

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,

Receipt confirmation of document(s)

FUGRO-SUHAIMI LTD.


Muhammad Nawaz
Lab. Supervisor
050-6800943

Signature :

Name (print) :

Date :

Company Stamp:



ACCREDITED
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

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

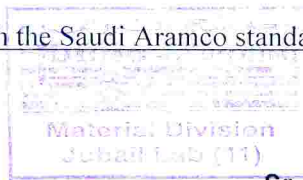
Properties:


Properties Tested	Test Method	Results	S. Aramco Specification
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	0.53	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 %		8.3	--
Loss at 500 revolutions %		33.2	40 max.
Ratio 100/500 rev.		0.25	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	8.8	25.0 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		
		0.020	0.03 max
Acid soluble sulphate (SO ₄), %	BS-812 Part 118	0.053	0.40 Max
Flakiness index	BS-812	7.5	--
Elongation index	BS-812	9.7	--
Coal & lignite	ASTM C-123	NIL	--

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

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

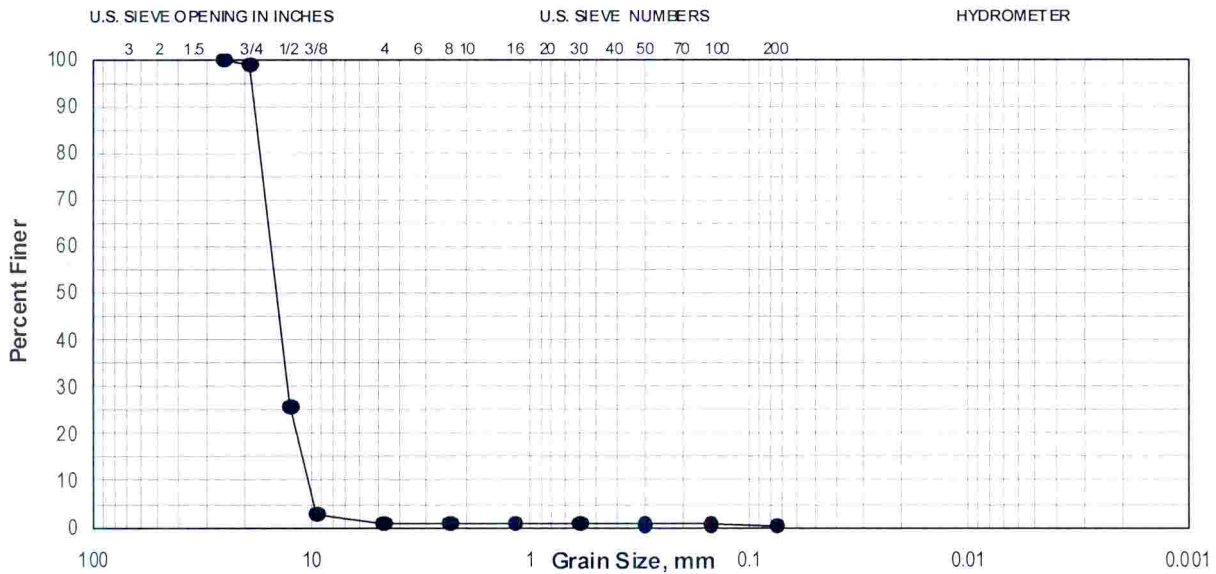
**Construction Materials Testing Laboratory
Jubail Branch**

P.O. Box 2165 – Tel.: (013) 341 2700
Dammam 31451 – Fax.: (013) 341 2701
Saudi Arabia – E-mail.: fsljubail@fugro-suhaimi.com



PARTICLE SIZE ANALYSIS TEST REPORT

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



السحيمي - فيغرو

SUMMARY OF TEST REPORT

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

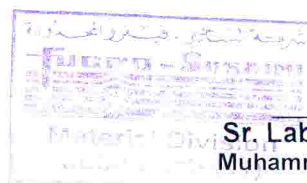
Properties:

Properties Tested	Test Method	Results	S. Aramco Specification
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	1.11	5.0 max.
Clay lumps & friable particles %	ASTM C-142	0.52	5.0 max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		8.7	--
Loss at 500 revolutions %		34.8	40 max.
Ratio 100/500 rev.		0.25	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	12.2	25.0 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		
(Cl), %		0.012	0.03 max
Acid soluble sulphate (SO ₄), %	BS-812 Part 118	0.135	0.40 Max
Flakiness index	BS-812	11.2	--
Elongation index	BS-812	15.0	--
Coal & lignite	ASTM C-123	NIL	--

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

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

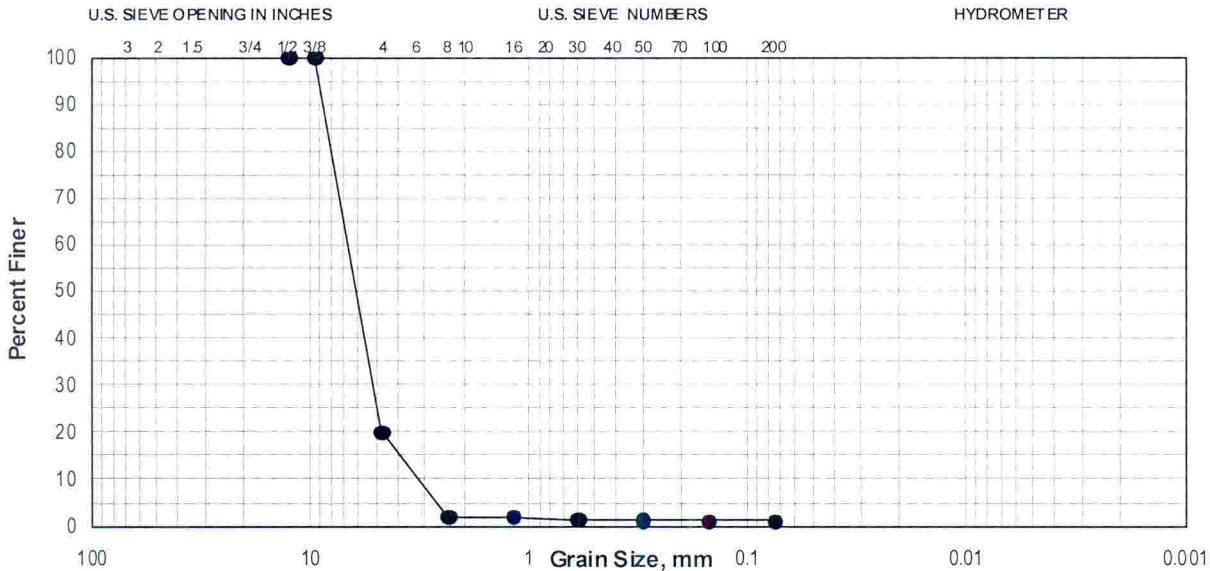
Construction Materials Testing Laboratory
Jubail Branch

P.O. Box 2165 - Tel.: (013) 341 2700
Dammam 31451 - Fax.: (013) 341 2701
Saudi Arabia - E-mail: fsljubail@fugro-suhaimi.com



PARTICLE SIZE ANALYSIS TEST REPORT

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



Gravel		Sand			Silt or Clay
Coarse	fine	Coarse	medium	fine	

Description of Sand / Gravel Particles:

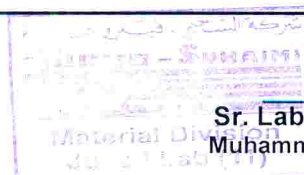
Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing %	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				

Remarks	
----------------	--

Tested By: Thomas David
CTTA # : 0194

Reviewed By: Imran Ahmed
CTTA # : 0556



(Handwritten signature)

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.



ACCREDITED
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.	11723
Material	Dune Sand	Date Sampled	04 Oct. 2015
Source	Baladiyah, Jubail (Sampled by FSL)	Date Reported	12 Oct. 2015

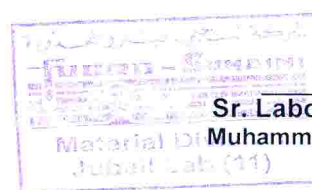
Properties:

Properties Tested	Test Method	Results	S. Aramco Specification
Sieve analysis	ASTM C-136	See Attached	--
Material finer than No. 200 sieve %	ASTM C-117	1.3	5.0 Max.
Clay lumps & friable particles %	ASTM C-142	-	3.0 Max.
Magnesium sulphate soundness loss (5 cycles) %	ASTM C-88	4.9	25.0 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.672	--
SSD basis		2.628	--
Dry basis		2.603	--
Absorption		1.0	
Acid soluble chloride, (Cl), %	ASTM C 114	0.008	0.06 max
Acid soluble sulphate (SO ₄), %			
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 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

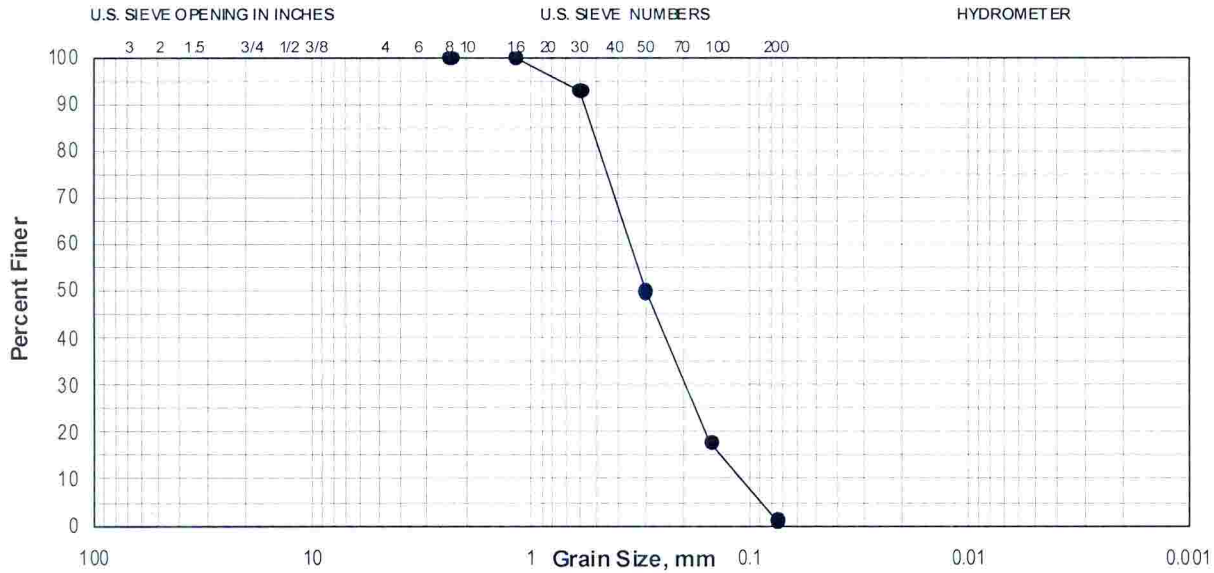
Construction Materials Testing Laboratory Jubail Branch

P.O. Box 2165 - Tel.: (013) 341 2700
Dammam 31451 - Fax.: (013) 341 2701
Saudi Arabia - E-mail.: fsljubail@fugro-suhaimi.com



PARTICLE SIZE ANALYSIS TEST REPORT

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



Gravel		Sand			Silt or Clay
Coarse	fine	Coarse	medium	fine	

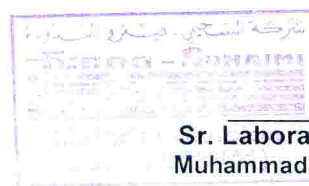
Description of Sand / Gravel Particles:

Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing %	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				

Remarks	
----------------	--

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.

TEST REPORT FOR CHEMICAL ANALYSIS ON WATER

Client	A.H. Al Marhoon & Bros. Co.	Report Date	12 Oct. 2015
Project	Concrete Batch Plant, Rahima	Job No.	SA08-3012
Source	Sampled by FSL	Lab No.	11724
		Sampled by	FSL Umer

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:

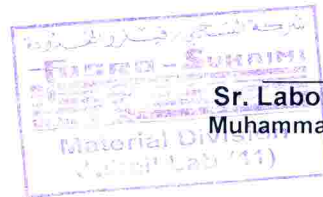
Test results

Serial No.	Determination	Test Results	S. Aramco Specification
2.	pH	7.52	6 - 8
3.	Chloride as Cl ⁻ , ppm	125.4	--
4.	Sulfate as SO ₃ , ppm	9.0	--
5.	Total Dissolved Solids- TDS, ppm	200	500 max

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

Tested By: CPN
CTTA # : -

Reviewed By: WN
CTTA # : -



Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

SUMMARY OF TEST REPORT COMBINED AGGREGATE

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	11721 – 11722
Material	3/4” - 3/8” Coarse Aggregate	Date Sampled	04 Oct. 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	12 Oct. 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	99	100	99	90 -100
12.5	26	100	59	--
9.5	3	100	47	20 – 55
4.75	1	20	9	0 – 10
2.36	1	2	1.5	0 – 5

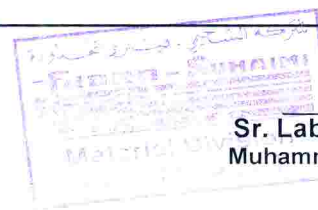
Combined Soundness Loss By Magnesium Sulfate

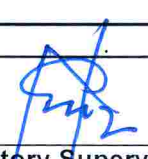
Aggregate Size :	20 mm	10 mm
Individual Loss %	8.8	12.2
Combined loss @ 55: 45%	10.3	

Remarks: _____

Tested By: Thomas David
CTTA # : 04194

Reviewed By: Imran Ahmed
CTTA # : 0556




Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037