responsible for reviewing and randomly checking the quantities submitted by the Contractor Quality Control (CQC) Technician. The Engineer shall collect a copy of the **Quality Control Technician’s Report** for both the asphalt plant and the asphalt road. In addition the Engineer shall collect all asphalt ticket packets associated with these reports. The Engineer is to ensure that the ticket packets for each day’s production match these reports.

When an error is detected, the correction will be shown on the latest report for that specific item. Reference will be made to the report with the corrected information. The report where the error first occurred will show the correction by striking through the error, and writing the correct information, with initials and date. Reports following the error will not require correction.

## **9.12.3 Resolution Reports for A.C. Content, Gradation and Density Cores**

In some instances when the CQC Technician’s results and the Verification Technician’s results do not compare for a specified test, then a Resolution report must be accomplished. The tests results of the Resolution Technician will be compared to the results of the CQC Technician and the Verification Technician.

If the Resolution results favor the CQC Technician’s results, use the CQC Technician’s results.



If the Resolution Technician's results favor the Verification Technician's results, use the Resolution Technician's results.

The cost of the resolution testing, performed by the Department which favors the results of the Verification Technicians, will be deducted from the Contractor on the next progress estimate. The District Material's Office has agreed to provide the resolution results to the Project Administrator via an email. A copy of this email needs to be provided in the Computation Book to support this deduct. ([See Attachment 9-9a, 9-9b & 9-9c](#)).

See the State Materials Office Website at the following URL: <http://www.dot.state.fl.us/statematerialsoffice/quality/programs/qualitycontrol/qcindex.htm>

#### 9-12.4 Composite Pay Factor - Excel Spreadsheet

The Verification Technician is responsible for entering the CQC Technician's test results in the Composite Pay Factor (CPF) spreadsheet to calculate the pay adjustments. These entries shall be done at the closing of a Lot during the life of the contract. It is the responsibility of the Project Engineer or designee to verify that the test results entered by the Verification Technician are correct. All reports shall be affixed to the CPF spreadsheet representing that Lot. See example of **Lot Submittal Package** ([See Attachment No. 9-4 and 9-4a thru 9-4d](#)). The reports along with the asphalt ticket packets shall be collected two working days after the closing of a Lot. The **Lot Submittal Package** shall be submitted with the Final Estimates Package.

#### 9.12.5 Composite Pay Factor Adjustments

Once a Lot is closed out and it has been determined by the Verification Technician (VT) that a CPF adjustment needs to be made, it shall be done during the month the Lot is closed out and paid accordingly on the next progress estimate. The engineer or designee shall calculate the unit price adjustment and enter the revised unit price adjustment on the monthly/progress estimate along with the tons represented by each lot produced.

These revised unit price adjustments range from 75% to 105%. All lots shall be grouped together for each unit price adjustment.

**Example:** Lots 2, 3, and 5 were at 101%: show the tons represented by these lots on the monthly/progress at the revised unit price for a 101% adjustment and place a brief comment explaining which lots received the adjustment(s). CPF

adjustments in Sitemanager will be handled by adjusting the unit price by the variance percent of the CPF. ([See Attachment No 9-89a &&, 9-89b](#)). Also place a new **Computation Sheet** in the **Computation Booklet** or break out the percentage adjustments on the original **Computation Sheet** for the adjusted item(s) ([See Attachment No. 9-3](#)).

#### 9.12.6 Low Pay Factor Material Documentation

(A) Composite Pay Factors  $< 80$  or  $\geq 75$

- (1) Remove and replace the tonnage in the Lot and pay the CPF represented by the replacement Lot. The original **Lot Submittal Package** will be explained with remarks as “No Pay”.
- (2) Obtain an Engineering Analysis, if agreed to by the Project Administrator, to determine if material may remain in place. If material is to remain in place, pay the original CPF. If the material is to be removed and replaced, pay the CPF represented by the replacement Lot. The original **Lot Submittal Package** will be explained with remarks as “No Pay” with reference to the new replacement **Lot Submittal Package**.

**Note:** The Engineer, at his/her sole option, may perform an evaluation and leave this material in place, apply the CPF for this Lot, or have this material removed and replaced as identified in **No. 1** above.

(B) Composite Pay Factor  $< 75$

Remove and replace the tonnage in this Lot and pay the CPF represented by the replacement Lot. The original **Lot Submittal Package** will be explained with remarks as “No Pay”.

(C) Independent Verification Test (VT) Failure

This shall be handled as stated above. In some instances, the Project Manager/Administrator will require removal and replacement of tonnage within a Lot. If removal and replacement is required, **DO NOT CORRECT THE REPORTS**. The reports should reflect what actually happened. This defective asphalt may be a partial subplot, an entire subplot, or an entire Lot. The CQC Technician should identify the problem before an entire Lot is placed. The defective asphalt will then be milled and replaced with asphalt within another Lot. This is documented in the “Remarks” area.

The Technician will document the tonnage of “acceptable asphalt” that is replacing the defective one that was previously placed. The previous report number and date will also be identified in the “Remarks”. The new asphalt will be analyzed in the new Lot and paid accordingly. The previous **Lot Submittal Package** will also be identified in the “Remarks” area showing a deduction of the asphalt in this Lot, and it will be referenced to the new **Lot Submittal Package** and to where this material was actually produced.

**Example:**

Lot 3 has defective asphalt for which the PA, after concurrence from the District Construction/Bituminous Engineer, required removal and replacement. The Project Manager identifies the area in writing to the Contractor. The Contractor will mill up this defective asphalt at their expense and replace with asphalt from a later Lot. This asphalt will be analyzed in this later Lot and be paid based on this later Lot’s CPF with remarks identifying the area and replacement tonnage represented. For example, the replacement tonnage equals 249 tons. The previous **Lot Submittal Package** will have a deduction of 249 tons handled in the remarks column and payment deducted at the previous Lot’s CPF and referenced to the new **Lot Submittal Package** in which the replacement tonnage was produced. The new **Lot Submittal Package** will clearly identify that 249 tons produced was needed to replace defective asphalt produced in Lot 3, with references and remarks.

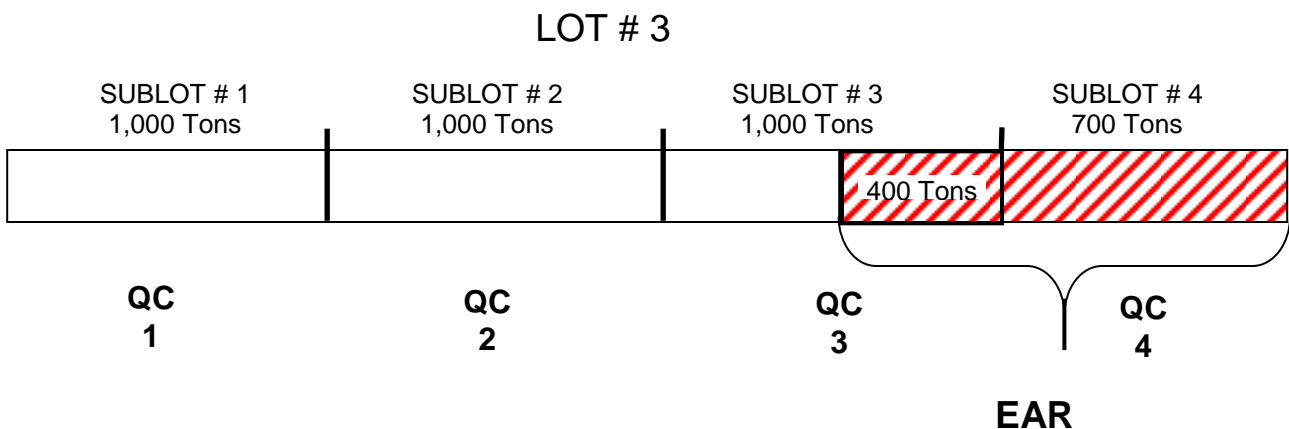
(D) Individual Quality Control Test

In some instances an individual QC test will bring the CPF down to either ( $<80$  or  $\geq 75$ ) or  $<75$ . The original lot is then paid based on the outcome of the CPF. The Contractor may perform an **Engineering Analysis Report (EAR)**, if approved by the PA, to isolate the tonnage that needs to be removed and the effected material will be deducted from the original **Lot Submittal Package** with remarks explaining its removal and replacement. The replacement material is to be paid in the **Lot Submittal Package** at the appropriate CPF for that lots production.

**Note:** If all material in a subplot is removed and replaced, the QC test for that subplot will be thrown out and the CPF will be based on the remaining QC test results. The VT is to compile a new CPF worksheet based on the remaining tests results, place it in the **Lot Submittal Package** and “VOID” the original CPF worksheet.

**Note:** When isolating tonnage where removal is required, the PA must evaluate the material between the previous QC test and the QC test that caused the Lot to fall into the Low Pay Factor and evaluate the material placed after previous or current QC test.

### Example of documenting Low Pay Factor Material due to Quality Control Test Failure



The production was shut down at 700 tons production in Sublot #4 due to a QC failure. After an EAR was performed it was determined that 400 tons in Sublot #3 was also affected.

All of Sublot #4 was removed therefore the remaining 3 QC test results are utilized to determine the CPF. The 3 QC test results represent the remainder of the Lot.

Total production for pay will be: 2,600 tons in Lot #3 based on the 3 QC tests. The 1,100 tons (400 tons Sublot #3 & 700 tons in Sublot #4) will be removed and replaced. The deduction will be handled in the remarks column of the **Lot Submittal Package** for Lot #3 with reference to the **Lot Submittal Package** where the replacement tonnage occurred. The replacement tonnage (1100 tons) will be paid at the CPF for the Lot that produced the replacement tonnage with explanation in the remarks column referencing this material to Lot #3. The Fuel & Bituminous Adjustments will follow the same process for the reduction.

## 9.13 DOCUMENTATION FOR MULTIPLE FINANCIAL IDENTIFICATION NUMBERS (FIN), UNDER ONE CONTRACT

All asphalt produced and accepted for a particular item shall be reported under the lead FIN (See exception below). The quantities for each FIN are determined by the Project Administrator, the prorated amount is determined from the Trns\*port Estimated System (TES) pay item breakout. This will be done by taking the total tons shown on the TES for each FIN and dividing it by the total tons for the contract, then multiplying this amount by the total tons placed. This shall be done **monthly** after the estimate cutoff day based on the Contractor's Certification of Quantities, if asphalt has been placed during the month and paid accordingly on the monthly progress estimate.

**Note:** This breakout is done monthly to ensure the fuel and bituminous adjustments are correctly adjusted for the period the asphalt was produced and accepted. The CPF breakout adjustments shall be done during the month when the Lot is closed out.

### Example

Project "A" TES shows 10,000 tons  
Project "B" TES shows 20,000 tons  
Total TES for contract = 30,000 tons

Tons placed this month = 4,359 tons

Project "A" would be determined by dividing 10,000 by 30,000 and multiplying by 4,359.  $10,000 \div 30,000 = .33 \times 4,359 = 1,438.47$  or 1,438.50 tons

Project "B" would be determined by dividing 20,000 by 30,000 and multiplying by 4,359.  $20,000 \div 30,000 = .67 \times 4,359 = 2,920.53$  or 2,920.50 tons

**Total** = 1,438.5 + 2,920.5 = 4,359 tons.

### Exception:

When an item is shown only on one FIN, those tons will be reported on that FIN.

## 9.14 DOCUMENTATION FOR MULTIPLE FINs, UNDER ONE CONTRACT, INCLUDING NON-FEDERAL AID (NFA) PARTICIPATING

All asphalt produced and accepted for a particular item shall be reported under the lead FIN including NFA participating (see exception below). The quantities for each FIN are determined by the PA, the prorated amount is determined from the Trns\*port Estimated System (TES) pay item breakout. This will be done by taking the total tons shown on the TES for each FIN and dividing it by the total tons for the contract, then multiplying this amount by the total tons placed. This shall be done **monthly** after the estimate cutoff day based on the Contractor's Certification of Quantities, if asphalt has been placed during the month and paid accordingly on the monthly progress estimate.

**Example:**

Project "A" TES shows 6,000 tons Federal Aid (FA) participating and 4,000 tons NFA participating

Project "B" TES shows 20,000 tons Federal Aid participating

Total TES for contract = 30,000 tons

Tons placed this month = 4,359 tons

Project "A" (FA) would be determined by dividing 6,000 (FA) by 30,000 and multiplying by 4,359.

$(FA) 6,000 \div 30,000 = .20 \times 4,359 = 871.80$

Project "A" (NFA) would be determined by dividing 4,000 (NFA) by 30,000 and multiplying by 4,359.

$(NFA) 4,000 \div 30,000 = .13 \times 4,359 = 566.67 \text{ or } 566.70 \text{ tons}$

Project "B" would be determined by dividing 20,000 by 30,000 and multiplying by 4,359.

$(FA) 20,000 \div 30,000 = .67 \times 4,359 = 2,920.53 \text{ or } 2,920.50 \text{ tons}$

**Total** =  $871.8 + 566.7 + 2,920.5 = 4,359 \text{ tons}$ .

**Exception:**

When an item is shown only on one FIN number, those Tons will be reported on that FIN number.

## **9.15 CPF DOCUMENTATION FOR MULTIPLE FIN, UNDER ONE CONTRACT**

All CPF's for asphalt produced and accepted for a particular item shall be reported under the lead FIN (see exception below). The quantities for each FIN will be determined by the PA, as the prorated amount determined from the TES pay item breakout. This will be done by taking the total tons shown on the TES for each FIN and dividing it by the total tons for the contract, then multiplying this amount by the total tons placed for each CPF. This shall be done during the month the Lot is closed out and paid accordingly on the monthly progress estimate.

**Example:**

Project "A" TES shows 10,000 tons

Project "B" TES shows 20,000 tons

Total TES for contract = 30,000 tons

Tons placed = 31,500 tons\*

CPF @ 105% = 8,000 tons  
CPF @ 102% = 20,000 tons  
CPF @ 98% = 3,500 tons

Project "A" is determined by dividing 10,000 by 30,000 and multiplied by the total tons for each CPF.

$10,000 \div 30,000 = .33$   
CPF @ 105% = 8,000 X .33 = 2,640.00 tons  
CPF @ 102% = 20,000 X .33 = 6,600.00 tons  
CPF @ 98% = 3,500 X .33 = 1,155.00

Project "B" is determined by dividing 20,000 by 30,000 and multiplied by the total tons for each CPF.

$20,000 \div 30,000 = .67$   
CPF @ 105% = 8,000 X .67 = 5,360.00 tons  
CPF @ 102% = 20,000 X .67 = 13,400.00 tons  
CPF @ 98% = 3,500 X .67 = 2,345.00 tons

**Total CPF @ 105%** = 2,640 + 5,360 = 8,000 tons  
**Total CPF @ 102%** = 6,600 + 13,400 = 20,000 tons  
**Total CPF @ 98%** = 1,155 + 2,345 = 3,500 tons

**Note:** This may be done on Federal Aid participating and Non Federal Aid participating projects. These pro-rated amounts shall be shown in the computation booklet along with the calculations.

**Note:** For this example, 31.500 Tons placed by Contractor is 105% maximum of the original Contract quantity, which is allowed per Specifications. (See next example for the maximum pay).

**Exception:**

When an item is shown only on one FIN number, those tons will be reported on that FIN number.

## **9.16 OVERALL SPREAD RATE ADJUSTMENT FOR MULTIPLE FIN, UNDER ONE CONTRACT (105% MAX PAY)**

This shows an example of a 105% Overall Adjustment Spread Rate on a multi fin project, how to calculate and separate quantities under the two projects.



**Example:**

Project "A" TES shows 13,754.2 Tons and 172,559 SY

Project "B" TES shows 91.1 Tons and 1,063 SY

Total TES for Contract = 13,845.3 Tons

Total TES for Contract = 173,622 SY Area

Design Spread Rate = 167.3 Lbs/SY

The **Specifications** shows that the Friction Course gets a maximum of 105% from design spread rate which = 175.7 Lbs/SY (max. allowed)

Project "A" overall adjustment would be determined by:

$(13,754.2 \div 13,845.3) = 0.99$  out of total Contract, and

Project "B" overall adjustment would be determined by:

$(91.1 \div 13,845.3) = 0.01$  out of total Contract

However, 15,281.2 Tons are the total Tons placed by Contractor on the road. The maximum Tons that could be placed should be calculated, as follows:

$(175.7 \text{ Lbs/SY} \times 173,622 \text{ SY}) \div 2000 \text{ Lbs/Tons} = 15,252.7 \text{ Tons}$

So 15,252.7 Tons is maximum that could be placed

Then the total deduction and the deduction on each project can be calculated. The Department can only pay up to 105% maximum. Since the contractor placed more tonnage than the maximum tonnage, there will be a deduction. The deduction is done as follows:

$15,252.7 \text{ Tons} - 15,281.2 \text{ Tons} = -28.5 \text{ Tons Total deduct}$

Therefore:

For Project "A"  $-28.5 \times 0.99 = -28.2 \text{ Tons}$  is deducted and

For project "B"  $-28.5 \times 0.01 = -0.3 \text{ Tons}$  is deducted.

The deduction under each project is from the original contract amount and unit price at 100%.

**Also**, if there is a CPF Adjustment, there is either a deduction or addition (depending on the factor) from the last CPF adjustment. Example: if the CPF =102% (or 0.02) and the last lot was 4000 Tons; unit price = \$ 5.00;

$0.02 \times \$ 5.00 = + \$ 0.10$  (New Unit Price)

For project A:  $+ \$ 0.10 \times -28.2 = - \$ 2.82$  deduct, and



For project B:                      + \$ 0.10 X    -0.3 = - \$ 0.03 deduct

## 9.17 CERTIFICATION OF QUANTITIES SUBMITTAL

The Contractor is required to fill out, sign and submit a ***Certification of Quantities (Asphalt and Bituminous Materials, Conventional Projects) Form No. 700-050-66*** to the PA for payment. This form is furnished by the Department ([See Attachment 9-5](#)), and is required to be turned in by the Contractor on a monthly basis. This form shows all the asphalt that was produced, accepted on the project and will be reported on the lead FIN. The Contractor only shows the tons that were accepted for the Contract. The Department will apply the CPF adjustment as defined above, after the Lot is closed out, and the ***Lot Submittal Package*** is received and verified. The Project Administrator shall keep a running total of each item's tonnage for the period represented and compare these to the ***Certification***. Any discrepancies shall be resolved before authorizing payment on the progress estimate. These ***Certifications*** are to accompany the ***Final Estimate Package***. The QC Manager shall handle discrepancies appropriately. If a ***Certification of Quantities*** has been determined to show tonnage that wasn't accepted on the project, the QC Manager must be notified for justification. A copy of the submittal should be provided to the State Construction Office.

**Note:** In some instances, the certifications will not match the asphalt quantity payable at the end of the project. This is due to removal and replacement for low CPFs. When this occurs, there should be notes on the summary, and running totals on the ***Lot Submittal Packages***. The Contractor shall not be required to adjust previous ***Certifications*** due to removal and replacement.

## 9.18 LIST OF ATTACHMENTS FOLLOWING THIS CHAPTER

Attachment No. 9-1 .....	Automatic Printer Ticket
Attachment No. 9-2 .....	Receipt/Invoice for Excess Materials Delivered to Warehouse
Attachment No. 9-3 .....	Computation Sheet for Superpave (Level B)
Attachment No. 9-4 & 9-4a thru 9- <del>4d</del> <u>4e</u> .....	Lot Submittal Package
Attachment No. 9-5 .....	Certification of Quantities
Attachment No. 9-6 .....	Spread Rate Calculation (FC-5)
Attachment No. 9-7 .....	Spread Rate Calculation (FC-9.5)
Attachment No. 9-8a & b .....	Reporting Composite Pay Factors (Sitemanager)
Attachment No. 9-9a, b, & c .....	Reporting Resolution Testing (Sitemanager)

**ATTACHMENT 9-1  
AUTOMATIC PRINTER TICKET**

**EAGLE ASPHALT COMPANY  
SOMEWHERE IN FL  
1-800-555-5555**

**Sold to:**  
**FIN Project ID: 123456-1-52-01**  
**Design No. SP 10-8280A**

<b>ACCOUNT</b>	<b>MIX</b>	<b>TRUCK</b>	<b>TONS</b>	
<b>15</b>	<b>Super Pave</b>	<b>573</b>	<b>22.46</b>	

***GROSS***            **Tons**  
***TARE***            **35.75**  
***NET***             **13.29**  
***MIX TEMPERATURE: 325°***  
***LOAD NO.:***     **22.46**  
***ACC. TOTAL: 196.11 TONS***  
***DATE/TIME: 01/01/2012 12:00 PM***

\_\_\_\_\_  
**Received by**

# **ATTACHMENT 9-2** **RECEIPT/INVOICE FOR EXCESS MATERIALS** **DELIVERED TO WAREHOUSE**

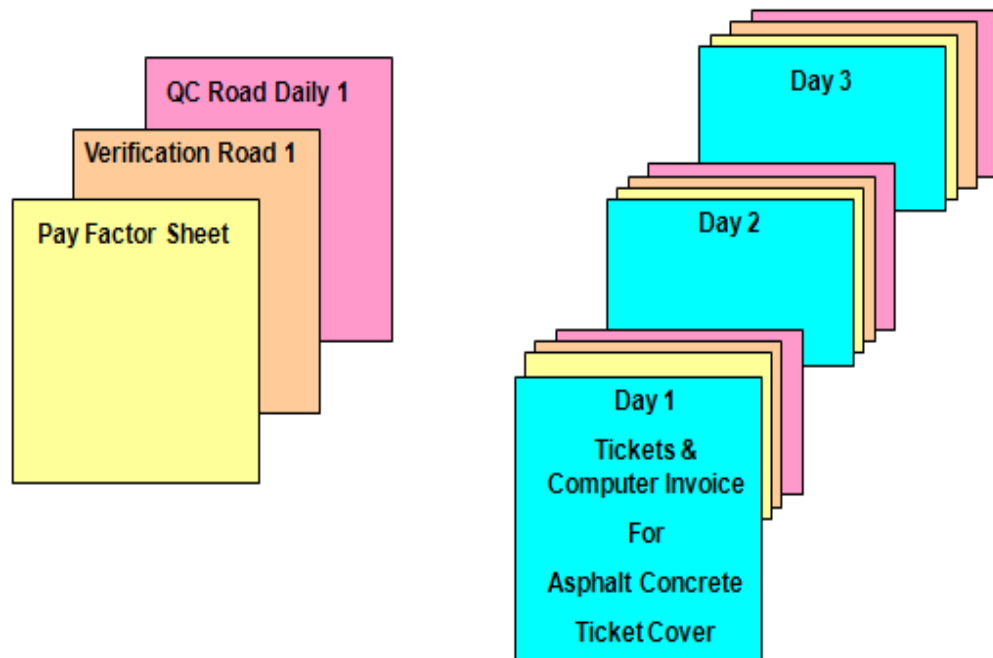
FLORIDA DEPARTMENT OF TRANSPORTATION				
MSIB034 :	RECEIPT OF GOODS FROM VENDOR			5/1/12 10.55.24
TCKT :	5/1/2012	TYPE: REGULAR RECEIPT		5/1/12
WHSE :				
VENDOR # :				
NAME :				
.....TOTAL COST.....				
0.0000				
COMM	DESCRIPTION	QTY RECVD	UM RE	UNIT PRICE
RESERVED:	.000	AVAILABLE	.000	TOT ONHAND: .000
BACKORDER:	.000			WHSE ORDER: .000
RECEIVED BY:			VERIFIED BY:	
PF1-Menu, PF2-Verify, PF5-Receive, Pf6-Another, PF8- Another (same vend # & PO#)				

9-27

**ATTACHMENT 9-4**  
**LOT SUBMITTAL PACKAGE**

**Lot Submittal Package**

To be compiled by Verification Technician at the end  
Of each lot and Submitted to the Engineer



# **ATTACHMENT 9-4a** **COMPUTER INVOICES FOR ASPHALTIC CONCRETE**

COMPUTER SUMMARY OF QUANTITIES FOR ASPHALTIC CONCRETE				
Fin. Project ID: _____		Date: _____		
Design Mix #: _____		Type of Material: _____		
Total No. of Invoices for this bundle: _____		Total No. of Tons/MTs for this bundle: _____		
Basis of Payment				
Sample No.:	Pay Item No.:	Lot:	Tons / MT:	Waste:
Sample No.:	Pay Item No.:	Lot:	Tons / MT:	Waste:
Sample No.:	Pay Item No.:	Lot:	Tons / MT:	Waste:
Sample No.:	Pay Item No.:	Lot:	Tons / MT:	Waste:
			Total: _____	Total: _____
Plant Inspector: _____		<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; margin: 0;"><b>MATERIAL DISPOSITION</b></p> <p>Rejected: _____</p> <p>Waste: _____</p> <p>No Pay: _____</p> <p>Total @ No Pay: _____</p> </div>		
Remarks: _____				
_____				
_____				

This is an example of the Summary of Quantities for Asphalt Concrete sheet. The asphalt tickets are to be collected by the Contractor's Quality Control Technician and a cover sheet filled out for the day's production. It lists project ID, type of material, date, design mix number, total number of tickets, total number of tons, how many tons were used on each pay item, how much waste there was and who the inspector was. Under Material Disposition:

**Rejected:** Tons of asphalt when Temperature is too hot or too cold and therefore the truck is rejected.

**Waste:** Tonnage in truck, usually the last truck, that some of the asphalt will be used, but not all and therefore, the unused portion is waste. The QC manager and/or the VT technician are not required to send the truck back to the plant for weighing the asphalt quantity that is waste. They should estimate the amount left in the truck based on (1) the spread rate on the project, or based on (2) visual inspection. Example (1): last load = 21.35 Tons (from Ticket); Spread rate on the project = 75 Lbs/SY. You will know the length and the width to come up with the paved area = 230 SY (for example). Tons Used =  $\frac{\text{Spread Rate (Lbs/SY)} \times \text{Area Paved (SY)}}{2000 \text{ Lbs/Tons}}$

$$= \frac{(75 \text{ Lbs/SY} \times 230 \text{ SY})}{2000 \text{ Lbs/Tons}} = 8.63 \text{ Tons}$$

$$\text{Tons Waste} = 21.35 - 8.63 = 12.72 \text{ Tons "Waste"}$$

Or (2) a visual inspection of the remaining asphalt in the truck could be determined to the nearest ¼ of a truck load. Either way is sufficient, since there shouldn't be that much of a difference. These two methods would consume less time and money for both parties.

**No Pay:** is when asphalt is included in the pay item such as curb pad, MOT repair, etc. It is very important that you read your contract and know which of these pay items will not be included.

## ATTACHMENT 9-4b PAY FACTOR WORKSHEET

Florida Department of Transportation						675-030-22 MATERIALS APW: 07/10
Asphalt Plant - Lot Verification and Pay Factor Worksheet for Superpave Mixtures						
Specification Version(s) 7/05		Project Information				
Contractor: <b>P&amp;S PAVING</b>					Fin. Project ID: <b>21042735201</b>	
Mix Type: <b>SP-12.5</b>	Design No.: <b>SP 10-8347B</b>		Plant No.: <b>A0712</b>		Reported By: <b>J. TULLY</b>	
LOT #: <b>3</b>	Intended Tons: <b>2000</b>		Actual Tons: <b>188.37</b>		Date Reported: <b>10/1/2010</b>	
Verification Sublot: <b>1</b>	Start Date: <b>8/13/2010</b>	End Date: <b>9/28/2010</b>	Tons in this lot requiring no density: <b>188.37 100.0%</b>			
Proj. Description: <b>A1A SUMMER HAVEN</b>						
Lot Verification						
Property	P <sub>a</sub>	P <sub>200</sub>	P <sub>b</sub>	Rice G <sub>mm</sub>	Lab G <sub>mb</sub>	
QC	38.82	5.84	4.73	2.523	2.427	
Verification	37.17	5.87	4.69	2.529	2.417	
Tolerance	IN	IN	IN	IN	IN	
Property	Core 1 G <sub>mb</sub>	Core 2 G <sub>mb</sub>	Core 3 G <sub>mb</sub>	Core 4 G <sub>mb</sub>	Core 5 G <sub>mb</sub>	
QC						
Verification						
Tolerance						
Lot Pay Factor Calculations						
Property	P <sub>a</sub>	P <sub>200</sub>	P <sub>b</sub>	V <sub>a</sub>	Density	
Sublot 1	38.82	5.84	4.73	3.80		
Sublot 2						
Sublot 3						
Sublot 4						
Target	42.00	4.80	4.90	4.0	92.0	
n=	1.00	1.00	1.00	1.00		
Mean	38.82	5.84	4.73	3.80		
SD						
Q <sub>u</sub>						
P <sub>u</sub>						
Q <sub>t</sub>						
P <sub>t</sub>						
PWL						
PF	1.00	1.00	1.05	1.05	1.00	
Note: Sublot values which appear in RED are outside of the Master Production Range as specified in Table 334-5, refer to 334-5.1.4.4.				Composite Pay Factor		1.03
Comments:						

Exported from Asphalt Plant Worksheet

This is an example of a composite pay factor worksheet. The Contractor's test results for each sublot are input into the spreadsheet. These results are for AC content, gradation, air voids and density.

The Verification Technician (VT) tests one predetermined sublot, if verified, the composite pay factor is the % pay for the entire verified lot. If the sublot doesn't verify, the verification technician tests the remaining sublots. If they compare, the whole lot is considered verified. If one more sublot does not verify, the whole lot goes to resolution.



[illegible]

9-31

# ATTACHMENT 9-4d ASPHALT ROADWAY – DAILY REPORT OF QUALITY CONTROL

Remove Raw at selection

Add Raw at selection

FINID (Project #)

210427-3-52-01

TIN#

W22111372

Intend Lot Size

4000 ton

Lot #

3

Mix Design #

SP 10-8347B

Clear EVERYTHING

Import from file

remove last lot

Import Tickets (beta)

Copy (constant)

Copy (varied)

Unit 9-4e

Gmm: 2.492

Email Form Feedback to:  
[SP1-ArchaltFarm@dot.state.fl.us](mailto:SP1-ArchaltFarm@dot.state.fl.us)

This is the Asphalt Roadway – Daily Report of Quality Control.

It shows Lot 1 and subplot 1.

It shows the Tonnage used, square yards calculated, the spread rates on each subplot. It gives the Average Spread Rate for this lot.

It shows the spread rate for the tack coat.

Total Tons used on this lot and the accumulative tons used so far, the total square yards, Temperature, etc.

Communication between the plant and road is the key to good quality control by the Contractor.

[illegible]

9-33

## ATTACHMENT 9-5

### Form 700-050-66 -- Bituminous Adjustment Example The Set-Up Sheet for Conventional Projects

<b>Contractor's Certification of Quantities</b> <b>Bituminous and Polymer Material</b> <b>(Conventional Projects)</b> <b>Certification No. <u>18</u></b>			
<b>Financial Project ID:</b>	<u>12345605201</u>		
<b>Contractor:</b>	<u>MR. ED'S ASPHALT CO. INC.</u>		
<b>Contract Number:</b>	<u>T1234</u>		
<b>From (Mo/Day/Yr):</b>	<u>01/15/12</u>	<b>To (Mo/Day/Yr):</b>	<u>02/19/12</u>

<b>Asphalt Material</b>			
<b>Pay Item Number:</b>	<u>337-7</u>	<b>Tonnage Placed:</b>	<u>1000.00</u>
<b>Pay Item Number:</b>	<u>334-1</u>	<b>Tonnage Placed:</b>	<u>1000.00</u>
<b>Pay Item Number:</b>	<u>          </u>	<b>Tonnage Placed:</b>	<u>          </u>
<b>Additional Gallons (ARMI):</b>	<u>500.0</u>		
<b>Base Index Month:</b>	<u>Aug-10</u>	<b>Base Asphalt Price Index:</b>	<u>2.0108</u>
<b>Current Index Month:</b>	<u>Feb-12</u>	<b>Current Asphalt Price Index:</b>	<u>2.6053</u>
<b>Asphalt Index Difference:</b>			<u>0.4940</u>

<b>Polymer Material</b>			
<b>Pay Item Number:</b>	<u>337-7</u>	<b>Tonnage Placed:</b>	<u>1000.00</u>
<b>Pay Item Number:</b>	<u>334-1</u>	<b>Tonnage Placed:</b>	<u>1000.00</u>
<b>Pay Item Number:</b>	<u>          </u>	<b>Tonnage Placed:</b>	<u>          </u>
<b>Base Index Month:</b>	<u>Aug-10</u>	<b>Base Polymer Price Index:</b>	<u>2.6773</u>
<b>Current Index Month:</b>	<u>Feb-12</u>	<b>Current Polymer Price Index:</b>	<u>3.2702</u>
<b>Polymer Index Difference:</b>			<u>0.4590</u>

<b>Asphalt Material</b> <b>(ASPHALT TREATED PERMEABLE BASE)</b>			
<b>Pay Item Number:</b>	<u>334-1</u>	<b>Tonnage Placed:</b>	<u>500.00</u>
<b>Base Index Month:</b>	<u>Aug-10</u>	<b>Base Asphalt Price Index:</b>	<u>2.0108</u>
<b>Current Index Month:</b>	<u>Feb-12</u>	<b>Current Asphalt Price Index:</b>	<u>2.6053</u>
<b>Asphalt Index Difference:</b>			<u>0.4940</u>

	<b>Navigation and Printing Functions</b>
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# ATTACHMENT 9-5a

## Form 700-050-66 - CONTRACTOR'S CERTIFICATION OF QUANTITIES BITUMINOUS MATERIAL - CONVENTIONAL PROJECTS

CONTRACTOR'S CERTIFICATION OF QUANTITIES BITUMINOUS AND POLYMER MATERIAL (CONVENTIONAL PROJECTS)				CONSTRUCTION 15/11
				CERTIFICATION NO. <b>18</b>
FINANCIAL PROJECT ID.	12345605201			
CONTRACTOR	MR. ED'S ASPHALT CO. INC.			
CONTRACT NO.	T1234			
PERIOD REPRESENTED BY CERTIFICATION:				
FROM (MO/DAY/YR) 01/15/12		TO (MO/DAY/YR) 02/13/12		
<b>ASPHALT MATERIAL</b>				
BASE PRICE INDEX:	2.0108	CURRENT PRICE INDEX:	2.6053	INDEX DIFFERENCE: 0.4940
		TONNAGE	GALLONS	MONTHLY PAYMENT
PAY ITEM NUMBER	337-7	1,000.0	14,563	\$7,197.09
PAY ITEM NUMBER	334- 1	1,000.0	14,563	\$7,197.09
PAY ITEM NUMBER				
GALLONS OF ASPHALT CEMENT USED IN MIX: *			29,138	\$14,394.18
ADDITIONAL GALLONS (ARMI):			500	\$247.00
TOTAL GALLONS:			29,638	
TOTAL MONTHLY PAYMENT:				\$14,641.18
<b>POLYMER MATERIAL</b>				
BASE PRICE INDEX:	2.6773	CURRENT PRICE INDEX:	3.2702	INDEX DIFFERENCE: 0.4530
		TONNAGE	GALLONS	MONTHLY PAYMENT
PAY ITEM NUMBER	337- 7	1,000.0	14,563	\$6,687.17
PAY ITEM NUMBER	334- 1	1,000.0	14,563	\$6,687.17
PAY ITEM NUMBER				
TOTAL GALLONS OF POLYMER USED IN MIX: *			29,138	
TOTAL MONTHLY PAYMENT:				\$13,374.34
<b>ASPHALT MATERIAL (ASPHALT TREATED PERMEABLE BASE)</b>				
BASE PRICE INDEX:	2.0108	CURRENT PRICE INDEX:	2.6053	INDEX DIFFERENCE: 0.4940
		TONNAGE	GALLONS	MONTHLY PAYMENT
PAY ITEM NUMBER	334- 1	500.0	3,497	\$1,727.52
TOTAL MONTHLY PAYMENT:				\$1,727.52

▶▶ Setup Form66

# ATTACHMENT 9-5b

## Contractor's Worksheet for DB/LS Project

### CONTRACTOR'S ESTIMATE WORKSHEET BITUMINOUS AND POLYMER MATERIAL (DESIGN BUILD AND LUMP SUM PROJECTS)

WORKSHEET NO. \_\_\_\_\_

FINANCIAL PROJECT ID. \_\_\_\_\_  
CONTRACTOR \_\_\_\_\_  
CONTRACT NO. \_\_\_\_\_

PERIOD REPRESENTED BY WORKSHEET:  
FROM (MO/DAY/YR) \_\_\_\_\_ TO (MO/DAY/YR) \_\_\_\_\_

#### ASPHALT MATERIAL

ASPHALT TONNAGE PLACED \_\_\_\_\_  
GALLONS OF ASPHALT CEMENT USED IN MIX \* \_\_\_\_\_  
ADDITIONAL GALLONS (ARMI\*) \_\_\_\_\_  
TOTAL GALLONS \_\_\_\_\_  
BASE ASPHALT PRICE INDEX FOR (\_\_\_\_): \_\_\_\_\_  
CURRENT ASPHALT PRICE INDEX FOR (\_\_\_\_): \_\_\_\_\_  
ASPHALT PRICE INDEX DIFFERENCE: \_\_\_\_\_  
MONTHLY DOLLAR AMOUNT: \_\_\_\_\_

#### POLYMER MATERIAL

POLYMER TONNAGE PLACED \_\_\_\_\_  
GALLONS OF POLYMER USED IN MIX \* \_\_\_\_\_  
TOTAL GALLONS \_\_\_\_\_  
BASE POLYMER PRICE INDEX FOR (\_\_\_\_): \_\_\_\_\_  
CURRENT POLYMER PRICE INDEX FOR (\_\_\_\_): \_\_\_\_\_  
POLYMER PRICE INDEX DIFFERENCE: \_\_\_\_\_  
MONTHLY DOLLAR AMOUNT: \_\_\_\_\_

#### ASPHALT MATERIAL (ASPHALT TREATED PERMEABLE BASE)

ASPHALT TONNAGE PLACED \_\_\_\_\_  
GALLONS OF ASPHALT CEMENT USED IN MIX\* \_\_\_\_\_  
BASE PRICE INDEX FOR (\_\_\_\_): \_\_\_\_\_  
CURRENT ASPHALT PRICE INDEX FOR (\_\_\_\_): \_\_\_\_\_  
ASPHALT PRICE INDEX DIFFERENCE: \_\_\_\_\_  
MONTHLY DOLLAR AMOUNT: \_\_\_\_\_

\* Calculations based on Specifications.

**ATTACHMENT 9-6  
SPREAD RATE CALCULATION  
FC-5 (0.75") (20mm)**

**English Formula = Thickness X Gsb X 40.5**

Thickness = (Inch) Plan Thickness

Gsb = Combined Aggregate Bulk Specific Gravity from  
Design Mix

$$0.75" \times 2.718 \times 40.5 = 82.6 \text{ (round to 83 Lbs/SY)}$$

**Note:** 40.5 Lbs/SY is a constant derived by the State Materials Office.

**Metric Formula = Thickness X Gsb X 0.83**

Thickness = (mm) Plan Thickness

Gsb = Combined Aggregate Bulk Specific Gravity from  
Design Mix

$$20 \text{ mm} \times 2.718 \times 0.83 = 45.1 \text{ (round to 45 kg/m}^2\text{)}$$

**Note:** 0.83 kg/m<sup>2</sup> is a constant derived by the State Materials Office.

**ATTACHMENT 9-7  
SPREAD RATE CALCULATION  
FC-9.5 (1.5") (40mm)**

**English Formula = Thickness X Gmm X 43.3**

Thickness = (Inch) Plan Thickness or Individual Layer Thickness  
Gmm = Maximum Specific Gravity from Design Mix

$$1.5" \times 2.424 \times 43.3 = 157.4 \text{ (round to 157 Lbs/SY)}$$

**Note:** 43.3 Lbs/SY is a constant derived by the State Materials Office.

**Metric Formula = Thickness X Gmm X 0.928**

Thickness = (mm) Plan Thickness or Individual Layer Thickness  
Gmm = Maximum Specific Gravity from Design Mix

$$40 \text{ mm} \times 2.424 \times 0.928 = 89.9 \text{ (round to 90 kg/m}^2\text{)}$$

**Note:** 0.928 kg/m<sup>2</sup> is a constant derived by the State Materials Office.



## ATTACHMENT 9-8a

### REPORTING COMPOSITE PAY FACTORS IN SITEMANAGER

Pay for all asphalt by reporting the full tonnage on a Daily Work Report.

Handle all Composite Pay Factors as a Line Item Adjustment reflecting only the variance in unit price from the full contract bid price.

Example: Lot no. 4 for 4000 tons has a composite pay factor of 98%

The contract bid price in \$49.85.

The Line Item Adjustment in Sitemanager would be entered under "Quantity" at 4000 Tons, and under "Unit Price" at – \$1.0000 (98% is  $0.98 - 1.0 = -0.02$ , and  $-0.02 \times \$49.85 = \$-1.0000$ ), and the total "Amount" will show as – \$ 4,000.00.

**Line Item Adjustments**

Contract ID : T7147 Estimate Nbr: 0019

Catg Nbr	Pri Nbr	Item Code	Line Item Number	Description	Price Adj. Type	Entered Date	St
0200	25715415201	0120 6	0150	EMBANKMENT		03/06/09	
0200	25715415201	0337 7 22	0215	ASPH CONC FRICTION COURSE, INC BIT, F	Gasoline	03/06/09	
0200	25715415201	0337 7 22	0215	ASPH CONC FRICTION COURSE, INC BIT, F		03/06/09	
0200	25715415201	0400 1 15	0230	CONCRETE CLASS I, MISCELLANEOUS		03/06/09	
0200	25715415201	0400 1 15	0230	CONCRETE CLASS I, MISCELLANEOUS	Gasoline	03/06/09	
0200	25715415201	0522 1	0525	SIDEWALK CONCRETE, 4" THICK		03/06/09	
0200	25715415201	0522 2	0530	SIDEWALK CONCRETE, 6" THICK		03/06/09	
0200	25715415201	0570 1 2	0560	PERFORMANCE TURF, SOD	Gasoline	03/06/09	
0200	25715415201	0334 1 14	0205	SUPERPAVE ASPHALTIC CONC, TRAFFIC D		03/23/09	

Project Number: 25715415201 Line Item Number: 0205

**Line Item Adjmnt Detail Information :**

Type: Composite Pay Factor Entered By: cn982sc

Amount: -4,000.00 Entered Date: 03/23/09

Quantity: 4,000.00000

Unit Price: -1.00000

**Stockpiled Information**

Stockpiled Sn: 0 Replenish Sn: 0

## ATTACHMENT 9-8b

### REPORTING COMPOSITE PAY FACTORS IN SITEMANAGER

Appropriate remarks should be made in a manner that reflects how the unit price was arrived at.

Lot 4 = 4000 tons; CPF Lot 4=98%; Unit Price=\$49.85  
 Adjustment Unit Price:  $\$49.85 \times -0.02 = -\$1.000$

$4000 \text{ tons} \times -\$1.000 = -\$4,000.00$

The screenshot shows the 'Line Item Adjustments' window in SITEMANAGER. At the top, 'Contract ID' is T7147 and 'Estimate Nbr' is 0019. A table on the left lists line items with 'Catg Nbr' 0200 and 'Prj Nbr' 25715415201. A 'Remarks (General Remarks)' dialog box is open, containing the following text:

Lot 4 = 4000 tons  
 CPF for lot 4 = 98%  
 Unit Price = \$49.85  
 Adjustment Unit Price =  $\$49.85 \times -0.02 = -\$1.00$

Below the dialog, the 'Project Number' is 25715415201 and the 'Line Item Number' is 0205. The 'Line Item Adjmnt Detail Information' section shows:

- Type: Composite Pay Factor
- Amount: -4,000.00
- Quantity: 4,000.00000
- Unit Price: -1.00000

Additional fields include 'Entered By: cn982sc', 'Entered Date: 03/23/09', and a 'Stockpiled Information' section with 'Stockpiled Sn: 0' and 'Replenish Sn: 0'.

## ATTACHMENT 9-9a

### Example

#### E-Mail from District Material's Office to the PA with No. of tests and Costs

Daniel Day

---

From: Daniel Day  
Sent: Thursday, May 21, 2012 @ 2:49 PM  
To: Howard Jump ([howard.jump@dot.state.fl.us](mailto:howard.jump@dot.state.fl.us))  
Cc: J. Corley; Bill Blass; etc; etc.  
Subject: FIN # 41109815201 Lot 6 Resolution Results

Howard,

Attached are the Resolution results for Lot 6 on the above mentioned project. The resolution results **DO NOT** compare with QC results. Therefore, acceptance and payment for the Lot with respect to density will be based on Resolution results. Cost for the Resolution testing should be deducted from the monthly estimate (see below).

For each subplot, the Resolution results for average Roadway Gmb should replace the QC results for average Roadway Gmb, and most likely changing the density value, Individual Pay Factor, and the Composite Pay Factor. Any new values should be compared to the Master Production Range as well as the criteria of 334-5.9.5 to determine acceptance.

- please do not approve the QC or RT samples for this Lot. The resolution lab will approve these samples.
- Resolution cost (- 31.60 per core X 9 cores = - \$ 284.40)

Thanks

Daniel Day

Assistant District Bituminous Manager

Florida Department of Transportation

100 N. Day Road (Ms 20)

Deland, Florida 33333

380-555-5550(office)

# ATTACHMENT 9-9b

## REPORTING COST OF RESOLUTION TESTING IN SITEMANAGER

**AASHTO SiteManager**

File Edit Services Window Help

**Line Item Adjustments**

Contract ID : T7147 Estimate Nbr: 0007

Catg Nbr	Pri Nbr	Item Code	Line Item Number	Description	Price Adj. Type	Entered Date	St
0200	25715415201	0430171101	0365	PIPE CULVERT OPTIONAL MATERIAL, ROL Gasoline		04/14/08	
0200	25715415201	0430171101	0365	PIPE CULVERT OPTIONAL MATERIAL, ROL		04/14/08	
0200	25715415201	0430172201	0385	PIPE CULVERT, OPTIONAL MATERIAL, OTH		04/14/08	
0200	25715415201	0430172201	0385	PIPE CULVERT, OPTIONAL MATERIAL, OTH Gasoline		04/14/08	
0200	25715415201	0430172202	0390	PIPE CULVERT, OPT MATERIAL, OTHER - E Gasoline		04/14/08	
0200	25715415201	0430172202	0390	PIPE CULVERT, OPT MATERIAL, OTHER - E		04/14/08	
0200	25715415201	0430174101	0395	PIPE CULVERT, OPTIONAL MATERIAL, ROL Gasoline		04/14/08	
0200	25715415201	0430174101	0395	PIPE CULVERT, OPTIONAL MATERIAL, ROL		04/14/08	
0200	25715415201	0334 1 13	0200	SUPERPAVE ASPHALTIC CONC, TRAFFIC C		04/14/08	

Project Number: 25715415201 Line Item Number: 0200

Line Item Adjmnt Detail Information :

Type: Resolution Testing Costs Entered By: jcn982ks

Amount: 82.80 Entered Date: 04/14/08

Quantity: .00000

Unit Price: 0.00000

Stockpiled Information

Stockpiled Sn: Replenish Sn:

Ready Server Systest SMADMIN jcn982ks

# ATTACHMENT 9-9c

## REPORTING COST OF RESOLUTION TESTING IN SITEMANAGER

**AASHTO SiteManager**

File Edit Services Window Help

**Line Item Adjustments**

Contract ID : T7147 Estimate Nbr: 0007

Catg Nbr	Pri Nbr	Remarks (General Remarks) :	St
0200	25715415201	Coarse aggregate gradation resolution tests for Lots 4 & 5.	
0200	25715415201		
0200	25715415201		
0200	25715415201		
0200	25715415201		
0200	25715415201		
0200	25715415201		
0200	25715415201		
0200	25715415201		
0200	25715415201		

Project Number: 25715415201 Line Item Number: 0200

**Line Item Adjmnt Detail Information :**

Type: Resolution Testing Costs Entered By: jcn982ks

Amount: -82.80 Entered Date: 04/14/08

Quantity: .00000

Unit Price: 0.00000

**Stockpiled Information**

Stockpiled Sn: 0 Replenish Sn: 0

Ready Server SvsTest SMADMIN jcn982ks