

السيد المهندس / رئيس قطاع التنفيذ والمناطق

تحية طيبة .. وبعد،،

بالإحالة إلى مشروع القطار الكهربائي فائق السرعة قطاع (برج العرب - العلمين)
نتشرف بأن نرفق لسيادتكم طيه المقاييس المعدلة بعد اعتماد لجنة المفاوضه
للقطاعات الآتية:

المسلسل	اسم الشركة	من المحطة	إلى المحطة	المرحلة
1	مكتب ناصر محمد عبده عمر الزنكلوني	333+800	334+400	أعمال الحفر وتشكيل الجسور

برجاء من سيادتكم التفضل بالأحاطه والتوجيه بالازم

وتفضلوا بقبول فائق الاحترام والتقدير،،

رئيس الإدارة المركزية

المنطقة الخامسة - غرب الدلتا

عميد مهندس //

"هاني محمد محمود طه"

مشروع القطر الكهربائي فائق السرعة قطاع (برج العرب - العميد)

المقايضة المعدلة بعد المفاوضات بتاريخ 2023-12-18

لبنود الاعمال تنفيذ شركة الزنكوني للمقاولات العامة و رصف الطرق

القطاع من المحطة 333+800 الى 334+400 أعمال الحفر وتشكيل الجسور

رقم البنود	بيان الأعمال	الوحدة	الكمية	الفئة	الاجمالي
1	اعمال الحفر				
1-1	بالمتر المكعب اعمال حفر باستخدام المعدات الميكانيكية لجميع انواع التربة عدا التربة الصخرية و تسوية السطح بالآلات التسوية والرش بالمياه الاصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول الى أقصى كثافة جافه (95% من الكثافة الجافة القصوى) ومحمل على البند تحميل ونقل التربة الزائدة لمسافة 500 متر من محور الطريق ويتم التنفيذ طبقا للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المتعددة والبند بجميع مشتتات طبقا لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس المشرف. وفي حالة زيادة مسافة نقل ناتج الحفر عن 500 متر من محور الطريق يتم حساب 1 جنيه لكلومتر زيادة	م ³			
	عن شهر فبراير طبقا للمفاوضة بتاريخ 2023-12-18		18,500.00	25.00	462,500
	عن شهر ابريل طبقا للمفاوضة بتاريخ 2023-12-18		7,500.00	26.35	197,625
	عن شهر مايو وما يليه طبقا للمفاوضة بتاريخ 2023-12-18		18,728.95	26.50	496,317
3	اعمال الردم				
3-1	بالمتر المكعب اعمال توريد ونقل التربة مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسمك لا يزيد عن 50 سم حتى منسوب 2- متر و بسمك لا يزيد عن 25 سم لاستكمال المنسوب التصميمي لتشكيل الجسر والاكتاف (نسبة تحمل كاليفورنيا لا تقل عن 15%) و رشها بالمياه الاصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول الى أقصى كثافة جافه (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المتعددة والبند بجميع مشتتات طبقا لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس المشرف. - في حالة طلب جهاز الاشراف زيادة نسبة الدمك 95% بحسب زياده 1 جنيه على زياده نسبة الدمك لكل 1% - مسافة النقل حتى 2 كم و يتم احتساب علاوة 1.5 جنيه لكل كم بالزيادة أو النقصان . - السعر يشمل عمل تشوينات و تخليط و اختيارات و نقل لموقع العمل حتى مسافة 2 كم .	م ³			
	عن شهر مايو وما يليه طبقا للمفاوضة بتاريخ 2023-12-18		55,618.53	101.40	5,639,719
	علاوة مسافة النقل للتراب 152 كم (158 - 2 = 156) 234 = 1.5 * 156		44,494.82	234.00	10,411,789
	علاوة مسافة النقل للرمل 126 كم (126 - 2 = 124) 186 = 1.5 * 124		11,123.71	186.00	2,069,009
	علاوة تحميل رسوم الكارثة والموازين طبقا للائحة الشركة الوطنية		55,618.53	13.00	723,041
	الإجمالي				20,000,000

(عشرون مليون جنيها فقط لا غير)

رئيس الادارة المركزية

مدير عام مشروعات المنطقة الخامسة

مهندس الهيئة

الشركة المنفذة

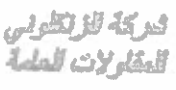
منطقة غرب الدلتا

م / محمد حسني فياض

م / مارجريت مجدي

م / محمد حسن



MATERIAL APPROVAL REQUEST	     

Contractor Company	Al-ZANKALONY CO. for General Contracting		Designer Company	(kk) Engineering Consulting Office	
Issued by Contractor	Name	Sign	Date/Serial Number	Time	
	أحمد جمال دوسا		2023-04-29 MAR 001	08:00	
Received by GARB CONSULTANT	Eng. Abdallah Omar	Abdallah Omar	MAR	C1 16	C2 EW
				C3 CS	DD 30
				MM 04	YY 23
				HH 08	MM 00

CODE-1	S1 to S21	D1 to S3	Kp XXX Note
	Station Reference	Depot Reference	For Kilometer point only Start Km is used
CODE-2	Work Activity		
CODE-3	Sub Element of Activity		

Description of Materials	Quality Test for Bed Excavation		
Location to be Used	Station (16+440 : 16+540) Station (16+600+ 16+960)		
Sample only	Yes	Materials Type	Bed Excavation
Supplier Name		Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No	Other	
Comments by: Eng. Abdallah Omar (KK)	Comments by: Eng. Alaa Abd-Allatif (ER)		
1-Quality test Result By Site Laboratory is Approved.	1-All tests were carried-out by material engineer for both contractor and GARB Consultant. 2-Results report attached and acceptable with the project specifications. 3-Final approval is subject to above mentioned comments.		

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال دوسا			A
QA/QC *	Eng. Abdallah Omar	Abdallah Omar		A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

* Designer

** Alignment/Bridges: Culvert only

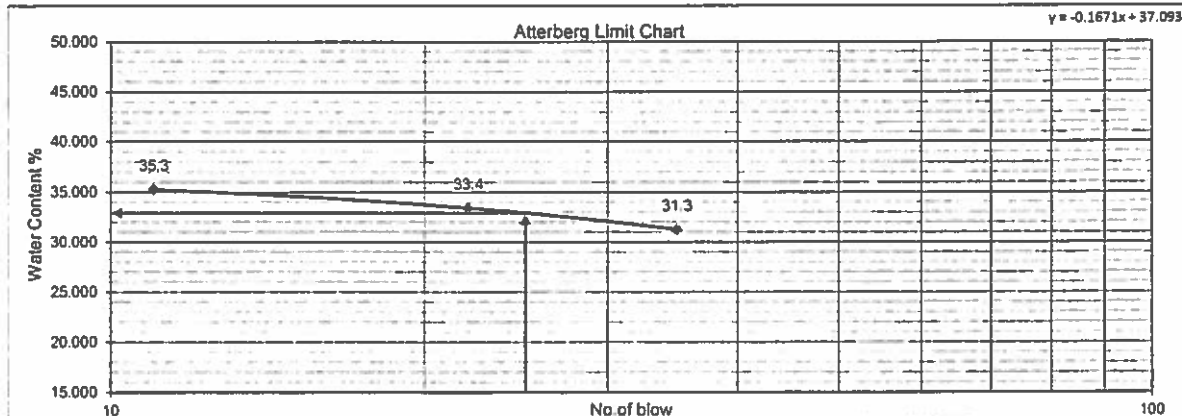
Project	Electrical Express Train From Borg Alarab to Alamein (EET)				Date	29-Apr-23
Station	From	016+440	TO	016+540		
		016+600		016+960	Request No.	QT 1
	Soil Classification (AASHTO M 145)					

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coarse sample =	4826		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2"	0	100.0	
1.5"	0	100.0	
1"	0	100.0	
3/4"	0	100.0	
3/8"	214	95.6	
4	798	83.46	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	36	77.46	
40	99	66.94	
200	248	42.07	

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	11	22	35			
Number of plate	A-7	A-19	A-26	A-11	A-15	A-14
Wt. Of plate	32.26	31.26	32.26	32.14	32.12	31.26
wt. of plate + wt. of wet sample	80.90	83.60	129.69	35.75	35.09	33.62
wt. of plate + wt. of dry sample	68.22	70.49	106.49	35.04	34.52	33.16
wt. of water	12.7	13.1	23.2	0.7	0.6	0.5
wt. of dry sample	36.0	39.2	74.2	2.9	2.4	1.9
moisture content	35.3	33.4	31.3	24.4	23.6	24.2
The Limits	Liquid Limit			Plastic Limite		24.08



Liquid Limit	32.92
plasticity index	8.8
Group Classification	A-4



الهيئة القومية للإنفاق



شركة المراكب
للمحركات المائية

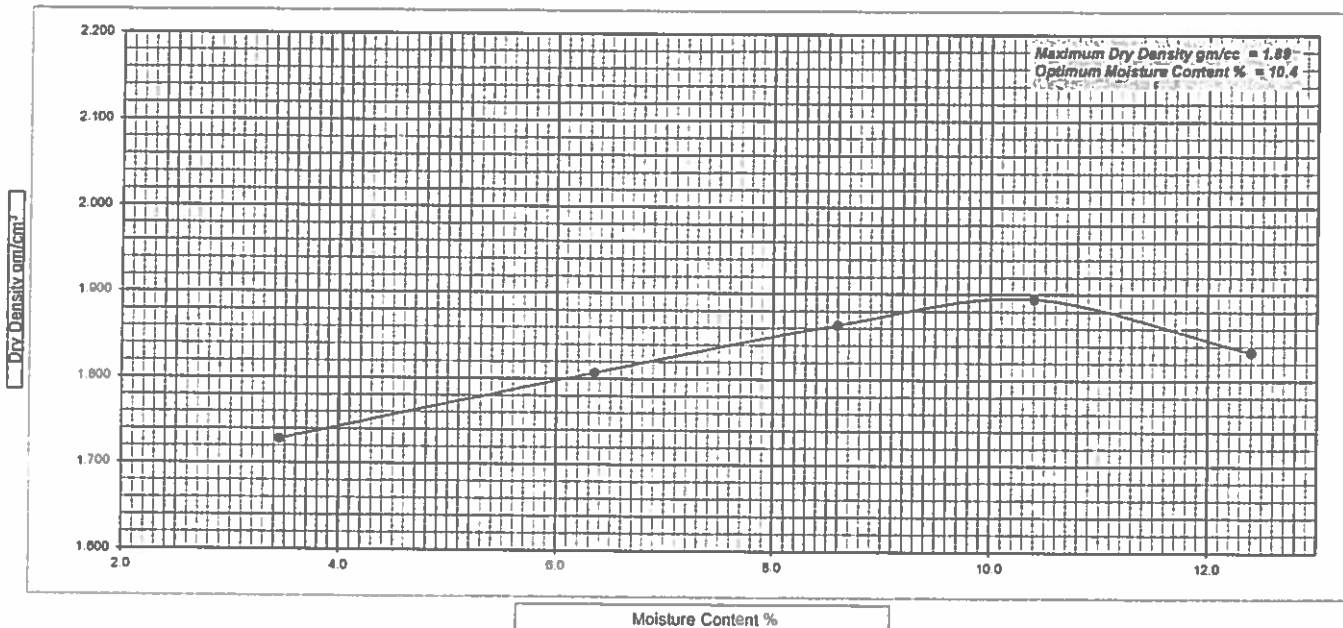
مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	29-Apr-23
Station	From	016+600	To	016+960	Request NO.
					QT 1

MOISTURE - DENSITY RELATIONSHIP OF SOILS ASTM D.1557

MOISTURE CONTENT													
CONTAINER NUMBER				A-9	A-2	A-10	A-13	A-7	A-25	A-19	A-30	A-31	A-1
A	TARE MASS	gms.		31.45	31.66	32.41	31.41	31.62	32.45	32.45	31.26	32.14	32.12
B	MASS WET SOIL & TARE ,	gms.		159.9	176.9	175.0	176.6	177.6	200.9	175.0	166.7	182.9	217.0
C	MASS DRY SOIL & TARE	gms.		155.7	172.0	166.7	167.8	165.9	187.7	161.8	153.7	166.4	196.4
D	MASS OF WATER	gms.	B-C	4.2	4.9	8.3	8.9	11.7	13.2	13.2	13.0	16.5	20.5
E	MASS OF DRY SOIL	gms.	C-A	124.3	140.4	134.3	136.4	134.3	155.3	129.4	122.5	134.3	164.3
F	MOISTURE CONTENT	%	$\frac{D}{E} \times 100$	3.4	3.5	6.2	6.5	8.7	8.5	10.2	10.6	12.3	12.5
AVERAGE		%		3.5		6.4		8.6		10.4		12.4	
DRY DENSITY													
TRIAL NUMBER				1		2		3		4		5	
G	MASS OF MOLD & WET SOIL	gms.		9598		9888		10110		10256		10189	
H	MASS OF MOLD	gms.		5728		5728		5728		5728		5728	
I	MASS OF WET SOIL	gms.	G-H	3870		4160		4382		4528		4461	
J	VOLUME OF MOLD	cm³		2165		2165		2165		2165		2165	
K	WET DENSITY	g/cm³	$\frac{I}{J}$	1.788		1.921		2.024		2.091		2.061	
L	DRY DENSITY	g/cm³	$\frac{K}{100 + F}$	1.73		1.81		1.86		1.89		1.83	



Eng. / CONSULTANT

Abdallah Omar

Eng. / CONTRACTOR

1.0

**MATERIAL
APPROVAL
REQUEST**

شركة الزكالي
للتنفيذ العامة



الهيئة العامة
للتأهيل والكباري
(GARB)



المجلس الأعلى
للمواصلات
والمواصلات



Contractor Company	Al-ZANKALONY CO. for General Contracting		Designer Company	(KK) Engineering Consulting Office	
Issued by Contractor	Name	Sign	Date/Serial Number	Time	
	أحمد جمال دودا		2023-04-27 MAR 002	08:00	
Received by GARB CONSULTANT	Eng. Abdallah Omar	Sign	MAR 333	EW	CS
			29	04	23
			08	00	

CODE-1	S1 to S21	D1 to S3	Kp XXX Note
CODE-2	Station Reference	Depot Reference	For Kilometer point only Start Km is used
CODE-3	Work Activity		
	Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (5000 m³)		
Location to be Used	From Station (333+940) to Station (334+540)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. Abdallah Omar (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	
1-Quality test Result By Site Laboratory is Approved.		1-All tests were carried-out by material engineer for both contractor and GARB Consultant.	
2-This Sample Representative (5000 m3) only.		2-Results report attached and acceptable with the project specifications.	
		3-Final approval is subject to above mentioned comments.	

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال دودا			A
QA/QC *	Eng. Abdallah Omar			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

* Designer

** Alignment/Bridges: Culvert only

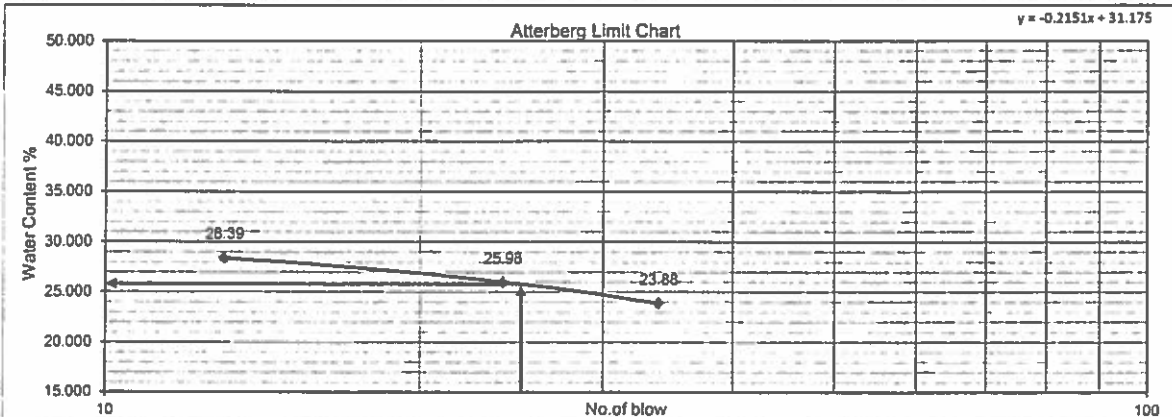
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكوني-المشون	Request NO.	2
Station	5000 m ³		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

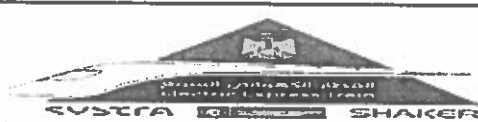
wt. of coars sample =	15598		
Sieve "Inch"	total retain (gm)	pass%	Specs Limits %
2"	0	100.0	
1.5"	100	99.4	
1"	789	94.9	
3/4"	841	94.6	
3/8"	5632	63.9	
4	8598	44.88	
wt. of fines sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	87	37.07	50 max
40	219	25.22	30 max
200	378	10.95	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	13	24	34			
Number of plate	A-19	A-15	A-10	A-15	A-3	A-18
Wt. Of plate	32.26	32.14	32.19	30.5	31.56	32.22
wt. of plate + wt. of wet sample	79.2	76.6	73.8	33.83	34.84	34.84
wt. of plate + wt. of dry sample	68.82	67.43	65.78	33.25	34.26	34.37
wt. of water	10.38	9.17	8.02	0.58	0.58	0.47
wt. of dry sample	36.56	35.29	33.59	2.75	2.7	2.15
moisture content	28.39	25.98	23.88	21.09	21.48	21.86
The Limits	Liquid Limit			Plastic Limite		21.48



Liquid Limit	25.80	
plasticity index	4.3	6 max
Group Classification	A-1-a	A-1-a & A-1-b



الهيئة القومية للإنفاق



شركة الترانزيت
للمحولات العامة

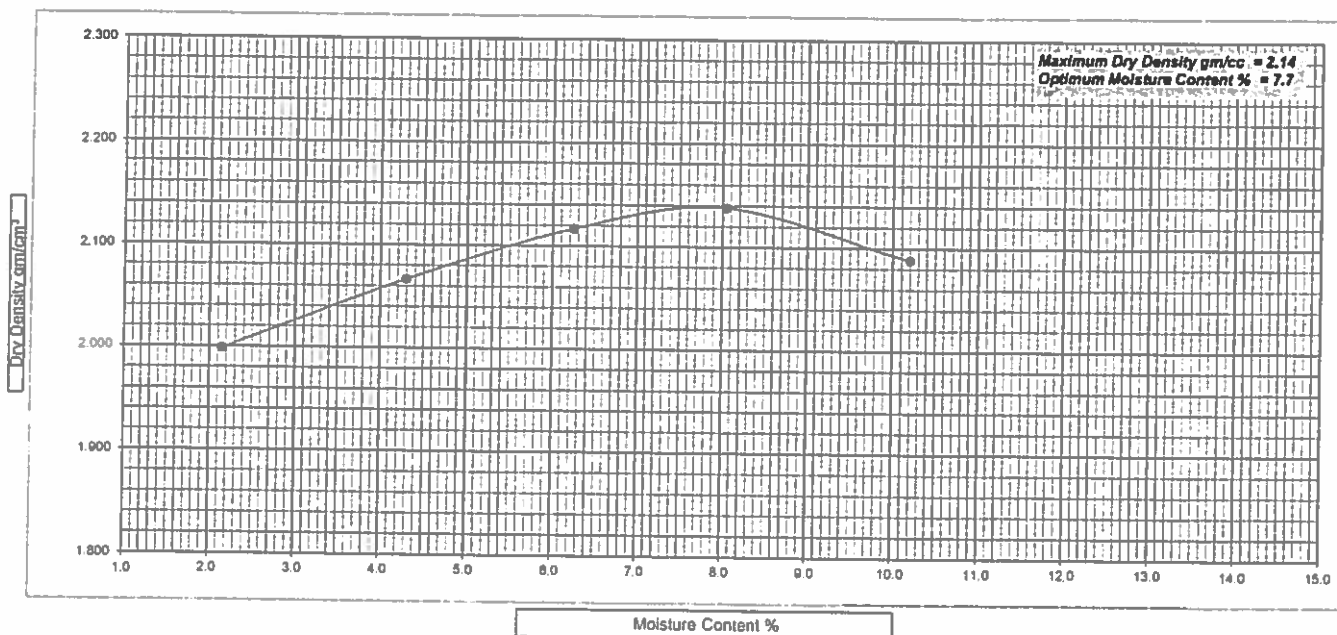
مكتب أ.د. خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)				Date	29-Apr-23
Station	From	5000 m ³	To		Request NO.	QT 2

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T160-74)

MOISTURE CONTENT													
CONTAINER NUMBER				7	5	14	28	16	1	2	10	9	3
A	TARE MASS	gms.		32.45	33.21	31.45	32.41	31.36	32.85	32.41	34.15	23.36	32.45
B	MASS WET SOIL & TARE	gms.		163.6	170.4	190.2	161.4	176.6	159.8	176.8	191.5	195.2	175.5
C	MASS DRY SOIL & TARE	gms.		160.8	167.6	183.8	156.0	168.2	152.3	166.0	179.8	179.3	162.2
D	MASS OF WATER	gms.	B-C	2.8	2.8	6.4	5.4	8.5	7.5	10.8	11.7	15.9	13.2
E	MASS OF DRY SOIL	gms.	C-A	128.4	134.4	152.4	123.6	136.8	119.5	133.6	145.7	156.0	129.8
F	MOISTURE CONTENT	%	$\frac{D}{E} \times 100$	2.2	2.1	4.2	4.4	6.2	6.3	8.1	8.0	10.2	10.2
AVERAGE		%		2.2		4.3		6.3		8.1		10.2	
DRY DENSITY													
TRIAL NUMBER				1		2		3		4		5	
G	MASS OF MOLD & WET SOIL	gms.		10148		10395		10598		10730		10711	
H	MASS OF MOLD	gms.		5729		5729		5729		5729		5729	
I	MASS OF WET SOIL	gms.	G-H	4419		4666		4869		5001		4982	
J	VOLUME OF MOLD	cm ³		2165		2165		2165		2165		2165	
K	WET DENSITY	g/cm ³	$\frac{I}{J}$	2.041		2.155		2.249		2.310		2.301	
L	DRY DENSITY	g/cm ³	$\frac{K}{100 + F}$	1.998		2.066		2.117		2.138		2.088	



Eng. / CONSULTANT

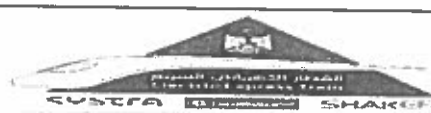
Abdallah Omar

Eng. / CONTRACTOR

IP



وزارة النقل
المصلحة العامة للنقل والبنية التحتية



المكتب الوطني للمهندسين
الهيئة القومية للإنشاءات

الهيئة القومية للإنشاءات



شركة الميكانيكا
للمحركات والمعدات

مكتب أ.د. خالد قنديل
Electrical Express Train From Borg Alarab to Alamein



ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein	Station	From	TO
Date	2023-04-29			
Request NO.	QT 2 5000 m³			

California Bearing Ratio ASTM D 1883

Molding Moisture Content				Density Determination			
Test No.		1	2	Test No.		1	
Can No.		12	10	Mold Volume	cm³	2152	
A Mass, Can	g	32.85	32.15	Mass Sample + Mold	g	11923	
B Mass, Wet Soil + Can	g	179.3	154.60	Mass Mold	g	6967	
C Mass, Dry Soil + Can	g	169.2	145.74	Mass Sample	g	4956	
D Mass, Moisture	g	10.1	8.86	Unit Wet Mass	g	2.303	
E Mass, Dry Soil	g	136.4	113.59	Percent Moisture	%	7.6	
F Moisture %	%	7.4	7.8	Unit Dry Mass	cm³	2.140	
AVERAGE	%	7.60		Cross sectional area of plunger=		19.35	cm²

Penetration (mm)	0.64	1.27	1.90	2.54	3.18	3.81	4.45	5.08	6.35	7.62
Dial Read.	0.06	0.14	0.22	0.29	0.34	0.39	0.43	0.47	0.53	0.57
Total Load KN	1.28	2.98	4.68	6.17	7.23	8.3	9.15	10	11.7	12.55
Unit Load kg/cm²	130.56	303.98	477.36	629.34	737.46	846.6	933.3	1020	1193.4	1280.1

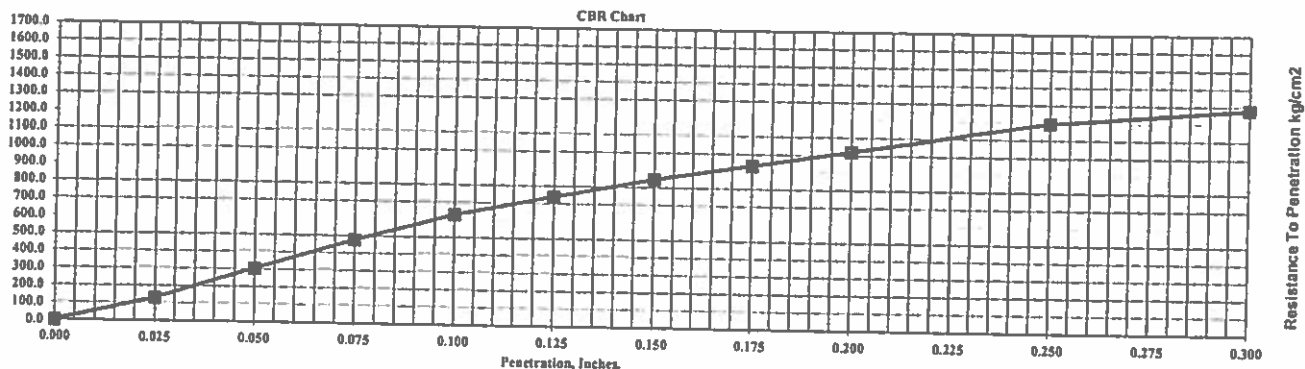
46%

50

Swell		
Date Molded		2023-05-03
Mold No.		1
Final Height	mm	4.32
Initial Height	mm	4.31
Difference	mm	0.01
Sample Length	mm	116.43
Percent Swell	%	0.01

Remarks:

- Max-Dry Density 2.140 g/cc
- Optimum Moisture Content 7.7 %
- No. of Blows 56
- CBR at 100% of max. density 50.0 %



Eng. / CONSULTANT

Abdallah Omar

Eng. / CONTRACTOR

[Signature]

MATERIAL APPROVAL REQUEST	شركة الزنكلوني المقاولات العامة		ENGINEERING CONSULTING OFFICE المكتب الاستشاري الهندسي إ. د. خالد شعيب	الهيئة العامة للطرق والكباري (GARB)	مركز الطرق	الهيئة العامة للإسكان	مركز الطرق	مركز الطرق	مركز الطرق

Contractor Company	Al-ZANKALONY CO. for General Contracting			Designer Company	(KK) Engineering Consulting Office						
Issued by Contractor	Name	Sign		Date/Serial Number	Time						
	أحمد جمال محمد	[Signature]		2023-04-20	08:00						
				MAR 2-1							
Received by GARB CONSULTANT	(KK) Khaleel Zak	[Signature]	MAR	C1	C2	C3	DD	MM	YY	HH	MM
				333	EW	CS	20	04	23	08	00

CODE-1	S1 to S21	D1 to S3	Kp XXX Note
	Station Reference	Depot Reference	For Kilometer point only Start Km is used
	Work Activity		
	Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (5000 m³)		
Location to be Used	From Station (333+800) to Station (334+400)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	
1-Quality test Result By Third Party Lab is Approved. 2-This Sample Representative (5000 m3) only.		1- All tests were carried-out by third Party lab (COMIBASSAL) 2-Results report attached and acceptable with the project specifications. 3-Final approval is subject to above mentioned comments	

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال محمد	[Signature]		A
QA/QC *	(KK) Khaleel Zak	[Signature]		A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif	[Signature]	15-6-2023	AWC

* Designer
** Alignment/Bridges Culvert only



COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egypton Accreditation council (EGAC) under No. 031706/1A

I- Introduction

General Consultant : SYSTRA
Consultant : Dr/ Khaled Kandil
Contractor : شركة الزنكلوني للمقاولات
Sample : FERMA
Station : St(333+800) to st(334+400)
Date of Test : 29/04/2023
QC : 1163-1

II- Sample description:

Gravel and sand

III- Required tests and Results

Required Tests		Results
1- Grain size analysis and classification	Grain size analysis	As showed in appendix
	Classification	A-1-a
2- Modified compaction (Proctor test)	MDD	2.100
	OMC	9.5%
3- Liquid limit, plastic limit and plasticity index	LL	NP
	PL	NP
	PI	NP
4- California bearing ratio (CBR)	CBR ratio	40%

IV- Notes

- 1- Samples were brought by : Consultant
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.

LAB DIRECTOR

Eng / Eman kandil



Geotechnical consultant

For Dr. M.
Dr. Mohamed Mostafa Badry

Kilo 23 Alexandria - Cairo Desert Road - Merghem

Tel: 002 03 4704595 - 002 034701191

Email : civdept@comibassal.com

WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt

Tel: 002 033920176 - 002 033931482

Fax :002 033900476

Email : internal-inspection@comibassal.com



COMIBASSAL International Controllers

Internal inspection and laboratories sector

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Accredited by : Egypton Accreditation council (EGAC) under No. 031708/1A

APPENDIX





COMIBASSAL International Controllers

Internal inspection and laboratories sector

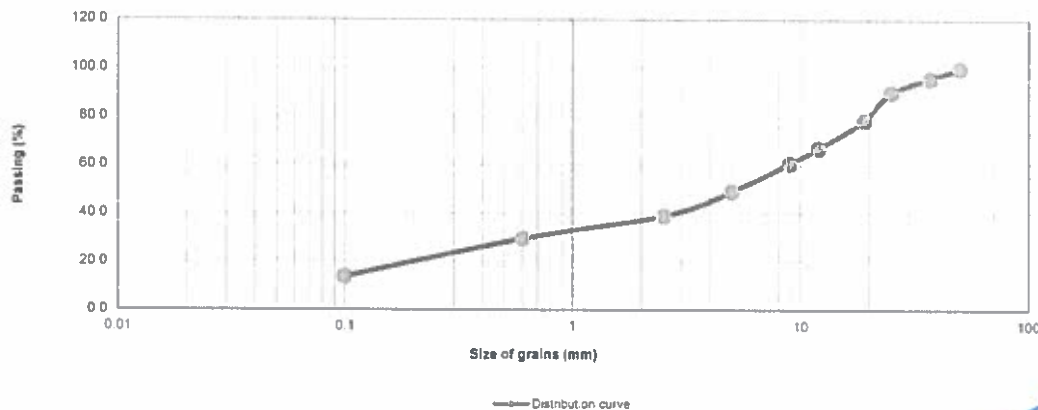
Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egypton Accreditation council (EGAC) under No. 031706/1A

PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

	WEIGHT RETAINED	CUMULATIVE WEIGHT RETAINED (gm)	CUMULATIVE PERCENTAGE RETAINED (%)	CUMULATIVE PERCENTAGE PASSING (%)	STANDURD SPECIFICATION LIMITS
2	0.00	0.00	0.00	100.0	
1 1/2	404.00	404.00	4.04	96.0	
1	586.00	990.00	9.90	90.1	
3/4	1181.00	2171.00	21.71	78.3	
1/2	1156.00	3327.00	33.27	66.7	
3/8	614.00	3941.00	39.41	60.6	
No.4	1160.00	5101.00	51.02	49.0	
No.10	103.00	103.00	20.60	38.9	
No.40	199.00	199.00	39.80	29.5	
No.200	360.00	360.00	72.00	13.7	

Total sample weight = 9999.00 pass No 4= 4898.0 Total fine aggregates weight = 500 gm
% 49.0

Size analysis distribution curve



Soil classification: A - 1- a (sample is non plastic)





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egypton Accreditation council (EGAC) under No. 031706/1A

Modified Proctor Test Report

ASTM - D 1557

Mould Number :- 2
Volume of mould = 2188 cm³
Weight of mould = 5925 g
G.S = 2.67 g/cm³

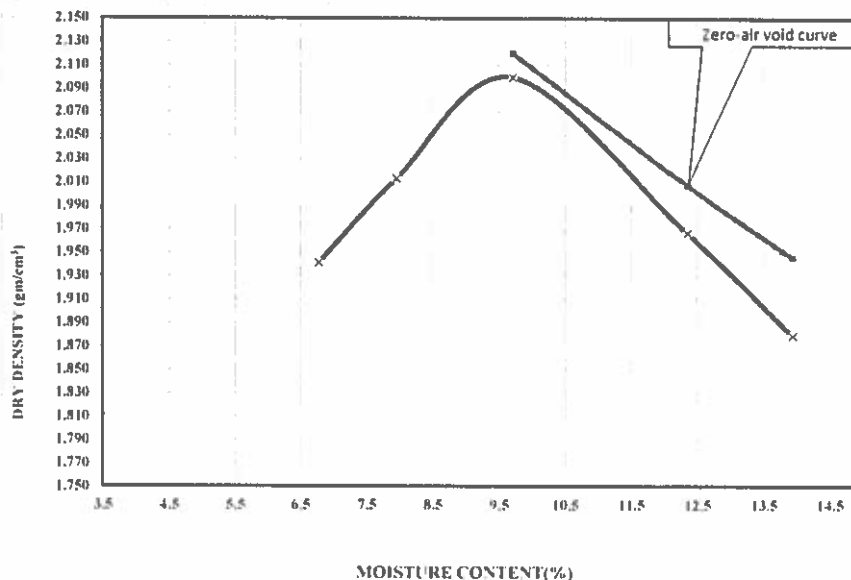
A- Density Calculations :-

	1	2	3	4	5
Weight.of wet soil+mould (g)	10460	10680	10965	10760	10610
Weight.of mould (g)	5925	5925	5925	5925	5925
Weight.of wet soil (g)	4535	4755	5040	4835	4685
Volume of mould (cm ³)	2188	2188	2188	2188	2188
Wet density (g/cm ³)	2.073	2.173	2.303	2.210	2.141
Dry density (g/cm ³)	1.941	2.013	2.100	1.967	1.879
Zero-air Void curve			2.120	2.008	1.946

B- Moisture Calculations :-

Weight.of wet soil+container (g)	250.0	250.0	250.0	250.0	250.0
Weight.of dry soil+container (g)	238.0	236.0	233.0	229.0	227.0
Weight.of container (g)	61.0	60.0	58.0	59.0	62.0
moisture content(%)	6.8	8.0	9.7	12.4	13.9

C - Dry density-Moisture relationship:-



M.D.D= 2.100 gm/cm³
O.M.C= 9.5 %





COMIBASSAL International Controllers

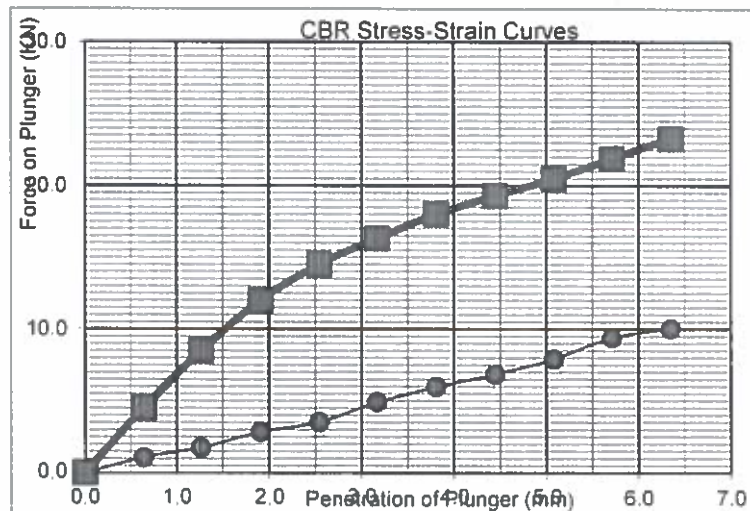
Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egypton Accreditation council (EGAC) under No. 031706/1A

Report Of CBR Test - ASTM - D 1883

NO OF BLOWS	56					
MOULD NO	2					
WT OF MOULD+SOIL	11954					
WT OF MOULD	7020					
WT OF SOIL	4934					
VOLUME OF MOULD	2188					
WET DENSITY	2.255					
	MC before soaking			Weight of Rammer	4.54Kg	
TIN NO	1			MDD	Kg/m3	2.100
WT OF WET SOIL+TIN	250.00			OMC	%	9.50
WT OF DRY SOIL+TIN	240.1					
WT OF WATER	9.90					
WT OF TIN	81					
WT OF DRY SOIL	159.1					
MOISTURE CONTENT	6.2					
DRY DENSITY	2.123					

Pen mm	Reading (Div)	Bearing (KN)	standar	CBR
0.00	0	0.0	0.0	56
0.64	110	1.1	4.5	
1.27	180	1.8	8.5	
1.91	290	2.8	12.0	
2.54	360	3.5	14.5	27
3.17	502	4.9	16.3	
3.81	610	6.0	18.0	
4.45	701	6.9	19.3	
5.08	810	7.9	20.5	40
5.71	960	9.4	21.9	
6.35	1025	10.0	23.3	





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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Accredited by : Egypton Accreditation council (EGAC) under No. 031706/1A

Report :	561 - 2 - Center
Date :	15-06-23

CHEMICAL ANALYSIS

General Consultant :	SYSTRA
Consultant :	SPECTRUM
Contractor :	شركة الزنكلوني للمقاولات
Project :	Electric express train
Sample :	Mix Aggregate Filter
Station :	ST (333 +800) ; (334 + 400)
Date of Test :	29-4-2023

Temperature : 25 °C

Humidity : 45%

ANALYSIS	RESULTS	TEST METHOD
ORGANIG MATTER	NEGATIVE	ASTM D 2974



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa



CODE-1	51 to 521	D1 to S3	kp XXX Note
CODE-2	Station Reference	Depot Reference	For kilometer point only Start km is used
CODE-3	Work Activity		
CODE-4	Sub Element of Activity		

Description of Materials	Location to be Used	From Station (333+940) to Station (334+540)			
		Fill Layer Total Quantity (5000 m³) ملءون (5000 m³)			
Sample only	Yes	Materials Type	Fill layers		
Supplier Name	ELSEWY	Data Sheet provided	Yes attached		
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Prequalification reference		Test Samples Results			
Reference Photos	No/Yes	Other			
Comments by: Eng. Abdallah Omar (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)			
1-Quality test Result By Site Laboratory is Approved.		1-All tests were carried-out by material engineer for both contractor and GARB Consultant.			
2-This Sample Representative (5000 m3) only.		2-Results report attached and acceptable with the project specifications.			
		3-Final approval is subject to above mentioned comments.			

APPROVAL STATUS			
Organisation	Name	Sign	Date
Contractor	Mr. J. A. A. A.		
QA/QC *	Eng. Abdallah Omar		
GARB **	Eng. Mohammed Fayad		
Employers Representative	Eng. Alaa Abd-Allatif		10-5-2023

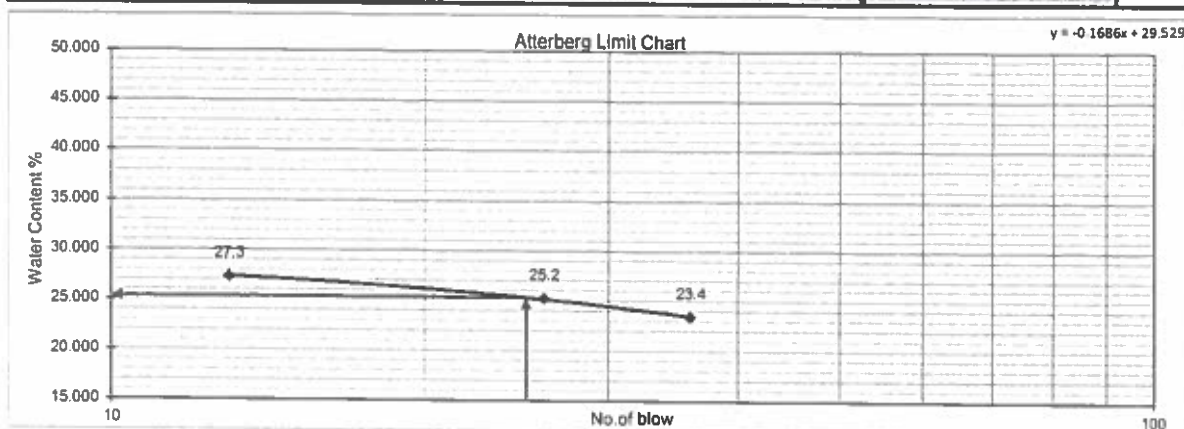
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	9-May-23
Company	شركة الزنكوني-المشون	Request NO.	QT 2-2
Station	5000 m ³		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	17410		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5"	85	99.5	
1 "	883	94.9	
3/4"	901	94.8	
3/8"	6632	61.9	
4	9769	43.89	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	87	36.25	50 max
40	219	24.67	30 max
200	356	12.64	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

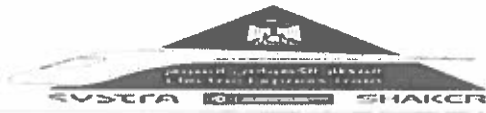
test	Liquid Limit			Plastic Limite		
Number of blows	13	26	36			
Number of plate	2	14	13	12	10	23
Wt. Of plate	31.63	32.63	32.41	32.48	31.45	32.15
wt. of plate+wt. of wet sample	82.04	85.68	78.42	36.33	35.23	36.34
wt. of plate + wt. of dry sample	71.23	74.99	69.69	35.68	34.59	35.63
wt. of water	10.8	10.7	8.7	0.6	0.6	0.7
wt. of dry sample	39.6	42.4	37.3	3.2	3.1	3.5
moisture content	27.3	25.2	23.4	20.2	20.5	20.5
The Limits	Liquid Limit			Plastic Limite		20.39



Liquid Limit	25.31	
plasticity Index	4.9	6 max
Group Classification	A-1-a	A-1-a & A-1-b



وزارة النقل
المكتب العام للطرق والجسور



الجمعية المصرية للمهندسين
الطرق والجسور

الهيئة القومية للإتفاق



مكتب أ.د/ خالد قنديل

Electrical Express Train From Borg Alarab to Alamein

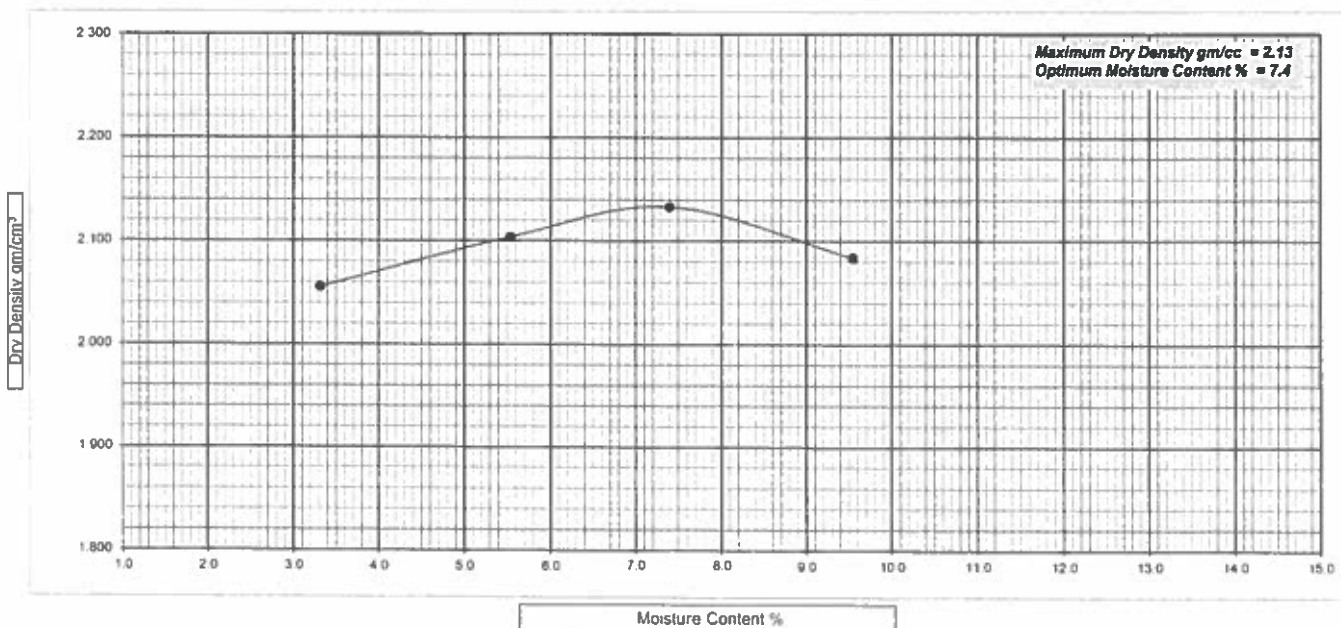


ENGINEERING CONSULTING OFFICE
المكتب الاستشاري للمهندسين
أ.د/ خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	10-May-23
Station	From	5000 m ²	To	Request NO.	QT 2-2

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T180-74)

CONTAINER NUMBER		2	3	15	27	13	23	11	16		
A	TARE MASS	gms.	31.41	32.36	32.41	32.48	32.41	31.63	32.14	32.42	
B	MASS WET SOIL & TARE	gms.	200.1	177.4	175.2	182.8	176.3	192.3	191.1	182.0	
C	MASS DRY SOIL & TARE	gms.	194.8	172.6	167.8	174.8	166.7	181.0	177.4	168.8	
D	MASS OF WATER	gms. B-C	5.3	4.8	7.4	8.0	9.7	11.4	13.7	13.2	
E	MASS OF DRY SOIL	gms. C-A	163.4	140.3	135.4	142.3	134.3	149.4	145.3	136.4	
F	MOISTURE CONTENT	% $\frac{D}{E} \times 100$	3.2	3.4	5.5	5.6	7.2	7.6	9.4	9.7	
AVERAGE		%	3.3		5.5		7.4		9.6		
TRIAL NUMBER		1	2	3	4						
G	MASS OF MOLD & WET SOIL	gms.	10326	10535	10689	10671					
H	MASS OF MOLD	gms.	5729	5729	5729	5729					
I	MASS OF WET SOIL	gms. G-H	4597	4806	4960	4942					
J	VOLUME OF MOLD	cm ³	2165	2165	2165	2165					
K	WET DENSITY	g/cm ³ $\frac{I}{J}$	2.123	2.220	2.291	2.283					
L	DRY DENSITY	g/cm ³ $\frac{K}{100 - F}$	2.055	2.103	2.133	2.084					



Eng. / CONSULTANT

Abdallah H. May

Eng. / CONTRACTOR

Signature

Contractor Company	AL-ZANKALONY CO. for General Contracting		Designer Company	(KK) Engineering Consulting Office		Name	Sign	Date/Serial Number	Time	
Issued by Contractor	 ١٥٠٩ دلف ١٢	 ١٥	MAR 2-3		08:00					
			2023-05-21							
Received by GARB CONSULTANT	 Eng. Abdallah Omar		C1	C2	C3	DD	MM	YY	HH	MM
	MAR	333	EW	CS	22	05	23	08	00	

CODE-1	Station Reference	Work Activity	Sub Element of Activity
	S1 to S21	D1 to S3	Kp XXX Note
		Depot Reference	For Kilometer point only Start Km is used

Description of Materials	Fill Layer Total Quantity (5000 m ³) غطاء		
Location to be Used	From Station (333+940) to Station (334+540)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. Abdallah Omar (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	
1-Quality test Result By Site Laboratory is Approved.		1-All tests were carried-out by material engineer for both contractor and GARB Consultant.	
2-This Sample Representative (5000 m3) only.		2-Results report attached and acceptable with the project specifications.	
		3-Final approval is subject to above mentioned comments.	

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	١٥٠٩ دلف ١٢			A
QA/QC *	Eng. Abdallah Omar			
GARB **	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

* Designer
** Alignment/Bridges: Culvert only

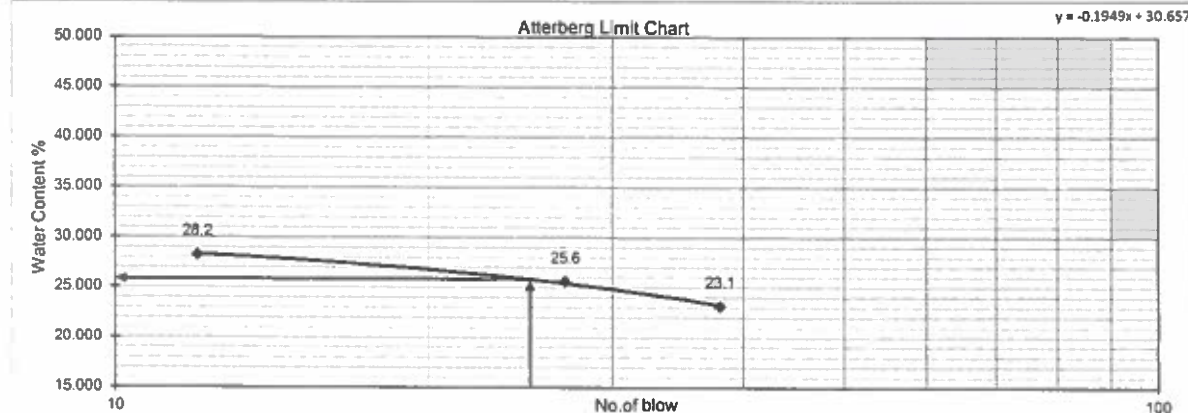
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	21-May-23
Company	شركة الزنكوني - القطاع	Request NO.	QT 2-3
Station	5000 m ³		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

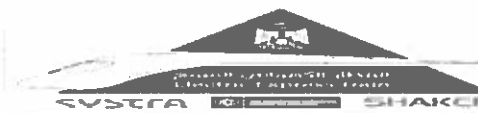
wt. of coars sample =	10839		
Sieve "Inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5"	183	98.3	
1 "	1430	86.8	
3/4"	3065	71.7	
3/8"	6109	43.6	
4	7371	32.00	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	53	28.60	50 max
40	165	21.44	30 max
200	369	8.38	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	12	27	38			
Number of plate	13	4	14	15	7	10
Wt. Of plate	32.04	31.78	32.2	30.88	33.35	32.48
wt. of plate + wt. of wet sample	61.29	60.84	64.84	34.30	37.03	35.70
wt. of plate + wt. of dry sample	54.85	54.92	58.71	33.69	36.38	35.12
wt. of water	6.4	5.9	6.1	0.6	0.6	0.6
wt. of dry sample	22.8	23.1	26.5	2.8	3.0	2.6
moisture content	28.2	25.6	23.1	21.6	21.3	22.0
The Limits	Liquid Limit			Plastic Limite		
	25.78			21.65		



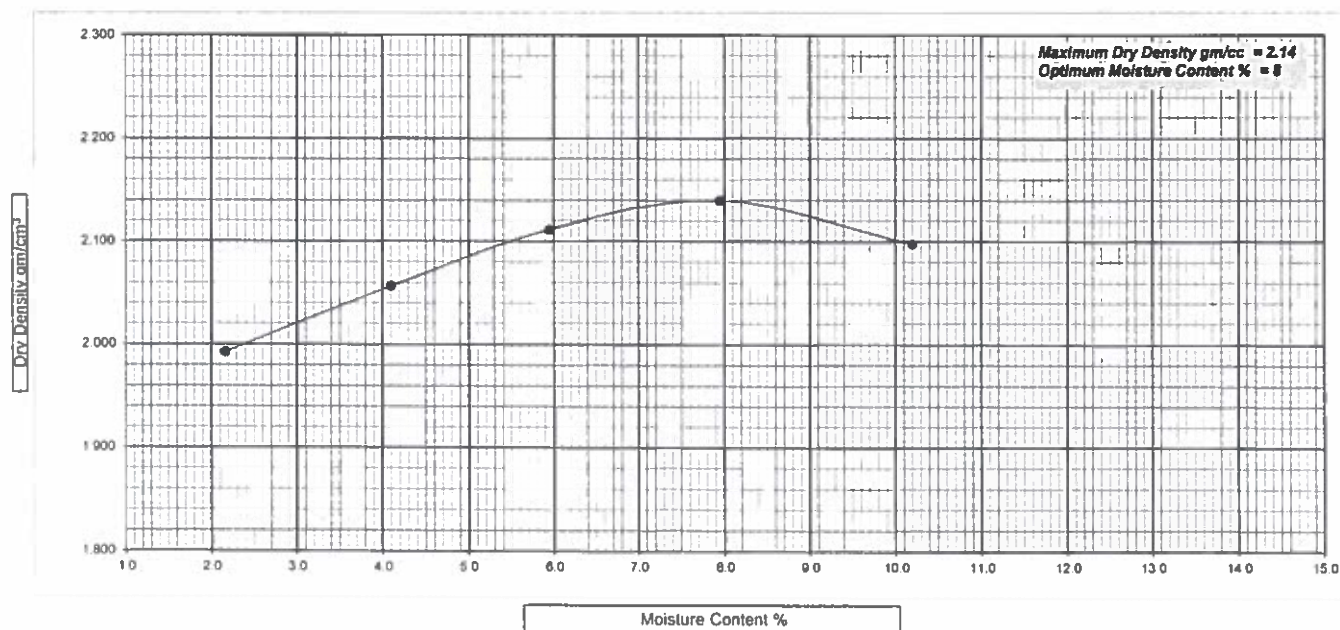
Liquid Limit	25.78	
plasticity Index	4.1	6 max
Group Classification	A-1-a	A-1-a & A-1-b

 مزاود النقل الهيئة العامة للطرق والمواصلات	 SYSTRA	الهيئة القومية للإنفاق مكتب أ.د. خالد قنديل Electrical Express Train From Borg Alarab to Alamein
شركة الزنكواني المقاولات العامة	 ENGINEERING CONSULTING OFFICE المكتب الاستشاري الهندسي	

Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	22-May-23
Station	From 5000 m ³ To	Request NO.	QT 2-3

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T180-74)

MOISTURE CONTENT													
CONTAINER NUMBER				19	18	30	21	26	23	20	12	18	13
A	TARE MASS	gms		32.15	31.6	31.26	32.58	32.46	31.45	32.63	31.26	32.85	32.42
B	MASS WET SOIL & TARE	gms		187.8	182.0	172.3	174.7	162.5	182.0	194.2	169.7	195.2	180.4
C	MASS DRY SOIL & TARE	gms		184.4	178.9	166.9	168.9	155.1	173.7	182.3	159.5	180.1	166.8
D	MASS OF WATER	gms	B-C	3.4	3.1	5.4	5.7	7.5	8.3	12.0	10.1	15.2	13.6
E	MASS OF DRY SOIL	gms	C-A	152.2	147.3	135.6	136.4	122.6	142.3	149.6	128.3	147.2	134.4
F	MOISTURE CONTENT	%	$\frac{D}{E} \times 100$	2.2	2.1	4.0	4.2	6.1	5.8	8.0	7.9	10.3	10.1
AVERAGE		%		2.2		4.1		6.0		8.0		10.2	
DRY DENSITY													
TRIAL NUMBER				1		2		3		4		4	
G	MASS OF MOLD & WET SOIL	gms.		10136		10363		10572		10730		10735	
H	MASS OF MOLD	gms.		5729		5729		5729		5729		5729	
I	MASS OF WET SOIL	gms.	G-H	4407		4634		4843		5001		5006	
J	VOLUME OF MOLD	cm ³		2165		2165		2165		2165		2166	
K	WET DENSITY	g/cm ³	$\frac{I}{J}$	2.036		2.140		2.237		2.310		2.311	
L	DRY DENSITY	g/cm ³	$\frac{K}{100 + F}$	1.992		2.056		2.111		2.140		2.097	



Eng. / CONSULTANT

Abdallah Omar

Eng. / CONTRACTOR

[Signature]

**MATERIAL
APPROVAL
REQUEST**

شركة الزنكلوني
المقاولات العامة



الهيئة العامة
للطرق والكباري
(GARB)



المعهد العالي للمهندسين
بجامعة القاهرة



Contractor Company		Al-ZANKALONY CO. for General Contracting			Designer Company		(KK) Engineering Consulting Office					
Issued by Contractor	Name	Sign		Date/Serial Number			Time					
	أحمد جمال وهدي			2023-05-08			08:00					
				MAR 2-2								
Received by GARB CONSULTANT		Eng. Abdallah Omar		MAR	C1 333	C2 EW	C3 CS	DD 09	MM 05	YY 23	HH 08	MM 00

CODE-1	S1 to S21 Station Reference	D1 to S3 Depot Reference	Kp XXX Note For Kilometer point only Start Km is used
CODE-2	Work Activity		
CODE-3	Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (5000 m³) مشون		
Location to be Used	From Station (333+940) to Station (334+540)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. Abdallah Omar (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	
1-Quality test Result By Site Laboratory is Approved.		1-All tests were carried-out by material engineer for both contractor and GARB Consultant.	
2-This Sample Representative (5000 m3) only.		2-Results report attached and acceptable with the project specifications.	
		3-Final approval is subject to above mentioned comments.	

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال وهدي			A
QA/QC *	Eng. Abdallah Omar			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

* Designer

** Alignment/Bridges: Culvert only

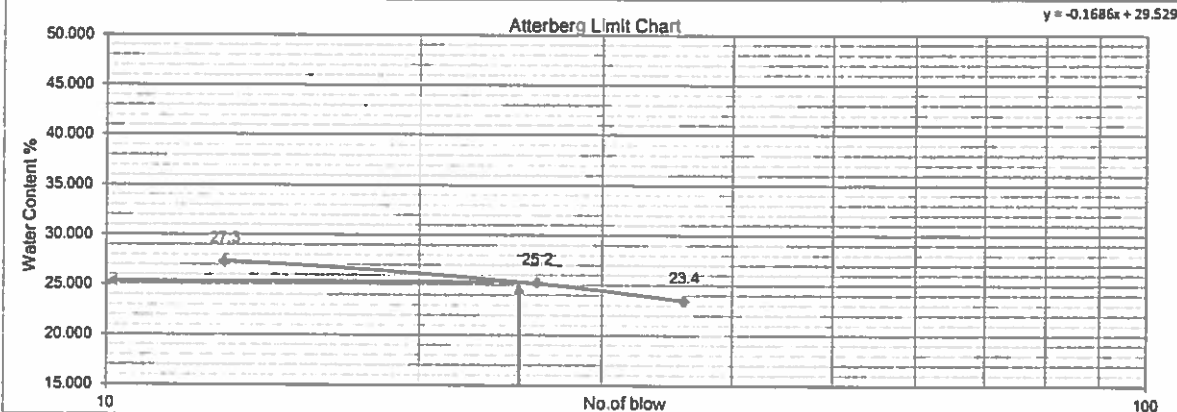
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	7-May-23
Company	شركة الزنكوني - المشون		
Station	5000 m ²	Request NO.	QT 2-2
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	17410		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2"	0	100.0	
1.5"	85	99.5	
1"	883	94.9	
3/4"	901	94.8	
3/8"	6632	61.9	
4	9769	43.89	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	87	36.25	50 max
40	219	24.67	30 max
200	356	12.64	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	13	26	36			
Number of plate	2	14	13	12	10	23
Wt. Of plate	31.63	32.63	32.41	32.48	31.45	32.15
wt. of plate + wt. of wet sample	82.04	85.68	78.42	36.33	35.23	36.34
wt. of plate + wt. of dry sample	71.23	74.99	69.69	35.68	34.59	35.63
wt. of water	10.8	10.7	8.7	0.6	0.6	0.7
wt. of dry sample	39.6	42.4	37.3	3.2	3.1	3.5
moisture content b	27.3	25.2	23.4	20.2	20.5	20.5
The Limits	Liquid Limit			Plastic Limite		20.39



Liquid Limit	25.31	
plasticity Index	4.9	6 max
Grou Classification	A-1-a	A-1-a & A-1-b



الهيئة القومية للإنفاق



شركة التكتيكات
للمقاولات العامة

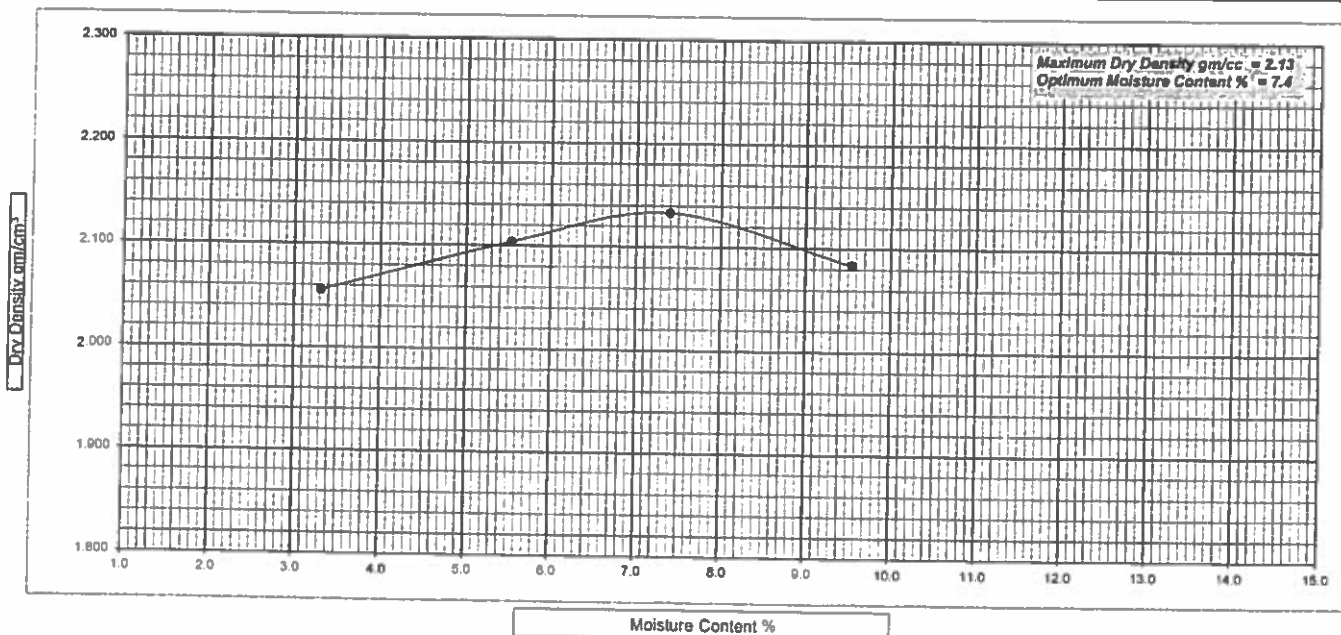
مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
إ.د/ خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	8-May-23
Station	From	5000 m ³	To	Request NO.	QT 2-2

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T180-74)

MOISTURE CONTENT													
CONTAINER NUMBER				2	3	15	27	13	23	11	16		
A	TARE MASS	gms.		31.41	32.36	32.41	32.48	32.41	31.63	32.14	32.42		
B	MASS WET SOIL & TARE	gms		200.1	177.4	175.2	182.8	176.3	192.3	191.1	182.0		
C	MASS DRY SOIL & TARE	gms		194.8	172.6	167.8	174.8	166.7	181.0	177.4	168.8		
D	MASS OF WATER	gms.	B-C	5.3	4.8	7.4	8.0	9.7	11.4	13.7	13.2		
E	MASS OF DRY SOIL	gms.	C-A	163.4	140.3	135.4	142.3	134.3	149.4	145.3	136.4		
F	MOISTURE CONTENT	%	$P_{LE} \times 100$	3.2	3.4	5.5	5.6	7.2	7.6	9.4	9.7		
AVERAGE		%		3.3		5.5		7.4		9.6			
DRY DENSITY													
TRIAL NUMBER				1	2	3	4						
G	MASS OF MOLD & WET SOIL	gms.		10326	10535	10689	10671						
H	MASS OF MOLD	gms.		5729	5729	5729	5729						
I	MASS OF WET SOIL	gms.	G-H	4597	4806	4960	4942						
J	VOLUME OF MOLD	cm ³		2165	2165	2165	2165						
K	WET DENSITY	g/cm ³	$\frac{I}{J}$	2.123	2.220	2.291	2.283						
L	DRY DENSITY	g/cm ³	$\frac{K}{100 + F}$	2.055	2.103	2.133	2.084						



Eng. / CONSULTANT

Abdallah H. M. M.

Eng. / CONTRACTOR

[Signature]

MATERIAL APPROVAL REQUEST

شركة الزنكلوني
للحلول العامة

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.ع. خالد فهد

الهيئة العامة
للطرق والكباري
(GARB)



المشروع: إنشاء جسر على نهر
في منطقة الرياض



Contractor Company	Al-ZANKALONY CO. for General Contracting		Designer Company	(KK) Engineering Consulting Office	
Issued by Contractor	Name	Sign	Date/Serial Number	Time	
	أحمد جمال وهداية		2023-05-21 MAR 2-3	08:00	
Received by GARB CONSULTANT	Eng. Abdallah Omar	MAR	EW	CS	DD
			22	05	23

CODE 1	S1 to S21	D1 to S3	Kp XXX Note
CODE 2	Station Reference	Depot Reference	For Kilometer point only Start Km is used
CODE 3	Work Activity		
	Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (5000 m³) القطاع		
Location to be Used	From Station (333+940) to Station (334+540)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. Abdallah Omar (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	
1-Quality test Result By Site Laboratory Is Approved.		1-All tests were carried-out by material engineer for both contractor and GARB Consultant.	
2-This Sample Representative (5000 m3) only.		2-Results report attached and acceptable with the project specifications.	
		3-Final approval is subject to above mentioned comments.	

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال وهداية			A
QA/QC *	Eng. Abdallah Omar			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

* Designer

** Alignment/Bridges: Culvert only

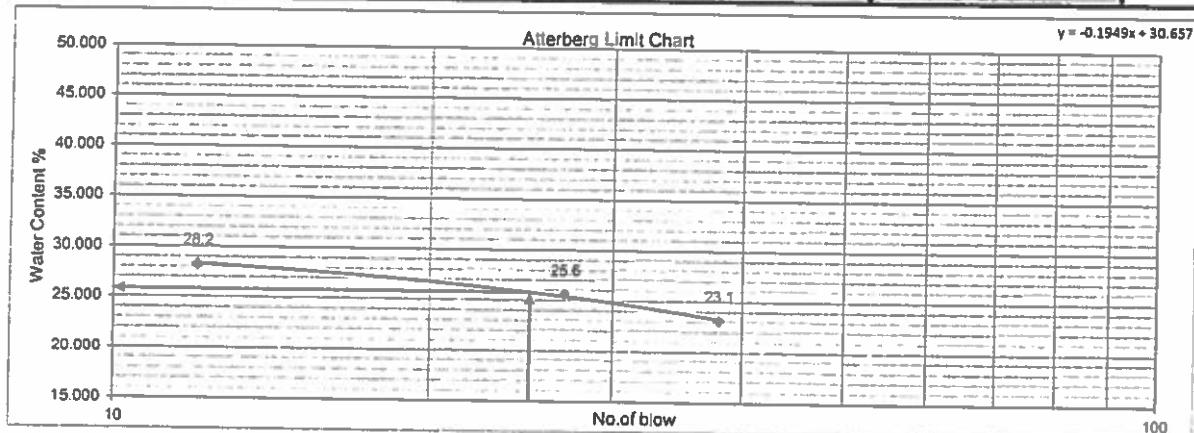
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	21-May-23
Company	شركة الزنكلوني - القطاع	Request NO.	QT 2-3
Station	5000 m ³		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

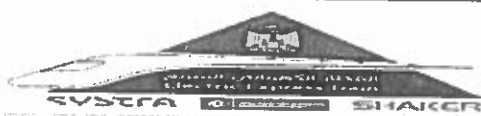
wt. of coarse sample =	10839		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2"	0	100.0	
1.5"	183	98.3	
1"	1430	86.8	
3/4"	3065	71.7	
3/8"	6109	43.6	
4	7371	32.00	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	53	28.60	50 max
40	165	21.44	30 max
200	369	8.38	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	12	27	38			
Number of plate	13	4	14	15	7	10
Wt. Of plate	32.04	31.78	32.2	30.88	33.35	32.48
wt. of plate + wt. of wet sample	61.29	60.84	64.84	34.30	37.03	35.70
wt. of plate + wt. of dry sample	54.85	54.92	58.71	33.69	36.38	35.12
wt. of water	6.4	5.9	6.1	0.6	0.6	0.6
wt. of dry sample	22.8	23.1	26.5	2.8	3.0	2.6
moisture content	28.2	25.6	23.1	21.6	21.3	22.0
The Limits	Liquid Limit			Plastic Limite		
				21.65		



Liquid Limit	25.78	
plasticity index	4.1	6 max
Group Classification	A-1-a	A-1-a & A-1-b



الهيئة القومية للإنفاق



شركة نقل كبرى
المقاولات العامة

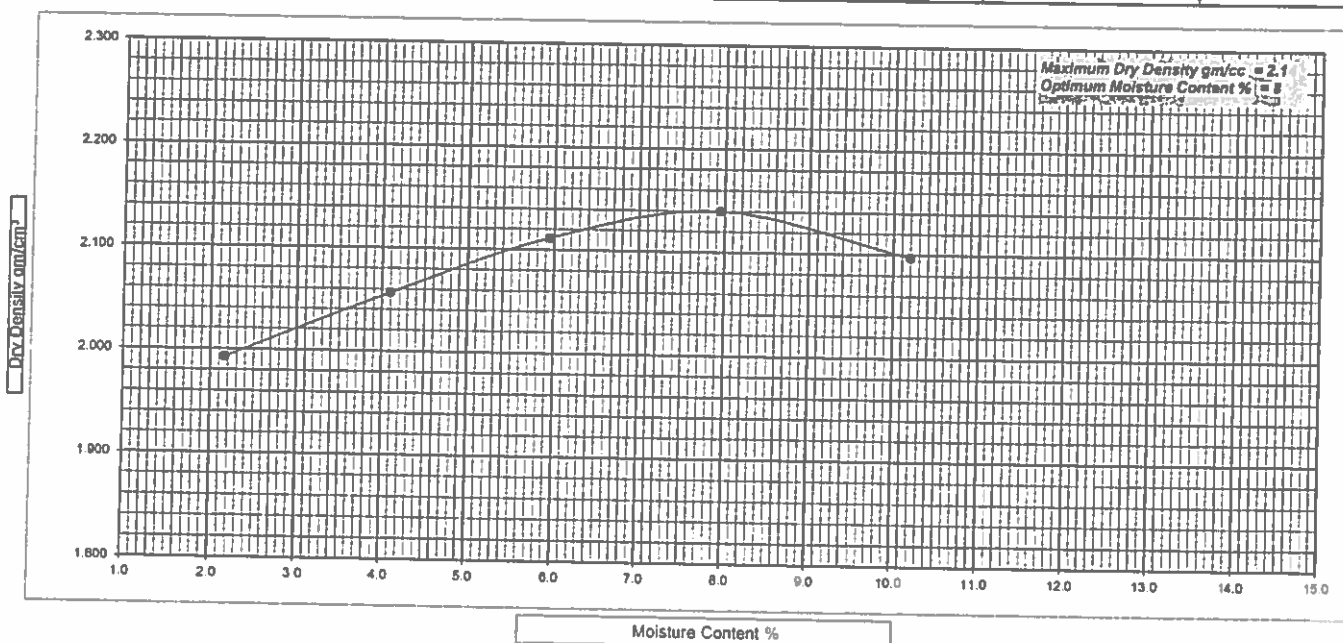
مكتب أ.د. خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	22-May-23
Station	From	5000 m ³	To	Request NO.	QT 2-3

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T180-74)

MOISTURE CONTENT													
CONTAINER NUMBER				19	18	30	21	26	23	20	12	18	13
A	TARE MASS	gms.		32.15	31.6	31.26	32.58	32.46	31.45	32.63	31.26	32.85	32.42
B	MASS WET SOIL & TARE ,	gms.		187.8	182.0	172.3	174.7	162.5	182.0	194.2	169.7	195.2	180.4
C	MASS DRY SOIL & TARE	gms		184.4	178.9	166.9	168.9	155.1	173.7	182.3	159.5	180.1	166.8
D	MASS OF WATER	gms.	B-C	3.4	3.1	5.4	5.7	7.5	8.3	12.0	10.1	15.2	13.6
E	MASS OF DRY SOIL	gms.	C-A	152.2	147.3	135.6	136.4	122.6	142.3	149.6	128.3	147.2	134.4
F	MOISTURE CONTENT	%	$\frac{D}{E} \times 100$	2.2	2.1	4.0	4.2	6.1	5.8	8.0	7.9	10.3	10.1
AVERAGE		%		2.2		4.1		6.0		8.0		10.2	
DRY DENSITY													
TRIAL NUMBER				1		2		3		4		4	
G	MASS OF MOLD & WET SOIL	gms.		10136		10363		10572		10730		10735	
H	MASS OF MOLD	gms		5729		5729		5729		5729		5729	
I	MASS OF WET SOIL	gms.	G-H	4407		4634		4843		5001		5006	
J	VOLUME OF MOLD	cm ³		2165		2165		2165		2165		2166	
K	WET DENSITY	g/cm ³	$\frac{I}{J}$	2.036		2.140		2.237		2.310		2.311	
L	DRY DENSITY	g/cm ³	$\frac{K}{100 - P}$	1.992		2.056		2.111		2.140		2.097	



Eng. / CONSULTANT

Abdullah H. Omar

Eng. / CONTRACTOR

[Signature]

**MATERIAL
APPROVAL
REQUEST**

شركة الزنكلوني
المقاولات العامة

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
د. خالد غنم

الهيئة العامة
للطرق والكباري
(GARB)



المركز القومي للمقاولات
مركز الدراسات والبحوث



Contractor Company	Al-ZANKALONY CO. for General Contracting		Designer Company	(KK) Engineering Consulting Office						
Issued by Contractor	Name	Sign	Date/Serial Number		Time					
	أحمد جمال وهدي		2023-04-29		08:00					
			MAR 003							
Received by GARB CONSULTANT	Eng. Abdallah Omar	Sign	C1	C2	C3	DD	MM	YY	HH	MM
			334	EW	CS	30	04	23	08	00

CODE-1	S1 to S21	D1 to S3	Kp XXX Note
CODE-2	Station Reference	Depot Reference	For Kilometer point only Start Km is used
CODE-3	Work Activity		
	Sub Element of Activity		

Description of Materials	JOB MIX مواد ترابيه + تجارب التحسين بالرمل		
Location to be Used	From Station (334+040) to Station (334+560)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. Abdallah Omar (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	
1-Quality test Result By Site Laboratory is Approved. تم اخذ عينه ترابيه شركة الزنكلوني م. مديري مشروع م. أحمد جمال وهدي م. محمد صافي لحساب نسبة التحسين بالرمل فأصبح النسبة التي فيها التربة تكون مطابقة للمواصفة Soil %75, Sand %25		1-All tests were carried-out by material engineer for both contractor and GARB Consultant. 2-Results report attached and acceptable with the project specifications. 3-Final approval is subject to above mentioned comments.	

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال وهدي			A
QA/QC *	Eng. Abdallah Omar			AWC
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

* Designer

** Alignment/Bridges: Culvert only

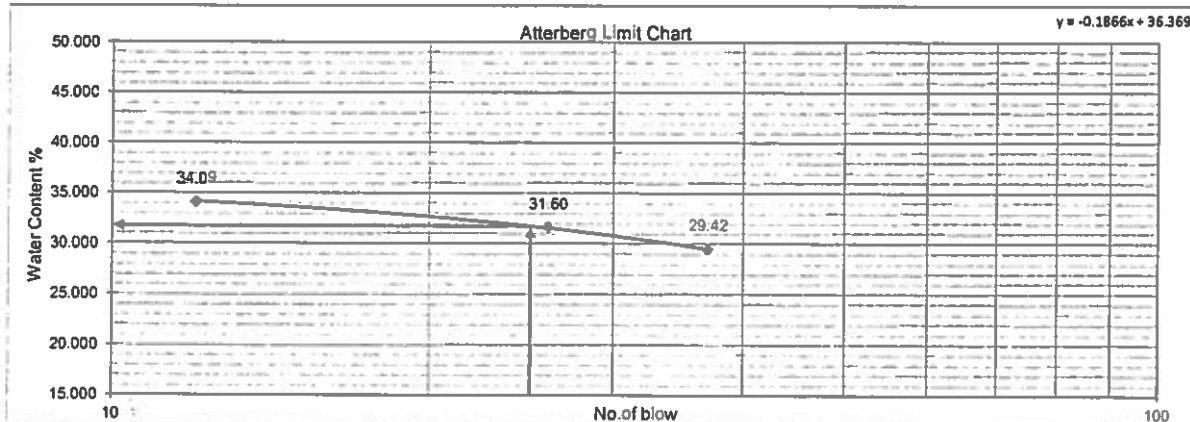
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكوني	Request NO.	2
Station	عينه من توريد محجر السيوي بالموقع		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	17410		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2"	0	100.0	
1.5"	85	99.5	
1"	883	94.9	
3/4"	901	94.8	
3/8"	6632	61.9	
4	9769	43.89	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	87	36.25	50 max
40	219	24.67	30 max
200	356	12.64	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	12	26	37			
Number of plate	A-13	A-2	A-15	A-1	A-5	A-14
Wt. Of plate	32.02	32.82	30.85	30.5	31.56	32.22
wt. of plate + wt. of wet sample	73.24	73.05	64.99	33.83	34.84	34.84
wt. of plate + wt. of dry sample	62.76	63.39	57.23	33.27	34.25	34.37
wt. of water	10.48	9.66	7.76	0.56	0.59	0.47
wt. of dry sample	30.74	30.57	26.38	2.77	2.69	2.15
moisture content	34.09	31.60	29.42	20.22	21.93	21.86
The Limits	Liquid Limit			Plastic Limite		21.34



Liquid Limit	31.70	
plasticity index	10.4	6 max
Group Classification	A-2-6	A-1-a & A-1-b



الهيئة القومية للإنفاق



شركة الزنكوني
المكبرات العامة

مكتب إ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
إ.د. خالد قنديل

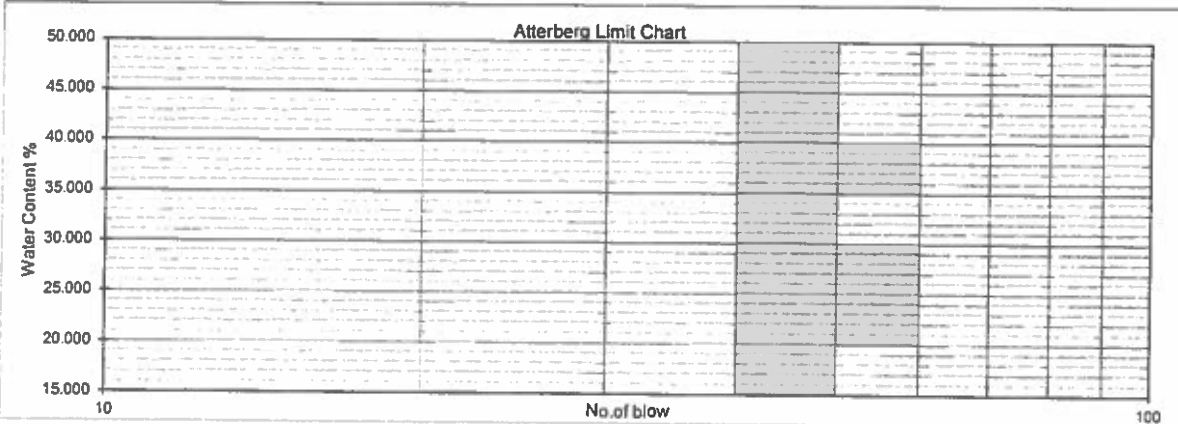
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكوني	Request NO.	2
Station	عينه من توريد محجر السيوي بالموقع		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =			
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2"			
1.5"			
1"			
3/4"			
3/8"			
4"			
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	10	98.00	50 max
40	189	62.20	30 max
200	481	3.80	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit	Plastic Limite
Number of blows	NP	NP
Number of plate		
Wt. Of plate		
wt. of plate + wt. of wet sample		
wt. of plate + wt. of dry sample		
wt. of water		
wt. of dry sample		
moisture content		
The Limits	Liquid Limit	Plastic Limite



Liquid Limit	NP	6 max
plasticity Index	A-3	A-1-a & A-1-b
Group Classification		

Eng. / CONSULTANT

A b S allah . omay

Eng. / CONTRACTOR

5

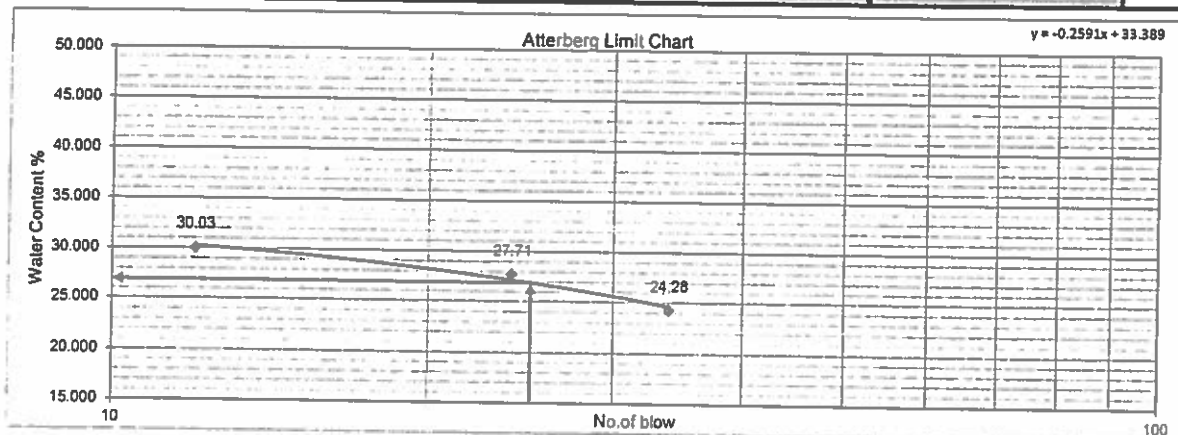
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكوني	Request NO.	2
Station	عينه من توريد محجر السيوي بالموقع +20% رمل		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	10880		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2"	0	100.0	
1.5"	0	100.0	
1"	370	96.6	
3/4"	1262	88.4	
3/8"	4190	61.5	
4	5700	47.61	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	55	42.37	50 max
40	257	23.14	30 max
200	404	9.14	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	12	24	34			
Number of plate	A-13	A-2	A-15	A-1	A-5	A-14
Wt. Of plate	32.02	32.82	30.85	30.5	31.56	32.22
wt. of plate + wt. of wet sample	73.24	73.05	64.99	33.83	34.84	34.84
wt. of plate + wt. of dry sample	63.72	64.32	58.32	33.27	34.27	34.38
wt. of water	9.52	8.73	6.67	0.56	0.57	0.46
wt. of dry sample	31.7	31.5	27.47	2.77	2.71	2.16
moisture content	30.03	27.71	24.28	20.22	21.03	21.30
The Limits	Liquid Limit			Plastic Limite		20.85



Liquid Limit	26.91	
plasticity index	6.1	6 max
Group Classification	A-2-A	A-1-a & A-1-b

A-2-u

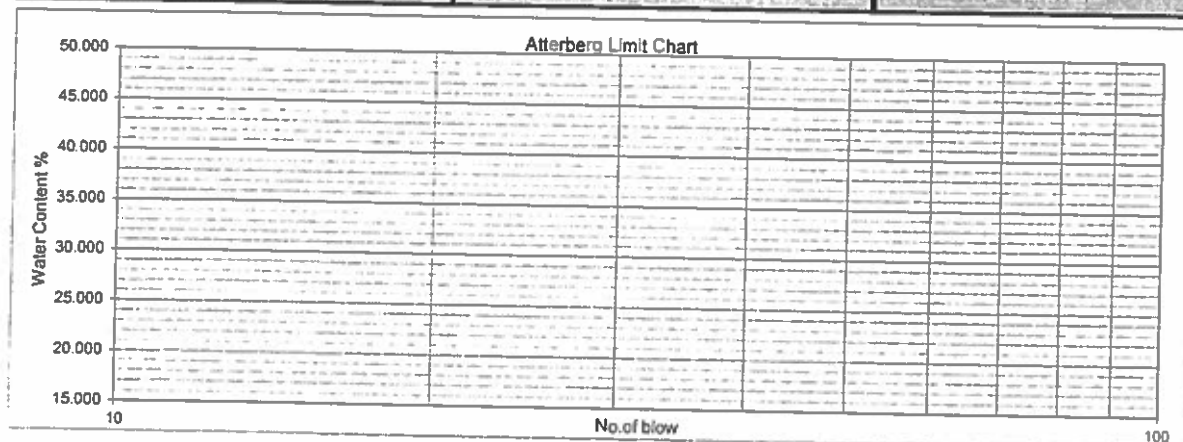
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكلوني	Request NO.	2
Station	عينه من توريد محجر السيوي بالموقع +25% رمل		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	11319		
Sieve "Inch"	total retain (gm)	pass%	Specs Limits%
2"	0	100.0	
1.5"	0	100.0	
1"	376	96.7	
3/4"	982	91.3	
3/8"	3195	71.8	
4"	4999	55.84	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits%
10	50	50.25	50 max
40	216	31.71	30 max
200	403	10.83	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit	Plastic Limite
Number of blows	NP	NP
Number of plate		
Wt. Of plate		
wt. of plate + wt. of wet sample		
wt. of plate + wt. of dry sample		
wt. of water		
wt. of dry sample		
moisture content		
The Limits	Liquid Limit	Plastic Limite



Liquid Limit	NP	6 max
plasticity Index	NP	A-1-a & A-1-b
Group Classification	A-1-A	

MATERIAL APPROVAL REQUEST						
	شركة الزنكلون للخدمات العامة		ENGINEERING CONSULTING OFFICE المكتب الاستشاري الهندسي إ. خالد شاذلي	الهيئة العامة للطرق والكباري (GAR)	الوزارة للتنمية الاقتصادية	وزارة الإسكان والتخطيط العمراني

Contractor Company	AI-ZANKALONY CO. for General Contracting			Designer Company	(KK) Engineering Consulting Office						
Issued by Contractor	Name	Sign		Date/Serial Number	Time						
	إبراهيم دويك			2023-04-29	08:00						
				MAR 003-1							
Received by GARB CONSULTANT	(KK) Khaled Zakir		MAR	C1	C2	C3	DD	MM	YY	HH	MM
				334	EW	CS	30	04	23	08	00

CODE-1	S1 to S21	D1 to S3	Kp XXX Note
	Station Reference	Depot Reference	For Kilometer point only Start Km is used
	Work Activity		
	Sub Element of Activity		

Description of Materials	JOB MIX		
Location to be Used	From Station (334+040) to Station (334+560)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	إبراهيم دويك			A
QA/QC *	(KK) Khaled Zakir			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif		15-6-2023	Awc

* Designer
 ** Alignment/Bridges Culvert only



COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egypton Accreditation council (EGAC) under No. 031706/1A

I- Introduction

General Consultant : SYSTRA
Consultant : Dr/ Khaled Kandil
Contractor : شركة الزنكلوني للمقاولات
Sample : Crushed stone and sand Mix (80:20)
Station : St(333+800) to st(334+400)
Date of Test : 29/04/2023
QC : 1163-2

II- Sample description:

Crushed stone and sand Mix (80:20)

III- Required tests and Results

Required Tests		Results
1- Grain size analysis and classification	Grain size analysis	As showed in appendix
	Classification	A-1-a
2- Modified compaction (Proctor test)	MDD	2.133
	OMC	8.5%
3- Liquid limit, plastic limit and plasticity index	LL	Np
	PL	Np
	PI	Np
4- California bearing ratio (CBR)	CBR ratio	41%

IV- Notes

- 1- Samples were brought by : Consultant
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.

LAB DIRECTOR

Eng / Eman kandil

Eman



Geotechnical consultant

For Dr. M.

Dr. Mohamed Mostafa Badry

Kilo 23 Alexandria - Cairo Desert Road - Merghem

Tel: 002 03 4704595 - 002 034701191

Email : civdept@comibassal.com

WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt

Tel: 002 033920176 - 002 033931482

Fax : 002 033900476

Email : internal-inspection@comibassal.com



COMIBASSAL International Controllers Internal inspection and laboratories sector

Accredited by : Egyption General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egyption Accreditation council (EGAC) under No. 031708/1A

APPENDIX



COMIBASSAL International Controllers

Internal inspection and laboratories sector

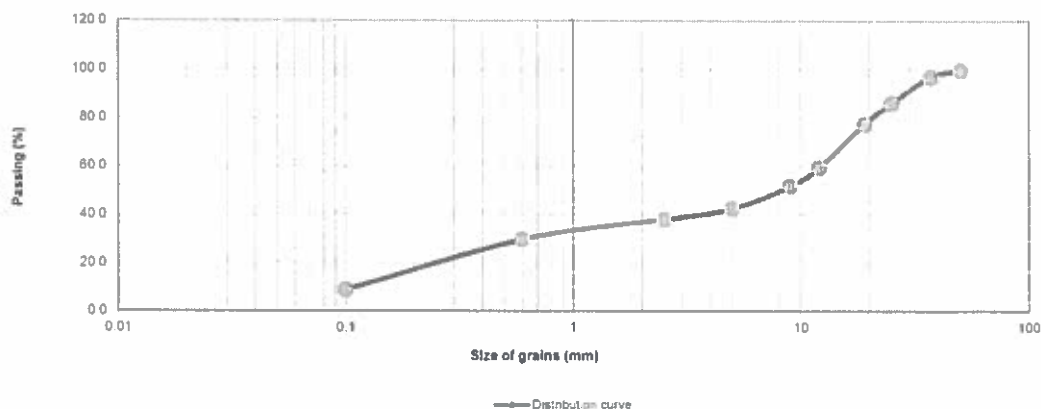
Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egypton Accreditation council (EGAC) under No. 031706/1A

PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

	WEIGHT RETAINED	CUMULATIVE WEIGHT RETAINED (gm)	CUMULATIVE PERCENTAGE RETAINED (%)	CUMULATIVE PERCENTAGE PASSING (%)	STANDARD SPECIFICATION LIMITS
2	0.00	0.00	0.00	100.0	
1 1/2	298.00	298.00	2.98	97.0	
1	1082.00	1380.00	13.80	86.2	
3/4	882.00	2262.00	22.62	77.4	
1/2	1811.00	4073.00	40.74	59.3	
3/8	751.00	4824.00	48.25	51.8	
No.4	924.00	5748.00	57.49	42.5	
No.10	53.00	53.00	10.60	38.0	
No.40	150.00	150.00	30.00	29.8	
No.200	396.00	396.00	79.20	8.8	

Total sample weight = 9998.00 pass No 4= 4250.0 Total fine aggregates weight = 500 gm
% 42.5

Size analysis distribution curve



Soil classification: A - 1 - a (Sample is non Plastic)





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egypton Accreditation council (EGAC) under No. 031706/1A

Modified Proctor Test Report ASTM - D 1557

Mould Number :- 2
Volume of mould = 2188 cm³
Weight of mould = 5657 g
G.S = 2.65 g/cm³

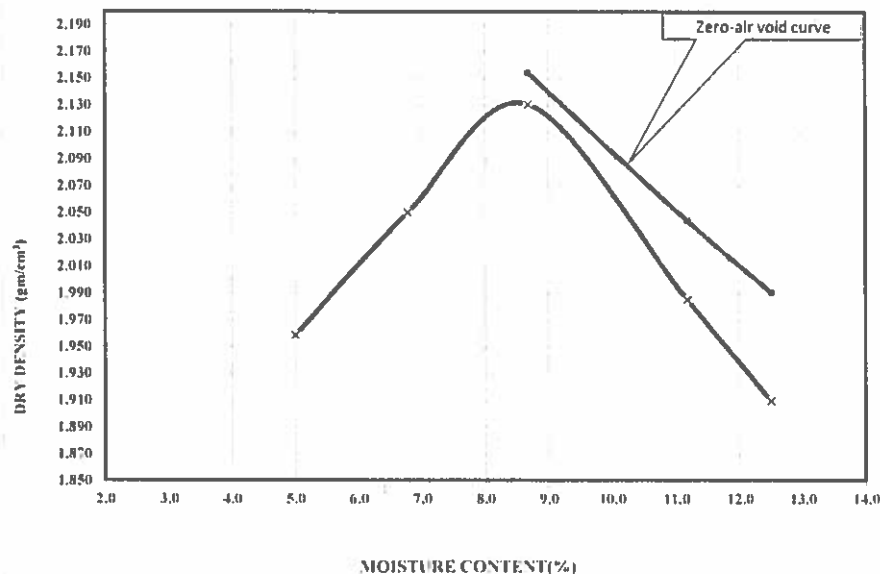
A- Density Calculations :-

	1	2	3	4	5
Weight.of wet soil+mould (g)	11760	12050	12327	12089	11960
Weight.of mould (g)	7260	7260	7260	7260	7260
Weight.of wet soil (g)	4500	4790	5067	4829	4700
Volume of mould (cm ³)	2188	2188	2188	2188	2188
Wet density (g/cm ³)	2.057	2.189	2.316	2.207	2.148
Dry density (g/cm ³)	1.959	2.050	2.131	1.985	1.909
Zero-air Void curve			2.154	2.044	1.991

B- Moisture Calculations :-

Weight.of wet soil+container (g)	250.0	250.0	250.0	250.0	250.0
Weight.of dry soil+container (g)	242.0	239.2	236.5	233.3	233.0
Weight.of container (g)	82.0	80.0	81.0	84.0	97.0
moisture content(%)	5.0	6.8	8.7	11.2	12.5

C - Dry density-Moisture relationship:-



M.D.D= 2.133 gm/cm³
O.M.C= 8.5 %





COMIBASSAL International Controllers

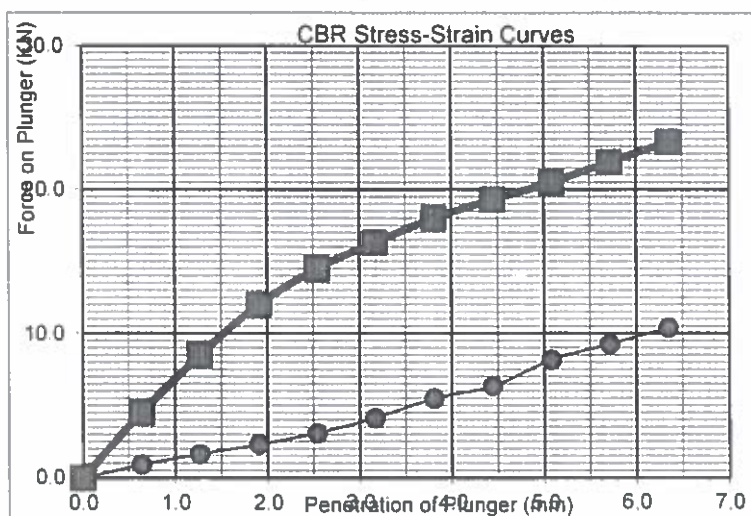
Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egypton Accreditation council (EGAC) under No. 031708/1A

Report Of CBR Test - ASTM - D 1883

NO OF BLOWS	56				
MOULD NO	2				
WT OF MOULD+SOIL	12022				
WT OF MOULD	7020				
WT OF SOIL	5002				
VOLUME OF MOULD	2188				
WET DENSITY	2.286				
	MC before soaking		Weight of Rammer	4.54Kg	
TIN NO	1		MDD	Kg/m3	2.133
WT OF WET SOIL+TIN	250.00				
WT OF DRY SOIL+TIN	238		OMC	%	8.500
WT OF WATER	12.00				
WT OF TIN	81				
WT OF DRY SOIL	157				
MOISTURE CONTENT	7.6				
DRY DENSITY	2.124				

Pen	Reading (Div)	Bearing (KN)	standar	CBR
mm	56	56	56	56
0.00	0	0.0	0.0	
0.64	92	0.9	4.5	
1.27	165	1.6	8.5	
1.91	235	2.3	12.0	
2.54	315	3.1	14.5	23
3.17	422	4.1	16.3	
3.81	560	5.5	18.0	
4.45	648	6.4	19.3	
5.08	833	8.2	20.5	41
5.71	945	9.3	21.9	
6.35	1060	10.4	23.3	





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011
Accredited by : Egypton Accreditation council (EGAC) under No. 031706/1A

Report :	489 - 1 - Center
Date :	15/06/2023

CHEMICAL ANALYSIS

General Consultant :	SYSTRA
Consultant :	SPECTRUM
Contractor :	شركة التكنولوجيا للمقاولات
Project :	Electric express train
Sample :	FERMA
Station :	ST (333 + 800) ; (334 + 400)
Date of Test :	29-4-2023

Temperature : 24 °C

Humidity : 40%

ANALYSIS	RESULTS	TEST METHOD
ORGANIG MATTER	NEGATIVE	ASTM D 2974



LAB DIRECTOR
CH/ Mostafa Asker

Moustafa



**MATERIAL
APPROVAL
REQUEST**

شركة الزنكالي
للطرق والبنى التحتية

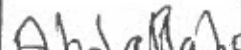
ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد شمس الدين

المهنة العامة
للطرق والكباري
(GARB)



المهندسين المعماريين والبنائيين
م.أ.د. محمد العبدالله



Contractor Company		Al-ZANKALONY CO. for General Contracting		Designer Company				(KK) Engineering Consulting Office			
Issued by Contractor	Name	Sign		Date/Serial Number				Time			
	أحمد جمال وهدهد			2023-05-22				08:00			
				MAR 004							
Received by GARB CONSULTANT	Eng. Abdallah Omar	 MAR		C1	C2	C3	DD	MM	YY	HH	MM
				333	EW	CS	23	05	23	08	00

CODE-1	S1 to S21	D1 to S3	Kp XXX Note
	Station Reference	Depot Reference	For Kilometer point only Start Km is used
CODE-2	Work Activity		
CODE-3	Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (10000 m³)		
Location to be Used	From Station (333+940) to Station (334+540)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. Abdallah Omar (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	
1-Quality test Result By Site Laboratory is Approved.		1-All tests were carried-out by material engineer for both contractor and GARB Consultant.	
2-This Sample Representative (5000 m3) only.		2-Results report attached and acceptable with the project specifications.	
		3-Final approval is subject to above mentioned comments.	

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال وهدهد			A
QA/QC *	Eng. Abdallah Omar			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

* Designer

** Alignment/Bridges: Culvert only

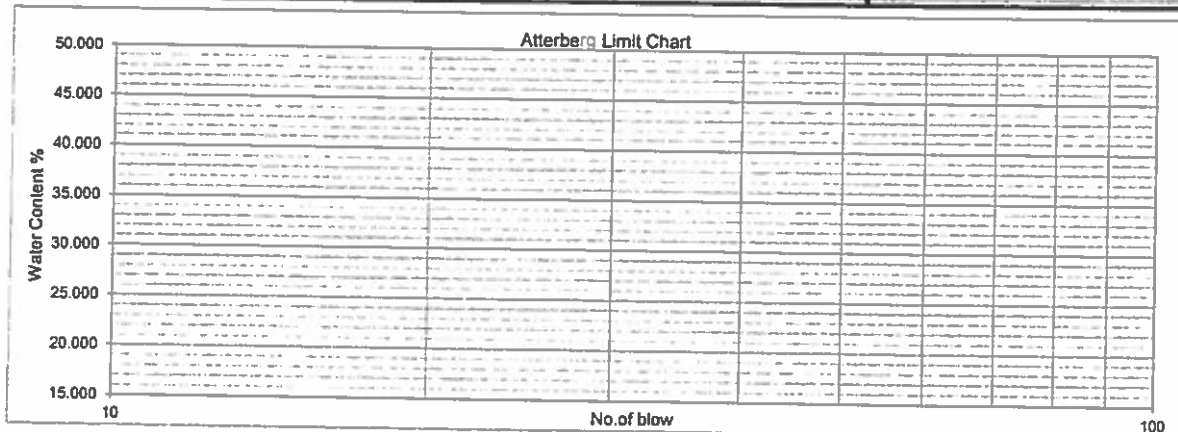
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	22-May-23
Company	شركة الزينكوني - المشون	Request NO.	QT 4
Station	10000 m ³		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

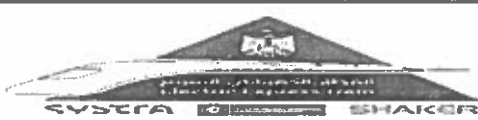
wt. of coars sample =	30198		
Sieve "Inch"	total retain (gm)	pass%	Specs Limits %
2"	0	100.0	
1.5"	609	98.0	
1"	3808	87.4	
3/4"	8113	73.1	
3/8"	17214	43.0	
4	20825	31.04	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	53	27.75	50 max
40	172	20.36	30 max
200	362	8.57	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

Test	Liquid Limit	Plastic Limite
Number of blows	NP	NP
Number of plate		
Wt. Of plate		
wt. of plate + wt. of wet sample		
wt. of plate + wt. of dry sample		
wt. of water		
wt. of dry sample		
moisture content		
The Limits	Liquid Limit	Plastic Limite



Liquid Limit	NP	6 max
plasticity Index	NP	6 max
Group Classification	A-1-a	A-1-a & A-1-b



الهيئة القومية للإنفاق



شركة للدراسات
المحركات العامة

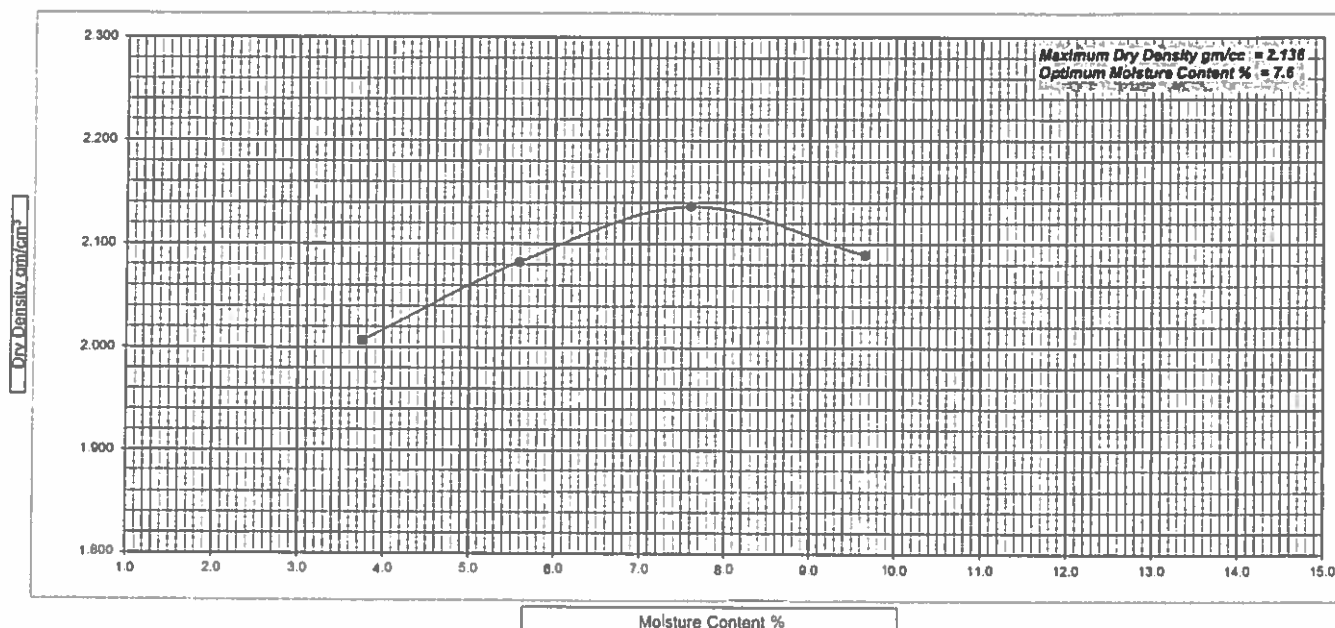
مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د/ خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	22-May-23
Station	From	5000 m ³	To	Request NO.	QT 4

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T,180-74)

MOISTURE CONTENT													
CONTAINER NUMBER				2	13	10	1	2	14	6	7		
A	TARE MASS	gms.		32.45	32.49	32.2	32.47	31.39	32.56	32.41	32.6		
B	MASS WET SOIL & TARE	gms.		173.0	180.0	204.4	189.2	219.2	182.1	173.0	199.6		
C	MASS DRY SOIL & TARE	gms.		167.7	174.9	195.5	180.7	205.7	171.8	160.7	184.9		
D	MASS OF WATER	gms.	B-C	5.3	5.1	8.9	8.5	13.6	10.3	12.3	14.8		
E	MASS OF DRY SOIL	gms.	C-A	135.3	142.4	163.3	148.3	174.3	139.3	128.3	152.3		
F	MOISTURE CONTENT	%	$\frac{D}{E} \times 100$	3.9	3.6	5.5	5.7	7.8	7.4	9.6	9.7		
AVERAGE		%		3.8		5.6		7.6		9.7			
DRY DENSITY													
TRIAL NUMBER				1		2		3		4			
G	MASS OF MOLD & WET SOIL	gms.		10236		10489		10705		10689			
H	MASS OF MOLD	gms.		5729		5729		5729		5729			
I	MASS OF WET SOIL	gms.	G-H	4507		4760		4976		4960			
J	VOLUME OF MOLD	cm ³		2165		2165		2165		2165			
K	WET DENSITY	g/cm ³	$\frac{1}{100}$	2.082		2.199		2.298		2.291			
L	DRY DENSITY	g/cm ³	$\frac{K}{100 + F}$	2.007		2.082		2.136		2.089			



Eng. / CONSULTANT
Abdallah. o may

Eng. / CONTRACTOR
SIP

**MATERIAL
APPROVAL
REQUEST**

المركبة للتطوير
المكثرات العامة



الهيئة العامة
للطرق والكباري
(GARB)



الهيئة العامة للتطوير
المكثرات العامة



Contractor Company	Al-ZANKALONY CO. for General Contracting		Designer Company	(KK) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	أحمد جمال وهدهد		2023-06-05	08:00							
			MAR 4-2								
Received by GARB CONSULTANT	Eng. Mohamed hassan	M.H. Ba Bad	MAR	C1	C2	C3	DD	MM	YY	HH	MM
				333	EW	CS	06	06	23	08	00

CODE-1	S1 to S21	D1 to S3	Kp XXX Note
CODE-2	Station Reference	Depot Reference	For Kilometer point only Start Km is used
CODE-3	Work Activity		
	Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (10000 m ³) مشون		
Location to be Used	From Station (333+940) to Station (334+540)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. Mohamed hassan (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	
المصبة هي من مطبوعة للمواصفات P.I → 13.8 تم الضبط بنسبة المشون وضابطة نسبة الخلط			

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال وهدهد			A
QA/QC *	Eng. Mohamed hassan			
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

* Designer

** Alignment/Bridges: Culvert only

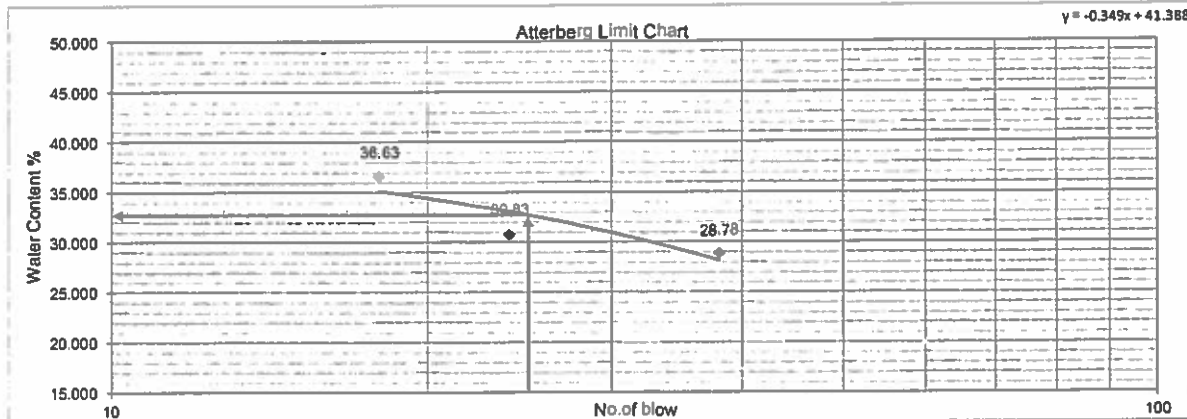
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	5-Jun-23
Company	شركة الزنكوني - المشون	Request NO.	QT 4-2
Station	Soil Classification (AASHTO M 145)		

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	17797		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2"	0	100.0	
1.5"	424	97.6	
1"	2137	88.0	
3/4"	3871	78.2	
3/8"	7936	55.4	
4	9836	44.73	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	52	40.08	50 max
40	158	30.60	30 max
200	365	12.08	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	18	24	38			
Number of plate	A-10	A-2	A-7	A-3	A-11	
Wt. Of plate	31.46	32.83	33.16	32.35	31.93	
wt. of plate + wt. of wet sample	48.58	59.65	52.67	33.96	33.08	
wt. of plate + wt. of dry sample	43.99	53.33	48.31	33.7	32.9	
wt. of water	4.59	6.32	4.36	0.26	0.18	
wt. of dry sample	12.53	20.5	15.15	1.35	0.97	
moisture content	36.63	30.83	28.78	19.26	18.56	
The Limits	Liquid Limit			Plastic Limite		18.91



Liquid Limit	32.66	
plasticity index	13.8	6 max
Group Classification	A-2-6	A-1-a & A-1-b

MATERIAL APPROVAL REQUEST	     
	شركة الترخيص GENERAL CONTRACTING COMPANY GENERAL ENGINEERING OFFICE GENERAL ENGINEERING OFFICE GENERAL ENGINEERING OFFICE GENERAL ENGINEERING OFFICE

Contractor Company	Al-ZANKALONY CO. for General Contracting		Designer Company	(KK) Engineering Consulting Office	
Issued by C	Name	Sign	Date/Serial Number	Time	
	أحمد جمال وهدية		2023-06-07 MAR 5	08:00	
Received by GARB CONSULTANT	(KK)	Khaled Zaki	333	EW	CS
			08	06	23
			08	00	

S1 to S21	D1 to S3	Kp XXX Note
Station Reference	Depot Reference	For Kilometer point only Start Km is used
Work Activity		
Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (15000 m ³) مشون		
to be Used	From Station (333+940) to Station (334+540)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Pregualification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by (KK)	Comments by: Eng. Alaa Abd-Allatif (ER)		
1- Quality test by Site Laboratory is Approved.	1-All tests were carried-out by material engineer for both contractor and GARB Consultant.		
2- This Sample Representative (5000 m ³) only.	2-Results report attached and acceptable with the project specifications.		
	3-Final approval is subject to above mentioned comments.		

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال وهدية			A
QA/QC *	(KK)	Khaled Zaki		
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

* Designer
** Alignment/Report only

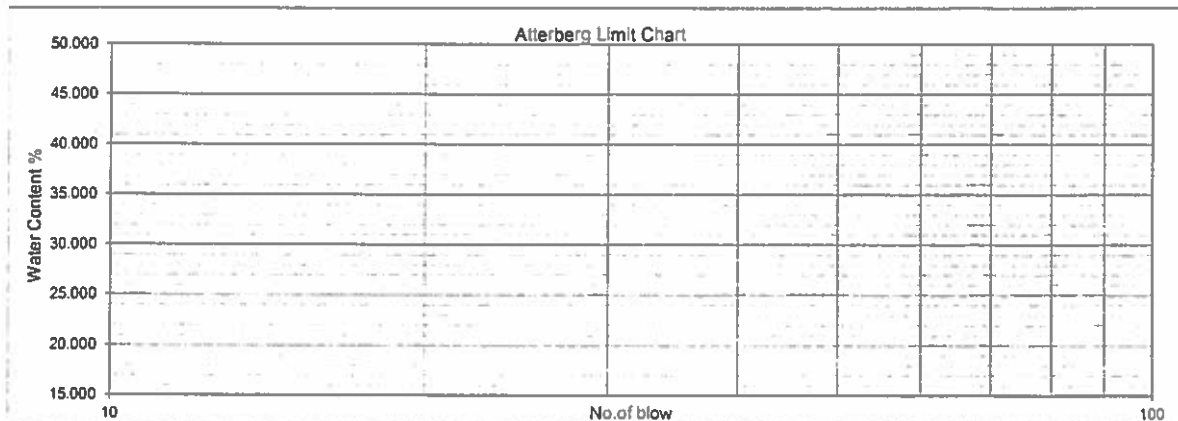
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	7-Jun-23
Company	شركة الزنكلوني-المشون	Request NO.	5
Station	15000 m ³		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

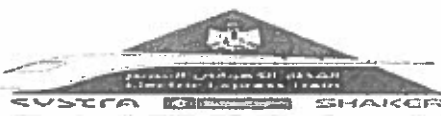
wt. of coars sample =	24312		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5"	385	98.4	
1 "	2771	88.6	
3/4"	5948	75.5	
3/8"	10562	56.6	
4	13560	44.23	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	56	39.27	50 max
40	167	29.45	30 max
200	376	10.97	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit	Plastic Limite
Number of blows	N.P	N.P
Number of plate		
Wt. Of plate		
wt. of plate+wt. of wet sample		
wt. of plate + wt. of dry sample		
wt. of water		
wt. of dry sample		
moisture content		
The Limits	Liquid Limit	Plastic Limite



Liquid Limit	NP	6 max
plasticity index		
Group Classification	A-1-a	A-1-a & A-1-b



الهيئة القومية للإنفاق



شركة الاستشارات
للمقاولات العامة

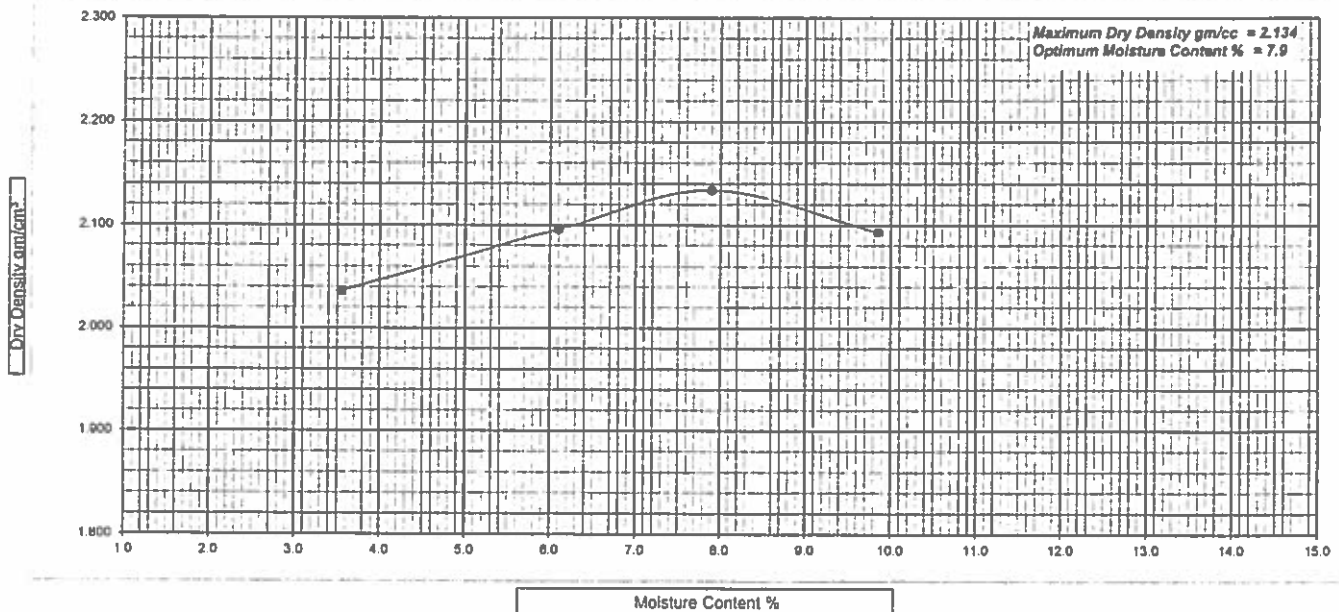
مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د/ خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	31-May-23
Station	From	15000 m ³	To	Request NO.	QT 5

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T.180-74)

MOISTURE CONTENT													
CONTAINER NUMBER				5	7	12	13	22	21	4	3		
A	TARE MASS	gms.		31.28	31.26	32.96	32.41	31.29	32.48	32.26	31.26		
B	MASS WET SOIL & TARE ,	gms.		178.6	169.3	194.4	182.4	161.3	191.0	207.2	208.5		
C	MASS DRY SOIL & TARE	gms.		173.5	164.6	185.2	173.7	151.5	179.7	191.6	192.5		
D	MASS OF WATER	gms.	B-C	5.1	4.7	9.1	8.8	9.7	11.3	15.6	16.0		
E	MASS OF DRY SOIL	gms.	C-A	142.2	133.4	152.3	141.3	120.2	147.2	159.4	161.2		
F	MOISTURE CONTENT	%	$\frac{D}{E} \times 100$	3.6	3.5	6.0	6.2	8.1	7.7	9.8	9.9		
AVERAGE		%		3.6		6.1		7.9		9.9			
DRY DENSITY													
TRIAL NUMBER				1		2		3		4			
G	MASS OF MOLD & WET SOIL	gms.		10015		10263		10432		10426			
H	MASS OF MOLD	gms.		5489		5489		5489		5489			
I	MASS OF WET SOIL	gms.	G-H	4526		4774		4943		4937			
J	VOLUME OF MOLD	cm ³		2147		2147		2147		2147			
K	WET DENSITY	g/cm ³	$\frac{I}{J}$	2.108		2.224		2.302		2.299			
L	DRY DENSITY	g/cm ³	$\frac{K}{100 + F}$	2.036		2.096		2.134		2.093			



Eng. / CONSULTANT

Charbel Zayeb

Eng. / CONTRACTOR

Signature of Contractor

MATERIAL
APPROVAL
REQUEST



Contractor	Al-ZANKALONY CO. for General Contracting		Designer Company		(KK) Engineering Consulting Office			
Received by CONSULTANT	Name	Sign	Date/Serial Number		Time			
	أحمد طاهر	[Signature]	2023-07-08		08:00			
	(KK) Khaled Taha	[Signature]	MAR 6					
	C1	C2	C3	DD	MM	YY	HH	MM
	333	EW	CS	09	07	23	08	00

S1 to S21	D1 to S3	Kp XXX Note
Station Reference	Depot Reference	For Kilometer point only Start Km is used
Work Activity		
Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (20000 m ³) مشون		
to be Used	From Station (333+940) to Station (334+540)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Spec in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Previous test reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Remarks	(KK)		
Quality test	Comments by: Eng. Alaa Abd-Allatif (ER)		
This Sample	1-All tests were carried-out by material engineer for both contractor and GARB Consultant.		
	2-Results report attached and acceptable with the project specifications.		
	3-Final approval is subject to above mentioned comments.		

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد طاهر	[Signature]		A
QC	(KK) Khaled Taha	[Signature]		
GB	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			

Signature only

شركة الزنكوني
للمقاولات

مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ. د. خالد قنديل

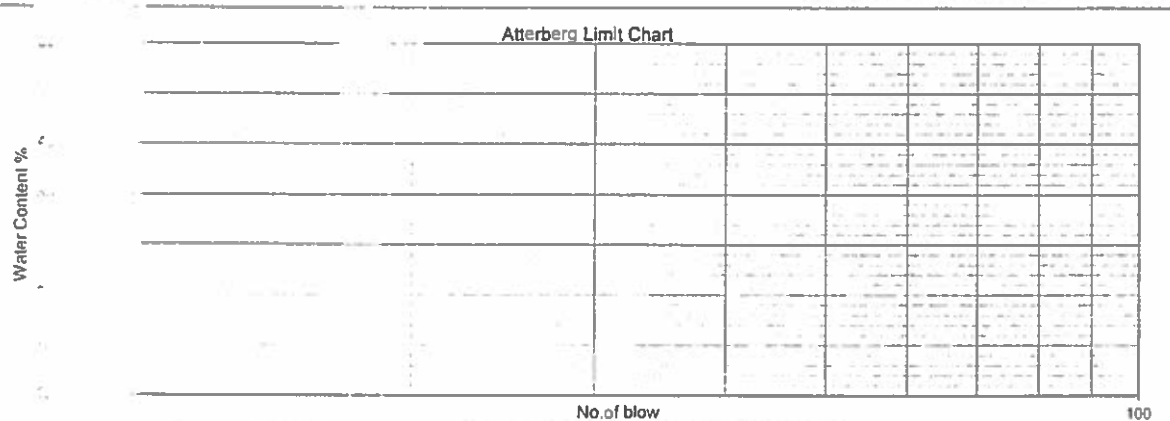
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	9-Jul-23
Company	شركة الزنكوني-المشون	Request NO.	6
Volume	20000 m ³		
	Soil Classification (AASHTO M 145)		

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of sample =	32581		
Sieve Size (mm)	total retain (gm)	pass%	Specs Limits %
75	0	100.0	
150	720	97.8	
300	2139	93.4	
475	3835	88.2	
750	10067	69.1	
1060	14005	57.01	
Sample =	500		
Sieve Size (mm)	total retain (gm)	total pass%	Specs Limits %
75	65	49.60	50 max
150	168	37.86	30 max
300	370	14.82	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit	Plastic Limite
Number of blows	N.P	N.P
Number of plate		
Wt. Of plate		
plate+wt.of wet sample		
plate + wt. of dry sample		
wt. of water		
wt. of dry sample		
moisture content		
The Limits	Liquid Limit	Plastic Limite



Liquid Limit	NP	6 max
plasticity index	NP	6 max
Group Classification	A-1-b	A-1-a & A-1-b



الهيئة القومية للإنفاق



مكتب خالد قنديل
المقاولات العامة

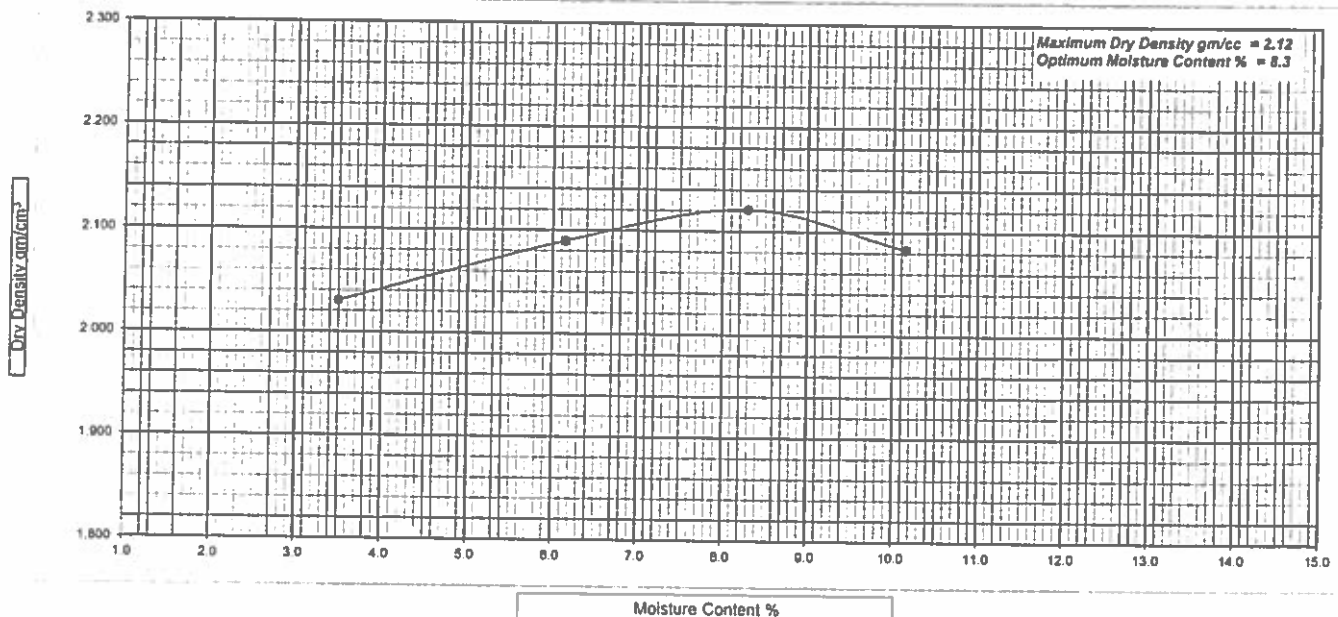
مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
10114014

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	9-Jun-23
Station	From	20000 m ³	To	Request NO.	QT 6

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T180-74)

MOISTURE CONTENT													
CONTAINER NUMBER				5	7	12	13	22	21	4	3		
A	TARE MASS	gms.		32.36	31.45	32.55	31.36	31.63	32.45	32.45	32.44		
B	MASS WET SOIL & TARE	gms.		167.4	189.5	183.6	180.4	218.1	209.5	187.4	183.2		
C	MASS DRY SOIL & TARE	gms.		163.0	184.1	174.9	171.7	204.0	195.8	173.1	169.4		
D	MASS OF WATER	gms.	B-C	4.4	5.5	8.7	8.7	14.1	13.7	14.3	13.8		
E	MASS OF DRY SOIL	gms.	C-A	130.6	152.6	142.4	140.3	172.3	163.4	140.6	137.0		
F	MOISTURE CONTENT	%	$\frac{D}{E} \times 100$	3.4	3.6	6.1	6.2	8.2	8.4	10.2	10.1		
AVERAGE		%		3.5		6.2		8.3		10.2			
DRY DENSITY													
TRIAL NUMBER				1	2	3	4						
G	MASS OF MOLD & WET SOIL	gms.		10000	10251	10421	10415						
H	MASS OF MOLD	gms.		5489	5489	5489	5489						
I	MASS OF WET SOIL	gms.	G-H	4511	4762	4932	4926						
J	VOLUME OF MOLD	cm ³		2147	2147	2147	2147						
K	WET DENSITY	g/cm ³	$\frac{I}{J}$	2.101	2.218	2.297	2.294						
L	DRY DENSITY	g/cm ³	$\frac{K}{100 + F}$	2.030	2.089	2.121	2.083						



Eng. / CONSULTANT

Khaled Zaki
فيل

Eng. / CONTRACTOR

Signature of Contractor

MATERIAL APPROVAL REQUEST

مطلب المواد
الموافق عليه

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي

الطريق و الكباري
(GARB)
الطريق العامة



المكتب الاستشاري الهندسي
Engineering Consulting Office

SHAKIR
SHAKIR

Contractor Company	Al-ZANKALONY CO. for General Contracting	Designer Company	(kk) Engineering Consulting Office
Name	Sign	Date/Serial Number	Time
Issued by Contractor	2023-04-28	08:00	
Received by GARB CONSULTANT	Eng. Abdallah Omar	16	00
	16	EW	CS
	DD	MM	YY
	MM	YY	MM

CODE-1	51 to 521	D1 to 53	Kp XXX Note
CODE-2	Station Reference	Depot Reference	For Kilometer point only Start Km is used
CODE-3	Work Activity	Sub Element of Activity	

Description of Materials	Location to be Used	Sample only	Yes	Materials Type	Bed Excavation	Supplier Name	Data Sheet provided	Yes attached	Reference in BoQ	Reference	Prequalification reference	Reference Photos	No	Other	Comments by: Eng. Abdallah Omar (KK)	Comments by: Eng. Alaa Abd-Allatif (ER)
1-Quality test Result By Site Laboratory is Approved.	2-Results report attached and acceptable with the project specifications.	3-Final approval is subject to above mentioned comments.														

APPROVAL STATUS

Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Abdallah Omar	Sign	Date	A
QA/QC *	Eng. Abdallah Omar	Sign	Date	A
GARB **	Eng. Mohammed Fayad	Sign	Date	
Employers Representative	Eng. Alaa Abd-Allatif	Sign	Date	AWC

* Designer
** Alignment/Bridges Culvert only



وزارة النقل
الهيئة العامة للطرق والكباري



القطار الكهربائي السريع
Electric Express Train
SYSTRA | EBR | SHAKER

الهيئة القومية للإنفاق



وزارة المالية

شركة الزنكولبي
المقاولات العامة

مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein



ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد قنديل

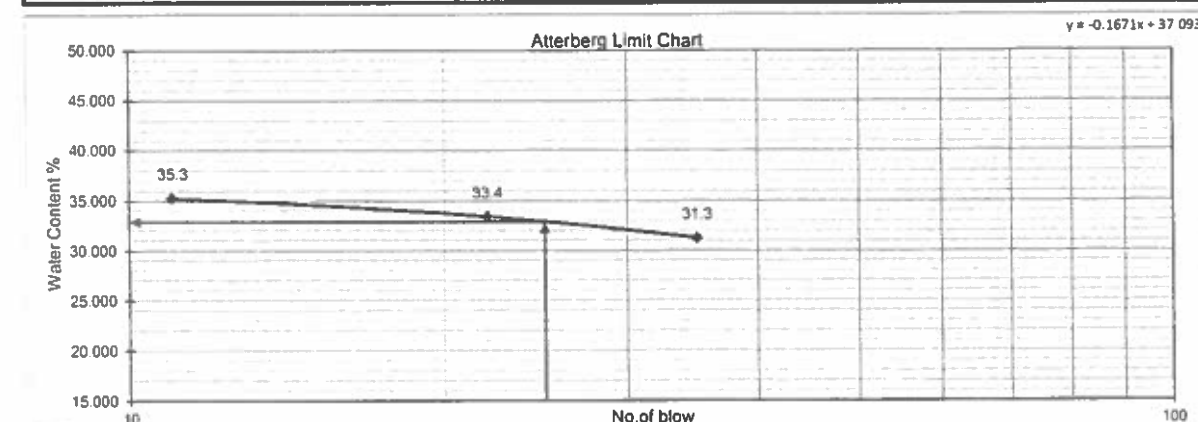
Project	Electrical Express Train From Borg Alarab to Alamein (EET)				Date	29-Apr-23
Station	From	016+440	TO	016+540	Request No.	QT 1
		016+600		016+960		
	Soil Classification (AASHTO M 145)					

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	4826		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5 "	0	100.0	
1 "	0	100.0	
3/4 "	0	100.0	
3/8 "	214	95.6	
4	798	83.46	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	36	77.46	
40	99	66.94	
200	248	42.07	

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	11	22	35			
Number of plate	A-7	A-19	A-26	A-11	A-15	A-14
Wt. Of plate	32.26	31.26	32.26	32.14	32.12	31.26
wt. of plate+wt. of wet sample	80.90	83.60	129.69	35.75	35.09	33.62
wt. of plate + wt. of dry sample	68.22	70.49	106.49	35.04	34.52	33.16
wt. of water	12.7	13.1	23.2	0.7	0.6	0.5
wt. of dry sample	36.0	39.2	74.2	2.9	2.4	1.9
moisture content	35.3	33.4	31.3	24.4	23.6	24.2
The Limits	Liquid Limit			Plastic Limite		24.08



Liquid Limit	32.92	
plasticity index	8.8	
Group Classification	A-4	

Eng. /CONSULTANT

Abdallah Omar

Eng. / CONTRACTOR

IP



الهيئة القومية للإنفاق



شركة الزنكروني
المقاولات العامة

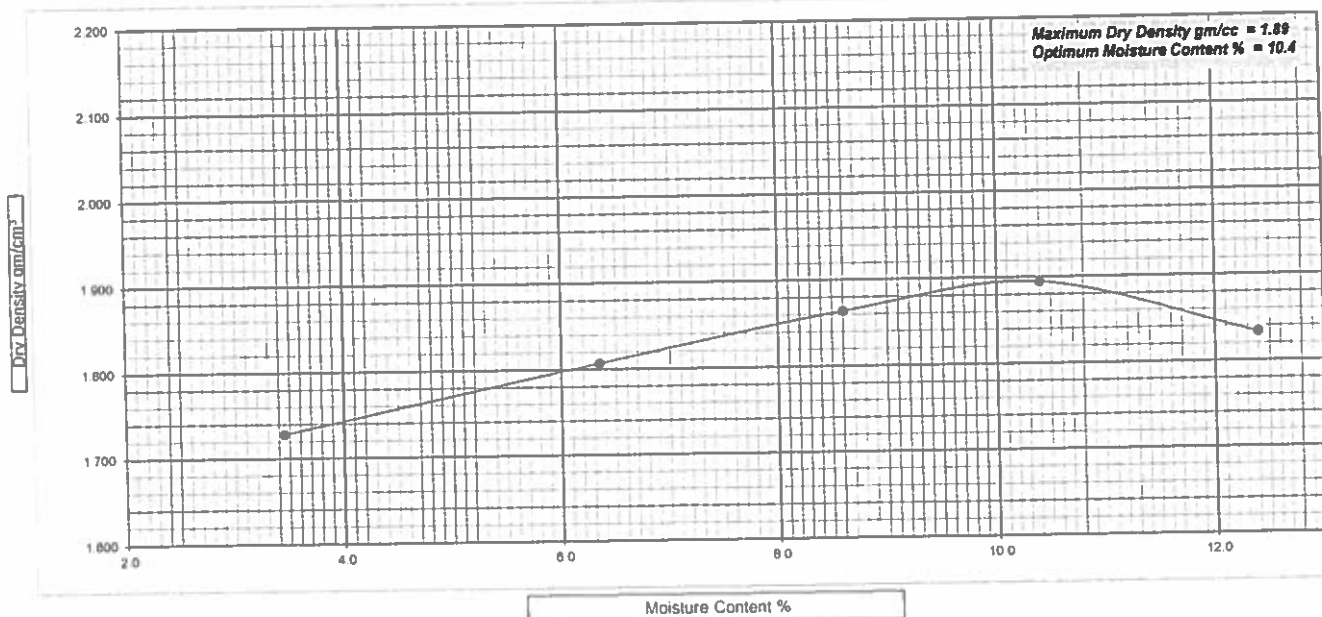
مكتب أ.د. خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	29-Apr-23
Station	From	016+600	To	016+960	Request NO.
					QT 1

MOISTURE - DENSITY RELATIONSHIP OF SOILS ASTM D 1557

MOISTURE CONTENT													
CONTAINER NUMBER				A-9	A-2	A-10	A-13	A-7	A-25	A-19	A-30	A-31	A-1
A	TARE MASS	gms.		31.45	31.66	32.41	31.41	31.62	32.45	32.45	31.26	32.14	32.12
B	MASS WET SOIL & TARE	gms.		159.9	176.9	175.0	176.6	177.6	200.9	175.0	166.7	182.9	217.0
C	MASS DRY SOIL & TARE	gms.		155.7	172.0	166.7	167.8	165.9	187.7	161.8	153.7	166.4	196.4
D	MASS OF WATER	gms.	B-C	4.2	4.9	8.3	8.9	11.7	13.2	13.2	13.0	16.5	20.5
E	MASS OF DRY SOIL	gms.	C-A	124.3	140.4	134.3	136.4	134.3	155.3	129.4	122.5	134.3	164.3
F	MOISTURE CONTENT	%	$\frac{D}{E} \times 100$	3.4	3.5	6.2	6.5	8.7	8.5	10.2	10.6	12.3	12.5
AVERAGE		%		3.5		6.4		8.6		10.4		12.4	
DRY DENSITY													
TRIAL NUMBER				1	2	3	4	5					
G	MASS OF MOLD & WET SOIL	gms.		9598	9888	10110	10256	10189					
H	MASS OF MOLD	gms.		5728	5728	5728	5728	5728					
I	MASS OF WET SOIL	gms.	G-H	3870	4160	4382	4528	4461					
J	VOLUME OF MOLD	cm ³		2165	2165	2165	2165	2165					
K	WET DENSITY	g/cm ³	$\frac{I}{J}$	1.788	1.921	2.024	2.091	2.061					
L	DRY DENSITY	g/cm ³	$\frac{K}{100 + F}$	1.73	1.81	1.86	1.89	1.83					



Eng. / CONSULTANT

Abdallah Omar

Eng. / CONTRACTOR

Signature

MATERIAL APPROVAL REQUEST

شركة الزنكلوني
المقاولات العامة

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ. خالد غنيم

الهيئة العامة
للطرق والكباري
(GARB)



المصالح الهندسية العامة
مركز الدراسات



Contractor Company	Al-ZANKALONY CO. for General Contracting			Designer Company	(KK) Engineering Consulting Office						
Issued by Contractor	Name	Sign		Date/Serial Number	Time						
	أحمد جمال دودا			2023-04-27 MAR 002	08:00						
Received by GARB CONSULTANT	Eng. Abdallah Omar		MAR	C1	C2	C3	DD	MM	YY	HH	MM
				333	EW	CS	29	04	23	08	00

CODE-1	S1 to S21	D1 to S3	Kp XXX Note
	Station Reference	Depot Reference	For Kilometer point only Start Km is used
CODE-2	Work Activity		
CODE-3	Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (5000 m³)		
Location to be Used	From Station (333+940) to Station (334+540)		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. Abdallah Omar (KK) 1-Quality test Result By Site Laboratory is Approved. 2-This Sample Representative (5000 m3) only.		Comments by: Eng. Alaa Abd-Allatif (ER) 1-All tests were carried-out by material engineer for both contractor and GARB Consultant. 2-Results report attached and acceptable with the project specifications. 3-Final approval is subject to above mentioned comments.	

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	أحمد جمال دودا			A
QA/QC *	Eng. Abdallah Omar			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif		3-5-2023	Awc

* Designer

** Alignment/Bridges : Culvert only

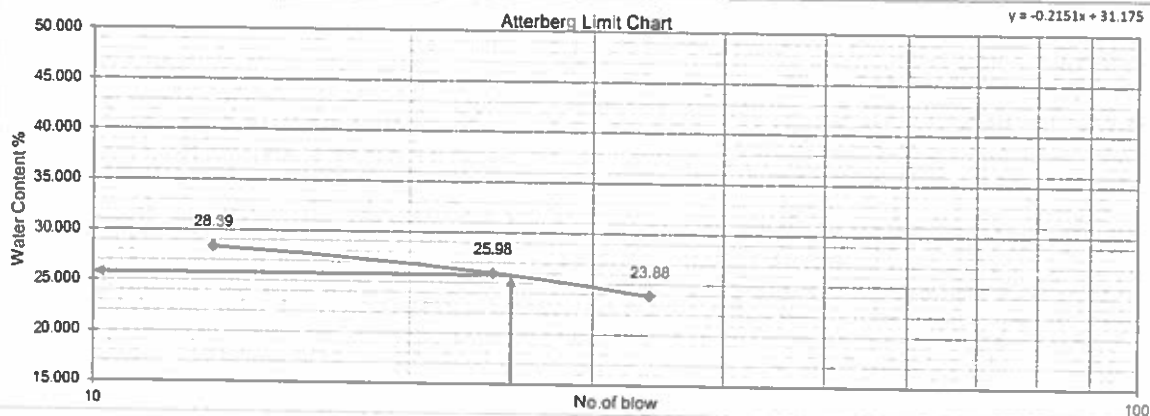
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكوني - المشون	Request NO.	2
Station	5000 m ³		
	Soil Classification (AASHTO M 145)		

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	15598		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5"	100	99.4	
1 "	789	94.9	
3/4"	841	94.6	
3/8"	5632	63.9	
4	8598	44.88	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	87	37.07	50 max
40	219	25.22	30 max
200	378	10.95	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	13	24	34			
Number of plate	A-19	A-15	A-10	A-15	A-3	A-18
Wt. Of plate	32.26	32.14	32.19	30.5	31.56	32.22
wt. of plate + wt. of wet sample	79.2	76.6	73.8	33.83	34.84	34.84
wt. of plate + wt. of dry sample	68.82	67.43	65.78	33.25	34.26	34.37
wt. of water	10.38	9.17	8.02	0.58	0.58	0.47
wt. of dry sample	36.56	35.29	33.59	2.75	2.7	2.15
moisture content	28.39	25.98	23.88	21.09	21.48	21.86
The Limits	Liquid Limit			Plastic Limite		21.48

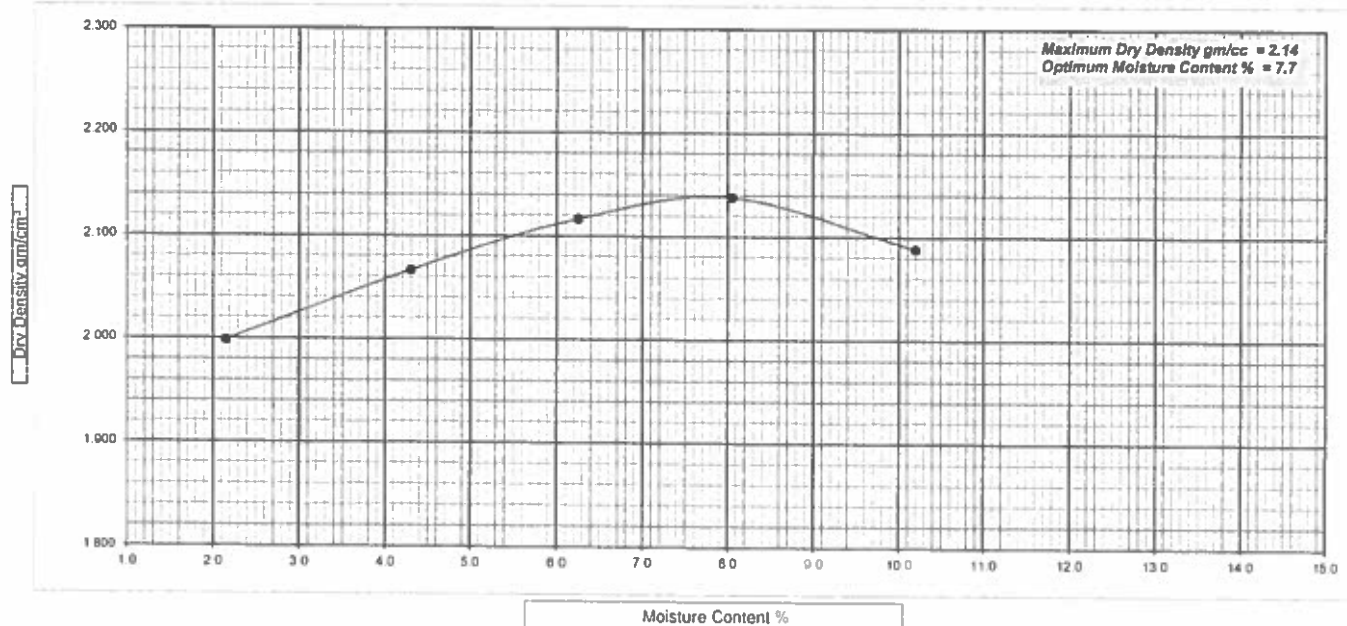


Liquid Limit	25.80	
plasticity index	4.3	6 max
Group Classification	A-1-a	A-1-a & A-1-b

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	29-Apr-23
Station	From	5000 m³	To	Request NO.	QT 2

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T180-74)

CONTAINER NUMBER			MOISTURE CONTENT									
			7	5	14	28	16	1	2	10	9	3
A	TARE MASS	gms.	32.45	33.21	31.45	32.41	31.36	32.85	32.41	34.15	23.36	32.45
B	MASS WET SOIL & TARE	gms.	163.6	170.4	190.2	161.4	176.6	159.8	176.8	191.5	195.2	175.5
C	MASS DRY SOIL & TARE	gms.	160.8	167.6	183.8	156.0	168.2	152.3	166.0	179.8	179.3	162.2
D	MASS OF WATER	gms. B-C	2.8	2.8	6.4	5.4	8.5	7.5	10.8	11.7	15.9	13.2
E	MASS OF DRY SOIL	gms. C-A	128.4	134.4	152.4	123.6	136.8	119.5	133.6	145.7	156.0	129.8
F	MOISTURE CONTENT	% $P_e \times 100$	2.2	2.1	4.2	4.4	6.2	6.3	8.1	8.0	10.2	10.2
AVERAGE			2.2	2.1	4.3	4.4	6.3	6.3	8.1	8.0	10.2	10.2
TRIAL NUMBER			DRY DENSITY									
			1	2	3	4	5					
G	MASS OF MOLD & WET SOIL	gms.	10148	10395	10598	10730	10711					
H	MASS OF MOLD	gms.	5729	5729	5729	5729	5729					
I	MASS OF WET SOIL	gms. G-H	4419	4666	4869	5001	4982					
J	VOLUME OF MOLD	cm³	2165	2165	2165	2165	2165					
K	WET DENSITY	g/cm³ $\frac{I}{J}$	2.041	2.155	2.249	2.310	2.301					
L	DRY DENSITY	g/cm³ $\frac{K}{100 + F}$	1.998	2.066	2.117	2.138	2.088					



Eng. / CONSULTANT

Abdallah.omar

Eng. / CONTRACTOR

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الهيئة القومية للإسفلت

شركة البترول
للخدمات العامة

مكتب أ/د خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ/د خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein	Station	From	TO
Date	2023-04-29			
Request NO.	QT 2 5000 m³			

California Bearing Ratio ASTM D 1883

Molding Moisture Content				Density Determination			
Test No.	1	2	Test No.	1			
Can No.	12	10	Mold Volume cm³		2152		
A Mass, Can	g 32.85	32.15	Mass Sample + Mold	g	11923		
B Mass, Wet Soil + Can	g 179.3	154.60	Mass Mold	g	6967		
C Mass, Dry Soil + Can	g 169.2	145.74	Mass Sample	g	4956		
D Mass, Moisture	g 10.1	8.86	Unit Wet Mass	g	2 303		
E Mass, Dry Soil	g 136.4	113.59	Percent Moisture	%	7.6		
F Moisture %	% 7.4	7.8	Unit Dry Mass cm³		2.140		
AVERAGE	% 7.60		Cross sectional area of plunger=		19.35	cm²	

Penetration (mm)	0.64	1.27	1.90	2.54	3.18	3.81	4.45	5.08	6.35	7.62
Dial Read.	0.06	0.14	0.22	0.29	0.34	0.39	0.43	0.47	0.53	0.57
Total Load KN	1.28	2.98	4.68	6.17	7.23	8.3	9.15	10	11.7	12.55
Unit Load kg/cm²	130.56	303.96	477.36	629.34	737.46	846.6	933.3	1020	1193.4	1280.1

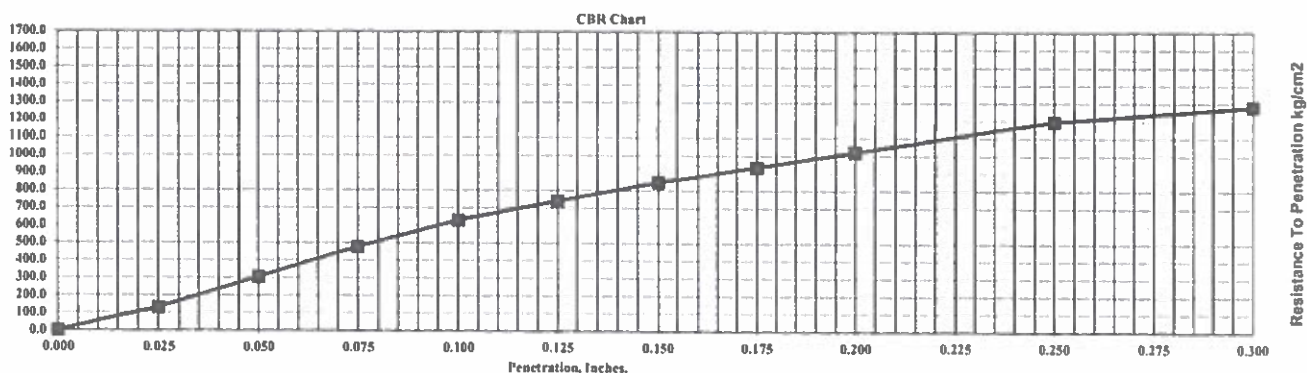
46%

50

Swell		
Date Molded		2023-05-03
Mold No.		1
Final Height	mm	4.32
Initial Height	mm	4.31
Difference	mm	0.01
Sample Length	mm	116.43
Percent Swell	%	0.01

Remarks:

- Max-Dry Density 2.140 g/cc
- Optimum Moisture Content 7.7 %
- No. of Blows 56
- CBR at 100% of max. density 50.0 %



Eng. / CONSULTANT

Abdallah Omar

Eng. / CONTRACTOR

5

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	ن'سوس دلاست			A
QA/QC *	Eng. Abdallah Omar			AWC
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif		30-4-2023	Awc

•• Alignment/Bridges: Culvert only

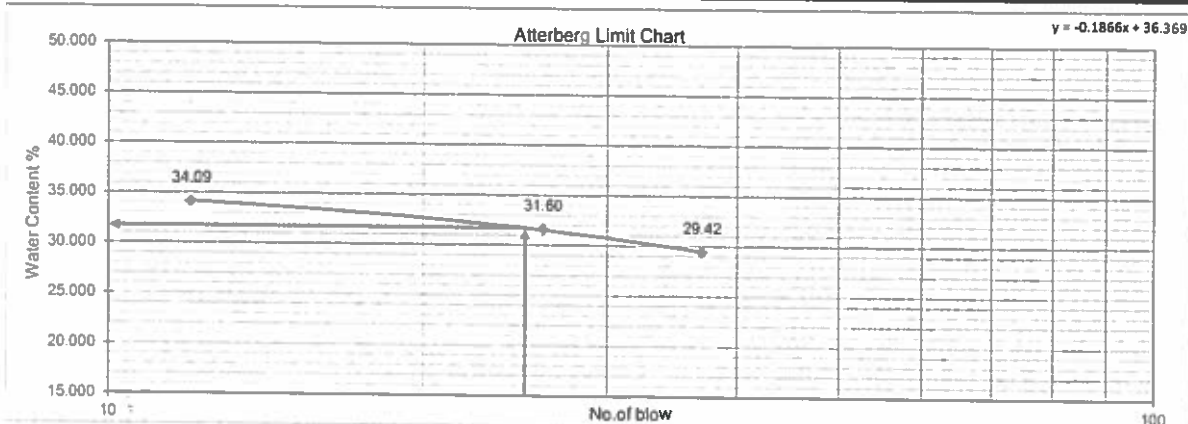
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكوني	Request NO.	2
Station	عينه من توريد محجر السيوي بالموقع		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	17410		
Sieve "Inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5"	85	99.5	
1 "	883	94.9	
3/4"	901	94.8	
3/8"	6632	61.9	
4	9769	43.89	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	87	36.25	50 max
40	219	24.67	30 max
200	356	12.64	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	12	26	37			
Number of plate	A-13	A-2	A-15	A-1	A-5	A-14
Wt. Of plate	32.02	32.82	30.85	30.5	31.56	32.22
wt. of plate+wt. of wet sample	73.24	73.05	64.99	33.83	34.84	34.84
wt. of plate + wt. of dry sample	62.76	63.39	57.23	33.27	34.25	34.37
wt. of water	10.48	9.66	7.76	0.56	0.59	0.47
wt. of dry sample	30.74	30.57	26.38	2.77	2.69	2.15
moisture content	34.09	31.60	29.42	20.22	21.93	21.86
The Limits	Liquid Limit			Plastic Limite		21.34



Liquid Limit	31.70	
plasticity index	10.4	6 max
Group Classification	A-2-4	A-1-a & A-1-b

A-2-6

Eng. / CONSULTANT

Eng. / CONTRACTOR

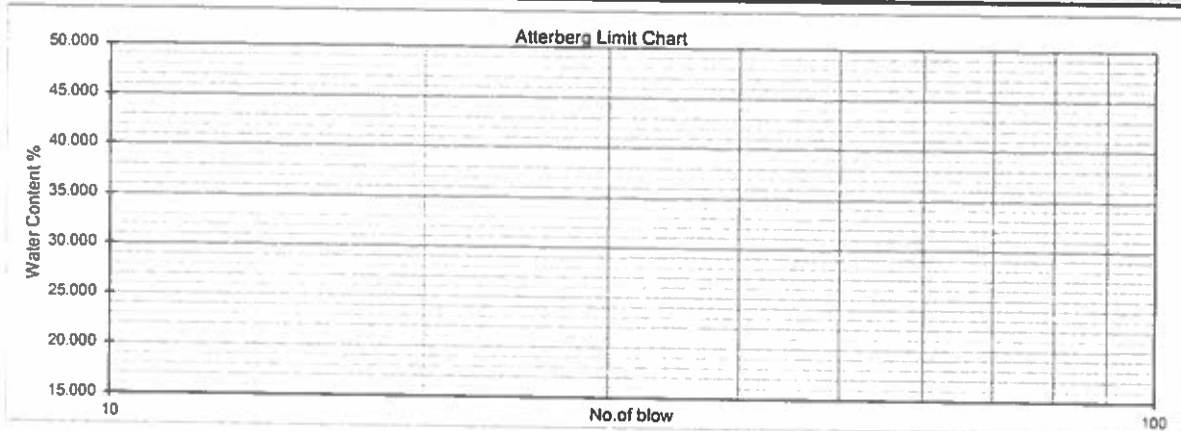
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكوبي	Request NO.	2
Station	عينه من توريد محجر السيوي بالموقع		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =			
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2"			
1.5"			
1"			
3/4"			
3/8"			
4			
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	10	98.00	50 max
40	189	62.20	30 max
200	481	3.80	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit	Plastic Limite
Number of blows	NP	NP
Number of plate		
Wt. Of plate		
wt. of plate + wt. of wet sample		
wt. of plate + wt. of dry sample		
wt. of water		
wt. of dry sample		
moisture content		
The Limits	Liquid Limit	Plastic Limite



Liquid Limit	NP	6 max
plasticity Index	NP	6 max
Group Classification	A-3	A-1-a & A-1-b



وزارة النقل
المكتب العامة للطرق والمواصلات



المتنقل الكهربائي السريع
Electrical Express Train

الهيئة القومية للإنفاق



شركة الزنكوني
المقاولات العامة

مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein



ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد قنديل

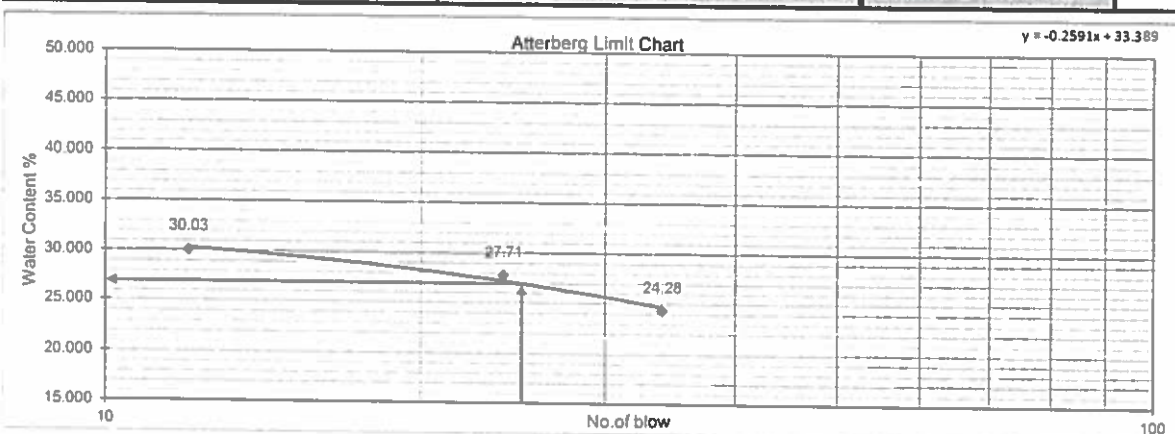
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكوني	Request NO.	2
Station	عينه من توريد محجر السيوي بالموقع +20% رمل		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	10880		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5"	0	100.0	
1 "	370	96.6	
3/4"	1262	88.4	
3/8"	4190	61.5	
4	5700	47.61	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	55	42.37	50 max
40	257	23.14	30 max
200	404	9.14	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit			Plastic Limite		
Number of blows	12	24	34			
Number of plate	A-13	A-2	A-15	A-1	A-5	A-14
Wt. Of plate	32.02	32.82	30.85	30.5	31.56	32.22
wt. of plate+wt. of wet sample	73.24	73.05	64.99	33.83	34.84	34.84
wt. of plate + wt. of dry sample	63.72	64.32	58.32	33.27	34.27	34.38
wt. of water	9.52	8.73	6.67	0.56	0.57	0.46
wt. of dry sample	31.7	31.5	27.47	2.77	2.71	2.16
moisture content	30.03	27.71	24.28	20.22	21.03	21.30
The Limits	Liquid Limit			Plastic Limite		20.85



Liquid Limit	26.91	
plasticity index	6.1	6 max
Group Classification	A-2-A	A-1-a & A-1-b

A-2-4

Eng. / CONSULTANT

Abdallah Omar

Page 3 of 4

Eng. / CONTRACTOR



وزارة النقل
الهيئة العامة للطرق والكباري



SYSTRA SHAKER

الهيئة القومية للإنفاق



شركة الزنكواني
المقاولات العامة

مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein



ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد قنديل

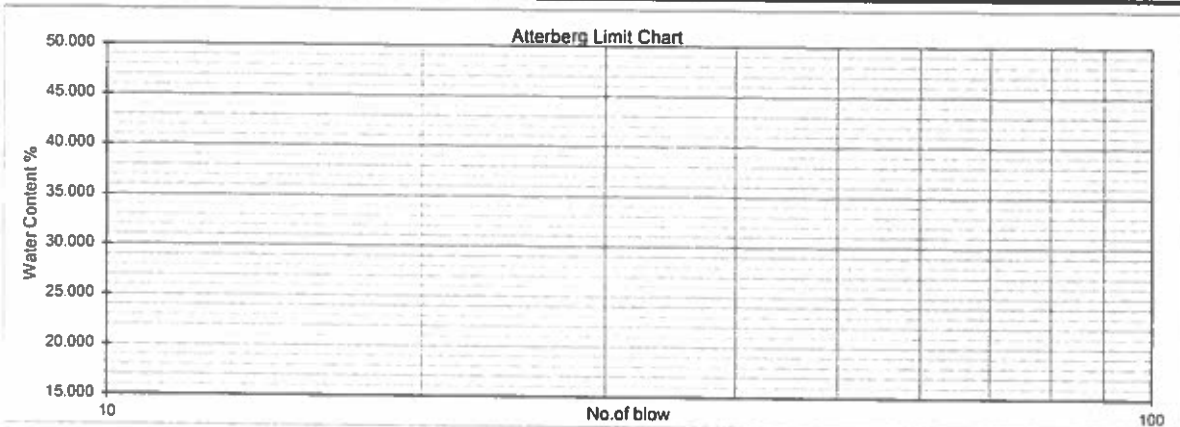
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	29-Apr-23
Company	شركة الزنكواني	Request NO.	2
Station	عينه من توريد مجر السيوي بالموقع +25% رمل		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coarse sample =	11319		
Sieve "Inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5"	0	100.0	
1 "	376	96.7	
3/4"	982	91.3	
3/8"	3195	71.8	
4	4999	55.84	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	50	50.25	50 max
40	216	31.71	30 max
200	403	10.83	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit	Plastic Limite
Number of blows	NP	NP
Number of plate		
Wt. Of plate		
wt. of plate + wt. of wet sample		
wt. of plate + wt. of dry sample		
wt. of water		
wt. of dry sample		
moisture content		
The Limits	Liquid Limit	Plastic Limite



Liquid Limit	NP	6 max
plasticity index		
Group Classification	A-1-A	A-1-a & A-1-b

Eng. / CONSULTANT

A. Abdallah Omar

Eng. / CONTRACTOR

MATERIAL APPROVAL REQUEST

مادة
موافقة



الهيئة العامة
للطرق والكباري
(GARB)



الهيئة العامة
للطرق والكباري
(GARB)



Contractor Company	Al-ZANKALONY CO. for General Contracting		Designer Company	(KK) Engineering Consulting Office		Issued by Contractor	Name	Sign	Date/Serial Number	Time	Received by GARB CONSULTANT	Eng. Abdallah Omar

CODE-1	51 to 521	D1 to 53	Kp XXX Note
	Station Reference	Depot Reference	For Kilometer point only Start Km is used
CODE-2	Work Activity		
CODE-3	Sub Element of Activity		

Description of Materials	Fill Layer Total Quantity (10000 m³)		
	Location to be Used		
Sample only	Yes	Materials Type	Fill layers
Supplier Name	ELSEWY	Data Sheet provided	Yes attached
Reference in BoQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP
Prequalification reference		Test Samples Results	
Reference Photos	No/Yes	Other	
Comments by: Eng. Abdallah Omar (KK)		Comments by: Eng. Alaa Abd-Allatif (ER)	
1-Quality test Result By Site Laboratory is Approved.		1-All tests were carried-out by material engineer for both contractor and GARB Consultant.	
2-This Sample Representative (5000 m3) only.		2-Results report attached and acceptable with the project specifications.	
3-Final approval is subject to above mentioned comments			

Organisation	Name	Sign	Date	A-AWC-R
Contractor	~10000 m³			A
QA/QC *	Eng. Abdallah Omar			H
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif			
APPROVAL STATUS				

** Designer
Alignment/Bridges: Culvert only

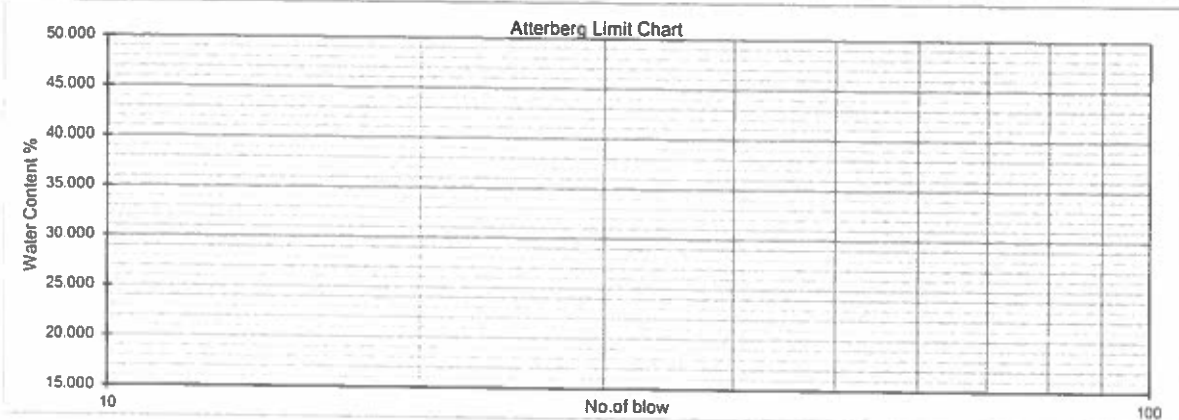
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	22-May-23
Company	شركة الزنكلوني-المشون	Request NO.	QT 4
Station	10000 m ²		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	30198		
Sieve "Inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5"	609	98.0	
1 "	3808	87.4	
3/4"	8113	73.1	
3/8"	17214	43.0	
4	20825	31.04	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	53	27.75	50 max
40	172	20.36	30 max
200	362	8.57	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit	Plastic Limite
Number of blows	NP	NP
Number of plate		
Wt. Of plate		
wt. of plate+wt. of wet sample		
wt. of plate + wt. of dry sample		
wt. of water		
wt. of dry sample		
moisture content		
The Limits	Liquid Limit	Plastic Limite



Liquid Limit	NP	6 max
plasticity Index		
Group Classification	A-1-a	A-1-a & A-1-b



الهيئة القومية للإنفاق



شركة القرائن
المقاولات العامة

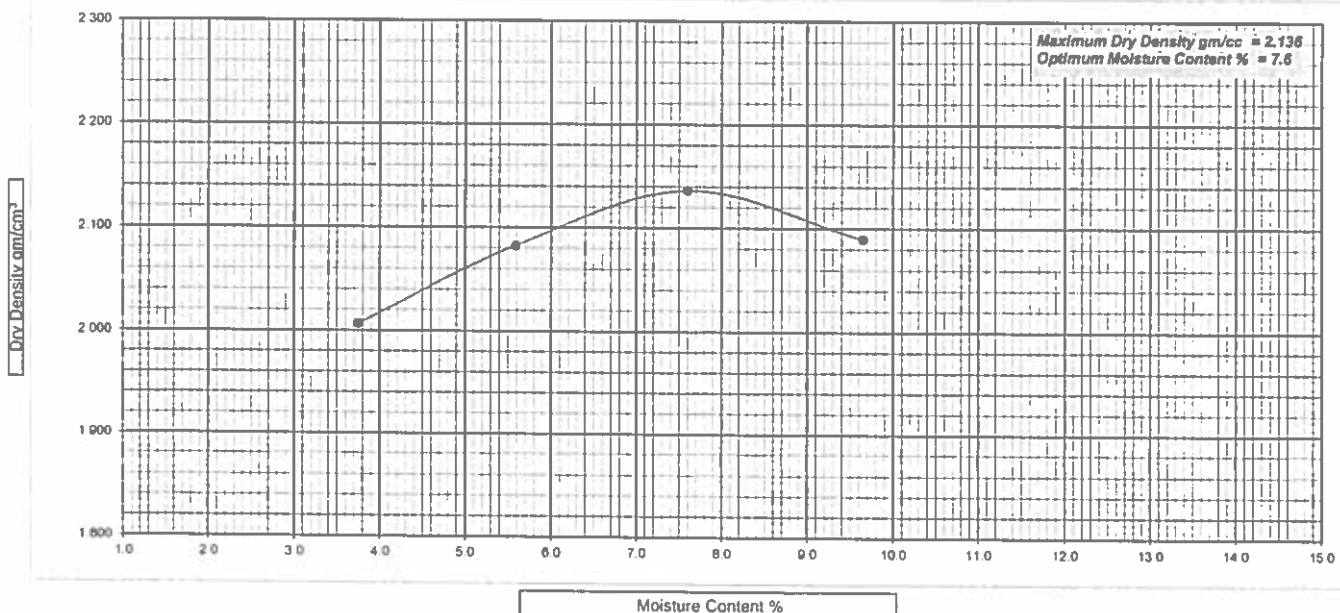
مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د/ خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	23-May-23
Station	From	5000 m ³	To	Request NO.	QT 4

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T180-74)

MOISTURE CONTENT													
CONTAINER NUMBER				2	13	10	1	2	14	6	7		
A	TARE MASS	gms.		32.45	32.49	32.2	32.47	31.39	32.56	32.41	32.6		
B	MASS WET SOIL & TARE	gms.		173.0	180.0	204.4	189.2	219.2	182.1	173.0	199.6		
C	MASS DRY SOIL & TARE	gms.		167.7	174.9	195.5	180.7	205.7	171.8	160.7	184.9		
D	MASS OF WATER	gms.	B-C	5.3	5.1	8.9	8.5	13.6	10.3	12.3	14.8		
E	MASS OF DRY SOIL	gms.	C-A	135.3	142.4	163.3	148.3	174.3	139.3	128.3	152.3		
F	MOISTURE CONTENT	%	$\frac{D}{E} \times 100$	3.9	3.6	5.5	5.7	7.8	7.4	9.6	9.7		
AVERAGE		%		3.8		5.6		7.6		9.7			
DRY DENSITY													
TRIAL NUMBER				1		2		3		4			
G	MASS OF MOLD & WET SOIL	gms.		10236		10489		10705		10689			
H	MASS OF MOLD	gms.		5729		5729		5729		5729			
I	MASS OF WET SOIL	gms.	G-H	4507		4760		4976		4960			
J	VOLUME OF MOLD	cm ³		2165		2165		2165		2165			
K	WET DENSITY	g/cm ³	$\frac{I}{J}$	2.082		2.199		2.298		2.291			
L	DRY DENSITY	g/cm ³	$\frac{K}{1 + \frac{F}{100}}$	2.007		2.082		2.136		2.089			



Eng. / CONSULTANT
Abdallah. Omar

Eng. / CONTRACTOR
[Signature]

Contractor Company		Al-ZANKALONY CO. for General Contracting		Designer Company		(KK) Engineering Consulting Office		Name		Sign		Date/Serial Number		Time		Received by GARB		(KK)		MAR 5		MAR 5		C1		C2		C3		EW		CS		08		06		23		08		00	
Contractor Company		Al-ZANKALONY CO. for General Contracting		Designer Company		(KK) Engineering Consulting Office		Name		Sign		Date/Serial Number		Time		Received by GARB		(KK)		MAR 5		MAR 5		C1		C2		C3		EW		CS		08		06		23		08		00	

Station Reference		S1 to S21		Depot Reference		D1 to S3		Kp XXX Note		Work Activity		Sub Element of Activity	

Description of Materials		to be Used		Sample only		Yes		Materials Type		Fill layers		Data Sheet provided		Yes attached		Specification		EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		Test Samples Results		Other		Comments		(KK)		Comments		Quality test Report by Site Laboratory is Approved.		2- This Sample Representative (5000 m3) only.		3-Final approval is subject to above mentioned comments.	
Fill Layer Total Quantity (15000 m ³)		From Station (333+940) to Station (334+540)		Yes		Materials Type		Fill layers		Data Sheet provided		Yes attached		Specification		EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		Test Samples Results		Other		Comments		(KK)		Comments		Quality test Report by Site Laboratory is Approved.		2- This Sample Representative (5000 m3) only.		3-Final approval is subject to above mentioned comments.			

Organisatic		Name		Sign		Date		A-AWC-R		Contractor		~'moultat		Khalid Qk!		(KK)		Eng. Mohammed Fayad		Employers Representative		Eng. Alaa Abd-Allatif		for		10-6-2023		Auc	
APPROVAL STATUS		Name		Sign		Date		A-AWC-R		Contractor		~'moultat		Khalid Qk!		(KK)		Eng. Mohammed Fayad		Employers Representative		Eng. Alaa Abd-Allatif		for		10-6-2023		Auc	



وزارة النقل
الهيئة العامة للطرق والمواصلات



SYSTRA SHAKER



الهيئة القومية للإنفاق



شركة الزنكوني
المقاولات العامة

مكتب أ.د. خالد قنديل

Electrical Express Train From Borg Alarab to Alamein



ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د. خالد قنديل

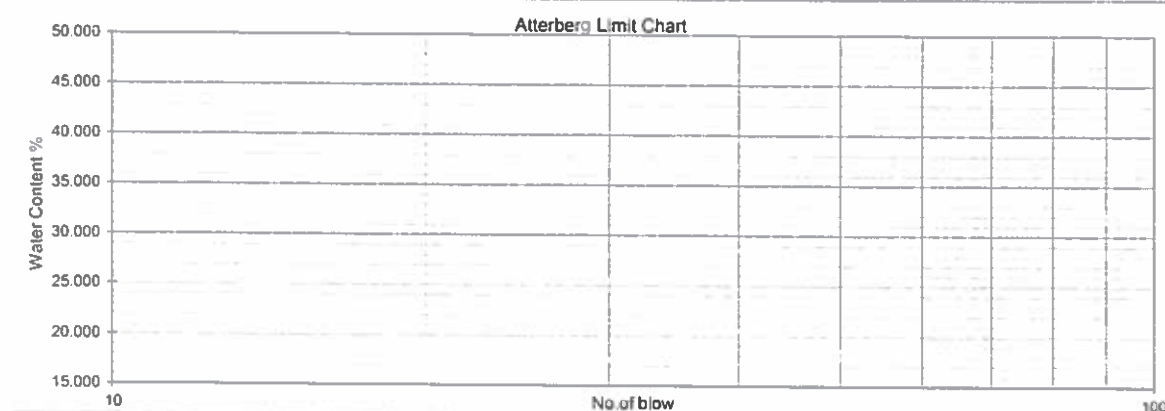
Project	Electrical Express Train From Borg Alarab to Alamein (EET)	Date	8-Jun-23
Company	شركة الزنكوني - المشون	Request NO.	5
Station	15000 m ³		
Soil Classification (AASHTO M 145)			

1- Sieve Analysis of Fine and Coarse Aggregates ASTM C 136

wt. of coars sample =	24312		
Sieve "inch"	total retain (gm)	pass%	Specs Limits %
2 "	0	100.0	
1.5"	385	98.4	
1 "	2771	88.6	
3/4"	5948	75.5	
3/8"	10562	56.6	
4	13560	44.23	
wt. of fine sample =	500		
Sieve No.	total retain (gm)	total pass%	Specs Limits %
10	56	39.27	50 max
40	167	29.45	30 max
200	376	10.97	15 max

2- Liquid Limit, Plastic Limit, and Plasticity Index ASTM D 4318

test	Liquid Limit	Plastic Limite
Number of blows	N.P	N.P
Number of plate		
Wt. Of plate		
wt. of plate+wt. of wet sample		
wt. of plate + wt. of dry sample		
wt. of water		
wt. of dry sample		
moisture content		
The Limits	Liquid Limit	Plastic Limite



Liquid Limit	NP	6 max
plasticity Index		
Group Classification	A-1-a	A-1-a & A-1-b

Eng. / CONSULTANT

[Signature]

Eng. / CONTRACTOR

[Signature]



الهيئة القومية للإنفاق



شركة شاكير
المقارلات العامة

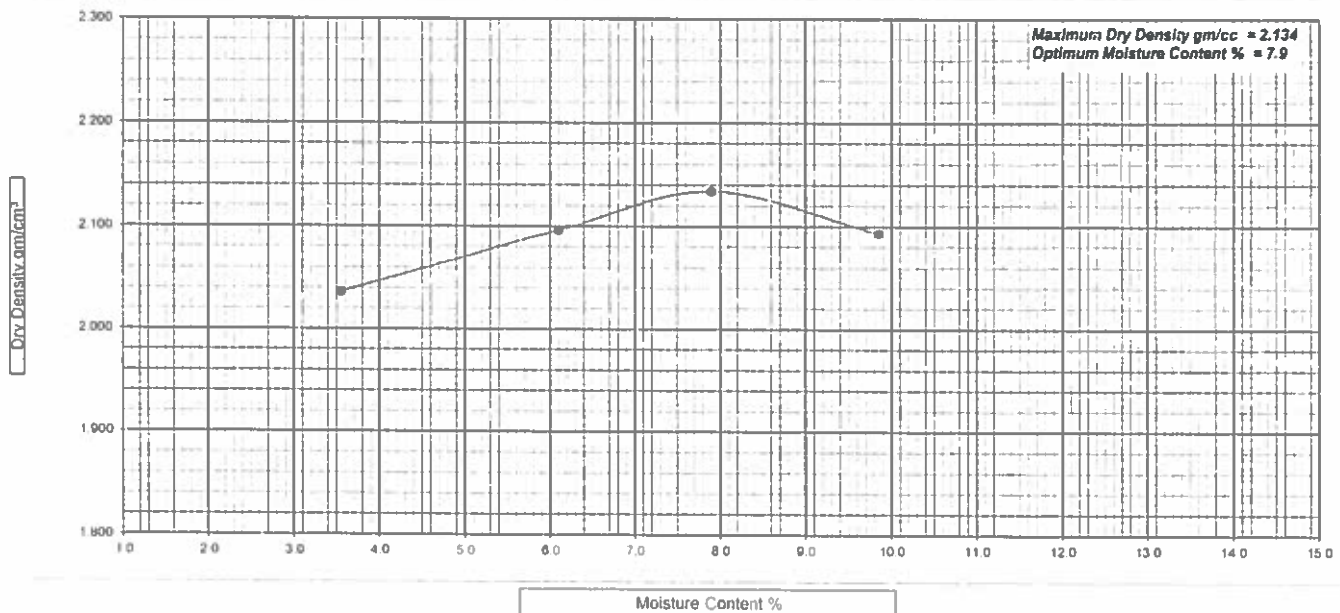
مكتب أ.د/ خالد قنديل
Electrical Express Train From Borg Alarab to Alamein

ENGINEERING CONSULTING OFFICE
المكتب الاستشاري الهندسي
أ.د/ خالد قنديل

Project	Electrical Express Train From Borg Alarab to Alamein (EET)			Date	9-Jun-23
Station	From	15000 m ³	To	Request NO.	QT 5

MOISTURE - DENSITY RELATIONSHIP OF SOILS AASHTO (T180-74)

CONTAINER NUMBER		MOISTURE CONTENT							
		5	7	12	13	22	21	4	3
A	TARE MASS	gms.	31.28	31.26	32.96	32.41	31.29	32.48	32.26
B	MASS WET SOIL & TARE	gms.	178.6	169.3	194.4	182.4	161.3	191.0	207.2
C	MASS DRY SOIL & TARE	gms.	173.5	164.6	185.2	173.7	151.5	179.7	191.6
D	MASS OF WATER	gms. B-C	5.1	4.7	9.1	8.8	9.7	11.3	15.6
E	MASS OF DRY SOIL	gms. C-A	142.2	133.4	152.3	141.3	120.2	147.2	159.4
F	MOISTURE CONTENT	% $\frac{D}{E} \times 100$	3.6	3.5	6.0	6.2	8.1	7.7	9.8
AVERAGE		%	3.6		6.1		7.9		9.9
TRIAL NUMBER		DRY DENSITY							
		1	2	3	4				
G	MASS OF MOLD & WET SOIL	gms.	10015	10263	10432	10426			
H	MASS OF MOLD	gms.	5489	5489	5489	5489			
I	MASS OF WET SOIL	gms. G-H	4526	4774	4943	4937			
J	VOLUME OF MOLD	cm ³	2147	2147	2147	2147			
K	WET DENSITY	g/cm ³ $\frac{I}{J}$	2.108	2.224	2.302	2.299			
L	DRY DENSITY	g/cm ³ $\frac{K}{100 + F}$	2.036	2.096	2.134	2.093			



Eng. / CONSULTANT

Handwritten signature of the consultant

Eng. / CONTRACTOR

Handwritten signature of the contractor