المينة المامة الطرق و الكياري (GARB)

(ISH DIER

محضر استلام موقع

مشروع: أعمال الجسر الترابي للخط الأول للقطار الكهربائي السريع قطاع (برج العرب - العلمين) في المسافة من الكم 370+371 إلى الكم 370+371 بطول 0.5 كم

> تنفيذ: شركة إنشاء للمقاولات العامة . إشراف : المنطقة الخامسة – منطقة غرب الدلتا طبقا للعدرقم (2024/2023/814) بتاريخ 2023/12/04 إنه في يوم الاربعاء الموافق 2023/12/5 اجتمع كل من:-

| مدير عام مشروعات - الهينة العامة للطرق والكياري | ١٩ السيد المهندس/محمد حسني فياض |
|---|---|
| مدير مشروع - الهيئة العامة للطرق والكباري | 2- السيدة المهندسة/مارجريت مجدي زاخر |
| مدير مشروع- شركة انشاء للمقاولات العامة | 3- السيد المهندس/ محمود شعبان أحمد |

وذلك للمرور على مسار العملية المذكورة عاليه لاستلام الموقع :-وقد تبين أن الموقع خالياً من العوائق الظاهرية ويسمح بالبدء في التنفيذ وبناء عليه يعتبر تاريخ 2023/12/5 هو تاريخ استلام الموقع ويدء الأعمال بالعملية واقفل المحضر على ذلك ووقع الحضور

التوقيعات

رئيس الإدارة الركزية Richard -3 منطقة غرب الدلتا × -2 الاسكندرية - مرســـي مطروح عميد . مهندس / 🗠 "هانی محمد محمود طه"

9









أنه في يوم السبت 2023/12/2 وبحضور كلا من :-

- 1-- م/ مارجريت مجدي الهيئة العامة للطرق والكباري
- 2- م/ عبدالعزيز مصطفى سبكترم للاستشارات الهندسية (مكتب د. عماد نبيل)

3--- م/ محمود شعبان احمد شركة إنشاء للمقاولات العامة

تم النزول والمعاينة وطبقا للتعليمات الواردة بالمقايسة بمسافات نقل التوريد للمن

(prepared subgrade & sub ballast)

من الكسارة حتى محور مسار الطريق وجد أنه :-

يتم النقل السن من الكسارة إلى محور مسار القطار السريع (الحمام – العلمين) لقطاع شركة إنشاء للمقاولات العامة من 371+000 الى 371+500 مسافة قدر ها :-

(83 كم)

التوقيعات :-شركة انشباء للمقاولات العامة 3-- م/ محمود شعبان إيد محمد محمود رضوان وشريكة التو قيم/ 1 المربع ... ٢٦٠ ٩٠٠ من تدا التوقيع/ 2023 <u>20</u> 2- م/ عبدالعزيز مصطفى 1-- م/ مارجريت مجدى التوقيع/ كم







محض____ر معاين___ة مساف____ة

أنه في يَوْمَ السبت 2023/12/2 وبحضور كلا من :-

- 1- م / مارجريت مجدي الهينة العامة للطرق والكباري
- 2-- م/ عبدالعزيز مصطفى سبكترم للاستشارات الهندسية (مكتب د, عماد نبيل)
 - 3--- م/ محمود شعبان احمد شركة إنشاء للمقاولات العامة

تم النزول والمعاينة وطبقا للتعليمات الواردة بالمقايسة بمسافات نقل التوريد للأتربة والرمال من المحجر حتى محور مسار الطريق وجد أنه :-

يتم النقل للأثرية والرمال من المحجر إلى محور مسار القطار السريع (الحمام – العلمين) لقطاع شركة . إنشاء للمقاولات العامة من 371+000 الى 371+500 مسافة قدرها :-

1-- 88 كم للتراب

2-- 68 كم للرمل

التوقيعات :-شركة انشاء للمقاولات العامة 3- م/محمود شعبان SPECTRUM SPECTRUM محمد محمود رضوان وشريكة T2271 - PIL - 214 - T3-2-- م/ عبدالعزيز مصطفى 2023 ニュ 1-- م/مارجريت مجدي التوقيع /

| 2783 | | :7 | | SPOC 12510 | Inshaa |
|----------|--|-------------|---|------------|---------|
| | مشروع : القطار السريع { السخنة المقايسة التقديرية لبنود الاعمال تنفيذ شرك القطاع من الكم 371+000 إلى الكم 0 | : إنشاء للم | فاولات العامة إ | (1) | |
| قع البند | بيان الأعمال | ferent | 4.0 | معزالقط | الاجدال |
| 1 3 | اعمل الردم | | | | |
| | العمل فتوريد قرية معايلة للمواصفات وللقابليا باستادام لان السويا يسعد لا يزيد من 53 سم حق مشوب -3 متر ويسعك لايزيد عن 25 سم لاستكمال قضور القصيري للفكيل البسر والاكتال إنسية تحمل كليلويتيا لا تلل من 15 كال ويقيه يأسية الاصولية في نسبة الرطونة قصلولية وعند الجد بالورانات قومول ال قص كالة سائة إ 1494 من 125 فترانة القصول) ويتم العليل طبقا للنشاعين القصيمية والطاعات العرضية فتواجية وارسومات القصيلية المحمدة وفرنة بحمدي مقتداتة طبقا لاصول العنامة ويوصفات قليلة العامة العرفية فتواجية وارسومات - واحدة طب جهالز الاشراف زوادة لسبة قلمات من وكالا بحسب زواعاً 3 جنية على زوادة لسبة الدماء الاي ال - مسافة التقى حق 5 كان ويزمة تعلمية علما لاصول العنامة ويوصفات قليلة العامة العليل والايزان وتشيمات - واحدة طب جهاز الاشراف زوادة لسبة قلمات من وكالا بحسب زواعاً 3 جنية على زوادة لسبة الدماء لكي 15. - مسافة التقى حق 5 كورتيم نخصان علاوية عارة جنية الكم بلاورانا والايزان الماء الماء الاراحيان الا | 4 | 3,500 | 85 | 297,500 |
| | علاوة مساطة انتقل 10 كم (الربة) (1.6 × 1.4 = 1.20) | 34 | 2,800 | 120.4 | 337,120 |
| 4 | علاوة سسافة النقل 58 كم (ربدل طبيعية) (4×64 ـ 4.24) | 34 | 700 | 92.4 | 64,680 |
| | علاوة تحصيل رسوم الكارثة والموازين طبقا للائصة الشركة الوطلية | 3,0 | 3,500 | 13 | 45,500 |
| 4 | طبقت الإسابي | 1.17 | 1.5.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1 | | |
| - | بالمتر المكتب أعمال لزية وقرش طبلة لأسبس (Prepared pubgrade) من الاحجار لصلية المشرعة لتج تكسير الكسارات والمطلبقة للمواصلات وطعي مجمو للسيبات 200 مم ولا تزيد لسبة السار من سنطن 200 من الالة وجهاز لوس تجانوس من 200 ولا يزيد الاستمامي من 200 ولا يتل مسلم للمرينة (200 ولا تزين لمع المصلي عن 30 مجابسكان وتيم فردها علي طبقتين باستخدام الات السوية المعرية (200 ولا تزين سمك المتركة بعد تمام للملك من 30 سم ورغيا بالجلية الاصولية للوسول في لسبة الرولية مع 200 ولا تزين لسبة المتركة بعد تمام للملك من 30 سم ورغيا بالعلم عن 200 من الات السوية المعينة على ان لا يزين سمك المتركة بعد تمام للملك من 30 سم ورغيا بالعبل الاصولية الوسول في لسبة الرطوية المعترية وللملك العبر، المتحادي العمالية ولمعائية ومتم التنفيذ عامة الالك من 200 من الالتة الموجة المعرية وللملك العبر، العبران العمالية ولمعائية ومتم التنفيذ عامة الالال من 200 من الالته المحوية المعتبة على ان لا يزين سمك العبران العمالية العمل من 20 سم ورغيا بالعبلية الاصولية الوسول في لسبة الرطوية المعترية وللملك العبر، العبران العملية ولمعائية ومتم التنفيذ علمة الالال من 2005 من الالته العبوية العملية المنا بحراء العبران العمل من 400 معائية المتروغ والتون الالامات الوليول في لسبة المعانية الوالا لا يدينو بعديم مشتعلات عليلة العمل من 200 مع ورغيا بالعبران الالا والالمات العينسي المتروف معالية العمل معالية العمل الالا العامة الالية العبرانية والوليون العلمان. - مساحة العبل اليدوالا المعمرية علية الالدانة المنطقة بها الماع رقم (كان من المكر الى المكر علم العمل العبران المالية المعمرية علية الالية المنطوية الماع رقم (كار من المكر علم العبران الميالية المعمرية علية الالية المنطانة بعنا الماع رقم (كان من المكر المكر المكر الى المكر علم العربية الموالية المعارية المعمرية علية الالية المناطين العبران العبران العبران العبران المكر المكر الالية الموالية العلم الملك والميامات العبنان العبران العبران العبران العبرالية العام - المام معامية المالية المعمرية علية الالية المناطية بعنا الماع رقم (كار من الكم 201 الى علم 1990 م | ۶ | 3,200 | 271 | 839,600 |
| | علاوة مــالة النكل 13 ⁶ م 19×5.5 × 75.6 | 34 | 3,200 | 75.60 | 241,920 |
| 10 U | علارة تحصيل رسوم الكارنة والبوارين طبقا للاتصة الشركة الوطنية | 34 | 3,200 | 25,00 | 80,000 |



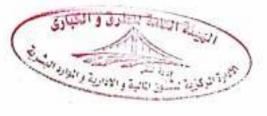




| and a construction | Che and and the state | | | | mathan |
|--|---|--------------|------------------|-----------|---------------------------------------|
| 17 | مشروع : القطار السريح (الس المقايسة التقديرية لبنود الاعمال تنفياً القطاع من الكم 371+000 إلى ال | ة: إثشاء للم | مقاولات العامة (| (1 | |
| وهيتما | ييان الأغسال | الوحدة | الكبية ا | ستر اللئة | الاجمال |
| اللمواصفات واقعي حج | بقرش طبقه أساس من الاحجار المشبّة المتعرمة ذلاح تكمير الكسارات والمطابقة ميريات ما بين 1.5 مم أل 40مم والا يزيد تسبة المار من منخل 200 من 155 والتدرج رح لا تقل تسبة تحمل كاليقورتيا عن 1956 لا يقل معامل المرونة (201) من تحربه لزم | | | | |
| الحميل عن 120 ميمار فرهة على طبقتين يات الدينة الامولية قوموز (1008) من الكافلة العد والرمومات التقسيلية ال المهندس المشرق. - مساه على لا تق - مناه على لا تق | ل ولا يزيد لسبة الفاقد بجهاز لوص الجاوس عن 300 والا يزيد الانصاص عن 2015 و ر الان السرية العديثة على ان لا يزيد سعات الطبقة بعد تمام السات من 20 سم ورغي نسبة الوطوية السطارية والدمان الجديد بالهزاسات الوصول الى أهمي كافاة جافة (لا تق وطفة النسل اجزء التجارب المعملية والحافية وتحم التقلية طبقا الصول المصاحة سدة والبلد يجمع مشتملاته طبقة المواصفات القلية المشروع وتقرير الاستشاري وتعاي | * | 2,975.16 | 298.00 | 886,597.08 |
| الحميل عن 120 ميمار فرهة على طبقتين باست بالدينة الاصولية قوسول (1008) من الكافلة العد والرسومات التقسيلية ال المهندس المشرق. - مساه على لا تق - مناه على لا تق | ل ولا يزيد نسبة الفاقد بجهاز لوس الجانوس من 130 والا يزيد الإنتصاص من 130 و م ر الان تضريرة المبيئة على الا يزيد سمك الطبق بعد تمام السات من 20 سم ورغي نسبة الوطونة المستريرة والدمانية الجرد بالهرضات الوصول الى قصي كافة جافة (لا تق والبلد بجميع مشتملاته طبقة للمواصفات القلية للمشروع وتقرير الاستشاري وتعلي والمبيد بجميع مشتملاته طبقة للمواصفات القلية للمشروع وتقرير الاستشاري وتعلي م جمعهرية طبقة والانة المنطقة بيقة فطع وقم (5) من الكم 251 الى الكم 2525 و | 3y 3y | 2,975.16 | 298.00 | 886,597.08 224,921.94 74,378.95 |









| | MATERIAL | | | | 35-B- | IN | | |
|---|--------------------------|-----------------------------|-----------------------------|---|--|--|--|--|
| | APPROVAL REQUEST | Inshaa | | inere Same estate Marga destate | | alle. | | |
| Com | tractor | INSHAA CENER | | | | D. | | |
| | L_11/26163 | INSHAA GENERAL O Company | OF CONSTRUCTION | Designe | er Company | T | | |
| 1 | 1 | Vame | Sign | | a company | (SPECTRUM) Engindering Consulting Office | | |
| Issue | | | | Date/Se | rial Number | Time | | |
| Conti | ractor | ng. Mahmoud haban | (3) E 2 [] 1 | 1 | | Time | | |
| 0 | | | 2.023 | | -03-2023 VI.A.R.J | 1:30 | | |
| GARB | red by | | 0-T | 1100 100000 | (f.1) | | | |
| | JLTANT | ng. Mazen Essamy | MAR | 2 A A A A A A A A A A A A A A A A A A A | C3 DD | MM YY DD MM | | |
| Eurowa | | | | 371 EVV | CS 11 | 73 1 10 1 | | |
| CODE - | | 51 to 521 | | | | | | |
| CODE - | £ 1 | Station Reference | D1 to S Dapot Refer | ence | E | Kp XXX Note | | |
| - coupys | - | | Work Acti Sub Element of | with | For Kilome | ter point only Start Kin is used | | |
| Descrip | tion of Mater | 110 | | Contraction and the second | | | | |
| | | rials Fill Layer Tot | al Quantity (5000 m3) | Unner Fee | | | | |
| Location | n to be Used | From Station | (371+000) to Station (3 | awher EW | oankment | | | |
| Sample | only | Yes | (3) to Station (3) | 71+500) | | | | |
| Ĩ. | | res | Materials Ty | /pe | Fill layers | | | |
| Supplier | Name | | | | | | | |
| 1 | | | Data Sheet p | provided | OF CONSTRU | INSHAA GENERAL | | |
| Reference | e in Reco | | | | contracting . | ICTION Company | | |
| | | 12-21 | Specification | | CONTRACTING ASTM D (1557) CARTHWORK SPECIFICATIONS & TESTING REPORT 10/521 AL 2010 | | | |
| Prequalifi | ication | | | | | REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP | | |
| reference | | | Test Samples | Results | | | | |
| Reference | | No/Yes | | | | | | |
| Comment | s by: Eng. Ma | izen Essamy (Spec | TRUM) Commen | 1 | | | | |
| | | | and a second of the | ts by: Eng. | Alaa Abd-Alla | atif (ED) | | |
| J-Disality tes | t Result il v Thin | d Party Lab is Approved | | | | in (cr) | | |
| 2-This Sample | e Representive (| (SODO m3) only. | 5- All re fearchass | Sta w | PTR OU | شركية | | |
| 1 | SPECT | RUM | 2-Results | report at | LIGCAL | اتشاء للمقاولات الد | | |
| | 1000 | 13 | project spe | ecification | inshaa e | Teetbole With The | | |
| 1 | 1.1000 | 2 | 3-Final ap | proval is | subject to | above mentioned | | |
| | 15 200 | 15 | comments | 14 | 1 | menhoped | | |
| | 1 | 3/5 | evalt \$ | or Che | nical anal | lysis Reputt | | |
| | Nesi | 34/ | | #= 5 | | D (Das A | | |
| Ormania | | | APPROVAL STATUS | #= I and g- 6 2023 # | | | | |
| Organisation | Name | | Sign | | | | | |
| Contractor | Eng. Mah | moud shaban | -(3) n | D | ate | A AWC-R | | |
| | THE PARTY | en Essamy | | | 31-03-2033 | A | | |
| QA/QC * | | | - CAE | - | | A 1 | | |
| | RB** Eng. Mohammed Fayad | | | | | - 4 | | |
| SARB** | Eng. Moha | annied Fayad | 1 | 4 | | A CONTRACTOR OF A CONTRACTOR OFTA CONTRACTOR O | | |
| SARB** | | 5 10 | | | | | | |
| QA/QC * SARB** mployers epresentative Designer Algement/Bridge | e Eng. Alaa J | Abd-Allatif | DI | 120 | 40.00 | Awc | | |



COMIBASSAL International Controllers

Accredited by : Egyption General Authority for Petroleum under No. 34/29-11-2011 Accredited by : Egyption Accreditation council (EGAC) under No. 051706/1A

I- Introduction

| General Consult | ant : | SYSTRA |
|-----------------|-------|----------------------------|
| Consultant | E. | SPECTRUM |
| Contractor | Ť. | شركة انشاء تلمقارلات |
| Sample | 2 | FERMA |
| Station | 12 | St(371+000) to St(371+500) |
| Date of Test | 1 | 31/03/2023 |
| QC | 1 | 1359 |
| | | |

II- Sample description:

Gravel and sand

III- Required tests and Results

| Required Test | Results | | |
|--|---------------------|-----------------------|--|
| 1- Grain size analysis and classifica- | Grain size analysis | As showed in appendix | |
| tion | Classification | A-1-a | |
| 2- Modified compaction (Proctor | MDD | 2.116 | |
| test) | OMC | 6.3% | |
| 3- Liquid limit, plastic limit and plas- | LL | Non plastic | |
| ticity index | PL | Non plastic | |
| | PI | Non plastic | |
| 4- California bearing ratio (CBR) | CBR ratio | 42% | |

IV-Notes

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



Kilo 23 Alexandria - Cairo Desert Road - Merghem Tel: 002 03 4704595 - 002 034701191 Enail : civdept@combassal.com WebSite : www.combassal.com



49 El Horria Ave. Alex,Egypt Tel: 002 033920176 - 002 033931482 Fax :002 033900476 Email : internal-Inspection@comibassal.com

RUM

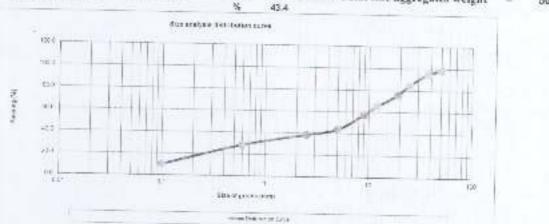


Accredited by : Egyption Accreditation council (EGAC) under No. 031708/1A

PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| | WEIGHT | CUMILIATIVE | CEMITATIVE. | CUMULATIVE | STANDURD |
|-------|----------|---------------|--------------|-------------|---------------|
| | RUTAINED | WEIGHT | PURCENTAGE | PERCENTAGE | SPECIFICATION |
| | 1200) | RELAINED (gm) | RELAINED (S) | PASSING (%) | LIMITS |
| 2 | 158.66 | 138.00 | 1.58 | .98.4 | |
| 1.1/2 | 358.00 | 516.00 | 5 1é | 94.8 | |
| 9 | 965.00 | 1481.00 | 11.81 | 85.2 | |
| 34 | 957.00 | 2438.00 | 24.38 | 75.6 | |
| 1.7 | 1023,300 | 3488.00 | 31,88 | 65.1 | |
| J-8 | 785.00 | 1273.00 | 42.73 | 57.3 | |
| No.4 | 1387.00 | 3660.00 | 56.50 | 43,4 | 1 |
| 56.10 | 60,00 | 66.00 | 12.00 | 38.2 | 612 0 |
| Va.40 | 174.93 | 174.00 | 34.80 | 28.3 | |
| 0.200 | 387.00 | 387.00 | 27.40 | 9.8 | |

500 gm



Soil classification: A - 1- a (Non Plastic)



Kilo 23 Alexandria - Cairo Desert Road - Merghem Tel: 002 03 4704595 - 002 034701 191 Enail : civdept@com/bassal.com WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt Tel: 002 033920176 - 002 033931482 Fax :002 033900476 Email : Internal-inspection@com/bassal.com



COMIBASSAL International Controllers

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Modified Proctor Test Report ASTM - D 1557

| Mould Number :- | 1 |
|-------------------|------|
| Volume of mould - | 2120 |
| Weight of mould = | 5657 |
| G.S = | 2.6 |
| | |

rm" B g/cm3

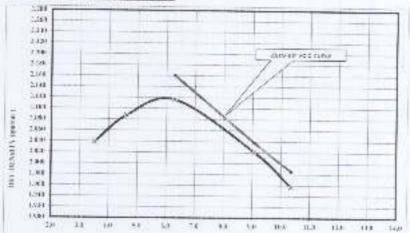
A- Density Calculations :-

| | 1 | 2 | 3 | 4 | 5 |
|------------------------------------|--------|-------|-------|-------|-------|
| Weight, of wet soil+mould (g) | 101.30 | 10285 | 10425 | 10330 | 10236 |
| Weight, of mould (g) | \$657 | 5657 | 5657 | 5657 | \$657 |
| Weight of wet suil (g) | 4473 | 4628 | 4768 | 4673 | 4579 |
| Volume of mould (cm ²) | 2120 | 2120 | 2120 | 2120 | 2120 |
| Wet density (g/cm ³) | 2.130 | 2,183 | 2.249 | 2.204 | 2.160 |
| Dry density (g/cm ²) | 2.038 | 2.087 | 2.116 | 3.021 | 1.957 |
| Zero-air Void curve | | ille. | 2.160 | 2.038 | 1.986 |

B-Moisture Calculations :-

| Weight of wet soil-container (g) | 250.0 | 250.0 | 250.0 | 250.0 | 250.0 |
|----------------------------------|-------|-------|-------|-------|-------|
| Weight of dry soil-container (g) | 244.3 | 242.5 | 240.0 | 236.2 | 234.9 |
| Weight of container (g) | 82.0 | \$0.0 | 81.0 | 84.0 | 88.0 |
| moisture content(%) | 3.5 | 4.6 | 6.3 | 9.1 | 10.4 |

C - Dry density-Moistury relationship:-



HOISTERE CRATENT(%)



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Contraction of

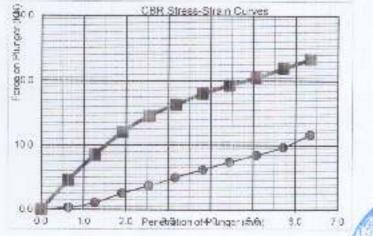
The state



Report Of CBR Test - ASTM - D 1883

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

| and the second se | BLOWS | | 56 | | | | Swi | ell % | |
|---|---|---------------|-------|------------|----------|---------|--------------|-------------------|--------|
| | MOULD NO | | 1 1 | | | | 56 | - | |
| WT OFMOULD+SOIL | | 11930 | | | Start | 0.00 | | | |
| WTOF | MOULD | | 7010 | 1 | | End | 0.00 | 13 | |
| WT OF | | | 4920 | 1 | _ | Swell | 0.00 | | A |
| statement of the second se | AE OF MO | OULD | 2198 | | | South A | 100.00 | | 11000 |
| WET D | ENSITY | | 2.238 | | | | | | + |
| | | | MC bo | fore so | aking | Weig | aht of Ran | nmer | 4.54Kp |
| TIN NO | England | | 1 | 1 | | | MDD | Kg/m3 | 2.116 |
| WT OF WET SOIL+TIN 2 | | 250.00 | | | | | | | |
| WT OF | WT OF DRY SOIL+TIN | | 240.5 | | - | | OMC | % | 6.3 |
| WT OF | WATER | | 9,50 | - | | | Gine | 70 | 9.4 |
| WTOFTIN | | 92 148.5 | | - | | PRO | VING R | ING | |
| WT OF TIN WT OF DRY SOIL MOISTURE CONTENT | | | | - | | Div/ | KN | 0.0210 | |
| MOISTURE CONTENT | | 6.4 | | _ | | | 1020-000 | Constraint (Aller | |
| DRY DI | ENSITY | and the state | 2.104 | | | 1. 100 | Capacit | y (KN) | 50 |
| Pen | Rea | ading (D | | Be | aring () | (N) | | CBR | |
| mm 0.00 | 56 | | | 56 | ar | | standar | 56 | |
| | 0 | | | 0.0 | | 110163 | 0.0 | 1993. | 8 |
| D.64 | 32 | | | 0.3 | 1 1 | 1 - 10 | 4.5 | | 2 |
| 1.27 | 108 | | | 1.1 | | - 06 | 8.5 | | 1 |
| 1.91 2.54 | 255 375 | | | 2.5 | - | | 12.0 | | - |
| 3.17 | 505 | | | 3.7 | | | 14.5 | 28 | |
| 3.81 | 632 | | | 6.2 | | | 16.3 18.0 | | |
| 4.45 | 753 | | | 7.4 | | | 19.3 | | |
| 5.0B | 865 | | | 8.5 | 1. 12 | | 20.5 | 42 | 0 |
| 5.71 | 987 | | | 9.7 | | | 21.9 | Caller. | 1 |
| | and the second se | | | 10.200.000 | | | | | |









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| Report | 1 | 541 - 1 - Center |
|--------|---|------------------|
| Date | 1 | 08/06/2023 |

CHEMICAL ANALYSIS

| General Consultant | 1 | SYSTRA |
|--------------------|---------|---------------------------------|
| Consultant | 5 | SPECTRUM |
| Contractor | 1 | شركة انشاء للمقاولات |
| Project | 10 | Electric express train |
| Sample | E) | FERMA |
| Station | : | ST (371 +0.00) ; (371 + 500) |
| Date of Test | 1 | 31-3-2023 |
| Temperature | : 25 °C | Humidity : 40% |

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| ORGANIG MATTER | NEGATIVE | ASTM D 2974 |



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\$5-B-IN A LERIA المتعام المقواكاني سيري الماني PPROVAL Inshaa * 1151.4 REQUEST 195208 01

| Contractor Company | INSHAA GENERAL (Company | OF CONSTRUCTION | Desi | gner C | ompa | nγ | | TRUM) (Iting Of | Engineer | ing |
|-------------------------|-----------------------------|-----------------|-------|--------|-------------------------------------|-----|------|---------------------|----------|-----|
| | Name | Sign | Date | /Seria | I Num | ber | Time | 9 | | |
| Issued by Contractor | Eng, Mohamed Hassan | 1023 | | (M., | -2023 A.R. A .G. 1) | eV | | 1 | 30 | |
| Received by | | 0- | C1 | 12 | C3 | DD | MM | YY. | . KH | MM |
| GARB CONSULTANT | Eng. Mazen Essamy | MA | R 371 | EW | cs | 08 | 04 | 23 | 01 | 50 |

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

| Description of Materials | Prepared Subgra | Prepared Subgrade Total Quantity (5000 m3) | | | | | | |
|--|------------------|---|--|--|--|--|--|--|
| Location to be Used | From Station (37 | rom Station (371+000) to Station (371+500) | | | | | | |
| Sample only | Yes | Materials Type | | Prepared Subgrade | | | | |
| Supplier Name | | Data Sheet provided | | Yes attached INSHAA GENERAL OF CONSTRUCTION Company contracting ASTM D (1557) | | | | |
| Reference in BoQ | (4-1) | Specification | | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 8Y CIVECON GROUP | | | | |
| Prequalification reference | | Test Samples Results | | | | | | |
| Reference Photos | No/Yes | Ot | her | | | | | |
| Comments by: Eng. Maze | n Essamy (SPECT | rrum) | Comments by: Er | ng. Alaa Abd-Allatif (ER) | | | | |
| 1-Quality test Result By Third I 2-This Sample Representive O | 12 | | (comibassal inten 2-Results report project specificati | attached and acceptable with the | | | | |

comments.

شركية الشاء للمقاولات المالية IGC Inshaa general construction

| Organisation | Name | Sign (D) | Date | A-AWC-R |
|-----------------------------|-----------------------|----------|--------------|---------|
| Contractor | Eng. Mohamed Hassan | 2027 | 08-04-2023 | А |
| QA/QC * | Eng. Mazen Essamy | A | | A |
| GARB** | Eng. Mohammed Fayad | | | |
| Employers Representative | Eng. Alaa Abd-Allatif | to sel | \$ 12.4.2023 | Awe |

File: M-A-R-P-1



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I- Introduction

| General Consulta | nt : | SYSTRA |
|------------------|------|----------------------------|
| Consultant | ÷ | SPECTRUM |
| Contractor | 13 | شركة انشاء للمقاولات |
| Sample | 1 | Prepare Sub-Grade |
| Station | + | St(371+000) to st(371+500) |
| Date of Test | 4 | 08/04/2023 |
| QC | 4 | 883-3 |
| | | |

II- Sample description:

Crushed stone and sand

III- Required tests

- 1- Grain size analysis and classification
- 2- Modified compaction (Proctor test)
- 3- Liquid limit, plastic limit and plasticity index
- 4- California bearing ratio (CBR)
- 5- Specific gravity (SG)
- 6- Los Angeles test

| 1- Grain size analysis and classifica- | Grain size analysis | As showed in appendix |
|--|---------------------|-----------------------|
| tion | Classification | A-1-a |
| 2- Modified compaction(Proctor | MDD | 2.155 |
| test) | OMC | 6.30% |
| 3- Liquid limit, plastic limit and plas- | LL | Non plastic |
| ticity index | PL | Non plastic |
| | PI | Non plastic |
| 4- California bearing ratio (CB | CBR ratio | 92% |
| 5- Specific gravity (SG), absorption | SSD | 2.569 |
| and degradation | Absorption | 1.2% |
| | Degradation | 0.2% |
| 6- Los Angeles test | Abrasion ratio | 27.2% |
| AB DIRECTOR | | nical consultant |

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شركة الشاء للمقاولات العامة GC

inshaa general construction



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APPENDIX

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BASSAL International Controllers Internal inspection and laboratories sector

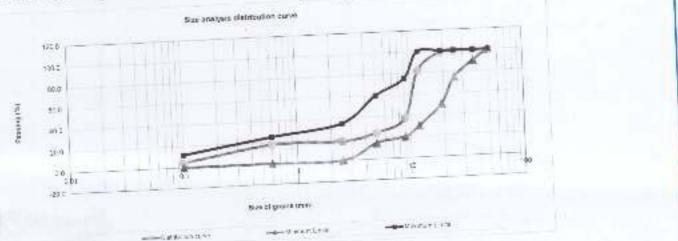
Accredited by : Egyption General Authority for Petroleum under No. 34/29-11-2011 Accredited by : Egyption Accreditation council (EGAC) under No. 031706/1A

PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| | WEIGHT | CUMULATIVE | CUMULATIVE | CUMULATIVE PERCENTAGE | STANDURD SPECIFICATI | ON |
|-------|----------|-----------------------|----------------------------|--------------------------|-------------------------|-----|
| | RETAINED | WEIGHT | PERCENTAGE RETAINED (%) | PASSING (%) | LIMIIS | |
| | (gm) | RETAINED (gm) 0.00 | 0.00 | 100.0 | 100 | 100 |
| 5 | 0.00 | 0.00 | 0.30 | 100.0 | so | 100 |
| + | 8.00 | 0.00 | 0.00 | 100.0 | 75 | :00 |
| 3 | 150.00 | 150.00 | 1.54 | 98,5 | 80 | 100 |
| 1.5 | 4355.00 | 6083.00 | 62.45 | 37,5 | 22 | 7 |
| 3/4 | 1255.00 | 7338.00 | 75,34 | 24.7 | 15 | 0 |
| 3,8 | 138.00 | 138.00 | 27.60 | 17.9 | c | 3 |
| No.10 | 405.00 | 405.00 | 81,00 | 4.7 | | - |

500 gm

ight pass No.3/8 = 9740.00 Total sample weight 40.9 35



SYRN

شركة انشاه للمقاولات العامة GC inshaa general construction

Soil classification: A - 1-a (Non Plastic) RUM



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Modified Proctor Test Report ASTM - D 1557

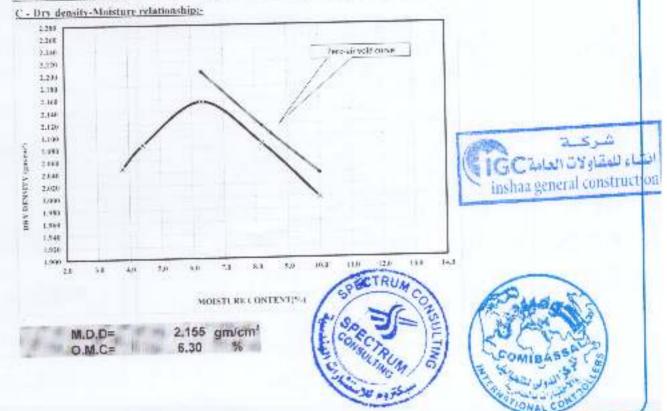
Mould Number :-Volume of mould = Weight of mould = G.S = 1 2190 cm⁴ 7047 g 2.56 g/cm3

A- Density Calculations :-

| | 1 | 2 | 3 | 4 | 5 |
|------------------------------------|-------|-------|-------|-------|-------|
| Weight.of wet soil+mould (g) | 11700 | 11818 | 12065 | 11993 | 11860 |
| Weight of mould (g) | 7047 | 74147 | 7047 | 7047 | 7047 |
| Weight of wet soil (g) | 4653 | 4771 | 5018 | 4946 | 4813 |
| Volume of mould (cm ²) | 2190 | 2190 | 2190 | 2190 | 2190 |
| Wet density (g/cm ²) | 2.125 | 2.179 | 2.291 | 2.258 | 2,198 |
| Dry density (g/cm ²) | 2.047 | 2.086 | 2.155 | 2.087 | 1.998 |
| Zero-air Void curve | 1 | | 2.204 | 2.116 | 2.038 |

B- Moisture Calculations :-

| | | The second second second second | and the second second | the second s | |
|----------------------------------|---------|---------------------------------|-----------------------|--|-------|
| Weight of wet soil-container (g) | 250.0 | 250.0 | 250.0 | 250.0 | 250.0 |
| Weight of dry soil+container (g) | 244.0 | 243.0 | 240.2 | 237.5 | 235.0 |
| Weight of container (g) | 85.5 | 85.5 | 85.0 | 85,0 | 85.0 |
| | 3.8 | 4.4 | 6.3 | 8.2 | 10.0 |
| moisture content(%) | - Perio | | | | |



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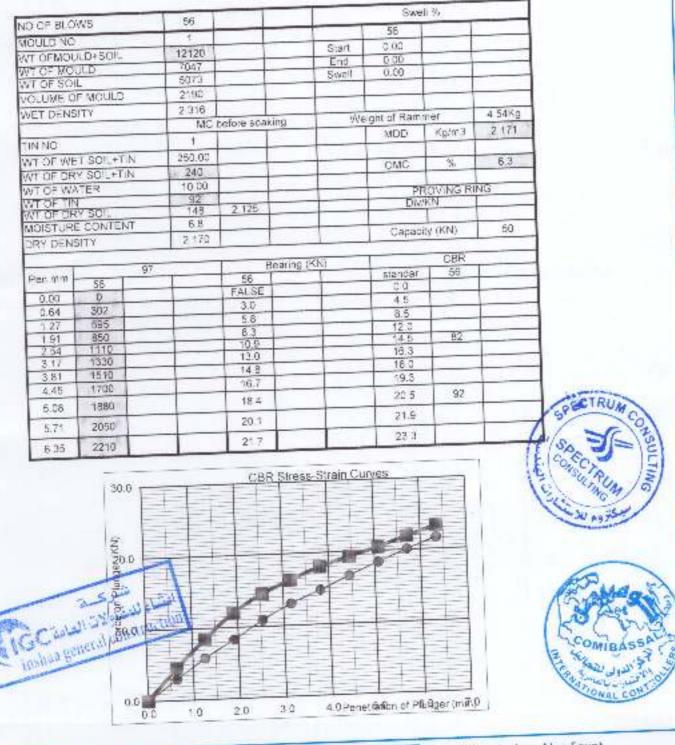


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Report Of CBR Test - ASTM - D 1883

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Absorption & Specific Gravity for Aggregate AASHTO T85 - ASTM C127

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| Weight of sample | 2500 |
|--|------|
| Weight of saturated - dry surface sample (B) | 2525 |
| Weight of saturated sample in water (C) | 1542 |
| Weight of dry sample aftre heating (A) | 2495 |

Results:-

| Saturation surface dry spicific gravity = B / (B-C) | 2.569 |
|---|-------|
| Bulk spicific gravity = A / (B-C) | 2.538 |
| Apparent spicific gravity = A /(A-C) | 2.618 |
| Asorbtion of water = (B-A)/A*100 | 1.2 |
| Degradation of aggregate = (2500-A)/ A*100 | 0.2 |









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In

ABRASION AND IMPACT " LOS ANGELES " TEST

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(For coarse aggregate)

ASTM- C 131-96 / AASHTO-T-96

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intitial Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3640 |
| % abrasion By Weight Passing from Sieve No.12 | 27.2% |





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| Report | 1 | 379 - 6 - Center |
|--------|---|------------------|
| Date | : | 12/04/2023 |

CHEMICAL ANALYSIS

| General Consultant | | SYSTRA |
|-------------------------|---|---|
| Consuliant | 1 | SPECTRUM |
| Contractor | 1 | شرکة تشاء تعقارات Electric espress train |
| Project | 1 | Prepard Sub Grade |
| Sample | 4 | ST (373 +0.00) : (374 +0.00) |
| Station Date of Test | = | 8-4-2023 |
| Temperature | | Humidity : 40% |

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| CHLORIDE | 0.0014% | |
| SULPHATE | 0.0080% | ASTM D 2974 |
| ORGANIG MATTER | NEGATIVE | |

CONSULTING

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LAB DIRECTOR CH/ Mostafa Asker

Mouldo

شركة الشاء للمقاولات العامة IGC inshaa general construction

| - | | S5-B-IN | | | | |
|-----------------------------|---|------------------------|----------|---------|---|--|
| MARIERI APPROV REQUES | AL Al Inshaa 1 | امنیا الکیاری 40 | | 1 | | |
| Contractor | INSHAA GENERAL OF CONSTRUCTION Company | | Designer | Company | (SPECTRUM) Engineering Consulting Office | |

| | Name | Sign | Date, | /Seria | Num | ber | Time | | | |
|-------------------------|--------------------------|------|-------|--------|-------------------------|-----|------|----|------|-----|
| issued by Contractor | Eng. Mahmoud shaban " | 2.23 | | (M./ | -2023 A.R.1Q S.11 | eV | | 1 | 30 | 1ľ |
| Received by | | - | 6 | C2 | G | DD | MM | ŶΫ | 1111 | NW. |
| GARB CONSULTANT | Eng. Mazen Essamy | MAR | 371 | EUV | 2,2 | 295 | Đ4 | 23 | 0.1 | :19 |

| CODE-1 | S1 to 521 Station Reference | D1 to 53 Depot Reference | Kp XXX Note For Kilometer point only Start Km is used |
|----------|--------------------------------|-----------------------------|--|
| CODE - 2 | | Work Activity | |
| CODE-3 | | Sub Element of Activity | |

| Description of Materials | Sub-Ballast Total | Sub-Ballast Total Quantity (5000 m3) | | | | |
|-------------------------------|-------------------|---|-----------------|--|--|--|
| Location to be Used | From Station (37 | From Station (371+000) to Station (371+500) | | | | |
| Sample only | Yes | Ma | terials Type | Prepared Subgrade | | |
| Supplier Name | | Data Sheet provided | | Yes attached INSHAA GENERAL OF CONSTRUCTION Company contracting ASTM D (1557) | | |
| Reference in BoQ | (4.2) | Specification | | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-43.2) VERSION 2-3% CIVECON GROUP | | |
| Prequalification reference | | Test Samples Results | | | | |
| Reference Photos | No/Yes | Other | | | | |
| Comments by: Eng. Mazo | en Essamy (SPECT | TRUM) | Comments by: Er | ng. Alaa Abd-Allatif (ER) | | |

1-Quality test Result By Third Farty Lab is Approved.



(com-bassal international) 2-Results report attached and acceptable with the

project specifications. 3-Final approval is subject to above mentioned

comments.

شرعيد الشاء للمقاولات المالة Inshaa general construction

| | | APPROVAL STATUS | L Sec. (2.1) | A 41110 D |
|-----------------------------|-----------------------|-----------------|--------------|-----------|
| Organisation | Name | Sign | Date | A-AWC-R |
| Contractor | Eng. Mohamed Hassan | - A 123 | 29-04-2023 | A |
| QA/QC* | Eng. Mazen Essamy | Q- | | A |
| GARB** | Eng. Mohammed Fayad | - 1 | | |
| Employers Representative | Eng. Alaa Abd-Allatif | for a set | 6-5-2023 | Awc |

** Alignment/Bridges: Culvert only



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I- Introduction

| General Consult | ant : | SYSTRA |
|-----------------|--------|-----------------------------|
| Consultant | E. | SPECTRUM |
| Contractor | 15 | شركة إنشاء للمقاولات |
| Sample | - 12 - | Sub-Ballast |
| Station | 18 | St(371+0.00) to st(371+500) |
| Date of Test | 10 | 29/04/2023 |
| QC | 1 | 1034-1 |

II- Sample description:

Crushed stone and sand

III- Required tests

- 1- Grain size analysis and classification
- 2- Modified compaction (Proctor test)
- 3- Liquid limit, plastic limit and plasticity index
- 4- California bearing ratio (CBR)
- 5- Specific gravity (SG)
- 6- Los Angeles test

IV- Results

| 1- Grain size analysis and classifica- | Grain size analysis | As showed in appendix |
|--|---------------------|-----------------------|
| tion | Classification | A-1-a |
| 2- Modified compaction (Proctor | MDD | 2.184 |
| test) | OMC | 7.5% |
| 3- Liquid limit, plastic limit and plas- | LL | Non plastic |
| ticity index | PL | Non plastic |
| | PI | Non plastic |
| 4- California bearing ratio (CBR) | CBR ratio | 95% |
| 5- Specific gravity (SG), absorption | SSD | 2.579 |
| and degradation | Absorption | 1.3% |
| | Degradation | 0.2% |
| 6- Los Angeles test | Abrasion ratio | 30% |

LAB DIRECTOR



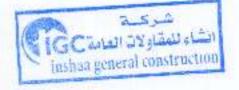
Geotechnical consultant For Dr. M Dr. Mohamed Mostafa Badry



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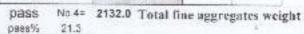
Internal inspection and laboratories sector

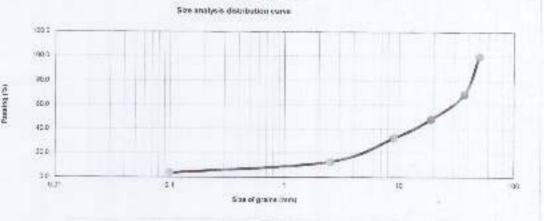
Accredited by : Egyption General Authority for Petroleum under No. 34/29-11-2011 Accredited by : Egyption Accreditation council (EGAC) under No. 031705/1A

PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| | WEIGHT | CUMULATIVE | CUMULATIVE | CUMULATIVE | STANDURD |
|--------|----------|---------------|--------------|-------------|---------------|
| | RETAINED | WEIGHT | PERCENTAGE | PERCENTAGE | SPECIFICATION |
| | (gm) | RETAINED (gm) | RETAINED (%) | PASSING (%) | LIMITS |
| 2 | 0.00 | 0.00 | 0.00 | 100.0 | |
| 1.1/2 | 3163.30 | 3103.00 | 31.63 | 69.0 | |
| i. | 1851.00 | 4954.00 | 49.54 | 50.5 | |
| 3/4 | 235.00 | 5189.00 | 51.89 | 48.1 | |
| 1/2 | 855.00 | 6044.00 | 60.44 | 39.6 | |
| 3/8 | 714.00 | 6758.00 | 67.58 | 32.4 | * |
| No.4 | 1110.00 | 7868.00 | 78.68 | 21.3 | |
| No.10 | 200.00 | 209.00 | 46.60 | 12.8 | |
| No.200 | 418.00 | 418.00 | 83.60 | 3.5 | |

total sample weight= 10000.00





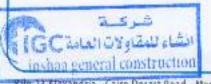
Collector ward

RUMC

ECTR

500 gm

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



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COMIBASSAL International Controllers Internal inspection and laboratories sector

Accredited by : Egyption General Authority for Patroleum under No. 34/29-11-2011 Accredited by : Egyption Accreditation council (EGAC) under No. 031706/IA

Modified Proctor Test Report ASTM - D 1557

Mould Number :-Volume of mould = Weight of mould = G.S =

2199 cm 7046 g 2.7 g/cm3

3

A- Density Calculations :-

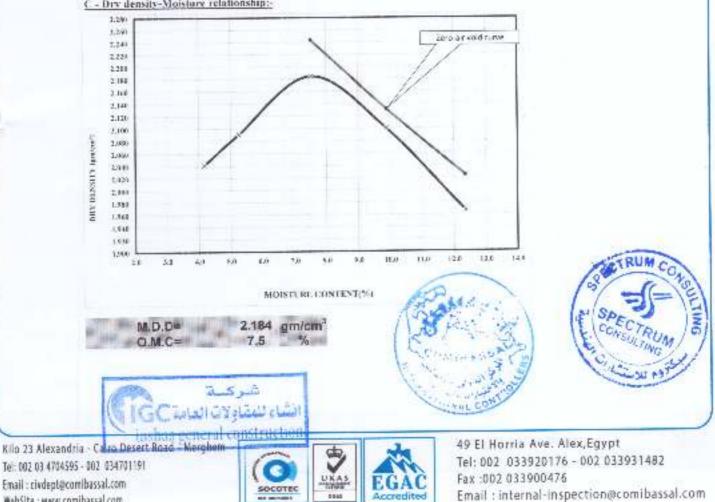
| | 1 | 2 | 3 | 4 | 5 |
|------------------------------------|-------|-------|-------|-------|-------|
| Weight of wet soil+mould (g) | 11721 | 11886 | 12211 | 12120 | 11905 |
| Weight of mould (g) | 7046 | 7046 | 7046 | 7046 | 7046 |
| Weight of wet soil (g) | 4675 | 4840 | 5165 | 5074 | 4859 |
| Volume of mould (cm ²) | 2199 | 2199 | 2199 | 2199 | 2199 |
| Wet density (g/cm2) | 2.126 | 2.201 | 2.349 | 2.307 | 2.210 |
| Dry density (g/cm ²) | 2.041 | 2.091 | 2,184 | 2.100 | 1.967 |
| Zero-nir Void curve | | | 2.244 | 2.131 | 2.024 |

B- Moisture Calculations :-

| Weight of wet soil (g) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
|------------------------|-------|-------|-------|-------|-------|
| Weight of dry soll (g) | 96.0 | 95.0 | 93.0 | 91.0 | 89.0 |
| moisture content% | 4.2 | 5.3 | 7.5 | 9,9 | 12.4 |

C - Dry density-Moisture relationship:-

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Report Of CBR Test - ASTM - D 1883

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

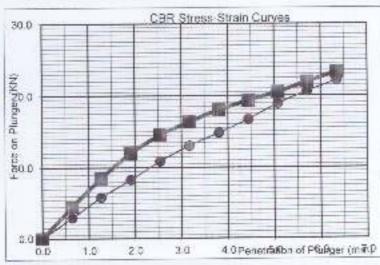
| NO OF BL | ows | 56 | | | Swy | e# 36 | |
|--------------------|---|--------|----------------|-------|---------------|---------|--------|
| MOULD NO | OULD NO 1 | | | | 56 | | |
| WT OFMOULD+SOIL | | 12150 | | Start | 0.00 | | |
| WT OF MC | | 7047 | | End | 0.00 | 3 | |
| WT OF SC | | 5103 | | Swel | 0.00 | 2 | |
| VOLUME : | OF MOULD | 2190 | | | | | |
| WET DEN | SITY | 2.330 | | | | 1. A | 2201 |
| | | MC | before soaking | We | ight of Rami | mer- | 4.54Kg |
| TIN NO | | 1 | | | MOD | Kg/m3 | 2 184 |
| WT OF WE | ET SOIL+TIN | 250.00 | | | | | |
| WT OF DRY SOIL+TIN | | 240 | | | OMC | % | 7.5 |
| WT OF W | the second | 10.00 | | 0 | 10000 | 1.000 | -197E |
| WT OF TIN | | 62 | | 10 | PROVING RI | | NG |
| WT OF DRY SOIL | | 148 | 2.125 | | Div/ | KN | |
| MOISTURE CONTENT | | 5.8 | | 1.1 | in the second | | |
| DRY DEN | BITY | 2.183 | | | Capacil | ly (KN) | 50 |
| | | | | | | | |
| Penmit | 190 20 | 97 | Bearing | (KN) | Constant of | CBR | |
| Penmin | 56 | | 58 | | standar | 56 | |
| 0.00 | D | | FALSE | | 0.0 | | _ |
| 0.84 | 302 | 1 | 3.0 | | 4.5 | | |
| 1.27 | 595 | 109- S | .5.8 | | 8.5 | 1 | |
| 1.91 | 850 | | 8.3 | | 12.0 | | |
| 2.54 | 1110 | | 10.9 | | 14.6 | 82 | |
| 3.17 | 1330 | | 13.0 | | 16.3 | 1 | |
| 3.81 | 1510 | | 14.8 | | 18.0 | | |
| 4.45 | 1700 | | 16.7 | | 19.3 | | |
| 5.08 | 1925 | | 18.9 | | 20.5 | 95 | |
| 5 71 | 2100 | | 20.6 | | .21.9 | | |
| 6.35 | 2260 | | 22.2 | | 23.3 | 1 | |

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Acces

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RUA



Absorption & Specific Gravity for Aggregate AASHTO T85 - ASTM C127

Accredited by : Egyption General Authority for Petroleum under No. 34/29-11-2011 Accredited by : Egyption Accreditation council (EGAC) under No. D31706/LA

| Weight of sample | 2500 |
|--|------|
| Weight of saturated - dry surface sample (B) | 2527 |
| Weight of saturated sample in water (C) | 1547 |
| Weight of dry sample aftre heating (A) | 2494 |

Results:-

| Saturation surface dry spicific gravity = B / (B-C) | 2.579 |
|---|-------|
| Bulk spicific gravity = A / (B-C) | 2.545 |
| Apparent spicific gravity = A /(A-C) | 2.634 |
| Asorbtion of water = (B-A)/A*100 | 1.3 |
| Degradation of aggregate = (2500-A)/ A*100 | 0.2 |
| | |



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ABRASION AND IMPACT " LOS ANGELES " TEST (For coarse aggregate) ASTM- C 131-96 / AASHTO-T-96

Accredited by : Egyption Accreditation council (EGAC) under No. 031708/IA

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intitial Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3500 |
| % abrasion By Weight Passing from Sieve No.12 | 30.0% |





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Accredited by : Egyption General Authority for Petrolaum under No. 34/29-11-2011 Accredited by : Egyption Accreditation council (EGAC) under No. 031706/LA

| Report | 1 | 442 - 1 - Center | |
|--------|---|------------------|--|
| Date | | 06/05/2023 | |

CHEMICAL ANALYSIS

| General Consultant | | SYSTRA |
|--------------------|---|-----------------------------------|
| Consultant | 4 | SPECTRUM |
| Contractor | r | شركة انشاء للطاولات |
| Project | 6 | Electric express train |
| Sample | | Sub Ballast |
| Station | : | ST (371 + 0.00) : (371 - 500) |
| Date of Test | ż | 29-4-2023 |
| | | |

Temperature : 21 °C

Humidity : 55%

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| CHLORIDE | 0.0053% | |
| SULPHATE | 0.0190% | ASTM D 2974 |
| ORGANIG MATTER | NEGATIVE | |



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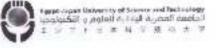
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LAB DIRECTOR CH/ Mostafa Asker

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| Contracto Company | | AA GENERAL Dany | OF CON | STRU | ICTION | Des | igner (| Compa | inγ | (SPE) | TRUM) (| ngineo | ring |
| Issued by | Name | | Sign | | | Dat | e/ Seri | al Nurr | nber | Tim | | ĸe | _ |
| Contracto | or Eng. N shaba | Aabmoud n | 2 | 101 | x sy | 2 | | /2023 | | 010 | 0 PM | | |
| Received b GARB CONSULTA | Eng. N | lazen Essamy | G | 7 | = | PLT 371 | (P.I | .T.1) CS CS | 00 10 | MM/ 04 | yy 2023 | R⊨ 2 | 0 |
| CODE-1 | | to 521 Reference | | | Depor | to 53 Reference Activity | | For Ki | llomete | Kp XXX If point a | Note | Km is t | sca |
| CODE -3 | _ | | | | | ant of Activity | _ | | - | _ | | _ | |
| Description | of Materials | Prepared st | harado | 1.000 | | | | | _ | | | | |
| 1.000 MIL | | 2. 120 CIN2 2013CSX | H2725-1241 | 100.00 | 192 | _ | | _ | | | | | |
| ocation to | | St. (371+350 |) To (37 | 3+500 |)) ((| | | | | | | | |
| VAR Approv | val No | M.A.R (P.S. | G 1] | | | | Date | Date 08/04/2023 | | | | _ | |
| upplier Nar | ne | | | | | | | | | - | | | |
| Test Requirement P.L.T (DIN 18134) | | 81341 | Specification | | | EARTH REPOR | T (CG21 | SPECIF | ICATION VERSIO | 45 & TES N 2 BY (| TING TVECD | N | |
| eference Pl | notos | Yes / No | | Other | | | Ref U | IR-P.S. | G (2) | 2 | | | |
| em Descr | and the second sec | | 1 | Unit | | Quantity | 240 P (2) | val Dat | 1000 | Note | | - | - |
| PLAIE | LOAD TEST | | | NUA | ABER | 6 | 10/0 | 04/202 | 23 | | | | |
| | | | | | - | | | | | | _ | - | - |
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| omments b | y: Eng. Mazen | Essamy (SPI | ECTRUN | A) | Con | mments by | Eng. | Alaa Ab | d-All | atif (El | R) | | |
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| ganisation | Name | 100.07200.000 | | Sign | | | | Date | | | A-AV | /C-R | |
| ntractor | Eng. Mahi | moud shaban | | - | 210 | frest | £ | 10-0- | 4-202 | 3 | A | ě. | |
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| RB** | Eng. Marg | ret magdy | 320 | | | - | | | | | | | |

* Designer ** Allgement / Bridges: Culvert Oray



Civil Engineering Testing & Consulting Unit

وحمة اغتبارات واستشارات المندسة الرمنية

Technical Report

Plate Loading Tests

KM 371+475, KM 371+450, KM 371+425, KM 371+400, KM 371+375, and KM 371+350

Project

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

Prepared for Inshaa General Construction lobilka CC - Abu Youssef, Alexandria, Egypt (April 10, 2023) CETC Unit CINTECH@ejust.edu.eg www.ejust.edu.eg Mobile: +201555631725 1 of 20 CETC23040016.Trans.GeoD

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وهدة اغتبارات واستشارات الم المنبة

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The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by Inshaa General Construction to conduct 6 plate loading tests on the Prepared Subgrade 2.0 of the Electric Express Train project at 6 locations (KM 371+475, KM 371+450, KM 371+425, KM 371+400, KM 371+375, and KM 371+350) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Mahmoud Shaban of Inshaa General Construction. Field team members (Mr.Mohamed Mamdouh) from the working CETCU team visited the project site on April 10, 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 19±1°C.

The plate was carried out on a Prepared Subgrade 2.0 (according to the company) at 6 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.

ding quature was a draw y multi-purpose Loader CA . The re 13 T # # 7 7 وهدة اعتجارات و استثبارات الاسده E-JUST CETC Unit

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Civil Engineering Testing & Consulring Unit

وهدة اغتمارات واستشارات المند الحنمة

3. Test Procedure and Results

The plate load test was conducted in accordance with the DIN18134. Loading, unloading, and reloading regimes were considered to estimate the resilient modulus of the tested soil. Prior to the test, the force transducer and dial gauge were reset to zero, and then a load corresponding to a stress of 0.01 MN/m2 was applied. The load was increased in the first loading cycle until a normal stress of 0.25 MN/m2 was reached, and the loading increment was 0.025 MN/m2. The load was gradually released in four stages. Following unloading, a second loading cycle was performed, but the load was only increased to the penultimate stage of the first cycle. 10 plate loading tests on the Prepared Subgrade 2.0 of the Electric Express Train project were conducted at 10 locations (KM 371+325, KM 371+300, KM 371+275, KM 371+250, KM 371+225, KM 371+200, KM 371+175, KM 371+150, KM 371+125, and KM 371+100) and the data collected at the 10 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 371+325), while Table 2 shows the data obtained at the second loading stage.

| Load (F) | Normal | Settleme |
|----------|---|--|
| kN | MN/m ² | mm |
| 1.414 | 0.005 | 0.00 |
| 7.07 | 0.025 | 0.28 |
| 14.14 | 0.050 | 0.34 |
| 21.21 | 0.075 | 0.45 |
| 28.28 | 0.100 | 0.55 |
| 35.35 | 0.125 | 0.64 |
| 42.42 | 0.150 | 0.73 |
| 49.49 | 0.175 | 0.83 |
| 56.56 | 0.200 | 0.92 |
| 63.63 | 0.225 | 1.02 |
| 70.7 | 0.250 | |
| 56.56 | 0.200 | 1407 4 |
| 49.49 | 0.175 | A108 3610 |
| 35.35 | 0.125 | 1 10 8 50.1 6 |
| 21.21 | 0.075 | 100.958 2 |
| 1.414 | 0.005 | 1035 1 31 |
| | kN 1.414 7.07 14.14 21.21 28.28 35.35 42.42 49.49 56.56 63.63 70.7 56.56 49.49 35.35 21.21 | kN MN/m ² 1.414 0.005 7.07 0.025 14.14 0.050 21.21 0.075 28.28 0.100 35.35 0.125 42.42 0.150 49.49 0.175 56.56 0.200 63.63 0.225 70.7 0.250 56.56 0.200 49.49 0.175 35.35 0.125 21.21 0.075 |

Table 1: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+325)

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 Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+325)

 Iterating stage
 Load (F)

 Normal stress (50)
 Settlement (S)

 MN/m²
 mm

| Contract of the | Load (F) | MIN/m ² | mm |
|--|----------|--------------------|-------|
| Loading stage | kN | | 0.15 |
| ON A STATE | 1.414 | 0.005 | 0.38 |
| 15.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0 | 7.07 | 0.025 | 0.46 |
| | 14.14 | 0.050 | 0.55 |
| 1. 二、二、三、三 | 21.21 | 0.075 | 0.65 |
| ****** | 28.28 | 0.100 | 0.76 |
| ET | 35.35 | 0.125 | 0.83 |
| 6 | 42.42 | 0.150 | 0.89 |
| 7 | 49.49 | 0.175 | 0.94 |
| 8 | 56.56 | 0.200 | 1.00 |
| 0 | 63.63 | 0.225 | 1.200 |

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 371+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 371+300) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 371+275) is provided in Tables 7-9 and Figure 3. The testing data corresponding to the fourth testing point (KM 371+250) is provided in Tables 10-12 and Figure 4. The testing data corresponding to the fifth testing point (KM 371+225) is provided in Tables 13-15 and Figure 5.

Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM

| 371+325) | 1st loading cycle | 2nd loading cycle |
|---------------------------------|-------------------|-------------------|
| Parameters | | 0.25 |
| (sp.max) MIN/m ² | 0.25 | 0.17 |
| a _o (mm) | 0.16 | 5.96 |
| a1 (mm/(MN/m ²)) | 3.95 | -10.43 |
| | -1.03 | |
| #2 (mm/(6/6)2/m ⁴)) | 121.65 | 134.10 |
| Ev= 1.5 r/ (a1+2, 50, was) | 1. | 10 |
| Ev2/EV1 | | |

انشاء للمقاولات العامة inshua general construction الدامعة المصرية البليلية اله Ŧ 12 1 نشارات الغ اهتمارات وال E-JUST CETC Unit



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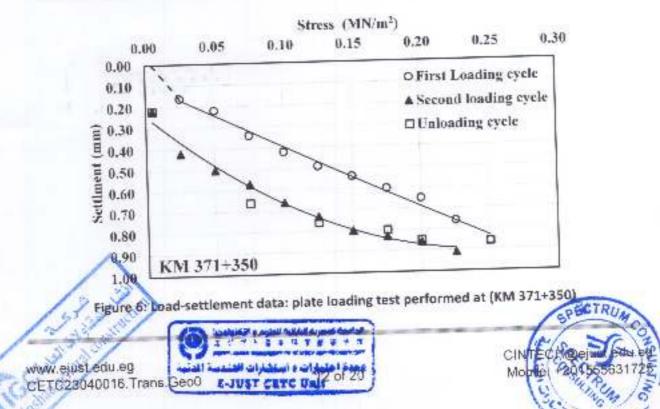
وحدة اغتبارات واستشارات المندسة الردنية

Table 17: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+350)

| a second s | Load (F) | Normal stress (so) | Settlement (S) |
|---|----------|--------------------|----------------|
| Loading stage kN | kN | MN/m ² | mm = mm |
| | 1.414 | 0.005 | 0.22 |
| 0 | | 0.025 | 0.42 |
| A starter of | 7.07 | 0.050 | 0.50 |
| 2 | 14.14 | 0.075 | 0.57 |
| 3 | 21.21 | | 0.66 |
| a 14 14 17 17 | 28.28 | 0.100 | |
| 5 | 35.35 | 0.125 | 0.73 |
| 6 | 42.42 | 0.150 | 0.80 |
| 0 | | 0.175 | 0.83 |
| 2 | 49.49 | 0.200 | 0.86 |
| 8 | 56.56 | 134379711 | 0.91 |
| 9 10 10 10 | 63.63 | 0.225 | |

Table 18: Calculations of the resilient modulus of the tested soil according to DIN18134:

| (KM 371+350) | 1st leading cycle | 2nd loading cycle | |
|-----------------------------|-------------------|-------------------|--|
| Parameters | 0.25 | 0.25 | |
| [swmax] MN/m* | 0.09 | 0.24 | |
| a; (mm/(MN/m²)) | 3.11 | 5.31 | |
| a. (mm/(MN2/m*)) | -0.55 | -10.77 | |
| Ev= 1.5 1/ (0, 402 51, WAR) | 151.18 | 171.72 | |
| Eu./Ev. | 1 | | |



Appendix a space disclose stary of Sciences and Technology Loop graduit or piglical starked in control in an extension Σ = σ = 0 = 10 = 10 = 10 = 10 = 20 Civil Englacering Testing & Consulting Unit وهذة اغتبارات واستشارات المندسة المنبعة

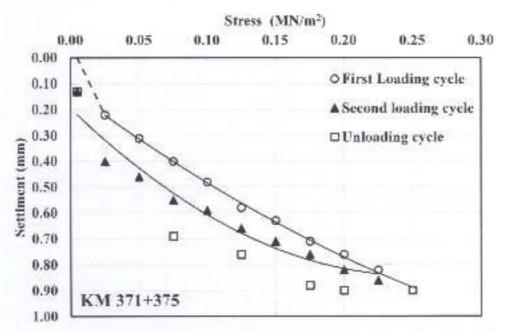


Figure 5: Load-settlement data: plate loading test performed at (KM 371+375)

| Loading stage | Load (F) | Normal stress (su) | Settlement (5) |
|---------------|----------|--------------------|----------------|
| | kN | MN/m ¹ | mm |
| 0 | 1.414 | 0.005 | 0.00 |
| 0 | 7.07 | 0.025 | 0.16 |
| 2 | 14.14 | 0.050 | 0.22 |
| 2 | 21.21 | 0.075 | 0.34 |
| 4 | 28.28 | 0.100 | 0.42 |
| 4 | 35.35 | 0.125 | 0.49 |
| 6. | 42.42 | 0.150 | 0.54 |
| 7 then the | 49.49 | 0.175 | 0.60 |
| 8 | 56.56 | 0.200 | 0.65 |
| 9 | 63.63 | 0.225 | 0.76 |
| 10 | 70.7 | 0.250 | 0.86 |
| 11 | 56.56 | 0.200 | 0.85 |
| 12 | 49.49 | 0.175 | 0.80 |
| 13 | 35.35 | 0.125 | 0.76 |
| 14 | 21.21 | 0.075 | 0.66 |
| 15 | 1.414 | 0.005 | 0.22 SPEC |
| | | | |

Table 16: Load-settlement data obtained at the first loading and unloading stages of the



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and the second

| plate loadin | g test performed at in | ne location (KM 371+375) Normal stress (so) | Settlement (S |
|-----------------------|------------------------|--|---------------|
| oading stag | Load (F) | MN/m ² | mm |
| 1.4 | KIN | 0.005 | 0.00 |
| 1. 第 至 年 | 1.414 | 0.025 | 0.22 |
| 1 mil. mil. mil. | 7.07 | 0.050 | 0.31 |
| *** | 14.14 | 0.075 | 0.40 |
| 3 10 10 10 | 21.21 | 0.100 | 0.48 |
| and the second second | 28.28 | 0.125 | 0.58 |
| 「「「」 | 35.35 | 0.150 | 0.63 |
| 5 11 10 10 10 | 42.42 | 0.175 | 0.71 |
| 7 10 10 10 10 | 49.49 | 0.200 | 0.76 |
| Base | 56.56 | | 0.82 |
| 9 | 63.63 | 0.225 | 0.90 |
| 10 | 70.7 | 0.250 | 0.90 |
| 11 | 56.56 | 0.200 | 0.88 |
| 12 | 49.49 | 0.175 | 0.76 |
| 13 | 35.35 | 0.125 | 0.69 |
| 14 | 21.21 | 0.075 | 0.13 |
| 15 | 1.414 | 0.005 | WIAV |
| | | | |

Table 14: Load-settlement data obtained at the second loading and unloading stages of the st performed at the location (KM 371+375)

| plate loading | test performed at the location | Normal stress (so) | Settlement (S) |
|---------------|--------------------------------|--------------------|----------------|
| Loading stage | Load (F) kN | MN/m ² | mm |
| | 1.414 | 0.005 | 0.13 |
| 0 | | 0.025 | 0.40 |
| 1 70 10 14 | 7.07 | 0.050 | 0.46 |
| 2 = = = = [| 14.14 | 0,075 | 0.55 |
| 3 | 71.21 | 0.100 | 0.59 |
| 4 | 28.28 | 0.175 | 0.66 |
| 5 | 35.35 | 0.150 | 0.71 |
| 6 | 42.42 | | 0.76 |
| 7 | 49.49 | 0.175 | 0.82 |
| 8 | 56.56 | 0.200 | 0.86 |
| 9. | 63.63 | 0.225 | |

Table 15: Calculations of the resilient modulus of the tested soil according to DIN18134:

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| (KM 371+375) Parameters | 1st loading cycle | - | 2nd loading cycle 0.25 |
|--|-------------------------------|------|---------------------------|
| (\$5, max) MN/m ² a, (mm) a, (mm/(MN/m ²)) a, (mm/(MN2/m ²)) | 0.25 0.12 3.95 -3.58 | | 0.19 5.16 10.27 |
| Ev= 1.5 r/ (a, fa) | TC Unit | 1.18 | THUM CONSULT |
| www.ejust.edu.eg CETC23040016.Trans.Geo0 | | | Mobile: +201355631725 |

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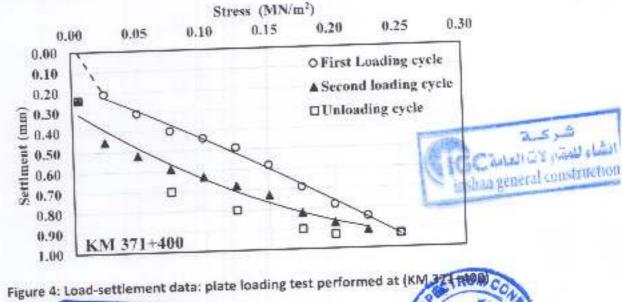
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| plate loading | test performed at th | ne location (KM 371+400) Normal stress (s ₀) | Settlement (5) |
|---------------|----------------------|---|----------------|
| Loading stage | Load (F) | MIN/m ² | mm |
| | 1.414 | 0.005 | 0.24 |
| | 7.07 | 0.025 | 0.45 |
| 日子市市 | 14.14 | 0.050 | 0.57 |
| 1 1 1 1 | 21.71 | 0.075 | 0.59 |
| | 28.28 | 0.100 | 0.63 |
| - | 35.35 | 0.125 | 0.68 |
| 5 | | 0.150 | 0.73 |
| 6 | 42.42 | 0.175 | 0.82 |
| 7 | 49.49 | 0.200 | 0.87 |
| 8 | 56.56 | 0.225 | 0.91 |
| 9 | 63.63 | w.www. | |

Table 12: Calculations of the resilient modulus of the tested soil according to DIN18134:

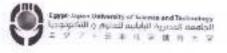
| (KM 371+400) | 1st loading cycle | 2nd leading cycle |
|----------------------------|-------------------|-------------------|
| Parameters | 0.25 | 0.25 |
| (spmax) MN/m ² | | 0.29 |
| a _p (mm) | 0.16 | 4.14 |
| mm/(MN/m ²)) | 2.65 | -6.43 |
| az (mm/(MN2/m*)) | 1.76 | 177.88 |
| Ev= 1.5 r/ (a1+8 - 51 MAX) | 145.57 | |
| EV,/EV | 1 | .22 |



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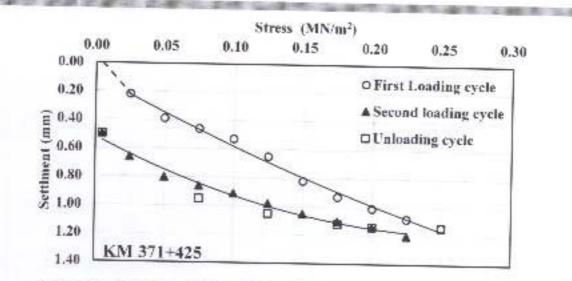


Figure 3: Load-settlement data: plate loading test performed at (KM 371+425)

Table 10: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+400)

| Loading stage | Load (F) | Normal stress (s ₀) | Settlement (S) |
|---------------|----------|---------------------------------|----------------|
| 10 M | kN | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.00 |
| 1 | 7.07 | 0.025 | 0.21 |
| 2 | 14.14 | 0.050 | 0.31 |
| 3 1 2 | 21.21 | 0.075 | 0.40 |
| 4 | 28.28 | 0.100 | 0.44 |
| 5 | 35.35 | 0.125 | 0.49 |
| 6 | 42.42 | 0.150 | 0.58 |
| 7 | 49.49 | 0.175 | 0.69 |
| 8 4 | 56.56 | 0.200 | 0.78 |
| 9 | 63.63 | 0.225 | 0.84 |
| LO | 70.7 | 0.250 | 0.93 |
| | 56.56 | 0.200 | 0.93 |
| | 49.49 | 0.175 | 0.90 |
| 13 | 35.35 | 0.125 | 0.80 |
| 14 | 21.21 | 0.075 | 0.70 |
| 15 | 1.414 | 0.005 | 0.24 |

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| Loading stage | Load (F) | Normal stress (so) | Settlement (5) | |
|---------------------------------------|----------|--------------------|----------------|--|
| cononig seage | kN | MN/m ² | mm | |
| 0 | 1.414 | 0.005 | 0.00 | |
| 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 7.07 | 0.025 | 0.22 | |
| L T I | 14.14 | 0.050 | 0.39 | |
| 3 | 21.21 | 0.075 | 0.46 | |
| 1 | 28.28 | 0.100 | 0.53 | |
| 5 | 35.35 | 0.125 | 0.65 | |
| 5 | 42.42 | 0.150 | 0.82 | |
| | 49.49 | 0.175 | 0.93 | |
| | 56.56 | 0.200 | 1.01 | |
| | 63.63 | 0.225 | 1.08 | |
| 10 | 70.7 | 0.250 | 1.14 | |
| 11 | 56.56 | 0.200 | 1.14 | |
| 12 | 49.49 | 0.175 | 1.12 | |
| 13 | 35.35 | 0.125 | 1.05 | |
| 4 | 21.21 | 0.075 | 0.95 | |
| 15 | 1.414 | 0.005 | 0.50 | |
| | | | | |

Table 7: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+425)

Table 8: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+425)

| Loading stage | Load (F) | Normal stress (5p) | Settlement (S) |
|---------------|----------|--------------------|----------------|
| toname stafe | kN | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.50 |
| 1. 1 = . | 7.07 | 0.025 | 0.66 |
| 2 | 14.14 | 0.050 | 0.80 |
| 3 | 21.21 | 0.075 | 0.86 |
| 4 | 28.28 | 0.100 | 0.91 |
| 5 3 # | 35.35 | 0.125 | 0.98 |
| 6 | 42.42 | 0.150 | 1.05 |
| 7 | 49.49 | 0.175 | 1.10 |
| 8 | 56.56 | 0.200 | 1.14 |
| 9 | 63.63 | 0.225 | 1.20 |

Table 9: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+425)

| and the state of the second | | | |
|---|-----------------------|---------------------------------------|---|
| Paran | neters | 1st loading cycle | Znd loading cycle |
| (s,,max) | MN/m ² | 0.25 | 0.25 |
| an tr | nm) | 0.10 | 0.52 |
| at (mm/(| MIN/m ²)) | 5.23 | 4.95 |
| B2 (mm/() | | -3.82 | PLETRUM CONT |
| Ev= 1.5 r/ (a | 148 . So. Mak) | 105.31 | \$ 16789 |
| Ev, | Ev1 | 1 | 59 3 5 5 |
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| شرکیت ۱) نمتاولات انعامت 1) a general construct | metal a | | |

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Table 5: Load-settlement data obtained at the second loading and unloading stages of the

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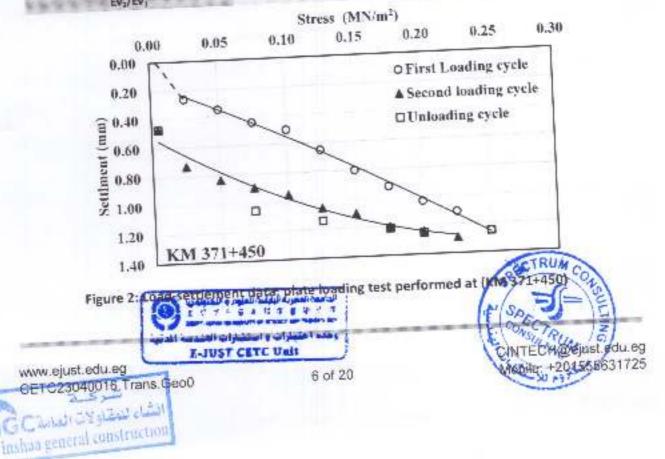
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| plate loading | test performed at the location | (KM 371+450) Normal stress (50) | Settlement (5) |
|---------------|--------------------------------|------------------------------------|-------------------------------|
| Loading stage | Load (P) | MN/m ² | 0.47 |
| 0 | 1.414 | 0.005 | 0.73 |
| 17 | 7.07 | 0.050 | 0.83 |
| 2 | 14.14 | 0.075 | 0.89 |
| 3 | 21.21 | 0.100 | 0.95 |
| 4 1 1 1 1 | 28.28 | 0.125 | 1.05 |
| 5 1 | 35.35 | 0.150 | 1.10 |
| 6 | 42.42 | 0.175 | 1.20 |
| 8 | 56.56 | 0.200 | 1.29 |
| 0 | 63.63 | 0.225 | Construction and Construction |

Table 6: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM

| 3/1+450) | 1st loading cycle | 2nd loading cycle |
|---|-------------------|-------------------|
| Parameters | 0.25 | 0.25 |
| (s _p ,max) MN/m ² | 100000 | 0.53 |
| a ₀ (nim) | 0.14 | 5.50 |
| a ₂ (mm/(MN/m ²)) | 3.81 | -9.65 |
| a ₂ (mm/(MN2/m ²)) | 2.61 | 145.58 |
| Ev= 1.5 r/ (a1+a1. 56 AUX) | | 44 |



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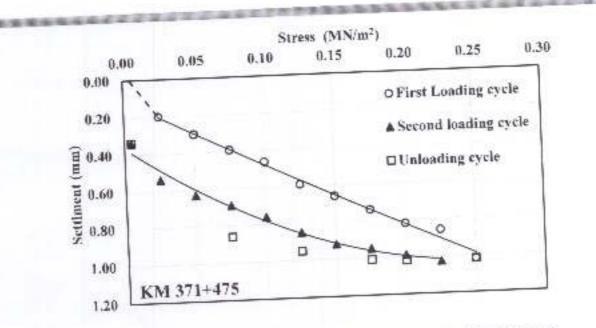


Figure 1: Load-settlement data: plate loading test performed at (KM 371+475)

| Table 4: Load-settlement data obtained at the first loading and unloadi | ing stages of the |
|---|-------------------|
| Table 4: Load-settlement data obtained at the | |
| Table 4: Load Section and at the location (KM 371+450) | Divertian States |

| plate loadin | ig test performed at t | Normal stress (sp) | Settlement (S) |
|--------------------------|------------------------|-------------------------------------|---|
| and the second | Load (F) | MN/m ² | mm |
| loading stag | kN . | 0.005 | 0.00 |
| Same | 1.414 | | 0.26 |
| | 7.07 | 0.025 | 0.34 |
| | 14.14 | 0.050 | 0.44 |
| 122 | 21.21 | 0.075 | 0.50 |
| | 28.28 | 0.100 | 0.65 |
| 1000 | 35.35 | 0.125 | 0.80 |
| | 42.42 | 0.150 | 0.92 |
| | 49.49 | 0.175 | 1.03 |
| | 56.56 | 0,200 | 1.11 |
| 1.0.0.0 | 63.63 | 0.225 | 1.25 |
| | 70.7 | 0.250 | 1.25 |
| 10 | 56.56 | 0.200 | |
| 11 | | 0.175 | 1.21 |
| 12 | 49.49 | 0.125 | 1.14 CTRUM |
| 13 | 35.35 | 100 Paldel de parte carlo 25 | 1.9568 |
| 14 | 10 | 0 + 1 + + + 1 0.005 | Alle Tabe |
| 15 | 1439 nor-warraw | Before an extension the second sec. | 1.21 1.14 1.055 41 Sofe C TRUM Consulting |
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| Loading stage | Load (F) | Normal stress (sp) | Settlement (S) | |
|----------------|----------|--------------------|----------------|--|
| committe stage | kN | MN/m ² | mm | |
| 0 | 1.414 | 0.005 | 0.34 | |
| 1 2 2 | 7.07 | 0.025 | 0.54 | |
| 2 | 14.14 | 0.050 | 0.63 | |
| 3 | 21.21 | 0.075 | 0.69 | |
| 4 | 28.28 | 0.100 | 0.76 | |
| 5 | 35.35 | 0.125 | 0.85 | |
| 6 18 18 | 42.42 | 0.150 | 0.92 | |
| 7 | 49.49 | 0.175 | 0.95 | |
| 8 III (B) | 56.56 | 0.200 | 0.99 | |
| 9 | 63.63 | 0.225 | 1.03 | |

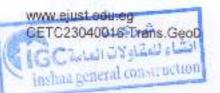
Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+475)

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 371+475) 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 371+450) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 371+425) is provided in Tables 7-9 and Figure 3. The testing data corresponding to the fourth testing point (KM 371+400) is provided in Tables 10-12 and Figure 4. The testing data corresponding to the fifth testing point (KM 371+375) is provided in Tables 13-15 and Figure 5. The testing data corresponding to the sixth testing point (KM 371+350) is provided in Tables 16-18 and Figure 6.

Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+475)

| Parameters | 1st loading cycle | 2nd loading cycle |
|------------------------------|-------------------|-------------------|
| (spmax) MN/m ² | 0.25 | 0.25 |
| a, (mm) | 0.11 | 0.37 |
| a1 (mm/(MN/m ²)) | 3.77 | 5.19 |
| az (mm/(MN2/m*)) | -1.03 | -10 18 |
| Ev= 1.5 r/ (a1+a2. SD. MAX) | 128.29 | 170.24 |
| Evy/Ev | 1 | 22 |

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3. Test Procedure and Results

The plate load test was conducted in accordance with the DIN18134. Loading, unloading, and reloading regimes were considered to estimate the resilient modulus of the tested soil. Prior to the test, the force transducer and dial gauge were reset to zero, and then a load corresponding to a stress of 0.01 MN/m2 was applied. The load was increased in the first loading cycle until a normal stress of 0.25 MN/m2 was reached, and the loading increment was 0.025 MN/m2. The load was gradually released in four stages. Following unloading, a second loading cycle was performed, but the load was only increased to the penultimate stage of the first cycle. 6 plate loading tests on the Prepared Subgrade 2.0 of the Electric Express Train project were conducted at 6 locations (KM 371+475, KM 371+450, KM 371+425, KM 371+400, KM 371+375, and KM 371+350) and the data collected at the 6 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 371+475), while Table 2 shows the data obtained at the second loading stage.

| Loading stage | Load (F) | Normal | Settleme |
|----------------------------|------------|-------------------|---|
| | kN | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.00 |
| 1 | 7,07 | 0.025 | 0.20 |
| 2-14 100 | 14.14 | 0.050 | 0.30 |
| 3 107 100 | 21.21 | 0.075 | 0.39 |
| 4 10 100 100 | 28.28 | 0.100 | 0.46 |
| 5 40 100 000 | 35.35 | 0.125 | 0.59 |
| 6 | 42.42 | 0.150 | 0.66 |
| 7 | 49.49 | 0.175 | 0.74 |
| B | 56.56 | 0.200 | 0.82 |
| 9 | 63.63 | 0.225 | 0.86 |
| 10 | 70.7 | 0.250 | 1.02 |
| 11 | 56.56 | 0.200 | 1.02 |
| 12 | 49.49 | 0.175 | 1.01 |
| 13 | 35.35 | 0.125 | 0.95 |
| 14 | 21.21 | 0.075 | 0.86 |
| 15 | 1.014 | 0.005 | 0.34SPECTAL |
| v ejust edu e C23040016 | Trans.Geo0 | 30 20 | 0.95 0.86 0.345PETRU 0.90 CINTECH@ejustedi Mobile 201,865631 |

Table 1: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+475)

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Test results presented herein report the load-settlement data obtained from 6 plate loading tests conducted on the Prepared Subgrade 2.0 of the Electric Express train project at 6 locations (KM 371+475, KM 371+450, KM 371+425, KM 371+400, KM 371+375, and KM 371+350) in accordance with German Standard, DIN18134.

| Location | E _{v1} MN/m2 | E _{r2} MN/m2 | E _{v2} /E _{v1} ratio |
|------------|--------------------------|--------------------------|--|
| KM 371+475 | 128.29 | 170.24 | 1.33 |
| KM 371+450 | 100.91 | 145.58 | 1.44 |
| KM 371+425 | 105.31 | 167.69 | 1.59 |
| KM 371+400 | 145.57 | 177.88 | 1.22 |
| KM 371+375 | 147.31 | 173.53 | 1.18 |
| KM 371+350 | 151.18 | 171.72 | 1.14 |

 Note: Before interpreting these test results for future applications, the Prepared Subgrade 2.0 insitu variability between the testing locations should be considered.

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Technical committee

Dr. Mahmoud Ahmed

Prof. Dr. Mohamed F. M. Fahmy





Lab Engineer

Mohamed A. Al-Najjar



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Appendix A





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Mr. Mohamed Location of test site: Field KM 371+475 Mamdouh team Project title: Date: 10/4/2023 Electric Express Train Project - Inshaa **General Construction** Diameter of loading Time 9:02:00 AM 600 plate 9:28:00 AM 1 Lever ratio Note: Prepared Subgrade 2.0 Type of Soil CAT 966F **Bedding material** 19°C Temperature Test regime Loading Stage No. Load (kN) Dial Gauge Reading (mm) Loading Stage 0 1.414 10.00 7.07 1 9.80 2 14.14 9.70 3 21.21 9.61 4 28.28 9.54 35.35 5 9.41 42.42 6 9.34 49.49 7 9.26 8 56.56 9.18 9 63.63 9.14 70.7 10 8.98 56.56 Unloading Stage 11 8.98 49.49 8.99 12 35.35 13 9.05 14 21.21 9.14 15 1.414 9.66 Loading Stage No. Load (kN) Dial Gauge Reading (mm) Test regime **Reloading Stage** 1.414 9.66 0 I 7.07 9.46 GCLAUS CASAR (Call 2 14.14 9.37 21.21 3 9.31 28.28 9,24 4 5 35.35 9.15 6 42.42 9.08 49,40 SP 7 9.05 6.01 36.56 8 63,63 8.99

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Mr.Mohamed Field Location of test site: KM 371+450 Mamdouh team 10/4/2023 Date: Electric Express Train Project - Inshua Project title: General Construction 9:35:00 AM Time Diameter of loading 600 10:03:00 AM plate Note: 1 Lever ratio Prepared Subgrade 2.0 CAT 966F Type of Soil 0 Bedding material 19°C Temperature Dial Gauge Reading (mm) Load (kN) Loading Stage No. Test regime 10.00 1.414 Loading Stage 0 9.74 7.07 1 9.66 14.14 2 9.56 21.21 3 9.50 28.28 4 9.35 35.35 5 9.20 42.42 6 9.08 49,49 7 8.97 56.56 8 8.89 63.63 9 8.75 70.7 10 8.75 56.56 11 Unloading Stage 8.79 49.49 12 8.86 35.35 13 8.95 21.21 14 9.53 1.414 15 Dial Gauge Reading (mm) Load (kN) Loading Stage No. Test regime 9.53 1.4140 **Reloading Stage** 9.27 7.07 1 9.17 14.14 2 انشاء للمقاولات العامة GC Inshaa general construction 9.11 21.21 3 9.05 28.28 4 8.95 35.35 5 8.90 42.42 6 8.80 49.49 7 8 56.56 8 63.63 9 10 5 ist.ed bg www.ejusi.edu.eg. مدن اعتهارات و اه 821725 16 of 20 CETC230400 6 Trong Deolants

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| Location of test site: | KM 371 | +425 | Field team | Mr.Mohamed Mamdoub | |
|------------------------|--|-------------------------------|----------------------------|---------------------------|--|
| Project title: | Electric Express Train General Cons | Project - Inshaa struction | Date: | 10/4/2023 | |
| Diameter of loading | 600 | Time | 10:10:00 AM 10:38:00 AM | | |
| plate | | | Note: | | |
| Lever ratio | Prepared Sul | horade 2.0 | CAT 9 | 66F | |
| Type of Soil | Tieparea ou | | | | |
| Bedding material | 190 | C | | | |
| Temperature | | Load (kN) | Dial G | auge Reading (mm) | |
| Test regime | B B | 1.414 | | 10.00 | |
| Loading Stage | 1 | 7.07 | 9,78 | | |
| | 2 | 14.14 | 9,61 | | |
| | 3 | 21.21 | 9.54 | | |
| | 4 | 28.28 | | 9.47 | |
| | | 35.35 | | 9,35 | |
| | 5 | 42.42 | - | 9.18 | |
| | 6 | 49.49 | - | 9.07 | |
| | 7 | 56.56 | - | 8.99 | |
| | 8 | 63.63 | 8.92 | | |
| | 9 | | | 8.86 | |
| | 10 | 70.7 | - | 8.86 | |
| Unloading Stage | 11 | 56.56 | | 8.88 | |
| | 12 | 49,49 | - | 8.95 | |
| | 13 | 35.35 | | 9.05 | |
| | 14 | 21.21 | | | |
| | 15 | 1.414 | - | 9.50 | |
| Test regime | Loading Stage No. | Load (kN) | Dial | Gauge Reading (mm 9.50 | |
| Reloading Stage | 0 | 1.414 | | | |
| OCTRU | 1 | 7.07 | | 9.34 | |
| er ch | 2 | 14.14 | - | 9.20 | |
| E JC Z | 3 | 21.21 | | 9.14 | |
| Reloading Stage | 4 | 28.28 | | 9.09 | |
| Per SI | 5 | 35.35 | | 9.02 | |
| 3 354/6 | 6 | 42.42 | | 8.95 | |
| - Wayner / | 7 | 49.49 | | 8.90 | |
| | 8 | 56.56 | | 8.86 | |
| | 9 | 63.63 | | 8.80 | |

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| Location of test site: | KM 371 | +400 | Field | Mr.Mohamed Mamdouh |
|--|---|---------------------------------|---------------------|---|
| Project title: | Electric Express Train General Con | i Project - Inshau struction | Date: | 10/4/2023 |
| 41 | | | Time | 10:45:00 AM |
| Diameter of loading plate | 600 |) | | 11:13:00 AM |
| Lever ratio | 1 | | Note: | 22 E |
| Type of Soil | Prepared Su | hgrade 2.0 | CAT 9 | 100 |
| Bedding material | | | - | |
| Temperature | 190 | B | Dial C | ange Reading (mm |
| Test regime | L. C. | Load (kN) 1.414 | Line o | 10.00 |
| Loading Stage | 0 | 7,07 | - | 9,79 |
| | 1 | U. I. STATES | - | 9.69 |
| | 2 | 14.14 | | 9,60 |
| | 3 | 21.21 | - | 9.56 |
| | 4 | 28.28 | | |
| | 5 | 35.35 | _ | 9.51 |
| | 6 | 42.42 | | 9,42 |
| | 7 | 49.49 | | 9.31 |
| | 8 | 56.56 | | 9.22 |
| | 9 | 63.63 | | 9.16 |
| | 10 | 70.7 | | 9.07 |
| ALL BUR Stans | 11 | 56.56 | | 9.07 |
| Unloading Stage | 12 | 49.49 | | 9,10 |
| | 13 | 35.35 | | 9.20 |
| | 14 | 21.21 | | 9.30 |
| | 15 | 1.414 | | 9.76 |
| | Loading Stage No. | Load (kN) | Dial | Gauge Reading (m) |
| Test regime | Loading Stage 140 | 1.414 | | 9.76 |
| Reloading Stage | 1 1 | 7.07 | | 9,55 |
| | | 14.14 | | 9.48 |
| شاء الدسم تحسية | 3 | 21.21 | | 9.41 |
| شا، للمقاولات المعامة C Caular Via Marach | 1000 | 28.28 | | 9.37 |
| s conteral constr | 4 | 35.35 | | 9.32 |
| Cachell UN June 1 | 5 | 42.42 | | 9.27 |
| 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 6 | 49.49 | | 9,18 |
| | | 56.56 | | 9.13 |
| | 8 | 63.63 | | 9.09 |
| | Louid Lynn Lunn I | 63.63 | - | A SPE |
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Civil Engineering Testing & Consulting Unit

وهدة اغتجارات و استشارات المندسة الحنوقة

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Mobile +201555631725

| Location of test site: | KM 37 | 71+375 | Field team | Mr.Mohamed Mamdouh |
|---|------------------------------------|------------------------------------|---------------|-----------------------|
| Project title: | Electric Express Tra General Co | ain Project - Inshaa mstruction | Date: | 10/4/2023 |
| Diameter of loading | | | Time | 11:20:00 AM |
| plate | 61 | 00 | | 11:48:00 AM |
| Lever ratio | | 1 | Note: | |
| Type of Soil | Prepared S | ubgrade 2.0 | CAT 9 | 56F |
| Bedding material | | | 2 | |
| Temperature | 19 | °C | | |
| Fest regime | Loading Stage No. | Lond (kN) | Dial G | uige Reading (mm) |
| Loading Stage | 0 | 1.414 | | 10.00 |
| | 1 | 7.07 | | 9.78 |
| | 2 | 14.14 | | 9.69 |
| | 3 | 21.21 | 9.60 | |
| | 4 | 28,28 | 9.52 | |
| | 5 | 35.35 | 9.42 | |
| | 6 | 42.42 | | 9.37 |
| | 7 | 49.49 | | 9.29 |
| | 8 | 56.56 | | 9.24 |
| | 9 | 63.63 | | 9.18 |
| | 10 | 70.7 | | 9.10 |
| Unloading Stage | 11 | 56,56 | | 9.10 |
| 2 2 | 12 | 49,49 | | 9.12 |
| | 13 | 35.35 | 1 | 9.24 |
| | 14 | 21.21 | | 9.31 |
| | 15 | 1.414 | | 9.87 |
| Test regime | Loading Stage No. | Load (kN) | Dial G | auge Reading (mm) |
| Reloading Stage | 0 | 1.414 | | 9.87 |
| | 1 | 7.07 | | 9.60 |
| 3 5 3 | 2 | 14.14 | | 9.54 |
| نشاء للمقادين المست | 3 | 21.21 | | 9.45 |
| شركية نشاء للمقاولات العامة C haa general constructio | 4 | 28.28 | | 9,41 |
| 199 Bellerar cur | 5 | 35.35 | | 9,34 |
| | 6 | 42.42 | - | 9.29 |
| - Martin Martin | | 49.49 | _ | 9.24 |
| النابية لعور والتابتديا | | 56.56 | - | 9.18 |
| 1 1 1 1 1 1 2 2 1 W | 9 9 | 63.63 | SA SA | 9.14 |

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وحدة اغتبارات واستخارات المندصة الحدنية

| Location of test site: | KM 37 | 1+350 | Field team | Mr.Mohamed Mamdouh | | |
|--|------------------------------------|-----------------------------------|---------------|-----------------------|--|--|
| Project title: | Electric Express Tra General Co | in Project - Inshaa astruction | Date: | 10/4/2023 | | |
| Diameter of loading | | | Time | 11:55:00 AM | | |
| plate | 60 | 0 | | 12:23:00 PM | | |
| Lever ratio | 1 | | Note: | 50.5 | | |
| Type of Soil | Prepared St | ibgrade 2.0 | CAT 9 | 66F | | |
| Bedding material | | | _ | | | |
| Temperature | 193 | | - | | | |
| Test regime | | 1.oad (kN) | Dial G | ange Reading (mm) | | |
| Loading Stage | 0 | 1.414 | | 10.00 | | |
| | 1 | 7.07 | - | 9.84 | | |
| | 2 | 14.14 | - | 9.78 | | |
| | 3 | 21.21 | 9.66 | | | |
| | 4 | 28.28 | | 9.58 | | |
| | 5 | 35.35 | | 9.51 | | |
| | 6 | 42.42 | | 9.46 | | |
| | 7 | 49.49 | | 9.40 | | |
| | 8 | 56.56 | 9.35 | | | |
| | 9 | 63.63 | | 9.24 | | |
| | 10 | 70.7 | | 9.14 | | |
| Unloading Stage | 11 | 56.56 | | 9.15 | | |
| C HIOHONG | 12 | 49.49 | | 9.20 | | |
| | 13 | 35.35 | | 9.24 | | |
| | 14 | 21.21 | | 9.34 | | |
| | 15 | 1.414 | | 9.78 | | |
| Test regime | Loading Stage No. | Load (kN) | Dial C | Sange Reading (mm | | |
| Reloading Stage | 0 | 1.414 | | 9.78 | | |
| | 1 | 7.07 | | 9.58 | | |
| | 2 | 14.14 | | 9.50 | | |
| 25,2 | 3 | 21.21 | | 9.43 | | |
| الشباء للسقاء وترتدوه | 4 | 28.28 | | 9.34 | | |
| هری. الشاء للبقار از العاد operal construction | 5 | 35.35 | | 9,27 | | |
| general construction | 6 | 42.42 | | 9.20 | | |
| | 7 | 49,49 | | 9.17 | | |
| | 0 | 56.56 | | 9.14 | | |
| 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | ET 3 7 9 | 63.63 | | 9.09 | | |



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Civil Engineering Testing & Consulting Unit

وحاة اغتبارات واستشارات المندسة المدلية

| Location of test site: | KM 37 | 1+325 | Field team | Mr. Mohaméd Manidouh | |
|--|------------------------------------|-------------|---------------|----------------------|--|
| Project title: | Electric Express Tra General Co | | Date: | 11/4/2023 | |
| Diameter of loading | | | Time | 9:02:00 AM | |
| plate | 61 | 00 | | 9:28:00 AM | |
| Lever ratio | 1 | E. | Note: | | |
| Type of Soil | Prepared S | ubgrade 2.0 | CAT 9 | 66F | |
| Bedding material | - | - | | | |
| Temperature | | °C | | | |
| Test regime | Loading Stage No. | Load (kN) | Dial G | uge Reading (mm) | |
| Loading Stage | 0 | 1.414 | _ | 10.00 | |
| | 1 | 7.07 | | 9.72 | |
| | 2 | 14.14 | | 9.66 | |
| | 3 | 21.21 | 9.55 | | |
| | 4 | 28.28 | | 9.45 | |
| | 5 | 35.35 | | 9.36 | |
| | 6 | 42.42 | | 9.27 | |
| | 7 | 49.49 | 1 | 9.17 | |
| | 8 | 56.56 | | 9.08 | |
| | 9 | 63.63 | | 8.98 | |
| | 10 | 70.7 | | 8.93 | |
| Unloading Stage | 11 | 56.56 | | 8.93 | |
| | 12 | 49.49 | | 8.94 | |
| | 13 | 35.35 | | 8.95 | |
| | 14 | 21.21 | | 9.05 | |
| | 15 | 1.414 | | 9.85 | |
| Test regime | Loading Stage No. | Load (kN) | Dial G | auge Reading (mm) | |
| Reloading Stage | 0 | 1.414 | | 9.85 | |
| | 1 | 7.07 | | 9.62 | |
| - | 2 | 14.14 | | 9.54 | |
| 1 m | 3 | 21.21 | | 9.45 | |
| and the stand | 4 | 28.28 | | 9.35 | |
| - alalla Statistrouting | 5 | 35.35 | | 9,24 | |
| Laboration and a state of the s | 6 | 42.42 | | 9.17 | |
| N30 8 | 7 | 49.49 | | 9.11 | |
| | 8 | 56.56 | | 9.06 SPECT | |
| | 9 | 63.63 | - | 8 pa SPEET | |

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| instance - | Name | | Sign | for all | | 0/04/2023 | | M9.00:10 | | 5 |
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Civil Engineering Testing & Consulting Unit

وهدة اختبارات و استشارات المقدسة المنية

Technical Report

Plate Loading Tests

KM 371+325, KM 371+300, KM 371+275, KM 371+250, KM 371+225, KM 371+200, KM 371+175, KM 371+150, KM 371+125, and KM 371+100

Project

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

> Prepared for Inshaa General Construction

Mobilka CC - Abu Youssef, Alexandria, Egypt

(April 11, 2023)





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المدنية

1. Introduction

The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by Inshaa General Construction to conduct 10 plate loading tests on the Prepared Subgrade 2.0 of the Electric Express Train project at 10 locations (KM 371+325, KM 371+300, KM 371+275, KM 371+250, KM 371+225, KM 371+200, KM 371+175, KM 371+150, KM 371+125, and KM 371+100) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Mahmoud Shaban of Inshaa General Construction. Field team members (Mr.Mohamed Mamdouh) from the working CETCU team visited the project site on April 11, 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 19±1°C.

 The plate was carried out on a Prepared Subgrade 2.0 (according to the company) at 10 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 plan beneath the reaction loading system and secured against tilting. • Theireaction loading system was a heavy multi-purpose Loader CAT 988

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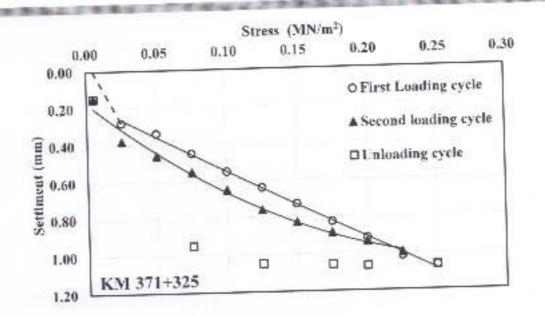


Figure 1: Load-settlement data: plate loading test performed at (KM 371+325)

Table 4: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+300)

| plate loading | test performed at 1 Load (F) | Normal stress (s ₀) | Settlement (S) |
|--|---------------------------------|--|-------------------------|
| Loading stage | kN | MIN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.00 |
| 1 - 1 - 1 - 1 | 7,07 | 0.025 | 0.25 |
| 1 | 14.14 | 0.050 | 0.30 |
| 2 | 21.21 | 0.075 | 0.40 |
| 4 | 28.28 | 0.100 | 0.51 |
| 5 | 35.35 | 0.125 | 0.60 |
| 6 | 42.42 | 0.150 | 0.72 |
| 7 | 49.49 | 0.175 | 0.80 |
| Contraction of the local division of the loc | 56.56 | 0.200 | 0.87 |
| 8 9 | 63.63 | 0.225 | 0.93 |
| 10 | 70.7 | 0.250 | 1.02 |
| 10 | 56.56 | 0.200 | 1.02 |
| 12 | 49.49 | 0.175 | 1.02 |
| and the second se | 35.35 | 0.125 | 0.98 |
| 13 | 21.21 | 0.075 | 0.88 |
| 14 | 1411 6 | wohing england ADP unit we's' | 0.30 |
| 15 | | From the second state of t | 0.88 0.30 CONSULTING |
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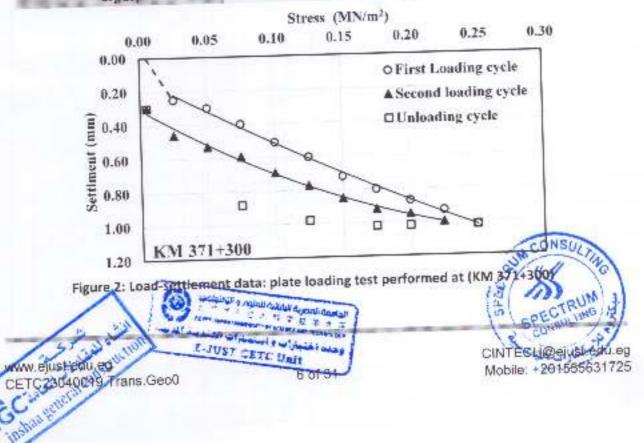
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Table 5: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+300)

| plate loading test performed at the lotent | mal stress (sp) Settlement (S) |
|--|--------------------------------|
| Loading stage Load (F) MN | /m ³ mm |
| 0.0 | 0.30 |
| 0.07 | 0.46 |
| 1 | 0.53 |
| 2 14.19 | 0.50 |
| 3 21.21 | 0.60 |
| 28.28 0.1 | 00 |
| 35.35 0.1 | 6.0 |
| 42.42 0.1 | 30 |
| 7 49.49 0.1 | |
| 56.56 0.2 | |
| s 63.63 0.2 | 25 1.00 |

Table 6: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+300)

| and the second s | 1st loading cycle | 2nd loading cycle |
|--|---|-------------------|
| Parameters | The second se | 0.25 |
| (somax) MN/m ³ | 0.25 | |
| an (mm) | 0.12 | 0.31 |
| and the second se | 4.23 | 4.59 |
| a_(mm/(MN/m ²)) | -2.43 | -6.68 |
| a ₂ (mm/(MN2/m [*])) | 124.31 | 154.08 |
| $E_{V}=1.5 t/ (a_1+a_2, s_{E,MMX})$ | and stores in the second se | |
| Evilevi | 1. | 24 |



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| Low real and real of | Load (F) | 1 1 1 N | on (KM 371+275) Normal stress (s _a) | Settlement (5) |
|-----------------------|----------|---------|--|----------------|
| Loading stage | kN | TH TH | MN/m ² | mm |
| 1 m | 1.414 | | 0.005 | 0.00 |
| Bur Bu | 7.07 | | 0.025 | 0.29 |
| | 14.14 | | 0.050 | 0.36 |
| and the second second | 21.21 | | 0.075 | 0.48 |
| 100 Mar 1991 | 28.28 | | 0.100 | 0.57 |
| 5 | 35.35 | | 0,125 | 0.64 |
| 6 | 42.42 | | 0.150 | 0.75 |
| 7 | 49.49 | | 0.175 | 0.86 |
| | 56.56 | | 0.200 | 0.95 |
| 9 | 63.63 | | 0.225 | 1.03 |
| 10 | 70.7 | | 0.250 | 1.16 |
| 11 | 56.56 | | 0.200 | 1.16 |
| 12 | 49.49 | | 0.175 | 1.16 |
| 13 | 35.35 | | 0.125 | 1.10 |
| 14 | 21.21 | | 0.075 | 0.99 |
| 15 | 1.414 | | 0.005 | 0.30 |

Table 8: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+275)

| plate loading | Load (F) | Normal stress (sp) | Settlement (5) |
|----------------|----------------|--------------------|----------------|
| Loading stage | kN | MN/m ² | mm, H |
| 0 | 1.414 | 0.005 | 0.30 |
| | 7.07 | 0.025 | 0.55 |
| 2 | 14.14 | 0.050 | 0.67 |
| | 21.21 | 0.075 | 0.75 |
| | 28.28 | 0.100 | 0.81 |
| - Strange of - | 35.35 | 0.125 | 0.90 |
| 6 | 42.42 | 0.150 | 0.93 |
| b | 49.49 | 0.175 | 1.00 |
| 1 | | 0.200 | 1.05 |
| 8 | 56.56 63.63 | 0.225 | 1.10 |
| | | | |

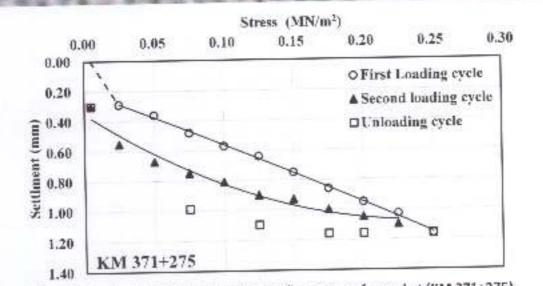
Table 9: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM

| 371+275) | 1st loading cycle | 2nd loading cycle |
|---|----------------------------|-----------------------|
| Parameters | 0.25 | 0.25 |
| (sp.max) MN/m ² | 0.20 | 0.35 |
| a ₀ (mm) | | EOONSU/2 |
| B2 (mm/(MN/m ²)) | 3.51 | 609NSULTING |
| a2 (mm/(MN2/m ²)) | 1.21 | 12 Artes |
| Ev= 1.5 r/ (a1+a2 50, MAR) | 118.02 | Is and all |
| ENJ/EV1 | 1.3 | 12 AL TRUNG |
| 100 | | SPECTRUM |
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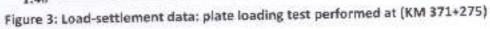


Table 10: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+250)

| plate loading | Load (F) | Normal stress (sa) | Settlement (5) |
|--|----------|--------------------|----------------|
| anding chang | kN | MN/m ² | mm |
| | 1.414 | 0.005 | 0.00 |
| office of the second | 7.07 | 0.025 | 0.31 |
| | 14.14 | 0.050 | 0.38 |
| 1 | 21.21 | 0.075 | 0.45 |
| | 28.28 | 0.100 | 0.53 |
| 5 | 35.35 | 0.125 | 0.61 |
| 6 | 42.42 | 0.150 | 0.72 |
| 7 | 49.49 | 0.175 | 0.80 |
| 8 | 56.56 | 0.200 | 0.86 |
| 9 | 63.63 | 0.225 | 0.95 |
| 10 # | 70.7 | 0.250 | 1.05 |
| 11 | 56.56 | 0.200 | 1.05 |
| A LO WING THE REAL PROPERTY AND A REAL PROPERT | 49.49 | 0.175 | 1.04 |
| 12 | 35.35 | 0.125 | 0.95 |
| 13 | 21.21 | 0.075 | 0.86 |
| 14 15 | 1.414 | 0.005 | 0.26 |
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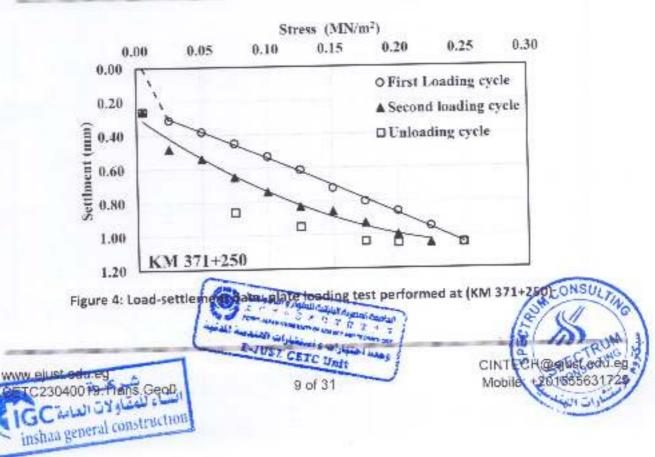
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Table 11: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+250) Load (F) Normal stress (sp) Settlement (S)

| Loading stage | kN | the second second | MN/m ² | mm - m |
|---------------|-------|-------------------|-------------------|--------|
| 0 | 1.414 | | 0.005 | 0.26 |
| 1 | 7.07 | | 0.025 | 0.48 |
| 2 | 14.14 | | 0.050 | 0.54 |
| 3 | 21.21 | | 0.075 | 0.65 |
| - | 28.28 | | 0.100 | 0.74 |
| - | 35.35 | | 0.125 | 0.83 |
| | 42.42 | | 0.150 | 0.86 |
| 7 | 49.49 | | 0.175 | 0.93 |
| | 56.56 | | 0.200 | 1.00 |
| 9. 7 10. | 63.63 | | 0.225 | 1.05 |

Table 12: Calculations of the resilient modulus of the tested soil according to DIN18134:

| [KIVI 3/1+230] | All and all an all and | 2nd loading cycle |
|--------------------------------|------------------------|---|
| Parameters | 1st loading cycle | and the second se |
| (seman) MN/m ³ | 0.25 | 0.25 |
| a _p (mm) | 0.23 | 0.29 |
| a, (mm/(MN/m ¹)) | 2.97 | 5.45 |
| a, (min/(MN2/m ⁴)) | 1.21 | -9.54 |
| Ev= 1.5 r/ (a1+a2. Summer) | 137.52 | 146.62 |
| EV2/EV1 | 1 | .07 |



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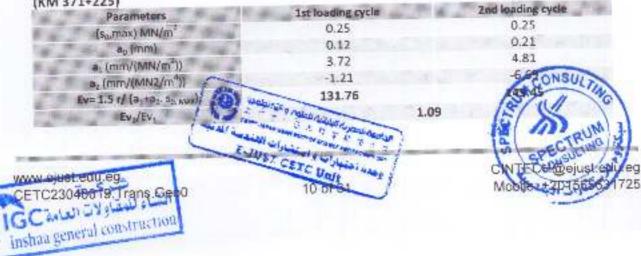
Table 13: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+225)

| Londing strong | Load (F) | Normal stress (s ₀) | Settlement (S) |
|---|--|---------------------------------|----------------|
| | kN | MN/m ² | mm ···· |
| | 1.414 | 0.005 | 0.00 |
| 1 3 7 4 | 7.07 | 0.025 | 0.20 |
| 1 | 14.14 | 0.050 | 0.29 |
| a mail | 21.21 | 0.075 | 0.40 |
| 4 | 28.28 | 0.100 | 0.49 |
| 5 . T . | 35.35 | 0.125 | 0.58 |
| A 10 17 | 42.42 | 0.150 | 0.64 |
| - | 49.49 | 0.175 | 0.71 |
| B.B | 56.56 | 0.200 | 0.80 |
| 9 | 63.63 | 0.225 | 0.88 |
| 10 | 70.7 | 0.250 | 0.99 |
| 11 | 56.56 | 0.200 | 0.99 |
| 12 | 49.49 | 0.175 | 0.97 |
| 13 | 35.35 | 0.125 | 0.87 |
| 14 | 21.21 | 0.075 | 0,74 |
| 15 | 1.414 | 0.005 | 0.19 |
| and the second se | CTL AT THE REAL PROPERTY OF TH | | |

Table 14: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+225)

| place loading | Load (F) | Normal stress (so) | Settlement (S) |
|---------------------|----------|--------------------|----------------|
| Longitum /r CP3 005 | kN | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.19 |
| 1 10 | 7.07 | 0.025 | 0.38 |
| 7 | 14.14 | 0.050 | 0.45 |
| 2 | 21.21 | 0.075 | 0.53 |
| | 28.28 | 0.100 | 0.61 |
| 5.8 7 8 | 35.35 | 0.125 | 0.69 |
| 2 | 42.42 | 0.150 | 0.79 |
| 7 | 49.49 | 0.175 | 0.85 |
| p in m | 56.56 | 8.200 | 0.90 |
| 8 | 63.63 | 0.225 | 0.95 |

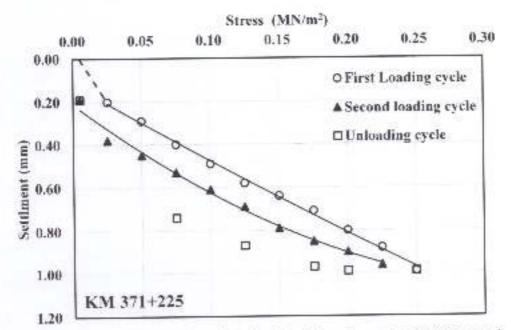
Table 15: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+225)

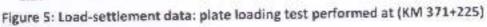


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The testing data corresponding to the sixth testing point (KM 371+200) is provided in Tables 16-18 and Figure 6. The testing data corresponding to the seventh testing point (KM 371+175) is provided in Tables 19-21 and Figure 7. The testing data corresponding to the eighth testing point (KM 371+150) is provided in Tables 22-24 and Figure 8. The testing data corresponding to the ninth testing point (KM 371+125) is provided in Tables 25-27 and Figure 9. The testing data corresponding to the tenth testing point (KM 371+100) is provided in Tables 28-30 and Figure 10.





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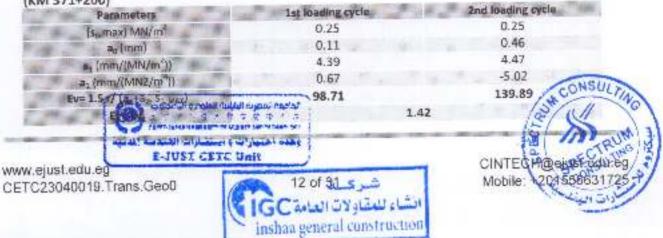
Table 16: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+200)

| Levening stoge | Load (E) | Normal stress (so) | Settlement (S) |
|---|----------|--------------------|----------------|
| | kN | MN/m ² | mm . |
| 0 | 1.414 | 0.005 | 0.00 |
| 1 | 7.07 | 0.025 | 0.25 |
| 2 | 14.14 | 0.050 | 0.32 |
| 3 1 | 21.21 | 0.075 | 0.40 |
| 4 | 28.28 | 0.100 | 0.52 |
| 5 | 35.35 | 0.125 | 0.69 |
| 6 | 42.42 | 0.150 | 0.80 |
| 7 | 49.49 | 0.175 | 0.91 |
| 8 | 56.56 | 0.200 | 1.02 |
| 9 | 63.63 | 0.225 | 1.13 |
| 10 | 70.7 | 0.250 | 1.23 |
| 11 | 56.56 | 0.200 | 1.23 |
| 12 | 49.49 | 0.175 | 1.23 |
| 13 | 35.35 | 0.125 | 1.15 |
| 14 | 21.21 | 0.075 | 1.04 |
| 15 | 1.414 | 0.005 | 0.44 |
| A CONTRACT OF A CONTRACT. | | | |

Table 17: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+200)

| Frank - Star | Load (F) | Normal stress (so) | Settlement (S) |
|---------------|----------|--------------------|----------------|
| Loading stage | kN | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.44 |
| 1 | 7.07 | 0.025 | 0.61 |
| 2 | 14.14 | 0.050 | 0.67 |
| | 21.21 | 0.075 | 0.78 |
| 4 | 28.28 | 0.100 | 0.86 |
| 5 | 35.35 | 0.125 | 0.93 |
| 6 | 42.42 | 0.150 | 1.00 |
| 7 | 49.49 | 0.175 | 1.08 |
| 8 | 56.56 | 0.200 | 1.14 |
| 9 | 63.63 | 0.225 | 1.23 |

Table 18: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+200)



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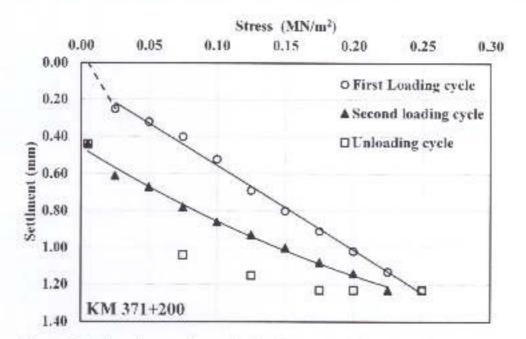


Figure 6: Load-settlement data: plate loading test performed at (KM 371+200)

| oading stage | Load (F) | Normal stress (s ₀) | Settlement (5) |
|----------------|--|---------------------------------|--------------------------------|
| manug sedge | kN | MIN/m ² | mm |
| - | 1.414 | 0.005 | 0.00 |
| 1 19 18 | 7.07 | 0.025 | 0.26 |
| Stor 198- 1 | 14.14 | 0.050 | 0.35 |
| | 21.21 | 0.075 | 0.46 |
| a last in | 28.28 | 0.100 | 0.56 |
| 1 | 35.35 | 0.125 | 0.68 |
| 1 . Care . 344 | 42.42 | 0.150 | 0.77 |
| 100 100 | 49.49 | 0.175 | 0.93 |
| - | 56.56 | 0.200 | 1.03 |
| - | 63.63 | 0.225 | 1.13 |
| 0 10 10 | 70.7 | 0.250 | 1.30 |
| 1 10 10 | 56.56 | 0.200 | 1.30 |
| 2 | 49.49 | 0.175 | 1.28 |
| 3 | 35.35 | 0.125 | STALL ING |
| 4 | 21.21 | 0.075 | AND |
| 5 | 1.414 | 0.005 | |
| | | | SPECTRUM |
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Table 19: Load-settlement data obtained at the first loading and unloading stages of the



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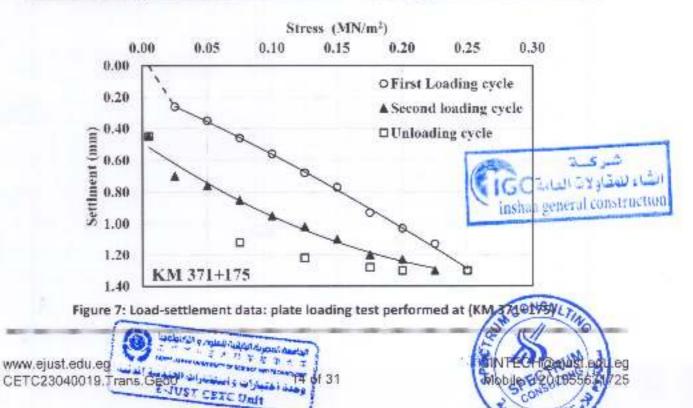
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Table 20: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+175)

| a man all such as a such | Load (F) | Normal stress (sn) | Settlement (S) |
|--------------------------|-----------------|--------------------|----------------|
| Loading stage | kN ^m | MN/m ² | mm |
| D allow state | 1.414 | 0.005 | 0.45 |
| 1 | 7.07 | 0.025 | 0.70 |
| 2 | 14.14 | 0.050 | 0.76 |
| 3 mile mar 7 | 21.21 | 0.075 | 0.85 |
| 4 | 28.28 | 0.100 | 0.95 |
| 5 | 35.35 | 0.125 | 1.02 |
| | 42.42 | 0.150 | 1.10 |
| 1 | 49.49 | 0.175 | 1.20 |
| 8 | 56.56 | 0.200 | 1.23 |
| 9 | 63.63 | 0.225 | 1.30 |
| | | | |

Table 21: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+175)

| Parameters | 1st loading cycle | 2nd loading cycle |
|-------------------------------|-------------------|-------------------|
| (stumax) MN/m ² | 0.25 | 0.25 |
| a _a (mm) | 0.16 | 0.49 |
| a, (mm/(MN/m ²)) | 3.64 | 5.50 |
| Br (mm/(MNZ/m ⁴)) | 3.40 | -8.70 |
| Ev= 1.5 r/ (a +a2 50 mm) | 100.21 | 135.45 |
| Ev2/Ev2 | 1.3 | 5 |





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Table 22: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+150)

| No. The T | Load (F) | Normal stress (sa) | Settlement (\$) |
|---------------|----------|--------------------|-----------------|
| Loading stage | kN | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.00 |
| 1 - | 7.07 | 0.025 | 0.30 |
| 2 (11) | 14.14 | 0.050 | 0.38 |
| 3 | 21.21 | 0.075 | 0.55 |
| 4 | 28.28 | 0.100 | 0.66 |
| 5 | 35.35 | 0.125 | 0.82 |
| 6 | 42.42 | 0.150 | 0.95 |
| 7 | 49.49 | 0.175 | 1.08 |
| 8 | 56.56 | 0.200 | 1.19 |
| 9 | 63.63 | 0.225 | 1.31 |
| 10 | 70.7 | 0.250 | 1.48 |
| 11 11 | 56.56 | 0.200 | 1.48 |
| 12 | 49.49 | 0.175 | 1.47 |
| 13 | 35.35 | 0.125 | 1.45 |
| 14 | 21.21 | 0.075 | 1.36 |
| 15 | 1,414 | 0.005 | 0.66 |

Table 23: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+150)

| Loading stage | Load (F) | Normal stress (sc) | Settlement (S) |
|-------------------|----------|---|----------------|
| | kN | MN/m ² | mm |
| | 1.414 | 0.005 | 0.66 |
| 10 10 1 | 7.07 | 0.025 | 0.88 |
| | 14.14 | 0.050 | 0.96 |
| 3 | 21.21 | 0.075 | 1.09 |
| 4 | 28.28 | 0.100 | 1.19 |
| 5 | 35.35 | 0.125 | 1.30 |
| The second second | 42.42 | 0.150 | 1.38 |
| All and | 49.49 | 0.175 | 1.47 |
| | 56.56 | 0.200 | 1.53 |
| 9 | 63.63 | 0.225 nodulus of the tested soll acc | 1.57 |

Table 24: Calculations of the resilient modulus of the tested soil according to (KM 371+150)

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| 0.25 |
|---|
| the second se |
| 0.15 |
| 5.23 |
| 0.12 |
| 85.49 |
| 1.41 |
| |

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sentrationa general construction 0.25 0.67 6.40 -10.64 128.18CONS/

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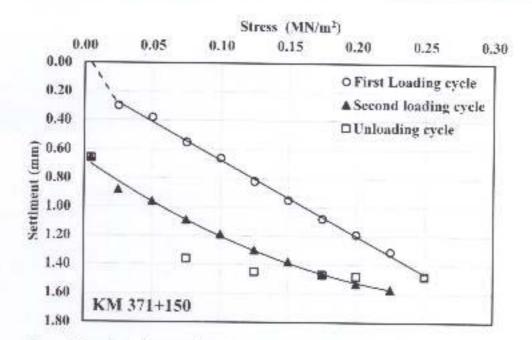


Figure 8: Load-settlement data: plate loading test performed at (KM 371+150)

| oading stage | Load (F) | Normal stress (so) | Settlement (S) |
|-----------------------|--|--------------------|--|
| whanig stage | kN | MN/m ² | mm |
| | 1.414 | 0.005 | 0.00 |
| and the second | 7.07 | 0.025 | 0.26 |
| Children and | 14.14 | 0.050 | 0.30 |
| | 21.21 | 0.075 | 0.43 |
| | 28.28 | 0.100 | 0.53 |
| and the second second | 35.35 | 0.125 | 0.67 |
| | 42.42 | 0.150 | 0.79 |
| A. MARTIN | 49.49 | 0.175 | 0.86 |
| - | 56.56 | 0.200 | 0,96 |
| | 63.63 | 0.225 | 0.86 0.96 1.02 1.10 1.10 1.10 1.10 1.10 1.10 1.10 |
|) | 70.7 | 0.250 | 1 IGC ameral cons |
| 1 | 56.56 | 0.200 | 1.16 inshaa gene |
| | 49.49 | 0.175 | 1.18 |
| | 35.35 | 0.125 | 1.12 |
| | 21.21 | 0.075 | 1.01 |
| | 1.414 | 0.005 | |
| | | W70420424 | 0.40 CONSULTING |
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Table 25: Load-settlement data obtained at the first loading and unloading stages of the

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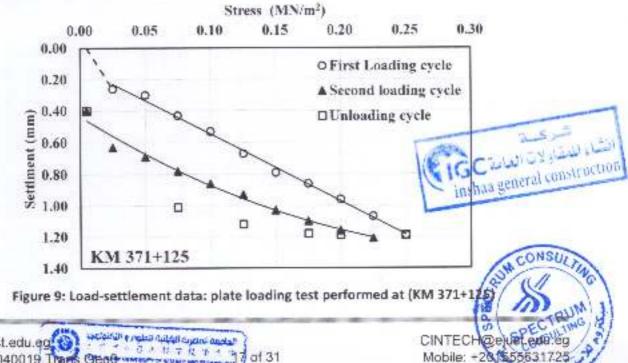
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Table 26: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+125)

| Loading stage | Inad (E) | Normal stress (s ₀) | Settlement (S) | |
|---------------|----------|---------------------------------|----------------|--|
| | kN | MIN/m ² | mm | |
| 0 | 1.414 | 0.005 | 0.40 | |
| 1 | 7.07 | 0.025 | 0.63 | |
| 2 | 14.14 | 0.050 | 0.69 | |
| 3 | 21.21 | 0.075 | 0.78 | |
| 4 | 28.28 | 0.100 | 0.86 | |
| 5 | 35.35 | 0,125 | 0.93 | |
| 6 | 42.42 | 0.150 | 1.03 | |
| 7 | 49.49 | 0.175 | 1.10 | |
| 8 | 56.56 | 0.200 | 1.16 | |
| 9 | 63.63 | 0.225 | 1.21 | |

Table 27: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+125)

| Parameters | 1st loading cycle | Znd loading cycle |
|---|-------------------|-------------------|
| (s _s ,max) MN/m ³ | 0.25 | 0.25 |
| a _s (mm) | 0.13 | 0.44 |
| a1 (mm/[MN/m ²)) | 4.18 | 5.10 |
| a2 (mm/(MN2/m*)) | 0.24 | -7.50 |
| Ev= 1.5 r/ (a1+32- 50 MAX) | 106.08 | 139.54 |
| Ev2/Ev1 | 1.3 | 12 |



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Table 28: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+100)

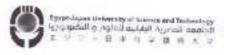
| Loading stage | Load (F) | Normal stress (sp) Settlement (5) | | |
|---------------|----------|-----------------------------------|------|--|
| | LN . | MIN/m ² | mm | |
| 0 | 1.414 | 0.005 | 0.00 | |
| 1 | 7.07 | 0.025 | 0.35 | |
| 2 | 14.14 | 0.050 | 0.41 | |
| 3 | 21.21 | 0.075 | 0.50 | |
| 4 | 28.28 | 0.100 | 0.60 | |
| 5 | 35.35 | 0.125 | 0.76 | |
| 6-1 III | 42.42 | 0.150 | 0.90 | |
| 7 | 49.49 | 0.175 | 1.00 | |
| 1.000 000 | 56.56 | 0.200 | 1.13 | |
| 1 | 63.63 | 0.225 | 1.22 | |
| 10 | 70.7 | 0.250 | 1.37 | |
| 11 | 56.56 | 0.200 | 1.37 | |
| | 49.49 | 0.175 | 1.36 | |
| 13 | 35.35 | 0.125 | 1.21 | |
| | 21.21 | 0.075 | 1.07 | |
| 15 | 1,414 | 0.005 | 0.34 | |

Table 29: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+100)

| Loading stage | Load (F) | Normal stress (so) | Settlement (S) | |
|---------------|----------|--------------------|----------------|--|
| and a second | kN | MN/m ² | mm | |
| 0 | 1.414 | 0.005 | 0.34 | |
| 18 | 7.07 | 0.025 | 0.70 | |
| 2 | 14.14 | 0.050 | 0.79 | |
| 3 | 21.21 | 0.075 | 0.85 | |
| 4 | 28.28 | 0.100 | Û.97 | |
| 5 | 35.35 | 0.125 | 1.09 | |
| 6 | 42.42 | 0.150 | 1.15 | |
| 7 2 3 | 49.49 | 0.175 | 1.24 | |
| 8 | 56.56 | 0.200 | 1.30 | |
| 9 | 63.63 | 0.225 | 1.37 | |

Table 30: Calculations of the resilient modulus of the tested soil according to DIN 18136 C

| (KM 3/1+100) | | | Construction Construction |
|--|-----------------------|------|--|
| Parameters | 1st loading cycle | 1 | 2nd loading cyclatishao general construction |
| (stomax) MN/m ² | 0.25 | | 0.25 |
| a, (mm) | 0.22 | | 0.42 |
| a (mm/(MN/m²)) | 3.84 | | 7.02 |
| a ₂ (mm/(MN2/m [°])) | 3.09 | | -12.85 |
| Ev=1.5r/ (a_ta_2, s_, and) | 97.57 | | 118.34 ONS// |
| EV approximation and a second a | Trypin-cho's" | 1.21 | 118.34 CONSULTING |
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| ب و استشراف القندين "كديمة E-JUST CETE 1 و www.ejust.edu.eg | njuia: baar i Init | | CINTECH Deiger add ad |
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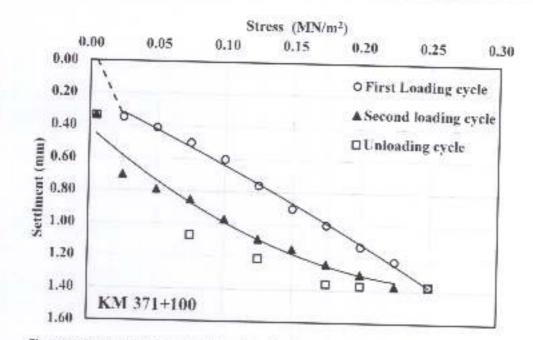


Figure 10: Load-settlement data: plate loading test performed at (KM 371+100)

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4. Closure

Test results presented herein report the load-settlement data obtained from 10 plate loading tests conducted on the Prepared Subgrade 2.0 of the Electric Express train project at 10 locations (KM 371+325, KM 371+300, KM 371+275, KM 371+250, KM 371+225, KM 371+200, KM 371+175, KM 371+150, KM 371+125, and KM 371+100) in accordance with German Standard, DIN18134.

| Location | E _{v1} MN/m2 | E _{v3} MN/m2 | E _{v2} /E _{v1} ratio |
|------------|--------------------------|--------------------------|--|
| KM 371+325 | 121.65 | 134.10 | 1.10 |
| KM 371+300 | 124.31 | 154.08 | 1.24 |
| KM 371+275 | 118.02 | 155.57 | 1.32 |
| KM 371+250 | 137.52 | 145.62 | 1.07 |
| KM 371+225 | 131.76 | 143.45 | 1.09 |
| KM 371+200 | 98.71 | 139.89 | 1.42 |
| KM 371+175 | 100.21 | 135.45 | 1.35 |
| KM 371+150 | 85.49 | 120.18 | 1.41 |
| KM 371+125 | 106.08 | 139.54 | 1.32 |
| KM 371+100 | 97.57 | 118.34 | 1.21 |

 Note: Before interpreting these test results for future applications, the Prepared Subgrade 2.0 insitu variability between the testing locations should be considered.

Technical committee

Dr. Mahmoud Ahmed

F-JUST CETC Date



Lab Engineer

Mohamed A. Al-Najjar



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Appendix A



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Figure input literarily of locate and Technology localization point multiply by order and the 2 2 2 7 1 2 2 1 9 2 1 9 2 1 9 2 1

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| Location of test site: | KM 3 | 371+300 | Field | Mr. Mohamed Manuluu | | |
|--|---------------------------------|---------------------------------------|-------------|---|--|--|
| Project title: | | rain Project - Inshaa Construction | Date: | 11/4/2023 | | |
| Diameter of loading | | | Time | 9:35:00 AM | | |
| plate | | 500 | CPRODUCTICS | 10:03:00 AM | | |
| Lever ratio | | 1 | Note: | 100000000000000000000000000000000000000 | | |
| Type of Soil | Prepared S | Subgrade 2.0 | CAT 96 | 6F | | |
| Bedding material | | 0 | | | | |
| Temperature | | 9°C | | | | |
| Test regime | Loading Stage No. | Load (kN) | Dial Ga | uge Reading (mm) | | |
| Loading Stage | 0 | 1.414 | | 10.00 | | |
| | 1 | 7.07 | | 9.75 | | |
| | 2 | 14.14 | 1 | 9.70 | | |
| | 3 | 21.21 | | 9.60 | | |
| | 4 | 28.28 | | 9,49 | | |
| | 5 | 35.35 | 0 | 9,49 | | |
| | 6 | 42.42 | 9.28 | | | |
| | 7 | 49.49 | 9.20 | | | |
| | 8 | 56.56 | 9.13 | | | |
| | 9 | 63.63 | 9.07 | | | |
| | 10 | 70.7 | | | | |
| Inloading Stage | 10 | 56.56 | 8.98 | | | |
| | 12 | 49.49 | 8.98 | | | |
| | 13 | | 8.98 | | | |
| | 13 | 35.35 | | 9.02 | | |
| | 11001 | 21.21 | - | 9.12 | | |
| lest regime | 15 | 1.414 | 9.70 | | | |
| teloading Stage | Loading Stage No. | Load (kN) | Dial Gay | ige Reading (mm) | | |
| coording stage | 0 | 1.414 | - | 9.70 | | |
| | - | 7.07 | | 9.54 | | |
| | 2 | 14.14 | | 9.47 | | |
| | 3 | 21.21 | | 9.41 | | |
| شركة | 4 | 28.28 | | 9.31 | | |
| الشاء للمقادين وراس | 5 | 35.35 | | 9.23 | | |
| شركية انشاء للمقاولات العامة (a general constructio | 6 | 42.42 | | 9.15 | | |
| a general constructio | 7 | 49,49 | | 9.08 N CON | | |
| | 8 | 56.56 | | 9.05 8 14 | | |
| ATTA LIGARD | Matura Contral An agree marked | 63.63 | | and the second se | | |
| 1 2021 2 5 7 | A REAL PROPERTY AND THE REAL OF | - | | | | |
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Civil Firghcering Testing & Consulting Unit

وحدة اغتيارات و استثارات المندسة المدنية

| Location of test site: | KM 3 | 71+275 | Field team | Mr.Mohamed Monidouh | |
|--|---|---------------------------------------|---------------|---------------------|--|
| Project title: | | rain Project - Inshaa Construction | Date: | 11/4/2023 | |
| Diameter of loading plate | 6 | 00 | Time | 10:10:00 AM | |
| | | | - | 10:38:00 AM | |
| Lever ratio Type of Soil | Personal A | 1 Subgrade 2.0 | Note: | | |
| Redding material | Trepared S | subgrade 2.0 | CAT 96 | 6F | |
| Temperature | 16 | P°C | - | | |
| Test regime | Loading Stage No. Load (kN) | | Dial Co | uge Reading (mm) | |
| loading Stage | 0 | 1.414 | L'ERI (12 | 10.00 | |
| an a | 1 | 7,07 | - | 9.71 | |
| | 2 | 14.14 | | 9.64 | |
| | 3 | 21.21 | - | 9.52 | |
| | 4 | 28.28 | - | 9.43 | |
| | 5 | 35.35 | - | 9.36 | |
| | 6 | 42.42 | 9.25 | | |
| | 7 | 49.49 | 9,14 | | |
| | 8 | 56.56 | 9.05 | | |
| | 9 | 63.63 | 8.97 | | |
| | 10 | 70.7 | - | 8.84 | |
| Inloading Stage | 11 | 56.56 | 8,84 | | |
| The state of the s | 12 | 49.49 | | | |
| | 13 | 35.35 | 8.84 | | |
| | 14 | 21.21 | 8.90 9.01 | | |
| | 15 | 1.414 | | 9.70 | |
| est regime | Loading Stage No. | Load (kN) | Dial Ca | uge Reading (mm) | |
| teloading Stage | 0 | 1.414 | Dial Ga | 9.70 | |
| | 1 | 7.07 | | 9.45 | |
| | | 14.14 | - | 9.33 | |
| شركية شاه للمقاولات العامة C Inneral construction | 3 | 21.21 | 2 | 9.25 | |
| مساء للمصاولات العامة | 4 | 28.28 | 0 | 9.19 | |
| aa general construction | 5 | 35.35 | | 9.10 | |
| and the second s | 6 | 42.42 | | 9.07 | |
| | 7 | 49.49 | | 9.00 | |
| | 8 | 56.56 | | | |
| 2 | Hat a minute and dynamical | 10.10 | | 8.95 CONSULT | |
| ejust.edu.eg | الله بين المراجع بين المراجع ا منهم المشيول المراجع والمستقصار المراجع | | - | A MARUN | |
| C23040019.Trans.Gec | JUST CETC Unit | 4 of 31 | | Mobile: +20155563 | |



Civil Engineering Testing & Consulting Unit

وهدلا انتهارات و استشارات المندسة الهدنية

| Location of test site: | KM | 371+250 | Field team | Mr.Mohamed Manufout | |
|--|--|---|-----------------------|---------------------|--|
| Project title: | Electric Express General | l rain Project - Inshaa Construction | Date: | 11/4/2023 | |
| Diameter of loading plate | 600 | | Time | 10:45:00 AM | |
| Lever ratio | | 1 | - | 11:12:00 AM | |
| Type of Soil | Prepared | Subgrade 2.0 | Note: | | |
| Bedding material | parter | | CAT 96 | 101 | |
| Temperature | 1 | 9°C | - | | |
| Test regime | Loading Stage No. | | | uge Reading (mm) | |
| Loading Stage | 0 | 1.414 | A-ML CO | 10.00 | |
| | 1 | 7.07 | | 9.69 | |
| | 2 | 14.14 | | 9.62 | |
| | 3 | 21.21 | | 9.55 | |
| | 4 | 28.28 | | 9.47 | |
| | 5 | 35.35 | | 9.39 | |
| | 6 | 42.42 | | 9.28 | |
| | 7 | 49,49 | | 9.20 | |
| | 8 | 56.56 | 9.14 | | |
| | 9 | 63.63 | - | 9.05 | |
| | 10 | 70.7 | | 8.95 | |
| Unloading Stage | 11 | 56.56 | 8,95 | | |
| | 12 | 49.49 | | 8.96 | |
| | 13 | 35.35 | | 9.05 | |
| | 14 | 21.21 | | 9.14 | |
| | 15 | 1.414 | | 9.74 | |
| Test regime | Loading Stage No. | Load (kN) | Dial Gauge Reading (m | | |
| Reloading Stage | 0 | 1.414 | | 9.74 | |
| | 1 | 7.07 | | 9.52 | |
| | 2 | 14.14 | | 9.46 | |
| شركية انشاء للمقاولات العادة a ceperal construction | 3 | 21.21 | - | 9.35 | |
| tion tion | 4 | 28.28 | | 9.26 | |
| au general construction | 5 | 35.35 | | 9.17 | |
| and a state of the | 6 | 42.42 | | 9.14 | |
| | 7 | 49.49 | | 9.07 | |
| | 8 | 56.56 | 1 | (18/85 G | |
| | State and and a state | 63.63 | 100 | (18/85 6) | |
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(Tvil Engineering Testing & Consulting Unit وحدة اغتمارات و استثفارات المدمسة الهدنية

| Location of test site: | KM 3 | 71+225 | Field team | Mr. Metamod Mamioul |
|--|---------------------------------|---------------------------------------|-----------------------|----------------------------|
| Project fifle: | Electric Express I General G | rain Project - Inshaa Construction | Date: | 11/4/2023 |
| Diameter of loading plate | | 500 | Time | 11:20:00 AM 11:48:00 AM |
| Lever ratio | | 1 | Note: | 11148:00 AM |
| Type of Soil | Prepared 3 | Subgrade 2.0 | CAT 96 | A IV |
| Bedding material | | *** | Car se | O F |
| Temperature | P | 9°C | _ | |
| Test regime | Loading Stage No. | Load (kN) | Dial Ga | uge Reading (mm) |
| Loading Stage | 0 | 1.414 | 10000.000 | 10.00 |
| | 1 | 7.07 | - | 9.80 |
| | 2 | 14.14 | | 9.71 |
| | 3 | 21.21 | | 9.60 |
| | 4 | 28.28 | 1 | 9.51 |
| | 5 | 35.35 | | 9.42 |
| | 6 | 42.42 | 9.36 | |
| | 7 | 49,49 | - | 9.29 |
| | 8 | 56,56 | 9.20 | |
| | 9 | 63.63 | 9.12 | |
| | 10 | 70.7 | 9.01 | |
| Unloading Stage | 11 | 56.56 | 9,01 | |
| 1999-1999-1999-1999-1999-1999-1999-199 | 12 | 49.49 | 9.03 | |
| | 13 | 35.35 | - | 9.13 |
| | 14 | 21.21 | 9.15 | |
| | 15 | 1.414 | - | 9.81 |
| lest regime | Loading Stage No. | Load (kN) | Dial Gauge Reading (m | |
| Reloading Stage | 0 | 1.414 | aviat Gate | 9.81 |
| | 1 | 7.07 | - | 9.62 |
| | 2 | 14.14 | | 9.55 |
| شركة شاه للمقاولات العامة haa general constructs | 3 | 21.21 | | 9.47 |
| مساء للمقاولات الدرري | 4 | 28.28 | - | 9,39 |
| construction construction | 5 | 35.35 | | 9.31 |
| Una Hene | 6 | 42.42 | | 9.21 |
| | 7 | 49.49 | | 0.16 |
| | 8 | 56.56 | | 010.000 |
| Partie tochinis a min | il Califiel Happice Blant all | 63.63 | | STRAT TO |
| FORT UTWINNING | TRADE TALE | | 1 | e () o) |
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Civil Engineering Testing & Consulting Unit وهدة اغتجارات واستنشارات المندسة البدئية

| Location of test site: | | 371+200 | Field feam | Mr.Mohamed Manufout | | |
|--|-----------------------------|---|-------------------------|---------------------|--|--|
| Project title: | Electric Express General | l'rain Project - Inshaa Construction | Date: | 11/4/2023 | | |
| Diameter of loading plate | | 600 | Time | 11:55:00 AM | | |
| Lever ratio | | I | - | 12:23:00 PM | | |
| Type of Soil | Prepared | Subgrade 2.0 | Note: | | | |
| Bedding material | | | CAT 96 | 101 | | |
| Temperature | 1 | 9°C | - | | | |
| Test regime | Loading Stage No. | Load (kN) | Dial Co | nge Reading (mm) | | |
| Loading Stage | 0 | 1.414 | asiai Gri | 10.00 | | |
| | 1 | 7.07 | | 9.75 | | |
| | 2 | 14.14 | 1 | 9.68 | | |
| | 3 | 21.21 | | 9.60 | | |
| | 4 | 28.28 | | 9.48 | | |
| | 5 | 35.35 | | 9.31 | | |
| | 6 | 42.42 | | 9.20 | | |
| | 7 | 49.49 | | 9.09 | | |
| | 8 | 56.56 | 8,98 | | | |
| | 9 | 63.63 | | 8.87 | | |
| | 10 | 70,7 | | 8.77 | | |
| Inloading Stage | 11 | 56.56 | 8.77 | | | |
| | 12 | 49,49 | | 8.77 | | |
| | 13 | 35.35 | - | 8.85 | | |
| | 14 | 21.21 | - | 8.96 | | |
| | 15 | 1.414 | | 9.56 | | |
| est regime | Loading Stage No. | Load (kN) | Dial Gauge Reading (mm) | | | |
| Reloading Stage | 0 | 1.414 | Senter Charl | 9.56 | | |
| | 1 | 7.07 | | 9.39 | | |
| | 2 | 14.14 | | 9.33 | | |
| | 3 | 21.21 | | 9.22 | | |
| شركية () للمقاولات العامة CC Ishaa general construe | e 11 4 | 28.28 | | 9.14 | | |
| ووللعشاولات العادة | 105 5 | 35.35 | | 9.07 | | |
| schaa general consicion | 6 | 42.42 | | 9.00 | | |
| and the second s | 7 | 49.49 | | 8.92 | | |
| | 8 | 56.56 | | SADONSUL | | |
| | 9 | 63.63 | | STAN ING | | |
| 1204 | C = 11 7 4 10 10 | | 1 | S C O | | |
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Civil Engineering Testing & Consulting Unit وهدة اغتيارات واستثثارات المندسة الودنية

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| Location of test site: | KM 371+175 | | Field team | Mr. Mohamed Maanhow | |
|--|---|---|-----------------------|--------------------------------------|--|
| Project title: | Electric Express T General | rain Project - Inshaa Construction | Date: | 11/4/2023 | |
| Diameter of loading plate | 1 | 600 | Time | 12:30:00 PM | |
| Lever ratio | | 1 | - | 12:58:00 PM | |
| Type of Soil | Prepared | Subgrade 2.0 | Note: | | |
| Bedding material | Trepareu | Subgrade 2.0 | CAT 96 | 56F | |
| Temperature | 1 | 9°C | - | | |
| Test regime | Loading Stage No. | 5. TT. | Distan | uge Reading (mm) | |
| Loading Stage | 0 | 1.414 | 474414 6.141 | 10.00 | |
| | 1 | 7.07 | | 9.74 | |
| | 2 | 14.14 | - | 9.65 | |
| | 3 | 21.21 | 10 | | |
| | 4 | 28.28 | 9.54 | | |
| | 5 | 35.35 | 9.44 | | |
| | 6 | 42.42 | 9,32 | | |
| | 7 | the second se | 9.23 | | |
| | 8 | 49,49 | 9.07 | | |
| | | 56.56 | 8.97 | | |
| | 9 | 63.63 | 8,87 | | |
| Inloading Stage | 10 | 70,7 | 8.70 | | |
| moading Stage | 11 | 56.56 | 8.70 | | |
| | 12 | 49.49 | 8.72 | | |
| | 13 | 35.35 | 8.78 | | |
| | 14 | 21.21 | | 8.88 | |
| | 15 | 1.414 | | 9.55 | |
| lest regime | Loading Stage No. | Load (kN) | Dial Gauge Reading (m | | |
| teloading Stage | 0 | 1.414 | | 9.55 | |
| | 1 | 7.07 | | 9.30 | |
| | 2 | 14.14 | | 9.24 | |
| | 3 | 21.21 | | 9.15 | |
| ور شرکت | 4 | 28.28 | | 9.05 | |
| an | 5 | 35.35 | | 8.98 | |
| aa general constructio | 6 | 42.42 | | 8.90 | |
| and the state of t | 7 | 49,49 | | 8.80 | |
| | 8 | 56.56 | | 8.7 CONSULT | |
| and a state of the second | and | 63.63 | | 800 11/1 | |
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Civil Engineering Testing & Consulting Unit

وهدة اغتبارات و استشارات المندصة المدنية

| Location of test site: | KM 3 | 71+150 | Field feam | Mr.Mohamed Manufunt | |
|--|-------------------|---------------------------------------|---------------|---------------------------|--|
| Project title: | | rain Project - Inshaa Construction | Date: | 11/4/2023 | |
| Diameter of loading | | 500 | Time | 1:07:00 PM | |
| plate | | 700 | | 1:35:00 PM | |
| Lever rafio | | 1 | Note: | Contraction of the second | |
| Type of Soil | Prepared 5 | Subgrade 2.0 | CAT 96 | 6F | |
| Bedding material | | | | | |
| Temperature | | 9°C | | | |
| Test regime | Loading Stage No. | Load (kN) | Dial Ga | uge Reading (mm) | |
| Loading Stage | 0 | 1.414 | | 10.00 | |
| | 1 | 7.07 | | 9.70 | |
| | 2 | 14.14 | | 9.62 | |
| | 3 | 21.21 | 9.45 | | |
| | 4 | 28.28 | 9.34 | | |
| | 5 | 35.35 | | 9.18 | |
| | 6 | 42.42 | 9.05 | | |
| | 7 | 49.49 | | 8.92 | |
| | 8 | 56.56 | 8.81 | | |
| | 9 | 63.63 | - | 8.69 | |
| | 10 | 70.7 | 8.52 | | |
| Inloading Stage | 11 | 56.56 | 8.52 | | |
| | 12 | 49,49 | 1 | 8.53 | |
| | 13 | 35.35 | | 8.55 | |
| | 14 | 21.21 | | 8.64 | |
| | 15 | 1.414 | 1 | 9.34 | |
| 'est regime | Loading Stage No. | Load (kN) | Dial Ga | uge Reading (mm) | |
| Reloading Stage | 0 | 1.414 | 9,34 | | |
| | 1 | 7.07 | | 9.12 | |
| | 2 | 14.14 | | 9.04 | |
| | 3 | 21.21 | 2.000 | 8.91 | |
| شركية | 4 | 28.28 | | 8.81 | |
| شركية انشاء للمقاولات العام general construction | 5 | 35.35 | | 8.70 | |
| general construction | 6 | 42.42 | | 8.62 | |
| Printer and a second | 7 | 49.49 | | 8.53 | |
| | 8 | 56.56 | | 8.47 | |
| | 9 | 63.63 | 1 | SA CONSULT | |

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Civil Engineering Tearing & Consulting Unit وحدة اغتجارات واستثقارات المندسة المدنية

| Location of test site: | KM 3 | 371+125 | Field team | Mr.Moliamed Manudou | |
|--|-----------------------------|---------------------------------------|------------------------|------------------------------------|--|
| Project title: | | rain Project - Inshaa Construction | Date: | 11/4/2023 | |
| Diameter of loading plate | | 500 | Time | 1:43:00 PM 2:10:00 PM | |
| Lever ratio | | 1 | Note: | | |
| Type of Soil | Prepared | Subgrade 2.0 | CAT 9 | 6F | |
| Bedding material | | | - | 101 | |
| Temperature | 1 | 9°C | | | |
| Test regime | Loading Stage No. Load (kN) | | Dial Ga | uge Reading (mm | |
| Loading Stage | 0 | 1,414 | | 10.00 | |
| | 1 | 7.07 | | 9.74 | |
| | 2 | 14.14 | | 9.70 | |
| | 3 | 21.21 | | 9.57 | |
| | 4 | 28.28 | | 9.47 | |
| | 5 | 35.35 | | 9.33 | |
| | 6 | 42.42 | | 9.21 | |
| | 7 | 49.49 | | 9.14 | |
| | 8 | 56.56 | 9.04 | | |
| | 9 | 63.63 | 8.93 | | |
| | 10 | 70.7 | 8.81 | | |
| Unloading Stage | 11 | 56,56 | 8.81 | | |
| | 12 | 49.49 | 1 | 8.82 | |
| | 13 | 35.35 | - | 8.88 | |
| | 14 | 21.21 | - | 8,99 | |
| | 15 | 1.414 | - | 9.60 | |
| Fest regime | Loading Stage No. | Load (kN) | Dial Gauge Reading (mm | | |
| Reloading Stage | 0 | 1.414 | 122401 (14) | 9.60 | |
| | 1 | 7,07 | - | 9.37 | |
| | 2 | 14.14 | - | 9.31 | |
| - C.A | 3 | 21.21 | | 9.22 | |
| شرکسة انشاه لله داريد. | 4 | 28.28 | | 9.14 | |
| انشاء للمقاولات العامة construction | 5 | 35.35 | | 9.07 | |
| a general construction | 6 | 42.42 | | 8.97 | |
| a starting | 7 | 49,49 | | 8.90 | |
| | 8 | 56.56 | | 0.01 | |
| والبلينية لتناور والتعسمين | CONTRACTOR OF A | 63.63 | | SAN CONSULT | |
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| C23040015. Trans. Geo | part / | 0 of 31 | | CINTECHIREINST M Mapile 2883563 | |



Civil Engineering Testing & Consulting Unit

وهدة اغتبارات و استشارات المندسة المدنية

21 -11

| Location of test site: | KM 3 | 71+100 | Field team | Mr.Mohamed Mandout | |
|--|---------------------------------|---------------------------------------|-----------------------|--------------------|--|
| Project title: | Electric Express T General (| rain Project - Inshaa Construction | Date: | 11/4/2023 | |
| Diameter of loading | 200 | | Time | 2:18:00 PM | |
| plate | 600 | | | 2:48:00 PM | |
| Lever ratio | 1 | | Note: | Complex Action 1 | |
| Type of Soil | Prepared Subgrade 2.0 | | CAT 90 | 6F | |
| Bedding material | | | | | |
| Temperature | 1 | 9°C | | | |
| Test regime | Loading Stage No. | Load (kN) | Dial Ga | inge Reading (mm) | |
| Loading Stage | 0 | 1.414 | | 10.00 | |
| | 1 | 7.07 | | 9.65 | |
| | 2 | 14.14 | | 9.59 | |
| | 3 | 21.21 | | 9.50 | |
| | 4 | 28.28 | | 9.40 | |
| | 5 | 35.35 | | 9.24 | |
| | 6 | 42.42 | | 9.10 | |
| | 7 | 49.49 | 9.00 | | |
| | 8 | 56.56 | 8.87 | | |
| | 9 | 63.63 | 8.78 | | |
| | 10 | 70.7 | | 8.63 | |
| Unloading Stage | 11 | 56.56 | 8.63 | | |
| | 12 | 49.49 | 1 | 8.64 | |
| | 13 | 35.35 | | 8.79 | |
| | 14 | 21.21 | 12.2 | 8.93 | |
| | 15 | 1.414 | | 9.66 | |
| lest regime | Loading Stage No. | Load (kN) | Dial Gauge Reading (m | | |
| Reloading Stage | 0 | 1.414 | | 9.66 | |
| | 1 | 7.07 | | 9.30 | |
| | 2 | 14.14 | | 9.21 | |
| شركية | 3 | 21.21 | | 9.15 | |
| يشاء للمقاولات العامة) | 4 | 28.28 | 19-11-1 | 9.03 | |
| uaa general construction | n 5 | 35.35 | 0 | 8.91 | |
| tan general t | 6 | 42.42 | | 8.85 | |
| | 7 | 49.49 | | 8.76 | |
| | 8 | 56.56 | | 8,70 | |
| مصرية البليقية التعوم والتقطووية | ental 9 | 63.63 | | CONSULA | |
| | Market and | - | 187 | 10 16 | |
| ejust advegenc unit 0230400 19. Trans. Geol | | 11 of 31 | SPE | CHATTER H@elust.er | |

| MATERIAL | | S5-B-1N |
|-----------------------|--------------------------------|------------------|
| INSPECTION REQUEST | N Inshaa al | |
| Contractor | INSHAA GENERAL OF CONSTRUCTION | Designer Company |

| Company | | | Des | Igner | Comp | зпу | (SPE | TRUMJ | nglore | ring |
|------------------|--|--|--|--|---|--|---|--|---|--|
| Name | Sien (2) | - | 0.7 | 10 | | - | | ulting Off | ice | |
| Fng Mashmad | BIT (5 | 20 | Date | e/ Seri | al Nut | nber | Tim | e | | |
| hassen elssyd | EA. | 2 | 12 | | 10.770 | | 01:0 | IO PM | | - |
| | | - | CI | - | - 2.4) | 00 | 1.000 | | 1.00 | |
| Eng. Mazen Essam | - | PLT | 371 | EW | cs | 11 | 05 | 2023 | 2 | MM 00 |
| | Company Name Eng. Moahmed hassen elssyd | Company Name Sign 5 Eng. Moahmed 5 | Company Name Sign Eng. Moahmed Sign hassen elssyd 2x 2.3 | Company Diss Name Sign Date Eng. Moahmed Eng. Mazen Essamy PLT | Company Designer Name Sign Eng. Moahmed Eng. Moahmed hassen elssyd 2002-3 Eng. Mazen Essamy PLT | Name Sign Date/ Serial Nur Eng. Moahmed 5 311 10-05-2023 hassen elssyd 20 2.3 (PLT.4) Eng. Mazen Essamy PLT 20 | Company Designer Company Name Sign Eng. Moahmed Sign hassen elssyd 20 2.3 Eng. Mazen Essamy PLT | Company Sign Date/ Serial Number Tim Name Sign Date/ Serial Number Tim Eng. Moahmed 2x 2.3 (P.L.T.4) 01:0 Eng. Mazen Essamy PLT 2x 2.3 Company | Company Sign Date/ Serial Number Time Name Sign Date/ Serial Number Time Eng. Moahmed Eng. Moahmed 200 2.3 (PLT.4) 01:00 PM Eng. Mazen Essamy PLT 200 2.3 cs 00 | Company Ocsigner Company (SPECTRUM) Englineer Name Sign Date/ Serial Number Consulting Office Eng. Moahmed Eng. Moahmed Eng. Value 10-05-2023 01:00 PM Eng. Mazen Essamy PLT 200 Cal Cal Cal Cal |

| CODE-1 | S1 to S21 Station Baference | D1 to 53 Depot Reference | Kp XXX Note |
|--------|--|--|---|
| CODE-3 | and a second | Work Activity Sub Element of Activity | For Kilometer point only Start Km is used |

| Description o | n waterials | Prepared sub grade level 2 | | | | | |
|---|-------------------|----------------------------|---------------|----------------------------------|--|---|---|
| Location to b | e Used | St. (371+000) To (371+100) | | | | | |
| MAR Approv. | il No | M.A.R.P.S. | G1 | | | Date | 09/04/2022 |
| Supplier Nam | | | 0.2 | | | | 08/04/2023 |
| Test Requirement P.L.T (DIN 18134) | | 134) | opecification | | EARTHWORK SPECIFICATIONS & TESTING REPORT (CG22-41.2) VERSION 2 BY CIVEDON GROUP | | |
| Reference Pho | | Yes / No | | Other | | Rev UIR- P-S-G 6 | |
| Item Descrip | | in the Ville | U | nit | Quantity | Arrival Date | and the second se |
| 1 PLATE | OAD TEST | | N | JMBER. | 4 | 11/05/2023 | Note |
| 3 | | _ | | | 1 | 10,007,0023 | |
| | | | _ | | | | |
| | | | | | | | |
| Comments by: | Test Result | Essamy (SPEC | | 1-P 2-R | late Load Te | Eng. Alaa Abd A it Was Carried-ou attached and acc | |
| Omments by: -The Plate Load | | SPERMIN 1813 | 4) is | 1-P 2-R spe 3-Fi com | late Load Te esults report cifications, nal approval iments. | it Wes Carried-ou attached and acc is subject to abov | t By (E-just) reptable with project |
| Omments by: -The Plate Load | Test Besult | SPERPIN 1813 | 4) is | 1-P 2-R spe 3-Fi com | late Load Te esults report cifications, nal approval iments. | it Was Carried-ou attached and acc is subject to abov | t By (E-just) reptable with project rementioned Calal ON glass ochoan general const |
| Omments by: -The Plate Load pproved, | Name | SPERPIN 1813 | 4) is | 1-P 2-R spe 3-Fi com | late Load Te esults report cifications, nal approval iments. | It Was Carried-ou attached and acc is subject to abov | t By (E-just) reptable with project rementioned Coulcil ON glass ashoa general com- A-AWC-R |
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Technical Report

Plate Loading Tests

KM 371+000 to 371+025, KM 371+025 to 371+050, KM 371+050 to 371+075, and KM 371+075 to 371+100

Prepared Subgrade 2

Project

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

Prepared for

Inshaa General Construction

3 Mobilka CC - Abu Youssef, Alexandria, Egypt

(May 11, 2023)

يعتبد الما اميين عنام الجامعة لواء مهندس (أسادة طبيعي

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Civil Fugineering Testing & Consultung Unit رحدة اغتبارات واستثقارات المند

1. Introduction

The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by Inshaa General Construction to conduct 4 plate loading tests on the Prepared Subgrade 2 of the Electric Express Train project at 4 locations (KM 371+000 to 371+025, KM 371+025 to 371+050, KM 371+050 to 371+075, and KM 371+075 to 371+100) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Mahmoud Shaban of Inshaa General Construction. Field team members (Mr.Mohamed Mamdouh) from the working CETCU team visited the project site on May 11, 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 24± 1°C.

 The plate was carried out on a Prepared Subgrade 2 (according to the company) at 4 points (KM 371+000 to 371+025, KM 371+025 to 371+050, KM 371+050 to 371+075/6 and KM 371+075 to 371+100). The test surface area was levelled, and the plate was bedded on this surface.

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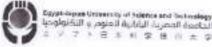
E-JUST CETC Unit

 The hydraulic jack was placed on the middle of, and normal to, the loading place beneath the reaction loading system and secured against tilting.

 The seattion loading system was a heavy resilting propose to ader CAT 966F 25-قادلان العامة onstruction AV CIUSLEDU A 23050015-A. Trans. GeoD

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3. Test Procedure and Results

The plate load test was conducted in accordance with the DIN18134. Loading, unloading, and reloading regimes were considered to estimate the resilient modulus of the tested soil. Prior to the test, the force transducer and dial gauge were reset to zero, and then a load corresponding to a stress of 0.01 MN/m2 was applied. The load was increased in the first loading cycle until a normal stress of 0.25 MN/m2 was reached, and the loading increment was 0.025 MN/m2. The load was gradually released in four stages. Following unloading, a second loading cycle was performed, but the load was only increased to the penultimate stage of the first cycle. 4 plate loading tests on the Prepared Subgrade 2 of the Electric Express Train project were conducted at 4 locations (KM 371+000 to 371+025, KM 371+025 to 371+050, KM 371+050 to 371+075, and KM 371+075 to 371+100) and the data collected at the 4 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 371+000 to 371+025), while Table 2 shows the data obtained at the second loading stage.

| Loading st | tage Load (F) | Normal | Settleme |
|------------|---------------------------------------|--|--|
| 1.1 | kN | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.00 |
| 1 | 7.07 | 0.025 | 0.20 |
| 2 | 14.14 | 0.050 | 0.28 |
| 3 | 21.21 | 0.075 | 0.35 |
| 4 | 28.28 | 0.100 | 0.51 |
| 5 | 35.35 | 0.125 | 0.71 |
| 5 10 | 42.42 | 0.150 | 0.84 |
| 1 | 49.49 | 0.175 | 1.00 |
| 3 | 56.56 | 0.200 | 1.14 |
| 1 | 63.63 | 0.225 | 1.23 |
| 0 | 70.7 | 0.250 | 1.36 |
| 1 | 56.56 | 0.200 | 1.36 |
| 2 | 49.49 | 0.175 | 134 |
| 3.4 | 35.35 | 0.125 | 134 552CTRU4 0069 000000000000000000000000000000000 |
| 4 | 21 21 | 0.075 | 124 124 |
| 5 | 1.414 | 0.005 | E man |
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| 25 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | ALCON & PRIMA TO A SCHOOL STATE | 11. 35. 11 |
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Table 1: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+000 to 371+025)

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| P | Load (F) | Normal stress (a) | Settlement (S) |
|---------------|----------|-------------------|----------------|
| Loading stage | kN. | MN/m ² | mm - |
| D | 1.414 | 0.005 | 0.69 |
| 1 | 7.07 | 0.025 | 0.85 |
| 2 | 14.14 | 0.050 | 0.95 |
| 3 | 21.21 | 0.075 | 1.00 |
| 4 | 28.28 | 0.100 | 1.07 |
| 5 | 35.35 | 0.125 | 1.15 |
| 6 | 42.42 | 0.150 | 1.20 |
| 7 | 49.49 | 0.175 | 1.28 |
| 8 | 56.56 | 0.200 | 1.33 |
| 9 | 63.63 | 0.225 | 1.40 |
| | | | |

Table 2: Load-settlement data obtained at the second loading and unloading stages of the

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 371+000 to 371+025) 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 371+025 to 371+050) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 371+050 to 371+075) is provided in Tables 7-9 and Figure 3. The testing data corresponding to the fourth testing point (KM 371+075 to 371+100) is provided in Tables 10-12 and Figure 4.

Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+000 to 371+025)

| Parameters | 1st loading cycle | 2nd loading cycle |
|---|-------------------|-------------------|
| (so,max) MN/m ² | 0.25 | 0.25 |
| a _o (mm) | 0.02 | 0.72 |
| a, (mm/(MN/m ²)) | 5.22 | 4.19 |
| a ₂ (mm/(MN2/m ⁴)) | 0.97 | -5.42 |
| Ev= 1.5 rl (a1+82-80, MAX) | 82.34 | 158.76 |
| EV./EV. | 1.9 | 93 |







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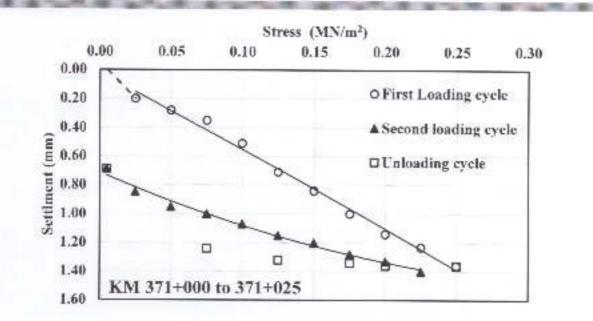


Figure 1: Load-settlement data: plate loading test performed at (KM 371+000 to 371+025)

| Charling and | Load (F) | Normal stress (o ₀) | Settlement (S) |
|--|----------|----------------------------------|---|
| Loading stage | kN | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.00 |
| 1 | 7.07 | 0.025 | 0.35 |
| 2 | 14.14 | 0.050 | 0.40 |
| 1 | 21.21 | 0.075 | 0.45 |
| 1.00 26 (00) | 28.28 | 0.100 | 0.54 |
| 5 | 35.35 | 0.125 | 0.65 |
| 6.9m Mt 1 | 42.42 | 0.150 | 0.73 |
| 7 | 49.49 | 0.175 | 0.81 |
| | 56.56 | 0.200 | 0.90 |
| 1 Contraction of the local division of the l | 63.63 | 0.225 | 1.00 |
| 10 | 70.7 | 0.250 | 1.08 |
| 11 | 56.56 | 0.200 | 1.08 |
| (2 h m - | 49.49 | 0.175 | 1.08 1.07 1.0 0.99 0.99 0.99 |
| 13 | 35.35 | 0.125 | 10 |
| L4 | 21.21 | 0.075 | OPT SA STA |
| 15 | 1.414 | A MILL LADIN MARCH MALLAN MALLAN | 030 460 |

| Table 4: Load-settlement data obtained at the first loading and unloading stages of the | |
|---|--|
| plate loading test performed at the location (KM 371+025 to 371+050) | |



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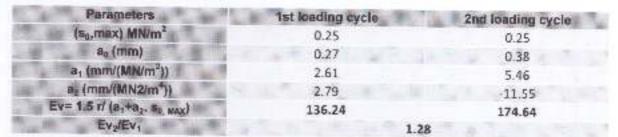


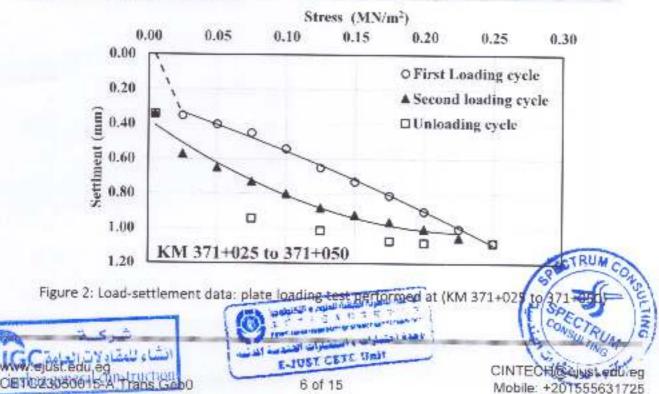
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| Table 5: Load-settlement data obtained at the second loading and unloading stages of | the |
|--|-----|
| plate loading test performed at the location (KM 371+025 to 371+050) | |

| Loading stage | koad (F) kN | Normal stress (σ _a) MN/m ² | Settlement (S) |
|---------------|-------------|--|----------------|
| 0 | 1.414 | 0.005 | 0.34 |
| 1. 00 | 7.07 | 0.025 | 0.57 |
| 2 | 14.14 | 0.050 | 0.65 |
| 3 | 21.21 | 0.075 | 0.73 |
| 4 | 28.28 | 0.100 | 0.80 |
| 5 | 35.35 | 0.125 | 0.88 |
| 6 | 42.42 | 0.150 | 0.92 |
| 7 | 49.49 | 0.175 | 0.96 |
| 8.411 | 56.56 | 0.200 | 1.00 |
| 9 | 63.63 | 0.225 | 1.05 |

Table 6: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+025 to 371+050)





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Table 7: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+050 to 371+075)

| Loading stage | Load (F) | Normal stress (an) | Settlement (S) |
|---|----------|--------------------|--|
| Sum True and Ca | kN. | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.00 |
| 1 | 7.07 | 0.025 | 0.25 |
| 2 | 14.14 | 0.050 | 0.32 |
| 3 | 21.21 | 0.075 | 0.43 |
| 1 | 28.28 | 0.100 | |
| 5 | 35.35 | 0.125 | 0.57 |
| 1 10 10 | 42.42 | 0.150 | 0.67 |
| the start and | 49.49 | 0.175 | 0.83 |
| ally the | 56.56 | 0.200 | 1. |
| 1000 | 63.63 | 0.225 | 1.08 |
| 0 | 70.7 | 0.250 | 1.17 |
| 1 | 56.56 | 0.200 | 1.31 |
| 2 | 49.49 | 0.175 | 1.30 |
| 3 | 35.35 | 0.125 | 1.29 |
| and the second se | 21.21 | 0.075 | 1.22 |
| A DESCRIPTION OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER OWNE | 1.414 | 0.005 | 1.15 0.45 |

Table 8: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+050 to 371+075)

| Loading stage | Load (F) | Normal stress (org) | Settlement (S) |
|---------------|----------|---------------------|----------------|
| | kN | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.45 |
| 1 | 7.07 | 0.025 | 0.63 |
| 2 | 14.14 | 0.050 | 0.75 |
| 3 | 21.21 | 0.075 | 0.88 |
| 4 # | 28.28 | 0.100 | 0.94 |
| 5 | 35.35 | 0.125 | 1.00 |
| 6 | 42.42 | 0.150 | 1.07 |
| 7 | 49,49 | 0.175 | 1.13 |
| 8 | 56.56 | 0.200 | 1.19 |
| 9 | 63.63 | 0.225 | 1.15 |

Table 9: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+050 to 371+075)

| Parameters | 1st loading cycle | 2nd loading cycle |
|--|---|-------------------|
| (s _p ,max) MN/m ² | 0.25 | (175 |
| a _o (mm) | 0.12 | WARUM CONS |
| #1 (mm/(MN/m ²)) | Same and a same and the same and the same | Section (1) |
| a2 (mm/(MN2/m*)) | 2.00 to 1 | S10.81 |
| Eve 1.5 r/ (a1+a2. 50, MUX) | 93.86 sale 1 sale 1 | 145.35 |
| and the second s | 1.55 Junit 1.55 | TSPECTRUM |
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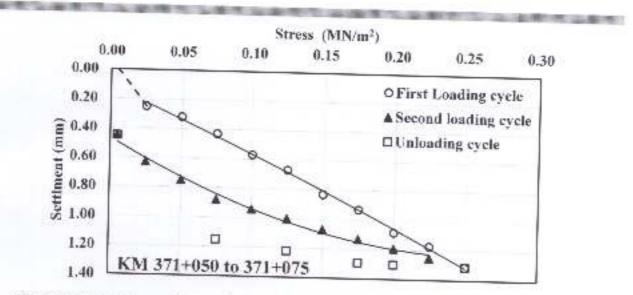


Figure 3: Load-settlement data: plate loading test performed at (KM 371+050 to 371+075)

Table 10: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+075 to 371+100)

| Loading stage | Load (F) kN | Normal stress (σ_0) | Settlement (S) |
|--|--|------------------------------|----------------|
| 0 | the second s | MN/m ² | mm |
| 0 | 1.414 | 0.005 | 0.00 |
| 1 (and 10 10) | 7.07 | 0.025 | 0.26 |
| 2 | 14.14 | 0.050 | 0.41 |
| 3 | 21.21 | 0.075 | 0.50 |
| 4 | 28.28 | 0.100 | 0.55 |
| 5 | 35.35 | 0.125 | |
| 6 | 42.42 | 0.150 | 0.65 |
| 7 | 49.49 | 0.175 | 0.74 |
| 8 | 56.56 | 0.200 | 0.85 |
| 9 | 63.63 | 0.225 | 0.94 |
| 10 | 70.7 | | 1.03 |
| 20 000 000 | 56.56 | 0.250 | 1.13 |
| A STATE OF | 49.49 | 0.200 | 1.13 |
| 10 | | 0.175 | 1.12 |
| and the second s | 35.35 | 0.125 | 1.05 |
| Contraction of the local division of the loc | 21.21 | 0.075 | 0.99 |
| 15 | 1.414 | 0,005 | 0.30 CONSUL |
| | | | CONSULS |



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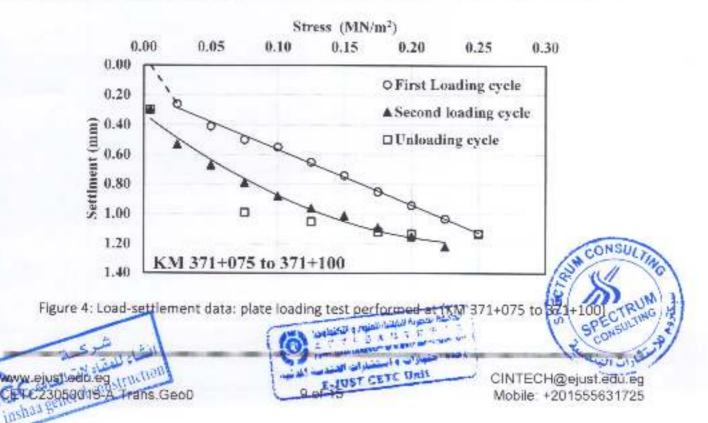
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Table 11: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+075 to 371+100)

| Loading stage | Load (F) | Normal stress (o ₀) | Settlement (S) | | |
|---------------|----------|---------------------------------|----------------|--|--|
| kN kN | | MN/m ² | mm | | |
| 0 | 1.414 | 0.005 | 0.30 | | |
| 1 1 | 7.07 | 0.025 | 0.53 | | |
| 2 | 14.14 | 0.050 | 0.67 | | |
| 3 | 21.21 | 0.075 | 0.79 | | |
| 4 | 28.28 | 0.100 | 0.88 | | |
| 5 m H | 35.35 | 0.125 | 0.96 | | |
| 5 | 42.42 | 0.150 | 1.01 | | |
| 7 2 2 | 49.49 | 0.175 | 1.09 | | |
| 8 | 56.56 | 0.200 | 1.15 | | |
| 9 | 63.63 | 0.225 | 1.22 | | |

Table 12: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+075 to 371+100)

| Parameters | 1st loading cycle | 2nd loading cycle |
|---|-------------------|-------------------|
| (s _p ,max) MN/m ² | 0.25 | 0.25 |
| a _n (mm) | 0.20 | 0.33 |
| a, (mm/(MN/m ²)) | 3.69 | 6.80 |
| B ₂ (mm/(MN2/m ⁴)) | 0.12 | -13.26 |
| Ev= 1.5 r/ (a1+a2, SD, MAX) | 120.92 | 129.14 |
| Ev2/EV1 | 1. | 07 |



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Civil Engineering Testing & Constituing Unit وحدة اغتجارات واستشارات المندسة المدنمة

4. Closure

Test results presented herein report the load-settlement data obtained from 4 plate loading tests conducted on the Prepared Subgrade 2 of the Electric Express train project at 4 locations (KM 371+000 to 371+025, KM 371+025 to 371+050, KM 371+050 to 371+075, and KM 371+075 to 371+100) in accordance with German Standard, DIN18134.

| 2 my2/ my1 millio |
|-------------------|
| 1.93 |
| 1.28 |
| 1.55 |
| 1.07 |
| |

 Note: Before interpreting these test results for future applications, the Prepared Subgrade 2 insitu variability between the testing locations should be considered.

Technical committee

Lab Engineer

Dr. Mahmoud Ahmed

Mohamed A. Al-Najjar

Prof. Dr. Mohamed F. M. Fahmy

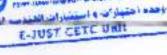


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Appendix A





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Civil Engineering Testing & Consulting Unit وهدة اغتبارات و استخارات المندسة المنية

| Location of test site: | KM 371+00 | 00 to 371+025 | Field team | Mr.Mohamed Mamdoub |
|--|-----------------------|--------------------------------------|---------------|-----------------------|
| Project title: | | rain Project - Inshaa onstruction | Date: | 11/5/2023 |
| Diameter of loading plate | | 600 | Time | 10:30:00 am |
| plate | | | | 10:58:00 am |
| Lever ratio | | 1 | Note: | eres-e |
| Type of Soil | Prepared | Subgrade 2 | CAT 90 | 66F |
| Bedding material | | | - | |
| Temperature | | 4°C | | |
| Test regime | Loading Stage No. | | Dial Ga | uge Reading (mm) |
| Loading Stage | 0 | 1.414 | | 10.00 |
| | 1 | 7.07 | | 9.80 |
| | 2 | 14.14 | | 9.72 |
| | 3 | 21.21 | | 9.65 |
| | 4 | 28.28 | | 9.49 |
| | 5 | 35.35 | | 9.29 |
| | 6 | 42.42 | 9.16 | |
| | 7 | 49.49 | 9.00 | |
| | 8 | 56.56 | 8.86 | |
| | 9 | 63.63 | | 8.77 |
| | 10 | 70.7 | - | 8.64 |
| Unloading Stage | 11 | 56,56 | | 8.64 |
| 494.00084547.00071C24047515 | 12 | 49.49 | | 8.66 |
| | 13 | 35.35 | | 8.68 |
| | 14 | 21.21 | | 8.76 |
| | 15 | 1.414 | | 9.31 |
| l'est regime | Loading Stage No. | Load (kN) | Dial Ga | nge Reading (mm) |
| Reloading Stage | 0 | 1.414 | | 9.31 |
| | 1 | 7.07 | | 9.15 |
| | 2 | 14.14 | | 9.05 |
| | 3 | 21.21 | | 9.00 |
| 1 | 4 | 28.28 | | 8.95 H CONSUL |
| - C | 5 | 35.35 | | 8,85/ (|
| الساء للمقاد لاء | River Bizest a return | 42.42 | - | |
| "Talali Construction | 3-1 To concenso | 49.19 | | AT OECTRU |
| الشاء للعقاد لات العامة. عنه general construction عنه general construction | | TC Unit 56.56 | | STATE SPECTRU |
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Civil Engineering Testing &: Consulting Unit وهدة اغتبارات واستشارات المندسة المنيية

| Location of test site: | KM 371+02 | 5 to 371+050 | Field | Mr.Mohamed | |
|--|-----------------------------------|-------------------------------------|-------------------|----------------------|--|
| Project title: | Electric Europe To | ain Ducisat Inches | team Date: | Mamdouh 11/5/2023 | |
| rojeci dde: | | ain Project - Inshaa onstruction | Date: | 11/3/2023 | |
| Diameter of loading | | | Time | 11:05:00 am | |
| plate | 6 | 00 | | 11:33:00 am | |
| ever ratio | | 1 | Note: CAT 966F | | |
| Type of Soil | Prepared | Subgrade 2 | | | |
| Bedding material | - | | | | |
| Femperature | 24 | РС | | | |
| l'est regime | Loading Stage No. | Load (kN) | Dial Ga | uge Reading (mm) | |
| Loading Stage | 0 | 1.414 | | 10.00 | |
| | 1 | 7.07 | | 9.65 | |
| | 2 | 14.14 | | 9.60 | |
| | 3 | 21.21 | | 9.55 | |
| | 4 | 28.28 | | 9.46 | |
| | 5 | 35.35 | | 9.35 | |
| | 6 | 42.42 | | 9.27 | |
| | 7 | 49,49 | - | 9.19 | |
| | 8 | 56.56 | | 9.10 | |
| | 9 | 63.63 | - | 9.00 | |
| | 10 | 70,7 | 8.92 | | |
| Inloading Stage | 11 | 56.56 | - | 8.92 | |
| and an | 12 | 49.49 | - | 8.93 | |
| | 13 | 35.35 | - | 8,99 | |
| | 14 | 21.21 | - | 9.06 | |
| | 15 | 1.414 | | 9.66 | |
| l'est regime | Loading Stage No. | Load (kN) | Dial Ca | uge Reading (mm) | |
| Reloading Stage | 0 | 1.414 | 17iar Cia | 9.66 | |
| centrating stage | 1 | 7.07 | - | 9.43 | |
| | 2 | 14.14 | - | 9.35 | |
| | | | | | |
| | 3 | 21.21 | - | 9.27 | |
| شركية الشاء للمقاولات العامة. a general construction | 4 | 28.28 | - | 9.20 | |
| النشاء للمقادين | 5 | 35.35 | | 9.12 | |
| Additional construction | 6 | 42.42 | - | 9.08 CONSU | |
| کی دیت و لات انعاد و a general construction | 7 | 49.49 | - | | |
| V.MIS- | The second distance of the second | 56.56 | _ | 9.06 | |
| (F) | 9 | 63.63 | | 8195 CTR | |
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Civil Engineering Testing & Consulting Unit وحدة اختيارات واستشارات المغدسة المدغية

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| ocation of test site: | KM 371+050 | 0 to 371+075 | Field team | Mr.Mohamed Mamdouh | | |
|------------------------------|------------------------------------|--|---------------|--|--|--|
| oject title: | Electric Express Tra General Co | ain Project - Inshaa onstruction | Date: | 11/5/2023 | | |
| iameter of loading | | | Time | 11:40:00 am | | |
| ate | 6 | 00 | | 12:08:00 pm | | |
| ever ratio | | 1 | Note: | | | |
| pe of Soil | Prepared S | Subgrade 2 | CAT 9 | CAT 966F | | |
| edding material | - | - | | | | |
| emperature | - | °C | | | | |
| st regime | Loading Stage No. | Load (kN) | Dial G | ruge Reading (mm) | | |
| ading Stage | 0 | 1.414 | | 10.00 | | |
| | 1 | 7.07 | | 9.75 | | |
| | 2 | 14.14 | | 9.68 | | |
| | 3 | 21.21 | | 9.57 | | |
| | 4 | 28.28 | | 9.43 | | |
| | 5 | 35.35 | | 9.33 | | |
| | 6 | 42.42 | 2 | 9.17 | | |
| | 7 | 49.49 | 1 | 9.07 | | |
| | 8 | 56.56 | - | 8.92 | | |
| | 9 | 63.63 | | 8.83 | | |
| | 10 | 70.7 | | 8.69 | | |
| nloading Stage | 11 | 56.56 | | 8.70 | | |
| Inonaning creage | 12 | 49.49 | | 8.71 | | |
| | 13 | 35.35 | | 8.78 | | |
| | 14 | 21.21 | | 8.85 | | |
| | 15 | 1.414 | | 9.55 | | |
| a alcology | Loading Stage No. | Load (kN) | Dial C | auge Reading (mm) | | |
| est regime cloading Stage | 0 | 1.414 | in o | 9.55 | | |
| cioaung Stage | 1 | 7.07 | | 9.37 | | |
| | 2 | 14.14 | - | 9.25 | | |
| | 3 | 21.21 | - | 9.12 | | |
| | 4 | 28.28 | | 9.06 | | |
| 0 e h | 5 | 35.35 | - | 9.00 | | |
| شرکے: شارید: بعد | 3 | 42.42 | - | | | |
| شاء للمقاولات العامة | 6 | 42.42 | | 8.93 8.87 | | |
| a general construction | 1 | 1 h hanne an | | 8.81 /5 | | |
| 10 Martin | 8 | 56.56 | - | 8.75 | | |
| | ALLER & PROMINIAN AND | 63.63 | 1 | 8./5 | | |
| ejust.edu.eg | Geo0t-JUST CETC UN | 14 of 15 | | 8.75 CINTECH@ejuste Mobile: -2015556 | | |

Mobile: -201555631725



Egges upon techenity of idence and Technology trapped in graphic field strategy in the second strategy is $\mathcal{X} \to \mathcal{X}$, $\mathcal{Y} \to \mathcal{Y} \to \mathcal{X} \to \mathcal{R}$, $\mathcal{R} \to \mathcal{R}$, $\mathcal{R} \to \mathcal{R}$

Civil Engineering Testing & Consulting Unit وحدة اغتبارات واستشارات الملدسة المدنية

| Location of test site: | KM 371+075 | 5 to 371+100 | Field team | Mr.Mohamed Mamdoub | | |
|--|------------------------------------|---|-------------------|--|--|--|
| Project title: | Electric Express Tra General Co | | Date: | 11/5/2023 | | |
| Diameter of loading | | | Time | 12:15:00 pm | | |
| plate | 60 | 00 | - | 12:43:00 pm | | |
| Lever ratio | 1 | | Note: CAT 966F | | | |
| Type of Soil | Prepared S | Subgrade 2 | | | | |
| Bedding material | | - | | | | |
| Temperature | 24 | The second se | - | | | |
| Test regime | Loading Stage No. | Load (kN) | Dial G | auge Reading (mm) | | |
| Loading Stage | 0 | 1.414 | | 10.00 | | |
| | 1 | 7.07 | | 9.74 | | |
| | 2 | 14.14 | | 9.59 | | |
| | 3 | 21.21 | | 9,50 | | |
| | 4 | 28.28 | | 9.45 | | |
| | 5 | 35.35 | | 9.35 | | |
| | 6 | 42.42 | | 9.26 | | |
| | 7 | 49.49 | | 9.15 | | |
| | 8 | 56.56 | | 9.06 | | |
| | 9 | 63.63 | | 8.97 | | |
| | 10 | 70.7 | | 8.87 | | |
| Unloading Stage | 11 | 56.56 | | 8.87 | | |
| Unioating stage | 12 | 49.49 | | 8.88 | | |
| | 13 | 35.35 | | 8.95 | | |
| | 14 | 21.21 | | 9.01 | | |
| | 15 | 1.414 | | 9.70 | | |
| West minister | Loading Stage No. | | Dial (| lange Reading (mm) | | |
| Test regime Reloading Stage | 0 | 1.414 | | 9.70 | | |
| Retoauting stage | 1 | 7.07 | | 9,47 | | |
| | 2 | 14.14 | | 9.33 | | |
| | 3 | 21.21 | | 9.21 | | |
| | 4 | 28.28 | | 9.12 | | |
| | 5 | 35.35 | | 9.04 | | |
| | 6 | 42.42 | | 9.04 8.99 (CON 8.91 (CON | | |
| المركبة | 1 | 49.49 | - | 8.91 8 10 | | |
| اء للمقاولات العامة GC Ishaa general construc | tion is an | 56.56 | | and the local states of the second states of the se | | |
| shaa general construct | | 6343 | 1 | 8.78 0 9PEC | | |

CINTECH@ejust.edu.eg Mobile: +201555631725

S5-B-IN

| MATERIAL INSPECTION REQUEST | - | Inshao | البلاغانة الطرق و (لكاري) (6048) | A | Notice Date and | |
|-----------------------------------|---|--------|--|---|-----------------|--|
| Contractor INC | | | | | | |

| Company | | | | | | | | SPECTRUM) Englowering Consulting Office | | |
|------------------------|---------------------------------|-------------------------------------|---|--|--|---|--|--|--|--|
| Name | Sign | Date | / Seri | ial Nun | nber | | | | - | |
| Eng. Mahmoud shaban | chê 50 E | 1 | 19/06 | 6/2023 | | I | 1 | | | |
| 5 | \sim | _ (1 | a | 10,C2 F | 00 | 3464 | ŶŸ | 1111 | MM | |
| Eng. Mazen Essamy | PLY | 371 | EW | CS | 20 | 06 | 2023 | 2 | 00 | |
| | Company Name Eng. Mahmoud | Name Sign Eng. Mahmoud shaban | Company Date Name Sign Eng. Maken Essamy Other Sign | Company Date/ Series Name Sign Eng. Mahmoud Charged Shaban Charged Eng. Mazen Essamy PLT | Company Date/ Serial Num Name Sign Eng. Mahmoud Charsel Shaban 19/06/2023 IP.L.T.5) 61 Eng. Mazen Essamy PLT | Company Date/ Serial Number Name Sign Eng. Mahmoud Classifier Company Image: Sign Bate/ Serial Number Image: Sign 19/06/2023 Image: Sign 19/06/2023 | Company Designer company (spectromy Name Sign Date/ Serial Number Time Eng. Mahmoud Charster 19/06/2023 02:0 Eng. Mazen Essamy PLT 20 00 | Company Delighter Company (SPECTRUM) E Consulting Off Name Sign Date/ Serial Number Time Eng. Mahmoud shaban Charged 19/06/2023 (P.L.T.5) 02:00 PM Eng. Mazen Essamy PLT Consulting Off | Company Delighter Company (SPECTROM) Engineer Consulting Office Name Sign Date/ Serial Number Time Eng. Mahmoud shaban Charafter 19/06/2023 (P.L.T.5) 02:00 PM Eng. Mazen Essamy PLT 271 50 MM YY 101 | |

| CODE-1 | 51 to S21 Station Reference | Di to \$3 Dapot Reference | Kp XXX Note |
|----------|--------------------------------|------------------------------|---|
| CODE - 2 | 101 | WorkActivity | For Kilometer point only Start Km is used |
| COBL - 3 | | Sub Element of Activity | |

| | | | Charles and the control of the | | | | | | | |
|-------------------------------------|---------------------------------------|--|--|---------|--|-------------------------------------|--|--|--|---|
| Descr | ription of | Materials | Sub Bailast 2. | | | | | | | |
| Locat | ion to be | Used | St. (371+000) To (371+100) | | | | | | | |
| MAR Approval No. M.A.R. (B.S.1) | | | | | | Date | T | 29/04/2023 | | |
| Suppl | plier Name | | | | | | | | - | |
| Test Requirement P | | P.L.T (DIN 18134) Specificatio | | ation | EARTHWORK SPECIFICATIO REPORT (DG21-41.2) VERSIO GROUP | | CATIONS & PESTING VERSION 2 BY CIVEC | | | |
| Refer | ence Pho | tos | Yes / No | | C | ther | | Rev UIR-S.B- | (7) | |
| Item | Descript | and the second sec | の明ら重 | 1 | Unit | 8.9 | Quantity | Arriva Dat | e h | Vote |
| 1 2 | PLATEL | OAD TEST | | | NUME | BER. | 4 | 20/06/202 | the state of the s | |
| 3 | | | | | | - | | | | |
| () () | | | | - | | - | | | _ | |
| | Plate Load | Eng. Mazen Test Result | Essamy (SF P.L.T (DIN 18 SPG | PECTRU | VI) | 1-Pl 2-Re spec | ate Load Te ssults repor ifications. | t attached and | out b accep | y (Comibassal) dable with project |
| Comm | Plate Load | | | | MJ. | 1-PI 2-Re spec 3-Fi | ate Load Te ssults repor ifications. | st was carried t attached and l is subject to a | out b accep bove | y (Comibassai) table with project |
| Comm 1 The I Approv | Plate Load | Test Result | | BI34)IS | PROVA | 1-PI 2-Re spec 3-Fi Rom | ate Load Te esults repor ifications, nal approva iments. | st was carried t attached and lis subject to a | out b accep bove | y (Comibessar) table with project semitiones کی تقریح کارت داشتا و Construction |
| Comm 1 The I Approv | Plate Load ved | Test Result | P.L.T (DIN 18 SPECTRUM SPECTRUM AND | AP | | 1-PI 2-Re spec 3-Fi Rom | ate Load Te esults repor ifications, nal approva iments. | at was carried t attached and lis subject to a lis subject to a Date | boys boys clip clip | y (Comibessal) itable with project per dones S you of the Notific tottl at construction |
| Comm 1 The I Approv | Plate Load ved | Test Result | | AP | PROVA | 1-PI 2-Re spec 3-Fi Rom | ate Load Te esults repor ifications, nal approva iments. | at was carried t attached and lis subject to a lis subject to a Date | out b accep bove | y (Comibessal) itable with project per dones S you of the Notific tottl at construction |
| Comm 1 The I Approv Organi | Plate Load ved isation ictor | Test Result | P.L.T (DIN 18 SPECTRUM SPECTRUM AND | AP | PROVA | 1-PI 2-Re spec 3-Fi Rom | ate Load Te esults repor ifications, nal approva iments. | at was carried t attached and lis subject to a lis subject to a Date | boys boys clip clip | y (Comibessal) itable with project per dones S you of the Notific tottl at construction |
| Comm 1 The I Approv | Plate Load ved isation ictor | Name Eng. Mah | P.L.T (DIN 18 SPECTRUM ONE Moud shaban | AP | PROVA | 1-PI 2-Re spec 3-Fi Rom | ate Load Te esults repor ifications, nal approva iments. | at was carried t attached and lis subject to a lis subject to a Date | boys boys clip clip | y (Comibessar) itable with project semitories Synchronics Synchronics (Construction (Construction A-AWC-R 3 A |

Representative Eng. Alas Despire ** Algement / Adges: Culvert Crity



COMIBASSAL International Controllers Internal inspection and laboratories sector Accredited by : Egyption General Authority for Petroleum under No. 34/29-11-2011 Accredited by : Egyption Accreditation council (EGAC) under No. 031706/IA

Technical report

of Plate Loading Test (DIN 18134)

| General | 1 | SYSTRA |
|--------------|---|-----------------------------|
| Consultant | 3 | SPECTRUM |
| Contractor | : | شركة إنشاء للمقاولات العامة |
| Project | : | ELECTRIC EXPRESS TRAIN |
| Sample | : | Sub-Ballast (2) |
| Station | | ST(371+000) TO ST(371+100) |
| Date of Test | : | 20/6/2023 |
| QC | : | 1453 |



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Introduction:

The Plate Load test is designed to determine the vertical deformation and strength characteristics of soll by assessing the force and amount of penetration with time when a rigid plate is made to penetrate the soil.

The test to be carried out on the native soil according to German specifications DIN 18134.

Test methods :

 The German standard DIN 18134 was applied to define the apparatus used, the loading system, test conditions, and procedure for plate load test.

2-Loading plates with a diamter of 600 mm have a thickness of 25mm and are provided with equally spaced stiffners with even upper faces parallel to the plate bottom face to allow 300 mm plate to be placed on top of it.

3- The loading system consisted of a hydrulic pump connected to a hydrulic jack of 700 bar capacity, which is capable of applying and releasing the load stages.

4 The dial gauge used to measure the plate settlement has a resolution of 0.01mm and the lever ratio was equal to 1.

5- The temperature at the time of the test was 25".

6- The plate was carried out on a native soil (sand-gravel). The test surface area was level ed and the plate was bedded on this surface.

7- The hyrulic jack was placed on the middle of, and at normal to, the loading plate beneth the reaction loading system and secured against tiliting.

8- The reaction loading system was a heavey multi-purpose excavator (more than 20 ton).

Description of exprement:

1- Loading, unloading and reloading regims were applied according to DIN 18134 for the plate load test to estimate the resilient modulus

2- Prior to the test, the force transeducer and dial guage were set to zero, after which a load was applied corresponding to a stress of 0.01 MN/m2.

3- In the first loading cycle, the load was increased until a normal stress of 0.25 MN/m2 was reached, and the loading increaement was 0.025 while 2. The load was released in four stages.

4- Following unloading, a further second loading cycle was carried out, in which, the load was increased only to the penultimate stage of the first cycle.

No 23 Alexandra - Caro Desert Road - Merghem Ale 23 Alexandra - Caro Desert Road - Merghem Ale 02 03 Azerson - 002 034701191 Eneil : ciwiepi@combassal.com Web3ne : www.combassal.com



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St (371+000) to (371+025) km

600

Table 1: Measured values for first loading cycle and unloading cycle

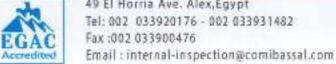
| Loading stage no. Lond (P) kN | | Normal stress (se) MN/m | Settlement of loading place 5 (mm) |
|--|---|-----------------------------|--|
| 0 | 1.414 | 0.005 | 0.00 |
| 1 | 7,07 | 0.625 | 0.07 |
| 2 | 14.14 | 11,3(50) | 0.14 |
| 3 | 21.21 | 0.075 | 8.21 |
| 4 | 29.28 | 0.199 | 8,26 |
| | 35.35 | 0.125 | 0.32 |
| - | 42.43 | 0.150 | 0.55 |
| 7 | 49.49 | 0.175 | 11.44 |
| 8 | 56.56 | 0.200 | 0.50 |
| q | 63,64 | 0.215 | 0.55 |
| (0 | 20.7 | 0.250 | 0.60 |
| 11 | 56,56 | 0.200 | 0.59 |
| 12 | 49.49 | 0.175 | 11.58 |
| 13 | 35.35 | 0.125 | 0.47 |
| 14 | 21,21 | 0.075 | 8.35 |
| 15 | 1.414 | 0,095 | 0.17 |
| | the second se | es for second londing cyrle | |
| Loading stage no. | Land (F) kN | Normal stress (30) MN/m2 | Settlement of busding plate S (mm) |
| 13 | 1.414 | 0.005 | 0.17 |
| lñ | 7.07 | 0.025 | 0.25 |
| 17 | 14.14 | 0.059 | 0.29 |
| 18 | 21.21 | 0.075 | 0.15 |
| [9 | 28.15 | 0.100 | 1641 |
| 20 | 35.35 | 0.125 | 0.46 |
| 21 | 42.42 | 0,150 | 0.32 |
| 22 | 49,49 | 0,175 | 0.96 |
| 23 | \$6.96 | 0,200 | 0.63 |
| 24 | 63,63 | 0.225 | 1665 |
| 100 | Fable 3: Com | pilation of results | S. Shine It |
| Para | meters | 1st hooding evele | 2nd loading sycle |
| 10. | MN/m ² | 0.250 | 0.250 |
| 1.0.0 | 100100000 | 0.008 | 9.164 |
| | mm) (MN/m ²)) | 2.680 | 2.747 |
| | MN ² /m ²)) | 4.152 | -3.298 |
| | | | 207.13 |
| and the second state and the second state of t | stande og en start. Ster t | 1.30 | 1.12 |

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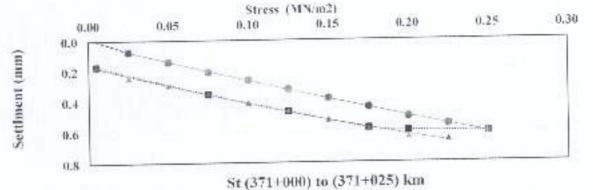


Fig. 1: Load-settlement curve, fitting curves according to Table 1 and Table 2 for the first and second loading cycles

Measurment points from the first loading cycle

Measurment points from the unicoiding cycle

- Measurment points from the second loading cycle
- 5 Settlement in mm
- o, Normal stress MN/m2





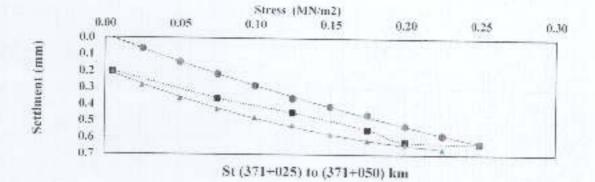


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Fig. 2: Load-settlement curve, fitting curves according to Table 4 and Table 5 for the first and second loading cycles

Measurment points from the first loading cycle -Measument points from the unloading cycle. Measurment points from the second loading tycle 11 5 Settlement in mm

ac Normal stress MN/m³





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St (371+050) to (371+075) km

500

| Table 7: Measured va | lues for first loading cycl | s and unloading cock- |
|----------------------|-----------------------------|-----------------------|
|----------------------|-----------------------------|-----------------------|

| Loading stage no. | Lund (F) §S | Normal stress (s _k) MN/m ² | Settlement of fronting plane S (mm) |
|--|----------------------|---|---|
| p | 1.414 | 0.045 | 6.00 |
| 1 | 7.67 | 0.125 | 6.09 |
| 2 | 11.11 | 0.080 | 0.14 |
| 1 | \$1.21 | 0.075 | 0.19 |
| + | 25,25 | 0,100 | 0.20 |
| 5 | 35.35 | -0.125 | 0.26 |
| 6 | 42.43 | 0.159 | 0.32 |
| 7 | 49.49 | 0.125 | 0.39 |
| 8 | \$6,56 | 0,200 | 0.45 |
| 0 | 63.63 | 6,225 | 0.52 |
| 10 | 28.7 | 0.250 | 0.55 |
| 11 | 36,56 | 0,200 | 8.62 |
| 11 | 19.19 | 0.175 | 0.55 |
| 16 | 35.35 | 0.125 | 0.44 |
| 14 | 21.21 | 1/075 | 0.32 |
| 15 | 1.41 + | 1.005 | 0.56 |
| | able 5. Measured yah | ies for second lootling cycle | |
| anding stage 20. | Load (F) kN | Normal arress (87) MN/m2 | Settlement of loading plate S (mm) |
| 15 | 1.414 | 0.005 | 816 |
| 10 | 7.07 | 0.025 | 0.20 |
| 17 | 14,14 | 0.050 | 0.25 |
| -18 | 31.21 | 0.075 | 8.31 |
| 19 | 28.28 | 0.100 | 0.36 |
| 20 | Le La | 0.125 | 0.42 |
| 11 | +2.+2 | 0.150 | 0.47 |
| 12 | 49.49 | 0.175 | 0.52 |
| 13 | 56.56 | 0,200 | 0.57 |
| 14 | 63.63 | 0.225 | 0.62 |
| | Table 9: Com | pilation of results | |
| Paran | witers. | Ist knaking tycle | 2nd loading evel |
| (C _{1+a}) | MN2m ² | 6.239 | 0.250 |
| ile in | | 4,056 | 0.150 |
| a. (uum/) | | 1,407 | 2165 |
| a ₂ (in m/() | | 2.547 | -0.288 |
| A CONTRACTOR OF A CONTRACTOR OF A | | 239.21 | 215,00 |
| of the second se | -a. 0, 0. x. | 0.99 | |
| SARCARUS . | | | (5) |

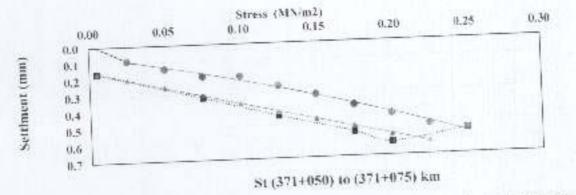
شركة 4 المقاولات العامة 7

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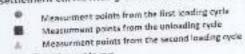


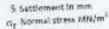


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Fig. 3: Load-settlement curve, fitting curves according to Table 7 and Table 8 for the first and second loading cycles















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5t (371+075) to (371+100) km

600

| Little Lie devance andea | out the st termine ciccas ten to | unanun" (ice |
|--------------------------|----------------------------------|---------------|
| | | Settlement of |

| 1 mediag stage no. | 1 and (F) 48 | Normal stress (s ₀) MN/m ² | Settlement of Inording plate S (mm) |
|---|---|---|---|
| .0 | 1.414 | 6.005 | 0.00 |
| 1 | 7.07 | 0.025 | 0.07 |
| 3 | 14.14 | 0.054 | 0.15 |
| 3 | 21.21 | 0.075 | 0.21 |
| 4 | 28.28 | 0.100 | 0.28 |
| 5 | 35.35 | 4,125 | 0.34 |
| 0 | 42.42 | 10,1201 | R.40 |
| 7 | 49.49 | 0.17# | 0.45 |
| 8 | \$6.50 | 0,200 | 0.80 |
| 9 | 4543 | 6,225 | 0.54 |
| 10 | 70.7 | 0.350 | 0.58 |
| U . | 50.50 | 0.209 | 0.57 |
| 12 | 49.49 | 0.175 | 0.50 |
| 13 | J5.15 | 0.125 | 0.45 |
| 14 | 21.21 | 0.075 | 0.30 |
| 15 | 6,614 | 0.005 | 9.20 |
| Т | able 11. Measured val- | ses for second loading cycle | |
| Londing stage 20. | Load (F) kN | Normal stress (30) MN-m2 | Settlement of loading plate S (nm) |
| 18 | 1.414 | 0.005 | 0.20 |
| 16 | 7,07 | 0.635 | 0.28 |
| 17 | 14.14 | 11.051 | 0.32 |
| 18 | 21.21 | 0.575 | 0.18 |
| 15 | 18.15 | 0.100 | 0.43 |
| 10 | 35.35 | 0.125 | 0.48 |
| 23 | =2,=2 | 0,150 | 0.52 |
| 22 | 49.49 | 0.375 | 0.57 |
| 31 | \$6.56 | 0.200 | 0.59 |
| 74 | 63.63 | 0.225 | 0.63 |
| | Table 12; Con | npilation of results | and the second second second |
| Para | neters | 1st leading cy cir | 2nd Maning tyth |
| (Of real | MN/m ² | 0.250 | 9.250 |
| | mm) | -10.003 | 0.196 |
| | MNon'i) | 2.197 | 2,598 |
| COLUMN THE REAL PROPERTY AND ADDRESS OF THE PARTY OF THE | MN/m ² f) | -3-435 | 1.515 |
| | and the second se | 118.11 | 1 414 34 |

الشاء لامتاولات العامة senetal construction

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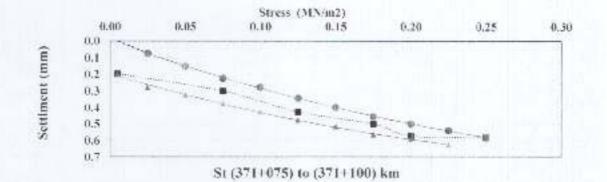
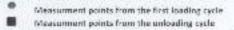


Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles



Measument points from the second loading cycle 5 Settlement in mm

 σ_0 Normal stress MN/m^l







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S5-B-IN

| MATERIAL INSPECTION REQUEST | -35 | Inshao | الهدامانة المرقو إكثري بالاقترا | | ata.gt.s |
|-----------------------------------|-----|--------|---------------------------------------|--|----------|
| | | | | | |

| Contractor | Company | | Designer Company | | | Consulting Office | | | | |
|-------------------------|-------------------|------|------------------|----------|--------|-------------------|------|-------|----|------|
| | Name | Sign | Date | / Serk | al Nun | nber | Time | 1 (I | | |
| Issued by Contractor | Eng. Mahmoud | | | 02:00 PM | | | | | | |
| Received by | | 2 | CI | 32 | Ċ. | 30 | M-M | YY | ÷Н | (M2M |
| GAR8 CONSULTANT | Eng. Mazen Essamy | PLT | 371 | EQU | CS | 21 | 06 | 2023 | 2 | 00 |

| CDDE-1 | S1 to S21 Station Reference | D1 to 53 Deput Reference | Kp XXX Note For Kilometer point only Start Km is used |
|--------|--------------------------------|-----------------------------|--|
| CCDE Z | Supplier and the second second | Work Activity | |
| CC01-1 | | Sub Element of Activity | |

| Descri | ption of Materials | Sub Ballast 2. | iub Ballast 2. | | | | | | |
|------------------------------------|--|----------------------------|----------------|-------|----------|--|---|--|--|
| locati | on to be Used | St. (371+100) To (371+275) | | | | | | | |
| MAR | Approval No | M.A.R (B.S.1) | | | Date | 29/04/2023 | | | |
| Suppli | er Name | | | | | | | | |
| Test Requirement P.L.T (DIN 18134) | | P.I.T (DIN 18134) | Specification | | ation. | EARTHWORK SPECIFICATIONS & LESTING REPORT (CG21-41.2) VERSION 2-BY CVECC GROUP | | | |
| Refen | ence Photos | Yes / No | | Other | 110 | Rev UIR-S.B-(8) | &(9) | | |
| Item | Description | 14 - T - A | L n | t m K | Quantity | Arrival Date | Note | | |
| 1 | PLATE LOAD TEST | | NUI | | 7 | 21/06/2023 | | | |
| 2 | and the second | | | | | 1 | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | and the second se | | |

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

1-The Plate Load Test Result PA of Dat Approved

1-Plate Load Test was carried- out by (Comibassal) 2-Results report attached and acceptable with project. specifications. 3-Final approval is subject to above meanorized comments.

| | | 1 | Laborato C | | |
|---|-----------------------|-----------------|--|---------|--|
| 777.2 · · · · · · · · · · · · · · · · · · · | | APPROVAL STATUS | and the second s | | |
| Organisation | Name | Sign | Date | A-AWC-R | |
| Contractor | Eng. Mahmoud shaban | che- 1 | 21-05-2023 | А | |
| QA/QC * | Eng. Mazen Essamy | A | | A | |
| GARB** | Eng. Margret magdy | | | | |
| Employers Representative | Eng. Alaa Abd-Allatif | for est | 22-6-2023 | Awa | |

* Disigner

** Alignment / Undges Colvert Only



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Technical report

of Plate Loading Test (DIN 18134)

| General | : | SYST |
|--------------|---|----------------------|
| Consultant | | SPEC |
| Contractor | : | تمانية الم العامة |
| Project | : | ELEC |
| Sample | : | Sub-B |
| Station | : | ST(371 |
| Date of Test | : | 21/6/ |
| QC | : | 1459 |

'RA TRUM شركة إنشاء للمقاولات TRIC EXPRESS TRAIN Ballast (2) 1+100) TO ST(371+275) /2023





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Introduction:

The Plate Load test is designed to determine the vertical deformation and strength characteristics of soil by assessing the force and amount of penetration with time when a rigid plate is made to penetrate the

The test to be carried out on the native soil according to German specifications DIN 18134.

Test methods :

1- The German standard DIN 18134 was applied to define the apparatus used, the loading system, test

2- Loading plates with a diamter of 600 mm have a thickness of 25mm and are provided with equally conditions, and procedure for plate load test. spaced stiffners with even upper faces parallel to the plate bottom face to allow 300 mm plate to be

3- The loading system consisted of a hydrulic pump connected to a hydrulic jack of 700 bar capacity,

which is capable of applying and releasing the load stages. 4- The dial gauge used to measure the plate settlement has a resolution of 0.01mm and the lever ratio

was equal to 1.

6- The plate was carried out on a native soil (sand-gravel). The test surface area was levelled and the 5. The temperature at the time of the test was 25^{*}.

7- The hyrulic jack was placed on the middle of, and at normal to, the loading plate beneth the reaction

8- The reaction loading system was a heavey multi-purpose excavator (more than 20 ton).

Description of exprement:

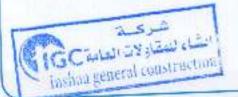
1- Loading, unloading and reloading regims were applied according to DIN 18134 for the plate load test

2- Prior to the test, the force transeducer and dial guage were set to zero, after which a load was applied

3- In the first loading cycle, the load was increased until a normal stress of 0.25 MN/m2 was reached,

and the loading increaement was 0.025 MN/m2. The load was released in four stages. 4- Following unloading, a further second loading cycle was carried out, in which, the load was increased

only to the penultimate stage of the first cycles pe



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St (371+100) to St (371+125) km

600

Lond (F) Settlement of Loading stage un. Normal stress (sal MNm) 4N inading plate S(mm) ų, 1.414 0.005 4.00 1 7.07 0.023 0.07 2 14.14 0.050 6.12 з 21,21 0.075 0.17 4 28.28 1.100 0.22 5 35.35 0.125 0.28 42,42 0.150 1.34 49,49 0.175 11.40 8 \$6.50 0.260 0.46 -0 63.63 0.225 11.52 10 70.7 0.250 0.58 11 56.56 0.200 0.25 12 49,49 6.175 #.55 13 35.35 0.125 0.44 14 21.21 0.075 0.31 15 L414 0.005 6.15 Table 2: Measured values for arcoad loading cycle

Table 1: Measured values for first loading cycle and unloading cycle

| Londing singe no. | Load (F) kN | Normal stress (s0) MN/m2 | Settlement of broding plate S |
|-------------------|----------------|-----------------------------|----------------------------------|
| 1.5 | 1.414 | 0.005 | (00.00) |
| 16 | 7.07 | 0.625 | 0.13 |
| 17 | 14.14 | 0.050 | 0.17 |
| 18 | 21.21 | 0.075 | 0.21 |
| 19 | 28.28 | 0.100 | 0.26 |
| 10 | 35,35 | 0.125 | 11.31 |
| 21 | 42,42 | 11,150 | 11.38 |
| 22 | 49.49 | 0.175 | 0.42 |
| 23 | 56.56 | 0.200 | 0.47 |
| 24 | ú.l.63 | 0.225 | 0.53 |

Table 3: Compilation of results

| cle 2nd loading cycle |
|-----------------------|
| 0.250 |
| 0.121 |
| 1.875 |
| 0.873 |
| 215.15 |
| 1.09 |
| |

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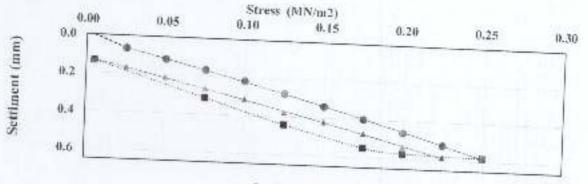
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St (371+100) to St (371+125) km

Fig. 1: Load-settlement curve, fitting curves according to Table 1 and Table 2 for the first and second loading cycles

- Measurment points from the first loading cycle
- 8 Measurment points from the unloading cycle
- Measurment points from the second loading cycle 5 Settlement in mm

og Normal stress MN/m2





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St (371+125) to St (371+150) km

600

Table 4: Mensured values for first loading syste and animaling syste

| Loading singe ne. | LowI (F) kN | Normal newss (ss) MN/m | Settlement of Ironding plate S (4000) |
|-------------------|----------------|------------------------|---|
| ů. | 1.414 | 0.004 | 0.00 |
| 1 | 7 (17 | 0,025 | 0.07 |
| 2 | 14.14 | 0,050 | 0.12 |
| 5 | 21.21 | 0,075 | 8.16 |
| 4 | 35.35 | 4,100 | 9,21 |
| 5 | 38.35 | 0.125 | 0.27 |
| 6 | 42.42 | 8.159 | 0.32 |
| ? | 49.49 | 0.176 | 8.38 |
| 8 | 56.56 | 0,200 | 0.44 |
| | 63.63 | 0.225 | 6.50 |
| 10 | 76,7 | 0.250 | 0.57 |
| 11 | 56,56 | 0.200 | 0.56 |
| 12 | 40:49 | 0.175 | 6.54 |
| 1.3 | 35.35 | 0.128 | 0.42 |
| 14 | 21.21 | 0,075 | 0.33 |
| 15 | 1.414 | 9.005 | 0.11 |

| E.cading stage to: | Load (F) kN | Nurmal scress (sb) M.N.m2 | Settlement of timiling plate 5 (mm) |
|--------------------|----------------|------------------------------|---|
| [5 | 1.414 | 6,008 | 9.13 |
| 15 | 7.07 | 0.025 | 6.16 |
| 17 | 14.14 | 6.050 | 0.31 |
| 14 | 21.21 | 0.075 | 0.26 |
| 19 | 28.28 | 0.105 | 0.71 |
| 20 | 15.35 | 0.125 | 0.37 |
| 21 | 12.43 | 0.150 | 0.41 |
| 21 | 49.49 | 0,175 | 0.45 |
| 23 | 96,56 | 0.200 | 0.51 |
| 14 | 63.63 | 0.225 | 0.57 |

Table 6: Compilation of results

der

ROCOTEC

100 808 5.8

| Parameters | 1st fooding cycle | 2nd loading cycle |
|--|-------------------|--|
| (G _{krad}) MN/m ² | 6.291 | 0.250 |
| s _s (mm) | 0.034 | 0.184 |
| a, (mm/(MN/m ²)) | 1.558 | 1.073 |
| $L_1 (mm/(MN^2m^2))$ | 2.344 | -0.211 |
| Eventship reaction of the second | 205,90 | 223.27 |
| R(2/Fy) | 1.00 | AND IN THE OWNER OF TAXABLE PARTY. |
| | tion when | Children and Chi |

23 pinter al

construction

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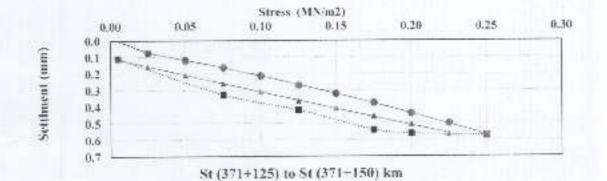
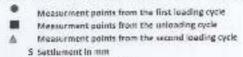
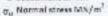


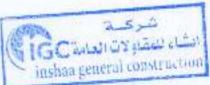
Fig. 2: Load-settlement curve, fitting curves according to Table 4 and Table 5 for the first and second loading cycles











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St (371+150) to St (371+175) km

600

Table 7: Measured values for first bonting cycle and unbailing cycle

| Loading stage no. | t out (F) BN | Normal stress (3c) MNim ² | Settlement of monthing plant S (mm) |
|-------------------|-----------------|--------------------------------------|---|
| ü | 1.414 | 6.005 | R.00 |
| 1 0 | 7.07 | 0.025 | 0.05 |
| 2 | 14.14 | 0,050 | 0.19 |
| 3 | 21.21 | 0.075 | 0.10 |
| 4 | 28.28 | 0.195 | 0.21 |
| 4 | 15.15 | 0.125 | 0.2? |
| 8 | 12.42 | 0.150 | 0.34 |
| 7 | 49.49 | 0.175 | 6,43 |
| 8 | 52.55 | 0.200 | 6.46 |
| 9 | 62.63 | 0.325 | 0.54 |
| 10 | 70.7 | 0,250 | 0.61 |
| 11 | 56.56 | 0.200 | 0.68 |
| 13 | 49.49 | 0.135 | 0.58 |
| 13 | 35.35 | 0,125 | 0.45 |
| 14 | 21.21 | 0.075 | 0.32 |
| 15 | 1.414 | 10005 | 0.10 |

| Loading stage nt. | Lond (F) aN | Normal series (sli) SIN/m2 | Settlement of tooling plate S (mm) |
|-------------------|----------------|-------------------------------|--|
| 15 | 1.414 | 0.005 | 0.10 |
| 15 | 7.07 | 0.025 | 6.14 |
| 17 | 1414 | 0.050 | 0,15 |
| 16 | 21.21 | 0.075 | 0.24 |
| 19 | 28.28 | 0,100 | 0.39 |
| 20 | 15.35 | 0.125 | 0.35 |
| 21 | 42.42 | 0.150 | 0.41 |
| 22 | 49.49 | 0.175 | 0.46 |
| 2.3 | 56.56 | 0.200 | 0.55 |
| 14 | 63.63 | 0.225 | 0.58 |

Table 9: Compilation of results

| Parameters | 1st hading cycle | 2nd loading typle |
|---------------------------------------|------------------|-------------------|
| (GLEUS) MN/m ² | 0,250 | 0.250 |
| a. (mm) | -0.001 | 0.089 |
| 41 (mm/(MN/m ²)) | 1.945 | 1.991 |
| a, (mm/(MN/m/)) | 1 960 | 1,533 |
| Even 1.5 of $\ln_1 t \pi_2$ (5, spec) | 184.77 | 200.99 |
| ABRIT | 1.0 | 9 |

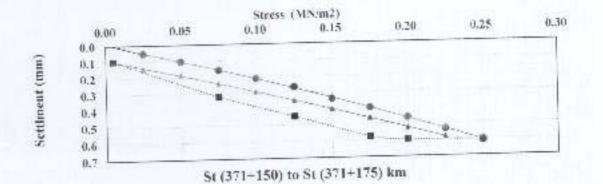


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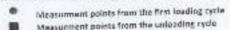






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Fig. 3: Load-settlement curve, fitting curves according to Table 7 and Table 8 for the first and second loading cycles



- Measurment points from the second loading cycle ٨
- S Settlement in mm
- Ga Normal stress MN/m











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St (371+175) to St (371+200) km

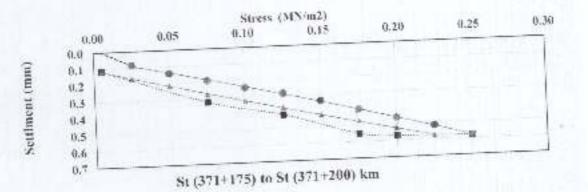
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| 4N 1.414 7.07 14.14 21.21 13.38 35.35 42.42 49.49 56.56 63.65 75.7 56.56 48.49 15.35 21.21 1.414 hlt IT: Measured so 1.414 | 0.008 0.025 0.050 0.075 0.100 0.125 0.125 0.150 0.200 0.225 0.250 0.200 0.255 0.200 0.175 0.200 0.175 0.150 0.200 0.175 0.150 0.200 0.175 0.150 0.200 0.175 0.150 0.200 0.200 0.175 0.150 0.200 0.200 0.175 0.150 0.200 0.175 0.150 0.200 0.200 0.175 0.150 0.200 0.200 0.175 0.200 0.200 0.175 0.100 0.200 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.200 0.175 0.100 0.175 0.100 0.200 0.175 0.100 0.175 0.100 0.200 0.175 0.100 0.175 0.100 0.175 0.100 0.100 0.100 0.100 0.100 0.100 0.105 0.100 0.100 0.105 0.000 0.105 0.000 0.105 0.000 0.105 0.000 0.105 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.000000 0.00000000 | 0.00 0.08 0.14 0.19 0.24 0.25 0.14 0.24 0.25 0.14 0.24 0.25 0.44 0.46 0.47 0.55 0.47 0.55 0.42 0.42 0.35 0.42 0.13 |
|--|---|---|
| 1.07 14.14 21.21 18.38 35.35 42.42 49.49 56.56 43.65 70.7 56.56 49.49 14.35 21.21 1.414 bits 17: Measured sur- | 0.025 0.050 0.075 0.100 0.125 0.150 0.150 0.155 0.200 0.255 0.200 0.255 0.200 0.125 0.200 0.255 0.200 0.125 0.200 0.125 0.200 0.125 0.200 0.125 0.205 0.205 0.205 0.125 0.205 0.255 0.205 0.255 0.205 0.255 0.555 0.255 0. | 0.14 0.19 0.24 0.25 0.44 0.40 0.46 0.46 0.47 0.55 0.41 0.35 0.41 0.35 0.13 Sentement of |
| 14,14 21,21 18,38 35,35 42,42 49,49 56,58 43,65 75,7 56,56 49,49 14,35 21,21 1,414 blz 11: Measured su | 0 (150 0,075 0,100 0,125 0,150 0,150 0,200 0,250 0,250 0,250 0,250 0,255 0,206 0,175 0,206 0,250 0,250 0,175 0,206 0,250 0,250 0,255 0 | 0.19 0.24 0.25 0.44 0.40 0.46 0.46 0.47 0.55 0.47 0.55 0.41 0.35 0.13 Sentement of |
| 21 21 18,38 35,35 42,42 49,49 56,56 43,65 75,7 56,56 49,49 34,35 21,21 1,414 ble 11: Measured su | 0,075 0,100 0,125 0,150 0,175 0,200 0,250 0,250 0,250 0,250 0,175 0,200 0,175 0,200 0,175 0,200 0,175 0,200 0,175 0,200 0,175 0,200 0,250 0,175 0,200 0,175 0,005 0, | 0.19 0.24 0.25 0.44 0.40 0.46 0.46 0.47 0.55 0.47 0.55 0.41 0.35 0.13 Sentement of |
| 21 21 18,38 35,35 42,42 49,49 56,56 43,65 75,7 56,56 49,49 34,35 21,21 1,414 ble 11: Measured su | 0.100 0.125 0.150 0.175 0.200 0.250 0.250 0.250 0.200 0.175 0.200 0.250 0.200 0.175 0.200 0.175 0.200 0.175 0.200 0.255 0.200 0.250 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.255 0.200 0.175 0.200 0.255 0.200 0.175 0.200 0.175 0.200 0.175 0.200 0.175 0.200 0.175 0.200 0.175 0.200 0.175 0.200 0.175 0.200 0.005 0. | 0.24 0.25 0.44 0.40 0.46 0.47 0.55 0.47 0.55 0.41 0.35 0.41 0.35 0.13 |
| 18.38 35.35 42.42 49.49 56.56 43.65 73.7 56.56 49.49 34.35 21.21 1.414 ble 11: Measured su | 6,125 0,150 0,175 0,200 0,250 0,250 0,250 0,255 0,206 0,175 0,206 0,175 0,175 0,206 0,175 0,206 0,175 0,206 0,250 0,250 0,250 0,250 0,250 0,250 0,250 0,250 0,250 0,250 0,250 0,255 0,206 0,255 0,206 0,255 0,255 0,206 0,255 0, | 0.20 0.34 0.40 0.46 0.41 0.55 0.47 0.55 0.42 0.42 0.42 0.32 0.13 |
| 35.35 42.42 49.49 56.55 43.65 75.7 56.56 49.49 14.35 21.21 1.414 ble 17: Measured su 1.465 (F) | 0.150 0.175 0.20b 0.25b 0.25b 0.25b 0.20b 0.175 0.20b 0.175 0.175 0.175 0.175 0.175 0.175 0.175 0.175 0.20b 0.25b 0.175 0.25b 0.25b 0.175 0.20b 0.175 0.25b 0.175 0.25b 0.175 0.25b 0.175 0.175 0.20b 0.175 0.25b 0.175 0.175 0.175 0.175 0.175 0.175 0.175 0.175 0.175 0.175 0.175 0.175 0.100 0.175 0.100 0.005 0. | 0.40 0.44 0.41 0.55 0.47 0.55 0.42 0.42 0.42 0.42 0.13 0.13 |
| 42.42 19.49 56.56 43.65 75.7 56.56 49.49 14.35 21.21 1.414 ble 17: Measured su 1.465 (F) | 0.135 0.20b 0.235 0.25b 0.20b 0.125 0.125 0.135 0.135 0.005 https://www.scin. Normal.sciences.(50) | 0.40 0.44 0.41 0.55 0.47 0.55 0.42 0.42 0.42 0.42 0.13 0.13 |
| 49.49 56.56 63.63 73.7 56.56 49.49 14.35 21.21 1.414 ble 11: Measured su 1.405 (F) | 0,200 0,215 0,250 0,200 0,175 0,135 0,1675 0,005 0 | 0.41 0.55 0.47 0.55 0.42 0.42 0.13 Sentienter1 of |
| 56,56 63,65 73,7 56,56 49,49 14,35 21,21 1,414 162,17: Measured sy 1,465 (0) | 0,224 0,25b 0,205 0,175 0,135 0,135 0,005 hus for second touting evely Nermal scess (80) | 0.41 0.55 0.47 0.55 0.42 0.42 0.13 Sentienter1 of |
| (3.65 73,7 56,56 49,49 14,35 21,31 1,414 162,117: Measured sy 1,404 (0) | 0,25b 0,205 0,125 0,125 0,135 0,005 hus for second touting evely Nermal scess (80) | 0.4 ² 0.55 0.42 0.32 0.13 Sentement of |
| 7557 56,56 49,49 16,35 21,21 1,414 ide 11: Measured va Lanst (F) | 0.200 0.125 0.135 0.045 0.005 hues for second loading even Nermal screes (80) | 0.55 0.42 0.32 0.13 Sentement of |
| 56,56 49,49 15,35 21,21 1,414 Ide 11: Measured va Lans (F) | 0,125 6,125 0,005 tures for sectored to offing evely Nerman screes (50) | 0.41 0.32 0.13 Sentierieri st |
| 49-49 14:35 21:21 1-414 Ide 11: Measured va Lans (E) | 6.135 0.005 fues for second tooling even Nermal screek (50) | 0.41 0.32 0.13 Sentierieri st |
| 14.35 21.21 1.414 hd: 11: Measured va 1.465 (F) | 0.075 0.005 hues for second totaling evely Nerman second (50) | 0.52 0.13 Sentierieri st |
| 21.21 1.414 Ide 11: Measured va Lant (E) | 0.005 hurs for second tooling evely Nerman second (50) | Senteneri st |
| La14 Ide 11: Measuril so Lans (E) | hies for second fourling over | Sentenerist |
| ide (1): Measurol so Lans (1) | Nermal Scess (80). | |
| EN. | | (inei) |
| | | 0.12 |
| 1.414 | the second se | 0.17 |
| | the second se | 6.12 |
| the second se | and the second se | 0.28 |
| | | 6.52 |
| | | 0.38 |
| and the second se | the second se | 0.41 |
| | | 0.47 |
| | | 0.52 |
| the second se | | 0.58 |
| (161 | | 01-3- |
| Luble 12- C | compilation of results | |
| unetters | Ist trading cycle | and the second se |
| | 0.350 | 0,250 |
| MAIN | 0.642 | 0,109 |
| [1008] | | 2,227 |
| (MN(m'1) | the second se | 0.731 |
| (MN7m7)) | the second se | 186.78 |
| HARLE HA HAVE | 210.40 | 6.59 |
| DN8U | | 10 |
| | | (The |
| | 1,414 7,07 14,14 23,21 28,28 35,35 42,42 49,49 56,50 63,63 Table 12: (mg0/rs (MN(m ²)) (MN(m ²)) | 1.414 0.005 7.07 0.025 1.414 0.090 23.21 0.075 28.28 0.109 35.35 0.125 42.42 0.159 42.42 0.175 49.49 0.175 63.63 0.206 63.63 0.325 Jabb 12: Compliation of results metters 1st trading tycle (MN/m) 0.285 (MN/m) 1.849 (MN/m) 1.849 (MN/m) 1.849 (MN/m) 1.0285 M80(m 1.192 |

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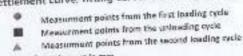


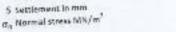


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Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles











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St (371+200) to St (371+225) km

600

Table 1.5: Measured values for first burling cycle and unbuilding cycle

| Crossing singe 20. | Load (F) kN | Normal stress (s.) MN/m ² | Settlement of tording plate \$ (nim) |
|--------------------|--------------------------|--------------------------------------|--|
| 0 | 1414 | 0.005 | 6.04 |
| | 1.97 | 0,025 | 0.07 |
| | 14.14 | 0.050 | 6.12 |
| 3 | 21.31 | 0.075 | 0.18 |
| 4 | 28.34 | 0.100 | 0.23 |
| | 35.35 | 0.125 | 0,18 |
| 6 | 02.42 | 0.150 | ίλ3J |
| 7 | 40.40 | 0,115 | 6.39 |
| 8 | 56.36 | 6,200 | 8.44 |
| 9 | 63.63 | 0.225 | 0;49 |
| 10 | 20.2 | 0.250 | 0,58 |
| H | 55.55 | 0,200 | 0.57 |
| 12 | 49,49 | 0.175 | 11.55 |
| 13 | 35.35 | 0,125 | 11.44 |
| 14 | 21,21 | 0.075 | 0.34 |
| 15 | 1.414 | 0.005 | 0.16 |
| 32 | Table 14: Mrasared volue | s for second hording evels | |
| Loading stuge m. | Lend (F) KN | Normal stress (s0) MN/m2 | Sertement of londing place S immy |
| 18 | 7.414 | 0.005 | 0.16 |
| 10 | 7.07 | 0.425 | 0,19 |
| 10 | 14.14 | 0.050 | 0.23 |
| 18 | 21.21 | 1,075 | 1618 |
| 10 | 28.28 | 0.105 | 0.53 |
| | 35.35 | 0.125 | 0.38 |
| 20 | 42.42 | 0,150 | 0.43 |
| 23 | 49.49 | 0.175 | 0,48 |
| 44 | | 1.963 | 0.51 |

53.63 the 15; Compilation of results

36.56

23

24

Sr

| Parameters | bei fantling cycle | 2nd and ing type |
|---|--------------------|---|
| (σ _{typen}) MN00 ¹ | 0.250 | 0.250 |
| n ₄ (mm) | 0.077 | 0.149 |
| a. (mm7(MN/m2)) | 1.853 | 1.040 |
| artminet (m 1) | 1,192 | 1,301 |
| CELEUR CAN | 209.22 | 218.25 |
| | 1.14 | A CONTRACTOR OF |

0.200

0.225

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49 El Horria Ave. Alex, Egypt Tel: 002 033920176 - 002 033931482 Fax :002 033900476 Email: internal-inspection@comibassal.com

0.53

R.98

and and the state of the



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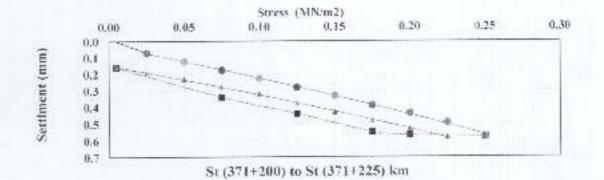
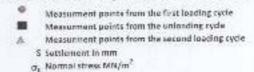


Fig. 5: Load-settlement curve, fitting curves according to Table 13 and Table 14 for the first and second loading cycles









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St (371+225) to St (371+250) km

600

Table 16: Mensared values for first loading evels and unboding evels

| Loading stage no. | Load (F) kN | Normal stress (38) MN/m ¹ | Settlement of boading plate S (2000) |
|-------------------|----------------|--------------------------------------|--|
| ÷Ð | 1.414 | 0.405 | 0.99 |
| 1 | 2,07 | 10124 | 81.0 |
| 2 | 14.14 | 0.050 | 0.12 |
| 3 | 21.21 | 0,075 | 0.17 |
| 4 | 28.28 | 0.100 | 0.22 |
| 5 | 35.35 | 0.125 | 0.28 |
| 6 | 42.42 | 0.150 | 0.32 |
| | 45,49 | 0.175 | 88.0 |
| 8 | 50.56 | 0.200 | 0.47 |
| .9 | \$3.53 | 0.225 | 0.55 |
| 10 | 70.7 | 0.250 | 0.61 |
| - 11 | 26.26 | 0.200 | 8.60 |
| 12 | 49,49 | 0.179 | 0.55 |
| 13 | 35.35 | 0,125 | 0.44 |
| 14 | 21.21 | 0.025 | 0.32 |
| 15 | 1.414 | 0.005 | 0.14 |

Tuble 17: Measured values for second leading cycle

| Loading stage so. | i oad (F) kN | Normal stress (sd) MN:m2 | Settlement of southing plate 5 (mm) |
|-------------------|-----------------|-----------------------------|---|
| 15 | 1,413 | 0.005 | 0,14 |
| 16 | 7.07 | 0.025 | 0.18 |
| 17 | 14.14 | 0.050 | 0.22 |
| 18 | \$1.31 | 0.075 | 0.27 |
| 10 | 28.28 | 0.100 | 0.31 |
| 20 | 15.15 | 0.125 | 0.36 |
| 24 | 42.42 | 1CT 50 | 0.42 |
| 22 | 49.49 | 6.175 | 0.45 |
| 23 | 56.56 | 9,290 | 9.52 |
| 24 | 65.65 | 0.225 | 0,58 |

Table 18: Compilation of results

| Paramoters | for building cycle | 2 sof-booding cycle |
|---|--------------------|---------------------|
| ortegran) MN/m ² | 0.250 | 0.350 |
| #m (0010) | 0.044 | 0.1.15 |
| #1 (00 mei MIN-in*1) | 1.355 | 1.575 |
| a ₂ (mm ₃ /MN ³ /m ³)) | 1.779 | 1.784 |
| Er LS part men 1 | (95.69 | 232.63 |
| CPIDE TRUA | 1.14 | |



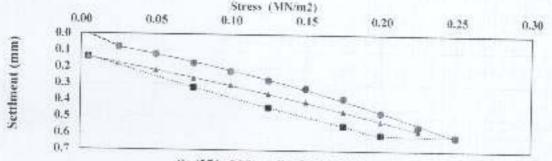
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St (371+225) to St (371+250) km

Fig. 6: Load-settlement curve, fitting curves according to Table 16 and Table 17 for the first and second loading cycles

-65 Measument points from the first loading cycle

- Measurment points from the unloading cycle Measurment points from the second loading cycle A 5 Settlement in mm
 - or Normal stress MN/m⁴





شركة اء للمتاولات العامة GC inshaa general construction

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St (371+250) to St (371+275) km

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600

Table 19: Mensured values for first heading cycle and autording cycle

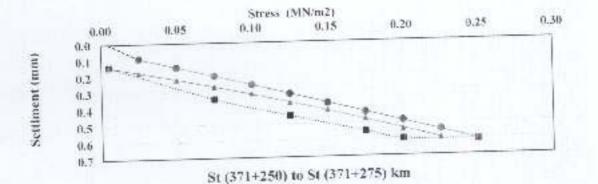
| Losd (F) RN | Normal stress (sq) MINon ⁷ | Settlement at loading plan- 8 thm |
|--|--|--|
| 1.414 | 0.005 | 0.00 |
| 7.47 | 0.025 | 8.69 |
| 14.14 | | R15 |
| and the second se | and the second se | 0,29 |
| the second se | the second se | 6.26 |
| 15.15 | | and the second se |
| 42.42 | the second se | 0,32 |
| 49.49 | and the second se | 0.43 |
| 55.55 | | 0.45 |
| 63.63 | | 0.54 |
| 70.7 | | and the second se |
| 56.56 | | 0.51 |
| 39.19 | and the second se | 0.48 |
| 35.35 | | 0.55 |
| | a state of the second se | 0.45 |
| | | 0.34 |
| | es for second budlies evels | 6,14 |
| Load (F) kN | Normal stress (sit) MS/m2 | Sertlement of loading plane S |
| 1414 | 0.505 | (1012) |
| and the second se | and the second se | 0.14 |
| and the second se | | 0.18 |
| 5 Y Y M M | | 0.22 |
| and the second se | the fact the second sec | 0.27 |
| the second se | | 6.31 |
| the second se | the second se | 0.17 |
| and the second se | | 0.42 |
| and the second se | | 0.47 |
| and the second sec | | 0.54 |
| | | 0.60 |
| | in it sums | |
| 2244 | lst loading syste | 2 ad honding cycle |
| IN90 ² | 0,259 | 0.250 |
| | 0.034 | 0.135 |
| The state of the s | 2.215 | 1.60* |
| ACHENT RI | 0.303 | 1.971 |
| to Barrel # | 126.41 | 214.55 |
| 12/2 U | 1,192 | |
| | 7.47 14.14 21.21 25.25 15.25 15.55 42.42 49.49 56.56 63.63 70.7 56.56 49.49 35.35 21.21 1.414 7.07 1.414 2.1.21 2.8.28 3.8.35 42.42 49.49 56.56 63.03 Table 2.1: Comp | 2.67 0.025 14.14 6.090 21.21 6.095 15.25 0.100 15.25 0.100 15.25 0.100 15.25 0.125 42.42 0.155 55.56 0.200 63.63 0.225 70.7 0.250 56.56 0.200 49.49 6.175 56.56 0.200 49.49 6.175 56.56 0.200 49.49 6.175 56.56 0.200 49.49 6.175 14.14 0.605 14.14 0.605 14.14 0.605 7.07 0.628 14.14 0.605 7.05 0.628 14.14 0.605 7.05 0.628 14.14 0.605 7.05 0.628 14.14 0.605 7.05 0.628 14.14 |



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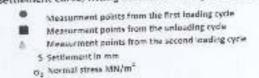




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Fig. 7: Load-settlement curve, fitting curves according to Table 19 and Table 20 for the first and second loading cycles









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Conclusions:

The present test results which obtained from the plate loading tests of the native soil on top of the sub-ballast layer of the electric express train project at location St (371+100) to St (371+275) km in accourdance to the German standard , DIN 18134 are illustrated in table 22.

Table 22 :Test results

| Location | Ev1(MN/m ²) | Ev2(MN/m ²) | Ev2/Ev1 ratio |
|--------------------------------|-------------------------|-------------------------|---------------|
| St (371+100) : St (371+125) km | 198.19 | 215.15 | 1.09 |
| 5t (371+125) : St (371+150) km | 209.90 | 222.27 | 1.06 |
| 5t (371+150) : 5t (371+175) km | 184.77 | 200.99 | 1.09 |
| St (371+175) : St (371+200) km | 210.48 | 186.78 | 0.89 |
| St (371+200) : St (371+225) km | 209.22 | 228.29 | 1.09 |
| 5t (371+225) : St (371+250) km | 195.69 | 222.63 | 1.14 |
| St (371+250) : St (371+275) km | 196.41 | 214.53 | 1.09 |

Lab Director

Eng/Eman Kandil



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49 El Horria Ave. Alex,Egypt Tel: 002 033920176 - 002 033931482 Fax:002 033900476 Emall : internal-Inspection@comibassal.com

Gentechnical Consulant For Dr. H -Dr / Mohameet Mostafa Badry



S5-B-IN

| MATERIAI INSPECTIO REQUEST | | Inshaa inshaa intervention | | And the | A DE NORMA | | ang | 1. <u>1. 1. 1. 1.</u> E | tradi Tata | 調 |
|-----------------------------------|-----------------------------|----------------------------------|-----------|----------|----------------|----------|----------|----------------------------|---------------|----------|
| Contractor Company | INSHAA GENERAL (Company | OF CONSTRUCTION | Desi | gner (| оптра | iny | | TRUM L thing Offi | | ing |
| terned in: | Name | Sign | Date | / Seri | al Nur | nber | Time | ÷. | | |
| Issued by Contractor | Eng. Mahmoud shaban | لم و- عماه | | 1000 | (2023 .T.7) | | 02:0 | 0 PM | | |
| Received by GAR9 CONSULTANT | Eng. Mazen Essamy | PLT | 61 371 | 22 EW | CS | 00 22 | MM 06 | үү 2023 | нн 2 | ММ 00 |

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| 120504 | 100000000000 | CHORE AND | Les pour generation | _ | - | | | - | | |
| Descr | ription of N | Aaterials | Sub Ballast 2. | | | | | | | |
| Locat | ion to be (| Ised | St. (371+275) To | (371+50 | 0) | | | | | |
| MAR. | Approval P | NO. | -M.A.R (B.S.1) Da | | Date | | 29/04 | /2023 | | |
| Suppl | lier Name | | | | | | | | | |
| Test P | Requireme | nt | P.L.T (DIN 18134 | 1) | Specific | ation | | 13 P. M. K. M. | | S & TESTING V 2 RY CIVECON |
| Refen | ence Photo | ðs. | Yes / No | | Other | | Rev UIR-S | i.B-(6)8 | (9)&(10 | 1) |
| tem | Descripti | on | the second second | Un | it 9 | Quantity | Arrival | Date | Note | 1 × |
| 1 | PLATE LC | AD TEST | | NU | IMBER | 9 | 22/06/2 | 2023 | | |
| 2 | | _ | 1000 | _ | | | | | | |
| | | | | | | | | | | |
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| | Plate Load | | PILTIDIN 18134 | CONSUL | 1 9 2-8 spe 3-F | late Load Ta esulta repol cilications inal approvi nments | est was carr rt attached al is subject | ied-out and acc to abov | t by (Cor eptable) ve menda | nibassal) with project |
| 4 Comn L-The Appro | Plate Load | | SPECTRUM SPECTRUM | CONSUL | 1 -9 2-R Spe 3-F Corr | late Load Ta esulta repol cilications inal approvi nments | est was carr rt attached al is subject | ied- out and acc to aboy کو دیار بر وراندا | t by (Cor eptable) ve menda | nibassal) with project |
| 4 Comn L-The Appro | Plate Load | Test Reaul | SPECTRUM SPECTRUM | APPRO | 1 -9 2-R Spe 3-F Corr | late Load Ta esulta repol cilications inal approvi nments | est was carr rt attached al is subject | ied- out and acc to aboy کو دیار بر وراندا | t by (Cor ectable) ve mentio مقر کر مقرو لارج در cotto | nibesse() with project aned لا مناب لا traction |
| 4 Comn L-The Appro Organ Contri | Plate Load oved hisation factor | Test Resul | SPECTRON SPE | APPRO | 1 -9 2-R Spe 3-F Corr | late Load Ta esulta repol cilications inal approvi nments | est was carr rt attached al is subject | ied-out and acc to aboy کیانیان بیاردان بیاردان بیاردان | t by (Cor ectable) ve mentio مقر کر مقرو لارج در cotto | nibesse() with project aned (file) A-AWC-R |
| 4 Comn L-The Appro | Plate Load oved hisation factor | Test Resul | t P.L.T I DIN 18134 | APPRO | 1 -9 2-R Spe 3-F Corr | late Load Ta esulta repol cilications inal approvi nments | est was carr rt attached al is subject | ied-out and acc to aboy کیانیان بیاردان بیاردان بیاردان | t by (Cor ectable) ve mentio مقر کر مقرو لارج در cotto | nibesse() with project aned (fuction) A-AWC-R A |

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Technical report

of Plate Loading Test (DIN 18134)

| General | |
|--------------|--|
| Consultant | |
| Contractor | |
| Project | |
| Sample | |
| Station | |
| Date of Test | |
| QC | |

شركة انشاء للمقاولات العامة 3C inshaa general construction

SYSTRA SPECTRUM شركة إنشاء للمقاولات العامة ELECTRIC EXPRESS TRAIN Sub-Ballast (2) ST(371+275) TO ST(371+500) 22/6/2023 1476



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Introduction:

The Plate Load test is designed to determine the vertical deformation and strength characteristics of soil by assessing the force and amount of penetration with time when a rigid plate is made to penetrate the soil.

The test to be carried out on the native soil according to German specifications DIN 18134.

Test methods :

1- The German standard DIN 18134 was applied to define the apparatus used, the loading system, test conditions, and procedure for plate load test.

2- Loading plates with a diamter of 600 mm have a thickness of 25mm and are provided with equally spaced stiffners with even upper faces parallel to the plate bottom face to allow 300 mm plate to be placed on top of it.

3- The loading system consisted of a hydrulic pump connected to a hydrulic jack of 700 bar capacity, which is capable of applying and releasing the load stages.

4- The dial gauge used to measure the plate settlement has a resolution of 0.01mm and the lever ratio was equal to 1.

The temperature at the time of the test was 25^o.

6- The plate was carried out on a native soil (sand-gravel). The test surface area was levelled and the plate was bedded on this surface.

7- The hyrulic jack was placed on the middle of, and at normal to, the loading plate beneth the reaction loading system and secured against tiliting.

8- The reaction loading system was a heavey multi-purpose excavator (more than 20 ton).

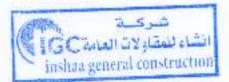
Description of exprement:

1- Loading, unloading and reloading regims were applied according to DIN 18134 for the plate load test to estimate the resilient modulus

2- Prior to the test, the force transeducer and dial guage were set to zero, after which a load was applied corressponding to a stress of 0.01 MN/m2.

3- In the first loading cycle, the load was increased until a normal stress of 0.25 MN/m2 was reached, and the loading increaement was 0.025 MN/m2. The load was released in four stages.

4- Following unloading, a further second loading GRE on a carried out, in which, the lead was increased only to the penultimate stage of the first of the



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St (371+275) to St (371+300) km

600

Table 1: Measured values for first houting cycle and unloading cycle

| Londing stage no. | Load (F) kN | Normal stress (8g) MN/m ² | Settlement of loading plate S (mm) |
|-------------------|--------------------------|--------------------------------------|---|
| 0 | 1,414 | 0.005 | 0.00 |
| 1 | 7.07 | 0,025 | 0.08 |
| 2 | 14.14 | 0.050 | 11.14 |
| 3 | 21,21 | 0.075 | 0.19 |
| + | 28.28 | 0,100 | 0.25 |
| | 35,35 | 0.125 | 0.34 |
| | 42.41 | 0,254 | 0.37 |
| 2 | 49,49 | 0.175 | 0.42 |
| 8 | 56.56 | 0.200 | 0.28 |
| .9 | 63.6,1 | 0.225 | 0.53 |
| 10 | 2074 | 6,250 | 0.59 |
| 11 | 56,56 | 0,200 | 0.55 |
| 12 | 49,49 | 0.175 | 0.56 |
| 13 | 35,35 | 0.125 | 0,43 |
| .14 | 21.21 | 0.075 | 0.30 |
| .15 | 1.434 | 0.005 | 0.12 |
| | Table 2: Measured values | for second loading cycle | |
| Londing stage no. | Load (T) uN | Normal stress (s0) MN/m2 | Sottlement of loading plate S (min) |
| 1.4 | 1.414 | 0.005 | 0.12 |
| 10 | 7,07 | 0.025 | 0.16 |
| 4.44 | 1.0.11 | | |

| LA | 1.414 | 0.505 | 0.12 |
|----|----------------|-------|--|
| 10 | 7,07 | 0.025 | 0.16 |
| 17 | 1.4.14 | 0.058 | 8,20 |
| 18 | 21.21 | 0.075 | 0.25 |
| 19 | 28.28 | 0,100 | 0.30 |
| 20 | 38.35 | 0.125 | 0.30 |
| 11 | 42.42 | 0.150 | 0.40 |
| 22 | 19,49 | 0.175 | 6.46 |
| 23 | 56,56 | 0.200 | 0,52 |
| 24 | 63.63 | 0.325 | 0.54 |
| | Table 2. Count | P | and the second design of the s |

Table 3: Compilation of results

| Parameters | 1st bouling cycle | 2nd loading cycle |
|--|-------------------|-------------------|
| (General) MNem | 0.250 | 0.250 |
| a (mpr SPECTA | 6.022 | 0,107 |
| a, (mmi) (kmin) | 2.345 | 1.991 |
| A: 100 mg Vinter | -01.380 | 0.053 |
| E-121 51. 2.00 VC | 200,01 | 226.67 |
| それご ばいしつ | 1.1. | Comments. |
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Stress (MN/m2) 0.00 0.05 0.10 0.15 0.200.250.30 0.0 Settlment (mm) 0.2 0.4 0.6

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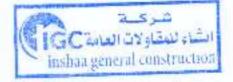
St (371+275) to St (371+300) km

Fig. 1: Load-settlement curve, fitting curves according to Table 1 and Table 2 for the first and second loading cycles

¢, Measurment points from the first loading cycle 30 Measurment points from the unloading cycle Measurment points from the second loading cycle S Settlement In mm

do Normal strass MN/m²





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St [371+300] to St (371+325) km

600

Table 4. Measured values for first loading eyele and unleading cycle

| Loading stage no. | Loud (F) kN | Normal access (s.) 31 N/m ² | Settlement of loading plate S (non |
|----------------------------------|---|--|--|
| 0 | 1,414 | 0,005 | 0,00 |
| .1 | 7.87 | 0.025 | 0.02 |
| 2 | 14.14 | 0.050 | 6.13 |
| 3 | 21.21 | 0.075 | 6.19 |
| | 35.25 | 0.100 | 0.25 |
| .5 | 35.35 | 0.125 | 0.30 |
| 6 | +2.+2 | 0.450 | 0.35 |
| | 49.49 | (C175 | 641 |
| 8 | 56.50 | 0.200 | 0.46 |
| 8 | 65.85 | 0.225 | 0.52 |
| 10 | .20.2 | 6.250 | 0.56 |
| 11 | 56.56 | 0,200 | 0,54 |
| 11 | 49.49 | 0.175 | 0.54 |
| 13 | 35.35 | 0.125 | 0.41 |
| 14 | 23,23 | 0.675 | 0.30 |
| 14 | 1.414 | n.ons. | 0.14 |
| | ahlt 5: Measured rates | es fue socond trading cycle | |
| Loading stage pa. | Load (F) LN | Normal stress (s0) MN/m2 | Settlement of loading place S (rear) |
| 15 | 1.414 | 0.005 | 0.14 |
| | | | |
| 16 | 7.67 | 0,025 | 8.19 |
| 17 | 7.67 | | CONTRACTOR IN A REPORT OF THE OWNER. |
| 17 | | 4,625 | 0.19 0.25 0.29 |
| 17 | 14.14 | 0.025 0.050 | 0.23 |
| 17 18 19 20 | 14.14 21.21 | 0.025 0.050 0.075 | 0.23 |
| 17 18 19 | 14.14 20.21 28.28 | 0,025 0,050 0.075 0,100 | 0.25 0.29 8,33 |
| 17 18 19 20 21 22 | 14.14 21.21 18.28 35.35 | 0.025 0.050 0.075 0.100 0.125 | 0.25 0.29 8.31 0.39 |
| 17 18 19 20 21 | 14.14 20.21 18.28 36.36 42.42 | 0,025 0,050 0.075 0,100 0,125 0,150 | 0.25 0.29 0.33 0.39 0.44 |

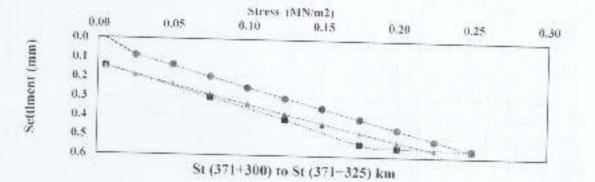
| Parameters | bai leading cycle | 2nd loading evele |
|--|-------------------|-------------------|
| (15 kees) MN/m ² | 0.250 | 0.250 |
| a, (mm) | 0.035 | 0.332 |
| n ₁ (mm/(MN/m ²)) | 5.234 | 2. 51 |
| A (MIN) STRUM | -0.363 | -0.962 |
| Eveld ring sol ant | 209.82 | 735.58 |
| EARNY - CA | 1.1 | 2 |
| | | |



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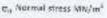


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Fig. 2: Load-settlement curve, fitting curves according to Table 4 and Table 5 for the First and second loading cycles

Measurment points from the first loading cycle -Measurment points from the unleading cycle 10

Measurment points from the second loading cycle S Settlement in mm









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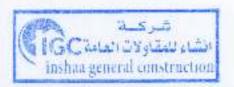
St (371+325) to St (371+350) km

600

| Falile 7: Mensureit- | salurs for first | loading evele | nnd | unioadeng zyzie. |
|----------------------|------------------|---------------|-----|------------------|
| | | | | |

| Landing shop: an. | Lauf (F) KN | Normal stress (s _k) MN/m ² | Settlement of loading plane S (mm) |
|-------------------------------|-----------------------------------|--|--|
| 0 | 1.014 | 8,005 | 0.90 |
| 1 | 7.07 | 0.025 | 0.04 |
| 1 | 14.14 | R dSb | 0.14 |
| 3 | 21.21 | 0.075 | 0.19 |
| 4 | 28.28 | 0.105 | b.25 |
| 8 | 35.35 | 0.125 | 0.31 |
| 6 | 12.42 | 0.150 | 0.37 |
| 1 | 49:49 | 4.175 | 10, 42 |
| 8 | 56.56 | 0,200 | 0.4% |
| 9 | 43.45 | 0.228 | 0.54 |
| 10 | 28.2 | 6.250 | 11.69 |
| 11 | 56.36 | 0.200 | 0.59 |
| 12 | 49.49 | 0.175 | 0.57 |
| 13 | 35.35 | 0.125 | 0.50 |
| 14 | 21.21 | 0.075 | 0.33 |
| 15 | 1.414 | 0.605 | 8.16 |
| 1 | able 8: Measured value | s for second leading cycle | |
| Loading stage tos. | Load (F) kN | Narmal stress (9)) MNra2 | Settlement of loading place S (mm) |
| 15 | 1,414 | Runs | 0.16 |
| 56 | 7.02 | 0.025 | 0.11 |
| 17 | 14.14 | 0.050 | 0.26 |
| 18 | 21.21 | 0.075 | 0,31 |
| 19 | 28.28 | 0.160 | 0.16 |
| 20 | 35.35 | 0.125 | 0.41 |
| 21 | 42, 42 | 0.130 | 0.46 |
| 22 | 49.49 | 0.175 | 0.51 |
| 23 | 51.55 | 0.200 | 0.56 |
| 24 | 63.63 | 0.225 | 0.60 |
| | Table 9. Camp | ilation of results | |
| | raoit 2. Comp | | |
| Paraz | | ist loading eyele | 2mt traiting cycli |
| Paraz (G _{tuna}) | eten. | the second s | 2nd leading cycle 0.250 |
| | ieten MN/m ² | ist loadine evele | the state of the s |
| (a ₁₀₄₃ .) | ieten MN/m ² om) | list loading evela 8/250 | |

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 $E_{k}=1.5~n^{2}\left(n_{1}+a_{2}\right)C_{0}\propto c_{0}$

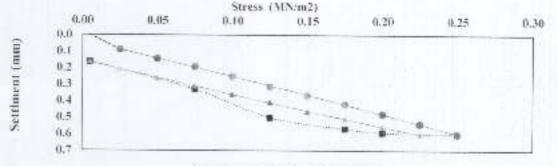
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St (371+325) to St (371+350) km

Fig. 3: Load-settlement curve, fitting curves according to Table 7 and Table 8 for the first and second loading cycles

Measurment south from the first loading cycle

Measurment paints from the unleading cycle
 Measurment paints from the second loading cycle

5 Settlement In mm or Normal stress MN/m²







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5t (371+350) to St (371+375) km

600

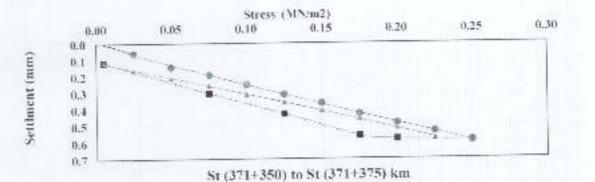
Table 10: Measured values for first loading cycle and unitabling cycle

| Loading stage no. Load (F) 58 Normal stress (s ₀) M25m ² 0 0 1.414 0.005 1 2.07 0.025 1 1 2.07 0.025 1 0.055 1 1 0.055 2 1+1.4 0.055 1 0.025 1 1 0.055 2 1+1.4 0.055 1 1 0.025 1 1 0.025 1 1 0.025 1 1 0.025 1 1 0.025 1 1 0.025 1 1 0.025 1 1 0.025 1 1 0.025 1 1 0.025 1 | Settleanest o indiag plain 8 (mm 0.00 0.14 0.19 0.25 0.31 0.37 0.44 0.49 0.54 |
|--|--|
| 1 2 107 0.025 2 1414 0.090 3 2121 0.025 4 2828 0.005 5 35.35 6.124 6 42.42 0.159 7 49.49 6.159 9 63.63 0.225 10 76.7 0.250 11 86.56 0.200 12 49.49 0.178 | 0.05 9.14 0.25 0.31 0.37 8.43 5.49 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | 0.14 0.19 0.25 0.31 0.37 0.44 5.45 |
| 5 21.21 0.025 4 18.26 0.100 5 35.35 6.125 6 42.42 6.155 7 49.49 0.178 8 56.56 9.200 9 63.63 0.225 10 76.7 0.250 11 56.56 0.200 12 49.49 0.178 | 0.14 0.19 0.25 0.31 0.37 0.44 5.45 |
| 4 28.26 0.100 5 35.35 6.125 6 42.42 6.155 7 49.49 6.155 8 56.56 9.200 9 63.63 0.225 10 76.7 0.250 11 56.56 0.200 12 49.49 0.178 | 0.19 0.25 0.31 0.37 8.43 5.49 |
| 5 35,35 6,124 6 42,42 6,159 7 49,43 6,159 8 86,56 9,200 9 63,63 0,225 10 76,7 0,250 14 86,56 0,200 12 49,49 0,178 | 0.25 0.31 0.37 0.43 0.49 |
| 6 42,42 0.159 7 49,49 6,159 8 86,86 9,200 9 63,63 0,225 10 76,7 0,250 14 86,56 0,200 12 49,49 0,178 | 0.31 0.37 0.43 0.49 |
| 7 49,49 0,158 8 %6,56 0,200 9 63,63 0,225 10 70,7 0,250 11 \$6,56 0,200 12 49,49 0,178 | 0.37 0.43 0.49 |
| 8 56.56 0.200 9 63.63 0.215 10 70.7 0.250 11 56.56 0.200 12 49.49 0.178 | 0,49 |
| 9 63/63 0,225 10 76/7 0,250 11 56/56 0/206 12 49,49 0.178 | and the second sec |
| 10 76.7 0.250 11 56.56 0.206 12 49.49 0.178 | 0.54 |
| 11 56.56 0.200 12 49.49 0.175 | |
| 12 49,49 0.175 | 4.59 |
| 1111 | 0.58 |
| 1.1 38.38 0.128 | 0.56 |
| wie- | 0.45 |
| 14 21.21 (0.078 | 0.30 |
| 15 1,414 0,005 | 0.12 |
| Table 11: 51rassured values for scrund loading evel- | |
| Londing stage on. Lond (F) Normal stress (s0) kN MN/m2 | Settlement of loading plate 5 |
| 15 1.11.1 0.005 | (mm) 0.12 |
| 16 7.07 0.025 | |
| 12 14,14 (685) | 6.17 |
| 18 21.21 0.075 | 0.1 |
| 19 28.28 0.100 | 0.26 |
| 20 35.35 0.125 | 0.36 |
| 21 42.43 0.150 | 0.41 |
| 22 49.49 0.225 | 0.41 |
| 23 \$6.55 0.200 | 0.52 |
| 24 63.63 0.225 | 6.55 |
| Fable 12: Compilation of results | -115 |
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| 110-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10-11-10 | |
| | second seco |
| | The second |
| In the second second second | |
| THE REPORT OF THE | 2128 |
| 19(1) 0,290 4, (mm) 0,004 a, (mm) 0,004 a, (mm) 0,004 a, (mm) 0,004 b, (mm) 0,004 | 0.250 0.113 1.370 0.605 217.28 |

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Fig. 4: Load settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles

- 10 Measurment points from the first loading cycle Measument points from the unloading type Measurment points from the second loading cycle 'n.
 - 5 Settlement in mm
 - σ_c Normal stress MN/m²

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St (371+375) to St (371+400) km

600

Table 13: Measured values for first loading evels and unloading cycle

| Londing stage ps. | Land (F) kN | Normal stress (s.) 31 X/m ² | Settlement of loading plate S jum |
|----------------------------|---|--|--|
| | 1.41+ | 0.605 | 0.50 |
| | 7,07 | 10125 | |
| 1 | Y# 24 | 0.050 | 0,13 |
| 3 | 21.21 | 0.075 | 0,12 |
| E E | 38.25 | 0.075 | 0,17 |
| | 35.15 | 0,125 | 0.23 |
| 6 | 12.42 | 0.150 | 0.27 |
| 2 | 49.19 | | 9,53 |
| | 56.54 | 0.175 | 0_19 |
| . 0 | 63.6J | 0.200 | 0.44 |
| 10 | 20.7 | 6.225 | 6,50 |
| 11 | 55.55 | 0.250 | 0.58 |
| 12 | 19,14 | 0.200 | 0.57 |
| 13 | 35.35 | 0.179 | 0.35 |
| B | 21 21 | 0.125 | 9.44 |
| 12 | 1411 | 4.675 | 0.34 |
| | | 0.005 | 0.13 |
| | nut or reasonal value | s for smont loading typh | |
| Londing stage no. | Lood (F) kN | Nteanal stress (s0) MNon2 | Settlement of booting place S |
| 15 | 1,414 | 0.005 | (900) |
| 16 | 7.67 | | 0.13 |
| 17 | 1.014 | 0.025 | 0.17 |
| 18 | 21.21 | 0.650 | 0.22 |
| 19 | 28.28 | 0.075 | 4.36 |
| 29 | 35.35 | 6.100 | 0.30 |
| 31 | 42.42 | 0.125 | 0.36 |
| 12 | and the second se | R.159 | 0.41 |
| 23 | 49.14 | 0.175 | 11.46 |
| 24 | 56.56 | 0.200 | 0.51 |
| | 63.63 | 0.225 | 0.55 |
| | Table 15: Compa | intion of results | Contraction in the local in |
| Paranu | | 1st leading cycle | 3 sid loading cycle |
| (GARD) A | 1N/m ² | 0.250 | 0.230 |
| <i>k</i> ₁₁ (m) | | 0.054 | 0.122 |
| a ₁ (mm) M | Nem () | 0,987 | 6.790 |
| 6: (2mm/(M | and the second se | 4.040 | 9.1-16 |
| Ey= 2.2 m (a) b) | D. D. MAN | 236.54 | a second design and the second s |
| | | COT DU S | 1 201.92 |
| Ev= 3,8 mm+n Ev3/E | | | 2.86,55 |

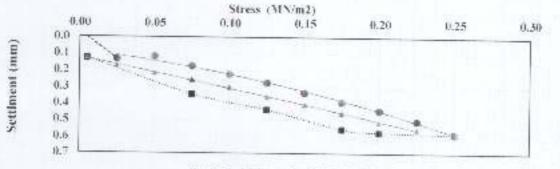


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St (371+375) to St (371+400) km

Fig. 5: Load-settlement curve, fitting curves according to Table 13 and Table 14 for the first and second loading cycles

-Measurment paints from the first loading cycle Measurment points from the unloading cycle Measurment points from the second loading cycle. Δ 5 Settlament in mm

is, Normal stress MN/m⁴







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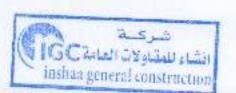
5t (371+400) to St (371+425) km

600

Table 16: Measured values for first loading cycle and unloading cycle

| Londing stage nu | Luset (F) kN | Normal stress (se) MNm ¹ | Settlement of loading plate S (mm) |
|-------------------|--------------------------|-------------------------------------|--|
| Ð | 1.414 | 0.605 | 8.00 |
| 1 | 7.67 | 0.025 | 0.09 |
| 2 | 14.14 | 0.056 | B.14 |
| 1 | 21.21 | R.078 | 0.20 |
| 3 | 28,28 | 0,150 | 0,26 |
| 5 | 45.15 | 0.125 | 0.3 |
| 6 | 42.42 | 6.150 | 0.36 |
| 7 | 16.16 | 0.175 | 12.41 |
| 8 | 55.55 | 0.200 | 0.46 |
| 11 | 63.63 | 0.235 | 0.53 |
| 10 | 70,7 | 8.250 | 0.59 |
| 11 | \$6.55 | 0.200 | 0.58 |
| 12 | 49,49 | 0.175 | 0.56 |
| .13 | 38.38 | 0.128 | R.44 |
| 14 | 21.21 | 270.0 | 6.32 |
| 15 | 1,11 | 0.048 | 0.1+ |
| | Table 17: Measurril valu | its for second loading evels | |
| Londing stage un. | Land (Fi 48 | Normal stress (s0) MN/m2 | Settlement of loading obste 5 (mm) |
| 15 | 1.414 | 0.005 | 0.11 |
| 10 | 2.07 | 0.025 | 0.15 |
| 12 | 11.14 | 0.050 | 0.23 |
| 18 | 21.21 | 0.075 | 0.27 |
| 19 | 28.24 | 6.100 | 0.32 |
| 20 | 38.35 | 0.125 | 0.36 |
| 21 | 42.42 | 0.150 | 0.41 |
| 22 | -49.49 | 0.175 | 0.46 |
| 23 | \$6.56 | 6.200 | 0.42 |
| 24 | 65.65 | 0.325 | 0.58 |
| | Table 18: Com | pilation of results | |
| Para | ntehers | 1st ionibug zyzle | 2nd in alling cycle |
| (5 | 151N/m ² | 0.250 | 0.250 |
| Card Life | | | 0.000 |

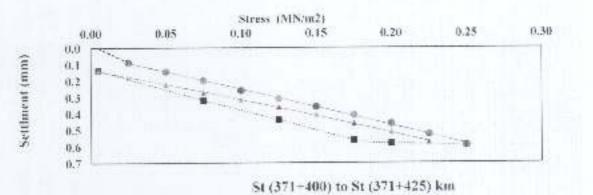
| | 155 101811-017 4 2 4 11 | - wan mannage care |
|---|-------------------------|--------------------|
| (contract MN/m ² | 0.250 | 0.250 |
| n _a (10001) | 0.039 | 0.134 |
| a) (mm/(MN/m ²)) | 2,085 | 1.520 |
| a ₃ (mm/tMN//m ⁴)) | 0.404 | 1.012 |
| Even 1.5 of improve discussion and CTR | JA 208 19 | 228,10 |
| 10310 15 | 5 50 | |



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Fig. 6: Load-sottlement curve, fitting curves according to Table 16 and Table 17 for the first and second loading cycles

- . Measurment points from the first loading cycle Measurment points from the unloading cycle. -Measurment points from the second loading cycle 2
 - 5 Settlement in mit
 - π_c Normal stress MN/m²

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St (371+425) to St (371+450) km

600

- Fable 19: Measured values for first boding eyele and mitiading cycle

| Londing stage 10. | Land (F) kN | Normal stress (s,) MA(m ² | Settlement of brading plate S (mm) |
|-------------------|----------------|---------------------------------------|--|
| 0 | 1.824 | 0.005 | 0.00 |
| t | 7,87 | 0,025 | 0.10 |
| 1 | 14.14 | 0,050 | 0,15 |
| 1 | 21.21 | 0.075 | 0,21 |
| + | 28.58 | 0.100 | 0.27 |
| 5 | 35.35 | 0.135 | 18.0 |
| 6 | 42.42 | 0.150 | 0.38 |
| 7 | 19,49 | 0.175 | 0.44 |
| 8 | 58.56 | 0.200 | 0.40 |
| 9. | 65.61 | 0.225 | 0.56 |
| 10 | 2012 | 0.250 | 0.62 |
| 11 | \$5.55 | 0.200 | 0.51 |
| 12 | 49,49 | 0.175 | 0.59 |
| 12 | \$5.35 | 0.125 | 0.47 |
| 14 | 21.21 | 0.075 | 0.35 |
| 15 | 1.414 | 0.005 | 0.18 |

Table 20: Measured values for second leading Q-C

| Londing singe no. | Lond (I/) KN | Normal stress (s0) VIN/m2 | Settlement of Institute plate 5 (0000) |
|-------------------|-----------------|------------------------------|--|
| 15 | 1.414 | 0.005 | 0.18 |
| 16 | 7.07 | 0.025 | 0.22 |
| 17 | 14,14 | 0,050 | 0.26 |
| 18 | 21.21 | 0,075 | 0.11 |
| (7) | 28.28 | 步,100 | 0.32 |
| 20 | 35.15 | 1,125 | 0.43 |
| 21 | 42,42 | 0.150 | 0.13 |
| 22 | 49,49 | 0.155 | 0.53 |
| 13 | 56.50 | 0,200 | 0.51 |
| 34 | 63.63 | 0.225 | 0.61 |

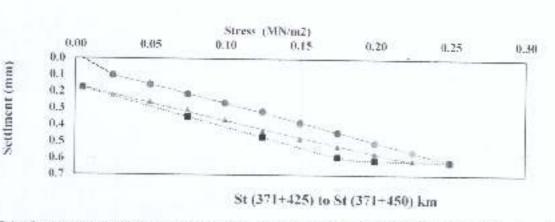




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Fig. 7: Load-settlement curve, fitting curves according to Table 19 and Table 20 for the first and second loading cycles

- 0 Measument points from the first loading cycle because ment points from the unloading cycle
- Measurment points from the second leading cycle 5 Settlement in mm
 - or Normal stress MN/m²











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St (371+450) to St (371+475) km

600

Table 22: Memorril tables for first histing cycle and unoviding cycle

| Looding stage no. | Lauri (P) KS | Normal stress (sq) \$15 cm ² | Settlement of Rodling plate & turn |
|-------------------|------------------------|---|--|
| ρ | 1.414 | 0.005 | 8,09 |
| 1 | 7,07 | 0.025 | 8.98 |
| 2 | 14.14 | -6.050 | 0.13 |
| 3 | 21.21 | 0.125 | 0.19 |
| - + C - 1 | 28.28 | 0.200 | 0.23 |
| 5 | 35.35 | 0.125 | 0.29 |
| + | 42.42 | 0.159 | B.35 |
| 1 | 40.14 | 0.178 | 0.41 |
| 8 | 50.26 | 0,200 | 0.47 |
| 9 | 63.63 | 0.225 | 0.53 |
| 10 | 76,7 | 0.250 | 0.49 |
| | 50.56 | 0.200 | 0.58 |
| 12 | 4a, 18 | D.178 | 0,56 |
| .13 | 35.35 | 0.125 | 0.44 |
| 14 | 21,21 | 0.025 | 0.35 |
| 15 | 1.04 | 0.005 | 0.12 |
| T. | ble 23. Measured value | es far scount huefing cycle | |
| Linding slage no. | Load (F) kN | Normal spress (50) MN/62 | Settlement of loading plate S (mm) |
| 15 | 1.41+ | 0.005 | 0.12 |
| 16 | 7.67 | 0.625 | 0.16 |
| 12 | 14.14 | 0.950 | 9.39 |
| 18 | 21.21 | 1,075 | 0.24 |
| 19 | 28.28 | ÷.100 | 0.31 |
| 20 | 35.35 | 0.125 | 0.15 |
| 21 | 42.42 | 0.155 | 0.41 |
| 22 | 49,89 | 0.175 | 6,45 |
| 30 | \$6,56 | 0.200 | 0.50 |
| 21 | \$3.63 | 36.22# | 0.59 |

| Fable 24: Com | putation of results | 110 300 300 - 1 |
|---|---------------------|-------------------|
| Parameters | In hading syste | 2ad footing cycle |
| (Ohner) MN/m ² | 0.250 | 0.250 |
| n, (mm) | 0.625 | 9/13 |
| *, (mm-(MN-m*)) | 1,976 | 1.920 |
| a2 (mm/(MN/cm*)) | 1.132 | 1.540 |
| $15 = 1.5 \text{ eV} (s + s_1, \sigma_{s_1+t_1+1})$ | 199.20 | 214.53 |
| Lastak pur | 1.15 | |

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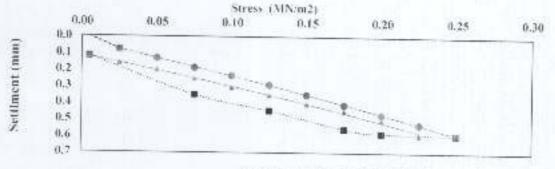
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St (371-450) to St (371+475) km

Fig. 8: Load-settlement curve, fitting curves according to Table 22 and Table 23 for the first and second loading cycles

Measurment points from the first lasting cycle
 Measurment points from the unloading cycle
 Measurment points from the unloading cycle

Measurment points from the second leading cycle 5 Sectionant in mm m₀ Normal stress h(x/m¹)







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5t (371+475) to St (371+500) km

600

Table 25: Measured values for first kinding cycle and an instituting cycle

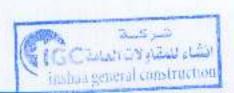
| Crading stoge an | Lond (F) EN | Normal stress (4,) MN/m ² | Settlement of buding plane S (1111) |
|------------------|----------------|--------------------------------------|---|
| | 1.414 | 0.005 | 0.00 |
| 1 | 7.07 | 0.025 | 11.67 |
| 2 | 14.14 | 0.050 | 0.12 |
| 3 | 21,21 | 0.075 | 0.17 |
| + | 28.26 | 0.100 | 0.22 |
| 5 | 38,35 | 0.125 | 0.28 |
| - F. | 42.42 | 0.150 | 0.34 |
| 20 | 49,49 | 0.178 | 0,39 |
| ñ | \$0.56 | 6,204 | 0.45 |
| 9 | 6365 | 0.228 | 0.52 |
| 10 | 2014 | 0.250 | 0.58 |
| 4 | 51,51 | 0.200 | 0.55 |
| 12 | 49,49 | 16.175 | 8.48 |
| 13 | 35.35 | 0.12.4 | 0,40 |
| 14 | 21.21 | 0.075 | 0.24 |
| 15 | 1.414 | 0.605 | 0.10 |

| Learning stage an. | Load (F) kN | Normal stress (30) M N/m2 | Settlement of loading plane 8 (mm) |
|--------------------|----------------|------------------------------|--|
| 15 | 1.41+ | 0.005 | 0.10 |
| м | 7,67 | 8.625 | 0.14 |
| .17 | J-LJ-L | 0.6% | 0.19 |
| 18 | 21.21 | 0.015 | 0.25 |
| 19 | 28.28 | 0,100 | 0.29 |
| 20 | 35.35 | 0.125 | 0.34 |
| 21 | 42.42 | 0.150 | Ŕ.39 |
| 12 | 49,48 | 0.175 | 0,45 |
| 20 | \$6.50 | 0.200 | 0.51 |
| 24 | 63.63 | 0.225 | 0,57 |

Table 27: Compilation of results

| Parameters | lst lonäing rych | 214 loading evel |
|---|------------------|------------------|
| (Geral) MN/m ² | 0.250 | 0.350 |
| a _r (mm) | 0.022 | 0.040 |
| 4, (mm/(MN/m ²)) | 3,811 | 1.939 |
| a ₂ (mm/(MN//m ²)) | 2,779 | 11 775 |
| Even 1.5 of (a restoring start) | 199,48 | 310.98 |
| Ev2/E+1 | 1.0: | |



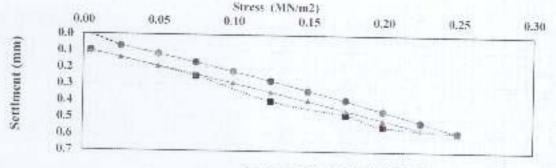


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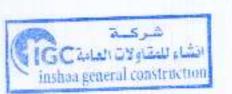
St (371+475) to St (371+500) km

Fig. 8: Load-settlement curve, fitting curves according to Table 25 and Table 26 for the first and second loading cycles

Measument points from the first loading cycle
 Measument points from the unloading cycle
 Measurment points from the second loading cycle

S Sattlement In min G Normal stress MN/m²

Sector States



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Conclusions:

The present test results which obtained from the plate loading tests of the native soil on the sub-ballast layer of the electric express train project at location from St (371+275) to St (371+500) km in accourdance to the German standard , DIN 18134 are illustrated in table 28.

| Location | Ev1(MN/m ²) | Ev2(MN/m ²) | Ev2/Ev1 ratio |
|--------------------------------|-------------------------|-------------------------|---------------|
| St (371+275) : St (371+300) km | 200.01 | 226.67 | 1.13 |
| St (371+300) : St (371+325) km | 209.52 | 235.58 | 1.12 |
| St (371+325) : St (371+350) km | 200.75 | 228.32 | 1.14 |
| St (371+350) : St (371+375) km | 190.87 | 217.28 | 1.14 |
| St (371+375) : St (371+400) km | 225.29 | 230.58 | 1.02 |
| St (371+400) : St (371+425) km | 205.79 | 228.10 | 1.11 |
| St (371+425) : St (371+450) km | 195.70 | 222.54 | 1.14 |
| 5t (371+450) : St (371+475) km | 199.20 | 214.52 | 1.08 |
| 5t (371+475) : St (371+500) km | 199.48 | 210.98 | 1.06 |



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