

SUMMARY OF TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10171
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	02 March 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	14 March 2015

Properties:

Properties Tested	Test Method	Results	S. Aramco Specification
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	0.3	5.0 max.
Clay lumps & friable particles %	ASTM C-142	0.20	5.0 Max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		7.8	--
Loss at 500 revolutions %		33.5	40 max.
Ratio 100/500 rev.		0.23	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	13.4	25.0 max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.629	--
SSD basis		2.585	--
Dry basis		2.558	--
Absorption		1.1	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
		0.015	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
		0.119	0.40 Max
Flakiness index	BS-812	10.7	--
Elongation index	BS-812	13.4	--
Coal & lignite	ASTM C-123	NIL	--

Remarks: All test results indicate compliance with the Saudi Aramco standard 09-SAMSS-088.

Tested By: Jose Daniel
CTTA # : 0195

Reviewed By: Imran Ahmed
CTTA # : 0556



Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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Certificate # 3512.05

Construction Materials Testing Laboratory Jubail Branch

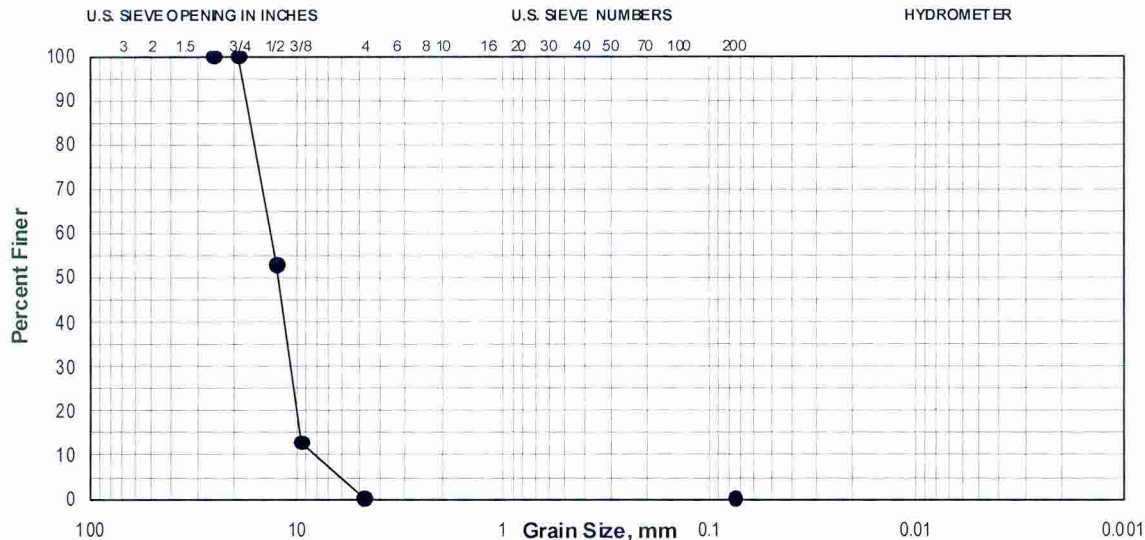
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10171
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	02 March 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	04 March 2015
Method	ASTM C-117/136	Date Reported	14 March 2015



Gravel		Sand			Silt or Clay
Coarse	fine	Coarse	medium	fine	

Description of Sand / Gravel Particles:

Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing %	Specification	Properties Tested		
			Item	Description	Result
1 (25.0 mm)	100				
3/4 (19 mm)	100				
1/2 (12.5 mm)	53				
3/8 (9.5 mm)	13				
#4 (4.75 mm)	0.4				
#8 (2.36 mm)	-				
#16 (1.18 mm)	-				
#100 (0.15 mm)	-				
#200 (75 mm)	0.3				

Remarks

Tested By: Jose Daniel
CTTA # : 0195

Reviewed By: Imran Ahmed
CTTA # : 0556



Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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SUMMARY OF TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10172
Material	3/8" (10- mm) Coarse Aggregate	Date Sampled	02 March 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	14 March 2015

Properties:

Properties Tested	Test Method	Results	S. Aramco Specification
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	0.9	5.0 max.
Clay lumps & friable particles %	ASTM C-142	0.25	5.0 max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		8.2	--
Loss at 500 revolutions %		34.3	40 max.
Ratio 100/500 rev.		0.24	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	15.4	25.0 max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.626	--
SSD basis		2.570	--
Dry basis		2.536	--
Absorption		1.4	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
		0.011	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
		0.285	0.40 Max
Flakiness index	BS-812	15	--
Elongation index	BS-812	10	--
Coal & lignite	ASTM C-123	NIL	--

Remarks: All test results indicate compliance with the Saudi Aramco standard 09-SAMSS-088.

Tested By: Jose Daniel
CTTA #: 0195

Reviewed By: Imran Ahmed
CTTA #: 0556



Material Division Laboratory Supervisor
Jubail Lab (Muhammad Nawaz CTTA # 0037)

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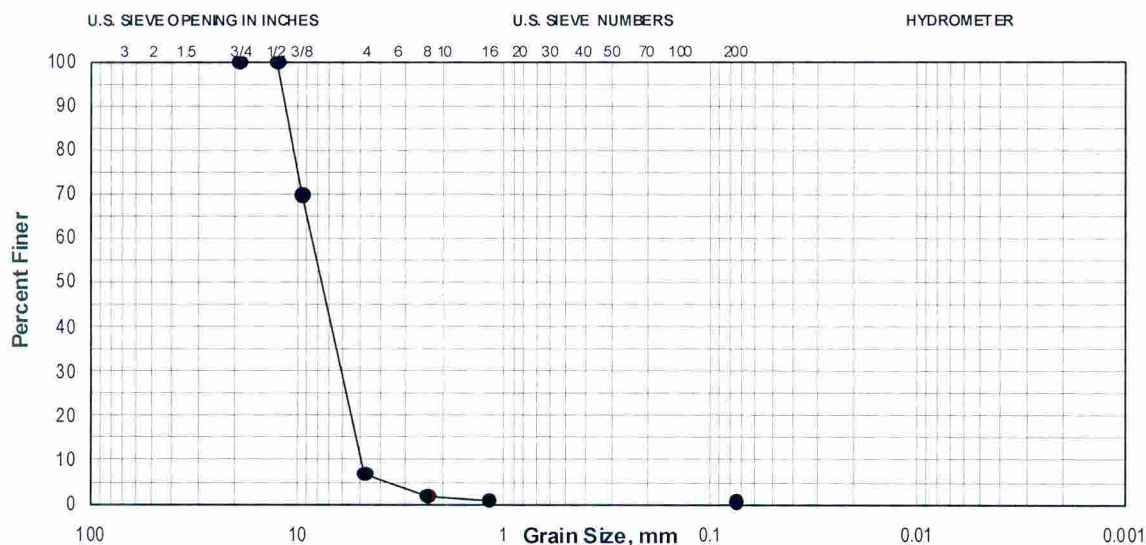


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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10172
Material	3/8" (10 mm) Coarse Aggregate	Date Sampled	02 March 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	04 March 2015
Method	ASTM C-117/136	Date Reported	14 March 2015



Gravel		Sand			Silt or Clay
Coarse	fine	Coarse	medium	fine	

Description of Sand / Gravel Particles:

Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing %	Specification	Properties Tested		
3/4 (19.0 mm)	100		Item	Description	Result
1/2 (12.5 mm)	100				
3/8 (9.5 mm)	70				
#4 (4.75 mm)	7				
#8 (2.36 mm)	2				
#16 (1.18 mm)	1				
#30 (0.600 mm)	-				
#50 (0.300 mm)	-				
#100 (0.15 mm)	-				
#200 (75 mm)	0.9				

Remarks

Tested By: Jose Daniel
CTTA # : 0195Reviewed By: Imran Ahmed
CTTA # : 0556

شركة السحيمي - فيفرو المحدودة
FUGRO-SUHAIMI
Material Division
Jubail
Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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SUMMARY OF TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10173
Material	Dune Sand	Date Sampled	02 March 2015
Source	Baladiyah, Jubail (Sampled by FSL)	Date Reported	14 March 2015

Properties:

Properties Tested	Test Method	Results	S. Aramco Specification
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	1.7	5.0 Max.
Clay lumps & friable particles %	ASTM C-142	N/A	3.0 Max.
Magnesium sulphate soundness loss (5 cycles) %	ASTM C-88	6.2	25.0 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.659	--
SSD basis		2.625	--
Dry basis		2.603	--
Absorption		0.9	
Acid soluble chloride, %	ASTM C 114	0.008	
(Cl), %			0.06 max
Acid soluble sulphate	BS-812 Part 118	0.081	
(SO ₃), %			0.40 Max
Organic impurities	ASTM C-40	Lighter then std.	Light then std.

Remarks: All test results indicate compliance with the Saudi Aramco standard 09-SAMSS-088.

Tested By: Jose Daniel
CTTA # : 0195

Reviewed By: Imran Ahmed
CTTA # : 0556



Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

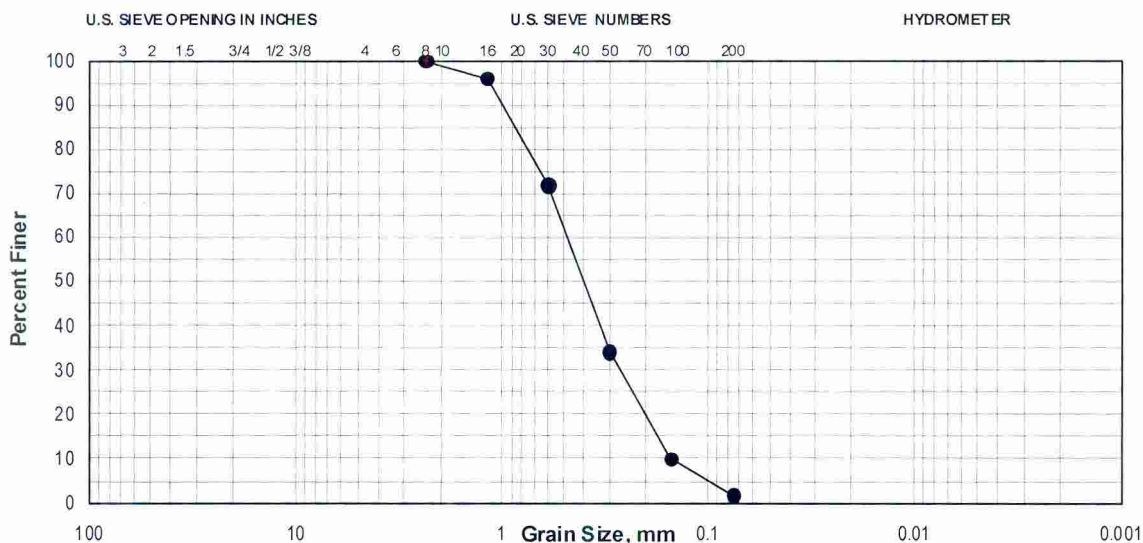
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Dammam 31451 - Fax.: (013) 341 2701
Saudi Arabia - E-mail.: fsljubail@fugro-suhaimi.com**PARTICLE SIZE ANALYSIS TEST REPORT**

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10173
Material	Dune Sand	Date Sampled	02 March 2015
Source	Baladiyah, Jubail (Sampled by FSL)	Date Tested	04 March 2015
Method	ASTM C-117/136	Date Reported	14 March 2015



Gravel		Sand			Silt or Clay
Coarse	fine	Coarse	medium	fine	

Description of Sand / Gravel Particles:

Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing %	Specification	Properties Tested		
			Item	Description	Result
#8 (2.36 mm)	100				
#16 (1.18 mm)	96				
#30 (0.600 mm)	72				
#50 (0.300 mm)	34				
#100 (0.15 mm)	10				
#200 (75 mm)	1.7				

Remarks

Tested By: Jose Daniel
CTTA #: 0195Reviewed By: Imran Ahmed
CTTA #: 0556

شركة السحيمي - فيفرو المحدودة
FUGRO-SUHAIMI
Material Division
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SUMMARY OF TEST REPORT

COMBINED AGGREGATE

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10171/10172
Material	3/4" - 3/8" Coarse Aggregate	Date Sampled	02 March 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	14 March 2015

Combined Grading

Sieve Size (mm)	Percent passing by weight			
	20-mm Size	10-mm size	55:45% 20:10-mm Blended	ASTM C 33 Size 67 limits
25	100	100	100	100
19	100	100	100	90 -100
12.5	53	100	75	--
9.5	13	70	39	20 – 55
4.75	0.4	7	3	0 – 10
2.36	-	2	1.0	0 – 5

Combined Soundness Loss By Magnesium Sulfate

Aggregate Size :	20 mm	10 mm
Individual Loss %	13.4	15.4
Combined loss @ 55: 45%	14.3	

Remarks: _____

Tested By: Jose Daniel

 CTTA # : 0195

Reviewed By: Imran Ahmed

 CTTA # : 0556



Sr. Laboratory Supervisor
 Muhammad Nawaz CTTA # 0037

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TEST REPORT FOR CHEMICAL ANALYSIS ON WATER

Client	A.H. Al Marhoon & Bros. Co.	Report Date	14 March. 2015
Project	Concrete Batch Plant, Rahima	Job No.	SA08-3012
Source	Sampled by FSL	Lab No.	10174
Sample Location	From Batch Plant	Sampled by	Sampled by FSL

Fugro-Suhaimi Ltd. (FSL) has performed chemical analysis on a water sample based on client request. The testing was carried out in accordance with the relevant ASTM and APHA Methods. The results and pertinent information are as follows:

Test results

Serial No.	Determination	Test Results	SCECO Specs.
2.	pH	6.62	7 – 8.5
3.	Chloride as Cl ⁻ , ppm	54.4	300 max
4.	Sulfate as SO ₃ , ppm	7.0	300 max
5.	Total Dissolved Solids- TDS, ppm	122.7	500 max

Remarks: Test results indicate compliance with the SCECO Standard 71-SMSS-5, Rev.4.

Tested By: CPN Reviewed By: WN
CTTA # : - CTTA # : -



Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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