Thinlay – More Than Just Preventative Maintenance

Virginia Asphalt Association 26th Fall Asphalt Conference

October 8,2013

Brian Dolan
President– Maryland Asphalt Association

Origin of Maryland Thin Lifts

Maryland is a long time user of thin asphalt overlays to maintain & preserve existing pavements

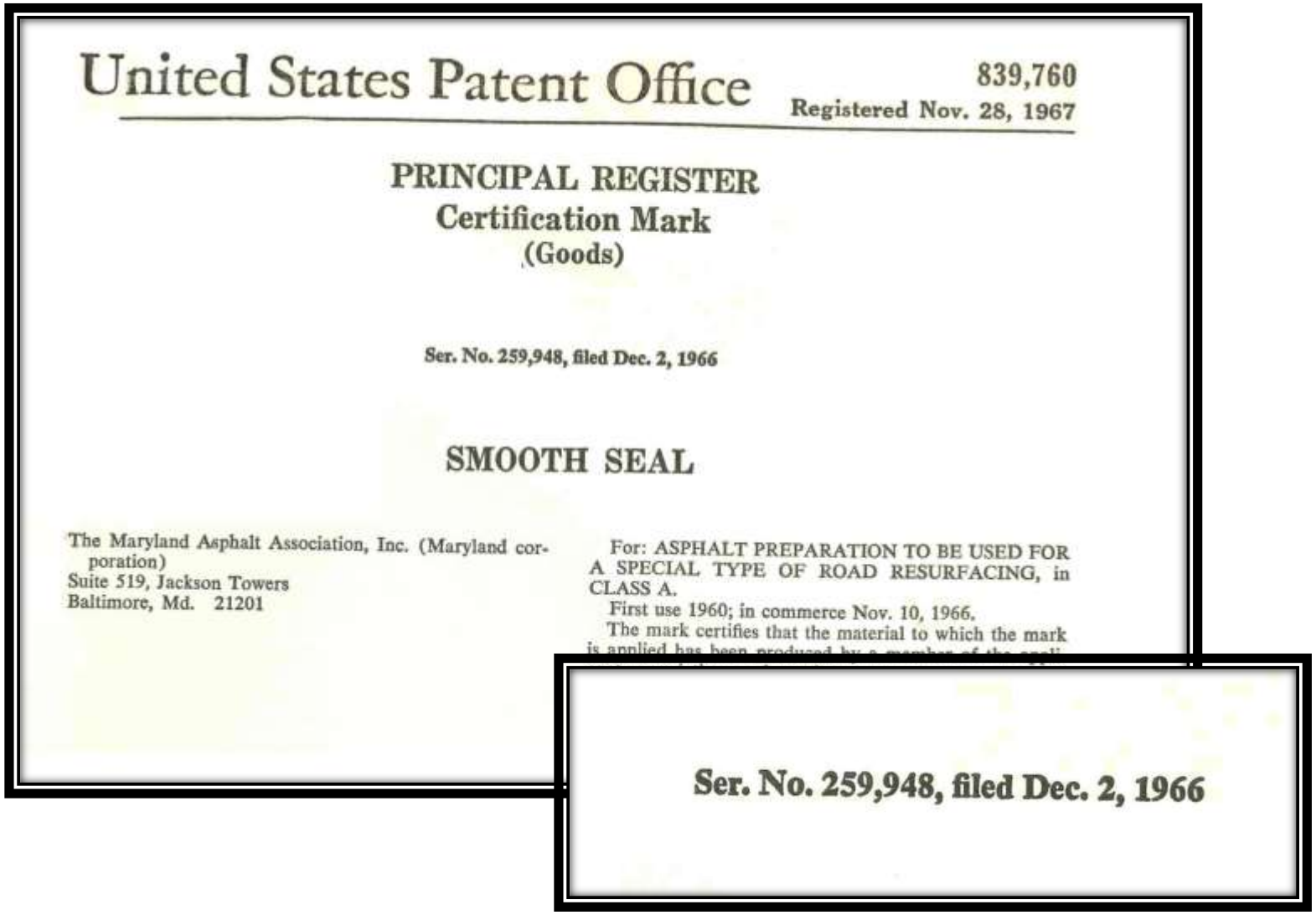
John Gray

- Mr. Gray, a native of Arbroath, Scotland, was a graduate of St. Andrew's University, MS Civil Engineering.
- He accepted a position with Montgomery County Maryland as Highway Design Engineer.
- He served in the Seabees in the 1950s before he was appointed Rockville's city engineer in 1957.
- 1961, Gray became the Director of Public Works for Rockville, MD.

John Gray

- Gained a national reputation for the development and use of inovative standards and specifications for asphalt street pavements.
- President of the **National Asphalt Pavement Association** from 1967 until retiring in 1992
- Helped establish the National Center for Asphalt Technology at Auburn University in the 1980's.

Smooth Seal



United States Patent Office

839,760
Registered Nov. 28, 1967

PRINCIPAL REGISTER
Certification Mark
(Goods)

Ser. No. 259,948, filed Dec. 2, 1966

SMOOTH SEAL

The Maryland Asphalt Association, Inc. (Maryland corporation)
Suite 519, Jackson Towers
Baltimore, Md. 21201

For: ASPHALT PREPARATION TO BE USED FOR A SPECIAL TYPE OF ROAD RESURFACING, in CLASS A.

First use 1960; in commerce Nov. 10, 1966.

The mark certifies that the material to which the mark is applied has been produced by a member of the appli-

Ser. No. 259,948, filed Dec. 2, 1966

Maryland's 1980s Marshall Mixes

917.01.03 Job Mix Design. Unless otherwise stipulated on the Plans or in the Special Provisions, the Contractor shall propose the bands he intends to employ in the several bituminous concrete layers within the pavement structure. The Contractor may elect to utilize a blend of crushed, recycled bituminous pavement material and softening agent, if needed, with the aggregates and bituminous material.

All mixtures to be used on the project shall be selected by the Contractor from the following:

Surface Designation Sieve Sizes	SN Percent Passing	ST Percent Passing
19.0 mm (3/4 in.)	100	–
9.5 mm (3/8 in.)	75–100	100
4.75 mm (No. 4)	–	90–100
1.18 mm (No. 16)	25–45	50–70
0.075 mm (No. 200)	1–12	1–12
Percent Sand	15–35	20–40

MD District Engineers

SN

		FAA P 401 3/4 Max P 401 3/4 Max	Rev 2/87 FAA P 401 3/4 Max P 401 3/4 Max	Rev 6/93 FAA P 401 3/4 Max P 401 3/4 Max	Asphalt Inst. Surface Coarse 1/2"Nom. 5A Mix	Asphalt Inst. Surface Coarse 3/8"Nom 6A Mix	ASTM D3515 1/2"Nom.	ASTM D3515 3/8"Nom	SN
19 mm	3/4	100	100	100	100		100		100
15.9 mm	5/8								
12.5 mm	1/2	82-100	82-96	79-99	90-100	100	90-100	100	
9.5 mm	3/8	68-90	75-89	68-88		90-100		90-100	75-100
4.75 mm	#4	50-79	59-73	48-68	45-70	60-80	44-74	55-85	
2.36 mm	#8	39-69	46-60	33-53	25-55	35-65	28-58	32-67	
1.18 mm	#16	*29-59	*34-48	20-40					25-45
600 µm	#30	20-49	24-38	14-30					
300 µm	#50	14-38	15-27	9-21	5-20	6-25	5-21	7-23	
150 µm	#100	*8-25	*8-18	6-16					
75 µm	#200	3-8	3-6	3-6	2-9	2-10	2-10	2-10	1-12

PopCorn

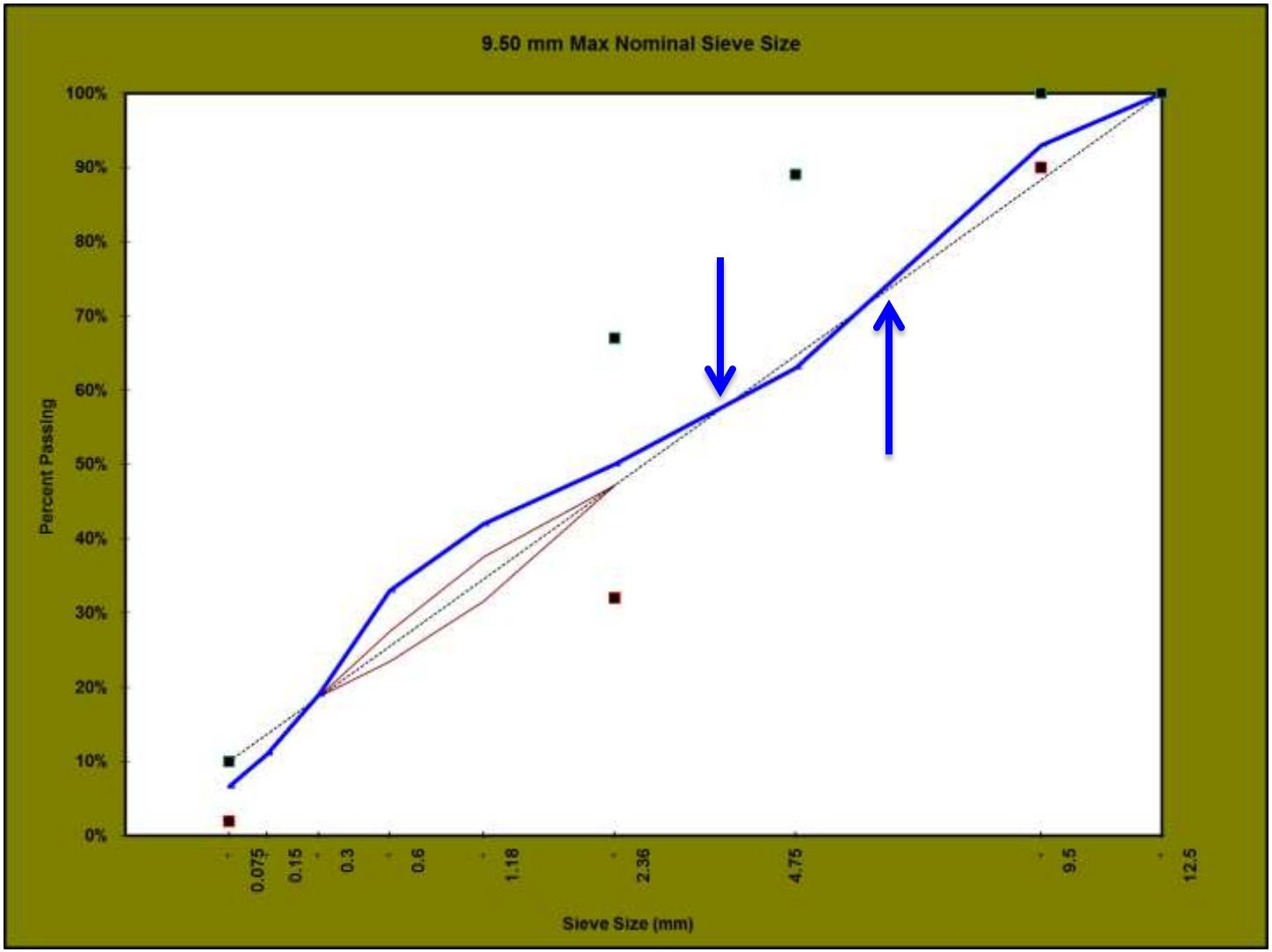
- ¾” Open Graded Lift
- AC 20 and later on AC 30
- Several Sheldon G. Hayes Award Winning Projects in Maryland
- Excellent Ride
- Excellent Friction
- Low Noise & Reduced Tire Spray
- Excellent Mat Texture and Appearance

Budget Tightening

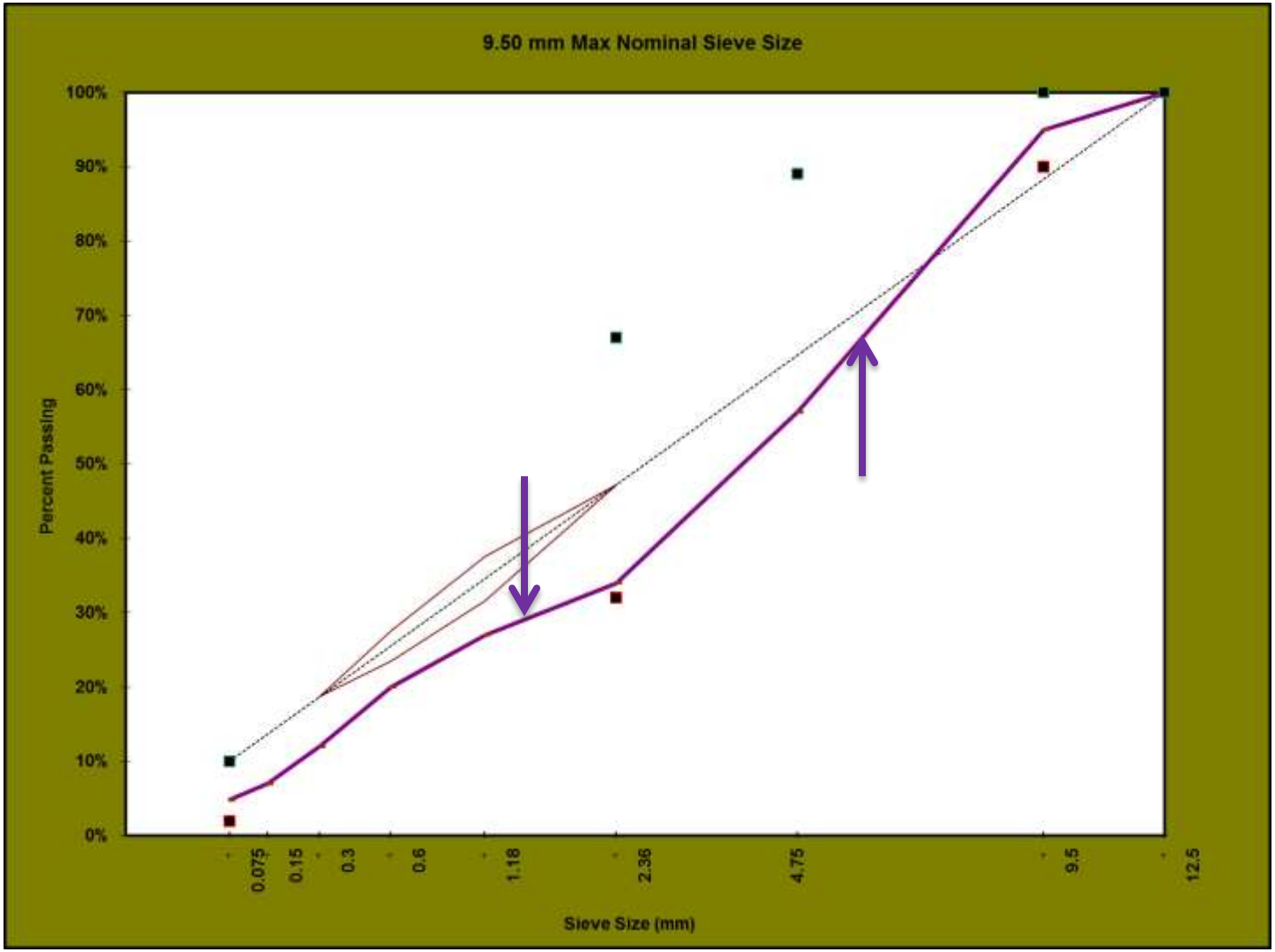
SuperPave®

	Table 1 – Aggregate Gradation – JMF and Control Point					
	Sieve Size	**SN**	**9.5mm**	**12.5mm**	**19.0mm**	**25.0mm**
37.5 mm	1.5"					100
25 mm	1"				100	90-100
19 mm	3/4"	100		100	90-100	20-90
12.5 mm	1/2"		100	90-100	23-90	
9.5 mm	3/8"	75-100	90-100	28-90		
4.75 mm	#4		32-90			
2.36 mm	#8		32-67	28-58	23-49	19-45
1.18 mm	#16	25-45				
600 µm	#30					
300 µm	#50					
150 µm	#100					
75 µm	#200	1-12	2-10	2-10	2-8	1-7

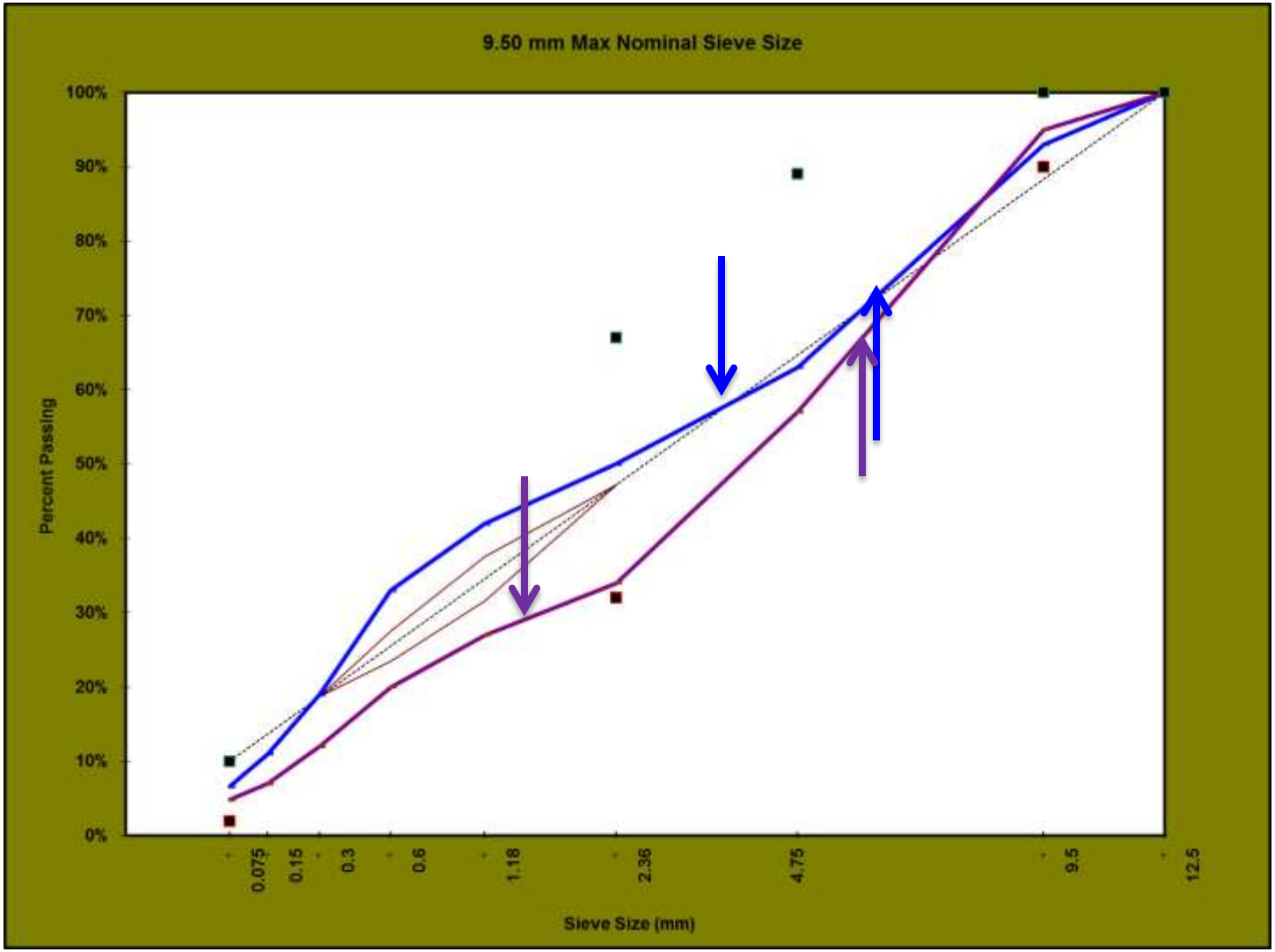
SN


9.50 mm Max Nominal Sieve Size
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Passing
0.075
0.15
0.3
0.6
1.18
2.36
4.75
9.5
12.5
Sieve Size (mm)

9.5 mm


9.50 mm Max Nominal Sieve Size
Percent Passing
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.075
0.15
0.3
0.6
1.18
2.36
4.75
9.5
12.5
Sieve Size (mm)

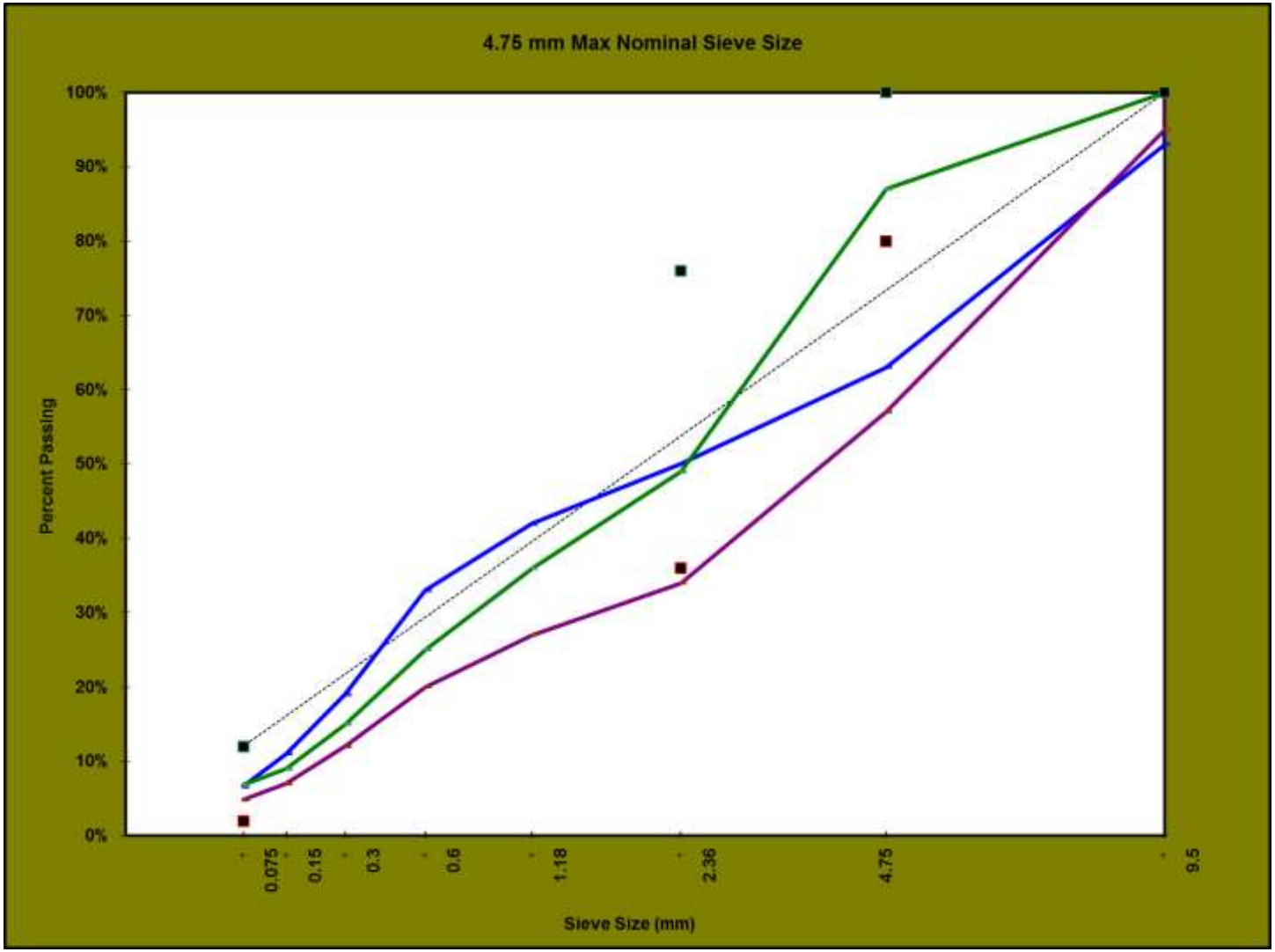
SN v/s 9.5 mm


9.50 mm Max Nominal Sieve Size
Percent Passing
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.075
0.15
0.3
0.6
1.18
2.36
4.75
9.5
12.5
Sieve Size (mm)

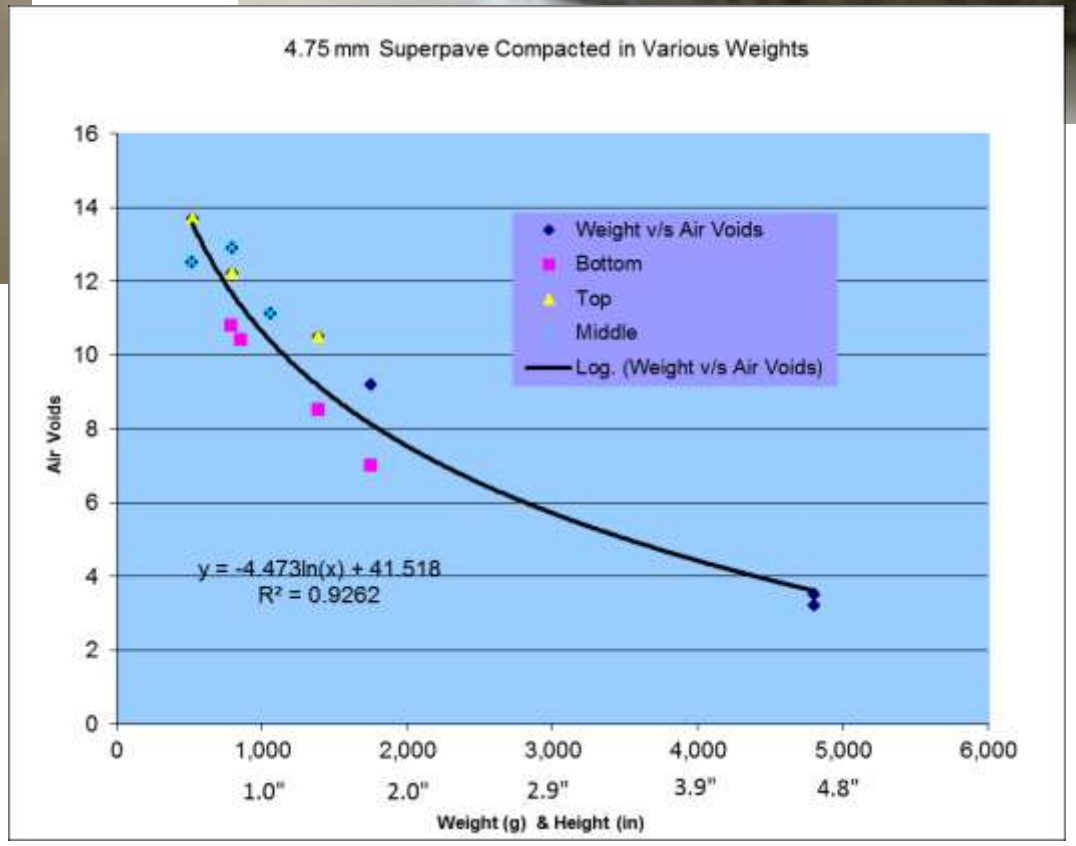
4.75 mm

	Table 1 – Aggregate Gradation – JMF and Control Point Information						
	Sieve Size	**SN**	**4.75 mm**	**9.5mm**	**12.5mm**	**19.0mm**	**25.0mm**
37.5 mm	1.5"						100
25 mm	1"					100	90-100
19 mm	3/4"	100			100	90-100	20-90
12.5 mm	1/2"		100	100	90-100	23-90	
9.5 mm	3/8"	75-100	95-100	90-100	28-90		
4.75 mm	#4		90-100	32-90			
2.36 mm	#8			32-67	28-58	23-49	19-45
1.18 mm	#16	25-45	30-60				
600 µm	#30						
300 µm	#50						
150 µm	#100						
75 µm	#200	1-12	6-12	2-10	2-10	2-8	1-7

4.75 mm


4.75 mm Max Nominal Sieve Size
Percent Passing
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.075
0.15
0.3
0.6
1.18
2.36
4.75
9.5
Sieve Size (mm)

4.75 mm


4.75 mm Superpave Compacted in Various Weights
Air Voids
16
14
12
10
8
6
4
2
0
Weight v/s Air Voids
Bottom
Top
Middle
Log. (Weight v/s Air Voids)
y = -4.473ln(x) + 41.518
R² = 0.9262
0
1,000
2,000
3,000
4,000
5,000
6,000
1.0"
2.0"
2.9"
3.9"
4.8"
Weight (g) & Height (in)

District - I ¾” lifts

				Total	Charge	Grinding	HMA	HMA Superpave
Route	Resurfacing Location	BMP	EMP	Miles	No.	Depth	Depth	Mix
MD 352	Whitehaven Road to MD 349 East	3.44	10.03	6.59	WI306A58	1-1/2"	1-1/2"	3/4" 9.5mm, W&L, 64-22, L2
	(FY12 - 25M State Phase 2 Project)					for Tie-ins		3/4" 9.5mm, Surf. 64-22, L2

Perpetual Pavement - AN INCH AT A TIME