



Certificate # 3512.05

**Construction Materials Testing Laboratory
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

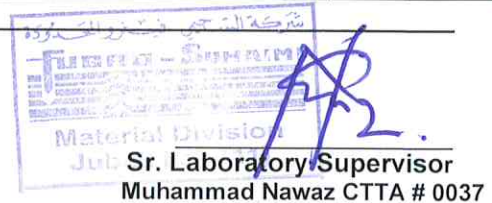
Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13238
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	06 Mar 2016
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	15 Mar 2016

Properties:

Properties Tested	Test Method	Results	SCECO Specs.
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	0.36	1.0 Max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		8.0	--
Loss at 500 revolutions %		33.1	35 Max.
Ratio 100/500 rev.		0.24	0.25 max
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	9.8	18 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.625	--
SSD basis		2.584	--
Dry basis		2.558	--
Absorption		1.0	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
(NaCl), %		0.011	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
(SO ₄), %		0.018	
Flakiness index	BS-812	8.3	30 Max.
Elongation index	BS-812	10.5	45 Max.
Coal & lignite	ASTM C-123	NIL	0.5 Max.

Remarks:

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





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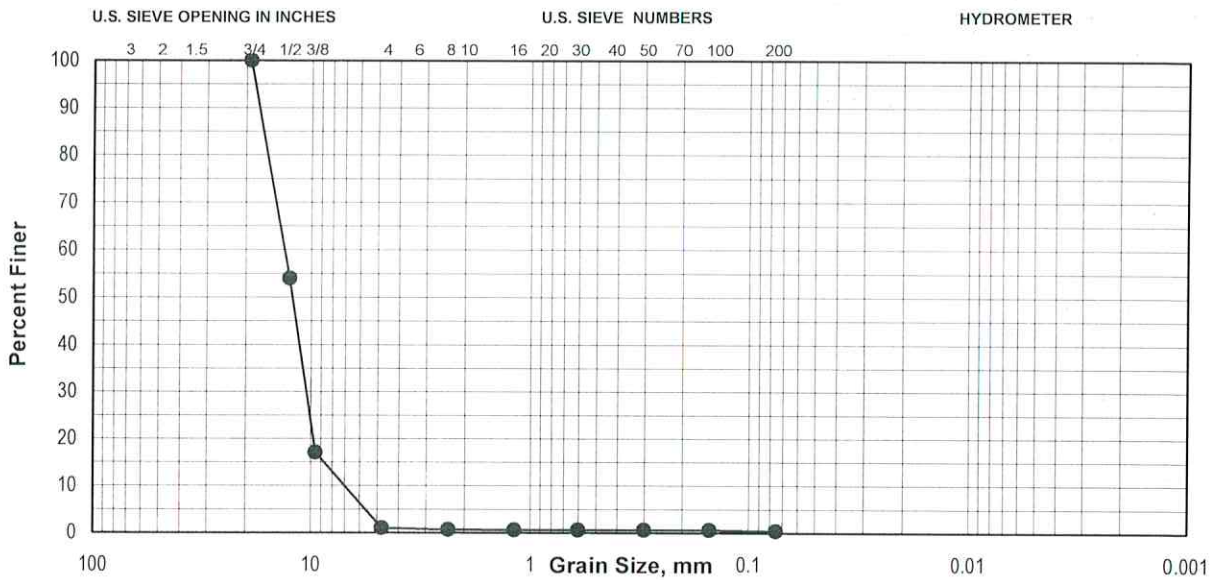
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13238
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	06 Mar 2016
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	07-08 Mar 2016
Method	ASTM C-136/117	Date Reported	15 Mar 2016



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)					
3/4 (19 mm)	100				
1/2 (12.5 mm)	54				
3/8 (9.5 mm)	17				
#4 (4.75 mm)	1				
#8 (2.36 mm)	0.7				
#16 (1.18 mm)	0.6				
#30 (0.600 mm)	0.6				
#50 (0.300 mm)	0.6				
#100 (0.150 mm)	0.6				
#200 (0.075 mm)	0.4				

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

FUGRO-SUHAIMI
Material Division
Jubail
Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037



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Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13239
Material	3/8" (10- mm) Coarse Aggregate	Date Sampled	06 Mar 2016
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	15 Mar 2016

Properties:

Properties Tested	Test Method	Results	SCECO Specs.
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	0.5	5.0 Max.
Clay lumps & friable particles %	ASTM C-142	0.52	1.0 Max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		8.5	--
Loss at 500 revolutions %		34.7	35 Max.
Ratio 100/500 rev.		0.24	0.25 max
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	15.5	18 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.624	--
SSD basis		2.570	--
Dry basis		2.537	--
Absorption		1.3	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
(NaCl), %		0.007	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
(SO ₄), %		0.158	0.5 max
Flakiness index	BS-812	10.0	30 Max.
Elongation index	BS-812	13.6	45 Max.
Coal & lignite	ASTM C-123	NIL	0.5 Max.

Remarks:

Tested By: Thomas
CTTA # : 0194Reviewed By: WN
CTTA # : -

Material Sr. Laboratory Supervisor
Jubail Muhammad Nawaz CTTA # 0037

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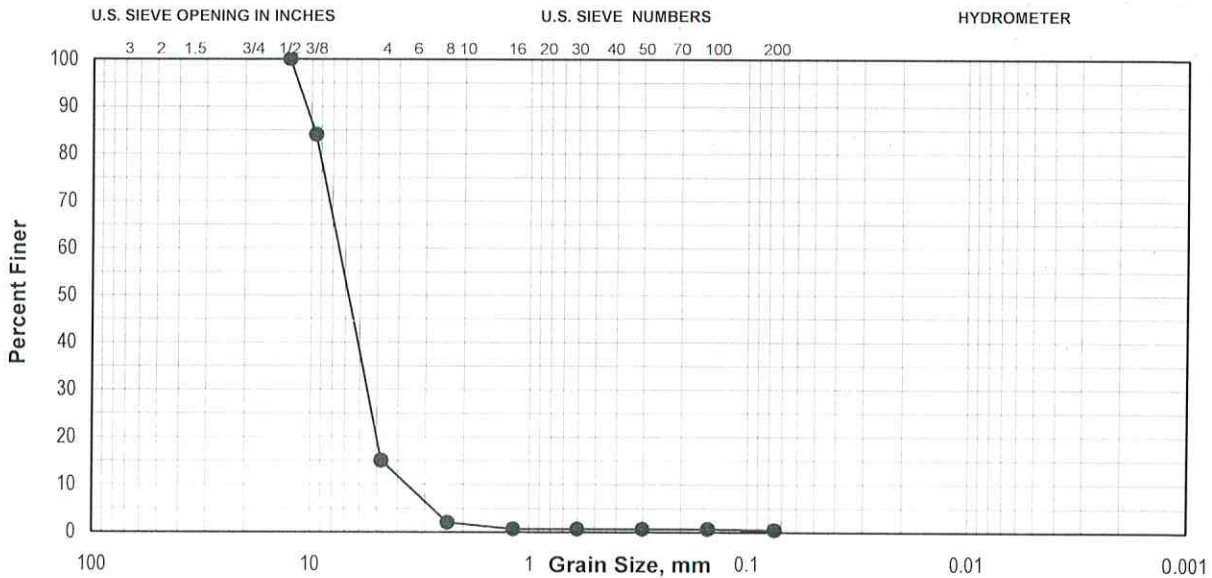
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13239
Material	3/8" (10 mm) Coarse Aggregate	Date Sampled	06 Mar 2016
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	07-08 Mar 2016
Method	ASTM C-117/136	Date Reported	15 Mar 2016



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)	84				
3/8 (9.5 mm)	15				
#4 (4.75 mm)	2				
#8 (2.36 mm)	0.7				
#16 (1.18 mm)	0.7				
#30 (0.600 mm)	0.7				
#50 (0.300 mm)	0.7				
#100 (0.15 mm)	0.7				
#200 (75 mm)	0.5				

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



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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.	13240
Material	Dune Sand	Date Sampled	06 Mar 2016
Source	Baladiyah, Jubail (Sampled by FSL)	Date Reported	15 Mar 2016

Properties:

Properties Tested	Test Method	Results	SCECO Specs.
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	1.9	2.0 Max.
Clay lumps & friable particles %	ASTM C-142	N/A	2.0 Max.
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	5.2	15 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.661	--
SSD basis		2.625	--
Dry basis		2.602	--
Absorption		0.9	1.0 max
Acid soluble chloride, (Cl), %	ASTM C 114		
(NaCl), %		0.004	0.05 max
(SO ₃), %		0.007	
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
(SO ₄), %		0.282	0.4 Max
(SO ₄), %		0.282	
Organic impurities	ASTM C-40	Light then std.	

Remarks: Not applicable: Material is finer than test size i.e. retained on Sieve No.16 hence the test is not applicable

Tested By: Thomas **Reviewed By:** WN
CTTA # : 0194 CTTA # : -



(Handwritten Signature)

**Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037**

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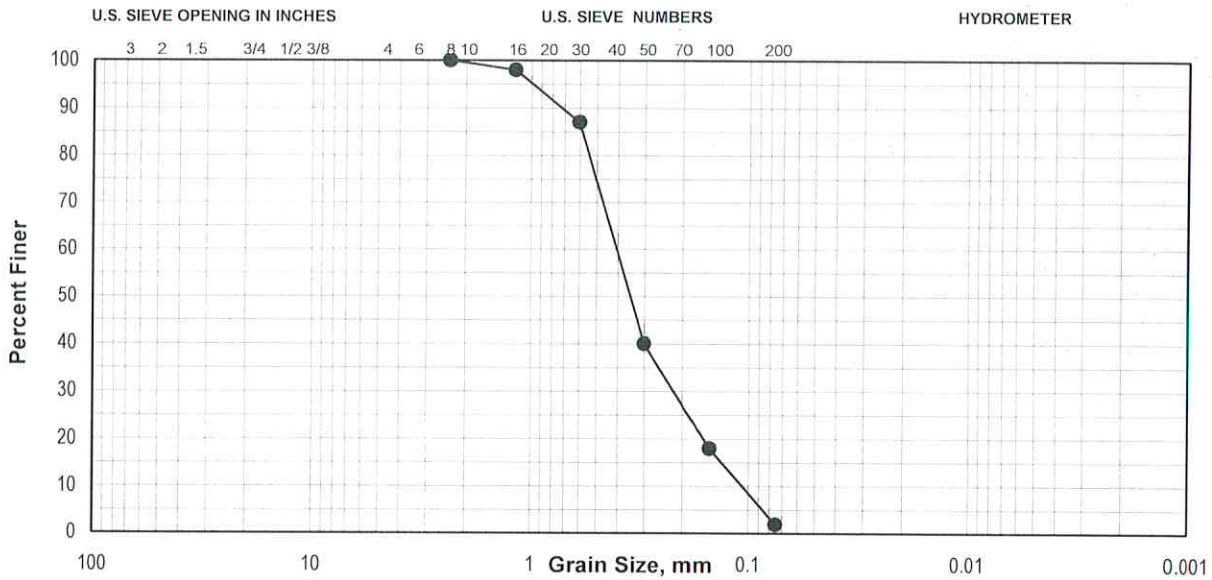
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13240
Material	Sand	Date Sampled	06 Mar 2016
Source	Baladiyah, Jubail (Sampled by FSL)	Date Tested	07-08 Mar 2016
Method	ASTM C-117/136	Date Reported	15 Mar 2016



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)	98				
#30 (0.600 mm)	87				
#50 (0.300 mm)	40				
#100 (0.15 mm)	18				
#200 (0.075 mm)	1.9				

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



(Signature)
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	15 Mar 2016
Project	Concrete Batch Plant, Rahima	Job No.	SA08-3012
Source	Sampled by FSL	Lab No.	13241
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.
1.	pH	7.8	7 – 8.5
2.	Chloride as Cl ⁻ , ppm	10.6	300 max
3.	Sulfate as SO ₃ , ppm	1.0	300 max
4.	Total Dissolved Solids- TDS, ppm	53.5	500 max

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

Tested By: Thomas
CTTA # : 0194

Reviewed By: WN
CTTA # : -



**Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037**