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**Coarse Aggregate 185/186**  
Final Report Date: 11/5/2014

**PSP Enrollment #3879**  
University of Arkansas  
Fayetteville, Arkansas USA

Submitted by sgwill@uark.edu on 9/24/2014 at 2:25 PM

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The Z-Score indicates the number of standard deviations from the average value. The Z-Score is determined by the following calculation:

$$Z\text{-Score} = (\text{Laboratory Test Result} - \text{Average Value}) / (\text{Standard Deviation})$$

The laboratory Rating calculation is based on the absolute value of the Z-Score (or number of standard deviations from the average). The following describes the laboratory Rating system:

- If Z-Score <= 1 Then Rating = 5
- If Z-Score > 1 And <= 1.5 Then Rating = 4
- If Z-Score > 1.5 And <= 2 Then Rating = 3
- If Z-Score > 2 And <= 2.5 Then Rating = 2
- If Z-Score > 2.5 And <= 3 Then Rating = 1
- If Z-Score > 3 Then Rating = 0

A negative sign on a Z-Score or Rating indicates that the laboratory's result was below the average, while a positive Z-Score or Rating indicates that the laboratory's result was above the average.

For more information on ratings, please review [Proficiency Sample Ratings: Being Average Has Never Been So Good](#).

Material Finer Than 75-µm (No. 200) Sieve

**Percentage Finer than the 75-µm sieve by washing** (0.01 percent) - T11/C117

[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)			
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating	
1	1707	<b>0.42</b>	0.467	0.101	<b>-0.46</b>	<b>-5</b>	<b>0.44</b>	0.518	0.103	<b>-0.76</b>	<b>-5</b>	0.047	<b>-0.47</b>	<b>-5</b>	

Sieve Analysis of Aggregates

**Total Material Passing the 25.0-mm (1-in.) Sieve** (0.1 percent) - T27/C136

[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)			
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating	
2	1717	<b>99.6</b>	100.00	**	**	**	<b>100</b>	100.00	**	**	**	**	**	**	

Sieve Analysis of Aggregates

**Total Material Passing the 19.0-mm (3/4-in.) Sieve** (0.1 percent) - T27/C136

[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)			
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating	
3	1717	<b>87.0</b>	86.90	0.61	<b>0.17</b>	<b>5</b>	<b>86.2</b>	85.89	0.69	<b>0.45</b>	<b>5</b>	0.44	<b>0.34</b>	<b>5</b>	

Sieve Analysis of Aggregates

**Total Material Passing the 12.5-mm (1/2-in.) Sieve** (0.1 percent) - T27/C136

[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)			
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating	
4	1717	<b>51.5</b>	50.78	1.10	<b>0.65</b>	<b>5</b>	<b>51.4</b>	50.55	1.10	<b>0.78</b>	<b>5</b>	0.50	<b>0.20</b>	<b>5</b>	

Sieve Analysis of Aggregates

**Total Material Passing the 9.5-mm (3/8-in.) Sieve** (0.1 percent) - T27/C136

[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)			
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating	
5	1716	<b>16.3</b>	16.54	0.65	<b>-0.38</b>	<b>-5</b>	<b>15.8</b>	15.65	0.61	<b>0.24</b>	<b>5</b>	0.31	<b>0.90</b>	<b>5</b>	

Sieve Analysis of Aggregates

**Total Material Passing the 4.75-mm (No. 4) Sieve** (0.1 percent) - T27/C136

[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)			
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating	
6	1716	<b>0.7</b>	0.90	0.34	<b>-0.60</b>	<b>-5</b>	<b>0.8</b>	0.94	0.34	<b>-0.40</b>	<b>-5</b>	0.10	<b>0.49</b>	<b>5</b>	

Coarse Aggregate Specific Gravity and Absorption

**Bulk Specific Gravity [or Relative Density, OD for C127]** - T85/C127

[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)			
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating	
7	1605	<b>2.815</b>	2.8121	0.0078	<b>0.38</b>	<b>5</b>	<b>2.816</b>	2.8089	0.0077	<b>0.92</b>	<b>5</b>	0.0040	<b>0.74</b>	<b>5</b>	

Coarse Aggregate Specific Gravity and Absorption

**Bulk Specific Gravity, SSD [or Relative Density, SSD for C127]** - T85/C127

[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)			
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating	
8	1605	<b>2.824</b>	2.8237	0.0061	<b>0.05</b>	<b>5</b>	<b>2.826</b>	2.8211	0.0059	<b>0.83</b>	<b>5</b>	0.0034	<b>0.96</b>	<b>5</b>	

Coarse Aggregate Specific Gravity and Absorption

**Apparent Specific Gravity [or Apparent Relative Density for C127]** - T85/C127

[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)			
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating	
9	1604	<b>2.842</b>	2.8454	0.0044	<b>-0.77</b>	<b>-5</b>	<b>2.844</b>	2.8437	0.0038	<b>0.09</b>	<b>5</b>	0.0027	<b>0.98</b>	<b>5</b>	

## Coarse Aggregate Specific Gravity and Absorption

**Absorption** (0.01 percent) - T85/C127[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)		
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating
10	1605	<b>0.34</b>	0.415	0.081	<b>-0.93</b>	<b>-5</b>	<b>0.35</b>	0.432	0.080	<b>-1.02</b>	<b>-4</b>	0.032	<b>-0.13</b>	<b>-5</b>

## Abrasion of Coarse Aggregate

**Percentage of Loss by Abrasion and Impact** (0.01 percent) - T96/C131[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)		
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating
11	604	--	41.286	2.497	--	--	--	38.950	2.126	--	--	--	--	--

## Sulfate Soundness of Aggregates

**Sodium Sulfate-Percentage of 19.0 to 9.5-mm fraction passing 8.0-mm sieve** (0.01 percent) - T104/C88[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)		
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating
12	356	--	0.749	0.463	--	--	--	0.795	0.463	--	--	--	--	--

## Sulfate Soundness of Aggregates

**Sodium Sulfate-Percentage of 9.5 to 4.75-mm fraction passing 4.0-mm sieve** (0.01 percent) - T104/C88[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)		
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating
13	355	--	1.150	0.744	--	--	--	1.076	0.661	--	--	--	--	--

## Sulfate Soundness of Aggregates

**Magnesium Sulfate-Percentage of 19.0 to 9.5-mm fraction passing 8.0-mm sieve** (0.01 percent) - T104/C88[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)		
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating
14	160	--	1.587	0.867	--	--	--	1.588	0.832	--	--	--	--	--

## Sulfate Soundness of Aggregates

**Magnesium Sulfate-Percentage of 9.5 to 4.75-mm fraction passing 4.0-mm sieve** (0.01 percent) - T104/C88[View Youden Diagram](#) | [View Performance Chart](#)

Sample 185							Sample 186					Repeatability(within-lab)		
	Total Labs	Lab Data	Avg	1S	Z-Score	Rating	Lab Data	Avg	1S	Z-Score	Rating	1S	Z-Score	Lab Rating
15	159	--	2.777	1.838	--	--	--	2.470	1.648	--	--	--	--	--

\*\* Ratings Suppressed

-- No Data Submitted or Data Out of Accepted Range

**\*\* Suppressed Items:**

**Sieve Analysis of Aggregates** (Total Material Passing the 25.0-mm (1-in.) Sieve) - Since nearly all laboratories submitting results for Test No. 2 reported 100 percent passing, no ratings have been assigned for this test and the scatter diagram on the AMRL website has been omitted.



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