Good Asphalt Starts With Good Stone

Meeting The Needs Of A Demanding Market

February 20, 2025

45th APAWV Asphalt Paving Conference

Embassy Suites – Charleston, WV

Chadley Miller
Quarry Operations Manager
J. F. Allen Company

Asphalt Pavement Association OF WEST VIRGINIA

J.F. ALLEN COMPANY

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Why Good Asphalt ?

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Why Good Asphalt ?

- Satisfy the General Public
- Maximize Efficiency of Infrastructure Dollars
- Keep Asphalt as Viable Alternative to Concrete
- Get Paid For the Project

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What Is Good Asphalt ?

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What Is Good Asphalt ?

- Old Perspective:
  - "Make it black and don't look back."
  - "When it rains, pray it drains."

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What Is Good Asphalt ?

- **Modern Perspective:**

  - A CONSISTANT mix of Liquid Asphalt and Aggregate that meets ALL Specifications, is Relatively Simple to Produce, a Pleasure to Lay, Easily Compacted across a Variety of Field Conditions, AND is Smooth……

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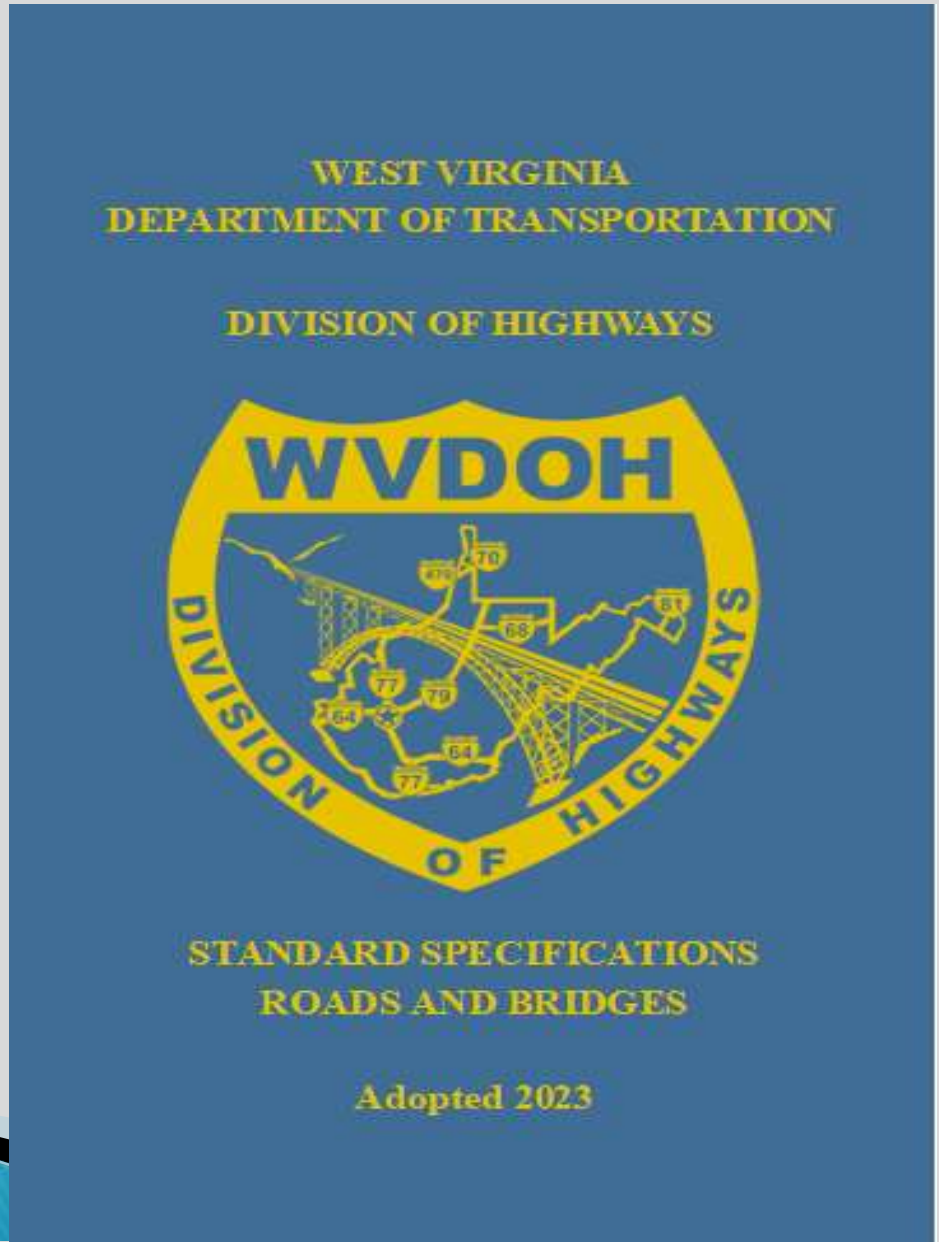

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What Is Good Asphalt ?

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 401

HOT MIX ASPHALT BASE, WEARING AND PATCHING AND LEVELING COURSES

DELETE THE ENTIRE CONTENTS AND THE TITLE AND REPLACE THE FOLLOWING:

SECTION 401

ASPHALT BASE, WEARING AND PATCHING AND LEVELING COURSES

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

SAMPLING COMPACTED ASPHALTIC MIXTURES FROM THE ROADWAY

1. PURPOSE

2. SCOPE

3. REFERENCED DOCUMENTS

4. EQUIPMENT

5. MEASUREMENT PROVISIONS

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

STANDARD METHOD OF MEASUREMENT FOR THICKNESS OF ASPHALT PAVEMENT USING DRILLED CORES

1. PURPOSE

2. SCOPE

3. REFERENCED DOCUMENTS

4. EQUIPMENT

5. MEASUREMENT PROVISIONS

GUIDE TO DETERMINING AVERAGE BASE AGGREGATE STRENGTH OF MULTI-LAYERED ASPHALT PAVEMENT SPECIMENS

1. PURPOSE

2. SCOPE

3. REFERENCED DOCUMENTS

4. APPARATUS

GUIDE TO DETERMINING AVERAGE BASE AGGREGATE STRENGTH OF MULTI-LAYERED ASPHALT PAVEMENT SPECIMENS

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

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MATERIALS PROCEDURE

1. PURPOSE

2. SCOPE

3. MATERIALS AND EQUIPMENT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

INDEX FOR EVALUATION OF ASPHALT PAVEMENTS WITH SUBSTANDARD PROPERTIES

1. PURPOSE

2. SCOPE

3. REFERENCED DOCUMENTS

4. REVIEW OF PROJECT DOCUMENTATION

1.0 PURPOSE

2.0 SCOPE

3.0 PROCEDURE

4.0 REPORTING

5.0 REFERENCED DOCUMENTS

6.0 KEY WORDS

88 Pages of “PWL” Stuff

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What Is Good Asphalt ?

- Specifications & MPs – Guidance / Parameters

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What Is Good Asphalt ?

- Specifications & MPs – Guidance / Definition
- Lab Testing – Volumetrics / Initial Indicators

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- Specifications & MPs – Guidance / Definition
- Lab Testing – Volumetrics / Initial Indicators
- Field Testing – Performance & Life Cycle Indicators

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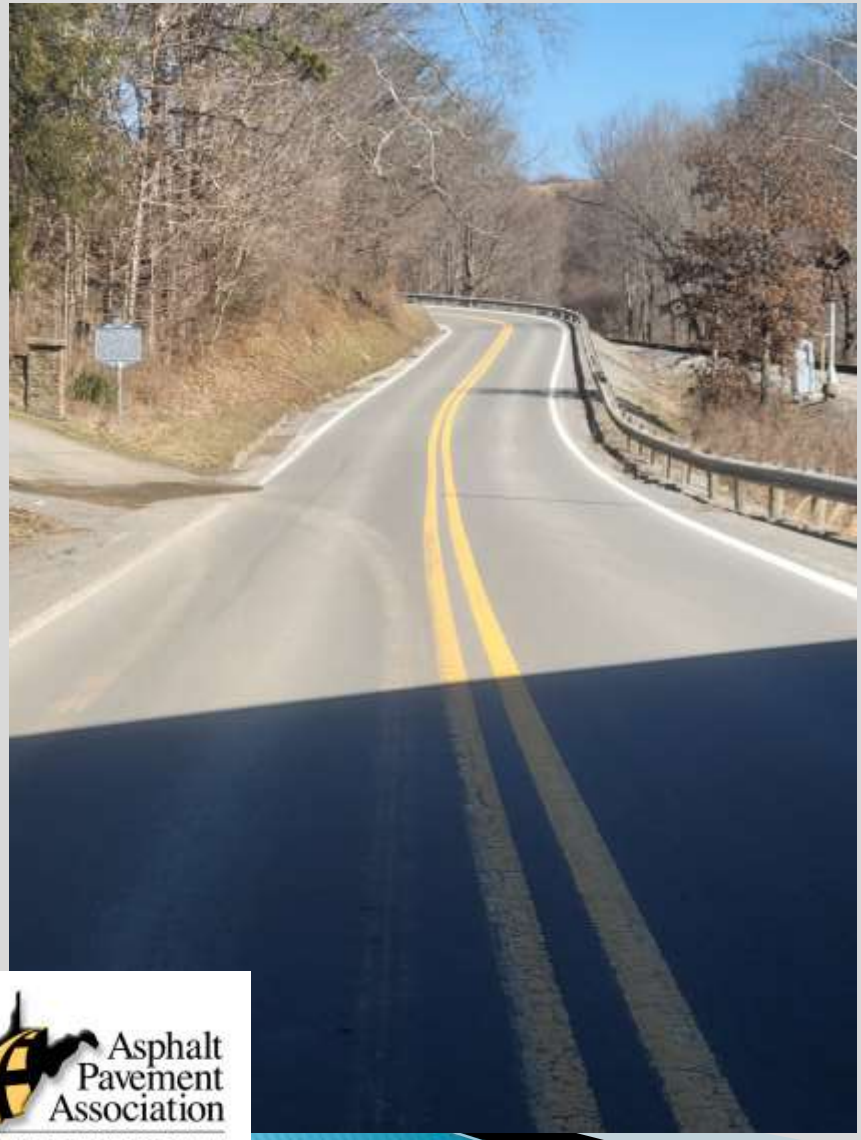

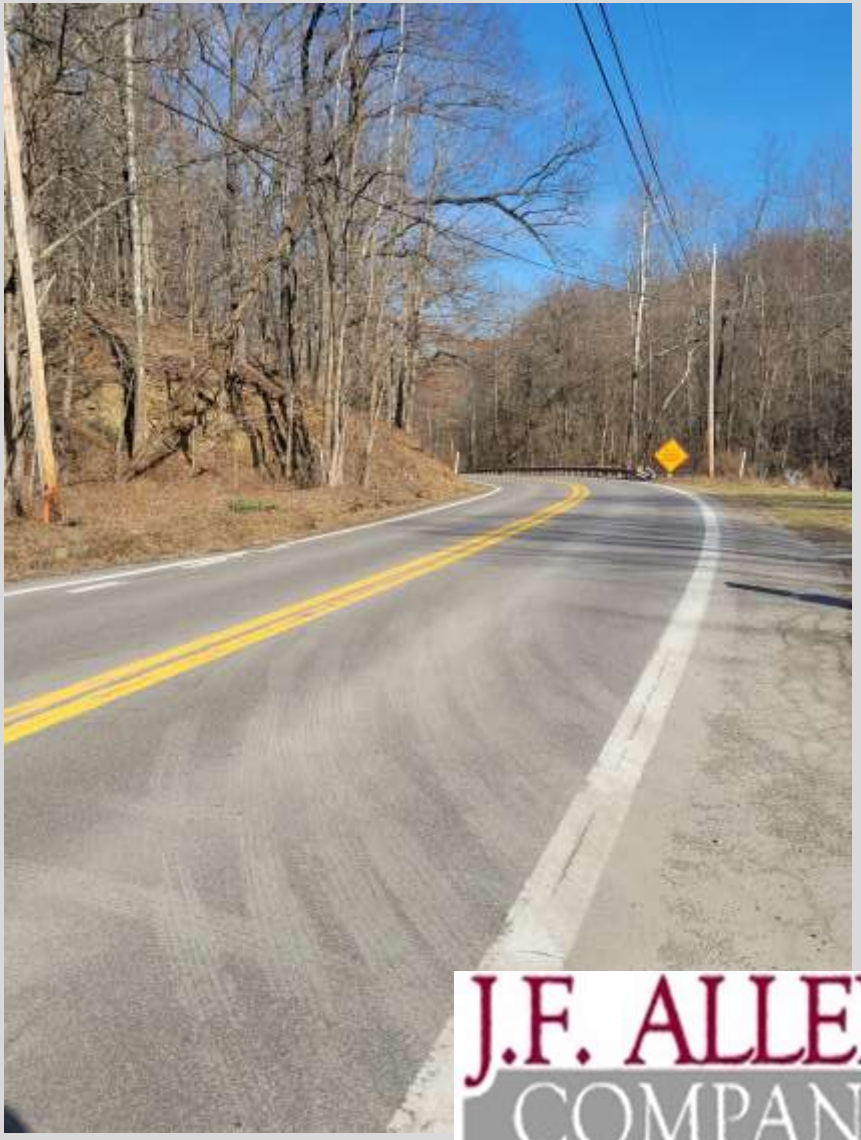

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What Is Good Asphalt ?

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What Is Good Asphalt ?

- Specifications & MPs – Guidance / Define Parameters
- Lab Testing – Volumetrics / Initial Indicators
- Field Testing – Performance & Life Cycle Indicators
- Monitoring – Track Actual Performance

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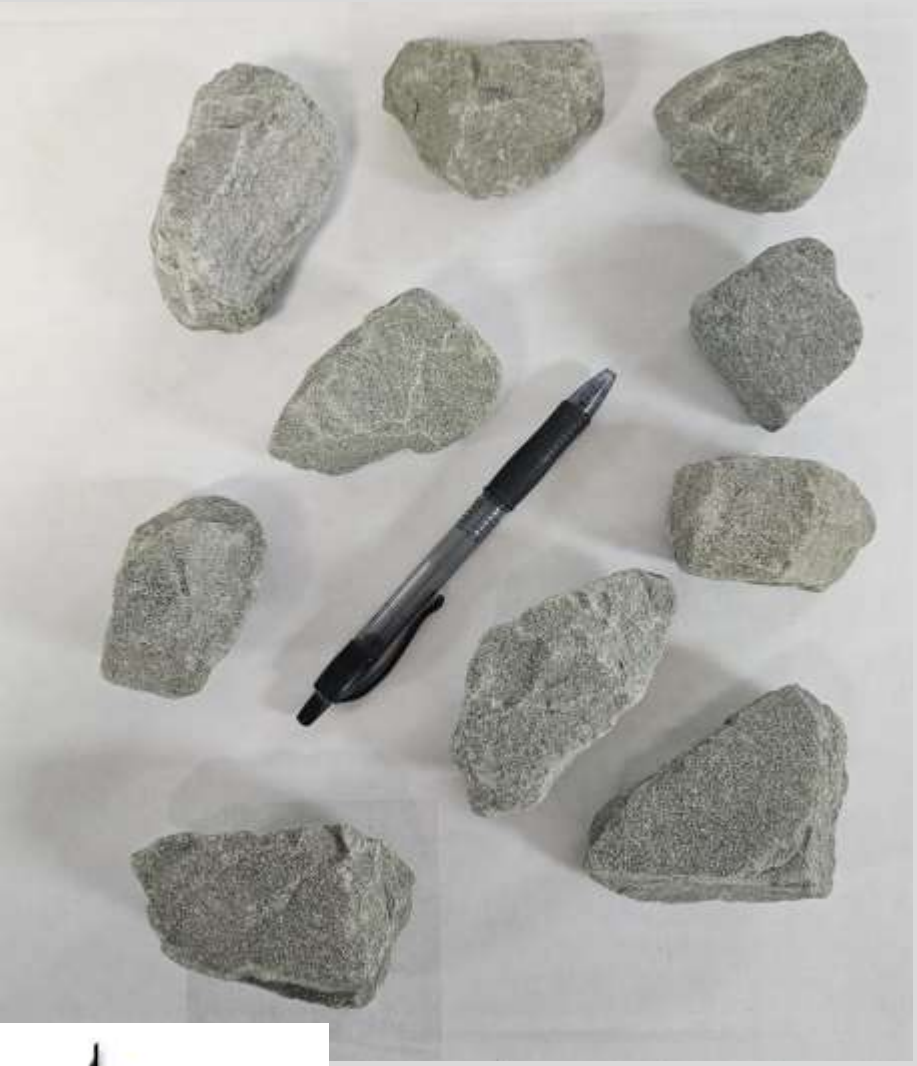
What Is Good Stone ?



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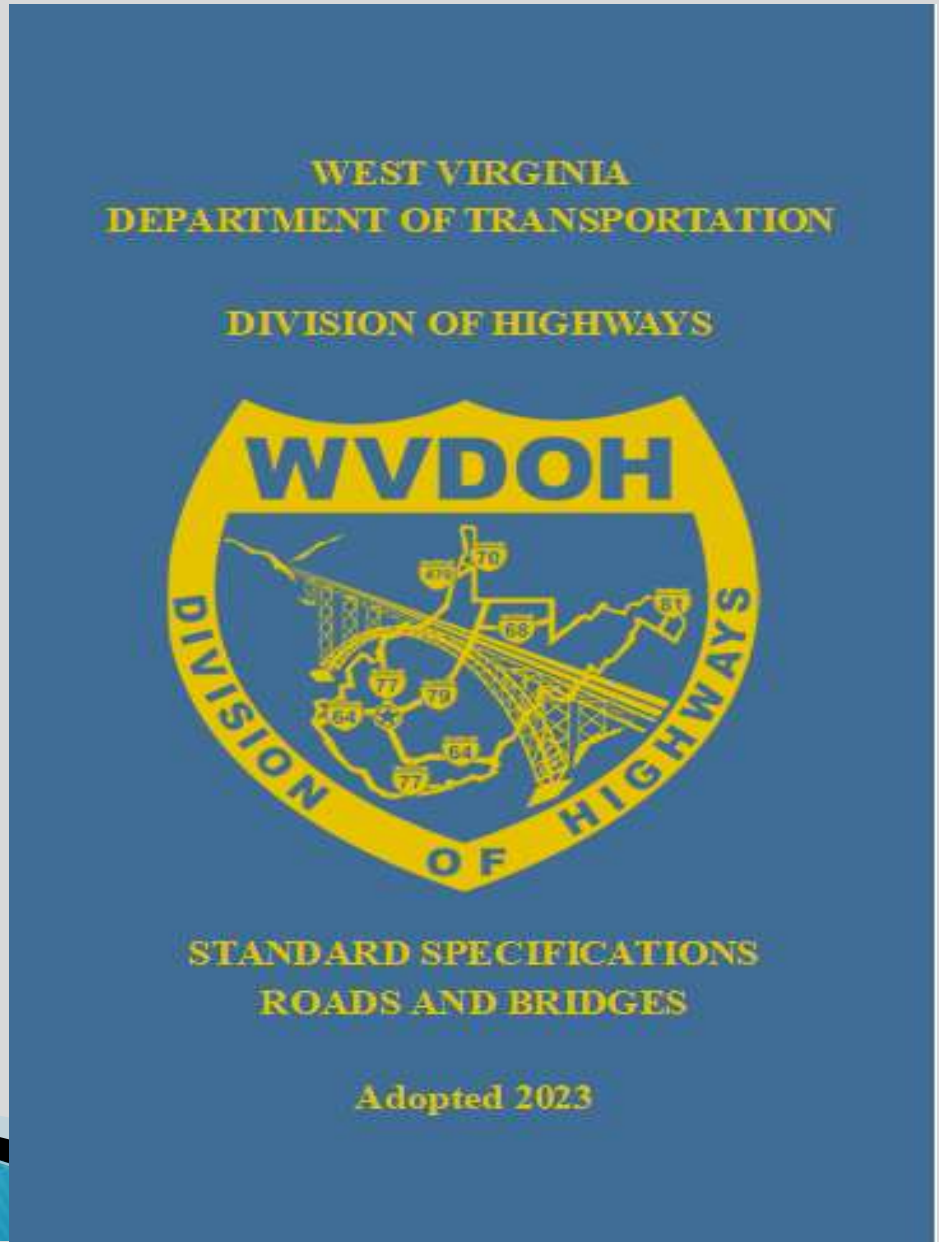

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What Is Good Stone ?

TABLE 703.4
STANDARD SIZES OF COARSE AGGREGATES (AASHTO M 43)

Size No.	Nominal Size Square Openings [1]	Amounts Finer Than Each Laboratory Sieve (Square Openings), Percent By Weight													
		4 in (100 mm)	3½ in (90 mm)	3 in (75 mm)	2½ in (63 mm)	2 in. (50 mm)	1½ in (37.5 mm)	1 in (25.0 mm)	3/4 in (19.0 mm)	1/2 in (12.5 mm)	3/8 in (9.5 mm)	No. 4 (4.75 mm)	No. 8 (2.36 mm)	No. 16 (1.18 mm)	No. 50 (300 µm)	No. 100 (150 µm)
1	**3½ to 1½ in** (90 to 37.5 mm)	100	90 to 100		25 to 60		0 to 15		0 to 5							
2	**2½ to 1½ in** (63 to 37.5 mm)			100	90 to 100	35 to 70	0 to 15		0 to 5							
24	**2½ to ¾ in** (63 to 19.0 mm)			100	90 to 100		25 to 60		0 to 10	0 to 5						
3	**2 to 1 in** (50 to 25.0 mm)				100	90 to 100	35 to 70	0 to 15		0 to 5						
357	**2 in to No. 4** (50 to 4.75 mm)				100	95 to 100		35 to 70		10 to 30		0 to 5				
4	**1½ to 3/4 in** (37.5 to 19.0 mm)					100	90 to 100	20 to 55	0 to 15		0 to 5					
467	**1½ in to No 4** (37.5 to 4.75 mm)					100	95 to 100		35 to 70		10 to 30	0 to 5				
5	**1 to 1/2 in** (25.0 to 12.5 mm)						100	90 to 100	20 to 55	0 to 10	0 to 5					
56	**1 to 3/8 in** (25.0 to 9.5 mm)						100	90 to 100	40 to 85	10 to 40	0 to 15	0 to 5				
57	**1 in. to No 4** (25.0 to 4.75 mm)						100	95 to 100		25 to 60		0 to 10	0 to 5			
6	**3/4 to 3/8 in** (19.0 to 9.5 mm)							100	90 to 100	20 to 55	0 to 15	0 to 5				
67	**3/4 in to No 4** (19.0 to 4.75 mm)							100	90 to 100		20 to 55	0 to 10	0 to 5			
68	**3/4 in to No 8** (19.0 to 2.36 mm)							100	90 to 100		30 to 65	5 to 25	0 to 10	0 to 5		
7	**1/2 in to No 4** (12.5 to 4.75 mm)								100	90 to 100	40 to 70	0 to 15	0 to 5			
78	**1/2 in to No 8** (12.5 to 2.36 mm)								100	90 to 100	40 to 75	5 to 25	0 to 10	0 to 5		
8	**3/8 in to No 8** (9.5 to 2.36 mm)									100	85 to 100	10 to 30	0 to 10	0 to 5		
89	**3/8 in to No 16** (9.5 to 1.18 mm)									100	90 to 100	20 to 55	5 to 30	0 to 10	0 to 5	
9	**No. 4 to No. 16** (4.75 to 1.18 mm)										100	85 to 100	10 to 40	0 to 10	0 to 5	
10	**No. 4 to 0 [2]** (4.75 mm to 0 [2])										100	85 to 100				10 to 30

[1] In inches, except where otherwise indicated. Numbered sieves are those of the United States Standard Sieve Series
[2] Screenings

Where standard size of coarse aggregate designated by two or three digit numbers are specified, obtain the specified gradation by combining the appropriate single digit standard size aggregates by a suitable proportioning device where has a separate compartment for each coarse aggregate combined. Performed the blending as directed by the Laboratory.

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What Is Good Stone ?

- Specifications – Guidance / Definine Parameters

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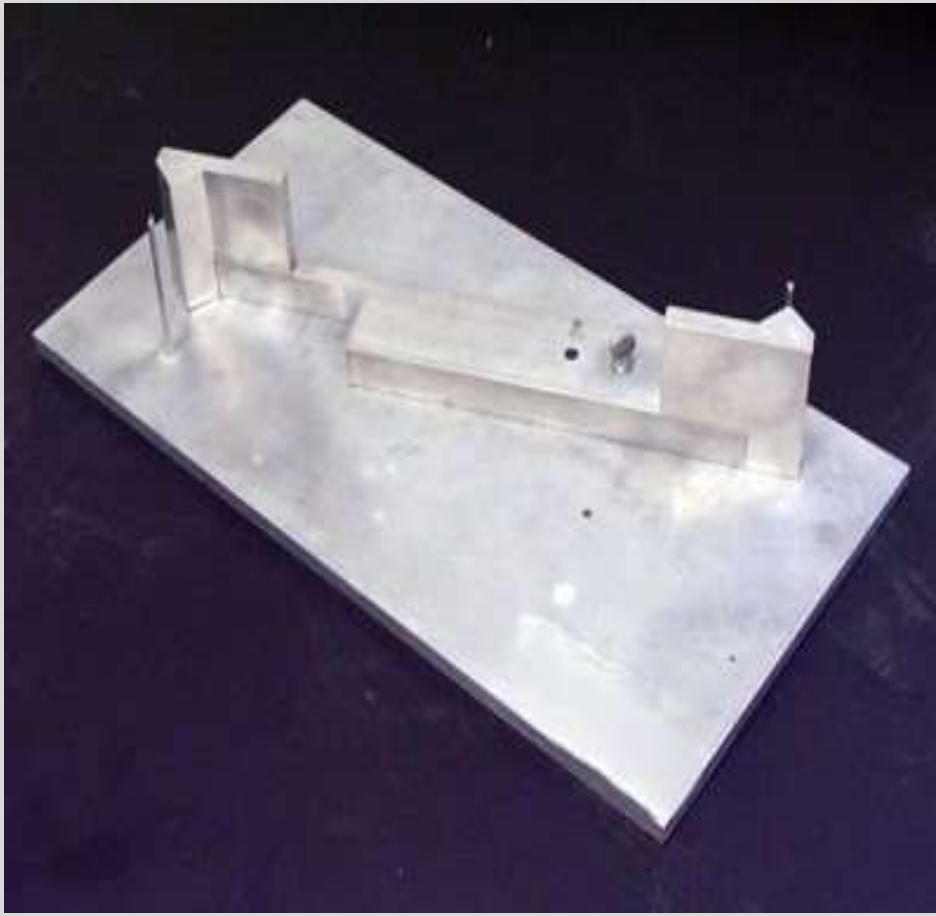

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What Is Good Stone ?

- Specifications & MPs – Guidance / Definine Parameters

- Lab Testing – Durability & Quality Indicators

1. Sodium Sulfate Soundness
2. LA Abrasion
3. Shale
4. Coal & Lightweights
5. Friables

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What Is Good Stone ?

- Specifications & MPs – Guidance / Definine Parameters

Asphalt – Tight Bands on many parameters

Stone – Wider Bands – Stockpile Gradations Don't Even Have To Pass

- Lab Testing – Durability & Quality Indicators

Asphalt – Every Day – Usually 2X Daily

Stone – Once a Year

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Stone Supply

- Asphalt Plants in WV :
  - Dependent – Aggregate Supply From an Outside Source (Another Company)
  - Self Reliant – Own Their Aggregate Source

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Managing Materials

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Shamblin Stone, Inc.
A CRH COMPANY

Managing Materials

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Shamblin Stone, Inc. A CRH COMPANY

Managing Materials

Dependent Plants :

- Received from External Supplier
- Minimal Control Over Product – Use Whacha' Got
- Asphalt Technicians Must Be Well Trained
- Less Flexibility With Scheduling Deliveries

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Managing Materials

Self Reliant Plants :

- Received From Own Sources
- Maximum Control Over Product
- Aggregate Technicians Must Be Well Trained
- More Flexibility With Scheduling Deliveries

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Stone Sources

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Stone Sources

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Stone Sources

- Aggregate Quarries in WV :
  - Underground – Stone Is Mined From Below the Surface
  - Open Pit – Overburden Is Removed Exposing Stone In Layers

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Stone Sources

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Stone Sources

- Underground:
  - Pros
    - Stone Is of More Consistent Quality
    - Environmental Conditions are Consistent
  - Cons
    - Heightened Safety Concerns
    - Not All Stone Is Recovered (Support)

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Stone Sources

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Stone Sources

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Stone Sources

- Open Pit :
  - Pros
    - More Stone Is Recovered
    - Working In “Normal” Environment
  - Cons
    - Stone Is Less Consistent (Quality)
    - Overburden Can Contaminate Clean Stone
    - Weather Has a Greater Effect On Process

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What Is Good Asphalt ?

- **Reminder:**

  - A CONSISTANT mix of Liquid Asphalt and Aggregate that meets ALL Specifications, is Relatively Simple to Produce, a Pleasure to Lay, Easily Compacted across a Variety of Field Conditions, AND is Smooth……

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Why Good Stone ?

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Why Good Stone ?

- Crushing Process:
  - Jaw Crusher – 40” Max Size → 10” Max
  - Cone Crusher – 10” x ¾” → 5” Max
  - VSI Crusher – 5” Max → 1 ½” Max
  - VSI Crusher – 1 ½” x ¾” → 1” Max

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Why Good Stone ?

- Crushing Process:
  - Jaw Crusher – 40” Max Size → 12” Max
  - HSI Crusher – 12” x ¾” → 2 ½” Max
  - – 2 ½” x 1” → Returns

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Stone Sources

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Best Management

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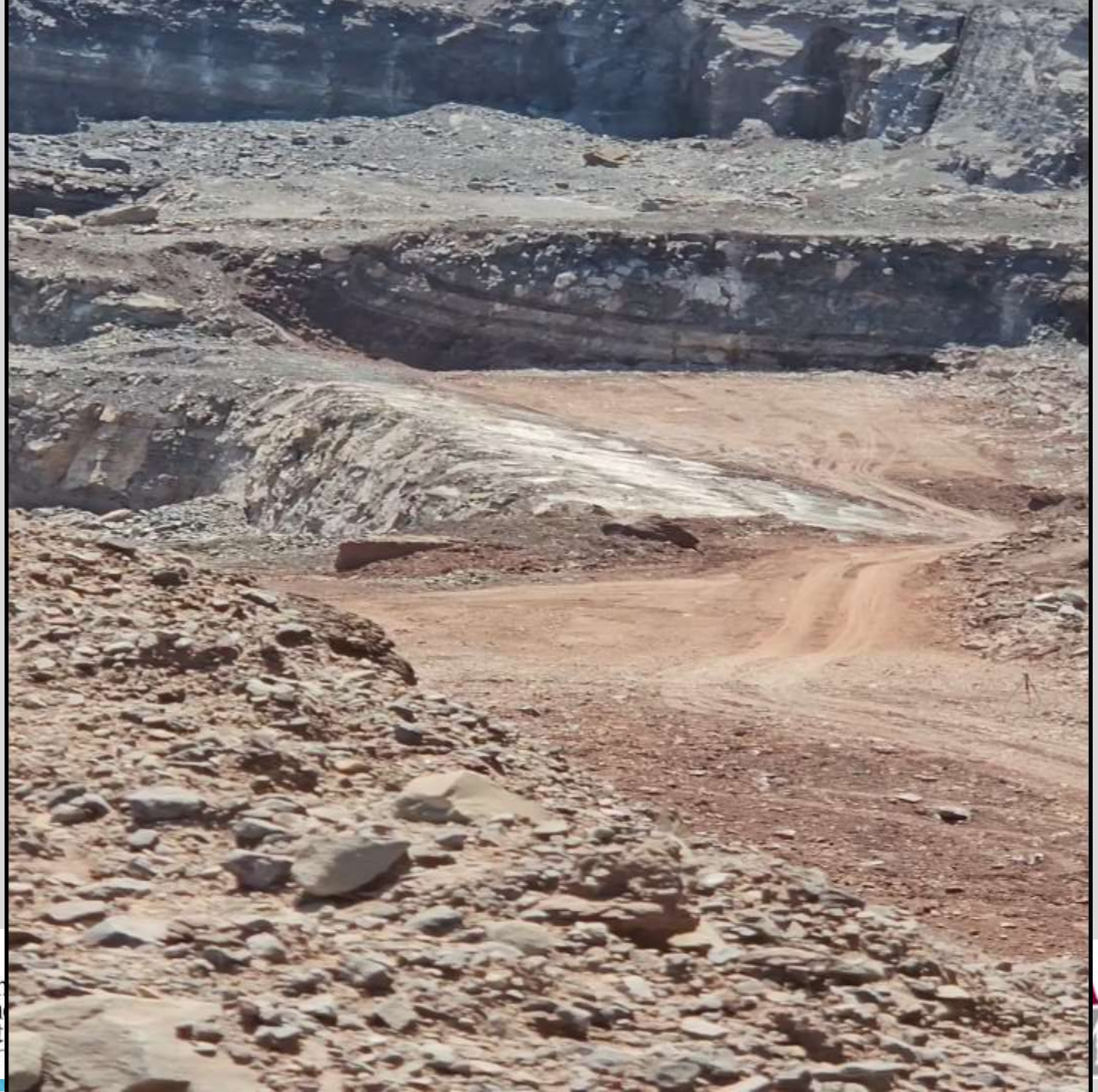

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Best Management

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Managing Materials

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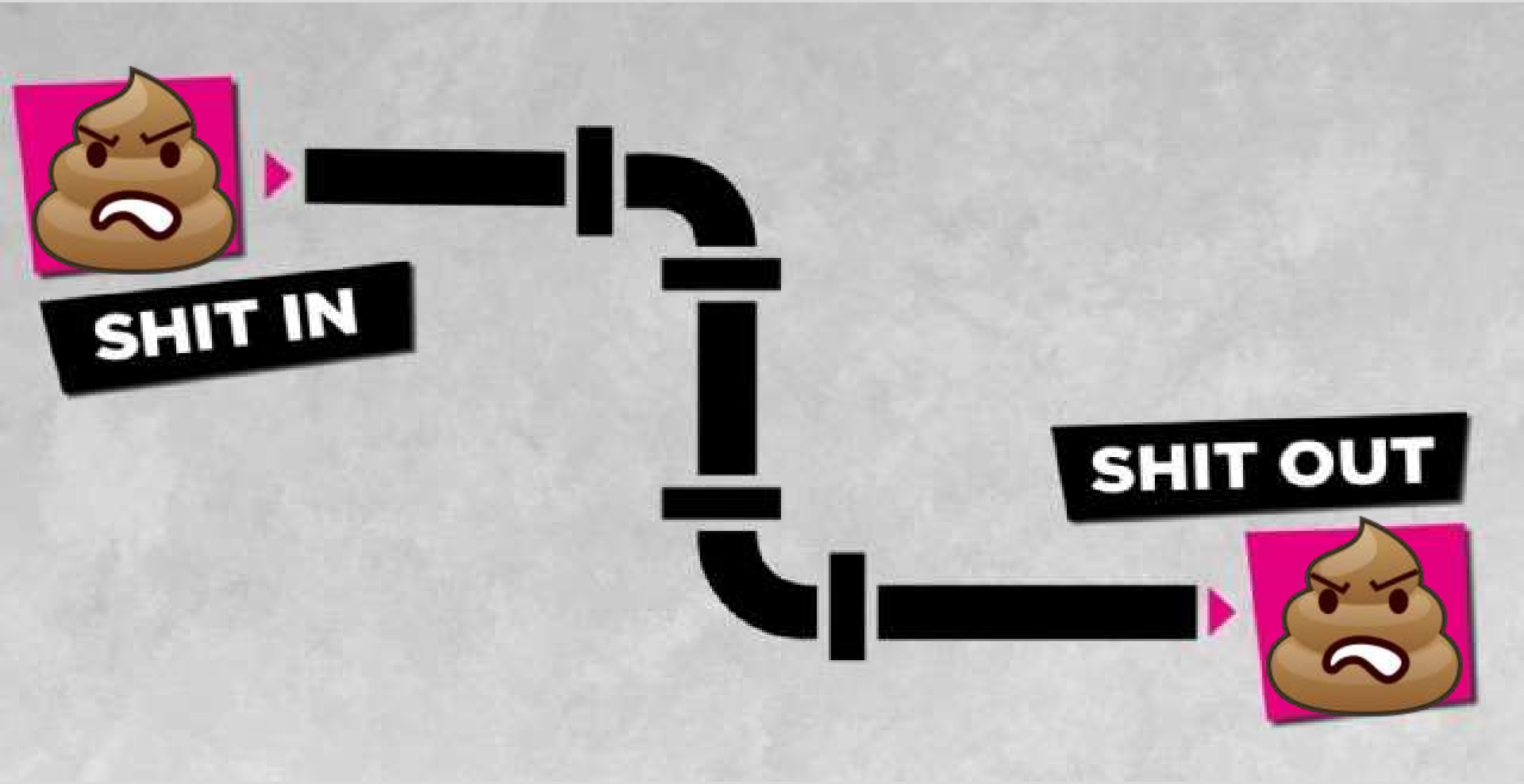

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Managing Materials

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Questions ???

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