

مقايضة معدلة بعد المفاوضات
الهيئة العامة للطرق والكبارى - وزارة النقل
عقد رقم ٢٠٢٢/٢٠٢١/١٢٣٧ اتجاء مطروح
مشروع : القطر السريع (السخنة - العطين - مطروح)
القطاع من الكم ٣٦٤+٠١٠ الى الكم ٣٦٦+٠٠٠ بطول ٢.٩٦ كم
تتليد شركة: العامة للمقاولات العمومية والاستيراد والتصدير

رقم البند	بيان الأعمال	الوحدة	الكمية	سعر الوحدة	الاجملى
	اعمال الردم اترية				
	اعمال تحميل وتوريد تربة مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسك لا يزيد عن ٥٠ سم حتى منسوب ٢٠ متر وبسك لا يزيد عن ٢٥ سم لاستكمال المنسوب التصميمى لتشكيل الجسر والاكتاف (نسبة تحمل كاتيفوربا لا تقل عن ١٥%) ورشها بالمدى الاسفلية الى نسبة الرطوبة المطلوبة والتمك الجيد بالهراسات للوصول الى أقصى كثافة جافة (95%) من الكثافة الجافة القصوى) ويتم التليد طبقا للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتاتة طبقا لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس المشرف. الى حافة طب جهاز الاتراف زيادة نسبة التمسك عن ٩٥% بحسب زيادة ١ جنية على زيادة نسبة التمسك لكل ١%. مسافة النقل حتى ٢ كم ويتم احتساب علاوة ١.٤ جنية للكم بالزيادة او التقلص. السعر يشمل عمل تشويكات وتخليط واختبارات ونقل لموقع العمل حتى مسافة ٢ كم السعر يشمل قيمة البعده للمحجربة .	م	٢٦٠٦٥.٤٨	٨٥	٢٢١٥٦٥.٨٠
	علاوة مسافة النقل ٩٢ كم - ٢ كم = ٩٠ كم (اثرية)	٢م	٢٠٨٥٢.٣٨	١٢٦	٢٦٢٧٣٩٩.٨٨
	علاوة مسافة النقل ٧٣ كم - ٢ كم = ٧٠ كم (رمل طبيعية)	٤م	٥٢١٣.١٠	٩٩.٤	٥١٨١٨٢.١٤
	علاوة تحميل رسوم الكثرة وقمولين طبقا للاتمة الشركة الوطنية	٢م	٢٦٠٦٥.٤٨	١٣	٣٣٨٨٥١.٢٤
	الاجملى				٥.٧٠٠.٠٠٠ ج.م.

يتم
رئيس الادارة المركزية
منطقة غرب الدلتا
(بالاسكندرية / مرسى مطروح)
عميد مهندس /
هانى محمد محمود طه"

مدير عام مشروعات (الهيئة)
م / محمد حسنى لياض

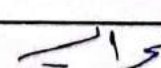
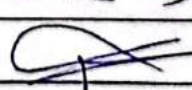
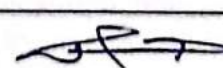
مدير المشروع (الهيئة)
م / مارجريت مجدى



Contractor Company		Al-Masa General Contracting Company		Designer Company		(SPECTRUM) Engineering Consulting Office					
Issued by Contractor	Name	Sign		Date/Serial Number		Time					
	Eng. Mohamed Elsaied			25/02/2023		3:00 PM					
			PLT20-EET								
Received by GARB CONSULTANT	Eng. Mazen Essamy		MIR	C1	C2	C3	DD	MM	YY	HH	MM
					363	EW	CS	26	2	23	

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		-1.5 FORM FERMA LEVEL			
Location to be Used		From	363+260	TO	363+380
MAR & UIR Approval No	IR-F130-EET	Date	25/02/2023		
	M.A.R.-F28-EET				
Supplier Name		Elsiw , Alharamin			
Test Requirement		P.L.T (DIN 18134)		Specification	
Reference Photos		No/Yes		Other	
		EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP			
Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	2		
2					
3					
4					
Comments by: Eng. Mazen Essamy (SPECTRUM)			Comments by: Eng. Alaa Abd-Allatif (ER)		
1-THE PLATE LOAD TEST RESULT P.L.T (DIN 18134) IS APPROVED			1-PLATE LOAD TEST WAS CARRIED - OUT BY (E-JUST)		
			2-Results report attached and acceptable with project specifications.		
			3-Final approval is subject to above mentioned comments.		

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif		26-2-2023	AWC

* Designer
 ** Alignment/Undiges: PLT20-EET



Technical Report

Plate Loading Tests

KM 363+280 and KM 363+320

Project

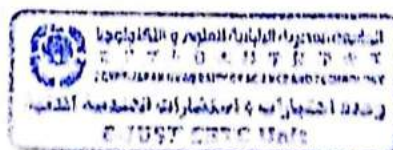
**Electric Express Train (Sokhna - New capital - 6th
of October city - New Elalamein city)**

Prepared for

AL-MASA General Contracting and Import & Export
Kilo 21 Square Beside Alfa Foam Factory 1st Floor Alexandria -
Egypt.



(February, 2023)





4. Closure

Test results presented herein report the load-settlement data obtained from two plate loading tests conducted on the Middle Embankment of the Electric Express train project at two locations (KM 363+280 and KM 363+320) in accordance with German Standard, DIN18134.

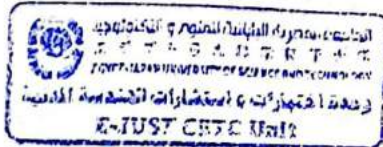
Location	E_{v1} MN/m ²	E_{v2} MN/m ²	E_{v2}/E_{v1} ratio
KM 363+280	117.52	123.11	1.05
KM 363+320	105.19	105.56	1.00

- Note: Before interpreting these test results for future applications, the Middle Embankment in-situ variability between the testing locations should be considered.

Technical committee

Dr. Mahmoud Ahmed

Prof. Dr. Mohamed F. M. Fahmy



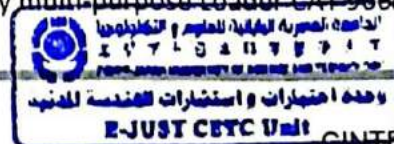


1. Introduction

The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by AL-MASA General Contracting and Import & Export to conduct two plate loading tests on the Middle Embankment of the Electric Express Train project at two locations (KM 363+280 and KM 363+320) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Mahmoud Adel of AL-MASA General Contracting and Import & Export. Field team members (Mr. Ahmed Sabry) from the working CETCU team visited the project site on February 26, 2023 and performed the required tests. This report summarizes the plate loading test procedure according to DIN18134, the test results and their interpretations, and the CETCU pertaining recommendations.

2. Test Set Up and Instrumentation

- The German standard DIN18134 was applied to define the test setup including the loading system, test conditions, and procedure for the plate loading tests.
- The tests were carried out to determine the Strain Moduli (E_{v1} and E_{v2}) and their ratio (E_{v2}/E_{v1}) from a stress – deformation relationship of two consecutive loading from Loading-Unloading-Loading regime.
- The loading plate has a diameter of 600 mm and a thickness of 25 mm and it is provided with equally spaced stiffeners. The upper plate face is parallel to the bottom face of the plate to allow a 300-mm plate to be placed on the 600-mm plate top.
- The loading system consisted of a hydraulic pump connected to a hydraulic jack of 700 bar capacity, which can apply and release the load increments.
- The dial gauge used to measure the plate settlement has a resolution of 0.01 mm and the lever ratio was equal to 1.
- The temperature at the time of the test was $20 \pm 1^\circ\text{C}$.
- The plate was carried out on a Middle Embankment (according to the company) at two points (KM 363+280 and KM 363+320). The test surface area was levelled, and the plate was bedded on this surface.
- The hydraulic jack was placed on the middle of, and normal to, the loading plate beneath the reaction loading system and secured against tilting.
- The reaction loading system was a heavy multi-purpose Loader CAT 966G.





3. Test Procedure and Results

The plate load test was conducted in accordance with the DIN18134. Loading, unloading, and reloading regimes were considered to estimate the resilient modulus of the tested soil. Prior to the test, the force transducer and dial gauge were reset to zero, and then a load corresponding to a stress of 0.01 MN/m² was applied. The load was increased in the first loading cycle until a normal stress of 0.25 MN/m² was reached, and the loading increment was 0.025 MN/m². The load was gradually released in four stages. Following unloading, a second loading cycle was performed, but the load was only increased to the penultimate stage of the first cycle. Two plate loading tests on the Middle Embankment of the Electric Express Train project were conducted at two locations (KM 363+280 and KM 363+320) and the data collected at the two test points is included in Appendix A.

Table 1 presents the load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 363+280), while Table 2 shows the data obtained at the second loading stage.

Table 1: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 363+280)

Loading stage	Load (F)	Normal stress (σ_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.20
2	14.14	0.050	0.30
3	21.21	0.075	0.43
4	28.28	0.100	0.53
5	35.35	0.125	0.65
6	42.42	0.150	0.73
7	49.49	0.175	0.82
8	56.56	0.200	0.88
9	63.63	0.225	0.95
10	70.7	0.250	1.02
11	56.56	0.200	1.02
12	49.49	0.175	0.95
13	35.35	0.125	0.80
14	21.21	0.075	0.65
15	1.414	0.005	0.05



Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 363+280)

Loading stage	Load (F)	Normal stress (σ_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.05
1	7.07	0.025	0.36
2	14.14	0.050	0.46
3	21.21	0.075	0.52
4	28.28	0.100	0.61
5	35.35	0.125	0.71
6	42.42	0.150	0.80
7	49.49	0.175	0.90
8	56.56	0.200	0.95
9	63.63	0.225	1.01

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 363+280) are shown in Figure 1. Table 3 shows the calculations of the resilient modulus of the tested soil according to DIN18134. The testing data corresponding to the second testing point (KM 363+320) is provided in Tables 4-6 and Figure 2.

Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 363+280)

Parameters	1st loading cycle	2nd loading cycle
($s_{0,max}$) MN/m ²	0.25	0.25
a_0 (mm)	0.06	0.12
a_1 (mm/(MN/m ²))	5.44	6.26
a_2 (mm/(MN ² /m ⁴))	-6.43	-10.44
$E_v = 1.5 r / (a_1 + a_2 \cdot s_{0,max})$	117.52	123.11
E_{v2}/E_{v1}	1.05	



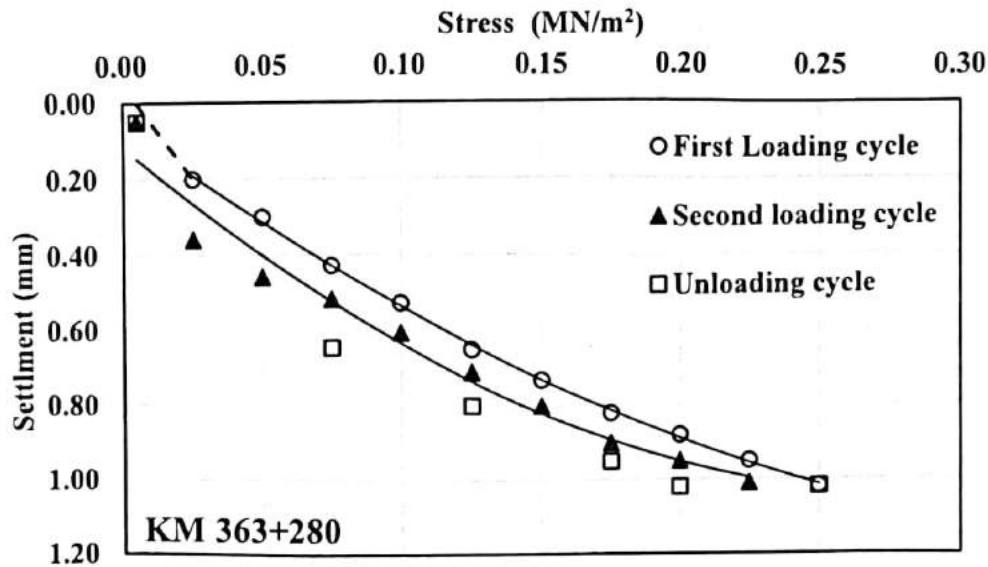


Figure 1: Load-settlement data: plate loading test performed at (KM 363+280)

Table 4: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 363+320)

Loading stage	Load (F)	Normal stress (σ_0)	Settlement (S)
	kN	MN/m^2	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.25
2	14.14	0.050	0.35
3	21.21	0.075	0.45
4	28.28	0.100	0.59
5	35.35	0.125	0.65
6	42.42	0.150	0.80
7	49.49	0.175	0.91
8	56.56	0.200	1.01
9	63.63	0.225	1.08
10	70.7	0.250	1.19
11	56.56	0.200	1.19
12	49.49	0.175	1.05
13	35.35	0.125	0.95
14	21.21	0.075	0.80
15	1.414	0.005	0.16



Table 5: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 363+320)

Loading stage	Load (F)	Normal stress (σ_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.16
1	7.07	0.025	0.31
2	14.14	0.050	0.42
3	21.21	0.075	0.56
4	28.28	0.100	0.68
5	35.35	0.125	0.75
6	42.42	0.150	0.82
7	49.49	0.175	0.97
8	56.56	0.200	1.07
9	63.63	0.225	1.15

Table 6: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 363+320)

Parameters	1st loading cycle	2nd loading cycle
($s_{0,max}$) MN/m ²	0.25	0.25
a_0 (mm)	0.12	0.16
a_1 (mm/(MN/m ²))	4.67	5.43
a_2 (mm/(MN ² /m ⁴))	-1.58	-4.67
$Ev = 1.5 / (a_1 + a_2 \cdot s_{0,max})$	105.19	105.56
Ev_2/Ev_1	1.00	

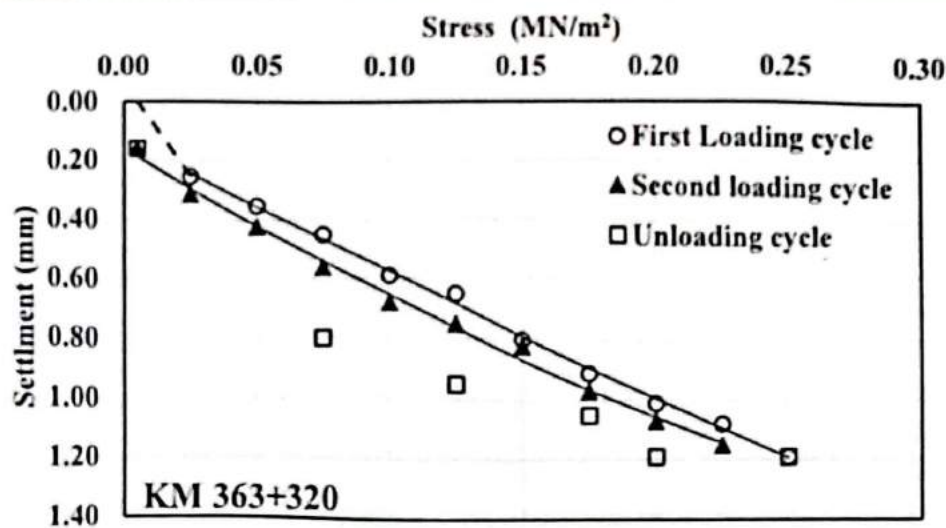
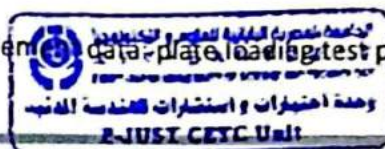


Figure 2: Load-settlement data-plate loading test performed at (KM 363+320)



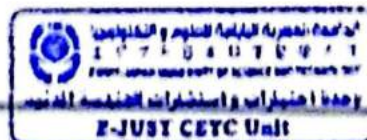


Egypt Japan University of Science and Technology
الجامعة المصرية اليابانية للعلوم والتكنولوجيا
エジプト日本科学技術大学

Civil Engineering Testing &
Consulting Unit

وحدة اختبارات واستشارات الهندسة
المدنية

Appendix A



Location of test site:	KM 363+320		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	26/2/2023
Diameter of loading plate	600		Time	12:42:00 pm
				1:10:00 pm
Lever ratio	1		Note: CAT 966G	
Type of Soil	Middle Embankment			
Bedding material	---			
Temperature	20°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.75	
	2	14.14	9.65	
	3	21.21	9.55	
	4	28.28	9.41	
	5	35.35	9.35	
	6	42.42	9.20	
	7	49.49	9.09	
	8	56.56	8.99	
	9	63.63	8.92	
	10	70.7	8.81	
Unloading Stage	11	56.56	8.81	
	12	49.49	8.95	
	13	35.35	9.05	
	14	21.21	9.20	
	15	1.414	9.84	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.84	
	1	7.07	9.69	
	2	14.14	9.58	
	3	21.21	9.44	
	4	28.28	9.32	
	5	35.35	9.25	
	6	42.42	9.18	
	7	49.49	9.03	
	8	56.56	8.93	
	9	63.63	8.85	

MATERIAL INSPECTION REQUEST



الهيئة العامة
للمرور والكباري
(GARB)



الهيئة العامة للتخطيط
والتطوير الاقتصادي



الهيئة العامة للتخطيط
والتطوير العمراني

Contractor Company	Al-Masa General Contracting Company			Designer Company	(SPECTRUM) Engineering Consulting Office						
Issued by Contractor	Name	Sign		Date/Serial Number	Time						
	Eng. Mohamed Elsaied			18/02/2023	3:00 PM						
				PLT 22-EET							
Received by GARB CONSULTANT	Eng. Mazen Essamy		MIR	C1	C2	C3	DD	MM	YY	HH	MM
				365	EW	CS	19	2	23		

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	FERMA LEVEL				
Location to be Used	From	365+300	TO	365+740	
MAR & UIR Approval No	IR-F122-EET , IR-F124-EET , IR-F125-EET		Date	18/02/2023	
	M.A.R.-F27-EET				
Supplier Name	Elsiwly , Alharamin				
Test Requirement	P.L.T (DIN 18134)		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP	
Reference Photos	No/Yes		Other		
Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	9		
2					
3					
4					
Comments by: Eng. Mazen Essamy (SPECTRUM)			Comments by: Eng. Alaa Abd-Allatif (ER)		
1-THE PLATE LOAD TEST RESULT P.L.T (DIN 18134) IS APPROVED			1-PLATE LOAD TEST WAS CARRIED - OUT BY (E-JUST) 2-Results report attached and acceptable with project specifications. 3-Final approval is subject to above mentioned comments.		

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif		19-2-2023	AWC

* Designer

** Alignment/Bridges: PLT 22-EET

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Egypt-Japan University of Science and Technology
الجامعة المصرية اليابانية للعلوم والتكنولوجيا
エジプト日本科学技術大学

Civil Engineering Testing &
Consulting Unit
وحدة الاختبارات واستشارات الهندسة
المدنية

Technical Report

Plate Loading Tests

KM 365+325, KM 365+375, KM 365+425,
KM 365+475, KM 365+525, KM 365+575,
KM 365+625, KM 365+675, KM 365+725,
KM 363+150, KM 363+200, and KM 363+240

Project

Electric Express Train (Sokhna - New capital - 6th
of October city - New Elalamein city)

Prepared for

AL-MASA General Contracting and Import & Export

Kilo 21 Square Beside Alfa Foam Factory 1st Floor Alexandria - Egypt.

(February, 2023)





4. Closure

Test results presented herein report the load-settlement data obtained from 12 plate loading tests conducted on the Upper Embankment of the Electric Express train project at 12 locations (KM 365+325, KM 365+375, KM 365+425, KM 365+475, KM 365+525, KM 365+575, KM 365+625, KM 365+675, KM 365+725, KM 363+150, KM 363+200, and KM 363+240) in accordance with German Standard, DIN18134.

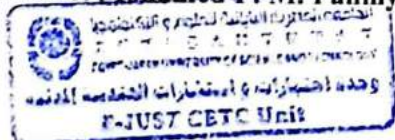
Location	E_{v1} MN/m ²	E_{v2} MN/m ²	E_{v2}/E_{v1} ratio
KM 365+325	88.06	104.90	1.19
KM 365+375	98.61	104.87	1.06
KM 365+425	117.42	126.33	1.08
KM 365+475	123.86	140.94	1.14
KM 365+525	85.51	94.86	1.11
KM 365+575	83.69	101.86	1.22
KM 365+625	78.27	97.53	1.25
KM 365+675	98.86	113.15	1.14
KM 365+725	93.33	96.28	1.03
KM 363+150	93.35	105.11	1.13
KM 363+200	100.47	107.45	1.07
KM 363+240	79.42	91.26	1.15

- Note: Before interpreting these test results for future applications, the Upper Embankment in-situ variability between the testing locations should be considered.

Technical committee

Dr. Mahmoud Ahmed

Prof. Dr. Mohamed F. M. Fahmy



Lab Engineer

Mohamed A. Al-Najjar



1. Introduction

The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by AL-MASA General Contracting and Import & Export to conduct 12 plate loading tests on the Upper Embankment of the Electric Express Train project at 12 locations (KM 365+325, KM 365+375, KM 365+425, KM 365+475, KM 365+525, KM 365+575, KM 365+625, KM 365+675, KM 365+725, KM 363+150, KM 363+200, and KM 363+240) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Mahmoud Adel of AL-MASA General Contracting and Import & Export. Field team members (Mr. Ahmed Sabry) from the working CETCU team visited the project site on February 19, 2023 and performed the required tests. This report summarizes the plate loading test procedure according to DIN18134, the test results and their interpretations, and the CETCU pertaining recommendations.

2. Test Set Up and Instrumentation

- The German standard DIN18134 was applied to define the test setup including the loading system, test conditions, and procedure for the plate loading tests.
- The tests were carried out to determine the Strain Moduli (Ev1 and Ev2) and their ratio (Ev2/Ev1) from a stress – deformation relationship of two consecutive loading from Loading-Unloading-Loading regime.
- The loading plate has a diameter of 600 mm and a thickness of 25 mm and it is provided with equally spaced stiffeners. The upper plate face is parallel to the bottom face of the plate to allow a 300-mm plate to be placed on the 600-mm plate top.
- The loading system consisted of a hydraulic pump connected to a hydraulic jack of 700 bar capacity, which can apply and release the load increments.
- The dial gauge used to measure the plate settlement has a resolution of 0.01 mm and the lever ratio was equal to 1.
- The temperature at the time of the test was $15 \pm 1^\circ\text{C}$.
- The plate was carried out on a Upper Embankment (according to the company) at 12 points. The test surface area was levelled, and the plate was bedded on this surface.
- The hydraulic jack was placed on the middle of, and normal to, the loading plate beneath the reaction loading system and secured against tilting.
- The reaction loading system was a heavy multi-purpose Loader CAT 966G.

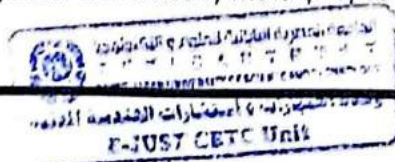




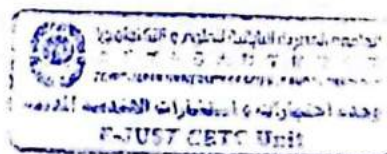
Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 365+325)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.21
1	7.07	0.025	0.35
2	14.14	0.050	0.53
3	21.21	0.075	0.65
4	28.28	0.100	0.78
5	35.35	0.125	0.90
6	42.42	0.150	0.97
7	49.49	0.175	1.05
8	56.56	0.200	1.15
9	63.63	0.225	1.23

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 365+325) are shown in Figure 1. Table 3 shows the calculations of the resilient modulus of the tested soil according to DIN18134. The testing data corresponding to the second testing point (KM 365+375) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 365+425) is provided in Tables 7-9 and Figure 3. The testing data corresponding to the fourth testing point (KM 365+475) is provided in Tables 10-12 and Figure 4. The testing data corresponding to the fifth testing point (KM 365+525) is provided in Tables 13-15 and Figure 5.

Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 365+325)

Parameters	1st loading cycle	2nd loading cycle
($s_{0,max}$) MN/m ²	0.25	0.25
a_0 (mm)	-0.01	0.19
a_1 (mm/(MN/m ²))	7.79	6.89
a_2 (mm/(MN ² /m ⁴))	-10.73	-10.39
$E_v = 1.5 r / (a_1 + a_2 \cdot s_{0,max})$	88.06	104.90
E_{v2}/E_{v1}	1.19	



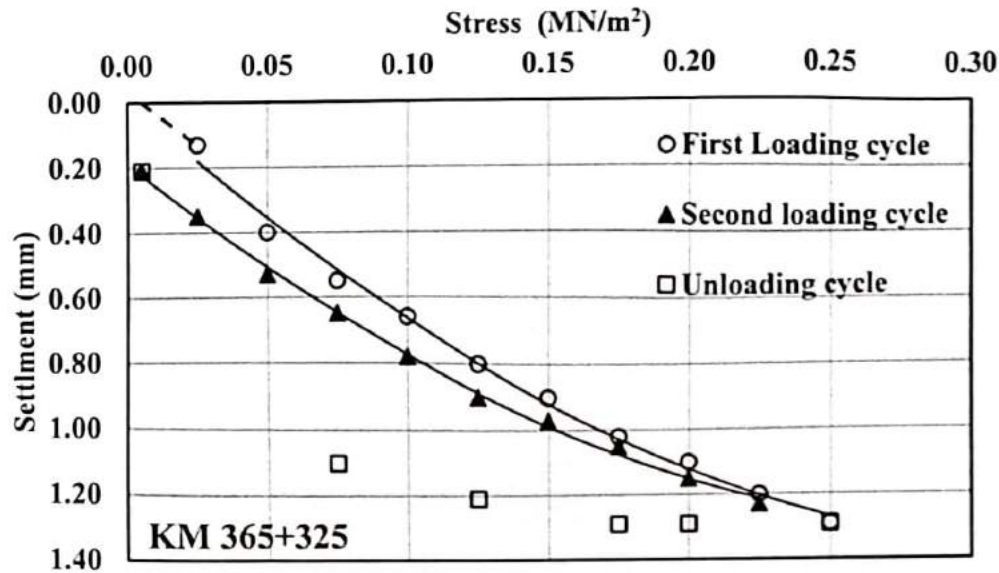


Figure 1: Load-settlement data: plate loading test performed at (KM 365+325)

Table 4: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 365+375)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.28
2	14.14	0.050	0.36
3	21.21	0.075	0.55
4	28.28	0.100	0.65
5	35.35	0.125	0.78
6	42.42	0.150	0.90
7	49.49	0.175	0.99
8	56.56	0.200	1.07
9	63.63	0.225	1.15
10	70.7	0.250	1.28
11	56.56	0.200	1.28
12	49.49	0.175	1.28
13	35.35	0.125	1.17
14	21.21	0.075	1.05
15	1.414	0.005	0.20

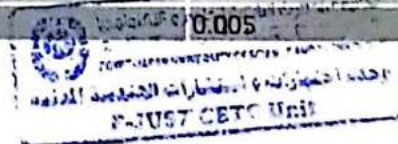




Table 7: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 365+425)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.21
2	14.14	0.050	0.28
3	21.21	0.075	0.42
4	28.28	0.100	0.53
5	35.35	0.125	0.63
6	42.42	0.150	0.70
7	49.49	0.175	0.79
8	56.56	0.200	0.86
9	63.63	0.225	0.97
10	70.7	0.250	1.06
11	56.56	0.200	1.06
12	49.49	0.175	1.06
13	35.35	0.125	0.97
14	21.21	0.075	0.83
15	1.414	0.005	0.20

Table 8: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 365+425)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.20
1	7.07	0.025	0.30
2	14.14	0.050	0.43
3	21.21	0.075	0.56
4	28.28	0.100	0.65
5	35.35	0.125	0.75
6	42.42	0.150	0.82
7	49.49	0.175	0.90
8	56.56	0.200	0.97
9	63.63	0.225	1.02

Table 9: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 365+425)

Parameters	1st loading cycle	2nd loading cycle
$(s_{0,max})$ MN/m ²	0.25	0.25
s_0 (mm)	0.09	0.17
a_1 (mm/(MN/m ²))	4.50	5.65
a_2 (mm/(MN ² /m ²))	-2.67	-8.37
$(\nu = 0.5) / (a_1 + a_2 \cdot s_{0,max})$	117.42	126.33
E_v/E_{v1}		1.08



Table 11: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 365+475)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.19
1	7.07	0.025	0.30
2	14.14	0.050	0.46
3	21.21	0.075	0.55
4	28.28	0.100	0.61
5	35.35	0.125	0.71
6	42.42	0.150	0.78
7	49.49	0.175	0.84
8	56.56	0.200	0.90
9	63.63	0.225	0.96

Table 12: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 365+475)

Parameters	1st loading cycle	2nd loading cycle
($s_{0,max}$) MN/m ²	0.25	0.25
a_0 (mm)	0.06	0.18
a_1 (mm/(MN/m ²))	5.32	5.34
a_2 (mm/(MN ² /m ⁴))	-6.73	-8.58
$E_v = 1.5 r / (a_1 + a_2 \cdot s_{0,MAX})$	123.86	140.94
E_{v2}/E_{v1}	1.14	

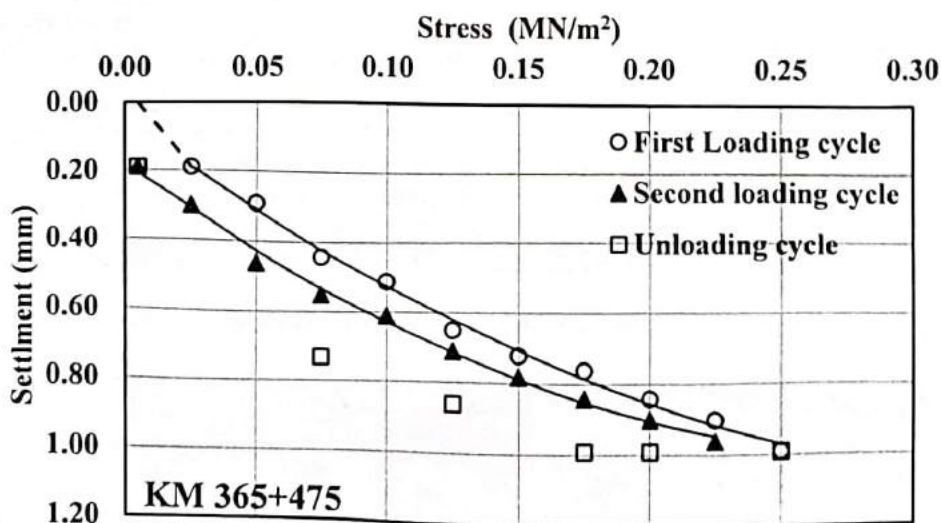


Figure 4: Load-settlement data plate loading test performed at (KM 365+475)



Table 16: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 365+575)

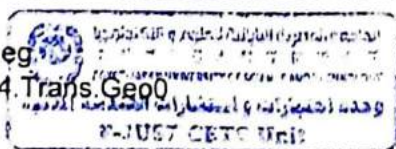
Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.20
2	14.14	0.050	0.38
3	21.21	0.075	0.54
4	28.28	0.100	0.69
5	35.35	0.125	0.81
6	42.42	0.150	0.93
7	49.49	0.175	1.09
8	56.56	0.200	1.15
9	63.63	0.225	1.25
10	70.7	0.250	1.44
11	56.56	0.200	1.44
12	49.49	0.175	1.44
13	35.35	0.125	1.21
14	21.21	0.075	1.00
15	1.414	0.005	0.28

Table 17: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 365+575)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.28
1	7.07	0.025	0.43
2	14.14	0.050	0.55
3	21.21	0.075	0.70
4	28.28	0.100	0.81
5	35.35	0.125	0.96
6	42.42	0.150	1.05
7	49.49	0.175	1.15
8	56.56	0.200	1.21
9	63.63	0.225	1.30

Table 18: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 365+575)

Parameters	1st loading cycle	2nd loading cycle
($s_{0,max}$) MN/m ²	0.25	0.25
a_0 (mm)	0.05	0.25
a_1 (mm/(MN/m ²))	6.73	6.63
a_2 (mm/(MN ² /m ⁴))	-5.40	-8.87
$Ev = 1.5 r / (a_1 + a_2 \cdot s_{0,max})$	83.69	101.86
Ev_2/Ev_1	1.22	



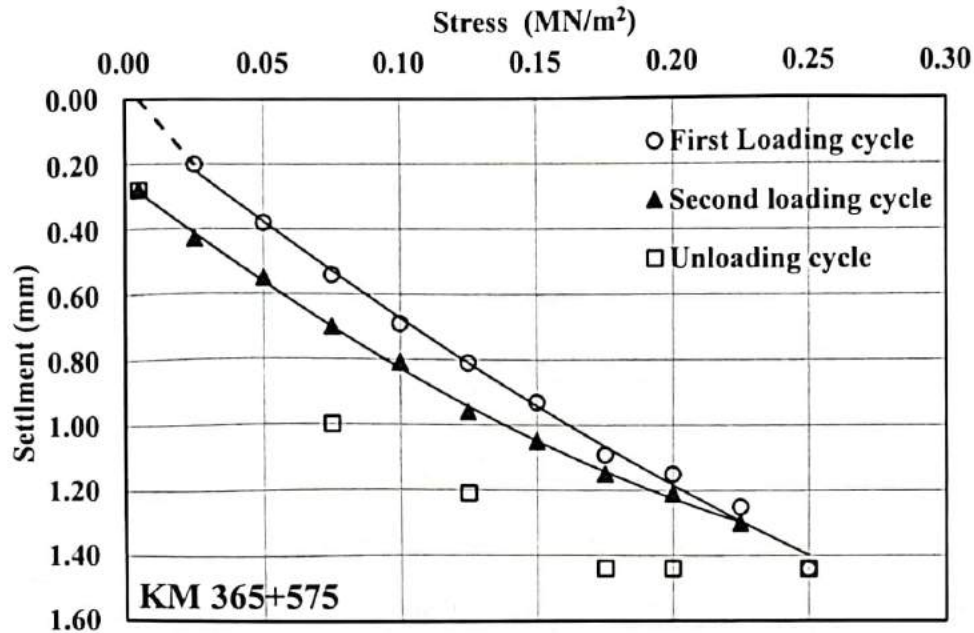


Figure 6: Load-settlement data: plate loading test performed at (KM 365+575)

Table 19: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 365+625)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.20
2	14.14	0.050	0.35
3	21.21	0.075	0.53
4	28.28	0.100	0.65
5	35.35	0.125	0.85
6	42.42	0.150	0.95
7	49.49	0.175	1.10
8	56.56	0.200	1.20
9	63.63	0.225	1.36
10	70.7	0.250	1.46
11	56.56	0.200	1.46
12	49.49	0.175	1.46
13	35.35	0.125	1.38
14	21.21	0.075	1.23
15	1.414	0.005	0.38

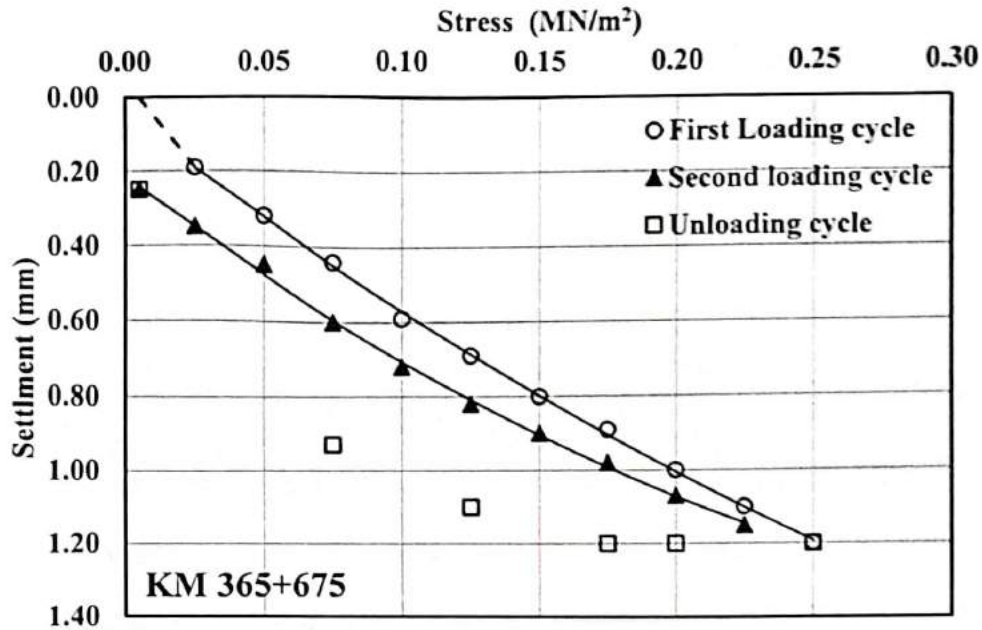


Figure 8: Load-settlement data: plate loading test performed at (KM 365+675)

Table 25: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 365+725)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.23
2	14.14	0.050	0.36
3	21.21	0.075	0.49
4	28.28	0.100	0.60
5	35.35	0.125	0.73
6	42.42	0.150	0.85
7	49.49	0.175	0.95
8	56.56	0.200	1.08
9	63.63	0.225	1.20
10	70.7	0.250	1.32
11	56.56	0.200	1.32
12	49.49	0.175	1.32
13	35.35	0.125	1.15
14	21.21	0.075	0.96
15	1.414	0.005	0.11

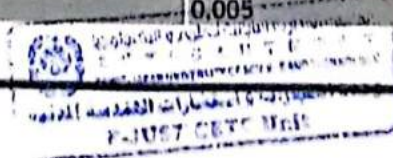




Table 34: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 363+240)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.25
2	14.14	0.050	0.48
3	21.21	0.075	0.60
4	28.28	0.100	0.76
5	35.35	0.125	0.92
6	42.42	0.150	1.07
7	49.49	0.175	1.19
8	56.56	0.200	1.27
9	63.63	0.225	1.40
10	70.7	0.250	1.50
11	56.56	0.200	1.50
12	49.49	0.175	1.50
13	35.35	0.125	1.44
14	21.21	0.075	1.28
15	1.414	0.005	0.35

Table 35: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 363+240)

Loading stage	Load (F)	Normal stress (s_0)	Settlement (S)
	kN	MN/m ²	mm
0	1.414	0.005	0.35
1	7.07	0.025	0.54
2	14.14	0.050	0.68
3	21.21	0.075	0.80
4	28.28	0.100	0.95
5	35.35	0.125	1.08
6	42.42	0.150	1.20
7	49.49	0.175	1.34
8	56.56	0.200	1.40
9	63.63	0.225	1.49

Table 36: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 363+240)

Parameters	1st loading cycle	2nd loading cycle
($s_{0,max}$) MN/m ²	0.25	0.25
a_0 (mm)	0.08	0.34
a_1 (mm/(MN/m ²))	7.82	7.07
a_2 (mm/(MN ² /m ⁴))	-8.61	-8.56
$E_v = 1.5 r / (a_1 + a_2 \cdot s_{0,max})$	79.42	91.26
E_{v1}/E_{v2}	1.15	

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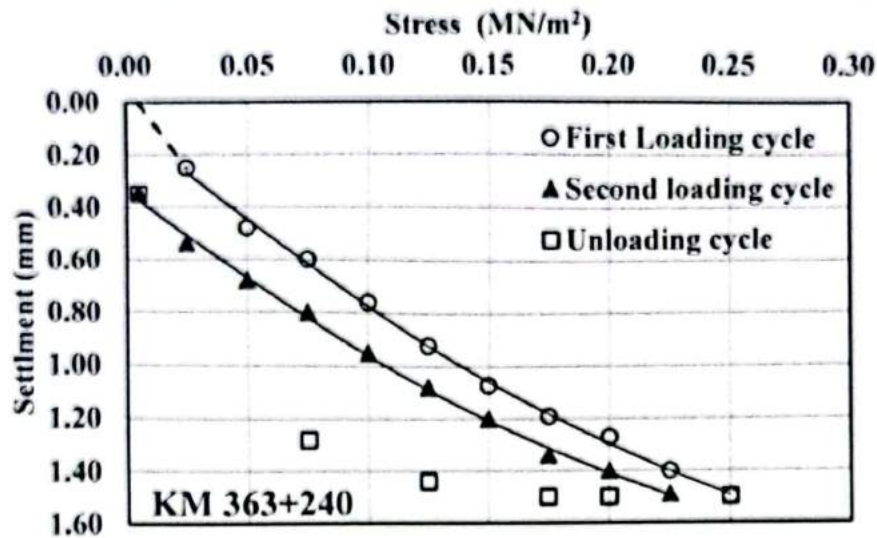
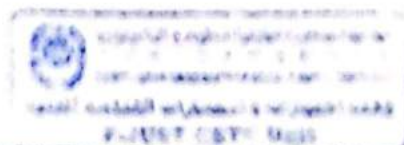


Figure 12: Load-settlement data: plate loading test performed at (KM 363+240)



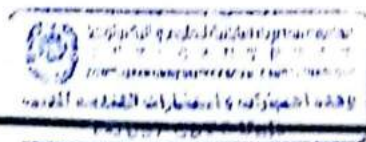


Egypt Japan University of Science and Technology
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Civil Engineering Testing &
Consulting Unit

وحدة الاختبارات واستشارات الهندسة
المدنية

Appendix A

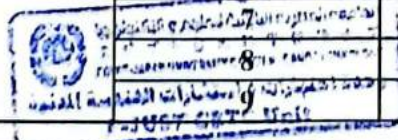




Location of test site:	KM 365+325		Field team	Mr. Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	9:45:00 am 10:13:00 am
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.87	
	2	14.14	9.60	
	3	21.21	9.45	
	4	28.28	9.34	
	5	35.35	9.20	
	6	42.42	9.10	
	7	49.49	8.98	
	8	56.56	8.90	
	9	63.63	8.80	
	10	70.7	8.71	
Unloading Stage	11	56.56	8.71	
	12	49.49	8.71	
	13	35.35	8.79	
	14	21.21	8.90	
	15	1.414	9.79	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.79	
	1	7.07	9.65	
	2	14.14	9.47	
	3	21.21	9.35	
	4	28.28	9.22	
	5	35.35	9.10	
	6	42.42	9.03	
	7	49.49	8.95	
	8	56.56	8.85	
	9	63.63	8.77	



Location of test site:	KM 365+375		Field team	Mr. Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	10:18:00 am 10:45:00 am
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.72	
	2	14.14	9.64	
	3	21.21	9.45	
	4	28.28	9.35	
	5	35.35	9.22	
	6	42.42	9.10	
	7	49.49	9.01	
	8	56.56	8.93	
	9	63.63	8.85	
	10	70.7	8.72	
Unloading Stage	11	56.56	8.72	
	12	49.49	8.72	
	13	35.35	8.83	
	14	21.21	8.95	
	15	1.414	9.80	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.80	
	1	7.07	9.60	
	2	14.14	9.50	
	3	21.21	9.37	
	4	28.28	9.25	
	5	35.35	9.12	
	6	42.42	9.05	
	7	49.49	8.95	
	8	56.56	8.85	
	9	63.63	8.78	





Location of test site:	KM 365+425		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	10:50:00 am 11:17:00 am
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.79	
	2	14.14	9.72	
	3	21.21	9.58	
	4	28.28	9.47	
	5	35.35	9.37	
	6	42.42	9.30	
	7	49.49	9.21	
	8	56.56	9.14	
	9	63.63	9.03	
	10	70.7	8.94	
Unloading Stage	11	56.56	8.94	
	12	49.49	8.94	
	13	35.35	9.03	
	14	21.21	9.17	
	15	1.414	9.80	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.80	
	1	7.07	9.70	
	2	14.14	9.57	
	3	21.21	9.44	
	4	28.28	9.35	
	5	35.35	9.25	
	6	42.42	9.18	
	7	49.49	9.10	
	8	56.56	9.03	
	9	63.63	8.98	

Location of test site:	KM 365+475		Field team	Mr. Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	11:22:00 am 11:50:00 am
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.81	
	2	14.14	9.71	
	3	21.21	9.56	
	4	28.28	9.49	
	5	35.35	9.35	
	6	42.42	9.28	
	7	49.49	9.24	
	8	56.56	9.16	
	9	63.63	9.10	
	10	70.7	9.01	
Unloading Stage	11	56.56	9.01	
	12	49.49	9.01	
	13	35.35	9.14	
	14	21.21	9.27	
	15	1.414	9.81	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.81	
	1	7.07	9.70	
	2	14.14	9.54	
	3	21.21	9.45	
	4	28.28	9.39	
	5	35.35	9.29	
	6	42.42	9.22	
	7	49.49	9.16	
	8	56.56	9.10	
	9	63.63	9.04	

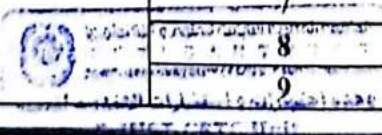


Location of test site:	KM 365+525		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	11:55:00 pm
				12:22:00 pm
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.71	
	2	14.14	9.57	
	3	21.21	9.42	
	4	28.28	9.25	
	5	35.35	9.14	
	6	42.42	9.03	
	7	49.49	8.90	
	8	56.56	8.80	
	9	63.63	8.65	
Unloading Stage	10	70.7	8.52	
	11	56.56	8.52	
	12	49.49	8.52	
	13	35.35	8.62	
	14	21.21	8.78	
	15	1.414	9.70	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.70	
	1	7.07	9.47	
	2	14.14	9.40	
	3	21.21	9.24	
	4	28.28	9.11	
	5	35.35	9.01	
	6	42.42	8.90	
	7	49.49	8.79	
	8	56.56	8.69	
	9	63.63	8.56	



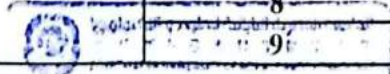


Location of test site:	KM 365+575		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	12:27:00 pm
				12:55:00 pm
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.80	
	2	14.14	9.62	
	3	21.21	9.46	
	4	28.28	9.31	
	5	35.35	9.19	
	6	42.42	9.07	
	7	49.49	8.91	
	8	56.56	8.85	
	9	63.63	8.75	
	10	70.7	8.56	
Unloading Stage	11	56.56	8.56	
	12	49.49	8.56	
	13	35.35	8.79	
	14	21.21	9.00	
	15	1.414	9.72	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.72	
	1	7.07	9.57	
	2	14.14	9.45	
	3	21.21	9.30	
	4	28.28	9.19	
	5	35.35	9.04	
	6	42.42	8.95	
	7	49.49	8.85	
	8	56.56	8.79	
	9	63.63	8.70	



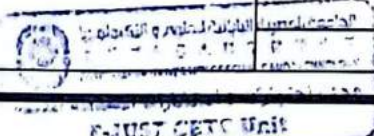


Location of test site:	KM 365+625		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	1:00:00 pm 1:27:00 pm
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.80	
	2	14.14	9.65	
	3	21.21	9.47	
	4	28.28	9.35	
	5	35.35	9.15	
	6	42.42	9.05	
	7	49.49	8.90	
	8	56.56	8.80	
	9	63.63	8.64	
	10	70.7	8.54	
Unloading Stage	11	56.56	8.54	
	12	49.49	8.54	
	13	35.35	8.62	
	14	21.21	8.77	
	15	1.414	9.62	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.62	
	1	7.07	9.49	
	2	14.14	9.34	
	3	21.21	9.16	
	4	28.28	9.08	
	5	35.35	8.95	
	6	42.42	8.85	
	7	49.49	8.75	
	8	56.56	8.65	
	9	63.63	8.55	

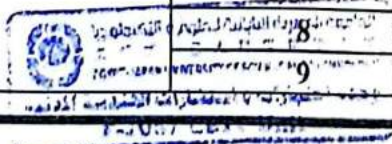




Location of test site:	KM 365+675		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	1:32:00 pm 2:00:00 pm
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.81	
	2	14.14	9.68	
	3	21.21	9.56	
	4	28.28	9.41	
	5	35.35	9.31	
	6	42.42	9.20	
	7	49.49	9.11	
	8	56.56	9.00	
	9	63.63	8.90	
	10	70.7	8.80	
Unloading Stage	11	56.56	8.80	
	12	49.49	8.80	
	13	35.35	8.90	
	14	21.21	9.07	
	15	1.414	9.75	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.75	
	1	7.07	9.65	
	2	14.14	9.55	
	3	21.21	9.40	
	4	28.28	9.28	
	5	35.35	9.18	
	6	42.42	9.10	
	7	49.49	9.02	
	8	56.56	8.93	
	9	63.63	8.85	

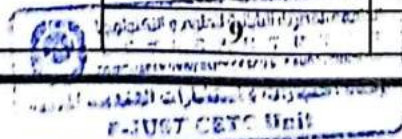


Location of test site:	KM 365+725		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	2:05:00 pm 2:32:00 pm
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.77	
	2	14.14	9.64	
	3	21.21	9.51	
	4	28.28	9.40	
	5	35.35	9.27	
	6	42.42	9.15	
	7	49.49	9.05	
	8	56.56	8.92	
	9	63.63	8.80	
	10	70.7	8.68	
Unloading Stage	11	56.56	8.68	
	12	49.49	8.68	
	13	35.35	8.85	
	14	21.21	9.04	
	15	1.414	9.89	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.89	
	1	7.07	9.67	
	2	14.14	9.55	
	3	21.21	9.42	
	4	28.28	9.30	
	5	35.35	9.15	
	6	42.42	9.06	
	7	49.49	8.99	
	8	56.56	8.88	
9	63.63	8.75		





Location of test site:	KM 363+150		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	2:45:00 pm 3:13:00 pm
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.72	
	2	14.14	9.60	
	3	21.21	9.40	
	4	28.28	9.27	
	5	35.35	9.18	
	6	42.42	9.08	
	7	49.49	8.95	
	8	56.56	8.85	
	9	63.63	8.77	
	10	70.7	8.65	
Unloading Stage	11	56.56	8.65	
	12	49.49	8.65	
	13	35.35	8.76	
	14	21.21	8.95	
	15	1.414	9.70	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.70	
	1	7.07	9.53	
	2	14.14	9.40	
	3	21.21	9.25	
	4	28.28	9.14	
	5	35.35	9.05	
	6	42.42	8.95	
	7	49.49	8.85	
	8	56.56	8.75	
	9	63.63	8.69	





Location of test site:	KM 363+200		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	3:18:00 pm 3:45:00 pm
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.75	
	2	14.14	9.65	
	3	21.21	9.52	
	4	28.28	9.40	
	5	35.35	9.28	
	6	42.42	9.17	
	7	49.49	9.07	
	8	56.56	8.98	
	9	63.63	8.86	
	10	70.7	8.76	
Unloading Stage	11	56.56	8.76	
	12	49.49	8.76	
	13	35.35	8.90	
	14	21.21	9.12	
	15	1.414	9.80	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.80	
	1	7.07	9.62	
	2	14.14	9.50	
	3	21.21	9.40	
	4	28.28	9.30	
	5	35.35	9.19	
	6	42.42	9.07	
	7	49.49	8.98	
	8	56.56	8.90	
	9	63.63	8.81	



Location of test site:	KM 363+240		Field team	Mr.Ahmed Sabry
Project title:	Electric Express Train Project - AL-MASA General Contracting and Import & Export		Date:	19/2/2023
Diameter of loading plate	600		Time	3:50:00 pm 4:17:00 pm
Lever ratio	1		Note: CAT 966G	
Type of Soil	Upper Embankment			
Bedding material	---			
Temperature	15°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Loading Stage	0	1.414	10.00	
	1	7.07	9.75	
	2	14.14	9.52	
	3	21.21	9.40	
	4	28.28	9.24	
	5	35.35	9.08	
	6	42.42	8.93	
	7	49.49	8.81	
	8	56.56	8.73	
	9	63.63	8.60	
	10	70.7	8.50	
Unloading Stage	11	56.56	8.50	
	12	49.49	8.50	
	13	35.35	8.56	
	14	21.21	8.72	
	15	1.414	9.65	
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)	
Reloading Stage	0	1.414	9.65	
	1	7.07	9.46	
	2	14.14	9.32	
	3	21.21	9.20	
	4	28.28	9.05	
	5	35.35	8.92	
	6	42.42	8.80	
	7	49.49	8.66	
	8	56.56	8.60	
	9	63.63	8.51	

MATERIAL INSPECTION REQUEST



الهيئة العامة
للطرق والكباري
(GARB)



الهيئة العامة
للتخطيط والتنمية
(MPEDEV)



Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	Eng. Mohamed Elsaied		01/02/2023	3:00 PM							
			(M.A.R.F19-EET) (REV)								
Received by GARB CONSULTANT	Eng. Mazen Essamy		MIR	C1	C2	C3	C4	MM	YY	HH	MM
				363	EW	C.S	17	4	23		

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 Quantity (95000 m3)			
Location to be Used	From	363+040	TO	366+000
sample only	yes	Materials Type	fill layer	
Supplier Name	Elsiwly , Alharamin	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. Mazen Essamy (SPECTRUM)		Comments by: Eng. Alaa Abd-Allatif (ER)		
1-quality test result by third party lab (comibassal) is Approved		1-All Tests Were Carried -Out By Third Party Lab (comibassal)		
2-this sample representative (5000 m3) only		2-Results report attached and acceptable with project specifications.		
		3-Final approval is subject to above mentioned comments.		

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QNGC *	Eng. Mazen Essamy			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif		17-4-2023	AWC

* Designer

** Agreement/Amend (M.A.R.F19-EET) (REV)



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الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

ISO 9001:2015 حاصلة على شهادة الأيزو

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والإعمال

معمد لدى الهيئة المصرية العامة للبترول

تحت رقم ٢٤ / ٢٩ / ١١٠٢٩

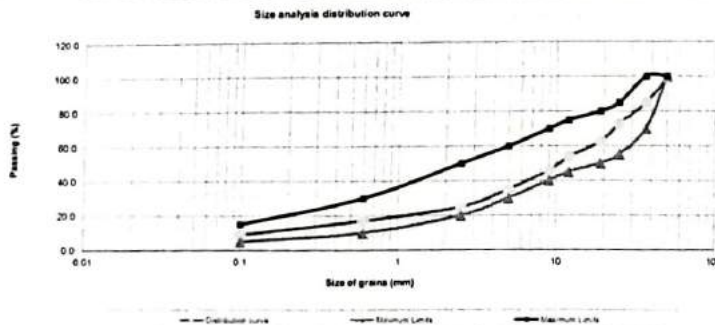
Report 349/1/Center

PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

General Consultant :	SYSTRA
Consultant :	SPECTRUM (Dr. Emad Nabil)
Contractor :	شركة الماسة للمطاولات السومية ورصف الطرق
Project :	Electric express train
Sample :	Ferma
Sector :	قطاع الحديد (363+000) : St (366+000)
Section :	st (365 + 560)
Date of Test :	01/02/2023

	WEIGHT RETAINED (gm)	CUMULATIVE WEIGHT RETAINED (gm)	CUMULATIVE PERCENTAGE RETAINED (%)	CUMULATIVE PERCENTAGE PASSING (%)	STANDARD SPECIFICATION LIMITS
2	140.00	140.00	1.42	98.6	100
1 1/2	1352.00	1492.00	15.16	84.8	70
1	1201.00	2693.00	27.37	72.6	55
3/4	985.00	3678.00	37.37	62.6	50
1/2	887.00	4565.00	46.39	53.6	45
3/8	756.00	5321.00	54.07	45.9	40
No.4	1075.00	6396.00	64.99	35.0	30
No.10	145.00	145.00	29.00	24.9	20
No.40	258.00	258.00	51.60	16.9	10
No.200	374.00	374.00	74.80	8.8	5

Total sample weight = 9841.00 pass No.4= 3445.0 Total fine aggregates weight = 500 gm



Soil classification: A - 1 - a

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECHNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M

الإدارة، ١٥٧، ش. صفية زغلول - الإسكندرية - مصر
٤٨٧٠٥٧٢ - ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥
40safia zaghoul st., p.o.Box 157 Alex, Egypt
Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع خلف ١٩ طريق الحرية - الإسكندرية - مصر
٣٩٠٠٤٧٦ - ٣٩٣١١٨٢ - ٣٩٢٠١٧٦
49 EL Horria Ave. - Alex, Egypt
Tel: 3920176 - 3931482 - Fax: 3900476
E-mail : internal-inspection@comibassal.com



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الجمعية التعاونية لإنتاجية لأعمال الوزن والمراجعة والجبرة الدولية (كوميبسال)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٠١١/١١٠٢٩/٢٤

Report : 349/2/Center

Report Of Liquid limit and Plastic Limit Test ASTM- D 1557

General Consultant :

SYSTRA

Consultant :

Dr : Emad Nabil (SPECTRUM)

Contractor :

شركة العنسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

قطاع المعيد (St (363 + 0.00) : St (366 + 0.00)

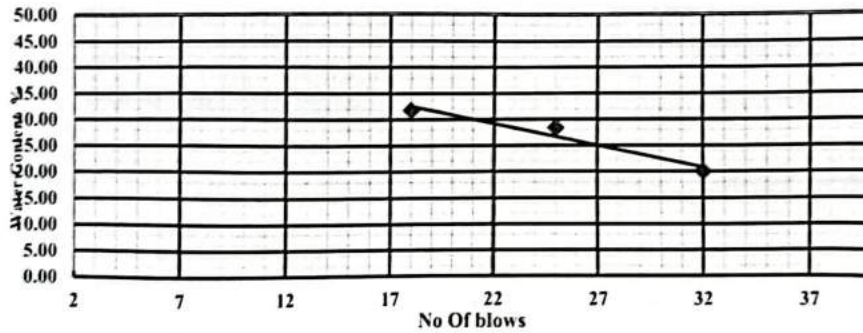
Station :

St (365+560)

Date of Test :

01/02/2023

Results



No. of blows	32	25	18
Wt. before drying	45.0	33.8	39.5
Wt. after drying	37.5	26.3	30.0
Moiture content %	20.0	28.3	31.7
(A) . L.L at blow no.25 =			26.5%

Wt. before drying	5.7	5.3	4.5
Wt. after drying	4.6	4.2	3.7
Molture content %	23.5	24.4	21.1
(B) . P.L =			23.0%

PI = (A-B) =	3.5%
--------------	------

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M

الإدارة، ١٥٧ شارع صفية زغلول - الإسكندرية - مصر

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥

40safia zaghloul st ., p.o.Box 157 Alex, Egypt

Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع خلف ٤٩ طريق الحرية - الإسكندرية - مصر
ت: ٣٩٢٠١٧٦ - ٣٩٢١١٨٢ - ف: ٣٩٠٠٤٧٦

49 EL Horria Ave .-Alex; Egypt

Tel: 3920176 - 3931482 - Fax: 3900476

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COMIBASSAL International Controllers

الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٠١١/١١٠٢٩/٢٤

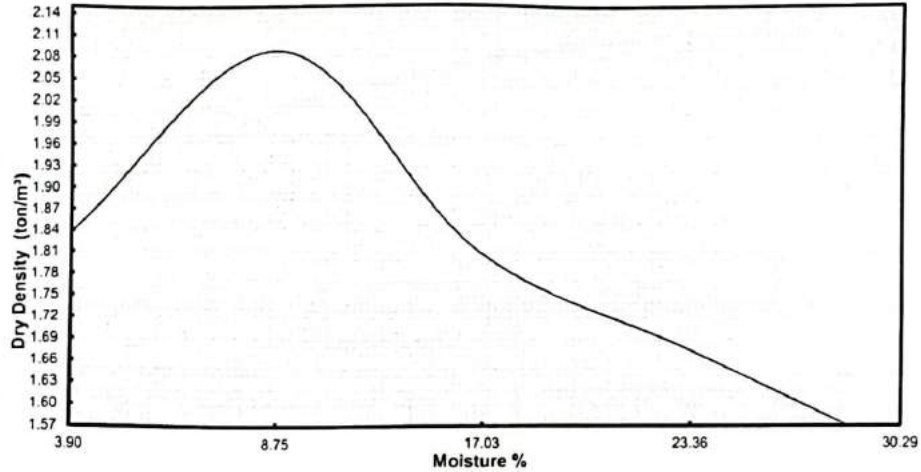
Report No. : 349 - 3 - center

Modified Proctor Test Report

ASTM - D 1557

General consultant	:	SYSTRA
Consultant	:	Dr : Emad Nabil (SPECTRUM)
Contractor	:	شركة العاسة للمقاولات
Project	:	Electric express train
Sample	:	Ferma
Sector	:	قطاع المعيد (St (363 + 000) : St (366 +000)
Station	:	ST (365 +560)
Date of Test	:	1/2/2023

Results



moisture content (%)	3.90	8.75	17.03	23.36	30.29
Dry Density (ton/m³)	1.84	2.09	1.81	1.67	1.54
Max. Dry Density (ton/m³)	2.09				
optimum moisture cont. (%)	8.75				

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Fer. Dr. M.

الإدارة، ١٥٧ ص.ب. - ص.ب. زغلول - الإسكندرية - مصر

ت. ٤٨٧٠٥٧٢ - ف. ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥

40safia zaghloul st ., p.o.Box 157 Alex, Egypt
Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر

ت. ٣٩٢٠١٧٦ - ٣٩٣١٤٨٢ - ف. ٣٩٠٠٤٧٦

49 EL Horria Ave .-Alex;Egypt

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E-mail : internal-inspection@comibassal.com



COMIBASSAL International Controllers

الجمعية التعاونية الانتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

ISO 9001:2015 حاصلة على شهادة الأيزو

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٤ / ١١٠٢٩ / ٢٠١١

Report no : 349 / 4 / center

Report Of C.B.R TEST ASTM - D 1883

General Consultant :

Consultant :

Contractor :

Project :

Sample :

Sector :

Station :

Date of Test :

SYSTRA

SPECTRUM (Dr. Emad Nabil)

شركة العاسة للمقاولات

Electric express train

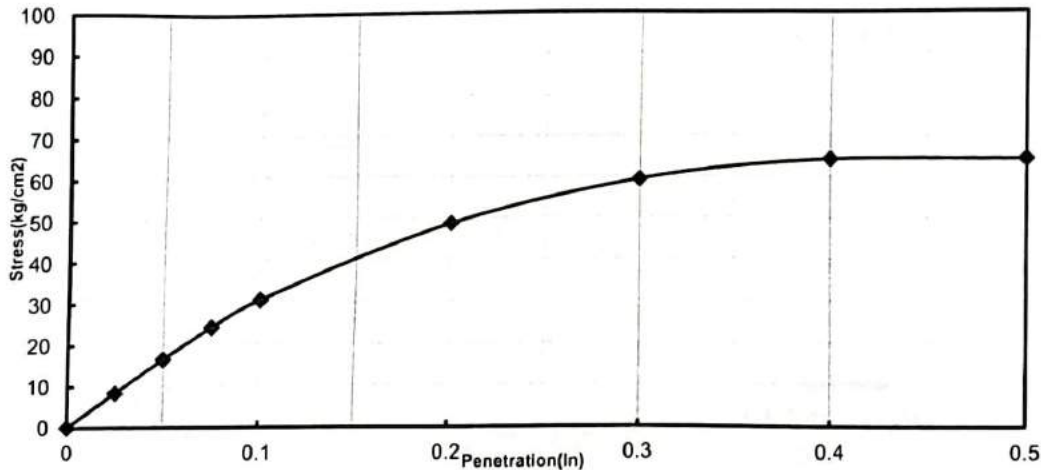
Ferma

قطاع العميد (St (363 + 0.00) : St (366 + 0.00)

St (365 + 560)

05/02/2023

RESULTS



Penetration (Inch)	0	0.025	0.05	0.075	0.1	0.2	0.3	0.4
stress (1 st phase) (kg/cm²)	0.00	5.20	13.00	22.62	27.82	48.10	57.72	61.05
stress (2nd phase) (kg/cm²)	0.00	11.44	19.76	25.22	32.97	48.98	60.58	67.60
Average stress (kg/cm²)	0.00	8.32	16.38	23.92	30.39	48.54	59.15	64.32

C.B.R = 46.0 %

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M

الإدارة، ١٥ شارع صفية زغلول - الإسكندرية - ب ١٥٧
ت: ٤٨٧٠٥٧٢ - ف: ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥
40safia zaghloul st ., p.o.Box 157 Alex, Egypt
Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر
ت: ٣٩٢٠١٧٦ - ٣٩٢١٤٨٢ - ف: ٣٩٠٠٤٧١
49 EL Horria Ave .-Alex; Egypt
Tel: 3920176 - 3931482 - Fax: 3900476
E-mail :internal-inspection@comibassal.com



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الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميبسال)

حاصلة على شهادة الأيزو ISO 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٤ / ١١٠٢٩ / ٢٠١١

Report :	200 -8 - Center
Date :	17/02/2023

ORGANIG CHEMICAL ANALYSIS

General Consultant :	SYSTRA
Consultant :	SPECTRUM (Dr . Emad Nabil)
Contractor :	شركة الماسه للمقاولات
Project :	Electric express train
Sample :	FERMA
Sector :	ST (363+0.00) : (366+0.00)
Station :	ST (365+560)
Date of Test :	13-2-2023

Temperature : 18 °C

Humidity : 50%

Analysis	Results	TEST METHOD
Organig Chemical	Negativ	ASTM _D 2974



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa

الإدارة، ٤٠ ش صفيية زغلول - الإسكندرية - ص - ب ١٥٧
٤٨٧٠٦٦٥ - ٤٨٦٩٧٩٨ - ف، ت، ٤٨٧٠٥٧٢
40safia zaghloul st ., p.o.Box 157 Alex, Egypt
Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر
٢٩٠٠٤٧٦ - ٢٩٢١٤٨٢ - ٢٩٢٠١٧٦ - ف، ت
49 EL Horria Ave .-Alex;Egypt
Tel: 3920176 - 3931482 - Fax: 3900476
E-mail :internal-inspection@comibassal.com

MATERIAL INSPECTION REQUEST	AL MASA		المهندسة العامة للطرق والكباري (GARB)		المكتب الهندسي للجسور والكباري		المكتب الهندسي للجسور والكباري	
	AL MASA		المهندسة العامة للطرق والكباري (GARB)		المكتب الهندسي للجسور والكباري		المكتب الهندسي للجسور والكباري	

Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	Eng. Mohamed Elsaied		06/02/2023	3:00 PM							
			(M.A.R-F25-EET) (REV)								
Received by GARB CONSULTANT	Eng. Mazen Essamy		MIR	C1	C2	C3	DD	MM	YY	HH	MM
				303	EW	CS	7	2	23		

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 Quantity (125000 m3)			
Location to be Used	From	363+040	TO	366+000
sample only	yes	Materials Type	fill layer	
Supplier Name	Elsawy , Alharamin	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. Mazen Essamy (SPECTRUM)		Comments by: Eng. Alaa Abd-Allatif (ER)		
1-quality test result by third party lab (comibassal) is Approved		1-All Tests Were Carried -Out By Thrd Party Lab (comibassal)		
2-this sample representative (5000 m3) only		2-Results report attached and acceptable with project specifications.		
		3-Final approval is subject to above mentioned comments.		

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif		11-2-2023	AWC

* Designer

** Alignment/Bridges (M.A.R-F25-EET) (REV)



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حاصلة على شهادة الأيزو ISO 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٠١١/١١٠٢٩/٢٤

Report 347/1/Center

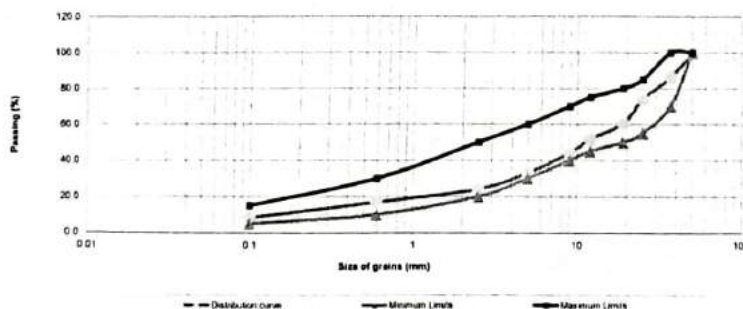
PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

General Consultant :	SYSTRA
Consultant :	SPECTRUM (Dr. Emad Nabil)
Contractor :	شركة الماسة للمقاولات السومية ورصف الطرق
Project :	Electric express train
Sample :	Ferma
Sector :	قطاع المعيد (St (363+000) : St (366+000))
Section :	st (364 + 950)
Date of Test :	07/02/2023

	WEIGHT RETAINED (gm)	CUMULATIVE WEIGHT RETAINED (gm)	CUMULATIVE PERCENTAGE RETAINED (%)	CUMULATIVE PERCENTAGE PASSING (%)	STANDARD SPECIFICATION LIMITS
2	98.00	98.00	0.95	99.1	100 100
1 1/2	1325.00	1423.00	13.74	86.3	70 100
1	1305.00	2728.00	26.34	73.7	55 85
3/4	1362.00	4090.00	39.50	60.5	50 80
1/2	924.00	5014.00	48.42	51.6	45 75
3/8	784.00	5798.00	55.99	44.0	40 70
No.4	1142.00	6940.00	67.02	33.0	30 60
No.10	136.00	136.00	27.20	24.0	20 50
No.40	245.00	245.00	49.00	16.8	10 30
No.200	375.00	375.00	75.00	8.2	5 15

Total sample weight = 10355.00 pass No.4= 3415.0 Total fine aggregates weight = 500 gm

Size analysis distribution curve



Soil classification: A - 1 - a

LAB DIRECTOR

Eng / Eman kandil

Eman.



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Fer Dr. M

الإدارة، ١٥٧ ش صافية زغلول - الإسكندرية - مصر

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥

40safia zaghloul st., p.o.Box 157 Alex, Egypt

Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر

ت: ٣٩٢٠١٧٦ - ٣٩٣١٤٨٢ - ف: ٣٩٠٠٤٧٦

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ISO 9001:2015 حاصلة على شهادة الأيزو

Accredited by:

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Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والإعمال

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٠١١/١١٠٢٩/٢٤

Report : 347 /2/Center

Report Of Liquid limit and Plastic Limit Test ASTM- D 1557

General Consultant :

SYSTRA

Consultant :

Dr : Emad Nabil (SPECTRUM)

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

St (363 + 0.00) : St (366 + 0.00) قطاع العميد

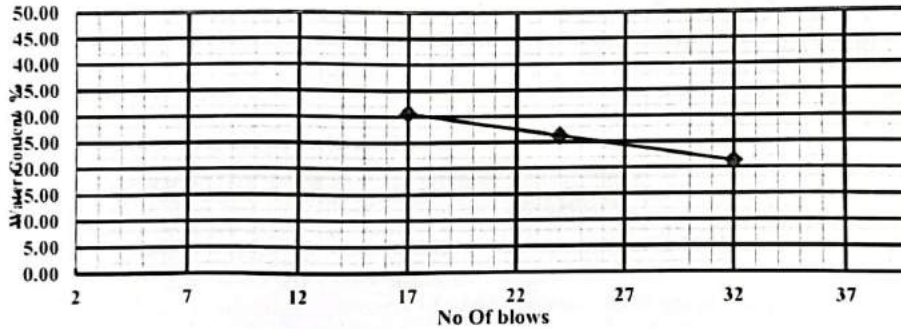
Station :

St (364+950)

Date of Test :

07/02/2023

Results



No. of blows	32	24	17
Wt. before drying	40.5	40.7	43.0
Wt. after drying	33.4	32.2	32.9
Moiture content %	21.2	26.2	30.6
(A) . L.L at blow no.25 = 26.0%			

Wt. before drying	5.8	5.9	5.8
Wt. after drying	4.6	4.9	4.8
Moiture content %	25.2	19.6	20.5
(B) . P.L = 21.8%			

$$PI = (A-B) = 4.2\%$$

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Fer Dr M

الإدارة: ٤٠ ش صفيية زغلول - الإسكندرية - مصر
٤٨٧٠٦٦٥ - ٤٨٦٩٧٩٨ - فاكس: ٤٨٧٠٥٧٢
40safia zaghoul st., p.o.Box 157 Alex, Egypt
Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع: خلف ٤٩ طريق الحرية - الإسكندرية - مصر
٢٩٠٠٤٧٦ - ٢٩٢١٤٨٢ - ٢٩٢٠١٧٦
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E-mail : internal-inspection@comibassal.com



COMIBASSAL International Controllers

الجمعية التعاونية لإنتاجية الأعمال والمراجعة والخبرة الدولية (كوميبسال)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:
Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٤ / ٢٩ / ١١٠١١

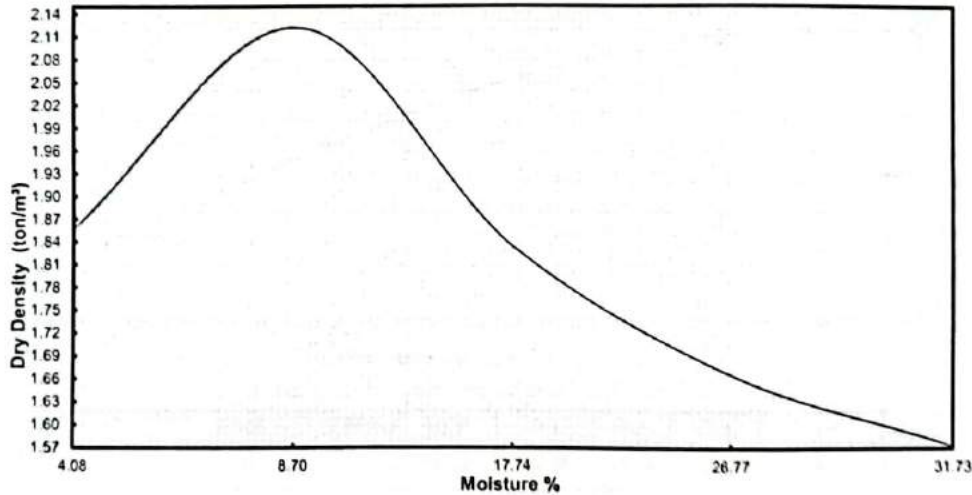
Report No. : 347 - 3 - center

Modified Proctor Test Report

ASTM - D 1557

General consultant : SYSTRA
Consultant : Dr : Emad Nabil (SPECTRUM)
Contractor : شركة العاسة للمقاولات
Project : Electric express train
Sample : Ferma
Sector : قطاع السعد (363 + 000) : St (366 +000)
Station : ST (364 +950)
Date of Test : 7/2/2023

Results



moisture content (%)	4.08	8.70	17.74	26.77	31.73
Dry Density (ton/m³)	1.86	2.12	1.83	1.67	1.57
Max. Dry Density (ton/m³)	2.12				
optimum moisture cont. (%)	8.70				

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M-





COMIBASSAL International Controllers

الجمعية التعاونية لإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسل)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٤ / ٢٩ / ١١٠١١

Report no : 347 / 4 / center

Report Of C.B.R TEST ASTM - D 1883

General Consultant :

SYSTRA

Consultant :

SPECTRUM (Dr. Emad Nabil)

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

قطاع العميد (366 + 0.00) : St (363 + 0.00)

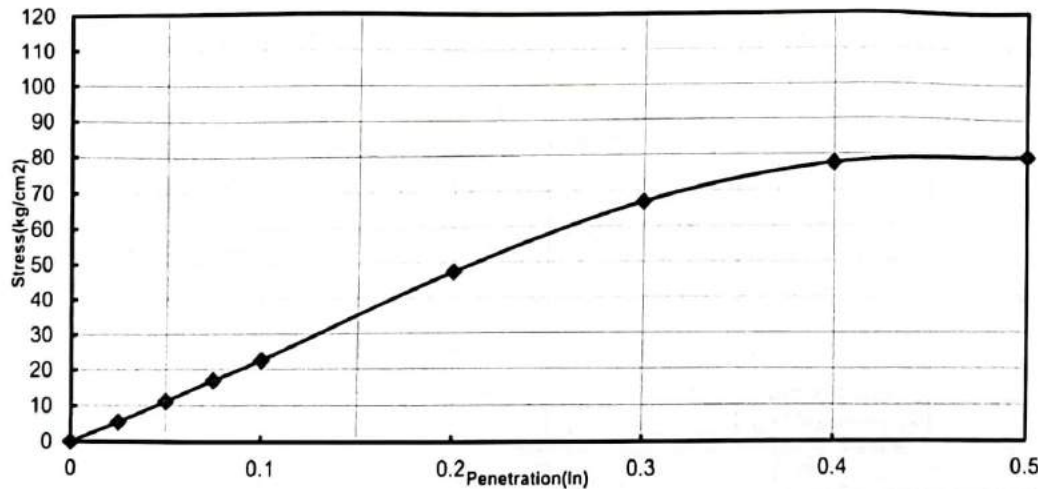
Station :

St (364+950)

Date of Test :

11/02/2023

RESULTS



Penetration (Inch)	0	0.025	0.05	0.075	0.1	0.2	0.3	0.4
stress (1 st phase) (kg/cm²)	0.00	1.82	7.38	14.82	19.76	45.08	62.40	69.42
stress (2nd phase) (kg/cm²)	0.00	9.00	14.82	18.98	25.22	49.40	71.24	85.80
Average stress (kg/cm²)	0.00	5.41	11.10	16.90	22.49	47.24	66.82	77.61

C.B.R = 44.8 %

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M





COMIBASSAL International Controllers

الجمعية التعاونية الانتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسل)

حاصلة على شهادة الايزو 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٤ / ٢٩ / ١١٠١١٠٢٠١١

Report :	200 -6 - Center
Date :	11/02/2023

ORGANIG CHEMICAL ANALYSIS

General Consultant :	SYSTRA
Consultant :	SPECTRUM (Dr . Emad Nabil)
Contractor :	شركة الماسه للمقاولات
Project :	Electric express train
Sample :	FERMA
Sector :	ST (363+0.00) : (366+0.00)
Station :	ST (364+950)
Date of Test :	7-2-2023

Temperature : 18 °C

Humidity : 50%

Analysis	Results	TEST METHOD
Organig Chemical	Negativ	ASTM _D 2974



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa Asker



APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif		11-2-2023	AWC

** Alignment/Bridges (M A R-F26-EET) (REV)



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الجمعية التعاونية الانتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

حاصلة على شهادة الأيزو ISO 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٤/١١٠٢٩/٢٠١١

Report 153/1/Center

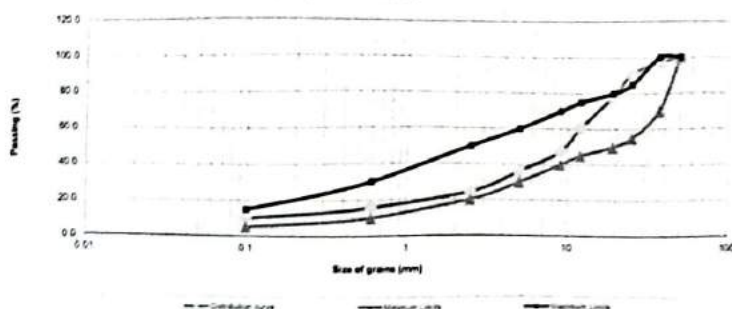
PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

General Consultant :	SYSTRA
Consultant :	SPECTRUM (Dr. Emad Nabil)
Contractor :	شركة الماسة تمقولات العمومية ورصف الطرق
Project :	Electric express train
Sample :	Ferma
Sector :	قطاع الحديد (363+000) : St (366+000)
Section :	st (364 + 000)
Date of Test :	08/02/2023

	WEIGHT RETAINED	CUMULATIVE WEIGHT	CUMULATIVE PERCENTAGE	CUMULATIVE PERCENTAGE	STANDARD SPECIFICATION
	(gm)	RETAINED (gm)	RETAINED (%)	PASSING (%)	LIMITS
2	0.00	0.00	0.00	100.0	100
1 1/2	252.00	252.00	2.79	97.2	70
1	562.00	814.00	9.02	91.0	55
3/4	1145.00	1959.00	21.72	78.3	50
1/2	1584.00	3543.00	39.28	60.7	45
3/8	1202.00	4745.00	52.60	47.4	40
No.4	1025.00	5770.00	63.96	36.0	30
No.10	162.00	162.00	32.40	24.4	20
No.40	284.00	284.00	56.80	15.6	10
No.200	362.00	362.00	72.40	9.9	5

Total sample weight = 9021.00 pass No.4= 3251.0 Total fine aggregates weight = 500 gm

Size analysis distribution curve



Soil classification: A - 1 - a

LAB DIRECTOR

Eng / Eman kandil

Ceman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Far- Dr. M





COMIBASSAL International Controllers

الجمعية التعاونية لانتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

ISO 9001:2015 حاصلة على شهادة الأيزو

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترو
تحت رقم ٢٠١١/١١٠٢٩/٢٤

Report : 353 /2/Center

Report Of Liquid limit and Plastic Limit Test

ASTM- D 1557

General Consultant :

SYSTRA

Consultant :

Dr : Emad Nabil (SPECTRUM)

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

St (363 + 0.00) : St (366 + 0.00) قطاع العميد

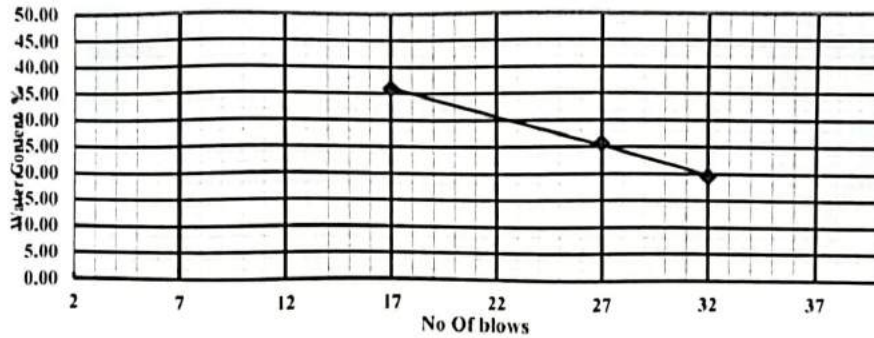
Station :

St (364 +0.00)

Date of Test :

08/02/2023

Results



No. of blows	32	27	17
Wt. before drying	44.7	41.7	38.6
Wt. after drying	37.4	33.2	28.4
Moiture content %	19.5	25.6	35.9
(A) . L.L at blow no.25 = 27.0%			

Wt. before drying	5.6	5.4	5.7
Wt. after drying	4.5	4.3	4.6
Moiture content %	24.4	25.6	23.9
(B) . P.L = 24.6%			

$$PI = (A-B) = 2.4\%$$

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. H —

الإدارة: ٤٠ ش صفيية زغلول - الإسكندرية ص - ب ١٥٧

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٩٩٧٩٨ - ٤٨٧٠٦٦٥

40safia zaghloul st ., p.o.Box 157 Alex, Egypt

Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع: خلف ١٩ طريق الحرية - الإسكندرية - مصر

ت: ٢٩٢٠١٧٦ - ٢٩٢١٤٨٢ - ف: ٢٩٠٠٤٣٦

49 EL Horria Ave .-Alex;Egypt

Tel: 3920176 - 3931482 - Fax: 3900476

E-mail :internal-inspection@comibassal.com



COMIBASSAL International Controllers

الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميبسال)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٤ / ١١٠٢٩ / ٢٠١١

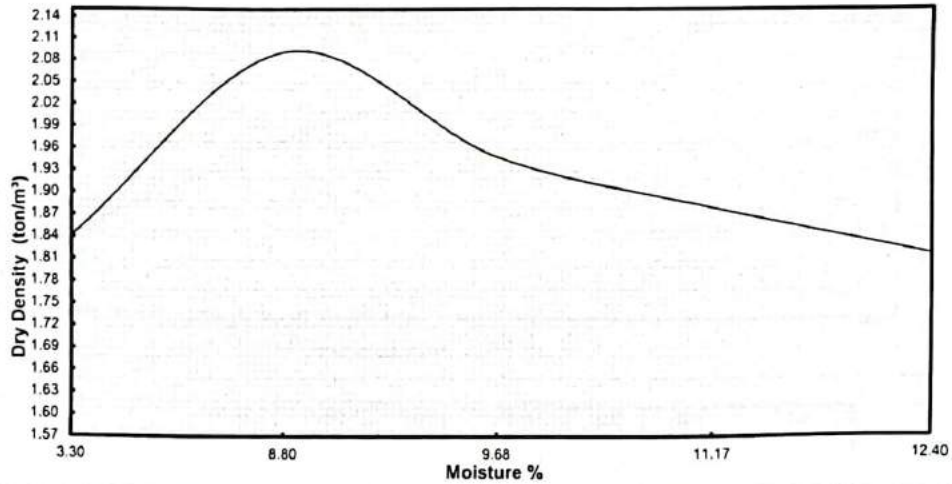
Report No. : 353 - 3 - center

Modified Proctor Test Report

ASTM - D 1557

General consultant	:	SYSTRA
Consultant	:	Dr : Emad Nabil (SPECTRUM)
Contractor	:	شركة الماسة للمقاولات
Project	:	Electric express train
Sample	:	Ferma
Sector	:	قطاع العميد (363 + 000) : St (366 +000)
Station	:	ST (364 +000)
Date of Test	:	8/2/2023

Results



moisture content (%)	3.30	8.80	9.68	11.17	12.40
Dry Density (ton/m³)	1.84	2.09	1.95	1.88	1.81
Max. Dry Density (ton/m³)	2.09				
optimum moisture cont. (%)	8.80				

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For. Dr. M

الإدارة، ١٥٧ ص. ب. ٤٨٧٠٦٦٥ - ٤٨٦٩٧٩٨ - ٤٨٧٠٥٧٣
ت. ٤٨٧٠٥٧٣ - ف. ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥

40safia zaghloul st., p.o.Box 157 Alex, Egypt
Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر
ت. ٣٩٢٠١٧٦ - ٣٩٣١٤٨٢ - ٣٩٠٠٤٧٦ - ف.

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حاصلة على شهادة الأيزو ISO 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتد لدى الهيئة المصرية العامة للبترو
تحت رقم ٢٤ / ١١٠٢٩ / ٢٠١١

Report no : 353 / 4 / center

Report Of C.B.R TEST ASTM - D 1883

General Consultant :

SYSTRA

Consultant :

SPECTRUM (Dr. Emad Nabil)

Contractor :

شركة الماسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

قطاع العميد (366 + 0.00) : St (363 + 0.00)

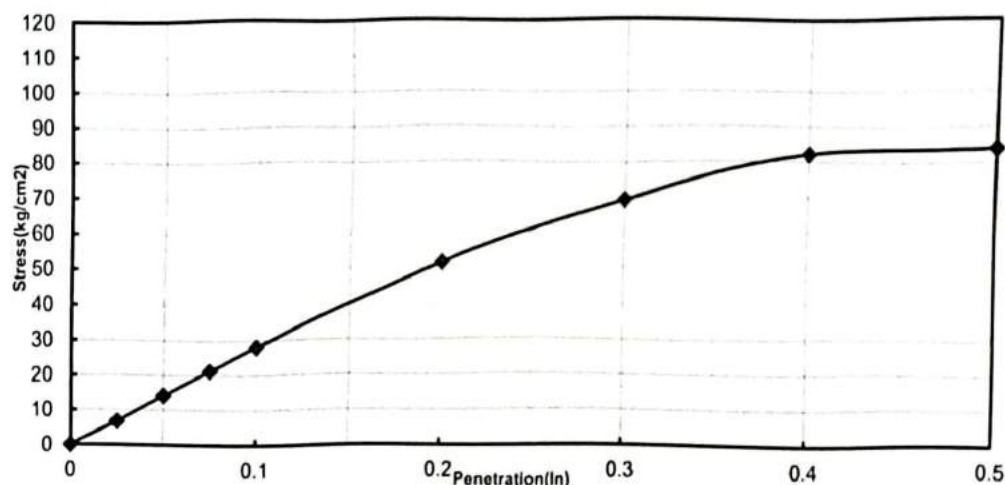
Station :

St (364 + 0.00)

Date of Test :

12/02/2023

RESULTS



Penetration (Inch)	0	0.025	0.05	0.075	0.1	0.2	0.3	0.4
stress (1 st phase) (kg/cm²)	0.00	6.03	10.40	16.12	23.14	48.98	66.04	66.04
stress (2nd phase) (kg/cm²)	0.00	7.38	17.94	26.52	32.97	53.82	72.80	98.28
Average stress (kg/cm²)	0.00	6.71	14.17	21.32	28.05	51.40	69.42	82.16

C.B.R = 48.7 %

LAB DIRECTOR

Eng / Eman kandil

Eman

GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Dr. M



MATERIAL INSPECTION REQUEST	AL MASA	الهيئة العامة للمطرق والكباري (GARB)	مجلس الوزراء	الهيئة العامة للتنظيم والإدارة	مجلس الوزراء	مجلس الوزراء

Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office	
Issued by Contractor	Name	Sign	Date/Serial Number	Time	
	Eng. Mohamed Elsaied		05/02/2023	3:00 PM	
			(M.A.R-F24-EET) (REV)		
Received by GARB CONSULTANT	Eng. Mazen Essamy		MIR	C1 363	C2 EW

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 Quantity (120000 m3)		
Location to be Used	From	363+040	TO 366+000
sample only	yes	Materials Type	fill layer
Supplier Name	Elsiwly , Alharamin	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. Mazen Essamy (SPECTRUM)	Comments by: Eng. Alaa Abd-Allatif (ER)
1-quality test result by third party lab (comibassal) is Approved	1-All Tests Were Carried -Out By Third Party Lab (comibassal)
2-this sample representative (5000 m3) only	2-Results report attached and acceptable with project specifications.
	3-Final approval is subject to above mentioned comments.

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif		17-2-2023	Awc

* Designer

** Alignment/Bridges. (M.A.R-F24-EET) (REV)



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الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

Egyptian General Authority for Petroleum
Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٠١١/١١٠٢٩/٢٤

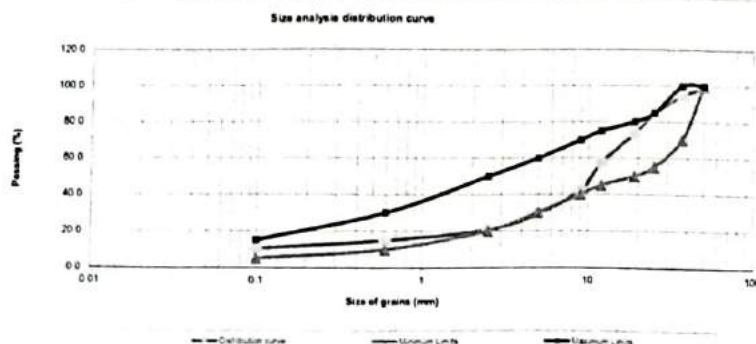
Report 355/1/Center

PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

General Consultant :	SYSTRA
Consultant :	SPECTRUM (Dr. Emad Nabil)
Contractor :	شركة الماسة للمقاولات والصيانة ورصف الطرق
Project :	Electric express train
Sample :	Ferma
Sector :	قطاع الحديد (St (363+000) : St (366+000
section :	st (365 + 600)
Date of Test :	06/02/2023

	WEIGHT RETAINED (gm)	CUMULATIVE WEIGHT RETAINED (gm)	CUMULATIVE PERCENTAGE RETAINED (%)	CUMULATIVE PERCENTAGE PASSING (%)	STANDARD SPECIFICATION LIMITS
2	114.00	114.00	1.30	98.7	100 100
1 1/2	362.00	476.00	5.42	94.6	70 100
1	895.00	1371.00	15.61	84.4	55 85
3/4	958.00	2329.00	26.52	73.5	50 80
1/2	1425.00	3754.00	42.74	57.3	45 75
3/8	1320.00	5074.00	57.77	42.2	40 70
No.4	1145.00	6219.00	70.81	29.2	30 60
No.10	147.00	147.00	29.40	20.6	20 50
No.40	245.00	245.00	49.00	14.9	10 30
No.200	322.00	322.00	64.40	10.4	5 15

Total sample weight = 8783.00 pass No.4= 2564.0 Total fine aggregates weight = 500 gm



Soil classification: A - 1 - a

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECHNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M





COMIBASSAL International Controllers

الجمعية التعاونية لإنتاجية الأعمال والخبرة الدولية (كوميباسل)

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قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترول
تحت رقم ٢٩/١١٠٢٩/٢٠١١

Report : 355 /2/Center

Report Of Liquid limit and Plastic Limit Test ASTM- D 1557

General Consultant :

SYSTRA

Consultant :

Dr : Emad Nabil (SPECTRUM)

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

St (363 + 0.00) : St (366 + 0.00) قطاع العميد

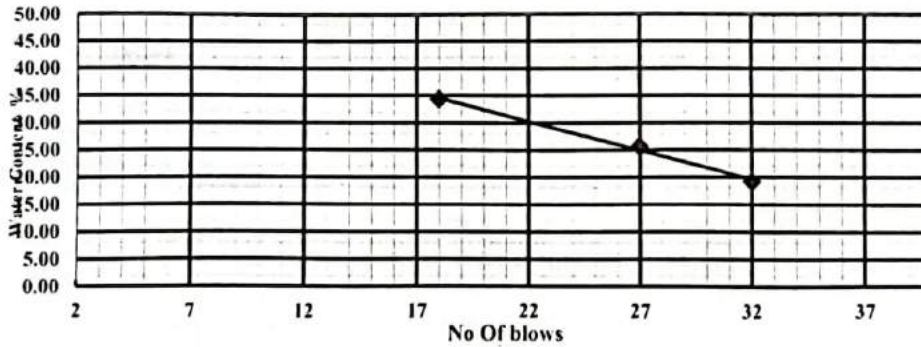
Station :

St (365 + 600)

Date of Test :

06/02/2023

Results



No. of blows	32	27	18
Wt. before drying	46.7	43.2	41.5
Wt. after drying	39.2	34.4	30.9
Moiture content %	19.1	25.6	34.3
(A) . L.L at blow no.25 =			27.0%

Wt. before drying	5.5	5.4	5.5
Wt. after drying	4.4	4.4	4.5
Moiture content %	25.0	24.1	23.6
(B) . P.L =			24.2%

$$PI = (A-B) = 2.8\%$$

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M-

الإدارة، ٤٠ ش صفيّة زغلول - الإسكندرية ص - ب ١٥٧

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٧٩٧٩٨ - ٤٨٧٠٦٦٥

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القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر

ت: ٣٩٢٠١٧٦ - ٣٩٣١٤٨٢ - ف: ٣٩٠٠٤٧٦

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قطاع التفتيش الداخلي والمعامل

معتمد لدى الهيئة المصرية العامة للبترو
تحت رقم ٢٠١١/١١٠٢٩/٢٤

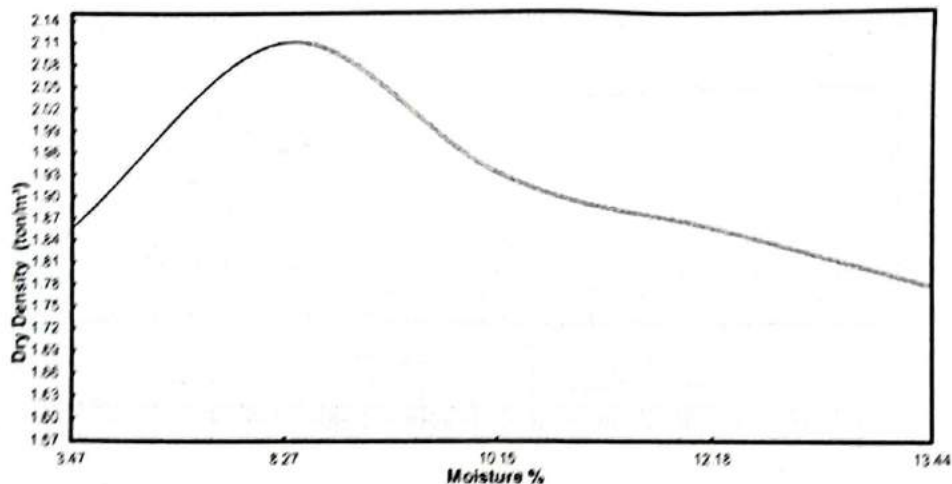
Report No. : 355 - 3 - center

Modified Proctor Test Report

ASTM - D 1557

General consultant	:	SYSTRA
Consultant	:	Dr : Emad Nabil (SPECTRUM)
Contractor	:	شركة الماسة للمقاولات
Project	:	Electric express train
Sample	:	Ferma
Sector	:	قطاع العمود (363 + 000) : St (366 + 000)
Station	:	ST (365 + 600)
Date of Test	:	6/2/2023

Results



moisture content (%)	3.47	8.27	10.15	12.18	13.44
Dry Density (ton/m³)	1.86	2.11	1.93	1.86	1.78
Max. Dry Density (ton/m³)	2.11				
optimum moisture cont. (%)	8.27				

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECHNICAL CONSULTANT

Dr/ Mohamed Badry

Fer. Dr. M





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قطاع التفتيش الداخلي والمعامل

معتد لدى الهيئة المصرية العامة للبترو
تحت رقم ٢٠١١/١١٠٢٩/٢٤

Report no : 355 / 4 / center

Report Of C.B.R TEST ASTM - D 1883

General Consultant :

SYSTRA

Consultant :

SPECTRUM (Dr. Emad Nabil)

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

قطاع العميد (St (363 + 0.00) : St (366 + 0.00)

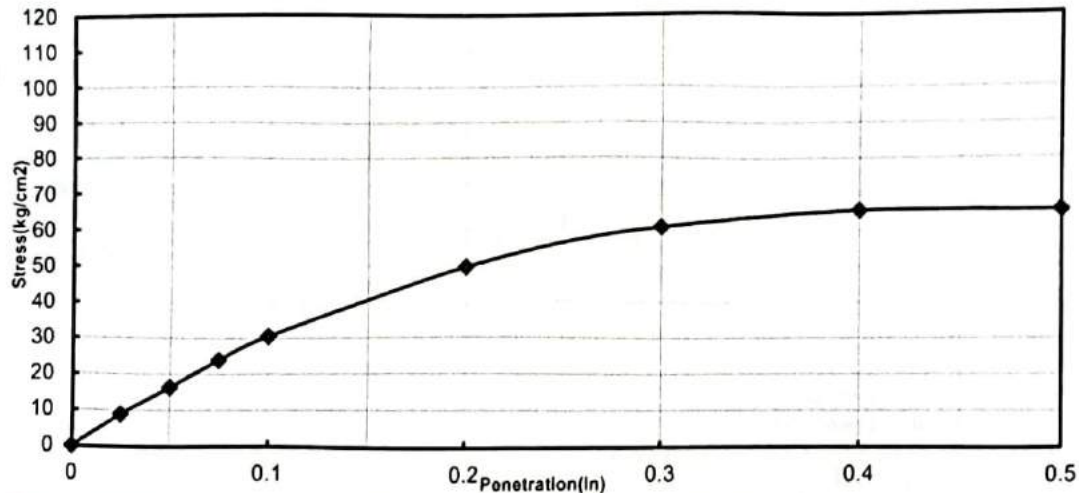
Station :

St (365 + 600)

Date of Test :

11/02/2023

RESULTS



Penetration (Inch)	0	0.025	0.05	0.075	0.1	0.2	0.3	0.4
stress (1 st phase) (kg/cm²)	0.00	8.06	14.82	23.92	28.08	48.62	61.05	65.00
stress (2nd phase) (kg/cm²)	0.00	9.62	17.94	23.92	32.97	50.18	61.05	66.04
Average stress (kg/cm²)	0.00	8.84	16.38	23.92	30.52	49.40	61.05	65.52

C.B.R = 46.8 %

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For - Dr. M

الإدارة، ١٥٧ شارع صفية زغلول - الإسكندرية - مصر

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٧٩٧٩٨ - ٤٨٧٠٦٦٥

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القطاع خلف ١٩ طريق الحرية - الإسكندرية - مصر

ت: ٣٩٢٠١٧٦ - ٣٩٢١٤٨٢ - ف: ٣٩٠٠٤٧٦

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Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

بمقتضى الهيئة المصرية العامة للبترول
تحت رقم ٢٤ / ٢٩ / ١١٠٢٩ / ٢٠١١

Report	:	200 - 14 - Center
Date	:	17/02/2023

ORGANIG CHEMICAL ANALYSIS

General Consultant	:	SYSTRA
Consultant	:	SPECTRUM (Dr . Emad Nabil)
Contractor	:	شركة الماسه للمقاولات
Project	:	Electric express train
Sample	:	FERMA
Sector	:	ST (363+0.00) : (366+0.00)
Station	:	ST (365+600)
Date of Test	:	14-2-2023

Temperature : 18 °C

Humidity : 50%

Analysis	Results	TEST METHOD
Organig Chemical	Negativ	ASTM _D 2974



LAB DIRECTOR
CH/ Mostafa Asker

Moustafa

