

The Bailey Method

Achieving Volumetrics and Compactability

Day 1 – Monday

- I. Introduction** (slides 1-9) **1:00 – 2:15 p.m.**
- a. Aggregate Blending
 - b. Origin of the Bailey Method
 - c. 0.45 Power Curve
 - d. The Big Picture
 - i. Coarse-Graded
 - ii. Stone Matrix Asphalt
 - iii. Fine-Graded
- II. Aggregate Packing** (slides 10-20) **2:15 – 3:00 p.m.**
- a. What is Voids in the Mineral Aggregate (**VMA**)?
 - b. Aggregate Packing Factors
 - c. Defining Coarse and Fine
 - d. Primary Control Sieve
 - e. Volume vs. Weight
- Break** **3:00 – 3:15 p.m.**
- III. Conducting Unit Weight Tests** (slides 21-33) **3:15 – 5:00 p.m.**
- a. Coarse Aggregates (**9.5 mm NMAS or >**)
 - i. Loose
 - ii. Rodded
 - iii. Rules-of-Thumb
 - b. Fine Aggregates (**4.75 mm NMAS or <**)
 - i. Loose
 - ii. Rodded
 - iii. Rules-of-Thumb
 - c. Video of Laboratory Unit Weight Tests

Day 2 – Tuesday

- IV. Review Time** **8:00 – 9:00 a.m.**
- V. Mix Type** (slides 34-59) **9:00 – 2:30 p.m.**
- a. Defining Mix Type
 - b. Determining Mix Type
- Break** **10:00 – 10:15 a.m.**
- c. Comparing CA's With Different Specific Gravities
 - d. CA Chosen Unit Weight
 - i. Mix Type
- Lunch** **Noon – 1:00 p.m.**
- ii. Categorizing Aggregates as CA or FA (**Tab 1**)
 - iii. Converting from Volume to Weight (**Tab 2**)
- Break** **2:30 – 2:45 p.m.**
- VI. Evaluating the Combined Blend** (slides 60-92) **2:45 – 5:00 p.m.**
- a. Coarse-Graded Mixes
 - i. Ratios – CA, FA_c and FA_f
 - ii. Overview of the Four Principles
 - iii. Summary Table & Suggested Ranges Based on NMAS
 - b. Stone Matrix Asphalt Mixes
 - i. Ratios - Similarities & Differences to C-G Mixes
 - ii. Overview of the Four Principles
 - iii. Summary Table & Suggested Ranges Based on NMAS
- Break** **4:00 – 4:15 p.m.**
- c. Fine-Graded Mixes
 - i. Revised Ratios – New CA, New FA_c and New FA_f
 - ii. Overview of the Four Principles
 - iii. Summary Table & Suggested Ranges Based on NMAS

Day 3 – Wednesday

VII. Review Time	8:00 – 9:00 a.m.
VIII. Volumetrics vs. CA Volume (slides 93-105)	9:00 – Noon
a. Coarse Volume Influence	
b. Fine Fraction Influence	
c. Coarse Fraction Influence	
d. Degradation Issues	
e. Influence of CA Volume on Field Compactability	
i. Coarse-Graded Mixes	
ii. Fine-Graded Mixes	
	Break
f. Aggregate Packing Overview	10:15 – 10:30 a.m.
g. Minus PCS Material (Tab 3)	
h. Fine-Graded Mixes that “ACT” as Coarse-Graded Mixes	
	Lunch
	Noon – 1:00 p.m.
IX. Volume Blending Spreadsheet (VBS) (slides 106-109)	1:00 – 2:00 p.m.
a. Required Information	
b. Initial Blending Example (Tab 4)	
X. VBS – Including Recycle (slides 110-113)	2:00 – 3:00 p.m.
a. Determining the Combined Blend	
b. Evaluating the Combined Blend	
c. Additional Considerations	
d. Initial RAP Blending Example (Tab 5)	
	Break
	3:00 – 3:15 p.m.
XI. VBS – Evaluating Existing Mixes (slides 114-116)	3:15 – 5:00 p.m.
a. Virgin (Tab 6)	
b. RAP (Tab 7)	

Day 4 – Thursday

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| XII. Review Time | 8:00 – 9:00 a.m. |
| XIII. Finding a Starting Point (slide 117) | 9:00 – 9:30 a.m. |
| a. Mix Type | |
| b. Mix Needs (Tab 8) | |
| XIV. Laboratory Blending (slides 118-120) | 9:30 – 10:00 a.m. |
| a. Virgin Mixes | |
| b. RAP Mixes | |
| | Break 10:00 – 10:15 a.m. |
| XV. Estimating VMA and Voids (slides 121-129) | 10:15 – 2:00 p.m. |
| a. Coarse-Graded Example | |
| b. Fine-Graded Example | |
| c. Hand-Calculation Example (Tab 9) | |
| | Lunch Noon – 1:00 p.m. |
| d. Spreadsheet Overview (Tab 10) | |
| XVI. VMA and Voids Est Spreadsheets (slides 130-138) | 2:00 – 5:00 p.m. |
| a. Estimated vs. Actual Results | |
| b. Estimation Sheets with Values: | |
| i. Hand-Calculation Example (Tab 11) | |
| | Break 3:00 – 3:15 p.m. |
| ii. Coarse-Graded Example (Tab 12A) | |
| iii. Evaluating Multiple Trials Before Doing Lab Work (Tab 12B) | |
| iv. Fine-Graded Example (Tab 13) | |

Day 5 – Friday

- XVII. Review Time** **8:00 – 8:30 a.m.**
- XVIII. Est Examples for Class Eval** (slides 139-140, **Tabs 14-15**) **8:30 – 11:30 a.m.**
- a. Close with Rules-of-Thumb
 - b. Wrong Mix Type and Size
 - c. Importance of Determining FA Dips
 - d. Questionable Samples
 - e. Shape, Strength or Texture SHIFT
 - i. Includes Gradation and AC Content trend example
 - f. Gsb Gravity Issue
 - g. Adjusting AC Volume Correction for Voids Estimation
 - h. Evaluating a Proposed Blend Adjustment
- Break** **10:15 – 10:30 a.m.**
- XIX. Est Spreadsheets – Interpreting Values** (slides 141-150) **11:30 – 11:55 a.m.**
- a. VMA1 graph – Sample to Design
 - b. Voids1 graph – Sample to Design
 - c. VMA2 graph – Sample to Sample
 - d. Voids2 graph – Sample to Sample
 - e. Things to Watch For!
 - i. Sample Location and Source
 - ii. FA Dip – Range Limits vs. Actual Values
 - iii. Individual Principle with Max Change
 - iv. Other Highlighted Cells
 - v. Negative Pba Values
 - vi. “Spread” Between Diff in VMA and Diff in Voids
 - vii. Enter ALL the Gmb’s and Gmm’s!
 - viii. Relating Standard Deviation to Proposed Adjustments
 - ix. Gradation and AC Content should NOT track!
 - x. Adjusting the Factor Range Limits during Optimization
- XX. Summary and Closing Thoughts** (slides 151-153) **11:55 – Noon**