

# MATERIAL APPROVAL REQUEST



|                             |                   |                     |                          |                                     |    |    |    |    |    |    |
|-----------------------------|-------------------|---------------------|--------------------------|-------------------------------------|----|----|----|----|----|----|
| Contractor Company          | ALADDIN(2)        |                     | Designer Company         | (K.K) Engineering Consulting Office |    |    |    |    |    |    |
| Issued by Contractor        | Name              | Sign                | Date/Serial Number       | Time                                |    |    |    |    |    |    |
|                             | Eng. MAHMOUD DIAB | <i>Mahmoud Diab</i> | 14/10/2023               | 10:00                               |    |    |    |    |    |    |
| Received by GARB CONSULTANT | Eng. SAIED SAIF   | Sign                | S5-A-AD-2-M.A.R. QT - 04 |                                     |    |    |    |    |    |    |
|                             |                   | <i>[Signature]</i>  | C1                       | C2                                  | C3 | DD | MM | YY | HH | MM |
|                             |                   |                     | 334                      | EW                                  | CS | 15 | 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)                                                                                                                                                                                          |                                                                               |
| 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 |                                                                               |

| 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>  | 25-10-2023 | 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 : 25/10/2023  
Reporting No. : 07  
Sample No. : 07

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 /   
الممثل عن العميل /   
الممثل عن العميل / 

Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
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Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 25/10/2023  
Reporting No. : 07  
Sample No. : 07

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

| Sieve Size<br>(mm) | Passing % |
|--------------------|-----------|
| 50                 | 97.8      |
| 37.5               | 94.5      |
| 25                 | 86.3      |
| 19                 | 79.7      |
| 12.50              | 63.5      |
| 9.50               | 58.8      |
| 4.75               | 47.3      |
| 2.36               | 45.5      |
| 2.00               | 43.7      |
| 1.18               | 38.9      |
| 0.600              | 31.5      |
| 0.425              | 28.3      |
| 0.300              | 24.1      |
| 0.150              | 19.7      |

Signature /



Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
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Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 25/10/2023  
Reporting No. : 07  
Sample No. : 07

**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) | 9.1            |

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إبراهيم إبراهيم - شارع عبد الله 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 : 25/10/2023  
Reporting No. : 07  
Sample No. : 07

**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          |

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المركز الرئيسي : شارع النيل - الأحياء - 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 : 25/10/2023  
Reporting No. : 07  
Sample No. : 07

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

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |
|------------------------------------------------------|----------------|------------------------------------|----------|
|                                                      |                | (A-1-a)                            | (A-1-b)  |
| 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).                                   | 28.3           | Max 30 %                           | Max 50 % |
| 0.075 mm (No. 200).                                  | 9.1            | Max 15 %                           | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |
| Liquid Limit .....                                   | NP             | -----                              | -----    |
| Plasticity index .....                               | NP             | Max 6 %                            | Max 6 %  |

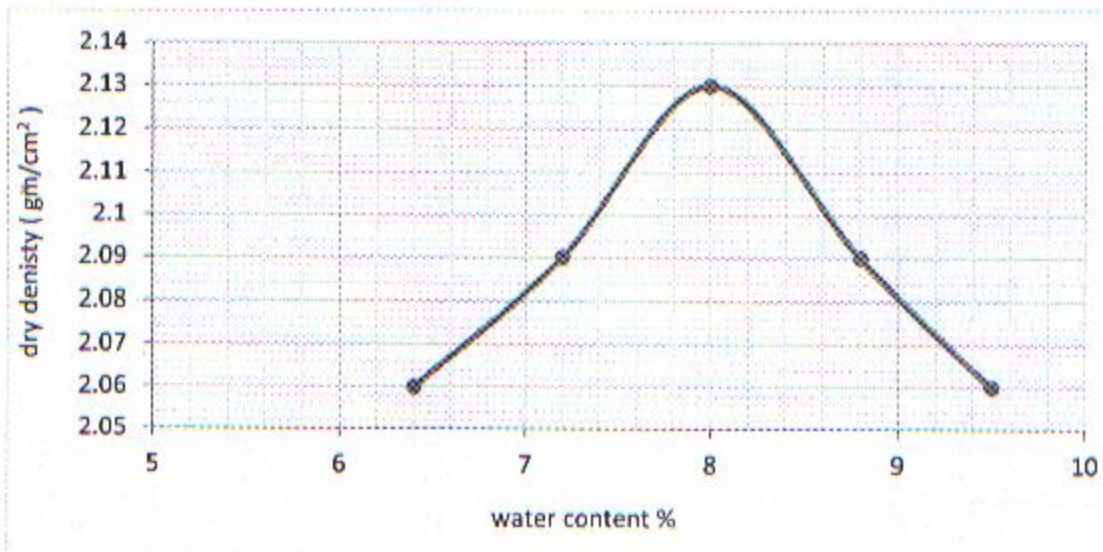
The test results are ( ☒ Comply - ☐ Not Comply ) with specifications limits

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الساحل الشمالي 02  
شركة 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 : 15/10/2023  
Reporting Date : 25/10/2023  
Reporting No. : 07  
Sample No. : 07

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



- Max dry density (gm/cm³) : 2.13
- Optimum moisture content % : 8.0

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... المهندس محمد السيد  
شركة الرئيسية : شارع النيل - القاهرة



Sample No. : 07

## ASTM D 1883

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 33.4  |
|                                   | 6.90         | 2.37           |       |

### Notes :

- 3- Surcharge load 4.50 Kg.

Signature

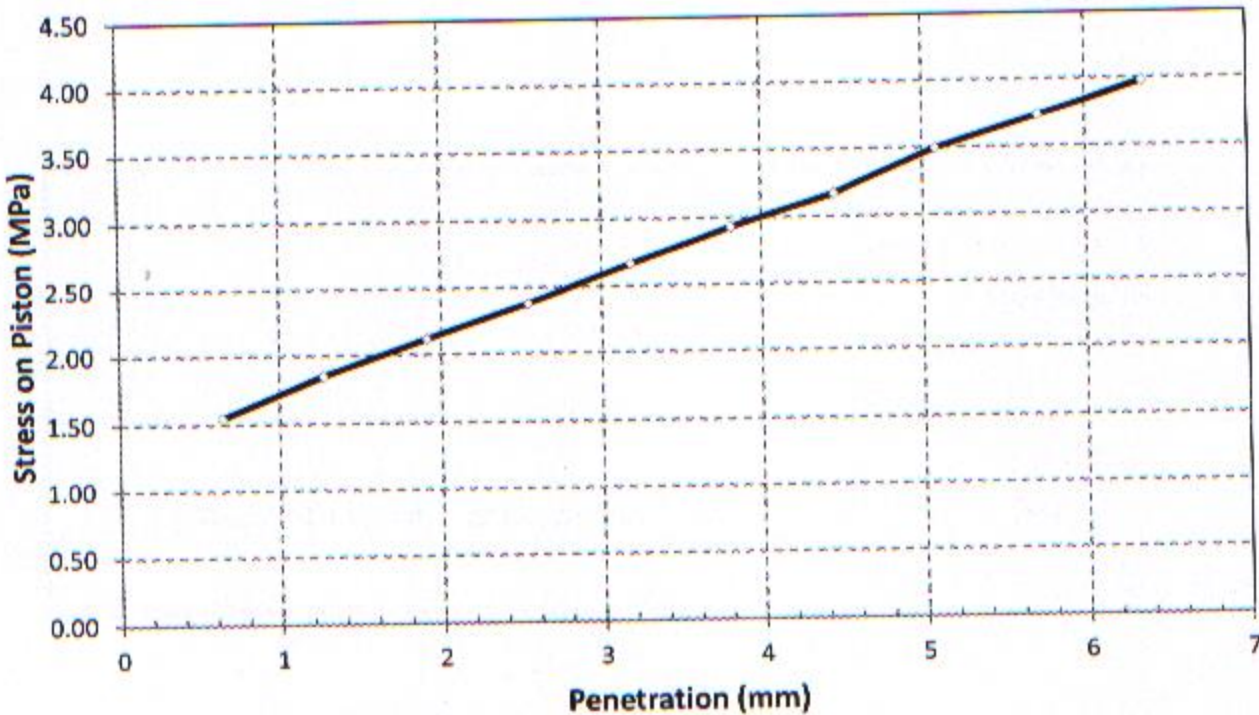
02/... nature

المقرر الرئيسي \* شارع مكة الأقصى. المرفأ القديم. المرفأ الجديد.



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 : 25/10/2023  
Reporting No. : 07  
Sample No. : 07

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



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الشارع 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 : 25/10/2023  
Reporting No. : 07  
Sample No. : 07

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

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

  
مكتب معامل الاستشارات الهندسية  
02  
Signature / .....  
البريد الإلكتروني : info@cel-egypt.com



# MATERIAL APPROVAL REQUEST



|                             |                   |                     |                            |                                     |    |    |    |    |    |    |
|-----------------------------|-------------------|---------------------|----------------------------|-------------------------------------|----|----|----|----|----|----|
| Contractor Company          | ALADDIN(2)        |                     | Designer Company           | (K.K) Engineering Consulting Office |    |    |    |    |    |    |
| Issued by Contractor        | Name              | Sign                | Date/Serial Number         | Time                                |    |    |    |    |    |    |
|                             | Eng. MAHMOUD DIAB | <i>Mahmoud Diab</i> | 14/10/2023                 | 10:00                               |    |    |    |    |    |    |
| Received by GARB CONSULTANT | Eng. SAIED SAIF   | <i>SAIED SAIF</i>   | S5 -A-AD-2 -M.A.R. QT - 03 |                                     |    |    |    |    |    |    |
|                             |                   |                     | C1                         | C2                                  | C3 | DD | MM | YY | HH | MM |
|                             |                   |                     | 334                        | EW                                  | CS | 15 | 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(1500 m3) |                                                                                                                                                                                                                                  |                                                                               |
| Location to be Used                | المشروع                            |                                                                                                                                                                                                                                  |                                                                               |
| 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 Zakl (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 |                                                                               |

| 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> | 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 /    
مكتب معامل الاستشارات الهندسية  
المناجيل السمانية  
شركة رئيسية - 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 : 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 الإستشارات الهندسية  
المساحة / الشماريخ  
Signature  
المركز الرئيسي : شارع الملك فيصل - القاهرة  
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           |

**CEL**  
مكتب معامل الاستشارات الهندسية  
البيلاجي محمد الشحات  
Signature  
الموقع الرئيسي : شارع نكت الألفظم - 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

**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             |



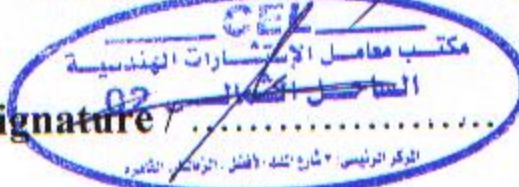
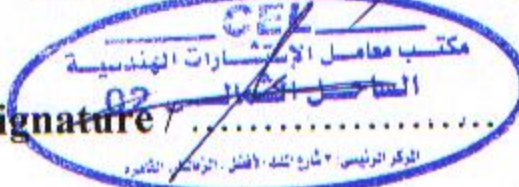


Company Name : علاء الدين و شركاه للمقاولات المتكاملة :  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample No. : 06

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

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |
|------------------------------------------------------|----------------|------------------------------------|----------|
|                                                      |                | (A-1-a)                            | (A-1-b)  |
| 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 %  |

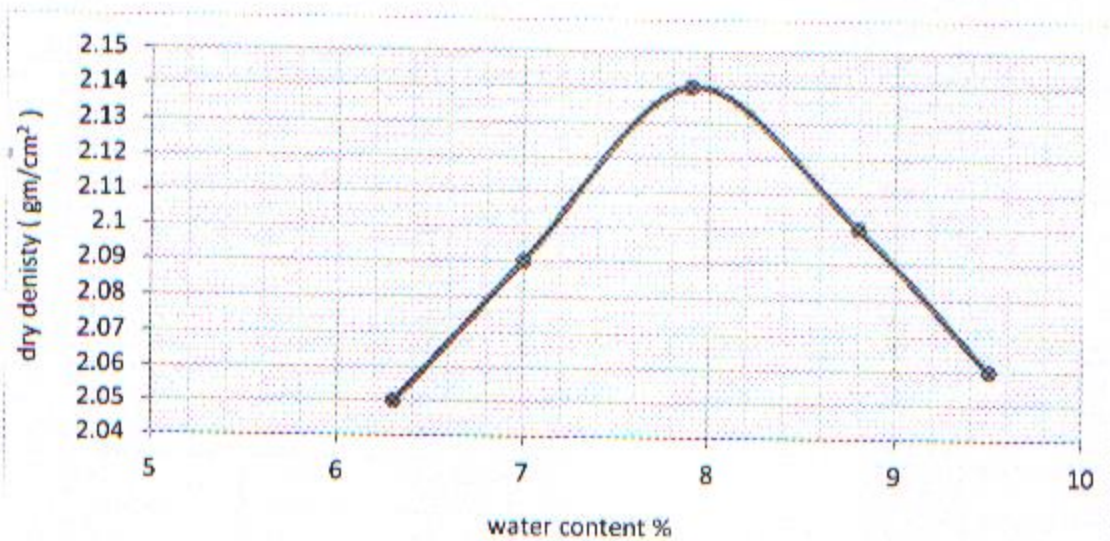
The test results are (☒ Comply - ☐ Not Comply) with specifications limits

Signature :   
المهندس :   
02

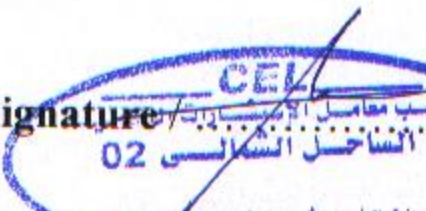


Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
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Delivery Date : 15/10/2023  
Reporting Date : 26/10/2023  
Reporting No. : 06  
Sample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

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



- Max dry density (gm/cm<sup>2</sup>) : 2.12
- Optimum moisture content % : 8.1

Signature:   
مكتب معامل الاستشارات الهندسية  
الانسان احمد الشاذلي 02  
البريد الإلكتروني: shazly@cel-egypt.com



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 :**

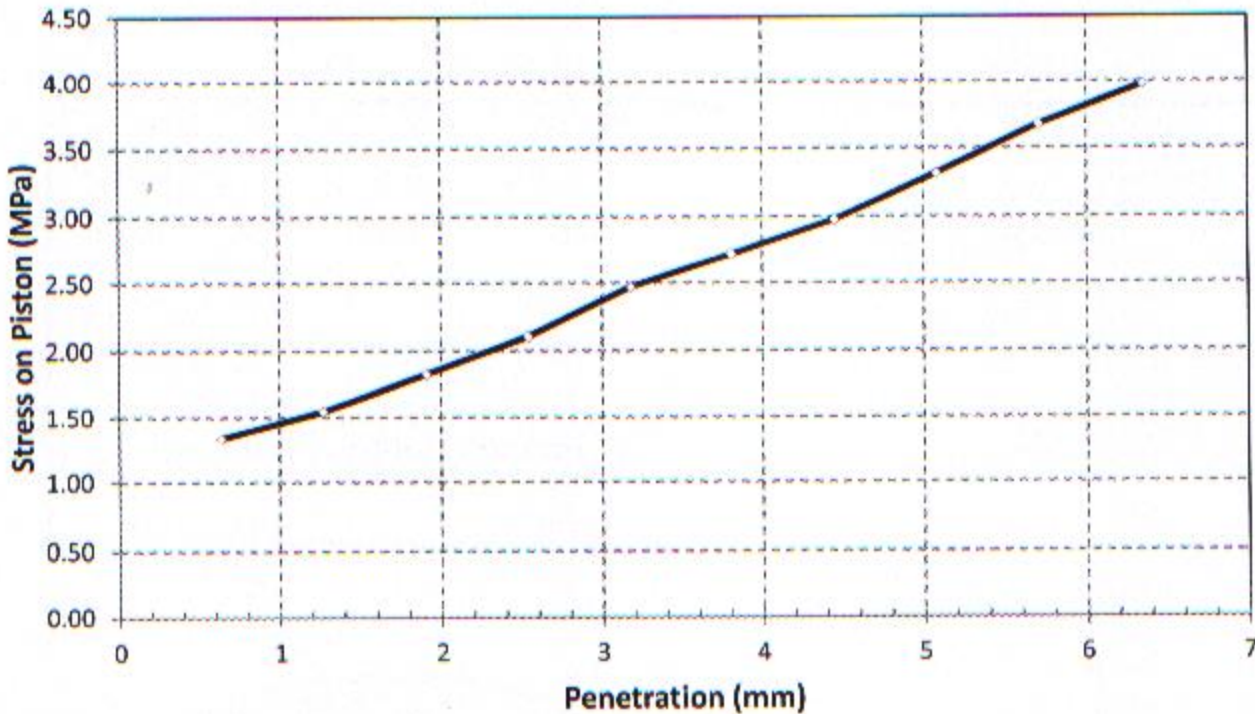
- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of 2.12 (gm /cm<sup>3</sup>) at 8.1 % optimum water content.

3- Surcharge load 4.50 Kg  
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  
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Sample No. : 06

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



**CEL**  
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Signature : .....  
المهندس / محمد أحمد السيد  
المقر 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  
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Reporting No. : 06  
Sample No. : 06

## Organic of Soil ASTM D-2974

### Method Type D

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

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Signature / التوقيع .....  
المركز الرئيسي : شارع الملك الأفطال - الزمالة - القاهرة



# MATERIAL APPROVAL REQUEST



|                             |                   |                     |                          |                                     |    |    |    |    |    |    |    |
|-----------------------------|-------------------|---------------------|--------------------------|-------------------------------------|----|----|----|----|----|----|----|
| Contractor Company          | ALADDIN(2)        |                     | Designer Company         | (K.K) Engineering Consulting Office |    |    |    |    |    |    |    |
| Issued by Contractor        | Name              | Sign                | Date/Serial Number       | Time                                |    |    |    |    |    |    |    |
|                             | Eng. MAHMOUD DIAB | <i>Mahmoud Diab</i> | 02/10/2023               | 10:00                               |    |    |    |    |    |    |    |
| Received by GARB CONSULTANT | Eng. SAIED SAIF   | <i>Saied Saif</i>   | S5-A-AD-2-M.A.R. QT - 02 | C1                                  | C2 | C3 | DD | MM | YY | HH | MM |
|                             |                   | MAR                 |                          | 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(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 |                                                                               |

| 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> | 16-10-2023 | 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 : 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 الشبلي  
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

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

| Sieve Size (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      |

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مكتب معامل الاستشارات الهندسية  
الساحل الشمالي  
شركة الرئيس - 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

**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           |

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الاستشاري  
الزمرات - القاهرة



Company Name : علاء الدين وشركاه 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 (%) |
|------------------|-------------|
| Liquid Limit     | NP          |
| Plastic Limit    | NP          |
| Plasticity Index | NP          |

Signature:   
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شركة علاء الدين وشركاه للمقاولات المتكاملة  
القاهرة - الجيزة - شبراخيت - دمياط - بورسعيد - سوهاج - الأقصر - أسوان



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 %  |

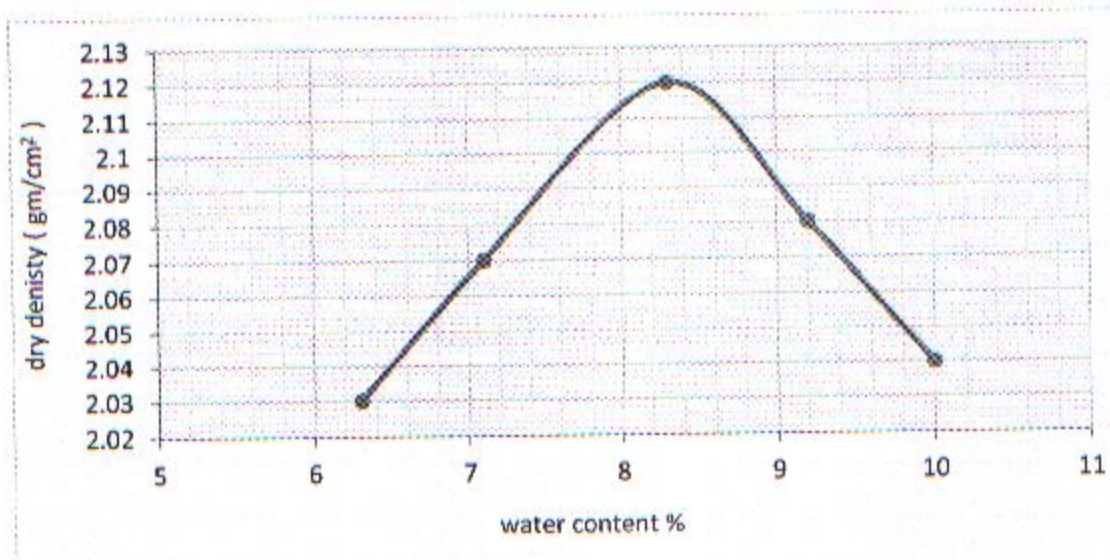
The test results are (☒ Comply - ☐ Not Comply) with specifications limits

Signature  
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.....  
المركز 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  
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

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الزمالك - القاهرة  
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 : 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.

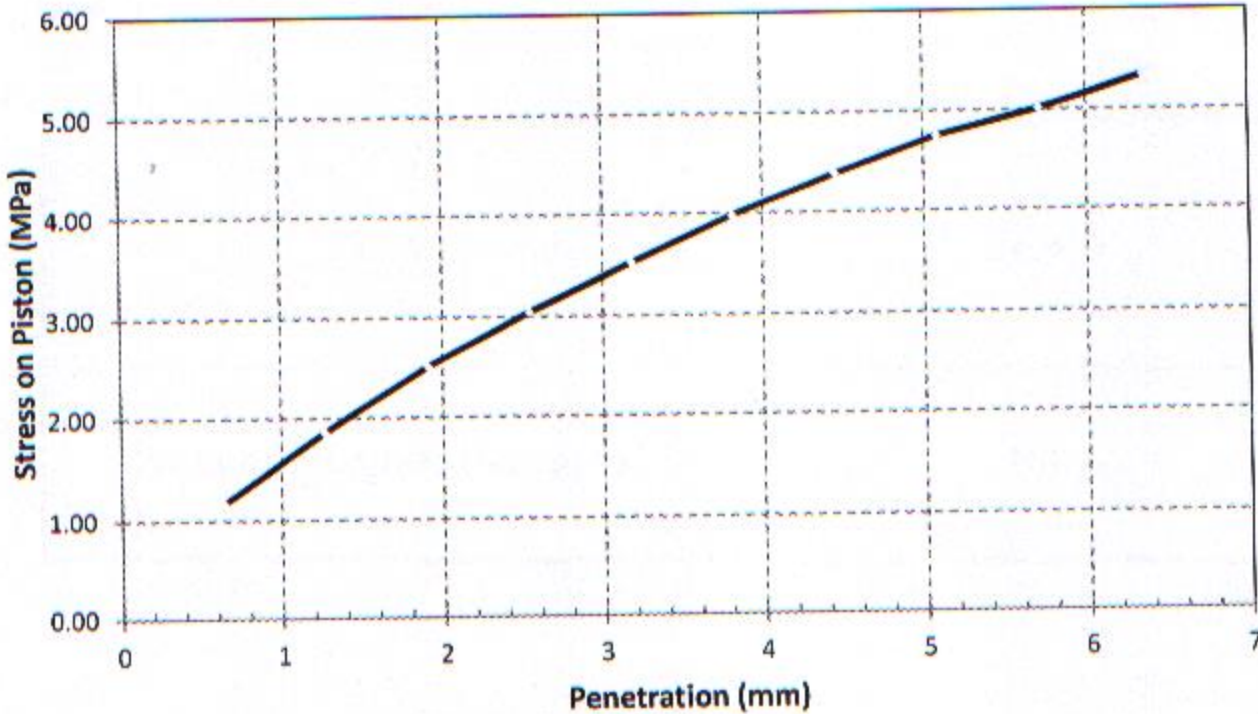
Signature

مكتب معامل الاستشارات الهندسية  
 الساجد الشاذلي 02  
 المرفأ النوليس ٢ 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

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



**CEL**  
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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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مكتسبيا معاميل الاستشارات الهندسية  
المبا حصيل المصالح السي 02  
المركز الرئيسي : شارع الملك الأفندي - الزمالك - القاهرة



# MATERIAL APPROVAL REQUEST



|                             |                   |                    |                                        |                                     |    |    |    |    |    |    |    |
|-----------------------------|-------------------|--------------------|----------------------------------------|-------------------------------------|----|----|----|----|----|----|----|
| Contractor Company          | ALADDIN(2)        |                    | Designer Company                       | (K.K) Engineering Consulting Office |    |    |    |    |    |    |    |
| Issued by Contractor        | Name              | Sign               | Date/Serial Number                     | Time                                |    |    |    |    |    |    |    |
|                             | Eng. MAHMOUD DIAB | <i>[Signature]</i> | 07/11/2023<br>S5-A-AD-2-M.A.R. QT - 05 | 10:00                               |    |    |    |    |    |    |    |
| Received by GARB CONSULTANT | Eng. SAIED SAIF   | <i>[Signature]</i> | MAR                                    | C1                                  | C2 | C3 | DD | MM | YY | HH | MM |
|                             |                   |                    |                                        | 334                                 | EW | CS | 8  | 11 | 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(1500 m3) |                                                                                                                                                                                                                                  |                                                                               |
| Location to be Used                | المشروع                            |                                                                                                                                                                                                                                  |                                                                               |
| 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 |                                                                               |

| APPROVAL STATUS          |                       |                    |            |         |
|--------------------------|-----------------------|--------------------|------------|---------|
| Organisation             | Name                  | Sign               | Date       | A-AWC-R |
| Contractor               | Eng.Mahmoud Diab      | <i>[Signature]</i> |            | A       |
| QA/QC *                  | Eng. SAIED SAIF       | <i>[Signature]</i> |            | A       |
| GARB**                   | Eng. Margret Magdy    |                    |            |         |
| Employers Representative | Eng. Alaa Abd-Allatif | <i>[Signature]</i> | 23-11-2023 | 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 : 08/11/2023  
Reporting Date : 23/11/2023  
Reporting No. : 08  
Sample No. : 08

Dear Gentleman,

Attached here with the Soil Embankment delivered on 08/11/2023

### 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   
مكتب معامل الاستشارات الهندسية  
السيد محمد السيد السيد  
المركز الرئيسي : شارع احمد لطفى 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 : 08/11/2023  
Reporting Date : 23/11/2023  
Reporting No. : 08  
Sample No. : 08

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

| Sieve Size<br>(mm) | Passing % |
|--------------------|-----------|
| 50                 | 100       |
| 37.5               | 97.6      |
| 25                 | 86.1      |
| 19                 | 76.4      |
| 12.50              | 62.4      |
| 9.50               | 59.7      |
| 4.75               | 53.2      |
| 2.36               | 48.9      |
| 2.00               | 46.1      |
| 1.18               | 42.1      |
| 0.600              | 35.5      |
| 0.425              | 28.7      |
| 0.300              | 22.1      |
| 0.150              | 16.7      |

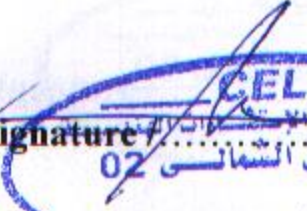
CEL  
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02  
المعتمد حسب المواصفة القياسية  
Signature / .....  
الموقع: نوبتو - شارع الملك الأفصل - القاهرة



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 : 08/11/2023  
Reporting Date : 23/11/2023  
Reporting No. : 08  
Sample No. : 08

**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) | 10.3           |

  
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**التفاضل الشهابى 02**  
 الرئيس التنفيذي \* شارع النيل - الأهرام - 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 : 08/11/2023  
Reporting Date : 23/11/2023  
Reporting No. : 08  
Sample No. : 08

**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             |

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الساحل الشمالي  
البرق الرئيسي \* شارع الملك الأفضل - الزمالة - القاهرة

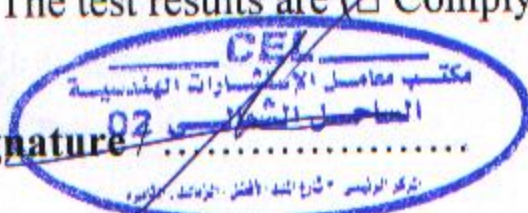


Company Name : علاء الدين و شركاه للمقاولات المتكاملة  
Project : Electric Express Train, from Al Ain Sokhna to Marsa Matrouh  
Type of sample : Soil Embankment  
Location : St. 334+000  
Delivery Date : 08/11/2023  
Reporting Date : 23/11/2023  
Reporting No. : 08  
Sample No. : 08

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

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |
|------------------------------------------------------|----------------|------------------------------------|----------|
|                                                      |                | (A-1-a)                            | (A-1-b)  |
| Group Classification                                 | (A-1-a)        | (A-1-a)                            | (A-1-b)  |
| 2.00 mm (No.10).                                     | 46.1           | Max 50 %                           | -----    |
| 0.425 mm (No. 40).                                   | 28.7           | Max 30 %                           | Max 50 % |
| 0.075 mm (No. 200).                                  | 10.3           | 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: 







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 : 08/11/2023  
Reporting Date : 23/11/2023  
Reporting No. : 08  
Sample No. : 08

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

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 1.69                   |
| 1.27        | 0.050 | 1.95                   |
| 1.91        | 0.075 | 2.21                   |
| 2.54        | 0.100 | 2.52                   |
| 3.18        | 0.125 | 2.81                   |
| 3.81        | 0.150 | 3.16                   |
| 4.45        | 0.175 | 3.42                   |
| 5.08        | 0.200 | 3.68                   |
| 5.71        | 0.225 | 3.98                   |
| 6.35        | 0.250 | 4.27                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 36.5  |
|                                   | 6.90         | 2.52           |       |

**Notes :**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of 2.11 (gm /cm<sup>3</sup>) at 8.3 % optimum water content.

3- Surcharge load 4.50 Kg.

Signature

مكتب معامل الاستشارات الهندسية

02

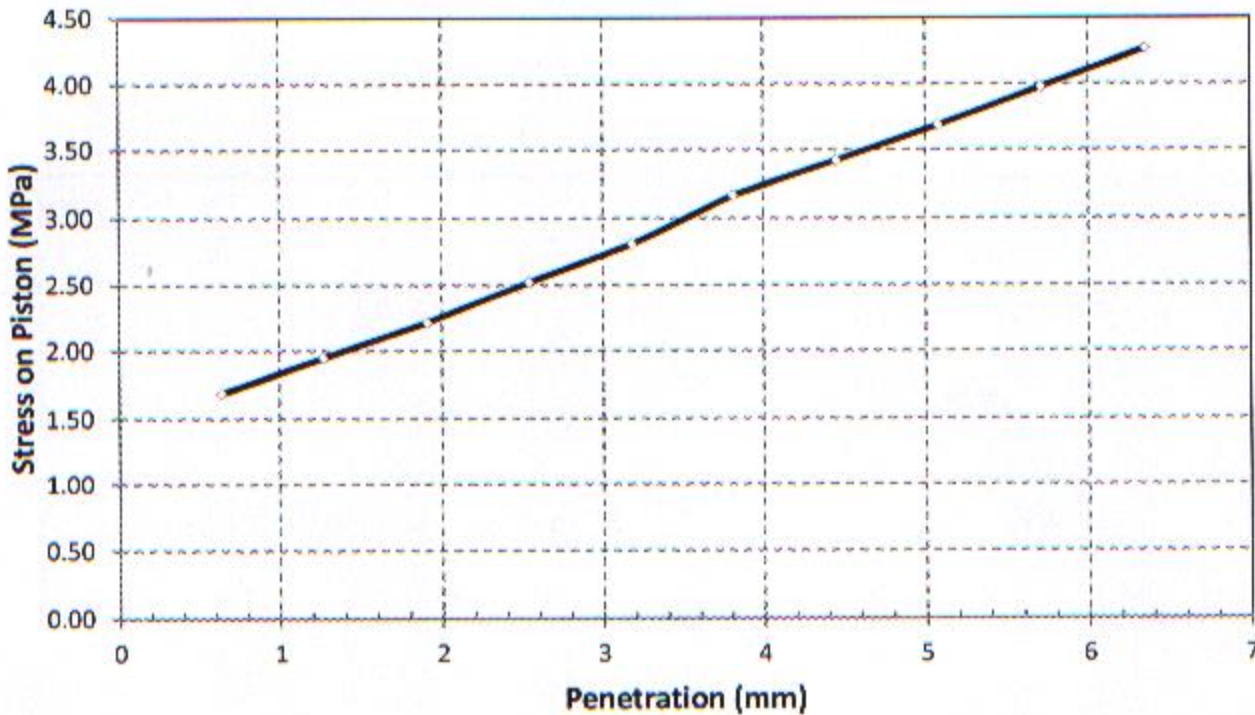
شركة الرئيس شارع الملك فيصل الزمالة - القاهرة



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 : 08/11/2023  
 Reporting Date : 23/11/2023  
 Reporting No. : 08  
 Sample No. : 08

### Load Penetration Curve of CBR Test

#### ASTM D-1883



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 CEL  
 مكتب معامل الاستشارات الهندسية  
 المركز الرئيسي: شارع الملك الأفندي، 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 :** 08/11/2023  
**Reporting Date :** 23/11/2023  
**Reporting No. :** 08  
**Sample No. :** 08

### Organic of Soil ASTM D-2974

#### Method Type D

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





# MATERIAL APPROVAL REQUEST



|                             |                   |                    |                    |                                     |    |    |    |    |    |    |    |
|-----------------------------|-------------------|--------------------|--------------------|-------------------------------------|----|----|----|----|----|----|----|
| Contractor Company          | ALADDIN(2)        |                    | Designer Company   | (K.K) Engineering Consulting Office |    |    |    |    |    |    |    |
| Issued by Contractor        | Name              | Sign               | Date/Serial Number | Time                                |    |    |    |    |    |    |    |
|                             | Eng. MAHMOUD DIAB | <i>maheD196</i>    | 14/08/2023         | 10:00                               |    |    |    |    |    |    |    |
| Received by GARB CONSULTANT | Eng. SAIED SAIF   | <i>[Signature]</i> | MAR                | C1                                  | C2 | C3 | DD | MM | YY | HH | MM |
|                             |                   |                    |                    | 334                                 | 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(2000 m3) |                                                                                                                                                                                                                                                             |                                                                               |
| Location to be Used                | المشروع                            |                                                                                                                                                                                                                                                             |                                                                               |
| 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                   | Nn/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 comibassal Lab . and garb consultant<br>3- results attached and found acceptable and comply with proj. specs.<br>4- final approval is subject to above mentioned comments |                                                                               |

| APPROVAL STATUS          |                       |                    |           |         |
|--------------------------|-----------------------|--------------------|-----------|---------|
| Organisation             | Name                  | Sign               | Date      | A-AWC-R |
| Contractor               | Eng.Mahmoud Diab      | <i>maheD196</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 وشركاه 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%                  |
| 3- Liquid limit, plastic limit and plasticity index                                              | LL                  | NP                    |
|                                                                                                  | PL                  | NP                    |
|                                                                                                  | PI                  | NP                    |
| 4- California bearing ratio (CBR)                                                                | 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







# COMIBASSAL International Controllers

## Internal inspection and laboratories sector

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# APPENDIX

Kilo 23 Alexandria - Cairo Desert Road - Merghem

Tel: 002 03 4704595 - 002 034701191

Email : [civdept@comibassal.com](mailto:civdept@comibassal.com)

WebSite : [www.comibassal.com](http://www.comibassal.com)



49 El Horria Ave. Alex, Egypt

Tel: 002 033920176 - 002 033931482

Fax : 002 033900476

Email : [internal-inspection@comibassal.com](mailto:internal-inspection@comibassal.com)





# COMIBASSAL International Controllers

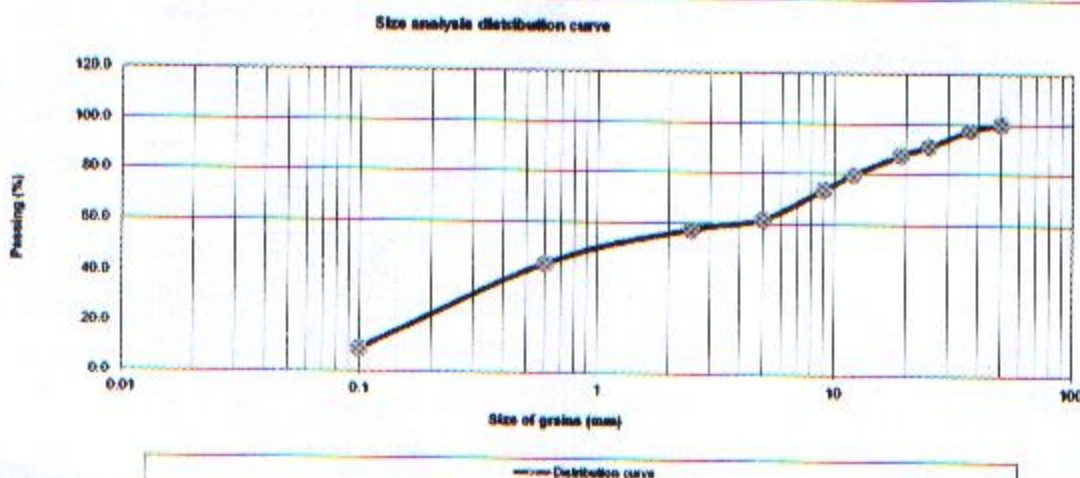
## Internal inspection and laboratories sector

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### 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= 6163.0 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

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### 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>

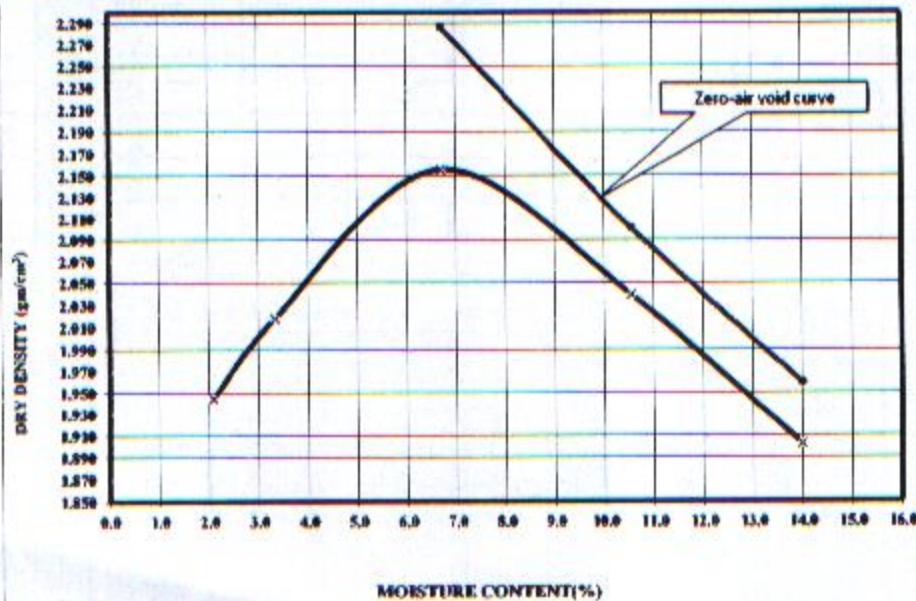
#### A- Density Calculations :-

|                                    | 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 g/cm<sup>3</sup>  
 O.M.C = 6.60 %







# COMIBASSAL International Controllers

## Internal inspection and laboratories sector

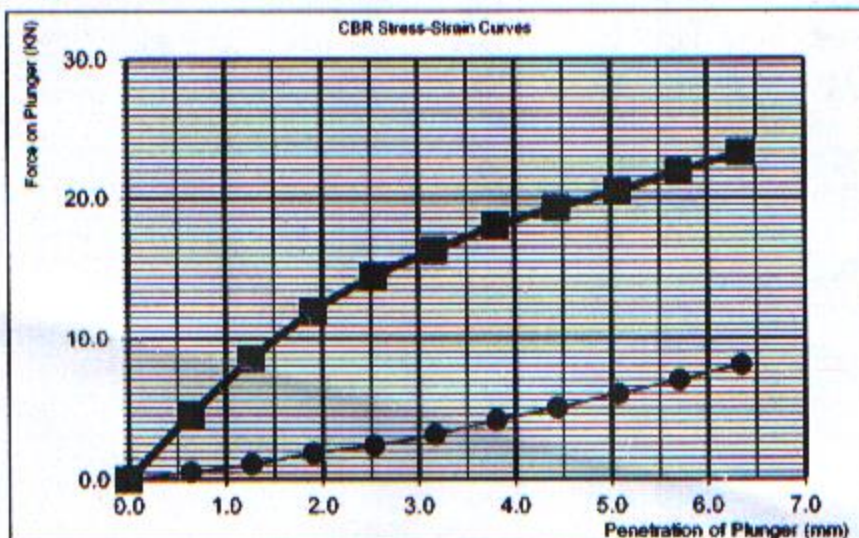
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### Report Of CBR Test - ASTM - D 1883

|                    |                   |  |                  |        |       |
|--------------------|-------------------|--|------------------|--------|-------|
| NO OF BLOWS        | 56                |  |                  |        |       |
| MOULD NO           | 1                 |  |                  |        |       |
| WT OF MOULD+SOIL   | 10945             |  |                  |        |       |
| WT OF MOULD        | 5880              |  |                  |        |       |
| WT OF SOIL         | 5065              |  |                  |        |       |
| 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            |  | OMC              | %      | 6.6   |
| WT OF DRY SOIL+TIN | 234               |  |                  |        |       |
| 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) | standard | CBR |
|------|---------------|--------------|----------|-----|
| mm   | 56            | 56           | 56       | 56  |
| 0.00 | 0             | 0.0          | 0.0      |     |
| 0.64 | 55            | 0.5          | 4.5      |     |
| 1.27 | 110           | 1.1          | 8.5      |     |
| 1.91 | 190           | 1.9          | 12.0     |     |
| 2.54 | 235           | 2.4          | 14.5     | 18  |
| 3.17 | 320           | 3.1          | 16.3     |     |
| 3.81 | 420           | 4.1          | 18.0     |     |
| 4.45 | 510           | 5.0          | 19.3     |     |
| 5.08 | 610           | 6.0          | 20.5     | 30  |
| 5.71 | 710           | 7.0          | 21.9     |     |
| 6.35 | 820           | 8.0          | 23.3     |     |



Kilo 23 Alexandria - Cairo Desert Road - Merghem  
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49 El Horria Ave. Alex, Egypt  
 Tel: 002 033920176 - 002 033931482  
 Fax : 002 033900476  
 Email : internal-inspection@comibassal.com





# COMIBASSAL International Controllers

## Internal inspection and laboratories sector

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

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

### CHEMICAL ANALYSIS

General Consultant : SYSTRA  
Consultant : Dr/ Khaled Kandil  
Contractor : شركة علاء 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 |
|----------------|----------|------------------|
| ORGANIG MATTER | NEGATIVE | ASTM D 2974      |



LAB DIRECTOR  
CH/ Mostafa Asker

*Mostafa*





# MATERIAL INSPECTION REQUEST



|                             |                   |                     |                                     |                                       |    |    |    |    |    |    |    |
|-----------------------------|-------------------|---------------------|-------------------------------------|---------------------------------------|----|----|----|----|----|----|----|
| Contractor Company          | ALADDIN(02)       |                     | Designer Company                    | (K - K) Engineering Consulting Office |    |    |    |    |    |    |    |
| Issued by Contractor        | Name              | Sign                | Date/Serial Number                  | Time                                  |    |    |    |    |    |    |    |
|                             | Eng. Mahmoud Diab | <i>Mahmoud Diab</i> | 11/11/2023<br>S5 -A-AD-2-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 |
|                             |                   |                     |                                     | 334                                   | EW | CS | 12 | 11 | 23 | 1  | 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 | -1.5                  |         |               |                                                                                  |      |
| Location to be Used      | From                  | 334+700 | TO            | 334+800                                                                          |      |
| MAR & UIR Approval No    | UIR S5 -A-AD-2 -F-5/2 |         | Date          | 05/11/2023                                                                       |      |
|                          | 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> | 12-11-2023 | Awc     |





## Technical Report

### Plate Loading Tests

KM 334+640, KM 334+740,  
and KM 334+840

(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 12, 2023)

مستند  
الميل عام الجامعة  
لواء هندسة / أسامة فتحي



الجامعة المصرية اليابانية للعلوم والتكنولوجيا  
EJUST

وحدة اختبارات واستشارات الهندسة المدنية

EJUST CETC UNIT





## 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 3 plate loading tests on the Middle Embankment (-1.5 m) of the Electric Express Train project at 3 locations (KM 334+640, KM 334+740, and KM 334+840) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Rabiee Roshdy of Aladdin and Partners Integrated Contracting. Field team members (Eng. Mohamed A. Elnaggar) from the working CETCU team visited the project site on November 12, 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  $26 \pm 1^\circ\text{C}$ .
- The plate was carried out on a Middle Embankment (-1.5 m) (according to the company) at 3 points (KM 334+640, KM 334+740, and KM 334+840). 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.



EJUST CETCU





### 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. 3 plate loading tests on the Middle Embankment (-1.5 m) of the Electric Express Train project were conducted at 3 locations (KM 334+640, KM 334+740, and KM 334+840) and the data collected at the 3 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+640), 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+640)**

| 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                        | 0.20           |
| 2             | 14.14    | 0.050                        | 0.32           |
| 3             | 21.21    | 0.075                        | 0.57           |
| 4             | 28.28    | 0.100                        | 0.65           |
| 5             | 35.35    | 0.125                        | 0.96           |
| 6             | 42.42    | 0.150                        | 1.14           |
| 7             | 49.49    | 0.175                        | 1.30           |
| 8             | 56.56    | 0.200                        | 1.44           |
| 9             | 63.63    | 0.225                        | 1.58           |
| 10            | 70.7     | 0.250                        | 1.73           |
| 11            | 56.56    | 0.200                        | 1.67           |
| 12            | 49.49    | 0.175                        | 1.61           |
| 13            | 35.35    | 0.125                        | 1.36           |
| 14            | 21.21    | 0.075                        | 1.20           |
| 15            | 1.414    | 0.005                        | 0.46           |







**Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 334+640)**

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.46           |
| 1             | 7.07     | 0.025                        | 0.69           |
| 2             | 14.14    | 0.050                        | 0.76           |
| 3             | 21.21    | 0.075                        | 0.94           |
| 4             | 28.28    | 0.100                        | 1.06           |
| 5             | 35.35    | 0.125                        | 1.23           |
| 6             | 42.42    | 0.150                        | 1.34           |
| 7             | 49.49    | 0.175                        | 1.44           |
| 8             | 56.56    | 0.200                        | 1.55           |
| 9             | 63.63    | 0.225                        | 1.64           |

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 334+640) 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+740) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 334+840) is provided in Tables 7-9 and Figure 3.

**Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 334+640)**

| Parameters                                 | 1st loading cycle | 2nd loading cycle |
|--------------------------------------------|-------------------|-------------------|
| ( $s_{0,max}$ ) MN/m <sup>2</sup>          | 0.25              | 0.25              |
| $a_0$ (mm)                                 | -0.05             | 0.46              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))            | 8.52              | 7.04              |
| $a_2$ (mm/(MN2/m <sup>4</sup> ))           | -5.34             | -7.90             |
| $Ev = 1.5 r / (a_1 + a_2 \cdot s_{0,MAX})$ | 62.66             | 88.80             |
| $Ev_2/Ev_1$                                | 1.42              |                   |





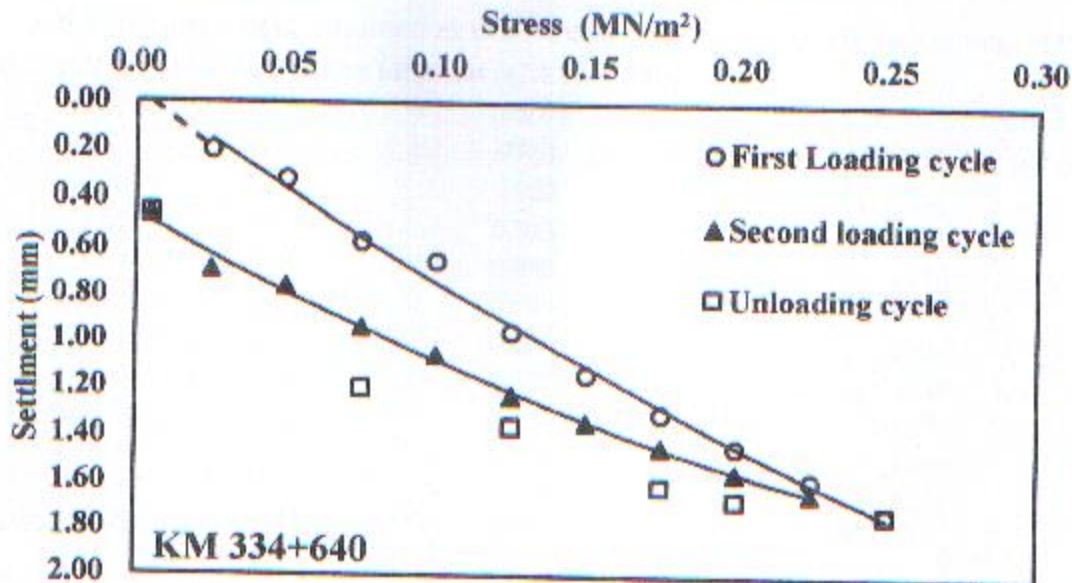


Figure 1: Load-settlement data: plate loading test performed at (KM 334+640)

Table 4: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 334+740)

| Loading stage | Load (F)<br>kN | Normal stress ( $\sigma_0$ )<br>MN/m <sup>2</sup> | Settlement (S)<br>mm |
|---------------|----------------|---------------------------------------------------|----------------------|
| 0             | 1.414          | 0.005                                             | 0.00                 |
| 1             | 7.07           | 0.025                                             | 0.28                 |
| 2             | 14.14          | 0.050                                             | 0.36                 |
| 3             | 21.21          | 0.075                                             | 0.61                 |
| 4             | 28.28          | 0.100                                             | 0.76                 |
| 5             | 35.35          | 0.125                                             | 0.93                 |
| 6             | 42.42          | 0.150                                             | 1.12                 |
| 7             | 49.49          | 0.175                                             | 1.26                 |
| 8             | 56.56          | 0.200                                             | 1.37                 |
| 9             | 63.63          | 0.225                                             | 1.53                 |
| 10            | 70.7           | 0.250                                             | 1.64                 |
| 11            | 56.56          | 0.200                                             | 1.59                 |
| 12            | 49.49          | 0.175                                             | 1.55                 |
| 13            | 35.35          | 0.125                                             | 1.42                 |
| 14            | 21.21          | 0.075                                             | 1.26                 |
| 15            | 1.414          | 0.005                                             | 0.54                 |

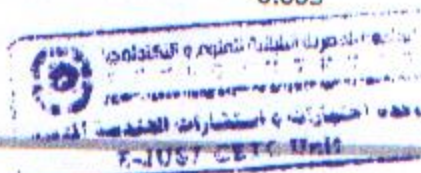






Table 5: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 334+740)

| Loading stage | Load (F)<br>kN | Normal stress ( $\sigma_0$ )<br>MN/m <sup>2</sup> | Settlement (S)<br>mm |
|---------------|----------------|---------------------------------------------------|----------------------|
| 0             | 1.414          | 0.005                                             | 0.54                 |
| 1             | 7.07           | 0.025                                             | 0.82                 |
| 2             | 14.14          | 0.050                                             | 0.90                 |
| 3             | 21.21          | 0.075                                             | 1.00                 |
| 4             | 28.28          | 0.100                                             | 1.15                 |
| 5             | 35.35          | 0.125                                             | 1.20                 |
| 6             | 42.42          | 0.150                                             | 1.31                 |
| 7             | 49.49          | 0.175                                             | 1.41                 |
| 8             | 56.56          | 0.200                                             | 1.50                 |
| 9             | 63.63          | 0.225                                             | 1.57                 |

Table 6: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 334+740)

| Parameters                                    | 1st loading cycle | 2nd loading cycle |
|-----------------------------------------------|-------------------|-------------------|
| ( $s_{0,max}$ ) MN/m <sup>2</sup>             | 0.25              | 0.25              |
| $a_0$ (mm)                                    | 0.04              | 0.58              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))               | 7.85              | 6.31              |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>4</sup> )) | -5.70             | -8.86             |
| $Ev = 1.5 r / (a_1 + a_2 \cdot s_{0,max})$    | 70.01             | 109.83            |
| $Ev_2/Ev_1$                                   | 1.57              |                   |

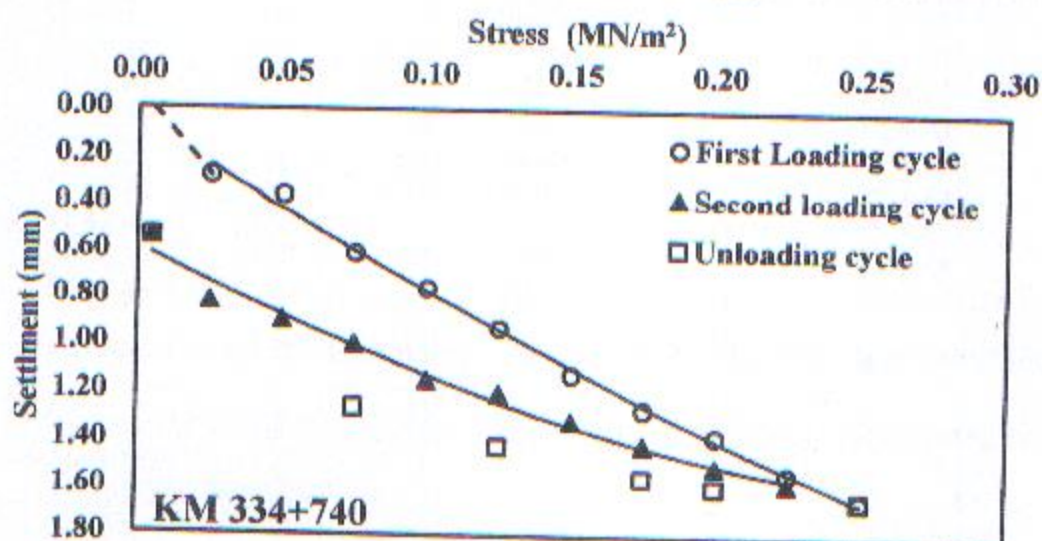


Figure 2: Load-settlement data: plate loading test performed at (KM 334+740)







**Table 7: 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) | 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                        | 0.67           |
| 3             | 21.21    | 0.075                        | 0.94           |
| 4             | 28.28    | 0.100                        | 1.12           |
| 5             | 35.35    | 0.125                        | 1.26           |
| 6             | 42.42    | 0.150                        | 1.40           |
| 7             | 49.49    | 0.175                        | 1.55           |
| 8             | 56.56    | 0.200                        | 1.65           |
| 9             | 63.63    | 0.225                        | 1.80           |
| 10            | 70.7     | 0.250                        | 1.85           |
| 11            | 56.56    | 0.200                        | 1.85           |
| 12            | 49.49    | 0.175                        | 1.82           |
| 13            | 35.35    | 0.125                        | 1.66           |
| 14            | 21.21    | 0.075                        | 1.50           |
| 15            | 1.414    | 0.005                        | 0.62           |

**Table 8: 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 ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.62           |
| 1             | 7.07     | 0.025                        | 0.88           |
| 2             | 14.14    | 0.050                        | 1.07           |
| 3             | 21.21    | 0.075                        | 1.23           |
| 4             | 28.28    | 0.100                        | 1.36           |
| 5             | 35.35    | 0.125                        | 1.48           |
| 6             | 42.42    | 0.150                        | 1.57           |
| 7             | 49.49    | 0.175                        | 1.67           |
| 8             | 56.56    | 0.200                        | 1.78           |
| 9             | 63.63    | 0.225                        | 1.87           |

**Table 9: 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              |
| $a_0$ (mm)                                    | 0.19              | 0.64              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))               | 10.59             | 8.68              |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>4</sup> )) | -15.89            | -14.83            |
| $Ev = 1.5 r / (a_1 + a_2 \cdot s_{0,max})$    | 67.96             | 90.42             |
| $Ev_2/Ev_1$                                   |                   | 1.33              |



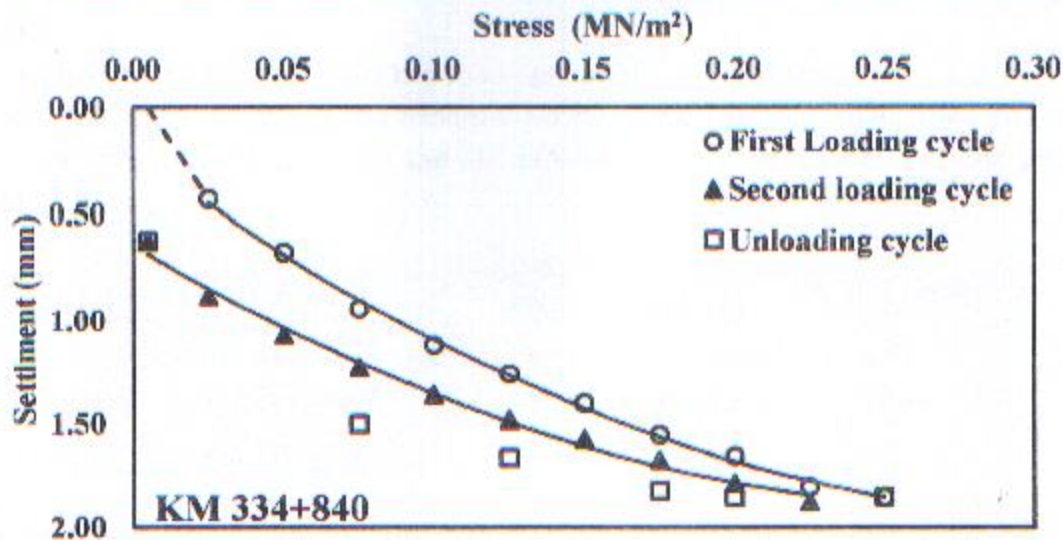


Figure 3: Load-settlement data: plate loading test performed at (KM 334+840)







#### 4. Closure

Test results presented herein report the load-settlement data obtained from 3 plate loading tests conducted on the Middle Embankment (-1.5 m) of the Electric Express train project at 3 locations (KM 334+640, KM 334+740, and KM 334+840) 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+640 | 62.66                         | 88.80 ✓                       | 1.42                  |
| KM 334+740 | 70.01                         | 109.83 ✓                      | 1.57                  |
| KM 334+840 | 67.96                         | 90.42 ✓                       | 1.33                  |

• 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

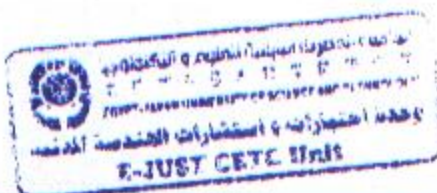
Mohamed A. Al-Najjar







## Appendix A







|                           |                                                                              |           |                         |                           |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|---------------------------|
| Location of test site:    | KM 334+640                                                                   |           | Field team              | Eng. Mohamed A. Elnaggar  |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 12/11/2023                |
| Diameter of loading plate | 600                                                                          |           | Time                    | 12:46:00 PM<br>1:14:00 PM |
| Lever ratio               | 1                                                                            |           | Note:<br>CAT 966E       |                           |
| Type of Soil              | Middle Embankment (-1.5 m)                                                   |           |                         |                           |
| Bedding material          | ---                                                                          |           |                         |                           |
| Temperature               | 26°C                                                                         |           |                         |                           |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                           |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |                           |
|                           | 1                                                                            | 7.07      | 9.80                    |                           |
|                           | 2                                                                            | 14.14     | 9.68                    |                           |
|                           | 3                                                                            | 21.21     | 9.43                    |                           |
|                           | 4                                                                            | 28.28     | 9.35                    |                           |
|                           | 5                                                                            | 35.35     | 9.04                    |                           |
|                           | 6                                                                            | 42.42     | 8.86                    |                           |
|                           | 7                                                                            | 49.49     | 8.70                    |                           |
|                           | 8                                                                            | 56.56     | 8.56                    |                           |
|                           | 9                                                                            | 63.63     | 8.42                    |                           |
|                           | 10                                                                           | 70.7      | 8.27                    |                           |
| Unloading Stage           | 11                                                                           | 56.56     | 8.33                    |                           |
|                           | 12                                                                           | 49.49     | 8.39                    |                           |
|                           | 13                                                                           | 35.35     | 8.64                    |                           |
|                           | 14                                                                           | 21.21     | 8.80                    |                           |
|                           | 15                                                                           | 1.414     | 9.54                    |                           |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                           |
| Reloading Stage           | 0                                                                            | 1.414     | 9.54                    |                           |
|                           | 1                                                                            | 7.07      | 9.31                    |                           |
|                           | 2                                                                            | 14.14     | 9.24                    |                           |
|                           | 3                                                                            | 21.21     | 9.06                    |                           |
|                           | 4                                                                            | 28.28     | 8.94                    |                           |
|                           | 5                                                                            | 35.35     | 8.77                    |                           |
|                           | 6                                                                            | 42.42     | 8.66                    |                           |
|                           | 7                                                                            | 49.49     | 8.56                    |                           |
|                           | 8                                                                            | 56.56     | 8.45                    |                           |
|                           | 9                                                                            | 63.63     | 8.36                    |                           |





|                           |                                                                              |           |                         |                          |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|
| Location of test site:    | KM 334+740                                                                   |           | Field team              | Eng. Mohamed A. Elnaggar |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 12/11/2023               |
| Diameter of loading plate | 600                                                                          |           | Time                    | 1:20:00 PM<br>1:45:00 PM |
| Lever ratio               | 1                                                                            |           | Note:<br>CAT 966E       |                          |
| Type of Soil              | Middle Embankment (-1.5 m)                                                   |           |                         |                          |
| Bedding material          | ---                                                                          |           |                         |                          |
| Temperature               | 26°C                                                                         |           |                         |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |                          |
|                           | 1                                                                            | 7.07      | 9.72                    |                          |
|                           | 2                                                                            | 14.14     | 9.64                    |                          |
|                           | 3                                                                            | 21.21     | 9.39                    |                          |
|                           | 4                                                                            | 28.28     | 9.24                    |                          |
|                           | 5                                                                            | 35.35     | 9.07                    |                          |
|                           | 6                                                                            | 42.42     | 8.88                    |                          |
|                           | 7                                                                            | 49.49     | 8.74                    |                          |
|                           | 8                                                                            | 56.56     | 8.63                    |                          |
|                           | 9                                                                            | 63.63     | 8.47                    |                          |
|                           | 10                                                                           | 70.7      | 8.36                    |                          |
| Unloading Stage           | 11                                                                           | 56.56     | 8.41                    |                          |
|                           | 12                                                                           | 49.49     | 8.45                    |                          |
|                           | 13                                                                           | 35.35     | 8.58                    |                          |
|                           | 14                                                                           | 21.21     | 8.74                    |                          |
|                           | 15                                                                           | 1.414     | 9.46                    |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Reloading Stage           | 0                                                                            | 1.414     | 9.46                    |                          |
|                           | 1                                                                            | 7.07      | 9.18                    |                          |
|                           | 2                                                                            | 14.14     | 9.10                    |                          |
|                           | 3                                                                            | 21.21     | 9.00                    |                          |
|                           | 4                                                                            | 28.28     | 8.85                    |                          |
|                           | 5                                                                            | 35.35     | 8.80                    |                          |
|                           | 6                                                                            | 42.42     | 8.69                    |                          |
|                           | 7                                                                            | 49.49     | 8.59                    |                          |
|                           | 8                                                                            | 56.56     | 8.50                    |                          |
|                           | 9                                                                            | 63.63     | 8.43                    |                          |



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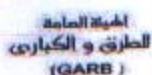




|                           |                                                                              |           |                         |                          |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|
| Location of test site:    | KM 334+840                                                                   |           | Field team              | Eng. Mohamed A. Elnaggar |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 12/11/2023               |
| 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               | 26°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     | 9.33                    |                          |
|                           | 3                                                                            | 21.21     | 9.06                    |                          |
|                           | 4                                                                            | 28.28     | 8.88                    |                          |
|                           | 5                                                                            | 35.35     | 8.74                    |                          |
|                           | 6                                                                            | 42.42     | 8.60                    |                          |
|                           | 7                                                                            | 49.49     | 8.45                    |                          |
|                           | 8                                                                            | 56.56     | 8.35                    |                          |
|                           | 9                                                                            | 63.63     | 8.20                    |                          |
|                           | 10                                                                           | 70.7      | 8.15                    |                          |
| Unloading Stage           | 11                                                                           | 56.56     | 8.15                    |                          |
|                           | 12                                                                           | 49.49     | 8.18                    |                          |
|                           | 13                                                                           | 35.35     | 8.34                    |                          |
|                           | 14                                                                           | 21.21     | 8.50                    |                          |
|                           | 15                                                                           | 1.414     | 9.38                    |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Reloading Stage           | 0                                                                            | 1.414     | 9.38                    |                          |
|                           | 1                                                                            | 7.07      | 9.12                    |                          |
|                           | 2                                                                            | 14.14     | 8.93                    |                          |
|                           | 3                                                                            | 21.21     | 8.77                    |                          |
|                           | 4                                                                            | 28.28     | 8.64                    |                          |
|                           | 5                                                                            | 35.35     | 8.52                    |                          |
|                           | 6                                                                            | 42.42     | 8.43                    |                          |
|                           | 7                                                                            | 49.49     | 8.33                    |                          |
|                           | 8                                                                            | 56.56     | 8.22                    |                          |
|                           | 9                                                                            | 63.63     | 8.13                    |                          |



# MATERIAL INSPECTION REQUEST



|                             |                           |                             |                                                           |                                       |          |          |          |          |          |         |         |
|-----------------------------|---------------------------|-----------------------------|-----------------------------------------------------------|---------------------------------------|----------|----------|----------|----------|----------|---------|---------|
| Contractor Company          | ALADDIN(02)               |                             | Designer Company                                          | (K - K) Engineering Consulting Office |          |          |          |          |          |         |         |
| Issued by Contractor        | Name<br>Eng. Mahmoud Diab | Sign<br><i>Mahmoud Diab</i> | Date/Serial Number<br>11/11/2023<br>S5 -A-AD-2-P.L.T (02) | Time<br>1:00 PM                       |          |          |          |          |          |         |         |
| Received by GARB CONSULTANT | Eng. Saied Saif           | <i>[Signature]</i>          | MIR                                                       | C1<br>334                             | C2<br>EW | C3<br>CS | DD<br>12 | MM<br>11 | YY<br>23 | HH<br>1 | MM<br>0 |

|        |                                |                             |                                                          |
|--------|--------------------------------|-----------------------------|----------------------------------------------------------|
| CODE-1 | S1 to S21<br>Station Reference | D1 to S3<br>Depot Reference | Kp XXX Note<br>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                                    | 334+700       | TO                                                                               | 334+800      |      |
| MAR & UIR Approval No    | UIR S5 -A-AD-2 -F-5/1<br>M.A.R. Q.T.-03 | Date          | 05/11/2023<br>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. | <p>1-P.L.T was carried- out by civil engineering testing &amp; consulting unit (Egypt.Japan University of Science and Technology)</p> <p>2-Results report attached and found acceptable and comply with project specifications.</p> <p>3-Final approval is subject to above mentioned comments.</p> |

| 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 |                     |      |         |





## Technical Report

### Plate Loading Tests

KM 334+640, KM 334+740,  
and KM 334+840

(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 12, 2023)

مستند  
الميل عام الجامعة  
لواء هندسة / أسامة فتحي



الجامعة المصرية اليابانية للعلوم والتكنولوجيا  
EJUST

وحدة اختبارات واستشارات الهندسة المدنية

EJUST CETC UNIT





## 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 3 plate loading tests on the Middle Embankment (-1.5 m) of the Electric Express Train project at 3 locations (KM 334+640, KM 334+740, and KM 334+840) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Rabiee Roshdy of Aladdin and Partners Integrated Contracting. Field team members (Eng. Mohamed A. Elnaggar) from the working CETCU team visited the project site on November 12, 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  $26 \pm 1^\circ\text{C}$ .
- The plate was carried out on a Middle Embankment (-1.5 m) (according to the company) at 3 points (KM 334+640, KM 334+740, and KM 334+840). 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.



EJUST CETCU





### 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. 3 plate loading tests on the Middle Embankment (-1.5 m) of the Electric Express Train project were conducted at 3 locations (KM 334+640, KM 334+740, and KM 334+840) and the data collected at the 3 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+640), 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+640)**

| 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                        | 0.20           |
| 2             | 14.14    | 0.050                        | 0.32           |
| 3             | 21.21    | 0.075                        | 0.57           |
| 4             | 28.28    | 0.100                        | 0.65           |
| 5             | 35.35    | 0.125                        | 0.96           |
| 6             | 42.42    | 0.150                        | 1.14           |
| 7             | 49.49    | 0.175                        | 1.30           |
| 8             | 56.56    | 0.200                        | 1.44           |
| 9             | 63.63    | 0.225                        | 1.58           |
| 10            | 70.7     | 0.250                        | 1.73           |
| 11            | 56.56    | 0.200                        | 1.67           |
| 12            | 49.49    | 0.175                        | 1.61           |
| 13            | 35.35    | 0.125                        | 1.36           |
| 14            | 21.21    | 0.075                        | 1.20           |
| 15            | 1.414    | 0.005                        | 0.46           |







**Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 334+640)**

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.46           |
| 1             | 7.07     | 0.025                        | 0.69           |
| 2             | 14.14    | 0.050                        | 0.76           |
| 3             | 21.21    | 0.075                        | 0.94           |
| 4             | 28.28    | 0.100                        | 1.06           |
| 5             | 35.35    | 0.125                        | 1.23           |
| 6             | 42.42    | 0.150                        | 1.34           |
| 7             | 49.49    | 0.175                        | 1.44           |
| 8             | 56.56    | 0.200                        | 1.55           |
| 9             | 63.63    | 0.225                        | 1.64           |

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 334+640) 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+740) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 334+840) is provided in Tables 7-9 and Figure 3.

**Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 334+640)**

| Parameters                                 | 1st loading cycle | 2nd loading cycle |
|--------------------------------------------|-------------------|-------------------|
| ( $s_{0,max}$ ) MN/m <sup>2</sup>          | 0.25              | 0.25              |
| $a_0$ (mm)                                 | -0.05             | 0.46              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))            | 8.52              | 7.04              |
| $a_2$ (mm/(MN2/m <sup>4</sup> ))           | -5.34             | -7.90             |
| $Ev = 1.5 r / (a_1 + a_2 \cdot s_{0,MAX})$ | 62.66             | 88.80             |
| $Ev_2/Ev_1$                                | 1.42              |                   |





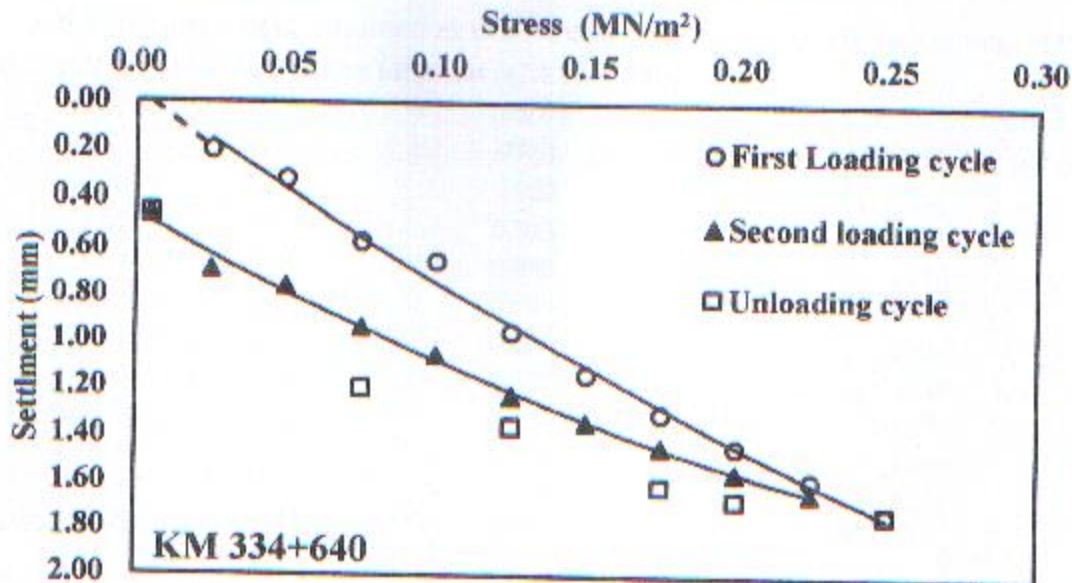


Figure 1: Load-settlement data: plate loading test performed at (KM 334+640)

Table 4: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 334+740)

| Loading stage | Load (F)<br>kN | Normal stress ( $\sigma_0$ )<br>MN/m <sup>2</sup> | Settlement (S)<br>mm |
|---------------|----------------|---------------------------------------------------|----------------------|
| 0             | 1.414          | 0.005                                             | 0.00                 |
| 1             | 7.07           | 0.025                                             | 0.28                 |
| 2             | 14.14          | 0.050                                             | 0.36                 |
| 3             | 21.21          | 0.075                                             | 0.61                 |
| 4             | 28.28          | 0.100                                             | 0.76                 |
| 5             | 35.35          | 0.125                                             | 0.93                 |
| 6             | 42.42          | 0.150                                             | 1.12                 |
| 7             | 49.49          | 0.175                                             | 1.26                 |
| 8             | 56.56          | 0.200                                             | 1.37                 |
| 9             | 63.63          | 0.225                                             | 1.53                 |
| 10            | 70.7           | 0.250                                             | 1.64                 |
| 11            | 56.56          | 0.200                                             | 1.59                 |
| 12            | 49.49          | 0.175                                             | 1.55                 |
| 13            | 35.35          | 0.125                                             | 1.42                 |
| 14            | 21.21          | 0.075                                             | 1.26                 |
| 15            | 1.414          | 0.005                                             | 0.54                 |

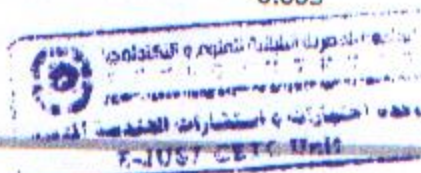






Table 5: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 334+740)

| Loading stage | Load (F)<br>kN | Normal stress ( $\sigma_0$ )<br>MN/m <sup>2</sup> | Settlement (S)<br>mm |
|---------------|----------------|---------------------------------------------------|----------------------|
| 0             | 1.414          | 0.005                                             | 0.54                 |
| 1             | 7.07           | 0.025                                             | 0.82                 |
| 2             | 14.14          | 0.050                                             | 0.90                 |
| 3             | 21.21          | 0.075                                             | 1.00                 |
| 4             | 28.28          | 0.100                                             | 1.15                 |
| 5             | 35.35          | 0.125                                             | 1.20                 |
| 6             | 42.42          | 0.150                                             | 1.31                 |
| 7             | 49.49          | 0.175                                             | 1.41                 |
| 8             | 56.56          | 0.200                                             | 1.50                 |
| 9             | 63.63          | 0.225                                             | 1.57                 |

Table 6: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 334+740)

| Parameters                                    | 1st loading cycle | 2nd loading cycle |
|-----------------------------------------------|-------------------|-------------------|
| ( $s_{0,max}$ ) MN/m <sup>2</sup>             | 0.25              | 0.25              |
| $a_0$ (mm)                                    | 0.04              | 0.58              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))               | 7.85              | 6.31              |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>4</sup> )) | -5.70             | -8.86             |
| $Ev = 1.5 r / (a_1 + a_2 \cdot s_{0,max})$    | 70.01             | 109.83            |
| $Ev_2/Ev_1$                                   | 1.57              |                   |

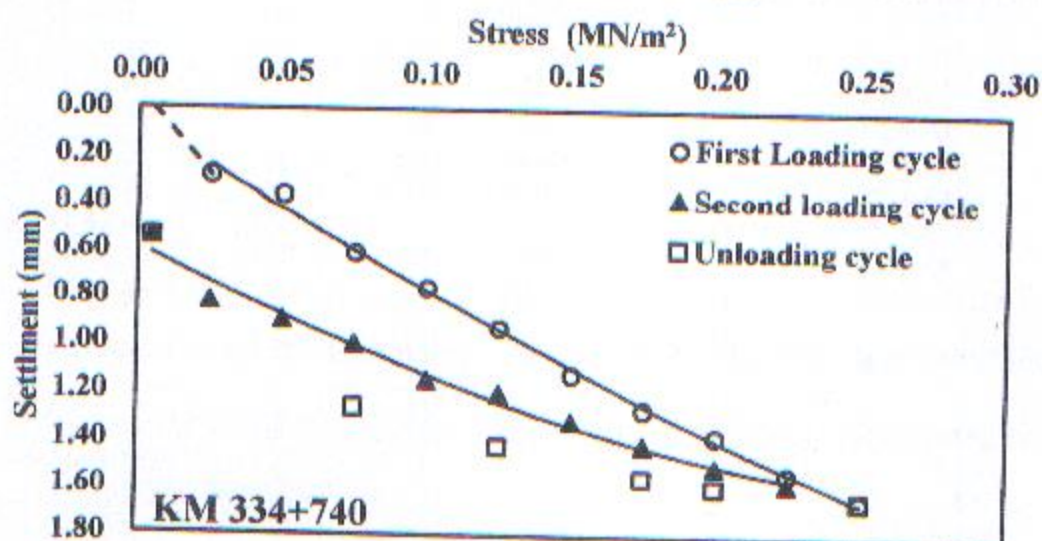


Figure 2: Load-settlement data: plate loading test performed at (KM 334+740)







**Table 7: 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) | 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                        | 0.67           |
| 3             | 21.21    | 0.075                        | 0.94           |
| 4             | 28.28    | 0.100                        | 1.12           |
| 5             | 35.35    | 0.125                        | 1.26           |
| 6             | 42.42    | 0.150                        | 1.40           |
| 7             | 49.49    | 0.175                        | 1.55           |
| 8             | 56.56    | 0.200                        | 1.65           |
| 9             | 63.63    | 0.225                        | 1.80           |
| 10            | 70.7     | 0.250                        | 1.85           |
| 11            | 56.56    | 0.200                        | 1.85           |
| 12            | 49.49    | 0.175                        | 1.82           |
| 13            | 35.35    | 0.125                        | 1.66           |
| 14            | 21.21    | 0.075                        | 1.50           |
| 15            | 1.414    | 0.005                        | 0.62           |

**Table 8: 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 ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.62           |
| 1             | 7.07     | 0.025                        | 0.88           |
| 2             | 14.14    | 0.050                        | 1.07           |
| 3             | 21.21    | 0.075                        | 1.23           |
| 4             | 28.28    | 0.100                        | 1.36           |
| 5             | 35.35    | 0.125                        | 1.48           |
| 6             | 42.42    | 0.150                        | 1.57           |
| 7             | 49.49    | 0.175                        | 1.67           |
| 8             | 56.56    | 0.200                        | 1.78           |
| 9             | 63.63    | 0.225                        | 1.87           |

**Table 9: 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              |
| $a_0$ (mm)                                    | 0.19              | 0.64              |
| $a_1$ (mm/(MN/m <sup>2</sup> ))               | 10.59             | 8.68              |
| $a_2$ (mm/(MN <sup>2</sup> /m <sup>4</sup> )) | -15.89            | -14.83            |
| $Ev = 1.5 r / (a_1 + a_2 \cdot s_{0,max})$    | 67.96             | 90.42             |
| $Ev_2/Ev_1$                                   |                   | 1.33              |



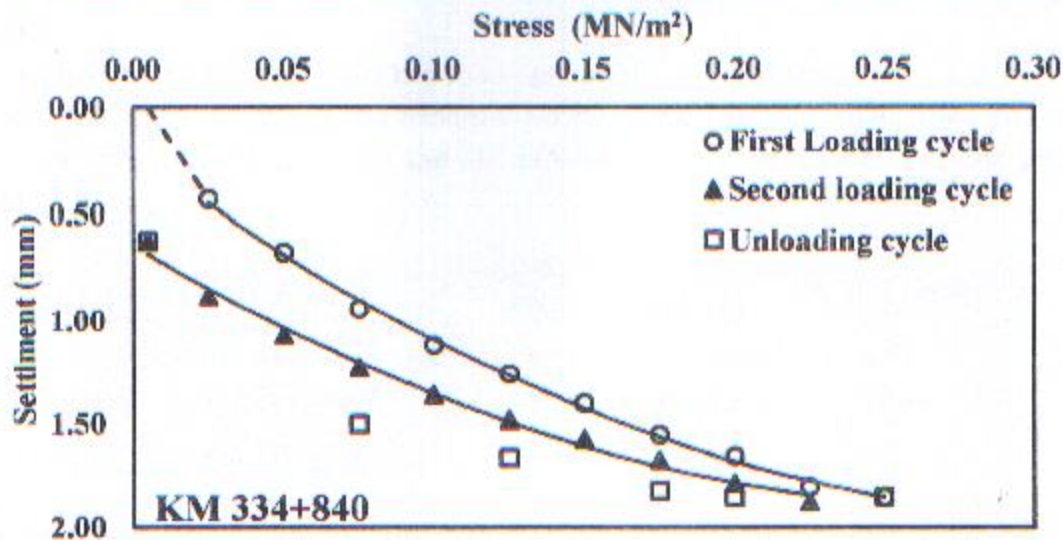


Figure 3: Load-settlement data: plate loading test performed at (KM 334+840)







#### 4. Closure

Test results presented herein report the load-settlement data obtained from 3 plate loading tests conducted on the Middle Embankment (-1.5 m) of the Electric Express train project at 3 locations (KM 334+640, KM 334+740, and KM 334+840) 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+640 | 62.66                         | 88.80 ✓                       | 1.42                  |
| KM 334+740 | 70.01                         | 109.83 ✓                      | 1.57                  |
| KM 334+840 | 67.96                         | 90.42 ✓                       | 1.33                  |

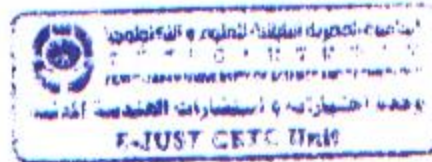
• Note: Before interpreting these test results for future applications, the Middle Embankment (-1.5 m) in-situ variability between the testing locations should be considered.

#### Technical committee

Prof. Dr. Mohamed F. M. Fahmy

#### Lab Engineer

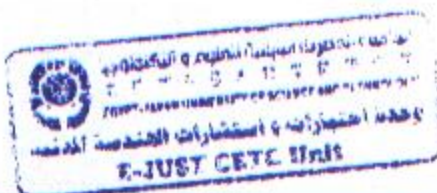
Mohamed A. Al-Najjar







## Appendix A







|                           |                                                                              |           |                         |                           |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|---------------------------|
| Location of test site:    | KM 334+640                                                                   |           | Field team              | Eng. Mohamed A. Elnaggar  |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 12/11/2023                |
| Diameter of loading plate | 600                                                                          |           | Time                    | 12:46:00 PM<br>1:14:00 PM |
| Lever ratio               | 1                                                                            |           | Note:<br>CAT 966E       |                           |
| Type of Soil              | Middle Embankment (-1.5 m)                                                   |           |                         |                           |
| Bedding material          | ---                                                                          |           |                         |                           |
| Temperature               | 26°C                                                                         |           |                         |                           |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                           |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |                           |
|                           | 1                                                                            | 7.07      | 9.80                    |                           |
|                           | 2                                                                            | 14.14     | 9.68                    |                           |
|                           | 3                                                                            | 21.21     | 9.43                    |                           |
|                           | 4                                                                            | 28.28     | 9.35                    |                           |
|                           | 5                                                                            | 35.35     | 9.04                    |                           |
|                           | 6                                                                            | 42.42     | 8.86                    |                           |
|                           | 7                                                                            | 49.49     | 8.70                    |                           |
|                           | 8                                                                            | 56.56     | 8.56                    |                           |
|                           | 9                                                                            | 63.63     | 8.42                    |                           |
|                           | 10                                                                           | 70.7      | 8.27                    |                           |
| Unloading Stage           | 11                                                                           | 56.56     | 8.33                    |                           |
|                           | 12                                                                           | 49.49     | 8.39                    |                           |
|                           | 13                                                                           | 35.35     | 8.64                    |                           |
|                           | 14                                                                           | 21.21     | 8.80                    |                           |
|                           | 15                                                                           | 1.414     | 9.54                    |                           |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                           |
| Reloading Stage           | 0                                                                            | 1.414     | 9.54                    |                           |
|                           | 1                                                                            | 7.07      | 9.31                    |                           |
|                           | 2                                                                            | 14.14     | 9.24                    |                           |
|                           | 3                                                                            | 21.21     | 9.06                    |                           |
|                           | 4                                                                            | 28.28     | 8.94                    |                           |
|                           | 5                                                                            | 35.35     | 8.77                    |                           |
|                           | 6                                                                            | 42.42     | 8.66                    |                           |
|                           | 7                                                                            | 49.49     | 8.56                    |                           |
|                           | 8                                                                            | 56.56     | 8.45                    |                           |
|                           | 9                                                                            | 63.63     | 8.36                    |                           |





|                           |                                                                              |           |                         |                          |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|
| Location of test site:    | KM 334+740                                                                   |           | Field team              | Eng. Mohamed A. Elnaggar |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 12/11/2023               |
| Diameter of loading plate | 600                                                                          |           | Time                    | 1:20:00 PM<br>1:45:00 PM |
| Lever ratio               | 1                                                                            |           | Note:<br>CAT 966E       |                          |
| Type of Soil              | Middle Embankment (-1.5 m)                                                   |           |                         |                          |
| Bedding material          | ---                                                                          |           |                         |                          |
| Temperature               | 26°C                                                                         |           |                         |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Loading Stage             | 0                                                                            | 1.414     | 10.00                   |                          |
|                           | 1                                                                            | 7.07      | 9.72                    |                          |
|                           | 2                                                                            | 14.14     | 9.64                    |                          |
|                           | 3                                                                            | 21.21     | 9.39                    |                          |
|                           | 4                                                                            | 28.28     | 9.24                    |                          |
|                           | 5                                                                            | 35.35     | 9.07                    |                          |
|                           | 6                                                                            | 42.42     | 8.88                    |                          |
|                           | 7                                                                            | 49.49     | 8.74                    |                          |
|                           | 8                                                                            | 56.56     | 8.63                    |                          |
|                           | 9                                                                            | 63.63     | 8.47                    |                          |
|                           | 10                                                                           | 70.7      | 8.36                    |                          |
| Unloading Stage           | 11                                                                           | 56.56     | 8.41                    |                          |
|                           | 12                                                                           | 49.49     | 8.45                    |                          |
|                           | 13                                                                           | 35.35     | 8.58                    |                          |
|                           | 14                                                                           | 21.21     | 8.74                    |                          |
|                           | 15                                                                           | 1.414     | 9.46                    |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Reloading Stage           | 0                                                                            | 1.414     | 9.46                    |                          |
|                           | 1                                                                            | 7.07      | 9.18                    |                          |
|                           | 2                                                                            | 14.14     | 9.10                    |                          |
|                           | 3                                                                            | 21.21     | 9.00                    |                          |
|                           | 4                                                                            | 28.28     | 8.85                    |                          |
|                           | 5                                                                            | 35.35     | 8.80                    |                          |
|                           | 6                                                                            | 42.42     | 8.69                    |                          |
|                           | 7                                                                            | 49.49     | 8.59                    |                          |
|                           | 8                                                                            | 56.56     | 8.50                    |                          |
|                           | 9                                                                            | 63.63     | 8.43                    |                          |



EJUST CETC UNIT





|                           |                                                                              |           |                         |                          |
|---------------------------|------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|
| Location of test site:    | KM 334+840                                                                   |           | Field team              | Eng. Mohamed A. Elnaggar |
| Project title:            | Electric Express Train Project - Aladdin and Partners Integrated Contracting |           | Date:                   | 12/11/2023               |
| 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               | 26°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     | 9.33                    |                          |
|                           | 3                                                                            | 21.21     | 9.06                    |                          |
|                           | 4                                                                            | 28.28     | 8.88                    |                          |
|                           | 5                                                                            | 35.35     | 8.74                    |                          |
|                           | 6                                                                            | 42.42     | 8.60                    |                          |
|                           | 7                                                                            | 49.49     | 8.45                    |                          |
|                           | 8                                                                            | 56.56     | 8.35                    |                          |
|                           | 9                                                                            | 63.63     | 8.20                    |                          |
|                           | 10                                                                           | 70.7      | 8.15                    |                          |
| Unloading Stage           | 11                                                                           | 56.56     | 8.15                    |                          |
|                           | 12                                                                           | 49.49     | 8.18                    |                          |
|                           | 13                                                                           | 35.35     | 8.34                    |                          |
|                           | 14                                                                           | 21.21     | 8.50                    |                          |
|                           | 15                                                                           | 1.414     | 9.38                    |                          |
| Test regime               | Loading Stage No.                                                            | Load (kN) | Dial Gauge Reading (mm) |                          |
| Reloading Stage           | 0                                                                            | 1.414     | 9.38                    |                          |
|                           | 1                                                                            | 7.07      | 9.12                    |                          |
|                           | 2                                                                            | 14.14     | 8.93                    |                          |
|                           | 3                                                                            | 21.21     | 8.77                    |                          |
|                           | 4                                                                            | 28.28     | 8.64                    |                          |
|                           | 5                                                                            | 35.35     | 8.52                    |                          |
|                           | 6                                                                            | 42.42     | 8.43                    |                          |
|                           | 7                                                                            | 49.49     | 8.33                    |                          |
|                           | 8                                                                            | 56.56     | 8.22                    |                          |
|                           | 9                                                                            | 63.63     | 8.13                    |                          |



## 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 334+700 الى الكم 334+800 بطول 0.10 كيلو متر .

تنفيذ: شركة علاء الدين وشركاؤه للمقاولات المتكاملة.  
إشراف : المنطقة الخامسة - منطقة غرب الدلتا

طبقاً للعقد رقم (٢٠٢٥/٢٠٢٤/١٥٠) بتاريخ ٢٠٢٤/٠٨/٠٦

إنه في يوم الأربعاء الموافق ٢٠٢٤/٠٨/٠٧ اجتمع كل من:-

- ١- السيد المهندس/محمد حسني فياض مدير عام مشروعات - الهيئة العامة للطرق والكباري
- ٢- السيدة المهندسة/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 بالبدء في التنفيذ وبناء عليه يعتبر تاريخ ٢٠٢٤/٠٨/٠٧ هو تاريخ استلام الموقع وبدء الأعمال بالعملية واقفل المحضر على ذلك ووقع الحضور

التوقيعات

٣- ربيع رشدي

٢- محمد حسني فياض

١- م. هاني محمد محمود طه

رئيس الإدارة المركزية  
منطقة غرب الدلتا

الاسكندرية - مرسى

مطروح

عميد مهندس /

"هاني محمد محمود طه"



[illegible]



قائمة الكميات الواردة بالمستخلص جاري (١)

مشروع : القطر الكهربائي فائق السرعة قطاع (برج العرب - العطين) تنفيذ شركة علاء الدين وشركاه للمقاولات المتكاملة القطاع من المحطة ٣٣٤+٧٠٠ الي ٣٣٤+٨٠٠

رقم البند و بيانه : ( ٣-٢ ) بالتر المسطح اصال تظهر الموقع من الاشجار والزروعات والمخالفات

تسقيف : شركة علاء الدين وشركاه للمقاولات المتكاملة

كمية المقايمة ٣ م ٠٠٠ ٦,000.00 مقدار العمل السابق :

| المساحة   | الايقة ( متر ) |       | الموقع الكلي متر |         | رقم الطلب | بيان الاعمال بالمقايمة                                                                                                                                                                                                                            |
|-----------|----------------|-------|------------------|---------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | العرض          | الطول | الي              | من      |           |                                                                                                                                                                                                                                                   |
| ٣,٨٨٠,٠٠٠ | ٣٨,٨٠٠         | 100   | 334+800          | 334+700 | CL(01)    | بالتر المسطح اصال تظهر الموقع من الاشجار والزروعات والمخالفات في مناطق الدلائل ذات الطبيعة الزراعية الكثيفة<br>والتخلص منها بالمقايمة العمومية تمهيدا لاصال الاربع المساحي اكمل حدود المشروع طبقا للشروط والامر اصفاك وتعليقات<br>المهندس المشرف. |
| ٣,٨٨٠,٠٠٠ |                |       |                  |         |           | اجملي الكميات خلال فترة المستخلص الحالية (٢)                                                                                                                                                                                                      |
| ٣,٨٨٠,٠٠٠ |                |       |                  |         |           | الاجملي الكلي                                                                                                                                                                                                                                     |

مهندس الهيئة  
م / صلاحيت ساجدي

المكتب الاستشاري الهندسي  
( ز.د. ) خالدة خالدة  
مدير المشروع السيد سيف  
مشروع : القطر الكهربائي السريع  
القطاع الخامس

مهندس الاستشاري  
مكتب KXZ  
مشروع القطر الكهربائي السريع  
غرب الفييل

مهندس الشركة  
م / ربيع راضي  
خالد المصطفى  
م.ت. : ٠٨٢٦ ٠٩٢٦  
م.ف. : ٠٩٢٦ ٠٩٢٦  
م.ف. : ٠٩٢٦ ٠٩٢٦  
م.ف. : ٠٩٢٦ ٠٩٢٦



م / مارجریت مجدی

١٠٠ / ١٠٠ / ١٠٠

XYX

مجلس الشورى

[illegible]

: السائل والمحلل

[illegible]

$\frac{1}{x^2} = x^{-2}$      $\frac{d}{dx} x^{-2} = -2x^{-3} = -\frac{2}{x^3}$

הַמִּשְׁכָּן הַזֶּה יֵאָדָר וְיִבְנוּ בְּתוֹכָם אֶת הַמִּשְׁכָּן הַגָּדוֹל - לְעֹלָם עוֹלָם.

(۱) قریح صلیبہ بنی اسرائیل الی انزل الیکم



[illegible][illegible]

Handwritten signature and a blue rectangular stamp with Arabic text and numbers.

16,000.00 مئة الف فقط . . . : الفصل الثاني

[illegible][illegible]



[illegible]


 ( ୧୫୮୭ )  
 ପୃଷ୍ଠା ୬ ॥ ଡାକ୍ତର  
 । ଦୀପ୍ତ । ପଦ୍ମ



|         |     |        |
|---------|-----|--------|
| 334+800 | 100 | ٨.٧٨٩  |
| 334+800 | 100 | ٨.٦٩٦٥ |
| 334+800 | 100 |        |

[illegible]

المبلغ 20,000,000 ريال سعودي

(1) جاري جاري  
 (GARB)  
 الجارية الجارية  
 الجارية الجارية



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 الاتي :

| الشركة                                 | من كم   | الى كم  |
|----------------------------------------|---------|---------|
| علاء الدين وشركاؤه للمقاولات المتكاملة | ٣٣٤+٧٠٠ | ٣٣٤+٨٠٠ |

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

رئيس الإدارة المركزية

المنطقة الخامسة- غرب الدلتا

عميد مهندس /

"هاني محمد محمود طاء"



|                                                             |                                                                             |
|-------------------------------------------------------------|-----------------------------------------------------------------------------|
| 4-1-                                                        | مسافة النقل 20 كم<br>يتم احتساب علاوة 1.3 جنية لكل 1 كم بالزيادة أو النقصان |
| قيمة المادة المحجوزة                                        |                                                                             |
| علاوة مسافة النقل 140 كم = 120 كم * 1.30 = 156 جنية         |                                                                             |
| علاوة تحصيل رسوم الكارثة والموازن طبق للاحقة الشركة الوطنية |                                                                             |



مشروع القطار الكهربائي فائق السرعة قطاع (برج العرب - العلمين)  
مرحلة تشكيل الجسر الترابي وطبقات الأساس والحمايات الخرسانية  
المقايسة المعدلة بعد المفاوضة بتاريخ 2023/12/18 لبنود الاعمال تنفيذ شركة علاء الدين وشركاؤه للمقاولات المتكاملة  
القطاع من محطة 334+700 الى 334+800 بطول 100 م  
طبقا للعقد رقم 150 /2025/2024

| رقم البند | بيان الأعمال                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | الوحدة | الفئة  | الكمية   | الاجمالى   |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|----------|------------|
| 4-2       | بالمتر المكعب اعمال توريد وفرش طبقة أساس من الاحجار الصلبة المتردجة ناتج تكسير الكسارات والمطابقة للمواصفات<br>والقصى حجم للحبيبات ما بين 31.5 مم الى 40 مم والا يزيد نسبة المار من منخل 200 عن 5% والتدرج بالاشتراطات<br>الخاصة بالمشروع لا تقل نسبة تحمل كاليفورنيا عن 80 % والا يقل معامل المرونة (Ev2) من تجربة لوح التحميل عن 120<br>ميجاباسكال والا يزيد نسبة الفاقد بجهاز لوس انجلوس عن 30 % والا يزيد الانكسار عن 15 % ويتم فردها على طبقتين<br>باستخدام الات التسوية الحديثة على ان لا يزيد سمك الطبقة بعد تمام الدمك عن 20 سم ورشها بالمياة الاصطناعية للوصول الى<br>نسبة الرطوبة المطلوبة والدمك الجيد بهراست للوصول الى أقصى كثافة جافة قصوى (لا يقل عن 100%) من الكثافة<br>المعملية و الغلة تشمل اجراء التجارب المعملية والحقلية ويتم تنفيذ طبقا لاصول الصناعة والرسومات التفصيلية المعتمدة والبند<br>بجميع مشتعلاته 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     | 154.20 | 1,900.00 | 292,980.00 |
|           | قيمة المادة المحجيرة                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3م     | 175.00 | 1,900.00 | 332,500.00 |
|           | علاوة مسافة النقل 140 كم = 120 * 1.30 = 156 جنيه                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3م     | 156.00 | 1,900.00 | 296,400.00 |
|           | علاوة تحصيل رسوم الكارثة والموازين طبقا للائحة الشركة الوطنية                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3م     | 25.00  | 1,900.00 | 47,500.00  |

#### المرحلة الرابعة : اعمال الخرسانة

| 5   | البلاطات الخرسانية                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | الوحدة | الفئة    | الكمية   | الاجمالى   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|----------|------------|
| 5-1 | بالمتر المسطح اعمال توريد و صب خرسانة عادية سمك 15 سم لحماية الاكثاف والمويل الجانبية تتكون من 0.8 م3 سن<br>دولوميت متدرج + 0.4 م3 رمل حرش و الإضافات طبقا لتعليمات الاستشاري (فبير + سيكا) على ان يكون السن نظيف و<br>مقسول و الرمل خالى من الشوائب و الطفلة و الاملاح و المواد الغريبة مع وضع فوم (بالفاصل) بسمك 2 سم (طبقا لتعليمات<br>الاستشاري) والبند يشمل تجهيز و استدلال مناسب التربة الطبيعية اسفل البلاطة للوصول الى المناسيب التصميمية على ان<br>تحقق الخرسانة اجهاد لا يقل عن 250 كجم/سم2 و تشطيب السطح و ملئ الفواصل بالبيتومين المرمل و التنفيذ طبقا لاصول<br>الصناعة و الرسومات التفصيلية المعتمدة و البند بجميع مشتعلاته طبقا لمواصفات الهيئة العامة للطرق والكبارى و تعليمات<br>المهندس المشرف .<br>يتم اضافة علاوة قدرها 5 جنية بعد اول 10 متر راسي على ان تضاف لكل مسطح (لا يقل عن 5 متر راسي) | 2م     | 462.00   | 1,239.00 | 572,418.00 |
| 5-2 | بالمتر المكعب اعمال توريد و صب خرسانة عادية لقدامات الحماية والمويل الجانبية تتكون من 0.8 م3 سن دولوميت متدرج +<br>0.4 م3 رمل حرش و الإضافات طبقا لتعليمات الاستشاري (فبير + سيكا) على ان يكون السن نظيف و مقسول و الرمل خالى من<br>الشوائب و الطفلة و الاملاح و المواد الغريبة مع وضع فوم (بالفاصل) بسمك 2 سم (طبقا لتعليمات الاستشاري) و البند يشمل<br>اعمال الحفر والشدات و كل ما يلزم لنهء العمل على ان تحقق الخرسانة اجهاد لا يقل عن 250 كجم/سم2 و ملئ الفواصل<br>بالبيتومين المرمل و التنفيذ طبقا لاصول الصناعة و الرسومات التفصيلية المعتمدة و البند بجميع مشتعلاته طبقا لمواصفات<br>الهيئة العامة للطرق والكبارى و تعليمات المهندس المشرف .<br>يتم اضافة علاوة قدرها 5 جنية بعد اول 10 متر راسي على ان تضاف لكل مسطح (لا يقل عن 5 متر راسي)                                                               | 3م     | 2,759.00 | 47,532.4 | 131,141.89 |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |          |          | 9,410,740  |

( تسع ملايين وأربعمائة وعشرة آلاف وسبعمائة وأربعون جنيها فقط لا غير )

مدير مشروعات ( الهيئة )

م / محمد حسنى فياض

مدير المشروع ( الهيئة )

م / مارجريت مجدى

مدير المشروع الاستشاري

م / سيد سيف

الشركة المنفذة

م / ابراهيم رشدى

يعتمد

رئيس الادارة المركزية

منطقة غرب الدلتا

الاسكندرية - مرسى مطروح

عميد مهندس /

" هانى محمد محمد طه "

