

A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

CIT ENGINEERING LABORATORIES

Construction * Materials * Technologies
Geotechnical, Environmental, & Materials Engineering/Testing/Research

June 30, 2010

Neilson Construction
P.O. Box 620
Huntington, Utah 84528

Project: Energy Solutions
Project#: 3022
Material: 2" Cap Rock
Source: Freemont Junction #1

Laboratory Test	Average Test Value	Score	Weight	Score & Weight	Max Score
Mineral Type			Igneous		
Specific Gravity	2.677	8.1	9	72.9	90
Absorption %	0.5%	8.0	2	16	20
Sodium Sulfate %	0.1%	10	11	110	110
LA Abrasion	6.3	7.2	1	7.2	10
Schmidt Hammer	37	4.4	3	13.2	30
Total Score				219.3	260

Rating = 84.3

TEST RESULTS

Specific Gravity and Absorption ASTM C-127
Lab # 211600

Relative Density (oven Dry) = 2.677
Relative Density (SSD) = 2.689
Relative Density (apparent) = 2.711
Absorption (%) = 0.5 %

performed prior to placement. Durability test is for 2" Cap Rock.
D50 = 2.0"

A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

Los Angeles Abrasion ASTM C-131
Lab # 211598

100 Revolutions	Grading A
12 Spheres	
% Wear	= 6.3 %

Sodium Soundness ASTM C-88
Lab # 211599

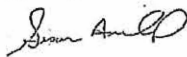
% Loss	= 0.1 %
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Schmitt Hammer
213839

Rebound Number	36, 38
Average	= 37

- Schmitt Hammer test performed on sawed surface of 6" cobbles

Sincerely,



Susan Arnold

A7. Cap Rock and Armoring **Cap Rock Durability and Gradation Test Results**



CONSTRUCTION MATERIALS TESTING LABORATORIES
 1000 S. 1000 E. MOAB, UT 84240-1000

September 22, 2009

Neilson Construction
 P.O. Box 620
 Huntington, Utah 84528

Project: Energy Solutions, Crescent Junction Disposal Cell Cap Rock
 Project#: 3022
 Material: Basalt
 Source: Freemont Junction #3

Laboratory Test	Average Test Value	Score	Weight	Score & Weight	Max Score
Mineral Type			Igneous		
Specific Gravity	2.670	8.1	9	72.9	90
Absorption %	0.8%	6.1	2	12.2	20
Sodium Sulfate %	0.0%	10	11	110	110
LA Abrasion	6.5	7.2	1	7.2	10
Schmidt Hammer	52	6.8	3	20.4	30
Total Score				222.7	260

Rating = 85.7

TEST RESULTS

Specific Gravity and Absorption ASTM C-127
 Lab # 179332

Relative Density (oven Dry) = 2.670
 Relative Density (SSD) = 2.691
 Relative Density (apparent) = 2.727
 Absorption (%) = 0.8 %

*Performed prior to placement. Durability test is for 2" Cap Rock.
 D50 = 2.0"*

A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

Los Angeles Abrasion ASTM C-131
Lab # 202571

100 Revolutions	Grading A
12 Spheres	
% Wear	= 7.8 %

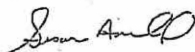
Sodium Soundness ASTM C-88
Lab # 202573

% Loss	= 0.0 %
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Schmitt Hammer
203967

Rebound Number	35,37,35
Average	= 36

Sincerely,



Susan Arnold

A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

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June 30, 2010

Neilson Construction
P.O. Box 620
Huntington, Utah 84528

Project: Energy Solutions
Project#: 3022
Material: 2" Cap Rock
Source: Freemont Junction #2

Laboratory Test	Average Test Value	Score	Weight	Score & Weight	Max Score
Mineral Type			Igneous		
Specific Gravity	2.675	8.1	9	72.9	90
Absorption %	0.8%	6.2	2	12.4	20
Sodium Sulfate %	0.1%	10	11	110	110
LA Abrasion	6.7	7.0	1	7.0	10
Schmidt Hammer	39	4.9	3	14.7	30
Total Score				217.0	260

Rating = 83.5

TEST RESULTS

Specific Gravity and Absorption ASTM C-127
Lab # 211607

Relative Density (oven Dry) = 2.675
Relative Density (SSD) = 2.698
Relative Density (apparent) = 2.738
Absorption (%) = 0.8 %

*Performed prior to placement. Durability testing is for 2" Cap rock.
D50 = 2.0"*

A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results



Construction • Materials • Technologies
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November 10, 2010

Neilson Construction
P.O. Box 620
Huntington, Utah 84528

Project: Energy Solutions
Project#: 3022
Material: 2" Cap Rock
Source: Freemont Junction (After Placement)

Laboratory Test	Average Test Value	Score	Weight	Score & Weight	Max Score
Mineral Type			Igneous		
Specific Gravity	2.685	8.3	9	74.7	90
Absorption %	0.6%	7.5	2	15.0	20
Sodium Sulfate %	0.0%	10	11	110	110
LA Abrasion	6.6	7.1	1	7.1	10
Schmidt Hammer	56	7.3	3	21.9	30
Total Score				228.7	260

Rating = 88.0

TEST RESULTS

Specific Gravity and Absorption ASTM C-127
Lab # 233040

Relative Density (oven Dry) = 2.685
Relative Density (SSD) = 2.701
Relative Density (apparent) = 2.728
Absorption (%) = 0.6 %

THIS DURABILITY IS FOR THE 1st 5,000 yd³ PLACED OF 2" Cap Rock.
D50 = 2.0"

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A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

Los Angeles Abrasion ASTM C-131
Lab # 233038

100 Revolutions	Grading A
12 Spheres	
% Wear	= 6.6 %

Sodium Soundness ASTM C-88
Lab # 233039

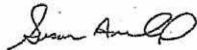
% Loss	= 0.0 %
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Schmitt Hammer
234317

Rebound Number	57,57,53
Average	= 56

- Schmitt Hammer test performed on sawed surface of 6" cobbles

Sincerely,



Susan Arnold

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A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

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July 22, 2011
Neilson Construction
P.O. Box 620
Huntington, Utah 84528.

Project: Energy Solutions
Project#: 3022
Material: Grey Basalt 2" Cap Rock
Source: Freemont Junction (In-Place)

Laboratory Test	Average Test Value	Score	Weight	Score & Weight	Max Score
Mineral Type			Igneous		
Specific Gravity	2.706	9.2	9	82.8	90
Absorption %	0.5%	8.0	2	16.0	20
Sodium Sulfate %	0.0%	10	11	110	110
LA Abrasion	7.1	6.3	1	6.3	10
Schmidt Hammer	64	8.8	3	26.4	30
Total Score				241.5	260

Rating = 92.9

TEST RESULTS

Specific Gravity and Absorption ASTM C-127
Lab # 258881

Relative Density (oven Dry) = 2.706
Relative Density (SSD) = 2.720
Relative Density (apparent) = 2.744
Absorption (%) = 0.5 %

*THIS DURABILITY REPRESENTS THE 2ND 5,000 yd³ PLACED OF 2" Cap rock.
D50 = 2.0".*

A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

Los Angeles Abrasion ASTM C-131
Lab # 258883

100 Revolutions 12 Spheres	Grading A
% Wear	= 7.1 %

Sodium Soundness ASTM C-88
Lab # 258882

% Loss	= 0.0 %
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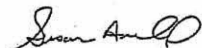
Schmitt Hammer

Rebound Numbers	= 64, 64
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Average	= 64
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- Schmitt Hammer test performed on surface of 6" cobbles

Sincerely,



Susan Arnold

LOGAN LAB: 2005 NORTH 600 WEST UNIT A LOGAN, UT 84321 (PHONE) 435.753.2850 (FAX) 435.753.2851
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A7. Cap Rock and Armoring
Cap Rock Durability and Gradation Test Results

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December 12, 2011
Neilson Construction
P.O. Box 620
Huntington, Utah 84528

Project: Energy Solutions
Project#: 3022
Material: Grey Basalt 2" Cap Rock #8
Source: Freemont Junction (In-Place)

Laboratory Test	Average Test Value	Score	Weight	Score & Weight	Max Score
Mineral Type			Igneous		
Specific Gravity	2.63	7.5	9	67.5	90
Absorption %	0.6%	7.4	2	14.8	20
Sodium Sulfate %	0.0%	10	11	110	110
LA Abrasion	6.6	7.1	1	7.1	10
Schmidt Hammer	52	6.8	3	20.4	30
Total Score				219.8	260

Rating = 84.5

TEST RESULTS

Specific Gravity and Absorption ASTM C-127
Lab # 287653

Relative Density (oven Dry) = 2.63
Relative Density (SSD) = 2.41
Relative Density (apparent) = 2.67
Absorption (%) = 0.6 %

This durability is for the 3rd 5,000 yd³ placed of 2" Cap rock.
D50 = 2.0"

A7. Cap Rock and Armoring
Cap Rock Durability and Gradation Test Results

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December 12, 2011
Neilson Construction
P.O. Box 620
Huntington, Utah 84528

Project: Energy Solutions
Project#: 3022
Material: Grey Basalt 2" Cap Rock #7
Source: Freemont Junction (In-Place)

Laboratory Test	Average Test Value	Score	Weight	Score & Weight	Max Score
Mineral Type			Igneous		
Specific Gravity	2.63	7.5	9	67.5	90
Absorption %	0.7%	6.8	2	13.6	20
Sodium Sulfate %	0.0%	10	11	110	110
LA Abrasion	6.7	7.0	1	7.0	10
Schmidt Hammer	42	5.3	3	15.9	30
Total Score				214.0	260

Rating = 82.3

TEST RESULTS

Specific Gravity and Absorption ASTM C-127
Lab # 287659

Relative Density (oven Dry) = 2.63
Relative Density (SSD) = 2.41
Relative Density (apparent) = 2.67
Absorption (%) = 0.7 %

*This durability is for the 4th 5,000 yd³ placed of 2" Cap rock.
D50 = 2.0"*

A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

Los Angeles Abrasion ASTM C-131 Lab # 287657

100 Revolutions 12 Spheres	Grading A
% Wear	= 6.7 %

Sodium Soundness ASTM C-88 Lab # 287658

% Loss	= 0.0 %
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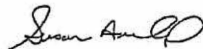
Schmitt Hammer

Rebound Numbers	= 42,42,43
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Average	= 42
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- Schmitt Hammer test performed on surface of 6" cobbles

Sincerely,



Susan Arnold

LOGAN LAB: 2005 NORTH 600 WEST UNIT A LOGAN, UT 84321 (PHONE) 435.753.2850 (FAX) 435.753.2851
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A7. Cap Rock and Armoring
Cap Rock Durability and Gradation Test Results

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December 12, 2011
Neilson Construction
P.O. Box 620
Huntington, Utah 84528

Project: Energy Solutions
Project#: 3022
Material: Grey Basalt 2" Cap Rock #6
Source: Freemont Junction (In-Place)

Laboratory Test	Average Test Value	Score	Weight	Score & Weight	Max Score
Mineral Type			Igneous		
Specific Gravity	2.62	7.3	9	65.7	90
Absorption %	0.6%	7.4	2	14.8	20
Sodium Sulfate %	0.0%	10	11	110	110
LA Abrasion	6.3	7.2	1	7.2	10
Schmidt Hammer	57	7.5	3	22.5	30
Total Score				220.2	260

Rating = 84.7

TEST RESULTS

Specific Gravity and Absorption ASTM C-127
Lab # 287656

Relative Density (oven Dry) = 2.62
Relative Density (SSD) = 2.64
Relative Density (apparent) = 2.66
Absorption (%) = 0.6 %

*This durability is for the 5th 5,000 yd³ placed of 2" cap rock.
D50 = 2.0"*

A7. Cap Rock and Armoring
Cap Rock Durability and Gradation Test Results

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December 12, 2011
Neilson Construction
P.O. Box 620
Huntington, Utah 84528

Project: Energy Solutions
Project#: 3022
Material: Grey Basalt 2" Cap Rock #5
Source: Freemont Junction (In-Place)

Laboratory Test	Average Test Value	Score	Weight	Score & Weight	Max Score
Mineral Type			Igneous		
Specific Gravity	2.62	7.3	9	65.7	90
Absorption %	0.9%	5.8	2	11.6	20
Sodium Sulfate %	0.0%	10	11	110	110
LA Abrasion	6.8	6.9	1	6.9	10
Schmidt Hammer	45	5.6	3	16.8	30
Total Score				211.0	260

Rating = 81.2

TEST RESULTS

Specific Gravity and Absorption ASTM C-127
Lab # 287650

Relative Density (oven Dry) = 2.62
Relative Density (SSD) = 2.65
Relative Density (apparent) = 2.69
Absorption (%) = 0.9 %

*This durability is for the 6th 5,000 yd³ placed lot 2" cap rock.
DSO = 2.0"*

A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-95 AASHTO T27-93)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-95 AASHTO T11-91)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 10/27/09
PROJECT: MISC. QC
SAMPLE LOCATION: FREMONT PIT - OFF BELT
MATERIAL TYPE: RAP 2" Cap rock Grey Basalt Source: Fremont Junction
TESTED BY: JC 1-6-1200 SAMPLED BY: CLIENT LAB #: 5149

Sieve/Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
4 in. (100mm)		0.0	100	100
3 in. (75mm)	16391.3	32.9	67	
2 in. (50mm)	12240.5	21.9	45	40 - 50
1 1/2 in. (37.5mm)	9224.1	16.5	29	20 - 30
1 in. (25mm)	6302.4	11.3	17	10 - 20
3/4 in. (19mm)	3488.2	6.2	11	
1/2 in. (12.5mm)	3034.6	5.4	6	5 - 25
3/8 in. (9.5mm)	278.7	1.0	5	
# 4 (4.75mm)	296.1	1.0	4	0 - 5
# 6 (2.35mm)	143.1	0.5	3	0 - 5
# 16 (1.18mm)	116.7	0.4	3	0 - 5
# 30 (600um)	93.5	0.3	2	
# 50 (300um)	90.4	0.3	2	
#100 (150um)	83.7	0.3	2	
#200 (75um)	83.4	0.3	1.5	0 - 5
-#200 (-75um)	15.1			

Total Sample Aggregate Weight: 55846.3

- 1/2" Aggregate Weight: 1622.7

- 1/2" After Wash Weight: 1200.7

REMARKS: Test performed prior to placement. 1-6-1200

I certify that this test was performed in accordance with ASTM C117-95 & C136-95/AASHTO T11-91 & T27-93.

[Signature]

P.O. BOX 427 CENTERFIELD, UT. 84622

(435) 528-5711

FAX (435) 528-5710

A7. Cap Rock and Armoring **Cap Rock Durability and Gradation Test Results**

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-95 AASHTO T27-93)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-95 AASHTO T11-91)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 10/30/09
PROJECT: MISC. QC
SAMPLE LOCATION: FREMONT PIT - OFF BELT
MATERIAL TYPE: RIPRAP 2" Cap rock Grey Basalt Source: Fremont Junction
TESTED BY: JC SAMPLED BY: CLIENT LAB #: 5150

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
4 in. (100mm)		0.0	100	100
3 in. (75mm)	15638.4	31.4	69	
2 in. (50mm)	11130.6	22.3	46	40 - 50
1 1/2 in. (37.5mm)	8286.6	16.6	30	20 - 30
1 in. (25mm)	5995.6	12.0	18	10 - 20
3/4 in. (19mm)	3312.4	6.6	11	
1/2 in. (12.5mm)	2692.1	5.4	6	5 - 25
3/8 in. (9.5mm)	308.4	0.6	5	
# 4 (4.75mm)	355.9	1.1	4	0 - 5
# 6 (2.35mm)	168.3	0.5	3	0 - 5
# 10 (1.18mm)	139.5	0.4	3	0 - 5
# 30 (600um)	119.2	0.4	2	
# 50 (300um)	112.9	0.3	2	
#100 (150um)	105.2	0.3	2	
#200 (75um)	92.9	0.3	1.3	0 - 5
-#200 (-75um)	16.3			

Total Sample Aggregate Weight: 49852.3

- 1/2" Aggregate Weight: 1856.3

- 1/2" After Wash Weight: 1428.6

REMARKS: Test performed prior to placement. 1612 BB

I certify that this test was performed in accordance with ASTM C117-95 & C136-95/AASHTO T11-91 & T27-93.

[Signature]

P.O. BOX 427 CENTERFIELD, UT. 84622

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A7. Cap Rock and Armoring **Cap Rock Durability and Gradation Test Results**

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-95 AASHTO T27-93)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-95 AASHTO T11-91)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 11/04/09
PROJECT: MISC. OC
SAMPLE LOCATION: FREMONT PIT - OFF BELT
MATERIAL TYPE: BIPRA 2" Cap rock Grey Basalt Source: Freemont Junction
TESTED BY: JC 1-6-1288 SAMPLED BY: CLIENT LAB #: 5159

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
4 in. (100mm)		0.0	100	100
3 in. (75mm)	16522.8	29.6	70	
2 in. (50mm)	11845.5	21.2	49	40 - 50
1 1/2 in. (37.5mm)	10787.4	19.3	30	20 - 30
1 in. (25mm)	5876.2	10.5	18	10 - 20
3/4 in. (19mm)	3618.9	6.5	13	
1/2 in. (12.5mm)	3344.9	6.0	7	5 - 25
3/8 in. (9.5mm)	277.6	1.2	6	
# 4 (4.75mm)	334.2	1.5	4	0 - 5
# 6 (2.36mm)	149.8	0.7	4	0 - 5
# 16 (1.18mm)	125.4	0.5	3	0 - 5
# 30 (600um)	101.4	0.4	3	
# 50 (300um)	98.7	0.4	2	
# 100 (150um)	87.4	0.4	2	
# 200 (75um)	88.5	0.4	1.4	0 - 5
-# 200 (-75um)	12.7			

Total Sample Aggregate Weight: 55896.7

- 1/2" Aggregate Weight: 1597.6

- 1/2" After Wash Weight: 1285.7

REMARKS: Test performed prior to placement, 1-6-1288

I certify that this test was performed in accordance with ASTM C117-93 & C136-95/AASHTO T11-91 & T27-93.

[Signature]

P.O. BOX 427 CENTERFIELD, UT. 84622

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A7. Cap Rock and Armoring **Cap Rock Durability and Gradation Test Results**

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-95 AASHTO T27-93)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-95 AASHTO T11-91)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 11/10/09
PROJECT: MISC. QC
SAMPLE LOCATION: FREMONT PIT - OFF BELT
MATERIAL TYPE: RAP 2" Cap rock Gray Basalt Source: Fremont Junction
TESTED BY: DB 1-6-12 BB SAMPLED BY: CLIENT LAB #: 5175

Sieve/Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
4 in. (100mm)		0.0	100	100
3 in. (75mm)	23576.9	21.7	78	
2 in. (50mm)	32329.4	29.6	49	40 - 50
1 1/2 in. (37.5mm)	20629.6	18.9	30	20 - 30
1 in. (25mm)	14090.4	12.9	17	10 - 20
3/4 in. (19mm)	5309.9	4.9	12	
1/2 in. (12.5mm)	5537.1	5.1	7	5 - 25
3/8 in. (9.5mm)	253.2	1.1	6	
# 4 (4.75mm)	399.0	1.7	4	0 - 5
# 6 (2.35mm)	239.1	1.0	3	0 - 5
# 16 (1.18mm)	172.0	0.7	3	0 - 5
# 30 (600um)	117.6	0.5	2	
# 50 (300um)	101.0	0.4	2	
# 100 (150um)	105.0	0.4	1	
# 200 (75um)	84.9	0.4	0.6	0 - 5
-# 200 (-75um)	15.8			

Total Sample Aggregate Weight: 109298.2
- 1/2" Aggregate Weight: 1653.7 - 1/2" After Wash Weight: 1487.8

REMARKS: Test performed prior to placement. 1-6-12 BB

I certify that this test was performed in accordance with ASTM C117-95 & C136-95/AASHTO T11-91 & T27-93.

M. Christensen

P.O. BOX 427 CENTERFIELD, UT. 84622

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A7. Cap Rock and Armoring **Cap Rock Durability and Gradation Test Results**

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-95 AASHTO T27-93)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-95 AASHTO T11-91)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 11/12/09
PROJECT: MISC. QC
SAMPLE LOCATION: FREMONT PIT - OFF BELT
MATERIAL TYPE: RIPPED 2" Cap rock Grey Basalt Source: Fremont Junction
TESTED BY: KC 1-6-12-08 SAMPLED BY: CLIENT LAB #: 5181

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
4 in. (100mm)		0.0	100	100
3 in. (75mm)	9965.3	20.2	80	
2 in. (50mm)	16501.7	33.6	46	40 - 50
1 1/2 in. (37.5mm)	6744.1	17.7	28	20 - 30
1 in. (25mm)	5262.9	10.7	18	10 - 20
3/4 in. (19mm)	3858.1	7.8	10	
1/2 in. (12.5mm)	2416.5	4.9	5	5 - 25
3/8 in. (9.5mm)	219.7	0.7	4	
# 4 (4.75mm)	365.5	1.2	3	0 - 5
# 8 (2.35mm)	184.6	0.6	3	0 - 5
# 16 (1.18mm)	131.4	0.4	2	0 - 5
# 30 (600um)	88.8	0.3	2	
# 50 (300um)	85.8	0.3	1	
#100 (150um)	96.2	0.3	1	
#200 (75um)	80.9	0.3	0.9	0 - 5
-#200 (-75um)	12.6			

Total Sample Aggregate Weight: 49385.0

- 1/2" Aggregate Weight: 1510.1

- 1/2" After Wash Weight: 1285.5

REMARKS: Test performed prior to placement. 11/12/08

I certify that this test was performed in accordance with ASTM C117-95 & C136-95/AASHTO T11-91 & T27-93.

[Signature]

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A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-95/AASHTO T27-93)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-95/AASHTO T11-91)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 11/16/09
PROJECT: MISC. QC
SAMPLE LOCATION: FREMONT PIT - OFF BELT
MATERIAL TYPE: RIPRAP 2" Cap rock Gray Basalt Source: Fremont Junction
TESTED BY: KC SAMPLED BY: CLIENT LAB #: 5187

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
4 in. (100mm)	-	0.0	100	100
3 in. (75mm)	10428.8	19.6	80	
2 in. (50mm)	17511.9	32.9	46	40 - 50
1 1/2 in. (37.5mm)	9587.9	18.0	30	20 - 30
1 in. (25mm)	6144.2	11.5	18	10 - 20
3/4 in. (19mm)	4094.4	7.7	10	
1/2 in. (12.5mm)	2512.6	4.7	6	5 - 25
3/8 in. (9.5mm)	312.8	0.8	5	
# 4 (4.75mm)	404.6	1.2	3	0 - 5
# 8 (2.36mm)	270.2	0.8	3	0 - 5
# 16 (1.18mm)	184.4	0.5	2	0 - 5
# 30 (600um)	123.4	0.4	2	
# 50 (300um)	114.8	0.3	1	
#100 (150um)	122.4	0.4	1	
#200 (75um)	95.6	0.3	0.8	0 - 5
-#200 (-75um)	13.8			

Total Sample Aggregate Weight: 53251.4

- 1/2" Aggregate Weight: 1889.6

- 1/2" After Wash Weight: 1642.0

REMARKS: Test performed prior to placement. 1-6-12-88

I certify that this test was performed in accordance with ASTM C117-95 & C136-95/AASHTO T11-91 & T27-93. [Signature]

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A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-CURRENT AASHTO T27-CURRENT)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-CURRENT AASHTO T11-CURRENT)

CLIENT: NIELSON CONSTRUCTION JOB#: 1337 DATE: 12/07/10
PROJECT: MISC. OC UMTRA
SAMPLE LOCATION: LIFT AREA IN PLACE SAMPLE 1 (lot #1) UCA0110112400
MATERIAL TYPE: COVER TOP 2" Cap rock Grey Basalt Source: Crescent Junction
TESTED BY: JC 1-6-12-09 SAMPLED BY: KCKH LAB #: 5997

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
8 in. (200mm)		0.0	100.0	
6 in. (150mm)		0.0	100.0	
4 in. (100mm)		0.0	100.0	100
3 in. (75mm)	15098.8	9.8	90.2	
2 in. (50mm)	70262.4	36.1	54.1	40 - 50
1 1/2 in. (37.5mm)	48295.0	24.6	29.3	20 - 30
1 in. (25mm)	24182.1	12.4	16.9	10 - 20
3/4 in. (19mm)	7462.6	3.8	13.1	
1/2 in. (12.5mm)	2702.1	6.7	6.4	5 - 15
3/8 in. (9.5mm)	454.4	1.1	5.3	
# 4 (4.75mm)	558.2	1.4	3.9	0 - 5
# 8 (2.36mm)	238.0	0.8	3.3	0 - 5
# 16 (1.18mm)	139.4	0.3	3.0	0 - 5
# 30 (600um)	99.4	0.2	2.7	
# 50 (300um)	111.0	0.3	2.4	
# 100 (150um)	151.5	0.4	2.1	
# 200 (75um)	208.4	0.5	1.8	0 - 5
-#200 (-75um)	43.4			

Total Sample Aggregate Weight: 194733.2

- 3/4" Aggregate Weight: 5280.9

- 2 1/4" Alter Wash Weight: 4704.8

REMARKS: 3 4-8-1109 samples were taken in lot #1 & combined to represent lot area. Test performed for 1st 5,000yd³ placed. 1-6-12-09

I certify that this test was performed in accordance with the current version(s) of ASTM C117 & C136/AASHTO T11 & T27.

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A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-CURRENT AASHTO T27-CURRENT)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-CURRENT AASHTO T11-CURRENT)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 12/07/10
PROJECT: MISC. OC UMTRA
SAMPLE LOCATION: LIFT AREA IN PLACE SAMPLE 2 (lot #2) UCA01101124-00
MATERIAL TYPE: COVER TOP 2" Cap rock Grey Basalt Source: Freemont Junction
TESTED BY: JC SAMPLED BY: KC/KH LAB #: 5998

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
8 in. (200mm)		0.0	100.0	
6 in. (150mm)		0.0	100.0	
4 in. (100mm)		0.0	100.0	100
3 in. (75mm)	14576.0	7.8	92.1	
2 in. (50mm)	70135.6	37.8	54.4	40 - 50
1 1/2 in. (37.5mm)	38522.5	20.8	33.6	20 - 30
1 in. (25mm)	22213.5	12.0	21.6	10 - 20
3/4 in. (19mm)	13677.2	7.4	14.2	
1/2 in. (12.5mm)	3008.1	8.2	6.1	5 - 15
3/8 in. (9.5mm)	443.1	1.2	4.9	
# 4 (4.75mm)	535.4	1.5	3.4	0 - 5
# 8 (2.36mm)	215.2	0.6	2.9	0 - 5
# 16 (1.18mm)	124.4	0.3	2.5	0 - 5
# 30 (600um)	79.5	0.2	2.3	
# 50 (300um)	88.5	0.2	2.1	
# 100 (150um)	117.0	0.3	1.7	
# 200 (75um)	148.5	0.4	1.3	0 - 5
# 200 (-75um)	29.0			

Total Sample Aggregate Weight: 165557.9

- 3/4" Aggregate Weight: 5253.6

- 3/4" After Wash Weight: 4788.6

REMARKS: 3 in place samples were taken
in lot #2 & combined to represent lot area.
Test performed for 2nd 5,000 yds placed.

I certify that this test was performed in accordance with the current version(s) of ASTM C117 & C136/AASHTO T11 & T27.

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A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-CURRENT AASHTO T27-CURRENT)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-CURRENT AASHTO T11-CURRENT)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 10/26/11
PROJECT: MISC. QC
SAMPLE LOCATION: LIFT AREA IN PLACE SAMPLE 1 UCD0110809-00
MATERIAL TYPE: GREY BASALT: COVER TOP 2" Cap rock Source: Freemont Junction
TESTED BY: KC 1-6-1200 SAMPLED BY: KC/KH LAB #: 6532

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
5 in. (200mm)		0.0	100.0	
6 in. (150mm)		0.0	100.0	
4 in. (100mm)		0.0	100.0	100
3 in. (75mm)	45644.7	12.7	87.3	
2 in. (50mm)	139534.8	38.0	49.3	40 - 50
1 1/2 in. (37.5mm)	70248.3	19.1	30.2	20 - 30
1 in. (25mm)	55494.7	15.1	15.1	10 - 20
3/4 in. (18mm)	23351.5	6.4	8.8	
1/2 in. (12.5mm)	2852.8	4.6	4.2	5 - 15
3/8 in. (9.5mm)	370.8	0.6	3.6	
# 4 (4.75mm)	391.6	0.6	3.0	0 - 5
# 8 (2.35mm)	160.0	0.3	2.7	0 - 5
# 16 (1.18mm)	124.2	0.2	2.5	0 - 5
# 30 (600um)	89.3	0.1	2.4	
# 50 (300um)	111.0	0.2	2.2	
# 100 (150um)	142.3	0.2	2.0	
# 200 (75um)	270.0	0.4	1.5	0 - 5
# 200 (-75um)	38.3			

Total Sample Aggregate Weight: 357512.5
- 3/4" Aggregate Weight: 5465.3 - 3/4" After Wash Weight: 4550.3

REMARKS: Test performed for 3rd 5,000 yd³ placed
Test passed due to in place tolerances.

I certify that this test was performed in accordance with the current version(s) of ASTM C117 & C136/AASHTO T11 & T27 John Christensen

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A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-CURRENT AASHTO T27-CURRENT)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-CURRENT AASHTO T11-CURRENT)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 10/26/11
PROJECT: MISC. QC
SAMPLE LOCATION: LIFT AREA IN PLACE SAMPLE 2 UCD0110809-00
MATERIAL TYPE: GREY BASALT: ~~COVER TOP 2" Cap rock~~ Source: Fremont Junction Grey Basalt
TESTED BY: KC SAMPLED BY: KC/KH LAB #: 6533

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
8 in. (200mm)		0.0	100.0	
6 in. (150mm)		0.0	100.0	
4 in. (100mm)		0.0	100.0	100
3 in. (75mm)	58923.4	20.8	79.2	
2 in. (50mm)	98838.5	34.8	44.5	40 - 50
1 1/2 in. (37.5mm)	48078.0	16.9	27.5	20 - 30
1 in. (25mm)	31549.6	11.1	16.4	10 - 20
3/4 in. (19mm)	15732.5	5.5	10.9	
1/2 in. (12.5mm)	2100.9	4.3	6.6	5 - 15
3/8 in. (9.5mm)	395.7	0.8	5.7	
# 4 (4.75mm)	446.6	0.9	4.8	0 - 5
# 8 (2.36mm)	202.8	0.4	4.4	0 - 5
# 16 (1.18mm)	156.2	0.3	4.1	0 - 5
# 30 (600um)	111.5	0.2	3.9	
# 50 (300um)	129.0	0.3	3.6	
# 100 (150um)	159.5	0.3	3.3	
# 200 (75um)	291.4	0.6	2.7	0 - 5
# 200 (-75um)	32.6			

Total Sample Aggregate Weight: 283728.8
- 3/4" Aggregate Weight: 5304.7 - 3/4" After Wash Weight: 4026.6

REMARKS: Test performed for 4th 5,000 yds placed.
Test passed.

I certify that this test was performed in accordance with the current version(s) of ASTM C117 & C136/AASHTO T11 & T27. John Christensen

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A7. Cap Rock and Armoring **Cap Rock Durability and Gradation Test Results**

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-CURRENT AASHTO T27-CURRENT)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-CURRENT AASHTO T11-CURRENT)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 11/02/11
PROJECT: MISC. QC
SAMPLE LOCATION: LOT 3 - IN PLACE SAMPLE UCD0110809-00
MATERIAL TYPE: COVER TOP 2" Cap rock Source: Freemont Junction Grey Basalt
TESTED BY: KC 1-6-12 BB SAMPLED BY: KH LAB #: 6540

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
8 in. (200mm)		0.0	100.0	
6 in. (150mm)		0.0	100.0	
4 in. (100mm)		0.0	100.0	100
3 in. (75mm)	30473.3	10.6	89.4	
2 in. (50mm)	120322.3	42.0	57.3	40 - 50
1 1/2 in. (37.5mm)	54892.2	19.2	80.1	20 - 30
1 in. (25mm)	38398.8	13.4	86.4	10 - 20
3/4 in. (19mm)	15496.2	5.4	94.3	
1/2 in. (12.5mm)	2426.9	4.2	95.1	5 - 15
3/8 in. (9.5mm)	452.0	0.8	99.2	
# 4 (4.75mm)	489.6	0.9	99.1	0 - 5
# 8 (2.36mm)	222.3	0.4	99.6	0 - 5
# 16 (1.18mm)	179.7	0.3	99.7	0 - 5
# 30 (600um)	129.2	0.2	99.8	
# 50 (300um)	144.7	0.3	99.7	
# 100 (150um)	178.6	0.3	99.7	
# 200 (75um)	245.3	0.4	99.6	0 - 5
# 200 (75um)	47.9			

Total Sample Aggregate Weight: 206271.0
- 3/4" Aggregate Weight: 5367.1 - 3/4" After Wash Weight: 4516.2

REMARKS: Test performed for the 5th 5,000 yd³ placed.
Test passed.

I certify that this test was performed in accordance with the current version(s) of ASTM C117 & C136/AASHTO T11 & T27 John Christensen

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A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-CURRENT AASHTO T27-CURRENT)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-CURRENT AASHTO T11-CURRENT)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 12/02/11
PROJECT: MISC. QC
SAMPLE LOCATION: LOT 2 - IN PLACE SAMPLE
MATERIAL TYPE: COVER TOP 2" Cap Rock Grey Basalt Source: Freemont Junction
TESTED BY: KC ^{1-6-12 BB} SAMPLED BY: KH LAB #: 6541

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
8 in. (200mm)		0.0	100.0	
6 in. (150mm)		0.0	100.0	
4 in. (100mm)		0.0	100.0	100
3 in. (75mm)	49200.7	14.0	86.0	
2 in. (50mm)	112239.6	31.9	54.1	40 - 50
1 1/2 in. (37.5mm)	68755.2	19.5	34.6	20 - 30
1 in. (25mm)	56324.9	16.0	18.6	10 - 20
3/4 in. (19mm)	23660.8	6.7	11.8	
1/2 in. (12.5mm)	1912.2	4.5	7.3	5 - 15
3/8 in. (9.5mm)	385.6	0.9	6.4	
# 4 (4.75mm)	514.9	1.2	5.2	0 - 5
# 8 (2.36mm)	313.1	0.7	4.4	0 - 5
# 16 (1.18mm)	242.4	0.6	3.9	0 - 5
# 30 (600um)	170.9	0.4	3.4	
# 50 (300um)	195.7	0.5	3.0	
#100 (150um)	228.5	0.5	2.4	
#200 (75um)	267.1	0.6	1.8	0 - 5
-#200 (-75um)	56.6			

Total Sample Aggregate Weight: 351819.3
- 3/4" Aggregate Weight: 4992.4 - 3/4" After Wash Weight: 4287.0

REMARKS: This gradation represents the 6th 5,000 yd³ placed.
Test passed due to in place testing tolerance.

I certify that this test was performed in accordance with the current version(s) of ASTM C117 & C136/AASHTO T11 & T27 John Christensen

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A7. Cap Rock and Armoring Cap Rock Durability and Gradation Test Results

CENTRAL UTAH TESTING & INSPECTION

SIEVE ANALYSIS: AGGREGATES (ASTM C136-CURRENT AASHTO T27-CURRENT)
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-CURRENT AASHTO T11-CURRENT)

CLIENT: NIELSON CONSTRUCTION JOB#: 1357 DATE: 12/02/11
PROJECT: MISC. QC
SAMPLE LOCATION: LOT 2 - IN PLACE SAMPLE UCK 20111122-00
MATERIAL TYPE: COVER TOP 2" Cap rock Gray Basalt Source: Fremont Junction
TESTED BY: KC 1-6-12 BB SAMPLED BY: KH LAB #: 6541

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
8 in. (200mm)		0.0	100.0	
6 in. (150mm)		0.0	100.0	
4 in. (100mm)		0.0	100.0	100
3 in. (75mm)	49200.7	14.0	86.0	
2 in. (50mm)	112239.6	31.6	54.1	40 - 50
1 1/2 in. (37.5mm)	68755.2	19.5	34.6	20 - 30
1 in. (25mm)	56324.9	16.0	16.6	10 - 20
3/4 in. (19mm)	23860.6	6.7	11.8	
1/2 in. (12.5mm)	1912.2	4.5	7.3	5 - 15
3/8 in. (9.5mm)	385.6	0.9	6.4	
# 4 (4.75mm)	514.9	1.2	5.2	0 - 5
# 8 (2.36mm)	313.1	0.7	4.4	0 - 5
# 16 (1.18mm)	242.4	0.6	3.9	0 - 5
# 30 (600um)	170.9	0.4	3.4	
# 50 (300um)	195.7	0.5	3.0	
# 100 (150um)	228.5	0.5	2.4	
# 200 (75um)	267.1	0.6	1.6	0 - 5
-#200 (-75um)	58.6			

Total Sample Aggregate Weight: 351819.3
- 3/4" Aggregate Weight: 4892.4 - 3/4" After Wash Weight: 4287.0

REMARKS: Test performed for 7th 5,000 yds placed.
Test passed due to in place tolerance.

I certify that this test was performed in accordance with the current version(s) of ASTM C117 & C136/AASHTO T11 & T27 Jedra Christensen

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