

المنطقة الخامسة - (غرب الدلتا)

السيد المهندس / رئيس قطاع التنفيذ والمناطق

تحية طيبة.. وبعد،

بالإحالة إلى مشروع القطار الكهربائي فائق السرعة (العين السخنة - العاصمة
الادارية - العلمين - مطروح) قطاع غرب النيل
نتشرف بأن نرفق لسيادتكم طيه المقايسة المعدلة للقطاعات الآتية: -

الشركة	من كم	الى كم	اتجاه
شركة الماسة للمقاولات العمومية والاستيراد والتصدير	363+000	366+000	إستكمال طبقات الأساس

برجاء من سيادتكم التفضل بالإحاطة والتوجيه بالازم

وتفضلوا بقبول فائق الاحترام والتقدير،



رئيس الإدارة المركزية

منطقة غرب الدلتا

الاسكندرية - مرسى مطروح

عميد - مهندس /

" هانى محمد محمود طه "

المقايمة المعدلة

الهيئة العامة للطرق والكباري - وزارة النقل

عقد رقم 2024/2023/947

المقايمة لبيوت الاعمال (استكمال طبقات الاساس)

مشروع : القطار السريع (المسخنة - الطمين - مطروح)

القطاع من الكم 363+000 الي الكم 366+000 بطول 3 كم

تنفيذ شركة: الماسة للمقايمة والاسناد والاستشارات والتصميم

رقم البند	بيان الاعمال	الوحدة	الكمية	الفئة	الاجمالي
2	اصال الردم				
1-2	بالمتر المكعب اصال توريد وتشغيل تربة صالحة للردم و مطابقة للمواصفات والتشغيل باستخدام المعدات بسمك لا يزيد عن 50 سم حتى منسوب 2 متر و بسمك لا يزيد عن 25 سم لاستكمال المنسوب التصميمي لتشكيل الجسر والكتاف (نسبة تحمل كاليفورنيا لا تقل عن 15%) و رشها بالمياه الاصولية للوصول الي نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول الي اقصى كثافة جافة (95 % من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند جميع مشتعلاته طبقا لاصول الصناعة ومواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس المشرف. - مسافة النقل 2 كم - يتم احتساب علاوة 1.5 جنيه لكل 1 كم بالزيادة او النقصان - السعر يشمل عمل تشوينات وتخليط واختبارات ونقل لموقع العمل حتى مسافة 2 كم - السعر يشمل قيمة المادة المحجرة	3م	28,409.94	91.70	2,605,191.50
	السعر خلال شهر ديسمبر سنة 2022 طبقا للمفاوضه				
	علاوة مسافة نقل للتربة لمسافة 92 كم - 2 كم = 90 كم (135.00 = 1.50 * 90)	3م	20,000.00	135.00	2,700,000.00
	علاوة مسافة نقل للتربة لمسافة 120 كم - 2 كم = 118 كم (177.00 = 1.50 * 118)	3م	2,727.95	177.00	482,847.50
	علاوة مسافة النقل للرمال لمسافة 73 كم - 2 كم = 71 كم (106.50 = 1.50 * 71)	3م	5,000.00	106.50	532,500.00
	علاوة مسافة النقل للرمال لمسافة 82 كم - 2 كم = 80 كم (120.00 = 1.50 * 80)	3م	681.99	120.00	81,838.56
	علاوة تحصيل رسوم الكارثة والموازن طبقا للاتحة الشركة الوطنية	3م	28,409.94	13.00	369,329.22
4	طبقات الاساس				
1-4	بالمتر المكعب اصال توريد وفرش طبقة تاسيس (prepared Subgrade) من الاحجار الصلبة المترجرة ناتج تكسير الكسارات والمطابقة للمواصفات واقصى حجم للحبيبات 100 مم والا تزيد نسبة المار من منخل 200 عن 12 % و التدرج الوارد بالاشتراطات الخاصة بالمشروع لا تقل نسبة تحمل كاليفورنيا عن 25 % والا تزيد نسبة الفاقد بجهاز لوس الجولوس عن 30 % والا يزيد الامتصاص عن 15% و الا يقل معامل المرونة (Ev2) من تجربة لوح التحميل عن 80 ميجاباسكال و يتم فردها على طبقتين باستخدام الات التسوية الحديثة علي ان لا يزيد سمك الطبقة بعد تمام الدمك عن 25 سم و رشها بالمياه الاصولية للوصول الي نسبة الرطوبة المطلوبة والدمك الجيد للهراسات للوصول الي اقصى كثافة جافة قصوي (لا تقل عن 95 %) من الكثافة المعملية والفئة تشمل اجراء التجارب المعملية والحقلية ويتم التنفيذ طبقا لاصول الصناعة والرسومات التفصيلية المعتمدة والبند جميع مشتعلاته طبقا للمواصفات الفنية للمشروع وتقرير الاستشاري وتعليمات المهندس المشرف - مسافة النقل لا تقل عن 20 كم - يتم احتساب علاوة 1.3 جنيه لكل 1 كم بالزيادة او النقصان	3م	28,761.893	126.80	3,647,008.02
	السعر خلال شهر ديسمبر سنة 2022 طبقا للمفاوضه				
	علاوة مسافة نقل السن لمسافة 77 كم - 20 كم = 57 كم (74.10 = 1.30 * 57)	3م	9,266.74	74.10	686,665.43
	علاوة مسافة نقل السن لمسافة 114 كم - 20 كم = 94 كم (122.20 = 1.30 * 94)	3م	19,495.153	122.20	2,382,307.68
	المادة المحجرة (prepared Subgrade) طبقا للمفاوضه	3م	28,761.893	161.00	4,630,664.76
	علاوة تحصيل رسوم الكارثة والموازن طبقا للاتحة الشركة الوطنية	3م	28,761.893	25.00	719,047.32
	الإجمالي				18,837,400.00
(ثمانية عشر مليوناً وثمانمائة وسبعة وثلاثون ألفاً وأربعمائة جنياً مصري فقط لا غير)					

مدير عام مشروعات (الهيئة)

م / محمد حسني فياض

رئيس الإدارة المركزية
منطقة غرب الدلتا

الاسكندرية - مرسى مطروح

عميد - مهندس /

" هاني محمد محمود طه "

مدير المشروع (الهيئة)

م / مارجريت مجدي زاخر

مدير مشروع الاستشاري

مكتب المهندسين

م / ملان عصامي صيد



مهندس الشركة

م / عبدالرحمن محمد عبدالصمد



مشروع : القطار الكهربائي السريع (العين السخنة -العاصمة الادارية -العلمين -مطروح) قطاع غرب النيل في المسافة
من الكم 363.000 الى الكم 366.000 بطول 3.00 كيلو متر - استكمال طبقات الأساس

رقم البند و بيانه : (1-3) اعمال توريد وتشغيل اترية صالحة للردم ومطابقة للمواصفات والتشغيل باستخدام المعدات بسمك لا يزيد عن 50 سم
حتى منسوب 2 متر وبسمك لا يزيد عن 25 سم لاستكمال المنسوب التصميمي
عن شهر ديسمبر 2022

تنفيذ : شركة الماسة للمقاولات العمومية والاستيراد والتصدير

3م

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مقدار العمل السابق :

28409.94		كمية الاعمال بالمقايمة					
الكمية	المسطح	الطول	الى الكم	من الكم	التاريخ	رقم الريكويست	البند
2,040.00	17.00	120.00	363+380	363+260	2023/03/12	IR-F134	<p>أعمال تحميل وتوريد ونقل اترية مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسمك لا يزيد عن 50 سم حتى منسوب 2 متر وبسمك لا يزيد عن 25 سم لاستكمال المنسوب التصميمي لتشكيل الجسر والاكتاف (نسبة تحمل كاليفورنيا لا تقل عن 15%) ورشها بالمياه الاصلوية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهواضات للوصول الى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتعلاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس المشرف .</p> <p>- في حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% يحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1%.</p> <p>-مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان.</p> <p>- السعر يشمل عمل تشوينات وتخليطواختبارات ونقل لموقع العمل حتى مسافة 2كم.</p> <p>- السعر يشمل قيمة المادة المحجرية.</p>
806.80	20.17	40.00	365+780	365+740	2023/03/14	IR-F135	
2,050.80	17.09	120.00	365+900	365+780	2023/03/14	IR-F136	
1,046.00	10.46	100.00	366+000	365+900	2023/03/14	IR-F137	
4,082.40	17.01	240.00	365+100	364+860	2023/03/16	IR-F138	
1,525.20	12.71	120.00	363+380	363+260	2023/03/16	IR-F139	
1,162.20	19.37	60.00	364+860	364+800	2023/03/16	IR-F140	
794.40	19.86	40.00	365+780	365+740	2023/03/20	IR-F141	
1,047.00	10.47	100.00	366+000	365+900	2023/03/21	IR-F142	
998.40	12.48	80.00	365+180	365+100	2023/03/21	IR-F143	
1,520.40	12.67	120.00	365+300	365+180	2023/03/22	IR-F144	
1,609.00	16.09	100.00	363+360	363+260	2023/03/24	IR-F145	
229.20	11.46	20.00	363+380	363+360	2023/03/30	IR-F146	
2,862.00	15.90	180.00	365+040	364+860	2023/04/01	IR-F147	
571.80	9.53	60.00	365+100	365+040	2023/04/03	IR-F159	
1,524.00	12.70	120.00	365+300	365+180	2023/04/06	IR-F148	
1,130.40	9.42	120.00	363+380	363+260	2023/04/06	IR-F149	
1,137.14	18.9523	60.00	363+060	363+000	2024/08/19	(S5-B-MS) (IR-F-45-D.P) REV-01	
1,135.20	18.92	60.00	363+060	363+000	2024/08/22	(S5-B-MS) (IR-F-47-D.P) REV-01	
1,137.60	18.96	60.00	363+060	363+000	2024/08/26	(S5-B-MS) (IR-F-49-D.P) REV-01	
28,409.94	اجمالي الكميات خلال فترة المستخلص الحالية (3م)						
28,409.94	الاجمالي الكلي (3م)						

مدير مشروع الهيئة

م/ مارجريت مجدي زاهر

مهندس الاستشاري

مكتب در عمال النيل

م/ مازن عصامي سيد

م/ محمد شهاب خليل

م/ محمد طيس

م/ عبد الرحمن محمد عبد الصمد

مشروع : القطار الكهربائى السريع (العين السخنة -العاصمة الادارية -العلمين -مطروح) قطاع غرب النيل فى المسافة
من الكم 363.000 الى الكم 366.000 بطول 3.00 كيلو متر - استكمال طبقات الأساس

رقم البند و بيانه : (1-3) علاوة مسافة النقل للتربة مسافة 120 كم بنسبة 80%

تنفيذ : شركة الماسة للمقاولات العمومية والاستيراد والتصدير

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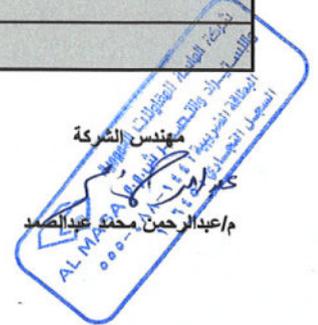
مقدار العمل السابق :

2727.95			كمية الاعمال بالمقايمة					
الكمية	نسبة التربة	المسطح	الطول	الى الكم	من الكم	التاريخ	رقم الريكويست	البند
909.71	80%	18.9523	60.00	363+060	363+000	2024/08/19	(S5-B-MS) (IR-F-45-D.P) REV-01	أعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام الات التصوية بسمك لايزيد عن 50 سم حتى منسوب -2 متر وبسمك لايزيد عن 25 سم لاستكمال المنسوب التصميمى لتشكيل الجسر والاكتاف (نسبة تحمل كالفورنيا لا تقل عن 15%) ورشها بالمياة الأصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهزاسات للوصول الى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس الشرف . - فى حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% بحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1% -مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان. - السعر يشمل عمل تشوينات وتخليطواختبارات ونقل موقع العمل حتى مسافة 2كم. - السعر يشمل قيمة المادة المحجرية.
908.16	80%	18.92	60.00	363+060	363+000	2024/08/22	(S5-B-MS) (IR-F-47-D.P) REV-01	أعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام الات التصوية بسمك لايزيد عن 50 سم حتى منسوب -2 متر وبسمك لايزيد عن 25 سم لاستكمال المنسوب التصميمى لتشكيل الجسر والاكتاف (نسبة تحمل كالفورنيا لا تقل عن 15%) ورشها بالمياة الأصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهزاسات للوصول الى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس الشرف . - فى حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% بحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1% -مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان. - السعر يشمل عمل تشوينات وتخليطواختبارات ونقل موقع العمل حتى مسافة 2كم. - السعر يشمل قيمة المادة المحجرية.
910.08	80%	18.96	60.00	363+060	363+000	2024/08/26	(S5-B-MS) (IR-F-49-D.P) REV-01	أعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام الات التصوية بسمك لايزيد عن 50 سم حتى منسوب -2 متر وبسمك لايزيد عن 25 سم لاستكمال المنسوب التصميمى لتشكيل الجسر والاكتاف (نسبة تحمل كالفورنيا لا تقل عن 15%) ورشها بالمياة الأصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهزاسات للوصول الى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس الشرف . - فى حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% بحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1% -مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان. - السعر يشمل عمل تشوينات وتخليطواختبارات ونقل موقع العمل حتى مسافة 2كم. - السعر يشمل قيمة المادة المحجرية.
2,727.95	اجمالي الكميات خلال فترة المستخلص الحالية (3م)							
2,727.95	الاجمالي الكلي (3م)							

مدير مشروع الهيئة
م/ ماجريت مجدي زاخر



مهندس الاستشاري
مكتب (XYZ)
م/ محمد شهاب خليل



مشروع : القطار الكهربائى السريع (العين السخنة -العاصمة الادارية -العلمين -مطروح) قطاع غرب النيل فى المسافة
من الكم 363.000 الى الكم 366.000 بطول 3.00 كيلو متر - استكمال طبقات الأساس

رقم البند و بيانه : (1-3) علاوة مسافة النقل للرمال مسافة 82 كم بنسبة 20%

تـنـفـيـذ : شركة الماسة للمقاولات العمومية والاستيراد والتصدير

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مقدار العمل السابق :

681.99		كمية الاعمال بالمقايمة						
الكمية	نسبة الرمال	المسطح	الطول	الى الكم	من الكم	التاريخ	رقم الريكويست	البند
227.43	20%	18.9523	60.00	363+060	363+000	2024/08/19	(S6-B-MS) (IR-F-46-D.P) REV-01	أعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسلك لايزيد عن 50 سم حتى منسوب 2- متر وبسلك لايزيد عن 25 سم لاستكمال المنسوب التصميمى لتشكيل الجسر والاكتاف (نسبة تحمل كالفورنيا لا تقل عن 15%) ورشها بالمياة الاصلوية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهواضات للوصول الى اقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس الشرف . - فى حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% بحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1% . -مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان. - السعر يشمل عمل تشوينات وتخليطواختبارات ونقل لموقع العمل حتى مسافة 2كم. - السعر يشمل قيمة المادة المحجرية.
227.04	20%	18.92	60.00	363+060	363+000	2024/08/22	(S6-B-MS) (IR-F-47-D.P) REV-01	أعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسلك لايزيد عن 50 سم حتى منسوب 2- متر وبسلك لايزيد عن 25 سم لاستكمال المنسوب التصميمى لتشكيل الجسر والاكتاف (نسبة تحمل كالفورنيا لا تقل عن 15%) ورشها بالمياة الاصلوية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهواضات للوصول الى اقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس الشرف . - فى حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% بحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1% . -مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان. - السعر يشمل عمل تشوينات وتخليطواختبارات ونقل لموقع العمل حتى مسافة 2كم. - السعر يشمل قيمة المادة المحجرية.
227.52	20%	18.96	60.00	363+060	363+000	2024/08/26	(S6-B-MS) (IR-F-49-D.P) REV-01	أعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسلك لايزيد عن 50 سم حتى منسوب 2- متر وبسلك لايزيد عن 25 سم لاستكمال المنسوب التصميمى لتشكيل الجسر والاكتاف (نسبة تحمل كالفورنيا لا تقل عن 15%) ورشها بالمياة الاصلوية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهواضات للوصول الى اقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس الشرف . - فى حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% بحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1% . -مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان. - السعر يشمل عمل تشوينات وتخليطواختبارات ونقل لموقع العمل حتى مسافة 2كم. - السعر يشمل قيمة المادة المحجرية.
681.99								اجمالي الكميات خلال فترة المستخلص الحالية (م3)
681.99								الاجمالي الكلى (م3)

مدير مشروع الهيئة

م/ ماجريت مجدي زاخر



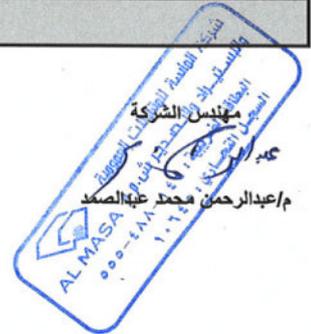
مهندس الاستشاري
مكتب م/ عثمان نبيل

م/ مازن كمالى سيد

مهندس الاستشاري
مكتب (XYZ)

م/ محمد شهاب خليل

م/ محمد شهاب خليل



مهندس الشركة
مكتب م/ محمد شهاب خليل

م/ عبدالرحمن محمدر عبدالصمد

مشروع : القطار الكهربائي السريع (العين السخنة -العاصمة الادارية -العلمين -مطروح) قطاع غرب النيل في المسافة من الكم 363.000 الى الكم 366.000 بطول 3.00 كيلو متر - استكمال طبقات الأساس

رقم البند و بيانه : (1-3) علاوة تحصيل رسوم الكارثة والموازن طبقا للاحه الشركة الوطنية

تـنـفـيـذ : شركة الماسة للمقاولات العمومية والاستيراد والتصدير

3م

25000.00

مقدار العمل السابق :

28409.94		كمية الاعمال بالمقايمة					
الكمية	المسطح	الطول	الى الكم	من الكم	التاريخ	رقم الريكويست	البند
1,137.14	18.9523	60.00	363+060	363+000	2024/08/19	(S5-B-MS) (IR-F-45-D.P) REV-01	أعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسبك لايزيد عن 50 سم حتى منسوب 2- متر وبسبك لايزيد عن 25 سم لاستكمال المنسوب التصميمي لتشكيل الجسر والاكتاف (نسبة تحمل كاليفورنيا لا تقل عن 15%) ورشها بالمياه الاصلوية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهزاسات للوصول الى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس الشرف . - في حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% يحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1% . -مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان. - السعر يشمل عمل تشوينات وتخليطواختبارات ونقل لموقع العمل حتى مسافة 2كم. - السعر يشمل قيمة المادة المحجرية.
1,135.20	18.92	60.00	363+060	363+000	2024/08/22	(S5-B-MS) (IR-F-47-D.P) REV-01	أعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسبك لايزيد عن 50 سم حتى منسوب 2- متر وبسبك لايزيد عن 25 سم لاستكمال المنسوب التصميمي لتشكيل الجسر والاكتاف (نسبة تحمل كاليفورنيا لا تقل عن 15%) ورشها بالمياه الاصلوية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهزاسات للوصول الى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس الشرف . - في حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% يحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1% . -مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان. - السعر يشمل عمل تشوينات وتخليطواختبارات ونقل لموقع العمل حتى مسافة 2كم. - السعر يشمل قيمة المادة المحجرية.
1,137.60	18.96	60.00	363+060	363+000	2024/08/26	(S5-B-MS) (IR-F-49-D.P) REV-01	أعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسبك لايزيد عن 50 سم حتى منسوب 2- متر وبسبك لايزيد عن 25 سم لاستكمال المنسوب التصميمي لتشكيل الجسر والاكتاف (نسبة تحمل كاليفورنيا لا تقل عن 15%) ورشها بالمياه الاصلوية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهزاسات للوصول الى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسي التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس الشرف . - في حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% يحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1% . -مسافة النقل حتى 2كم ويتم احتساب علاوة 1.5 جنيه للكم بالزيادة او النقصان. - السعر يشمل عمل تشوينات وتخليطواختبارات ونقل لموقع العمل حتى مسافة 2كم. - السعر يشمل قيمة المادة المحجرية.
3,409.94	اجمالي الكميات خلال فترة المستخلص الحالية (3م)						
28,409.94	الاجمالي الكلي (3م)						

مدير مشروع الهيئة

م/ ماجريت مجدي زاهر



مهندس الاستشاري

مكتب (XYZ)

م/ محمد شهاب خليل



مشروع : القطر الكهربائي السريع (العين السخنة - العاصمة الإدارية - العدين - مطروح) قطاع غرب النيل في المسافة
من الكم 363.000 الى الكم 366.000 بطول 3.00 كيلو متر - استكمال طبقات الأسس
رقم البند و بيانه : (1-4) بالمتر المكعب أعمال توريد وفرش طبقة تأسيس (Prepared subgrade) من الاجرار الصلبة المتدرجة ناتج تكسير الكسارات والمطابقة للمواصفات
عن شهر ديسمبر 2022
تفويذ : شركة العمامة للمقاولات الصومية والاستيراد والتصدير

3*

741.24

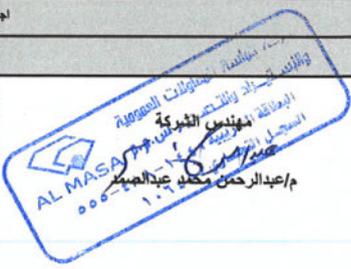
مقدار العمل السابق :

28761.893			كمية الاصل بالمقايمة					3*		741.24	مقدار العمل السابق :
الكمية	المسطح	الطول	ترقيم EET		ترقيم ENR		التاريخ	ITEM	رقم الريكويست	البند	
			من الكم	الى الكم	من الكم	الى الكم					
236.14	3.919	60.00	364+860	364+800	-	-	2023/01/04	Prepared Subgrade (2)	IR-SG-10-EET	بالمتر المكعب أعمال توريد وفرش طبقة تأسيس (Prepared subgrade) من الاجرار الصلبة المتدرجة ناتج تكسير الكسارات والمطابقة للمواصفات واقصى حجم للحبيبات 100 مم والا تزيد نسبة المار من منخل 200 عن 12% والتدرج الوارد بالاشتراطات الخاصة بالمشروع لا تقل نسبة تحمل كاليفورنيا عن 25% والا تزيد نسبة الفلذ بجهاز لوسن لتجروس عن 30% والا يزيد الامتصاص عن 15% والا يقل معامل المرونة (Ev2) من تجربه لوح التحميل عن 80 ميجاباسكال ويتم فردها على طبقتين باستخدام الات التسوية الحديثة على ان لا يزيد سم الطبقة بعد تمام الدمك عن 25 سم ورشها بالمياه الاصلوية للوصول الي نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول الي القصى كثافة جافة (لا تقل عن 95% من الكثافة الجافة القصى) والفنه تشمل اجراء التجارب المعملية والحقلية ويتم التنفيذ طبقا لاصول الصناعة والرسومات التفصيلية المعتمدة والبند بجميع مشتلاته طبقا للمواصفات الفنية للمشروع وتقرير الاستشاري وتعليمات المهندس المشرف. - مسلفه النقل 20 كم. - يتم احتساب علاوه 1.3 جنيه لكل 1 كم بالزيادة او النقصان.	
236.14	3.919	60.00	365+780	365+720	-	-	2023/01/04	Prepared Subgrade (2)	IR-SG-11-EET		
236.14	3.919	60.00	365+840	365+780	-	-	2023/01/04	Prepared Subgrade (2)	IR-SG-12-EET		
391.90	3.919	100.00	363+700	363+600	-	-	2023/03/16	Prepared Subgrade (2)	IR-SG-21-EET		
783.80	3.919	200.00	363+900	363+700	-	-	2023/04/04	Prepared Subgrade (2)	IR-SG-22-EET		
862.18	3.919	220.00	364+120	363+900	-	-	2023/04/04	Prepared Subgrade (2)	IR-SG-23-EET		
82.36	4.118	20.00	363+120	363+100	-	-	2023/05/03	Prepared Subgrade (1)	IR-SG-24-EET		
78.38	3.919	20.00	363+120	363+100	-	-	2023/05/07	Prepared Subgrade (2)	IR-SG-25-EET		
82.36	4.118	20.00	363+280	363+260	-	-	2023/05/23	Prepared Subgrade (1)	IR-SG-26-EET		
78.38	3.919	20.00	363+280	363+260	-	-	2023/05/27	Prepared Subgrade (2)	IR-SG-27-EET		
466.40	2.332	200.00	363+300	363+100	3+860	3+660	2023/07/11	Prepared Subgrade (1)	IR-SG-01-ENR		
326.48	2.332	140.00	365+980	365+840	6+540	6+400	2023/07/12	Prepared Subgrade (1)	IR-SG-02-ENR		
428.80	2.144	200.00	363+300	363+100	3+860	3+660	2023/07/16	Prepared Subgrade (2)	IR-SG-03-ENR		
233.20	2.332	100.00	365+840	365+740	6+400	6+300	2023/07/18	Prepared Subgrade (1)	IR-SG-04-ENR		
652.96	2.332	280.00	365+740	365+460	6+300	6+020	2023/07/19	Prepared Subgrade (1)	IR-SG-05-ENR		
569.68	2.332	240.00	365+260	365+020	6+820	6+580	2023/07/22	Prepared Subgrade (1)	IR-SG-06-ENR		
466.40	2.332	200.00	365+460	365+260	6+020	6+820	2023/07/22	Prepared Subgrade (1)	IR-SG-07-ENR		
267.28	2.144	120.00	365+560	365+440	6+120	6+000	2023/07/24	Prepared Subgrade (2)	IR-SG-08-ENR		
385.92	2.144	180.00	365+440	365+260	6+000	6+820	2023/07/25	Prepared Subgrade (2)	IR-SG-09-ENR		
614.66	2.144	240.00	365+260	365+020	6+820	6+580	2023/07/25	Prepared Subgrade (2)	IR-SG-10-ENR		
614.66	2.144	240.00	365+980	365+740	6+540	6+300	2023/07/30	Prepared Subgrade (2)	IR-SG-11-ENR		
385.92	2.144	180.00	365+740	365+560	6+300	6+120	2023/08/02	Prepared Subgrade (2)	IR-SG-12-ENR		
139.92	2.332	60.00	363+400	363+340	3+960	3+900	2023/08/19	Prepared Subgrade (1)	IR-SG-13-ENR		
128.64	2.144	60.00	363+400	363+340	3+960	3+900	2023/08/24	Prepared Subgrade (2)	IR-SG-14-ENR		
1,072.80	2.980	360.00	364+100	363+740	-	-	2023/10/28	Prepared Subgrade (1)	(S5-B-MS) (IR-S.G-01-D.P)		
1,052.28	2.923	360.00	364+100	363+740	-	-	2023/10/31	Prepared Subgrade (2)	(S5-B-MS) (IR-S.G-02-D.P)		
1,247.48	4.798	260.00	363+740	363+480	-	-	2023/11/11	Prepared Subgrade (1)	(S5-B-MS) (IR-S.G-03-D.P)		
1,225.12	4.712	260.00	363+740	363+480	-	-	2023/11/14	Prepared Subgrade (2)	(S5-B-MS) (IR-S.G-04-D.P)		
1,048.32	2.912	360.00	364+460	364+100	-	-	2023/12/05	Prepared Subgrade (1)	(S5-B-MS) (IR-S.G-05-D.P)		
225.00	3.760	60.00	363+060	363+000	-	-	2023/12/09	Prepared Subgrade (1)	(S5-B-MS) (IR-S.G-06-D.P)		
285.92	7.148	40.00	363+100	363+060	-	-	2023/12/09	Prepared Subgrade (1)	(S5-B-MS) (IR-S.G-07-D.P)		
1,009.08	2.803	360.00	364+460	364+100	-	-	2023/12/09	Prepared Subgrade (2)	(S5-B-MS) (IR-S.G-08-D.P)		
225.00	3.760	60.00	363+060	363+000	-	-	2023/12/11	Prepared Subgrade (2)	(S5-B-MS) (IR-S.G-09-D.P)		
278.12	6.953	40.00	363+100	363+060	-	-	2023/12/11	Prepared Subgrade (2)	(S5-B-MS) (IR-S.G-10-D.P)		
216.09	7.203	30.00	363+310	363+280	-	-	2023/12/16	Prepared Subgrade (1)	(S5-B-MS) (IR-S.G-11-D.P)		
858.96	7.168	120.00	363+480	363+360	-	-	2023/12/16	Prepared Subgrade (1)	(S5-B-MS) (IR-S.G-12-D.P)		
835.66	6.953	120.00	363+480	363+360	-	-	2023/12/20	Prepared Subgrade (2)	(S5-B-MS) (IR-S.G-13-D.P)		
210.24	7.008	30.00	363+310	363+280	-	-	2023/12/25	Prepared Subgrade (2)	(S5-B-MS) (IR-S.G-14-D.P)		
1,811.92	4.118	440.00	365+300	364+860	-	-	2024/05/11	Prepared Subgrade (1)	(S5-B-MS) (IR-S.G-28-EET)		
1,724.36	3.919	440.00	365+300	364+860	-	-	2024/05/16	Prepared Subgrade (2)	(S5-B-MS) (IR-S.G-29-EET)		
658.88	4.118	160.00	366+000	365+840	-	-	2024/05/11	Prepared Subgrade (1)	(S5-B-MS) (IR-S.G-30-EET)		
627.04	3.919	160.00	366+000	365+840	-	-	2024/05/16	Prepared Subgrade (2)	(S5-B-MS) (IR-S.G-31-EET)		
279.84	2.332	120.00	366+040	364+920	6+580	6+460	2023/10/14	Prepared Subgrade (1)	(S5-B-MS) (IR-SG-15-ENR)		
267.28	2.144	120.00	366+040	364+920	6+580	6+460	2023/10/18	Prepared Subgrade (2)	(S5-B-MS) (IR-SG-16-ENR)		
699.60	2.332	300.00	364+760	364+460	6+300	6+000	2023/12/19	Prepared Subgrade (1)	(S5-B-MS) (IR-SG-17-ENR)		
373.12	2.332	160.00	364+920	364+760	6+460	6+300	2023/12/20	Prepared Subgrade (1)	(S5-B-MS) (IR-SG-18-ENR)		
643.20	2.144	300.00	364+760	364+460	6+300	6+000	2023/12/23	Prepared Subgrade (2)	(S5-B-MS) (IR-SG-19-ENR)		
343.04	2.144	160.00	364+920	364+760	6+460	6+300	2023/12/25	Prepared Subgrade (2)	(S5-B-MS) (IR-SG-20-ENR)		
25,733.75										اجمالي الكميات خلال فترة المستخلص الحالية (3)	
26,474.99										الاجمالي الكاسى (3)	

مدير مشروع الهيئة
م/ مارجريت مجدي زاهر



مهندس الاستشاري
مكتب (XYZ)
م/ محمد شهاب خليل



MATERIAL APPROVAL REQUEST



الهيئة العامة للطرق والكباري (GARB)



الهيئة العامة للتخطيط



Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	Eng. Mohamed Elsaied		30/09/2023 (S5-B-MS) (MAR-S.G-06)	1:00 PM							
Received by GARB CONSULTANT	Eng. Mazen Essamy		MAR	C1	C2	C3	DD	MM	YY	HH	MM
				363	EW	CS	1	10	2023		

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

Description of Materials	Prepared Subgrade Total Quantity (30,000 m3)				
Location to be Used	From	363+000	TO	366+000	Rev-29
		363+180		366+180	Rev-35
sample only	yes	Materials Type	P.S.G		
Supplier Name	Elsiw , Alharamin	Data Sheet Provided	yes attached		
reference in BOQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Prequalification Reference		Test Samples Results			
Reference Photos	NO	Other			
Comments by: Eng. Mazen Essamy (SPECTRUM)		Comments by: Eng. Alaa Abd-Allatif (ER)			
1-quality test result by third party lab (combassal) is Approved.		1-All Tests Were Carried -Out By Third Party Lab.			
2-this sample representative (5000.m3) only.		2-Results report attached and acceptable with project specifications.			

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif			A

* Designer
 ** Allignment/Bridges (S5-B-MS) (MAR-S.G-06)

MATERIAL APPROVAL REQUEST



الهيئة العامة
للطرق والكباري
(GARB)



Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	Eng. Mohamed Elsaied		30/09/2023 (S5-B-MS) (MAR-S.G-06)	1:00 PM							
Received by GARB CONSULTANT	Eng. Mazen Essamy		MAR	C1	C2	C3	DD	MM	YY	HH	MM
				363	EW	CS	1	10	2023		

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

Description of Materials	Prepared Subgrade Total Quantity (30,000 m3)				
Location to be Used	From	363+000	TO	366+000	Rev-29
		363+180		366+180	Rev-35
sample only	yes	Materials Type	P.S.G		
Supplier Name	Elsiwiy , Alharamin	Data Sheet Provided	yes attached		
reference in BOQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Prequalification Reference		Test Samples Results			
Reference Photos	NO	Other			
Comments by: Eng. Mazen Essamy (SPECTRUM)		Comments by: Eng. Alaa Abd-Allatif (ER)			
1-quality test result by third party lab (combassal) is Approved		1-All Tests Were Carried -Out By Third Party Lab			
2-this sample representative (5000 m3) only		2-Results report attached and acceptable with project specifications.			
		3-Final approval is subject to above mentioned comments.			

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif			AWC

* Designer

** Alignment/Bridget (S5-B-MS) (MAR-S.G-06)

5/



COMIBASSAL International Controllers Internal inspection and laboratories sector

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

SOIL REPORTS FOR ELECTRIC EXPRESS TRAIN PROJECT

Contractor : شركة الماسة للمقاولات
Date of report : 5/10/2023
QC : 990-1





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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

I- Introduction

General Consultant	:	SYSTRA
Consultant	:	Spectrum
Contractor	:	شركة الماسة للمقاولات
Project	:	Electric Express Train
Station	:	St(363+000) to St(366+000)
Sample	:	Prepared Sub-Grade
Date of Test	:	1/10/2023
QC	:	990-1

II- Sample description:

Crushed stone and sand

III- Required tests and Results:

Required Tests		Results
1- Grain size analysis and Percentage of MATERIALS FINER THAN No. 200 (75 μ m)	Grain size analysis	As showed in appendix
	Pass From No.200	4.2%
2- Modified compaction (Proctor test)	MDD	2.172
	OMC	6.5%
	LL	Non plastic
3- Liquid limit, plastic lim/t and plasticity index	PL	Non plastic
	PI	Non plastic
	CBR ratio	95%
4- California bearing ratio (CBR)	CBR ratio	95%
5- Specific gravity (SG), absorption and degradation	S S D	2.553
	Absorption	1.8%
	Degradation	0.2%
6- Los Angeles test	Abrasion ratio	23.5%

IV- Notes:

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

LAB DIRECTOR

Eng / Eman kandil

Eman



Geotechnical consultant

For: DR. H.
Dr. Mohamed Mostafa Badry



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WebSite : www.comibassal.com



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COMIBASSAL International Controllers

Internal inspection and laboratories sector

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APPENDIX

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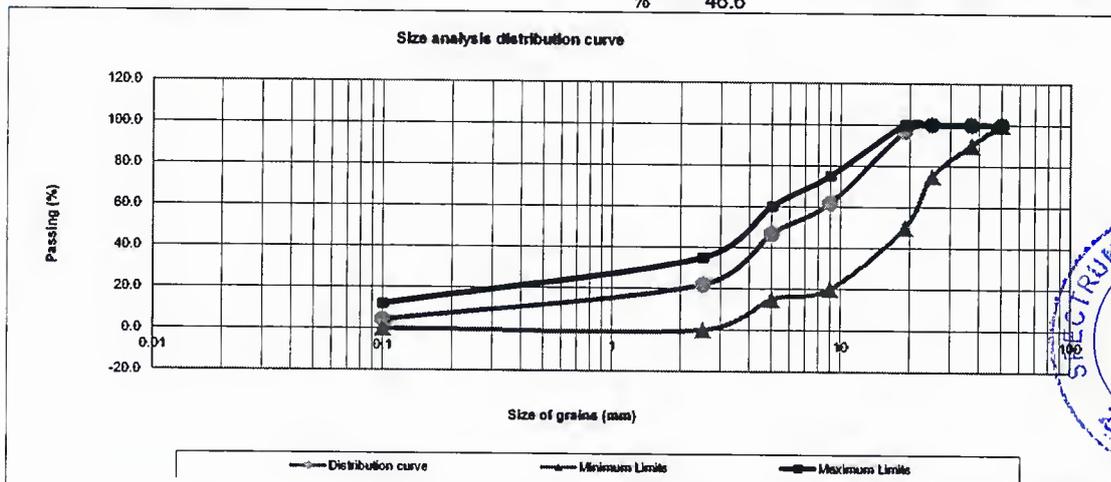
Internal inspection and laboratories sector

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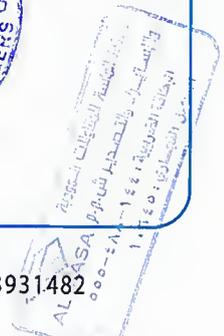
PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

	WEIGHT	CUMULATIVE	CUMULATIVE	CUMULATIVE	STANDURD	
	RETAINED	WEIGHT	PERCENTAGE	PERCENTAGE	SPECIFICATION	
	(gm)	RETAINED (gm)	RETAINED (%)	PASSING (%)	LIMITS	
5	0.00	0.00	0.00	100.0	100	100
4	0.00	0.00	0.00	100.0	90	100
3	0.00	0.00	0.00	100.0	75	100
1.5	319.00	319.00	3.19	96.8	50	100
3/4	3506.00	3825.00	38.25	61.8	20	75
3/8	1512.00	5337.00	53.37	46.6	15	60
No.10	265.50	265.50	53.10	21.9	0	35
No.200	455.40	455.40	91.08	4.2	0	12

Total sample weight = 10000.00 pass No.3/8= 4663.0 Total fine aggregates weight = 500 gm
% 46.6



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





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Internal inspection and laboratories sector

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Modified Proctor Test Report ASTM - D 1557

Mould Number :- 3
 Volume of mould = 2231 cm³
 Weight of mould = 4980 g
 G.S = 2.63 g/cm³

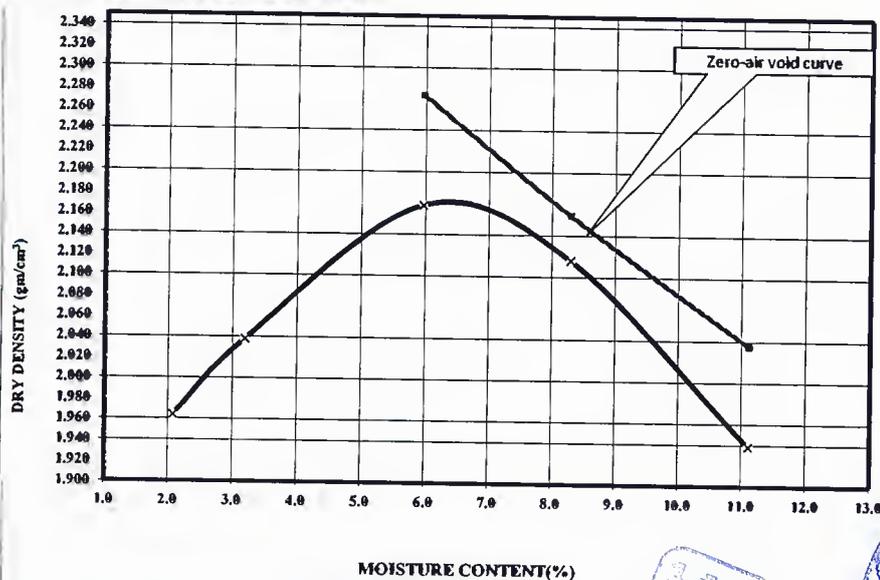
A- Density Calculations :-

	1	2	3	4	5
Weight of wet soil+mould (g)	9453	9671	10105	10092	9785
Weight of mould (g)	4980	4980	4980	4980	4980
Weight of wet soil (g)	4473	4691	5125	5112	4805
Volume of mould (cm ³)	2231	2231	2231	2231	2231
Wet density (g/cm ³)	2.005	2.103	2.297	2.291	2.154
Dry density (g/cm ³)	1.964	2.038	2.168	2.116	1.938
Zero-air Void curve			2.273	2.159	2.035

B- Moisture Calculations :-

Weight of wet soil+container (g)	250.0	250.0	250.0	250.0	250.0
Weight of dry soil+container (g)	245.5	243.2	237.5	233.0	228.0
Weight of container (g)	29.0	30.0	28.0	28.0	30.0
moisture content(%)	2.1	3.2	6.0	8.3	11.1

C - Dry density-Moisture relationship:-



M.D.D= 2.172 gm/cm³
 O.M.C= 6.50 %



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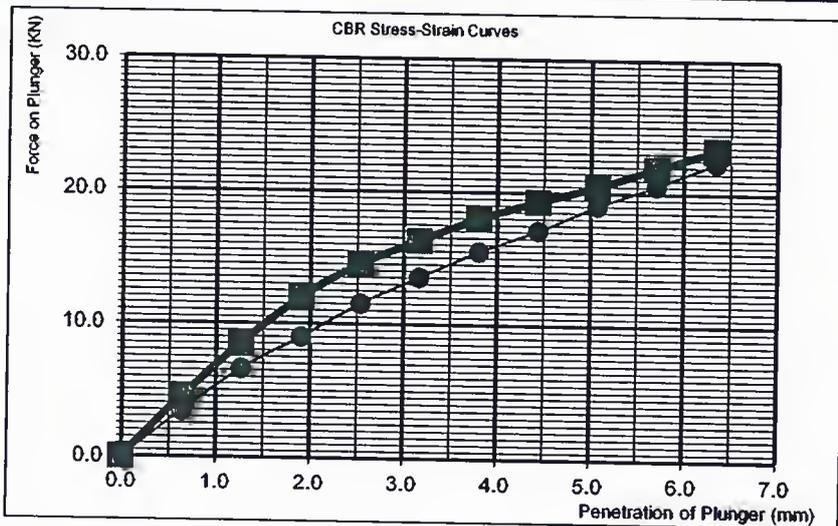
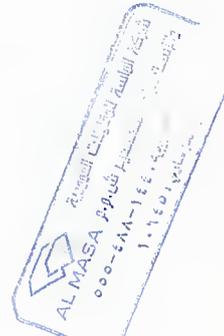
Internal inspection and laboratories sector

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

Report Of CBR Test - ASTM - D 1883

NO OF BLOWS	56				
MOULD NO	1				
WT OF MOULD+SOIL	10070				
WT OF MOULD	5172				
WT OF SOIL	4898				
VOLUME OF MOULD	2120				
WET DENSITY	2.310				
	MC before soaking		Weight of Rammer	4.54Kg	
TIN NO	1		MDD	Kg/m3	2.172
WT OF WET SOIL+TIN	250.00		OMC	%	6.5
WT OF DRY SOIL+TIN	243.5				
WT OF WATER	6.50				
WT OF TIN	88				
WT OF DRY SOIL	99				
MOISTURE CONTENT	6.6				
DRY DENSITY	2.168				

Pen	Reading (Div)	Bearing (KN)	standar	CBR
mm	56	56	56	
0.00	0	0.0	0.0	
0.64	348	3.4	4.5	
1.27	674	6.6	8.5	
1.91	920	9.0	12.0	
2.54	1175	11.5	14.5	87
3.17	1380	13.5	16.3	
3.81	1580	15.5	18.0	
4.45	1745	17.1	19.3	
5.08	1940	19.0	20.5	95
5.71	2100	20.6	21.9	
6.35	2280	22.4	23.3	





COMIBASSAL International Controllers

Internal inspection and laboratories secto

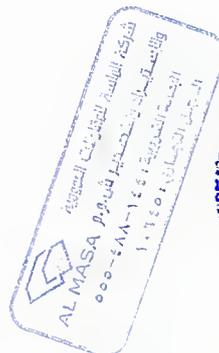
Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011

Absorption & Specific Gravity for Aggregate AASHTO T85 - ASTM C127

Weight of sample	2500
Weight of saturated - dry surface sample (B)	2540
Weight of saturated sample in water (C)	1545
Weight of dry sample aftr heating (A)	2494

Results:-

Saturation surface dry spicific gravity = $B / (B-C)$	2.553
Bulk specific gravity = $A / (B-C)$	2.507
Apparent spicific gravity = $A / (A-C)$	2.628
Asorbtion of water = $(B-A)/A*100$	1.8
Degradation of aggregate = $(2500-A)/ A*100$	0.2



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COMIBASSAL International Controllers

Internal inspection and laboratories secto

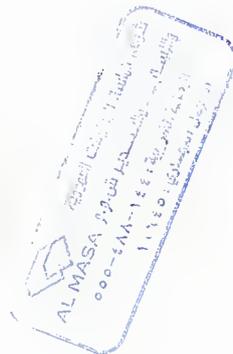
Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011

ABRASION AND IMPACT " LOS ANGELES " TEST

(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	3825
% abrasion By Weight Passing from Sieve No.12	23.5%



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COMIBASSAL International Controllers

Internal inspection and laboratories sector

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

Report	:	394 - 1 - Center
Date	:	04/10/2023

CHEMICAL ANALYSIS

General Consultant	:	SYSTRA
Consultant	:	SPECTRUM
Contractor	:	شركة الماسه للمقاولات العمومية ورصف الطرق
Project	:	Electric express train
Sample	:	Prepared Sub Grade
Station	:	ST (363 + 00.0):(366 + 00.0)
Date of Test	:	1-10-2023
Temperature	:	28 °C
		Humidity : 35%

ANALYSIS	RESULTS	TEST METHOD
CHLORIDE	0.0014%	ASTM D 1411
SULPHATE	0.0042%	ASTM D 1580
ORGANIG MATTER	NEGATIVE	ASTM D 2974



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa



MATERIAL APPROVAL REQUEST



الهيئة العامة
للطرق و الكبارى
(GARB)



Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	Eng. Mohamed Elsaied		31/10/2023 (S5-B-MS) (MAR-S.G-07)	1:00 PM							
Received by GARB CONSULTANT	Eng. Mazen Essamy		MAR	C1	C2	C3	DD	MM	YY	HH	MM
				363	EW	CS	1	11	2023		

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

Description of Materials	Prepared Subgrade Total Quantity (35,000 m3)				
Location to be Used	From	363+000	TO	366+000	Rev-29
		363+180		366+180	Rev-35
sample only	yes	Materials Type	P.S.G		
Supplier Name	Elsiwiy , Alharamin	Data Sheet Provided	yes attached		
reference in BOQ		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Prequalification Reference		Test Samples Results			
Reference Photos	NO	Other			
Comments by: Eng. Mazen Essamy (SPECTRUM)		Comments by: Eng. Alaa Abd-Allatif (ER)			
1-quality test result by third party lab (comibassal) is Approved.		1-All Tests Were Carried -Out By Third Party Lab.			
2-this sample representative (5000 m3) only.		2-Results report attached and acceptable with project specifications.			

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif			A

* Designer

** Alignment/Bridge: (S5-B-MS) (MAR-S.G-07)

MATERIAL APPROVAL REQUEST



الهيئة العامة
للطرق والكبارى
(GARB)



الهيئة العامة
للتنمية الاقتصادية



Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	Eng. Mohamed Elsaied		31/10/2023 (S5-B-MS) (MAR-S.G-07)	1:00 PM							
Received by GARB CONSULTANT	Eng. Mazen Essamy		MAR	C1	C2	C3	DD	MM	YY	HH	MM
				363	EW	CS	1	11	2023		

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

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Prequalification Reference		Test Samples Results			
Reference Photos	NO	Other			
Comments by: Eng. Mazen Essamy (SPECTRUM)			Comments by: Eng. Alaa Abd-Allatif (ER)		
1-quality test result by third party lab (comibassal) is Approved.			1-All Tests Were Carried -Out By Third Party Lab		
2-this sample representative (5000 m3) only			2-Results report attached and acceptable with project specifications.		
			3-Final approval is subject to above mentioned comments.		

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers' Representative	Eng. Alaa Abd-Allatif		2023/11/05	AWC

* Designer

** Alignment/Bridge: (S5-B-MS) (MAR-S.G-07)

55/11

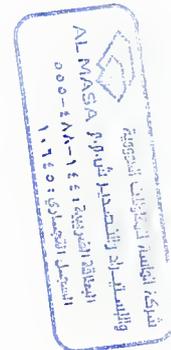


COMIBASSAL International Controllers Internal inspection and laboratories sector

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

SOIL REPORTS FOR ELECTRIC EXPRESS TRAIN PROJECT

Contractor : شركة الماسة للمقاولات
Date of report : 5/11/2023
QC : 990-2





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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

I- Introduction

General Consultant	:	SYSTRA
Consultant	:	Spectrum
Contractor	:	شركة الماسة للمقاولات
Project	:	Electric Express Train
Station	:	St(363+000) to St(366+000)
Sample	:	Prepared Sub-Grade
Date of Test	:	1/11/2023
QC	:	990-2

II- Sample description:

Crushed stone and sand

III- Required tests and Results:

Required Tests		Results
1- Grain size analysis and Percentage of MATERIALS FINER THAN No. 200 (75 μ m)	Grain size analysis	As showed in appendix
	Pass From No.200	4.9%
2- Modified compaction (Proctor test)	MDD	2.189
	OMC	6.3%
	LL	Non plastic
3- Liquid limit, plastic lim/t and plasticity index	PL	Non plastic
	PI	Non plastic
	CBR ratio	96%
4- California bearing ratio (CBR)	CBR ratio	96%
5- Specific gravity (SG), absorption and degradation	S S D	2.549
	Absorption	1.7%
	Degradation	0.3%
6- Los Angeles test	Abrasion ratio	23.8%

IV- Notes:

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

LAB DIRECTOR

Eng / Eman kandil

Eman



Geotechnical consultant

For: Dr. M.
Dr. Mohamed Mostafa Badry





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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

APPENDIX

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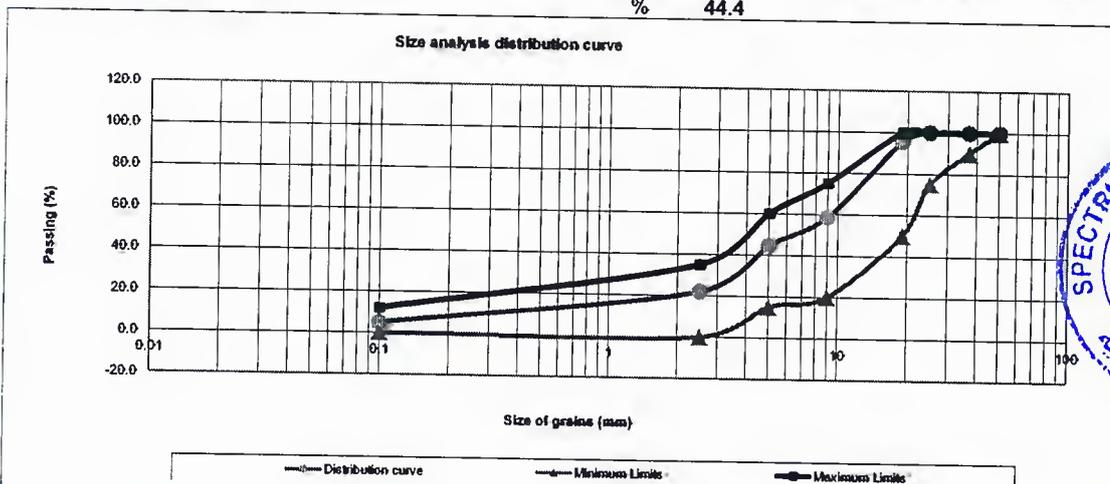
Internal inspection and laboratories sector

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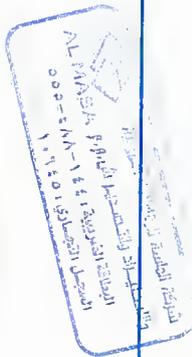
PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

	WEIGHT	CUMULATIVE	CUMULATIVE	CUMULATIVE	STANDURD	
	RETAINED	WEIGHT	PERCENTAGE	PERCENTAGE	SPECIFICATION	
	(gm)	RETAINED (gm)	RETAINED (%)	PASSING (%)	LIMITS	
5	0.00	0.00	0.00	100.0	100	100
4	0.00	0.00	0.00	100.0	90	100
3	0.00	0.00	0.00	100.0	75	100
1.5	452.00	452.00	4.52	95.5	50	100
3/4	3685.00	4137.00	41.37	58.6	20	75
3/8	1426.00	5563.00	55.63	44.4	15	60
No.10	253.00	253.00	50.60	21.9	0	35
No.200	445.00	445.00	89.00	4.9	0	12

Total sample weight = 10000.00 pass No.3/8= 4437.0 Total fine aggregates weight = 500 gm
% 44.4



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





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Modified Proctor Test Report ASTM - D 1557

Mould Number :- 3
 Volume of mould = 2180 cm³
 Weight of mould = 5531 g
 G.S = 2.67 g/cm³

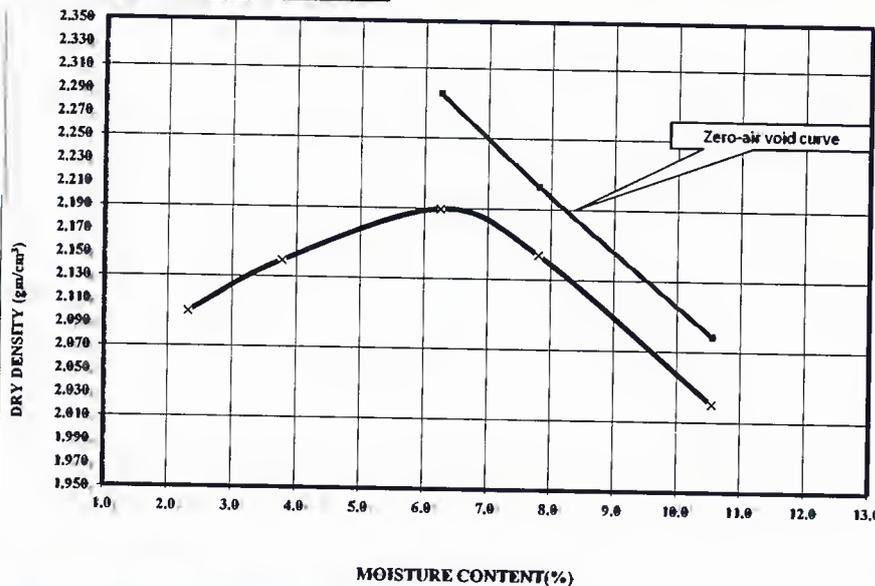
A- Density Calculations :-

	1	2	3	4	5
Weight.of wet soil+mould (g)	10214	10381	10602	10586	10412
Weight.of mould (g)	5531	5531	5531	5531	5531
Weight.of wet soil (g)	4683	4850	5071	5055	4881
Volume of mould (cm ³)	2180	2180	2180	2180	2180
Wet density (g/cm ³)	2.148	2.225	2.326	2.319	2.239
Dry density (g/cm ³)	2.100	2.144	2.189	2.151	2.025
Zero-air Void curve			2.288	2.210	2.083

B- Moisture Calculations :-

Weight.of wet soil+container (g)	250.0	250.0	250.0	250.0	250.0
Weight.of dry soil+container (g)	245.0	242.0	237.0	234.0	229.0
Weight.of container (g)	29.0	30.0	29.0	29.0	30.0
moisture content(%)	2.3	3.8	6.3	7.8	10.6

C - Dry density-Moisture relationship:-



M.D.D= 2.189 gm/cm³
 O.M.C= 6.30 %





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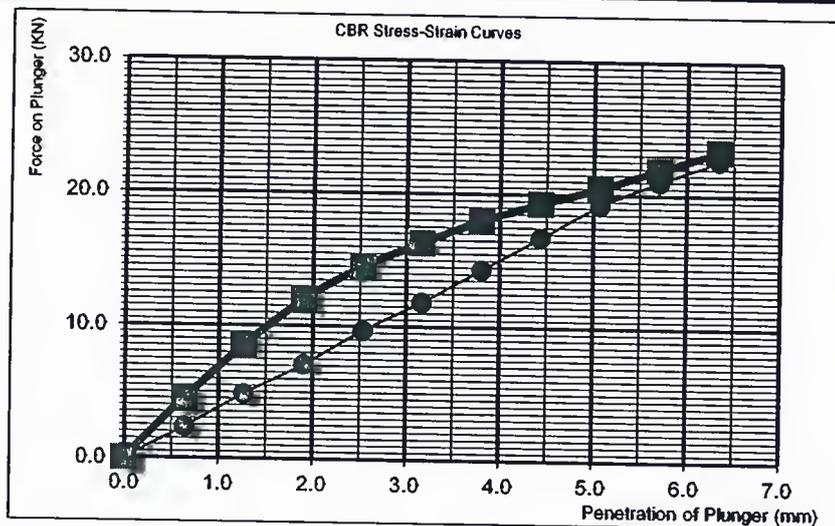
Internal inspection and laboratories sector

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

Report Of CBR Test - ASTM - D 1883

NO OF BLOWS	56				
MOULD NO	1				
WT OF MOULD+SOIL	10060				
WT OF MOULD	5172				
WT OF SOIL	4888				
VOLUME OF MOULD	2120				
WET DENSITY	2.306				
	MC before soaking		Weight of Rammer	4.54Kg	
TIN NO	1		MDD	Kg/m3	2.189
WT OF WET SOIL+TIN	250.00		OMC	%	6.3
WT OF DRY SOIL+TIN	243.5				
WT OF WATER	6.50				
WT OF TIN	88				
WT OF DRY SOIL	99				
MOISTURE CONTENT	6.6				
DRY DENSITY	2.164				

Pen	Reading (Div)	Bearing (KN)	standar	CBR
mm	56	56	standar	56
0.00	0	0.0	0.0	
0.64	240	2.4	4.5	
1.27	495	4.9	8.5	
1.91	725	7.1	12.0	
2.54	988	9.7	14.5	73
3.17	1210	11.9	16.3	
3.81	1460	14.3	18.0	
4.45	1708	16.7	19.3	
5.08	1960	19.2	20.5	96
5.71	2140	21.0	21.9	
6.35	2305	22.6	23.3	





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Internal inspection and laboratories sector

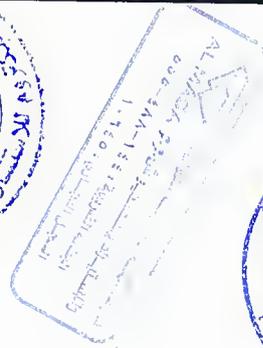
Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011

ABRASION AND IMPACT " LOS ANGELES " TEST

(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	3810
% abrasion By Weight Passing from Sieve No.12	23.8%





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Internal inspection and laboratories sector

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Absorption & Specific Gravity for Aggregate AASHTO T85 - ASTM C127

Weight of sample	2500
Weight of saturated - dry surface sample (B)	2536
Weight of saturated sample in water (C)	1541
Weight of dry sample aftr heating (A)	2493

Results:-

Saturation surface dry spicific gravity = $B / (B-C)$	2.549
Bulk spicific gravity = $A / (B-C)$	2.506
Apparent spicific gravity = $A / (A-C)$	2.619
Asorbtion of water = $(B-A) / A * 100$	1.7
Degradation of aggregate = $(2500-A) / A * 100$	0.3





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Internal inspection and laboratories sector

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Report	:	394 - 2 - Center
Date	:	04/11/2023

CHEMICAL ANALYSIS

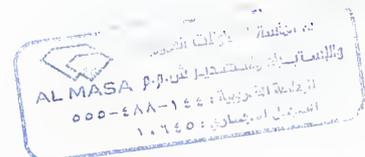
General Consultant	:	SYSTRA
Consultant	:	SPECTRUM
Contractor	:	شركة الماسه للمقاولات العمومية ورصف الطرق
Project	:	Electric express train
Sample	:	Prepared Sub Grade
Station	:	ST (363 + 00.0):(366 + 00.0)
Date of Test	:	1-11-2023
Temperature	:	28 °C
		Humidity : 35%

ANALYSIS	RESULTS	TEST METHOD
CHLORIDE	0.0011%	ASTM D 1411
SULPHATE	0.0034%	ASTM D 1580
ORGANIG MATTER	NEGATIVE	ASTM D 2974



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa



Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	Eng. Mohamed Elsaied		31/10/2023 (S5-B-MS) (PLT-S.G-01-D.P)	10:00 AM							
Received by GARB CONSULTANT	Eng. Mazen Essamy		MIR	C1	C2	C3	DD	MM	YY	HH	MM
				363	EW	CS	1	11	2023	10	0

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

Description of Materials	Prepared Subgrade (2) AT (+0.50)				
Location to be Used	From	363+740	TO	364+100	Rev-29
		363+920		364+280	Rev-35
MAR & UIR Approval No	(S5-B-MS) (IR-S.G-02-D.P)		Date	31/10/2023	
	(S5-B-MS) (MAR-S.G-06)			01/10/2023	
Supplier Name	Elsiwiy , Alharamin				
Test Requirement	P.L.T (DIN 18134)	Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Reference Photos	No/Yes	Other			

Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	8		
2					

Comments by: Eng. Mazen Essamy (SPECTRUM) <div style="text-align: center;"></div> 1-THE PLATE LOAD TEST RESULT P.L.T (DIN 18134) IS APPROVED	Comments by: Eng. Alaa Abd-Allatif (ER) 1-PLATE LOAD TEST WAS CARRIED - OUT BY THIRD PART LAB 2-Results report attached and acceptable with project specifications.
---	---

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif			A

* Designer
 ** Alignment/Bridge: (S5-B-MS) (PLT-S.G-01-D.P)

MATERIAL INSPECTION REQUEST



الهيئة العامة
للطرق والكباري
(GARB)



Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office						
Issued by Contractor	Name	Sign	Date/Serial Number	Time						
	Eng. Mohamed Elsaied		31/10/2023 (S5-B-MS) (PLT-S.G-01-D.P)	10:00 AM						
Received by GARB CONSULTANT	Eng. Mazen Essamy	MIR	G1	C2	C3	DD	MM	YY	HH	MM
			363	EW	CS	1	11	2023	10	0

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

Description of Materials	Prepared Subgrade (2) AT (+0.50)				
Location to be Used	From	363+740	TO	364+100	Rev-29
		363+920		364+280	Rev-35
MAR & UIR Approval No	(S5-B-MS) (IR-S.G-02-D.P)	Date	31/10/2023		
	(S5-B-MS) (MAR-S.G-06)		01/10/2023		
Supplier Name	Elsiw , Alharamin				
Test Requirement	P.L.T (DIN 18134)	Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Reference Photos	No/Yes	Other			
Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	8		

Comments by: Eng. Mazen Essamy (SPECTRUM)	Comments by: Eng. Alaa Abd-Allatif (ER)
1-THE PLATE LOAD TEST RESULT P.L.T. (DIN 18134) IS APPROVED	1-PLATE LOAD TEST WAS CARRIED - OUT BY THIRD PART LAB 2-Results report attached and acceptable with project specifications. 3-Final approval is subject to above mentioned comments.

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

* Designer

** Alignment/Bridge: (S5-B-MS) (PLT-S.G-01-D.P)



COMIBASSAL International Controllers Internal inspection and laboratories sector

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

Technical report of Plate Loading Test (DIN 18134)

General	:	SYSTRA
Consultant	:	SPECTRUM
Contractor	:	شركة الماسة للمقاولات
Project	:	ELECTRIC EXPRESS TRAIN
Sample	:	Prepared Sub-grade(2)
Station	:	ST(363+740) TO ST(364+100)
Date of Test	:	2/11/2023
QC	:	983 - 2





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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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.

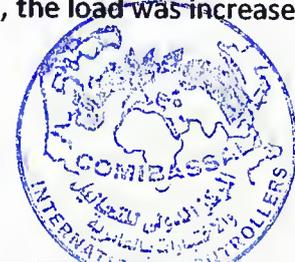
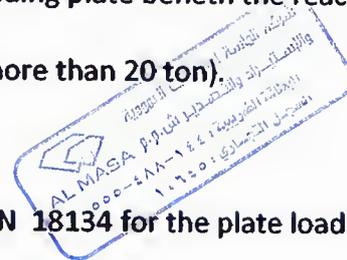
The test to be carried out on the native soil according to German specifications DIN 18134.

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 diameter of 600 mm have a thickness of 25mm and are provided with equally spaced stiffeners 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 hydraulic pump connected to a hydraulic 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 levelled and the plate was bedded on this surface.
- 7- The hydraulic jack was placed on the middle of, and at normal to, the loading plate beneath the reaction loading system and secured against tilting.
- 8- The reaction loading system was a heavy multi-purpose excavator (more than 20 ton).

Description of experiment:

- 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 transducer and dial gauge 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 increment 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 cycle.





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Internal inspection and laboratories sector

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St (363+740)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.19
2	14.14	0.050	0.28
3	21.21	0.075	0.41
4	28.28	0.100	0.57
5	35.35	0.125	0.65
6	42.42	0.150	0.77
7	49.49	0.175	0.85
8	56.56	0.200	0.95
9	63.63	0.225	1.04
10	70.7	0.250	1.12
11	56.56	0.200	1.11
12	49.49	0.175	1.10
13	35.35	0.125	1.09
14	21.21	0.075	1.07
15	1.414	0.005	0.69

Table 2: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.69
16	7.07	0.025	0.77
17	14.14	0.050	0.89
18	21.21	0.075	0.96
19	28.28	0.100	1.02
20	35.35	0.125	1.07
21	42.42	0.150	1.15
22	49.49	0.175	1.22
23	56.56	0.200	1.28
24	63.63	0.225	1.34

Table 3: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.039	0.689
a_1 (mm/(MN/m ²))	5.549	3.660
a_2 (mm/(MN ² /m ⁴))	-4.952	-3.622
$E_v = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	104.38	163.34
E_v2/E_v1	1.56	





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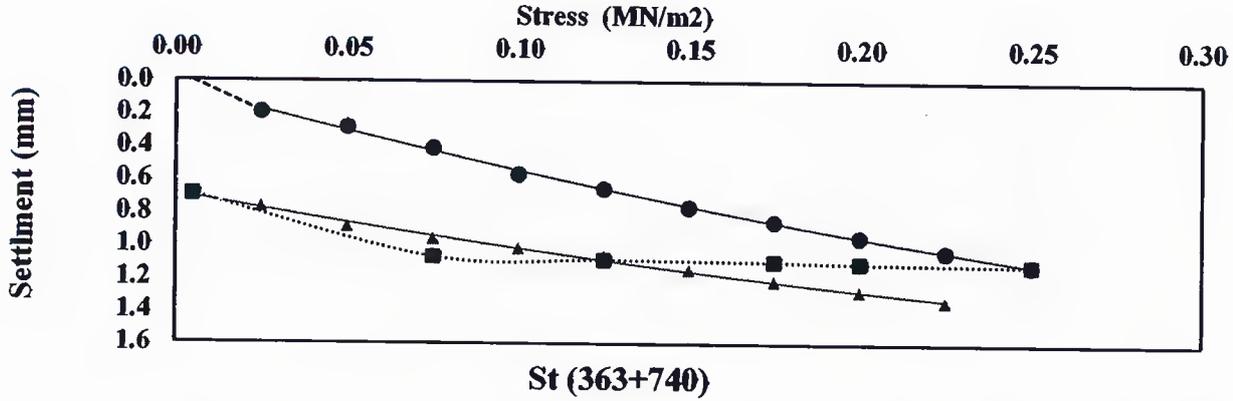


Fig. 1: Load-settlement curve, fitting curves according to Table 1 and Table 2 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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Internal inspection and laboratories sector

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St (363+790)

600

Table 4: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.12
2	14.14	0.050	0.24
3	21.21	0.075	0.30
4	28.28	0.100	0.36
5	35.35	0.125	0.40
6	42.42	0.150	0.45
7	49.49	0.175	0.55
8	56.56	0.200	0.65
9	63.63	0.225	0.78
10	70.7	0.250	0.89
11	56.56	0.200	0.88
12	49.49	0.175	0.87
13	35.35	0.125	0.85
14	21.21	0.075	0.85
15	1.414	0.005	0.43

Table 5: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.43
16	7.07	0.025	0.53
17	14.14	0.050	0.59
18	21.21	0.075	0.64
19	28.28	0.100	0.67
20	35.35	0.125	0.71
21	42.42	0.150	0.76
22	49.49	0.175	0.81
23	56.56	0.200	0.84
24	63.63	0.225	0.90

Table 6: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.121	0.445
a_1 (mm/(MN/m ²))	1.495	2.593
a_2 (mm/(MN ² /m ⁴))	6.083	-2.870
$E_v = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	149.23	239.95
E_v2/E_v1	1.61	

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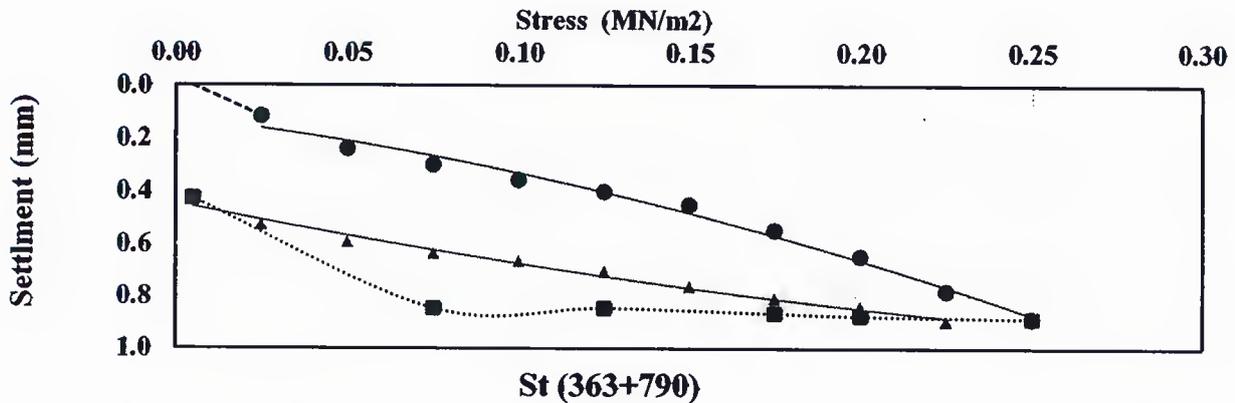


Fig. 2: Load-settlement curve, fitting curves according to Table 4 and Table 5 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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Internal inspection and laboratories sector

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St (363+840)

600

Table 7: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.17
2	14.14	0.050	0.29
3	21.21	0.075	0.37
4	28.28	0.100	0.50
5	35.35	0.125	0.56
6	42.42	0.150	0.65
7	49.49	0.175	0.74
8	56.56	0.200	0.87
9	63.63	0.225	0.97
10	70.7	0.250	1.07
11	56.56	0.200	1.06
12	49.49	0.175	1.08
13	35.35	0.125	1.07
14	21.21	0.075	1.06
15	1.414	0.005	0.63

Table 8: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.63
16	7.07	0.025	0.71
17	14.14	0.050	0.77
18	21.21	0.075	0.82
19	28.28	0.100	0.87
20	35.35	0.125	0.92
21	42.42	0.150	0.98
22	49.49	0.175	1.03
23	56.56	0.200	1.12
24	63.63	0.225	1.20

Table 9: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
s_0 (mm)	0.086	0.646
a_1 (mm/(MN/m ²))	3.769	1.987
a_2 (mm/(MN ² /m ⁴))	0.606	1.818
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,max})$	114.79	184.33
$Ev2/Ev1$	1.61	





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Internal inspection and laboratories sector

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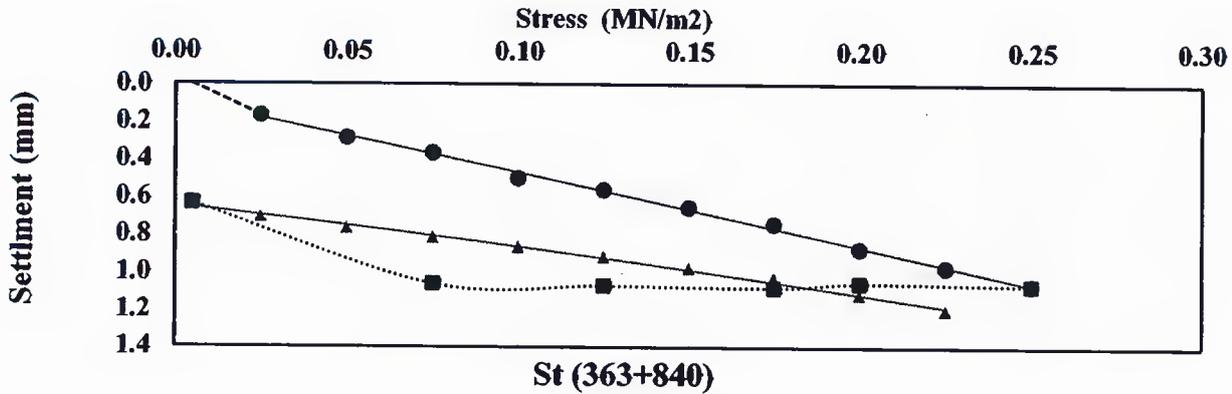


Fig. 3: Load-settlement curve, fitting curves according to Table 7 and Table 8 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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St (363+890)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.07
2	14.14	0.050	0.13
3	21.21	0.075	0.18
4	28.28	0.100	0.22
5	35.35	0.125	0.27
6	42.42	0.150	0.33
7	49.49	0.175	0.37
8	56.56	0.200	0.43
9	63.63	0.225	0.52
10	70.7	0.250	0.55
11	56.56	0.200	0.54
12	49.49	0.175	0.53
13	35.35	0.125	0.52
14	21.21	0.075	0.51
15	1.414	0.005	0.26

Table 11: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.26
16	7.07	0.025	0.32
17	14.14	0.050	0.39
18	21.21	0.075	0.43
19	28.28	0.100	0.47
20	35.35	0.125	0.50
21	42.42	0.150	0.54
22	49.49	0.175	0.56
23	56.56	0.200	0.58
24	63.63	0.225	0.61

Table 12: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.030	0.261
a_1 (mm/(MN/m ²))	2.807	3.280
a_2 (mm/(MN/m ²))	1.172	-4.777
$EV = \frac{1}{E_0} + \frac{a_1 + a_2 \cdot \sigma_{0,MAX}}{E_1 + E_2}$	145.18	215.74
	1.49	





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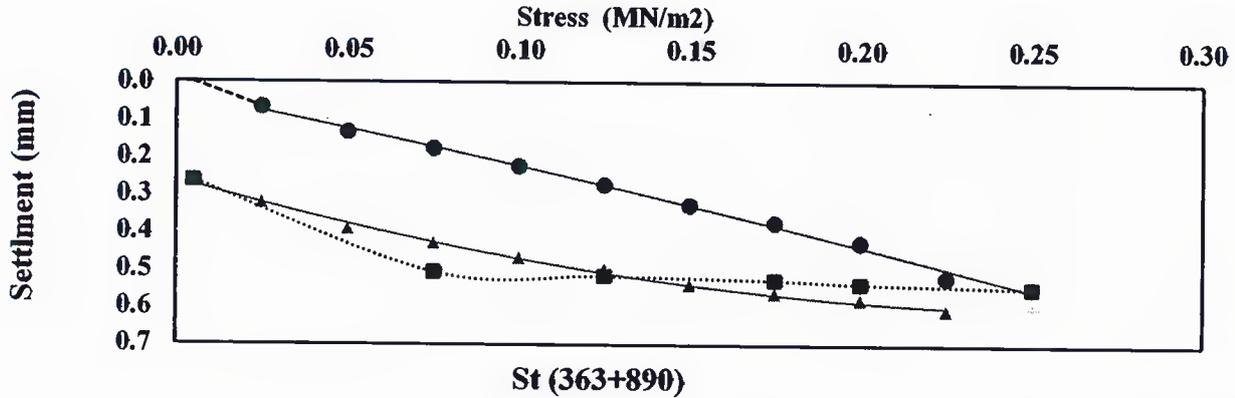


Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (363+940)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.11
2	14.14	0.050	0.23
3	21.21	0.075	0.28
4	28.28	0.100	0.35
5	35.35	0.125	0.42
6	42.42	0.150	0.44
7	49.49	0.175	0.50
8	56.56	0.200	0.56
9	63.63	0.225	0.64
10	70.7	0.250	0.64
11	56.56	0.200	0.63
12	49.49	0.175	0.62
13	35.35	0.125	0.61
14	21.21	0.075	0.60
15	1.414	0.005	0.32

Table 14: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.32
16	7.07	0.025	0.36
17	14.14	0.050	0.43
18	21.21	0.075	0.47
19	28.28	0.100	0.51
20	35.35	0.125	0.54
21	42.42	0.150	0.58
22	49.49	0.175	0.61
23	56.56	0.200	0.65
24	63.63	0.225	0.70

Table 15: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.048	0.316
a_1 (mm/(MN/m ²))	3.909	2.558
a_2 (mm/(MN ² /m ⁴))	-3.577	-1.772
$Ev = 1.5 r / (a_1 + a_2 \sigma_{0,max})$	149.26	212.77
$Ev/2a_1$	1.43	

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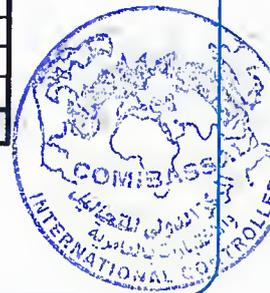


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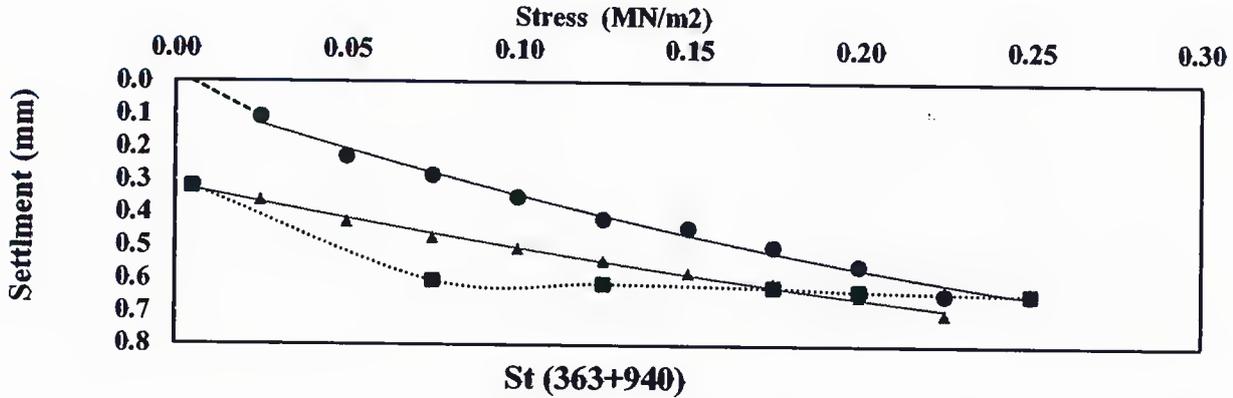


Fig. 5: Load-settlement curve, fitting curves according to Table 13 and Table 14 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (363+990)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) 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	0.13
3	21.21	0.075	0.20
4	28.28	0.100	0.24
5	35.35	0.125	0.27
6	42.42	0.150	0.29
7	49.49	0.175	0.32
8	56.56	0.200	0.37
9	63.63	0.225	0.41
10	70.7	0.250	0.46
11	56.56	0.200	0.45
12	49.49	0.175	0.44
13	35.35	0.125	0.43
14	21.21	0.075	0.35
15	1.414	0.005	0.22

Table 17: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.22
16	7.07	0.025	0.25
17	14.14	0.050	0.28
18	21.21	0.075	0.31
19	28.28	0.100	0.34
20	35.35	0.125	0.37
21	42.42	0.150	0.39
22	49.49	0.175	0.42
23	56.56	0.200	0.43
24	63.63	0.225	0.46

Table 18: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
s_0 (mm)	0.047	0.216
a_1 (mm/(MN/m ²))	3.281	2.399
a_2 (mm/(MN ² /m ⁴))	-1.112	-1.493
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	149.85	222.12
$Ev2/Ev1$	1.48	

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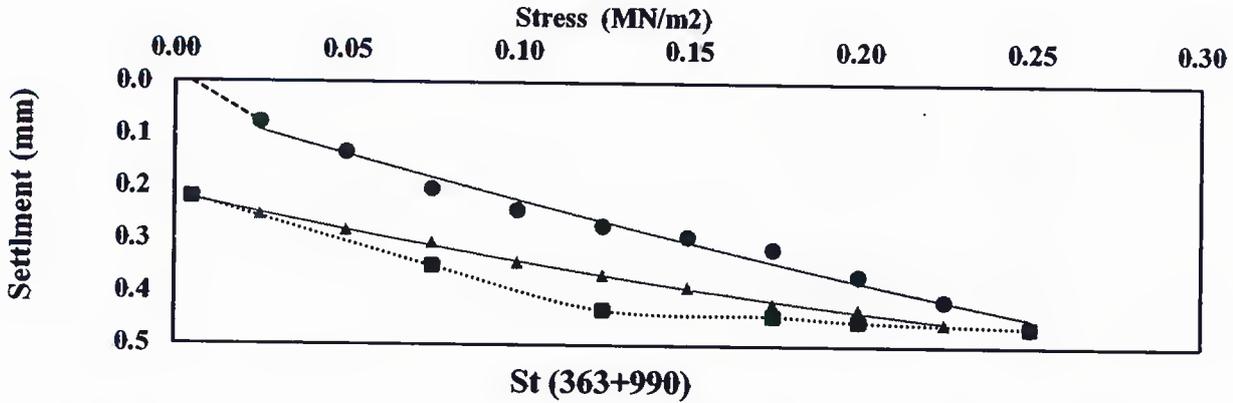


Fig. 6: Load-settlement curve, fitting curves according to Table 16 and Table 17 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (364+040)

600

Table 19: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.09
2	14.14	0.050	0.17
3	21.21	0.075	0.27
4	28.28	0.100	0.33
5	35.35	0.125	0.39
6	42.42	0.150	0.45
7	49.49	0.175	0.52
8	56.56	0.200	0.57
9	63.63	0.225	0.61
10	70.7	0.250	0.66
11	56.56	0.200	0.65
12	49.49	0.175	0.64
13	35.35	0.125	0.63
14	21.21	0.075	0.60
15	1.414	0.005	0.38

Table 20: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.38
16	7.07	0.025	0.49
17	14.14	0.050	0.54
18	21.21	0.075	0.61
19	28.28	0.100	0.61
20	35.35	0.125	0.65
21	42.42	0.150	0.67
22	49.49	0.175	0.71
23	56.56	0.200	0.76
24	63.63	0.225	0.81

Table 21: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0, \max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.002	0.408
a_1 (mm/(MN/m ²))	3.676	2.470
a_2 (mm/(MN ² /m ²))	-4.244	-3.530
$E_v = 1.5 r / (a_1 + a_2 \cdot \sigma_{0, \max})$	172.09	283.52
E_v2/E_v1	1.65	





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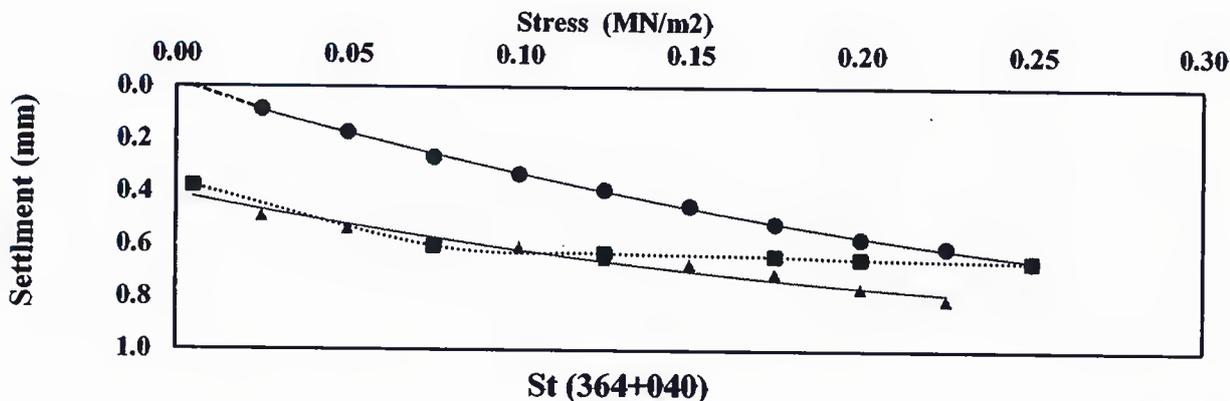


Fig. 7: Load-settlement curve, fitting curves according to Table 19 and Table 20 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (364+090)

600

Table 22: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) 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	0.20
3	21.21	0.075	0.31
4	28.28	0.100	0.47
5	35.35	0.125	0.58
6	42.42	0.150	0.70
7	49.49	0.175	0.80
8	56.56	0.200	0.86
9	63.63	0.225	0.97
10	70.7	0.250	1.03
11	56.56	0.200	1.02
12	49.49	0.175	1.01
13	35.35	0.125	1.00
14	21.21	0.075	0.91
15	1.414	0.005	0.49

Table 23: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.49
16	7.07	0.025	0.58
17	14.14	0.050	0.65
18	21.21	0.075	0.70
19	28.28	0.100	0.76
20	35.35	0.125	0.81
21	42.42	0.150	0.86
22	49.49	0.175	0.91
23	56.56	0.200	0.97
24	63.63	0.225	1.03

Table 24: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	-0.084	0.497
a_1 (mm/(MN/m ²))	6.171	2.797
a_2 (mm/(MN ² /m ⁴))	-6.750	-2.071
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	100.36	197.43
$Ev2/Ev1$	1.97	

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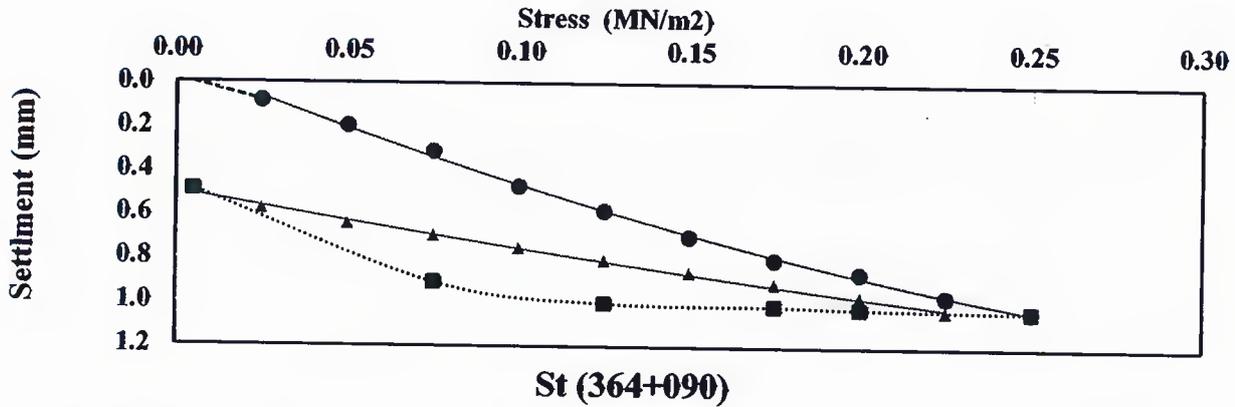


Fig. 8: Load-settlement curve, fitting curves according to Table 22 and Table 23 for the first and second loading cycles

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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Conclusions:

The present test results which were obtained via the plate loading tests of the native soil on prepared subgrade(2) layer of the electric express train project at location from St(363+740) to St(364+100) in accordance to the German standard , DIN 18134 are illustrated in table 25 .

Table 25 :Test results

Location	Ev1(MN/m ²)	Ev2(MN/m ²)	Ev2/Ev1 ratio
St (363+740)	104.38	163.34	1.56
St (363+790)	149.23	239.95	1.61
St (363+840)	114.79	184.33	1.61
St (363+890)	145.18	215.74	1.49
St (363+940)	149.26	212.77	1.43
St (363+990)	149.85	222.12	1.48
St (364+040)	172.09	283.52	1.65
St (364+090)	100.36	197.43	1.97

Lab Director

Eng / Eman Kandil

Eman

Geotechnical Consultant

Dr / Mohamed Mostafa Badry

Dr. M.



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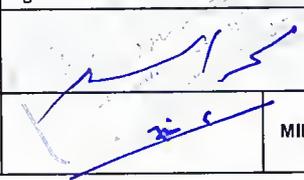


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Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office						
Issued by Contractor	Name	Sign	Date/Serial Number	Time						
	Eng. Mohamed Elsaied		14/11/2023 (S5-B-MS) (PLT-S.G-02-D.P)	10:00 AM						
Received by GARB CONSULTANT	Eng. Mazen Essamy	MIR	C1	C2	C3	DD	MM	YY	HH	MM
			363	EW	CS	15	11	2023	10	0

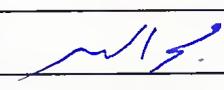
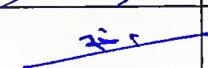
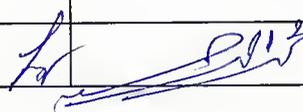
CODE-1	S1 to S21	D1 to S3	Kp XXX Note
	Station Reference	Depot Reference	For Kilometer point only Start Km is used
TRADE 2	Work Activity		
	Sub Element of Activity		

Description of Materials	Prepared Subgrade (2) AT (+0.50)				
Location to be Used	From	363+480	TO	363+740	Rev-29
		363+660		363+920	Rev-35
MAR & UIR Approval No	(S5-B-MS) (IR-S.G-04-D.P)	Date	14/11/2023		
	(S5-B-MS) (MAR-S.G-06)		01/10/2023		
Supplier Name	Elsiwly , Alharamin				
Test Requirement	P.L.T (DIN 18134)	Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Reference Photos	No/Yes	Other			

Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	6		

Comments by: Eng. Mazen Essamy (SPECTRUM)	Comments by: Eng. Alaa Abd-Allatif (ER)
1-THE PLATE LOAD TEST RESULT P.L.T (DIN 18134) IS APPROVED	1-PLATE LOAD TEST WAS CARRIED - OUT BY THIRD PART LAB 2-Results report attached and acceptable with project specifications. 3-Final approval is subject to above mentioned comments.



APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif		16-11-2023	AWC

* Designer
** Alignment/Bridge: (S5-B-MS) (PLT-S.G-02-D.P)



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Technical report

of Plate Loading Test (DIN 18134)

General	:	SYSTRA
Consultant	:	SPECTRUM
Contractor	:	شركة الماسة للمقاولات
Project	:	ELECTRIC EXPRESS TRAIN
Sample	:	Prepared Sub-grade (2)
Station	:	ST(363+480) TO ST(363+740)
Date of Test	:	16/11/2023
QC	:	983 -1



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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 diameter of 600 mm have a thickness of 25mm and are provided with equally spaced stiffeners 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 hydraulic pump connected to a hydraulic 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 levelled and the plate was bedded on this surface.
- 7- The hydraulic jack was placed on the middle of, and at normal to, the loading plate beneath the reaction loading system and secured against tilting.
- 8- The reaction loading system was a heavy multi-purpose excavator (more than 20 ton).

Description of experiment:

- 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 transducer 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 increament 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 cycle.





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St (363+480)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.12
2	14.14	0.050	0.17
3	21.21	0.075	0.23
4	28.28	0.100	0.31
5	35.35	0.125	0.41
6	42.42	0.150	0.52
7	49.49	0.175	0.58
8	56.56	0.200	0.64
9	63.63	0.225	0.70
10	70.7	0.250	0.79
11	56.56	0.200	0.78
12	49.49	0.175	0.77
13	35.35	0.125	0.76
14	21.21	0.075	0.74
15	1.414	0.005	0.41

Table 2: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.41
16	7.07	0.025	0.48
17	14.14	0.050	0.55
18	21.21	0.075	0.60
19	28.28	0.100	0.63
20	35.35	0.125	0.68
21	42.42	0.150	0.72
22	49.49	0.175	0.75
23	56.56	0.200	0.77
24	63.63	0.225	0.82

Table 3: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0, \max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.019	0.412
a_1 (mm/(MN/m ²))	3.142	2.691
a_2 (mm/(MN ² /m ⁴))	-0.222	-4.202
$E_v = 1.5 r / (a_1 + a_2 \cdot \sigma_{0, \max})$	145.79	274.30
E_v2/E_v1		1.88



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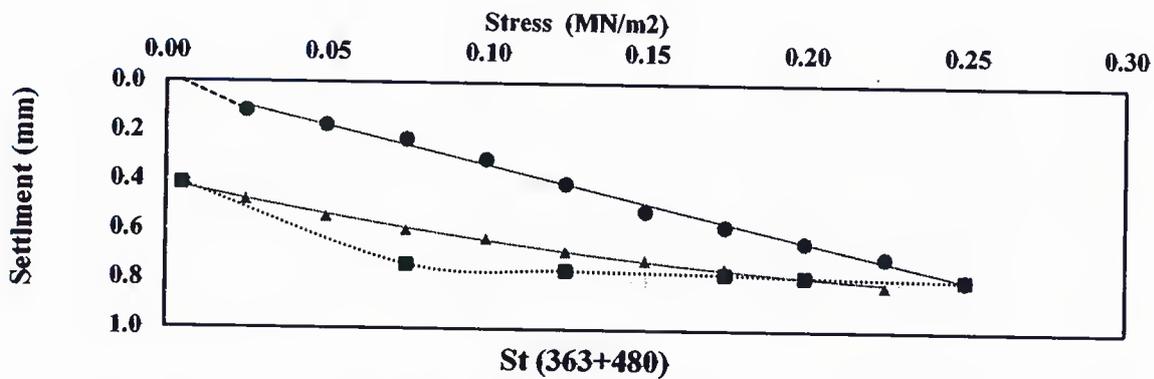


Fig. 1: Load-settlement curve, fitting curves according to Table 1 and Table 2 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_p Normal stress MN/m²





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St (363+530)

600

Table 4: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.11
2	14.14	0.050	0.18
3	21.21	0.075	0.24
4	28.28	0.100	0.33
5	35.35	0.125	0.40
6	42.42	0.150	0.46
7	49.49	0.175	0.55
8	56.56	0.200	0.65
9	63.63	0.225	0.71
10	70.7	0.250	0.77
11	56.56	0.200	0.76
12	49.49	0.175	0.74
13	35.35	0.125	0.67
14	21.21	0.075	0.58
15	1.414	0.005	0.23

Table 5: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.23
16	7.07	0.025	0.34
17	14.14	0.050	0.42
18	21.21	0.075	0.46
19	28.28	0.100	0.51
20	35.35	0.125	0.53
21	42.42	0.150	0.56
22	49.49	0.175	0.61
23	56.56	0.200	0.66
24	63.63	0.225	0.69

Table 6: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.034	0.249
a_1 (mm/(MN/m ²))	2.844	3.026
a_2 (mm/(MN/m ²))	0.667	-5.052
$E_v = 1.5 \pi / (a_1 + a_2 \cdot \sigma_{0,max})$	149.45	255.26
E_v2/E_v1	1.71	





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Internal inspection and laboratories sector

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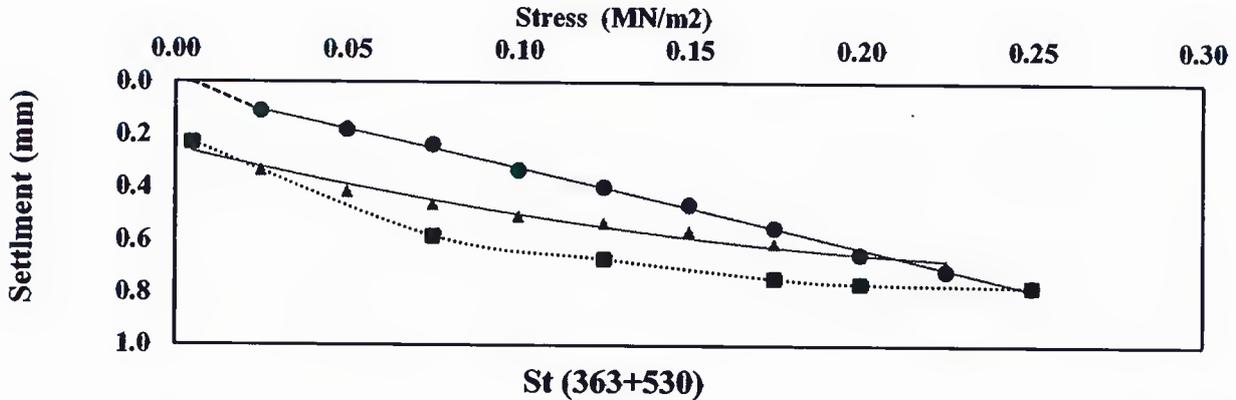


Fig. 2: Load-settlement curve, fitting curves according to Table 4 and Table 5 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (363+580)

600

Table 7: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.11
2	14.14	0.050	0.25
3	21.21	0.075	0.55
4	28.28	0.100	0.54
5	35.35	0.125	0.62
6	42.42	0.150	0.75
7	49.49	0.175	0.85
8	56.56	0.200	0.92
9	63.63	0.225	0.97
10	70.7	0.250	1.00
11	56.56	0.200	0.99
12	49.49	0.175	0.98
13	35.35	0.125	0.97
14	21.21	0.075	0.96
15	1.414	0.005	0.74

Table 8: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.74
16	7.07	0.025	0.87
17	14.14	0.050	0.92
18	21.21	0.075	0.97
19	28.28	0.100	1.00
20	35.35	0.125	1.04
21	42.42	0.150	1.08
22	49.49	0.175	1.14
23	56.56	0.200	1.21
24	63.63	0.225	1.25

Table 9: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0, \max})$ MN/m ²	0.250	0.250
a_0 (mm)	-0.041	0.773
a_1 (mm/(MN/m ²))	7.182	2.517
a_2 (mm/(MN ² /m ⁴))	-12.065	-1.934
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0, \max})$	108.00	221.32
$Ev2/Ev1$	2.05	





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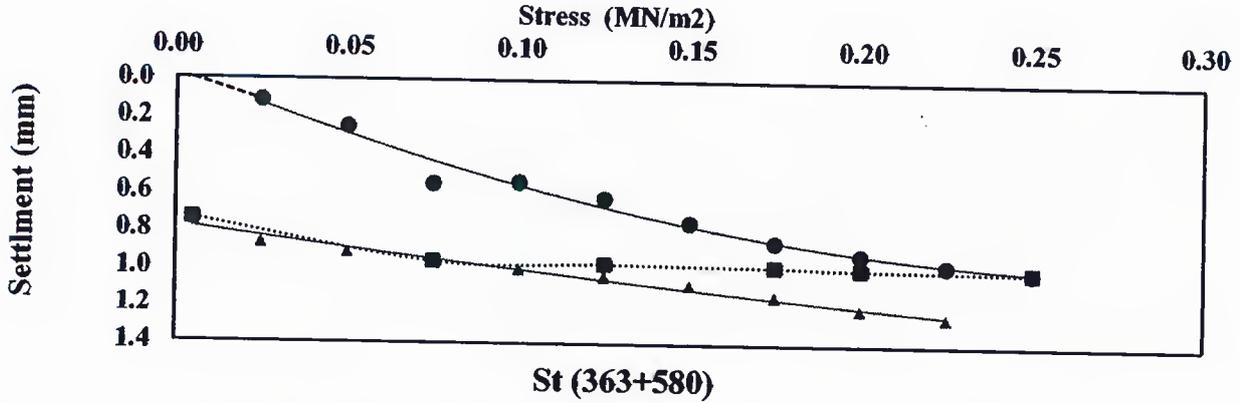


Fig. 3: Load-settlement curve, fitting curves according to Table 7 and Table 8 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (363+630)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) 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	0.15
3	21.21	0.075	0.21
4	28.28	0.100	0.25
5	35.35	0.125	0.29
6	42.42	0.150	0.32
7	49.49	0.175	0.36
8	56.56	0.200	0.38
9	63.63	0.225	0.42
10	70.7	0.250	0.46
11	56.56	0.200	0.45
12	49.49	0.175	0.44
13	35.35	0.125	0.43
14	21.21	0.075	0.42
15	1.414	0.005	0.10

Table 11: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.10
16	7.07	0.025	0.17
17	14.14	0.050	0.23
18	21.21	0.075	0.29
19	28.28	0.100	0.33
20	35.35	0.125	0.37
21	42.42	0.150	0.40
22	49.49	0.175	0.43
23	56.56	0.200	0.49
24	63.63	0.225	0.55

Table 12: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.034	0.109
a_1 (mm/(MN/m ²))	3.417	2.324
a_2 (mm/(MN ² /m ⁴))	-3.052	-2.009
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	169.55	247.05
$Ev2/Ev1$	1.46	





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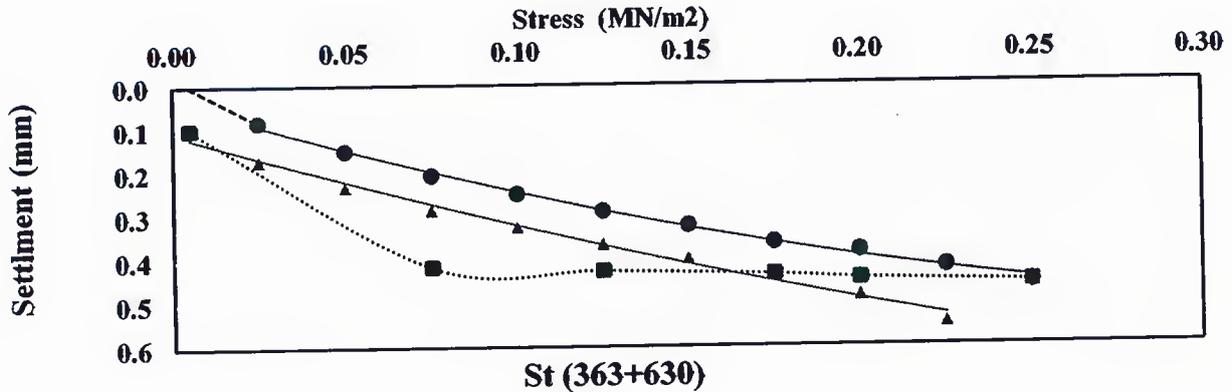


Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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St (363+680)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.07
2	14.14	0.050	0.20
3	21.21	0.075	0.33
4	28.28	0.100	0.42
5	35.35	0.125	0.47
6	42.42	0.150	0.59
7	49.49	0.175	0.68
8	56.56	0.200	0.78
9	63.63	0.225	0.92
10	70.7	0.250	1.10
11	56.56	0.200	1.09
12	49.49	0.175	1.08
13	35.35	0.125	1.07
14	21.21	0.075	1.02
15	1.414	0.005	0.80

Table 14: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.80
16	7.07	0.025	0.91
17	14.14	0.050	1.02
18	21.21	0.075	1.26
19	28.28	0.100	1.35
20	35.35	0.125	1.45
21	42.42	0.150	1.52
22	49.49	0.175	1.62
23	56.56	0.200	1.69
24	63.63	0.225	

Table 15: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,MAX})$ MN/m ²	0.250	0.250
a_0 (mm)	0.020	0.772
a_1 (mm/(MN/m ²))	3.293	3.192
a_2 (mm/(MN ² /m ⁴))	3.436	-4.837
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	108.39	226.92
$Ev2/Ev1$	2.09	

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1.10/2011
1.45
1.52
1.62
1.69





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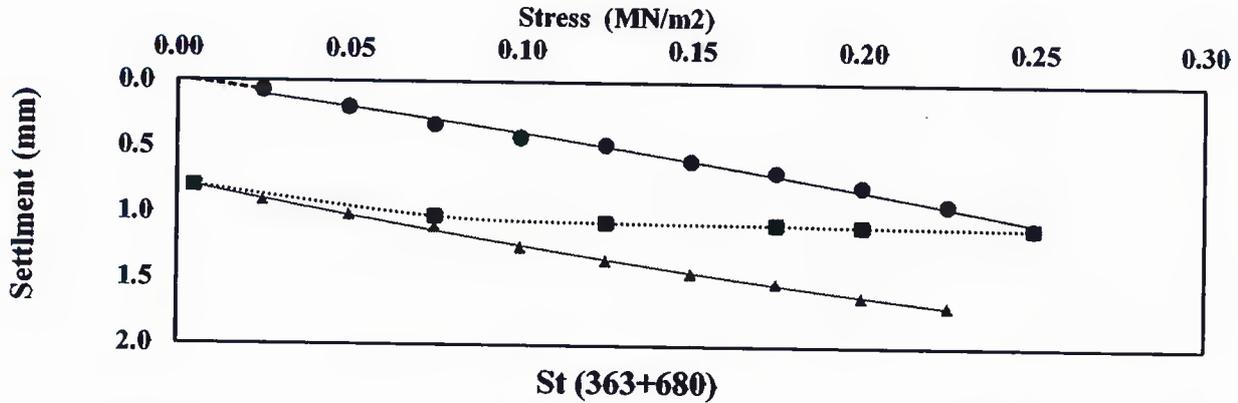


Fig. 5: Load-settlement curve, fitting curves according to Table 13 and Table 14 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (363+730)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.09
1	7.07	0.025	0.11
2	14.14	0.050	0.21
3	21.21	0.075	0.29
4	28.28	0.100	0.37
5	35.35	0.125	0.44
6	42.42	0.150	0.56
7	49.49	0.175	0.82
8	56.56	0.200	1.00
9	63.63	0.225	1.12
10	70.7	0.250	1.24
11	56.56	0.200	1.23
12	49.49	0.175	1.22
13	35.35	0.125	1.21
14	21.21	0.075	1.20
15	1.414	0.005	0.74

Table 17: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.74
16	7.07	0.025	0.84
17	14.14	0.050	0.92
18	21.21	0.075	0.99
19	28.28	0.100	1.06
20	35.35	0.125	1.10
21	42.42	0.150	1.18
22	49.49	0.175	1.25
23	56.56	0.200	1.30
24	63.63	0.225	1.36

Table 18: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.055	0.741
a_1 (mm/(MN/m ²))	2.067	3.473
a_2 (mm/(MN ² /m ⁴))	11.520	-3.241
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	90.98	169.01
$Ev2/Ev1$		1.86

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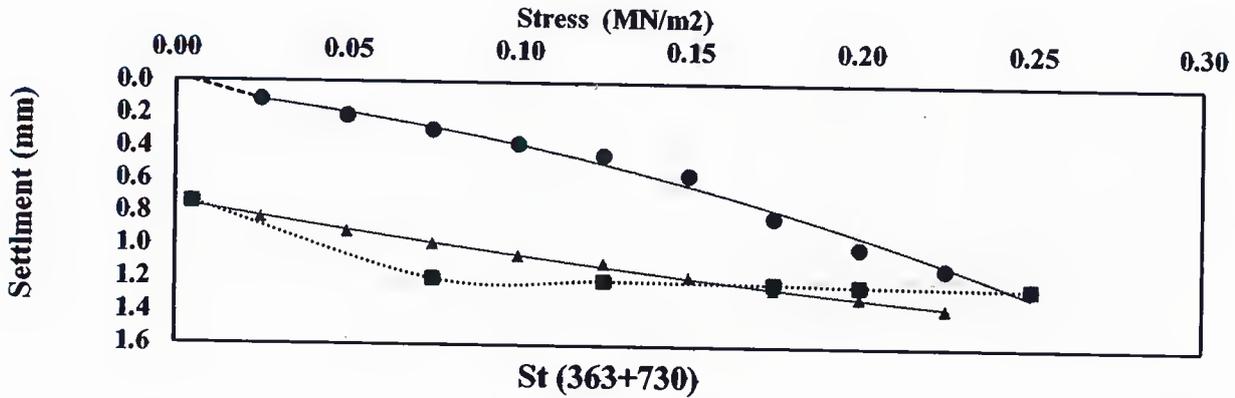


Fig. 6: Load-settlement curve, fitting curves according to Table 16 and Table 17 for the first and second loading cycles

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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Conclusions:

The present test results which were obtained via the plate loading tests of the native soil on prepared subgrade (2) layer of the electric express train project at location from St(363+480) to St(363+740) in accordance to the German standard , DIN 18134 are illustrated in table 19 .

Table 19 :Test results

Location	Ev1(MN/m ²)	Ev2(MN/m ²)	Ev2/Ev1 ratio
St (363+480)	145.79	274.30	1.88
St (363+530)	149.45	255.26	1.71
St (363+580)	108.00	221.32	2.05
St (363+630)	169.55	247.05	1.46
St (363+680)	108.39	226.92	2.09
St (363+730)	90.98	169.01	1.86

Lab Director

Eng / Eman Kandil

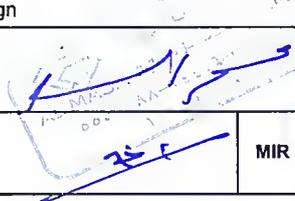
Eman.

Geotechnical Consultant

Dr / Mohamed Mostafa Badry

For. Dr. M.



Contractor Company	Al-Masa General Contracting Company			Designer Company	(SPECTRUM) Engineering Consulting Office						
Issued by Contractor	Name	Sign		Date/Serial Number			Time				
	Eng. Mohamed Elsaied			09/12/2023			10:00 AM				
Received by GARB CONSULTANT	Eng. Mazen Essamy	MIR		C1	C2	C3	DD	MM	YY	HH	MM
				364	EW	CS	10	12	2023	10	0

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

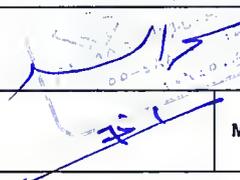
Description of Materials	Prepared Subgrade (2) AT (+0.50)				
Location to be Used	From	364+100	TO	364+460	Rev-29
		364+280		364+640	Rev-35
MAR & UIR Approval No	(S5-B-MS) (IR-S.G-08-D.P)		Date	09/12/2023	
	(S5-B-MS) (MAR-S.G-07)			01/11/2023	
Supplier Name	Elsiwiy , Alharamin				
Test Requirement	P.L.T (DIN 18134)	Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Reference Photos	No/Yes	Other			

Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	8		
2					

Comments by: Eng. Mazen Essamy (SPECTRUM)	Comments by: Eng. Alaa Abd-Allatif (ER)
<p>1-THE PLATE LOAD TEST RESULT P.L.T (DIN 18134) IS APPROVED</p> 	<p>1-PLATE LOAD TEST WAS CARRIED - OUT BY THIRD PART LAB</p> <p>2-Results report attached and acceptable with project specifications.</p>

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif			A

* Designer
 ** Alignment/Bridge: (S5-B-MS) (PLT-S.G-03-D.P)

Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office						
Issued by Contractor	Name	Sign	Date/Serial Number	Time						
	Eng. Mohamed Elsaied		09/12/2023 (S5-B-MS) (PLT-S.G-03-D.P)	10:00 AM						
Received by GARB CONSULTANT	Eng. Mazen Essamy	MIR	C1	C2	C3	DD	MM	YY	HH	MM
			364	EW	CS	10	12	2023	10	0

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

Description of Materials	Prepared Subgrade (2) AT (+0.50)				
Location to be Used	From	364+100	TO	364+460	Rev-29
		364+280		364+640	Rev-35
MAR & UIR Approval No	(S5-B-MS) (IR-S.G-08-D.P)		Date	09/12/2023	
	(S5-B-MS) (MAR-S.G-07)			01/11/2023	
Supplier Name	Elsiwiy , Alharamin				
Test Requirement	P.L.T (DIN 18134)	Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Reference Photos	No/Yes	Other			

Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	8		

Comments by: Eng. Mazen Essamy (SPECTRUM)	Comments by: Eng. Alaa Abd-Allatif (ER)
<p>1-THE PLATE LOAD TEST RESULT P.L.T (DIN:18134) IS APPROVED</p> 	<p>1-PLATE LOAD TEST WAS CARRIED - OUT BY THIRD PART LAB</p> <p>2-Results report attached and acceptable with project specifications.</p> <p>3-Final approval is subject to above mentioned comments.</p>

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif		11-12-2023	AWC

* Designer
 ** Alignment/Bridger (S5-B-MS) (PLT-S.G-03-D.P)



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Internal inspection and laboratories sector

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

Technical report

of Plate Loading Test (DIN 18134)

General	:	SYSTRA
Consultant	:	SPECTRUM
Contractor	:	شركة الماسة للمقاولات
Project	:	ELECTRIC EXPRESS TRAIN
Sample	:	Prepared Sub-grade (2)
Station	:	ST(364+100) TO ST(364+460)
Date of Test	:	11/12/2023
QC	:	983 - 3





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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 diameter of 600 mm have a thickness of 25mm and are provided with equally spaced stiffeners 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 hydraulic pump connected to a hydraulic 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 levelled and the plate was bedded on this surface.
- 7- The hydraulic jack was placed on the middle of, and at normal to, the loading plate beneath the reaction loading system and secured against tilting.
- 8- The reaction loading system was a heavy multi-purpose excavator (more than 20 ton).

Description of experiment:

- 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 transducer and dial gauge 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 increment 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 cycle.

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St (364+100)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.07
2	14.14	0.050	0.17
3	21.21	0.075	0.27
4	28.28	0.100	0.39
5	35.35	0.125	0.48
6	42.42	0.150	0.54
7	49.49	0.175	0.61
8	56.56	0.200	0.68
9	63.63	0.225	0.75
10	70.7	0.250	0.85
11	56.56	0.200	0.84
12	49.49	0.175	0.83
13	35.35	0.125	0.82
14	21.21	0.075	0.78
15	1.414	0.005	0.37

Table 2: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.37
16	7.07	0.025	0.44
17	14.14	0.050	0.50
18	21.21	0.075	0.57
19	28.28	0.100	0.65
20	35.35	0.125	0.70
21	42.42	0.150	0.74
22	49.49	0.175	0.78
23	56.56	0.200	0.81
24	63.63	0.225	0.86

Table 3: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,MAX})$ MN/m ²	0.250	0.250
s_0 (mm)	-0.038	0.355
a_1 (mm/(MN/m ²))	4.485	3.301
a_2 (mm/(MN ² /m ⁴))	-4.103	-4.875
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	130.09	216.06
$Ev2/Ev1$	1.66	

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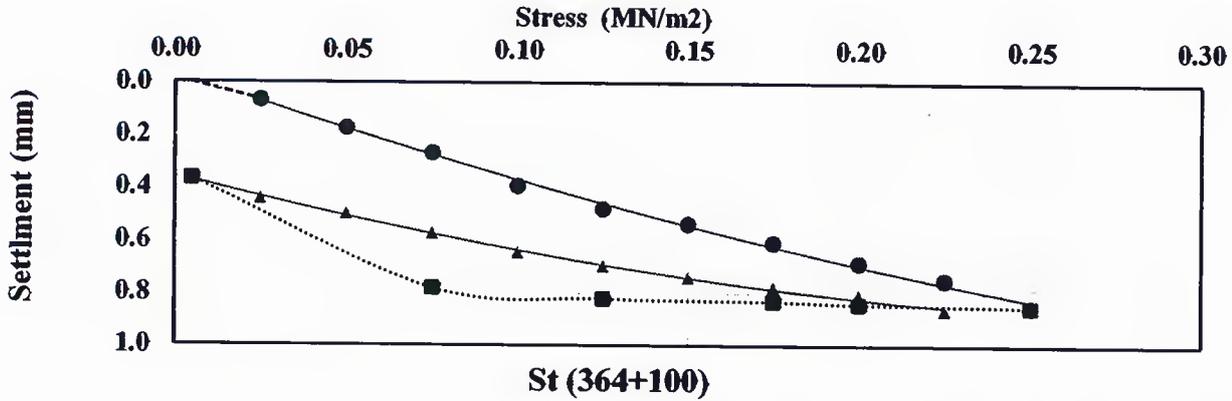


Fig. 1: Load-settlement curve, fitting curves according to Table 1 and Table 2 for the first and second loading cycles

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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St (364+150)

600

Table 4: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.06
2	14.14	0.050	0.12
3	21.21	0.075	0.16
4	28.28	0.100	0.20
5	35.35	0.125	0.24
6	42.42	0.150	0.27
7	49.49	0.175	0.29
8	56.56	0.200	0.32
9	63.63	0.225	0.37
10	70.7	0.250	0.42
11	56.56	0.200	0.41
12	49.49	0.175	0.40
13	35.35	0.125	0.39
14	21.21	0.075	0.38
15	1.414	0.005	0.18

Table 5: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.18
16	7.07	0.025	0.22
17	14.14	0.050	0.27
18	21.21	0.075	0.32
19	28.28	0.100	0.35
20	35.35	0.125	0.38
21	42.42	0.150	0.41
22	49.49	0.175	0.42
23	56.56	0.200	0.45
24	63.63	0.225	0.48

Table 6: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.025	0.171
a_1 (mm/(MN/m ²))	3.797	3.106
a_2 (mm/(MN ² /m ⁴))	-1.071	-3.504
$E_v = 1.5 \tau / (a_1 + a_2 \cdot \sigma_{0,MAX})$	127.50	201.81
E_{v2}/E_{v1}	1.58	





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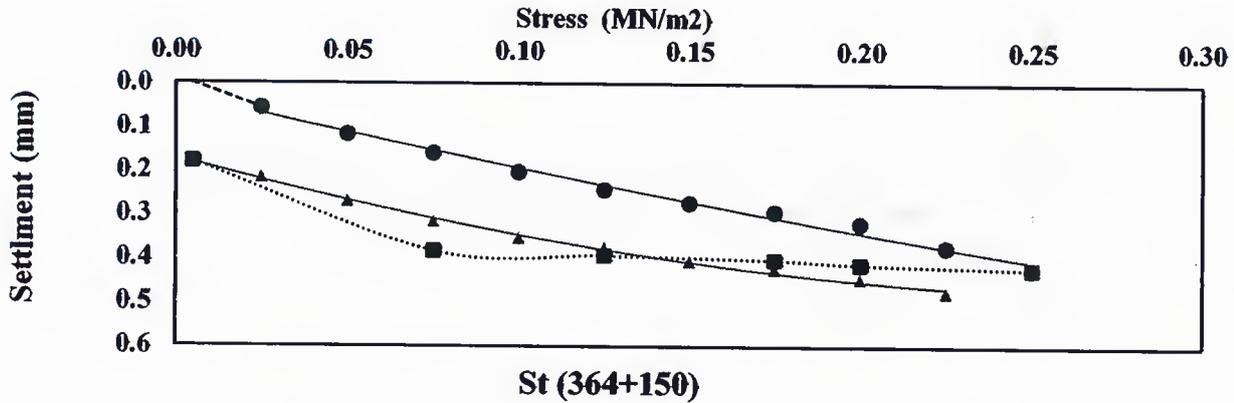


Fig. 2: Load-settlement curve, fitting curves according to Table 4 and Table 5 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (364+200)

600

Table 7: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.04
2	14.14	0.050	0.10
3	21.21	0.075	0.18
4	28.28	0.100	0.23
5	35.35	0.125	0.28
6	42.42	0.150	0.33
7	49.49	0.175	0.37
8	56.56	0.200	0.41
9	63.63	0.225	0.47
10	70.7	0.250	0.51
11	56.56	0.200	0.50
12	49.49	0.175	0.49
13	35.35	0.125	0.48
14	21.21	0.075	0.45
15	1.414	0.005	0.23

Table 8: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.23
16	7.07	0.025	0.30
17	14.14	0.050	0.35
18	21.21	0.075	0.40
19	28.28	0.100	0.45
20	35.35	0.125	0.46
21	42.42	0.150	0.48
22	49.49	0.175	0.50
23	56.56	0.200	0.53
24	63.63	0.225	0.55

Table 9: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
s_0 (mm)	-0.017	0.235
a_1 (mm/(MN/m ²))	3.661	2.990
a_2 (mm/(MN ² /m ⁴))	-2.344	-4.523
$Ev = 1.5 \tau / (a_1 + a_2 \cdot \sigma_{0,MAX})$	146.34	242.03
$Ev2/Ev1$	1.65	





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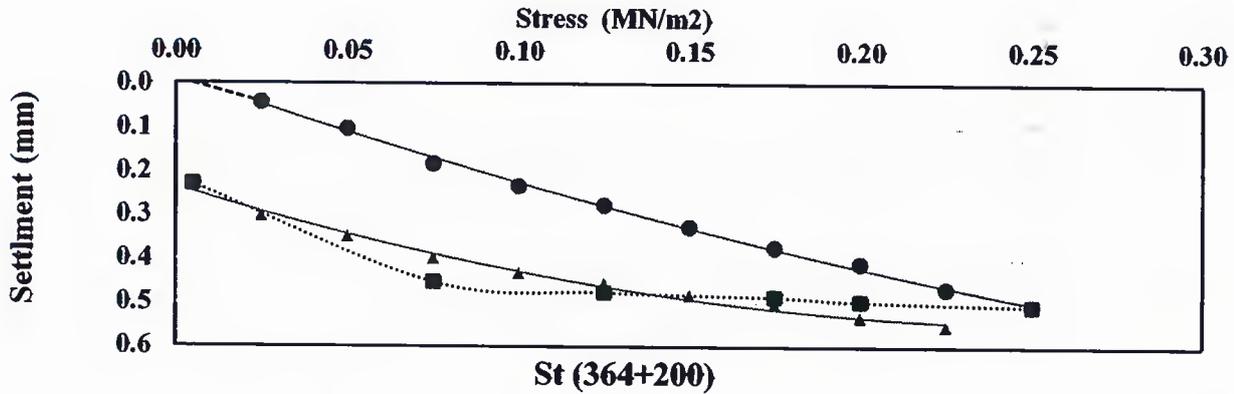


Fig. 3: Load-settlement curve, fitting curves according to Table 7 and Table 8 for the first and second loading cycles

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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St (364+250)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.13
2	14.14	0.050	0.20
3	21.21	0.075	0.26
4	28.28	0.100	0.39
5	35.35	0.125	0.47
6	42.42	0.150	0.56
7	49.49	0.175	0.65
8	56.56	0.200	0.70
9	63.63	0.225	0.74
10	70.7	0.250	0.79
11	56.56	0.200	0.78
12	49.49	0.175	0.77
13	35.35	0.125	0.76
14	21.21	0.075	0.75
15	1.414	0.005	0.48

Table 11: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.48
16	7.07	0.025	0.57
17	14.14	0.050	0.62
18	21.21	0.075	0.66
19	28.28	0.100	0.72
20	35.35	0.125	0.76
21	42.42	0.150	0.80
22	49.49	0.175	0.83
23	56.56	0.200	0.86
24	63.63	0.225	0.91

Table 12: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,MAX})$ MN/m ²	0.250	0.250
a_0 (mm)	0.002	0.490
a_1 (mm/(MN/m ²))	4.342	2.594
a_2 (mm/(MN ² /m ⁴))	-4.547	-3.476
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	140.40	260.78
$Ev2/Ev1$	1.86	

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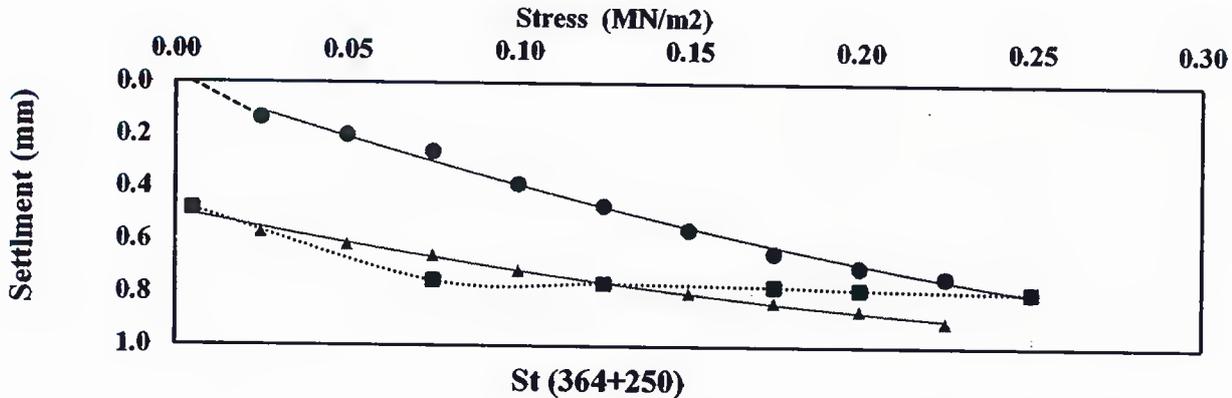


Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (364+300)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.17
2	14.14	0.050	0.22
3	21.21	0.075	0.25
4	28.28	0.100	0.29
5	35.35	0.125	0.32
6	42.42	0.150	0.35
7	49.49	0.175	0.37
8	56.56	0.200	0.40
9	63.63	0.225	0.43
10	70.7	0.250	0.45
11	56.56	0.200	0.44
12	49.49	0.175	0.43
13	35.35	0.125	0.42
14	21.21	0.075	0.41
15	1.414	0.005	0.22

Table 14: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.22
16	7.07	0.025	0.26
17	14.14	0.050	0.29
18	21.21	0.075	0.33
19	28.28	0.100	0.37
20	35.35	0.125	0.40
21	42.42	0.150	0.43
22	49.49	0.175	0.46
23	56.56	0.200	0.48
24	63.63	0.225	0.51

Table 15: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.138	0.214
a_1 (mm/(MN/m ²))	3.640	2.757
a_2 (mm/(MN ² /m ⁴))	-1.536	-2.101
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	138.22	201.61
$Ev2/Ev1$	1.46	





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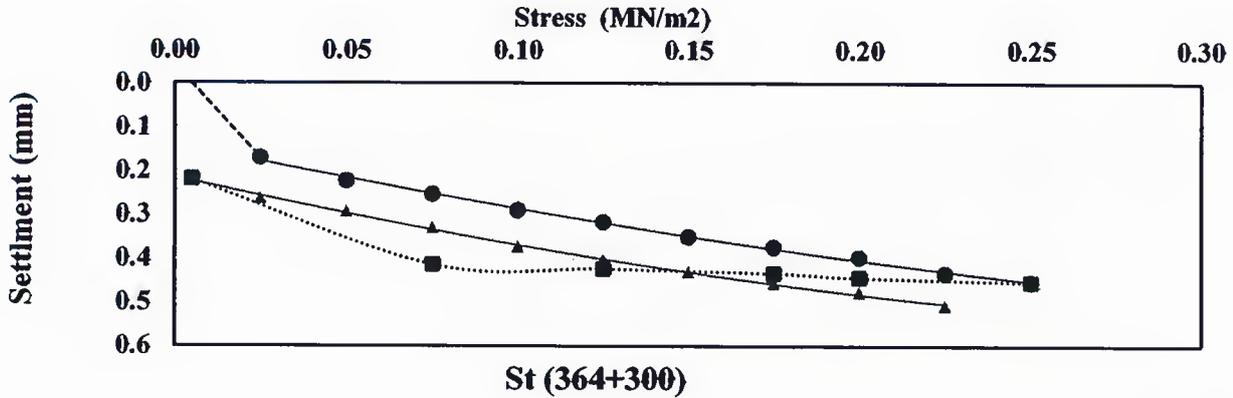


Fig. 5: Load-settlement curve, fitting curves according to Table 13 and Table 14 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (364+350)

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.10
2	14.14	0.050	0.19
3	21.21	0.075	0.30
4	28.28	0.100	0.38
5	35.35	0.125	0.45
6	42.42	0.150	0.52
7	49.49	0.175	0.60
8	56.56	0.200	0.66
9	63.63	0.225	0.72
10	70.7	0.250	0.79
11	56.56	0.200	0.78
12	49.49	0.175	0.77
13	35.35	0.125	0.76
14	21.21	0.075	0.75
15	1.414	0.005	0.47

Table 17: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.47
16	7.07	0.025	0.53
17	14.14	0.050	0.59
18	21.21	0.075	0.64
19	28.28	0.100	0.66
20	35.35	0.125	0.74
21	42.42	0.150	0.76
22	49.49	0.175	0.80
23	56.56	0.200	0.82
24	63.63	0.225	0.85

Table 18: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.007	0.465
a_1 (mm/(MN/m ²))	4.024	-2.871
a_2 (mm/(MN ² /m ⁴))	-3.678	-3.840
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	144.93	235.52
$Ev2/Ev1$	1.63	



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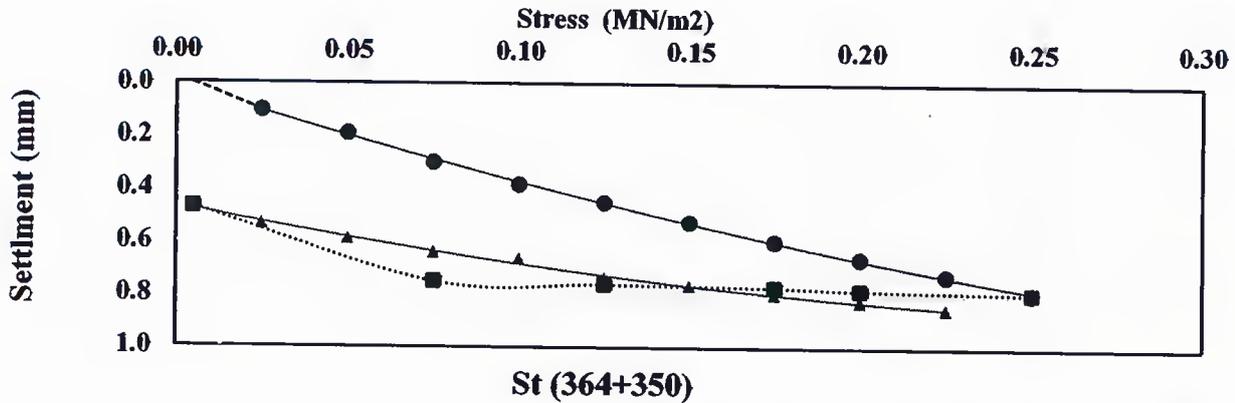


Fig. 6: Load-settlement curve, fitting curves according to Table 16 and Table 17 for the first and second loading cycles

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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St (364+400)

600

Table 19: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) 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	0.19
3	21.21	0.075	0.30
4	28.28	0.100	0.38
5	35.35	0.125	0.44
6	42.42	0.150	0.50
7	49.49	0.175	0.57
8	56.56	0.200	0.65
9	63.63	0.225	0.70
10	70.7	0.250	0.70
11	56.56	0.200	0.69
12	49.49	0.175	0.68
13	35.35	0.125	0.66
14	21.21	0.075	0.58
15	1.414	0.005	0.30

Table 20: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.30
16	7.07	0.025	0.39
17	14.14	0.050	0.47
18	21.21	0.075	0.53
19	28.28	0.100	0.57
20	35.35	0.125	0.60
21	42.42	0.150	0.63
22	49.49	0.175	0.66
23	56.56	0.200	0.68
24	63.63	0.225	0.73

Table 21: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	-0.028	0.312
a_1 (mm/(MN/m ²))	4.740	3.588
a_2 (mm/(MN ² /m ⁴))	-6.629	-5.906
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	145.95	213.05
$Ev2/Ev1$	1.46	



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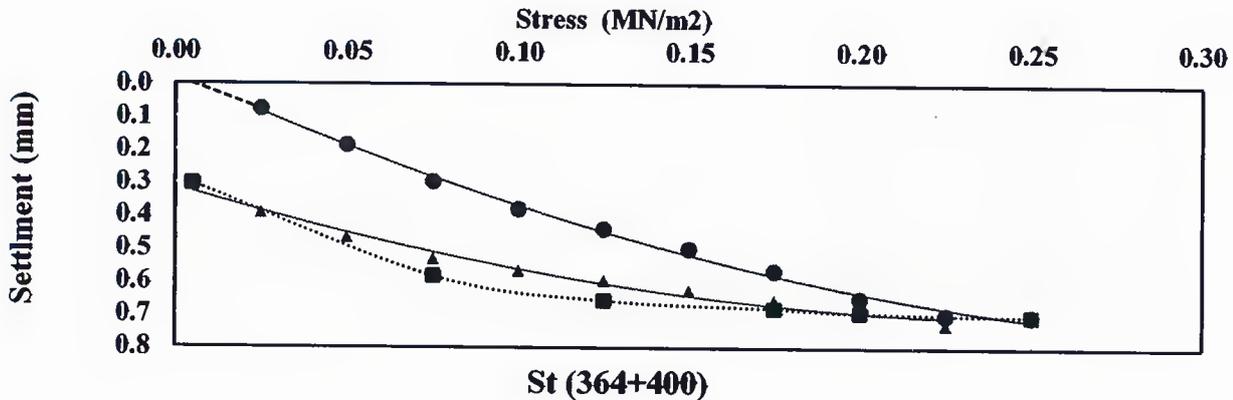


Fig. 7: Load-settlement curve, fitting curves according to Table 19 and Table 20 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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St (364+450)

600

Table 22: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.17
2	14.14	0.050	0.22
3	21.21	0.075	0.30
4	28.28	0.100	0.35
5	35.35	0.125	0.39
6	42.42	0.150	0.44
7	49.49	0.175	0.47
8	56.56	0.200	0.52
9	63.63	0.225	0.55
10	70.7	0.250	0.63
11	56.56	0.200	0.62
12	49.49	0.175	0.61
13	35.35	0.125	0.60
14	21.21	0.075	0.56
15	1.414	0.005	0.30

Table 23: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.30
16	7.07	0.025	0.34
17	14.14	0.050	0.40
18	21.21	0.075	0.43
19	28.28	0.100	0.50
20	35.35	0.125	0.53
21	42.42	0.150	0.57
22	49.49	0.175	0.57
23	56.56	0.200	0.59
24	63.63	0.225	0.63

Table 24: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.119	0.287
a_1 (mm/(MN/m ²))	3.640	3.039
a_2 (mm/(MN ² /m ⁴))	-1.556	-4.205
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	138.41	226.41
$Ev2/Ev1$	1.64	

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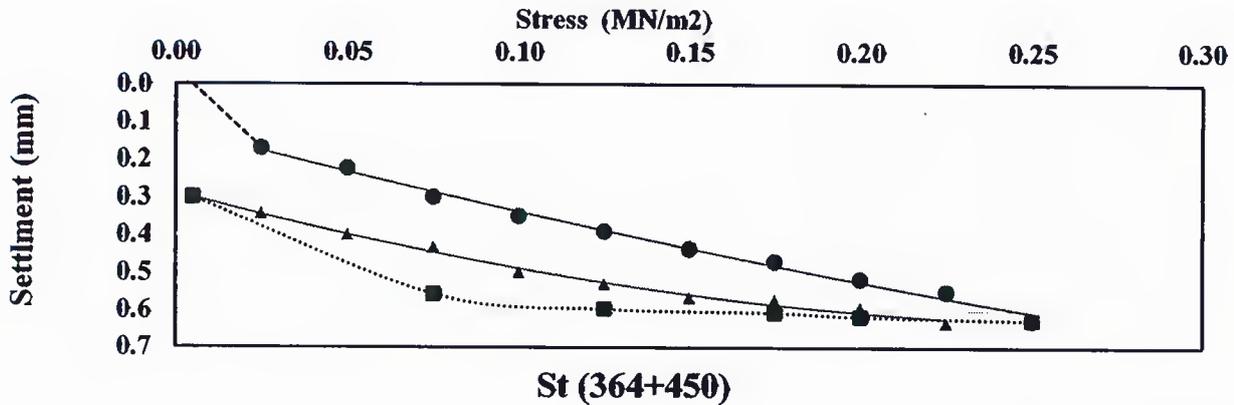


Fig. 8: Load-settlement curve, fitting curves according to Table 22 and Table 23 for the first and second loading cycles

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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Conclusions:

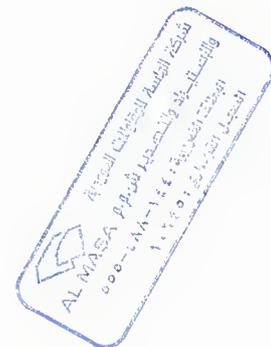
The present test results which were obtained via the plate loading tests of the native soil on prepared sub-grade (2) layer of the electric express train project at location from St(364+100) to St(364+460) in accordance to the German standard , DIN 18134 are illustrated in table 25 .

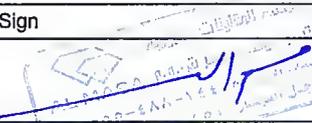
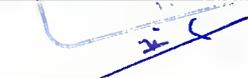
Table 25 :Test results

Location	Ev1(MN/m ²)	Ev2(MN/m ²)	Ev2/Ev1 ratio
St (364+100)	130.09	216.06	1.66
St (364+150)	127.50	201.81	1.58
St (364+200)	146.34	242.03	1.65
St (364+250)	140.40	260.78	1.86
St (364+300)	138.22	201.61	1.46
St (364+350)	144.93	235.52	1.63
St (364+400)	145.95	213.05	1.46
St (364+450)	138.41	226.41	1.64

Lab Director
Eng / Eman Kandil

Geotechnical Consultant
Dr / Mohamed Mostafa Badry



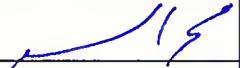
Contractor Company	Al-Masa General Contracting Company			Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign		Date/Serial Number	Time							
	Eng. Mohamed Elsaied			11/12/2023 (S5-B-MS) (PLT-S.G-04-D.P)	10:00 AM							
Received by GARB CONSULTANT	Eng. Mazen Essamy		MIR		C1	C2	C3	DD	MM	YY	HH	MM
					363	EW	CS	12	12	2023	10	0

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

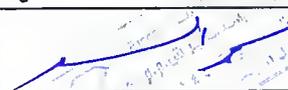
Description of Materials	Prepared Subgrade (2) AT (+0.50)				
Location to be Used	From	363+000	TO	363+060	Rev-29
		363+180		363+240	Rev-35
MAR & UIR Approval No	(S5-B-MS) (IR-S.G-09-D.P)		Date	11/12/2023	
	(S5-B-MS) (MAR-S.G-07)			01/11/2023	
Supplier Name	Elsiwiy , Alharamin				
Test Requirement	P.L.T (DIN 18134)		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP	
Reference Photos	No/Yes		Other		

Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	2		
2					

Comments by: Eng. Mazen Essamy (SPECTRUM) <div style="text-align: center;">  1-THE PLATE LOAD TEST RESULT P.L.T (DIN 18134) IS APPROVED </div>	Comments by: Eng. Alaa Abd-Allatif (ER) 1-PLATE LOAD TEST WAS CARRIED - OUT BY THIRD PART LAB 2-Results report attached and acceptable with project specifications.
---	---

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif			A

* Designer
 ** Alignment/Bridge: (S5-B-MS) (PLT-S.G-04-D.P)

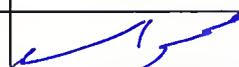
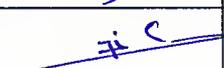
Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	Eng. Mohamed Elsaied		11/12/2023 (S5-B-MS) (PLT-S.G-04-D.P)	10:00 AM							
Received by GARB CONSULTANT	Eng. Mazen Essamy		MIR	C1	C2	C3	DD	MM	YY	HH	MM
				363	EW	CS	12	12	2023	10	0

CODE-1	S1 to S21 Station Reference	D1 to S3 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	Prepared Subgrade (2) AT (+0.50)				
Location to be Used	From	363+000	TO	363+060	Rev-29
		363+180		363+240	Rev-35
MAR & UIR Approval No	(S5-B-MS) (IR-S.G-09-D.P)		Date	11/12/2023	
	(S5-B-MS) (MAR-S.G-07)			01/11/2023	
Supplier Name	Elsiwiy , Alharamin				
Test Requirement	P.L.T (DIN 18134)		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP	
Reference Photos	No/Yes		Other		

Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	2		

Comments by: Eng. Mazen Essamy (SPECTRUM)	Comments by: Eng. Alaa Abd-Allatif (ER)
 1-THE PLATE LOAD TEST RESULT P.L.T (DIN 18134) IS APPROVED	1-PLATE LOAD TEST WAS CARRIED - OUT BY THIRD PART LAB 2-Results report attached and acceptable with project specifications. 3-Final approval is subject to above mentioned comments.

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif		13-12-2023	Awc

* Designer

** Alignment/Bridge: (S5-B-MS) (PLT-S.G-04-D.P)



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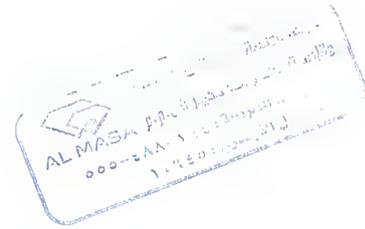
Internal inspection and laboratories sector

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

Technical report

of Plate Loading Test (DIN 18134)

General Consultant	:	SYSTRA
Consultant	:	SPECTRUM
Contractor	:	شركة الماسة للمقاولات
Project	:	ELECTRIC EXPRESS TRAIN
Sample	:	Subgrade (2)
Station	:	ST(363+025) TO ST(363+100)
Date of Test	:	13/06/2023
QC	:	2266-1





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Internal inspection and laboratories sector

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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.

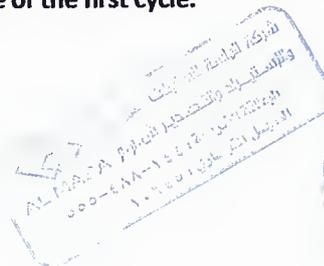
The test to be carried out on the native soil according to German specifications DIN 18134.

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 diameter of 600 mm have a thickness of 25mm and are provided with equally spaced stiffeners 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 hydraulic pump connected to a hydraulic 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 levelled and the plate was bedded on this surface.
- 7- The hydraulic jack was placed on the middle of, and at normal to, the loading plate beneath the reaction loading system and secured against tilting.
- 8- The reaction loading system was a heavy multi-purpose excavator (more than 20 ton).

Description of experiment:

- 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 transducer and dial gauge 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 increment 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 cycle.





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Internal inspection and laboratories sector

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363+025

600

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

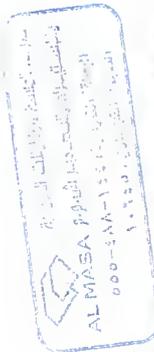
Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.17
2	14.14	0.050	0.28
3	21.21	0.075	0.37
4	28.28	0.100	0.47
5	35.35	0.125	0.56
6	42.42	0.150	0.70
7	49.49	0.175	0.75
8	56.56	0.200	0.85
9	63.63	0.225	0.99
10	70.7	0.250	1.06
11	56.56	0.200	1.05
12	49.49	0.175	1.01
13	35.35	0.125	0.87
14	21.21	0.075	0.68
15	1.414	0.005	0.36

Table 2: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.44
16	7.07	0.025	0.52
17	14.14	0.050	0.60
18	21.21	0.075	0.67
19	28.28	0.100	0.72
20	35.35	0.125	0.79
21	42.42	0.150	0.81
22	49.49	0.175	0.87
23	56.56	0.200	0.91
24	63.63	0.225	0.97

Table 3: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
s_0 (mm)	0.072	0.433
a_1 (mm/(MN/m ²))	4.046	3.325
a_2 (mm/(MN ² /m ⁴))	-0.303	-4.515
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,max})$	113.34	204.88
$Ev2/Ev1$		1.81





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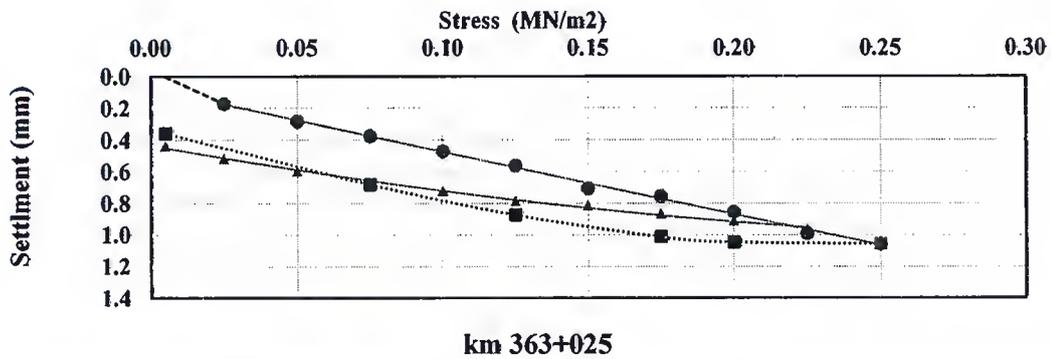
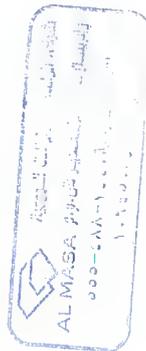


Fig. 1: Load-settlement curve, fitting curves according to Table 1 and Table 2 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





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Internal inspection and laboratories sector

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363+050

600

Table 4: Measured values for first loading cycle and unloading cycle

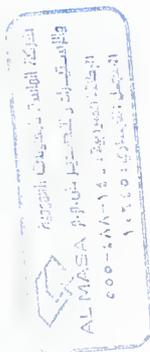
Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.23
2	14.14	0.050	0.34
3	21.21	0.075	0.46
4	28.28	0.100	0.61
5	35.35	0.125	0.72
6	42.42	0.150	0.87
7	49.49	0.175	0.97
8	56.56	0.200	1.10
9	63.63	0.225	1.17
10	70.7	0.250	1.21
11	56.56	0.200	1.18
12	49.49	0.175	1.13
13	35.35	0.125	0.95
14	21.21	0.075	0.75
15	1.414	0.005	0.41

Table 5: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.41
16	7.07	0.025	0.66
17	14.14	0.050	0.82
18	21.21	0.075	0.93
19	28.28	0.100	1.00
20	35.35	0.125	1.10
21	42.42	0.150	1.16
22	49.49	0.175	1.20
23	56.56	0.200	1.28
24	63.63	0.225	1.30

Table 6: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.050	0.440
a_1 (mm/(MN/m ²))	6.315	7.422
a_2 (mm/(MN ² /m ⁴))	-6.164	-16.420
$E_v = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,max})$	94.26	135.62
E_{v2}/E_{v1}	1.44	

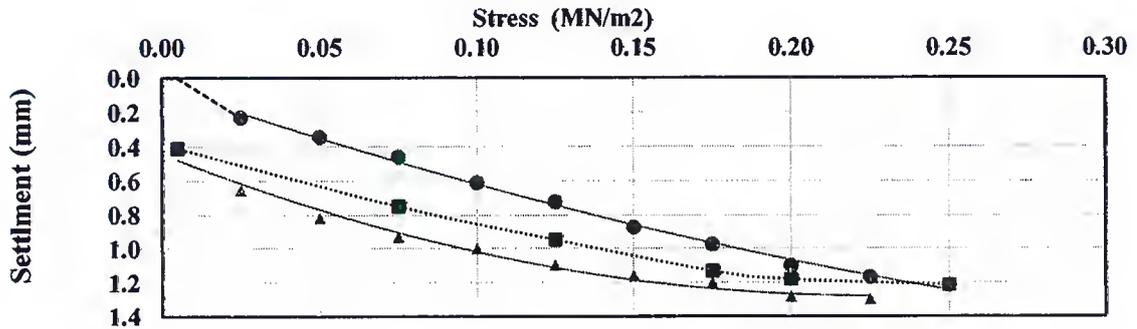




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Internal inspection and laboratories sector

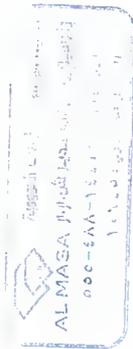
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km 363+050

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

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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

363+075

600

Table 7: Measured values for first loading cycle and unloading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.10
2	14.14	0.050	0.29
3	21.21	0.075	0.39
4	28.28	0.100	0.48
5	35.35	0.125	0.61
6	42.42	0.150	0.78
7	49.49	0.175	0.85
8	56.56	0.200	0.92
9	63.63	0.225	1.04
10	70.7	0.250	1.09
11	56.56	0.200	1.08
12	49.49	0.175	1.05
13	35.35	0.125	0.86
14	21.21	0.075	0.70
15	1.414	0.005	0.44

Table 8: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.44
16	7.07	0.025	0.58
17	14.14	0.050	0.73
18	21.21	0.075	0.83
19	28.28	0.100	0.91
20	35.35	0.125	0.97
21	42.42	0.150	1.03
22	49.49	0.175	1.09
23	56.56	0.200	1.15
24	63.63	0.225	1.17

Table 9: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0, \max})$ MN/m ²	0.250	0.250
a_0 (mm)	-0.041	0.438
a_1 (mm/(MN/m ²))	6.227	5.859
a_2 (mm/(MN ² /m ⁴))	-6.690	-11.760
$E\nu = 1.5 r / (a_1 + a_2 \cdot \sigma_{0, \max})$	98.79	154.15
$E\nu_2/E\nu_1$	1.56	

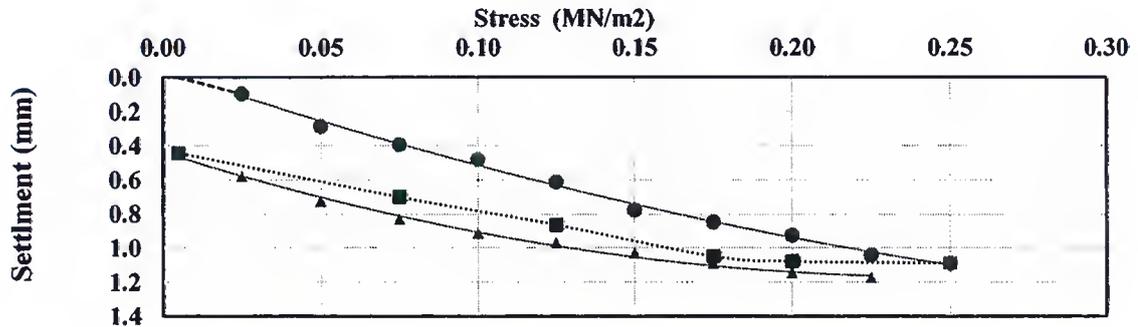




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Internal inspection and laboratories sector

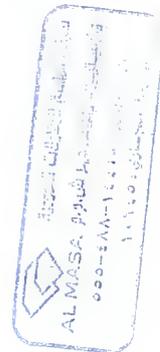
Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011



km 363+075

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

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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Internal inspection and laboratories sector

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363+100

600

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

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.19
2	14.14	0.050	0.33
3	21.21	0.075	0.47
4	28.28	0.100	0.61
5	35.35	0.125	0.80
6	42.42	0.150	1.01
7	49.49	0.175	1.20
8	56.56	0.200	1.40
9	63.63	0.225	1.46
10	70.7	0.250	1.54
11	56.56	0.200	1.52
12	49.49	0.175	1.44
13	35.35	0.125	1.23
14	21.21	0.075	0.95
15	1.414	0.005	0.58

Table 11: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (s_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.58
16	7.07	0.025	0.86
17	14.14	0.050	1.01
18	21.21	0.075	1.13
19	28.28	0.100	1.27
20	35.35	0.125	1.39
21	42.42	0.150	1.50
22	49.49	0.175	1.57
23	56.56	0.200	1.63
24	63.63	0.225	1.66

Table 12: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,MAX})$ MN/m ²	0.250	0.250
a_0 (mm)	-0.038	0.599
a_1 (mm/(MN/m ²))	7.439	8.654
a_2 (mm/(MN ² /m ⁴))	-3.517	-17.478
$Ev = 1.5 r / (a_1 + a_2 \cdot \sigma_{0, MAX})$	68.59	105.02
$Ev2/Ev1$		1.53





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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

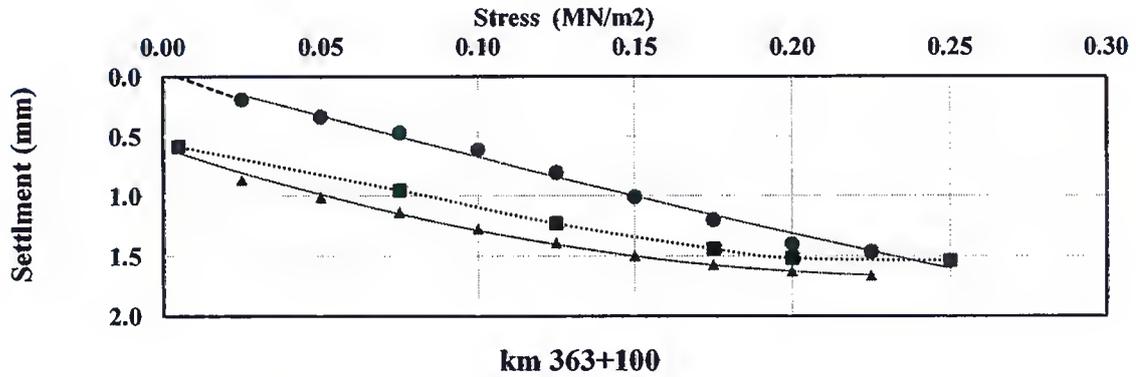
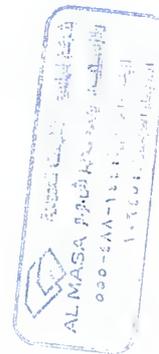


Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles

- Measurement points from the first loading cycle
- Measurement points from the unloading cycle
- ▲ Measurement points from the second loading cycle
- S Settlement in mm
- σ_0 Normal stress MN/m²





COMIBASSAL International Controllers Internal inspection and laboratories sector

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

Conclusions:

The present test results which obtained from the plate loading tests of the native soil on Subgrade (2) layer of the electric express train project at location (from km 363+025 to km 363+100) in accordance to the German standard , DIN 18134 are illustrated in table 13 .

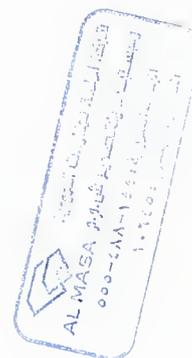
Table 13 :Test results

Location	Ev1(MN/m ²)	Ev2(MN/m ²)	Ev2/Ev1 ratio
363+025	113.34	204.88	1.81
363+050	94.26	135.62	1.44
363+075	98.79	154.15	1.56
363+100	68.59	105.02	1.53

Lab Director
Eman.
Eng / Eman Kandil



Geotechnical Consultant
For. Dr. H.
Dr / Mohamed Mostafa Badry



MATERIAL INSPECTION REQUEST



الهيئة العامة للطرق والكبارى (GARB)



Contractor Company	Al-Masa General Contracting Company		Designer Company				(SPECTRUM) Engineering Consulting Office			
Issued by Contractor	Name	Sign	Date/Serial Number				Time			
	Eng. Mohamed Elsaied		11/12/2023 (S5-B-MS) (PLT-S.G-05-D.P)				10:00 AM			
Received by GARB CONSULTANT	Eng. Mazen Essamy	MIR	C1	C2	C3	DD	MM	YY	HH	MM
			363	EW	CS	12	12	2023	10	0

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

Description of Materials	Prepared Subgrade (2) AT (+0.50)				
Location to be Used	From	363+060	TO	363+100	Rev-29
		363+240		363+280	Rev-35
MAR & UIR Approval No	(S5-B-MS) (IR-S.G-10-D.P)		Date	11/12/2023	
	(S5-B-MS) (MAR-S.G-07)			01/11/2023	
Supplier Name	Elsiwiy , Alharamin				
Test Requirement	P.L.T (DIN 18134)		Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP	
Reference Photos	No/Yes		Other		

Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	2		
2					

Comments by: Eng. Mazen Essamy (SPECTRUM)	Comments by: Eng. Alaa Abd-Allatif (ER)
<p>1-THE PLATE LOAD TEST RESULT P.L.T (DIN.18134) IS APPROVED</p>	<p>1-PLATE LOAD TEST WAS CARRIED - OUT BY THIRD PART LAB</p> <p>2-Results report attached and acceptable with project specifications.</p>

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif		12-2023	A

* Designer

** Alignment/Bridge: (S5-B-MS) (PLT-S.G-05-D.P)

MATERIAL INSPECTION REQUEST



الهيئة العامة للطرق والكبارى (GARB)



المشروع: الخط الكهربائي



Contractor Company	Al-Masa General Contracting Company		Designer Company	(SPECTRUM) Engineering Consulting Office							
Issued by Contractor	Name	Sign	Date/Serial Number	Time							
	Eng. Mohamed Elsaied		11/12/2023 (S5-B-MS) (PLT-S.G-05-D.P)	10:00 AM							
Received by GARB CONSULTANT	Eng. Mazen Essamy		MIR	C1	C2	C3	DD	MM	YY	HH	MM
				363	EW	CS	12	12	2023	10	0

CODE	S1 to S21	D1 to S3	Kp XXX Note
	Station Reference	Depot Reference	For Kilometer point only Start Km Is used
Work Activity			
Sub Element of Activity			

Description of Materials	Prepared Subgrade (2) AT (+0.50)				
Location to be Used	From	363+060	TO	363+100	Rev-29
		363+240		363+280	Rev-35
MAR & UIR Approval No	(S5-B-MS) (IR-S.G-10-D.P)		Date	11/12/2023	
	(S5-B-MS) (MAR-S.G-07)			01/11/2023	
Supplier Name	Elsiyw , Alharamin				
Test Requirement	P.L.T (DIN 18134)	Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP		
Reference Photos	No/Yes	Other			

Item	Description	Unit	Quantity	Arrival Date	Note
1	PLATE LOAD POINT	NUMBER	2		

Comments by: Eng. Mazen Essamy (SPECTRUM)	Comments by: Eng. Alāa Abd-Allatif (ER)
 1-THE PLATE LOAD TEST RESULT P.L.T (DIN 18134) IS APPROVED	1-PLATE LOAD TEST WAS CARRIED - OUT BY THIRD PART LAB 2-Results report attached and acceptable with project specifications. 3-Final approval is subject to above mentioned comments.

APPROVAL STATUS				
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Elsaied			A
QA/QC *	Eng. Mazen Essamy			A
GARB**	Eng. Margeret Magdy			
Employers Representative	Eng. Alaa Abd-Allatif		13-12-2023	Awc

* Designer
 ** Alignment/Bridge: (S5-B-MS) (PLT-S.G-05-D.P)



COMIBASSAL International Controllers

Internal inspection and laboratories sector

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



Technical report

of Plate Loading Test (DIN 18134)

General Consultant	:	SYSTRA
Consultant	:	SPECTRUM
Contractor	:	شركة الماسة للمقاولات
Project	:	ELECTRIC EXPRESS TRAIN
Sample	:	Subgrade (2)
Station	:	ST(363+025) TO ST(363+100)
Date of Test	:	13/06/2023
QC	:	2266-1



Kilo 23 Alexandria - Cairo Desert Road - Merghem

Tel: 002 03 4704595 - 002 034701191

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WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt

Tel: 002 033920176 - 002 033931482

Fax :002 033900476

Email : internal-inspection@comibassal.com



COMIBASSAL International Controllers

Internal inspection and laboratories sector

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

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 diameter of 600 mm have a thickness of 25mm and are provided with equally spaced stiffeners 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 hydraulic pump connected to a hydraulic 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 levelled and the plate was bedded on this surface.
- 7- The hydraulic jack was placed on the middle of, and at normal to, the loading plate beneath the reaction loading system and secured against tilting.
- 8- The reaction loading system was a heavy multi-purpose excavator (more than 20 ton).

Description of experiment:

- 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 transducer and dial gauge 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 increment 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 cycle.





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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

363+025

600

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

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.17
2	14.14	0.050	0.28
3	21.21	0.075	0.37
4	28.28	0.100	0.47
5	35.35	0.125	0.56
6	42.42	0.150	0.70
7	49.49	0.175	0.75
8	56.56	0.200	0.85
9	63.63	0.225	0.99
10	70.7	0.250	1.06
11	56.56	0.200	1.05
12	49.49	0.175	1.01
13	35.35	0.125	0.87
14	21.21	0.075	0.68
15	1.414	0.005	0.36

Table 2: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.44
16	7.07	0.025	0.52
17	14.14	0.050	0.60
18	21.21	0.075	0.67
19	28.28	0.100	0.72
20	35.35	0.125	0.79
21	42.42	0.150	0.81
22	49.49	0.175	0.87
23	56.56	0.200	0.91
24	63.63	0.225	0.97

Table 3: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
($\sigma_{0,max}$) MN/m ²	0.250	0.250
a_0 (mm)	0.072	0.433
a_1 (mm/(MN/m ²))	4.046	3.325
a_2 (mm/(MN ² /m ⁴))	-0.303	-4.515
$E_v = 1.5 r / (r_1 + a_2 \cdot \sigma_{0,max})$	113.34	204.88
E_v2/E_v1		1.81

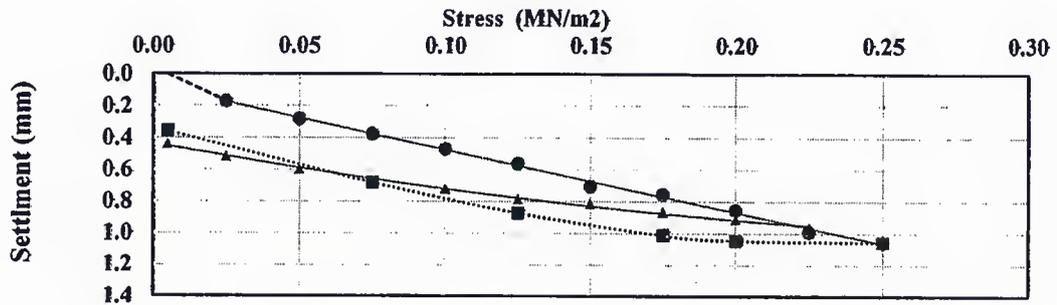




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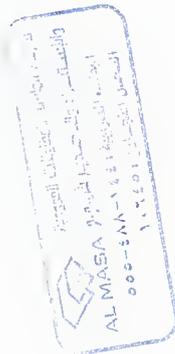
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km 363+025

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

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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363+050

600

Table 4: Measured values for first loading cycle and unloading cycle

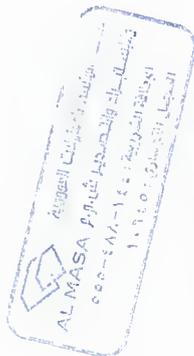
Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.23
2	14.14	0.050	0.34
3	21.21	0.075	0.46
4	28.28	0.100	0.61
5	35.35	0.125	0.72
6	42.42	0.150	0.87
7	49.49	0.175	0.97
8	56.56	0.200	1.10
9	63.63	0.225	1.17
10	70.7	0.250	1.21
11	56.56	0.200	1.18
12	49.49	0.175	1.13
13	35.35	0.125	0.95
14	21.21	0.075	0.75
15	1.414	0.005	0.41

Table 5: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.41
16	7.07	0.025	0.66
17	14.14	0.050	0.82
18	21.21	0.075	0.93
19	28.28	0.100	1.00
20	35.35	0.125	1.10
21	42.42	0.150	1.16
22	49.49	0.175	1.20
23	56.56	0.200	1.28
24	63.63	0.225	1.30

Table 6: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0,max})$ MN/m ²	0.250	0.250
a_0 (mm)	0.050	0.440
a_1 (mm/(MN/m ²))	6.315	7.422
a_2 (mm/(MN ² /m ⁴))	-6.164	-16.420
$E_v = 1.5 r / (a_1 + a_2 \cdot \sigma_{0,MAX})$	94.26	135.62
E_{v2}/E_{v1}		1.44





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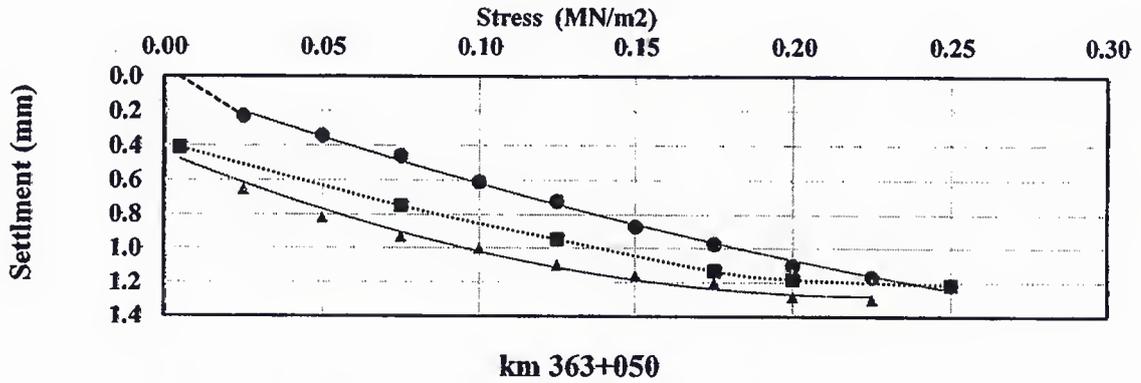


Fig. 2: Load-settlement curve, fitting curves according to Table 4 and Table 5 for the first and second loading cycles

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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363+075

600

Table 7: Measured values for first loading cycle and unloading cycle

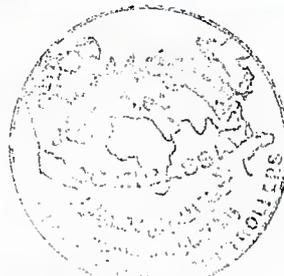
Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
0	1.414	0.005	0.00
1	7.07	0.025	0.10
2	14.14	0.050	0.29
3	21.21	0.075	0.39
4	28.28	0.100	0.48
5	35.35	0.125	0.61
6	42.42	0.150	0.78
7	49.49	0.175	0.85
8	56.56	0.200	0.92
9	63.63	0.225	1.04
10	70.7	0.250	1.09
11	56.56	0.200	1.08
12	49.49	0.175	1.05
13	35.35	0.125	0.86
14	21.21	0.075	0.70
15	1.414	0.005	0.44

Table 8: Measured values for second loading cycle

Loading stage no.	Load (F) kN	Normal stress (σ_0) MN/m ²	Settlement of loading plate S (mm)
15	1.414	0.005	0.44
16	7.07	0.025	0.58
17	14.14	0.050	0.73
18	21.21	0.075	0.83
19	28.28	0.100	0.91
20	35.35	0.125	0.97
21	42.42	0.150	1.03
22	49.49	0.175	1.09
23	56.56	0.200	1.15
24	63.63	0.225	1.17

Table 9: Compilation of results

Parameters	1st loading cycle	2nd loading cycle
$(\sigma_{0, \max})$ MN/m ²	0.250	0.250
a_0 (mm)	-0.041	0.438
a_1 (mm/(MN/m ²))	6.227	5.859
a_2 (mm/(MN ² /m ⁴))	-6.690	-11.760
$E_v = 1.5 r / (a_1 + a_2 \cdot \sigma_{0, \max})$	98.79	154.15
E_v2/E_v1		1.56

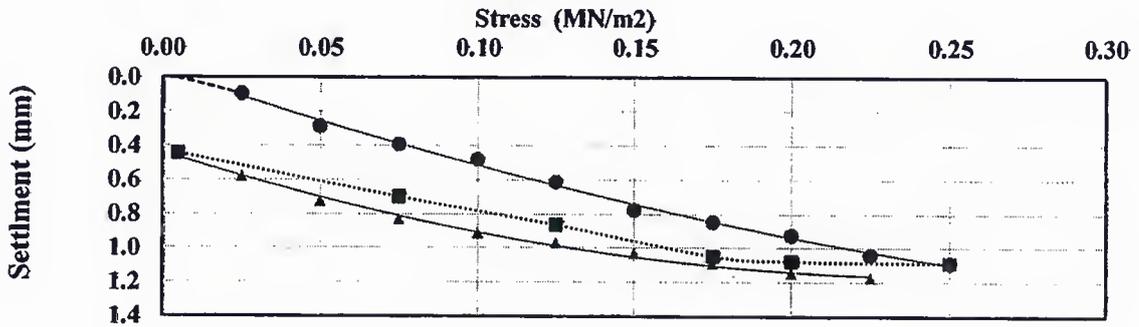




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km 363+075

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

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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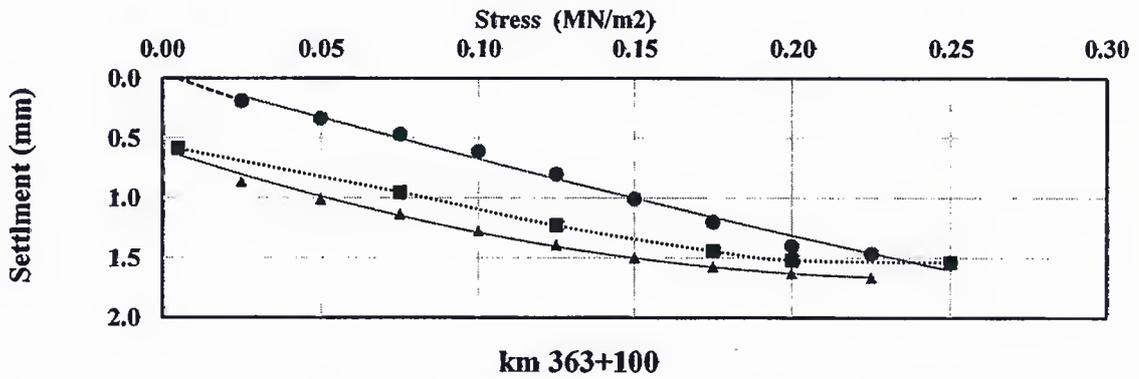
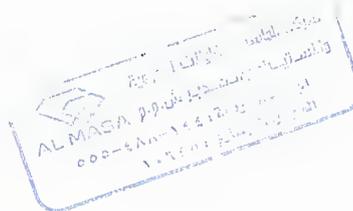


Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles

- Measurement points from the first loading cycle
 - Measurement points from the unloading cycle
 - ▲ Measurement points from the second loading cycle
- S Settlement in mm
 σ_0 Normal stress MN/m²





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Conclusions:

The present test results which obtained from the plate loading tests of the native soil on Subgrade (2) layer of the electric express train project at location (from km 363+025 to km 363+100) in accordance to the German standard , DIN 18134 are illustrated in table 13 .

Table 13 :Test results

Location	Ev1(MN/m ²)	Ev2(MN/m ²)	Ev2/Ev1 ratio
363+025	113.34	204.88	1.81
363+050	94.26	135.62	1.44
363+075	98.79	154.15	1.56
363+100	68.59	105.02	1.53

Lab Director
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