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**\*\*\*\*THIS IS A NEW APPENDIX. – PLEASE READ CAREFULLY.\*\*\*\***  
**TROUBLESHOOTING FLEXIBLE PAVING MIXTURES**

**PLANT TROUBLESHOOTING**

Asphalt Binder

If Computed Percent Binder is High:

- a. Check tank stick readings and computations.
- b. Check to be sure that all mix produced was included in the computations.
- c. Check for spilled, wasted, or otherwise used asphalt cement.
- d. Check to be sure all asphalt listed as **added** during the period should be included.
- e. Check truck scales and total mix made.
- f. Check cold-feed and pump setting.
- g. Check aggregate delivery level for uniformity.

If Computed Percent Binder is Low:

- a. Check tank stick readings and computations.
- b. Check total mix made.
- c. Check to be sure that all asphalt added during the period is included.
- d. Check cold-feed and pump setting.
- e. Check for plugged nozzle.
- f. Check pumping pressures.
- g. Check strainer screen.
- h. Check truck scales.

Gradation

Non-compliant cold-feed gradation and other production mix irregularities may result from the following causes:

- Sample not representative of lot (Multiple hot bins)
- Improper bin balance
- Test errors, weights, calculations, etc.
- Incorrect cold-feed settings
- Non-uniform cold-feed delivery
- Stockpile segregation
- Stockpile contamination
- Storage bin segregation
- Intermingling of aggregates in stockpiles and/or feeders
- Wet, non-uniform stockpiles
- Degradation

**MIX TROUBLESHOOTING**

The tables below are intended to provide guidance on dealing with the most common problems, which arise during the production of asphalt concrete mixture. The first table deals with problems, which can show up in the laboratory setting and the second table deals with problems, which can appear in the field.

The following example explains how to read the tables. Both tables are read downward. The shaded regions are the items to be considered for adjusting purposes.

**Lab Problem Table**

The first step is to identify which lab problem is occurring. If “Low Voids” is the identified problem, move down the column to the “Step 1 Check”. Assuming the first check is to be made on the “Binder Content”, move down the column to “Step 2 If”. If the Binder Content is high proceed to “Step 3 Verify”. Each of the shaded items identified in the “Step 3 Verify” should be looked at before proceeding further. Assuming that the items in “Step 3 Verify” are on target, go to “Step 4 Do”. In this case, the action to be taken in “Step 4 Do” is to “Lower Binder” in the mix. In all cases, the items in the “Step 3 Verify” are assumed to be within the allowable tolerances and won’t fall outside of allowable tolerances if the action in “Step 4 Do” is taken.

LAB PROBLEM		Low Voids	High Voids	Low Film Thickness	High Film Thickness	Low VMA	High VMA
Step 1-Check	Binder Content						
	Gradation						
	Agg. SG (Gsb)						
	Agg. Abs.						
Step 2-If	Low Binder						
	High Binder						
	Low -200						
	High -200						
	Off JMF Target						
Step 3-Verify	Filler Bitumen Ratio						
	Film Thickness						
	VMA						
	Field Compaction						
	Voids						
	Individual Agg. Sources						
Step 4-Do	Decrease Binder						
	Increase Binder						
	Lower -200						
	Increase -200						
	Adjust Agg. Proportions						
	Recompute Volumetrics						

**Field Problem Table**

The first step is to identify which field problem is occurring. If “High Field Voids” is the identified problem, move down the column to the “Step 1 Check”. Assuming the first check is to be made on the “Lab Voids”, move down the column to “Step 2 If”. If the Lab Voids are high proceed to “Step 3 Verify”. Each of the shaded items identified in the “Step 3 Verify” should be looked at

before proceeding further. Assuming that the items in “Step 3 Verify” are on target, go to “Step 4 Do”. In this case the process of looking at the “Step 3 Verify” would lead to the Lab Problem Table and cause one of the actions for High Lab Voids to be used.

In all cases, the items in the “Step 3 Verify” are assumed to be within allowable tolerances and won’t fall outside of allowable tolerances if the action in “Step 4 Do” is taken.

FIELD PROBLEM		Low Field Voids		High Field Voids		Tender Mix		Low Density Q.I.		Agglomerates	Uncoated Aggr.	Brown Rock	Stripping
Step 1 - Check	Stockpiles												
	Aggr. Absorption												
	Binder Content												
	Lab Voids												
	Film Thickness												
	Mixing Time												
	Moisture in Mix												
	Mix Temp at Plant												
	Mat Temp												
Step - 2	Low												
	High												
	Yes												
Step 3 - Verify	Filler/Bitumen Ratio												
	Film Thickness												
	Voids												
	Field Compaction												
	Aggr. Breakdown												
	Individual Aggr. Sources												
	Moisture												
	Amount of Clay binder												
	Go to Lab Problem Table												
Step 4 - Do	Increase Binder												
	Lower Temp												
	Increase Temp												
	Cover Loads												
	Increase Aggr. Dryer Time												
	Screen												
	Adjust Aggr. Proportions												
	Increase Wet Mixing Time												