



Certificate # 3512.05

Construction Materials Testing Laboratory **FUGRO - SUHAIMI**
Jubail Branch

P.O. Box 2165 – Tel.: (013) 341 2700
Dammam 31451 – Fax.: (013) 341 2701
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.	10858
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	01 June 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	13 June 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	0.14	5.0 max.
Clay lumps & friable particles %	ASTM C-142	0.34	5.0 Max.
Los Angeles Abrasion	ASTM C-131	--	
Loss at 100 revolutions %		7.8	--
Loss at 500 revolutions %		32.5	40 max.
Ratio 100/500 rev.		0.24	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	12.2	25.0 max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.638	--
SSD basis		2.591	--
Dry basis		2.563	--
Absorption		1.1	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114	0.016	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118	0.310	0.40 Max
Flakiness index	BS-812	11.4	--
Elongation index	BS-812	13.0	--
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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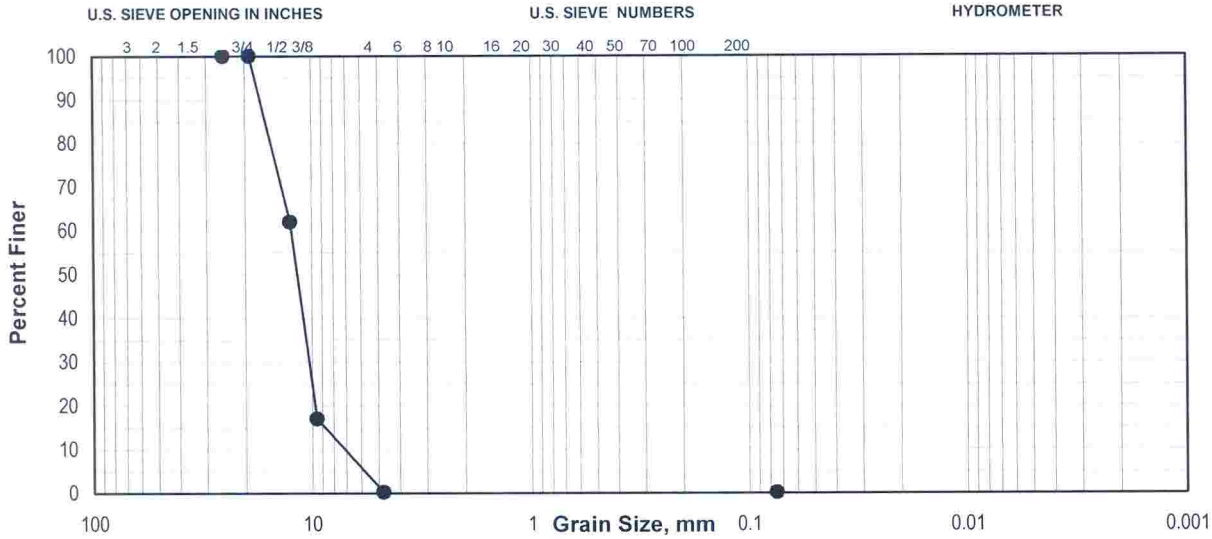


Certificate # 3512.05

PARTICLE SIZE ANALYSIS TEST REPORT

السحيمي - فيفرو

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10858
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	01 June 2015
Source	Al Marhoon RMC Plant	Date Tested	03-04 June



Method	ASTM C-136/117	Date Reported	13 June 2015
Gravel		Sand	
Coarse	fine	Coarse	medium fine
Silt or Clay			


Description of Sand / Gravel Particles:

Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing g %	Specification	Properties Tested		
			Item	Description	Result
1 (25.0 mm)	100				
3/4 (19 mm)	100				
1/2 (12.5 mm)	62				
3/8 (9.5 mm)	17				
#4 (4.75 mm)	0.2				
#8 (2.36 mm)	-				
#16 (1.18 mm)	-				
#30(600)	-				
#50(300)	-				
#100 (0.15 mm)	-				
#200 (75 mm)	0.14				

Remarks

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


 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.	10859
Material	3/8" (10- mm) Coarse Aggregate	Date Sampled	01 June 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	13 June 2015

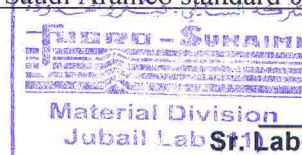
Properties:

Properties Tested	Test Method	Results	S. Aramco Specification
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	0.32	5.0 max.
Clay lumps & friable particles %	ASTM C-142	0.51	5.0 max.
Los Angeles Abrasion	ASTM C-131	--	--
Loss at 100 revolutions %		8.2	--
Loss at 500 revolutions %		34.2	40 max.
Ratio 100/500 rev.		0.24	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	15.0	25.0 max.
Specific gravity and absorption	ASTM C-127	--	--
Apparent		2.630	--
SSD basis		2.568	--
Dry basis		2.530	--
Absorption		1.5	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114	--	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118	0.279	0.40 Max
Flakiness index	BS-812	11.6	--
Elongation index	BS-812	10.6	--
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



St. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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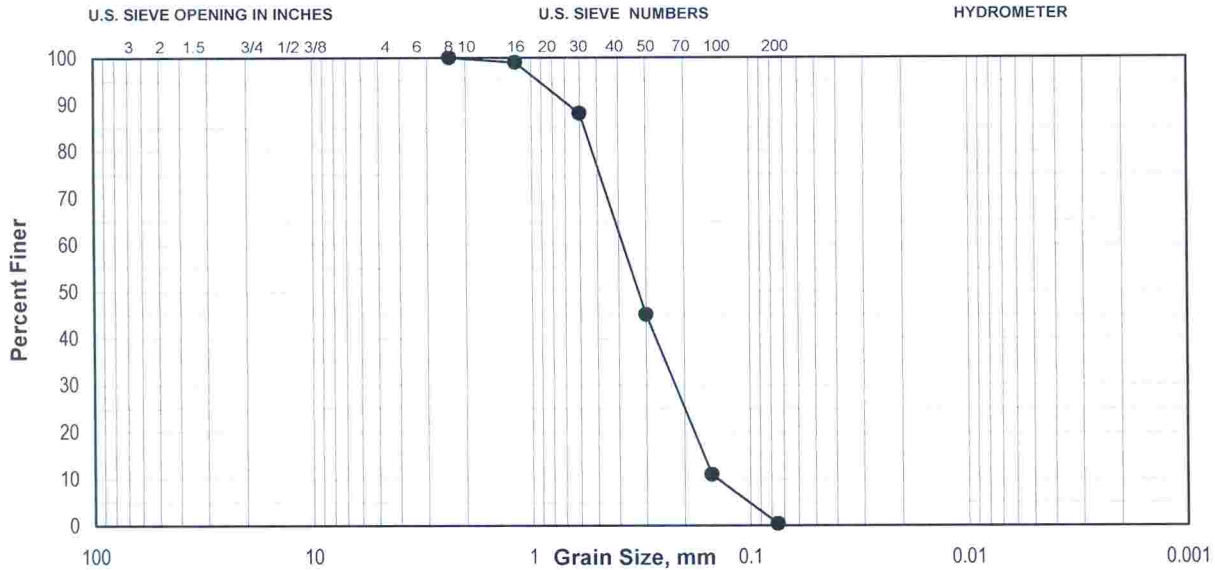
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السحيمي - فيفرو

PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10860
Material	Sand	Date Sampled	01 June 2015
Source	Al Marhoon RMC Plant	Date Tested	03-04 June 2015



Method	ASTM C-117/136	Date Reported	13 June 2015
Gravel		Sand	
Coarse	fine	Coarse	medium
		fine	
Silt or Clay			

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)	99				
#30 (0.600 mm)	88				
#50 (0.300 mm)	45				
#100 (0.15 mm)	11				
#200 (75 mm)	0.4				

Remarks	
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Tested By: Thomas Reviewed By: Imran Ahmed
CTTA # : 0194 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.	10860
Material	Dune Sand	Date Sampled	01 June 2015
Source	Baladiyah, Jubail (Sampled by FSL)	Date Reported	13 June 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	0.4	5.0 Max.
Clay lumps & friable particles %	ASTM C-142	--	3.0 Max.
Magnesium sulphate soundness loss (5 cycles) %	ASTM C-88	5.8	25.0 Max.
Specific gravity and absorption	ASTM C-127	--	
Apparent		2.656	--
SSD basis		2.622	--
Dry basis		2.601	--
Absorption		0.8	
Acid soluble chloride, (Cl), %	ASTM C 114	0.012	0.06 max
Acid soluble sulphate (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: Thomas
 CTTA # : 0194

Reviewed By: Imran Ahmed
 CTTA # : 0556



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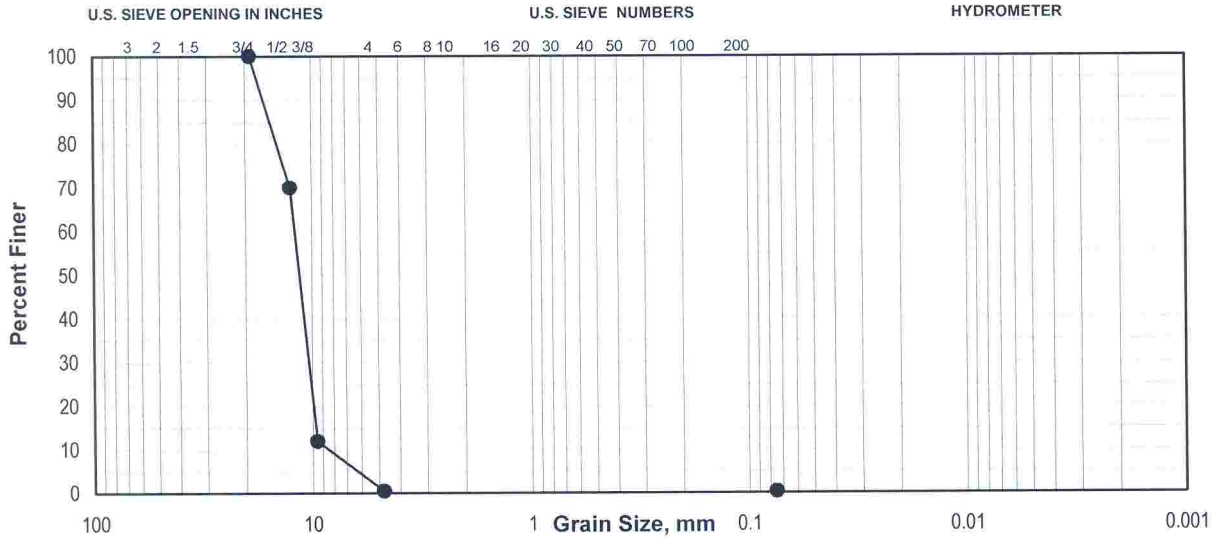


السحيمي - فيغرو

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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.	10859
Material	3/8" (20 mm) Coarse Aggregate	Date Sampled	01 June 2015
Source	Al Marhoon RMC Plant	Date Tested	03-04 June



Method	ASTM C-136/117	Date Reported	13 June 2015
Gravel		Sand	
Coarse	fine	Coarse	medium fine
Silt or Clay			

Description of Sand / Gravel Particles:

Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing %	Specification	Properties Tested		
			Item	Description	Result
1 (25.0 mm)					
3/4 (19 mm)	100				
1/2 (12.5 mm)	70	100			
3/8 (9.5 mm)	12	70			
#4 (4.75 mm)	0.4	12			
#8 (2.36 mm)	-	0.4			
#16 (1.18 mm)	-				
#30(600)	-				
#50(300)	-				
#100 (0.15 mm)	-				
#200 (75 mm)	0.32				

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



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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.	10858 / 10859
Material	3/4" - 3/8" Coarse Aggregate	Date Sampled	01 June 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	13 June 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	62	100	79	--
9.5	17	70	41	20 – 55
4.75	0.2	12	6	0 – 10
2.36	-	0.4	0.2	0 – 5

Combined Soundness Loss By Magnesium Sulfate		
Aggregate Size :	20 mm	10 mm
Individual Loss %	12.2	15.0
Combined loss @ 55: 45%	13.46	

Remarks:

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

شركة السحيمي - فيفرو
FUGRO - SUHAIMI
Material Division
Jubail
Sr. Laboratory Supervisor
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TEST REPORT FOR CHEMICAL ANALYSIS ON WATER

Client	A.H. Al Marhoon & Bros. Co.	Report Date	13 June 2015
Project	Concrete Batch Plant, Rahima	Job No.	SA08-3012
Source	Sampled by FSL	Lab No.	10861
		Sampled by	FSL Jubail

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	7.76	6 - 8
3.	Chloride as Cl ⁻ , ppm	3.0	--
4.	Sulfate as SO ₃ , ppm	17.73	--
5.	Total Dissolved Solids- TDS, ppm	64.8	500 max

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

Tested By: Thomas
CTTA # : 0194

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CTTA # : 0556



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