



Hi-Grade Materials Co.
Ready Mix Concrete – Rock & Sand
17671 Bear Valley Road, Hesperia California 92345
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To: Hi-Grade Materials Co.
Attention: Lori Clifton

17 November 2015

Project: Hi-Grade Materials Co. - Littlerock Quarry
6500 East Avenue T
Littlerock, California 93543

Re: Littlerock Pit-Run Material

On 16 November 2015, samples were taken from the “pit” portion of Littlerock quarry and returned to the laboratory to determine basic cleanness results of unprocessed materials and compare them to minimum requirements for various agency standards. The results are as follows:

- ASTM C117-13: Standard Test Method for Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing
 - Result:
 - 8.6%
 - Limitations:
 - ASTM C33-13: Standard Specification for Concrete Aggregates
 - 0-3%
 - Standard Specifications for Public Works Construction (2015 Edition)
 - 0-5%
 - California Department of Transportation 2015 Standard Specifications
 - 0-8%
- California Test 217 (Rev. 2011): Method of Test for Sand Equivalent
 - Result:
 - 49
 - Limitations:
 - California Department of Transportation 2015 Standard Specifications
 - 75 (minimum)
 - Standard Specifications for Public Works Construction (2015 Edition)
 - 75 (minimum)
- California Test 227(Rev. 2012): Method of Test for Evaluating Cleanness of Coarse Aggregate
 - Result:
 - 68
 - Limitations:
 - California Department of Transportation 2015 Standard Specifications
 - 75 (minimum)
 - Standard Specifications for Public Works Construction (2015 Edition)
 - 75 (minimum)

Please Note: In regards to the two California Test Methods (217 & 227): 75 is the specified minimum, however standard industry practice targets results of 80 & 90 respectively.

Please refer to the attached document: Laboratory Test Results – Concrete Conformance Aggregate Testing reported by Earth Systems indicating the results we need to achieve per market requirements. Thank you for your time. If you should have any questions, please do not hesitate to contact me at your earliest convenience.

Respectfully,

Stefan Reder
Quality Assurance Manager
(760) 552-2393
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May 11, 2015

PL-03511-01

Hi-Grade Materials
17671 Bear Valley Road
Hesperia, California 93345

Attention: Mr. Stefan Reder

Subject: **Laboratory Test Results**
Concrete Aggregate Conformance Testing
Hi-Grade Materials Littlerock Quarry (P.O. # LQ675120CG)
Littlerock, California

This report presents the results of laboratory tests performed on four (4) samples of concrete aggregate. The samples were delivered to Earth Systems' Palmdale laboratory on April 16, 2014. Per your request the following tests were performed:

- 1) Sieve Analysis (ASTM C-136)
- 2) Specific Gravity (ASTM C-127)
- 3) Los Angeles Abrasion (ASTM C-131)
- 4) Sodium Sulfate Soundness (ASTM C-88)
- 5) Sand Equivalent (Caltest 217)
- 6) Durability Index (Caltest 229)
- 7) Clay Lumps and Friable Particles (ASTM C-142)
- 8) Lightweight Pieces in Aggregate (ASTM C-123)
- 9) Cleanness Value (Caltest 227)
- 10) Organic Impurities (ASTM C-40)
- 11) Mortar Strength (Caltest 515)

The laboratory test results are attached. Earth Systems trust this report meets your current needs. If you have any questions please contact us.

Respectfully submitted,

Earth Systems
Southern California

A handwritten signature in black ink, appearing to read "Tim Thomson".

Tim Thomson
Laboratory Manager

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Summary of Laboratory Test Results
Hi-Grade Materials Littlerock Quarry
1 1/2" Concrete Aggregate (#2 Rock)
Received April 17, 2015

1) **Sieve Analysis (ASTM C-136)**

<u>Sieve Size</u>	<u>Percent Passing</u>	<u>ASTM C-33 Size No. 4</u>	<u>SSPWC No. 2 Rock</u>
2"	100	100	100
1 1/2"	100	90-100	90-100
1"	21	20-55	5-40
3/4"	8	0-15	0-15
3/8"	5	0-5	0-5
#200	0.2		0-2

2) **Specific Gravity (ASTM C-127)**

Bulk SpG =	2.685		
Bulk SSD SpG=	2.704		2.58 Min.
Apparent SpG=	2.737		
Absorption =	0.7 %		

3) **Los Angeles Abrasion (ASTM C-131)** - (Grading A)

<u>Revolutions</u>	<u>% Loss</u>		
100	8.0		15 Max.
500	34.5	50 Max.	52 Max.

4) **Sodium Soundness (ASTM C-88)**

Weighted Loss =	0.6	12.0% Max.
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6) **Durability Index (Caltest 229)**

Durability Index =	85
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7) **Clay Lumps and Friable Particles (ASTM C-142)**

Clay Lumps and Friable Particles = 0.1	3.0 Max.
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8) **Lightweight Pieces in Aggregate (ASTM C-123)**

Coal and Lignite = 0.0	0.5 Max.
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9) **Cleanness Value (Caltest 227)**

Cleanness Value = 94	75 Min.
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Summary of Laboratory Test Results
Hi-Grade Materials Littlerock Quarry
1" Concrete Aggregate (#3 Rock)
Received April 17, 2015

1) **Sieve Analysis (ASTM C-136)**

<u>Sieve Size</u>	<u>Percent Passing</u>	<u>ASTM C-33 Size No. 56</u>	<u>SSPWC No. 3 Rock</u>
1 1/2"	100	100.0	100
1"	99	90-100	90-100
3/4"	73	40-85	55-85
1/2"	26	10-40	
3/8"	6	0-15	8-20
#4	2	0-5	0-5
#8	1		0-5
#200	0.2		0-2

2) **Specific Gravity (ASTM C-127)**

Bulk SpG =	2.657		
Bulk SSD SpG=	2.684		2.58 Min.
Apparent SpG=	2.732		
Absorption =	1.1 %		

3) **Los Angeles Abrasion (ASTM C-131)** - (Grading B)

<u>Revolutions</u>	<u>% Loss</u>		
100	8.9		15 Max.
500	36.3	50 Max.	52 Max.

4) **Sodium Soundness (ASTM C-88)**

Weighted Loss =	1.1	12.0% Max.
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6) **Durability Index (Caltest 229)**

Durability Index=	85
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7) **Clay Lumps and Friable Particles (ASTM C-142)**

Clay Lumps and Friable Particles = 0.1	3.0 Max.
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8) **Lightweight Pieces in Aggregate (ASTM C-123)**

Coal and Lignite = 0.0	0.5 Max.
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9) **Cleanness Value (Caltest 227)**

Cleanness Value = 97	75 Min.
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Summary of Laboratory Test Results
Hi-Grade Materials Littlerock Quarry
3/8" Concrete Aggregate (#4 Rock)
Received April 17, 2015

1) **Sieve Analysis (ASTM C-136)**

<u>Sieve Size</u>	<u>Percent Passing</u>	<u>ASTM C-33 Size No. 8</u>	<u>SSPWC No. 4 Rock</u>
3/4"	100		100
1/2"	100	100	
3/8"	95	85-100	85-100
#4	12	10-30	0-30
#8	1	0-10	0-10
#16	0	0-5	
#200	0.2		0-2

2) **Specific Gravity (ASTM C-127)**

Bulk SpG =	2.606		
Bulk SSD SpG=	2.648		2.58 Min.
Apparent SpG=	2.720		
Absorption =	1.5 %		

3) **Los Angeles Abrasion (ASTM C-131)** - (Grading C)

<u>Revolutions</u>	<u>% Loss</u>		
100	9.2		15 Max.
500	36.0	50 Max.	52 Max.

4) **Sodium Soundness (ASTM C-88)**

Weighted Loss =	1.2	12.0% Max.
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6) **Durability Index (Caltest 229)**

Durability Index =	85
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7) **Clay Lumps and Friable Particles (ASTM C-142)**

Clay Lumps and Friable Particles = 0.1	3.0 Max.
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8) **Lightweight Pieces in Aggregate (ASTM C-123)**

Coal and Lignite = 0.0	0.5 Max.
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9) **Cleanness Value (Caltest 227)**

Cleanness Value = 94	75 Min.
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Summary of Laboratory Test Results
Hi-Grade Materials Littlerock Quarry
Washed Concrete Sand
Received April 17, 2015

1) **Sieve Analysis (ASTM C-136)**

<u>Sieve Size</u>	<u>Percent Passing</u>	<u>ASTM C-33 Fine Agg</u>	<u>SSPWC Wash Con Sand</u>
3/8"	100	100	100
#4	99	95-100	95-100
#8	81	80-100	75-90
#16	61	50-85	55-75
#30	41	25-60	30-50
#50	22	5-30	10-25
#100	10	0-10	2-10
#200	4.9		0-5
Fineness Modulus:	2.86	2.3 to 3.1	

2) **Specific Gravity (ASTM C-128)**

Bulk SpG =	2.611
Bulk SSD SpG=	2.652
Apparent SpG=	2.724
Absorption =	1.6 %

3) **Los Angeles Abrasion (ASTM C-131)**

Not Applicable

4) **Sodium Soundness (ASTM C-88)**

Weighted Loss =	1.4	12.0% Max.	10.0% Max.
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5) **Sand Equivalent (Caltest 217)**

Sand Equivalent =	80	75 Min.
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6) **Durability Index (Caltest 229)**

Durability Index =	90
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Summary of Laboratory Test Results
Hi-Grade Materials Littlerock Quarry
Washed Concrete Sand
Received April 17, 2015

	<u>ASTM C-33</u> <u>Fine Agg.</u>	<u>SSPWC</u> <u>Wash Con Sand</u>
7) <u>Clay Lumps and Friable Particles (ASTM C-142)</u>		
Clay Lumps and Friable Particles = 0.1	3.0 Max.	
8) <u>Lightweight Pieces in Aggregate (ASTM C-123)</u>		
Coal and Lignite = 0.0	0.5 Max.	
10) <u>Organic Impurities (ASTM C-40)</u>		
Organic Plate Number: < 1		
11) <u>Mortar Strength (Caltest 515)</u>		
Mortar Strength = 98 %		