



Project: Phoenix Industries, LLC
Date: 5/6/2020
Sample: Mix 1 - APA Results - 100% RAP / PelletRAP

Summary of Method

Specimens compacted by NCAT with plant mix received from the client
 Specimens compacted to 7.0 ± 0.5 percent air voids
 Testing performed by AASHTO T340
 76°C Test Temperature
 100 lb wheel load
 100 psi tire pressure
 8,000 cycles
 Manual Rut Depths Reported
 2 manual readings taken per specimen

Summary of Results

Table 1: Individual Gmb, Air Voids, and Manual Rut Depths

Mix ID	Specimen ID	Gmb	Va, %	Manual Rut Depth (mm)	Average Rut Depth (mm)
Phoenix Industries - Mix 1	1	2.336	6.5	2.80	3.30
	3	2.312	7.5	3.15	
	4	2.324	7.0	3.06	
	5	2.323	7.1	2.86	
	6	2.321	7.1	3.99	
	7	2.325	7.0	3.93	



Project: Phoenix Industries, LLC
Date: 5/7/2020
Material Description: Mix 1 - DC(T) Results
 100% RAP / PelletRAP

Project Notes

Specimens compacted by NCAT with plant mix received from the client
 Six replicates were prepared and tested
 Specimen air voids were determined at NCAT on the final trimmed specimens

DC(T) testing was performed in accordance with ASTM D 7313-13
 -12°C Test Temperature
 Test performed at the low PG grade (PG 76-22 base binder) plus 10°C
 Testing was performed in a TestQuip DC(T) device
 Crack Mouth Opening Displacement (CMOD) Rate of 0.017 mm/second
 Test measures the force applied to the specimen and plots that against the CMOD displacement
 The area under this curve is the Fracture Energy (FE)
 A higher Fracture Energy would be indicative of a mixture with greater thermal cracking resistance

The Fracture Energy data were inspected for outliers in accordance with ASTM E178-16a
 Any statistical outliers would be identified below and not included in the average values

Marasteanu et al. (2012) published the following minimum DCT criteria in a national pooled fund study on low temperature cracking in asphalt pavements
 Criteria assume the test is performed at the low binder PG grade + 10°C
 Minimum FE of 400 J/m² - Low Traffic Pavements (< 10 Million ESALs)
 Minimum FE of 460 J/m² - Medium Traffic Pavements (10-30 Million ESALs)
 Minimum FE of 690 J/m² - High Traffic Pavements (>30 Million ESALs)

Results Summary

A summary of the DC(T) test results are shown in Table 1 below, while the average values are shown in Table 2
 No statistical outliers for Fracture Energy were observed for the provided mixture

Table 1: Individual DC(T) Test Results

Mix ID	Specimen ID	Air Voids (%)	Fracture Energy (J/m ²)	ASTM E178 Statistical Outlier?
Phoenix Industries - Mix 1	1B	6.9	466	
Phoenix Industries - Mix 1	8A	7.4	368	
Phoenix Industries - Mix 1	9A	6.9	494	
Phoenix Industries - Mix 1	9B	7.3	381	
Phoenix Industries - Mix 1	10A	6.6	435	
Phoenix Industries - Mix 1	10B	7.2	382	

Table 2: DC(T) Statistical Summary

Mix ID	Replicates	Fracture Energy (J/m ²)		
		Average	St. Dev.	CV(%)
Phoenix Industries - Mix 1	6	421.0	51.9	12.3