

# MATERIAL APPROVAL REQUEST



|                             |                   |                     |                                          |                  |                                     |    |    |    |    |    |    |
|-----------------------------|-------------------|---------------------|------------------------------------------|------------------|-------------------------------------|----|----|----|----|----|----|
| Contractor Company          | ALADDIN(5)        |                     |                                          | Designer Company | (K.K) Engineering Consulting Office |    |    |    |    |    |    |
| Issued by Contractor        | Name              | Sign                | Date/Serial Number                       | Time             |                                     |    |    |    |    |    |    |
|                             | Eng. MAHMOUD DIAB | <i>Mahmoud Diab</i> | 14/08/2023<br>S5 -A-AD-5 -M.A.R. QT - 01 | 10:00            |                                     |    |    |    |    |    |    |
| Received by GARB CONSULTANT | Eng. SAIED SAIF   | <i>[Signature]</i>  | MAR                                      | C1               | C2                                  | C3 | DD | MM | YY | HH | MM |
|                             |                   |                     |                                          | 335              | EW                                  | CS | 15 | 8  | 23 | 10 | 0  |

|          |                         |                 |                                           |
|----------|-------------------------|-----------------|-------------------------------------------|
| 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(3000 m3 ) |                      |                                                                               |
| Location to be Used        | المشور                              |                      |                                                                               |
| Sample only                | Yes                                 | Materials Type       | fill layers                                                                   |
| Supplier Name              |                                     | Data Sheet provided  | Yes attached                                                                  |
| Reference in BoQ           |                                     | Specification        | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41 2) VERSION 2 CIVECON GROUP |
| Prequalification reference |                                     | Test Samples Results |                                                                               |
| Reference Photos           | No/Yes                              | Other                |                                                                               |

Comments by: Eng.khaled Zaki (k.k)

Comments by: Eng. Alaa Abd-Allatif (ER)

QUALITY TEST RESULT IS APPROVED

- 1- one sample was selected for quality test
- 2- All tests were carried - out by comibassal Lab .
- 3- results attached and found acceptable and comply with proj. specs.
- 4- final approval is subject to above mentioned comments
- 5-The original copy is attached to (S5 -A-AD-2 -M.A.R. QT - 01)

| APPROVAL STATUS          |                       |                     |           |         |
|--------------------------|-----------------------|---------------------|-----------|---------|
| Organisation             | Name                  | Sign                | Date      | A-AWC-R |
| Contractor               | Eng.Mahmoud Diab      | <i>Mahmoud Diab</i> |           | A       |
| QA/QC *                  | Eng. SAIED SAIF       | <i>[Signature]</i>  |           | A       |
| GARB**                   | Eng. Margret Magdy    |                     |           |         |
| Employers Representative | Eng. Alaa Abd-Allatif | <i>[Signature]</i>  | 24-8-2023 | Awc     |

\* Designer

\*\* Alignment/Bridges: Culvert: only



# COMIBASSAL International Controllers

## Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/29-11-2011

## SOIL REPORTS FOR ELECTRIC EXPRESS TRAIN PROJECT

**Contractor :** شركة علاء الدين وشركاؤه للمقاولات المتكاملة  
**Date :** 24/8/2023  
**QC :** 936



# COMIBASSAL International Controllers

## Internal inspection and laboratories sector

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### I- Introduction

General Consultant : SYSTRA  
Consultant : Dr/Khaled kandil  
Contractor : شركة علاء الدين وشركاؤه للمقاولات المتكاملة  
Sample : Ferma  
Station : St(334+500)  
Date of Test : 20/8/2023  
QC : 936

### II- Sample description:

Gravel and Sand job mix (80:20)

### III- Required tests and Results

| Required Tests                                                                                   |                     | Results               |
|--------------------------------------------------------------------------------------------------|---------------------|-----------------------|
| 1- Grain size analysis and classification and Percentage of MATERIALS FINER THAN No. 200 (75 µm) | Grain size analysis | As showed in appendix |
|                                                                                                  | Classification      | A-1-b                 |
|                                                                                                  | Pass From No.200    | 9.0%                  |
| 2- Modified compaction (Proctor test)                                                            | MDD                 | 2.155                 |
|                                                                                                  | OMC                 | 6.6%                  |
|                                                                                                  | LL                  | NP                    |
| 3- Liquid limit, plastic lim/t and plasticity index                                              | PL                  | NP                    |
|                                                                                                  | PI                  | NP                    |
|                                                                                                  | CBR ratio           | 30%                   |

### 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. H. Dr. Mohamed Mostafa Badry

Kilo 23 Alexandria - Cairo Desert Road - Merghem

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# COMIBASSAL International Controllers

## Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011

# APPENDIX

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# COMIBASSAL International Controllers

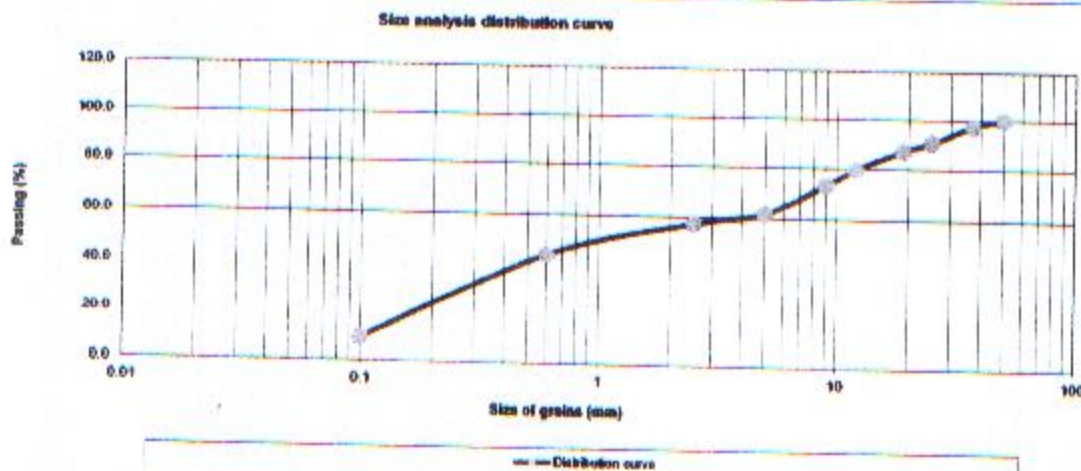
## Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/29-11-2011

### PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

|        | WEIGHT<br>RETAINED<br>(gm) | CUMULATIVE<br>WEIGHT<br>RETAINED (gm) | CUMULATIVE<br>PERCENTAGE<br>RETAINED (%) | CUMULATIVE<br>PERCENTAGE<br>PASSING (%) | STANDARD<br>SPECIFICATION<br>LIMITS |
|--------|----------------------------|---------------------------------------|------------------------------------------|-----------------------------------------|-------------------------------------|
| 2      | 0.00                       | 0.00                                  | 0.00                                     | 100.0                                   |                                     |
| 1 1/2  | 256.00                     | 256.00                                | 2.56                                     | 97.4                                    |                                     |
| 1      | 670.00                     | 926.00                                | 9.26                                     | 90.7                                    |                                     |
| 3/4    | 359.00                     | 1285.00                               | 12.85                                    | 87.2                                    |                                     |
| 1/2    | 781.00                     | 2066.00                               | 20.66                                    | 79.3                                    |                                     |
| 3/8    | 609.00                     | 2675.00                               | 26.75                                    | 73.3                                    |                                     |
| No.4   | 1162.00                    | 3837.00                               | 38.37                                    | 61.6                                    |                                     |
| No.10  | 34.00                      | 34.00                                 | 6.80                                     | 57.4                                    |                                     |
| No.40  | 145.00                     | 145.00                                | 29.00                                    | 43.8                                    |                                     |
| No.200 | 427.00                     | 427.00                                | 85.40                                    | 9.0                                     |                                     |

Total sample weight = 10000.00 pass No.4= 6183.0 Total fine aggregates weight = 500 gm  
% 61.6



Soil classification: A - 1 - b 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

### Modified Proctor Test Report ASTM - D 1557

Mould Number :- 1  
Volume of mould = 2165 cm<sup>3</sup>  
Weight of mould = 5854 g  
G.S = 2.7 g/cm<sup>3</sup>

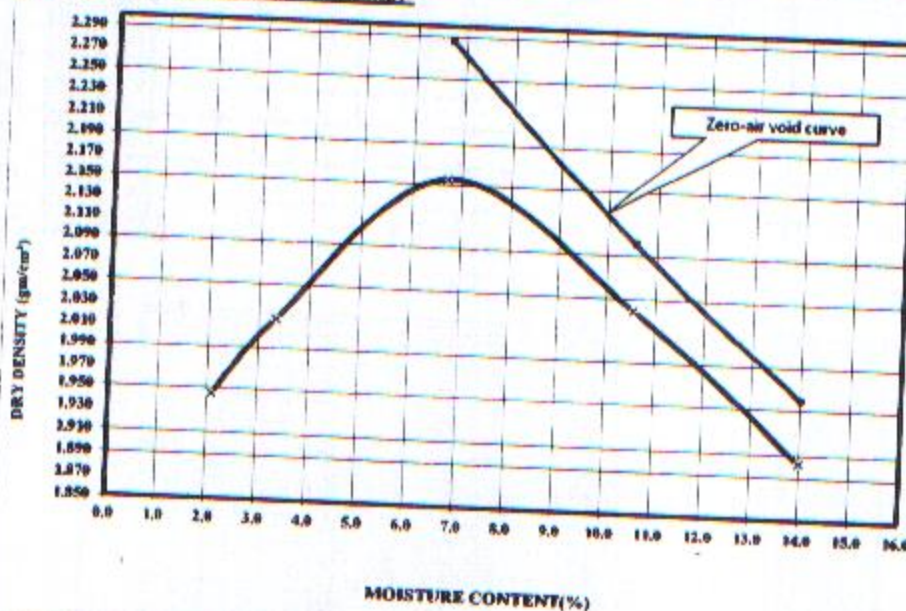
#### A- Density Calculations :-

|                                    | 1     | 2     | 3     | 4     | 5     |
|------------------------------------|-------|-------|-------|-------|-------|
| Weight of wet soil+mould (g)       | 9423  | 9646  | 10125 | 10023 | 9832  |
| Weight of mould (g)                | 4994  | 4994  | 4994  | 4994  | 4994  |
| Weight of wet soil (g)             | 4429  | 4652  | 5131  | 5029  | 4838  |
| Volume of mould (cm <sup>3</sup> ) | 2231  | 2231  | 2231  | 2231  | 2231  |
| Wet density (g/cm <sup>3</sup> )   | 1.985 | 2.085 | 2.300 | 2.254 | 2.169 |
| Dry density (g/cm <sup>3</sup> )   | 1.945 | 2.018 | 2.155 | 2.039 | 1.902 |
| Zero-air Void curve                |       |       | 2.286 | 2.101 | 1.960 |

#### 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) | 245.5 | 243.0 | 236.0 | 229.0 | 223.0 |
| Weight of container (g)          | 30.0  | 33.0  | 27.0  | 30.0  | 30.0  |
| moisture content(%)              | 2.1   | 3.3   | 6.7   | 10.6  | 14.0  |

#### C - Dry density-Moisture relationship:-



M.D.D = 2.155 gm/cm<sup>3</sup>  
O.M.C = 6.60 %





# COMIBASSAL International Controllers

## Internal inspection and laboratories sector

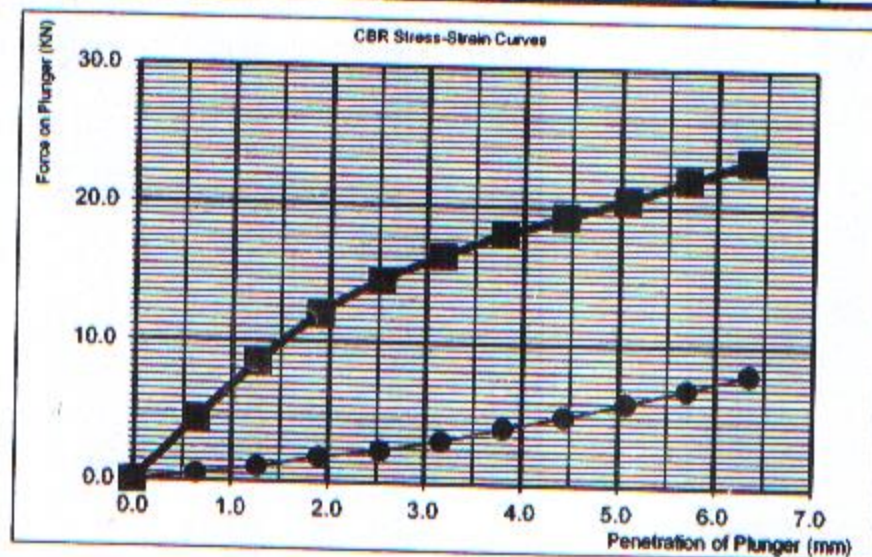
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### Report Of CBR Test - ASTM - D 1883

|                    |                   |  |                  |        |       |
|--------------------|-------------------|--|------------------|--------|-------|
| NO OF BLOWS        | 56                |  |                  |        |       |
| MOULD NO           | 1                 |  |                  |        |       |
| WT OF MOULD+SOIL   | 10945             |  |                  |        |       |
| WT OF MOULD        | 5890              |  |                  |        |       |
| WT OF SOIL         | 5055              |  |                  |        |       |
| VOLUME OF MOULD    | 2200              |  |                  |        |       |
| WET DENSITY        | 2.298             |  |                  |        |       |
|                    | MC before soaking |  | Weight of Rammer | 4.54Kg |       |
| TIN NO             | 1                 |  | MDD              | Kg/m3  | 2.155 |
| WT OF WET SOIL+TIN | 250.00            |  |                  |        |       |
| WT OF DRY SOIL+TIN | 234               |  | OMC              | %      | 6.6   |
| WT OF WATER        | 16.00             |  |                  |        |       |
| WT OF TIN          | 31                |  |                  |        |       |
| WT OF DRY SOIL     | 203               |  |                  |        |       |
| MOISTURE CONTENT   | 7.9               |  |                  |        |       |
| DRY DENSITY        | 2.130             |  |                  |        |       |

| Pen  | Reading (Div) | Bearing (KN) | CBR     |
|------|---------------|--------------|---------|
| mm   | 56            | 56           | standar |
| 0.00 | 0             | 0.0          | 56      |
| 0.64 | 55            | 0.5          | 0.0     |
| 1.27 | 110           | 1.1          | 4.5     |
| 1.91 | 190           | 1.9          | 8.5     |
| 2.54 | 245           | 2.4          | 12.0    |
| 3.17 | 320           | 3.1          | 14.5    |
| 3.81 | 420           | 4.1          | 16.3    |
| 4.45 | 510           | 5.0          | 18.0    |
| 5.08 | 610           | 6.0          | 19.3    |
| 5.71 | 710           | 7.0          | 20.5    |
| 6.35 | 820           | 8.0          | 21.9    |
|      |               |              | 23.3    |



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# COMIBASSAL International Controllers

## Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/28-11-2011

|          |                  |
|----------|------------------|
| Report : | 388 - 1 - Center |
| Date :   | 24/08/2023       |

### CHEMICAL ANALYSIS

General Consultant : SYSTRA  
Consultant : Dr/ Khaled Kandil  
Contractor : شركة علام الدين وشركاه للمقاولات المتكاملة  
Project : Electric express train  
Sample : FERMA  
Station : ST( 334 +500 )  
Date of Test : 20- 8 -2023  
Temperature : 28 °C  
Humidity : 35%

| ANALYSIS       | RESULTS  | METHOD REFERENCE |
|----------------|----------|------------------|
| ORGANIC MATTER | NEGATIVE | ASTM D 2974      |



LAB DIRECTOR  
CH/ Mostafa Asker

*Moustaf*

|                             |                            |      |                    |                  |                                     |    |    |    |    |    |    |
|-----------------------------|----------------------------|------|--------------------|------------------|-------------------------------------|----|----|----|----|----|----|
| Contractor Company          | ALADDIN(5)                 |      |                    | Designer Company | (K.K) Engineering Consulting Office |    |    |    |    |    |    |
| Issued by Contractor        | Name                       | Sign | Date/Serial Number | Time             |                                     |    |    |    |    |    |    |
|                             | Eng. MAHMOUD DIAB          |      | 02/10/2023         | 10:00            |                                     |    |    |    |    |    |    |
|                             | S5 -A-AD-5 -M.A.R. QT - 02 |      |                    |                  |                                     |    |    |    |    |    |    |
| Received by GARB CONSULTANT | Eng. SAIED SAIF            |      | MAR                | C1               | C2                                  | C3 | DD | MM | YY | HH | MM |
|                             |                            |      |                    | 334              | EW                                  | CS | 3  | 10 | 23 | 10 | 0  |

|          |                         |                 |                                           |
|----------|-------------------------|-----------------|-------------------------------------------|
| 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(1000 m3 ) |                                                                                                                                                                                                                                                                                                                     |                                                                               |
|----------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Location to be Used                    | المشور                              |                                                                                                                                                                                                                                                                                                                     |                                                                               |
| Sample only                            | Yes                                 | Materials Type                                                                                                                                                                                                                                                                                                      | fill layers                                                                   |
| Supplier Name                          |                                     | Data Sheet provided                                                                                                                                                                                                                                                                                                 | Yes attached                                                                  |
| Reference in BoQ                       |                                     | Specification                                                                                                                                                                                                                                                                                                       | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 CIVECON GROUP |
| Prequalification reference             |                                     | Test Samples Results                                                                                                                                                                                                                                                                                                |                                                                               |
| Reference Photos                       | No/Yes                              | Other                                                                                                                                                                                                                                                                                                               |                                                                               |
| Comments by: Eng.khaled Zaki (k.k)     |                                     | Comments by: Eng. Alaa Abd-Allatif (ER)                                                                                                                                                                                                                                                                             |                                                                               |
| <b>QUALITY TEST RESULT IS APPROVED</b> |                                     | 1- one sample was selected for quality test<br><br>2- All tests were carried - out by CEL Lab .<br><br>3- results attached and found acceptable and comply with proj. specs.<br><br>4- final approval is subject to above mentioned comments<br><br>5-The original copy is attached to (S5 -A-AD-2 -M.A.R. QT - 02) |                                                                               |

| APPROVAL STATUS          |                       |      |            |         |
|--------------------------|-----------------------|------|------------|---------|
| Organisation             | Name                  | Sign | Date       | A-AWC-R |
| Contractor               | Eng.Mahmoud Diab      |      |            | A       |
| QA/QC *                  | Eng. SAIED SAIF       |      |            | A       |
| GARB**                   | Eng. Margret Magdy    |      |            |         |
| Employers Representative | Eng. Alaa Abd-Allatif |      | 16-10-2023 | AWC     |

\* Designer

\*\* Alignment/Bridges: Curven only

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 03/10/2023  
Reporting Date : 16/10/2023  
Reporting No. : 04  
Sample No. : 04

Dear Gentleman,

Attached here with the Soil Embankment delivered on 03/10/2023

### Materials test

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883
7. Organic Content ASTM D-2974

*Note: The client to our laboratory brought the sample and the laboratory is not responsible for the way it is taken.*

Signature /...02...  
الساحل البشير  
مكتب معامل الاستشارات الهندسية  
المرکز الرئيسي: شارع الملك الأفصل - الزمالة - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 03/10/2023  
Reporting Date : 16/10/2023  
Reporting No. : 04  
Sample No. : 04

**RESULTS OF SIEVE ANALYSIS According to ASTM D-C 136**

| Sieve Size<br>(mm) | Passing % |
|--------------------|-----------|
| 50                 | 100       |
| 37.5               | 96.6      |
| 25                 | 89.3      |
| 19                 | 74.6      |
| 12.50              | 67.2      |
| 9.50               | 59.4      |
| 4.75               | 51.4      |
| 2.36               | 46.2      |
| 2.00               | 43.7      |
| 1.18               | 38.9      |
| 0.600              | 34.1      |
| 0.425              | 28.7      |
| 0.300              | 21.3      |
| 0.150              | 18.6      |

Signature



Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 03/10/2023  
Reporting Date : 16/10/2023  
Reporting No. : 04  
Sample No. : 04

**Materials finer than 75  $\mu$ m (no.200) sieve  
by washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ m (No.200) | 10.9           |

Signature / .....  
مكتب معامل الاستشارات الهندسية  
الاستاذ المساعد  
02  
د. محمد توفيق - مدير عام  
د. محمد توفيق - مدير عام

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 03/10/2023  
Reporting Date : 16/10/2023  
Reporting No. : 04  
Sample No. : 04

**Results of liquid limit and plasticity index  
of soils according to ASTM D-4318**

| Test             | Results<br>(%) |
|------------------|----------------|
| Liquid Limit     | NP             |
| Plastic Limit    | NP             |
| Plasticity Index | NP             |

Signature:   
الساحيل الشهابي  
مكتب معامل الاستشارات الهندسية  
الرئيس - شارع الملك الأفصل - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 03/10/2023  
Reporting Date : 16/10/2023  
Reporting No. : 04  
Sample No. : 04

**Soil Classification According to Project Specs (Embankment)**

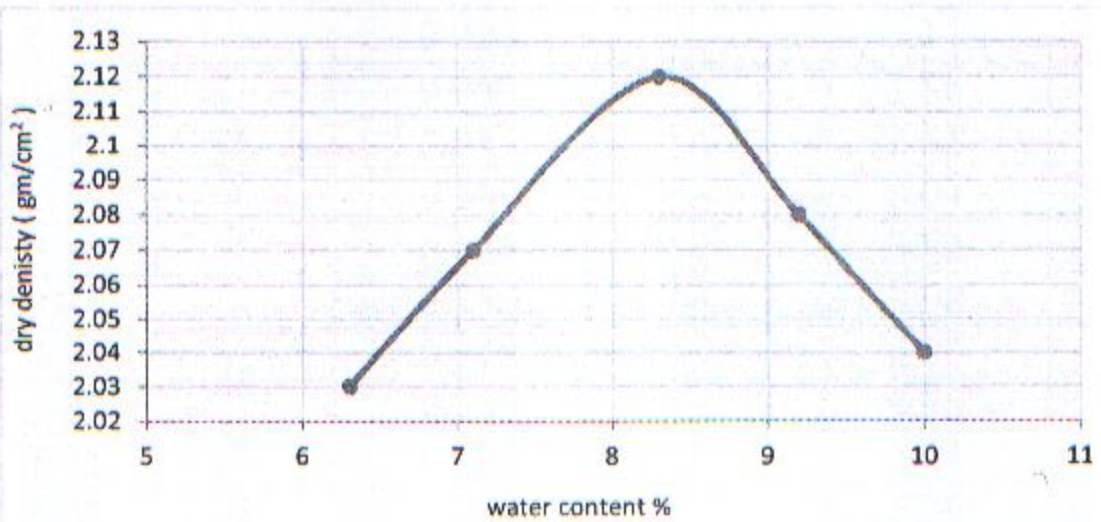
| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |
|------------------------------------------------------|----------------|------------------------------------|----------|
| Group Classification                                 | (A-1-a)        | (A-1-a)                            | (A-1-b)  |
| 2.00 mm (No.10).                                     | 43.7           | Max 50 %                           | -----    |
| 0.425 mm (No. 40).                                   | 28.7           | Max 30 %                           | Max 50 % |
| 0.075 mm (No. 200).                                  | 10.9           | Max 15 %                           | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |
| Liquid Limit .....                                   | NP             | -----                              | -----    |
| Plasticity index .....                               | NP             | Max 6 %                            | Max 6 %  |

The test results are (☒ Comply - ☐ Not Comply) with specifications limits

**Signature**  
مكتب معامل الاستشارات الهندسية  
.....  
المركز الرئيسي : شارع الملك الأفضل - الزمالة - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 03/10/2023  
Reporting Date : 16/10/2023  
Reporting No. : 04  
Sample No. : 04

**Moisture – Density relation of soil**  
**Test result (Modified proctor test)**  
**ASTM D-1557**



- Max dry density (gm/cm³) : 2.12
- Optimum moisture content % : 8.3

Signature

CEL  
مكتب معامل الاستشارات الهندسية  
٣٠٠ شارع النيل - القاهرة  
شركة التأسيس ٢ شارع الملك الأفيل - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
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Delivery Date : 03/10/2023  
Reporting Date : 16/10/2023  
Reporting No. : 04  
Sample No. : 04

**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 1.17                   |
| 1.27        | 0.050 | 1.86                   |
| 1.91        | 0.075 | 2.51                   |
| 2.54        | 0.100 | 3.04                   |
| 3.18        | 0.125 | 3.52                   |
| 3.81        | 0.150 | 3.98                   |
| 4.45        | 0.175 | 4.38                   |
| 5.08        | 0.200 | 4.76                   |
| 5.71        | 0.225 | 5.01                   |
| 6.35        | 0.250 | 5.34                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 44.1  |
|                                   | 6.90         | 3.04           |       |

**Notes :**

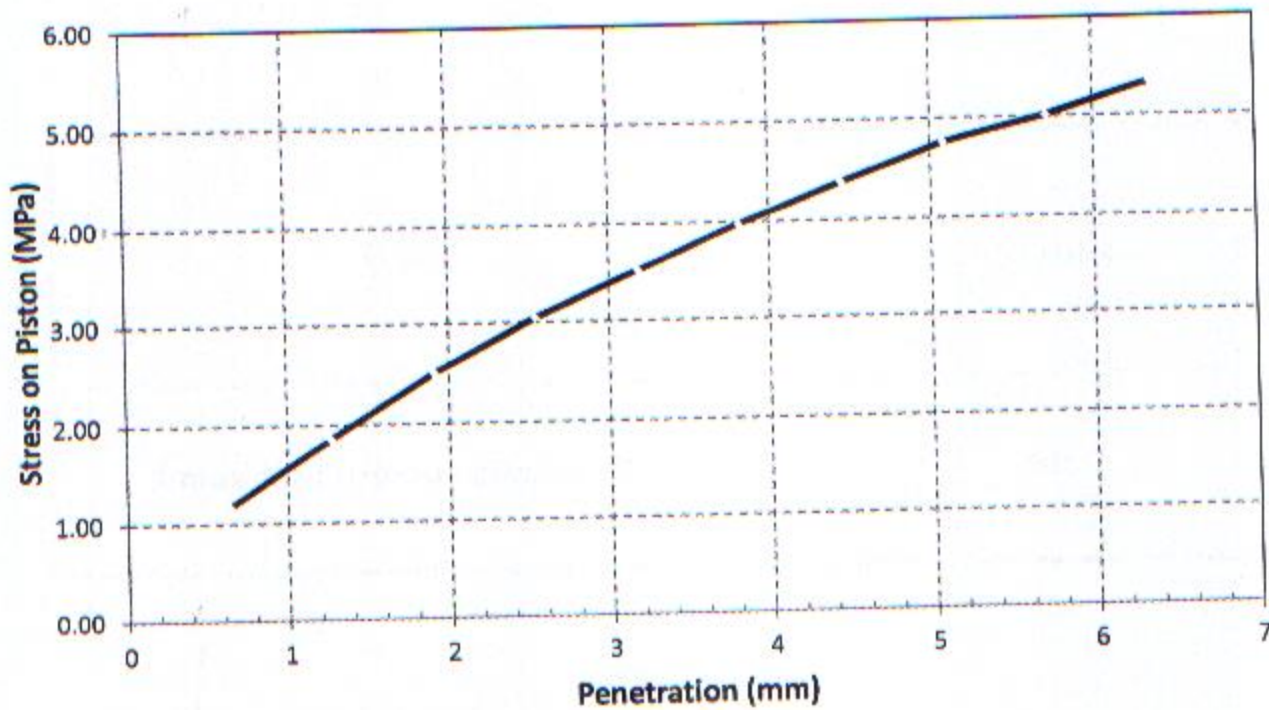
- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of 2.12 (gm /cm<sup>3</sup>) at 8.3 % optimum water content.
- 3- Surcharge load 450 Kg.

Signature

02

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 03/10/2023  
Reporting Date : 16/10/2023  
Reporting No. : 04  
Sample No. : 04

**Load Penetration Curve of CBR Test**  
**ASTM D-1883**



CEL  
مكتب معاميل الإستشارات الهندسية  
الساحل الشمالي 02  
Signature /

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 03/10/2023  
Reporting Date : 16/10/2023  
Reporting No. : 04  
Sample No. : 04

**Organic of Soil ASTM D-2974**  
**Method Type D**

| Test                        | Results |
|-----------------------------|---------|
| Amount of organic content % | Nil     |

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مكتب معامل الاستشارات الهندسية  
الساحل الشمالي 02  
البريد الإلكتروني : info@cel-egypt.com

# MATERIAL APPROVAL REQUEST



|                             |                   |               |     |                                          |                                     |          |          |          |          |          |         |
|-----------------------------|-------------------|---------------|-----|------------------------------------------|-------------------------------------|----------|----------|----------|----------|----------|---------|
| Contractor Company          | ALADDIN(5)        |               |     | Designer Company                         | (K.K) Engineering Consulting Office |          |          |          |          |          |         |
| Issued by Contractor        | Name              | Sign          |     | Date/Serial Number                       | Time                                |          |          |          |          |          |         |
|                             | Eng. MAHMOUD DIAB | <i>maumad</i> |     | 14/10/2023<br>S5 -A-AD-5 -M.A.R. QT - 03 | 10:00                               |          |          |          |          |          |         |
| Received by GARB CONSULTANT | Eng. SAIED SAIF   | <i>SA</i>     | MAR | C1<br>334                                | C2<br>EW                            | C3<br>CS | DD<br>15 | MM<br>10 | YY<br>23 | HH<br>10 | MM<br>0 |

|        |                         |                 |                                           |
|--------|-------------------------|-----------------|-------------------------------------------|
| 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(1500 m3 ) |                      |                                                                               |
| Location to be Used        | العشون                              |                      |                                                                               |
| Sample only                | Yes                                 | Materials Type       | fill layers                                                                   |
| Supplier Name              |                                     | Data Sheet provided  | Yes attached                                                                  |
| Reference in BoQ           |                                     | Specification        | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41 2) VERSION 2 GIVECON GROUP |
| Prequalification reference |                                     | Test Samples Results |                                                                               |
| Reference Photos           | No/Yes                              | Other                |                                                                               |

|                                    |                                                                                                                                                                                                                                                                                                    |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Comments by: Eng.khaled Zaki (k.k) | Comments by: Eng. Alaa Abd-Allatif (ER)                                                                                                                                                                                                                                                            |
| QUALITY TEST RESULT IS APPROVED    | 1- one sample was selected for quality test<br>2- All tests were carried - out by CEL Lab .<br>3- results attached and found acceptable and comply with proj. specs.<br>4- final approval is subject to above mentioned comments<br>5-The original copy is attached to (S5 -A-AD-2-M.A.R. QT - 03) |

| APPROVAL STATUS          |                       |                 |            |         |
|--------------------------|-----------------------|-----------------|------------|---------|
| Organisation             | Name                  | Sign            | Date       | A-AWC-R |
| Contractor               | Eng.Mahmoud Diab      | <i>maumad</i>   |            | A       |
| QA/QC *                  | Eng. SAIED SAIF       | <i>SA</i>       |            | A       |
| GARB**                   | Eng. Margret Magdy    |                 |            |         |
| Employers Representative | Eng. Alaa Abd-Allatif | <i>for Alaa</i> | 26-10-2023 | Awc     |

\* Designer

\*\* Alignment/Bridges: Culvert only

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample No. : 06

Dear Gentleman,

Attached here with the Soil Embankment delivered on 15/10/2023

### Materials test

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883
7. Organic Content ASTM D-2974

*Note: The client to our laboratory brought the sample and the laboratory is not responsible for the way it is taken.*

Signature / 

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample No. : 06

## RESULTS OF SIEVE ANALYSIS According to ASTM D-C 136

| Sieve Size<br>(mm) | Passing % |
|--------------------|-----------|
| 50                 | 100       |
| 37.5               | 97.5      |
| 25                 | 84.0      |
| 19                 | 77.8      |
| 12.50              | 67.5      |
| 9.50               | 63.1      |
| 4.75               | 60.8      |
| 2.36               | 53.6      |
| 2.00               | 48.9      |
| 1.18               | 43.6      |
| 0.600              | 38.9      |
| 0.425              | 33.4      |
| 0.300              | 24.6      |
| 0.150              | 19.6      |

CEL  
مكتب معامل الاستشارات الهندسية  
Signature: .....  
المركز الرئيسي : شارع النيل - الزمالة - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample No. : 06

**Materials finer than 75  $\mu$ m (no.200) sieve  
by washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 11.7           |

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السيد جمال الشحات  
المقر الرئيسي : شارع الملك الأفصل - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample No. : 06

**Results of liquid limit and plasticity index  
of soils according to ASTM D-4318**

| Test             | Results<br>(%) |
|------------------|----------------|
| Liquid Limit     | NP             |
| Plastic Limit    | NP             |
| Plasticity Index | NP             |



Company Name : علام الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample No. : 06

**Soil Classification According to Project Specs (Embankment)**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |
|------------------------------------------------------|----------------|------------------------------------|----------|
| Group Classification                                 | (A-1-a)        | (A-1-a)                            | (A-1-b)  |
| 2.00 mm (No.10).                                     | 48.9           | Max 50 %                           | -----    |
| 0.425 mm (No. 40).                                   | 33.4           | Max 30 %                           | Max 50 % |
| 0.075 mm (No. 200).                                  | 11.7           | Max 15 %                           | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |
| Liquid Limit .....                                   | NP             | -----                              | -----    |
| Plasticity index .....                               | NP             | Max 6 %                            | Max 6 %  |

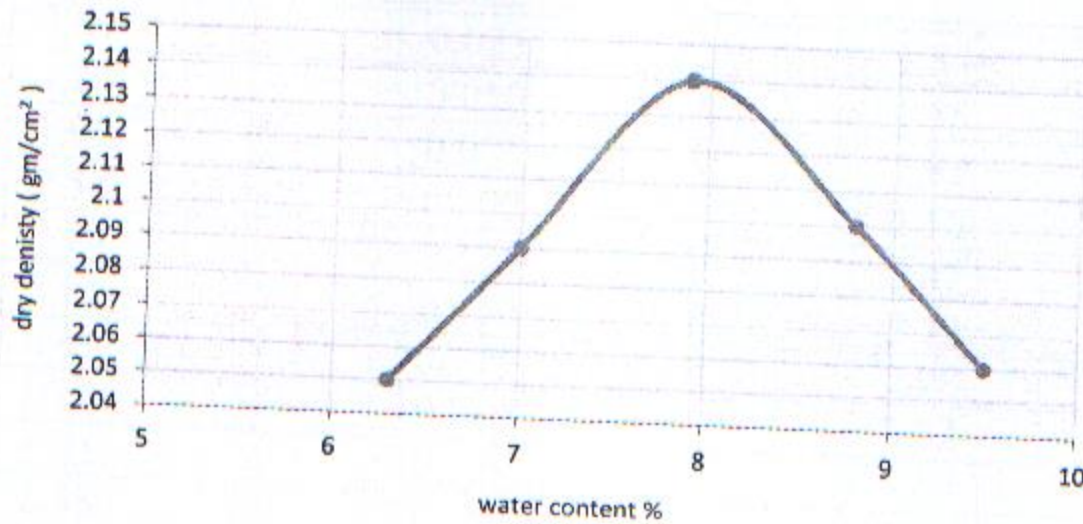
The test results are (☒ Comply - ☐ Not Comply) with specifications limits

Signature

مكتب معامل الاستشارات الهندسية  
الملك الأفصل  
الرئيس: ٣ شارع الملك الأفصل - الزمالك - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample No. : 06

**Moisture – Density relation of soil**  
**Test result (Modified proctor test)**  
**ASTM D-1557**



- Max dry density (gm/cm³) : 2.12
- Optimum moisture content % : 8.1

Signature :   
مكتب معامل الاستشارات الهندسية  
الساحل الشمالي 02

المركز الرئيسي : شارع عبد الفتاح الزكي - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
 Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
 Type of sample : Soil Embankment  
 Location : St. 334+000  
 Delivery Date : 15/10/2023  
 Reporting Date : 26/10/2023  
 Reporting No. : 06  
 Sample No. : 06

**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 1.34                   |
| 1.27        | 0.050 | 1.55                   |
| 1.91        | 0.075 | 1.83                   |
| 2.54        | 0.100 | 2.10                   |
| 3.18        | 0.125 | 2.47                   |
| 3.81        | 0.150 | 2.72                   |
| 4.45        | 0.175 | 2.98                   |
| 5.08        | 0.200 | 3.32                   |
| 5.71        | 0.225 | 3.67                   |
| 6.35        | 0.250 | 3.98                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 30.5  |
|                                   | 6.90         | 2.10           |       |

**Notes :**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of 2.12 (gm /cm<sup>3</sup>) at 8.1 % optimum water content.

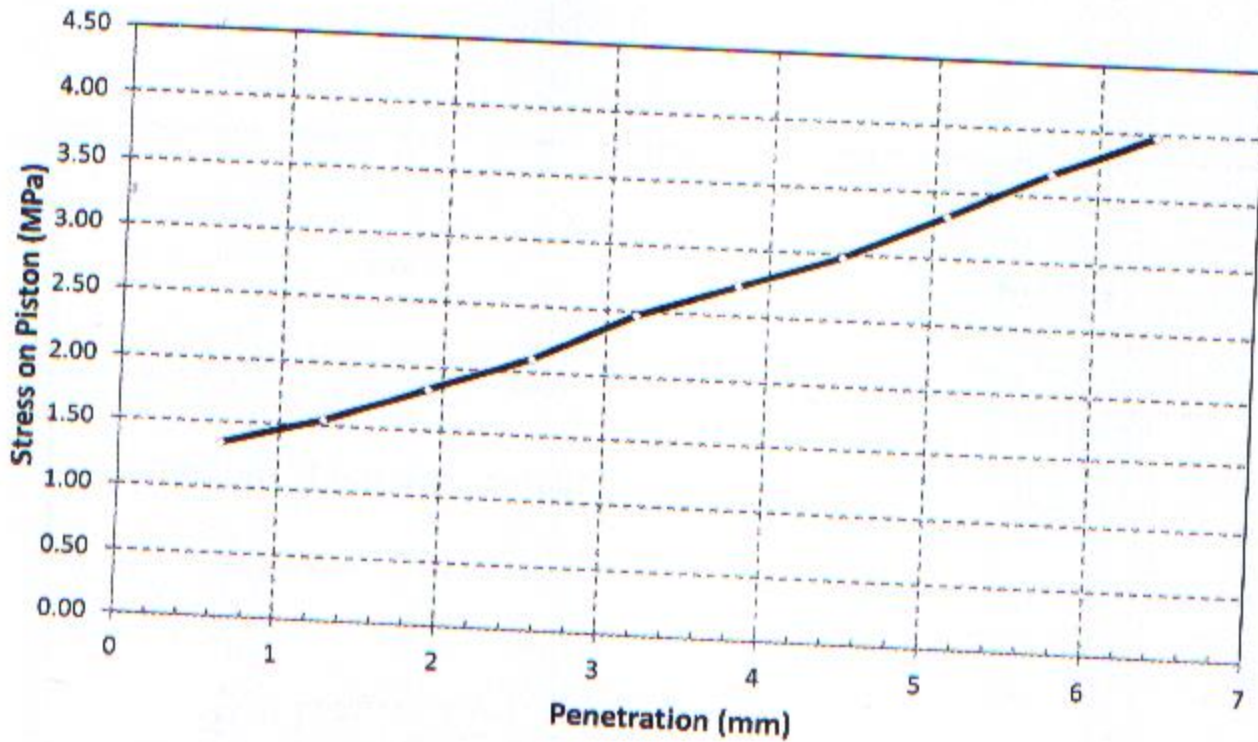
3- Surcharge load 4.50 Kgs

Signature /

الساحم الشامي 02

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample No. : 06

## Load Penetration Curve of CBR Test ASTM D-1883



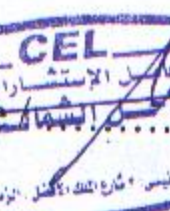
Signature / .....  
المهندس / .....  
المركز الرئيسي : شارع الملك الأفندي - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample No. : 06

## Organic of Soil ASTM D-2974

### Method Type D

| Test                        | Results |
|-----------------------------|---------|
| Amount of organic content % | Nil     |

Signature:   
مكتب معامل الاستشارات الهندسية  
شركة التأسيس - شارع الملك الأفضل - الزمالة - القاهرة

# MATERIAL APPROVAL REQUEST



|                             |                   |                     |                                         |                                     |          |          |         |          |          |          |         |
|-----------------------------|-------------------|---------------------|-----------------------------------------|-------------------------------------|----------|----------|---------|----------|----------|----------|---------|
| Contractor Company          | ALADDIN(5)        |                     | Designer Company                        | (K.K) Engineering Consulting Office |          |          |         |          |          |          |         |
| Issued by Contractor        | Name              | Sign                | Date/Serial Number                      | Time                                |          |          |         |          |          |          |         |
|                             | Eng. MAHMOUD DIAB | <i>Mahmoud Diab</i> | 2/12/2023<br>S5 -A-AD-5 -M.A.R. QT - 04 | 10:00                               |          |          |         |          |          |          |         |
| Received by GARB CONSULTANT | Eng. SAIED SAIF   | <i>Saied Saif</i>   | MAR                                     | C1<br>334                           | C2<br>EW | C3<br>CS | DD<br>8 | MM<br>12 | YY<br>23 | HH<br>10 | MM<br>0 |

|          |                         |                 |                                           |
|----------|-------------------------|-----------------|-------------------------------------------|
| 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(1500 m3 ) |                      |                                                                               |
| Location to be Used        | المشور                              |                      |                                                                               |
| Sample only                | Yes                                 | Materials Type       | fill layers                                                                   |
| Supplier Name              |                                     | Data Sheet provided  | Yes attached                                                                  |
| Reference in BoQ           |                                     | Specification        | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 CIVECON GROUP |
| Prequalification reference |                                     | Test Samples Results |                                                                               |
| Reference Photos           | No/Yes                              | Other                |                                                                               |

|                                    |                                                                                                                                                                                                                                                                                                     |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Comments by: Eng.khaled Zaki (k.k) | Comments by: Eng. Alaa Abd-Allatif (ER)                                                                                                                                                                                                                                                             |
| QUALITY TEST RESULT IS APPROVED    | 1- one sample was selected for quality test<br>2- All tests were carried - out by CEL Lab .<br>3- results attached and found acceptable and comply with proj. specs.<br>4- final approval is subject to above mentioned comments<br>5-The original copy is attached to (S5 -A-AD-3 -M.A.R. QT - 05) |

| APPROVAL STATUS          |                       |                             |            |         |
|--------------------------|-----------------------|-----------------------------|------------|---------|
| Organisation             | Name                  | Sign                        | Date       | A-AWC-R |
| Contractor               | Eng.Mahmoud Diab      | <i>Mahmoud Diab</i>         |            | A       |
| QA/QC *                  | Eng. SAIED SAIF       | <i>Saied Saif</i>           |            | A       |
| GARB**                   | Eng. Margret Magdy    |                             |            |         |
| Employers Representative | Eng. Alaa Abd-Allatif | <i>for Alaa Abd-Allatif</i> | 19-12-2023 | Awc     |

\* Designer

\*\* Alignment/Bridges: Culvert only

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Reporting Date : 03/12/2023  
Reporting Date : 19/12/2023  
Reporting No. : 09  
Sample No. : 09

Dear Gentleman,

Attached here with the Soil Embankment delivered on 25/10/2023

### Materials test

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883
7. Organic Content ASTM D-2974

*Note: The client to our laboratory brought the sample and the laboratory is not responsible for the way it is taken.*

Signature  02

Company Name : علاء الدين و شركاه للمقاولات المتكاملة :  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Reporting Date : 03/12/2023  
Reporting Date : 19/12/2023  
Reporting No. : 09  
Sample No. : 09

**RESULTS OF SIEVE ANALYSIS According to ASTM D-C 136**

| Sieve Size<br>(mm) | Passing % |
|--------------------|-----------|
| 50                 | 100       |
| 37.5               | 99.2      |
| 25                 | 91.2      |
| 19                 | 81.2      |
| 12.50              | 71.4      |
| 9.50               | 62.3      |
| 4.75               | 54.1      |
| 2.36               | 49.8      |
| 2.00               | 46.2      |
| 1.18               | 41.2      |
| 0.600              | 34.9      |
| 0.425              | 28.2      |
| 0.300              | 23.4      |
| 0.150              | 18.9      |

مكتب معامل الإستشارات الهندسية  
المساحة 02  
Signature / .....

Company Name : علاء الدين و شركاه للمقاولات المتكاملة :  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Reporting Date : 03/12/2023  
Reporting Date : 19/12/2023  
Reporting No. : 09  
Sample No. : 09

**Materials finer than 75  $\mu$ m (no.200) sieve  
by washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 9.8            |

**CEL**  
مكتب معامل الاستشارات الهندسية  
التمثيل حسن الشاذلي  
Signature 02  
المرشد الرئيسي - شارع الملك الأفضل - الزمالك - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Reporting Date : 03/12/2023  
Reporting Date : 19/12/2023  
Reporting No. : 09  
Sample No. : 09

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results (%) |
|------------------|-------------|
| Liquid Limit     | NP          |
| Plastic Limit    | NP          |
| Plasticity Index | NP          |

  
مكتب معامل الإستشارات الهندسية  
... المهندس ...  
02  
برام التوقيع : شبرا للبناء الأفضل - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Reporting Date : 03/12/2023  
Reporting Date : 19/12/2023  
Reporting No. : 09  
Sample No. : 09

### Soil Classification According to Project Specs (Embankment)

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |
|------------------------------------------------------|----------------|------------------------------------|----------|
| Group Classification                                 | (A-1-a)        | (A-1-a)                            | (A-1-b)  |
| 2.00 mm (No.10).                                     | 46.2           | Max 50 %                           | -----    |
| 0.425 mm (No. 40).                                   | 28.2           | Max 30 %                           | Max 50 % |
| 0.075 mm (No. 200).                                  | 9.8            | Max 15 %                           | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |
| Liquid Limit .....                                   | NP             | -----                              | -----    |
| Plasticity index .....                               | NP             | Max 6 %                            | Max 6 %  |

The test results are (☒ Comply - ☐ Not Comply) with specifications limits

Signature:   
مكتبة معامل الاستشارات الهندسية  
الملك الأفضل  
شارع الملك الأفضل - الجيزة - القاهرة

5

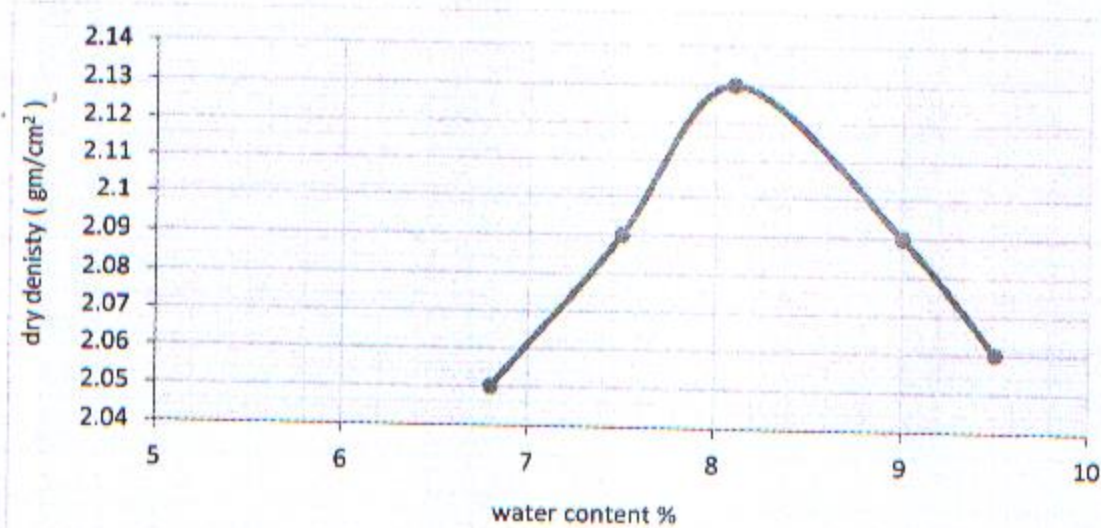
3 El Malek El Afdal Street  
Zamalek, Cairo.  
Tel.& Fax : 27367231 - 27363093



ش الملك الأفضل  
الزمالك - القاهرة  
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣  
www.cel-egypt.com

Company Name : علام الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Reporting Date : 03/12/2023  
Reporting Date : 19/12/2023  
Reporting No. : 09  
Sample No. : 09

**Moisture – Density relation of soil**  
**Test result (Modified proctor test)**  
**ASTM D-1557**



- Max dry density (gm/cm³) : 2.13
- Optimum moisture content % : 8.1

Signature /   
مكتب معامل الاستشارات الهندسية  
المعامل الشمالي 02  
بني سويف - شارع الملك الأفضل - الزمالة - القاهرة

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Reporting Date : 03/12/2023  
Reporting Date : 19/12/2023  
Reporting No. : 09  
Sample No. : 09

**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 2.12                   |
| 1.27        | 0.050 | 2.69                   |
| 1.91        | 0.075 | 3.16                   |
| 2.54        | 0.100 | 3.49                   |
| 3.18        | 0.125 | 3.84                   |
| 3.81        | 0.150 | 4.18                   |
| 4.45        | 0.175 | 4.50                   |
| 5.08        | 0.200 | 4.86                   |
| 5.71        | 0.225 | 5.23                   |
| 6.35        | 0.250 | 5.56                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 50.6  |
|                                   | 6.90         | 3.49           |       |

**Notes :**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of 2.13 (gm /cm<sup>3</sup>) at 8.1 % optimum water content.

3- Surcharge load 4.50 Kg/cm<sup>2</sup>

Signature

شركة المهندس علاء الدين و شركاه للمقاولات المتكاملة

3 El Malek El Afdal Street  
Zamalek, Cairo.

Tel.& Fax : 27367231 - 27363093



ش الملك الأفضل

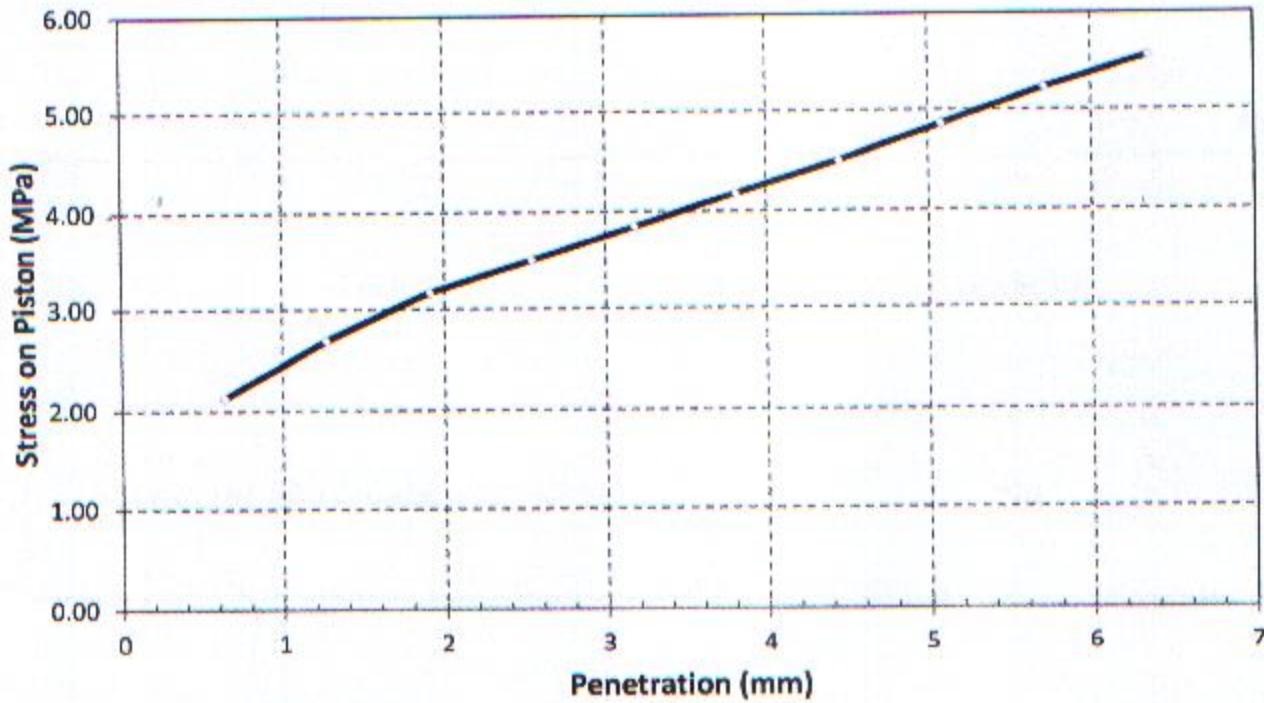
الزمالك - القاهرة

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Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Reporting Date : 03/12/2023  
Reporting Date : 19/12/2023  
Reporting No. : 09  
Sample No. : 09

**Load Penetration Curve of CBR Test**  
**ASTM D-1883**



Signature

CEL  
مكتب معامل الاستشارات الهندسية  
التمثيل القانوني  
شركة برنيس - شارع الملك الحسن الثاني - القاهرة



# MATERIAL INSPECTION REQUEST



|                             |                   |                     |                                     |                                       |          |
|-----------------------------|-------------------|---------------------|-------------------------------------|---------------------------------------|----------|
| Contractor Company          | ALADDIN(05)       |                     | Designer Company                    | (K - K) Engineering Consulting Office |          |
| Issued by Contractor        | Name              | Sign                | Date/Serial Number                  | Time                                  |          |
|                             | Eng. Mahmoud Diab | <i>Mahmoud Diab</i> | 05/08/2023<br>S5 -A-AD-5-P.L.T (01) | 1:00 PM                               |          |
| Received by GARB CONSULTANT | Eng. Saied Saif   | <i>Saied Saif</i>   | MIR                                 | C1<br>334                             | C2<br>EW |
|                             |                   |                     |                                     | C3<br>CS                              | DD<br>6  |
|                             |                   |                     |                                     | MM<br>8                               | YY<br>23 |
|                             |                   |                     |                                     | HH<br>1                               | MM<br>0  |

|        |                         |                 |                                           |
|--------|-------------------------|-----------------|-------------------------------------------|
| 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 | CUT BED              |         |               |                                                                                  |      |
| Location to be Used      | From                 | 335+000 | TO            | 335+060                                                                          |      |
| MAR & UIR Approval No    | UIR S5 -A-AD-5 -C-01 |         | Date          | 02/08/2023                                                                       |      |
|                          | M.A.R. Q.T.-C-01     |         |               | 29/07/2023                                                                       |      |
| Supplier Name            |                      |         |               |                                                                                  |      |
| 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 test      | NUMBER  | 1             |                                                                                  |      |
| 2                        |                      |         |               |                                                                                  |      |
| 3                        |                      |         |               |                                                                                  |      |
| 4                        |                      |         |               |                                                                                  |      |

|                                                             |                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Comments by: Eng. Saied Saif (K.K)                          | Comments by: Eng. Alaa Abd-Allatif (ER)                                                                                                                                                                                                                                          |
| 1-The Plate Load Test Result P.L.T.(DIN 18134) is Approved. | 1-P.L.T was carried- out by civil engineering testing & consulting unit (Egypt.Japan University of Science and Technology)<br>2-Results report attached and found acceptable and comply with project specifications.<br>3-Final approval is subject to above mentioned comments. |

| APPROVAL STATUS          |                       |                         |          |         |
|--------------------------|-----------------------|-------------------------|----------|---------|
| Organisation             | Name                  | Sign                    | Date     | A-AWC-R |
| Contractor               | Eng. Mahmoud Diab     | <i>Mahmoud Diab</i>     |          | A       |
| QA/QC *                  | Eng. Saied Saif       | <i>Saied Saif</i>       |          | A       |
| GARB**                   | Eng. Margret Magdy    |                         |          |         |
| Employers Representative | Eng. Alaa Abd-Allatif | <i>Alaa Abd-Allatif</i> | 1-8-2023 | AWC     |



## Technical Report

### Plate Loading Tests

KM 334+840, KM 334+940,  
KM 335+057, KM 334+500,  
and KM 334+560

Native Soil

### Project

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

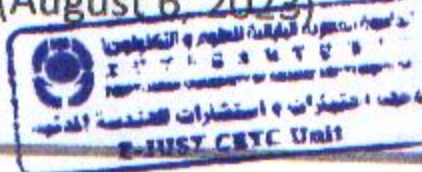
Prepared for

Aladdin and Partners Integrated Contracting

El khalig El masri Street, Hadayek El Kobba -149

يعتمد  
أمين عام الجامعة  
لواء مهديس / أسامة فتح

(August 6, 2023)





## 1. Introduction

The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by Aladdin and Partners Integrated Contracting to conduct 5 plate loading tests on the Native Soil of the Electric Express Train project at 5 locations (KM 334+840, KM 334+940, KM 335+057, KM 334+500, and KM 334+560) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Rabiee Roshdy of Aladdin and Partners Integrated Contracting. Field team members (Sameh Hassan) from the working CETCU team visited the project site on August 6, 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  $33 \pm 1^\circ\text{C}$ .
- The plate was carried out on a Native Soil (according to the company) at 5 points (KM 334+840, KM 334+940, KM 335+057, KM 334+500, and KM 334+560). 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 966E.





### 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/m<sup>2</sup> was applied. The load was increased in the first loading cycle until a normal stress of 0.25 MN/m<sup>2</sup> was reached, and the loading increment was 0.025 MN/m<sup>2</sup>. 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. 5 plate loading tests on the Native Soil of the Electric Express Train project were conducted at 5 locations (KM 334+840, KM 334+940, KM 335+057, KM 334+500, and KM 334+560) and the data collected at the 5 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 334+840, 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 334+840)

| Loading stage | Load (F)<br>kN | Normal<br>MN/m <sup>2</sup> | Settlement<br>mm |
|---------------|----------------|-----------------------------|------------------|
| 0             | 1.414          | 0.005                       | 0.00             |
| 1             | 7.07           | 0.025                       | 0.23             |
| 2             | 14.14          | 0.050                       | 0.33             |
| 3             | 21.21          | 0.075                       | 0.40             |
| 4             | 28.28          | 0.100                       | 0.48             |
| 5             | 35.35          | 0.125                       | 0.60             |
| 6             | 42.42          | 0.150                       | 0.69             |
| 7             | 49.49          | 0.175                       | 0.81             |
| 8             | 56.56          | 0.200                       | 0.93             |
| 9             | 63.63          | 0.225                       | 1.03             |
| 10            | 70.7           | 0.250                       | 1.14             |
| 11            | 56.56          | 0.200                       | 1.11             |
| 12            | 49.49          | 0.175                       | 1.04             |
| 13            | 35.35          | 0.125                       | 0.90             |
| 14            | 21.21          | 0.075                       | 0.75             |
| 15            | 1.414          |                             | 0.04             |





**Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 334+840)**

| Loading stage | Load (F) | Normal stress ( $\sigma_v$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.04           |
| 1             | 7.07     | 0.025                        | 0.30           |
| 2             | 14.14    | 0.050                        | 0.39           |
| 3             | 21.21    | 0.075                        | 0.52           |
| 4             | 28.28    | 0.100                        | 0.59           |
| 5             | 35.35    | 0.125                        | 0.70           |
| 6             | 42.42    | 0.150                        | 0.81           |
| 7             | 49.49    | 0.175                        | 0.90           |
| 8             | 56.56    | 0.200                        | 0.95           |
| 9             | 63.63    | 0.225                        | 1.03           |

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 334+840) 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 334+940) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 335+057) is provided in Tables 7-9 and Figure 3. The testing data corresponding to the fourth testing point (KM 334+500) is provided in Tables 10-12 and Figure 4. The testing data corresponding to the fifth testing point (KM 334+560) is provided in Tables 13-15 and Figure 5.

**Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 334+840)**

| Parameters                                    | 1st loading cycle | 2nd loading cycle |
|-----------------------------------------------|-------------------|-------------------|
| $(s_0, \max)$ MN/m <sup>2</sup>               | 0.25              | 0.25              |
| $s_0$ (mm)                                    | 0.15              | 0.07              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))               | 3.11              | 6.44              |
| $a_2$ (mm/(MN2/m <sup>2</sup> ))              | 3.52              | -10.02            |
| $E_v = 1.5 \pi / (a_1 + a_2 \cdot s_0, \max)$ | 112.77            | 114.44            |
| $E_{v2}/E_{v1}$                               | 1.01              |                   |



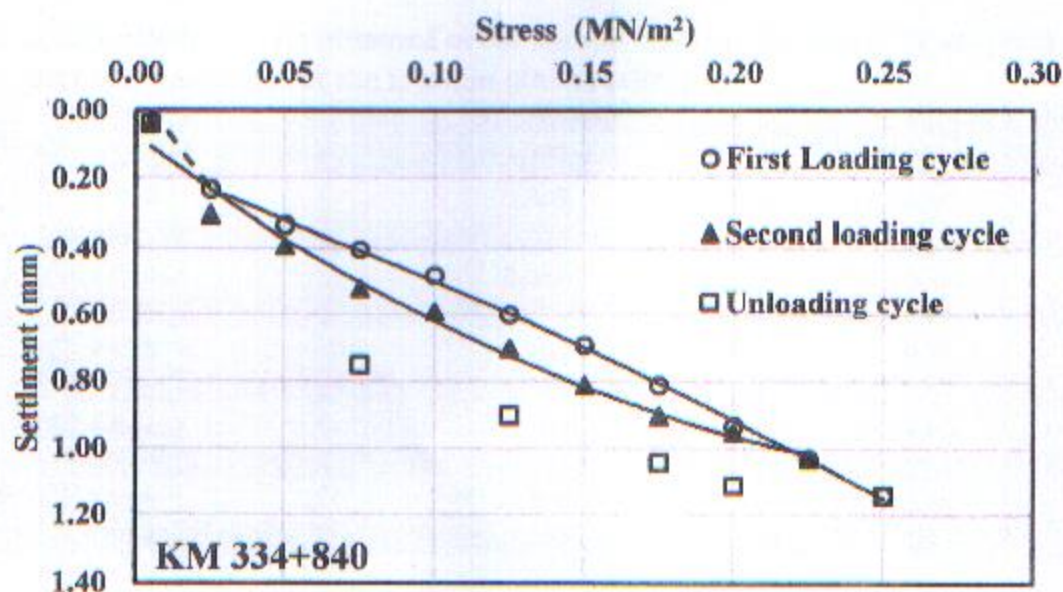


Figure 1: Load-settlement data: plate loading test performed at (KM 334+840)

Table 4: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 334+940)

| Loading stage | Load (F) | Normal stress ( $\sigma_c$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | $\text{MN/m}^2$              | mm             |
| 0             | 1.414    | 0.005                        | 0.00           |
| 1             | 7.07     | 0.025                        | 0.33           |
| 2             | 14.14    | 0.050                        | 0.40           |
| 3             | 21.21    | 0.075                        | 0.51           |
| 4             | 28.28    | 0.100                        | 0.63           |
| 5             | 35.35    | 0.125                        | 0.72           |
| 6             | 42.42    | 0.150                        | 0.85           |
| 7             | 49.49    | 0.175                        | 0.96           |
| 8             | 56.56    | 0.200                        | 1.08           |
| 9             | 63.63    | 0.225                        | 1.27           |
| 10            | 70.7     | 0.250                        | 1.36           |
| 11            | 56.56    | 0.200                        | 1.31           |
| 12            | 49.49    | 0.175                        | 1.25           |
| 13            | 35.35    | 0.125                        | 1.08           |
| 14            | 21.21    | 0.075                        | 0.93           |
| 15            | 1.414    | 0.005                        | 0.06           |





Table 5: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 334+940)

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.06           |
| 1             | 7.07     | 0.025                        | 0.40           |
| 2             | 14.14    | 0.050                        | 0.51           |
| 3             | 21.21    | 0.075                        | 0.66           |
| 4             | 28.28    | 0.100                        | 0.79           |
| 5             | 35.35    | 0.125                        | 0.92           |
| 6             | 42.42    | 0.150                        | 1.00           |
| 7             | 49.49    | 0.175                        | 1.13           |
| 8             | 56.56    | 0.200                        | 1.28           |
| 9             | 63.63    | 0.225                        | 1.34           |

Table 6: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 334+940)

| Parameters                                                | 1st loading cycle | 2nd loading cycle |
|-----------------------------------------------------------|-------------------|-------------------|
| ( $\sigma_0$ , max) MN/m <sup>2</sup>                     | 0.25              | 0.25              |
| $s_0$ (mm)                                                | 0.24              | 0.11              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))                           | 3.29              | 7.92              |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>2</sup> ))             | 5.09              | -11.24            |
| $E_v = 1.5 \tau / (a_1 + a_2 \cdot s_0 \cdot \text{MAX})$ | 98.69             | 88.01             |
| $E_{v2}/E_{v1}$                                           | 0.89              |                   |

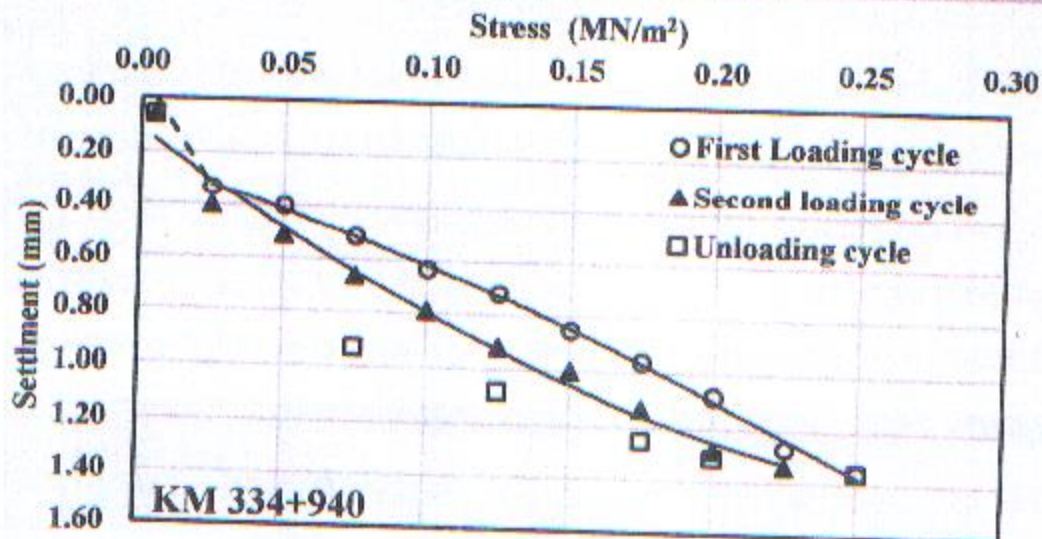


Figure 2: Load-settlement data: plate loading test performed at (KM 334+940)



**Table 7: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 335+057)**

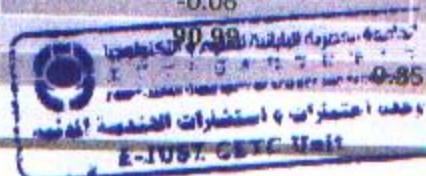
| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.00           |
| 1             | 7.07     | 0.025                        | 0.35           |
| 2             | 14.14    | 0.050                        | 0.54           |
| 3             | 21.21    | 0.075                        | 0.69           |
| 4             | 28.28    | 0.100                        | 0.75           |
| 5             | 35.35    | 0.125                        | 0.85           |
| 6             | 42.42    | 0.150                        | 1.00           |
| 7             | 49.49    | 0.175                        | 1.13           |
| 8             | 56.56    | 0.200                        | 1.26           |
| 9             | 63.63    | 0.225                        | 1.37           |
| 10            | 70.7     | 0.250                        | 1.51           |
| 11            | 56.56    | 0.200                        | 1.46           |
| 12            | 49.49    | 0.175                        | 1.40           |
| 13            | 35.35    | 0.125                        | 1.23           |
| 14            | 21.21    | 0.075                        | 1.02           |
| 15            | 1.414    | 0.005                        | 0.08           |

**Table 8: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 335+057)**

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.08           |
| 1             | 7.07     | 0.025                        | 0.40           |
| 2             | 14.14    | 0.050                        | 0.55           |
| 3             | 21.21    | 0.075                        | 0.76           |
| 4             | 28.28    | 0.100                        | 0.89           |
| 5             | 35.35    | 0.125                        | 1.00           |
| 6             | 42.42    | 0.150                        | 1.21           |
| 7             | 49.49    | 0.175                        | 1.34           |
| 8             | 56.56    | 0.200                        | 1.41           |
| 9             | 63.63    | 0.225                        | 1.49           |

**Table 9: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 335+057)**

| Parameters                                    | 1st loading cycle | 2nd loading cycle |
|-----------------------------------------------|-------------------|-------------------|
| $\{s_0, \max\}$ MN/m <sup>2</sup>             | 0.25              | 0.25              |
| $a_0$ (mm)                                    | 0.26              | 0.09              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))               | 4.96              | 9.68              |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>2</sup> )) | -0.06             | -15.48            |
| $E_v = 1.5 a_1 (a_2 + a_1 \cdot s_0, \max)$   |                   | 77.39             |
| $E_{v2}/E_{v1}$                               |                   |                   |



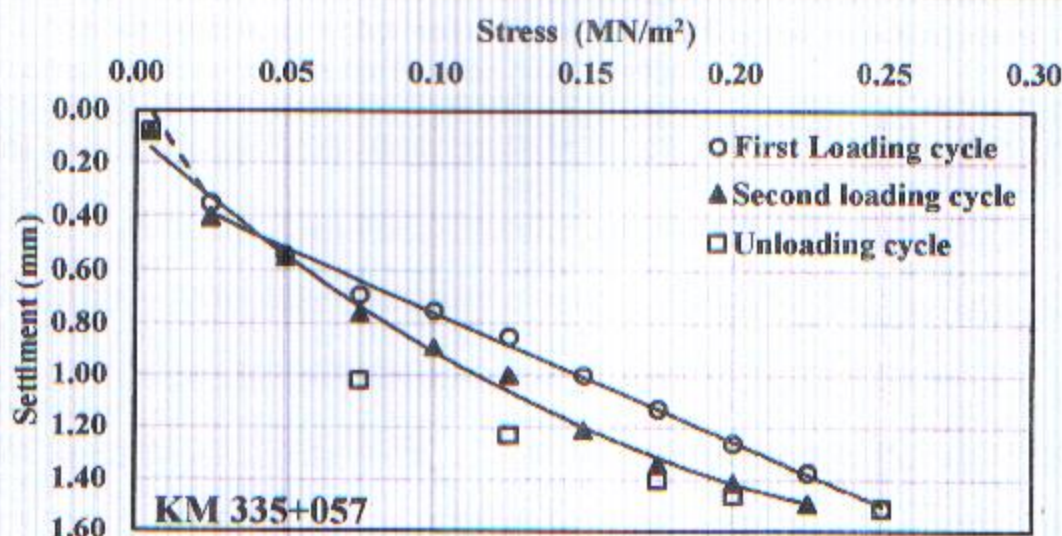


Figure 3: Load-settlement data: plate loading test performed at (KM 335+057)

Table 10: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 334+500)

| Loading stage | Load (P) | Normal stress ( $\sigma$ ) | Settlement (S) |
|---------------|----------|----------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>          | mm             |
| 0             | 1.414    | 0.005                      | 0.00           |
| 1             | 7.07     | 0.025                      | 0.31           |
| 2             | 14.14    | 0.050                      | 0.38           |
| 3             | 21.21    | 0.075                      | 0.57           |
| 4             | 28.28    | 0.100                      | 0.69           |
| 5             | 35.35    | 0.125                      | 0.86           |
| 6             | 42.42    | 0.150                      | 1.04           |
| 7             | 49.49    | 0.175                      | 1.27           |
| 8             | 56.56    | 0.200                      | 1.45           |
| 9             | 63.63    | 0.225                      | 1.65           |
| 10            | 70.7     | 0.250                      | 1.84           |
| 11            | 56.56    | 0.200                      | 1.79           |
| 12            | 49.49    | 0.175                      | 1.73           |
| 13            | 35.35    | 0.125                      | 1.61           |
| 14            | 21.21    | 0.075                      | 1.46           |
| 15            | 1.414    | 0.005                      | 0.55           |

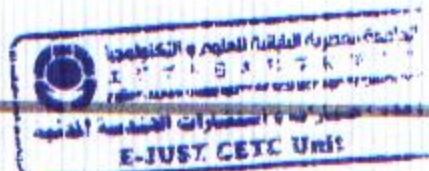




Table 11: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 334+500)

| Loading stage | Load (F) | Normal stress ( $\sigma_p$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.55           |
| 1             | 7.07     | 0.025                        | 0.79           |
| 2             | 14.14    | 0.050                        | 0.98           |
| 3             | 21.21    | 0.075                        | 1.20           |
| 4             | 28.28    | 0.100                        | 1.37           |
| 5             | 35.35    | 0.125                        | 1.56           |
| 6             | 42.42    | 0.150                        | 1.75           |
| 7             | 49.49    | 0.175                        | 1.88           |
| 8             | 56.56    | 0.200                        | 1.96           |
| 9             | 63.63    | 0.225                        | 2.00           |

Table 12: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 334+500)

| Parameters                                    | 1st loading cycle | 2nd loading cycle |
|-----------------------------------------------|-------------------|-------------------|
| ( $s_{p,max}$ ) MN/m <sup>2</sup>             | 0.25              | 0.25              |
| $a_0$ (mm)                                    | 0.16              | 0.50              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))               | 4.59              | 10.83             |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>4</sup> )) | 8.85              | -17.88            |
| $E_v = 1.5 / (a_1 + a_2 \cdot s_{p,max})$     | 66.12             | 70.78             |
| $E_{v2}/E_{v1}$                               | 1.07              |                   |

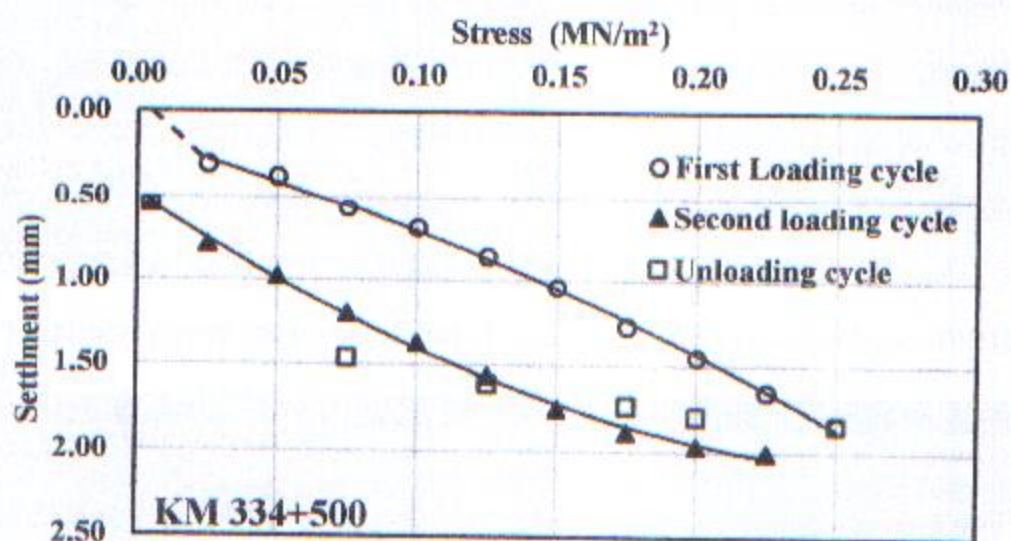


Figure 4: Load-settlement data: plate loading test performed at (KM 334+500)



Table 13: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 334+560)

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.00           |
| 1             | 7.07     | 0.025                        | 0.38           |
| 2             | 14.14    | 0.050                        | 0.49           |
| 3             | 21.21    | 0.075                        | 0.57           |
| 4             | 28.28    | 0.100                        | 0.69           |
| 5             | 35.35    | 0.125                        | 0.83           |
| 6             | 42.42    | 0.150                        | 0.98           |
| 7             | 49.49    | 0.175                        | 1.14           |
| 8             | 56.56    | 0.200                        | 1.29           |
| 9             | 63.63    | 0.225                        | 1.46           |
| 10            | 70.7     | 0.250                        | 1.58           |
| 11            | 56.56    | 0.200                        | 1.58           |
| 12            | 49.49    | 0.175                        | 1.54           |
| 13            | 35.35    | 0.125                        | 1.36           |
| 14            | 21.21    | 0.075                        | 1.17           |
| 15            | 1.414    | 0.005                        | 0.30           |

Table 14: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 334+560)

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.30           |
| 1             | 7.07     | 0.025                        | 0.55           |
| 2             | 14.14    | 0.050                        | 0.70           |
| 3             | 21.21    | 0.075                        | 0.85           |
| 4             | 28.28    | 0.100                        | 0.97           |
| 5             | 35.35    | 0.125                        | 1.12           |
| 6             | 42.42    | 0.150                        | 1.24           |
| 7             | 49.49    | 0.175                        | 1.36           |
| 8             | 56.56    | 0.200                        | 1.44           |
| 9             | 63.63    | 0.225                        | 1.53           |

Table 15: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 334+560)

| Parameters                                                        | 1st loading cycle | 2nd loading cycle |
|-------------------------------------------------------------------|-------------------|-------------------|
| ( $s_{0.05}$ max) MN/m <sup>2</sup>                               | 0.25              | 0.25              |
| $a_0$ (mm)                                                        | 0.27              | 0.31              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))                                   | 3.72              | 8.03              |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>2</sup> ))                     | 6.49              | -11.69            |
| $E_{vs} = 1.5 \cdot a_1 / (a_1 + a_2 \cdot s_{0.05} \text{ max})$ | 84.28             | 88.14             |
| $E_{v1}/E_{v2}$                                                   | 1.05              |                   |



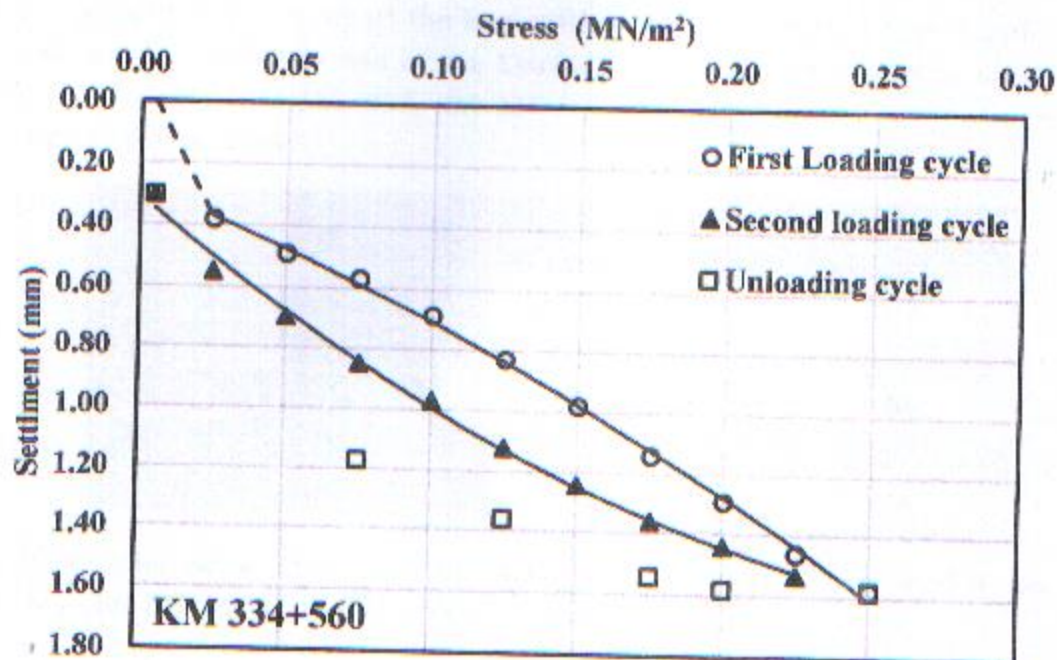


Figure 5: Load-settlement data: plate loading test performed at (KM 334+560)



#### 4. Closure

Test results presented herein report the load-settlement data obtained from 5 plate loading tests conducted on the Native Soil of the Electric Express train project at 5 locations (KM 334+840, KM 334+940, KM 335+057, KM 334+500, and KM 334+560) in accordance with German Standard, DIN18134.

| Location   | $E_{v1}$<br>MN/m <sup>2</sup> | $E_{v2}$<br>MN/m <sup>2</sup> | $E_{v2}/E_{v1}$ ratio |
|------------|-------------------------------|-------------------------------|-----------------------|
| KM 334+840 | 112.77                        | 114.44                        | 1.01                  |
| KM 334+940 | 98.69                         | 88.01                         | 0.89                  |
| KM 335+057 | 90.99                         | 77.39                         | 0.85                  |
| KM 334+500 | 66.12                         | 70.78                         | 1.07                  |
| KM 334+560 | 84.28                         | 88.14                         | 1.05                  |

\* Note: Before interpreting these test results for future applications, the Native Soil 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



## Appendix A



|                           |                                                                              |                   |                         |                           |
|---------------------------|------------------------------------------------------------------------------|-------------------|-------------------------|---------------------------|
| Location of test site:    | KM 334+840                                                                   |                   | Field team              | Sameh Hassan              |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |                   | Date:                   | 6/8/2023                  |
| Diameter of loading plate | 600                                                                          |                   | Time                    | 12:35:00 PM<br>1:02:00 PM |
| Lever ratio               | 1                                                                            |                   | Note:<br>CAT 966E       |                           |
| Type of Soil              | Native Soil                                                                  |                   |                         |                           |
| Bedding material          | ---                                                                          |                   |                         |                           |
| Temperature               | 33°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             | 9.67                    |                           |
|                           | 3                                                                            | 21.21             | 9.60                    |                           |
|                           | 4                                                                            | 28.28             | 9.52                    |                           |
|                           | 5                                                                            | 35.35             | 9.40                    |                           |
|                           | 6                                                                            | 42.42             | 9.31                    |                           |
|                           | 7                                                                            | 49.49             | 9.19                    |                           |
|                           | 8                                                                            | 56.56             | 9.07                    |                           |
|                           | 9                                                                            | 63.63             | 8.97                    |                           |
|                           | 10                                                                           | 70.7              | 8.86                    |                           |
| Unloading Stage           | 11                                                                           | 56.56             | 8.89                    |                           |
|                           | 12                                                                           | 49.49             | 8.96                    |                           |
|                           | 13                                                                           | 35.35             | 9.10                    |                           |
|                           | 14                                                                           | 21.21             | 9.25                    |                           |
|                           | 15                                                                           | 1.414             | 9.96                    |                           |
|                           | Test regime                                                                  | Loading Stage No. | Load (kN)               | Dial Gauge Reading (mm)   |
| Reloading Stage           | 0                                                                            | 1.414             | 9.96                    |                           |
|                           | 1                                                                            | 7.07              | 9.70                    |                           |
|                           | 2                                                                            | 14.14             | 9.61                    |                           |
|                           | 3                                                                            | 21.21             | 9.48                    |                           |
|                           | 4                                                                            | 28.28             | 9.41                    |                           |
|                           | 5                                                                            | 35.35             | 9.30                    |                           |
|                           | 6                                                                            | 42.42             | 9.19                    |                           |
|                           | 7                                                                            | 49.49             | 9.10                    |                           |
|                           | 8                                                                            | 56.56             | 9.05                    |                           |
|                           | 9                                                                            | 63.63             | 8.97                    |                           |



|                           |                                                                              |           |                         |                          |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|
| Location of test site:    | KM 334+940                                                                   |           | Field team              | Sameh Hassan             |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 6/8/2023                 |
| Diameter of loading plate | 600                                                                          |           | Time                    | 1:07:00 PM<br>1:34:00 PM |
| Lever ratio               | 1                                                                            |           | Note:<br>CAT 966E       |                          |
| Type of Soil              | Native Soil                                                                  |           |                         |                          |
| Bedding material          | ---                                                                          |           |                         |                          |
| Temperature               | 33°C                                                                         |           |                         |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |                          |
|                           | 1                                                                            | 7.07      | 9.67                    |                          |
|                           | 2                                                                            | 14.14     | 9.60                    |                          |
|                           | 3                                                                            | 21.21     | 9.49                    |                          |
|                           | 4                                                                            | 28.28     | 9.37                    |                          |
|                           | 5                                                                            | 35.35     | 9.28                    |                          |
|                           | 6                                                                            | 42.42     | 9.15                    |                          |
|                           | 7                                                                            | 49.49     | 9.04                    |                          |
|                           | 8                                                                            | 56.56     | 8.92                    |                          |
|                           | 9                                                                            | 63.63     | 8.73                    |                          |
|                           | 10                                                                           | 70.7      | 8.64                    |                          |
| Unloading Stage           | 11                                                                           | 56.56     | 8.69                    |                          |
|                           | 12                                                                           | 49.49     | 8.75                    |                          |
|                           | 13                                                                           | 35.35     | 8.92                    |                          |
|                           | 14                                                                           | 21.21     | 9.07                    |                          |
|                           | 15                                                                           | 1.414     | 9.94                    |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Reloading Stage           | 0                                                                            | 1.414     | 9.94                    |                          |
|                           | 1                                                                            | 7.07      | 9.60                    |                          |
|                           | 2                                                                            | 14.14     | 9.49                    |                          |
|                           | 3                                                                            | 21.21     | 9.34                    |                          |
|                           | 4                                                                            | 28.28     | 9.21                    |                          |
|                           | 5                                                                            | 35.35     | 9.08                    |                          |
|                           | 6                                                                            | 42.42     | 9.00                    |                          |
|                           | 7                                                                            | 49.49     | 8.87                    |                          |
|                           | 8                                                                            | 56.56     | 8.72                    |                          |
|                           | 9                                                                            | 63.63     | 8.66                    |                          |

|                           |                                                                              |           |                         |              |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------|
| Location of test site:    | KM 335+057                                                                   |           | Field team              | Sameh Hassan |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 6/8/2023     |
| Diameter of loading plate | 600                                                                          |           | Time                    | 1:39:00 PM   |
| Lever ratio               | 1                                                                            |           |                         | 2:06:00 PM   |
| Type of Soil              | Native Soil                                                                  |           | Note:<br>CAT 966E       |              |
| Bedding material          | ---                                                                          |           |                         |              |
| Temperature               | 33°C                                                                         |           |                         |              |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |              |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |              |
|                           | 1                                                                            | 7.07      | 9.65                    |              |
|                           | 2                                                                            | 14.14     | 9.46                    |              |
|                           | 3                                                                            | 21.21     | 9.31                    |              |
|                           | 4                                                                            | 28.28     | 9.25                    |              |
|                           | 5                                                                            | 35.35     | 9.15                    |              |
|                           | 6                                                                            | 42.42     | 9.00                    |              |
|                           | 7                                                                            | 49.49     | 8.87                    |              |
|                           | 8                                                                            | 56.56     | 8.74                    |              |
|                           | 9                                                                            | 63.63     | 8.63                    |              |
|                           | 10                                                                           | 70.7      | 8.49                    |              |
| Unloading Stage           | 11                                                                           | 56.56     | 8.54                    |              |
|                           | 12                                                                           | 49.49     | 8.60                    |              |
|                           | 13                                                                           | 35.35     | 8.77                    |              |
|                           | 14                                                                           | 21.21     | 8.98                    |              |
|                           | 15                                                                           | 1.414     | 9.92                    |              |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |              |
| Reloading Stage           | 0                                                                            | 1.414     | 9.92                    |              |
|                           | 1                                                                            | 7.07      | 9.60                    |              |
|                           | 2                                                                            | 14.14     | 9.45                    |              |
|                           | 3                                                                            | 21.21     | 9.24                    |              |
|                           | 4                                                                            | 28.28     | 9.11                    |              |
|                           | 5                                                                            | 35.35     | 9.00                    |              |
|                           | 6                                                                            | 42.42     | 8.79                    |              |
|                           | 7                                                                            | 49.49     | 8.66                    |              |
|                           | 8                                                                            | 56.56     | 8.59                    |              |
|                           | 9                                                                            | 63.63     | 8.51                    |              |



|                           |                                                                              |           |                         |                          |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|
| Location of test site:    | KM 334+500                                                                   |           | Field team              | Sameh Hassan             |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 6/8/2023                 |
| Diameter of loading plate | 600                                                                          |           | Time                    | 2:11:00 PM<br>2:38:00 PM |
| Lever ratio               | 1                                                                            |           | Note:<br>CAT 966E       |                          |
| Type of Soil              | Native Soil                                                                  |           |                         |                          |
| Bedding material          | ---                                                                          |           |                         |                          |
| Temperature               | 33°C                                                                         |           |                         |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |                          |
|                           | 1                                                                            | 7.07      | 9.69                    |                          |
|                           | 2                                                                            | 14.14     | 9.62                    |                          |
|                           | 3                                                                            | 21.21     | 9.43                    |                          |
|                           | 4                                                                            | 28.28     | 9.31                    |                          |
|                           | 5                                                                            | 35.35     | 9.14                    |                          |
|                           | 6                                                                            | 42.42     | 8.96                    |                          |
|                           | 7                                                                            | 49.49     | 8.73                    |                          |
|                           | 8                                                                            | 56.56     | 8.55                    |                          |
|                           | 9                                                                            | 63.63     | 8.35                    |                          |
|                           | 10                                                                           | 70.7      | 8.16                    |                          |
| Unloading Stage           | 11                                                                           | 56.56     | 8.21                    |                          |
|                           | 12                                                                           | 49.49     | 8.27                    |                          |
|                           | 13                                                                           | 35.35     | 8.39                    |                          |
|                           | 14                                                                           | 21.21     | 8.54                    |                          |
|                           | 15                                                                           | 1.414     | 9.45                    |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Reloading Stage           | 0                                                                            | 1.414     | 9.45                    |                          |
|                           | 1                                                                            | 7.07      | 9.21                    |                          |
|                           | 2                                                                            | 14.14     | 9.02                    |                          |
|                           | 3                                                                            | 21.21     | 8.80                    |                          |
|                           | 4                                                                            | 28.28     | 8.63                    |                          |
|                           | 5                                                                            | 35.35     | 8.44                    |                          |
|                           | 6                                                                            | 42.42     | 8.25                    |                          |
|                           | 7                                                                            | 49.49     | 8.12                    |                          |
|                           | 8                                                                            | 56.56     | 8.04                    |                          |
|                           | 9                                                                            | 63.63     | 8.00                    |                          |

|                           |                                                                              |           |                         |                          |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|
| Location of test site:    | KM 334+560                                                                   |           | Field team              | Sameh Hassan             |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 6/8/2023                 |
| Diameter of loading plate | 600                                                                          |           | Time                    | 2:43:00 PM<br>3:10:00 PM |
| Lever ratio               | 1                                                                            |           | Note:<br>CAT 966E       |                          |
| Type of Soil              | Native Soil                                                                  |           |                         |                          |
| Bedding material          | ---                                                                          |           |                         |                          |
| Temperature               | 33°C                                                                         |           |                         |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |                          |
|                           | 1                                                                            | 7.07      | 9.62                    |                          |
|                           | 2                                                                            | 14.14     | 9.51                    |                          |
|                           | 3                                                                            | 21.21     | 9.43                    |                          |
|                           | 4                                                                            | 28.28     | 9.31                    |                          |
|                           | 5                                                                            | 35.35     | 9.17                    |                          |
|                           | 6                                                                            | 42.42     | 9.02                    |                          |
|                           | 7                                                                            | 49.49     | 8.86                    |                          |
|                           | 8                                                                            | 56.56     | 8.71                    |                          |
|                           | 9                                                                            | 63.63     | 8.54                    |                          |
| Unloading Stage           | 10                                                                           | 70.7      | 8.42                    |                          |
|                           | 11                                                                           | 56.56     | 8.42                    |                          |
|                           | 12                                                                           | 49.49     | 8.46                    |                          |
|                           | 13                                                                           | 35.35     | 8.64                    |                          |
|                           | 14                                                                           | 21.21     | 8.83                    |                          |
|                           | 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      | 9.45                    |                          |
|                           | 2                                                                            | 14.14     | 9.30                    |                          |
|                           | 3                                                                            | 21.21     | 9.15                    |                          |
|                           | 4                                                                            | 28.28     | 9.03                    |                          |
|                           | 5                                                                            | 35.35     | 8.88                    |                          |
|                           | 6                                                                            | 42.42     | 8.76                    |                          |
|                           | 7                                                                            | 49.49     | 8.64                    |                          |
|                           | 8                                                                            | 56.56     | 8.56                    |                          |
|                           | 9                                                                            | 63.63     | 8.47                    |                          |

# MATERIAL INSPECTION REQUEST



|                             |                   |                     |                                     |                                       |    |    |    |    |    |    |    |
|-----------------------------|-------------------|---------------------|-------------------------------------|---------------------------------------|----|----|----|----|----|----|----|
| Contractor Company          | ALADDIN(05)       |                     | Designer Company                    | (K - K) Engineering Consulting Office |    |    |    |    |    |    |    |
| Issued by Contractor        | Name              | Sign                | Date/Serial Number                  | Time                                  |    |    |    |    |    |    |    |
|                             | Eng. Mahmoud Diab | <i>Mahmoud Diab</i> | 31/10/2023<br>S5 -A-AD-5-P.L.T (02) | 1:00 PM                               |    |    |    |    |    |    |    |
| Received by GARB CONSULTANT | Eng. Saied Saif   | <i>Saied Saif</i>   | MIR                                 | C1                                    | C2 | C3 | DD | MM | YY | HH | MM |
|                             |                   |                     |                                     | 335                                   | EW | CS | 1  | 11 | 23 | 1  | 0  |

|          |                         |                 |                                           |
|----------|-------------------------|-----------------|-------------------------------------------|
| 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                |         |               |                                                                                  |      |
| Location to be Used      | From                | 335+000 | TO            | 335+060                                                                          |      |
| MAR & UIR Approval No    | UIR S5 -A-AD-5 -F-5 |         | Date          | 30/10/2023                                                                       |      |
|                          | M.A.R. Q.T.-03      |         |               | 15/10/2023                                                                       |      |
| Supplier Name            |                     |         |               |                                                                                  |      |
| 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 test     | NUMBER  | 1             |                                                                                  |      |
| 2                        |                     |         |               |                                                                                  |      |
| 3                        |                     |         |               |                                                                                  |      |
| 4                        |                     |         |               |                                                                                  |      |

|                                                             |                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Comments by: Eng. Saied Saif (K.K)                          | Comments by: Eng. Alaa Abd-Allatif (ER)                                                                                                                                                                                                                                          |
| 1-The Plate Load Test Result P.L.T.(DIN 18134) is Approved. | 1-P.L.T was carried- out by civil engineering testing & consulting unit (Egypt.Japan University of Science and Technology)<br>2-Results report attached and found acceptable and comply with project specifications.<br>3-Final approval is subject to above mentioned comments. |

| APPROVAL STATUS          |                       |                         |           |         |
|--------------------------|-----------------------|-------------------------|-----------|---------|
| Organisation             | Name                  | Sign                    | Date      | A-AWC-R |
| Contractor               | Eng. Mahmoud Diab     | <i>Mahmoud Diab</i>     |           | A       |
| QA/QC *                  | Eng. Saied Saif       | <i>Saied Saif</i>       |           | A       |
| GARB**                   | Eng. Margret Magdy    |                         |           |         |
| Employers Representative | Eng. Alaa Abd-Allatif | <i>Alaa Abd-Allatif</i> | 1-11-2023 | Awc     |



# Technical Report

## Plate Loading Tests

KM 334+940 and KM 335+040

(Middle Embankment (-1.5 m))

## Project

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

Prepared for

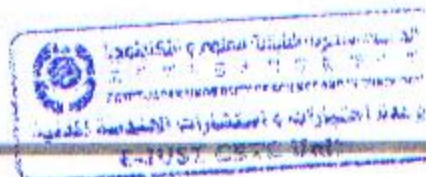
Aladdin and Partners Integrated Contracting

El khalig El masri Street, Hadayek El Kobba -149

(November 1, 2023)



مستند  
إعداد  
إدارة  
الهندسة  
المدنية  
الجامعة  
المصرية  
اليابانية  
للعلوم  
والتكنولوجيا



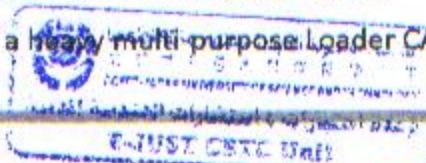


## 1. Introduction

The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by Aladdin and Partners Integrated Contracting to conduct two plate loading tests on the Middle Embankment (-1.5 m) of the Electric Express Train project at two locations (KM 334+940 and KM 335+040) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Rabiee Roshdy of Aladdin and Partners Integrated Contracting. Field team members (Sameh Hassan) from the working CETCU team visited the project site on November 1, 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  $27 \pm 1^\circ\text{C}$ .
- The plate was carried out on a Middle Embankment (-1.5 m) (according to the company) at two points (KM 334+940 and KM 335+040). 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 966E.





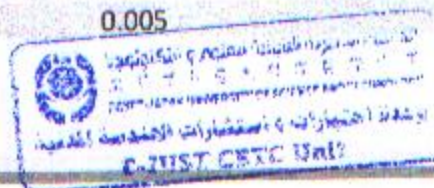
### 3. Test Procedure and Results

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/m<sup>2</sup> was applied. The load was increased in the first loading cycle until a normal stress of 0.25 MN/m<sup>2</sup> was reached, and the loading increment was 0.025 MN/m<sup>2</sup>. 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 (-1.5 m) of the Electric Express Train project were conducted at two locations (KM 334+940 and KM 335+040) 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 334+940), 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 334+940)**

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.00           |
| 1             | 7.07     | 0.025                        | 0.43           |
| 2             | 14.14    | 0.050                        | 0.57           |
| 3             | 21.21    | 0.075                        | 0.69           |
| 4             | 28.28    | 0.100                        | 0.85           |
| 5             | 35.35    | 0.125                        | 1.00           |
| 6             | 42.42    | 0.150                        | 1.16           |
| 7             | 49.49    | 0.175                        | 1.27           |
| 8             | 56.56    | 0.200                        | 1.38           |
| 9             | 63.63    | 0.225                        | 1.54           |
| 10            | 70.7     | 0.250                        | 1.65           |
| 11            | 56.56    | 0.200                        | 1.63           |
| 12            | 49.49    | 0.175                        | 1.58           |
| 13            | 35.35    | 0.125                        | 1.48           |
| 14            | 21.21    | 0.075                        | 1.34           |
| 15            | 1.414    | 0.005                        | 0.45           |





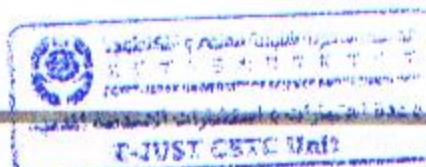
**Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 334+940)**

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.45           |
| 1             | 7.07     | 0.025                        | 0.84           |
| 2             | 14.14    | 0.050                        | 0.93           |
| 3             | 21.21    | 0.075                        | 1.00           |
| 4             | 28.28    | 0.100                        | 1.14           |
| 5             | 35.35    | 0.125                        | 1.25           |
| 6             | 42.42    | 0.150                        | 1.35           |
| 7             | 49.49    | 0.175                        | 1.46           |
| 8             | 56.56    | 0.200                        | 1.54           |
| 9             | 63.63    | 0.225                        | 1.59           |

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 334+940) 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 335+040) is provided in Tables 4-6 and Figure 2.

**Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 334+940)**

| Parameters                                    | 1st loading cycle | 2nd loading cycle |
|-----------------------------------------------|-------------------|-------------------|
| ( $s_{0,max}$ ) MN/m <sup>2</sup>             | 0.25              | 0.25              |
| $a_0$ (mm)                                    | 0.27              | 0.53              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))               | 6.11              | 7.56              |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>4</sup> )) | -2.24             | -12.87            |
| $Ev = 1.5 r / (a_1 + a_2 \cdot s_{0,max})$    | 81.14             | 103.48            |
| $Ev_2/Ev_1$                                   | 1.28              |                   |



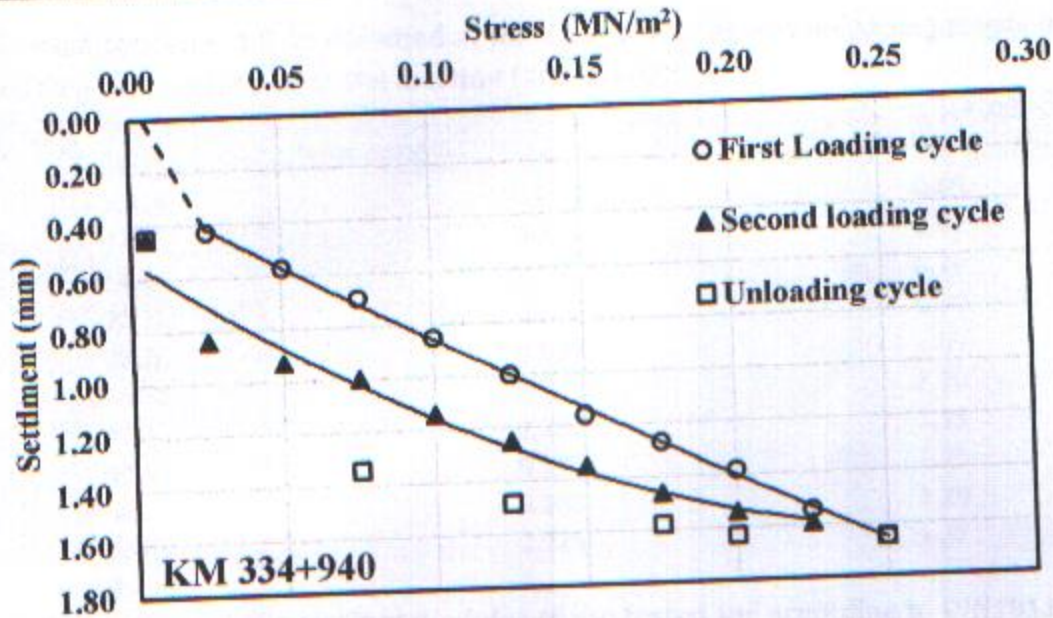


Figure 1: Load-settlement data: plate loading test performed at (KM 334+940)

Table 4: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 335+040)

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.00           |
| 1             | 7.07     | 0.025                        | 0.27           |
| 2             | 14.14    | 0.050                        | 0.38           |
| 3             | 21.21    | 0.075                        | 0.55           |
| 4             | 28.28    | 0.100                        | 0.70           |
| 5             | 35.35    | 0.125                        | 0.85           |
| 6             | 42.42    | 0.150                        | 1.00           |
| 7             | 49.49    | 0.175                        | 1.13           |
| 8             | 56.56    | 0.200                        | 1.25           |
| 9             | 63.63    | 0.225                        | 1.29           |
| 10            | 70.7     | 0.250                        | 1.40           |
| 11            | 56.56    | 0.200                        | 1.40           |
| 12            | 49.49    | 0.175                        | 1.40           |
| 13            | 35.35    | 0.125                        | 1.30           |
| 14            | 21.21    | 0.075                        | 1.17           |
| 15            | 1.414    | 0.005                        | 0.40           |

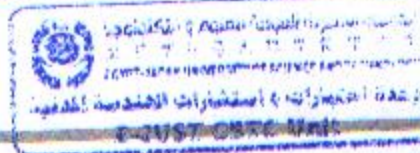




Table 5: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 335+040)

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.40           |
| 1             | 7.07     | 0.025                        | 0.62           |
| 2             | 14.14    | 0.050                        | 0.79           |
| 3             | 21.21    | 0.075                        | 0.90           |
| 4             | 28.28    | 0.100                        | 1.00           |
| 5             | 35.35    | 0.125                        | 1.10           |
| 6             | 42.42    | 0.150                        | 1.19           |
| 7             | 49.49    | 0.175                        | 1.25           |
| 8             | 56.56    | 0.200                        | 1.29           |
| 9             | 63.63    | 0.225                        | 1.33           |

Table 6: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 335+040)

| Parameters                                    | 1st loading cycle | 2nd loading cycle |
|-----------------------------------------------|-------------------|-------------------|
| ( $s_{0,max}$ ) MN/m <sup>2</sup>             | 0.25              | 0.25              |
| $a_0$ (mm)                                    | 0.06              | 0.41              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))               | 7.43              | 7.72              |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>4</sup> )) | -8.06             | -16.37            |
| $Ev = 1.5 r / (a_1 + a_2 \cdot s_{0,MAX})$    | 83.18             | 123.99            |
| $Ev_2/Ev_1$                                   | 1.49              |                   |

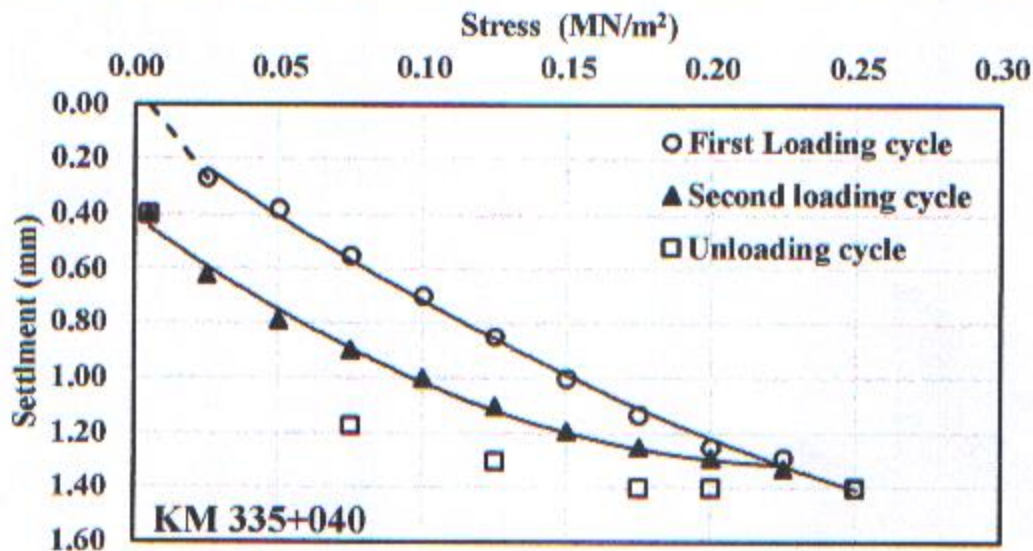


Figure 2: Load-settlement data: plate loading test performed at (KM 335+040)



#### 4. Closure

Test results presented herein report the load-settlement data obtained from two plate loading tests conducted on the Middle Embankment (-1.5 m) of the Electric Express train project at two locations (KM 334+940 and KM 335+040) in accordance with German Standard, DIN18134.

| Location   | $E_{v1}$<br>MN/m <sup>2</sup> | $E_{v2}$<br>MN/m <sup>2</sup> | $E_{v2}/E_{v1}$ ratio |
|------------|-------------------------------|-------------------------------|-----------------------|
| KM 334+940 | 81.14                         | 103.48                        | 1.28                  |
| KM 335+040 | 83.18                         | 123.99                        | 1.49                  |

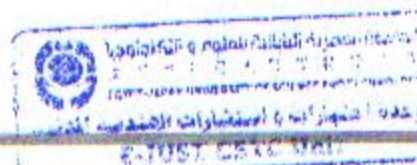
- Note: Before interpreting these test results for future applications, the Middle Embankment (-1.5 m) in-situ variability between the testing locations should be considered.

#### Technical committee

Prof. Dr. Mohamed F. M. Fahmy

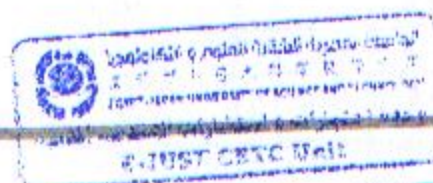
#### Lab Engineer

Mohamed A. Al-Najjar





## Appendix A





|                           |                                                                              |           |                         |                          |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|
| Location of test site:    | KM 334+940                                                                   |           | Field team              | Samch Hassan             |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 1/11/2023                |
| Diameter of loading plate | 600                                                                          |           | Time                    | 1:20:00 PM<br>1:47:00 PM |
| Lever ratio               | 1                                                                            |           | Note:<br>CAT 966E       |                          |
| Type of Soil              | Middle Embankment (-1.5 m)                                                   |           |                         |                          |
| Bedding material          | ---                                                                          |           |                         |                          |
| Temperature               | 27°C                                                                         |           |                         |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |                          |
|                           | 1                                                                            | 7.07      | 9.57                    |                          |
|                           | 2                                                                            | 14.14     | 9.43                    |                          |
|                           | 3                                                                            | 21.21     | 9.31                    |                          |
|                           | 4                                                                            | 28.28     | 9.15                    |                          |
|                           | 5                                                                            | 35.35     | 9.00                    |                          |
|                           | 6                                                                            | 42.42     | 8.84                    |                          |
|                           | 7                                                                            | 49.49     | 8.73                    |                          |
|                           | 8                                                                            | 56.56     | 8.62                    |                          |
|                           | 9                                                                            | 63.63     | 8.46                    |                          |
|                           | 10                                                                           | 70.7      | 8.35                    |                          |
| Unloading Stage           | 11                                                                           | 56.56     | 8.37                    |                          |
|                           | 12                                                                           | 49.49     | 8.42                    |                          |
|                           | 13                                                                           | 35.35     | 8.52                    |                          |
|                           | 14                                                                           | 21.21     | 8.66                    |                          |
|                           | 15                                                                           | 1.414     | 9.55                    |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Reloading Stage           | 0                                                                            | 1.414     | 9.55                    |                          |
|                           | 1                                                                            | 7.07      | 9.16                    |                          |
|                           | 2                                                                            | 14.14     | 9.07                    |                          |
|                           | 3                                                                            | 21.21     | 9.00                    |                          |
|                           | 4                                                                            | 28.28     | 8.86                    |                          |
|                           | 5                                                                            | 35.35     | 8.75                    |                          |
|                           | 6                                                                            | 42.42     | 8.65                    |                          |
|                           | 7                                                                            | 49.49     | 8.54                    |                          |
|                           | 8                                                                            | 56.56     | 8.46                    |                          |
|                           | 9                                                                            | 63.63     | 8.41                    |                          |



|                           |                                                                              |           |                         |                          |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|
| Location of test site:    | KM 335+040                                                                   |           | Field team              | Sameh Hassan             |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 1/11/2023                |
| Diameter of loading plate | 600                                                                          |           | Time                    | 1:52:00 PM<br>2:19:00 PM |
| Lever ratio               | 1                                                                            |           | Note:<br>CAT 966E       |                          |
| Type of Soil              | Middle Embankment (-1.5 m)                                                   |           |                         |                          |
| Bedding material          | ---                                                                          |           |                         |                          |
| Temperature               | 27°C                                                                         |           |                         |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |                          |
|                           | 1                                                                            | 7.07      | 9.73                    |                          |
|                           | 2                                                                            | 14.14     | 9.62                    |                          |
|                           | 3                                                                            | 21.21     | 9.45                    |                          |
|                           | 4                                                                            | 28.28     | 9.30                    |                          |
|                           | 5                                                                            | 35.35     | 9.15                    |                          |
|                           | 6                                                                            | 42.42     | 9.00                    |                          |
|                           | 7                                                                            | 49.49     | 8.87                    |                          |
|                           | 8                                                                            | 56.56     | 8.75                    |                          |
|                           | 9                                                                            | 63.63     | 8.71                    |                          |
|                           | 10                                                                           | 70.7      | 8.60                    |                          |
| Unloading Stage           | 11                                                                           | 56.56     | 8.60                    |                          |
|                           | 12                                                                           | 49.49     | 8.60                    |                          |
|                           | 13                                                                           | 35.35     | 8.70                    |                          |
|                           | 14                                                                           | 21.21     | 8.83                    |                          |
|                           | 15                                                                           | 1.414     | 9.60                    |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Reloading Stage           | 0                                                                            | 1.414     | 9.60                    |                          |
|                           | 1                                                                            | 7.07      | 9.38                    |                          |
|                           | 2                                                                            | 14.14     | 9.21                    |                          |
|                           | 3                                                                            | 21.21     | 9.10                    |                          |
|                           | 4                                                                            | 28.28     | 9.00                    |                          |
|                           | 5                                                                            | 35.35     | 8.90                    |                          |
|                           | 6                                                                            | 42.42     | 8.81                    |                          |
|                           | 7                                                                            | 49.49     | 8.75                    |                          |
|                           | 8                                                                            | 56.56     | 8.71                    |                          |
|                           | 9                                                                            | 63.63     | 8.67                    |                          |

قائمة الكميات الواردة بالمستخلص

|                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| بالمنز المعكبي اصطلح على منطقه<br>السطح بالارت الشويه والارطى<br>بالتهر سمت التوصل الى اقصى ك<br>وقبل الاثرية الزائدة لمسافة ٥٠٠<br>العرضيه النموذجيه والاسيحه<br>ومواصفات الهيدر<br>وفي حاله زياده مسافه تثل نتائج |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

مهندس الشركة  
م / ربيع رشدي

مجلس الشورى  
د / رياض رشدي

قائمة الكميات الواردة بالمستخلص جاري (١)

مستخرج : الطحلل الكهربائي فائق السرعة قطاع (إرج الرب - الطمين) تنفيذ شركة علاء الدين وشركاه للمقاولات الكهكامة القطاع من المحطة ٣٣٥٠٠٠٠ الي ٣٣٥٠٠٠٠٠٠

رقم البند وبيانه : ( ٢-٣ ) بالمعز المسطح اعمل تطهير الموقع من الاشجار والمزروعات و المخلقات

نفاي : شركة علاء الدين وشركاه للمقاولات المتكاملة

₹ 4,500.00

كمية المقايضة

22

مقدار العمل السابق :

[illegible]

لاجمالي الكافي (م)

جمالي الكميات خلال فترة المستخلص الحالية (م)

مهندس الهيثية  
م / مازجرم مجدي

• مهنتس المشتركة

X

م / ربيع رشتی

5/2/20

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مجلس الشركة  
٢٠ / ربيع الثاني  
١٤٢٥ هـ


 ( ୧୪୪୭ )  
 ୧୧/୧୨/୨୦୧୭  
 ଓଡ଼ିଶା ସରକାର

*(Handwritten signature)*

مجلس القضاة  
١٠ / ربيع الثاني


 ( 8456 )  
 ॥ ६ ॥ ११/११  
 ॥ ११/११ ॥

|         |         |    |      |
|---------|---------|----|------|
| 335+060 | 335+060 | 60 | ٢٠٢٤ |
|---------|---------|----|------|

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مجلس الوزراء  
الرياض - المملكة العربية السعودية

| الخصية | %٢٠ | نسبة الملاءمة (متر) |      | طول     | التي    | من         | الطلب     | تاريخ الطلب | رقم الطلب  | بيان الاعمال المطلوبه |
|--------|-----|---------------------|------|---------|---------|------------|-----------|-------------|------------|-----------------------|
|        |     | مساحة الملاءمة      |      |         |         |            |           |             |            |                       |
|        |     | طول                 | التي |         |         |            |           |             |            |                       |
| ٢٨٢,٧٨ | %٢٠ | ٤,٧١                | 60   | 335+060 | 335+000 | 11/9/2023  | IR (F-01) | ١١/٩/٢٠٢٣   | ١١/٩/٢٠٢٣  | ١١/٩/٢٠٢٣             |
| ٢٧٥,٧٨ | %٢٠ | ٤,٥٩                | 60   | 335+060 | 335+000 | 3/10/2023  | IR (F-02) | ٣/١٠/٢٠٢٣   | ٣/١٠/٢٠٢٣  | ٣/١٠/٢٠٢٣             |
| ٢٦٧,٧٨ | %٢٠ | ٤,٤٦                | 60   | 335+060 | 335+000 | 8/10/2023  | IR (F-03) | ٨/١٠/٢٠٢٣   | ٨/١٠/٢٠٢٣  | ٨/١٠/٢٠٢٣             |
| ٢٦٠,٧٨ | %٢٠ | ٤,٣٤                | 60   | 335+060 | 335+000 | 16/10/2023 | IR (F-04) | ١٦/١٠/٢٠٢٣  | ١٦/١٠/٢٠٢٣ | ١٦/١٠/٢٠٢٣            |
| ١٧٨,٧٨ | %٢٠ | ٢,٠٤                | 60   | 335+060 | 335+000 | 23/10/2023 | IR (F-05) | ٢٣/١٠/٢٠٢٣  | ٢٣/١٠/٢٠٢٣ | ٢٣/١٠/٢٠٢٣            |
| ١٣٠,٤٤ | %٢٠ | ٢,١٧                | 60   | 335+060 | 335+000 | 30/10/2023 | IR (F-06) | ٣٠/١٠/٢٠٢٣  | ٣٠/١٠/٢٠٢٣ | ٣٠/١٠/٢٠٢٣            |
| ١٣٨,٠٠ | %٢٠ | ٢,٢٠                | 60   | 335+060 | 335+000 | 7/11/2023  | IR (F-07) | ٧/١١/٢٠٢٣   | ٧/١١/٢٠٢٣  | ٧/١١/٢٠٢٣             |
| ١٣٣,٧٦ | %٢٠ | ٢,٢٣                | 60   | 335+060 | 335+000 | 20/11/2023 | IR (F-08) | ٢٠/١١/٢٠٢٣  | ٢٠/١١/٢٠٢٣ | ٢٠/١١/٢٠٢٣            |
| ١٣٥,٧٢ | %٢٠ | ٢,٢٦                | 60   | 335+060 | 335+000 | 27/11/2023 | IR (F-09) | ٢٧/١١/٢٠٢٣  | ٢٧/١١/٢٠٢٣ | ٢٧/١١/٢٠٢٣            |
| ١٣٥,٧٢ | %٢٠ | ٢,٢٦                | 60   | 335+060 | 335+000 | 25/12/2023 | IR (F-10) | ٢٥/١٢/٢٠٢٣  | ٢٥/١٢/٢٠٢٣ | ٢٥/١٢/٢٠٢٣            |
| ١٣٧,٥٦ | %٢٠ | ٢,٢٩                | 60   | 335+060 | 335+000 | 4/3/2024   | IR (F-11) | ٤/٣/٢٠٢٤    | ٤/٣/٢٠٢٤   | ٤/٣/٢٠٢٤              |

مقدار العمل السابق :

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(۱) عَزَّ وَجَلَّ خُذْ مِثْلَ مَا جَاءَكَ مِنَ الْكُتُبِ وَالْأَقْبَابِ الْقَائِمَةِ



مجلس الشورى  
١٠ / ١١ / ١٤٢٥ هـ

(1) 1996-97

## محضر استلام موقع

مشروع: أعمال الجسر الترابي والأعمال الصناعية لمشروع القطار الكهربائي السريع (العين السخنة - مطروح) لتنفيذ أعمال الجسر الترابي قطاع (برج العرب - العلمين) في المسافة من الكم 335+000 الى الكم 335+060 بطول 0.06 كيلو متر .

تنفيذ: شركة علاء الدين وشركاؤه للمقاولات المتكاملة.

إشراف : المنطقة الخامسة - منطقة غرب الدلتا

طبقاً للعقد رقم (٢٠٢٥/٢٠٢٤/٤١٢) بتاريخ ٢٠٢٤/١٠/٣٠

إنه في يوم الأربعاء الموافق ٢٠٢٤/١١/٢٠ اجتمع كل من:-

- ١- السيد المهندس/محمد حسني فياض مدير عام مشروعات - الهيئة العامة للطرق والكباري
- ٢- السيدة المهندس/مارجريت مجدي زاخر مدير مشروع - الهيئة العامة للطرق والكباري
- ٣- السيد المهندس/ربيع رشدي مدير مشروع - شركة علاء الدين وشركاؤه للمقاولات المتكاملة

وذلك للمرور على مسار العملية المذكورة عاليه لاستلام الموقع :-  
وقد تبين أن الموقع خالياً من العوائق الظاهرية ويسمح بالبداية في التنفيذ وبناء عليه يعتبر تاريخ ٢٠٢٤/١١/٢٠ هو تاريخ استلام الموقع وبداية الأعمال بالعملية واقفل المحضر على ذلك ووقع الحضور

التوقيعات

رئيس الإدارة المركزية

منطقة غرب الدلتا

الاسكندرية - مرسى

مطروح

عميد . مهندس /

"هاني محمد محمود طه"

٣- ربيع رشدي

٢- محمد حسني فياض

١- مارجريت مجدي زاخر

المنطقة الخامسة - ( غرب الدلتا )

السيد المهندس / رئيس قطاع التنفيذ والمناطق

تحية طيبة.. وبعد،،

بالإحالة إلى مشروع القطار الكهربائي السريع قطاع ( برج العرب - العلمين ) ( القطاع الخامس-أ )

نتشرف بأن نرفق لسيادتكم طيه المقايضة المعدلة بعد المفاوضة بتاريخ

٢٠٢٣/١٢/١٨ للقطاع الآتى :

| الشركة                                 | من كم   | الى كم  |
|----------------------------------------|---------|---------|
| علاء الدين وشركاؤه للمقاولات المتكاملة | ٣٣٤+٨٠٠ | ٣٣٤+٩٠٠ |

برجاء من سيادتكم التفضل بالأحاطه والتوجيه بالازم  
وتفضلوا بقبول فائق الاحترام والتقدير،،



رئيس الإدارة المركزية

المنطقة الخامسة- غرب الدلتا

 عميد مهندس /

"شاني محمد محمود طه"

مشروع القطار الكهربائي فائق السرعة قطاع (برج العرب - العلمين)  
مرحلة تشكيل الجسر الترابي وطبقات الأساس والحمايات الخرسانية  
المقايسة المعدلة بعد المفاوضات بتاريخ 2023/12/18 لنود الأعمال تنفيذ شركة علاء الدين وشركاؤه للمقاولات المتكاملة  
القطاع من محطة 335+000 الى 335+060 بطول 60 م  
طبقا للعقد رقم 412 / 2025/2024

| رقم البند                                         | بيان الأعمال                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | الوحدة | القناة | الكمية    | الاجمالي     |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|-----------|--------------|
| <b>المرحلة الاولى : اعمال الحفر وتشكيل الجسور</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |        |           |              |
| 1                                                 | <b>اعمال الحفر</b><br>بالمتر المكعب اعمال حفر باستخدام المعدات الميكانيكية لجميع انواع التربة عدا التربة الصخرية و تسوية السطح بالات التسوية والرش بالمياه الاصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول الى اقصى كثافة جافة (95%) من الكثافة الجافة القصوى) ومجمل على البند تحميل ونقل التربة الزائدة لمسافة 500 متر من محور الطريق ويتم التنفيذ طبقا للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المقتمدة والبند بجميع مشتلاته طبقا لاصول الصناعة ومواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس المشرف.<br>وفي حالة زيادة مسافة نقل ناتج الحفر عن 500 متر من محور الطريق يتم حساب 1 جنية لكلومتر زيادة .                                                                                                                                                                                                                                                                                                                                             | 3م     | 28.10  | 8,000.00  | 224,800.00   |
| 2                                                 | <b>اعمال الازالة و التطهير</b><br>بالمتر المكعب اعمال تطهير الموقع من الاشجار والمزروعات والمخلفات في مناطق الدلتا ذات الطبيعة الزراعية الكثيفة والتخلص منها بالمقالب العمومية تمهيدا لاعمال الرقع المساحي لكامل حدود المشروع طبقا للشروط والمواصفات وتعليمات المهندس المشرف.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2م     | 6.00   | 4,500.00  | 27,000.00    |
| <b>المرحلة الثانية : اعمال الردم</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |        |           |              |
| 3                                                 | <b>اعمال الردم</b><br>اعمال تحميل وتوريد ونقل تربة مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسمك لا يزيد عن 50 سم حتى منسوب - 2 متر وبسمك لا يزيد عن 25 سم لاستكمال المنسوب التصميمي لتشكيل الجسر والاكثاف (نسبة تحمل كاليفورنيا لا تقل عن 15 %) ورشها بالمياه الاصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول الى اقصى كثافة جافة ( 95% من الكثافة الجافة القصوى ) ويتم التنفيذ طبقا للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المقتمدة والبند بجميع مشتلاته طبقا لاصول الصناعة ومواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس المشرف.<br>في حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% يحسب زيادة 1 جنية على زيادة نسبة الدمك لكل 1% .<br>مسافة النقل حتى 2 كم ويتم احتساب علاوة 1.5 جنية للكم بالزيادة.<br>السعر يشمل عمل تشوينات وتخليط واختيارات ونقل لموقع العمل حتى مسافة 2 كم .<br>السعر يشمل قيمة المادة المحجيرة .                                                                                                                  | 3م     | 102.50 | 18,000.00 | 1,845,000.00 |
| 3-1                                               | علاوة مسافة نقل للتربة لمسافة 139 كم $205.5 = 1.5 \times 137$ جنيه                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3م     | 205.50 | 14,400.00 | 2,959,200.00 |
|                                                   | علاوة مسافة نقل للرمل لمسافة 109 كم $160.5 = 1.5 \times 107$ جنيه                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3م     | 160.50 | 3,600.00  | 577,800.00   |
|                                                   | علاوة حصول رسوم الكارثة والموازين طبقا للاحقة الشركة الوطنية                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3م     | 13.00  | 18,000.00 | 234,000.00   |
| <b>المرحلة الثالثة : اعمال طبقات الاساس</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |        |           |              |
| 4                                                 | <b>طبقات الاساس</b><br>بالمتر المكعب اعمال توريد وفرش طبقة تاسيس ( prepared Subgrade ) من الاحجار الصلبة المترجرة ناتج تكسير الكسارات والمطابقة للمواصفات واقصى حجم للحبيبات 100 مم والا تزيد نسبة المار من منخل 200 عن 12 % و التدرج الوارد بالاشتراطات الخاصة بالمشروع لا تقل نسبة تحمل كاليفورنيا عن 25 % و الا تزيد نسبة الفاقد بجهاز لوس انجلوس عن 30 % والا يزيد الامتصاص عن 15% و الا يقل معامل المرونة ( Ev2 ) من تجربة لوح التحميل عن 80 ميجاباسكال ويتم فرداها على طبقتين باستخدام الات التسوية الحديثة على ان لا يزيد سمك الطبقة بعد تمام الدمك عن 25 سم و رشها بالمياه الاصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول الى اقصى كثافة جافة قصوى ( لا تقل عن 95 % ) من الكثافة المعملية والفة تشمل اجراء التجارب المعملية والحقلية ويتم التنفيذ طبقا لاصول الصناعة والرسومات التفصيلية المقتمدة والبند بجميع مشتلاته طبقا للمواصفات الفنية للمشروع وتقرير الاستشاري وتعليمات المهندس المشرف.<br>مسافة النقل 20 كم<br>- يتم احتساب علاوة 1.3 جنيه لكل 1 كم بالزيادة او النقصان | 3م     | 150.00 | 1,700.00  | 255,000.00   |
| 4-1                                               | قيمة المادة المحجيرة                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3م     | 161.00 | 1,700.00  | 273,700.00   |
|                                                   | علاوة مسافة النقل 140 كم $120 = 1.30 \times 156$ جنيه                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3م     | 156.00 | 1,700.00  | 265,200.00   |
|                                                   | علاوة حصول رسوم الكارثة والموازين طبقا للاحقة الشركة الوطنية                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3م     | 25.00  | 1,700.00  | 42,500.00    |

مدير مشروعات ( الهيئة )

م / حسن فياض

مدير المشروع ( الهيئة )

م / مارجريث مجدى

مدير المشروع الاستشاري

م / محمد سيف

الشركة المنفذة

م / ابراهيم رشدى

مشروع القطار الكهربائي فائق السرعة قطاع (برج العرب - العلمين)  
مرحلة تشكيل الجسر الترابي وطبقات الأساس والحمايات الخرسانية  
المقاييس المعدلة بعد المفاوضة بتاريخ 2023/12/18 لينود الاعمال تنفيذ شركة علاء الدين وشركاه للمقاولات المتكاملة  
القطاع من محطة 335+000 الى 335+060 بطول 60 م  
طبقا للعقد رقم 412 / 2025/2024

| رقم البند | بيان الأعمال                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | الوحدة | الفئة  | الكمية   | الاجمالي   |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|----------|------------|
| 4-2       | بالمتر المكعب أعمال توريد وفرش طبقة أساس من الاحجار الصلبة المترجرة ناتج تكسير الكسارات والمطابقة للمواصفات وأقصى حجم للحبيبات ما بين 31.5 مم الي 40 مم والا يزيد نسبة المار من منخل 200 عن 5% والتدرج الوارد بالاشتراطات الخاصة بالمشروع لا تقل نسبة تحمل كاليفورنيا عن 80 % والا يقل معامل المرونة (Ev2) من تجربة لوح التحميل عن 120 ميجاباسكال والا يزيد نسبة الفاقد بجهاز لوس انجلوس عن 30 % والا يزيد الامتصاص عن 15 % ويتم فردها على طبقتين باستخدام الات التسوية الحديثة على ان لا يزيد سمك الطبقة بعد تمام الدمك عن 20 سم و رشها بالمياة الاصولية للوصول الي نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول الي أقصى كثافة جافة قصوي ( لا يقل عن 100%) من الكثافة المعملية و الفئة تشمل اجراء التجارب المعملية والحقلية ويتم تنفيذ طبقا لاصول الصناعة والرسومات التفصيلية المعتمدة والبند بجميع مشتلاته طبقا للمواصفات الفنية للمشروع وتقرير الاستشاري وتعليمات المهندس المشرف .<br>-مسافة النقل 20 كم<br>- يتم احتساب علاوة 1.3 جنيه لكل 1 كم بالزيادة او النقصان | م3     | 154.20 | 1,120.00 | 172,704.00 |
|           | قيمة المادة المحجيرة                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | م3     | 175.00 | 1,120.00 | 196,000.00 |
|           | علاوة مسافة النقل 140 كم = 120 كم * 1.30 = 156 جنيه                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | م3     | 156.00 | 1,120.00 | 174,720.00 |
|           | علاوة تحصيل رسوم الكارثة والموازين طبقا لائحة الشركة الوطنية                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | م3     | 25.00  | 1,120.00 | 28,000.00  |

#### المرحلة الرابعة : اعمال الخرسانة

| 5   | البلاطات الخرسانية                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | الوحدة | الفئة    | الكمية  | الاجمالي   |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|---------|------------|
| 5-1 | بالمتر المسطح اعمال توريد و صب خرسانة عادية سمك 15 سم لحماية الاكثاف والمويل الجانبية تتكون من 0.8 م3 سن دولوميت متدرج + 0.4 م3 رمل حرش و الإضافات طبقا لتعليمات الاستشاري (فيبر + سبكا) على ان يكون السن نظيف و مغسول و الرمل خالي من الشوائب و الطفلة و الاملاح و المواد الغريبة مع وضع فوم (بالفاصل) بسمك 2 سم (طبقا لتعليمات الاستشاري) والبند يشمل تجهيز و استعداد مناسيب التربة الطبيعية اسفل البلاطة للوصول الى المناسيب التصميمية على ان تحقق الخرسانة اجهاد لا يقل عن 250 كجم/سم2 و تشطيب السطح و ملئ الفواصل بالبيتومين المرمل و التنفيذ طبقا لاصول الصناعة و الرسومات التفصيلية المعتمدة و البند بجميع مشتلاته طبقا للمواصفات الفنية العامة للطرق والكباري و تعليمات المهندس المشرف .<br>يتم اضافة علاوة قدرها 5 جنيه بعد اول 10 متر راسي على ان تضاف لكل مسطح (لا يقل عن 5 متر راسي) | م2     | 462.00   | 649.095 | 299,881.89 |
| 5-2 | بالمتر المكعب اعمال توريد و صب خرسانة عادية لخدمات الحماية والمويل الجانبية تتكون من 0.8 م3 سن دولوميت متدرج + 0.4 م3 رمل حرش و الإضافات طبقا لتعليمات الاستشاري (فيبر + سبكا) على ان يكون السن نظيف و مغسول و الرمل خالي من الشوائب و الطفلة و الاملاح و المواد الغريبة مع وضع فوم (بالفاصل) بسمك 2 سم (طبقا لتعليمات الاستشاري) والبند يشمل اعمال الحفر والشدات وكل ما يلزم لنهوه العمل على ان تحقق الخرسانة اجهاد لا يقل عن 250 كجم/سم2 و ملئ الفواصل بالبيتومين المرمل و التنفيذ طبقا لاصول الصناعة و الرسومات التفصيلية المعتمدة و البند بجميع مشتلاته طبقا للمواصفات الفنية العامة للطرق والكباري و تعليمات المهندس المشرف .<br>يتم اضافة علاوة قدرها 5 جنيه بعد اول 10 متر راسي على ان تضاف لكل مسطح (لا يقل عن 5 متر راسي)                                                               | م3     | 2,759.00 | 49.9073 | 137,694.24 |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |          |         | 7,713,200  |

( سبع ملايين وسبعمئة وثلاثة عشر ألفا ومئتان جنيتها فقط لا غير )

مدير مشروع ( الهيئة )

م / محمد حسنى فياض

مدير المشروع ( الهيئة )

م / مارجريت مجدى

مدير المشروع الاستشاري

م / محمد سيف

الشركة المنفذة

م / ايمن رشدى

يعتمد

رئيس الادارة المركزية

منطقة غرب الدلتا

الاسكندرية - مرسى مطروح

عميد مهندس /

" هانى محمد محمد طه "