

SUMMARY OF TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	11007
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	01 July 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	16 July 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	0.6	5.0 max.
Clay lumps & friable particles %	ASTM C-142	0.38	5.0 Max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		8.1	--
Loss at 500 revolutions %		33.8	40 max.
Ratio 100/500 rev.		0.24	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	10.4	25.0 max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.621	--
SSD basis		2.580	--
Dry basis		2.554	--
Absorption		1.0	2.5 max
Acid soluble chloride, %	ASTM C 114		
(Cl), %		0.016	0.03 max
Acid soluble sulphate	BS-812 Part 118		
(SO ₃), %		0.157	0.40 Max
Flakiness index	BS-812	8.1	--
Elongation index	BS-812	9.6	--
Coal & lignite	ASTM C-123	NIL	--

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

Tested By: Thomas
CTTA # : 0194

Reviewed By: Imran Ahmed
CTTA # : 0556



Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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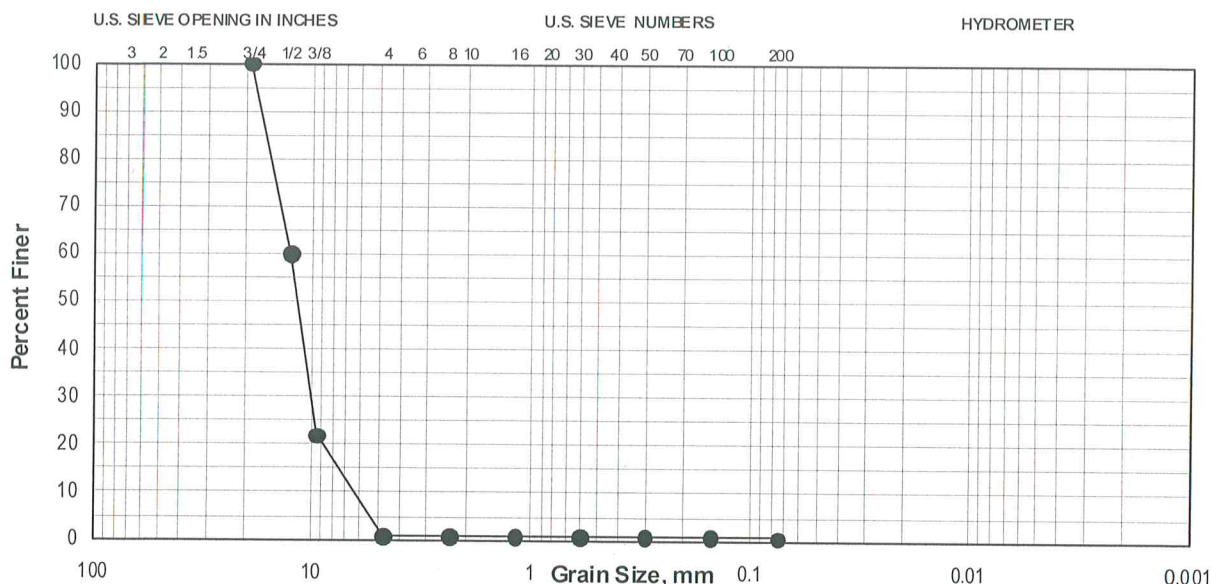
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**Construction Materials Testing Laboratory
Jubail Branch**P.O. Box 2165 – Tel.: (013) 341 2700
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السحيمي - فيفرو

PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	11007
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	01 July 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	05-06 July 2015
Method	ASTM C-136/117	Date Reported	16 July 2015



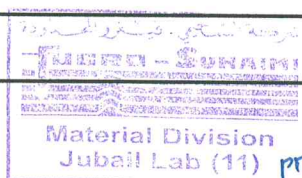
Gravel		Sand			Silt or Clay
Coarse	fine	Coarse	medium	fine	

Description of Sand / Gravel Particles:

Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing g %	Specification	Properties Tested		
1 (25.0 mm)	100		Item	Description	Result
3/4 (19 mm)	60				
1/2 (12.5 mm)	22				
3/8 (9.5 mm)	0.8				
#4 (4.75 mm)	0.8				
#8 (2.36 mm)	0.8				
#16 (1.18 mm)	0.8				
#30(600)	0.8				
#50(300)	0.8				
#100 (0.15 mm)	0.8				
#200 (75 mm)	0.6				

Remarks	
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Tested By: Thomas Reviewed By: Imran Ahmed
CTTA # : 0194 CTTA # : 0556Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037



Certificate # 3512.05

Construction Materials Testing Laboratory - FUGRO - SUHAIMI
Jubail BranchP.O. Box 2165 - Tel.: (013) 341 2700
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Saudi Arabia - E-mail.: fsljubail@fugro-suhaimi.com**SUMMARY OF TEST REPORT**

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	11008
Material	3/8" (10- mm) Coarse Aggregate	Date Sampled	01 July 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	16 July 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	1.1	5.0 max.
Clay lumps & friable particles %	ASTM C-142	0.44	5.0 max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		8.6	--
Loss at 500 revolutions %		34.8	40 max.
Ratio 100/500 rev.		0.25	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	14.7	25.0 max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.632	--
SSD basis		2.573	--
Dry basis		2.538	--
Absorption		1.4	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
		0.020	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
		0.264	0.40 Max
Flakiness index	BS-812	9.6	--
Elongation index	BS-812	12.4	--
Coal & lignite	ASTM C-123	NIL	--

Remarks: All test results indicate compliance with the Saudi Aramco standard 09-SAMSS-088.Tested By: Thomas
CTTA # : 0194Reviewed By: Imran Ahmed
CTTA # : 0556**Sr. Laboratory Supervisor**
Muhammad Nawaz CTTA # 0037

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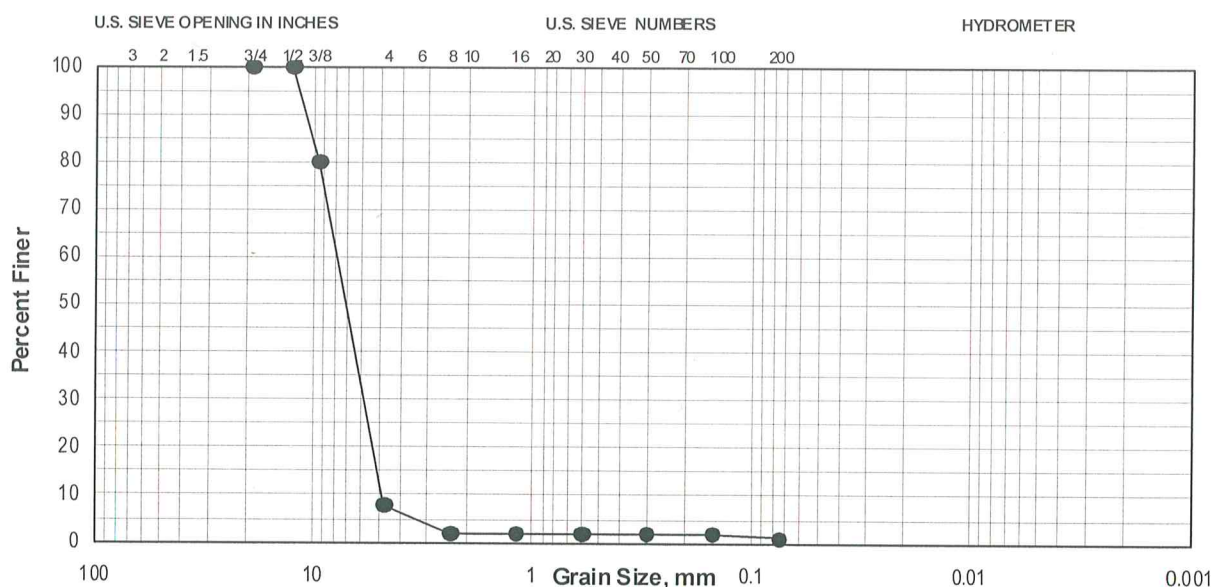
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	11008
Material	3/8" (10 mm) Coarse Aggregate	Date Sampled	01 July 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	05-06 July 2015
Method	ASTM C-117/136	Date Reported	16 July 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
3/4 (19.0 mm)	100				
1/2 (12.5 mm)	100				
3/8 (9.5 mm)	80				
#4 (4.75 mm)	8				
#8 (2.36 mm)	2				
#16 (1.18 mm)	2				
#30 (0.600 mm)	2				
#50 (0.300 mm)	2				
#100 (0.15 mm)	2				
#200 (75 mm)	1.1				

Remarks

Tested By: Thomas Reviewed By: Imran Ahmed
CTTA # : 0194 CTTA # : 0556Sr. Laboratory Supervisor
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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.	11007 – 11008
Material	3/4" - 3/8" Coarse Aggregate	Date Sampled	01 July 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	16 July 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	60	100	78	--
9.5	22	80	48	20 – 55
4.75	0.8	8	4	0 – 10
2.36	-	2	0.9	0 – 5

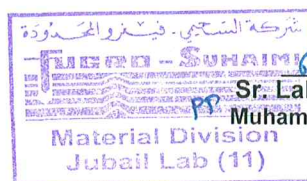
Combined Soundness Loss By Magnesium Sulfate

Aggregate Size :	20 mm	10 mm
Individual Loss %	10.4	14.7
Combined loss @ 55: 45%	12.3	

Remarks:

Tested By: Thomas
CTTA # : 0194

Reviewed By: Imran Ahmed
CTTA # : 0556



Sr. Laboratory Supervisor
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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.	11009
Material	Dune Sand	Date Sampled	01 July 2015
Source	Baladiyah, Jubail (Sampled by FSL)	Date Reported	16 July 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	N/A	3.0 Max.
Magnesium sulphate soundness loss (5 cycles) %	ASTM C-88	6.5	25.0 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.661	--
SSD basis		2.623	--
Dry basis		2.600	--
Absorption		0.9	
Acid soluble chloride, %	ASTM C 114	0.008	
(Cl), %			0.06 max
Acid soluble sulphate	BS-812 Part 118	0.053	
(SO ₃), %			0.40 Max
Organic impurities	ASTM C-40	Lighter than std	Light than std.

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

Tested By: Thomas Reviewed By: Imran Ahmed
CTTA #: 0194 CTTA #: 0556


Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037



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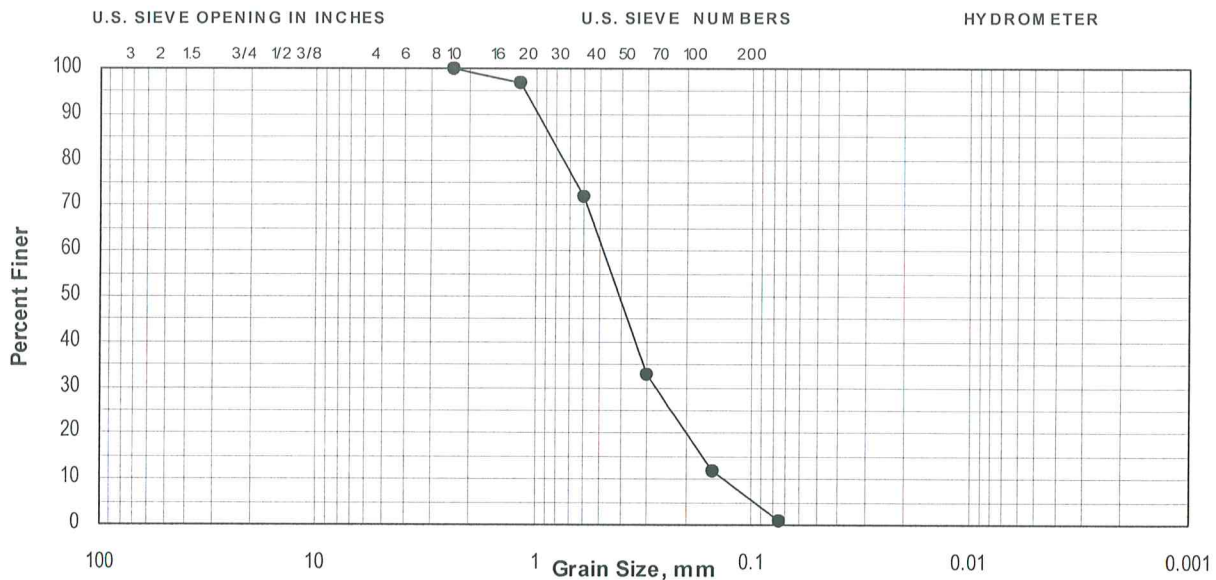
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	11009
Material	Sand	Date Sampled	01 July 2015
Source	Baladiyah, Jubail (Sampled by FSL)	Date Tested	05-06 July 2015
Method	ASTM C-117/136	Date Reported	16 July 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)	97				
#30 (0.600 mm)	72				
#50 (0.300 mm)	33				
#100 (0.15 mm)	12				
#200 (75 mm)	0.9				

Remarks

Tested By: Thomas Reviewed By: Imran Ahmed
CTTA #: 0194 CTTA #: 0556Sr. 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	16 July 2015
Project	Concrete Batch Plant, Rahima	Job No.	SA08-3012
Source	Sampled by FSL	Lab No.	11010
		Sampled by	

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:

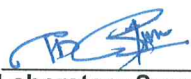
Test results

Serial No.	Determination	Test Results	S. Aramco Specification
2.	pH	7.14	6 - 8
3.	Chloride as Cl ⁻ , ppm	37.2	--
4.	Sulfate as SO ₃ , ppm	2.0	--
5.	Total Dissolved Solids- TDS, ppm	110.8	500 max

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

Tested By: Thomas
CTTA # : 0194

Reviewed By: Imran Ahmed
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