PA Turnpike 2025 Update

PAPA Regional Technical Meetings

March 18, 19, & 20, 2025

New for 2025 Construction Season

- For contracts bid in 2025, 64E-22 Asphalt is specified for all asphalt mixtures. PTC Maintenance Crews are exempt from this specification. Existing contracts will continue to have mixes containing 64S-22 and 64E-22 asphalt, as per bid.
  ATPB
  25mm RB
  25mm
  19mm
  12.5mm
  12.5mm SMA

Anti-Strip

Zycotherm SP2 is specified in the PTC CS 413 and must be plant blended at a minimum of .1% per the total asphalt in a given JMF.

CS 413.2 (g) Rev.4/11/25
Anti-Strip Additives. Use ZycoTherm SP2 in-line, blended and metered, at the Asphalt Producer's Plant at a minimum rate of 0.1% of the total asphalt for the JMF being produced. Asphalt terminal or refinery blending of anti-strip additive is not permitted. If the WMA Technology includes an anti-strip additive as part of its WMA Technology, perform moisture susceptibility analysis as specified in Section 413.2(e)1.

PENNA TURN PIKE

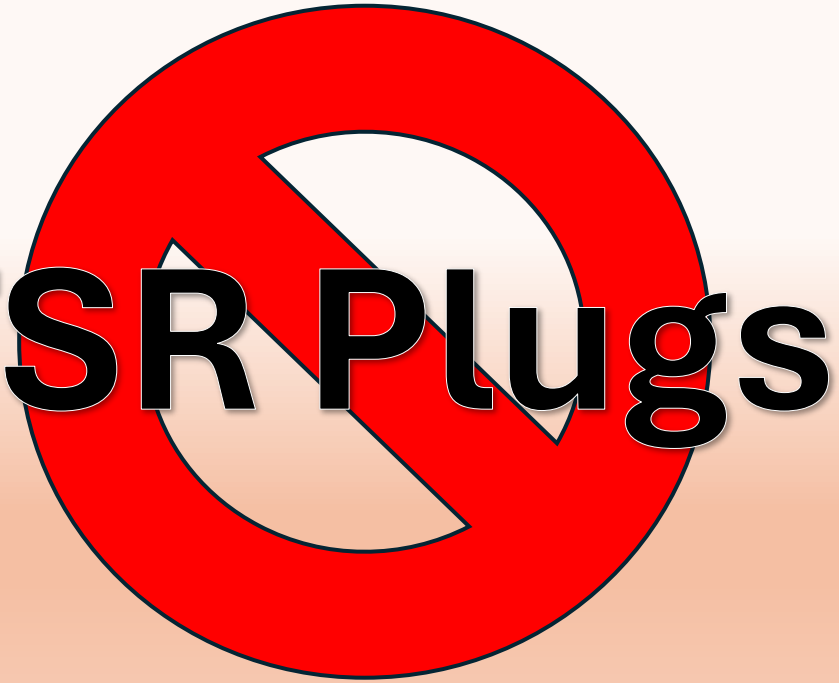
WMA/Anti-Strip

CS 413.2(e)1.

1. Virgin Material Mixtures. Size, uniformly grade, and combine aggregate fractions, asphalt binder, and either WMA Technology additive(s) or modifier(s) in proportions to produce a JMF that conforms to the material, gradation, and volumetric Superpave Asphalt Mixture Design requirements according to Bulletin 27, Chapter 2A. Produce an asphalt mixture for the specified nominal maximum aggregate size and design ESALs except as procedurally modified by the WMA Technology Manufacturer Technical Representative (Technical Representative) to address laboratory procedures when preparing, compacting and testing asphalt mixtures to achieve a uniform blend. Special additive(s) or modifier(s) need not be used if mixture temperature, workability, and compaction can be achieved solely through plant mechanical modification to produce foamed asphalt. Incorporate the WMA Technology additive or modifier during the volumetric asphalt mixture design process so that the JMF volumetrics and material percentages are based on a mixture with the WMA Technology.

AASHTO T283 - TSR

AASHTO T 283 /TSR Samples are no longer required for PTC Asphalt Mix Design Submittals and when switching AC suppliers during seasonal asphalt production.



PENNA TURN PIKE

In Place of TSR

CS-413.2

1.d.6.Moisture Susceptibility. For all asphalt mixtures, upon the first day of production, a production sample must be acquired and a split, ASTM D3625 boil test must be completed. Half of the sample is to be tested at the producer's asphalt lab and the other half of the sample is to be placed in a silicone lined sample box labeled with the JMF number, date of production, and plant code. The sample box is to be given to the PTC Materials Manager along with a copy of the asphalt affidavit for the asphalt used in production of the sample.

In Place of TSR

CS-413.2
1.d.2. Asphalt Content. Perform tests to determine the asphalt content of the completed mixture to verify that it conforms to the tolerances of Table I. Test the samples according to PTM No. 757 Method A. If necessary, make request to the Commission's Materials Management Supervisor to use PTM No. 702. Whenever asphalt supplier changes, perform a boil test as per ASTM D 3625. The Commission Representative, at their discretion, may request a boil test of the JMF during production.

Electronic Ticketing

Haul Hub / DOT Slip is required for electronic ticketing on all PTC Construction Contracts for Asphalt, Aggregate, and Concrete Deliveries.

PTC Maintenance Department is implementing the use of Haul Hub/DOT Slip for E-Ticketing for deliveries to maintenance sheds and material pick up at vendor locations.

Innovation

The PA Asphalt Producer Association and the PA Concrete Pavement Association continue to present the PTC with products and practices that represent innovation in materials and production.

The PTC is receptive to innovation and seeks to verify the benefits of innovation through testing in our materials lab and by piloting some of these innovations in our roadway contracts.

However, when these innovations are bid and piloted, it is imperative that industry steps up and implements the necessary processes, so the innovations are produced and placed correctly meeting or exceeding the specified contract requirements. If industry fails to do so, then the PTC is wasting time and money piloting innovative products and processes, and the benefits of the innovation are not realized.

2025 HiMA Contracts

Currently Advertised

T-067.00R003-3-02

Asphalt Resurfacing Between Milepost 67.59 and Milepost 75.58 in Westmoreland County

40,000 Tons of 12.5mm SMA PG 76E-28HP

Tentatively to be Advertised May 2025

A-020.00R003-3-02

ASPHALT RESURFACING BETWEEN MILEPOST A-20.31 AND MILEPOST A-25.67 IN MONTGOMERY COUNTY

27,000 Tons of 12.5mm SMA PG 76E-28HP

Sampling of Asphalt Binder

The PTC Materials Unit will be randomly requesting and witnessing samples of liquid asphalt taken from producer asphalt storage tanks during the 2025 Construction Season. Compliance for contract specified PG Asphalt Grade will be checked. The asphalt bill of lading/certification will be required for the sampled asphalt.

Sampling of Asphalt Binder

CS 106.2(b) Materials

(b) Inspection. Inspect material delivered to the project and stockpile the material passing inspection for use. Do not incorporate questionable material, until material is tested by a laboratory designated by the Commission and accepted in writing by the Representative. The Commission reserves the right to reject questionable material delivered to the project when the laboratory test results are not according to the specifications. Furnish assistance to the Inspector, as required to obtain samples.

Allow designated Commission representatives to inspect material being used, or intended to be used, at any time before, during, or after material preparation, while being used during the progress of the work, or after the work has been completed. Furnish or arrange with producers or manufacturers to provide necessary material, labor, tools, and equipment for such inspection.

Inspections and tests, if made at any point other than the point of incorporation in the work, will not guarantee acceptance of the material. Inspection and testing performed by the Commission will not relieve the Contractor's responsibility for QC.

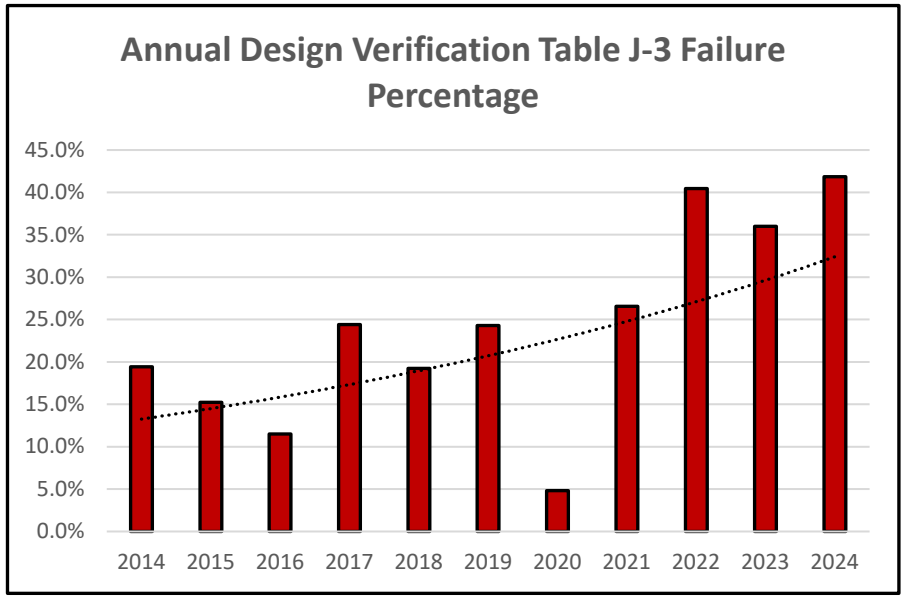
PTC Materials lab Update

Lab Manager : Brian Paroda

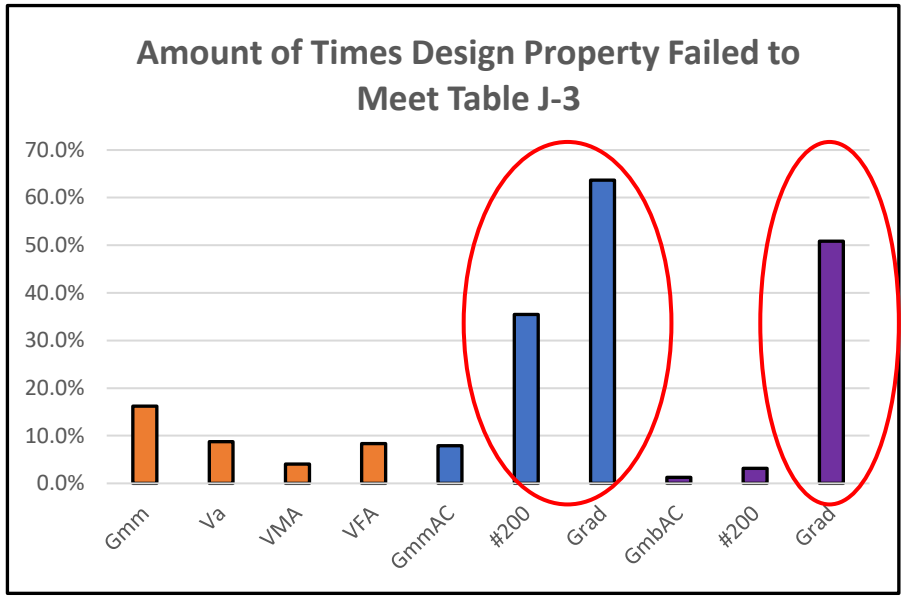
2025 PAPA Technical Meetings

Verification Issues

- Table J-3 verification failures are increasing.



- Hand blended Gmm/Gmb samples fail to meet gradation 60% of time.



- Incorrect gradations of hand blended samples tend to correlate with poor production controllability.

(If "targets" are incorrect, how do you hit them?)

Average Percent Within Limits (PWL) Results >= 90%

Acceptance Results

	AC	200	100	50	30	16	8	4	3/8"	1/2"	3/4"	1"	1 1/2"	OA PWL	Gmm	Gmb	Va	VMA	OA PWL
9.5	81	62	99	97	96	90	96	96	100	100				92	94	91	88	87	90
12.5	89	78	100	100	76	68	66	64	63	75	100			80	95	94	89	99	94
SMA125	76	72	100	99	99	99	92	97	49	76	22			80	98	81	70	65	79
19	92	68	100	100	99	98	82	72	73	62	77	100		85	89	94	89	91	91
25	85	76	100	69	95	94	43	53	58	35	63	96	100	74	93	95	90	86	91
RB-25	68	100	100	100	89	97	60	58	54	70	50	100	100	80	100	100	100	88	97

Poor Examples of Maximum Gravities?

Lack of Controllability Leads to Failures

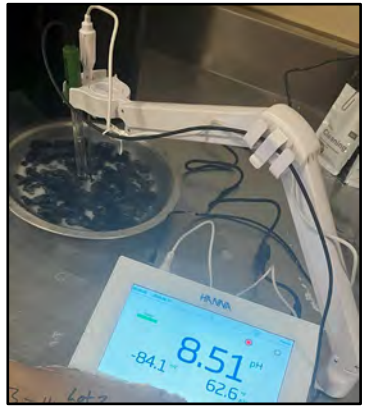
- Over the past 10 years, 5 of 45 (11%) producer plants accumulated **65%** of all acceptance volumetric failures.

	Volumetrics					Asphalt & Gradations				
	Avg O.A	Gmm	Gmb	Va	VMA	Avg. O. A.	AC	#200	#8	#4
Plant #1	**88**	94	90	**78**	90	89	92	**75**	**89**	**74**
Plant #2	**78**	**69**	**79**	**72**	90	85	**87**	**78**	**76**	**70**
Plant #3	**83**	**82**	90	**78**	**83**	87	**87**	**58**	**83**	**72**
Plant #4	**88**	91	**84**	**77**	98	89	**86**	**76**	**88**	**79**
Plant #5	**90**	93	92	**89**	**88**	84	95	**55**	**86**	**75**

- Lack of controllability tend to result in failures.
- 580K tons of material produced with **0** PWL for #200 sieve.
- 44% chance that all produced materials will result in a **0** PWL for gradation.

2024 Stripping Research Improvements

Greater pH accuracy and repeatability

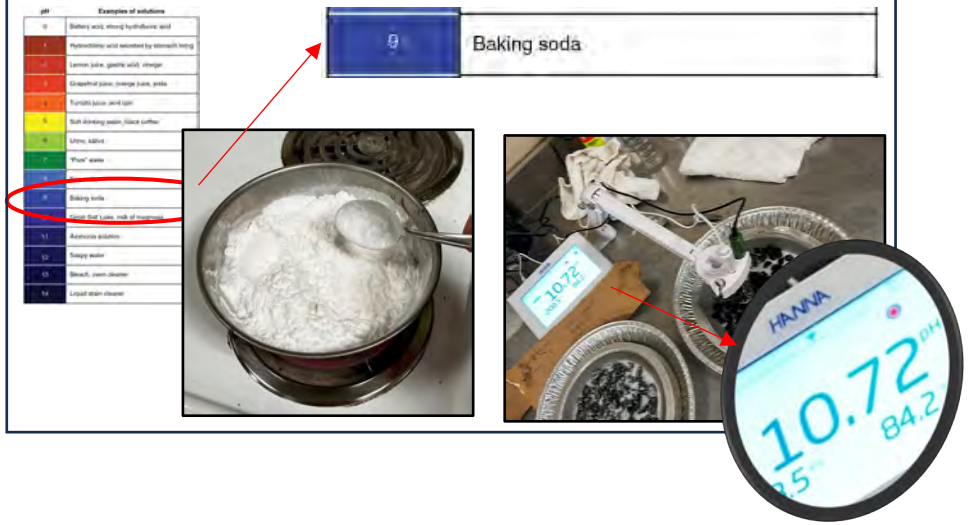


Developed Standardized Testing

2024 PTC Extended Boil Test Procedure

1. Blend up an approximately 500g sample of course aggregate & binder >= #4 sieve.
2. Place sample is a shallow bowl or pan (Aluminum pie plates work well).
3. Use 700 ml of water to cover the sample completely.
4. Add 8 to 10 tablespoons of sodium bicarbonate to the water covered sample.
5. Check water pH to ensure the range has become more alkaline (8.0-8.5).
6. Allow to set for 72 hours undisturbed. pH can be checked to ensure that the water remains alkaline. I have tested samples for up to 120 hours.
7. After 72 hours, decant water and place sample in oven for heating. Material temperature must be below boiling temperature of water but above 180F, according to ASTM D3625.
8. Prior to extracting sample from oven, boil water for sample testing.
9. Immediately place half of the heated sample (approximately 250g) into the boiling water. Most likely there will be residual sodium bicarbonate (carbonate after heating) transferred into the boiling water as well.
10. Boil for 10 mins +/- 15 seconds.
11. At the end of 10 minutes, remove the sample from heat.
12. Skim off any free bitumen from the surface of the water.
13. Decant the water and place the sample on a white paper towel.

Better Fundamental Understanding



Established Quantitative Measures

Pre-Binder Wt. = 274.6g

Liquid Binder Wt. = 5.5g

Total Sample Wt. = 280.1g

Pre-Soak Test Wt. = 279.8g

Post-Soak Test Wt. = 277.0g

Total Sample Loss = 2.8g

Monitoring Implementation

Incidental Amine & Silane Blending

- Minimal cross contamination can negatively impact the effectiveness of Silane based anti-strips.

25% Amine / **75%** Silane

Loss of 1.7 g / 0.6%

50% Amine / **50%** Silane

Loss of 2.5 g / 0.9%

75% Amine / **25%** Silane

Loss of 5.4 g / 1.9%

Comparative Research

Alkaline vs Sodium Brine

Sodium Bicarbonate

8.2-8.6 pH

Sodium Brine

7.1-7.5 pH

Sodium Brine Soak

Amine

Pre-Soak = 281.7g

Post-Soak = 279.0g

-2.7g (46.6%) Total Loss

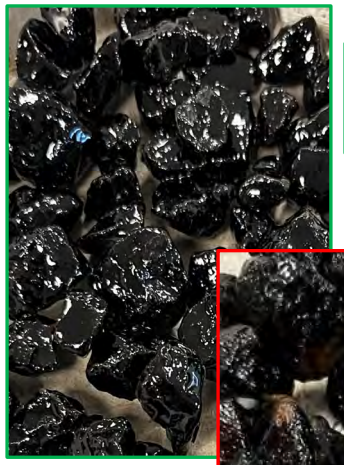
Aminopropyltrimethylsiloxane

Pre-Soak = 280.4g

Post-Soak = 278.1g

-2.3g (39.7%) Total Loss

Silane (Italy)

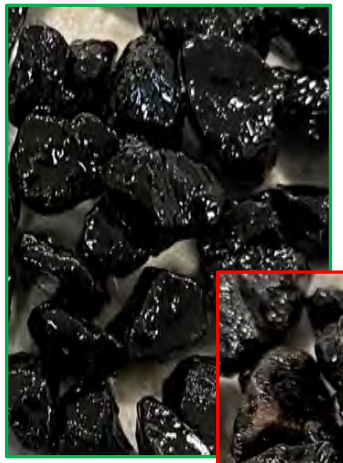


Pre-Soak = 279.9g

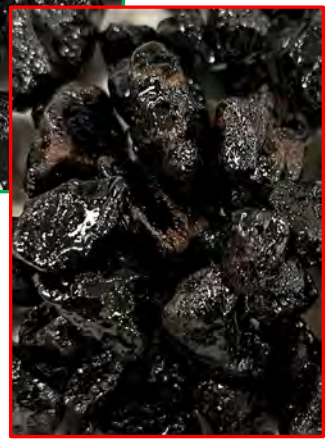
Post-Soak = 278.4g

-1.5g (25.9%) Total Loss

Silane (India)



Pre-Soak = 280.4g



Post-Soak = 279.5g

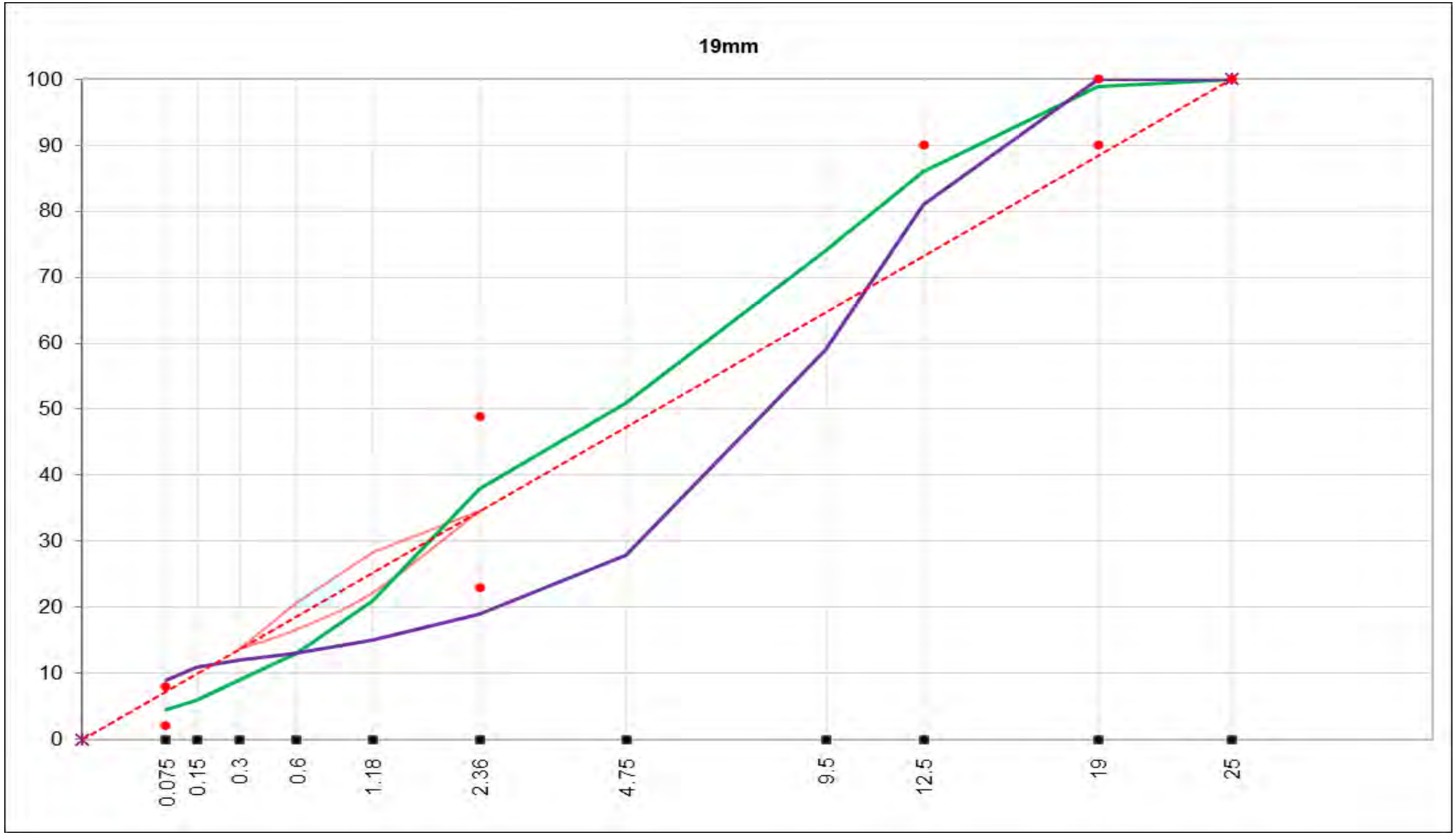
-0.9g (15.5%) Total Loss

*Calculations based upon the mean of 5.8g of liquid binder per specimen. (6.8g of binder added to specimen - 1.0g mean loss in bowl = 5.8g)

Reevaluating: 19mm Wearing

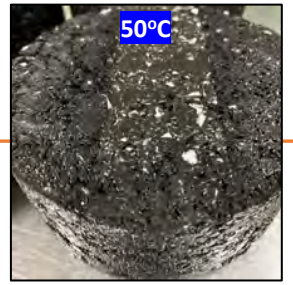
- Current PTC Special Provision: Minimum of 32% passing #8 sieve, 64S-22, SRL-E, 3 to < 30

Conventional vs Gap Graded



Rut Test Results

Conventional 19mm:
35% - #8
4.8% - #200
4.9% - AC
64E-22

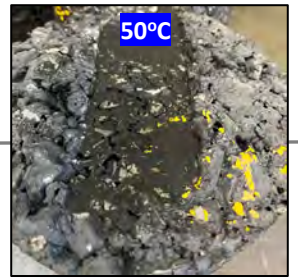


Rut Depth
2.17 mm

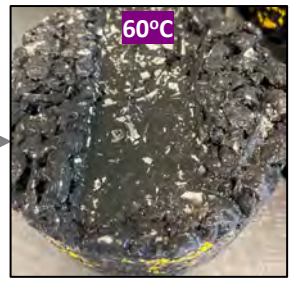
Rut Depth
16.75 mm

Crack Index / Strength
90 / 187 PSI

Gap Graded 19mm:
19% - #8
9.0% - #200
5.2% - AC
64E-22



Rut Depth
5.74 mm

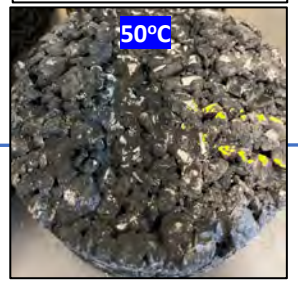


Rut Depth
9.31 mm

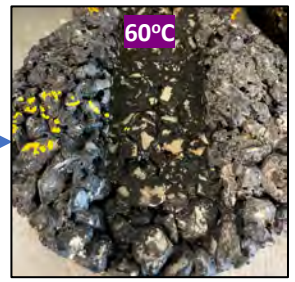
Crack Index / Strength
794 / 100 PSI

Gap Graded 19mm / RAP:
18% - #8
8.7% - #200
5.1% - AC
64E-22

10% RAP

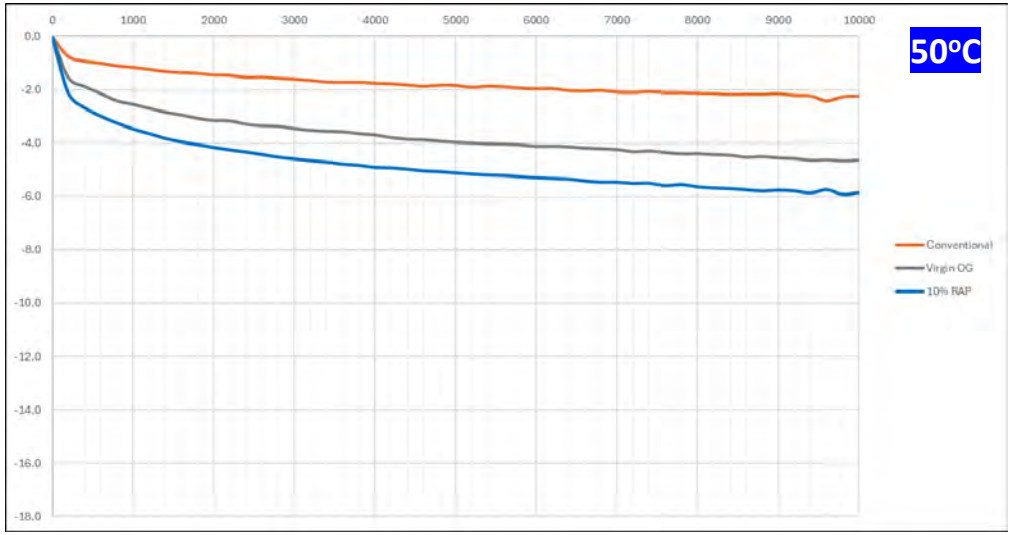


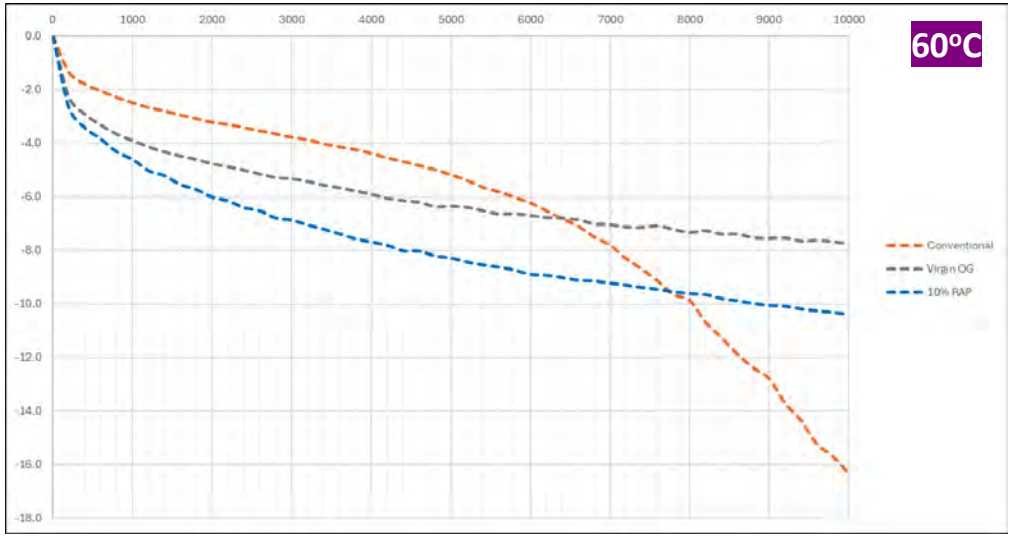
Rut Depth
6.91 mm



Rut Depth
11.85 mm

Crack Index / Strength
466 / 112 PSI





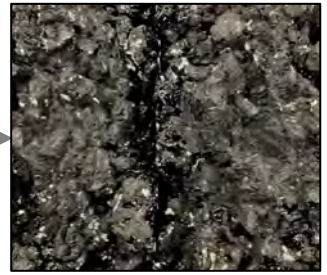
Crack Test Results

Conventional 19mm:
35% - #8
4.8% - #200
4.9% - AC
64E-22

Crack Index
90

Strength (PSI)
187 PSI

Gap Graded 19mm:
19% - #8
9.0% - #200
5.2% - AC
64E-22



Crack Index
794

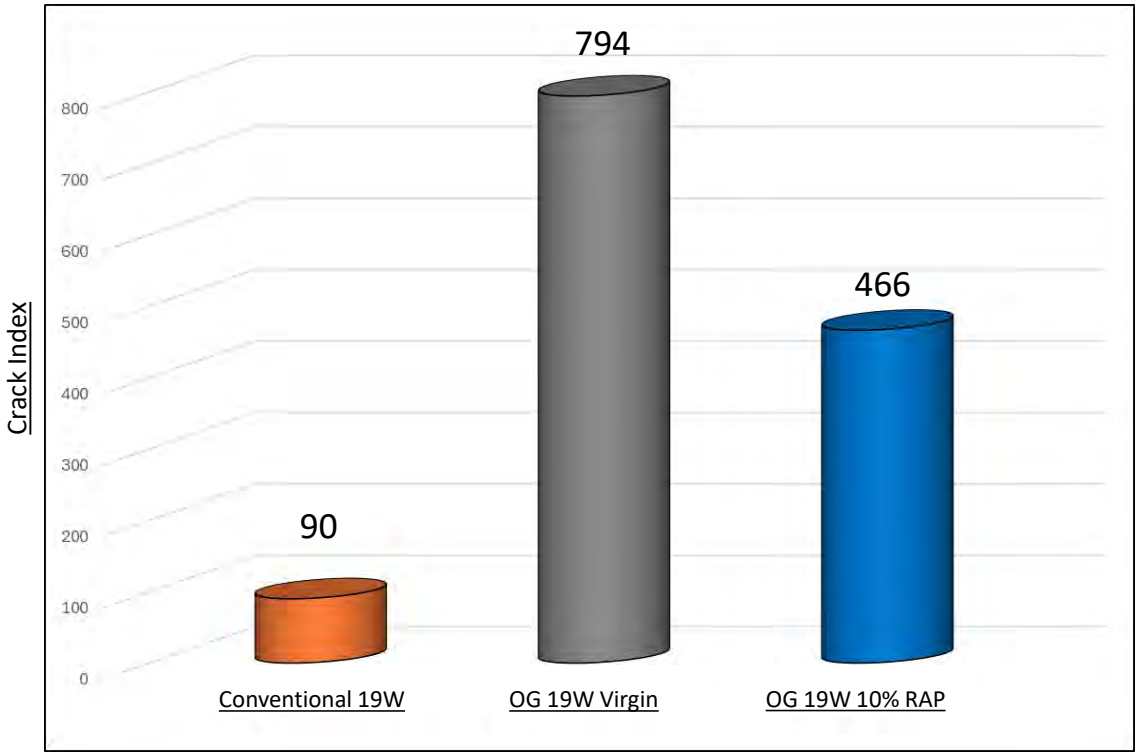
Strength (PSI)
101 PSI

Gap Graded 19mm / RAP:
18% - #8
8.7% - #200
5.1% - AC
64E-22

10% RAP

Crack Index
466

Strength (PSI)
112 PSI



Questions

Thank You