

DOCUMENT TRANSMITTAL

Ref. No.	: FSL JUBAIL : SA08-3012	Date	: 13 October 2015
To	: A.H. Al Marhoon & Bros.Co Rahima, Saudi Arabia Fax: (03) 667-4721		
Attention	: Plant Manager		
Re	: Monthly Aggregate Testing – October 2015		


Please find enclosed the following documents:

Quantity	Document Reference	
1 each	3/4" Coarse Aggregate	Lab.No. 11721
-do-	3/8" Coarse Aggregate	Lab.No. 11722
-do-	Dune Sand	Lab.No. 11723
-do-	Summary Combined Aggregate	Lab No. 11721 – 11722
-do-	Chemical Analysis, Water	Lab No. 11724
	Invoice #	
Remarks:	ARAMCO & SCECO Specs.	

We request you to return a signed copy of this document transmittal form by facsimile transmission on 03 341-2701

Regards,

FUGRO-SUHAIMI LTD.

  
Muhammad Nawaz  
Lab. Supervisor  
050-6800943

Receipt confirmation of document(s)

Signature :

Name (print) :

Date :

Company Stamp:



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**

<b>Client</b>	A.H. Al Marhoon & Bros. Co.	<b>Job No.</b>	SA08-3012
<b>Project</b>	Concrete Batch Plant, Rahima	<b>Lab No.</b>	11721
<b>Material</b>	3/4" (20 mm) Coarse Aggregate	<b>Date Sampled</b>	04 Oct. 2015
<b>Source</b>	Al Osais, Abuhadriya (Sampled by FSL)	<b>Date Reported</b>	12 Oct. 2015

**Properties:**

Properties Tested	Test Method	Results	SCECO Specs.
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	0.53	5.0 Max.
Clay lumps & friable particles %	ASTM C-142	0.38	1.0 Max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		8.3	--
Loss at 500 revolutions %		33.2	35 Max.
Ratio 100/500 rev.		0.25	0.25 max
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	8.8	18 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.626	--
SSD basis		2.585	--
Dry basis		2.559	--
Absorption		1.0	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
(NaCl), %		0.020	0.03 max
Acid soluble sulphate (SO <sub>3</sub> ), %	BS-812 Part 118		
(SO <sub>4</sub> ), %		0.053	0.5 max
Flakiness index	BS-812	7.5	30 Max.
Elongation index	BS-812	9.7	45 Max.
Coal & lignite	ASTM C-123	NIL	0.5 Max.

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

The copyright of this document is owned by Fugro-Suhaimi Ltd. It may not be reproduced except with prior written approval from the company.



Certificate # 3512.05

## Construction Materials Testing Laboratory Jubail Branch

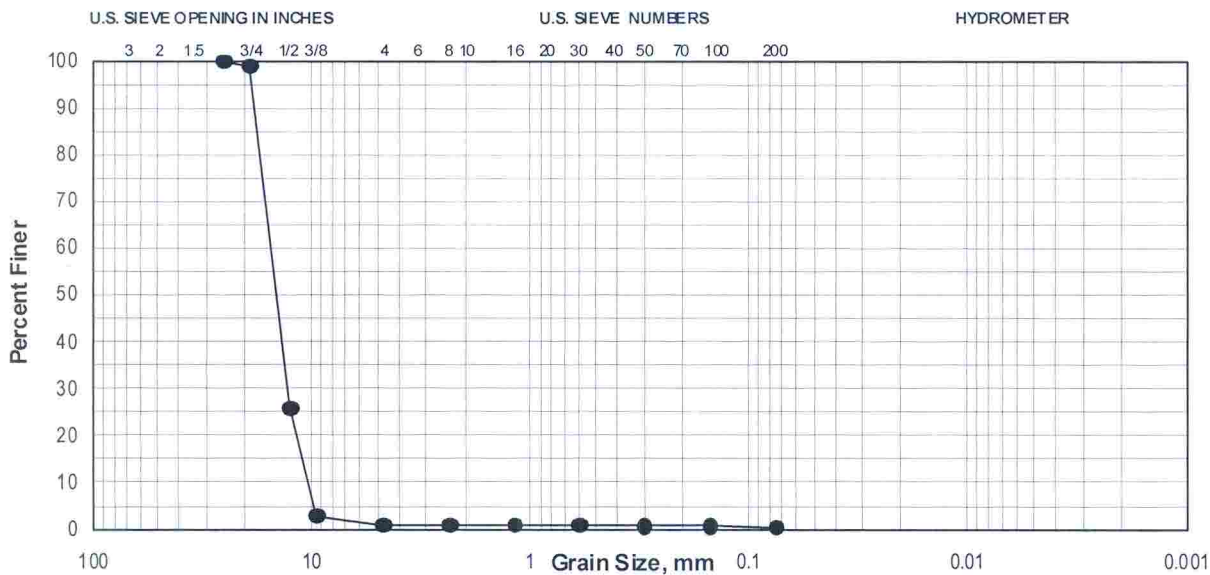
P.O. Box 2165 - Tel.: (013) 341 2700  
Dammam 31451 - Fax.: (013) 341 2701

Saudi Arabia - E-mail.: [fsljubail@fugro-suhaimi.com](mailto:fsljubail@fugro-suhaimi.com)



# PARTICLE SIZE ANALYSIS TEST REPORT

<b>Client</b>	A.H. Al Marhoon & Bros. Co.	<b>Job No.</b>	SA08-3012
<b>Project</b>	Concrete Batch Plant, Rahima	<b>Lab No.</b>	11721
<b>Material</b>	3/4" (20 mm) Coarse Aggregate	<b>Date Sampled</b>	04 Oct. 2015
<b>Source</b>	Al Osais, Abuhadriya (Sampled by FSL)	<b>Date Tested</b>	05-06 Oct. 2015
<b>Method</b>	ASTM C-136/117	<b>Date Reported</b>	12 Oct. 2015



Gravel		Sand			Silt or Clay
Coarse	fine	Coarse	medium	fine	

**Description of Sand / Gravel Particles:**

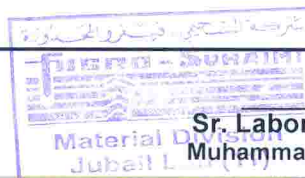
Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing g %	Specification	Properties Tested		
			Item	Description	Result
1 (25.0 mm)	100				
3/4 (19 mm)	99				
1/2 (12.5 mm)	26				
3/8 (9.5 mm)	3				
#4 (4.75 mm)	1				
#8 (2.36 mm)	1				
#16 (1.18 mm)	1				
#30 (0.600 mm)	0.96				
#50 (0.300 mm)	0.90				
#100 (0.150 mm)	0.87				
#200 (0.075 mm)	0.53				

**Remarks**

Tested By: Thomas David  
CTTA # : 0194

Reviewed By: Imran Ahmed  
CTTA # : 0556



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





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



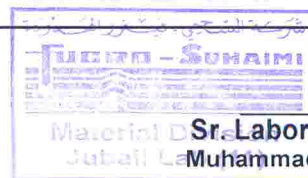
السحيمي - فيفرو

**SUMMARY OF TEST REPORT**

<b>Client</b>	A.H. Al Marhoon & Bros. Co.	<b>Job No.</b>	SA08-3012
<b>Project</b>	Concrete Batch Plant, Rahima	<b>Lab No.</b>	11722
<b>Material</b>	3/8" (10- mm) Coarse Aggregate	<b>Date Sampled</b>	04 Oct. 2015
<b>Source</b>	Al Osais, Abuhadriya (Sampled by FSL)	<b>Date Reported</b>	12 Oct. 2015

**Properties:**

Properties Tested	Test Method	Results	SCECO Specs.
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	1.11	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 %		8.7	--
Loss at 500 revolutions %		34.8	35 Max.
Ratio 100/500 rev.		0.25	0.25 max
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	12.2	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, %	ASTM C 114		
(Cl), %		0.012	0.03 max
(NaCl), %		0.020	
Acid soluble sulphate	BS-812 Part 118		
(SO <sub>3</sub> ), %		0.135	
(SO <sub>4</sub> ), %		0.135	0.5 max
Flakiness index	BS-812	11.2	30 Max.
Elongation index	BS-812	15.0	45 Max.
Coal & lignite	ASTM C-123	NIL	0.5 Max.

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

The copyright of this document is owned by Fugro-Suhaimi Ltd. It may not be reproduced except with prior written approval from the company.



Certificate # 3512.05

Construction Materials Testing Laboratory  
Jubail Branch

P.O. Box 2165 - Tel.: (013) 341 2700  
Dammam 31451 - Fax.: (013) 341 2701

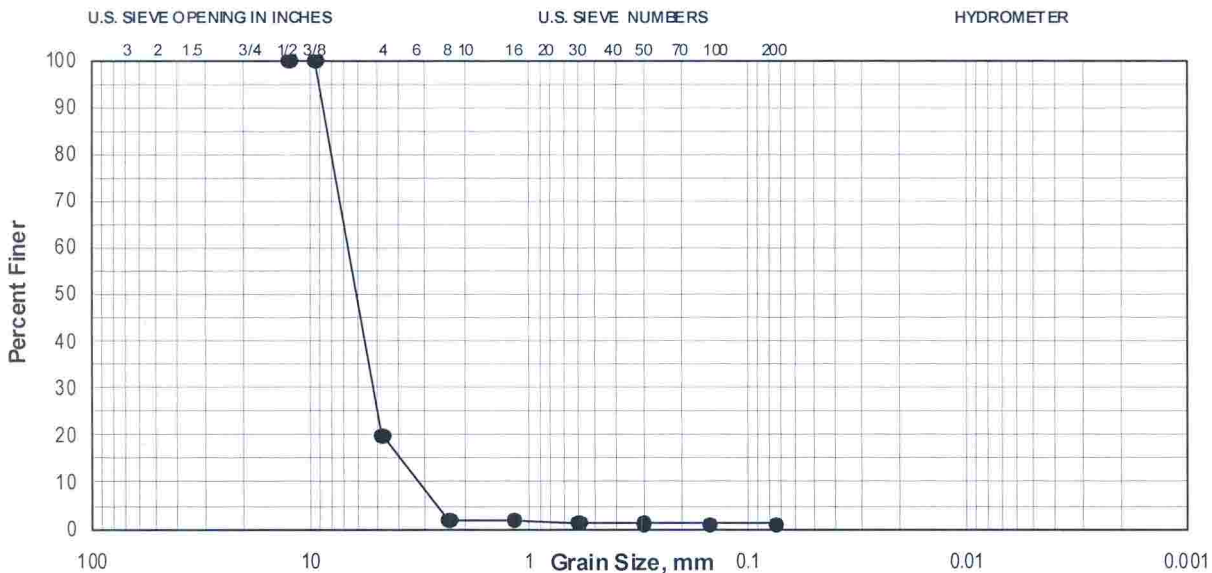
Saudi Arabia - E-mail.: fsljubail@fugro-suhaimi.com



السحيمي - فيفرو

**PARTICLE SIZE ANALYSIS TEST REPORT**

<b>Client</b>	A.H. Al Marhoon & Bros. Co.	<b>Job No.</b>	SA08-3012
<b>Project</b>	Concrete Batch Plant, Rahima	<b>Lab No.</b>	11722
<b>Material</b>	3/8" (10 mm) Coarse Aggregate	<b>Date Sampled</b>	04 Oct. 2015
<b>Source</b>	Al Osais, Abuhadriya (Sampled by FSL)	<b>Date Tested</b>	05-06 Oct. 2015
<b>Method</b>	ASTM C-117/136	<b>Date Reported</b>	12 Oct. 2015



<b>Gravel</b>		<b>Sand</b>			<b>Silt or Clay</b>
Coarse	fine	Coarse	medium	fine	

Description of Sand / Gravel Particles:

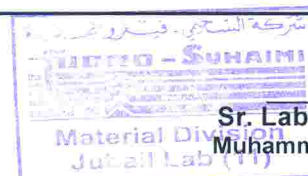
<b>Shape</b>	<b>Hardness</b>	<b>Specific Gravity</b>

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)	100				
#4 (4.75 mm)	20				
#8 (2.36 mm)	2				
#16 (1.18 mm)	2				
#30 (0.600 mm)	1.45				
#50 (0.300 mm)	1.25				
#100 (0.15 mm)	1.16				
#200 (75 mm)	1.11				

<b>Remarks</b>	
----------------	--

Tested By: Thomas David  
CTTA # : 0194

Reviewed By: Imran Ahmed  
CTTA # : 0556



Sr. Laboratory Supervisor  
Muhammad Nawaz CTTA # 0037

The copyright of this document is owned by Fugro-Suhaimi Ltd. It may not be reproduced except with prior written approval from the company.



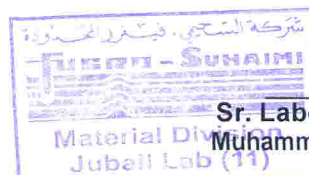
Certificate # 3512.05

**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](mailto:fsljubail@fugro-suhaimi.com)**SUMMARY OF TEST REPORT**

<b>Client</b>	A.H. Al Marhoon & Bros. Co.	<b>Job No.</b>	SA08-3012
<b>Project</b>	Concrete Batch Plant, Rahima	<b>Lab No.</b>	11723
<b>Material</b>	Dune Sand	<b>Date Sampled</b>	04 Oct. 2015
<b>Source</b>	Baladiyah, Jubail (Sampled by FSL)	<b>Date Reported</b>	12 Oct. 2015

**Properties:**

Properties Tested	Test Method	Results	SCECO Specs.
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	1.3	2.0 Max.
Clay lumps & friable particles %	ASTM C-142	N/A	2.0 Max.
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	4.9	15 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.672	--
SSD basis		2.628	--
Dry basis		2.603	--
Absorption		1.0	1.0 max
Acid soluble chloride, (Cl), %	ASTM C 114		
(NaCl), %		0.008	0.05 max
Acid soluble sulphate (SO <sub>3</sub> ), %	BS-812 Part 118		
(SO <sub>4</sub> ), %		0.013	
		0.398	
		0.398	0.4 Max
Organic impurities	ASTM C-40	Lighter than std.	

**Remarks:** Not applicable: Material is finer than test size i.e. retained on Sieve No.16 hence the test is not applicableTested By: Thomas David  
CTTA # : 0194Reviewed By: Imran Ahmed  
CTTA # : 0556**Sr. Laboratory Supervisor**  
**Muhammad Nawaz CTTA # 0037**

The copyright of this document is owned by Fugro-Suhaimi Ltd. It may not be reproduced except with prior written approval from the company.





Certificate # 3512.05

**Construction Materials Testing Laboratory  
Jubail Branch**

P.O. Box 2165 – Tel.: (013) 341 2700  
Dammam 31451 – Fax.: (013) 341 2701

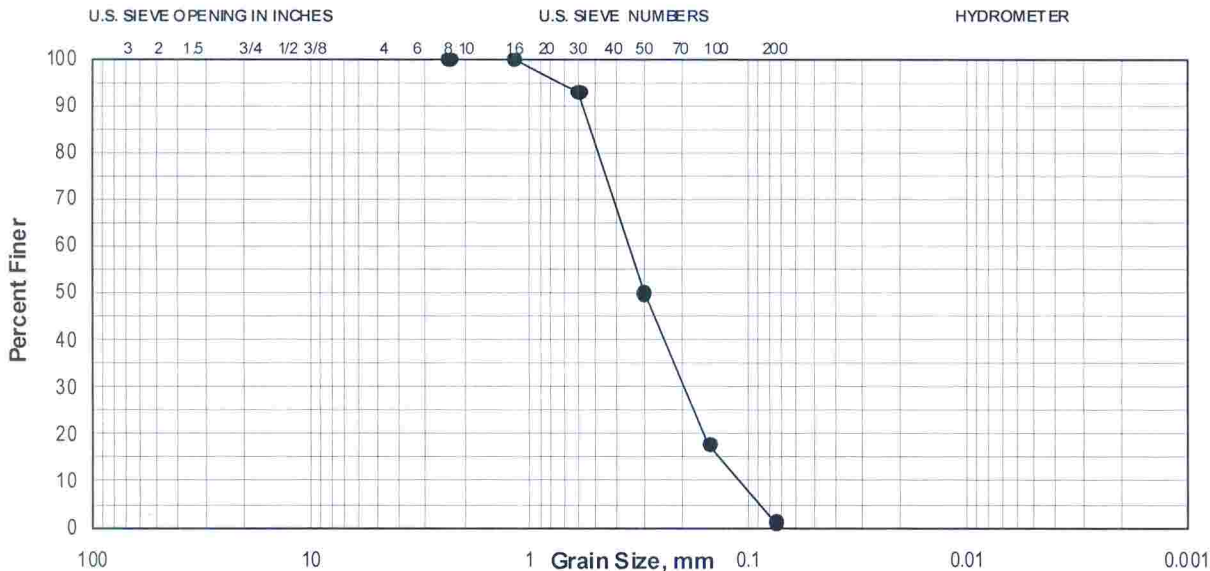
Saudi Arabia – E-mail.: fsljubail@fugro-suhaimi.com



السحيمي - فيغرو

**PARTICLE SIZE ANALYSIS TEST REPORT**

<b>Client</b>	A.H. Al Marhoon & Bros. Co.	<b>Job No.</b>	SA08-3012
<b>Project</b>	Concrete Batch Plant, Rahima	<b>Lab No.</b>	11723
<b>Material</b>	Sand	<b>Date Sampled</b>	04 Oct. 2015
<b>Source</b>	Baladiyah, Jubail (Sampled by FSL)	<b>Date Tested</b>	05-06 Oct. 2015
<b>Method</b>	ASTM C-117/136	<b>Date Reported</b>	12 Oct. 2015



<b>Gravel</b>		<b>Sand</b>			<b>Silt or Clay</b>
Coarse	fine	Coarse	medium	fine	

**Description of Sand / Gravel Particles:**

<b>Shape</b>	<b>Hardness</b>	<b>Specific Gravity</b>

Sieve Size Inch(mm)	Passing %	Specification	Properties Tested		
			Item	Description	Result
#8 (2.36 mm)	100				
#16 (1.18 mm)	100				
#30 (0.600 mm)	93				
#50 (0.300 mm)	50				
#100 (0.15 mm)	18				
#200 (0.075 mm)	1.3				

<b>Remarks</b>	
----------------	--

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



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

The copyright of this document is owned by Fugro-Suhaimi Ltd. It may not be reproduced except with prior written approval from the company.



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



## TEST REPORT FOR CHEMICAL ANALYSIS ON WATER

<b>Client</b>	A.H. Al Marhoon & Bros. Co.	<b>Report Date</b>	12 Oct. 2015
<b>Project</b>	Concrete Batch Plant, Rahima	<b>Job No.</b>	SA08-3012
<b>Source</b>	Sampled by FSL	<b>Lab No.</b>	11724
<b>Sample Location</b>	From Batch Plant	<b>Sampled by</b>	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	7.52	7 – 8.5
3.	Chloride as Cl <sup>-</sup> , ppm	125.4	300 max
4.	Sulfate as SO <sub>3</sub> , ppm	9.0	300 max
5.	Total Dissolved Solids- TDS, ppm	200	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