

أعمال الجسر الترابي للخط الأول للقطار الكهربائي السريع قطاع (برج العرب/العلمين) المسافة من الكم 371+000 إلى الكم 371+500 بطول 0.5 كم

رقم البند و بيانه : (1-3) بالمتر المكعب اعمال توريد وتشغيل اترية صالحة للردم و مطابقة للمواصفات

تستقيسة : شركة الشاه للمفاولات العامة

3e 0.0

مقنار العمل السابق :

الكمية	د(متر)	الايماد (متر)		الموقع ال	0.00	
	مساحة المقطع	طول	ال	من	رام اطلب	جيان الإصال والمقايسة
510	5.1	100	371+100	371+000	IR-F.1	اميل تحيل وارزيد تربة معابة لليوامدان وتشنيها بسنخط الان السوية بسنة الإيواش (9 سم من مسوب 3 متروسط الايواد عن 25 سو لاستكال المسوي العموم الشكل الجمر ولاكاف إسرة
500	5	100	371+100	371+000	IR-F.2	تصل كاليورثيا لا تقل عن 150% ورغها بالسبة الإصوابية ال نسبة الرطوبة المعاومة والدبات الحرد والهواب البوصول في اقص كافة جانة (625% من التعاق العراقة النصوى ورغم التعليد طبقا للمعاسب المصيمية
490	4,9	100	371+100	371+000	IR- F.3	والقناطات المرضية المواجية والمودات الطعيفية السندية والباب مجموع متشارلة طبة لامون الجناطة ومؤمرات البيئة المائة للطرق والكراري وقطيات المهائد المطارقية والكراري وقطيات المهائد المجاهدة والالا يعمى الرائة 1 والمراز الرائية المهائد المهائد المائة المراز (200 يعمى الرائة 1
483	4.83	100	371+100	371+000	IR- F.4	جنوب على وذنا لمية التعلق لكل الان مسالة تعلى حق 2 كم ويتو الساسية متودة 1 جنوة الكم بارونية و المسالة
480	4.8	100	371+100	371+000	IR- F.5	- تبسور بشمل حدل تشوينات والخابط واختبارات واللى الموقع العمل حتى - سناقة ع كم - خدمتر برفض فيدة الدادة المحجورة .
2463.00			(°p)	ا لازة المستخلص الحالية	اجمالي الكبيات خلال	
2463.00				لـى الكلـى (م ⁽)	الاجما	

مدير مشروع الهيدة م/ مارجريت مجدي مهندس الاستشاري مهندس الاستشاري مهندس الاستشاري مكتب XYZ مكتب XYZ مكتب AYZ مكتب الاستشاري مكتب المكتب المكتب

مهندس الشركة م/محمود شعبان محماس عكما م

A Samuel



أعمال الجسر الترابي للخط الأول للقطار الكهربائي السريع قطاع (برج العرب/العلمين) المسافة من الكم 371+000 إلى الكم 371+500 بطول 0.5 كم

رقم البند و بيانه : (3-1) بالمتر المكعب اعمال توريد وتشغيل اثرية صالحة للردم و مطابقة للمواصفات (علاوة تحصيل رسوم الكارتات و الموازيين طيقا للاتحه الشركه الوطنيه)

تستفيسك وشركة انشاء للمقاولات العامة

30

0.0 مقدار العمل السابق :

الكنية	د (متر)	الابد	كيلوماري	الموقع انا	رقم الطلب	سان الإصدال بالمقايسة
-2001	مساحة المقطع	طول	U	Dr.	رهم الطلبية	بيان ومدل ومعايده
510	5.1	100	371+100	371+000	IR- F.1	عمل نصيل وتوريد اترية مطابقة لليواميذات وتشعيلها باستعدام الكت السوية بسماد لا يهد بن 23 سم حتى بالموي- 2 مر ويسعاد لايزيد عن 25 سم كسكدار الملسوب للتسليق الشكل
500	5	100	371+100	371+000	IR- F.Z	الجسر والأكاف رئيسية لحمل كاليفورتيا لا تقل هن 12 % وريفها والميلا الاصوارية في نسبة الوطوية المطلوبة والمملد الجيد والهياسات الوصول في الفني كافاء جاعة (1995 من الكافلة البرطة اللمبوي (وينم العقيد طبقا المعاسب التصميمية و المؤاعات
490	4.9	100	371+100	371+000	IR-F,3	المرحدة الموقيعة والرسومات التصيفية المصدة والبند بجميع مشتمانات هيئة الرسول اجتلاءة ومواجهات الهيئة العامة للطرق والكراري والدينات المهتمي المشرف.
483	4.83	100	371+100	371+000	III-F4	الى حالة عالى جهاز الانتهاف زيادة السبة المدك هن 1932 يحسب زيادة 1 جنية على زيادة نسبة الدخك فكي 1961. - مدافة النظل حال 2 كوريتم استعباب علاوة 1,5 جنية للكم داردادة إن التقبيان
480	4.8	100	371+100	371+000	IR- F.5	السعر بخمل عمل كثيرات وتقليلها وأختدارات وتقل لموقع العمل حق مساقة ج كم ماسعر بشعل فينة العادة المحجرية
463.00			('e)	فترة المستخلص الحالية	جمالي الكميات خلال	
12.70 P. Or Service						

الإجمالين الكلبي (م")

مهتدس الاستشاري مهتدس الإستشاري مدير مشروع الهيئة مکتب د/ عماد نبیل مكتب XYZ م/ عارجريت مجدي 2

2463.00



فَالْمَةَ الْكَمِياتُ الْوَارِدَةَ بِالمُسْتَخَلِّصِ جَارِيَ (1)

أعمال الجسر الترابي للخط الأول للقطار الكهرباني السريع قطاع (برج العرب/العلمين) المسافة من الكم 371+000 إلى الكم 371+500 بطول 0.5 كم

رقم البند و بيانه : (1-3) بالمتر المكعب اعمال توريد وتشغيل الربة صالحة للردم و مطابقة للمواصفات (علاوة مسافة ثقل التربة لمسافة 88 كم) (120.4=4.4*8)

السنفيسة وشركة انشاء للمقاولات العامة

3e 0.0

مقدار العمل السابق :

لكمية	تسبة العلاوة	(nic)	الإيما	لبلومغري	الموقع اثا		
	@3001 e/em	مبداحة المضطع	طول	ال	i.o	رقم انطلب	برات الأعمال بالمقايسة
408	80%	5.1	100	371+100	371+000	IR- F.1	تعال تحميل وزيريد الربة سناية الدو مدت وتشفيلها واستعدام الات نسرية بسفاد لا وزيد من 50 سم من مسورة -2 مع ويسماء كرايد من 22 سم السخاف المشروب المناسي الذاكل الجمير ولا كاف إسماء
400	80%	5	100	371+100	371+000	IR-F,Z	سل كاليوريز لا تقل من 15 هم ريفها بالمرة الاصوارة أن السرة الرخورة المطابعة والنمك الجند بالهراسات لوصول أن اللس 12 % جالة (1944 من الانتقاق الجدالة العمون إريام التقايل طبة المناسبية التحميمية
392	80%	4.9	100	371+100	371+000	IR- F.3	والطلاعات الدونية المواجرة والرسوات الطعورية المدسة والبار جميع بشتمانة طياة الموال الملاكة ويواجلات الهيئة العامة الطوار و الكوان والطبيق الميثرات المؤسس المثرات إن حالة طاب جهاز كالموال وإدارا سرة المحاد من 50% يحسب راداد ا
386.4	80%	4.83	100	371+100	371+000	IR- F.4	جنية على زودا نمية الدملة الآل 18. مسافة النفل من 2 كم ويتو احتساب مارية 1.5 جنية قدم والزيادة او التصادر
384	80%	4.8	100	371+100	371+000	IR- F.5	اسمر مشمل عمل تصويفات وضايط واختيارات ويقل لمواج الممل حي مساقة 2 كم -اسمر وفيس فيمة المامة المحديثة.
1970.4		.,,		حالية (م")	ا. خيلال فِتَرَةِ المِستخلس الْ	ا اجمالي الكميات	
1970.4					الإجمالي الكني (م")	or and a second	

مدير مشروع الهيئة م/ مارجريت مجدي د/ مهندس الاستشاري معطم الاستشاري معطم الاستشاري مكتب د/ عتاد خيال مرام عبد العزيز ما طفي العزيز ما العز

مهددس الشركة م/ محمود شعبان كار مراحد كار م

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أعمال الجسر الترابي للخط الأول للقطار الكهربائي السريع قطاع (برج العرب/العلمين) المسافة من الكم 371+000 إلى الكم 371+500 بطول 0.5 كم

رقم البند و بيانه : (1-3) بالمتر المكعب اعمال توريد وتشغيل انرية صالحة للردم و مطابقة للمواصفات (علاوة مساقة نقل الرمل لمساقة 68 كم] (66°1.4-92.4)

السنفيسة وشركة انشاء للمقاولات العامة

0.0

مقدار العمل السابق :

		طد (عقر)	الإب	فيلومتي	الموقع الك	27.4	بيان الاعمال بالمقاسية
لكبية	تسبة الملاوة	مساحة المقطح	طول	J	ů•	رقم الطلب	amband Carat nin
102	20%	5.1	100	371+100	371+000	IR-F.1	المعال تحصل ومويد غيرة معابلة المواديدات وتشفيلها باستانيام فات الحواد بحدث لا يوزد عن الاسم على مضوب ع على إستانيا
100	20%	5	100	371+100	371+000	(R-F.2	ولا سم (مستثمان المصوب التمييني التنافي الجمير والإداق إليها الحمل الاميوريالا الله من 12 فارا يعقم الميالا الحمولية في أسيمة الرطوية المقاولة والملك الجميد الهرسات الرصول بن الحي 22 في الا 12 ويورد الكذاة الجمالة الصوبي الإنباء المتاوية على المساوية المساوية
98	20%	4.9	100	371+100	371+000	IR-F.3	و الخاط الدرائية المواحرة والصواحات الطعيدية المعادنة والبدر ويصوع مكتفرات طبة الحيول المستحد ومؤمرات الدينة الحاجة الجزار ويسوع مكتفرات طبقة الحيول المستحد المقارض المقارض المقارض - إلى حالة عالب جهال الخليات إن السياحة عدمات من 1908 ومسب وراسة 1
96.6	20%	4.83	100	371+100	371+000	IR-F,4	جدة طلق ويراه فسية على المناسبة المساورة على المؤرد مساوحة القال حدي 2 كو وزيد استساب عدوة 2 راجعية الكو والوادة و مساورة على حدل الموردات والقالية واستوارات ونقل نموقع المعل حق
96	20%	4.8	100	371+100	371+000	IR- F.5	مسالة ع كم مقسم ويلمز أربعة الدادة المحيدية .
492.6				الية (م)	لال فترة السنتخلص الحا	اجمالي الكميات خا	
492.6					معالس الكلس (م")	الاء	

مهتدس الاستشاري مکتب XYZ م / محمد خلیل

مهندس الشركة



أعمال الجسر الترابي للخط الأول للقطار الكهربائي السريع قطاع (برج العرب/العلمين) المساقة من الكم 371+000 إلى الكم 371+500 بطول 0.5 كم

رقِم البند و بيانه : (1-4) بالمتر المكعب اعمال توريد وفرش طبقة الاساس (prepared subgrade) من الاحجار الصلبة المتدرجة ناتج تكسير الكسارات والمطابقة للمواصفات

تُنفين : شركة إنشاء للمقاولات العامة 0.0

مقدار العمل السابق:

			-	0.0		- Giran Orient June	
الكمية	بعاد (متر)	الاه	فيلومتري	الموقع الك	0.0.5	2 . 15 . 11 . 11 . 15 . 1	
-usse)	مساحة المقطع	طول	الى	من	رقم الطلب	بيان الأعمال بالمقايسة	
823.60	4,118	200	371+300	371+100	IR(PSG-1)	المتر المكتب الدال توريد وقرق طبالة المهين (prepared subgrade) و الإحجاز الحيارة المتمومة الج الأسارات والمطابقة المواسقات	
783.80	3,919	200	371+500	371+300	IR(PSG-2)REV	وأقمع الحبيب 100 مم ولا كود نمية الدار من ماذان 200 هن 11.20 المرح الوارد الانافر فات الكامة والدنروع 100ر نسبة نحمل كالبغويند من 25% والا يؤيد نسبة الفاقد بجهار لوس فجوس عراق الا كود	
313.52	3.919	80	371+300	371+220	IR(PSG-3)REV	الإعتماعي عن وواد والا بالي معامل المرولة (1926) من تجربة اوج التحايل من 13 برجابيكا، ويد فرماعلي طبقتي باستعدام الات السورة الحديثة على الا بريد سالة الطبقة بعد تمام التحاد عن 15 مم	
470.28	3.919	120	371+220	371+100	IR(PSG-4)	ريقها بالمراه الاسواية للرصية ال نصية الرمانية المطاوية والماه الجيد. الهراسات الموسول في الأمم كالله جاله إلا تقل عن 1939 (من القلالة الجالة المعملية والقله تشمل اجراء التجارب المصارية و الطالبة ورات	
411.80	4.118	100	371+100	371+000	IR(PSG-5)	التنابية طبقا لاصول المرتات والرسومات التحصيلية المختلف والبلب بحسو متشارك طبقا المواصلات القنية للمطروح وتقريع الاستشاري وتعليمات الموادس المخرف	
391.90	3.919	100	371+100	371+000	IR(PSG-6)	حسانة النفاز 20 كم. - يتم استداب قدا جهة الكم بالرودة أو الناصات. - عدم و يشم لينة فدواه المحجولة.	
3194.	90		لية (م³)	ستخلص الحاا	بيات خلال فترة الم	اجمالي الكم	
3194.	90			ى (م ³)	الاجمالي الكلـ		

مهندس الاستشاري مكتب XYZ

م / محمد خليل

مهندس الشركة

المندولا الاستيشاري

مدير مشروع الهيئة م / مارجريت مجدي زاخر



أعمال الجسر الترابي للخط الأول للقطار الكهريائي السريع. قطاع (برج العرب/العلمين) المسافة من الكم 371+000 إلى الكم 371+500 إلى الكم 370+570 يطول 0.5 كم

رقم البند و بيانه : (1-4) بالمتر المكعب اعمال توريد وقرش طبقة الاساس (prepared subgrade) من الاحجار الصلبة المتدرجة نائج تكسير الكسارات والمطابقة للمواصفات...(علاوة تحصيل رسوم الكارتات و الموازيين طبقا للاتحه الشركه الوطنيه)

تستفيدنا بشركة إنشاء للمقاولات العامة

30 0.0

مقدار العمل السابق:

			26	U.U		مقدار العمل المنادق:		
الكمية	الإبعاد (متر) الأ طول مساحة المقطع الأ	كيلومتري	الموقع الك	10.11 %	200000000000000000000000000000000000000			
-qaxi	مساحة المقطع	طول	الى	من	رقم الطلب	بيان الاعمال بالمقابسة		
823.60	4.118	200	371+300	371+100	IR(PSG-1)	بالدار المكتب المال ترزي وقرش طبقة لاسيس (prepared)		
783.80	3.919	200	371+500	371+300	IR(PSG-2)REV	بارد بروارد) من الاحجاز استها المنتاجة الاج كامير الاسارات والمطابقة المواصفات واقتبي الحييات 100 مع والا اؤما تسبق العار من منطق 200 من 201 والدين اليان والانتراطات الخاصة بالمشروع لا تقي تصها الحمل كالهورتها من 25% والا اؤراد أسبة الأقد بحوار أوس		
313.52	3.919	80	371+300	371+220	IR(PSG-3)REV	الجدارين من 2000 و 9 الزيرة الدائمياني من كليان والرابقي معادل العروف [273] من لابرية أمور "المعارض من المي سيطينيكي أن يعم طرفته على طيارين واستكدام فات السوطة العمولة علي في رويد مستد المتبالة بعد الميار الرابطة من 25 سم ورشواء أنجية الأجوارة الأوسول في تسيد الرابقية		
470.28	3.919	120	371+220	371+100	IR(PSG-4)	البخارية يتبناء الحيد للهراسات الوصول في الحج كالله جاله (لا كان من 1925 من 2018 المبالة المصنية واللغة تشمل اجراء النجارية		
411.80	4.118	100	371+100	371+000	IR(PSG-5)	المعينة والمطلح وبعد النظيا طبقا (صول المطاعه والرمونات المارية المساعة والرمونات المراجعة ا		
391.90	3.919	100	371+100	371+000	IR(PSG-6)	يتم صداب 2 راجت لكم والويدا او اللحالاد القاسم يشمل فيمة المود المحجرية .		
3194.9	90		(³ / ₄)	نخلص الحالية	يات خلال فترة المست	اجمالی الکم		
3194.9	90			(م ³)	الإجماليي الكليي			

مدير مشروع الهيئة

م / مارجريت مجدي زاخر سلا ي مهندش الاستشاري مكتبر دارعماد تبيل م/عبدالعزيز مصطفى

مهندس الاستشاري مكتب XYZ م / محمد خليل

Note 1

مهندس الشركة



أعمال الجسر الترابي للخط الأول للقطار الكهربائي السريع قطاع (يرج العرب/العلمين) المسافة من الكم 371+000 إلى الكم 371+500 بطول 0.5 كم

رقم البند و بيانه : (1-4) بالمتر المكعب اعمال توريد وفرش طبقة الاساس (prepared subgrade) من الاحجار الصلبة المتدرجة ناتج تكسير الكسارات والمطابقة للمواصفات ... (علاوة مسافة نقل السن 83كم)(63*1.2=5.55)

تـنفيــذ: شركة إنشاء للمقاولات العامة

مقدار العمل السابق :

				0.0		Change Come, Serve
الكمية	بعاد (متر)	ועו	كيلومتري	الموقع الك	11.11.5	4 - 25 D M - 24 A
-44441	مساحة المقطع	طول	ائی	من	رقم الطلب	بيان الاعمال بالمقايسة
823.60	4.118	200	371+300	371+100	IR(P5G-1)	ارش فتكسر، المان توريد وتوش طيقة تأسيس (corpored subgrade) من الاحجاز العالية الرخورية الاج الاسم الاسترات والمسابقة
783.80	3.919	200	371+500	371+300	IR(PSG-2)REV	الموصفات والعم الحبيبات (10 سم والا كوب المراة النافر ان ماها). 23 من 23% والدارج الوقرة الإشارة الدائمة المشروع لا تكل السية الممل كاليلويترا من 25% والا كود السية اللاقة وجهاز نوس الجالوس
313.52	3.919	80	371+300	371+220	IR(PSG-3)REV	ري025 و لا تربط (بالتصباص من 15) و الأطل معلماً الموقة (14) ان برية لين التحميل عن 80 درجاء كان ويتم فريطة عني حقيقتي ماستخدام فإن الفسوية العمية: على الإبرية صعاد المؤلة بعد النام الدمان من 25
470.28	3.919	120	371+220	371+100	IR(PSG-4)	سم ورينها وادره الإصوابة فوصول في نسبة فوضية المطابعة والعلا: الجيد للبولسات للوصول إن النبي كانه جائه (1917) من 1925 من 1931ء المطابق المصلية والله تشمل جوارة التجارية المصابة والحالاية
411.80	4.118	100	371+100	371+000	IR(PSG-5)	يت التثير طبقا للصول المنافدة ليسادك التحبيلية المعتمدة والبلاد بجمع منتشارته طبقا طبواسلات الليبة للمشروع والربر الأساداري وكالرمان المهتمل
391.90	3.919	100	371+100	371+000	IR(PSG-6)	سنالة أنظل الذكو . جنم احتساب 2] جنمة الكورياتونة از الطندانة خارجون رفيل فيدة المواد المحجوبة .
3194.9	90		ية (م ³)	ستخلص الحال	سيات خلال فترة المس	اجمالي الكت
3194.9	90			رم ³ و) ب	الاجمالي الكال	

مدير مشروع الهيئة

م / مارجريت مجدي زاخر

مهندس الاستشاري مكتب XYZ مكتب د/عماد نبيل م/محمد خليل م/عبدالعزيز مصافق

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مانش المركة



أعمال الجسر الترابي للخط الأول للقطار الكهرباني السريع قطاع (برج العرب/العلمين) المسافة من الكم 371+000 إلى الكم571+50 يطول 0.5 كم

رقم البند و بينه : (4-2) بالمتر المكعب اعمال توريد وقرش طبقة اساس من الاحجار الصلبة المندرجة ناتج تكسير الكسارات والمطابقة للمواصفات.......

تنفينذ : شركة إنشاء للمقاولات العامة

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مقدار العمل السابق :

الكمية	بعاد (متر)	54	تيلومتري	الموقع الك	رقم الطلب	بيان الاعمال بالمقايسة
	مساحة المقطع	طول	الى	عن	رقم العللب	بيال الإعمال بالمقايسة
358.92	2.991	120	371+500	371+380	IR(SB-1)	
299.10	2.991	100	371+380	371+280	IR(SB-2)	بالمار المكتب المعال توريد والرش طبقة اساس من الإحجاز المبلية المصروفة القاج تكسم الكسارات والمطالقة
358.92	2.991	120	371+220	371+100	IR(SB-3)	لمواصفات والعمي مجم لتحييات ما ين 5,12 مم ال 6,0 مد والرويد شمة لدار من منظل 200 من 400 والتدرج الوارد والرشارطات لعاصة بالمشروع 200 نسبة الجمل
179.46	2.991	60	371+280	371+220	IR(SB-4)REV	كَالْبِشِ تَبَاعِنَ (199 وَالْ يَكُلُ مِمَامَنَ الْمُرَولَةِ [600] مِن تَجِرِيَةَ لَنِ التَحْمِيلُ مِنْ (190 مِنِيَالِمِكَالِ وَالْأَيْنِيِّ لَمَامِةً
299,10	2.991	100	371+100	371+000	IR(58-5)	لفاقد بجهاز لومن الجلوس عن 1900 و الا يؤيد الاستصاص هن - 1910 ويتم فردها على طباتين باستخدام الات الشيوبة المبارئة على الا يزيد بسات الطبقة بدر تمام الساء عن 20
286.40	2.864	100	371+500	371+400	IR(SB-6)	منم ورغها والمراه الإصوارة الوصول ال أسرة فرطوية المطاوية والمات الجريد للهرامات الوصول ال المس كتفاة
285.40	2.864	100	371+100	371+000	IR(SB-7)REV	جانة فصري (لا يزان من 10200) من الكذاف المصلية والذات الغيل لجراء الجراي المصلية والحقلية ويقم تنظيا في الاصول الصناعة والرسومات التقصيمة المعتمدة والبند
286.40	2.864	100	371+200	371+100	IR(SB-8)REV	يجميع منتماراته طبقالمو صفات فقتية للمشروع وتقوير فرسنداري وتعليدت لمهندس فلمشرف مسافة فنق 192 كس
286.40	2,864	100	371+300	371+200	IR(SB-9)	ينم تحساب 12 سنة الكم بازوادة از القصان - السعر بشمر البنة العالم المسجورة
286.40	2,864	100	371+400	371+300	IR(SB-10)	
2927.	50		نية (م³)	ستخلص الحا	ميات خلال فترة ال	اجمالي الك
2927.	50		-1107	ني (م ³)	الاجمالي الك	

مدير مشروع الهيئة م / مارجريتٍ مجدي زاخر موجعي الاستشاري مكتب داعماد شيل دو/عبدالحكود مصطف مهندس الاستشاري مكتب XYZ م/ محمد خليل

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أعمال الجسر الترابي للخط الأول للقطار الكهربائي السريع قطاع (برج العرب/العلمين) المسافلة من الكم 371+000 إلى الكم 371+370 يطول 0.5 كم

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مقدار العمل السابق :

الكمية	بعاد (متر)	V)	ليلومتري	الموقع الك	outhough the second	7 . 10 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 .
witers	مساحة المقطع	طول	انی	من	رقم الطنب	بيان الاعمال بالمقايسة
358.92	2.991	120	371+500	371+380	IR(SB-1)	والمتر المكتب المنال توريد وقرش طبقة السامن من
299.10	2.991	100	371+380	371+280	IR(SB-2)	الإحجاز الصلية استرجة اللاح لاصور الصارات - والمطابقة المواصفات وألمي حجم للحريبات ما بين 2.52 من ال 40 من والا يزيد تسبة المار من منطل
358.92	2.991	120	371+220	371+100	IR(SB-3)	200 من 5% واتطرع قوارد بالاغترطات الخاصة بالسفروع لا تقل نسبة تحمل كاليغورتيا من 400 والا يكل معامل الدريقة (202) من تجوية لوح
179.46	2.991	60	371+280	371+220	IR(SB-4)REV	التحميل عن 120 ميجايدكان والايزيد نسبة الفاقد بجهلز لوس انجلوس عن 300 والايزيد الاستصاص
299.10	2.991	100	371+100	371+000	IR(SB-5)	عن 1975 ويتم فردها على طبقتون باستخدام الات التسوية الجديرته على الا يزيد سماك الطبقة بعد تسام التسان عن 20 سم ورشها بالمباد الاصوابية النوصول
286,40	2.864	100	371+500	371+400	IR(SB-6)	لي نسبة فرطوية فيطوية واسك الجيد لليراسات طوصول في اقتم كالله جاله فصوي (لا يش عن
286.40	2,864	100	371+100	371+000	IR(SB-7)REV	(1015) إمن الكثارة المحملية والقلد لشمل اجراء المحارب المحملية والمطلبة ويتم تنفيذ طبقا الاعبوال المجارب المحاربة المحملية المحمدة والبناء.
286.40	2.864	100	371+200	371+100	IR(SB-8)REV	بجميع مشتملاته طبقا للمواصفات الفتية للمشروح ولقرح الاستشاري وتعليدات الميندس المشرف
286.40	2.864	100	371+300	371+200	IR(SB-9)	حسافة الثاني 23 كم . حيثم احتساب 12 جنوة الكم بالزيادة او
286.40	2.864	100	371+400	371+300	IR(SB-10)	القديان. - المعر يفض فيدة البادة المحجرية
2927.	50		حالية (م ³)	المستخلص الد	الكميات خلال فترة	اجمالي
2927.	50			لكلسي (م ³)	الإجمالسي ا	

مدير مشروع الهيئة

م / مارجريت مجدي زاخر

مهنائی الاشتیاری مختنید/عمادتین م/عیدالعزیز مصطفی م/عیدالعزیز مصطفی م/عیدالعزیز مصطفی م/عیدالعزیز مصطفی

مهندس الاستشاري مكتب XYZ Audi III September 19 September



أعمال الجسر الترابي للخط الأول للقطار الكهرباني السريح قطاع (برج العرب/العلمين) المسافة من الكم 371+000 إلى الكم371+500 بطول 0.5 كم

رقم البند و بياته : (2-2) بالمتر المكعب اعمال توريد وفرش طبقة اساس من الاحجار الصلبة المندرجة ناتج تكسير الكسارات والمطابقة للمواصقات......(علاوة مسافة نقل السن83كم)(63*5.6=1.2)

تنفيل : شركة إنشاء للمقاولات العامة

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مقدار العمل السابق :

الكمية	هاد (متر)	اللاد	يلومتري	الموقع اثك	N. Constant Posts	V 45.00 W 204.00 S
	مساحة المقطع	طول	الى	من	رقم الطلب ا	بيان الإعمال بالمقايسة
358.92	2.991	120	371+500	371+380	IR(SB-1)	والمائر المكامية المعال توريد وقرش طبكة السامن ادن
299.10	2.991	100	371+380	371+280	IR(SB-2)	الراسجة الصلية المتدوجة عائج تكسير الكسارات - والسطابقة للمواسطات والنس حجم الحبيبات عاجن
358.92	2.991	120	371+220	371+100	IR(SB-3)	2.55 مم الى 20 مع والا يزير نسبة المار من منخل 203 من 230 والعرج الوارد بالالمترمات الضاحة بالمشروع لانتقل لمية تحتل كاليفورنيا عن 850 والا
179.46	2.991	60	371+280	371+220	IR(SB-4)REV	يقل معامل السرولة (202) من تجرية لوح التحميل عن 120 مرجايسكال والزيريد لصية القائد بعيارً لوس
299.10	2.991	100	371+100	371+000	IR(SB-5)	نجلوس عن530 (14 يزيد الامتصاص عن 15% وردم أ- أفردها على طبقتين واستخدام الات التسوية المدينة
286.40	2.864	100	371+500	371÷400	IR(SB-6)	ولي إلا يزيد مسلك لطبكه يعارضها الدمك عن 20 سم ورضها بإنساد الاصوارة الرحيق في نسبة الرجوية المطلوبة والمك تعبيد للهراسات الوصوك في أنسة
286.40	2.864	100	371+100	371+000	IR(SB-7)REV	كان جاند قصوي (لا يقل عن 2000) من 49050 المصلية والفته تشمل اجراء التجارب المحلية
286.40	2.864	100	371+200	371+100	IR(SB-8)REV	و لحيليه وردم تنفيذ طبقا لاصول المشاعه والرمزهات التقميلية المشدد والهند بجميع مشتملاته طبقا المواصفات النبة للمشروع والعرب الاستشاري
286.40	2.864	100	371+300	371+200	IR(SB-9)	وتطبيعات لمهتلمن الدشرة» حمالة النقل 20 كم ،
286.40	2.864	100	371+400	371+300	IR(5B-10)	ديتم بجيداب 12 جنية للكم بالزيادة او التقصات . اسمر بضال ثايمة العادة المحجوبة
2927.5	50		الية (م ³)	مستخلص الح	ميات خلال فترة ال	اجمال الک
2927.5	50				الاجمالين الأ	

مدير مشروع الهيئة

ميبارس الإستشاري مهتدس الاستشاري

مكتب XYZ م/ محمد خليل



محضر استلام موقع

مشروع: أعمال الجسر الترابي للخط الأول للقطار الكهربائي السريع قطاع (برج العرب - العلمين) في المسافة من الكم 000+371 إلى الكم 500+371 بطول 0.5 كم

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

مدير عام مشروعات - الهينة العامة للطرق والكياري

مدير مشروع - الهيئة العامة للطرق والكباري

مدير مشروع ـ شركة انشاء للمقاولات العامة

1- السيد المهندس/محمد حسني فياض

2- السيدة المهندسة/مارجريت مجدى زاخر

3- السيد المهندس/ محمود شعبان أحمد

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

التوقيعات

رئيس الإدارة الركزية

منطقة غرب الدلتا

الاسكندرية - مرسسسي مطروح،

عميد . مهندس ا 🖭

"هانی محمد محمود طه"

282-13-3

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محضر معاينة مسافية

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

الهيئة العامة للطرق والكباري

1-- م/ مارجريت مجدي

سبكترم للاستشارات الهندسية (مكتب د عماد نبيل)

2- م/ عبدالعزيز مصطفى

شركة إنشاء للمقاولات العامة

3-- م/ محمود شعبان احمد

تم النزول والمعاينة وطبقا للتعليمات الواردة بالمقايسة بمسافات نقل التوريد للسن

(prepared subgrade & sub ballast)

من الكسارة حتى محور مسار الطريق وجد أنه :-

يتم النقل السن من الكسارة إلى محور مسار القطار السريع (الحمام - العلمين) لقطاع شركة إنشاء للمقاولات العامة من 400+371 الى 500+371 مسافة قدرها :-

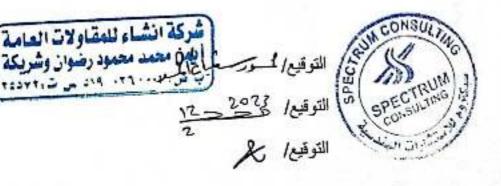
(83 كم)

التوقيعات :-

3-- م/ محمود شعبان

2- م/ عبدالعزيز مصطفى

1-- م/ مارجریت مجدی









محضر معاينة مسافة

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

الهينة العامة للطرق والكباري

1- م/مارجريت مجدي

سبكترم للاستشارات الهندسية (مكتب درعماد نبيل)

2-- م/ عبدالعزيز مصطفى

شركة إنشاء للمقاولات العامة

3- م/ محمود شعبان احمد

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

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

1-- 88 كم للتراب

2-- 68 كم للرمل

التوقيعات :-

3- م/محمود شعبان

2- م/ عبدالعزيز مصطفى

1-- مامارجريت مجدي

شركة انشاء للمقاولات العامة أيمز معمد معمود رضوان وشريكة الموقيع المراحة الموقيع المراحة الموقيع المراحة الموقيع المراحة الموقيع المراحة المر











مشروع : القطار السريع ﴿ السخنة - العلمين - مطروح ﴾ المقايسة التقديرية لينود الاعمال تتغيذ شركة: إنشاء للمقاولات العامة ﴿1﴾ القطاع من الكم 371+000 إلى الكم 371+500 بطول 500 م

14	بيان الإعمال المسابق	Logi	1,0	معز الفية	الإجدال
	اعمل الردم				
3	اعمال الحمل وتوريد الربة محكيفة المواصدات والشابلية باستخدام لات النسوية بسعاد لا يزيد من 53 سم حتى منسوب - -1 متر وبسعاد الرزيد عن 25 سم لاستكمال المنسوب التصميمي الشكيل البسم والاكتاف إنسية المسل كاليلويتيا لا تقل من 15 كا إورشها ولمبية الاسواية الى فسية الرطوية المطاوية والعمد الجهد بالبراسات الوصول إلى النص كالفة جافة إ 470 من الكافة الجباة المعمولي ويتم التفايل طبقا النساسية القصيمية والقطاعات الموضية المواجهة والرسوطات المقاسمية المحتمدة والبند بحمود مشتمالات طبقا الاسول العدامة وتوضيفات الهيئة العامة الديار والكياري وتشابعات - في حافة طنب جهال الاشراف واداة لسمية الدماء من 1955 بحسب توادة الرائحية على إدارة المهاة الدماء التي 191 - مسافة النقل من 2 كم ويتم محتساب علاوة 1.4 جنية الكم بالوادة او المقامات - السمر بشمل فيها الشواف واحافظ بالانترات وقائل لموقع الدمل حتى مسافة 2 كم	ት	3,500	ES	297,500
	ملاوة مسافة انتقل EE كم (الربة 45 ° 1.4 : 1,20.4)	34	2,800	120.4	337,120
	علاوة مساقة النقل 28 كم (زمال طبيعية) (45°14.4 و 92.4)	34	700	92.4	64,680
	علاوة تحميل رسوم الكرتة والموازين طبقا للإثمة الشركة الوطلية	34	3,500	13	45,500
	طبقات الإسابي	177			
	بالدتر الدكسية أعمال لوزيد وقرش طبله تأسيس (Prepared subgrade) من الاحجاز الصلية المتدرجة لاتح بالدتر الدكسية أعلى المسلمة المتدرجة لاتح الكبير الكبيرة الديارات والمطابقة للمواصلات وطهى حجم للحيبيات 100 مع والا تزيد لسبة العال تزيد المار من منطل 200 من أياد وليبا عن 105 والا تزيد لسبة المعلى الميارية عن 105 والا تزيد للمسلم المارية إلى المياد الميارية الميارية (105 والا يزيد الاحتصال من 105 والا يقل معلى الميارية (105 وليم قربط الميارية المنارية المدينة على إن لا يزيد سمك أنوج المدينة الميارية والمعلى الميارية والمعلى الميارية المعلى الميارية والمعلى الميارية والمعارية والمعارية والمعارية والمعارية والمعارية والمعارية والمعارية والمعارية والمعارية المعارية والمعارية المعارية والمعارية المعارية والمعارية والمعارية المعارية والمعارية المعارية والمعارية المعارية والإرازية المعارية المعارية المعارية المعارية المعارية علية الإلفاء المعارية المعارية علية الماع وقو (3) من الكم 205 الى الكم 1925.	7	3,200	271	839,600
	علاوة مسالة فنقل 55 كم (12°52 5 5 5 6 6 1	30	3,200	75.60	241,920
130	علارة تعصيل وسوم الكارنة والموازين طبقا للائحة الشركة الوطنية	30	3,200	25,00	B0,000









HET 121 181 184





Annual Action Street

مشروع : القطار السريح (السخنة - العلمين - مطروح) المقايسة التقديرية لبنود الاعمال تنفيذ شركة: إنشاء للمقاولات العامة (1) القطاع من الكم 371+000 الي الكم 371+500 بطول 500 م

الاجمال	سحر القلة	April 1	Baryl	يبان والسال	dig fal		
886,597.08	298.00	2,975.16	*	العقر المكتب أعمال توريد وطرق طبقة أساس من الاحجار العبقية المتعرجة التج تكسير الكسارات والمطابقة المواصفات وطعي حجم للحييات ما بين 1.15مم ال 60مم والا يزيد تسبة العار من منظل 200 من 450 والتدرج الوارد الاختيار عادات الداصة بالمشروع لا تقل نسبة المالة كالبغورة عن 6000 والا بقال مدولة (201) من تحريه لوج المحمل عن 100 ميجاب كان والا يزيد نسبة المالة بجهاز لوس الجاوس 6000 والا يزيد الإطاعات من 600 مع ورشها الرفاعا على طبقتين باستخدام الان التسوية العديثة على ان لا يزيد حصله الطبقة بعد تمام المحات من 20 مع ورشها الرفاعا على طبقتين باستخدام الان المساورة العديدة والمعاقبة والمطابقة ويتم التنظية طبقاً الاستوار المستعادة المواصفات التفصيلية المحديدة والبند يجمع مشتملاته طبقاً للمواصفات الطنية للمشروع والقرير الاستشاري وتطيعات المهاس المشرف بعد المساورة على 5 كم وازياده او القصان يتم المسابق عارة 100 كلم 100.			
224,921.94	75.60	2,975.16	. 30	ملاوة مساقة النقل85 كم (75.6 = 1.2 ° 63)	1		
74,378.95	25.00	2,975.16	3,	علاوة تحصيل رسوم الكارنة والموازين طبقا للاتحة الشركة الوطنية			
3,142,218				الاجمالي			



شركة إنشاء للمقاولات العامة أيمن محمد محمود رضوان وشريكه بـفر، ١٩٠/٠٢٦/٠٠٤ س.ت: ٢٥٥٥٢





inshaq







Contractor Company	- independ	OF CONSTRUCTION	Designer Company	Trac
Iron da	Name	Sign		(SPECTRUM) Engineering Consulting Office
Issued by Contractor	Eng. Mahmoud	(B)	Date/Serial Number	Time
Received by	shaban	2023	30-03-2023 (M.A.R.)	. 1:30
SARB ONSULTANT	Eng. Mazen Essamy	MAR	(f.1)	MM YY I no In

- GDDE-1 51 to 521		
CODE - 2 Station Reference	D1 to 53	
CODE - 3	Dapot Reference Work Acciety	Kp XXX Note For Kilometer point only Start Kin is used
	Sub Flement of Activity	- Form only Start Kin is used
Description of Materials City		

Description of Materials	Fill Layer Tota	Fill Layer Total Quantity (5000 m3) Upper Embankment						
Location to be Used	From Station (rom Station (371+000) to Station (371+500)						
Sample only	Yes							
F		Materials Type	Fill layers					
Supplier Name		Data Sheet provided	Yes attached INSHAA GENERAL					
Reference in BoQ	(2-1)	Specification	OF CONSTRUCTION Company contracting ASTM D (1557) EARTHWORK SPECIFICATIONS & TESTING BEPORT 10521 A1 2011					
Prequalification reference			REPORT (CG21-41.2) VERSION 2 BY CIVECON GROUP					
Reference Dhou	Mo (V-	Test Samples Results						
omments by: Eng. Mazen	No/Yes	Other						

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

I- All fests will

J-Duality test Result div Third Party Lab is Approved.

2-7his Sample Representive (5000 m3) only.



شركمة Jennethussin Inton الشاء للمقاولات العامة 2-Results report attached and asceptable with the project specifications.

3-Final approval is subject to above mentioned comments

wait for chemical analysis Result of

Organisation	Name	APPROVAL STATUS		
Contractor	Eng. Mahmoud shaban	Sign (4)	Date	A-AWC-R
QA/QC *	Eng. Mazen Essamy	200	31 02 2022	А
GARB**	Eng. Mohammed Fayad			A
mployers epresentative	10 min 10	 		-
Designer Allenment/Bridges:		NI pr PS	15 8-4 2023	Awa



BASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egyption General Authority for Petroleum under No. 34/29-11-2011 Accredited by : Egyption Accreditation council (EGAC) under No. 031708/1A

I- Introduction

General Consultant :

SYSTRA

Consultant

SPECTRUM.

Contractor

شركة الثباء تلمقاولات

Sample

FERMA

Station

St(371+000) to St(371+500)

Date of Test

31/03/2023

OC.

1359

II- Sample description:

Gravel and sand

III- Required tests and Results

Required Test	Results			
1- Grain size analysis and classifica-	Grain size analysis	As showed in appendi		
tion	Classification	A-1-a		
2- Modified compaction (Proctor	MDD	2.116		
test)	OMC	6,3%		
3- Liquid limit, plastic limit and plas-	LL	Non plastic		
ticity index	PL	Non plastic		
	PI	Non plastic		
4- California bearing ratio (CBR)	CBR ratio	42%		

IV- Notes

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

LAB DIRECTOR

Eng / Eman kandil



Geotechnica Consultant

Dr. Mohamed Mostafa Badry

شركة مشاء للمقاولات العامة inshaa general construction

Kilo 23 Alexandria - Cairo Desert Road - Merghem Tel: 002 03 4704595 - 002 034701191

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PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

	WEIGHT	CUMULATIVE	CEMELATIVE	CUMULATIVE	STANDURD
	RUTAINED	WEIGHT	PURCENTAGE	PERCENTAGE	SPECIFICATION
	(200)	RELAINED (gm).	RETAINED (S)	PASSING (%)	-
2	158.00	138,00	1.58	98.4	
13/2	358.90	516.00	5.16	94.8	
1.1	965.00	1481.00	11.81	85.2	
3/4	987.00	2438.00	24 18	75,6	
1/2	1050,00	3488.00	34.88	65.1	
3/8	785.00	1277.00	42.73	57.3	
No.4	1387.00	3660 00	56.60	43.4	
Nr.10	60,00	60.00	12.00	38.2	
No.40	174.93	174.00	34.80	28.3	100000
No.200	387.00	387.00	77.40	9.8	

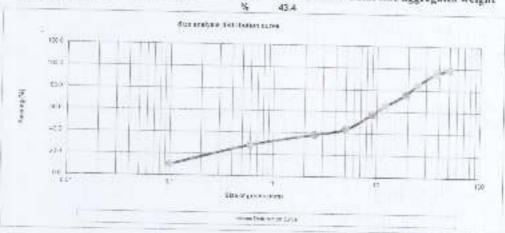
Total sample weight

= 10000.00

pass North

No 4- 4340.0 Lotul fine aggregates weight

500 gm



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



A STANDARD OF THE STANDARD OF

Section of the sectio

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Modified Proctor Test Report ASTM - D 1557

Mould Number :-Volume of mould =

2120 mg

Weight of mould = G.5 =

5657 g.

2.5 g/cm3

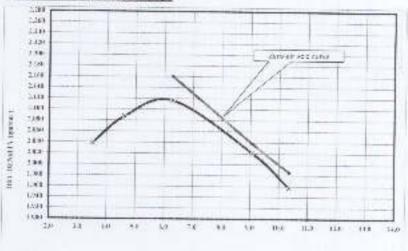
A- Density Calculations :-

	1	2	- 3	4	- 5
Weight, of wet soil+mould (g)	10130	10285	10425	10330	10236
Weight,of mould (g)	5657	5657	5657	5657	5657
Weight of wet sail (g)	4473	4628	4768	4673	4579
Volume of mould (cm2)	2120	2120	2120	2120	2120
Wet density (g/cm²)	2.110	2.183	2.249	2.204	2.160
Dry density (g/cm²)	2.038	2.087	2.116	3.021	1.957
Zero-zir Void curve			2.160	2.038	1.986

B- Moisture Calculations :-

Weight of wet soil-container (g)	25000	250.0	250.0	250.8	250.0
Weight of dry suil-container (g)	244.3	242.5	240.0	236.2	234.8
Weight of container (g)	82.0	80.0	81.0	84.0	88.0
moisture content(%)	3.5	4.6	6.3	9,1	10.4

C - Dry density-Maisture relationship:-



MOISTERE CENTENTING

M.D.D= O.M.C=

2.116 gm/em⁵ 8.3 %



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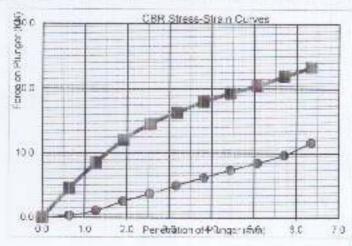
Email: internal-inspection@com/bassal.com



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Report Of CBR Test - ASTM - D 1883

	BLOWS	56				Sw	ell %	
MOUL		1	Value -			56		
WTOF	MOULD+SOIL	11930	-		Start	0.00		
WIGF	MOULD	7010			End	0.00		
WTOF	SOIL	4920			Swell	0.00		
Mark State Committee of the Committee of	ME OF MOULD	2198			SALEN	0.000		
WETD	ENSITY	2.238						+
		MC be	efore so	aking	Weig	ght of Ran	nmer	4.54Kg
TIN NO		1				MDD	Kg/m3	2.116
WT OF	WET SOIL+TI	N 250.00				-	regimo	4.7.10
WT OF	DRY SOIL+TH	V 240.5				OMC	%	6.3
WT OF	WATER	9.50			-	CHIC	76	0.4
WITCHTIN		92				PRO	VINGE	ING
WT OF DRY SOIL		148.5				PRÓVING R Div/KN		0.0210
MOISTURE CONTENT							Till Same	TOXIST DATE
DRY DE	ENSITY	2.104			100	Capacil	ty (KN)	50
Pen Reading (Div		(DIV)	Bearing (KN)		(N)		-	
0.00	56		56			standar	CBR 56	
0.00	0		0.0			0.0	15-175	
0.64	32		0.3			4.5		
1.27	108		1.1			8.5		1100
1.91	255 375		2.5			12.0		
3.17	505	-	5.0	-	-	14.5	28	
3.81	632	-	6.2	-		16.3		
4.45	753		7.4			19.3		
5.0B	865		8.5	1. 72		20.5	42	-
5.71	987		9.7	-		21.9	792	
2.4			441		PR 0-0-01	A 144		







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Report	4	541 - 1 - Center	
Date	1	08/06/2023	

CHEMICAL ANALYSIS

General Consultant

Consultant

Contractor

Project

Sample Station

Date of Test

-

10

:

Temperature : 25 °C

SYSTRA

SPECTRUM

شركة الشاء للمقاولات

Electric express train

FERMA

ST (371 +0.00); (371 + 500)

31-3-2023

Humidity: 40%

ANALYSIS	RESULTS	TEST METHOD
ORGANIG MATTER	NEGATIVE	ASTM D 2974





CH/ Mostafa Asker



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Email: internal-Inspection@comibassal.com











Contractor Company	INSHAA GENERAL OF CONSTRUCTION Company		Desi	Designer Company				(SPECTRUM) Engineering Consulting Office				
	Name	Sign	Date	e/Seria	Num	ber	Time					
Issued by Contractor	Eng. Mohamed Hassan	1023		(M.	-2023 A.R. J Q .G. 1)	eV		1:	30			
Received by		O	(c1	(2	C3.	DD	MM	YY	RH	MM		
GARB CONSULTANT	Eng. Mazen Essamy	MAI	371	EW	CS	0.8	04	23	01	30		

(006-1	Si to 521 Station Reference	DI to 53 Depot Reference	Kp XXX Note For Kilometer point only Start Km is used
CODE - 2	5,546,050,000,4560	Work Activity	
CODE-3		Sub Element of Activity	

Description of Materials	Prepared Subgra	de Total Qu	antity (5000 m3)	
Location to be Used	From Station (37	1+000) to 5	tation (371+500)	Works and and a second
Sample only	Yes	Ma	sterials Type	Prepared Subgrade
Supplier Name		Da	ta Sheet provided	Yes attached INSHAA GENERAL OF CONSTRUCTION Company contracting ASTM D (1557)
Reference in BoQ	(4-1)	Spe	ecification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2 8Y CIVECON GROUP
Prequalification reference		Tes	st Samples Results	
Reference Photos	No/Yes	Oth	her	
Comments by: Eng. Maze	n Essamy (SPECT	RUM)	Comments by: Er	ng. Alaa Abd-Allatif (ER)
1-Quality test Result By Third F			(comibassal inter- 2-Results report project specificati	attached and acceptable with the

1000		APPROVAL STATUS		
Organisation	Name	Sign 🕡	Date	A-AWC-R
Contractor	Eng. Mohamed Hassan	25	08-04-2023	А
QA/QC*	Eng. Mazen Essamy	O C	-	A
GARB**	Eng. Mohammed Fayad			
Employers Representative	Eng. Alaa Abd-Allatif	to we see	P 3 12-4-2023	Awe

^{*} Designer

^{**} Alignment/Bridges: Culven only



COMIBASSAL International Controllers

Internal inspection and laboratories sector

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I- Introduction

General Consultant :

SYSTRA

Consultant

SPECTRUM

Contractor

شركة انشاء للمقاولات

Sample

Prepare Sub-Grade

Station

St(371+000) to st(371+500)

Date of Test

08/04/2023

QC

883-3

II- Sample description:

Crushed stone and sand

III- Required tests

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

شركة الشاء للمقاولات العامة IGC inshaa general construction

IV- Results

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

LAB DIRECTOR

Eng / Eman kandil



Geotechnical consultant

Dr. Mohamed Mostafa Bady

Kila 23 Alexandria - Cairo Desert Road - Merghem

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APPENDIX

Kilo 23 Alexandria - Calro Desert Road - Merghem

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PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

	WEIGHT	CUMULATIVE	CUMULATIVE PERCENTAGE	PERCENTAGE	STANDERD SPECIFICATI	ON
	RETAINED	WEIGHT RETAINED (gm)	RETAINED (%)	PASSING (%)	LIMITS	
	(gm) (1.00)	0.00	0.00	100.0	100	100
5		0.00	0.00	100.0	80	100
+	0.00	0,00	0.00	100.0	75	10
3	8.00	150,00	1.54	98.5	50	:10
1.5	150,00		62.15	37.51	20	- 7
3/4	4355.00	(083,00	-	24.7	15	
3/8	1255.00	7338,00	75,34	17.9	e e	
No.10	138.00	138.00	27.60	11.2		
No.200	405,00	405.00	85,000	4.7 - 3980.0 Total	2	

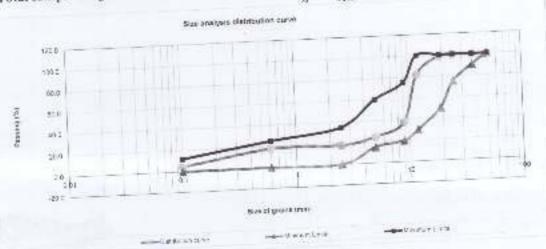
Total sample weight

= 9740.00

pass No.3/9= 3980.0 Total fine aggregates weight

40.9

500 gm



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



انشاء للمقاولات العامة inshaa general construction



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Email: civdept@comibassal.com ucacaa - www mmihassal.com







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Modified Proctor Test Report ASTM - D 1557

Mould Number :-

Volume of mould =

Weight of mould =

G.5 =

2190 cm1

7047 g

2.56 g/cm3-

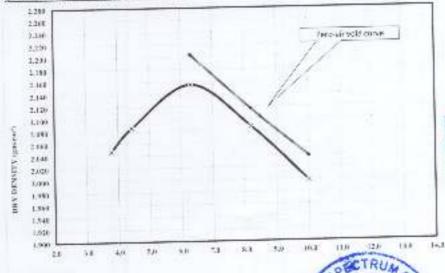
A- Density Calculations :-

	1	2	3	4	5
Weight, of wet soil+mould (g)	11700	11818	12065	11993	11860
Weight of mould (g)	7047	7047	7047	7047	7047
Weight of wet soil (g)	4653	4771	5018	4946	4813
Volume of mould (cm²)	2190	2190	2190	2190	2190
Wet density (g/cm²)	2.125	2.179	2.291	2.258	2,198
Dry density (g/cm²)	2.047	2.086	2.155	2.087	1.998
Zero-air Void curve			2.204	2.116	2.038

B- Moisture Calculations :-

Weight of wet soil-container (g)	250.0	250.0	250.0	250.0	250.0
Weight of dry soil-container (g)	244.0	243.0	240.2	237.5	235.0
	85.5	85.5	85.0	85,0	85.0
Weight of container (g) moisture content(%)	3.8	4.4	6.3	8.2	10.0

C - Dry density-Moisture relationship;



الله المقاولات العامة inshaa general construction

MOISTURE CONTENTS 4

M.D.D= O.M.C=

2,155 gm/cm² 6.30



Kilo 23 Alexandria - Cairo Desert Road - Merghem

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Fax:002 033900476

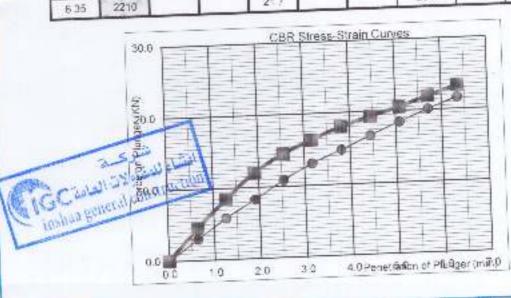
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Report Of CBR Test - ASTM - D 1883

	36	Swel							
		56		_	_	56			IO CE BLO
		0.00	Start	-		+			IOULD NO
		0.00	End.	-		12120		LD+501-	UCMRO TV
		0.00	Swell			7047		JLD.	VT OF MO
			1	-	-	5073		L	VT OF SOIL
			-	-		2190	- 33	F MOULD	CLUME OF
4.54%9	ref	ght of Ramii	Wite	1		2.316		ITY	VET DENS
2 171	Kg/m3		7/6	saking	ofore soa	MC	- 8		7777
20.117	MPH 2	MDD				1			IN NO
6.3	%					250.00	N	T SOLL+T	MT OF WE
0.0	76	OMC				240	N	v sou +Ti	AT OF DR
NG	OVING RI	505		10-		10.00		TER	NT OF WA
1.0	CN ING ING	Divit	1			92			WT OF TIN
W-75		12/06/	-		2.125	148		Y 501	WT OF CR
50	o OONS	Capacit	_			6.8	JT.	CONTEN	MOISTURE
	3.50047	Cabani	1			2.170			DRY DENS
	CBR	_	727.10			W	-	1011	
	56	standar	KNI	Bearing (110	97		2000
		0.0	1	-	56			55	Pen mm
1		4.5	+	-	FALSE			0	0.00
1		8.5	-	-	3.0			302	0.64
		12.0	-	-	5.8			695	5.27
1	82	14.5		-	10.9			850	1.91
-		16.3			13.0	-		1110	2.54
-		18.0		-	14.8		13	1330	3.17
1		19.3			26.7	-	01	1510	3.81
	92	20.5				-		1700	4.45
		21.9	-	-	18.4		V-	1880	5.08
_	1	23.3		1	20.1			2050	5.71
	1	240		7	21.7		1	2210	6.35







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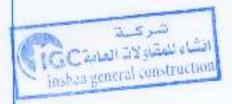
Accredited by : Egyption General Authority for Petroleum under No. 34/29-11-2011 Accredited by : Egyption Accreditation council (EGAC) under No. 031706/1A

Absorption & Specific Gravity for Aggregate AASHTO T85 - ASTM C127

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

Results:-

Saturation surface dry spicific gravity = B / (B-C)	2.569
Bulk spicific gravity = A / (B-C)	2.538
Apparent spicific gravity = A /(A-C)	2.618
Asorbtion of water = (B-A)/A+100	1.2
Degradation of aggregate = (2500-A)/ A*100	0.2
(4)	







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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	3640
% abrasion By Weight Passing from Sieve No.12	27.2%





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**		379 - 6 - Center
Report		
Date	:	12/04/2023

CHEMICAL ANALYSIS

General Consultant

Consultant Contractor

Project.

Sample

Station Date of Test SYSTRA

SPECTRUM

شركة الشاء للمقاولات

Electric express train

Prepard Sub Grade

ST (373 +0.00): (374 +0.00)

8-4-2023

Temperature : 20 °C

Humidity : 40%

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





LAB DIRECTOR CH/ Mostafa Asker



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Inshag





Contractor Company	INSHAA GENERAL (Company	OF CONSTRUCTION	Desi	gner C	ompa	ny	The second second	RUM) E	ngineer ice	yri
	Name	Sign	Date	/Seria	Num	ber	Time			
Issued by Contractor	Eng. Mahmoud shaban	2-23		(M./	-2023 А.Я./Qа S.1)	eV		1:	30	10
Received by			6	C2	G	DD	MM	YY	1111	NW.
GARB CONSULTANT	Eng. Mazen Essamy	MA	R 371	EW	22	23:	D4	23	0.1	:19

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

Description of Materials	Sub-Ballast Tota	rom Station (371+000) to Station (371+500)						
Location to be Used	From Station (37							
Sample only	Yes	Materials Type	Prepared Subgrade					
Supplier Name		Data Sheet provided	Yes attached INSHAA GENERAL OF CONSTRUCTION Company contracting ASTM D (1557)					
Reference in BoQ	(4.2)	Specification	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG21-41.2) VERSION 2-3Y CIVECON GROUP					
Prequalification reference		Test Samples Results						
Reference Photos	No/Yes	Other						

Comments by: Eng. Mazen Essamy (SPECTRUM)

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

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

2-This Sample Representive | 5000 m3) only.



1- All tests were carried-out by third Paris Lib (combassal international)

 Results report attached and acceptable with the project specifications.

3-Final approval is subject to above mentioned

comments.

inshaa general construction

			Trends of the	
		APPROVAL STATUS	- Admittante and	
Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mohamed Hassan	₩ 1 92°	29-04-2023	А
QA/QC*	Eng. Mazen Essamy	200.5		A
GARB**	Eng. Mohammed Fayad		7.1.2	
Employers Representative	Eng. Alaa Abd-Allatif	for a sell	J 6-5-2023	Awc

^{*} Designer •

^{**} Alignment/Bridges: Culvert only



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inspection and laboratories sector

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I- Introduction

General Consultant:

SYSTRA

Consultant

SPECTRUM

Contractor

شركة إنشاء للمقاولات

Sample

Sub-Ballast

Station

St(371+0.00) to st(371+500)

Date of Test

29/04/2023

OC

1034-1

II- Sample description:

Crushed stone and sand

III- Required tests

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

IV- Results

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

LAB DIRECTOR

eman Eng / Eman kandil

Geotechnical consultant

for Dr. M

Dr. Mohamed Mostafa Badry



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انشاء للمقاولات العامة

inshaa general construction

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BASSAL International Controllers

Internal inspection and laboratories sector

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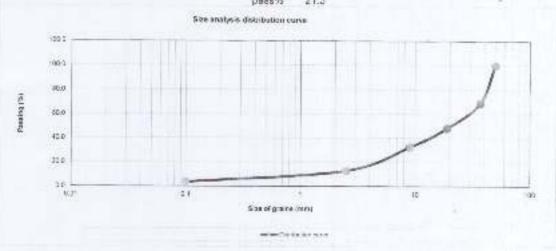
PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

	WEIGHT	CUMULATIVE	CUMULATIVE	CUMULATIVE	STANDURD	
	RETAINED	WEIGHT	PERCENTAGE	PERCENTAGE	SPECIFICATIO	
	(gm)	RETAINED (gm)	RETAINED (%)	PASSING (%)	LIMITS	
2	0.00	0.00	0.00	100.0		
1.1/2	3163.30	3103.00	31.63	69.0		
1	1851.00	4954,00	49.54	50.5		
3/4	235.00	5189,00	51.89	48.1		
1/2	855.00	6944.00	60.44	39.6		
3/8	714.60	6758,00	67.58	32.4	*	
No.4	1110.00	7868.00	78.68	21.3		
No.10	200.00	209.00	40.00	12.8		
No.200	418.00	418.00	83.60	3.5		

total sample weight= 10000.00

No 4= 2132.0 Total fine aggregates weight pass 21.3 рава55

500 gm



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

شركة انشاء للمقاولات العامة ٢ inshaa general construction

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Modified Proctor Test Report ASTM - D 1557

Mould Number :-

- 3

Volume of mould =

2199 cm

Weight of mould =

7046 g

69=

2.7 g/cm3

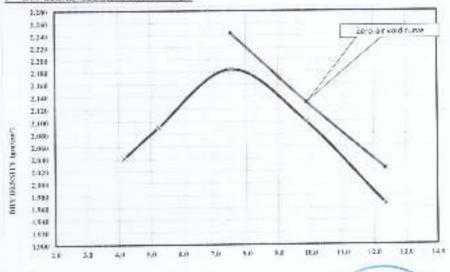
A- Density Calculations :-

	1	2	3	4	5
Weight of wet soil mould (g)	11721	11886	12211	12120	11905
Weight of mould (g)	7046	7046	7046	7046	7046
Weight of wet soil (g)	4675	4840	5165	5074	4859
Volume of mould (cm²)	2199	2199	2199	2199	2199
Wet density (g/cm²)	2.126	2.201	2.349	2.307	2.210
Dry density (g/cm²)	2.041	2.091	2.184	2.100	1.967
Zero-nir Void curve	-		2.244	2.131	2.024

B- Moisture Calculations :-

Weight of wet soil (g)	100.0	100.0	100.0	100.0	100.0
Weight of dry soll (g)	96.0	95.0	93.0	91.0	89.0
moisture content%	4.2	5.3	7.5	9.9	12.4

C - Dry density-Moisture relationship:-



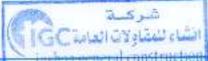
MOISTURE CONTENT(%)

M.D.D

2,184 gm/cm³

35 mm





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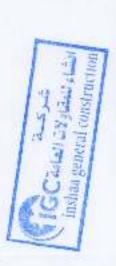
Email: internal-inspection@comibassal.com

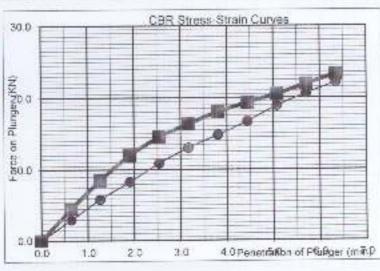


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Report Of CBR Test - ASTM - D 1883

NO OF BLOWS 56						Swe	st 36		
MOULD N	0.		1				56	- 1	
A CONTRACTOR OF THE PARTY.	ULD+SOIL		12150			Start	0.00		
WT OF MO	Control of the Control		7047			End	0.00	3	
WT OF SC			5103			Swe	0.00		
VOLUME :	OF MOULD		2190						
WET DEN		1 3	2.330					6 3	200
			MC	before soak	ing	We	ight of Rami	mer-	4.54Kg
CM MIT			1				MOD	Kg/m3	2.184
WT OF W	ET SOIL+T	IN	250.00						
	RY SOIL+TI		240				OMC	%	7,5
WT OF W			10.00		- 0	1 5 5 7		10000	3 100
WT OF TH	N		62					CVING RE	4G
WT OF DE		9153	148	2.125			Div/	KN	
MOISTUR	E CONTEN		5.8				100000000000000000000000000000000000000		
DRY DEN	SITY		2.183			Capacity (K		y (KN)	50
Pen mm	56 50	97			aring (KN			CBR	
	56			58			standar	56	
0.00	D			FALSE			0.0		
0.84	302			3.0			4.5		
1.27	595			5.8			8.5		
1.91	850			8.3			12.0	- 24	
2.54	1110			10.9			14.5	82	
3.17	1330			13.0			16.3		
3.81	1510			14.8			18.0		
4.45	1700			16.7			19.3		
5.08	1925			18.9			20.5	95	
5.71	2100			20.6			21.9		
6.35	2260			22.2			23.3	1	









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Absorption & Specific Gravity for Aggregate AASHTO T85 - ASTM C127

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

Results:-

2.579
2.545
2.634
1.3
0.2







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ABRASION AND IMPACT "LOS ANGELES "TEST

(For coarse aggregate)
ASTM- C 131-96 / AASHTO-T-96

Speed	For 500 Revolution
Trial Grading	А
Intitial Weight (W1) gms	5000
Weight of tested sample (W2) gms Retained on sieve No.12	3500
% abrasion By Weight Passing from Sieve No.12	30.0%





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

CHEMICAL ANALYSIS

General Consultant :

Consultant :

Project : Sample :

Station

Date of Test

SYSTRA

SPECTRUM

غركة الشاء للعقاولات

Electric express train

Sub Ballast

ST (371+0.00): (371-500)

29-4-2023

Temperature : 21 °C

Humidity: 55%

CHLORIDE	0.0053%	TEST METHOD
SULPHATE	0.0190%	ASTM D 2974
ORGANIG MATTER	NEGATIVE	





LAB DIRECTOR CH/ Mostafa Asker

Moustal



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MATERIAL INSPECTION REQUEST











Contractor Company	INSHAA GENERAL Company	OF CONSTRUCTION	Des	igner	Compa	any	(SPE)	CTRUM) (ulting Off	ngineo	ring
Issued by	Name	Sign	Date	/ Seri	al Nur	nher	Tim		ке	
Contractor	Eng. Mahmoud shaban	27012/2		09/04	4/2023 -T.1)	nipe:		00 PM		
Received by SARB	Eng. Mazen Essamy		Ci	0	63	DD:	MM	yv	H+	ME
CONSULTANT	end- museu casamy	PL	371	TW	CS	10	04	2023	2	00

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

Desc	ription of Materials	Prepared subgrad	repared subgrade level 2				
Locat	tion to be Used	St. (371+350) To (3	it. (371+350) To (373+500)				
MAR	Approval No	M.A.R (P.S.G 1)	M.A.R (P.S.G 1)			Date	08/04/2023
Supp	lier Name						7.7.1(1.00.0
Test I	3equirement	uirement P.L.T (DIN 18134) S		Specific	EARTHWORK SPECIFICATION REPORT (CG21-41.2) VERSION GROUP		DEICATIONS & TESTING 2) VERSION 2 BY CIVECON
Refer	ence Photos	Yes / No		Other		Ref UIR-P.S.G (2)
Item	Description		Unit		Quantity		Note
2	PLATE LOAD TEST		NUM	MBER	5	10/04/2023	Nute
3							
4							

y: Eng. Mazen Essamy (SPECTRUM)

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

I-The Plat P.L.T (DIN 18134) Is

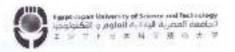
Appro

1 Plate Load Test was carried- out by (F-just) 2-Results report accurbed and acceptable with project. specifications.

3-Final approval is subject to above mentioned comments. النشاء للمقاولات العاصة

inshaa general construction APPROVAL STATUS Organisation Name Sign Date A-AWC-R Contractor Eng. Mahmoud shaban 10-04-2023 A QA/QC * Eng. Mazen Essamy GARB** Eng. Margret magdy Employers Eng. Alea Abd-Allatif Representative * Designar

^{**} Allgoment / Bridges: Culvert Only



(Ivil Engineering Testing & Consulting Unit وحدة اغتبارات و استشارات المندسة البعلية

Technical Report

Plate Loading Tests

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

Project

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

Prepared for Inshaa General Construction

Mobilka CC - Abu Youssef, Alexandria, Egypt

(April 10, 2023)





Civil Engineering Testing & Consulting Unit وحدة اغتبارات واستشارات الم

The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by Inshaa General Construction to conduct 6 plate loading tests on the Prepared Subgrade 2.0 of the Electric Express Train project at 6 locations (KM 371+475, KM 371+450, KM 371+425, KM 371+400, KM 371+375, and KM 371+350) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Mahmoud Shaban of Inshaa General Construction. Field team members (Mr.Mohamed Mamdouh) from the working CETCU team visited the project site on April 10, 2023 and performed the required tests. This report summarizes the plate loading test procedure according to DIN18134, the test results and their interpretations, and the CETCU pertaining recommendations.

2. Test Set Up and Instrumentation

- The German standard DIN18134 was applied to define the test setup including the loading system, test conditions, and procedure for the plate loading tests.
- The tests were carried out to determine the Strain Moduli (Ev1 and Ev2) and their ratio (Ev2/Ev1) from a stress – deformation relationship of two consecutive loading from Loading-Unloading-Loading regime.
- The loading plate has a diameter of 600 mm and a thickness of 25 mm and it is provided with equally spaced stiffeners. The upper plate face is parallel to the bottom face of the plate to allow a 300-mm plate to be placed on the 600-mm plate top.
- The loading system consisted of a hydraulic pump connected to a hydraulic jack of 700 bar capacity, which can apply and release the load increments.
- The dial gauge used to measure the plate settlement has a resolution of 0.01 mm and the lever ratio was equal to 1.
- The temperature at the time of the test was 19± 1°C.
- The plate was carried out on a Prepared Subgrade 2.0 (according to the company) at 6 points. The test surface area was levelled, and the plate was bedded on this surface.

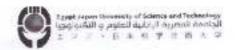
The hydraulic jack was placed on the middle of, and normal to, the loading plate beneath the reaction loading system and secured against tilting.

ding quaturary as a beauty multi-purpose Loader CA

وهدة اعتجازات واستشارات الاسدد E-JUST CETC Unit

www.ejust.edu.eg CETC23040016.Trans.Geo0

2 of 20



3. Test Procedure and Results

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

Table 1 presents the load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+325), while Table 2 shows the data obtained at the second loading stage.

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

Loading stage	Load (F)	Normal	Settleme
	kN	MN/m²	mm
0	1.414	0.005	0,00
1	7.07	0.025	0.28
2	14.14	0.050	0.34
3 11	21.21	0.075	0.45
4	28.28	0.100	0.55
5	35.35	0.125	0.64
6	42.42	0.150	0.73
7	49.49	0.175	0.83
8	56.56	0.200	0.92
9	63.63	0.225	1.02
10	70.7	0.250	LATEP
11	56.56	0.200	1407
12	49.49	0.175	/A1/08
13	35.35	0.125	1.03
14	21.21	0.075	0.95
15.	1.414	0.005	1035

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

plate loading	test performed at the location	(KM 371+325) Normal stress (5 ₀)	Settlement (S)
Loading stage	Load (F)	MN/m²	mm
有利用电池	KN	0.005	0.15
DE MINE	1.414	0.025	0.38
与用水体室	7.07	0.050	0.46
234.54	14.14		0.55
古电影形术	21.21	0.075	0.65
****	28.28	0.100	0.76
*****	35,35	0.125	0.83
	42.42	0.150	
b		0.175	0,89
10000	49,49	0.200	0.94
8	56.56	0.225	1.00
9	63,63	515-55	

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 371+325) are shown in Figure 1. Table 3 shows the calculations of the resilient modulus of the tested soil according to DIN18134. The testing data corresponding to the second testing point (KM 371+300) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 371+275) is provided in Tables 7-9 and Figure 3. The testing data corresponding to the fourth testing point (KM 371+250) is provided in Tables 10-12 and Figure 4. The testing data corresponding to the fifth testing point (KM 371+225) is provided in Tables 13-15 and Figure 5.

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

371+325)	1st loading cycle	2nd loading cycle
Parameters	and the second s	0.25
(sp,max) MN/m²	0.25 0.16	0.17
a _o (mm)		5.96
a ₂ (mm/(MN/m ²))	3.96 -1.03	-10.43
# ₂ (mm/(MN2/m ⁴))	121.65	134.10
Ev= 1.5 f/ (a1+2, 50, wa)		10
Ev ₂ /Ev ₁		

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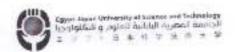


Table 17: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+350)

plate loading	test performed at the loca Load (F)	Normal stress (so)	Settlement (S)
Loading stage	kN	MN/m²	mm = mm
	1.414	0.005	0.22
1000	7.07	0.025	0.42
200		0.050	0.50
2	14.14	0.075	0.57
3/1	21.21	0.100	0.66
A	28.28	0.125	0.73
5	35.35		0.80
6	42.42	0.150	0.83
7	49.49	0.175	0.86
8	56.56	0.200	0.91
9 100	63.63	0.225	0.51

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

KM 371+350)	1st loading cycle	2nd loading cycle
Parameters	0.25	0.25
[swmax] MN/m*	0.09	0.24
es (mm)	3.11	5.31
a_(mm/(MN/m ²))	-0.55	-10.77
a ₂ (mm/(MN2/m ²))	151.18	171.72
Ev= 1.5 r/ (0:+0; 51, MA)		.14
Ev ₃ /EV ₁		124

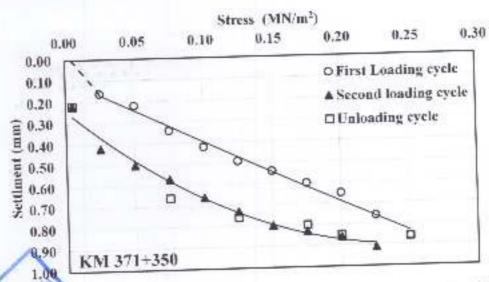
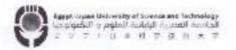


Figure 6: load-settlement data: plate loading test performed at (KM 371+350)



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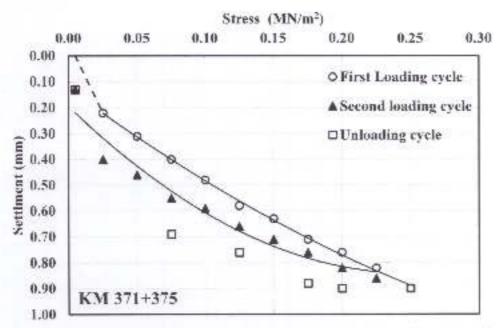


Figure 5: Load-settlement data: plate loading test performed at (KM 371+375)

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

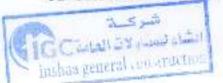
single district and district	Load (F)	Normal stress (su)	Settlement (5)
Loading stage	kN	MN/m ¹	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.16
2	14.14	0.050	0.22
3	21.21	0.075	0.34
4	28.28	0.100	0.42
5	35.35	0.125	0.49
6	42.42	0.150	0.54
7 100 100	49.49	0.175	0.60
8	56.56	0.200	0.65
9	63.63	0.225	0.76
10	70.7	0.250	0.86
11	56.56	0.200	0.85
12	49.49	0.175	0.80
13	35.35	0.125	0.76
14	21.21	0.075	0.66
15	1 414	0.005	0.86

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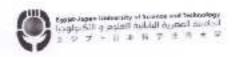


Table 13: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+375)

late loading	test performed at t	he location (KM 371+375) Normal stress (s ₀)	Settlement (S)
which there were not become	Load (F) kN	MN/m²	mm
The second second	1.414	0.005	0.00
		0.025	0.22
	7.07	0.050	0.31
2 2 2 2 2	14.14	0.075	0.40
	21.21	0.100	0.48
	28.28	0.125	0.58
	35.35	0.150	0.63
5 = = =	42.42	0.175	0.71
7 11 12 10 10	49.49	0.200	0.76
8 = = =	56.56	0.725	0.82
9	63.63	0.250	0.90
10	70.7	0.200	0.90
11	56.56	0.175	0.88
12	49.49	0.125	0.76
13	35.35		0.69
14	21.21	0.075	0.13
15	1.414	0.005	

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

plate loading	test performed at t	he location (KM 3/1+3/5) Normal Stress (5 ₀)	Settlement (S)
Loading stage	Load (F)	MN/m²	mm
0	1.414	0.005	0.13
1 1 1 1	7.07	0.025 0.050	0.46
2 = = = -	14.14	0.075	0.55
4	71.21 78.28	0.100	0.59 0.66
5 = 1	35.35	0.175	0.71
6	42.42	0.175	0.76
2	49.49 56.56	0.200	0.82
9	63.63	0,225	0.80

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

(KM 371+375)	1st loading cycle		2nd loading cycle
Parameters (s;,max) MN/m² a, (mm) a, (mm/(MN/m²))	0.25 0.12 3.95 -3.58		0.25 0.19 5.16
Ev= 1.5 r/ (a, a, d,	A S S S S S S S S S S S S S S S S S S S	1.18	SALE

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Table 11: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+400)

plate loading	test performed at the loc Load (F)	Normal stress (s ₀)	Settlement (5)
Loading stage	kN	MN/m²	mm
THE RES	1.414	0.005	0.24
	77-77-7	0.025	0.45
	7.07	0.050	0.57
-	14.14	0.075	0.59
3	21,71	0.100	0.63
4	28.28	0.125	0.68
5	35,35	0.150	0.73
6	42.42	0.175	0.82
7	49.49		0.87
8	56.56	0.200	0.91
9	63.63	0.225	3 / 432

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

(KM 371+400)	1st loading cycle	2nd leading sycle
Parameters	The same of the sa	D.25
(spmax) MN/m	0.25	
a _p (mm)	0.16	0.29
a _i (mm/(MN/m²))	2.65	4.14
a ₂ (mm/(MN2/m ²))	1.76	-6.43
	145.57	177.88
Ev= 1.5 r/ (a1+8; St. was)		.22
EV,/EV	A STATE OF THE STA	

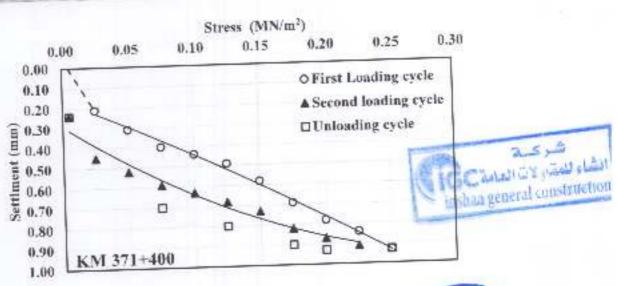
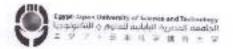


Figure 4: Load-settlement data: plate loading test performed at (KM 371 100)

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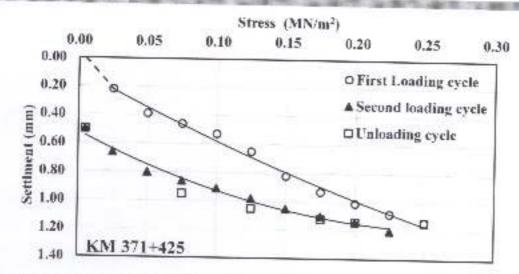


Figure 3: Load-settlement data: plate loading test performed at (KM 371+425)

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

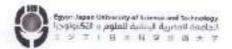
Loading stage	Load (F)	Normal stress (s ₀)	Settlement (S)
avoiding stings	kN	MN/m²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.21
2 11	14.14	0.050	0.31
3.	21.21	0.075	0.40
4	28.28	0.100	0.44
5	35.35	0.125	0.49
6	42.42	0.150	0.58
7	49.49	0.175	0.69
8	56.56	0.200	0.78
9	63.63	0.225	0.84
10	70.7	0.250	0.93
	56.56	0.200	0.93
	49.49	0.175	0.90
13	35.35	0.125	0.80
	21.21	0.075	0.70
15	1.414	0.005	0.24



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

Loading stage	Load (F)	Normal stress (s ₀)	Settlement (5)
rononig stage	kN	MN/m²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.22
2	14.14	0.050	0.39
3	21.21	0.075	0.46
4	28.28	0.100	0.53
5	35.35	0.125	0.65
6	42.42	0.150	0.82
7	49.49	0.175	0.93
8	56.56	0.200	1.01
9	63.63	0.225	1.08
10	70.7	0.250	1.14
11	56.56	0.200	1.14
12	49.49	0.175	1.12
13	35.35	0.125	1.05
14	21.21	0.075	0.95
15	1.414	0.005	0.50

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

Loading stage	Load (F)	Normal stress (5p)	Settlement (S)
	kN	MN/m²	mm m
0	1.414	0.005	0.50
1	7.07	0.025	0.66
2	14.14	0.050	0.80
3 =	21.21	0.075	0.86
4	28.28	0.100	0.91
5 # #	35.35	0.125	0.98
6	42.42	0.150	1.05
7	49.49	0.175	1.10
8	56.56	0.200	1.14
9	63.63	0.225	1.20

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

Parameters	1st loading cycle	2nd loading cycle
(s _s .max) MN/m'	0.25	0.25
a ₀ (mm)	0.10	0.52
a ₁ (mm/(MN/m ²))	5.23	4.95
B ₂ (mm/(MN2/m ⁴))	-3.82	TRUM COUR
Ev= 1.5 r/ (a1+a2 sq. max)	105.31	16789
Ev ₂ /Ev ₁		1.59
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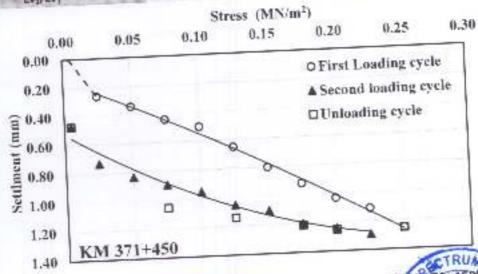


Table 5: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+450)

plate loading	test performed at the location	Normal stress (5 ₀)	Settlement (5)
Loading stage 1 2 3 4 5 6 7	Load (F)	MN/m ² 0.005 0.025 0.050 0.075 0.100 0.125 0.150 0.175 0.200 0.225	0.47 0.73 0.83 0.89 0.95 1.05 1.10 1.20 1.24 1.29
9 4 4 4 4	63.63		ending to DIN18134; (KM

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

371+450)	1st loading cycle	2nd loading cycle
Parameters	The state of the s	0.25
= (spimax) MN/m²	0.25	0.53
a _q (n/m)	0.14	5.50
a ₂ (mm/(MN/m ²))	3.81	-9.65
a ₂ (mm/(MN2/m ³))	2.61	145.58
Ev= 1.5 r/ (aj+aj, 56, mux)	1.4	14
EV ₂ /EV ₁	(242/1-2)	



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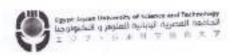
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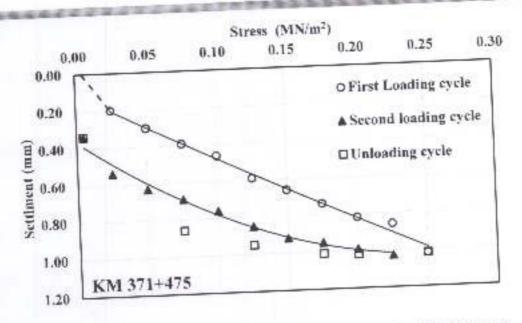


Figure 1: Load-settlement data: plate loading test performed at (KM 371+475)

Table 4: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+450)

Normal stress (s.) Settlement (S)

plate loading	test performed at the	Normal stress (sp)	Settler
Loading stage	Load (F)	MN/m ²	THE RESERVE
40000	KIR	0.005	0.00
0	1.414	0.025	0.26
1	7.07	0.050	0.34
2	14.14	0.075	0.44
3	21.21	0.100	0.50
4	28.28	0.125	0.65
5	35.35		0.80
6	42.42	0.150	0.92
7	49.49	0.175	1.03
8	56.56	0,200	1.11
9	63.63	0,225	1.25
10	70.7	0.250	1.25
Control of the Contro	56,56	0.200	1.21
11	49.49	0.175	
12	The state of the s	0.125	1.14
13	35.35	Audital deposit Care Care Care	1.955
14	27 T T T T	1 x x x 1 '0,005	47/5
15	1427	and Attract on account on a	
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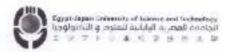


Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+475)

Loading stage	Load (F)	Normal stress (s _p)	Settlement (S)
committee stage	kN	MN/m ²	mm
0	1.414	0.005	0.34
	7.07	0.025	0.54
2	14.14	0.050	0.63
	21.21	0.075	0.69
	28.28	0.100	0.76
	35.35	0.125	0.85
	42.42	0.150	0.92
7	49.49	0.175	0.95
0 0	56.56	0.200	0.99
9	63.63	0.225	1.03

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 371+475) are shown in Figure 1. Table 3 shows the calculations of the resilient modulus of the tested soil according to DIN18134. The testing data corresponding to the second testing point (KM 371+450) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 371+425) is provided in Tables 7-9 and Figure 3. The testing data corresponding to the fourth testing point (KM 371+400) is provided in Tables 10-12 and Figure 4. The testing data corresponding to the fifth testing point (KM 371+375) is provided in Tables 13-15 and Figure 5. The testing data corresponding to the sixth testing point (KM 371+350) is provided in Tables 16-18 and Figure 6.

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

Parameters	1st loading cycle	2nd loading cycle
(spmax) MN/m²	0.25	0.25
a _a (mm)	0.11	0.37
a ₁ (mm/(MN/m ²))	3.77	5.19
a ₂ (mm/(MN2/m ⁴))	-1.03	-10 18
Ev= 1.5 r/ (a1+a2. St. MAX)	128.29	170.24
Ev ₂ /Ev ₁	1.	33









3. Test Procedure and Results

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

Table 1 presents the load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+475), while Table 2 shows the data obtained at the second loading stage.

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

Loading stage	Load (F)	Normal	Settleme
-	kn	MN/m²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.20
2	14.14	0.050	0.30
3 11 11	21.21	0.075	0.39
4	28.28	0.100	0.46
5	35.35	0.125	0.59
6	42.42	0.150	0.66
7	49.49	0.175	0.74
В	56.56	0.200	0.82
9	63.63	0.225	0.86
10	70.7	0.250	1.02
11	56.56	0.200	1.02
12	49.49	0.175	1.01
13	35.35	0.125	0.95
14	21.21	0.075	0.86
15	1.914	0.005	0.34SPECTRU

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4. Closure

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

1	Location	E _n MN/m2	E _{v2} MN/m2	E _{v2} /E _{v1} ratio
-	KM 371+475	128.29	170.24	1.33
4.4	KM 371+450	100.91	145.58	1.44
原傳	KM 371+425	105.31	167.69	1.59
0.00	KM 371+400	145.57	177.88	1.22
此用	KM 371+375	147,31	173.53	1.18
安里	KM 371+350	151.18	171.72	1.14

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

Technical committee

Dr. Mahmond Ahmed

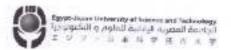
Prof. Dr. Mohamed F. M. Fahmy





Lab Engineer Mohamed A. Al-Najjar





Chil Engineering Testing & Consisting Unit

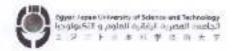
وحمة اغتجارات و استشارات العندسة الجنبية

Appendix A









Civil Engineering Testing & Consulting Unit

وحدة اقتبارات و استشارات المندسة المدنية

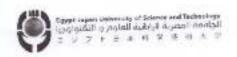
Location of test site:	KM 3	71+475	Field team	Mr.Mohamed Mamdouh
Project title:		ain Project - Inskaa onstruction	Date:	10/4/2023
Diameter of loading			Time	9:02:00 AM
plate	6	00		9:28:00 AM
Lever ratio		1	Note:	and the second s
Type of Soil	Prepared S	subgrade 2.0	CAT 9	56F
Bedding material	1.			
Temperature	15	PC		
Test regime	Loading Stage No.	Load (kN)	Dial Ga	inge Reading (mm
Loading Stage	0	1.414		10.00
	1	7.07		9.80
	2	14.14		9.70
	3	21.21		9.61
	4	28.28		9.54
	5	35.35		9.41
	6	42.42		9.34
	7	49,49		9.26
	8	56.56		9.18
	9	63.63		9.14
	10	70.7		8.98
Unloading Stage	11	56.56		8.98
- management	12	49,49	-	8.99
	13	35.35		9.05
	14	21.21		9.14
	15	1.414		9.66
Test regime	Londing Stage No.	Load (kN)	Dial Co	inge Reading (mm
Reloading Stage	0	1.414	DOTAL COR	9.66
recionaing stage	1	7.07	-	9.46
	2	14.14	+	9,37
الشاء للسد عدة		21.21	-	9.31
DOLLAR PROMETE NO.	4	28.28		9.24
الشاء ليوسنو لانة العامة العامة (emeracion a general construction	5	35.35	_	9.15
A DEUSLA	3		-	
			SPEC	9.08
	7	49/40/10	E	9,05 SPSC7
	8	₹6.56 S.T.	Dali	1000
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وهفة اغتجارات و استشارات العندسة البدمية

Location of test site:	KM 37	1+450	Field	Mr.Mohamed Mamdouh
Project title:	Electric Express Trai	n Project - Inshua	Date:	10/4/2023
Diameter of loading			Time	9:35:00 AM
plate	600)		10:03:00 AM
Lever ratio	1		Notes	
Type of Soil	Prepared Su	bgrade 2.0	CAT 9	66F
Bedding material	0	7.940	_	
Temperature	190		and of so	D. Verstern
Test regime	Loading Stage No.	Load (kN)	Dial G	auge Rending (mm)
Loading Stage	0	1.414		10.00
F-1000-011071-011-011-01	1	7.07		9.74
	2	14.14		9,66
	3	21.21		9.56
	4	28.28		9.50
	5	35.35		9,35
	6	42.42		9.20
	7	49,49		9.08
	8	56.56		8.97
	9	63.63		8.89
	10	70.7		8.75
Unloading Stage	11	56,56		8.75
Onnauing Stage	12	49.49		8.79
	13	35.35		8.86
	14	21.21		8.95
	15	1.414		9.53
The second second	Loading Stage No.	Load (kN)	Dial (Jauge Reading (mm
Test regime	0	1,414		9.53
Reloading Stage	1	7.07		9.27
		14.14		9.17
وندر شركية	3	21.21		9.11
فساء للعقاولات الماء	4	28.28		9.05
moral construction	5	35,35		8.95
شركة نشاء للعقاو لات العادة aa general constructio	6	42.42		8.90
100	7	49,49		8.80
	8	56.56		9.76
	9	63.63	-	8.75 PECTRU
	The state of the s	40100	_	14/

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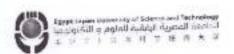
وحدة اغتبارات و استشارات العندسة البدئية

Location of test site:	KM 371	+425	Field	Mr.Mohamed Mamdoub
Project title:	Electric Express Train General Con-	Project - Inshaa struction	Date:	10/4/2023
	Contrar Contrar		Time	10:10:00 AM
Diameter of loading plate	600			10:38:00 AM
Lever ratio	1		Note:	2.0
Type of Soil	Prepared Sul	hgrade 2.0	CAT 9	66F
Bedding material			-	
Temperature	190		DistC	ange Reading (mm)
Test regime	TOWNS AND THE PROPERTY OF THE	Load (kN) 1.414	1/1/11/54	10.00
Loading Stage	Ð		1	9.78
	1	7.07	-	9.61
	2	14.14	-	9.54
	3	21.21		9.47
	4	28.28	-	9.35
	5	35.35	_	
	6	42.42		9,18
	7	49.49		9.07
	8	56.56		8.99
	9	63,63		8.92
	10	70.7		8.86
Unloading Stage	11	56,56		8.86
Unioading stage	12	49,49		8.88
	13	35.35		8.95
	14	21.21		9.05
	15	1.414		9.50
-	Loading Stage No.	Load (kN)	Dial	Gauge Reading (mm
Test regime	B B	1.414		9.50
Remaining stage	1	7.07		9.34
Reloading Stage	2	14.14		9.20
16 DE 3	3	21.21		9.14
3 = 18	4	28.28	4	9.09
15 A 30	5	35.35		9.02
1 44/5	6	42.42		8.95
Washer!	7	49.49		8.90
4	8	56.56		8.86
	9	63.63		8.80

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Location of test site:	KM 371	+400	Field team	Mr.Mohamed Mamdouh
Project title:	Electric Express Train General Con-	Project - Inshau struction	Date:	10/4/2023
	General Cont		Time	10:45:00 AM
Diameter of loading plate	600			11:13:00 AM
Lever ratio	1		Note:	2352
Type of Soil	Prepared Sul	hgrade 2.0	CAT 9	60F
Bedding material			-	
Temperature	190		Disto	ange Reading (mm)
Test regime	Loading Stage No.	Load (kN)	LHarte	10.00
Loading Stage	0	1.414	-	9.79
	1	7.07	_	
	2	14.14		9,69
	3	21.21		9.60
	4	28.28		9.56
	5	35.35		9.51
	6	42.42		9.42
	7	49,49		9.31
	8	56.56		9.22
	9	63.63		9.16
	10	70.7		9.07
		56,56		9.07
Unloading Stage	11	49,49		9.10
	12	35,35	-	9.20
	13	21.21		9.30
	14	1.414	_	9.76
	15		Dial	Gauge Reading (ma
Test regime	Loading Stage No.	Load (kN) 1,414	12,002	9.76
Reloading Stage	0	7.07		9,55
	1	14.14		9.48
تشريخية والمنتاولات العائد C والمناودة العائد العائد astras general construc	2	21.21		9.41
المنافقاء لاترال والما	1000		_	9.37
Carrol construct	4	28.28		9.32
المعقام لان العامة astras general construc	5	35.35	-	9.27
	6	42.42		9.18
	7	49.49		9.13
	8	56.56		9.09
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وهده اعتبارات واستشارات القندسة الدسا

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وهنة اغتمارات و استشارات المندسة المنفية

Location of test site:	KM 37	1+375	Field team	Mr.Mohamed Mamdouh
Project title:	Electric Express Tra General Co	ain Project - Insbaa oustruction	Date:	10/4/2023
Diameter of loading	61	00	Time	11:20:00 AM 11:48:00 AM
		1	Note:	
Lever ratio	Prepared S	ubgrade 2.0	CAT 9	96F
Type of Soil Redding material	- Trepared 5		- Casa ()	103
Temperature	19	°C		
Fest regime	Loading Stage No.	Lond (kN)	Dial G	inge Reading (mm)
Loading Stage	0	1.414	-	10.00
	1	7.07	7	9.78
	2	14.14		9,69
	3	21.21		9,60
	4	28,28		9.52
	5	35.35		9.42
	6	42.42	-	9,37
	7	49.49	-	9.29
		56.56	-	9.24
	8		-	
	9	63.63	-	9.18
	10	70.7	-	9.10
Unloading Stage	11	56.56	_	9.10
	12	49,49		9.12
	13	35.35		9.24
	14	21.21		9.31
	15	1.414		9.87
Test regime	Loading Stage No.	Load (kN)	Dial G	auge Reading (mm
Reloading Stage	0	1.414		9.87
	1	7.07		9.60
75.0	2	14.14		9.54
نشاء للعقادين	3	21.21		9.45
شركية نشاء للعقاولات العامة C jaa general constructio	4	28.28		9.41
199 Belletat Com	5	35,35		9,34
THE RESERVE OF THE PARTY OF THE	6	42.42		9.29
	7	49.49		9.24
البايلية للعلوم والترتينات الأسام	THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAM	56.56		9,18
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وحدة افتجارات و استشارات المندسة المدنية

Location of test site:	KM 37	1+350	Field team	Mr.Mohamed Mamdouh
Project title:	Electric Express Tra General Co		Date:	10/4/2023
Diameter of loading	66	10	Time	11:55:00 AM 12:23:00 PM
			Note:	
Lever ratio	Prepared S	ubgrade 2.0	CAT 9	66F
Type of Soil Bedding material				5.000
Temperature	19	°C		
Test regime	Loading Stage No.	1.oad (kN)	Dial G	auge Reading (mm)
Loading Stage	0	1.414		10.00
201111111111111111111111111111111111111	1	7.07		9.84
	2	14.14		9.78
	3	21.21		9.66
	4	28.28		9.58
	5	35.35		9.51
	6	42.42		9.46
	7	49,49		9.40
	8	56.56		9.35
	9	63,63		9,24
	10	70.7		9.14
Unloading Stage	11	56,56		9.15
Unioning stage	12	49.49		9.20
	13	35.35		9.24
	14	21.21		9.34
	15	1,414		9.78
T continue	Loading Stage No.	Load (kN)	Dial C	ange Reading (mm
Test regime Reloading Stage	0	1.414		9.78
Kemaung Stage	1	7.07		9.58
	2	14.14		9.50
النفاء شرعية	3	21.21		9.43
The second secon	4	28.28		9.34
general construction	5	35.35		9,27
ediff. (a)	6	42.42		9.20
	7	49,49		9.17
		56.56		9.14
Description (major) Apple	T T 9	63.63		9.09

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Location of test site:	KM 37	71+325	Field team	Mr. Mohamed Mandouh
Project title:	Electric Express Tra General Co	in Project - Inshaa instruction	Date:	11/4/2023
Diameter of loading			Time	9:02:00 AM
plate	64	00		9:28:00 AM
Lever ratio	201	E	Note:	
Type of Soil	Prepared S	ubgrade 2.0	CAT 9	66F
Bedding material		-		
Temperature	19	°C		
Test regime	Loading Stage No.	Load (kN)	Dial G	uge Reading (mm)
Loading Stage	0	1.414		10.00
	1	7.07		9.72
	2	14.14		9.66
	3	21.21	- 0	9.55
	4	28.28		9.45
	5	35.35		9.36
	6	42.42		9.27
	7	49,49		9.17
	8	56.56	1	9.08
	9	63.63		8.98
	10	70.7		8.93
Unloading Stage	11	56.56		8.93
	12	49.49		8.94
	13	35.35		8.95
	14	21.21		9.05
	15	1.414		9.85
Test regime	Loading Stage No.	Load (kN)	Dial G	ange Reading (mm)
Reloading Stage	0	1.414		9.85
OF THE PROPERTY OF THE PARTY OF	1	7.07		9.62
	2	14.14		9.54
100	1	21.21		9.45
naa general construction	4	28.28		9.35
الماناتاطان العامات	5	35.35		9.24
general	6	42.42		9.17
hau e	7	49.49		9.11
	8	56.56		9.06 SP SP
	9	63.63		900 3000

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MATERIAL INSPECTION REQUEST

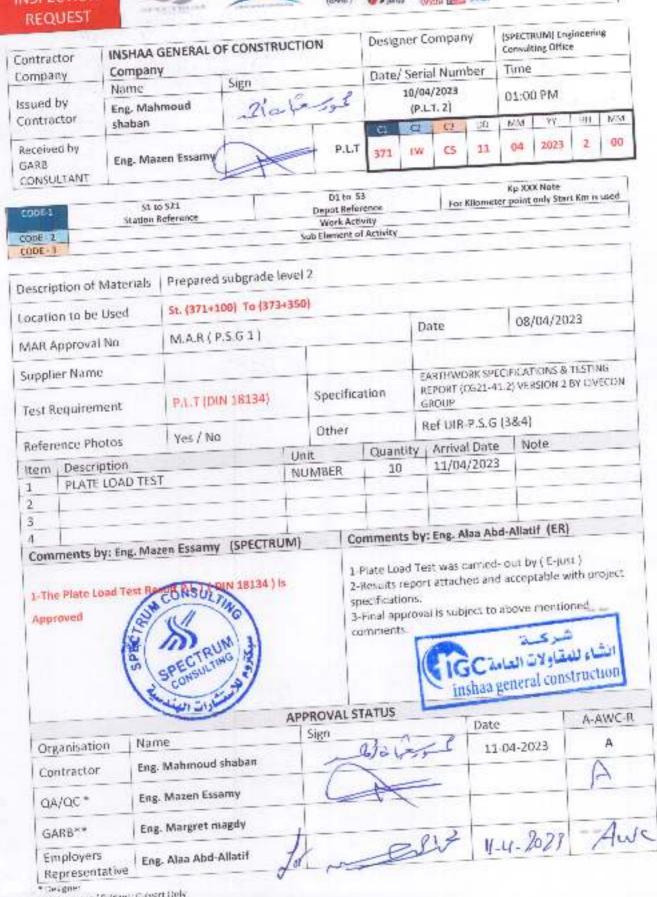












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Civil Engineering Testing & Consulting Unit وهذة اغتبارات و استشارات المندسة الجنية

Technical Report

Plate Loading Tests

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

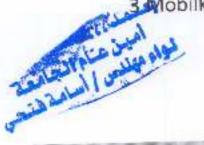
Project

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

Prepared for Inshaa General Construction

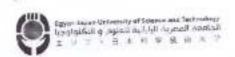
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(April 11, 2023)





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Civil Engineering Testing & Consulting Unit

وهدة اختيارات واستشارات المن

1. Introduction

The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by Inshaa General Construction to conduct 10 plate loading tests on the Prepared Subgrade 2.0 of the Electric Express Train project at 10 locations (KM 371+325, KM 371+300, KM 371+275, KM 371+250, KM 371+225, KM 371+200, KM 371+175, KM 371+150, KM 371+125, and KM 371+100) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Mahmoud Shaban of Inshaa General Construction. Field team members (Mr.Mohamed Mamdouh) from the working CETCU team visited the project site on April 11, 2023 and performed the required tests. This report summarizes the plate loading test procedure according to DIN18134, the test results and their interpretations, and the CETCU pertaining recommendations.

2. Test Set Up and Instrumentation

- The German standard DIN18134 was applied to define the test setup including the loading system, test conditions, and procedure for the plate loading tests.
- The tests were carried out to determine the Strain Moduli (Ev1 and Ev2) and their ratio (Ev2/Ev1) from a stress – deformation relationship of two consecutive loading from Loading-Unloading-Loading regime.
- The loading plate has a diameter of 600 mm and a thickness of 25 mm and it is. provided with equally spaced stiffeners. The upper plate face is parallel to the bottom face of the plate to allow a 300-mm plate to be placed on the 600-mm plate top.
- The loading system consisted of a hydraulic pump connected to a hydraulic jack of 700 bar capacity, which can apply and release the load increments.
- The dial gauge used to measure the plate settlement has a resolution of 0.01 mm and the lever ratio was equal to 1.
- The temperature at the time of the test was 19± 1°C.
- The plate was carried out on a Prepared Subgrade 2.0 (according to the company) at 10 points. The test surface area was levelled, and the plate was bedded on this surface.

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

The reaction loading system was a heavy multi-purpose Loader CAT 988

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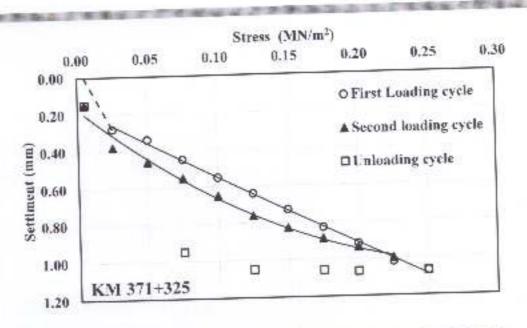


Figure 1: Load-settlement data: plate loading test performed at (KM 371+325)

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

0 1.414 7.07 2 14.14 3 21.21 4 28.28 5 35.35 6 42.42	MM/m² 0.005 0.00 0.00 0.025 0.25 0.30 0.075 0.40 0.51 0.525 0.50 0.51 0.525 0.50 0.72
0 1.414 1 7.07 2 14.14 3 21.21 4 28.28 5 35.35 6 42.42	0.025 0.050 0.075 0.100 0.125
1 7.07 2 14.14 3 21.21 4 28.28 5 35.35 6 42,42	0.050 0.30 0.075 0.40 0.100 0.51 0.125 0.60
2 14.14 3 21.21 4 28.28 5 35.35 6 42,42	0.075 0.40 0.100 0.51 0.125 0.60
3 21.21 4 28.28 5 35.35 6 42.42	0.100 0.51 0.125 0.60
4 28.28 5 35.35 6 42,42	0.125 0.60
5 35.35 6 42.42	0.72
6 42,42	0.72
	0.130
7 49.49	0.175 0.80
g 56.56	0.200 0.87
9 63.63	0.225 0.93
10 70.7	0.250 1.02
56.56	0.200 1.02
12 49.49	0.175
13 35.35	0.125 0.98
24 21 21	0.075 0.88 0.30 CONSU
15 1414 (G) Western Produ	0.30 COMS

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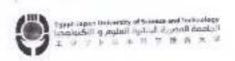


Table 5: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+300)

late loading	test performed at the	Normal stress (s ₀)	Settlement (S)
oading stage	Load (F)	MN/m²	mm
THE THE RESERVE	1000	0.005	0.30
No. of Street, or other Persons, page 1	1.414	0.025	0,46
W # 40 M	7.07	0.050	0.53
图 學 主 由	14.14	0.075	0,59
	21.21	0.100	0.69
	28.28	0.125	0.77
	35,35	0.150	0.85
6	42,42	0.175	0.92
7	49.49		0.95
8	56.56	0.200	1.00
9	63.63	0.225	

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

3/1+300)	1st loading cycle	2nd loading cycle
Parameters	The second second second	0.25
(somax) MN/m	0.25	0.31
a _o (mm)	0.12	
a, (mm/(MN/m²))	4.23	4.59
	-2.43	-6.68
a ₂ (mm/(MN2/m³))	124.31	154.08
Ev= 1.5 f/ (31+82, 55, MAX)	and the same of th	24
Ev ₂ /Ev ₁	1.	24

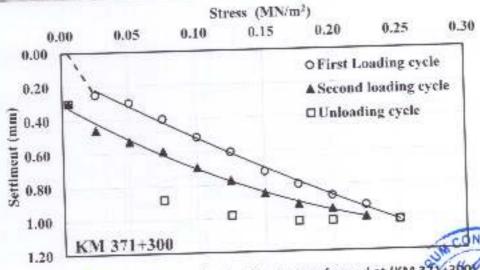


Figure 2: Load-settlement data: plate loading test performed at (KM 3)

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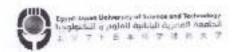


Table 7: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+275)

The state of the s	Load (F)	Normal stress (s ₀)	Settlement (5)
Loading stage	kN	MN/m ²	mm
7	1.414	0.005	0.00
But Bu	7.07	0.025	0.29
	14.14	0,050	0.36
	21.21	0.075	0.48
W. C. W.	28.28	0.100	0.57
5	35.35	0.125	0.64
The second second	42.42	0.150	0.75
5	49.49	0.175	0.86
8 7 8	56.56	0.200	0.95
9	63.63	0.225	1.03
	70.7	0.250	1.16
10	56.56	0.200	1.16
12	49.49	0.175	1.16
	35.35	0.125	1.10
13	21.21	0.075	0.99
15	1.414	0.005	0.30

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

Normal stress (sp Load (F) MN/m° 0.30 0.005 1.414 0.55 0.025 7.07 0.67 0.050 14.14 0.75 0.075 21.21 0.81 0.100 28.28 0.90 0.125 35.35 0.93 0.150 42.42 1.00 0.175 49.49 1.05 0.200 56.56 1.10 0.225 63.63

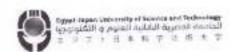
Table 9: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+275)

Water day a little	mim w.	2nd loading cycle
	-	0.25
0.25		4.7.7.7
0.20		0.35
3.51		352.49/1 ING
1.21	-	CONTRACTOR OF
118.02		15 A55
	1.32	a TRUM
		O SPECULTING
	3.51 1.21	0.25 0.20 3.51 1.21 118.02

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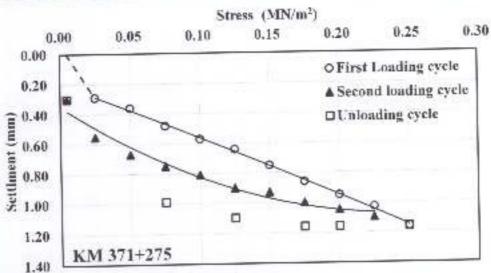


Figure 3: Load-settlement data: plate loading test performed at (KM 371+275)

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

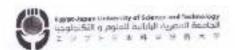
	Load (F)	Normal stress (s _n)	Settlement (5)
	kN	MN/m²	mm
MAGNITY.	1.414	0.005	0.00
Olivaria Pro-	7.07	0.025	0.31
W - T-	14.14	0.050	0.38
-	21.21	0.075	0.45
	28.28	0.100	0.53
	35.35	0.125	0.61
No. of Concession, Name of Street, or other Persons, or other Pers	42.42	0.150	0.72
	49.49	0.175	0.80
	56.56	0.200	0.86
	63.63	0.225	0.95
9	70.7	0.250	1.05
10	56.56	0.200	1.05
11	49.49	0.175	1,04
12	A CONTRACTOR OF THE PARTY OF TH	0.125	0.95
13	35.35	0.075	0.86
14	21.21	0.005	0.26
15	1.414	ACAS.	

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Table 11: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+250)

Loading stage	(pad (F)	Normal stress (s _n)	Settlement (S)
	kN	MN/m²	mm
0	1.414	0.005	0.26
1-	7.07	0.025	0.48
2	14.14	0.050	0.54
27	21.21	0.075	0.65
	28.28	0.100	0.74
	35.35	0.125	0.83
6	42.42	0.150	0.86
7	49.49	0.175	0.93
	56.56	0.200	1.00
9 7 (6)	63.63	0.225	1.05

Table 12: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+250)

A 371+250)	1st loading cycle	2nd loading cycle
Parameters	1st mading cycle	The state of the s
(se max) MN/m	0.25	0.25
a _p (mm)	0.23	0.29
a ₁ (mm/(MN/m ¹))	2.97	5.45
a ₂ (mm/(MN2/m³))	1.21	-9.54
Ev= 1.5 r/ (a1+a2. Su max)	137.52	146.62
EV ₂ /EV ₁	1	.07

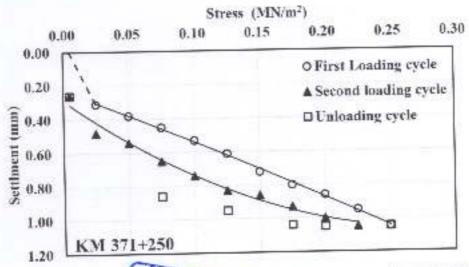


Figure 4: Load-settlement attack performed at (KM 371+250) ONSUL)

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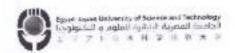


Table 13: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+225)

1	Load (F)	Normal stress (s ₀)	Settlement (S)
Loading stage	kN	MN/m²	mm
0	1.414	0.005	0.00
1 5 %	7.07	0.025	0.20
2 10 110	14.14	0.050	0.29
THE PERSON P	21.21	0.075	0.40
4	28.28	0.100	0.49
6 7 4	35.35	0.125	0.58
W 8-75	42.42	0.150	0.64
7	49.49	0.175	0.71
9	56.56	0.200	0.80
8	63.63	0.225	0.88
9	70.7	0.250	0.99
11	56.56	0.200	0.99
12	49.49	0.175	0.97
13	35.35	0.125	0.87
14	21.21	0.075	0.74
15	1.414	0.005	0.19

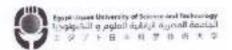
Table 14: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+225)

The state of the s	t word (m)	Normal stress (s _o)	Settlement (S)
	kN	MN/m²	mm
0	1.414	0.005	0.19
1	7.07	0.025	0.38
7	14.14	0.050	0.45
2	21.21	0.075	0.53
8 - 7 -	28.28	0.100	0.61
5	35.35	0.125	0.69
6	42.42	0.150	0.79
7 10 10 1	49.49	0.175	0.85
B	56.56	8,200	0.90
9	63.63	0.225	0.95

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

(KM 371+225)	19-480- w 19-w	2nd loading cycle
Parameters	1st loading cycle	
(samax) MN/m²	0.25	0.25
a _p (mm)	0.12	0.21
a, (mm/(MN/m²))	3.72	4.81
s ₂ (mm/(MN2/m ⁴))	-1.21	-5 CONS
Ev= 1.5 r/ (a, ta, s, num); (1)	131.76	13711
	The sales of the s	9 (5)
and in	The second section of the section of th	12 1/11
- La	The state of the s	100 0EC
	War Company	1 2 045

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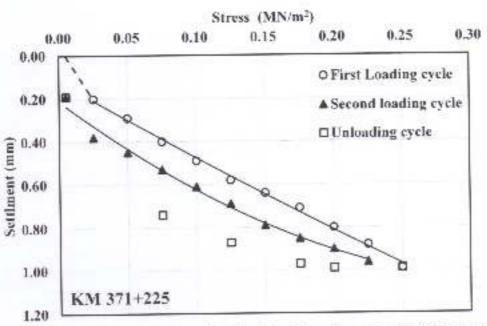


Figure 5: Load-settlement data: plate loading test performed at (KM 371+225)

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





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

Loading stage	Load (F)	AND THE PARTY AN	
	kN # T	MN/m	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.25
2	14.14	0.050	0.32
3	21.21	0.075	0,40
4	28.28	0.100	0.52
5	35.35	0.125	0.69
6	42.42	0.150	0.80
7	49.49	0.175	0.91
8	56.56	0.200	1.02
9	63.63	0.225	1.13
10	70.7	0.250	1.23
11 =	56.56	0.200	1.23
12	49.49	0.175	1.23
13	35.35	0.125	1.15
14	21.21	0.075	1.04
15	1.414	0.005	0.44

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

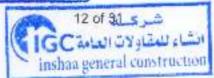
Brown .	Load (F)	Settlement (S)	
Loading stage	kN	NN/m²	mm
	1.414	0.005	0.44
	7.07	0.025	0.61
2 7	14.14	0.050	0.67
3	21.21	0.075	0.78
4 (4)	28.28	0.100	0.86
5	35.35	0.125	0.93
6	42.42	0.150	1.00
7 - 111 -	49.49	0.175	1.08
8	56.56	0.200	1.14
9	63.63	0.225	1.23

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

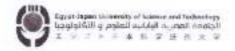
(KM 371+200)	and the second second second	THE RESERVE AND PARTY.	4 1 4 4 5 4 5 5 5 5 5 5 5
Parameters	1st loading cycle	100	2nd loading cycle
[samax] MN/m²	0.25		0.25
a _o (mm)	0.11		0.46
a, (mm/(MN/m ²))	4.39		4.47
a ₂ (mm/(MN2/m ²))	0.67		-5.02
Form 1 5 of 19 43 5 1000	98.71		139.89 CONS
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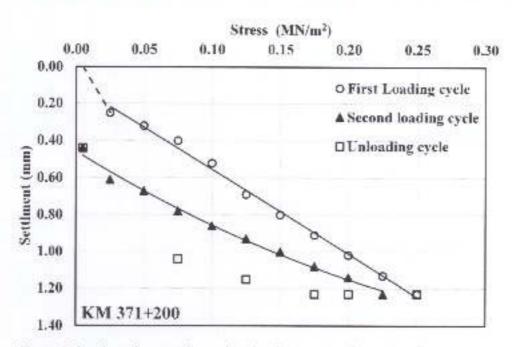


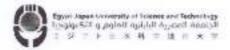
Figure 6: Load-settlement data: plate loading test performed at (KM 371+200)

Table 19: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+175)

Loading stage	Load (F)	Normal stress (s ₀)	Settlement (5)
Luauing stage	kN	MN/m²	mm
0	1.414	0.005	0.00
1 16 16	7.07	0.025	0.26
2	14.14	0.050	0.35
3	21.21	0.075	0.46
4	28.28	0.100	0.56
5	35.35	0.125	0.68
6	42.42	0.150	0.77
7	49.49	0.175	0.93
8	56.56	0.200	1.03
9	63.63	0.225	1.13
10	70.7	0.250	1.30
21	56.56	0.200	1.30
12	49.49	0.175	1.28
13	35.35	0.125	1.22 ONS(I)
14	21.21	0.075	SASULTING
15	1.414	0.005	08/45(V) (C)

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

The effects of a sec	Load (F)	Normal stress (s _n)	Settlement (5)
Loading stage	kN	MN/m ²	man
0	1.414	0.005	0.45
1	7.07	0.025	0.70
2	14.14	0.050	0.76
3 100	21.21	0.075	0.85
4	28.28	0.100	0.95
5	35.35	0.125	1.02
6	42.42	0.150	1.10
7	49.49	0.175	1.20
8	56.56	0.200	1.23
9	63.63	0.225	1.30

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

Parameters	1st loading cycle	2nd loading cycle
(s _{te} max) MN/m ²	0.25	0.25
a _a (mm)	0.16	0.49
a ₁ (mm/(MN/m ²))	3.64	5.50
8 _z (mm/(MNZ/m ⁴))	3.40	-8.70
Eve 1.5 (/ (a +a2 50 mm)	100.21	135.45
Ev ₂ /Ev ₁	1.35	

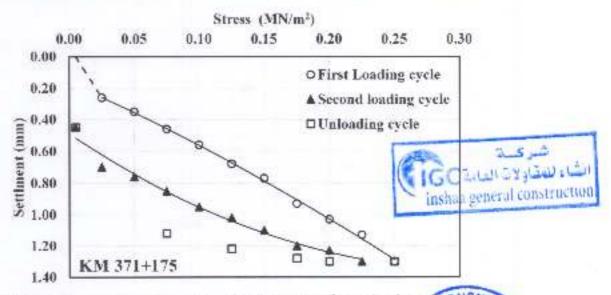
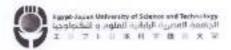


Figure 7: Load-settlement data: plate loading test performed at (KM 3749175VL)

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

Loading stage	Load (F)	Normal stress (sa)	Settlement (S)	
	kn	MN/m²	mm	
0	1,414	0.005	0.00	
1 -	7.07	0.025	0.30	
2	14.14	0.050	0.38	
3	21.21	0.075	0.55	
4	28.28	0.100	0.66	
5	35.35	0.125	0.82	
6	42.42	0.150	0.95	
7	49.49	0.175	1.08	
8	56.56	0.200	1.19	
9	63.63	0.225	1.31	
10	70.7	0.250	1.48	
11	56.56	0.200	1.48	
12	49,49	0.175	1.47	
13	35.35	0.125	1.45	
14	21.21	0.075	1.36	
15	1,414	0.005	0.66	

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

Loading stage	Load (F)	Normal stress (s _c)	Settleme	ent (S)
	KN KN	MN/m²	mn	1
0	1.414	0.005	0.66	
3 1	7.07	0.025	0.88	
2	14.14	0.050	0.96	
3	21.21	0.075	1.09	
4	28.28	0.100	1.19	
5	35.35	0.125	1.30	
6	42.42	0.150	1.38	
7	49.49	0.175	1.47	
8	56.56	0.200	1.53	
9	63.63	0.225	1.57	-

Table 24: Calculations of the resilient modulus of the tested soil according to 18438134; انشاء لنفاز لات العام 154 (KM 371+150)

(KM 371+150)

Parameters

(s₂,max) MN/m²

0.25

a₃ (mm)

3.15

a₄ (mm/(MN/m²))

5.23

a₄ (mm/(MN2/m²))

Ev=1.5 t/ (a₁m₂, s₃ v_{AX})

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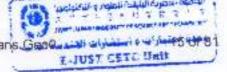
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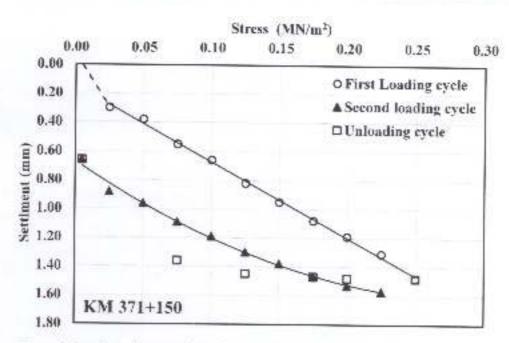
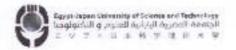


Figure 8: Load-settlement data: plate loading test performed at (KM 371+150)

Table 25: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+125)

Loading stage	Load (F)	Normal stress (so)	Settlement (S)
containing storage	kN	MN/m²	mm
0	1.414	0.005	0.00
1	7.07	0.025	0.26
2	14.14	0.050	0.30
3	21.21	0.075	0.43
4	28.28	0.100	0.53
	35.35	0.125	0.67
6	42.42	0.150	0.79
7	49.49	0.175	0.86
	56.56	0.200	0.96
	63,63	0.225	103 - 05,10157
	70.7	0.250	1.15 IGC and DY sinshaa general e
11	56.56	0.200	1.16 inshad gener
12	49.49	0.175	1.18
13	35.35	0.125	1.12
14	21.21	0.075	1.01
15	1.414	0.005	0.40 CONSULT

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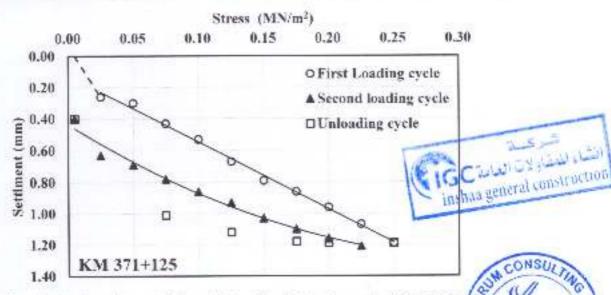
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Table 26: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+125)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Load (F) Normal stress (s _n) S		Settlement (S)
Loading stage	kN	MN/m²	mm
0	1.414	0.005	0.40
1	7.07	0.025	0.63
2	14.14	0.050	0.69
3	21.21	0.075	0.78
4	28.28	0.100	0.86
5	35.35	0.125	0.93
6	42.42	0.150	1.03
7	49.49	0.175	1.10
8	56.56	0.200	1.16
9	63.63	0.225	1.21

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

Parameters	1st loading cycle	2nd loading cycle
(s _s ,max) MN/m	0.25	0.25
a ₂ (mm)	0.13	0.44
a, (mm/(MN/m²))	4.18	5.10
a ₂ (mm/(MN2/m³))	0.24	-7.50
Ev= 1.5 r/ (a1+3). Su MAX)	106.08	139.54
Ev ₂ /Ev ₁	1.3	2



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Figure 9: Load-settlement data: plate loading test performed at (KM 371+175)

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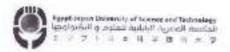


Table 28: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+100)

Loading stage	Load (F) Normal stress (s		Settlement (5)
	kN	MN/m²	mm
0	1.414	0.005	0.00
La Contract of	7.07	0.025	0.35
2	14.14	0.050	0.41
A TOP OF	21.21	0.075	0.50
4	28.28	0.100	0.60
S LOW THE PARTY	35.35	0.125	0.76
	42.42	0.150	0.90
	49.49	0.175	1.00
-	56.56	0.200	1.13
	63.63	0.225	1.22
0	70.7	0.250	1.37
1	56.56	0.200	1.37
	49.49	0.175	1.36
	35.35	0.125	1.21
A	21.21	0.075	1.07
5	1,414	0.005	0.34

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

Load (F) Normal stress (s.) Loading stage Settlement (5) MN/m2 mm 1.414 0.005 0.34 7.07 0.025 0.70 14.14 0.050 0.79 21.21 0.075 0.85 28.28 0.100 0.97 35.35 0.125 1.09 42.42 0.150 1.15 7 49.49 0.175 1.24 56.56 0.200 1.30 63.63 0.225 1.37

Table 30: Calculations of the resilient modulus of the tested soil according to DIN 1345 C نشاء للمقاولات العامة (KM 371+100)

Perameters 1st leading cycle

1.21

Parameters	1st loading cycle	2nd loading cycle!
[s _{to} max] MN/m ²	0.25	0.25
a, (mm)	0.22	0.42
a (mm/(MN/m²))	3.84	7.02
a ₂ (mm/(MN2/m ²))	3.09	-12.85
Ev=1.5 r/ (a ₁ +a ₂ : s _{0, boot})	97.57	118.34

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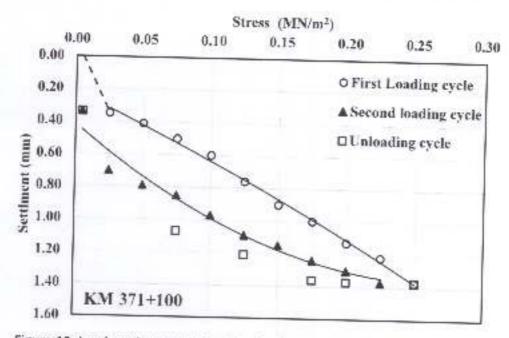


Figure 10: Load-settlement data: plate loading test performed at (KM 371+100)



4. Closure

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

Location	E _{v1} MN/m2	E _{v2} MN/m2	E _{v2} /E _{v1} ratio
KM 371+325	121.65	134.10	1.10
KM 371+300	124.31	154.08	1.24
KM 371+275	118.02	155,57	1.32
KM 371+250	137.52	145.62	1.07
KM 371+225	131.76	143.45	1.09
KM 371+200	98.71	139.89	1.42
KM 371+175	100.21	135.45	1.35
KM 371+150	85.49	120.18	1.41
KM 371+125	106.08	139.54	1.32
KM 371+100	97.57	118.34	1.21

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

Technical committee

Dr. Mahmoud Ahmed





Lab Engineer

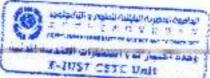
Mohamed A. Al-Najjar

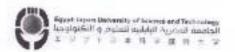




وحدة افتهارات و استشارات المنمسة المنبة

Appendix A





وحدة اغتجارات و استشارات المندسة الحنية

Location of test site:	KM 371+300		Field	Mr. Mohamed Manufus	
Project title:	Electric Express T General	Frain Project - Inshaa Construction	Date:	11/4/2023	
Diameter of loading	600		Time	9:35:00 AM	
Lever ratio	1			10:03:00 AM	
Type of Soil	Prenaved	Subgrade 2.0	Note:		
Redding material	1 (c)#/cu	0	CAT 9	96F	
Temperature	1	9°C	-		
Test regime	Loading Stage No.		Dial Co	nge Reading (mn	
Loading Stage	0	1.414	Dial On	10.00	
AMERICAN TRANSPORTER	1	7,07	-		
	2	14.14	9.75		
	3	21.21	9.70		
	4		9.60		
	5	28.28	9.49		
		35.35	10	9.40	
	6	42.42	9.28		
	7	49.49	9.20		
	- 8	56.56	9.13		
	9	63.63	9.07		
	10	70.7		8.98	
Inloading Stage	11	56.56		8.98	
	12	49.49		8.98	
	13	35.35		9.02	
	14	21.21		9.12	
	15	1.414		9.70	
est regime	Loading Stage No.	Load (kN)	Dial Gas	ige Reading (mm	
teloading Stage	0	1.414		9.70	
	1	7.07		9.54	
	2	14.14		9.47	
	3	21.21		9.41	
a e to	4	28.28		9,31	
انشاء للمقديدة	. 5	35.35	-	9.23	
شركة: انشاء للمقاولات العامة: na general constructio	6	42.42			
aa general conscious	7	49.49			
and a superior	0	2,2,	9.08		

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وعدة المتجلزات و استشارات المعدسة المدنجة

Location of test site:	KM 371+275		Field team	Mr. Mohamed Mamdou	
Project title:		rain Project - Inshaa Construction	Date:	11/4/2023	
Diameter of loading plate		500	Time	10:10:00 AM 10:38:00 AM	
Lever ratio	1		Note:	101001100 /4/12	
Type of Soil	Prepared 5	Subgrade 2.0	CAT 966F		
Redding material					
Temperature	1	9°C			
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (m)		
Loading Stage	0	1,414	1	10.00	
	1	7.07		9.71	
	2	14.14	9.64		
	3	21.21	9,52		
	4	28.28	9,43		
	5	35.35	9,36		
	6	42.42	9,25		
	7	49,49	9,14		
	8	56.56	9.05		
	9	63.63	8.97		
	10	70.7	8.84		
Unloading Stage	11	56.56	8.84		
CONTRACTOR SECURES	12	49.49		8.84	
	13	35,35		8.90	
	14	21,21	10	9.01	
	15	1.414	-	9.70	
Test regime	Loading Stage No.	Load (kN)	Dial Ca	uge Reading (mm)	
Reloading Stage	0	1.414	Dia Ga	9.70	
	1	7,07		9.45	
		14.14	1	9.33	
شركسة شاء للمقاؤلات العامة C construction (construction)	3	21.21		9.25	
ساء للمقاولات العامة	0 4	28.28	0	9.19	
haa general constructi	5	35.35		9.10	
- Control of the Cont	6	42.42		9.07	
	7	49,49	1	9.00	
	8	56.56	-	8.95 CONSULT	
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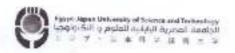
Location of test site;	KM.	371+250	Field team	Mr.Mohamed Manufau		
Project title:	Electric Express General	l rain Project - Inshaa Construction	Date:	11/4/2023		
Diameter of loading plate	600		Time	10:45:00 AM		
P(-):1213				11:12:00 AM		
Lever ratio		1	Note:			
Type of Soil	Prepared	Subgrade 2.0	CAT 966F			
Bedding material	-		100000000000000000000000000000000000000			
Temperature		9°C				
Test regime Loading Stage	Loading Stage No.		Dial Gauge Reading (mn			
coatting Stage	0	1.414		10.00		
	1	7.07		9.69		
	2	14.14	9.62			
	3	21.21	9.55			
	4	28.28	9.47			
	5	35.35	9.39			
	6	42.42	()	9.28		
	7	49.49		9.20		
	8	56.56		9.14		
	9	63.63				
	10	70.7	9.05			
Inloading Stage	11	56.56	-	8.95		
***************************************	12	49,49	-	8,95		
	13	35.35	-	8.96		
	14		-	9.05		
	15	21.21		9.14		
est regime		1.414	9.74			
teloading Stage	Loading Stage No.	Load (kN)	Dial Gau	ge Reading (mm)		
- Annah - Annah -		1.414		9.74		
	1	7.07		9.52		
شوكسة انشاء للعقاولات العامة paral construction	2	14.14		9.46		
انشاء للعقاديوت	3	21.21		9,35		
المتفاولات العامة a general construction	4	28.28		9.26		
a general conse	5	35.35		9.17		
-		42,42	1	9.14		
	. 7	49,49		9.07		
	8	56.56	/3	CONHULTING		
	all residence bearing	63.63	100	((8/95 6)		

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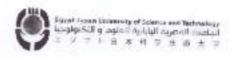


وحدة اختمارات و استشارات الملمسة الهدنية

Location of test site:	KM 3	371+225	Field team	Mr. Metamed Mamileu	
Project fiffe:	Electric Express 1 General 6	rain Project - Inshaa Construction	Date:	11/4/2023	
Diameter of loading plate		600	Time	11:20:00 AM 11:48:00 AM	
Lever ratio		1	Note:	11.40.00 A.VI	
Type of Soil	Prepared :	Subgrade 2.0	CAT 96	EV.	
Bedding material		****		O.F.	
Temperature	19°C				
Test regime	Loading Stage No.	Load (kN)	Dial Gauge Reading (mm)		
Loading Stage	0	1.414	of Child Dudge.	10.80	
	1	7.07		9.80	
	2	14.14	9.71		
	3	21.21	9,60		
	4	28.28	9.51		
	5	35.35		9.42	
	6	42.42		9.36	
	7	49,49		9.29	
	8	56,56	9.20		
	9	63.63	9.12		
	10	70.7	9.01		
Inloading Stage	- 11	56.56	9.01		
	12	49.49	-	9.03	
est regime oading Stage	13	35.35		9.13	
	14	21.21		9.26	
	15	1.414		9.81	
est regime	Loading Stage No.	Load (kN)	Dial Gar	ge Reading (mm)	
teloading Stage	0	1.414	77.111	9.81	
	1	7.07		9.62	
	2	14.14		9.55	
ن شرکیة	3	21.21		9.47	
ساء للمقاولات العامة	4	28.28		9,39	
sag general constructs	5	35.35		9.31	
شركة شاه للمقاولات العامة C naa general construct	6	42.42		9.21	
	7	49.49		0.15	
	8	56.56		STENSULTUS.	
Bee tuckiful a rais	ii Cadajali elayasia Masetali	63.63		Wat The	

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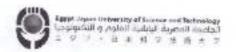


وحدة اغتجارات و استشارات المندسة البدنية

Location of test site:	KM:	371+200	Field team	Mr. Mohamed Manufout		
Project title:	Electric Express 1 General	rain Project - Inshaa Construction	Date:	11/4/2023		
		600	Time	11:55:00 AM		
		000	THEOREM	12:23:00 PM		
Lever ratio		I	Note:	77.785.775 A.404		
	Prepared	Prepared Subgrade 2.0		CAT 966F		
			99.65530	875		
	19°C					
	Loading Stage No.		Dial Gauge Reading (mm)			
loading Stage	0	1.414		10.00		
	1	7.07		9.75		
	2	14.14		9.68		
	3	21.21	9.60			
	4	28.28	9.48			
	5	35,35		9.31		
	6	42.42		9.20		
	7	49.49		9.09		
	- 8	56.56		8.98		
	9	63.63	8,87			
	10	70.7	8.77			
nloading Stage	11	56.56	8.77			
	12	49,49		8.77		
Diameter of loading plate	13	35.35	8.85			
	14	21.21		8.96		
	15	1.414		9.56		
	Loading Stage No.	Load (kN)	Dia! Gan	ge Reading (mm)		
cloading Stage	0	1.414		9.56		
	1	7.07		9.39		
	2	14.14		9.33		
- A	3	21.21		9.22		
الدائدة المتا	÷11 4	28.28		9.14		
و معقاولات العادة	1108 5	35.35		9.07		
shaa general construct	6	42.42		9.00		
	7	49.49		0.00		
	8	56.56		8.92		
	0	63.63		Comor		

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وحدة اغتيارات و استشارات العندسة الودنية

Location of test site:	KM 3	371+175	Field team	Mr. Mohamed Mandon	
Project title:		rain Project - Inshaa Construction	Date:	11/4/2023	
Diameter of loading		enn	Time	12:30:00 PM	
plate	600		100000	12:58:00 PM	
Lever ratio		1	Note:		
Type of Soil	Prepared	Subgrade 2.0	CAT 96	6F	
Control of the Contro		-			
		9°C			
	Loading Stage No.	Load (kN)	Dial Ga	uge Reading (mm	
Loading Stage	0	1.414	-	10.00	
	1	7.07	9.74		
	2	14.14	9,65		
	3	21,21	9.54		
	4	28.28	9.44		
	5	35.35	9.32		
	6	42.42	9.23		
	7	49,49	9.07		
	8	56.56	8,97		
	9	63.63	8.87		
	10	70,7	8.70		
nloading Stage	11	56.56	8.70		
Sedding material Temperature Test regime Todding Stage Inloading Stage Test regime Test regime Test regime Test regime Test regime Test regime	12	49,49		8.72	
	13	35.35	===	8.78	
	14	21.21		8.88	
	15	1,414		9.55	
est regime	Loading Stage No.	Load (kN)	Dist Car	ige Reading (mm)	
teloading Stage	0	1.414	DIM GAI	9.55	
	1	7.07	1	9.30	
19	2	14.14	+	9.24	
research)	3	21.21	+	9.15	
7.5.4	4	28.28			
شركسة نشاء للتفاؤلات العامة [5	35.35		9.05	
aa general constructio	6	42.42		8.98	
aa genero con-	7	49.49		77.33076	
	8	56.56		8.80 8.20 CONSUL	
	العامة المناسبة المنا	63.63		n.	

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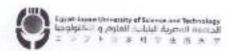


وعدة اختيارات و استشارات المندسة الجنبية

Location of test site:	KM 3	71+150	Field team	Mr. Mohamed Manning	
Project title:	Electric Express T General (rain Project - Inshaa Construction	Date:	11/4/2023	
Diameter of loading	400		Time	1:07:00 PM	
plate		600		1:35:00 PM	
Lever ratio		1	Note:		
Type of Soil	Prepared :	Subgrade 2.0	CAT 966F		
		nee.			
		9°C			
	Loading Stage No.		Dial Gauge Reading (
Loading Stage	0	1,414		10.00	
	1	7.07	9.70		
	2	14.14	9.62		
	3	21.21	9.45		
	4	28.28	9.34		
	5	35.35		9.18	
	6	42.42	9.05		
	7	49.49		8.92	
	8	56,56		8.81	
	9	63.63	8.69		
	10	70.7	8.52		
Enloading Stage	11	56.56		8.52	
Lever ratio Type of Soil Sedding material Temperature Test regime Loading Stage Inloading Stage	12	49,49		8.53	
	13	35.35		8.55	
	14	21.21	1	8.64	
	15	1.414	+	9,34	
l'est regime	Loading Stage No.	Load (kN)	Dial Ca	uge Reading (mm)	
Reloading Stage	0	1,414	Dial tra	9.34	
	1	7.07		9.12	
	2	14.14	1	9.04	
	3	21.21	-	8.91	
3 5 . Å	4	28.28		8.81	
شركسة انشاء للمقاولات العامة proton	5	35.35		8.70	
general construction	6	42.42		777.777	
general construction	7	49.49	-	8.62	
	8	56.56	+	8.53	
	9	63.63	-	8.47	

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وحدة اغتجارات و استشارات العندسة الجنبية

Location of test site:	KM 3	KM 371+125		Mr. Moliamed Manadous		
Project title:	Electric Express Train Project - Inshau General Construction		Date:	11/4/2023		
Diameter of loading plate	600		Time	1:43:00 PM 2:10:00 PM		
Lever ratio		1	N	2:10:00 FM		
Type of Soil	Prepared Subgrade 2.0		Note: CAT 90	Commit		
Bedding material			CATN	101		
Temperature	11	9°C				
Test regime	Loading Stage No.	Load (kN)	Dist Go	uge Reading (mm)		
Loading Stage	0	1,414	177111 (33)	10.00		
	1	7,07	1	9.74		
	2	14.14		9.70		
	3	21.21	9,57			
	4	28.28		9.47		
	5	35.35				
	6	42.42	-	9.33		
	7	49.49	-	9.21		
	8	56.56	9.14			
	9		9.04			
		63.63	8.93			
Unlooding Store	10	70.7	8.81			
inioading Stage	11	56.56	8.81			
	12	49.49		8.82		
nloading Stage	13	35.35		8.88		
	14	21.21		8.99		
	15	1.414		9.60		
Test regime	Loading Stage No.	Load (kN)	Dial Gar	uge Reading (mm)		
Reloading Stage	0	1.414		9.60		
	1	7.07		9.37		
	2	14.14		9.31		
شركمة	3	21.21		9.22		
النساء للعقاد لات الدرا	4	28.28		9.14		
a general construction	5	35.35		9.07		
1 general	6	42.42		8.97		
	7	49.49		8.90		
		56.56				
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وهدة اغتيارات و استشارات الحندسة البدنية

Location of test site:	KM 3	KM 371+100		Mr. Mohamed Mandon		
Project title:		Electric Express Train Project - Inshan General Construction		11/4/2023		
Diameter of loading	600		Time	2:18:00 PM		
Lever ratio		1	-	2:48:00 PM		
Type of Soil	Prepared Subgrade 2.0		Note: CAT 90	ozer -		
Bedding material	1.75 pared	rrepared Subgrade 2.0		DO P		
Temperature	1	19°C				
Test regime	Loading Stage No.		DiaLCo	inge Reading (mm)		
Loading Stage	0	1.414	201111 (31)	10.00		
	1	7,07		9,65		
	2	14.14		9,59		
	3	21.21	9.50			
	4	28.28	9,40			
	5	35.35	9,24			
	6	42.42		9.10		
	7	49.49	+	9.00		
	8	56.56	8.87			
	9	63.63	8.78			
	10	70.7	8.63			
Inloading Stage	11	56,56				
mounting straigs	12	49.49	+	8.63		
	13	35.35	-	8.64		
	14	21.21		8.79		
	15	-	-	8.93		
l'est regime		1.414	157 37 25	9.66		
Reloading Stage	Loading Stage No.	Load (kN) 1.414	Diai Ga	uge Reading (mm)		
and a surger	1	7.07	+	9.66		
	2	14.14				
A		21,21		9.21		
شركسة شاء للمقاولات العامة C	3			9.15		
ساء للمشاولات العامة 🕳	4 m 5	28.28		9.03		
iaa general constructi	Fig. 2	35.35	1	8.91		
	7	42.42		8.85		
		49.49	-	8.76		
	8	56.56	1	CONSTITUTE		
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MATERIAL INSPECTION REQUEST











Contractor Company	company		Des	Designer Company				(SPECTRUM) Engineering			
ssued by Rame Eng. Moahmed	ssued by Name Sign		Dat	Date/ Serial Number			Consulting Office Time				
	19 77	Dat									
Contractor	hassen elssyd	2023	- (//	10-05-2023 (P.L.T.4)		01:00 PM					
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ARB	Eng. Mazen Essamy	1	G	C3	- 53	00	MM	YY	HH	149	
ONSULTANT	SERVICE STATE OF STAT	PI	371	EW	CS	11	05	2023	3	00	

CODE-1	51 to 521 Station Reference	D1 to 53 Depot Reference	Kp XXX Note
CODE-3	7.00	Work Activity Sub Element of Activity	For Kilometer point only Start Km is used

Desc	ription of Materials	Prepared sub grade level 2					
Loca	tion to be Used		St. (371+000) To (371+100)				
MAR	Approval No	MARPS-G1			Date	08/04/2023	
Supp	lier Name	ALFARDI		4.5546	00/04/2023		
Test Requirement		P.L.T (DIN 18134) Specification		cation	EARTHWORK SPECIFICATIONS & TESTING REPORT (CG22-41.2) VERSION 2 BY CIVECON GROUP		
	ence Photos	Yes / No	Other		Rev UIR- P.S.G. 6		
Item	The state of the s		Unit	O THE	Quantity	Arrival Date	Note
2	PLATE LOAD TEST		NUN	1BER	4	11/05/2023	Hote
3							
1	ents by: For Mason						

Comments by: Eng. Mazen Essamy (SPECTRUM)

Comments by: Eng. Alaa Abd Allatif (ER)

1-The Plate Load Test Besult P. D.C. 9(N 18134) is

Approved.

1-Plate Load Test Was Carried-out By (E-just)

2-Results report attached and acceptable with project specifications.

3-Final approval is subject to above mentioned comments.

Organisation	Name	APPROVAL STATUS	1	
Contractor		Sign @ 21	Date	A-AWC-R
Contractor	Eng. Mohamed Hassan	2023	11.05.2022	A
QA/QC*	Eng. Mazen Essamy	100		Δ
GARB**	Eng. Mohammed Fayad			L2
Employers Representative	Eng. Alaa Abd-Allatif	A 20	\$ 12-5-2029	1 20

⁴⁺ Alignment / Bridges: Colvert Coly



Civil Engineering Testing & Consulting Unit

المناب التجارات و استشارات العندسة البينية

Technical Report

Plate Loading Tests

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

Prepared Subgrade 2

Project

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

Prepared for

Inshaa General Construction

3 Mobilka CC - Abu Youssef, Alexandria, Egypt

بعثمد ،،، أمين عبام الجامعة دواء مهندس إنسانية طبيح

(May 11, 2023)





وحدة المتجارات و استنفارات العندسة المرنمة

1. Introduction

The Civil Engineering Testing & Consulting Unit (CETCU) of the Egypt-Japan University of Science and Technology (EJUST) was retained by Inshaa General Construction to conduct 4 plate loading tests on the Prepared Subgrade 2 of the Electric Express Train project at 4 locations (KM 371+000 to 371+025, KM 371+025 to 371+050, KM 371+050 to 371+075, and KM 371+075 to 371+100) in accordance with the German Standard DIN18134. The mandate was communicated by Eng. Mahmoud Shaban of Inshaa General Construction. Field team members (Mr.Mohamed Mamdouh) from the working CETCU team visited the project site on May 11, 2023 and performed the required tests. This report summarizes the plate loading test procedure according to DIN18134, the test results and their interpretations, and the CETCU pertaining recommendations.

2. Test Set Up and Instrumentation

- The German standard DIN18134 was applied to define the test setup including the loading system, test conditions, and procedure for the plate loading tests.
- The tests were carried out to determine the Strain Moduli (Ev1 and Ev2) and their ratio (Ev2/Ev1) from a stress – deformation relationship of two consecutive loading from Loading-Unloading-Loading regime.
- The loading plate has a diameter of 600 mm and a thickness of 25 mm and it is provided with equally spaced stiffeners. The upper plate face is parallel to the bottom face of the plate to allow a 300-mm plate to be placed on the 600-mm plate top.
- The loading system consisted of a hydraulic pump connected to a hydraulic jack of 700 bar capacity, which can apply and release the load increments.
- The dial gauge used to measure the plate settlement has a resolution of 0.01 mm and the lever ratio was equal to 1.
- The temperature at the time of the test was 24± 1°C.
- The plate was carried out on a Prepared Subgrade 2 (according to the company) at 4 points (KM 371+000 to 371+025, KM 371+025 to 371+050, KM 371+050 to 371+075 Pa and KM 371+075 to 371+100). The test surface area was levelled, and the plate was bedded on this surface.
- The hydraulic jack was placed on the middle of, and normal to, the loading plate beneath the reaction loading system and secured against tilting.

The seaction loading system was a heavy multipurpose thader CAT 966F.

onstruction

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وحدة اغتيارات و استشارات المغدسة المخبية

3. Test Procedure and Results

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

Table 1 presents the load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+000 to 371+025), while Table 2 shows the data obtained at the second loading stage.

Table 1: Load-settlement data obtained at the first loading and unloading stages of the plate loading test performed at the location (KM 371+000 to 371+025)

Loading stag	te Load (F)	Normal Normal	Settleme
一	kN	MN/m²	mm
0	1,414	0.005	0.00
1	7.07	0.025	0.20
2	14.14	0.050	
3	21.21	0.075	0.28
4	28.28	0.100	0.35
5	35.35	0.125	0.51
5	42,42	0.150	0.71
7 4 7	49.49		0.84
3 4 7 4	56.56	0.175	1.00
-	63.63	0.200	1.14
10	70.7	0.225	1.23
1		0.250	1.36
	56.56	0.200	1.36
2	49.49	0.175	1,34
3	35.35	0.125	5PECTO
4	21.21	0.075	18124
5	1.414	0.005	134 E925CTRU4 124 C 069
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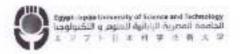


Table 2: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+000 to 371+025)

F	Load (F)	Normal stress (on)	Settlement (S)
Loading stage	kN	MN/m²	mm.
D	1.414	0.005	0.69
1	7.07	0.025	0.85
2	14.14	0.050	0.95
3	21.21	0.075	1.00
4	28.28	0.100	1.07
5	35.35	0.125	1.15
6	42.42	0.150	1.20
7	49.49	0.175	1.28
8.	56.56	0.200	1.33
9	63.63	0.225	1.40

The load-settlement data obtained in all loading and unloading stages for the test performed at the first location (KM 371+000 to 371+025) are shown in Figure 1. Table 3 shows the calculations of the resilient modulus of the tested soil according to DIN18134. The testing data corresponding to the second testing point (KM 371+025 to 371+050) is provided in Tables 4-6 and Figure 2. The testing data corresponding to the third testing point (KM 371+050 to 371+075) is provided in Tables 7-9 and Figure 3. The testing data corresponding to the fourth testing point (KM 371+075 to 371+100) is provided in Tables 10-12 and Figure 4.

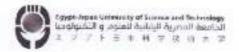
Table 3: Calculations of the resilient modulus of the tested soil according to DIN18134: (KM 371+000 to 371+025)

Parameters	1st loading cycle	2nd loading cycle
(so,max) MN/m²	0.25	0.25
a ₀ (mm)	0.02	0.72
a ₁ (mm/(MN/m²))	5.22	4.19
a ₂ (mm/(MN2/m³))	0.97	-5.42
Ev= 1.5 r/ (a ₁ +a ₂ , a _{9, Max})	82,34	158.76
Ev ₃ /Ev ₁	1.9	3









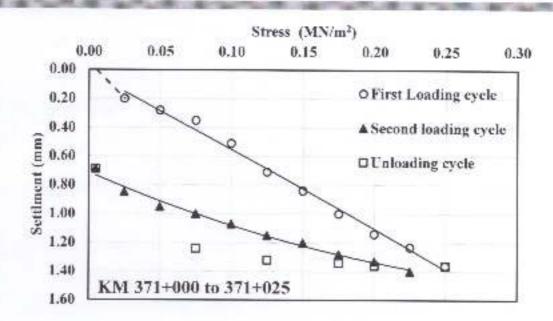


Figure 1: Load-settlement data: plate loading test performed at (KM 371+000 to 371+025)

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

Loading stage	Load (F)	Normal stress (σ_0)	Settlement (S)	
	RN .	MN/m²	mm	
0	1.414	0.005	0.00	
1	7.07	0.025	0.35	
2	14.14	0.050	0.40	
3	21.21	0.075	0.45	
Self His day	28.28	0.100	0.54	
	35.35	0.125	0.65	
5 111	42.42	0.150	0.73	
7	49.49	0.175	0.81	
3 4 4	56.56	0.200	0.90	
	63.63	0.225	1.00	
	70.7	0.250	1.08	
1	56.56	0.200	1.08	
2	49.49	0.175	1.08 1.07 SPECTRUM 1.07 0.00 SPECTRUM 0.00 SPECTRUM	
3	35.35	0.125	10	
4	21.21	0.075	0.000	
15	1.414	gently landstell and the landstell to part	0 10 0 0	

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

Loading stage	Load (F)	Normal stress (σ_0)	Settlement (S)
and the Fall of the	kN	MN/m²	mm
0	1.414	0.005	0.34
10 100	7.07	0.025	0.57
2	14.14	0.050	0.65
3	21.21	0.075	0.73
4	28.28	0.100	0.80
5	35.35	0.125	0.88
The same of	42.42	0.150	0.92
7	49.49	0.175	0.96
	56.56	0.200	1.00
	63.63	0.225	1.05

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

Parameters	1st loading cycle	2nd loading cycle
(s ₀ ,max) MN/m ²	0.25	0.25
a _a (mm)	0.27	0.38
a ₁ (mm/(MN/m²))	2.61	5.46
a ₂ (mm/(MN2/m ⁴))	2.79	-11.55
Ev= 1.5 r/ (a,+a, s, MAX)	136.24	174.64
Ev ₂ /Ev ₁	1.3	

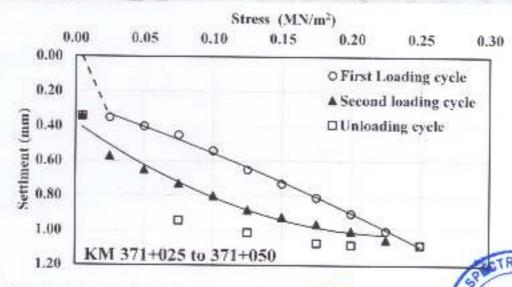
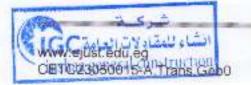
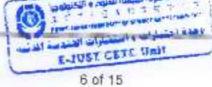
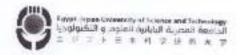


Figure 2: Load-settlement data: plate loading test performed at (KM 371+029 to/371+050)





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

Loading stage	Loadiff	Normal stress (onl	Settlement (S)
0	1.414	MN/m²	mm
1		0.005	0.00
ATT THE RESERVE TO TH	7.07	0.025	0.25
2	14.14	0.050	0.32
3	21.21	0.075	0.43
4	28.28	0.100	0.57
5	35.35	0.125	0.67
6	42.42	0.150	0.83
7	49.49	0.175	
8	56.56	0.200	0.93
9	63.63	0.225	1.08
10	70.7		1.17
11	56.56	0.250	1.31
12	49.49	0.200	1.30
MC		0.175	1.29
- CARLO - CARL	35.35	0.125	1.22
	21.21	0.075	1.15
15	1.414	0.005	0.45

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

Loading stage	Load (F)	Normal stress (σ_0)	Settlement (S)
	kN	MN/m²	mm
0	1.414	0.005	0.45
1	7.07	0.025	0.63
2	14.14	0.050	0.75
3	21.21	0.075	0.88
4	28.28	0.100	0.94
5	35.35	0.125	1.00
6	42.42	0.150	1.07
7	49.49	0.175	1.13
8	56.56	0.200	1.19
9	63.63	0.225	1.25

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

Parameters	1st loading cycle	2nd loading cycle
(s _p ,max) MN/m ²	0.25	(1.75
a ₀ (mm)	0.12	GARUM CONS
a ₁ (mm/(MN/m ²))	and the control of the state of	1000 (9)
a ₂ (mm/(MN2/m ⁴))	2.00	210.81
Eve 1.5 r/ (a1+82. Sp. MXX)	93.86	145.26
Ev ₂ /Ev ₁	E-JUST CETC Unit 1.55	CONSCILING
X-1	£-1051 C-1051	E-CONSULTING
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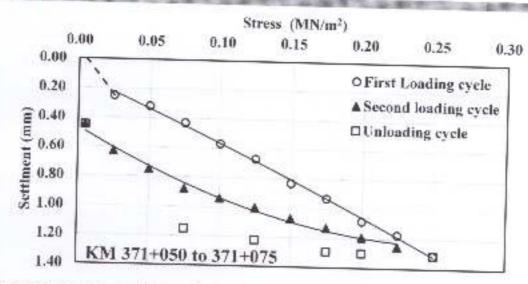


Figure 3: Load-settlement data: plate loading test performed at (KM 371+050 to 371+075)

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

Loading stage	Load (F)	Normal stress (σ_0)	Settlement (S)
0	THE RESERVE OF THE PARTY OF THE	MN/m ²	mm
0	1.414	0.005	0.00
Transfer and	7.07	0.025	0.26
2	14.14	0.050	0.41
3	21.21	0.075	0.50
4	28.28	0.100	
5	35.35	0.125	0.55
6	42.42	0.150	0.65
7	49.49	0.175	0.74
8	56.56	0.200	0.85
9	63.63		0.94
10	70.7	0.225	1.03
11		0.250	1.13
	56.56	0.200	1.13
12	49.49	0.175	1.12
	35.35	0.125	1.05
Charles Inc. (Marcon)	21.21	0.075	0.99
15	1.414	0,005	0.30 CONSU



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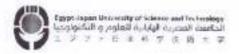


Table 11: Load-settlement data obtained at the second loading and unloading stages of the plate loading test performed at the location (KM 371+075 to 371+100)

Loading stage	Load (F) Normal stress (σ_0)		Settlement (S)
Loading stage	kN	MN/m ²	mm
0	1.414	0.005	0.30
15 1 1	7.07	0.025	0.53
2	14.14	0.050	0.67
	21.21	0.075	0.79
4	28.28	0.100	0.88
	35.35	0,125	0.96
5	42.42	0.150	1.01
7 = = =	49.49	0.175	1.09
3	56.56	0.200	1.15
9	63.63	0.225	1.22

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

Parameters	1st loading cycle	2nd loading cycle
(s ₀ ,max) MN/m ²	0.25	0.25
a _n (mm)	0.20	0.33
a, (mm/(MN/m²))	3.69	6.80
B _z (mm/(MN2/m ⁴))	0.12	13,26
Ev= 1.5 r/ (a1+a2, \$0, MAX)	120.92	129.14
Ev ₂ /Ev ₁	1.4	07

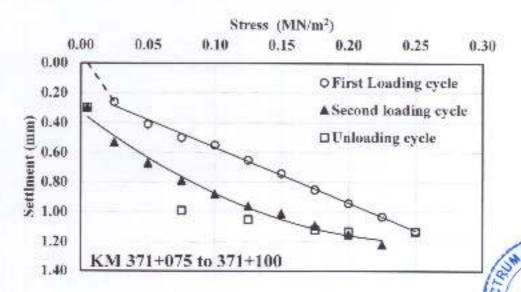
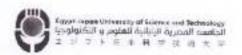


Figure 4: Load-settlement data: plate loading test performed at (KM 371+075 to

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4. Closure

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

Location	E _{vi} MN/m2	E _{v2} MN/m2	E _{v2} /E _{v1} ratio
KM 371+000 to 371+025	82.34	158.76	1.93
KM 371+025 to 371+050	136.24	174.64	1.28
KM 371+050 to 371+075	93.86	145.26	1.55
KM 371+075 to 371+100	120.92	129.14	1.07

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

Technical committee

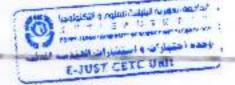
Dr. Mahmoud Ahmed

Prof. Dr. Mohamed F. M. Fahmy

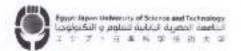
Lab Engineer

Mohamed A. Al-Najjar





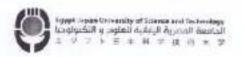




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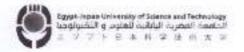
Appendix A





وحدة اغتيارات و استشارات المندسة المنبية

Location of test site:	KM 371+00	00 to 371+025	Field team	Mr.Mohamed Mamdouh	
Project title:		гиіп Project - Inshaa onstruction	Date:	11/5/2023	
Diameter of loading plate	6	600	Time	10:30:00 am	
		4/		10:58:00 am	
Lever ratio		1	Note:	Plean.	
Type of Soil	Prepared	Subgrade 2	CAT 9	6F	
Bedding material		40.5	4		
Temperature		t°C		VALUE	
Test regime	Loading Stage No.	Load (kN)	Dial Ga	uge Reading (mm)	
Loading Stage	0	1.414	-	10.00	
	1	7.07		9.80	
	2	14.14		9.72	
	3	21.21	9.65		
	4	28.28	9.49		
	5	35.35	9.29		
	6	42.42	9.16		
	7	49.49	9.00		
	8	56.56	8.86		
	9	63.63	8.77		
	10	70.7	8.64		
Unloading Stage	11	56,56	8.64		
AND PROCESS AND ENGINEERS	12	49.49	8.66		
	13	35.35	8.68		
	14	21.21		8.76	
	15	1.414	9.31		
l'est regime	Loading Stage No.	Load (kN)	Dist Ga	nge Reading (mm)	
Reloading Stage	0	1.414	151117 1112	9.31	
	1	7.07	1	9.15	
	2	14.14	1	9.05	
	3	21.21			
1	4	28.28	+	9.00 8.95 M CONSU	
	5	35.35	-	105/10/	
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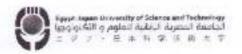
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Location of test site:	KM 371+025 to 371+050		Field team	Mr.Mohamed Mamdouh
Project title:	Electric Express Tr General C	Date:	11/5/2023	
Diameter of loading		~~	Time	11:05:00 am
plate	6	00		11:33:00 am
Lever ratio		1	Note:	
Type of Soil	Prepared	Subgrade 2	CAT 9	6F
Bedding material	-	-		
Temperature		°C		
Fest regime	Loading Stage No.	Load (kN)	Dial Ga	uge Reading (mm
Loading Stage	0	1.414		10.00
	1	7.07		9.65
	2	14.14		9.60
	3	21.21		9.55
	4	28.28		9.46
	5	35.35	9.35	
	6	42.42	9.27	
	7	49.49	9.19	
	8	56.56	9.10	
	9	63.63	9.00	
	10	70,7	8.92	
Unloading Stage	11	56.56	8.92	
A	12	49,49	8,93	
	13	35.35	8,99	
	14	21.21	9.06	
	15	1.414	9,66	
Test regime	Loading Stage No.	Load (kN)	Dial Ga	nige Reading (mn
Reloading Stage	0	1.414	77.00	9.66
The state of the s	1	7.07	9.43	
	2	14.14		9.35
	3	21.21		9.27
	4	28.28	+	9.20
الشارين شركسة	5	35.35	1	9.12
انشاء للمقاولات العامة construction	6	42.42	1	
aa general construction	7	49.49	-	9.08 9.04 SM CONS
14.5	1	56.56	9	9.05
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Location of test site:	KM 371+050	0 to 371+075	Field team	Mr.Mohamed Mamdouh	
Project title:	Electric Express Tr. General Co	Date:	11/5/2023		
Diameter of loading	66	00	Time	11:40:00 am 12:08:00 pm	
Lever ratio		1	Note:	-	
Type of Soil	Prepared !	Subgrade 2	CAT 9	66F	
Bedding material	-	-			
Temperature	24	°C			
Test regime	Luading Stage No.	Load (kN)	Dial G	rage Reading (mm)	
Loading Stage	0	1.414		10.00	
	1	7.07		9.75	
	2	14.14	9.68		
	3	21.21	9.57		
	4	28.28	- 3	9.43	
	5	35.35	9.33		
	6	42.42	3	9.17	
	7	49.49	9.07		
	8	56.56	8.92		
	9	63.63	8.83		
	10	70.7	8.69		
Unloading Stage	11	56,56	8.70		
e-months of the	12	49,49		8.71	
	13	35.35		8.78	
	14	21.21		8.85	
	15	1.414		9.55	
Test regime	Loading Stage No.	Load (kN)	Dial G	auge Reading (mm	
Reloading Stage	0	1.414		9.55	
	1	7.07		9.37	
	2	14.14		9.25	
	3	21.21		9.12	
	4	28.28	9,06		
شركة	5	35.35		9.00	
ساء للمشاه لات الماسات	a) 6	42.42		8.93	
naa general construction	7	49.49		8.93 8.87	
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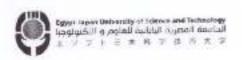
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ocation of test site:	KM 371+075 to 371+100		Field team	Mr.Mohamed Mamdouh	
roject title:	Electric Express Tra General Go	ain Project - Inshaa onstruction	Date:	11/5/2023	
Diameter of loading			Time	12:15:00 pm	
date	60	00		12:43:00 pm	
ever ratio		1	Note:	vege :	
Type of Soil	Prepared 5	Subgrade 2	CAT 9	66F	
Bedding material					
l'emperature		PC	DS-1-65	mes Bading (mm)	
l'est regime	Loading Stage No.	Load (kN)	marc	nuge Reading (mm) 10.00	
Loading Stage	0	1.414		9.74	
	1	7.07			
	2	14.14	-	9.59	
	3	21.21		9,50	
	4	28.28		9.45	
	5	35.35		9.35	
	6	42.42		9.26	
	7	49.49		9.15	
	8	56.56	33	9.06	
	9	63.63		8.97	
	10	70.7		8.87	
Unloading Stage	11	56.56		8.87	
Omoromy stage	12	49.49		8.88	
	13	35,35		8.95	
	14	21.21		9.01	
	15	1.414	_	9.70	
			Dial (lange Reading (mm	
Test regime	1.oading Stage No. 0	1.414	-	9.70	
Reloading Stage		7.07		9,47	
	2	14.14		9.33	
		21.21	9.21		
	3	28.28	-	9.12	
	4	35.35		0.0.1	
	5			8.99 Sh CO	
شركسن	6	42.42	-	8.91	
the second of th	7	Contraction of the Contract	1	8.85	
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Contractor Company	INSHAA GENERAL OF CONSTRUCTION Company		Designer Company			(SPECTRUM) Engineering Consulting Office				
Issued by	Name	Sign Date/ Serial Number 19/06/2023 (P.L.T.5)		Date/ Serial Number		Time				
Contractor	Eng. Mahmoud shaban			02:00 PM						
Received by GARB			(1	0	2.C2 F	50	3454	YY	181	MM
CONSULTANT	Eng. Mazen Essamy	PL	371	EW.	CS	20	06	2023	2	00

COOE-1	51 to 521 Station Reference	Di to \$3 Dapot Reference	Kp XXX Note
CODE 2		Work Activity	For Kilometer point only Start ifm is used
CODE-3		Sub Element of Activity	

Desc	ription of Materials	Sub Bailast 2.	Sub Bailast 2.						
Locat	ion to be Used	St. (371+000) To (3	St. (371+000) To (371+100)						
МАЯ	Approval No	M.A.R (B.S.1)				Date	29/04/2023		
Suppl	lier Name								
Test F	Requirement	P.L.T (DIN 18134)	S134) Specification REPOR		EARTHWORK SPECIFICATIONS & TESTING REPORT (DG21-41.2) VERSION 2 BY CIVECUM GROUP				
Reference Photos Yes / No Other		. 19	Rev UIR-S.B-(7)						
Item 1 2	Description PLATE LOAD TEST	A PERSON NAMED IN COLUMN	Unit	BER	Quantity 4	Arriva Date 20/06/2023	Note: 4 1 14		
3									

Comments by: Eng. Mazen Essamy (SPECTRUM)

Comments by: Eng. Also Abd-Ailstif (ER)

1 The Plate Load Test Result P.L.T (DIN 18134) is

Approved

1-Plate Load Test was carried- out by (Comibassal) 2-Results report attached and acceptable with project specifications.

3-Final approval is subject to above mentioned comments.

IC Chewi a war et al in the construction

Organisation	Name	Sign	Date	A-AWC-R
Contractor	Eng. Mahmoud shaban	ويستخبانه	∠ 20-06-2023	A
QA/QC*	Eng. Mazen Essamy			A
GARB**	Eng. Margret magdy			,
Employers Representative	Eng. Alsa Abd-Allatif	In Es	21-6-2023	Auk

^{*} Designer ** Alignment / Bridges: Culvert Only



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Technical report of Plate Loading Test (DIN 18134)

General : SYSTRA

Consultant : SPECTRUM

شركة إنشاء للمقاولات العامة : Contractor

Project : ELECTRIC EXPRESS TRAIN

Sample : Sub-Ballast (2)

Station : ST(371+000) TO ST(371+100)

Date of Test : 20/6/2023

QC : 1453



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Internal inspection and laboratories sector

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

Introduction:

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

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

Test methods:

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

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

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

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

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

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

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

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

Description of exprement:

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

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

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

4- Following unloading, a further reconditioning sycle was carried out, in which, the load was increased only to the penultimate stage q

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

600

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

Londing stage no.	Lond (F)	Normal stress (s ₀) MN/m	Settlement of loading place 5 (mm)	
0	1.414	0,005		
1	7,07	0.025	0.07	
2	14.14	(1.1(54)	8.14	
3	21.21	0.075	0.21	
4 29.28		0.199	8,26	
	35.35	0.125	0.32	
.0	42.41	42.41 0.150	H.44	
	49.49	0.175		
8	56.56	0,200	0.50	
9	63,63	0.215	0.55	
(0	70.7	0.250	0.60	
11	56.56	0.200	0.59	
12	49.49	0.175	11.58	
13	35.35	0.125	0.47	
14	21,21	0.075	8,35	
15	1.414	8,005	0.17	

Table 2: Measured values for second londing cycle

Loading stage no.	ling stage no. Loud (F)		Settlement of hunding plate S (mm)		
15	1.414	11,005	0.17		
Jń	7.07	0.025	0.25		
17	14.14	0,059	0.29 0.35 0.41		
18	21.21	0.075			
{9	28,28	0.100			
20	35.35	0.125	0.46		
21	42.42	0.150	0.52		
22	49,49	0.175	0.56		
2.3	56.56	0,290	0.63		
24	63,63	0.225	1065		

Table 3: Compilation of results

Ist loading evele	2nd loading cycle
0.250	0.250
0.008	6.164
2.680	2.747
1.152	-3.298
198.12	207.13
	0.250 0.008 2.680 4.152

شرکیدة انشاء للعقاولات العامة IGC inshaa general construction

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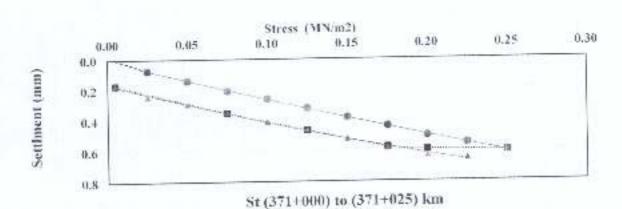


Fig. 1: Load-settlement curve, fitting curves according to Table 1 and Table 2 for the first and second loading cycles

- Measurment points from the first loading cycle.
- Measurment points from the unloading cycle
 Measurment points from the second loading cycle
 - 5 Settlement in mm
 - O. Normal stress MN/m2







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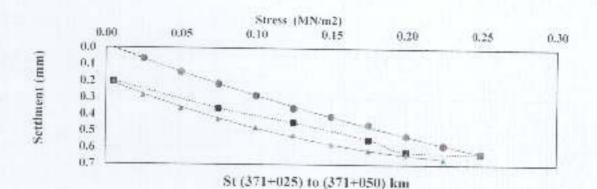


Fig. 2: Load-settlement curve, fitting curves according to Table 4 and Table 5 for the first and second loading cycles

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

5 Settlement in mm α_c. Normal stress MN/m³







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> St (371+050) to (371+075) km 500

Table 7: Measured values the first leading excle and unloading excle

Loading stage no.	Lunt (F) RN	Normal stress (s _k) MN/m ²	Settlement of Jointing plate S (mm) 6.00	
- P	1.414	0.005		
1	7,07	0.025	6,00	
2	11.11	6,rën	0.14	
1	\$1.21	0.075	0.19	
+	25,25	28,28 0,100		
5	35.35	0.125	0.26	
Ď.	42.43	6.139	0.32	
7	49.49	0.175	0.39	
8	\$6.56	6.200	0.45	
9	63.63	5,228	0.52	
10	78.7	0.250	0.55	
-11	56.56	9,200	0.62	
12	The state of the s		0.55	
13.	L. C. Tributania and C.		0.44	
14	21.21	0.075	0.32	
15	1.41 #	0.005	0.16	

Table 5. Measured values for second booling cycle

Londing stage no.	Lead (F) kN	Normal stress (89) MNm2	Settlement of isotilog plate S (1994) 0.16 0.20 0.25 0.31 0.36 0.42 0.47	
15	1.414	0.005		
10	7.07	0.025		
17	14.14	0.050		
-18	21.21	0.075		
19	28.28	0.100		
20	50.50	0.125		
21	42.42	0.156		
12	49.49	0,175	0.52	
23	56.56	0,200	0.87	
14	63.63	0.225	0.62	

Table 9: Compilation of results

	phianter in trains	4
Parameters	be leading cycle	2nd loading cycle
(64+m) MN/m ²	6,338	0.250
a _s (mm)	4,056	0.150
a; (mm/(MN/m*))	1.407	2.165
x ₂ (mm/(MN ² /m/1)	2,547	-0.288
200 (4 Tab. 0 a u.s.)	220.21	215,00
The Contract of the Contract o	220.21	2150



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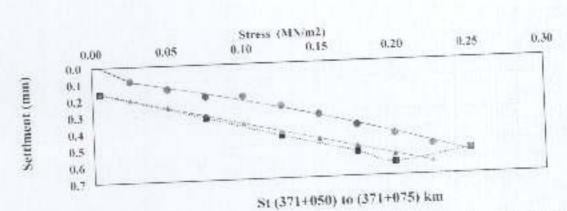


Fig. 3: Load-settlement curve, fitting curves according to Table 7 and Table 8 for the first and second loading cycles

- Measurment points from the first loading cycle
- Measurment points from the unloading cycle Measurment points from the second leading cycle
 - 5. Settlement in mm
 - Gg Normal stress MN/m2







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

600

Eable 16: Measured values for first loading evels and unbading evels

1 anding stage no.	Lond (F) &S	Normalarress (s _i) MNm ²	Settlement of harding plate 3 (mm)		
.0	1.81	6,005			
1	7.07	0.025	0.07		
3	14.14	0.050	0.15		
3	21.21	0.075	0.21		
4	28.28	0.100	0.28		
5	35.35	0.125	0.34		
- 6	42.42	0.150	0.40		
7	49.49	0.175	0.45		
8	36.50	0.200	0.80		
9.	65.65	R.225	0.54		
60	20.7	0.350	0.58		
11	50.50	0.203	0.57		
12	49.49	0.175	0.50		
13	35.15	0.125	0.43		
14	21.21	0.075	0.30		
15	0.014	0.005	9.20		

Table 11: Measured values for second bacture cycle

Landing stage no.	Load (F)	Normal stress (ab) MN·m3	Settlement of tending plate 8 (0.20) (0.20) (0.28) (0.32) (0.32) (0.43) (0.43) (0.44) (0.52) (0.57) (0.59) (0.63)	
15	1.414	0.005		
36	7,07	0.625		
17	14,14	11.050		
18	21.21	0.075		
19	18.15	0.500		
10	35.35	0.125		
21	42,42	0.150		
22	25.45	0.375		
2.1	56.56	0.200		
74	62.63	6.225		

Table 12: Compilation of results

Parameters	Let leading sycle	2nd teaning cycle
logent MN/m	0.250	0.250
4, (mm)	-1000	0.196
a, (mmqMNm'))	2.197	2,698
a ₂ (min/(MN//m ²))	-3-48b	3.515
N-MADE TANK	192.44	247.34
3777	4.4	

wneral construction

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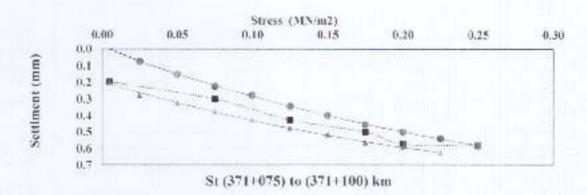
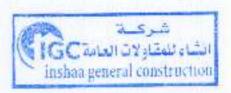


Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles

- Measument points from the first loading cycle
 Measument points from the unloading cycle
 Measument points from the second loading cycle
 - 5- Settlement in mm co Normal stress MK/m³







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MATERIAL INSPECTION REQUEST











Contractor Company	INSHAA GENERAL (Company	of CONSTRUCTION	Desi	gner C	sqmo	ŋγ	100000	niciva) Es lung Offic		ing
1100 Property	Name	Sign	Date	Date/ Serial Number 20/06/2023 (P.LT.6)		Number Time				
Issued by Contractor	Eng. Mahmoud shaban	a1/2 - 1				02:00 PM				
Received by	1		EC1	C1 32 C2 20		MM	YY	нH	WM	
GARB CONSULTANT	Eng. Mazen Essamy	PL	371	EW	CS	21	06	2023	2	00

CODE-1	S1 to S21 Station Reference	D1 to 53 Deput Reference	Kp XXX Note For Kilometer point only Start Km is used
CCDE 2		Work Activity	
CODE-3		Sub Element of Activity	

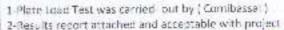
Descri	iption of Materials	Sub Ballast 2.						
Locati	on to be Used	St. (371+100) To (371+275)						
MAR /	Approval No	M.A.R (B.S.1)			Date	29/04/2023		
Suppli	ier Name							
Test R	Requirement	P.L.T (DIN 18134)		Specific	ation.		IFICATIONS & TESTING 2) VERSION 2-BY CIVECON	
Refer	ence Photos	Yes / No		Other		Rev UIR-S.B-(8)	&(9)	
Item	Description	4 - 3	nt Qu		Quantity	Arrival Date	Note	
1	PLATE LOAD TEST		NUMBER		7	21/06/2023		
2	MININGS TO A STATE OF							
3						-		
4					merchanic colonic (co	and the second second		

Comments by: Eng. Mazen Essamy (SPECTRUM)

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

1-The Plate Load Test Result P

Approved



specifications.

3-Final approval is subject to above meattored انشاه للمقاولات العادة ي comments.

tushan general countriction APPROVAL STATUS A-AWC-R Date Sign Organisation Name 21-05-2023 Eng. Mahmoud shaban Contractor Eng. Mazen Essamy QA/QC * GARB** Eng. Margret magdy 22-6-2023 Employers Eng. Alaa Abd-Allatif Representative

Disigner

^{**} Allayment / Undges Colvert Only



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Technical report of Plate Loading Test (DIN 18134)

General

Consultant

Contractor

Project

Sample

Station

Date of Test

QC

SYSTRA

SPECTRUM

شركة إنشاء للمقاولات العامة

ELECTRIC EXPRESS TRAIN

Sub-Ballast (2)

ST(371+100) TO ST(371+275)

21/6/2023

1459





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Introduction:

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

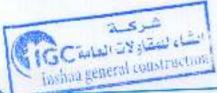
The test to be carried out on the native soil according to German specifications DIN 18134.

Test methods:

- 1- The German standard DIN 18134 was applied to define the apparatus used, the loading system, test
- 2- Loading plates with a diamter of 600 mm have a thickness of 25mm and are provided with equally conditions, and procedure for plate load test. spaced stiffners with even upper faces parallel to the plate bottom face to allow 300 mm plate to be
- 3- The loading system consisted of a hydrulic pump connected to a hydrulic jack of 700 bar capacity, which is capable of applying and releasing the load stages.
- 4- The dial gauge used to measure the plate settlement has a resolution of 0.01mm and the lever ratio was equal to 1.
- 6- The plate was carried out on a native soil (sand-gravel). The test surface area was levelled and the The temperature at the time of the test was 25°.
- 7- The hyrulic jack was placed on the middle of, and at normal to, the loading plate beneth the reaction
- 8- The reaction loading system was a heavey multi-purpose excavator (more than 20 ton).

Description of exprement:

- 1- Loading, unloading and reloading regims were applied according to DIN 18134 for the plate load test
- 2- Prior to the test, the force transeducer and dial guage were set to zero, after which a load was applied
- 3- In the first loading cycle, the load was increased until a normal stress of 0.25 MN/m2 was reached, and the loading increaement was 0.025 MN/m2. The load was released in four stages.
- 4- Following unloading, a further second loading cycle was carried out, in which, the load was increased only to the penultimate stage of the first cycles pe



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> St (371+100) to St (371+125) km 600

Table 1: Measured values for first leading tyels and unloading confe

Loading stage on.	Lond (F)	Normal stress (sa) vivim	Settlement of inading plate S (mm)
0	1.414	0.005	41,00
- P	7.07	0.025	0.07
1	14.14	0.050	
-	21,21	0.075	0.12
4	28.28	0.100	0.22
5	35.35	0.125	0.28
6	42,42	0.150	0.34
7 8	49,49	0.175	0.40
9	56.56	0.200	Outri
10	63.63	0.225	0.52
	70.7	0.250	0.58
11	56.56	0.200	0.57
13	49,49	0.175	# 55
14	35.55	0.125	0.44
15	21,21	0.079	0.31
1.5	L414	0.005	0.15

Table 2: Measured values for around londing cycle

Loading stage no.	Load (F)	Normal stress (s0) MN/m2	Settlement of loading place S (mm)
1.5	1,414	0.005	0.13
16	7.07	0.025	0.17
17	14.14	0.050	0.21
18	21.21	0.075	The state of the s
19	28.28	0.100	0.26
10	35,35	0.125	0.31
21	42,42	11,150	0.42
22	49.49	0.175	The state of the s
2.1	56.56	0.200	0,47
24	6.1.63	0.225	0.53

Table 3: Compilation of results

	abitation of testific	
Parameters	1st loading cycle	2nd loading cycle
(6 _{9,600}) MN/m ²	0.250	0.250
A _O (man)	0.016	0.121
$a_1 (minr(MN/m^2))$ $a_2 (minr(MN^2/m^2))$	6,917	1.875
	1.415	0,873
Lt. (0) (4, -0, -0, y(x))	198,19	215.15
Charles I	1.09	The state of the s

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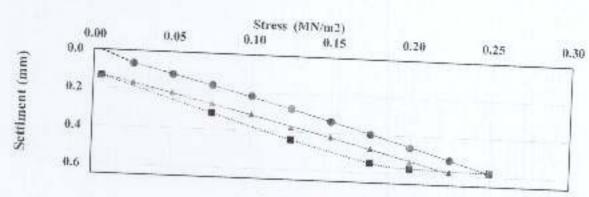
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St (371+100) to St (371+125) km

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

- Measurment points from the first loading cycle.
- Measurment points from the unloading cycle
 - Measurment points from the second loading cycle
 - 5 Settlement in mm
 - Co Normal stress Mry/m"







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> St (371+125) to St (371+150) km 600

Table 4: Mensured values for first loading cycle and unboding cycle

Loading sage no.	Loud (F) kN	Normal moss (sa) MN/m	Settlement of fronting plate S (aun)
Q	1.014	0.905	0.00
1	7.07	0,625	0.07
2	14.14	0,050	0.12
3	21.21	0.075	0.16
4	38.35	0.100	0.21
	35.35	0.125	0.27
- 6	42.42	8.150	0.32
?	49.49	fc178	0.38
8	56.56	6,200	0.44
9	63.63	0.225	0.50
10	76,7	0.250	0.51
11	56,56	0.200	0,56
12	49:49	0.175	6.54
1.3	35.35	0.129	0.42
14	21.21	0,075	0.33
15	1.414	9,005	0.11

Table 5: Measured values for second hading evels

Leading stage as:	Load (F) kY	Nurmat serves (s0) M.Nem2	Sefficient of Marting plane 5 (mm)
15	1.414	0.005	0.11
16	7.07	0.025	0.16
17	14.14	0.050	0.21
14	-21.21	0.675	0.26
19	28.28	0.105	0.31
20	35.35	0.125	0.37
21	42.42	0.150	0.41
21	49.49	0,175	0.45
23	96.56	0.200	0.51
14	63.63	0.225	0.87

and see and motion of results		
Parameters	1st leading eyele	2nd feeding cycle
$(\sigma_{k_{BMS}}) MN/m^2$	6.290	0.250
× _s (mm)	0.034	0.184
B; (mm/(MN/m²))	1.558	1.073
$A_1 (\text{mmr}(MN^2m^3))$	2,344	-0.211
Exertification of sax	209,90	122.27
E(2/E)	1.00	



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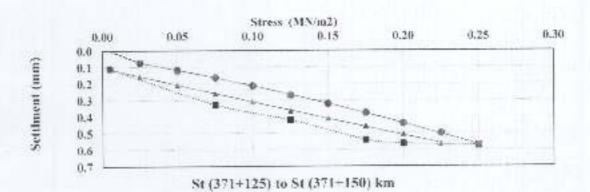


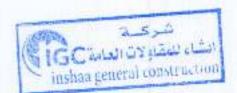
Fig. 2: Load-settlement curve, fitting curves according to Table 4 and Table 5 for the first and second loading cycles

Measurment points from the first loading cycle Measurment points from the unloading cycle Measurment points from the second loading cycle S Settlement in mm

σ_α Normal stress MN/m²







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> St (371+150) to St (371+175) km 600

Table 2: Measured values for first leading cycle and unhading cycle

Loading stage on.	1 and (F) 5/8	Normal serves (a) MNqu ²	Settlement of loading plans S (mm
0	1.414	0.005	0.00
1.	7.07	0.025	0.05
2	14.14	0,050	0.10
3	21.21	0.075	0.16
4	28.28	0.100	0.21
5	15.35	0.125	0.27
8	12.42	0.150	0.34
7	49,49	0.575	6,40
8	56,58	0.200	6,46
9	62.63	0.325	0.54
10	70.7	0,250	0.61
FI.	56,56	0.200	0.68
13	49.49	0.135	0.58
13	35.35	0.125	0.45
14	21.21	0.075	0.32
15	1.414	0,005	0.10

Table 8: Menured values for second horting cycle

Leading stage no.	1 and (F)	Normal serves (sli) 51N/m2	Settlement of tooling plate S
15	1.414	0.005	0.10
16	7.07	0.025	6.14
17	14.14	0.050	0.15
16	21.21	0.075	0.24
1.9	28.28	0,100	0.39
20	35.35	0.125	0.35
21	42.42	0.150	0.41
22	49,49	0.175	0.46
23	56.56	0.200	0.53
14	63.63	0.225	0,58

Table 9: Compilation of results

Paraneters	1st leading cycle	2nd loading cycle
(G _{Level}) MN/m ²	0,250	0.250
a _{tr} (mm)	-0.001	0.089
4 ₁ (mm ² (MN ² m ²))	1,946	1.991
a ₂ (mm(MN/m ²))	1.960	1,533
Even 1.5 of (mg+#g % squar)	184.77	200.99
ETT-	1.0	9

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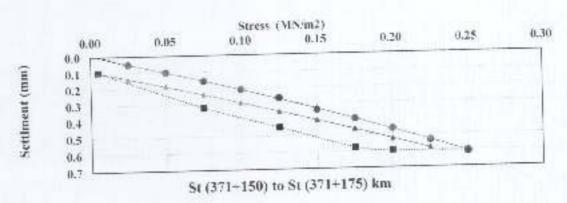


Fig. 3: Load-settlement curve, fitting curves according to Table 7 and Table 8 for the first and second loading cycles

- Measument points from the first loading cycle Measurement points from the unloading ryde
- Measurment points from the second leading cycle
 - S Settlement in sun G. Normal stress MN/m







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> St (371+175) to St (371+200) km 500

Table 10: Measured values for first looking cycle and enloading cycle

	Load (f)	Suranzisteessis, MNm.	Scatteneur of leading plate 'S (mm)
Landung stage un.		1,000	0.00
	1.414	0,005	6.08
"	7.07	0.025	0.14
1	14,14	0.050	9.19
2	21.21	0,075	0.24
3	18,18	0.100	0.29
- +	35.35	8/125	0.34
	42.42	0.150	IL40
- 6	19,49	0.175	0.46
-	56,56	0,200	0.43
8	43.67	0,250	0.53
	70.7	0.200	0.47
10	56,56	0,175	0,55
11	49.49	0.135	0.41
13	35.35	0,695	0.37
11	21.21	0.005	0.13
14	1.414	to recent touting evels	
	Table 11: Measured	splines for second footling evels	Settlement s

To You	ble 11: Measured values	for second fairling even	Sentiement of
	Lant (E)	Nermal acess (801. McNm2	trading plant S
Leading stage 40-	IN IN	0,005	0.12
15	1,414	0.025	0.17
16	7.07	0.090	6,12
17	14.14	0.025	0.28
15	21.21	R.100	6.52
19	28.28	0,125	0.38
20	35.35	0.150	0.43
21	42.42	0.125	0.47
23	49.49	0.200	0.52
2.3	56.50	9,229	0.58
24	63.63	ipilation of results	

A CONTRACTOR	lat fending cycle	2nd mediag eyeb
Parameters	0.285	0,250
(O _{total}) MN/m	0,842	0.100
a _n (mill)	1.840	2,227
4, (mm/(MN(m²))	1.192	0,731
4- (mm²(MN²/m²))	218.48	186,78
TONSU	6,5	9

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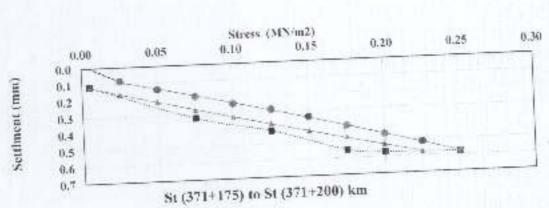
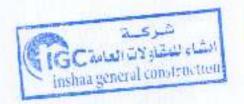


Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second loading cycles

- Measurment points from the first loading cycle
- Measurment gaints from the unloading cycle
- Measument points from the second loading cycle
 - 5 settlement in mm
 - Go Normal stress N/N/m







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> St (371+200) to 5t (371+225) km 600

Table 13: Measured values for first burling cycle and indesting cycle

(,making stage 24.)	Load (F) kN	Normal stress (s.) MS/m ²	Settlement of tording plate \$ (mm)	
0	1.414	0.605	6.04	
-	1.97	6,025	0.07	
	14.14	0,050	0.12	
- 1 -	21.21	10075	0.18	
1	28.38	0.100	0.23	
- 1	35.35	0.125	0,18	
	92.42	0.350	0.33	
- F	40.49	6,115	0.39	
8	26.96	0.200	0.44	
9	63.63	0.225	0.49	
10	70,7	0.250	0,58	
11	56.56	0.200	0.51	
13	49,49	0.175	0.55	
13	35.35	0,125	11.44	
14	21.21	0.0175	0.34	
15	1.414	0.005	0.16	

Table 14: Messered values for second loading cycle

Loading stripe on.	ng singe on. Lond (F)		Sentement of loading place 5 (min)		
15	1414	0.905	0.16		
	7.07	0.105	0,19		
16 7.07 17 16.14 18 21.21 19 28.28 20 35.35		0.050	0.23 618		
		0,075			
		0.105	0.38		
		0.125			
	42.42	0.150	0.43		
23	49.49	0.175	0,43		
23 76.46		0.200	0.53		
24	63.63	0.225	R.98		

Table 15: Compilation of results

Table 15: Compilation of results				
Parameters	by faciling cycle	2nd indiag tytle		
(a _{toka}) MNon ¹	0.250	0.250		
n _e (mm)	0.037	0.149		
a. (mm/(MN/m ³))	1,855	1.046		
actminets (m l)	1,192	1,301		
Carlot Carlot	209.22	218.25		
16 2 2000 4	1.0			

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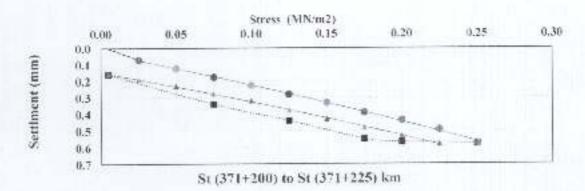


Fig. 5: Load-settlement curve, fitting curves according to Table 13 and Table 14 for the first and second loading cycles

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

S Settlement in mm

or, Normal stress MN/m²







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> St (371+225) to St (371+250) km 600

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

Londing stage no.	Load (F) Nurmal stress (sg.) M!		Settlement of freading plate S (2000)
-0	1.414	0.005	0.00
1	2,07	10123	80.0
2	14.14	0.050	0.12
3	21.21	0,075	0.17
1	28.28	0.100	0.22
5	35,35	0.125	0.28
6	42.42	0.150	0.32
1	45,49	0.175	0,38
. 8	56,56	0.200	0.47
9	83.63	0.225	0.55
10	70.7	0.250	0.61
- 11	50.50	6.200	0.60
12	49.49	0.175	0.55
1.1	35.35	0.125	0.44
14	21.21	0.025	0.32
15	1.414	0.005	0.14

Table 17: Measured values for second teating evelo-

Loading stage an	Food (F)	Normal stress (s0) MN:m2	Settlement of juncting plate ((mor)	
15	1.111	0.005	0.14	
16	7.07	0.025	0.18	
17	14.14	0.050	0.22	
18	21.21	0.025	0.27	
19	28.28	0.100	0.31	
20	35.25	0.125	0.36	
21	42.47	R (5)	0.43	
22	49.49	0.175	0.45	
23	56.56	9,290	6.52	
24	65.65	0.225	0.58	

Table 18: Compilation of results

The state of the s					
Paramoters	lar looning cycle	2 aid lumling eyel 0.350			
(et _{erra}) MN/m ²	0.250				
a _n (mm)	0.0+4	0.135			
# ₁ (m/m ² (MN/m ²))	1,355	1.575			
a ₂ tnun((MN*/m*t)	1,779	1.784			
Ex 1.5 part represent	195.69	222.63			
O. S. RULL		SASSESSI IN ROLL			

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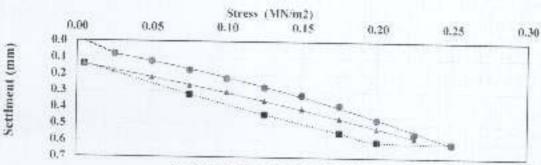
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St (371+225) to St (371+250) km

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

- Measurment points from the first leading cycle
- Measurment points from the unloading cycle

 Measurment points from the second loading cycle
 - 5 Settlement in mm
 - G₂ Normal stress MN/m²







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> 5t (371+250) to St (371+275) km 600

Table 19; Mensered values for first hading cycle and amounting

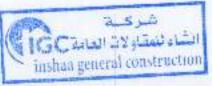
Londing stage no.	Load (F)	Normal stress (se) MN(m)	Settlement of loading plane 8 thm	
- 0	1.414	0.005	0.00	
1	7,67	0.025	11.69	
1	14.14	6,090	0.15	
1	21.21	0.075	6,39	
4	15,25	0.100	6.26	
3	35,55	0.125	0.32	
6	42.42	0.150	0.48	
7	49.49	0.175	0.43	
5	56.56	0.200	0.49	
9	63,63	0.225	0.54	
10	70.7	0.250	0.61	
11/	56.56	0.200	0.46	
12	39.49	0.175	0.55	
13	35.35	0.125	0.45	
14	21,21	0.075	0.34	
15	1.414	0.005	0.14	

Fable 20: Measured varges for second lending evel-

Londing stage no.	Load (F) kN	Normal stress (sil) MN/m2	Settlement of loading plane 8 (non)	
15	1414	0.005	0.14	
34	7,07	0.02%	0.18	
- 17	14.14	14.14 0.050		
18	21.21	0.075	0.22	
19	28,28	0.300	6.31	
20	35.35	0.125	0.37	
21	42.42	0.159	0.42	
22	49.49	B.178	0.47	
23	56.56	0.200	0.54	
24	63.63	0,225	0.60	

Table 21: Commitation of results

Parameters	1st loading eyele	2 ad leading cycle
19 ₁₀₀ MNm ³	(8,250)	0.250
A ₆ (1000)	0.034	0.136
a Imaci Managar	2.215	1.60%
A COMPOSE AND TRA	0.305	1.971
En Sphantin to make	196.44	21455
L KAR	1.46	71 N 10 10 10 10 10 10 10 10 10 10 10 10 10



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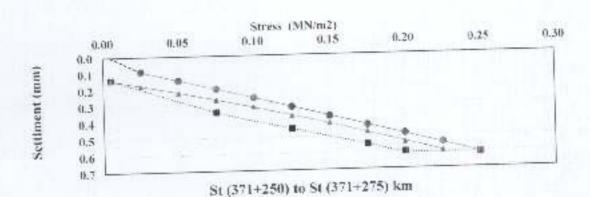


Fig. 7: Load-settlement curve, fitting curves according to Table 19 and Table 20 for the first and second loading cycles

- Measurment points from the first leading cycle
- Measurment points from the unloading cycle Measurment points from the second leading cycle

 - 5 Settlement in mm
 - O₂ 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 top of the sub-ballast layer of the electric express train project at location St (371+100) to St (371+275) km in accoundance to the German standard , DIN 18134 are illustrated in table 22.

Table 22 : Test results

Location	Ev1(MN/m²)	Ev2(MN/m ²)	Ev2/Ev1 ratio
St (371+100) : St (371+125) km	198.19	215.15	1.09
St (371+125) : St (371+150) km	209.90	222.27	1.06
5t (371+150) : 5t (371+175) km	184.77	200.99	1.09
St (371+175) : St (371+200) km	210.48	186.78	0.89
St (371+200) : St (371+225) km	209.22	228.29	1.09
5t (371+225) : St (371+250) km	195.69	222.63	1.14
St (371+250) : St (371+275) km	196.41	214.53	1.09

Lab Director

Eng/Eman Kandil

lman.

For Dr. H -

Dr / Mohamed Mostafa Badry





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MATERIAL INSPECTION REQUEST













Contractor Company	INSHAA GENERAL (Company	OF CONSTRUCTION	Desi	gner C	ompa	ny		TRUME L		ng
to exceed the	Name	Sign	Date	/ Seri	al Nur	nber	Time	ė.		
Issued by Contractor	Eng. Mahmoud shaban	1 وسيحان	-8		/2023 .T.7)		02:0	0 PM		
Received by	20 2702 20		2.1	2211	Q2-	00	MM	YY	HH.	MM
GARB CONSULTANT	Eng. Mazen Essamy	P	371	EW	C5	22	06	2023	2	00

CERTE-1	51 to 521	D1 to 53	Rp XXX Note
	Station Reference	Dopot Reference	For Kilometer point only Start Km is used
CODE 2	and the second second	Work Activity	
COGE-3		Sub Element of Activity	

Description of Materials Su			Sub Ballast 2.						
Locat	tion to be (ised	St. (371+275) T	o (371+50	10)				
MAR Approval No		M.A.R. (B.S.1)				Date	29/04	/2023	
Supp	lier Name								
Test I	Requireme	nt	P.L.T DIN 181	34)	Specifi	cation		FARTHWORK SPECIFICATIONS & TESTIN REPORT (OG21-41,2) VERSION 2 BY CIVE GROUP	
Refer	rence Photo	os.	Yes / No		Other		Rev UIR-5.8-(6)&(9)&(10)		
tem	Descripti		2 1	- Un	it a	Quantity	Arrival Date	Note	1 × 3
1	PLATE LO	AD TEST		NU	IMBER	9	22/06/2023		
2						-	The state of the s		
2									
A Comr L-The	Plate Load		ESSAMY (SPEC		1 2-	Plate Load Te Results repor	r: Eng. Alaa Abd- est was carried- o t attached and as	ut by Co	mibassal)
4 Comr	Plate Load			4 CONSULT	1 2- 50 3- 00	Plate Load Ta Results repor edificacions. Final approva imments	st was carried- or t attached and as is subject to abo	ut by ; Co coeptable overment	mibassal) with project oned
1-The Appro	Plate Load		SPECTAU	4)15 CONSULTI	1 2- 30 3- 00	Plate Load Ta Results repor edificacions. Final approva imments	st was carried- or t attached and as is subject to abo	ut by ; Co coeptable overment	mibassal) with project oned
4 Comr 1-The Appro	Plate Load oved	Test Resul	SPECTAU	4 CONSULT	1 2- 30 3- 00	Plate Load Ta Results repor edificacions. Final approva imments	ist was carried-or t attached and at it is subject to abo	ut by ; Co coeptable ove ment معاولات القاولات إ oral com	mibassa() with project oned oned struction
4 Comr L-The Appro Organ	Plate Load oved nisation ractor	Test Resul	SPECTAL	4)15 CONSULTI	1 2- 30 3- 00	Plate Load Ta Results repor edificacions. Final approva imments	ist was carried-or t attached and at it is subject to abi	ut by ; Co coeptable ove ment معاولات القاولات إ oral com	mibassa() with project oned oned struction A-AWC-R
4 Comp 1-The Appro	Plate Load oved nisation ractor	Name Eng. Mai	SPECTAL SPECTA	4)15 CONSULTI	1 2- 30 3- 00	Plate Load Ta Results repor edificacions. Final approva imments	ist was carried-or t attached and at it is subject to abi	ut by ; Co coeptable ove ment معاولات القاولات إ oral com	mibassa() with project oned oned struction A-AWC-R

^{*} Designer ** Alignment / Bridges: Culvert Only



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Technical report of Plate Loading Test (DIN 18134)

General

Consultant :

Contractor :

Project Sample

Station

Date of Test

QC

SYSTRA

SPECTRUM

شركة إنشاء للمقاولات العامة

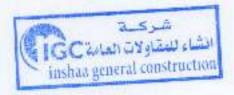
ELECTRIC EXPRESS TRAIN

Sub-Ballast (2)

ST(371+275) TO ST(371+500)

22/6/2023

1476





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Introduction:

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

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

Test methods:

- 1- The German standard DIN 18134 was applied to define the apparatus used, the loading system, test conditions, and procedure for plate load test.
- 2- Loading plates with a diameter of 600 mm have a thickness of 25mm and are provided with equally spaced stiffners with even upper faces parallel to the plate bottom face to allow 300 mm plate to be placed on top of it.
- 3- The loading system consisted of a hydrulic pump connected to a hydrulic jack of 700 bar capacity, which is capable of applying and releasing the load stages.
- 4- The dial gauge used to measure the plate settlement has a resolution of 0.01mm and the lever ratio was equal to 1.
- 5- The temperature at the time of the test was 25°.
- 6- The plate was carried out on a native soil (sand-gravel). The test surface area was levelled and the plate was bedded on this surface.
- 7. The hyrulic jack was placed on the middle of, and at normal to, the loading plate beneth the reaction loading system and secured against tiliting.
- 8- The reaction loading system was a heavey multi-purpose excavator (more than 20 ton).

Description of exprement:

- 1- Loading, unloading and reloading regims were applied according to DIN 18134 for the plate load test to estimate the resilient modulus
- 2- Prior to the test, the force transeducer and dial guage were set to zero, after which a load was applied corressponding to a stress of 0.01 MN/m2.
- 3- In the first loading cycle, the load was increased until a normal stress of 0.25 MN/m2 was reached, and the loading increaement was 0.025 MN/m2. The load was released in four stages.
- 4- Following unloading, a further second loading extra via carried out, in which, the lead was increased only to the penultimate stage of the first cycle:



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> St (371+275) to St (371+300) km 600

Fable 1: Measured values for first booting cycle and undoading cycle

Londing stage no.	Load (F) kN	Normal stress (8g) MN/m ²	Sattlement of loading plate S (mm)
0	1,414	0.004	0.00
1.	7.07	0.025	0.08
2	14.14	0.050	0.14
3	21,21	0.075	0.19
+	28,28	0,100	0.25
	35,35	0.125	0.31
-6	42.42	0,154	0.37
10-2	49,49	0.175	0.42
8	56.56	0.200	0.28
9	63.63	0.225	0.53
10	207.2	0,250	0.59
H	36,36	0,200	0.58
12	49,49	0.175	9.56
13	35,35	0.125	0,43
14	21.21	0.079	0.30
15	1.414	0.005	0.12

Table 2: Measured values for second loading cycle

Londing stage no.	Load (F) kN	Normal scress (s0) MN/m2	Sittlement of loading plate S (min)
1.5	1.414	0.565	0.12
16	7,07	0.025	0.16
17	11.14	0.050	8,20
18	21.21	0.075	0.25
19	28.28	0,100	0.30
20	35.35	0.125	0.35
11	42.42	0.150	0.40
22	19, 19	0.175	6.46
23	56.56	B.200	6,52
24	63.63	0.325	0.54

Table 3: Commitation of results

	TARREST OF PESSINS	
Parameters	1st boiling cycle	2nd loading cycle
(G _{b,ten}) MNon	0.250	0.250
a, (may SPEC)	6.022	0.107
a) (mmi) (min)	2,345	1.991
#; turney year	-0.380	0.053
Ev- Life (S (Que))	200,01	226,67
4 PAIN 5 7 PAIN	1.1.	

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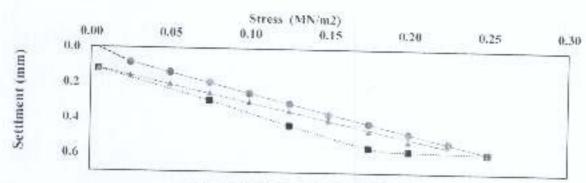
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St (371+275) to St (371+300) km

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

- Measurment points from the first loading cycle

 Measurment points from the unleading cycle

 Weasurment points from the second loading cycle
 - S Settlement in mm o₀ Normal stress MN/m²







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> St [371+300] to St (371+325) km 600

Table 4. Measured values for first leading eyele and unleading eyele

Leading stage no.	Load (F) kN	Normal atress (s.) MN/m ²	Settlement of loading plate S (non-
0	4,414	0,005	0,00
1	7.87	0.025	0.00
4	1414	0.080	0.13
3	21.21	0.075	0.19
+	38.28	0.100	0.25
	35.35	0.125	0.30
- 6	+2.+2	0.150	0.35
1	49.49	(c) 7.6	6.41
- 8	56.50	0.200	0.46
9	8583	0.225	6.52
10	20.2	6.250	0.56
11	56.56	0,200	0.55
13	49.49	0.175	0.54
13	35.35	0.125	0.41
14	1):31	0.675	0.30
14	1.414	0.005	0.14

Fahle 5: Measured values he second fending cock-

Leading stage to.	Load (F) kN	Normal stress (sd) MN/m2	Settlement of loading place S (mm)
15	1,414	6.005	0.14
16	7.07	0.025	0.19
17	14.14	0.050	0.25
15	21.21	0.075	0.29
19	18,28	0.100	6,31
26	35.35	0.125	0,39
21	42.42	(0.15)	6.44
32	49.49	0.178	0.46
23	56.56	0.200	0.53
24	65/63	0.225	0.50

Table 6: Commission of results

Parameters	by lighting cycle	2nd loading evelo
(6 _{kea}) MN/m ²	0.250	0.250
a _x (mm)	0.025	0.131
n ₁ (min/(MN/m ²))	3.234	2.51
a: (mm/M) at TRUE	-0.303	-0.862
Eve L5 may age and	209.82	235,58
EMEVY - E &	1.1.	ž



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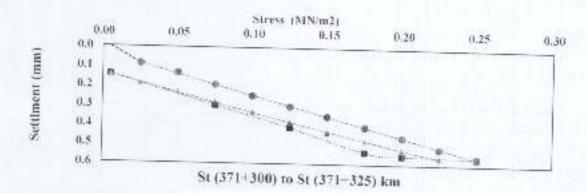


Fig. 2: Load-sottlement curve, fitting curves according to Table 4 and Table 5 for the First and second loading cycles

- Measurment points from the first loading cycle
- fréeaurment points from the unloading cycle
 - Measurment points from the second luading cycle
 - 5 Settlement in mm
 - on Normal stress MN/m³







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> St (371+325) to St (371+350) km 600

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

Landing strep: an.	Land (F) KS	Normal atress (s ₆) MN/m ²	Settlement of loading plate 5 (mm)
	1.03	0,005	0.04
4	7.07	0.025	0.09
1	14.14	u deb	0.14
3	21.21	0.075	0.19
4	25.25	0.100	0.25
	36.35	0.125	8.31
6	12.12	0.150	0.37
7	49.49	4.175	0,42
8	36.56	0,390	6.45
9	43.65	0.228	0.54
10	70.7	6.250	8.60
11	56.36	0.200	0.59
12	49.49	0,175	0.87
13	35.35	0.125	0.50
14	21.21	8.075	0.33
3.5	1.414	0.005	8.16

Eable 8: Measurest values for second leading cycle

Leading stage os.	Load (F) kN	Narmal stress (#9)	Settlement of loading place S (mm)
15	1,414	iones	0.16
56	7.07	0,075	0.21
17	14.14	0.050	0.26
18	21.21	6,075	0.31
19	28.28	0,160	0.36
20	35.35	0.125	0.41
21	42, 42	0.130	0.46
22	49,49	0.175	0.51
23	51:51:	0.200	0.56
24	63.63	0.225	0.60

Table 9: Compilation of excuts

Parameters.	1st loading eyele	2mt tearling cycle
(Group) MN/m ²	0.250	0.250
a _i , (mm)	10037	0.154
#p (mme(MN/m*))	2,075	2.142
a ₂ (mm/(MN/m²))	4,667	0.536
$K_{k}=1.5 \text{ of } (n_{k}+n_{k}) C_{k} \cos k$	200.75	228.32
	OF RUE	





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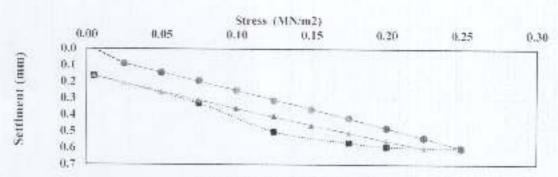


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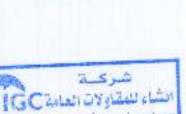
St (371+325) to St (371+350) km

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

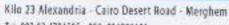
Measurment points from the first loading cycle
Measurment points from the unloading cycle
Measurment points from the second loading cycle

5 Settlement in mm or Normal stress MN/m²





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> 5t (371+350) to St (371+375) km 600

Table 10: Measured values for first leading cycle and unfauling cycle

Loading stage no.	Load (F) &N	Normal stress [8 ₉] M Nem ²	Sertlement of landing plate S (mm)
. 0	4.414	0.005	0.00
1	2.07	0.025	0.05
2	14.14	0,160	6.14
5	21.21	0.028	0:19
+	25.26	41.500	0.25
5	35,35	0.124	0.31
6	42.42	0.150	0.37
2	49,49	R.178	843
8	36.36	0.304	0,49
9	63,63	0.225	0.54
10	79.7	0.250	0.59
11	56.56	0.206	0.58
12	49,49	0.175	0.56
1.1	35.55	0.125	0.43
14	21,21	0.078	0.30
15	1,414	0,005	0.12

Lording stage on	Laurit (F) kN	Normal stress (sb) MN/m2	Settlement of leading plane 5 (mm)
19	1.111	0.605	0.12
16	7.07	0.025	6.17
19	14,14	0.850	6.21
18	21.21	0,075	0.26
19	28.28	25,160	0.11
20	35.35	0.125	0.36
21	12.42	0,150	0.41
22	40.40	0.275	0.46
33	56,56	0.200	1),52
2.1	63:63	0.229	0.58

Parameters	diation of results Introduce of cie	2nd Seating rycle
($\sigma_{\rm tree}$) MN·m ²	0.250	0.250
a _L (mm)	6.004	0.113
a_(mm/(MN/m²))	2,575	1,870
n-(mm/MN/mm)	4),569	0.805
five library and I RUA	196.87	217.28
Ev2/Ey	1.1-	



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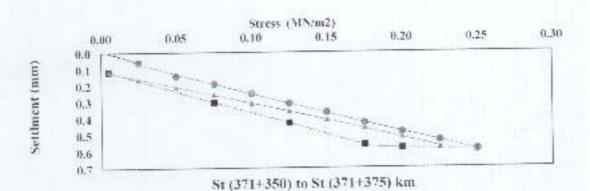
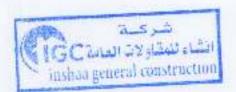


Fig. 4: Load-settlement curve, fitting curves according to Table 10 and Table 11 for the first and second-leading cycles

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







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> St (371+375) to 5t (371+400) km 500

Fairle 13: Measured values for first loading excit and unic

Leading stage or.	Lood (F) kN	Normal stress (s.) 313/m ²	Settlement of loading place S (mm
	1.41+	0.605	0.50
Li .	7,07	10125	0,13
1	10.14	0.050	0.12
3	21.21	0.075	0.12
	35,25	0.100	0.23
	35.55	0.128	0.27
6	12.42	0.150	0,33
	49.19	0.178	0.39
	56.54	0.200	0.44
. 0	63.63	0.226	6,50
10	20.7	0.250	0.58
- 11	56.86	0.200	0.57
12	19,49	0.175	0.65
B	J5.35	0.125	9.44
H	21.21	10.025	0.24
- 12	1.411	0.005	0.13

Falde 14: 'Heasured values for second involved

Loading stage no.	Lood (F) kN	Normal stress (s0) MN/m2	Settlement of loading place 5 (mm)
35	1,414	0.005	0.13
16	7.67	0.025	0.17
- 17	13.14	0.650	0.22
18	21.21	(0)75	9.36
19	28.28	6,100	0.30
29	35.35	0.125	0.36
31	42.42	R159	9.41
22	49.34	0.175	0.46
23	56.56	6.200	8.51
24	63.63 Tobb 14.65	0.225	0.55

Parameters	181 fearing cycle	3 ad loading evel
(Φ _{3.6 ga}) MN/m ²	0.250	0.250
s,, (mm)	1084	0.122
a ₁ (mmc(MN(m ⁻))	0,987	1,790
6- (2000/(MN*(sa*))	4,662	9,1-16
Exe 1.5 m (o) *n m m (xx)	225,24	256,56
Ev2/Ev1	OSCTRUA 1/02	





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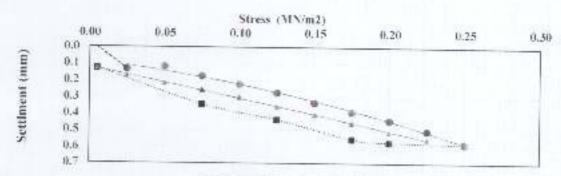
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St (371+375) to St (371+400) km

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

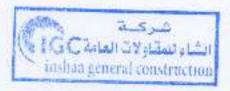
Measurment points from the first loading cycle
Measurment points from the unloading cycle

Measurment points from the second leading cycle

S Settlement in mm

e_o Normal stress MN/m³







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

600

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

Londing stage no.	Linet (F) &N	Normal stress (sq.) MN/m ²	Settlement of leading plate S (mm)
	1.414	0.605	8.00
-1	7.07	0.025	0.09
2	14.14	0.050	0.14
1	21.21	0.074	0.20
- 3	28,28	0,100	0.26
5	45.15	0.125	0.3
6.	42.42	6.150	0.36
7	19.19	0.175	0.41
8	56.56	0.200	6.46
	63.63	0.235	0.53
10	76,7	0.250	0.50
11	56.56	0.200	0.58
12	49,49	0.175	0.86
.13	38.38	D/125	0.44
14	21.21	0,075	0,32
15	1,114	0.065	0.1+

Table 17: Measured values for second loading evel-

Londing stage on.	Lund (F)	Storatal stress (sit) MN/m2	Settlement of loading plate S (mm)
15	1.414	0.005	0.14
to.	2.07	0.025	0.15
17	11,14	0.050	0.23
18	2(.2)	0.073	0.27
19	28.28	6100	0.32
20	38.36	0.125	0.36
21	42.42	0.130	0.41
22	49.49	6.178	0.46
2.5.	\$6.56	6,200	0.82
24	65.65	0.325	0.58

Table 18: Compilation of results

Parameters.	lst limiting syste	2nd footling cycle
(m _{1,10}) N/m ²	0.250	0.250
n _e (mm)	0.039	0.434
a ₁ (mm/(MN/m ²))	2,086	1.720
a ₃ (mm/(MN//m ⁴))	tealu .	1.012
Eve 1.5 of myrap diagonal Control	M 208.79	228,10

1.A31

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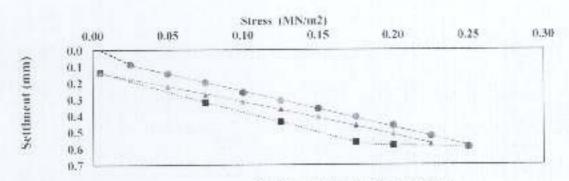


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St (371+400) to St (371+425) km

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

- Measurment points from the first leading cycle Measurment points from the unloading cycle.
 - Measurment points from the second loading cycle
 - 5. Settlement in min To Normal stress MN/m2







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> St (371+425) to St (371+450) km 600

Fable 19. Measured values for first boding eyelr and mitsuling cycle.

Loading stage an.	Land (F) kN	Normal stress (s _c) MA(m ²	Settlement of loading plate S (non)
0	5.814	0.005	0.00
t	7,87	0.025	0.10
- 1	14.14	((050	0.16
1	21.21	1,075	0.21
4	28.28	0.100	0.27
	35.35	10135	0.31
6	42.42	0.150	0.38
7	19,49	0.175	0.44
8.	58,56	0.200	0.40
9.	65.63	0.225	0.56
10	76,7	0.250	0.62
11	55.56	0.200	0.61
12	49.49	0.175	0.59
12	35.35	0.125	0.47
14	21.21	03075	0.35
15.	1,414	0.005	0.18

Lable 20: Measured values for second leading cycle

Londing stage no.	Lond (V) kN	Normal stress (s0) VIN/m2	Settlement of leading plate 5 (000)
15	1,484	0.005	81.0
16	7.07	0.025	0.22
17	14.14	0,050	0.26
18	21.21	0.075	0.31
19	28.28	0.100	0.32
20	35.35	K125	0.43
21	42,42	0.150	0.19
22	49,49	0.159	4.53
13	50.50	0.200	0.51
34	63.63	10225	0.61

Table 21: Compilation of results

2000 2000		
Parameters	st loading evelt	2nd boating cycle
(Oran) MA/m SPE	1 RU (250	0.250
3, (mm)	CAN.	0.161
a. (mm//MN/m*))	17/12/	2.108
as (mm((MN cm t)) A / c /	- 100 l	0.562
line Library my Garant Con C	1997	222.54
Bo2/Ect 4	P. /5/ 11	· ASSIN.

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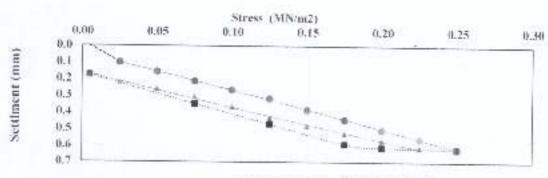
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St (371+425) to St (371+450) km

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

Measurment points from the first loading cycle focusurment points from the unloading cycle

Measurment points from the second leading cycle

5. Settle neut in mm

σ_E Normal stress MN/m²







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> St (371+450) to St (371+475) km 600

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

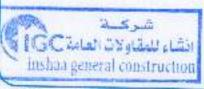
Landing stage no.	Local (F) EN	Normal stress (s _i) 51N ₀₀ ⁷	Settlement of loading plate 5 (mm)
0	1.414	0.005	0.00
	5,07	0.025	R48
2	14.14	6.050	0.13
3	21.21	0.305	0.19
1	28.28	0.200	0.23
5	35.35	0.125	0.29
+	42.42	0.159	0.35
- 1	49.49	0.178	0.41
8	0,200		0.47
9	63.63	0.225	0.53
10	79.7	0.250	0.59
- 11	56.56	0.200	0.58
12	1a.18	0.178	0.56
. 13	35.35	0.125	0.44
14	21.21	0.025	0.35
13	1.114	0.005	0.12

Table 33. Measured values for second fraction code

Landing stage no.	Load (F) kN	Normal scress (all) MN/m2	Settlement of loading plate S (mm)
15	1.414	0.805	0.12
16	7.07	0.625	0.16
19	14.14	8.950	9,29
38	21.21	1:075	0.24
19	28.28	6,100	0.31
20	35.35	0.125	0.35
31	22,42	0.150	0.41
22	49.19	0.175	6,45
33	56,56	0.200	0.50
24	65.63	0.22#	0.59

Table 22: Compilation of results

Parameters	be heding syste-	2nd honting cycle
(Ohm) MN/m2	11,250	0.250
u, (mm)	11,625	0.113
(mm(MN*m*))	1,976	1.920
a ₂ (mm/(MN/cm ²))	1.132	1.540
$\pi_{ij} = 1.5 \text{ eV} (s_i + s_0, \sigma_{s_i, (s_i + s_i)})$	199.20	21453
UND TRILL	1.00	THE RESERVE OF THE PERSON NAMED IN COLUMN 1



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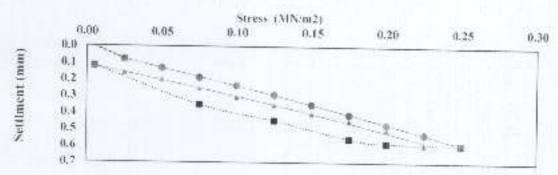


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St (371-450) to St (371+475) km

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

- Measurment points from the first leading cycle
 Measurment points from the unloading cycle
 - Measument points from the second leading cycle
 - 5 Settlement in mm of Normal stress NAV/m¹







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> 5t (371+475) to St (371+500) km 600

Table 25: Measured values for first landing cycle and anisosting cycle

Litading stage an	Lond (F)	Numinal stress (s _c) MN/m ²	Settlement of building plane S (2001)
11	1.414	6,068	0.10
1	7.07	0.025	1167
2	14.14	1(050	0.12
3	21.21	0.075	0.17
	28.38	0.100	0.22
5	38,35	0.125	0.28
6.	42.42	0.150	0.34
1	49,49	0.178	0.39
ñ	50.56	9,2141	0.46
	63.63	6.228	0.52
10	76.7	0.250	0.58
	51.56	0.200	0.55
17	49,49	0.175	0.48
13	35.35	0.128	0,40
14	21.21	0.015	0.25
15	1.414	0.005 os for second hading cycle	0.10

Settlement of Load (F) Leading stage an. Normal stress (80) loading plate S kN M Nim2 (mm) 1.41+ 0.005 0.10 14 7,47 Beids 0.14 14.14 0.050 0.19 28 21.21 0.075 28.28 0,100 0.29 20 15.35 0.125 0.34 21 42.42 0.050 0.39

> 63.63 0.225

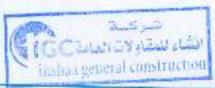
0.175

0.200

49,48

56.50

Parameters	opilation of results	7
	1st londing recht	2 ad loading evels
(6 _{seed}) MN/m ²	0.250	0.250
a _r (mm)	0.022	0.380
Ar (mm/(MN/m²))	1,911	1.939
a ₂ (mm/(34N 7m ²))	2,779	11775
Ext L5 of taments was 1	199,48	210.58
Ev2/Ev1	1.0:	



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23

24





0.45

0.51

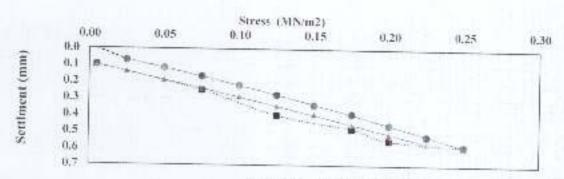
0,51

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

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

- Measurment points from the first loading cycle
- Measurment points from the unloading cycle

 Measurment points from the second leading cycle
 - S Settlement In min
 - 64 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 the sub-ballast layer of the electric express train project at location from St (371+275) to St (371+500) km in accoundance to the German standard, DIN 18134 are illustrated in table 28.

Table 28 :Test results

Location	Ev1(MN/m²)	Ev2(MN/m²)	Ev2/Ev1 ratio
St (371+275) : St (371+300) km	200.01	226.67	1.13
St (371+300) : St (371+325) km	209.52	235.58	1.12
St (371+325) : St (371+350) km	200.75	228.32	1.14
St (371+350) : St (371+375) km	190.87	217.28	1.14
St (371+375) : St (371+400) km	225.29	230.58	1.02
St (371+400) : St (371+425) km	205.79	228.10	1.11
St (371+425) : St (371+450) km	195.70	222.54	1.14
St (371+450) : St (371+475) km	199.20	214.52	1.08
St (371+475) : St (371+500) km	199.48	210.98	1.06

Eng / Eman Kandil



Geotechnical Consulant For Dr. H. Dr./ Mohamed Wostafa Badry





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