

SECTION 11.4

ADJUSTMENTS

11.4.1 PURPOSE

This procedure provides guidance for determining the various pay adjustments associated with asphalt pay items (Pay Quantity Adjustments, Composite Pay Factor (CPF) Adjustments, and Bituminous Adjustments). Example calculations are provided in the Appendices at the end of this Chapter.

11.4.2 AUTHORITY

Sections 20.23(3)(a), and 334.048(3), Florida Statutes

11.4.2.1 REFERENCES

**Sections 9, 234, 285, 330, 334, 337 and 339 of the *Standard Specifications for Road and Bridge Construction*
Section 514, *FDOT Design Standards***

11.4.3 TYPES OF ADJUSTMENTS

11.4.3.1 PAY QUANTITY ADJUSTMENTS

The Department will pay for the asphalt placed up to 105% of the Adjusted Plan Quantity on Asphalt Square Yard and Tonnage Pay Items.

Exceptions: Temporary Asphalt, Turnout Construction (Asphalt), and Asphalt Cubic Yard Pay Items (Asphalt Treated Permeable Base (ATPB)), do not receive pay quantity adjustments. On conventional (pay item) projects, Overbuild and Turnout Construction are not limited to 105% of the Adjusted Plan Quantity. Payment is made for the quantity that is placed.

The Asphalt Roadway – Daily Report of Quality Control (QC Report) has been updated to include automation of some adjustments. The Project Administrator (PA) (or designee) will only need to enter the Plan Quantity Tonnage and any Engineer directed change(s) to the QC report. The QC Report will calculate the Tonnage-weighted G_{mm} (or G_{sb} for open graded Friction Course FC - 5) for each pay item based on the Tonnages and Mix Designs used on the project.

11.4.3.1.1 SQUARE YARD PAY ITEM ADJUSTMENTS

The only Asphalt Plan Quantity Square Yard pay items are the **Asphalt Base (Optional Base-Black Base)** groups.

The pay area will be determined based upon the following formula, where SY is square yards:

$$\text{Pay Area (SY)} = \text{Plan Surface Area (SY)} \times \frac{\text{Actual Tonnage Placed}}{\text{Adjusted Plan Quantity Tonnage}}$$

Where the Adjusted Plan Quantity (PQ) Tonnage is determined as follows:

$$\text{Adjusted PQ (TN)} = \frac{(\text{Plan Surface Area} \times t \times \text{Tonnage-Weighted Average } G_{mm} \times 43.3)}{2,000 \text{ Lbs/TN}}$$

And:

Plan Surface Area = PQ Area including any Engineer approved quantity revisions (SY)

t = Plan Thickness (in)

43.3 = Conversion Factor (a constant derived by the State Material's Office)

Tonnage-Weighted Average G_{mm} =

$$\frac{(\text{Tons}_{\text{Mix } 1}) (G_{mm, \text{Mix } 1}) + (\text{Tons}_{\text{Mix } 2}) (G_{mm, \text{Mix } 2}) + (\text{Tons}_{\text{Mix } n}) (G_{mm, \text{Mix } n})}{\text{Tons}_{\text{Mix } 1} + \text{Tons}_{\text{Mix } 2} + \text{Tons}_{\text{Mix } n}}$$

The Pay Adjustment (SY) is determined as follows:

$$\text{Pay Adjustment (SY)} = \text{Pay Area (SY)} - \text{Plan Quantity (SY)}$$

The Pay Adjustment can be positive, negative, or zero. The positive adjustment is limited to 105% of the Plan Quantity (SY)

See **Appendix A** for Example (1) Negative Adjustment; Example (2) Positive Adjustment within the 105%; and Example (3) Limit to 105% (when placement exceeds 105%)

11.4.3.1.2 CUBIC YARD PAY ITEM ADJUSTMENTS

The only Asphalt Cubic Yard Pay Item is Asphalt Treated Permeable Base (ATPB). This pay item **does not** allow for 105% pay adjustment. ATPB **does** receive CPF Adjustments and Fuel and Bituminous Adjustments (if applicable).

11.4.3.1.3 TONNAGE PAY ITEM ADJUSTMENTS

1. SUPERPAVE STRUCTURAL AND FRICTION COURSES

Note: Calculations shown below are now part of the QC Report as stated above in 11.4.3.1.

The maximum tonnage paid will be based upon the following formula:

$$\text{Maximum Tons Pay} = \text{Adjusted PQ} \times 1.05$$

Where the Adjusted PQ Tonnage is determined as follows:

$$\text{Adjusted PQ (TN)} = \frac{\text{PQ (TN)} \times \text{Tonnage-Weighted } G_{mm}}{\text{Design } G_{mm}}$$

PQ (TN) = Original PQ including any Engineer approved quantity revisions (TN)

Design G_{mm} = 2.540 (Dense Graded Structural Asphalt or Friction per 334-1.4 of the Specifications) or Design G_{sb} = 2.635 (Open Graded Friction Course – Section 337-8.2 of the Specifications)

The Tonnage-Weighted G_{mm} (or G_{sb} for FC-5) is determined from the **Asphalt Roadway-Daily Report of Quality Control Report** for each pay item used. The equation for this is as follows:

$$\text{Tonnage-Weighted } G_{mm} = \frac{(\text{Tons}_{\text{Mix 1}})(G_{mm, \text{Mix 1}}) + (\text{Tons}_{\text{Mix 2}})(G_{mm, \text{Mix 2}}) + (\text{Tons}_{\text{Mix n}})(G_{mm, \text{Mix n}})}{\text{Tons}_{\text{Mix 1}} + \text{Tons}_{\text{Mix 2}} + \text{Tons}_{\text{Mix n}}}$$

See **Appendix A** for Example (4) “No Adjustments”; Example (5) “Exceeding the 105% adjustment”; and Example (6) “within the 105% Adjustment”.

2. MISCELLANEOUS ASPHALT

The Designer quantity is determined based on a spread rate of 100 Lbs/SY/inch of design thickness of asphalt placed over the area in the plans.

The maximum tonnage paid will be based upon the following formula:

$$\text{Maximum Tons Pay} = \text{Adjusted PQ} \times 1.05$$

Where the Adjusted PQ is determined as follows:

$$\text{Adjusted Plan Quantity} = \frac{\text{PQ (TN)} \times \text{Tonnage-Weighted } G_{mm}}{\text{Design } G_{mm}}$$

And:

PQ (TN) = Original PQ including any Engineer approved quantity revisions (TN)

$$\text{Tonnage-weighted } G_{mm} = \frac{(\text{Tons}_{\text{Mix 1}}) (G_{mm \text{ Mix 1}}) + (\text{Tons}_{\text{Mix 2}}) (G_{mm \text{ Mix 2}}) + (\text{Tons}_{\text{Mix n}}) (G_{mm \text{ Mix n}})}{\text{Tons}_{\text{Mix 1}} + \text{Tons}_{\text{Mix 2}} + \text{Tons}_{\text{Mix n}}}$$

Design G_{mm} = 2.540 (per 334-1.4 of the Specifications)

See **Appendix A**: Example (7) for paying up to 105% on Miscellaneous Asphalt.

3. TURNOUT CONSTRUCTION (ASPHALT)

Turnout Construction Asphalt is also a tonnage pay item, however, it does not receive pay quantity adjustments. It does not receive a CPF adjustment. It does receive Fuel & Bituminous adjustments, if applicable, per Specifications.

11.4.3.2 THICKNESS ADJUSTMENTS

11.4.3.2.1 (Core-Out Adjustments) (White Base)

This section is for Optional Base Courses (white base only) such as Limerock, Cemented Coquina, etc. This pay item group (see **Section 285** of the **Specifications**) is Plan Quantity subject to the provisions of **Section 9-3.2** of the **Specifications**.

The thickness is cored in accordance with **Section 285-7** of the **Specifications**. The core-out report is used to calculate the average thickness.

The pay area is calculated as follows:

$$\text{Pay Area} = \text{Surface Area} \times \frac{\text{Calculated Average Thickness per 285-7}}{\text{Plan Thickness}}$$

The pay area shall not exceed 105% of the Surface Area. There will be no adjustment for base courses that are constructed using mixed-in-place material.

See **Appendix B** for Adjustment Examples.

11.4.3.2.2 THICKNESS/SPREAD RATE ADJUSTMENTS (COMPOSITE BASE)

For Composite Base, there is a granular Subbase (White Base) and an Asphalt Base. The construction of both the subbase and Type, B-12.5 is bid and used as Optional Base.

Granular subbases include Limerock, Cemented Coquina, Shell Rock, RCA Base at LBR 120, Bank Run Shell, and Graded Aggregate Base at LBR 100. All subbase thicknesses are 4" minimum.

The Asphalt Base is a Type B-12.5 with a thickness of 4" to 7" thick (see **Design Standards – Section 514**). The White Base will receive a thickness adjustment as shown above in 11.4.3.2, and the Asphalt Base will receive a thickness adjustment calculated from the spread rate (extracted from the **Asphalt Roadway – Daily Report of Quality Control** as shown in 11.4.3.1.3). However, the spread rate will be converted to inches. The inches are added to the thickness adjustment of the White Base, and a total is generated of the Composite Base for a thickness adjustment not to exceed 105%.

See **Appendix C** for Example of Composite Base Thickness Adjustment

11.4.3.3 COMPOSITE PAY FACTOR (CPF) ADJUSTMENTS

Once a LOT is closed and it has been determined by the Verification Technician (VT) that a CPF adjustment must be made, the adjustment shall be made during the month the LOT is closed 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 and LOT tonnages on the monthly/progress estimate.

These revised unit price adjustments can range from 75% to 105%. LOTs shall be grouped together for each unit price adjustment when applicable.

CPF adjustments in Site Manager will be handled by adjusting the unit price by the appropriate CPF [see **Appendix D**, Example (2) (A) and (2) (B)]. Show the calculations under the pay item on the **Plan Summary Box** in the **Plans** or break out the percentage adjustments for the adjusted item(s). See **Appendix D**; Example (3).

Note: Plan Quantity vs. the quantity shown on the Asphalt Roadway – Daily Report of Quality Control (QCRR) - In some instances, this Report will show more or less square yards than the 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 in the QCRR not match plan quantity square yards; the square yards will be adjusted on the last CPF Adjustment to equal Plan Quantity. The PA needs to use reasonable investigation to see if plan quantity is in error and warrants an adjustment.

CPF Adjustments apply to Superpave Base, Friction, Structural, Composite Base (Asphalt portion), and Asphalt Treated Permeable Base Courses. There will be no CPF adjustments on Miscellaneous Asphalt, Turnout Construction (Asphalt), and Temporary Asphalt. (Reason: Temporary asphalt is placed and removed. The Department will not pay for temporary asphalt separately – it is always included in the quantity for another pay item such as temporary detour. Miscellaneous Asphalt and Turn out Construction Asphalt are not tested and are accepted on a visual basis. These pay items will have a CPF of 1.00 - no adjustment).

11.4.3.3.1 Resident Office's Responsibility

The Project Engineer and the Verification Technician (VT) are responsible for verifying the Contractor's Quality Control (CQC) Technician's test results entered in the Material's Acceptance and Certification (MAC) system and that the CPF reports are correct. The CPF adjustments shall be made at the closing of a LOT for the life of the Contract. See example of ***LOT Submittal Package*** (See ***Section 11.1; Attachment No. 11-1-2 and 11-1-2a thru 11-1-2e of this Manual***). 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 electronically (the original asphalt tickets (white tickets) will be scanned with the LOT Submittal Package. The hard copies will be destroyed.***

11.4.3.3.2 Pay Factor Material Documentation- Materials Acceptance Resolution (MAR)

MAR (previously known as Disposition of Defective Materials (DDM)), in some instances, the Project Manager/Administrator will require removal and replacement of tonnage within a LOT due to material defect. This defective asphalt may be a partial subplot, an entire subplot, or an entire LOT. The QC Technician should identify the problem before an entire LOT is placed. The defective asphalt will then be milled and replaced with asphalt from another LOT. The original ***LOT Submittal Package*** will be explained with remarks as "No Pay" with reference to the new replacement ***LOT Submittal Package***. The replacement material is to be paid in the ***Lot Submittal Package*** at the appropriate CPF for that lot's production with references and remarks to the defective material LOT Submittal Package.

Note: The reports should reflect what actually happens in each LOT.

(A) Composite Pay Factors < 80 and ≥ 75

- (1) Remove and replace the tonnage in this *LOT* at no cost to the Department. Notate ***LOT Submittal Packages*** as underlined above
- (2) Obtain an Engineering Analysis, if agreed to by the PA, to determine if material may remain in place. If material is to remain in place, apply the

CPF for this LOT. If the material is to be removed and replaced, notate **LOT Submittal Packages** as underlined above.

- (3) The Engineer, at his/her sole option, may perform an evaluation to leave the defective material in place and apply the CPF for this LOT.

(B) Composite Pay Factor < 75

Remove and replace the tonnage in this *LOT* at no cost to the Department. Notate **LOT Submittal Packages** as underlined above.

(C) Independent Verification (IV) Test Failure

Remove and replace the tonnage in this *LOT* at no cost to the Department. Notate **LOT Submittal Packages** as underlined above.

Example 1:

LOT 3 had defective asphalt for which the PA, after concurrence from the District Construction/Bituminous Engineer, required removal and replacement. The PA identified the area in writing to the Contractor. The Contractor removed the defective asphalt at the Contractor's expense and replaced with asphalt from LOT 5. The replacement asphalt will be paid based on LOT 5's CPF with remarks identifying the area and replacement tonnage represented in LOT 3.

For example, the replacement tonnage equals 249 tons. The ***LOT Submittal Package*** for LOT 3 will be explained with remarks as "No Pay" with reference to the replacement asphalt included in the ***LOT Submittal Package*** for LOT 5. The ***LOT Submittal Package*** for LOT 5 will clearly identify that 249 tons was produced to replace defective asphalt produced in LOT 3, with references and remarks. The 249 tons will be included in LOT 5 and paid at the LOT 5 CPF.

(D) Individual Quality Control (QC) Test

In some instances, an individual QC test will bring the CPF down and require removal and replacement (CPF <80). The original lot is then paid based on the outcome of the CPF (A or B above). The Contractor may perform an ***Engineering Analysis Report (EAR)***, if approved by the PA, to isolate the tonnage that needs to be removed rather than the entire LOT. The affected material will be deducted from the original ***LOT Submittal Package***. The original ***LOT Submittal Package*** will be explained with remarks for this material as "No Pay" with reference to the new replacement ***LOT Submittal Package***. The replacement material is to be paid in the ***LOT Submittal***

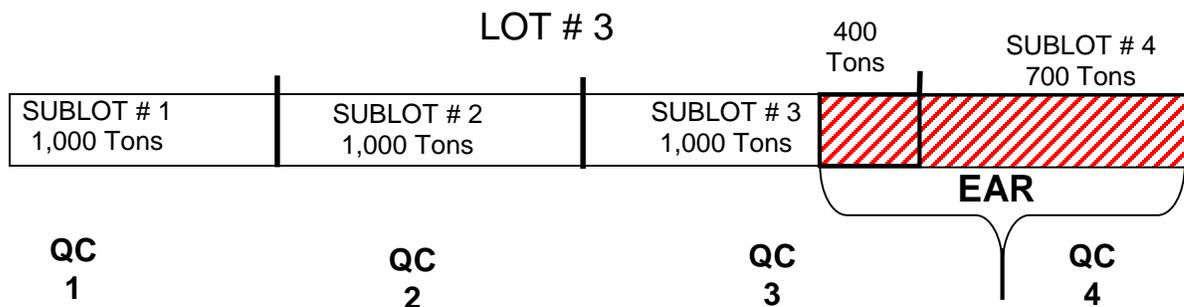
Package at the appropriate CPF for that lot's production with references and remarks to the defective material **LOT Submittal Package**.

Note 1: If all material in a subplot is removed and replaced, the QC test for that subplot will be thrown out and the CPF for the LOT will be based on the remaining subplot QC test results. MAC will automatically adjust the CPF accordingly.

Note 2: 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.

See **Appendix D**; Example (1) e-mail from the District Material's Office (DMO) to the PA with Number of tests and costs, and Example (2) (A) and (2) (B) for reporting cost resolution testing in Site Manager.

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 used 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 (1,100 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 as removal and replacement of asphalt material (on MAR's). For example; the Bituminous Adjustment for the asphalt that was rejected by the amount of 1,100 Tons will be deducted on the monthly bituminous certification submitted by the Contractor for the period reflecting Sublots 3 & 4 that were placed previously.

Likewise, the monthly bituminous adjustment for the replaced 1,100 Tons of asphalt will be included on the monthly bituminous certification related to the period when the replacement will take place. Explanations and references will be made on the bituminous certification sheets and the **LOT Submittal Packages** in question to address the removal and replacement quantity.

See **Appendix F** for an example on how to handle removal and replacement tonnage on the QCRR. The link will take you to the State Construction Site where a MAR Removal Example is shown and a Straightedge Correction example is shown.

See **Appendix D**; Examples (4), (5), (6) and (7) for CPF calculations.

11.4.3.4 BITUMINOUS ADJUSTMENTS

Asphalt produced and accepted on a project will receive a bituminous adjustment if requirements are met, per **Specifications 9-2.1.2** (see note below for exceptions). The requirements are original Contract time of more than 365 calendar days or more than 5,000 tons of asphalt concrete on conventional and Lump Sum (LS)/Design Build (DB) Contracts.

There will be no Bituminous Adjustments on Optional Base Pay Items unless the Designer specifies Black Base only on the Typical Section in the Plans.

Bituminous Adjustments will be made on Superpave Asphalt Base, Structural and Friction Courses, Turnout Construction "Asphalt", Asphalt Treated Permeable Base, on Miscellaneous Asphalt Pavement, and on Asphalt Rubber Membrane Interlayer Pay Items.

The Department will adjust the price for bituminous material, excluding cutback and emulsified asphalt to reflect increases or decreases in the **Asphalt Price Index (API)** of bituminous material from that in effect during the month in which bids were received. The Department will determine the API for each month and place it on the State Construction Website. When an estimate is generated, Bituminous Adjustments must be calculated per **Specifications** using the **Asphalt Price Index Table** and a line item adjustment will be added to or subtracted from the estimate as a line item adjustment in Site Manager by the PA.

The Average Price Indexes for Bituminous and Polymer (for Unmodified Binders 67 & lower, and for Modified Binders 76 and higher) are posted on the State Construction Office Website. **Asphalt Price Indexes** can be found on the Department's State Construction Website at www.dot.state.fl.us/Construction/fuel&bit/fuel&bit.htm.

The Department will also make a Bituminous Adjustment for Polymer (Unmodified Binders 67 or lower and Modified Binders 67 and higher) on all Contracts that meet the criteria of **Section 9-2.1.2** of the **Specifications**. The Criteria for Polymers will be as stated above.

Note: When a Composite Base item(s) is specified in the Plans, a price adjustment for bituminous material will apply to that asphalt portion of the base only, according to Section 9-2.1.2 of the Specifications.

11.4.3.4.1 CONTRACTOR'S RESPONSIBILITY

It is the Contractor's responsibility to provide the Department a Certification of Quantities using the Department's forms available on the State Construction's website at:

<http://www.fdot.gov/construction/fuel&bit/FuelForms.shtm>

The Certification will be turned in monthly to the PA for payment.

11.4.3.4.2 CUTOFF PERIOD

All **Certifications of Quantities** or worksheets provided by the Contractor will need to represent the amount of material placed on the project and accepted by the Department during the estimate cutoff period. The estimate cutoff dates are provided on the State Construction Office Website at <http://www.dot.state.fl.us/Construction/CONSTADM/EstimatesCutOff.shtm>.

Below is an example to show how the estimate cutoff dates are to be used in processing the **Certification of Quantities** or Worksheets submitted by the Contractor.

EXAMPLE 1: Conventional Project

The cutoff date for Progress Estimate #18 is July 17th, 2016. See the snapshot of the cutoff dates that are listed on the State Construction Website below.

The Contractor's Certification of Quantities should reflect all material placed and accepted from June 13th, 2016, thru July 17th, 2016 (day after cutoff date of previous month to cutoff date of present month). On Conventional Projects, the Contractor will use **Form 700-050-66** which is the **Certification of Quantities Form** for Bituminous Material. On this Form, the July bituminous index will be used for the example mentioned above. Once the Contractor fills out the Set-Up sheet, and clicks on "Go to Main Sheet" (located at bottom of the form) the **Certification of Quantities Form** will appear all filled out with quantities for pay. The Contractor will sign this form and turn it in to the PA monthly for payment. Also see **Appendix E**, Example (1) (A) and (1) (B) of **Form 700-050-66** (Set up and certification sheets) filled out by a Contractor for a Conventional Project

Example of the Cut-Off dates for 2016 on the State Construction Website

2016		
January 17, 2016	February 21, 2016	March 20, 2016
April 17, 2016	May 15, 2016	June 12, 2016 (2nd Sunday)
July 17, 2016	August 21, 2016	September 18, 2016
October 16, 2016	November 13, 2016 (2nd Sunday)	December 18, 2016

Note: for LS/DB projects, the Contractor will use the worksheets, also provided on the State Construction Website.

11.4.3.4.3 RESIDENT OFFICE PERSONNEL RESPONSIBILITY

It is the responsibility of the Resident Office (RO)/Construction Consulting Engineering Inspection (CCEI) personnel to make sure that the Contractor adjusts the bituminous material monthly on each project assigned to them that meets the criteria specified in **Section 9** of the **Specifications**. Once the Contractor turns in a certification or worksheet, the RO/CCEI personnel, in charge of the Contract, will spot check the form/worksheet for quantity errors, indexes, dates, etc.

It is the responsibility of the PA to enter the adjustments as a line item adjustment in Site Manager. The adjustments can be negative or positive.

11.4.4 LIST OF APPENDICES FOLLOWING THIS CHAPTER

Appendix A Pay Quantity Adjustments

Example (1) SY Pay Item Negative Adjustment	Page No. 13
Example (2) SY Pay Item Positive Adjustment within 105%	Page No. 15
Example (3) SY Pay Item Adjustment Exceeding 105%	Page No. 17
Example (4) Tonnage Pay Item "No Adjustment"	Page No. 19
Example (5) Tonnage Pay Item Exceeding 105%	Page No. 20
Example (6) Tonnage Pay Item within 105% Adjustment	Page No. 23
Example (7) Tonnage Miscellaneous Asphalt Adjustment	Page No. 25

Appendix B Thickness Adjustment (Core Out) (White Base)

Example (1) Positive Core-out Adjustment	Page No. 26
Example (2) Negative Core-out Adjustment	Page No. 27
Example (3) Deficient Area Adjustment	page No. 28

Appendix C Thickness Spread Rate Adjustment Composite Base

Example (1)	Page No. 29
-------------	-------------

Appendix D Composite Pay Factor Examples

Example (1) Resolution Test Results –email	Page No. 30
Example (2) (A) Pay for CPF in Site Manager	Page No. 31
Example (2) (B) CPF "Remarks" in Site Manager	Page No. 32
Example (3) CPF Calculation in Plan Summary Box	Page No. 333
Example (4) CPF Tonnage Pay Item Calculations	
Example (4) (A) CPF < 80 and ≥ 75	Page No. 34
Example (4) (B) CPF is > 80 and < 100	Page No. 35
Example (4) (C) CPF = 100%	Page No. 36
Example (4) (D) CPF > 100%	Page No. 37
Example (5) CPF Calculation on SY Pay Items	Page No. 38
Example (6) CPF Calculations on CY Pay Items	Page No. 39
Example (7) CPF for Multi FIN under one Contract	Page No. 40

Appendix E Bituminous Adjustment Calculations on Conventional Projects

Example (1) (A) Form 700-050-66 Set-Up Sheet	Page No. 42
Example (1) (B) Certification Sheet by Contractor	Page No. 43

Appendix F GUIDANCE FOR REMOVAL AND REPLACEMENT ON THE QCRR, LINK.

Page No. 43

APPENDIX A
105% Adjustments on Square Yard Pay Items (Plan Quantity)

EXAMPLE (1): Negative Adjustment

A negative adjustment could occur when the Contractor places less tonnage than planned.

Given:

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 = \$50.35 per SY

Design Thickness = 9"

G_{mm} used for PQ determination per Specification 334-1.4 = 2.540 for Dense Graded Asphalt

The Contractor will lay the 9" in 3 courses; 3" each course

The Design Spread Rate = $2.540 \times 43.3 \times 9 = 989.84 = 990$ Lbs/SY

The Target Spread Rate = 330 Lbs/SY per Lift ($990 \div 3 = 330$ Lbs/SY based on the Specifications 334-1.4)

Total Tons Placed on the Project = 22,890 Tons

From the Asphalt Roadway – Daily Report of Quality Control, three Design Mixes were used and their recorded tonnages:

Mix 1 with 17,451 Tons at G_{mm} of 2.561

Mix 2 with 3,780 Tons at G_{mm} of 2.599, and

Mix 3 with 1,659 Tons at G_{mm} of 2.488

What is the Final Pay?

Solution:

1. The Tonnage-Weighted G_{mm} is calculated first

$$\text{Tonnage-Weighted } G_{mm} = [(17,451 \times 2.561) + (3,780 \times 2.599) + (1,659 \times 2.488)] \div (17,451 + 3,780 + 1,659)$$

$$= (44,692 + 9,824.2 + 4,127.5) \div 22,890$$

$$\text{Tonnage-Weighted } G_{mm} = 2.562$$

2. The Adjusted PQ Tonnage is calculated second

$$\text{The Adjusted PQ Tons} = \frac{(\text{PQ Area} \pm \text{Any Revisions}) \times t \times 43.3 \times 2.562}{2000}$$

$$= \frac{46,800 \text{ (there were no revisions)} \times 9 \times 43.3 \times 2.562}{2000}$$

$$\text{Adjusted PQ Tonnage} = 23,362.8 \text{ Tons}$$

3. Last we obtain the pay adjusted area

$$\begin{aligned} \text{The Pay Adjustment} &= \text{PQ Area X Ratio of } \left(\frac{\text{Tonnage Placed on Project}}{\text{Adjusted PQ Tons}} \right) - 1 \\ &= 46,800 \text{ SY X } [(22,890 \div 23,362.8) - 1] \\ &= 46,800 [- 0.0202] \\ \text{Pay Adjustment (SY)} &= -947 \text{ SY} \end{aligned}$$

Note:

1. Since there were no Plan Errors or Field Revisions in this example, the Contractor will receive payment for the full PQ Area of 46,800 SY in Site Manager (Asphalt Base is a PQ SY pay item). However,
2. Due to less asphalt being placed (per **Specifications, Section 330-6.1.5**, the spread rate is within plus or minus 5% of the target spread rate). In this case, a minus 2% due to the negative ratio of 0.0202. This is within the 5% range, and since there were no other deficiencies, the Contractor will be deducted 947 SY; ($- 947 \times \$ 50.35 = - \$ 47,681.45$). This will be entered in Site Manager as a negative Line Item Adjustment.
3. The Contractor will receive a Bituminous Adjustment for all the asphalt produced and accepted, per **Specifications**, if applicable.
4. Fuel Adjustment: (see Typical Section in the Plans. Fuel Adjustments for Optional Base Asphalt should be the only option given. If not, this pay item will not receive a fuel adjustment). If there is an adjustment, a - 947 SY will be deducted from this pay item in Site Manager, entered as a negative Line Item Adjustment. See **Chapter 5, Section 5.14** of this Manual for Fuel Adjustments.
5. For CPF's to be deducted or added they must be < or > 1. See CPF calculations for SY pay items under **Section 11.4.3.4.2 (E)**.

APPENDIX A
105% Adjustments on Square Yard Pay Items (Plan Quantity)

EXAMPLE 2: Positive Adjustment within the maximum 105% allowed

Given:

A project with Superpave Base Asphalt, Type B (12.5), Group 15

PQ Area = 46,800 SY

Contractor placed 24,340 Tons

Three Design Mixes with recorded tonnages; they are:

Mix 1 with 18,451 Tons at G_{mm} of 2.561

Mix 2 with 4,780 Tons at G_{mm} of 2.599, and

Mix 3 with 1,109 Tons at G_{mm} of 2.488

What is the Final Pay?

Solution:

$$1. \text{ Tonnage-Weighted Average} = \frac{[(18,451 \times 2.561) + (4,780 \times 2.599) + (1,109 \times 2.488)]}{(18,451 + 4,780 + 1,109)}$$

$$= \frac{(47,253 + 12,423.2 + 2,759.2)}{24,340}$$

$$= \frac{62,435.4}{24,340}$$

$$\text{Tonnage Weighted } G_{mm} = 2.565$$

$$2. \text{ The Adjusted PQ Tons} = \frac{(\text{PQ Area} + \text{Any Revisions}) \times 9 \times 43.3 \times 2.565}{2000}$$

$$= \frac{46,800 \text{ (no revisions)} \times 9 \times 43.3 \times 2.565}{2000}$$

$$\text{Adjusted PQ Tonnage} = 23,390.1 \text{ Tons}$$

$$3. \text{ The Pay Adjustment} = \text{PQ Area} \times \text{Ratio of } \left(\frac{\text{Tonnage Placed on Project}}{\text{Adjusted PQ Tons}} \right) - 1$$

$$= 46,800 \text{ SY} \times [(24,340 \div 23,390.1) - 1]$$

$$= 46,800 [0.0406]^*$$

$$\text{Pay Adjustment} = 1,901 \text{ SY to be added as a positive line item adjustment}$$

***Note:**

1. Since there were no Plan Errors or Field Revisions in this example, the Contractor will receive payment for the full PQ Area of 46,800 SY in Site Manager. However,
2. The 0.0406 is 104% < the 105% adjustment. This adjustment is per Specifications: the Contractor can receive up to 105% adjustment of the Design Area multiplied by the ratio of the adjusted PQ Tonnage. The Contractor will receive a positive Line Item Adjustment for the 1,901 SY in Site Manager.
3. The Contractor will receive a + 1,901 SY Fuel Adjustment in Site Manager shown as a Line Item Adjustment, if applicable (see note under example 1).
4. For Bituminous Adjustments, the Contractor will get paid for all the asphalt produced and accepted.
5. CPF will be paid accordingly; CPF < 1 or > 1 will be adjusted in Site Manager as negative or positive Line Item Adjustments. See calculations for SY pay items under **Section 11.4.3.4.2 (E)**.

APPENDIX A
105% Adjustments on Square Yard Pay Items (Plan Quantity)

EXAMPLE 3: Adjustments exceeding the 105% limit

Given:

A project with Superpave Base Asphalt, Type B (12.5), Group 15

Tons placed = 24,950 Tons

PQ Area = 46,800 SY

The three Design Mixes used and their recorded tonnages are:

Mix 1 with 18,451 Tons at G_{mm} of 2.561

Mix 2 with 4,780 Tons at G_{mm} of 2.599, and

Mix 3 with 1,719 Tons at G_{mm} of 2.488

$$1. \text{ Tonnage-Weighted Average} = [(18,451 \times 2.561) + (4,780 \times 2.599) + (1,719 \times 2.488)] \div (18,451 + 4,780 + 1,719)$$

$$= (47,253 + 12,423.2 + 4,276.9) \div 24,950$$

$$= 64,253.1 \div 24,950$$

$$\text{Tonnage Weighted } G_{mm} = 2.563$$

$$2. \text{ The Adjusted PQ Tons} = \frac{(\text{PQ Area} + \text{Any Revisions}) \times t \times 43.3 \times 2.563}{2000}$$

$$= \frac{46,800 \times 9 \times 43.3 \times 2.563}{2000}$$

$$\text{Adjusted PQ Tonnage} = 23,371.9 \text{ Tons}$$

$$3. \text{ The Pay Adjustment} = \text{PQ Area} \times \text{Ratio of } \left(\frac{\text{Tonnage Placed on Project}}{\text{Adjusted PQ Tons}} \right) - 1$$

$$= 46,800 \text{ SY} \times [(24,950 \div 23,371.9) - 1]$$

$$= 46,800 [0.0675]^*$$

$$= 3,159 \text{ SY}$$

* 0.0625 or 106% is > 105%, and per **Specifications**, the Contractor can only receive up to 105% adjustment of the Design PQ Area multiplied by the ratio of the adjusted PQ tonnage.

Therefore, the corrected adjustment will be:

$46,800 \times 0.05 = 2,340$ SY (the Contractor has already placed this amount + more. We pay up to 105% only)

Pay Adjusted Area = 2,340 SY (this will be added as a + line item adjustment)

Note:

1. Since there were no Plan Errors or Field Revisions in this example, the Contractor will receive payment for the full PQ Area of 46,800 SY in Site Manager.
2. The Contractor will receive a positive Line Item Adjustment for the 2,340 SY in Site Manager.
3. The extra tonnage placed will be deducted from the CPF Sheet, the Fuel (if this item receives a fuel adjustment), and from the Bituminous Sheets. The equivalent Tonnage will need to be calculated from the extra Square Yards = $2,925 \text{ SY} - 2,340 \text{ SY} = 585 \text{ SY}$

Calculating the Tonnage from the 585 SY:

$$\begin{aligned} \text{The Adjusted PQ Tons} &= \frac{(\text{PQ Area} \pm \text{Any Revisions}) \times 9 \times 43.3 \times 2.565}{2000} \\ &= \frac{(585 \times 9 \times 43.3 \times 2.565)}{2000} \\ &= 292.4 \text{ Tons to be deducted from Fuel (if applicable),} \\ &\text{Bituminous and CPF (this will be done on the last Bituminous,} \\ &\text{Fuel and CPF Work Sheets/Certifications). See CPF} \\ &\text{calculations for SY pay items under } \mathbf{Section\ 11.4.3.4.2\ (E)}. \end{aligned}$$

APPENDIX A 105% Adjustments on Tonnage Pay Items

EXAMPLE (4): No Adjustment

This example is rare, but could happen: Contractor placed less Tonnage than Planned. This example is for a Contract with two FPID's

To calculate for an adjustment of up to 105% for Project A & Project B, given the following:
From the Contract and per **Specifications 334-1.4**: for Dense Graded Structural or Friction Courses a $G_{mm} = 2.540$ will be used to determine design quantities

Project "A" Plan Quantity Tons show 13,754.3 Tons

Project "B" Plan Quantity Tons show 91.1 Tons

Total PQ Tons from Contract and Plans = 13,845.3 Tons Total PQ Area (SY) =173,622 SY

Project "A":

Total asphalt placed = 13,345.0 Tons placed

Three Design Mixes were used corresponding G_{mm} 's per the QC Report:

Mix1; $G_{mm} = 2.599$ at Tons 9,000.0;

Mix 2; $G_{mm} = 2.615$ at 2,500.0 Tons and

Mix 3 $G_{mm} = 2.578$ at 1,845.0 Tons

Project "B" total Asphalt placed = 89.2 Tons

With one Design Mix and one corresponding G_{mm} :

Mix 1; $G_{mm} = 2,599.0$ at 89.2 Tons

Total Tonnage placed on this Contract = 13,434.2 Tons placed on the two projects

Per **Specifications** Friction Course pay item quantity (or Structural Asphalt) is paid up to a maximum of 105% of the adjusted plan quantity for the pay item, and where the

$$\text{Adjusted PQ Tons} = \frac{(\text{PQ Tons} \pm \text{Any Revisions}) \times \text{Tonnage-Weighted } G_{mm}}{\text{Design } G_{mm}}$$

And the Tonnage-weighted $G_{mm} =$

$$\frac{(\text{Tons}_{\text{Mix 1}})(G_{mm, \text{Mix 1}}) + (\text{Tons}_{\text{Mix 2}})(G_{mm, \text{Mix 2}}) + (\text{Tons}_{\text{Mix n}})(G_{mm, \text{Mix n}})}{\text{Tons}_{\text{Mix 1}} + \text{Tons}_{\text{Mix 2}} + \text{Tons}_{\text{Mix n}}}$$

1. On this Contract; Design Mix 1 for Projects A & B = 9,000.0 + 89.2 = 9,089.2 Tons

$$\begin{aligned} \text{Tons Weighted-G}_{mm} &= \frac{(9,089.2 \times 2.599) + (2,500.0 \times 2.615) + (1,845 \times 2.578)}{9,089.2 + 2,500.0 + 1,845.0} \\ &= (23,622.8 + 6,537.5 + 4,756.4) \div 13,434.2 \end{aligned}$$

Tonnage Weighted-G_{mm} = 2.599 for total Contract

2. The Adjusted PQ Tons = $\frac{13,845.3 \text{ Tons} \times 2.599}{2.540}$

= 14,166.9 Tons

3. And Maximum Pay Tons = 1.05 X Adjusted Plan Quantity Tons
= 1.05 X 14,166.9
= 14,875.2 Tons Maximum that we pay up to.

However, the Contractor only placed 13,434.2 Tons total for Contract.
So we can only pay up to what the Contractor placed.

Contractor will get paid for
Project A = 13,345.0 Tons
Project B = 89.2 Tons

If the CPF is < or > than 1; Contractor will receive a negative or positive adjustment. See CPF calculations for tonnage pay items under **Section 11.4.3.4.2 (E)**.

If applicable per Specifications, Contractor will also receive Fuel & Bituminous adjustments on the asphalt placed and accepted.

APPENDIX A
105% Adjustments on Tonnage Pay Items

EXAMPLE (5): Exceeding the 105% Adjustment

What if Contractor placed More Tonnage than what was planned for?
Total Tons placed = 14,950 Tons on both projects under this Contract?

Given the following:

From the Contract and per **Specifications 334-1.4**: For Dense graded Structural or Friction Courses a $G_{mm} = 2.540$ will be used for design quantities.

Project "A" Plan Quantity Tons show 13,754.3 Tons
Project "B" Plan Quantity Tons show 91.1 Tons
Total PQ Tons from Contract and Plans = 13,845.3
Tons Total PQ Area (SY) = 173,622 SY

Total Tons placed and accepted on both projects = 14,950 Tons
Project "A" Total Asphalt Placed = 14,419.8 Tons
Three Design Mixes were used with the corresponding tonnages:
 Mix 1; $G_{mm} = 2.599$ at 9,000.0 Tons;
 Mix 2; $G_{mm} = 2.615$ at 2,500.0 Tons and
 Mix 3; $G_{mm} = 2.578$ at 2,919.8 Tons

Project "B" Total Asphalt Placed = 530.2 Tons
 Mix 3: $G_{mm} = 2.578$ and tonnage = at 530.2 Tons

For Mix 3 total Tons = 530.2 + 2,919.8 = 3,450.0 Tons at $G_{mm} = 2.578$

$$1. \text{ Tons-Weighted } G_{mm} = \frac{(9,000.0 \times 2.599) + (2,500.0 \times 2.615) + (3,450.0 \times 2.578)}{9,000.0 + 2,500.0 + 3,450.0}$$

$$\text{Tons-Weighted } G_{mm} = (23,391 + 6,537.5 + 8,894.1) \div 14,950 = 2.597$$

$$2. \text{ The Adjusted Plan Quantity Tons} = \frac{13,845.3 \text{ Tons} \times 2.597}{2.540}$$

$$\text{Adjusted PQ Tons} = 14,156.0 \text{ Tons}$$

$$3. \text{ Max Pay Tons} = 1.05 \times \text{Adjusted Plan Quantity Tons}$$

$$\text{Max Pay Tons} = 1.05 \times 14,156.0 = 14,863.8 \text{ Tons}$$

Note:

1. Contractor placed more than the maximum tonnage allowed per Specifications (pay up to 105% of the adjusted PQ Tonnage) so we will pay what the Contractor placed on both projects = 14,863.8 Tons and deduct the difference from the tonnage placed on the last report.
2. Tonnage Placed = 14,950.0 Tons
Maximum pay up to 105% = 14,863.8 Tons
 $14,950.0 - 14,863.8 = 86.2$ Tons to be deducted total, and
% Project A = $(13,754.3 \div 13,845.3) 100 = 99\%$ or 0.99
% Project B = $(91.1 \div 13,845.3) 100 = 1\%$ or 0.01

For Project "A" $-86.2 \times 0.99 = -85.3$ Tons is deducted from Project A and
For project "B" $-86.2 \times 0.01 = -0.9$ Tons is deducted from Project B
These adjustments will be entered in Site Manager as negative Line Item Adjustments.

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

3. 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 = \$ 50.05;

$$0.02 \times \$ 50.05 = + \$ 1.0010 = +\$ 1.00 \text{ (New Unit Price)}$$

Note: Round to two decimal points for calculations involving Dollar amounts. Use all decimal places for mathematical functions, other than Dollar amounts, then round to the appropriate decimal place at the end for the final amount/quantity.

For project A: + \$ 1.00 X - 85.3 Tons = - \$ 85.30 deduct, and
For project B: + \$ 1.00 X - 0.9 Tons = - \$ 0.90 deduct

4. The **Asphalt Roadway – Daily Report of Quality Control** will display tons, area, mixes used, and spread rates.
5. Fuel and Bituminous Adjustments will also be deducted if the Contractor places more tonnage than the maximum allowed of up to 105%. The tonnage will be deducted using the last Fuel adjustment index in Site Manager and on the final Bituminous Certification accordingly.

See **Section 11.5** for other asphalt pavement deficiencies and examples such as straight edge deficiencies. Also see **Appendix F**, Examples (1) and (2) for thickness and spread rate calculations on multi and single layers.

APPENDIX A 105% Adjustments on Tonnage Pay Items

EXAMPLE (6): Within the 105% Adjustment - Open Graded FC-5

Given the following:

Open graded Friction Course as specified in **Section 337-8.2** of the **Specifications** using Gsb = 2.635 (on all the equations shown previously for Tonnage pay items, the G_{mm} will be substituted for Gsb). For open graded FC, only one layer of asphalt is placed.

Total PQ Tons from Plans and Contract = 13,936.5 Tons

Total PQ Area (SY) = 173,622 SY

Total Tons placed and accepted on project = 14,650 Tons

Three Design Mixes were used with Tonnages:

Mix 1; Gsb = 2.638 at 9,000.0 Tons;

Mix 2; Gsb = 2.640 at 2,500.0 Tons and

Mix 3; Gsb = 2.636 at 3,150.0 Tons

1. Tonnage-Weight Gsb =

$$\frac{(\text{Tons}_{\text{Mix 1}})(G_{\text{sb, Mix 1}}) + (\text{Tons}_{\text{Mix 2}})(G_{\text{sb, Mix 2}}) + (\text{Tons}_{\text{Mix n}})(G_{\text{sb, Mix n}})}{\text{Tons}_{\text{Mix 1}} + \text{Tons}_{\text{Mix 2}} + \text{Tons}_{\text{Mix n}}}$$

$$\begin{aligned} \text{Tons-Weighted Gsb} &= \frac{(9,000.0 \times 2.638) + (2,500.0 \times 2.640) + (3,150.0 \times 2.636)}{9,000.0 + 2,500.0 + 3,150} \\ &= (23,742.0 + 6,600 + 8,303.4) \div 14,650 \end{aligned}$$

$$\text{Tonnage-Weighted Gsb} = 2.638$$

2. Adjusted Plan Quantity Tonnage =

$$\frac{(\text{Plan Quantity Tons (per Contract)} \pm \text{any change(s)}) \times \text{Tonnage-Weighted Gsb}}{\text{Design Gsb}}$$

$$\begin{aligned} \text{Adjusted PQ Tons} &= (13,936.5 \times 2.638) \div 2.635 \\ &= 13,952.4 \text{ Tons} \end{aligned}$$

$$\begin{aligned} 3. \text{ Max Pay Tons} &= 1.05 \times \text{Adjusted Plan Quantity Tons} \\ &= 1.05 \times 13,952.4 \\ &= 14,650.0 \text{ Tons Maximum that we pay up to.} \end{aligned}$$

The Contractor placed the exact tonnage that we could pay up to. Therefore, Contractor will get paid the total tonnage placed which equals up to the 105% per Specifications.

The Contractor will receive Fuel and Bituminous adjustments for the total asphalt that was placed and accepted. Also the CPF if > or < than 1 will be adjusted in Site Manger.

APPENDIX A
105% Adjustments on Tonnage Pay Items

EXAMPLE (7): Payment of up to 105% on Miscellaneous Asphalt:

Original Area = 800 SY; there were no Engineer Field Changes

Original PQ Tons = 80.00 Tons

Final Area = 800 SY

Final Tons = 90.5 Tons

G_{mm} as specified in **Section 334-1.4** of the **Specifications** = 2.540

Only one Mix was used for this pay item $G_{mm} = 2.544$

1. Tonnage Weighted $G_{mm} = (90.5 \text{ Tons} \times 2.544) \div 90.5 = 2.544$
2. Adjusted Plan Quantity Tons = $(80.0 \text{ Tons} \times 2.544) \div 2.540$
= 80.1 Tons
3. $1.05 \times 80.1 = 84.1$ Tons maximum that we can pay

And $90.5 - 84.1 = 6.4$ Tons will be deducted from the Bituminous and Fuel reports.

Note: There will be no CPF adjustment on Miscellaneous Asphalt. This pay item does receive Fuel & Bituminous adjustments per **Specifications**.

APPENDIX B
THICKNESS ADJUSTMENTS FOR OPTIONAL BASE (CORE OUT) (WHITE BASE)

EXAMPLE (1): Positive Core-Out Adjustment Calculations

Type: Limerock, Plan Thickness = 7.00"
Plan Quantity Area = 8,000 SY
Final Area = 8,000 SY
Specifications allow 1/2" per **Section 285-7**
Actual Average Core-out Report Thickness = 7.50"

Calculated Average Thickness = $\frac{7.50" - 7.00"}{7.00"} = 0.071428571^* \times 100 = 7.1428571 \% > 5\%^{**}$

*Make sure to use the floating decimal to calculate over or under the 105%.

0.071428571 is over 7%. It exceeds the 5% stated in the **Specifications, Section 285-8..**

Maximum Thickness Adjusted Area = 8,000 SY X 0.05 = 400 SY Thickness Adjustment
The Department will pay the Contractor the 8,000 SY area per plan, and can only pay up to 400 SY for the maximum thickness adjustment per **Specifications**. 400 SY will need to be shown as a positive line item adjustment in Site Manager.

APPENDIX B
THICKNESS ADJUSTMENTS FOR OPTIONAL BASE (CORE OUT) (WHITE BASE)

EXAMPLE (2): Negative Core-Out Adjustment Calculations

Type: Limerock Plan Thickness = 8.00"
Plan Quantity Area = 10,500 SY
Final Area = 10,000 SY
Specifications allow 1/2" per **Section 285-7** of the **Specifications**

Actual Average Core-out Report Thickness = 7.79" (See Note 1)

Calculated Average Thickness = $\frac{7.79" - 8.00"}{8.00"} = - 0.0262500^* < 5\%$

- 0.0262500 is a negative 2% and within the 5%.

The Maximum Thickness Adjustment Area = - 0.026250 X 10,500 SY = - 275.6 = - 276 SY
(Negative Thickness Adjustment)

The Department will pay the Contractor the 10,500 SY area per plan, and has to deduct 276 SY for the negative thickness adjustment.

- 276 SY will need to be shown as a negative line item adjustment

*Make sure to use the floating decimal on your calculator to come up with either the negative or positive adjustment.

Note 1: Any Core-out average less than the plan specified thickness (in this example, anything less than 8") will be considered a negative adjustment.

Note 2: Any shy area on the Core-out report is excluded from the Core-out average calculation. Shy areas will need to be corrected by scarifying and adding additional base material. Or if authorized by the Engineer, it may be left in place without correction and at no pay (per **Specifications 285-6.2**). See Example (3) for a deficient area left in place with no pay calculation.

**APPENDIX B
 DEFICIENCY ADJUSTMENTS FOR OPTIONAL BASE (CORE OUT) (WHITE BASE)**

EXAMPLE (3): Deficient Area Calculation (area left in place with No Pay)

From the last page of the core out report seen below:

FDOT V4.2.2 6/2008 Updated Report and type selection									
CORE-OUT AVERAGES								PAGE NO 6	
DATE PROC: 2/8/2016						DISTRICT 5			
PROJECT NO. 123456-1-52-01						Date 06/08/2015			
ROAD 40						MIN 12.00 MAX 13.00			
COUNTY MARION									
DATA IS IN ENGLISH						VALUES ARE IN INCHES			
STATION	WIDTH	ACTUAL THICKNESS				SPECIFICATION ALLOWANCE			
		LEFT	CENTER	RIGHT	AVERAGE	LEFT	CENTER	RIGHT	AVERAGE
615+02	24		12.20		12.20		12.20		12.20
543+50	24	12.80			12.80	12.80			12.80
542+42	24			12.80	12.80		12.80		12.80
541+20	24		12.50		12.50		12.50		12.50
537+12	24			12.40	12.40		12.40		12.40
537+83	24		12.10		12.10		12.10		12.10
538+38	24	11.90			11.90	*SHY*			
532+40	24	12.40			12.40	12.40			12.40
534+21	24			12.00	12.00		12.00		12.00
535+10	24		12.10		12.10		12.10		12.10
525+95	24			12.30	12.30		12.30		12.30
527+30	24	12.30			12.30	12.30			12.30
529+05	24		12.20		12.20		12.20		12.20
522+45	24			12.00	12.00		12.00		12.00
523+71	24	11.90			11.90	*SHY*			
524+80	24		12.30		12.30		12.30		12.30
519+85	24		12.10		12.10		12.10		12.10
518+70	24			12.00	12.00		12.00		12.00
517+80	24	12.70			12.70	12.70			12.70
JOB AVERAGE		3269.80/ 259		12.6247		3242.50/ 257		12.6167	

On This project, the Plan thickness is 12.5 Inches. This report shows two (2) shy areas that will need to be addressed if the Contractor does not choose to correct by scarifying and adding additional base material. In this case, the Engineer authorized that the area be left in-place at no pay per **Specifications 285-6**.

- 1st shy core is at Station 538+38
- 2nd shy core is at Station 523+71

The Length of the deficiency is calculated from the closest non-deficient cores on each side of the deficient core.

In this example;

1st length is from Sta. 537+83 to Sta. 532+40 = 543 Ft.

2nd length is from Sta. 522+45 to Sta. 524+80 = 235 Ft.

Any shy area left in place at No Pay will be excluded from the core out average calculation and a deduction for the shy area will be made to the plan quantity.

Note: Preferably the Contractor, to his advantage, should revisit the shy cores to take additional cores to isolate the area. If this does not occur, the length will be taken from the core out report from the nearest acceptable core of each side of the deficient core which will increase the deducted area

Plan Thickness = 12.5 Inches

Plan Quantity Area = 30,000 SY

Total Length of Shy Area = 778 Ft.

Total Width of Shy Area = 24 Ft.

Calculate the Shy Area Left in Place at NO PAY:

$$\text{Shy Area} = \frac{L (\text{Ft.}) \times W(\text{Ft.})}{9 \left(\frac{\text{SF}}{\text{SY}} \right)}$$

$$\text{Shy Area} = \frac{(778 \text{ Ft})(24 \text{ Ft}')}{9 \text{ SF/SY}} = 2,075 \text{ SY Deduction}$$

APPENDIX C
EXAMPLE OF COMPOSITE BASE THICKNESS ADJUSTMENT

EXAMPLE (1): Thickness Adjustment; Pay item 285-709 –Base Group 9

Given

Composite base = 4" Limerock and 4" Type B-12.5 Asphalt (dense graded using $G_{mm} = 2.540$ from **Specifications, Section 334-1.4**).

Total SY area = 10,000 SY (5,000 SY for Limerock and 5,000 SY for Composite Base)
Core-out report for Limerock = 4.25". We will need to calculate the Asphalt Average Thickness

From **Asphalt Roadway-Daily Report of Quality Control** Report we have the following information: G_{mm} used 2.499 and Average Spread Rate = 459 Lbs/SY

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

$$43.3^* \times \text{inches} \times G_{mm}^{**}$$

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

** G_{mm} used on the project for this pay item

Core-out report for Limerock = 4.25"

Average spread rate for Asphalt Base = 459 Lbs/SY*** this is calculated from the QC Report

Plan Quantity = 10,000 SY

***Convert Lbs to inches based on reverse formula in **Section 234-8.1**

$$459 \div 43.3 \div 2.499 = 4.24" \text{ thickness of asphalt base}$$

4.25" (Limerock) + 4.24" (Asphalt) = 8.49" average thickness for composite base.

$$\text{Thickness adjustment} = \frac{(8.49" - 8.00")}{8.00"} = .0613 (>5\%) \text{ **** X Surface Area}$$

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

Thickness Adjustment = 0.05 X Surface Area

0.05 X 10,000 SY = 500 SY Thickness Adjustment, and 500 will need to be shown as a positive line item adjustment

**APPENDIX D
RESOLUTION TEST RESULTS**

**EXAMPLE (1):
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, 2015 @ 2:49 PM
To: Howard Jump (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)

APPENDIX D REPORTING COST OF RESOLUTION TESTING IN SITE MANAGER

EXAMPLE (2) (A):

The cost of the resolution testing, if performed by the Department and favors the Verification Technicians results, will be deducted from the Contractor's next progress estimate. The cost of the testing can be found at the following URL.

<http://www.dot.state.fl.us/statematerialsoffice/administration/resources/library/publications/index.shtml>

Resolution Testing Fees: If a Contract was let in January 2010 and a resolution test was done in January 2011, you would use the January 2010 year pricing index. In other words. The resolution testing fees are based on the year the Contract was let.

Line Item Adjustments

Contract ID : T7063 Estimate Nbr: 0019

Catg Nbr	Prj Nbr	Remarks (General Remarks) :	Entered Date
0300	40723315201	Coarse aggregate gradation resolution test for Lot # 6	11/03/11

Project Number: 40723315201 Line Item Number: 0040

Line Item Adjmt Detail Information :

Type: Resolution Testing Costs Entered By: cn982sc

Amount: .00 Entered Date: 11/03/11

Quantity: .00000

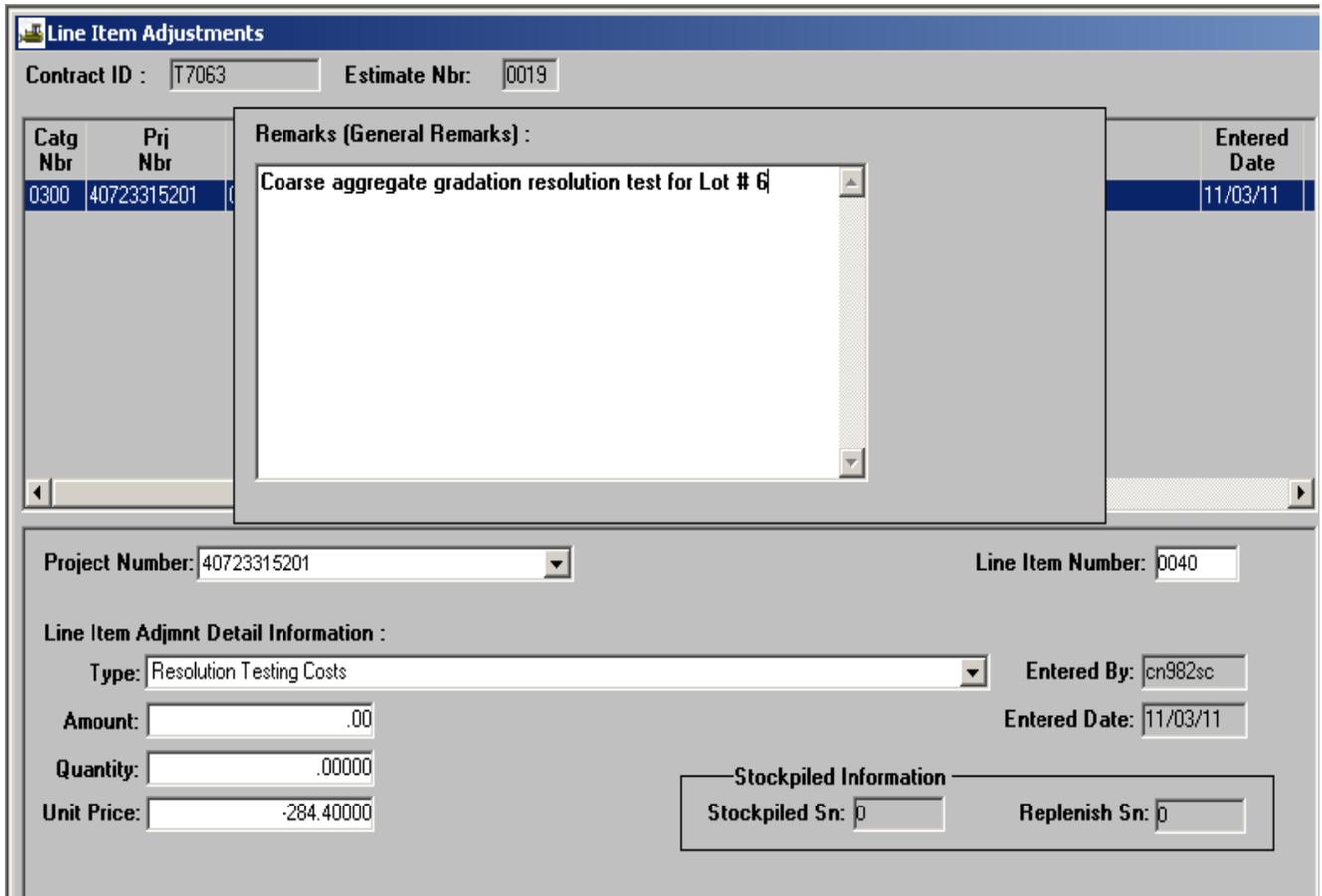
Unit Price: -284.40000

Stockpiled Information

Stockpiled Sn: 0 Replenish Sn: 0

APPENDIX D REPORTING COST OF RESOLUTION TESTING IN SITE MANAGER

EXAMPLE (2) (B):



Catg Nbr	Proj Nbr	Remarks (General Remarks)	Entered Date
0300	40723315201	Coarse aggregate gradation resolution test for Lot # 6	11/03/11

Contract ID : T7063 Estimate Nbr: 0019

Project Number: 40723315201 Line Item Number: 0040

Line Item Adjmnt Detail Information :

Type: Resolution Testing Costs Entered By: cn982sc

Amount: .00 Entered Date: 11/03/11

Quantity: .00000

Unit Price: -284.40000

Stockpiled Information

Stockpiled Sn: 0 Replenish Sn: 0

Under remarks: put what this test was for: In this case: (Coarse Aggregate Gradation Resolution for Lot 6). See attached letter from the Materials Office with resolution cost. Also see Chapter 11 of CPAM, Section 11-4 and Attachments 11-4-3 and 11-4-4-a & b.

APPENDIX D
EXAMPLE (3): Plan Summary Box for Superpave Asphaltic Concrete (Traffic B)
Documenting CPF Calculations

SUMMARY OF PAVEMENT														
PAY ITEM NO.	PAY ITEM DESCRIPTION	LOCATION		SIDE	AREA ID	LENGTH	WIDTH	UNIT	QUANTITY		TOTAL		DESIGN NOTES	CONSTRUCTION REMARKS
		STA. TO STA.	DESCRIPTION						P	F	P	F		
285-707	OPTIONAL BASE GROUP 07	Sta. 0+00 to 110+25				11250.0	24.0	SY	30000.00	V	30000.0	V		No Plan Errors No Field Revisions
														5200 @ .96 CPF*
														12100 @ 0.98 CPF
														12300 @ 1.02 CPF
														400 @ 1.02 CPF
														* See asphalt folder for CPF adjustments
														Typical Section indicates black bas only

APPENDIX D CPF ADJUSTMENT CALCULATIONS

EXAMPLE (4): CPF Calculation for Tonnage Pay items;

All documentation will be handled for < 80 and ≥ 75 or < 75 as shown in Example 3.

EXAMPLE (4) (A): If CPF is < 80 or ≥ 75

In this example, the CPF is @ 76%

LOT 2; 4000 Tons; Unit Price = \$ 50.05

$$0.76 - 1.0 = -0.24$$

$$-0.24 \times \$ 50.05 = -\$ 12.0120 = -\$ 12.01 \text{ (round to 2 decimals for the dollar amount)}$$

$-\$ 12.01 \times 4000 = -\$ 48,040.00$ (negative Line Item Adjustment in Site Manager). This is if the Engineer decides to leave in place at reduced price.

APPENDIX D CPF ADJUSTMENT CALCULATIONS

EXAMPLE (4) (B): If CPF is > 80 and < 100

In this example, the CPF is @ 98%

LOT 3; 4000 Tons; Unit Price = \$ 50.05

$0.98 - 1.0 = - 0.02$

$- 0.02 \times \$ 50.05 = - \$ 1.0010 = - \$ 1.00$ New Unit Price (round to 2 decimals for \$ amount)

$4,000 \text{ Tons} \times - \$ 1.00 = - \$ 4,000.00$ (This will be a negative Line Item Adjustment in Site Manager)

APPENDIX D CPF ADJUSTMENT CALCULATIONS

EXAMPLE (4) (C): If CPF = 100%

There is no CPF adjustment at 100%.

APPENDIX D CPF ADJUSTMENT CALCULATIONS

EXAMPLE (4) (D): If CPF is > 100%

In this example, the CPF is @ 103% (> 100% and up to 105%)

LOT 5; 4000 Tons; Unit price \$ 50.05

$$1.03 - 1.00 = 0.03$$

$$0.03 \times \$ 50.05 = \$ 1.5015 = \$1.50 \text{ New unit price (round to 2 decimal points for \$ amount)}$$

$$4,000 \text{ Tons} \times 1.50 = \$ 6,000.00 \text{ (Positive Line Item Adjustment in Site Manager)}$$

APPENDIX D CPF ADJUSTMENT CALCULATIONS

EXAMPLE (5) CPF for Square Yard Pay Items

CPF @ 105%; Square Yard Pay Item (Example Superpave Base):
Tons from Asphalt report; LOT 1 = 4000 Tons; Area = 25,397 SY;
Unit price = \$ 55.05
 $1.05 - 1.00 = 0.05$
 $0.05 \times \$ 55.05 = \$ 2.7525 = 2.75$ (New Unit Price) (round to 2 decimal points for \$ amount)
 $25,397 \text{ SY} \times \$ 2.75 = \$ 69,841.75$ (Positive Line Item Adjustment in Site Manager)

Note: Calculations for CPF <80 or ≥ 75 ; or < 75; > 80 and up to 105%; will also be calculated the same way. You will get the square yards represented by the LOT tonnage from the Asphalt Reports and calculate accordingly.

APPENDIX D CPF ADJUSTMENT CALCULATIONS

EXAMPLE (6): CPF Calculations for a Cubic Yard Pay Item

As described above, asphalt treated permeable base is measured and paid for in cubic yards. Therefore, we will get the cubic yards from the Asphalt Roadway – Daily Report of Quality Control, and calculate the adjustment as described in this example:

Example: from Asphalt Reports: LOT 3 @ CPF of 105%

Total Tonnage LOT 3 = 1623.55 Tons;

Total Square Yards LOT 3 = 9,494.13 SY

The Unit Price is \$ 240.05

The volume from the Asphalt Roadway – Daily Report of Quality Control = **1,055 CY**

Now we can calculate the dollar adjustment for this LOT:

$$1.05 - 1.00 = 0.05$$

$$0.05 \times \$ 240.05 = \$ 12.0025 = \$ 12.00 \text{ (round to 2 decimal points)}$$

$$1,055 \times \$ 12.00 = \$ 12,660.00 \text{ (Positive Line Item Adjustment in Site Manager)}$$

APPENDIX D CPF ADJUSTMENT CALCULATIONS

EXAMPLE (7): CPF Documentation for Multiple FIN Projects, 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 pay item breakout as provided in the plan set. This will be done by taking the total tons shown 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.

Given:

Project "A" shows 10,000 tons
Project "B" shows 20,000 tons
Total 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.

$$10,000 \div 30,000 = 0.33$$

$$\text{CPF @ 105\%} = 8,000 \times 0.33 = 2,640.00 \text{ tons}$$

$$\text{CPF @ 102\%} = 20,000 \times 0.33 = 6,600.00 \text{ tons}$$

$$\text{CPF @ 98\%} = 3,500 \times 0.33 = 1,155.00 \text{ tons}$$

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

$$20,000 \div 30,000 = 0.67$$

$$\text{CPF @ 105\%} = 8,000 \times 0.67 = 5,360.00 \text{ tons}$$

$$\text{CPF @ 102\%} = 20,000 \times 0.67 = 13,400.00 \text{ tons}$$

$$\text{CPF @ 98\%} = 3,500 \times 0.67 = 2,345.00 \text{ tons}$$

$$\text{Total CPF @ 105\%} = 2,640 + 5,360 = 8,000 \text{ tons}$$

$$\text{Total CPF @ 102\%} = 6,600 + 13,400 = 20,000 \text{ tons}$$

$$\text{Total CPF @ 98\%} = 1,155 + 2,345 = 3,500 \text{ tons}$$

Note 1: This may be done on Federal Aid participating and Non Federal Aid participating projects. These pro-rated amounts shall be shown in a file attached electronically to the **Plan Summary Box** along with the calculations, or the calculation could be shown at the bottom of the **Plan Summary Box** for Construction Remarks and calculations.

Note 2: For this example: 31,500 Tons placed by Contractor is 105% maximum of the original Contract quantity, which is allowed per **Specifications**.

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

APPENDIX E
Bituminous Adjustments on Conventional Projects

Example (1) (A): Form 700-050-66 – Set-Up Sheet by Contractor

Contractor's Certification of Quantities Asphalt Mixes with Modified and Unmodified Binders (Conventional Projects) Certification No. <u>18</u>			
Financial Project ID:	<u>12345615201</u>		
Contractor:	<u>MR. ED'S ASPHALT CO., INC.</u>		
Contract Number:	<u>T1234</u>		
From (Mo/Day/Yr):	<u>06/13/16</u>	To (Mo/Day/Yr):	<u>07/17/16</u>
Asphalt Mixes with Unmodified Binders (PG 67 & Lower)			
Pay Item Number:	<u>337-7</u>	Tonnage Placed:	<u>1000.0</u>
Pay Item Number:	<u>334-1</u>	Tonnage Placed:	<u>1000.0</u>
Pay Item Number:	<u></u>	Tonnage Placed:	<u></u>
Additional Gallons (ARMI*):	<u>500.0</u>		
Base Index Month:	<u>Jan-15</u>	Base Asphalt Price Index:	<u>2.3515</u>
Current Index Month:	<u>Jul-16</u>	Current Asphalt Price Index:	<u>1.3739</u>
		Asphalt Index Difference:	<u>-0.8600</u>
Asphalt Mixes with Modified Binders (PG 76 & Higher)			
Pay Item Number:	<u>337-7</u>	Tonnage Placed:	<u>1000.0</u>
Pay Item Number:	<u>334-1</u>	Tonnage Placed:	<u>1000.0</u>
Pay Item Number:	<u></u>	Tonnage Placed:	<u></u>
Base Index Month:	<u>Jan-15</u>	Base Polymer Price Index:	<u>2.9622</u>
Current Index Month:	<u>Jul-16</u>	Current Polymer Price Index:	<u>1.8822</u>
		Polymer Index Difference:	<u>-0.9319</u>
Asphalt Material (ASPHALT TREATED PERMEABLE BASE)			
Pay Item Number:	<u>334-1</u>	Tonnage Placed:	<u>500.0</u>
Base Index Month:	<u>Jan-15</u>	Base Asphalt Price Index:	<u>2.3515</u>
Current Index Month:	<u>Jul-16</u>	Current Asphalt Price Index:	<u>1.3739</u>
		Asphalt Index Difference:	<u>-0.8600</u>
Navigation and Printing Functions			
<input type="button" value="Go To Main Sheet"/>		<input type="button" value="Go To Last Month Sheet"/>	
<input type="button" value="Save As Month Sheet"/>		<input type="button" value="Remove Last Month Sheet"/>	
Effective January 2007 Lettin FORM: 700-050-66 (7/21/20)			

APPENDIX E Bituminous Adjustment on Conventional Projects

EXAMPLE (1) (B): Form 700-050-66 - CONTRACTOR'S CERTIFICATION OF QUANTITIES

CONTRACTOR'S CERTIFICATION OF QUANTITIES ASPHALT MIXES WITH MODIFIED AND UNMODIFIED BINDERS (CONVENTIONAL PROJECTS)		CONSTRUCTION 8/7/15
		CERTIFICATION NO. 18
FINANCIAL PROJECT ID:	<u>12345615201</u>	
CONTRACTOR	<u>MR. ED'S ASPHALT CO., INC.</u>	
CONTRACT NO.	<u>T1234</u>	
PERIOD REPRESENTED BY CERTIFICATION:		
FROM (MO/DAY/YR)	<u>06/13/16</u>	TO (MO/DAY/YR) <u>07/17/16</u>
ASPHALT MIXES WITH UNMODIFIED BINDERS (PG 67 & LOWER)		
BASE PRICE INDEX:	<u>2.3515</u>	CURRENT PRICE INDEX: <u>1.3739</u> INDEX DIFFERENCE: <u>-0.8600</u>
	TONNAGE	GALLONS
PAY ITEM NUMBER	<u>337-7</u>	<u>1,000.0</u>
		MONTHLY PAYMENT
		<u>-\$12,529.34</u>
PAY ITEM NUMBER	<u>334-1</u>	<u>1,000.0</u>
		MONTHLY PAYMENT
		<u>-\$12,529.34</u>
PAY ITEM NUMBER	<u></u>	<u></u>
		MONTHLY PAYMENT
		<u></u>
GALLONS OF ASPHALT CEMENT USED IN MIX: *		<u>29,138</u>
		MONTHLY PAYMENT
		<u>-\$25,058.68</u>
ADDITIONAL GALLONS (ARMI):		<u>500</u>
		MONTHLY PAYMENT
		<u>-\$430.00</u>
TOTAL GALLONS:		<u>29,638</u>
TOTAL MONTHLY PAYMENT:		<u>-\$25,488.68</u>
ASPHALT MIXES WITH MODIFIED BINDERS (PG 76 & HIGHER)		
BASE PRICE INDEX:	<u>2.9622</u>	CURRENT PRICE INDEX: <u>1.8822</u> INDEX DIFFERENCE: <u>-0.9319</u>
	TONNAGE	GALLONS
PAY ITEM NUMBER	<u>337-7</u>	<u>1,000.0</u>
		MONTHLY PAYMENT
		<u>-\$13,576.85</u>
PAY ITEM NUMBER	<u>334-1</u>	<u>1,000.0</u>
		MONTHLY PAYMENT
		<u>-\$13,576.85</u>
PAY ITEM NUMBER	<u></u>	<u></u>
		MONTHLY PAYMENT
		<u></u>
TOTAL GALLONS OF POLYMER USED IN MIX: *		<u>29,138</u>
TOTAL MONTHLY PAYMENT:		<u>-\$27,153.70</u>
ASPHALT MATERIAL (ASPHALT TREATED PERMEABLE BASE)		
BASE PRICE INDEX:	<u>2.3515</u>	CURRENT PRICE INDEX: <u>1.3739</u> INDEX DIFFERENCE: <u>-0.8600</u>
	TONNAGE	GALLONS
PAY ITEM NUMBER	<u>334-1</u>	<u>500.0</u>
		MONTHLY PAYMENT
		<u>-\$3,007.42</u>
TOTAL MONTHLY PAYMENT:		<u>-\$3,007.42</u>
I certify that, based on my personal knowledge and well-founded belief following my own reasonable investigation, the tons and gallons (metric tons and liters) represented by this Certification are true and correct.		
Contractor's Authorized Agent (Print Name & Co.)	<u>Mr. Ed's Asphalt Co., Inc.</u>	
	<u>Edward A. McDonalds</u>	
Contractor's Authorized Agent (Signature)		Date <u></u>

**APPENDIX F
GUIDANCE FOR REMOVAL AND REPLACEMENT ON THE QCRR**

EXAMPLE MAR REMOVAL (PAGE 1)

EXAMPLE STRAIGHT EDGE CORRECTION (PAGE 2)

SEE ATTACHED LINK:

<http://www.fdot.gov/construction/Asphalt/PDFFiles/MAR%20Straightedge%20and%20MAR%20Removal%20Instructions.pdf>