

DOCUMENT TRANSMITTAL

Ref. No.	: FSL JUBAIL : SA08-3012	Date	: 18 May 2015
To	: A.H. Al Marhoon & Bros.Co Rahima, Saudi Arabia Fax: (03) 667-4721		
Attention	: Plant Manager		
Re	: Monthly Aggregate Testing – May 2015		

Please find enclosed the following documents:

Quantity	Document Reference	
1 each	3/4" Coarse Aggregate	Lab.No. 10670
-do-	3/8" Coarse Aggregate	Lab.No. 10671
-do-	Dune Sand	Lab.No. 10672
-do-	Summary Combined Aggregate	Lab No. 10670 – 10671
-do-	Chemical Analysis, Water	Lab No. 10673
	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:

SUMMARY OF TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10670
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	30 Apr. 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	17 May 2015

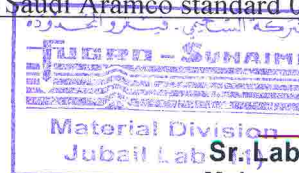
Properties:

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	0.22	5.0 Max.
Los Angeles Abrasion	ASTM C-131		
Loss at 100 revolutions %		7.3	--
Loss at 500 revolutions %		31.9	40 max.
Ratio 100/500 rev.		0.23	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	14	25.0 max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.658	--
SSD basis		2.611	--
Dry basis		2.582	--
Absorption		1.1	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
(Cl), %		0.004	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
(SO ₃), %		0.121	0.40 Max
Flakiness index	BS-812	9.5	--
Elongation index	BS-812	12	--
Coal & lignite	ASTM C-123	NIL	--

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

Tested By: Jose Daniel
CTTA # : 0195

Reviewed By: Imran Ahmed
CTTA # : 0556



Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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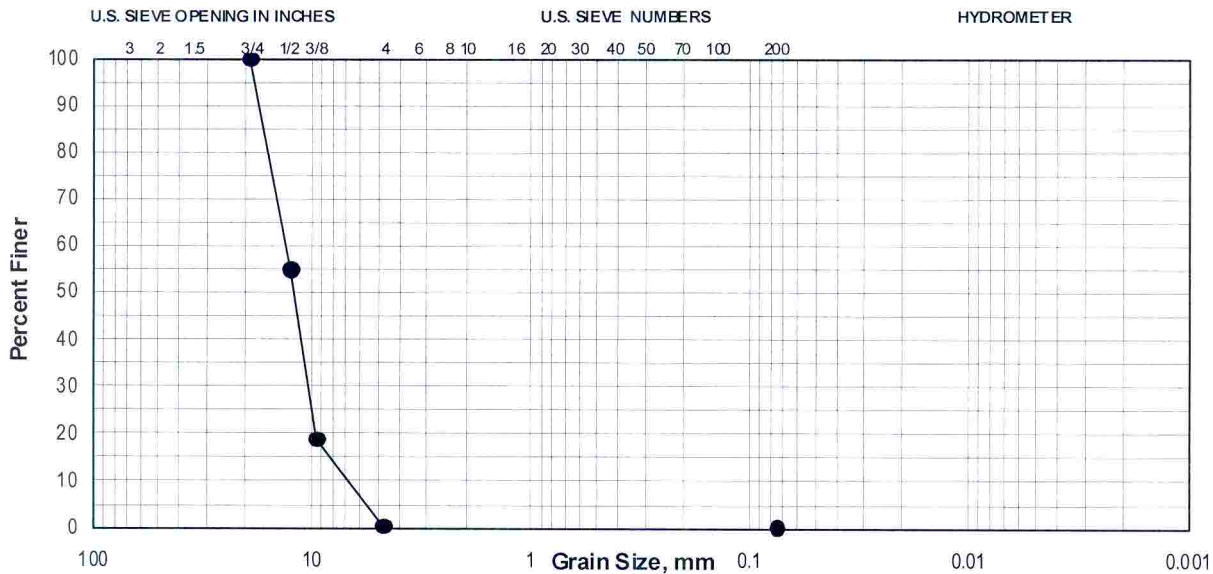
**Construction Materials Testing Laboratory
Jubail Branch**

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.	10670
Material	3/4" (20 mm) Coarse Aggregate	Date Sampled	30 Apr. 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	02 May 2015
Method	ASTM C-136/117	Date Reported	17 May 2015



Gravel		Sand			Silt or Clay
Coarse	fine	Coarse	medium	fine	

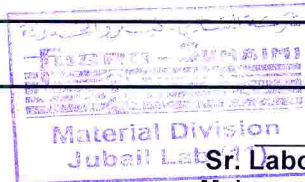
Description of Sand / Gravel Particles:

Shape	Hardness	Specific Gravity

Sieve Size Inch(mm)	Passing g %	Specification	Properties Tested		
			Item	Description	Result
1 (25.0 mm)					
3/4 (19 mm)	100				
1/2 (12.5 mm)	55				
3/8 (9.5 mm)	19				
#4 (4.75 mm)	0.5				
#8 (2.36 mm)	-				
#16 (1.18 mm)	-				
#30(600)	-				
#50(300)	-				
#100 (0.15 mm)	-				
#200 (75 mm)	0.4				

Remarks	
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Tested By: Jose Daniel Reviewed By: Imran Ahmed
CTTA # : 0195 CTTA # : 0556



(Signature)

Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037



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Jubail BranchP.O. Box 2165 - Tel.: (013) 341 2700
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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.	10671
Material	3/8" (10- mm) Coarse Aggregate	Date Sampled	30 Apr. 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	17 May 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	1.0	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 %		8.1	--
Loss at 500 revolutions %		33.5	40 max.
Ratio 100/500 rev.		0.24	--
Magnesium sulfate soundness loss (5 cycles) %	ASTM C-88	16.2	25.0 max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.645	--
SSD basis		2.578	--
Dry basis		2.537	--
Absorption		1.6	2.5 max
Acid soluble chloride, (Cl), %	ASTM C 114		
(Cl), %		0.007	0.03 max
Acid soluble sulphate (SO ₃), %	BS-812 Part 118		
(SO ₃), %		0.306	0.40 Max
Flakiness index	BS-812	17.8	--
Elongation index	BS-812	11.3	--
Coal & lignite	ASTM C-123	NIL	--

Remarks: All test results indicate compliance with the Saudi Aramco standard 09-SAMSS-088.Tested By: Jose Daniel
CTTA # : 0195Reviewed By: Imran Ahmed
CTTA # : 0556Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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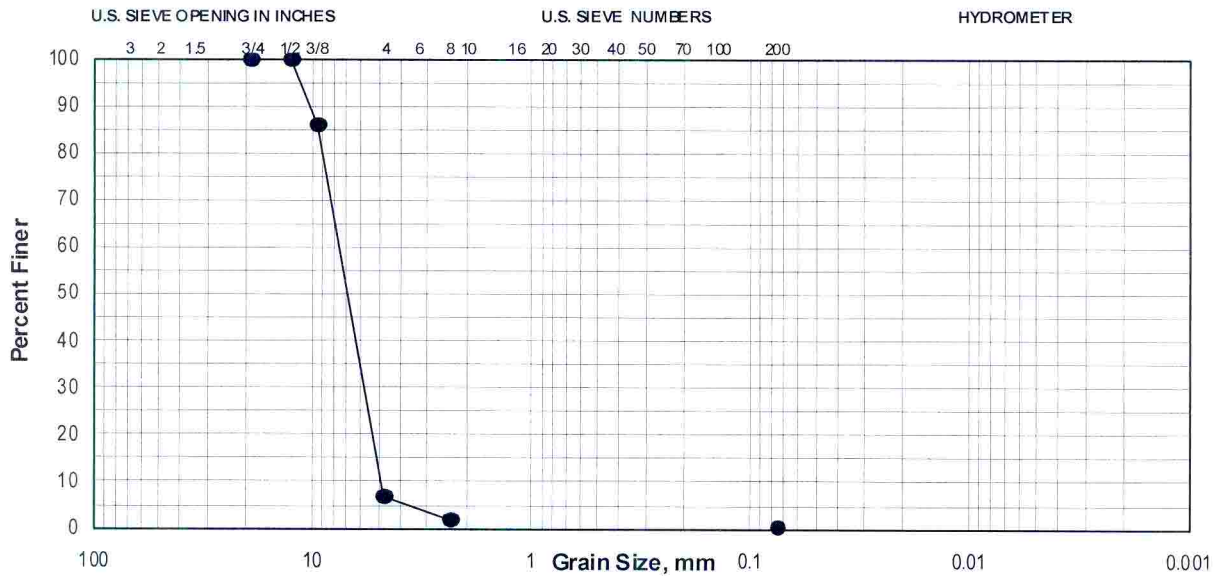
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10671
Material	3/8" (10 mm) Coarse Aggregate	Date Sampled	30 Apr. 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Tested	02 May 2015
Method	ASTM C-117/136	Date Reported	17 May 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)	100				
1/2 (12.5 mm)	100				
3/8 (9.5 mm)	86				
#4 (4.75 mm)	7				
#8 (2.36 mm)	2				
#16 (1.18 mm)	-				
#30 (0.600 mm)	-				
#50 (0.300 mm)	-				
#100 (0.15 mm)	-				
#200 (0.75 mm)	0.5				

Remarks	
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Tested By: Jose Daniel
CTTA # : 0195

Reviewed By: Imran Ahmed
CTTA # : 0556

**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.	10672
Material	Dune Sand	Date Sampled	30 Apr. 2015
Source	Baladiyah, Jubail (Sampled by FSL)	Date Reported	17 May 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	1.8	5.0 Max.
Clay lumps & friable particles %	ASTM C-142	N/A	3.0 Max.
Magnesium sulphate soundness loss (5 cycles) %	ASTM C-88	6.9	25.0 Max.
Specific gravity and absorption	ASTM C-127		
Apparent		2.650	--
SSD basis		2.621	--
Dry basis		2.602	--
Absorption		0.7	
Acid soluble chloride, (Cl), %	ASTM C 114	0.007	0.06 max
Acid soluble sulphate (SO ₃), %			
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: Jose Daniel
CTTA # : 0195Reviewed By: Imran Ahmed
CTTA # : 0556**Sr. Laboratory Supervisor**
Muhammad Nawaz CTTA # 0037

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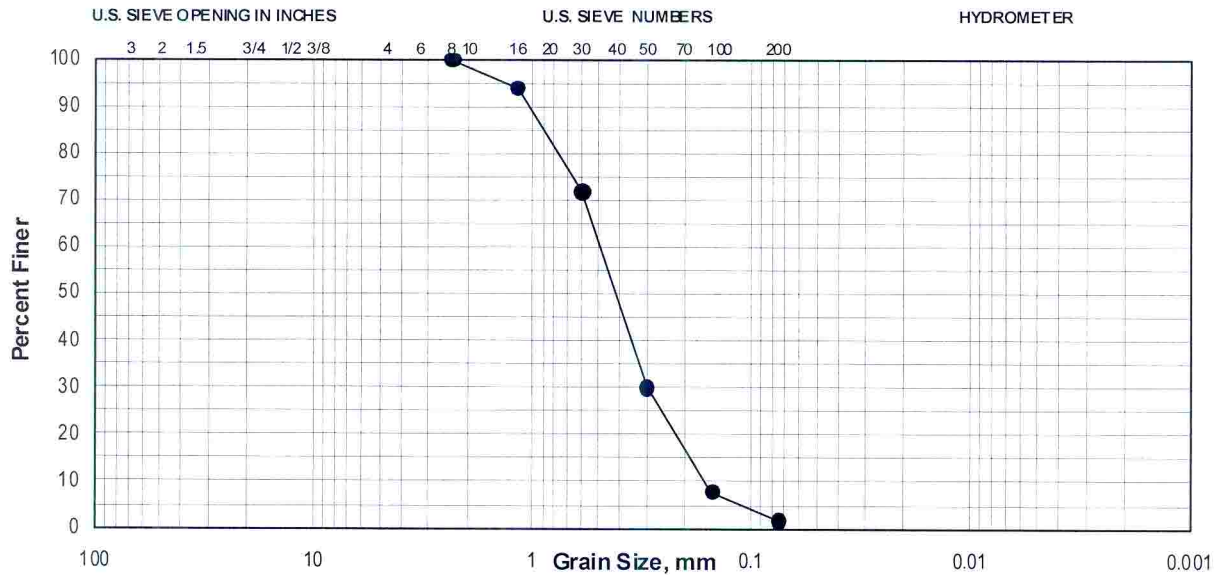
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PARTICLE SIZE ANALYSIS TEST REPORT

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10672
Material	Sand	Date Sampled	30 Apr. 2015
Source	Baladiyah, Jubail (Sampled by FSL)	Date Tested	02 May. 2015
Method	ASTM C-117/136	Date Reported	17 May. 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)	94				
#30 (0.600 mm)	72				
#50 (0.300 mm)	30				
#100 (0.15 mm)	8				
#200 (75 mm)	1.8				

Remarks	
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Tested By: Jose Daniel
CTTA # : 0195

Reviewed By: Imran Ahmed
CTTA # : 0556



Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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السحيمي - فيفرو

TEST REPORT FOR CHEMICAL ANALYSIS ON WATER

Client	A.H. Al Marhoon & Bros. Co.	Report Date	17 May 2015
Project	Concrete Batch Plant, Rahima	Job No.	SA08-3012
Source	Sampled by FSL	Lab No.	10673
		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	7.57	6 - 8
3.	Chloride as Cl ⁻ , ppm	47.8	--
4.	Sulfate as SO ₃ , ppm	9.0	--
5.	Total Dissolved Solids- TDS, ppm	116.2	500 max

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

Tested By: CPN Reviewed By: WN
CTTA # : -- CTTA # : --



Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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السحيمي - فيفرو

SUMMARY OF TEST REPORT
COMBINED AGGREGATE

Client	A.H. Al Marhoon & Bros. Co.	Job No.	SA08-3012
Project	Concrete Batch Plant, Rahima	Lab No.	10670-10671
Material	3/4" - 3/8" Coarse Aggregate	Date Sampled	30 Apr. 2015
Source	Al Osais, Abuhadriya (Sampled by FSL)	Date Reported	17 May. 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	55	100	75	--
9.5	19	86	40	20 - 55
4.75	0.5	7	3	0 - 10
2.36	-	2	1.5	0 - 5

Combined Soundness Loss By Magnesium Sulfate

Aggregate Size :	20 mm	10 mm
Individual Loss %	14.0	16.2
Combined loss @ 55: 45%	14.9	

Remarks: _____

Tested By: Jose Daniel
CTTA # : 0195Reviewed By: Imran Ahmed
CTTA # : 0556Sr. Laboratory Supervisor
Muhammad Nawaz CTTA # 0037

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