

مطلباً معاً به الطارعا

الهيئة العامة للطرق والمواصلات - وزارة النقل  
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رقم ٩١/١٩٩٨ - ٩٩/٩٩٩٩ : انتهاء مطروح  
٩٩٩٩ : السجل - السلسلة - الضمان - مطروح

مطروح: قطار السريع (السكة - القطار - مطروح)  
السكة: ٢١٢٥٠٠ - القطار: ٢١٢٥٠٠ - مطروح: ٢١٢٥٠٠

القطاع من رقم ٢٦٤٠.١٠ إلى رقم ٢٦٤٠.١١ يكون

المادة السادسة: الحظر على المصارف والمصارف الأجنبية

[illegible]

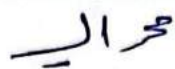
م / محمد حسن ليانين (الهيئة)  
مدير عام مشروعات  
والمساحة المركزية  
محافظة غرب الدلتا

م / مارجريت مجدي  
مدير المشروع (الهيئة)

(بالاستغفارية / المرسى مطروح)

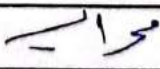
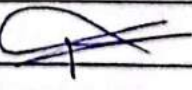
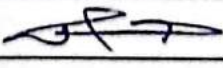
عبد مهندس  
ہاشم محمد محمود



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

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

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

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

\* Designer

\*\* Alignment/Unidges: PLT20-EET



## Technical Report

### Plate Loading Tests

KM 363+280 and KM 363+320

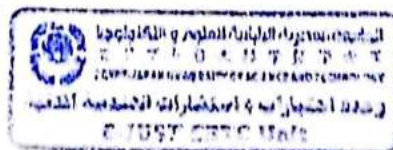
### Project

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

### Prepared for

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

(February, 2023)





#### 4. Closure

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

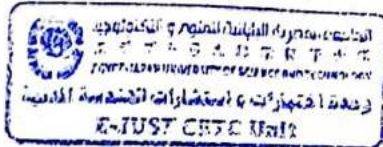
| Location   | $E_{v1}$<br>MN/m <sup>2</sup> | $E_{v2}$<br>MN/m <sup>2</sup> | $E_{v2}/E_{v1}$ ratio |
|------------|-------------------------------|-------------------------------|-----------------------|
| KM 363+280 | 117.52                        | 123.11                        | 1.05                  |
| KM 363+320 | 105.19                        | 105.56                        | 1.00                  |

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

#### Technical committee

Dr. Mahmoud Ahmed

Prof. Dr. Mohamed F. M. Fahmy



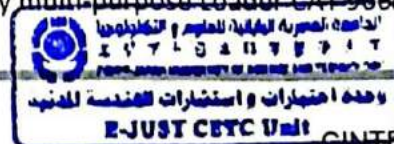


## 1. Introduction

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

## 2. Test Set Up and Instrumentation

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





### 3. Test Procedure and Results

The plate load test was conducted in accordance with the DIN18134. Loading, unloading, and reloading regimes were considered to estimate the resilient modulus of the tested soil. Prior to the test, the force transducer and dial gauge were reset to zero, and then a load corresponding to a stress of 0.01 MN/m<sup>2</sup> was applied. The load was increased in the first loading cycle until a normal stress of 0.25 MN/m<sup>2</sup> was reached, and the loading increment was 0.025 MN/m<sup>2</sup>. The load was gradually released in four stages. Following unloading, a second loading cycle was performed, but the load was only increased to the penultimate stage of the first cycle. Two plate loading tests on the Middle Embankment of the Electric Express Train project were conducted at two locations (KM 363+280 and KM 363+320) and the data collected at the two test points is included in Appendix A.

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

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

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | 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                        | 0.30           |
| 3             | 21.21    | 0.075                        | 0.43           |
| 4             | 28.28    | 0.100                        | 0.53           |
| 5             | 35.35    | 0.125                        | 0.65           |
| 6             | 42.42    | 0.150                        | 0.73           |
| 7             | 49.49    | 0.175                        | 0.82           |
| 8             | 56.56    | 0.200                        | 0.88           |
| 9             | 63.63    | 0.225                        | 0.95           |
| 10            | 70.7     | 0.250                        | 1.02           |
| 11            | 56.56    | 0.200                        | 1.02           |
| 12            | 49.49    | 0.175                        | 0.95           |
| 13            | 35.35    | 0.125                        | 0.80           |
| 14            | 21.21    | 0.075                        | 0.65           |
| 15            | 1.414    | 0.005                        | 0.05           |



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

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.05           |
| 1             | 7.07     | 0.025                        | 0.36           |
| 2             | 14.14    | 0.050                        | 0.46           |
| 3             | 21.21    | 0.075                        | 0.52           |
| 4             | 28.28    | 0.100                        | 0.61           |
| 5             | 35.35    | 0.125                        | 0.71           |
| 6             | 42.42    | 0.150                        | 0.80           |
| 7             | 49.49    | 0.175                        | 0.90           |
| 8             | 56.56    | 0.200                        | 0.95           |
| 9             | 63.63    | 0.225                        | 1.01           |

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

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

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



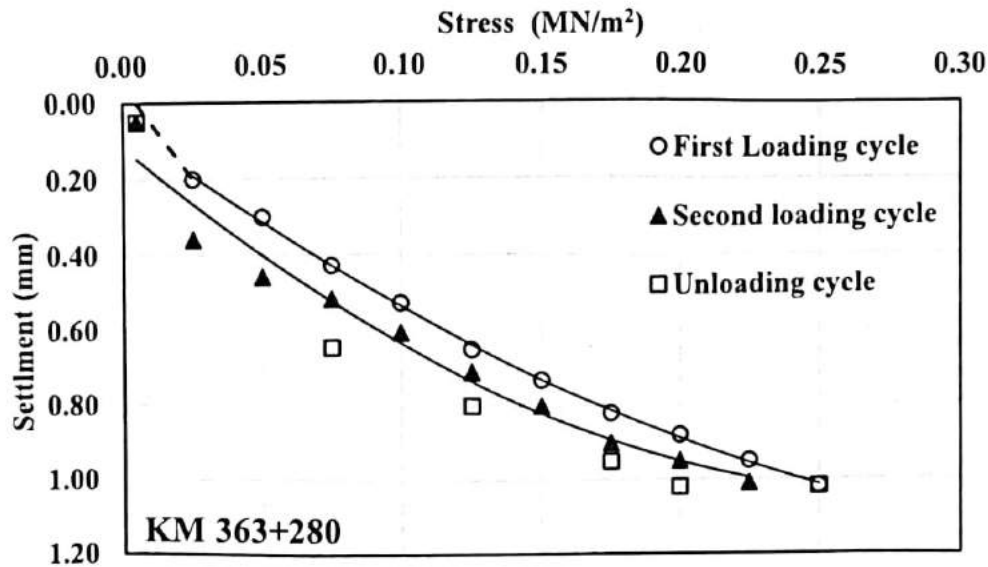


Figure 1: Load-settlement data: plate loading test performed at (KM 363+280)

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

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | $\text{MN/m}^2$              | mm             |
| 0             | 1.414    | 0.005                        | 0.00           |
| 1             | 7.07     | 0.025                        | 0.25           |
| 2             | 14.14    | 0.050                        | 0.35           |
| 3             | 21.21    | 0.075                        | 0.45           |
| 4             | 28.28    | 0.100                        | 0.59           |
| 5             | 35.35    | 0.125                        | 0.65           |
| 6             | 42.42    | 0.150                        | 0.80           |
| 7             | 49.49    | 0.175                        | 0.91           |
| 8             | 56.56    | 0.200                        | 1.01           |
| 9             | 63.63    | 0.225                        | 1.08           |
| 10            | 70.7     | 0.250                        | 1.19           |
| 11            | 56.56    | 0.200                        | 1.19           |
| 12            | 49.49    | 0.175                        | 1.05           |
| 13            | 35.35    | 0.125                        | 0.95           |
| 14            | 21.21    | 0.075                        | 0.80           |
| 15            | 1.414    | 0.005                        | 0.16           |





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

| Loading stage | Load (F) | Normal stress ( $\sigma_0$ ) | Settlement (S) |
|---------------|----------|------------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>            | mm             |
| 0             | 1.414    | 0.005                        | 0.16           |
| 1             | 7.07     | 0.025                        | 0.31           |
| 2             | 14.14    | 0.050                        | 0.42           |
| 3             | 21.21    | 0.075                        | 0.56           |
| 4             | 28.28    | 0.100                        | 0.68           |
| 5             | 35.35    | 0.125                        | 0.75           |
| 6             | 42.42    | 0.150                        | 0.82           |
| 7             | 49.49    | 0.175                        | 0.97           |
| 8             | 56.56    | 0.200                        | 1.07           |
| 9             | 63.63    | 0.225                        | 1.15           |

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

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

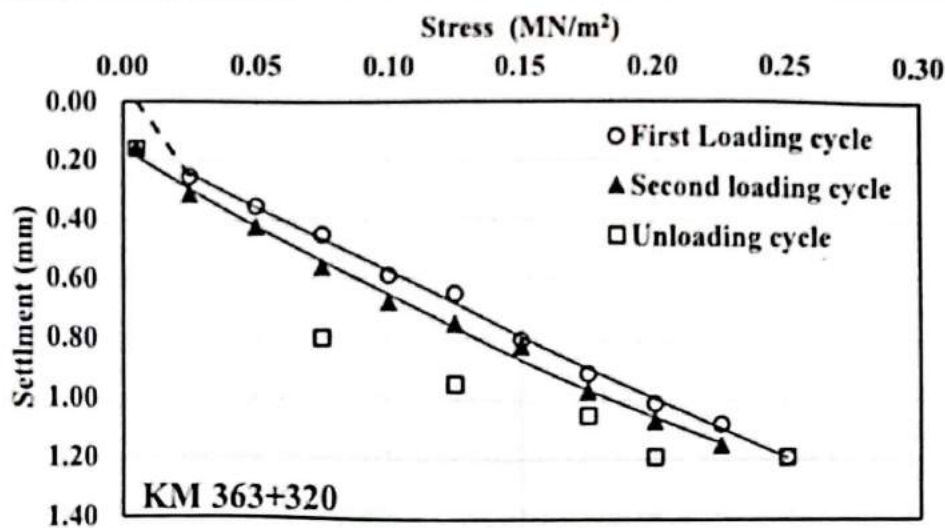
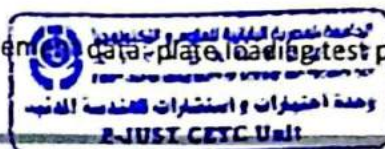


Figure 2: Load-settlement data-plate loading test performed at (KM 363+320)



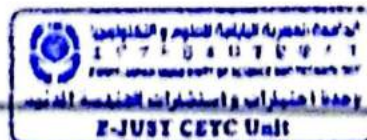


Egypt Japan University of Science and Technology  
الجامعة المصرية اليابانية للعلوم والتكنولوجيا  
エジプト日本科学技術大学

Civil Engineering Testing &  
Consulting Unit

وحدة اختبارات واستشارات الهندسة  
المدنية

# Appendix A



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

# MATERIAL INSPECTION REQUEST



الهيئة العامة  
للمرور والكباري  
(GARB)



الهيئة العامة للتخطيط  
والتطوير الاقتصادي



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

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

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

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

\* Designer

\*\* Alignment/Bridges: PLT 22-EET

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Egypt-Japan University of Science and Technology  
الجامعة المصرية اليابانية للعلوم والتكنولوجيا  
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Consulting Unit  
وحدة الاختبارات واستشارات الهندسة  
المدنية

## Technical Report

### Plate Loading Tests

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

### Project

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

Prepared for

AL-MASA General Contracting and Import & Export

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

(February, 2023)





#### 4. Closure

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

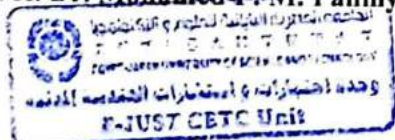
| Location   | $E_{v1}$<br>MN/m <sup>2</sup> | $E_{v2}$<br>MN/m <sup>2</sup> | $E_{v2}/E_{v1}$ ratio |
|------------|-------------------------------|-------------------------------|-----------------------|
| KM 365+325 | 88.06                         | 104.90                        | 1.19           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

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

#### Technical committee

Dr. Mahmoud Ahmed

Prof. Dr. Mohamed F. M. Fahmy



Lab Engineer

Mohamed A. Al-Najjar



## 1. Introduction

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

## 2. Test Set Up and Instrumentation

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

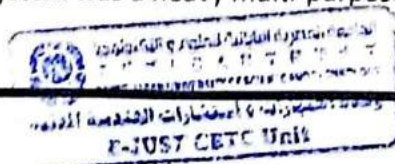




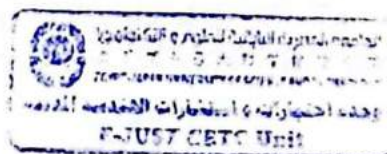
Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 365+325)

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

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

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

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



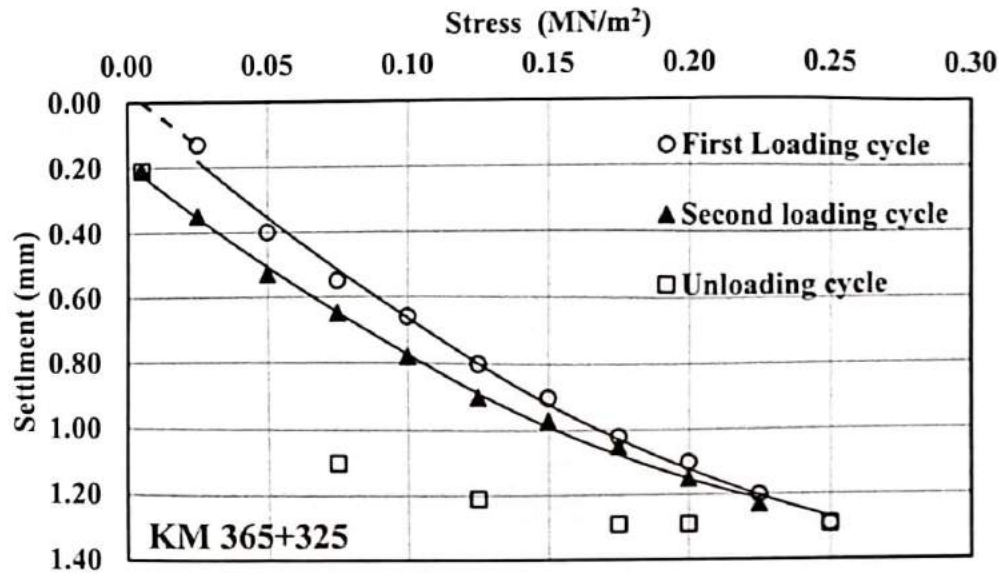


Figure 1: Load-settlement data: plate loading test performed at (KM 365+325)

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

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

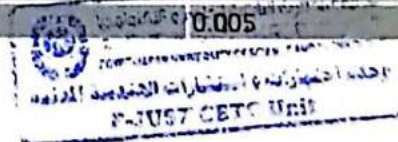




Table 7: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 365+425)

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

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

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

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

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



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

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

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

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

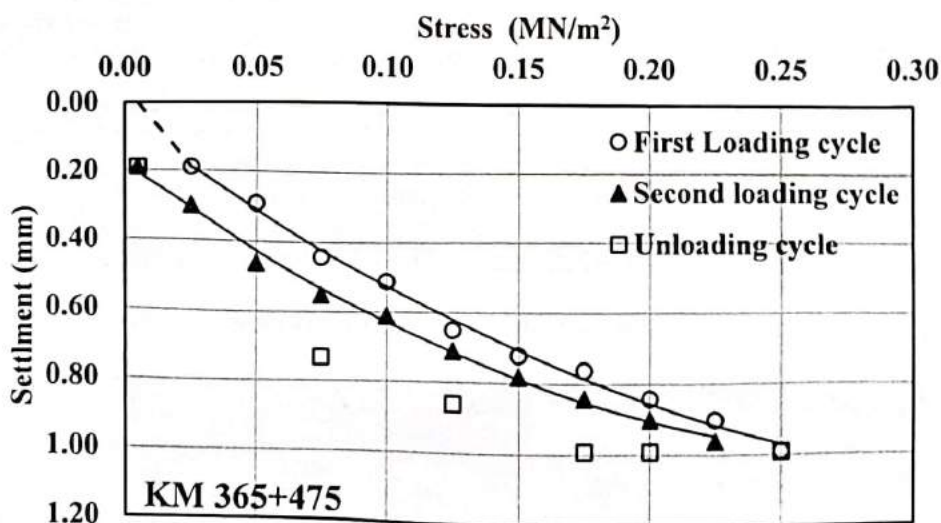


Figure 4: Load-settlement data plate loading test performed at (KM 365+475)



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

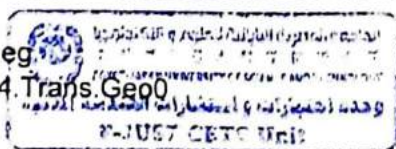
| Loading stage | Load (F) | Normal stress ( $s_0$ ) | Settlement (S) |
|---------------|----------|-------------------------|----------------|
|               | kN       | MN/m <sup>2</sup>       | mm             |
| 0             | 1.414    | 0.005                   | 0.00           |
| 1         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

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

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

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

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



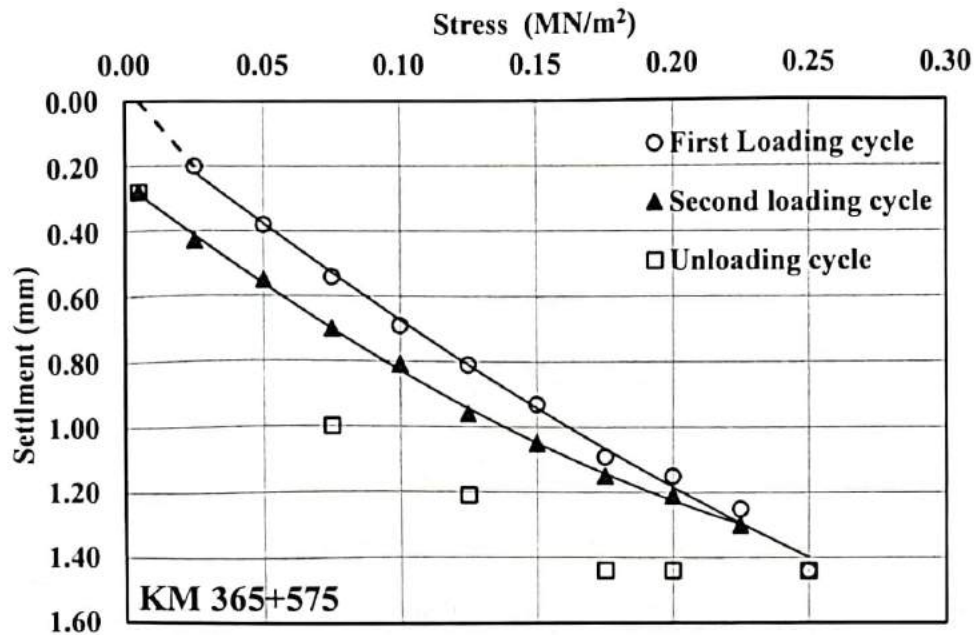


Figure 6: Load-settlement data: plate loading test performed at (KM 365+575)

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

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

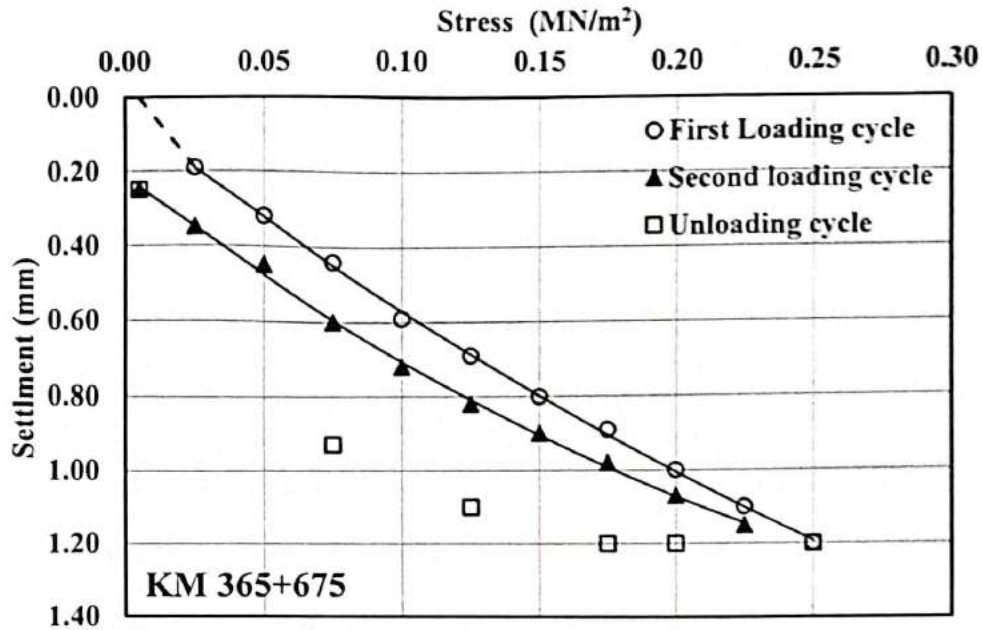


Figure 8: Load-settlement data: plate loading test performed at (KM 365+675)

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

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

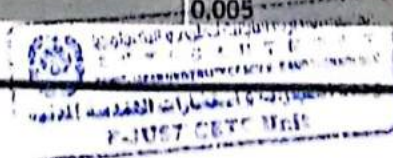




Table 34: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 363+240)

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

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

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

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

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

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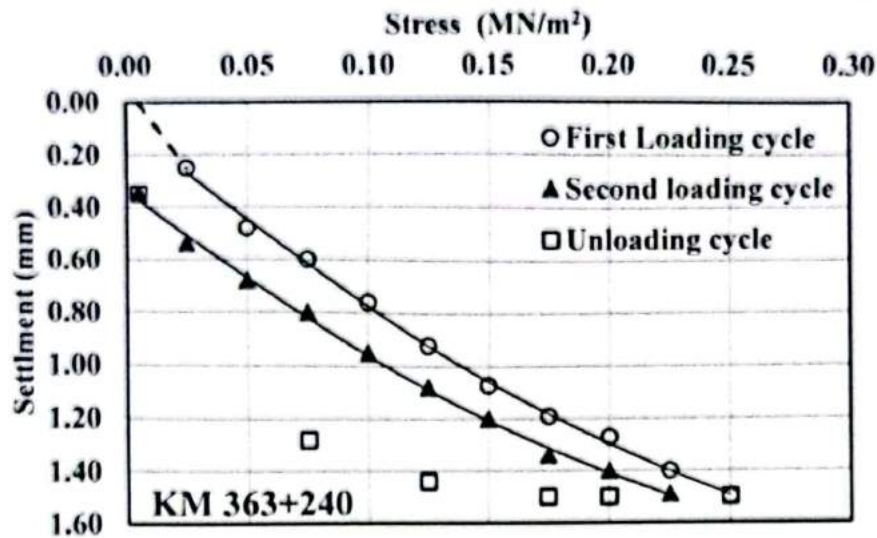
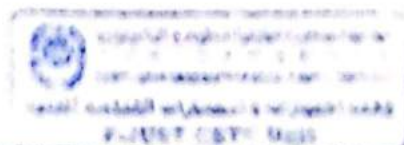


Figure 12: Load-settlement data: plate loading test performed at (KM 363+240)



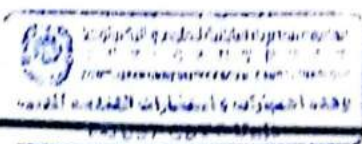


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Civil Engineering Testing &  
Consulting Unit

وحدة الاختبارات واستشارات الهندسة  
المدنية

## Appendix A

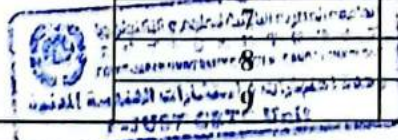




|                           |                                                                                     |           |                         |                           |
|---------------------------|-------------------------------------------------------------------------------------|-----------|-------------------------|---------------------------|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



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





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

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



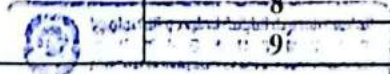
|                           |                                                                                     |           |                         |                |
|---------------------------|-------------------------------------------------------------------------------------|-----------|-------------------------|----------------|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



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

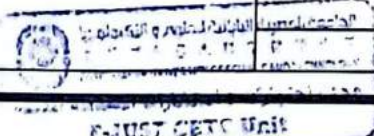


|                           |                                                                                     |           |                         |                          |
|---------------------------|-------------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|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

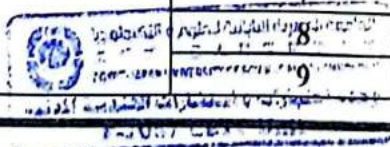




|                           |                                                                                     |           |                         |                          |
|---------------------------|-------------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|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

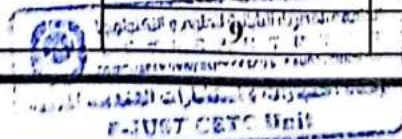


|                           |                                                                                     |           |                         |                          |
|---------------------------|-------------------------------------------------------------------------------------|-----------|-------------------------|--------------------------|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





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





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



مختبر اختبار المواد  
الهندسية  
19/2/2023

E-JUST CERT. Unit



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

# MATERIAL INSPECTION REQUEST



الهيئة العامة  
للطرق والكباري  
(GARB)



الهيئة العامة  
للتخطيط والتنمية  
(MPEDEV)



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

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

|                                                                     |                                  |                                                                       |                                                                                  |         |
|---------------------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------|---------|
| Description of Materials                                            | FILL LAYER Quantity ( 95000 m3 ) |                                                                       |                                                                                  |         |
| Location to be Used                                                 | From                             | 363+040                                                               | TO                                                                               | 366+000 |
| sample only                                                         | yes                              | Materials Type                                                        | fill layer                                                                       |         |
| Supplier Name                                                       | Elsiwly , Alharamin              | Data Sheet Provided                                                   | yes attached                                                                     |         |
| reference in BOQ                                                    |                                  | Specification                                                         | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41 2) VERSION 2 BY CIVECON GROUP |         |
| Prequalification Reference                                          |                                  | Test Samples Results                                                  |                                                                                  |         |
| Reference Photos                                                    | NO                               | Other                                                                 |                                                                                  |         |
| Comments by: Eng. Mazen Essamy (SPECTRUM)                           |                                  | Comments by: Eng. Alaa Abd-Allatif (ER)                               |                                                                                  |         |
| 1-quality test result by third party lab ( comibassal ) is Approved |                                  | 1-All Tests Were Carried -Out By Third Party Lab ( comibassal )       |                                                                                  |         |
| 2-this sample representative ( 5000 m3 ) only                       |                                  | 2-Results report attached and acceptable with project specifications. |                                                                                  |         |
|                                                                     |                                  | 3-Final approval is subject to above mentioned comments.              |                                                                                  |         |
|                                                                     |                                  |                                                                       |                                                                                  |         |

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

\* Designer

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



## COMIBASSAL International Controllers

الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

ISO 9001:2015 حاصلة على شهادة الأيزو

Accredited by:

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

قطاع التفتيش الداخلي والإعمال

معمد لدى الهيئة المصرية العامة للبترول

تحت رقم ٢٤/٢٩/١١٠٢٩

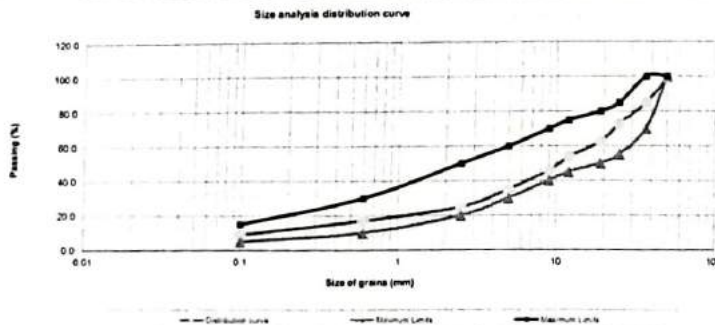
Report 349/1/Center

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

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

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

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



Soil classification: A - 1 - a

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECHNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M

الإدارة، ١٥٧ ش صفيية زغلول - الإسكندرية - مصر

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥

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

Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع خلف ١٩ طريق الحرية - الإسكندرية - مصر

ت: ٣٩٢٠١٧٦ - ٣٩٢١٨٢ - ف: ٣٩٠٠٤٧٦

49 EL Horria Ave. -Alex,Egypt

Tel: 3920176 - 3931482 - Fax: 3900476

E-mail :internal-inspection@comibassal.com



## COMIBASSAL International Controllers

الجمعية التعاونية لإنتاجية لأعمال الوزن والمراجعة والجبرة الدولية (كوميبسال)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

Report : 349/2/Center

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

General Consultant :

SYSTRA

Consultant :

Dr : Emad Nabil ( SPECTRUM)

Contractor :

شركة العنسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

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

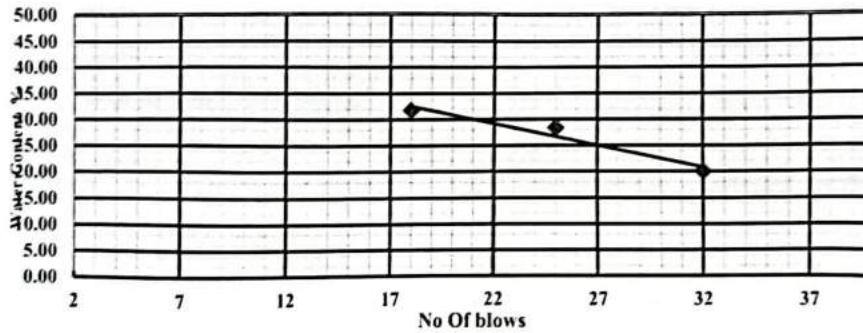
Station :

St ( 365+560 )

Date of Test :

01/02/2023

### Results



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

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

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

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M

الإدارة، ١٥٧ شارع صفيحة زغلول - الإسكندرية - مصر

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥

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

Tel:4870573 - Fax + Tel : 4869798 - 4870665



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

49 EL Horria Ave .-Alex; Egypt

Tel: 3920176 - 3931482 - Fax: 3900476

E-mail : internal-inspection@comibassal.com



## COMIBASSAL International Controllers

الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسل)

حاصلة على شهادة الأيزو ISO 9001:2015

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

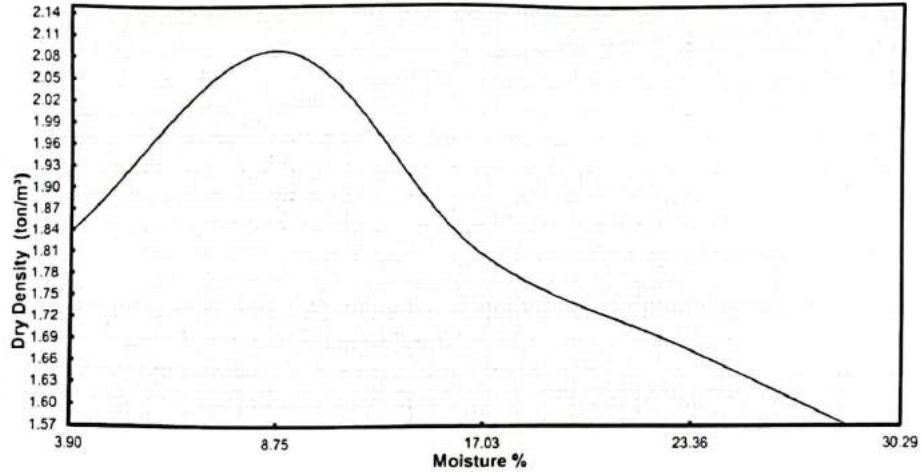
Report No. : 349 - 3 - center

### Modified Proctor Test Report

#### ASTM - D 1557

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

#### Results



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

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Fer. Dr. M.

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

ت. ٤٨٧٠٥٧٢ - ف. ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥

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



القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر

ت. ٣٩٢٠١٧٦ - ٣٩٣١٤٨٢ - ف. ٣٩٠٠٤٧٦

49 EL Horria Ave .-Alex;Egypt

Tel: 3920176 - 3931482 - Fax: 3900476

E-mail : internal-inspection@comibassal.com



## COMIBASSAL International Controllers

الجمعية التعاونية الانتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

ISO 9001:2015 حاصلة على شهادة الأيزو

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

Report no : 349 / 4 / center

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

General Consultant :

SYSTRA

Consultant :

SPECTRUM ( Dr. Emad Nabil )

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

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

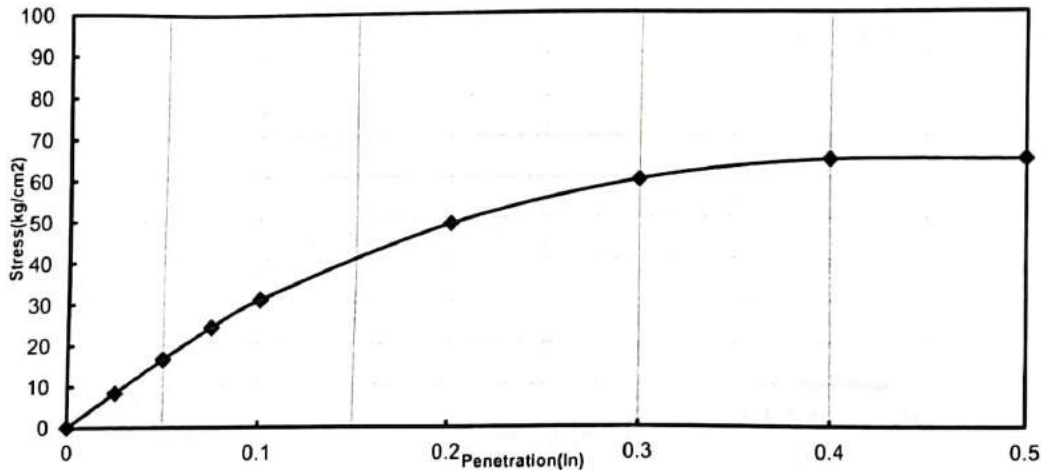
Station :

St ( 365 + 560 )

Date of Test :

05/02/2023

### RESULTS



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

C.B.R = 46.0 %

LAB DIRECTOR

Eng / Eman kandil

*Eman*



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

*For Dr. M*

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



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



## COMIBASSAL International Controllers

الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميبسال)

حاصلة على شهادة الأيزو ISO 9001:2015

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

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

### ORGANIG CHEMICAL ANALYSIS

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

Temperature : 18 °C

Humidity : 50%

| Analysis         | Results | TEST METHOD  |
|------------------|---------|--------------|
| Organig Chemical | Negativ | ASTM _D 2974 |



LAB DIRECTOR  
CH/ Mostafa Asker

*Mostafa*

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



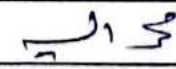
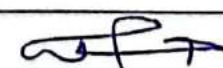
القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر  
ت ٣٩٢٠١٧٦ - ٣٩٢١٤٨٢ - ف ٣٩٠٠٤٧٦  
49 EL Horria Ave .-Alex;Egypt  
Tel: 3920176 - 3931482 - Fax: 3900476  
E-mail :internal-inspection@comibassal.com

|                                    |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>MATERIAL INSPECTION REQUEST</b> |  |  |  |  |  |
|                                    | <p>المشروع العام<br/>للطرق والكباري<br/>(GARB)</p>                                |                                                                                   |                                                                                    |                                                                                     |                                                                                     |

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

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

|                                                                     |                                   |                                                                       |                                                                                  |         |
|---------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------|---------|
| Description of Materials                                            | FILL LAYER Quantity ( 125000 m3 ) |                                                                       |                                                                                  |         |
| Location to be Used                                                 | From                              | 363+040                                                               | TO                                                                               | 366+000 |
| sample only                                                         | yes                               | Materials Type                                                        | fill layer                                                                       |         |
| Supplier Name                                                       | Elsawy , Alharamin                | Data Sheet Provided                                                   | yes attached                                                                     |         |
| reference in BOQ                                                    |                                   | Specification                                                         | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP |         |
| Prequalification Reference                                          |                                   | Test Samples Results                                                  |                                                                                  |         |
| Reference Photos                                                    | NO                                | Other                                                                 |                                                                                  |         |
| Comments by: Eng. Mazen Essamy (SPECTRUM)                           |                                   | Comments by: Eng. Alaa Abd-Allatif (ER)                               |                                                                                  |         |
| 1-quality test result by third party lab ( comibassal ) is Approved |                                   | 1-All Tests Were Carried -Out By Thrd Party Lab ( comibassal )        |                                                                                  |         |
| 2-this sample representative ( 5000 m3 ) only                       |                                   | 2-Results report attached and acceptable with project specifications. |                                                                                  |         |
|                                                                     |                                   | 3-Final approval is subject to above mentioned comments.              |                                                                                  |         |
|                                                                     |                                   |                                                                       |                                                                                  |         |

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

\* Designer

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



# COMIBASSAL International Controllers

الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

حاصلة على شهادة الأيزو ISO 9001:2015

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

Report 347/1/Center

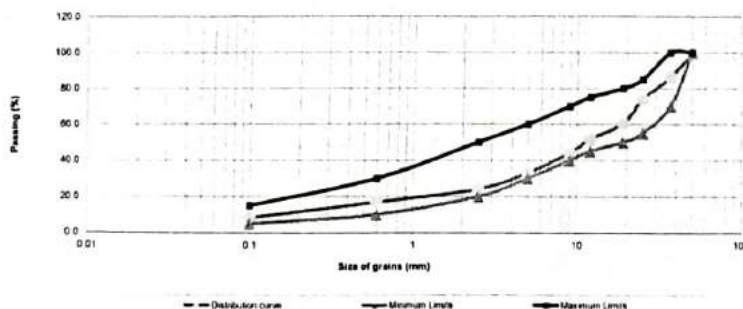
## PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

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

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

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

Size analysis distribution curve



Soil classification: A - 1 - a

LAB DIRECTOR

Eng / Eman kandil

Eman.



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Fer Dr. M

الإدارة، ١٥٧ ش صافية زغلول - الإسكندرية - مصر

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥

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

Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر

ت: ٣٩٢٠١٧٦ - ٣٩٣١٤٨٢ - ف: ٣٩٠٠٤٧٦

49 EL Horria Ave. -Alex; Egypt

Tel: 3920176 - 3931482 - Fax: 3900476

E-mail :internal-inspection@comibassal.com



## COMIBASSAL International Controllers

الجمعية التعاونية لأعمال الوزن والمراجعة والخبرة الدولية (كوميبسال)

ISO 9001:2015 حاصلة على شهادة الأيزو

Accredited by:

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

قطاع التفقيش الداخلي والإعمال

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

Report : 347 /2/Center

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

General Consultant :

SYSTRA

Consultant :

Dr : Emad Nabil ( SPECTRUM)

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

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

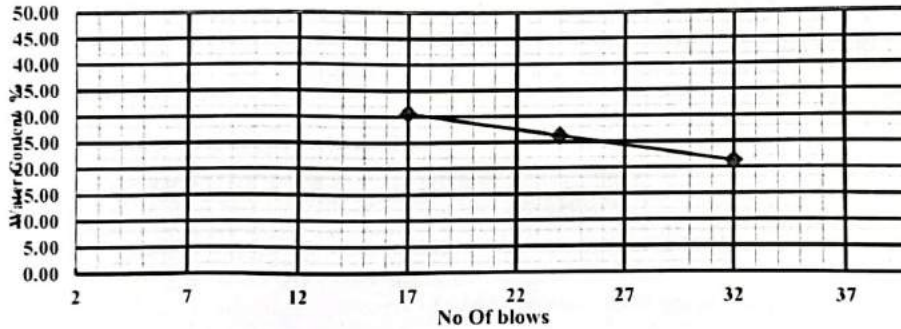
Station :

St ( 364+950 )

Date of Test :

07/02/2023

### Results



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

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

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

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Fer Dr M

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



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



## COMIBASSAL International Controllers

الجمعية التعاونية لإنتاجية الأعمال والمراجعة والخبرة الدولية (كوميبسال)

حاصلة على شهادة الأيزو 9001:2015

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

قطاع التفتيش الداخلي والمعامل

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

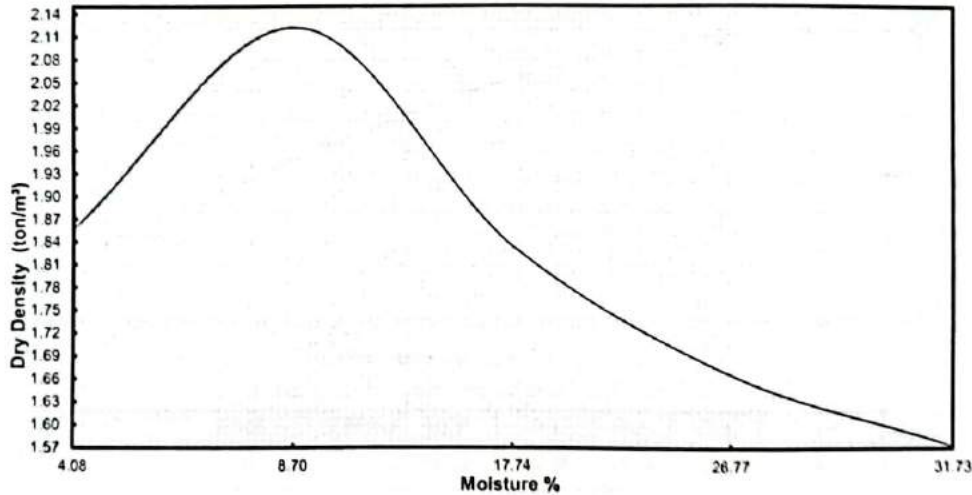
Report No. : 347 - 3 - center

### Modified Proctor Test Report

#### ASTM - D 1557

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

#### Results



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

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M-





## COMIBASSAL International Controllers

الجمعية التعاونية لإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسل)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

Report no : 347 / 4 / center

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

General Consultant :

SYSTRA

Consultant :

SPECTRUM ( Dr. Emad Nabil )

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

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

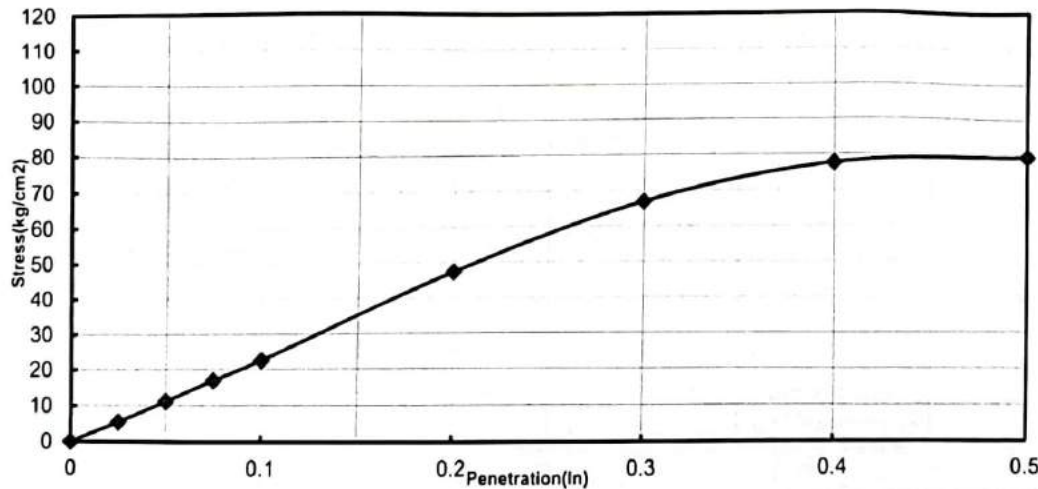
Station :

St ( 364+950 )

Date of Test :

11/02/2023

### RESULTS



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

C.B.R = 44.8 %

LAB DIRECTOR

Eng / Eman kandil

Eman

GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M





## COMIBASSAL International Controllers

الجمعية التعاونية الانتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسل)

حاصلة على شهادة الايزو 9001:2015

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

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

### ORGANIG CHEMICAL ANALYSIS

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

Temperature : 18 °C

Humidity : 50%

| Analysis         | Results | TEST METHOD  |
|------------------|---------|--------------|
| Organig Chemical | Negativ | ASTM _D 2974 |

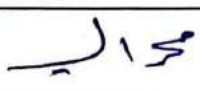


LAB DIRECTOR  
CH/ Mostafa Asker

*Mostafa Asker*

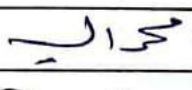
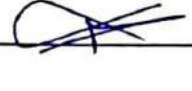
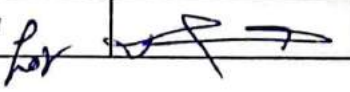


|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| MATERIAL<br>INSPECTION<br>REQUEST |      |  |
|                                   | الهيئة العامة للطرق والكبارى (GARB)<br>وزارة النقل<br>الهيئة العامة للطرق والكبارى (GARB)                                                                                                                                                                                                                                                                                                                                      |  |

|                             |                                     |                                                                                   |                       |                                          |    |    |    |    |    |    |    |
|-----------------------------|-------------------------------------|-----------------------------------------------------------------------------------|-----------------------|------------------------------------------|----|----|----|----|----|----|----|
| Contractor Company          | Al-Masa General Contracting Company |                                                                                   | Designer Company      | (SPECTRUM) Engineering Consulting Office |    |    |    |    |    |    |    |
| Issued by Contractor        | Name                                | Sign                                                                              | Date/Serial Number    | Time                                     |    |    |    |    |    |    |    |
|                             | Eng. Mohamed Elsaied                |  | 07/02/2023            | 3:00 PM                                  |    |    |    |    |    |    |    |
|                             |                                     |                                                                                   | (M.A.R-F26-EET) (REV) |                                          |    |    |    |    |    |    |    |
| Received by GARB CONSULTANT | Eng. Mazen Essamy                   |  | MIR                   | C1                                       | C2 | C3 | DD | MM | YY | HH | MM |
|                             |                                     |                                                                                   |                       | 363                                      | EW | CS | 8  | 2  | 23 |    |    |

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

|                                                                     |                                   |                                                                       |                                                                                  |         |
|---------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------|---------|
| Description of Materials                                            | FILL LAYER Quantity ( 130000 m3 ) |                                                                       |                                                                                  |         |
| Location to be Used                                                 | From                              | 363+040                                                               | TO                                                                               | 366+000 |
| sample only                                                         | yes                               | Materials Type                                                        | fill layer                                                                       |         |
| Supplier Name                                                       | Elsiwiy , Alharamin               | Data Sheet Provided                                                   | yes attached                                                                     |         |
| reference in BOQ                                                    |                                   | Specification                                                         | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP |         |
| Prequalification Reference                                          |                                   | Test Samples Results                                                  |                                                                                  |         |
| Reference Photos                                                    | NO                                | Other                                                                 |                                                                                  |         |
| Comments by: Eng. Mazen Essamy (SPECTRUM)                           |                                   | Comments by: Eng. Alaa Abd-Allatif (ER)                               |                                                                                  |         |
| 1-quality test result by third party lab ( comibassal ) is Approved |                                   | 1-All Tests Were Carried -Out By Third Party Lab ( comibassal )       |                                                                                  |         |
| 2-this sample representative ( 5000 m3 ) only                       |                                   | 2-Results report attached and acceptable with project specifications. |                                                                                  |         |
|                                                                     |                                   | 3-Final approval is subject to above mentioned comments.              |                                                                                  |         |
|                                                                     |                                   |                                                                       |                                                                                  |         |

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

\* Designer

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



## COMIBASSAL International Controllers

الجمعية التعاونية الانتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

حاصلة على شهادة الأيزو ISO 9001:2015

Accredited by:

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Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

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

Report 153/1/Center

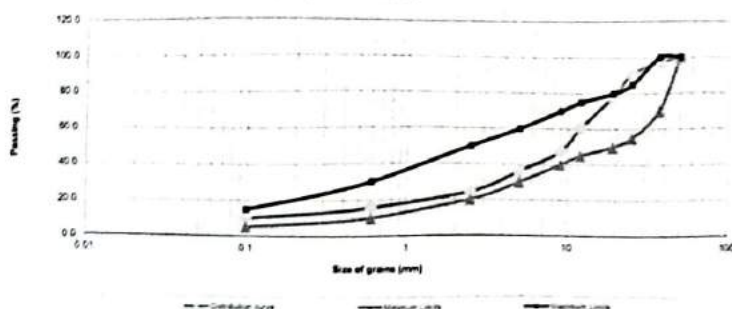
### PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

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

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

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

Size analysis distribution curve



Soil classification: A - 1 - a

LAB DIRECTOR

Eng / Eman kandil

Ceman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Far-Dr. M





## COMIBASSAL International Controllers

الجمعية التعاونية لانتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

ISO 9001:2015 حاصلة على شهادة الأيزو

Accredited by:

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Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

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

Report : 353 /2/Center

### Report Of Liquid limit and Plastic Limit Test

#### ASTM- D 1557

General Consultant :

SYSTRA

Consultant :

Dr : Emad Nabil ( SPECTRUM)

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

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

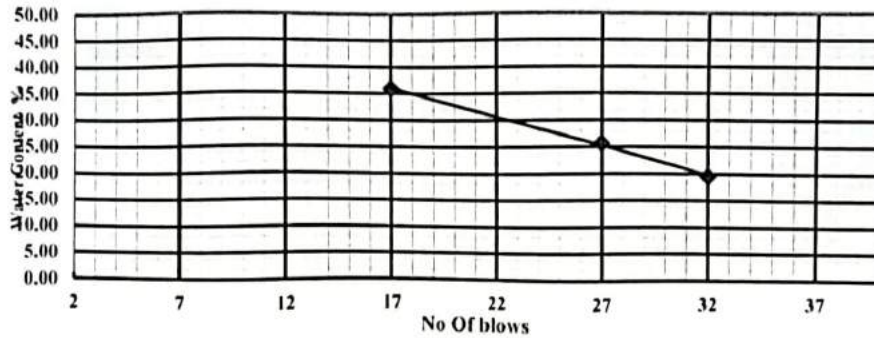
Station :

St ( 364 +0.00 )

Date of Test :

08/02/2023

#### Results



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

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

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

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. H —

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

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٩٩٧٩٨ - ٤٨٧٠٦٦٥

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

Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع: خلف ١٩ طريق الحرية - الإسكندرية - مصر

ت: ٢٩٢٠١٧٦ - ٢٩٢١٤٨٢ - ف: ٢٩٠٠٤٣٦

49 EL Horria Ave .-Alex;Egypt

Tel: 3920176 - 3931482 - Fax: 3900476

E-mail :internal-inspection@comibassal.com



## COMIBASSAL International Controllers

الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميبسال)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

Egyptian General Authority for Petroleum  
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قطاع التفتيش الداخلي والمعامل

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

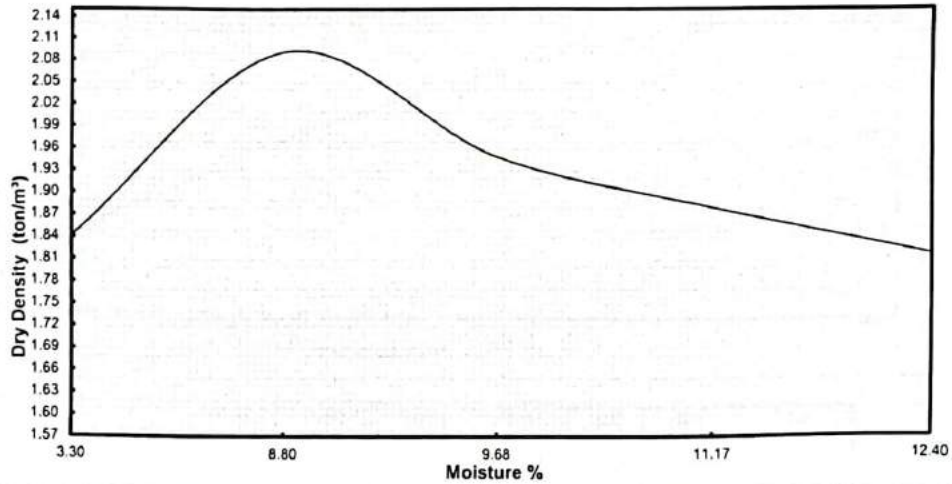
Report No. : 353 - 3 - center

### Modified Proctor Test Report

#### ASTM - D 1557

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

#### Results



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

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Dr. M.

الإدارة، ١٥٧ شارع صفية زغلول - الإسكندرية - مصر

ت. ٤٨٧٠٥٧٢ - ف. ٤٨٦٩٧٩٨ - ٤٨٧٠٦٦٥

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

Tel:4870573 - Fax + Tel : 4869798 - 4870665



القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر

ت. ٣٩٢٠١٧٦ - ٣٩٣١٤٨٢ - ف. ٣٩٠٠٤٧٦

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## COMIBASSAL International Controllers

الجمعية التعاونية الانتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

حاصلة على شهادة الأيزو ISO 9001:2015

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

Report no : 353 / 4 / center

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

General Consultant :

SYSTRA

Consultant :

SPECTRUM ( Dr. Emad Nabil )

Contractor :

شركة الماسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

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

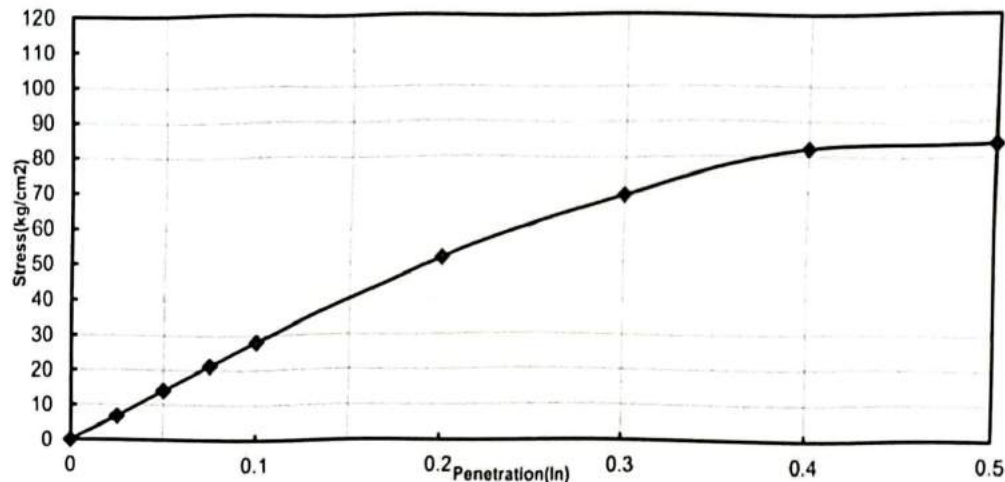
Station :

St ( 364 + 0.00 )

Date of Test :

12/02/2023

### RESULTS



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

C.B.R = 48.7 %

LAB DIRECTOR

Eng / Eman kandil

Eman

GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

Dr. M





## COMIBASSAL International Controllers

الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميبسال)

حاصلة على شهادة الأيزو 9001:2015

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قطاع التفتيش الداخلي والمعامل

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

|          |                   |
|----------|-------------------|
| Report : | 200 - 12 - Center |
| Date :   | 11/02/2023        |

### ORGANIG CHEMICAL ANALYSIS

|                      |                                |
|----------------------|--------------------------------|
| General Consultant : | SYSTRA                         |
| Consultant :         | SPECTRUM ( Dr . Emad Nabil )   |
| Contractor :         | شركة الماسه للمقاولات          |
| Project :            | Electric express train         |
| Sample :             | FERMA                          |
| Sector :             | ST ( 363+0.00 ) : ( 366+0.00 ) |
| Station :            | ST ( 364+0.00 )                |
| Date of Test :       | 8-2-2023                       |

Temperature : 18 °C

Humidity : 50%

| Analysis         | Results | TEST METHOD  |
|------------------|---------|--------------|
| Organig Chemical | Negativ | ASTM _D 2974 |



LAB DIRECTOR  
CH/ Mostafa Asker

Moustafa



|                                   |         |                                            |              |                                   |              |              |
|-----------------------------------|---------|--------------------------------------------|--------------|-----------------------------------|--------------|--------------|
| MATERIAL<br>INSPECTION<br>REQUEST | AL MASA | الهيئة العامة<br>للمطرق والكباري<br>(GARB) | مجلس الوزراء | الهيئة العامة<br>للتنظيم والإدارة | مجلس الوزراء | مجلس الوزراء |
|                                   |         |                                            |              |                                   |              |              |

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

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

|                            |                                   |                      |                                                                                  |
|----------------------------|-----------------------------------|----------------------|----------------------------------------------------------------------------------|
| Description of Materials   | FILL LAYER Quantity ( 120000 m3 ) |                      |                                                                                  |
| Location to be Used        | From                              | 363+040              | TO 366+000                                                                       |
| sample only                | yes                               | Materials Type       | fill layer                                                                       |
| Supplier Name              | Elsiwly , Alharamin               | Data Sheet Provided  | yes attached                                                                     |
| reference in BOQ           |                                   | Specification        | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP |
| Prequalification Reference |                                   | Test Samples Results |                                                                                  |
| Reference Photos           | NO                                | Other                |                                                                                  |

|                                                                     |                                                                       |
|---------------------------------------------------------------------|-----------------------------------------------------------------------|
| Comments by: Eng. Mazen Essamy (SPECTRUM)                           | Comments by: Eng. Alaa Abd-Allatif (ER)                               |
| 1-quality test result by third party lab ( comibassal ) is Approved | 1-All Tests Were Carried -Out By Third Party Lab ( comibassal )       |
| 2-this sample representative ( 5000 m3 ) only                       | 2-Results report attached and acceptable with project specifications. |
|                                                                     | 3-Final approval is subject to above mentioned comments.              |

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

\* Designer

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



## COMIBASSAL International Controllers

الجمعية التعاونية الإنتاجية لأعمال الوزن والمراجعة والخبرة الدولية (كوميباسال)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

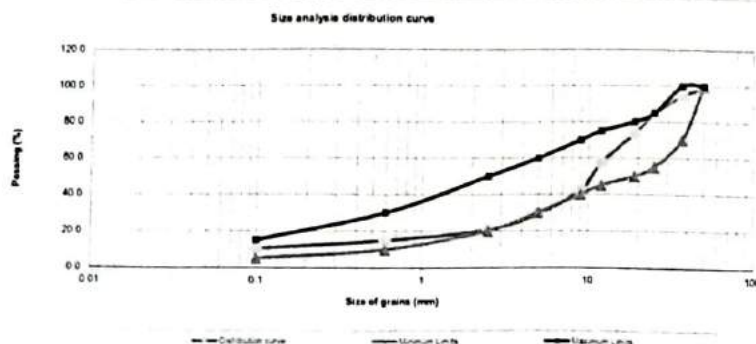
Report 355/1/Center

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

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

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

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



Soil classification: A - 1 - a

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECHNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M





## COMIBASSAL International Controllers

الجمعية التعاونية لإنتاجية الأعمال والخبرة الدولية (كوميباسل)

حاصلة على شهادة الأيزو 9001:2015

Accredited by:

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

قطاع التفتيش الداخلي والمعامل

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

Report : 355 /2/Center

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

General Consultant :

SYSTRA

Consultant :

Dr : Emad Nabil ( SPECTRUM)

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

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

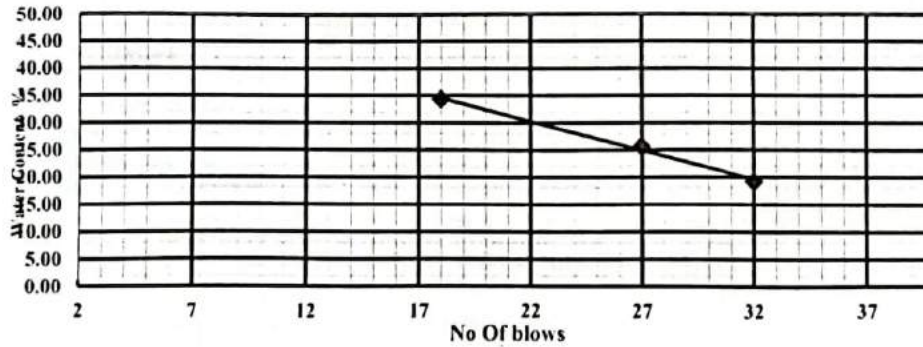
Station :

St ( 365 + 600)

Date of Test :

06/02/2023

### Results



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

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

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

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M-

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

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٧٩٧٩٨ - ٤٨٧٠٦٦٥

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



القطاع، خلف ٤٩ طريق الحرية - الإسكندرية - مصر

ت: ٣٩٢٠١٧٦ - ٣٩٣١٤٨٢ - ف: ٣٩٠٠٤٧٦

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## COMIBASSAL International Controllers

الجمعية التعاونية الانتاجية لأعمال الوزن والمراجعة والظيرة الدولية (كوميباسال)

حاصلة على شهادة الأيزو ISO 9001:2015

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Under No.: 34/29.11.2011

قطاع التفتيش الداخلي والمعامل

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

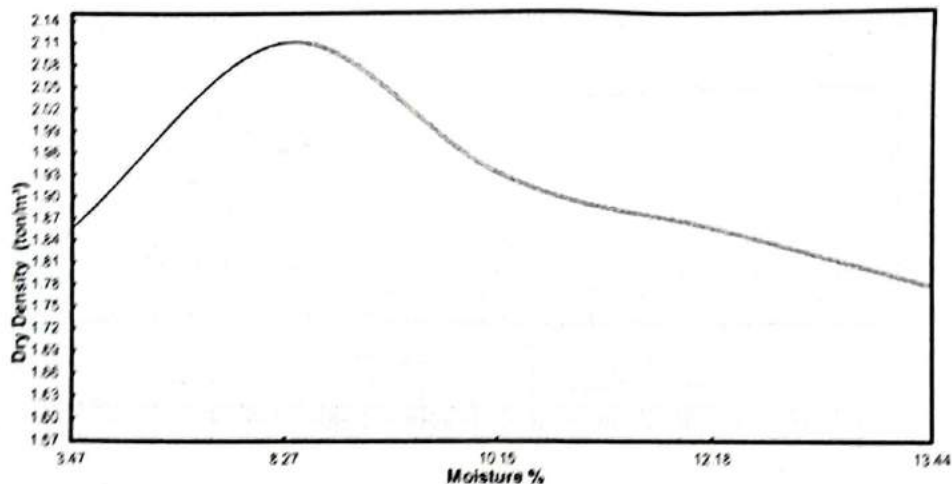
Report No. : 355 - 3 - center

### Modified Proctor Test Report

#### ASTM - D 1557

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

#### Results



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

LAB DIRECTOR

Eng / Eman kandil

Eman



GEO TECHNICAL CONSULTANT

Dr/ Mohamed Badry

For Dr. M





## COMIBASSAL International Controllers

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ISO 9001:2015 حاصلة على شهادة الأيزو

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قطاع التفتيش الداخلي والمعامل

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

Report no : 355 / 4 / center

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

General Consultant :

SYSTRA

Consultant :

SPECTRUM ( Dr. Emad Nabil )

Contractor :

شركة العاسة للمقاولات

Project :

Electric express train

Sample :

Ferma

Sector :

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

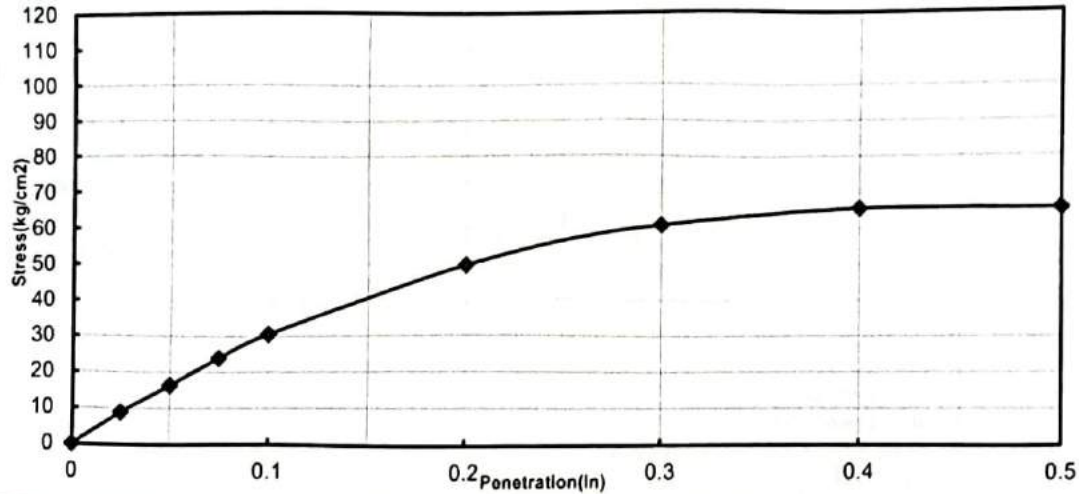
Station :

St ( 365 + 600 )

Date of Test :

11/02/2023

### RESULTS



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

C.B.R = 46.8 %

LAB DIRECTOR

Eng / Eman kandil

*Eman*



GEO TECNICAL CONSULTANT

Dr/ Mohamed Badry

*For Dr. M*

الإدارة، ١٥٧ شارع صفية زغلول - الإسكندرية - مصر

ت: ٤٨٧٠٥٧٢ - ف: ٤٨٧٩٧٩٨ - ٤٨٧٠٦٦٥

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القطاع خلف ٤٩ طريق الحرية - الإسكندرية - مصر

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حاصلة على شهادة الأيزو ISO 9001:2015

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قطاع التفتيش الداخلي والمعامل

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

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

### ORGANIG CHEMICAL ANALYSIS

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

Temperature : 18 °C

Humidity : 50%

| Analysis         | Results | TEST METHOD  |
|------------------|---------|--------------|
| Organig Chemical | Negativ | ASTM _D 2974 |



LAB DIRECTOR  
CH/ Mostafa Asker

*Mostafa*

