



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.	13492
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	04 April 2016
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	16 April 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	0.30	5.0 Max.
Clay lumps & friable particles %	ASTM C-142	0.40	1.0 Max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		7.8	--
Loss at 500 revolutions %		32.7	35 Max.
Ratio 100/500 rev.		0.24	0.25 max
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	10.1	18 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.623	--
SSD basis		2.577	--
Dry basis		2.549	--
Absorption		1.1	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
(NaCl), %		0.015	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
(SO ₄), %		0.025	
Flakiness index	BS-812	8.6	30 Max.
Elongation index	BS-812	11.1	45 Max.
Coal & lignite	ASTM C-123	NIL	0.5 Max.

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

Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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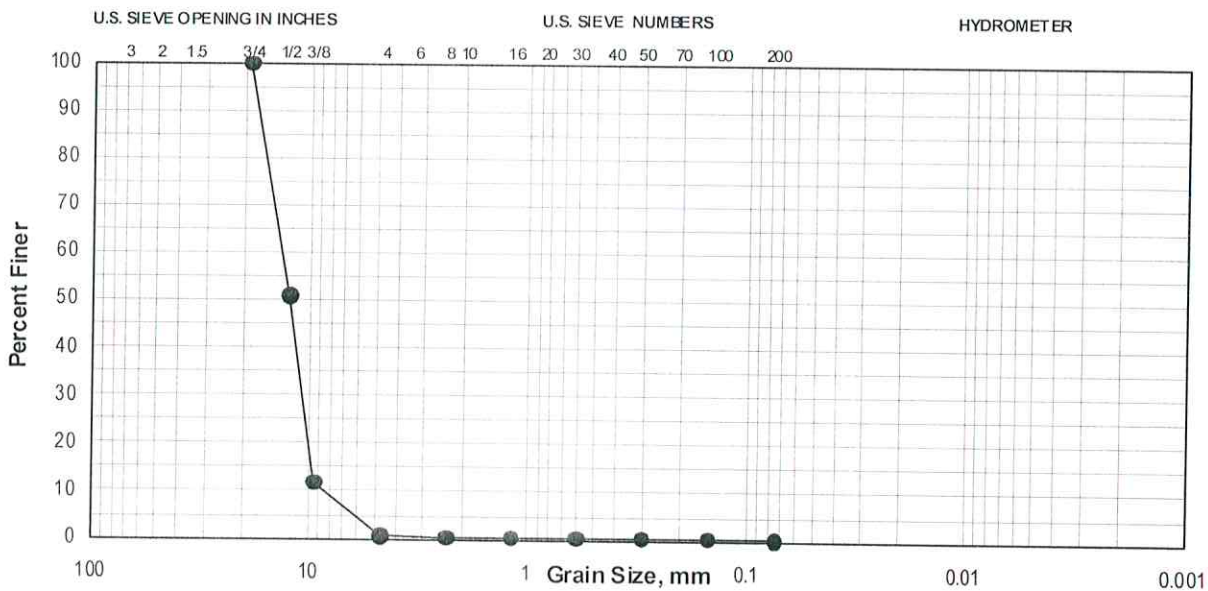
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13492
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	04 April 2016
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	05-06 April 2016
Method	ASTM C-136/117	Date Reported	16 April 2016



Gravel		Sand			Silt or Clay
Coarse	fine	Coarse	medium	fine	

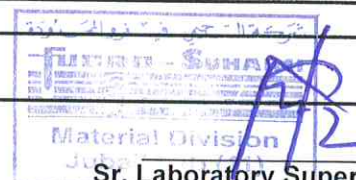
Description of Sand / Gravel Particles:

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)	51				
3/8 (9.5 mm)	12				
#4 (4.75 mm)	0.5				
#8 (2.36 mm)	0.5				
#16 (1.18 mm)	0.5				
#30 (0.600 mm)	0.5				
#50 (0.300 mm)	0.5				
#100 (0.150 mm)	0.5				
#200 (0.075 mm)	0.3				

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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السحيمي - فيفرو

SUMMARY OF TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13493
Material	3/8" (10- mm) Coarse Aggregate	Date Sampled	04 April 2016
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	16 April 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	0.44	1.0 Max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		8.4	--
Loss at 500 revolutions %		34.9	35 Max.
Ratio 100/500 rev.		0.24	0.25 max
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	14.7	18 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.627	--
SSD basis		2.573	--
Dry basis		2.540	--
Absorption		1.3	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
(NaCl), %		0.018	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
(SO ₄), %		0.030	
Flakiness index	BS-812	9.0	30 Max.
Elongation index	BS-812	12.9	45 Max.
Coal & lignite	ASTM C-123	NIL	0.5 Max.

Remarks:

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

Material: **Sr. Laboratory Supervisor**
Jubail **Muhammad Nawaz CTTA # 0037**

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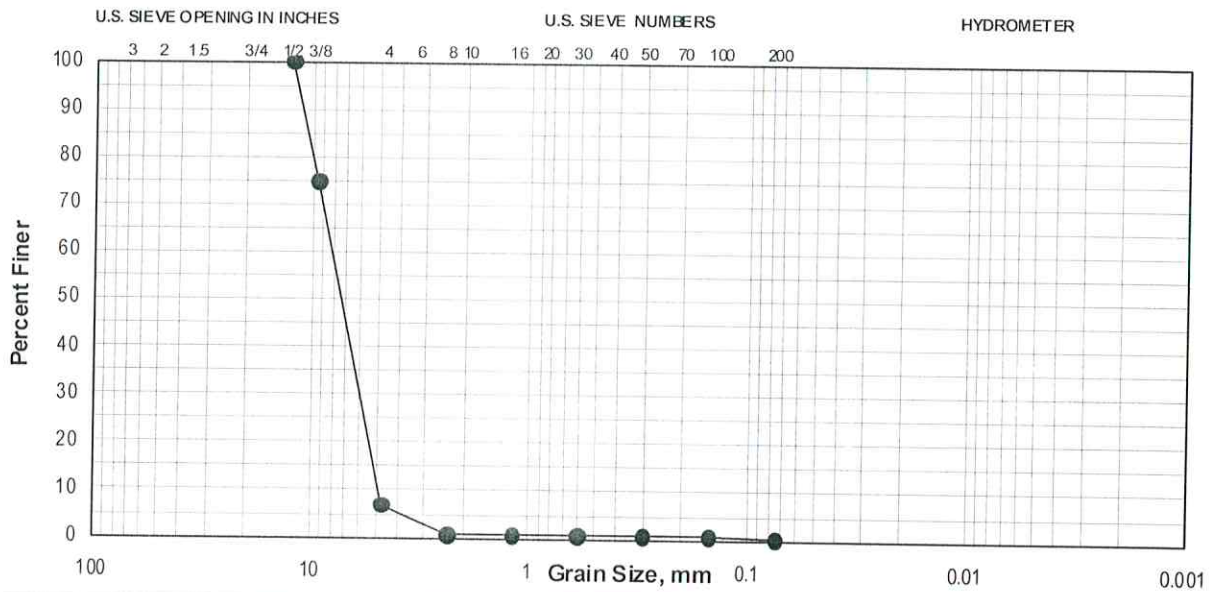
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13493
Material	3/8" (10 mm) Coarse Aggregate	Date Sampled	04 April 2016
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	05-06 April 2016
Method	ASTM C-117/136	Date Reported	16 April 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)					
1/2 (12.5 mm)	100				
3/8 (9.5 mm)	75				
#4 (4.75 mm)	7				
#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)	0.4				

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

Muhammad Nawaz
 Sr. Laboratory Supervisor
 CTTA # 0037

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السحيمي - فيفرو

SUMMARY OF TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13502
Material	Dune Sand	Date Sampled	04 April 2016
Source	Baladiyah, Jubail (Sampled by FSL)	Date Reported	16 April 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	1.8	2.0 Max.
Clay lumps & friable particles %	ASTM C-142	N/A	2.0 Max.
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	5.5	15 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.654	--
SSD basis		2.615	--
Dry basis		2.599	--
Absorption		0.8	1.0 max
Acid soluble chloride, %	ASTM C 114		
(Cl), %		0.007	0.05 max
(NaCl), %		0.012	
Acid soluble sulphate	BS-812 Part 118		
(SO ₃), %		0.081	0.4 Max
(SO ₄), %		0.081	
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 # : -

السحيمي - فيفرو
FUGRO - SUHAIMI
Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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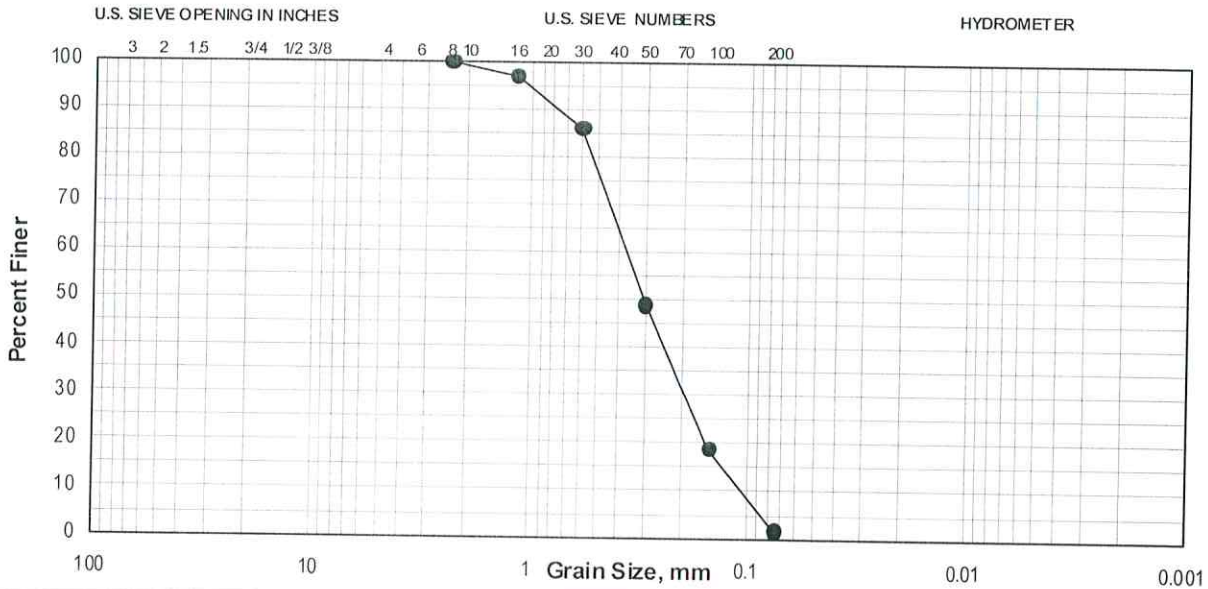
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	13502
Material	Sand	Date Sampled	04 April 2016
Source	Baladiyah, Jubail (Sampled by FSL)	Date Tested	05-06 April 2016
Method	ASTM C-117/136	Date Reported	16 April 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)	97				
#30 (0.600 mm)	86				
#50 (0.300 mm)	49				
#100 (0.15 mm)	19				
#200 (0.075 mm)	1.8				

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

شركة السحيمي - فيفرو
FUGRO - SUHAIMI
Material Division
Jubail Lab (11)
Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037



Certificate # 3512.05

السحيمي - فيفرو

TEST REPORT FOR CHEMICAL ANALYSIS ON WATER

Client	A.H. Al Marhoon & Bros. Co.	Report Date	16 April 2016
Project	Concrete Batch Plant, Rahima	Job No.	SA08-3012
Source	Sampled by FSL	Lab No.	13503
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	7.17	7 – 8.5
2.	Chloride as Cl ⁻ , ppm	49.6	300 max
3.	Sulfate as SO ₃ , ppm	17.0	300 max
4.	Total Dissolved Solids- TDS, ppm	119.7	500 max

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

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

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