

المنطقة المركزية الثامنة

السيد المهندس / رئيس قطاع التنفيذ والمناطق

تحية طيبة وبعد ،،،

بالإشارة إلى مشروع إستكمال أعمال الجسر الترابي للخط الثاني القطاع الخامس من مشروع إنشاء القطار الكهربائي السريع قطاع (قوص – ادفو) ( ج ) لتنفيذ المسافة من الكم 660+000 الي 664+000 بطول 4 كم (بالامر المباشر)

تنفيذ : شركة المستقبل للمقاولات العمومية عقد رقم (2024/2023/4)  
نتشرف بأن نرفق لسيادتكم طيه (مقايضة معدلة رقم 1)



وتفضلوا بقبول فائق التحية والاحترام،

رئيس الإدارة المركزية للمنطقة الثامنة

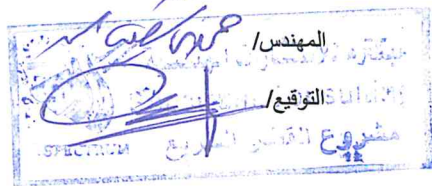


مهندس /

عماد حسين

| مقاييسه معدلة                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |         |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|-----------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |         |           |
| <b>أعمال إنشاء الجسر الترابي للقطار الكهربائي السريع (أكتوبر / أوسمبل)</b><br><b>من محطة ١١٠,١٣ + ٦٢٩ حتى محطة ٦٢٤,٦٣ + ٧١٥ بطول ٨٦,٥١٤٥ كم</b><br><b>تنفيذ شركة / المستقبل للمقاولات العمومية من محطة ٦٥٨+٨٣٨ الى ٦٦٢+٨٢٠ بطول ٣,٩٨ كم (ج)</b>                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |         |           |
| رقم البند                                                                                                                                                                                                                                                                                                                                   | بيان الأعمال                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | الوحدة         | الكمية  | سعر الفئة |
| <b>إعمال الإنزائة والتطهير</b>                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |         |           |
| 1-1                                                                                                                                                                                                                                                                                                                                         | بالمتر المسطح أعمال تطهير الموقع من الأشجار والمزروعات والمخلفات في مناطق الدلتا ذات الطبيعة الزراعية الكثيفة بعمق حتى ٣٠ سم و التخلص منها بالمقالب العمومية تمهيداً لأعمال الرفع المساحي لكامل حدود المشروع طبقاً للشروط والمواصفات وتعليمات المهندس المشرف. مسافة النقل حتى ٥٠٠ متر و يتم احتساب علاوة ٠,٣٠ جنيه لكل ١ كم.                                                                                                                                                                                                                                                                                                                                                                                              | م <sup>٢</sup> | ٠       | ٦,٠٠      |
| 2-1                                                                                                                                                                                                                                                                                                                                         | بالمتر المكعب أعمال تكسير وإزالة المسطحات المنهارة بالرصف الحالي في الأماكن التي يحددها المهندس المشرف ونقل ناتج التكسير خارج الموقع ومتوسط مسافة النقل حتى ١٠ كم وعمل ما يلزم لنهر العمل طبقاً لكراسة الشروط والمواصفات وتعليمات المهندس المشرف. وفي حالة زيادة مسافة نقل ناتج التكسير عن ١٠ كم من محور الطريق يتم حساب ١ جنيه للكيلومتر للزيادة أو النقص.                                                                                                                                                                                                                                                                                                                                                               | م <sup>٣</sup> | ٠       | ٦١,٠٠     |
| <b>إعمال الحفر</b>                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |         |           |
| 1-2                                                                                                                                                                                                                                                                                                                                         | بالمتر المكعب أعمال حفر باستخدام المعدات الميكانيكية لجميع أنواع التربة عدا التربة الصخرية وتسوية السطح بالآلات التسوية والرش بالمياه الأصولية للوصول إلى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول إلى أقصى كثافة جافه (٩٥%) من الكثافة الجافة القصوى) ومحمل على البند تحميل ونقل الأتربة الزائدة لمسافة ٥٠٠ متر من محور الطريق ويتم التنفيذ طبقاً للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لأصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس المشرف.<br>-علاوة اجنية /كم لمسافة نقل ناتج الحفر وتصبح ١,١ جنيه/كم ابتداء من ٤/٥/٢٠٢٣<br>-علاوة زيادة السولار ٠,٦ جنيه /م <sup>٣</sup> ابتداء من ٤/٥/٢٠٢٣                     | م <sup>٣</sup> | ٠       | ٢٣,٠٠     |
| 2-2                                                                                                                                                                                                                                                                                                                                         | بالمتر المكعب أعمال حفر باستخدام المعدات الميكانيكية في التربة المتماسكة عدا التربة الصخرية (باستخدام البلوزر) وتسوية السطح بالآلات التسوية والرش بالمياه الأصولية للوصول إلى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول إلى أقصى كثافة جافه (٩٥%) من الكثافة الجافة القصوى) ومحمل على البند تحميل ونقل الأتربة الزائدة لمسافة ٥٠٠ متر من محور الطريق ويتم التنفيذ طبقاً للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لأصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس المشرف.<br>-علاوة اجنية /كم لمسافة نقل ناتج الحفر وتصبح ١,١ جنيه/كم ابتداء من ٤/٥/٢٠٢٣<br>-علاوة زيادة السولار ٠,٧ جنيه /م <sup>٣</sup> ابتداء من ٤/٥/٢٠٢٣ | م <sup>٣</sup> | ١٠٠,٠٠٠ | ٢٦,٠٠     |

استشارى سبكتروم



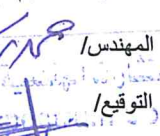
مهندس الشركة المنفذة

المهندس/ محمود  
التوقيع/





| مقاييسه معدلة                                                                                                                                                                                                                                                                                                                               |                                                                                             |                |        |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------|--------|-----------|
|     |                                                                                             |                |        |           |
| <b>أعمال إنشاء الجسر الترابي للقطار الكهربائي السريع (أكتوبر / أوسمبل)</b><br><b>من محطة ١١٠,١٣ + ٦٢٩ حتى محطة ٦٢٤,٦٣ + ٧١٥ بطول ٨٦,٥١٤٥ كم</b><br><b>تنفيذ شركة / المستقبل للمقاولات العمومية من محطة ٦٥٨+٨٣٨ الى ٦٦٢+٨٢٠ بطول ٣,٩٨ كم (ج)</b>                                                                                             |                                                                                             |                |        |           |
| رقم البند                                                                                                                                                                                                                                                                                                                                   | بيان الأعمال                                                                                | الوحدة         | الكمية | سعر الفئة |
| 4-2                                                                                                                                                                                                                                                                                                                                         | بالمتر المكعب اعمال حفر بالمعدات الميكانيكية فى تربة صخرية                                  | م <sup>٣</sup> |        |           |
|                                                                                                                                                                                                                                                                                                                                             | ذات إجهاد ( ٢٠٠-١٠٠ ) كجم/سم <sup>٢</sup>                                                   |                | ٠      | ٦٠,٠٠     |
|                                                                                                                                                                                                                                                                                                                                             | ذات إجهاد ( ٢٠٠-١٠٠ ) كجم/سم <sup>٢</sup> من يناير ٢٠٢٣                                     |                | ٠      | ٦٢,٠٠     |
|                                                                                                                                                                                                                                                                                                                                             | علاوة ١,٦ جنيه /م <sup>٣</sup> لارتفاع السولار وذلك للكميات المنفذة بعد ٤/٥/٢٠٢٣            |                | ٠      | ٧٠,٠٠     |
|                                                                                                                                                                                                                                                                                                                                             | ذات إجهاد ( ٣٠٠-٢٠٠ ) كجم/سم <sup>٢</sup>                                                   |                | ٠      | ٧٥,٠٠     |
|                                                                                                                                                                                                                                                                                                                                             | ذات إجهاد ( ٣٠٠-٢٠٠ ) كجم/سم <sup>٢</sup> من يناير ٢٠٢٣                                     |                | ٠      | ٨٢,٠٠     |
|                                                                                                                                                                                                                                                                                                                                             | علاوة ١,٩ جنيه /م <sup>٣</sup> لارتفاع السولار وذلك للكميات المنفذة بعد ٤/٥/٢٠٢٣            |                | ٠      | ٨٨,٠٠     |
|                                                                                                                                                                                                                                                                                                                                             | ذات إجهاد ( ٤٠٠-٣٠٠ ) كجم/سم <sup>٢</sup>                                                   |                | ٠      | ٦,٠٠      |
|                                                                                                                                                                                                                                                                                                                                             | ذات إجهاد ( ٤٠٠-٣٠٠ ) كجم/سم <sup>٢</sup> من يناير ٢٠٢٣                                     |                | ٠      | ٧,٠٠      |
|                                                                                                                                                                                                                                                                                                                                             | علاوة ٢,٢ جنيه /م <sup>٣</sup> لارتفاع السولار وذلك للكميات المنفذة بعد ٤/٥/٢٠٢٣            |                | ٠      |           |
|                                                                                                                                                                                                                                                                                                                                             | علاوة زيادة إجهاد كل ١٠٠ كجم/سم <sup>٢</sup> لكل متر مكعب                                   |                | ٠      |           |
|                                                                                                                                                                                                                                                                                                                                             | علاوة زيادة إجهاد كل ١٠٠ كجم/سم <sup>٢</sup> لكل متر مكعب وذلك للكميات المنفذة بعد ٤/٥/٢٠٢٣ |                | ٠      |           |
|                                                                                                                                                                                                                                                                                                                                             | ومحمل على البند الاتى                                                                       |                |        |           |
|                                                                                                                                                                                                                                                                                                                                             | ١- تحميل ونقل ناتج الحفر لمسافة لا تقل عن ٥٠٠ متر                                           |                |        |           |
|                                                                                                                                                                                                                                                                                                                                             | ٢ - ارنكة الميول الجانبية باستخدام المعدات الميكانيكية                                      |                |        |           |
|                                                                                                                                                                                                                                                                                                                                             | ٣- توريد اترية مطابقة للمواصفات وتشغيلها باستخدام الات التسوية بسمك لا يزيد عن ٢٥ سم        |                |        |           |
|                                                                                                                                                                                                                                                                                                                                             | لاستكمال المنسوب التصميمى لتشكيل الجسر والاكتاف (نسبة تحمل كاليفورنيا حتى ١٠ %)             |                |        |           |
|                                                                                                                                                                                                                                                                                                                                             | ورشها بالمياه الاصولية للوصول الى نسبة الرطوبة المطلوبة والتمك الجيد بالهراسات              |                |        |           |
|                                                                                                                                                                                                                                                                                                                                             | لوصول الى اقصى كثافة جافة (٩٥% من الكثافة الجافة القصوى). ويتم التنفيذ طبقاً                |                |        |           |
|                                                                                                                                                                                                                                                                                                                                             | للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند          |                |        |           |
|                                                                                                                                                                                                                                                                                                                                             | بجميع مشتلاتة طبقاً لاصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات            |                |        |           |
|                                                                                                                                                                                                                                                                                                                                             | المهندس المشرف.                                                                             |                |        |           |

استشارى سيكترم  
 المهندس/   
 التوقيع/   
 مشروع القطار السريع



مهندس الشركة المنفذة  
 المهندس/   
 التوقيع/ 

شركة المستقبل للمقاولات العمومية  
 س.ت: ١٦٢٢٧  
 ب.ض: ٣٥٩ - ٥٧٢ - ٣٤٧



## مقاييسه معدلة



أعمال إنشاء الجسر الترابي للقطار الكهربائي السريع (أكتوبر / أوسمبل)

من محطة ١١٠,١٣ + ٦٢٩ حتى محطة ٦٢٤,٦٣ + ٧١٥ بطول ٨٦,٥١٤٥ كم

تنفيذ شركة / المستقل للمقاولات العموميه من محطة ٦٥٨+٨٣٨ الي ٦٦٧+٨٢٠ بطول ٣,٩٨ كم (ج)

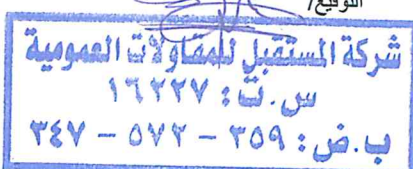
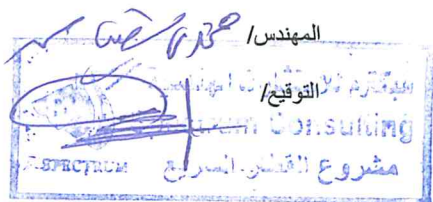
| رقم البند | بيان الأعمال                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | الوحدة | الكمية  | سعر الفئة | الإجمالي  |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------|-----------|-----------|
| 3         | <b>إعمال الردم Embankment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |         |           |           |
| 1-3       | أعمال تحميل وتوريد ونقل أترية مطابقة للمواصفات وتشغيلها باستخدام آلات التسوية بسمك لا يزيد عن ٥٠ سم حتى منسوب (2- متر) اسفل منسوب الفرمة و بسمك لا يزيد عن ٢٥ سم اعلي من منسوب (2- متر) من منسوب الفرمة لاستكمال المنسوب التصميمي لتشكيل الجسر والأكتاف (نسبة تحمل كاليفورنيا حتى ١٥%) ورشها بالمياه الأصولية للوصول إلى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول إلى أقصى كثافة جافة (٩٥% من الكثافة الجافة القصوى) ويتم التنفيذ طبقاً للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لأصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس المشرف.<br>- فى حالة طلب جهاز الإشراف زيادة نسبة الدمك عن ٩٥% يحسب زيادة ١ جنيه على زيادة نسبة الدمك لكل ١%.<br>- مسافة النقل حتى ٢ كم و يتم احتساب علاوة ١,٤ جنيه لكل كم بالزيادة أو النقصان وتصيح ١,٥ جنيه /كم ابتداء من ٤/٥/٢٠٢٣.<br>- السعر يشمل عمل تشوينات و تخليط و اختبارات و نقل لموقع العمل حتي مسافة ٢ كم ،<br>-علاوة زيادة السولار ١,٦ جنيه /م٣ ابتداء من ٤/٥/٢٠٢٣<br>-السعر لا يشمل قيمة المادة المحجريه.                                                                                                                                                                     | م٣     | ١٢٣,٣٣٣ | ٦٠,٠٠     | ٧,٤٠٠,٠٠٠ |
| 2-3       | أعمال تحميل وتوريد ونقل أترية مطابقة للمواصفات وذلك باستخدام ناتج الحفر الصخرى الصالح وذلك طبقاً لتعليمات المهندس المشرف والتدرج المطلوب باستخدام الكاسور ذلك بعد التأكد من التدرج والمقاسات المطلوبة لاختبار المناخل طبقاً لتوصيف الاستشاري وتشغيلها باستخدام آلات التسوية بسمك لا يزيد عن ٥٠ سم حتى منسوب 2- متر وبسمك لا يزيد عن ٢٥ سم لاستكمال المنسوب التصميمي لتشكيل الجسر والأكتاف (نسبة تحمل كاليفورنيا لا تقل ١٥%) ورشها بالمياه الأصولية للوصول إلى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول إلى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقاً للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لأصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس المشرف.<br>- فى حالة طلب جهاز الإشراف زيادة نسبة الدمك عن ٩٥% يحسب زيادة ١ جنيه على زيادة نسبة الدمك لكل ١%.<br>- مسافة النقل حتى ٢ كم و يتم احتساب علاوة ١,٤ جنيه لكل كم بالزيادة أو النقصان وتصيح ١,٥ جنيه /كم ابتداء من ٤/٥/٢٠٢٣.<br>- السعر يشمل عمل تشوينات و تخليط و اختبارات و نقل لموقع العمل حتي مسافة ٢ كم ،<br>-السعر يشمل مسافة نقل ناتج الحفر وتغذية الكاسور والنقل الى موقع القطاع بمتوسط مسافة ٣ كم<br>-علاوة زيادة السولار ٣ جنيه /م٣ | م٣     | .       | ١١٠,٠٠    | .         |
| 4         | <b>طبقة تأسيس Prepared Subgrade</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |         |           |           |
| 1-4       | بالمتر المكعب أعمال توريد وفرش طبقة تأسيس (Prepared Subgrade) من الأحجار الصلبة المترججة ناتج تكسير الكسارات والمطابقة للمواصفات وأقصى حجم للحبيبات ١٠٠ مم وألا تزيد نسبة المار من منخل ٢٠٠ عن ١٢% والتدرج الوارد بالاشتراطات الخاصة بالمشروع لا تقل نسبة تحمل كاليفورنيا عن ٢٥% وألا تزيد نسبة الفاقد بجهاز لوس أنجلوس عن ٣٠% وألا يزيد الامتصاص عن ١٥% وألا يقل معامل المرونة (Ev2) من تجربة لوح التحميل عن ٨٠ ميجاباسكال ويتم فردها على طبقتين باستخدام آلات التسوية الحديثة على أن لا يزيد سمك الطبقة بعد تمام الدمك عن ٢٥ سم ورشها بالمياه الأصولية للوصول إلى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول إلى أقصى كثافة جافة قصوى (لا تقل عن ٩٥% من الكثافة المعملية والفئة تشمل إجراء التجارب المعملية والحقلية ويتم التنفيذ طبقاً لأصول الصناعة والرسومات التفصيلية والبند بجميع مشتملاته طبقاً للمواصفات الفنية للمشروع وتقرير الاستشاري وتعليمات المهندس المشرف.<br>- مسافة النقل لا تقل عن ٢٠ كم.<br>- يتم احتساب علاوة ١,٢ جنيه لكل ١ كم بالزيادة أو النقصان وتصيح ١,٣ جنيه /كم ابتداء من ٤/٥/٢٠٢٣.<br>- السعر لا يشمل قيمة المواد المحجريه.<br>علاوة زيادة السولار ١,٨ جنيه /م٣ ابتداء من ٤/٥/٢٠٢٣                                                                                                   | م٣     | .       | ١٣٠,٠٠    | .         |

استشارى سبكترم

مهندس الشركة المنفذة

المهندس/ محمد حجاز

التوقيع/





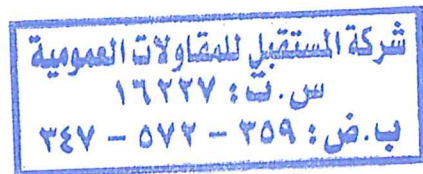
|                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |        |           |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|-----------|----------|
| <div>   <div>   </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |        |           |          |
| <div> <div>مقاييسه معدلة</div> <div> أعمال إنشاء الجسر الترابي للقطار الكهربائي السريع (أكتوبر / أوسمبل)<br/> من محطة ١١٠,١٣ + ٦٢٩ حتى محطة ٦٢٤,٦٣ + ٧١٥ بطول ٨٦,٥١٤٥ كم<br/> تنفيذ شركة / المستقبل للمقاولات العموميه من محطة ٦٥٨+٨٣٨ الي ٦٦٢+٨٢٠ بطول ٣,٩٨ كم (ج) </div> </div>                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |        |           |          |
| رقم البند                                                                                                                                                                                                                                                                                                                                                             | بيان الأعمال                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | الوحدة | الكمية | سعر الفئه | الاجمالى |
| 5                                                                                                                                                                                                                                                                                                                                                                     | طبقات الأساس Subballast                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |        |           |          |
| 1-5                                                                                                                                                                                                                                                                                                                                                                   | <p>بالمتر المكعب أعمال توريد وفرش طبقة أساس من الأحجار الصلبة المترجة ناتج تكسير الكسارات والمطابقة للمواصفات وأقصى حجم للحبيبات ما بين ٣١,٥ مم إلى ٤٠ مم وألا يزيد نسبة المار من منخل ٢٠٠ عن ٥% والتدرج الوارد بالاشتراطات الخاصة بالمشروع لا تقل نسبة تحمل كاليفورنيا عن ٨٠% وألا يقل معامل المرونة (EV2) من تجربة لوح التحميل عن ١٢٠ ميجاباسكال وألا يزيد نسبة الفاقد بجهاز لوس أنجلوس عن ٣٠% وألا يزيد الامتصاص عن ١٥% ويتم فردها على طبقتين باستخدام آلات التسوية الحديثة على أن لا يزيد سمك الطبقة بعد تمام الدمك عن ٢٠ سم ورشها بالمياه الأصولية للوصول إلى نسبة الرطوبة المطلوبة والدمك الجيد للهراسات للوصول إلى أقصى كثافة جافة قصوى (لا تقل عن ١٠٠%) من الكثافة العملية والفئة تشمل إجراء التجارب المعملية والحقلية ويتم التنفيذ لأصول طبقاً للصناعة والرسومات التفصيلية المعتمدة و البند بجميع مشتملاته طبقاً للمواصفات الفنية للمشروع وتقرير الاستشارى وتعليمات المهندس المشرف.</p> <p>- مسافة النقل لا تقل عن ٢٠ كم.</p> <p>- يتم احتساب علاوة ١,٢ جنيه لكل ١ كم بالزيادة أو النقصان وتصبح ١,٣ جنيه /كم ابتداء من ٤/٥/٢٠٢٣.</p> <p>- السعر لا يشمل قيمة المواد المحجيرة.</p> <p>-علاوة زيادة السولار ١,٨ جنيه /م ٣ ابتداء ٤/٥/٢٠٢٣</p> | م ٣    | .      | ١٣٥,٠٠    |          |

استشارى سبكتروم



مهندس الشركة المنفذة

المهندس / محمود حماد  
التوقيع /





| مقاييسه معدلة                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |        |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |        |            |
| <b>أعمال إنشاء الجسر القرائي للقطار الكهربائي السريع ( أكتوبر / أوسمبل )</b><br><b>من محطة ١١٠,١٣ + ٦٢٩ حتى محطة ٦٢٤,٦٣ + ٧١٥ بطول ٨٦,٥١٤٥ كم</b><br><b>تنفيذ شركة / المستقبل للمقاولات العموميه من محطة ٦٥٨+٨٣٨ الي ٦٦٢+٨٢٠ بطول ٣,٩٨ كم (ج)</b>                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |        |            |
| رقم البند                                                                                                                                                                                                                                                                                                                                   | بيان الأعمال                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | الوحدة | الكمية | سعر الفقة  |
| 7                                                                                                                                                                                                                                                                                                                                           | البلاطات الخرسانية / الرصف الحرساني                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |        |            |
| 1-7                                                                                                                                                                                                                                                                                                                                         | بالمتر المصطح أعمال توريد وصب خرسانة عادية سمك ١٥ سم لإرتفاع ١٠متر رأسي لحماية الأكتاف والميول الجانبية تتكون من ٣ م ٠,٨ سن دولوميت متدرج + ٣ م ٠,٤ رمل حرش والإضافات طبقاً لتعليمات الإستشاري (فيبر +سيكا) على أن يكون السن نظيف ومغسول والرمل خالي من الشوائب والطفلة والأملاح والمواد الغريبة مع وضع فوم (بالفاصل) بسمك ٢سم (طبقاً لتعليمات الإستشاري) والبند يشمل تجهيز وإستبدال مناسيب التربة الطبيعية أسفل البلاطة للوصول إلى المناسيب التصميمية على أن تحقق الخرسانة إجهاد لا يقل عن ٢٥٠ كجم / سم ٢ وتنظيف السطح وملئ الفواصل بالبيتومين المرمل والتنفيذ طبقاً لأصول الصناعة والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لمواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس المشرف.<br>يتم إضافة علاوة قدرها ٥ جنيه بعد أول ١٠متر رأسي على أن تضاف لكل مسطح (لا يقل عن ٥ متر رأسي) | ٢م     | ٠      | ٤٣٣,٠٠     |
| 2-7                                                                                                                                                                                                                                                                                                                                         | بالمتر المكعب أعمال توريد وصب خرسانه عادية لتنفيذ قدمه سفليه وعلويه للاكتاف والميول الجانبية تتكون من ٣ م ٠,٨ سن دولوميت متدرج+٣ م ٠,٤ رمل حرش والإضافات طبقاً لتعليمات الإستشاري (فيبر +سيكا) على أن يكون السن نظيف ومغسول والرمل خالي من الشوائب والطفلة والأملاح والمواد الغريبة مع وضع فوم (بالفاصل) بسمك ٢سم طبقاً لتعليمات الإستشاري والبند يشمل أعمال الحفر والشدات وكل م يلزم لإنهوا الأعمال أسفل البلاطة للوصول إلى المناسيب التصميمية على أن تحقق الخرسانة إجهاد لا يقل عن ٢٥٠ كجم/سم ٢ وملئ الفواصل بالبيتومين المرمل والتنفيذ طبقاً لأصول الصناعة والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لمواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس المشرف.                                                                                                                      | ٣م     | ٠,٠٠   | ٢,٦٨٥,٠٠   |
| الإجمالي                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |        | ١٠,٠٠٠,٠٠٠ |

مهندس الهيئة  
/المهندس/  
التوقيع/



مهندس الشركة المنفذة  
/المهندس/  
التوقيع/

رئيس الادارة المركزية  
للمنطقة الثامنة  
التوقيع/

م/ عماد حسين



شركة المستقبل للمقاولات العمومية  
س.ت: ١٦٢٢٢٧  
ب.ض: ٣٥٩ - ٥٧٢ - ٣٤٧



## محضر اعتماد حصر كميات



التاريخ : ٢٠٢٣-١٠-١٥

اسم المشروع : مشروع القطار الكهربائي السريع (6 أكتوبر - اسوان - أبو سمبل ) القطاع الخامس

قامت شركة برليانت كونسلت للاستشارات المساحية (استشارى الاعمال المساحية لهيئة الطرق والكبارى )

باعتماد الكميات المنفذة الخاصة بشركة المستقبل للمقاولات العمومية

| م            | من المحطة رقم | الى المحطة رقم | التصنيف                       | الكمية بالمتر المكعب | الملاحظات                |
|--------------|---------------|----------------|-------------------------------|----------------------|--------------------------|
| 1            | 658+840       | 662+820        | اعمال القطع باستخدام البلدوزر | 74269.69             | اعمال قطع على ( RE05 )   |
| 2            | 658+840       | 662+820        | اعمال الردم                   | 26268.97             | اعمال الردم على ( RE05 ) |
| اجمالى القطع |               |                |                               | 74269.69             |                          |
| اجمالى الردم |               |                |                               | 26268.97             |                          |

المرفقات :

1- استلام ميزانية شبكية

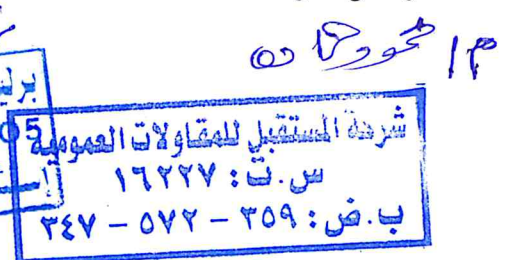
2- قطاعات عرضية

3- شيت اكسيل لتوضيح اعمال الحصر

استشارى الهيئة

استشارى المساحة

مهندس الشركة المنفذة







Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية  
مشروعات محافظات الوجه القبلى

Company : شركة المستقبل

Project : Electric Express Train - Sector (5) – Qous to Arment.  
Subject : Determine the deformation and strength characteristics of soil by the plate loading test according specifications DIN 18134:2012 04 and project requirements  
Test Location : Station 660+700 to 660+800  
Station 660+750  
Level -2.5  
Test Date : 04/09/2023  
Report Date : 07/09/2023  
Type of soil : Original earth  
Report No. : 1

Dear Gentleman,

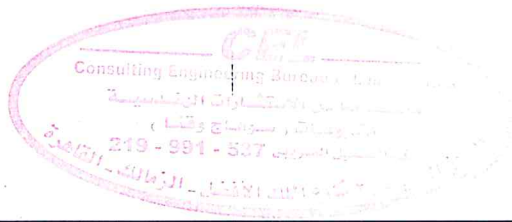
According to the above mentioned subject the test performed as follows:-

Apparatus

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (Enerbac)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

Test Procedure:

1. Clean the ground on test area to the required level with undisturbed soil
2. Install loading plates 300 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test applied preloading about 30 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 300 mm loading plate, the limit values are 5.0 kg/cm<sup>2</sup>
6. The load shall be applied in six stages, in approximately equal increments, until the required maximum normal stress is reached.
7. Each change in load (from stage to stage) shall be completed within one minute
8. The load shall be released in 3 stages, to 50 % , 25 % , and approximately 2 % of the maximum load.
9. Following unloading, a further (2<sup>nd</sup>) loading cycle shall be carried out, in which, however, the load is to be increased only to the penultimate stage of the first cycle (so that the full load is not reached).
10. At each stage the load shall be maintained until the rate of settlement of the plate becomes less than 0.02 mm/min.
11. Remove the loads



3 El Malek El Afdal Street  
Zamalek, Cairo.  
Tel.& Fax : 27367231 - 27363093



٣ ش الملك الأفضل  
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#### Report

1. Evaluation and representation of results.

2. Load Settlement curve.

3. The test report content the following:-

- location of test site - Dimension of loading plate.
- Measuring device used - Type of soil.
- Type of Bedding material below the plate -Weathering condition.
- Time and date of measurements - Unusual observation made during test .
- Dial gauge reading and corresponding normal stress - Loading-settlement curve.
- Description of the soil condition below the plate after testing.

#### Report

- Type of soil : Original earth
- Job requirement :  $E_{v2} > 40 \text{ MPa}$

| Item                                                             | Descriptions   |
|------------------------------------------------------------------|----------------|
| Type of bedding material below the plate                         | Natural Soil   |
| Plate Diameter (mm)                                              | 300            |
| date of measurement                                              | : 04/09/2023   |
| Unusual observation made during test                             | NO             |
| Description of the soil conditions below the plate after testing | No deformation |

#### Evaluation and representation of results

| Test No. | Station |         | Location | Level<br>( m ) | First Cycle      | Second Cycle     | $E_{v2} / E_{v1}$<br>Ratio |
|----------|---------|---------|----------|----------------|------------------|------------------|----------------------------|
|          | From    | To      |          |                | $E_{v1}$ ( MPa ) | $E_{v2}$ ( Mpa ) |                            |
| 1        | 660+700 | 660+800 | 660+750  | -2.5           | 112.9            | 142.6            | 1.26                       |

Signature /

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مكتب معامل الإستشارات الهندسية  
مشروعات محافظات الوجه القبلي

Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 04/09/2023  
report date : 07/09/2023  
Station : 660+750  
Test No. : 1

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.94  | 0.06             | 19.91  | 0.09             | 0.07    |
| 2       | 1.66             | 19.87  | 0.13             | 19.79  | 0.21             | 0.17    |
| 3       | 2.50             | 19.68  | 0.32             | 19.61  | 0.39             | 0.36    |
| 4       | 3.33             | 19.51  | 0.49             | 19.47  | 0.53             | 0.51    |
| 5       | 4.17             | 19.39  | 0.61             | 19.27  | 0.73             | 0.67    |
| 6       | 5.00             | 19.17  | 0.83             | 19.09  | 0.91             | 0.87    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 19.24  | 0.76             | 19.17  | 0.83             | 0.80    |
| 2       | 1.25             | 19.36  | 0.64             | 19.25  | 0.75             | 0.70    |
| 3       | 0.100            | 19.72  | 0.28             | 19.67  | 0.33             | 0.31    |

**Loading Stage (2)**

| Loading             | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------------------|------------------|--------|------------------|--------|------------------|---------|
| 0                   | 0.83             | 19.60  | 0.40             | 19.59  | 0.41             | 0.40    |
| approximately equal | 1.66             | 19.49  | 0.51             | 19.44  | 0.56             | 0.54    |
| stress is reached.  |                  |        |                  |        |                  |         |
| 2                   | 2.50             | 19.38  | 0.62             | 19.31  | 0.69             | 0.66    |
| 3                   | 3.33             | 19.21  | 0.79             | 19.19  | 0.81             | 0.80    |
| 4                   | 4.17             | 19.12  | 0.88             | 19.09  | 0.91             | 0.90    |



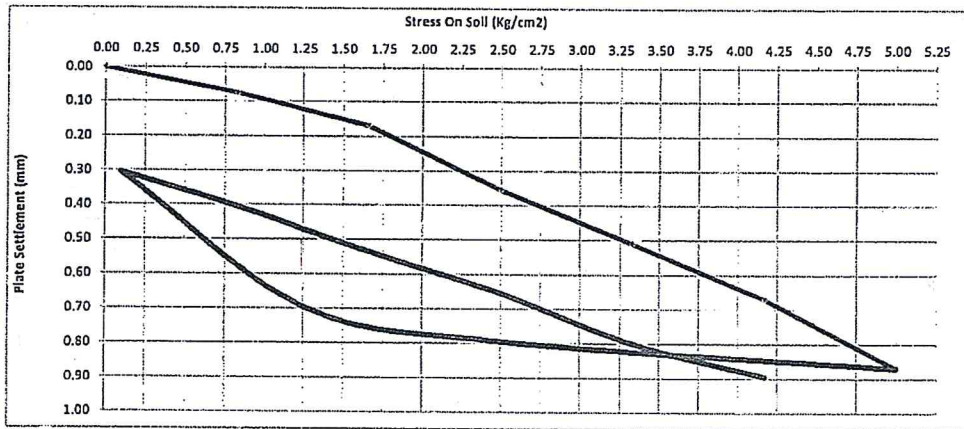
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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 04/09/2023  
report date : 07/09/2023  
Station : 6601750  
Test No. : 1

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.07 | 0.17   | 0.36   | 0.51   | 0.67   | 0.87   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 0.87 | 0.80 | 0.70  | 0.31 |

|                                                             |                |                |           |
|-------------------------------------------------------------|----------------|----------------|-----------|
| D (mm) = 300                                                | S1 (mm) = 0.15 | S2 (mm) = 0.54 | ΔS = 0.39 |
| Ev1 (MPa) = $(0.75 \cdot D \cdot \Delta \sigma) / \Delta S$ | 112.9          |                |           |

$$Ev2/Ev1 = 1.26$$

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.31 | 0.40    | 0.54   | 0.66   | 0.80   | 0.90   |

|                                                             |                |                |           |
|-------------------------------------------------------------|----------------|----------------|-----------|
| D (mm) = 300                                                | S1 (mm) = 0.51 | S2 (mm) = 0.82 | ΔS = 0.31 |
| Ev2 (MPa) = $(0.75 \cdot D \cdot \Delta \sigma) / \Delta S$ | 142.6          |                |           |

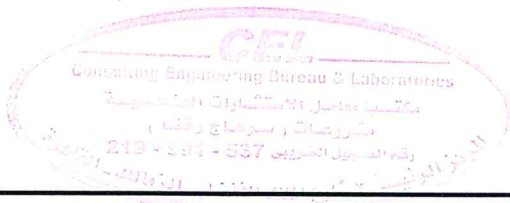
Ev1 = Modulus of deformation during the loading stage.

Ev2 = Modulus of deformation during the Reloading stage.

D = Plate diameter (mm)

Δs = The difference between 0.3 and 0.7 from the maximum loading (smax) (kg/cm<sup>2</sup>)

DS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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**Company** : شركة المستقبل

**Project** : Electric Express Train - Sector (5) – Qous to Arment.  
**Subject** : Determine the deformation and strength characteristics of soil by the plate loading test according specifications DIN 18134:2012-04 and project requirements  
**Test Location** : Station 660+600 to 660+700  
**Station** : 660+650  
**Level** : -2.5  
**Test Date** : 04/09/2023  
**Report Date** : 07/09/2023  
**Type of soil** : Original earth  
**Report No.** : 1

Dear Gentleman,

According to the above mentioned subject the test performed as follows:-

**Apparatus**

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (Enerbac)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

**Test Procedure:**

1. Clean the ground on test area to the required level with undisturbed soil
2. Install loading plates 300 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test applied preloading about 30 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 300 mm loading plate, the limit values are 5.0 kg/cm<sup>2</sup>
6. The load shall be applied in six stages, in approximately equal increments, until the required maximum normal stress is reached.
7. Each change in load (from stage to stage) shall be completed within one minute
8. The load shall be released in 3 stages, to 50 %, 25 %, and approximately 2 % of the maximum load.
9. Following unloading, a further (2<sup>nd</sup>) loading cycle shall be carried out, in which, however, the load is to be increased only to the penultimate stage of the first cycle (so that the full load is not reached).
10. At each stage the load shall be maintained until the rate of settlement of the plate becomes less than 0.02 mm/min.
11. Remove the loads



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#### Report

1. Evaluation and representation of results.
2. Load Settlement curve.
3. The test report content the following:-
  - location of test site - Dimension of loading plate.
  - Measuring device used - Type of soil.
  - Type of Bedding material below the plate -Weathering condition.
  - Time and date of measurements - Unusual observation made during test .
  - Dial gauge reading and corresponding normal stress - Loading-settlement curve.
  - Description of the soil condition below the plate after testing.

#### Report

- Type of soil : Original earth
- Job requirement :  $E_{v2} > 40 \text{ MPa}$

| Item                                                             | Descriptions   |
|------------------------------------------------------------------|----------------|
| Type of bedding material below the plate                         | Natural Soil   |
| Plate Diameter (mm)                                              | 300            |
| date of measurement                                              | : 04/09/2023   |
| Unusual observation made during test                             | NO             |
| Description of the soil conditions below the plate after testing | No deformation |

#### Evaluation and representation of results

| Test No. | Station |         | Location | Level<br>( m ) | First Cycle              | Second Cycle             | $E_{v2} / E_{v1}$<br>Ratio |
|----------|---------|---------|----------|----------------|--------------------------|--------------------------|----------------------------|
|          | From    | To      |          |                | $E_{v1} \text{ ( MPa )}$ | $E_{v2} \text{ ( Mpa )}$ |                            |
| 1        | 660+600 | 660+700 | 660+650  | -2.5           | 91.2                     | 134.0                    | 1.47                       |

Signature /

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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 04/09/2023  
report date : 07/09/2023  
Station : 660+650  
Test No. : 1

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.80  | 0.20             | 19.82  | 0.18             | 0.19    |
| 2       | 1.66             | 19.66  | 0.34             | 19.50  | 0.50             | 0.42    |
| 3       | 2.50             | 19.39  | 0.61             | 19.30  | 0.70             | 0.65    |
| 4       | 3.33             | 19.28  | 0.72             | 19.09  | 0.91             | 0.82    |
| 5       | 4.17             | 19.02  | 0.98             | 18.91  | 1.09             | 1.04    |
| 6       | 5.00             | 18.88  | 1.12             | 18.82  | 1.18             | 1.15    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 18.96  | 1.04             | 18.90  | 1.10             | 1.07    |
| 2       | 1.25             | 19.11  | 0.89             | 19.06  | 0.94             | 0.92    |
| 3       | 0.100            | 19.56  | 0.44             | 19.49  | 0.51             | 0.48    |

**Loading Stage (2)**

| Loading             | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------------------|------------------|--------|------------------|--------|------------------|---------|
| 0                   | 0.83             | 19.44  | 0.56             | 19.38  | 0.62             | 0.59    |
| approximately equal | 1.66             | 19.30  | 0.70             | 19.25  | 0.75             | 0.73    |
| stress is reached.  |                  |        |                  |        |                  |         |
| 2                   | 2.50             | 19.18  | 0.82             | 19.16  | 0.84             | 0.83    |
| 3                   | 3.33             | 19.00  | 1.00             | 18.99  | 1.01             | 1.01    |
| 4                   | 4.17             | 18.87  | 1.13             | 18.89  | 1.11             | 1.12    |



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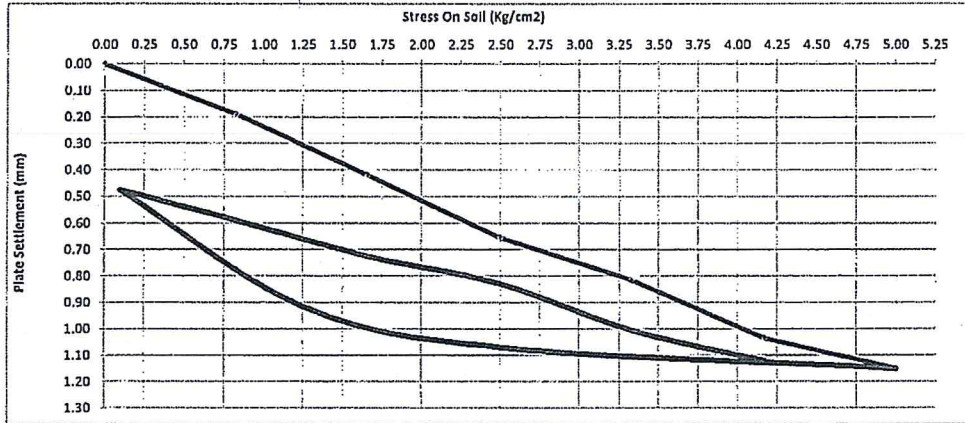


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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 04/09/2023  
report date : 07/09/2023  
Station : 660+650  
Test No. : 1

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.19 | 0.42   | 0.65   | 0.82   | 1.04   | 1.15   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 1.15 | 1.07 | 0.92  | 0.48 |

|                                                            |               |              |           |
|------------------------------------------------------------|---------------|--------------|-----------|
| D (mm) = 300                                               | S1 (mm)= 0.38 | S2(mm)= 0.86 | ΔS = 0.48 |
| Ev1 (MPa) = $(0.75 \cdot D \cdot \Delta\sigma) / \Delta S$ | 91.2          |              |           |

$$Ev2/Ev1 = 1.47$$

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.48 | 0.59    | 0.73   | 0.83   | 1.01   | 1.12   |

|                                                            |               |              |           |
|------------------------------------------------------------|---------------|--------------|-----------|
| D (mm) = 300                                               | S1 (mm)= 0.70 | S2(mm)= 1.03 | ΔS = 0.33 |
| Ev2 (MPa) = $(0.75 \cdot D \cdot \Delta\sigma) / \Delta S$ | 134.0         |              |           |

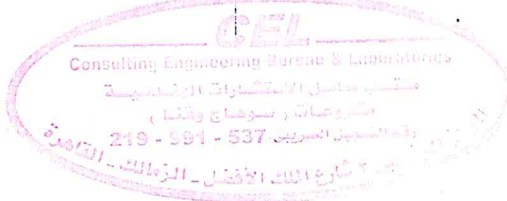
Ev1 = Modulus of deformation during the loading stage.

Ev2 = Modulus of deformation during the Reloading stage.

D = Plate diameter (mm)

DS = The difference between 0.3 and 0.7 from the maximum loading (smax) (kg/cm<sup>2</sup>)

DS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company : شركة المستقبل

Project : Electric Express Train - Sector (5) -- Qous to Arment.  
Subject : Determine the deformation and strength characteristics of soil by the plate loading test according specifications DIN 18134:2012-04 and project requirements  
Test Location : Station (660+00 to 660+200)  
Test Date : 29/08/2023  
Report Date : 30/08/2023  
Type of soil : Original earth  
Report No. : 1 : 2

Dear Gentleman,

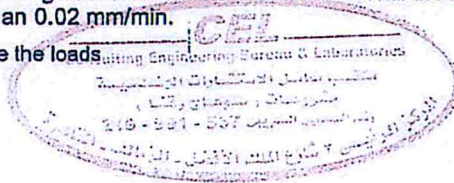
According to the above mentioned subject the test performed as follows:-

#### Apparatus

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (Enerbac)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

#### Test Procedure:

1. Clean the ground on test area to the required level with undisturbed soil
2. Install loading plates 300 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test applied preloading about 30 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 300 mm loading plate, the limit values are 5.0 kg/cm<sup>2</sup>
6. The load shall be applied in six stages, in approximately equal increments, until the required maximum normal stress is reached.
7. Each change in load (from stage to stage) shall be completed within one minute
8. The load shall be released in 3 stages, to 50 % , 25 % , and approximately 2 % of the maximum load.
9. Following unloading, a further (2<sup>nd</sup>) loading cycle shall be carried out, in which, however, the load is to be increased only to the penultimate stage of the first cycle (so that the full load is not reached).
10. At each stage the load shall be maintained until the rate of settlement of the plate becomes less than 0.02 mm/min.
11. Remove the loads



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#### Report

1. Evaluation and representation of results.
2. Load Settlement curve.
3. The test report content the following:-
  - location of test site - Dimension of loading plate.
  - Measuring device used - Type of soil.
  - Type of Bedding material below the plate -Weathering condition.
  - Time and date of measurements - Unusual observation made during test .
  - Dial gauge reading and corresponding normal stress - Loading-settlement curve.
  - Description of the soil condition below the plate after testing.

#### Report

- Type of soil : Original earth
- Job requirement :  $E_{v2} > 40 \text{ MPa}$

| Item                                                               | Descriptions   |
|--------------------------------------------------------------------|----------------|
| - Type of bedding material below the plate                         | Natural Soil   |
| - Plate Diameter (mm)                                              | 300            |
| - date of measurement                                              | 29/08/2023     |
| - Unusual observation made during test                             | NO             |
| - Description of the soil conditions below the plate after testing | No deformation |

#### Evaluation and representation of results

| Test No. | Station |         | Location | Level ( m ) | First Cycle              | Second Cycle             | $E_{v2}/E_{v1}$ Ratio |
|----------|---------|---------|----------|-------------|--------------------------|--------------------------|-----------------------|
|          | From    | To      |          |             | $E_{v1} \text{ ( MPa )}$ | $E_{v2} \text{ ( Mpa )}$ |                       |
| 1        | 660+000 | 660+100 | 660+075  | -2.5        | 131.5                    | 137.8                    | 1.05                  |
| 2        | 660+100 | 660+200 | 660+140  | -2.5        | 123.5                    | 143.3                    | 1.16                  |

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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 29/08/2023  
report date : 30/08/2023  
Location : Station (660+075 )  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**

**DIN 18134**

**Loading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.92  | 0.08             | 19.85  | 0.15             | 0.11    |
| 2       | 1.66             | 19.80  | 0.20             | 19.69  | 0.31             | 0.25    |
| 3       | 2.50             | 19.69  | 0.31             | 19.48  | 0.52             | 0.41    |
| 4       | 3.33             | 19.57  | 0.43             | 19.39  | 0.61             | 0.52    |
| 5       | 4.17             | 19.32  | 0.68             | 19.21  | 0.79             | 0.73    |
| 6       | 5.00             | 19.06  | 0.94             | 19.00  | 1.00             | 0.97    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 19.14  | 0.86             | 19.09  | 0.91             | 0.89    |
| 2       | 1.25             | 19.32  | 0.68             | 19.29  | 0.71             | 0.70    |
| 3       | 0.100            | 19.68  | 0.32             | 19.58  | 0.42             | 0.37    |

**Loading Stage (2)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.83             | 19.52  | 0.48             | 19.45  | 0.55             | 0.52    |
| 1       | 1.66             | 19.38  | 0.62             | 19.31  | 0.69             | 0.66    |
| 2       | 2.50             | 19.24  | 0.76             | 19.19  | 0.81             | 0.79    |
| 3       | 3.33             | 19.09  | 0.91             | 19.05  | 0.95             | 0.93    |
| 4       | 4.17             | 18.99  | 1.01             | 18.97  | 1.03             | 1.02    |



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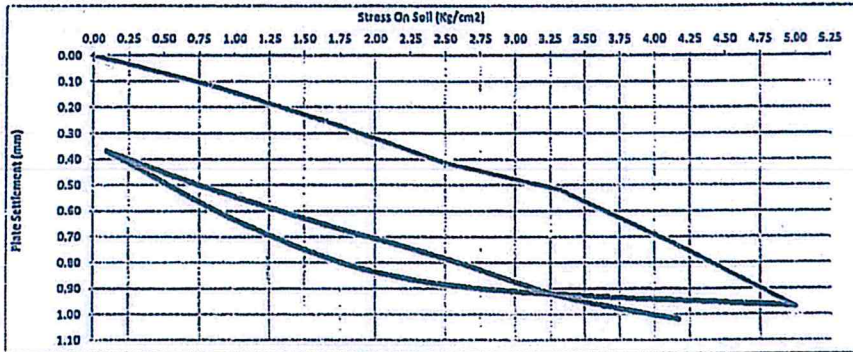


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Company Name : شركة المسكيت  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 29/08/2023  
report date : 30/08/2023  
Location : Station (0601075)  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.6 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.11 | 0.25   | 0.41   | 0.52   | 0.73   | 0.97   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 0.97 | 0.89 | 0.70  | 0.37 |

|             |                |           |      |           |      |      |      |
|-------------|----------------|-----------|------|-----------|------|------|------|
| D (mm) =    | 300            | S1 (mm) = | 0.23 | S2 (mm) = | 0.56 | ΔS = | 0.34 |
| Ev1 (MPa) = | (0.75*D*Δσ)/ΔS |           |      |           |      |      |      |

$$Ev2/Ev1 = 1.05$$

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.37 | 0.52    | 0.66   | 0.79   | 0.93   | 1.02   |

|             |                |           |      |           |      |      |      |
|-------------|----------------|-----------|------|-----------|------|------|------|
| D (mm) =    | 300            | S1 (mm) = | 0.63 | S2 (mm) = | 0.95 | ΔS = | 0.32 |
| Ev2 (MPa) = | (0.75*D*Δσ)/ΔS |           |      |           |      |      |      |

Ev1 = Modulus of deformation during the loading stage.

Ev2 = Modulus of deformation during the Reloading stage.

D = Plate diameter (mm)

ΔS = The difference between 0.3 and 0.7 from the maximum loading (smax) (kg/cm<sup>2</sup>)

DS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company Name : شركة المسقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 29/08/2023  
report date : 30/08/2023  
Location : Station (660+140 )  
Test No. : 02

**Nonrepetitive Static Plate Load Tests of Soils**

**DIN 18134**

**Loading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.88  | 0.12             | 19.81  | 0.19             | 0.16    |
| 2       | 1.66             | 19.71  | 0.29             | 19.65  | 0.35             | 0.32    |
| 3       | 2.50             | 19.64  | 0.36             | 19.47  | 0.53             | 0.45    |
| 4       | 3.33             | 19.49  | 0.51             | 19.29  | 0.71             | 0.61    |
| 5       | 4.17             | 19.31  | 0.69             | 19.12  | 0.88             | 0.79    |
| 6       | 5.00             | 19.10  | 0.90             | 18.98  | 1.02             | 0.96    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 19.17  | 0.83             | 19.07  | 0.93             | 0.88    |
| 2       | 1.25             | 19.36  | 0.64             | 19.22  | 0.78             | 0.71    |
| 3       | 0.100            | 19.74  | 0.26             | 19.62  | 0.38             | 0.32    |

**Loading Stage (2)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.83             | 19.61  | 0.39             | 19.50  | 0.50             | 0.45    |
| 1       | 1.66             | 19.49  | 0.51             | 19.46  | 0.54             | 0.53    |
| 2       | 2.50             | 19.38  | 0.62             | 19.32  | 0.68             | 0.65    |
| 3       | 3.33             | 19.24  | 0.76             | 19.19  | 0.81             | 0.79    |
| 4       | 4.17             | 19.09  | 0.91             | 19.02  | 0.98             | 0.95    |



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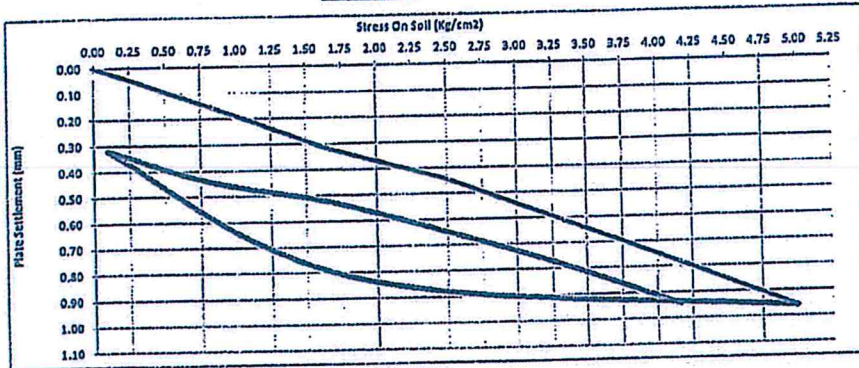
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مشروعات محافظات الوجه القبلي

Company Name  
Project  
Test Date  
report date  
Location  
Test No.

شركة المستقبل :  
Electric Express Train - Sector (5) - Qous to Arment.  
29/08/2023  
30/08/2023  
Stallion (600+140)  
02

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.18 | 0.32   | 0.45   | 0.61   | 0.79   | 0.96   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 0.96 | 0.88 | 0.71  | 0.32 |

|             |                |          |      |         |      |      |       |
|-------------|----------------|----------|------|---------|------|------|-------|
| D (mm) =    | 300            | S1 (mm)= | 0.29 | S2(mm)= | 0.65 | ΔS = | 0.36  |
| Ev1 (MPa) = | (0.75*D*Δσ)/ΔS |          |      |         |      |      | 123.5 |

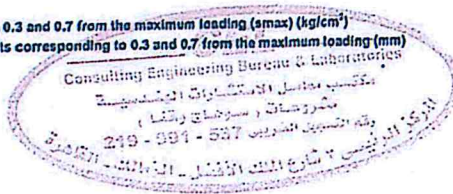
$$Ev2/Ev1 = 1.16$$

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.32 | 0.45    | 0.53   | 0.65   | 0.79   | 0.95   |

|             |                |          |      |         |      |      |       |
|-------------|----------------|----------|------|---------|------|------|-------|
| D (mm) =    | 300            | S1 (mm)= | 0.51 | S2(mm)= | 0.82 | ΔS = | 0.31  |
| Ev2 (MPa) = | (0.75*D*Δσ)/ΔS |          |      |         |      |      | 143.3 |

Ev1 = Modulus of deformation during the loading stage.  
Ev2 = Modulus of deformation during the reloading stage.  
D = Plate diameter (mm)

Δσ = The difference between 0.3 and 0.7 from the maximum loading (σmax) (kg/cm<sup>2</sup>)  
ΔS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company : شركة المستقبل

Project : Electric Express Train - Sector (5) - Qous to Arment.  
Subject : Determine the deformation and strength characteristics of soil by the plate loading test according specifications DIN 18134:2012-04 and project requirements  
Test Location : Station 660+500 to 660+600  
Station : 660+550  
Level : -2.5  
Test Date : 04/09/2023  
Report Date : 07/09/2023  
Type of soil : Original earth  
Report No. : 1

Dear Gentleman,

According to the above mentioned subject the test performed as follows:-

Apparatus

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (Enerbac)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

Test Procedure:

1. Clean the ground on test area to the required level with undisturbed soil
2. Install loading plates 300 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test applied preloading about 30 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 300 mm loading plate, the limit values are 5.0 kg/cm<sup>2</sup>
6. The load shall be applied in six stages, in approximately equal increments, until the required maximum normal stress is reached.
7. Each change in load (from stage to stage) shall be completed within one minute
8. The load shall be released in 3 stages, to 50 % , 25 % , and approximately 2 % of the maximum load.
9. Following unloading, a further (2<sup>nd</sup>) loading cycle shall be carried out, in which, however, the load is to be increased only to the penultimate stage of the first cycle (so that the full load is not reached).
10. At each stage the load shall be maintained until the rate of settlement of the plate becomes less than 0.02 mm/min.
11. Remove the loads



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#### Report

1. Evaluation and representation of results.
2. Load Settlement curve.
3. The test report content the following:-
  - location of test site - Dimension of loading plate.
  - Measuring device used - Type of soil.
  - Type of Bedding material below the plate -Weathering condition.
  - Time and date of measurements - Unusual observation made during test .
  - Dial gauge reading and corresponding normal stress - Loading-settlement curve.
  - Description of the soil condition below the plate after testing.

#### Report

- Type of soil : Original earth
- Job requirement :  $E_{v2} > 40 \text{ MPa}$

| Item                                                             | Descriptions   |
|------------------------------------------------------------------|----------------|
| Type of bedding material below the plate                         | Natural Soil   |
| Plate Diameter (mm)                                              | 300            |
| date of measurement                                              | : 04/09/2023   |
| Unusual observation made during test                             | NO             |
| Description of the soil conditions below the plate after testing | No deformation |

#### Evaluation and representation of results

| Test No. | Station |         | Location | Level<br>( m ) | First Cycle              | Second<br>Cycle          | $E_{v2} / E_{v1}$<br>Ratio |
|----------|---------|---------|----------|----------------|--------------------------|--------------------------|----------------------------|
|          | From    | To      |          |                | $E_{v1} \text{ ( MPa )}$ | $E_{v2} \text{ ( Mpa )}$ |                            |
| 1        | 660+500 | 660+600 | 660+550  | -2.5           | 87.2                     | 123.7                    | 1.42                       |

Signature /

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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) – Qous to Arment.  
Test Date : 04/09/2023  
report date : 07/09/2023  
Station : 660+550  
Test No. : 1

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.81  | 0.19             | 19.85  | 0.15             | 0.17    |
| 2       | 1.66             | 19.69  | 0.31             | 19.52  | 0.48             | 0.40    |
| 3       | 2.50             | 19.50  | 0.50             | 19.32  | 0.68             | 0.59    |
| 4       | 3.33             | 19.31  | 0.69             | 19.05  | 0.95             | 0.82    |
| 5       | 4.17             | 19.09  | 0.91             | 18.90  | 1.10             | 1.01    |
| 6       | 5.00             | 18.92  | 1.08             | 18.75  | 1.25             | 1.17    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 19.00  | 1.00             | 18.77  | 1.23             | 1.12    |
| 2       | 1.25             | 19.17  | 0.83             | 18.94  | 1.06             | 0.94    |
| 3       | 0.100            | 19.62  | 0.38             | 19.51  | 0.49             | 0.43    |

**Loading Stage (2)**

| Loading             | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------------------|------------------|--------|------------------|--------|------------------|---------|
| 0                   | 0.83             | 19.40  | 0.60             | 19.40  | 0.60             | 0.60    |
| approximately equal | 1.66             | 19.37  | 0.63             | 19.28  | 0.72             | 0.67    |
| stress is reached.  |                  |        |                  |        |                  |         |
| 2                   | 2.50             | 19.21  | 0.79             | 19.19  | 0.81             | 0.80    |
| 3                   | 3.33             | 19.02  | 0.98             | 19.00  | 1.00             | 0.99    |
| 4                   | 4.17             | 18.89  | 1.11             | 18.86  | 1.14             | 1.13    |



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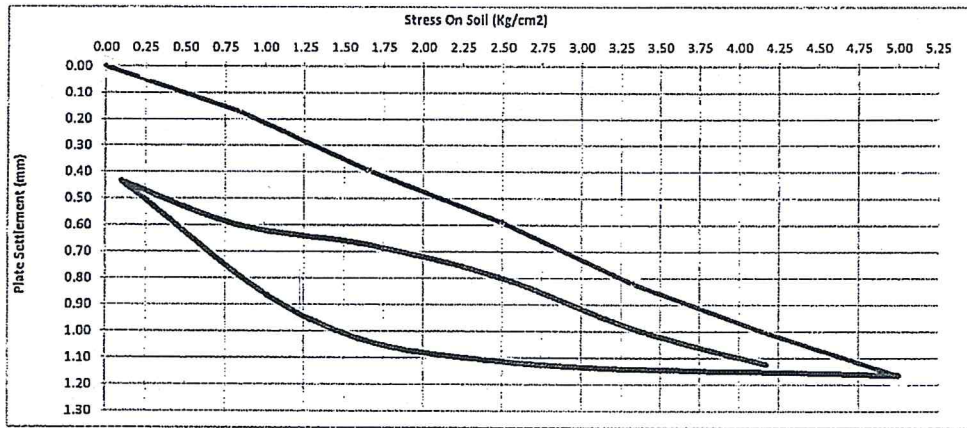


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Company Name : شركة المستقل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 04/09/2023  
report date : 07/09/2023  
Station : 660+550  
Test No. : 1

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



|                 |      |      |        |        |        |        |        |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.17 | 0.40   | 0.59   | 0.82   | 1.01   | 1.17   |

|                 |      |      |       |      |
|-----------------|------|------|-------|------|
| UnLoading (1)   | 1    | 2    | 3     | 4    |
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 1.17 | 1.12 | 0.94  | 0.43 |

|             |                |           |      |          |      |      |      |
|-------------|----------------|-----------|------|----------|------|------|------|
| D (mm) =    | 300            | S1 (mm) = | 0.36 | S2(mm) = | 0.86 | ΔS = | 0.51 |
| Ev1 (MPa) = | (0.75*D*Δσ)/ΔS |           | 87.2 |          |      |      |      |

$$Ev2/Ev1 = 1.42$$

|                 |      |         |        |        |        |        |
|-----------------|------|---------|--------|--------|--------|--------|
| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.43 | 0.60    | 0.67   | 0.80   | 0.99   | 1.13   |

|             |                |           |       |          |      |      |      |
|-------------|----------------|-----------|-------|----------|------|------|------|
| D (mm) =    | 300            | S1 (mm) = | 0.66  | S2(mm) = | 1.02 | ΔS = | 0.36 |
| Ev2 (MPa) = | (0.75*D*Δσ)/ΔS |           | 123.7 |          |      |      |      |

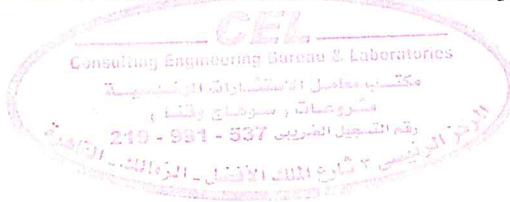
Ev1 = Modulus of deformation during the loading stage.

Ev2 = Modulus of deformation during the Reloading stage.

D = Plate diameter (mm)

DS = The difference between 0.3 and 0.7 from the maximum loading (smax) (kg/cm<sup>2</sup>)

DS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company : شركة المستقبل

Project : Electric Express Train - Sector (5) – Qous to Arment.  
Subject : Determine the deformation and strength characteristics of soil by the plate loading test according specifications DIN 18134:2012-04 and project requirements  
Test Location : Station (660+300 to 660+500)  
Test Date : 02/09/2023  
Report Date : 03/09/2023  
Type of soil : Original earth  
Report No. : 1 : 2

Dear Gentleman,

According to the above mentioned subject the test performed as follows:-

**Apparatus**

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (Enerbac)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

**Test Procedure:**

1. Clean the ground on test area to the required level with undisturbed soil
2. Install loading plates 300 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test applied preloading about 30 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 300 mm loading plate, the limit values are 5.0 kg/cm<sup>2</sup>
6. The load shall be applied in six stages, in approximately equal increments, until the required maximum normal stress is reached.
7. Each change in load (from stage to stage) shall be completed within one minute
8. The load shall be released in 3 stages, to 50 % , 25 % , and approximately 2 % of the maximum load.
9. Following unloading, a further (2<sup>nd</sup>) loading cycle shall be carried out, in which, however, the load is to be increased only to the penultimate stage of the first cycle (so that the full load is not reached).
10. At each stage the load shall be maintained until the rate of settlement of the plate becomes less than 0.02 mm/min.
11. Remove the loads

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#### Report

1. Evaluation and representation of results.
2. Load Settlement curve.
3. The test report content the following:-
  - location of test site - Dimension of loading plate.
  - Measuring device used - Type of soil.
  - Type of Bedding material below the plate -Weathering condition.
  - Time and date of measurements - Unusual observation made during test .
  - Dial gauge reading and corresponding normal stress - Loading-settlement curve.
  - Description of the soil condition below the plate after testing.

#### Report

- Type of soil : Original earth
- Job requirement :  $E_{v2} > 40 \text{ MPa}$

| Item                                                               | Descriptions   |
|--------------------------------------------------------------------|----------------|
| - Type of bedding material below the plate                         | Natural Soil   |
| - Plate Diameter (mm)                                              | 300            |
| - date of measurement                                              | 02/09/2023     |
| - Unusual observation made during test                             | NO             |
| - Description of the soil conditions below the plate after testing | No deformation |

#### Evaluation and representation of results

| Test No. | Station |         | Location | Level ( m ) | First Cycle            | Second Cycle           | $E_{v2}/E_{v1}$ Ratio |
|----------|---------|---------|----------|-------------|------------------------|------------------------|-----------------------|
|          | From    | To      |          |             | $E_{v1} \text{ (MPa)}$ | $E_{v2} \text{ (Mpa)}$ |                       |
| 1        | 660+300 | 660+400 | 660+340  | -2.5        | 94.3                   | 112.0                  | 1.19                  |
| 2        | 660+400 | 660+500 | 660+460  | -2.5        | 85.6                   | 130.8                  | 1.53                  |

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مكتب معامل الاستشارات الهندسية  
مشروعات محافظات الوجه القبلي

Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 02/09/2023  
report date : 03/09/2023  
Location : Station (660+340 )  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.78  | 0.22             | 19.80  | 0.20             | 0.21    |
| 2       | 1.66             | 19.56  | 0.44             | 19.63  | 0.37             | 0.41    |
| 3       | 2.50             | 19.32  | 0.68             | 19.48  | 0.52             | 0.60    |
| 4       | 3.33             | 19.17  | 0.83             | 19.24  | 0.76             | 0.80    |
| 5       | 4.17             | 19.00  | 1.00             | 19.01  | 0.99             | 0.99    |
| 6       | 5.00             | 18.89  | 1.11             | 18.90  | 1.10             | 1.11    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 18.98  | 1.02             | 19.00  | 1.00             | 1.01    |
| 2       | 1.25             | 19.21  | 0.79             | 19.26  | 0.74             | 0.76    |
| 3       | 0.100            | 19.62  | 0.38             | 19.67  | 0.33             | 0.35    |

**Loading Stage (2)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.83             | 19.50  | 0.50             | 19.53  | 0.47             | 0.48    |
| 1       | 1.66             | 19.47  | 0.53             | 19.39  | 0.61             | 0.57    |
| 2       | 2.50             | 19.32  | 0.68             | 19.24  | 0.76             | 0.72    |
| 3       | 3.33             | 19.12  | 0.88             | 19.05  | 0.95             | 0.91    |
| 4       | 4.17             | 18.97  | 1.03             | 18.88  | 1.12             | 1.08    |



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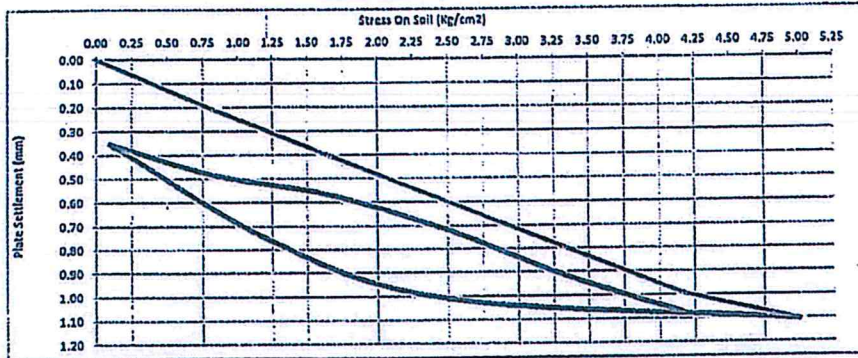


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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 02/09/2023  
Report date : 03/09/2023  
Location : Station (660+340)  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm²) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.21 | 0.41   | 0.60   | 0.80   | 0.99   | 1.11   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm²) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 1.11 | 1.01 | 0.76  | 0.35 |

|             |                |           |      |          |      |      |      |
|-------------|----------------|-----------|------|----------|------|------|------|
| D (mm) =    | 300            | S1 (mm) = | 0.37 | S2(mm) = | 0.84 | ΔS = | 0.47 |
| Ev1 (MPa) = | (0.75*D*Δσ)/ΔS |           | 94.3 |          |      |      |      |

Ev2/Ev1 = 1.19

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm²) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.35 | 0.48    | 0.67   | 0.72   | 0.91   | 1.08   |

|             |                |           |       |          |      |      |      |
|-------------|----------------|-----------|-------|----------|------|------|------|
| D (mm) =    | 300            | S1 (mm) = | 0.55  | S2(mm) = | 0.95 | ΔS = | 0.39 |
| Ev2 (MPa) = | (0.75*D*Δσ)/ΔS |           | 112.0 |          |      |      |      |

Ev1 = Modulus of deformation during the loading stage.

Ev2 = Modulus of deformation during the Reloading stage.

D = Plate diameter (mm)

Δs = The difference between 0.3 and 0.7 from the maximum loading (smax) (kg/cm²)

DS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company Name : شركة المستقل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 02/09/2023  
report date : 03/09/2023  
Location : Station (660+460 )  
Test No. : 02

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

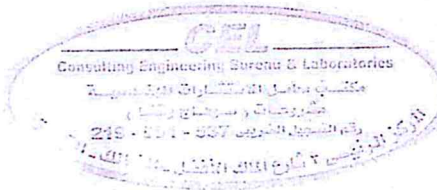
| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.78  | 0.22             | 19.76  | 0.24             | 0.23    |
| 2       | 1.66             | 19.64  | 0.36             | 19.58  | 0.42             | 0.39    |
| 3       | 2.50             | 19.42  | 0.58             | 19.36  | 0.64             | 0.61    |
| 4       | 3.33             | 19.20  | 0.80             | 19.12  | 0.88             | 0.84    |
| 5       | 4.17             | 19.00  | 1.00             | 18.98  | 1.02             | 1.01    |
| 6       | 5.00             | 18.86  | 1.14             | 18.81  | 1.19             | 1.17    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 18.94  | 1.06             | 18.89  | 1.11             | 1.09    |
| 2       | 1.25             | 19.12  | 0.88             | 19.06  | 0.94             | 0.91    |
| 3       | 0.100            | 19.49  | 0.51             | 19.44  | 0.56             | 0.54    |

**Loading Stage (2)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.83             | 19.37  | 0.63             | 19.30  | 0.70             | 0.66    |
| 1       | 1.66             | 19.20  | 0.80             | 19.17  | 0.83             | 0.82    |
| 2       | 2.50             | 19.08  | 0.92             | 19.00  | 1.00             | 0.96    |
| 3       | 3.33             | 18.92  | 1.08             | 18.88  | 1.12             | 1.10    |
| 4       | 4.17             | 18.81  | 1.19             | 18.76  | 1.24             | 1.22    |



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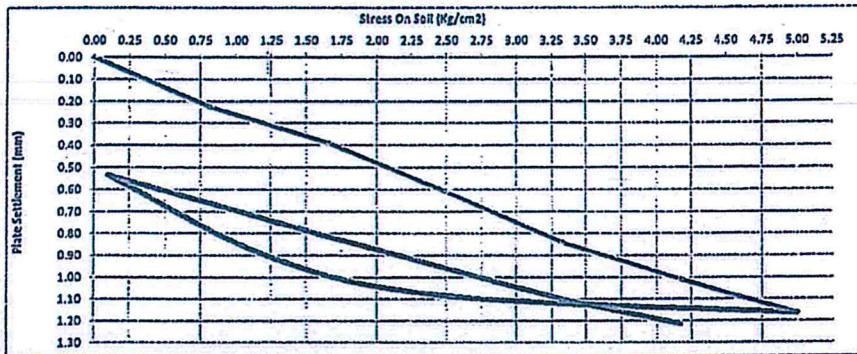


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Company Name : شركة المستقل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 02/09/2023  
report date : 03/09/2023  
Location : Station (660+460)  
Test No. : 02

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.23 | 0.39   | 0.61   | 0.84   | 1.01   | 1.17   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 1.17 | 1.09 | 0.91  | 0.54 |

|             |                |          |      |         |      |      |      |
|-------------|----------------|----------|------|---------|------|------|------|
| D (mm) =    | 300            | S1 (mm)= | 0.36 | S2(mm)= | 0.97 | ΔS = | 0.52 |
| Ev1 (MPa) = | (0.75*D*Δσ)/ΔS |          |      |         |      |      |      |

$$Ev2/Ev1 = 1.53$$

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.54 | 0.00    | 0.82   | 0.90   | 1.10   | 1.22   |

|             |                |          |      |         |      |      |      |
|-------------|----------------|----------|------|---------|------|------|------|
| D (mm) =    | 300            | S1 (mm)= | 0.79 | S2(mm)= | 1.12 | ΔS = | 0.34 |
| Ev2 (MPa) = | (0.75*D*Δσ)/ΔS |          |      |         |      |      |      |

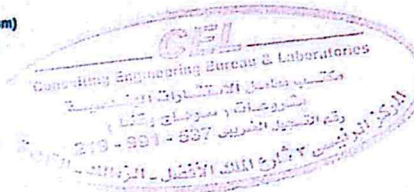
Ev1 = Modulus of deformation during the loading stage.

Ev2 = Modulus of deformation during the Reloading stage.

D = Plate diameter (mm)

Δσ = The difference between 0.3 and 0.7 from the maximum loading (σmax) (kg/cm<sup>2</sup>)

ΔS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 661+500 E=482368.5864 N=2846989.3628  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 05

Dear Gentleman,

Attached here with the delivered on 8 / 3 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature /

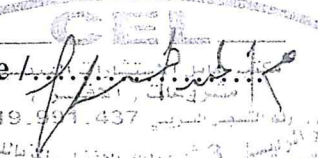




Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 661+500 E=482368.5864 N=2846989.3628  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 05

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 93.2      |
| 37.5               | 1.5                | 83.8      |
| 25                 | 1                  | 70.3      |
| 19                 | $\frac{3}{4}$      | 63.7      |
| 12.50              | $\frac{1}{2}$      | 50.1      |
| 9.50               | $\frac{3}{8}$      | 44.7      |
| 4.75               | 4                  | 35.5      |
| 2.00               | 10                 | 32.6      |
| 0.425              | 40                 | 25.6      |

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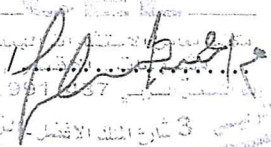


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Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 661+500 E=482368.5864 N=2846989.3628  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 05

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 11.7           |

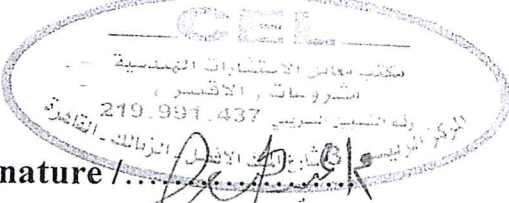
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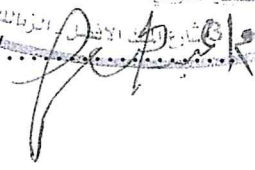


Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 661+500 E=482368.5864 N=2846989.3628  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 05

**Results of liquid limit and plasticity index  
of soils according to ASTM D-4318**

| Test             | Results<br>(%) |
|------------------|----------------|
| Liquid Limit     | 0              |
| Plastic Limit    | 0              |
| Plasticity Index | 0              |

  
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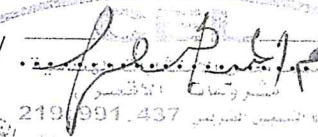
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Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 661+500 E=482368.5864 N=2846989.3628  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 05

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 32.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 25.6           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 11.7           | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

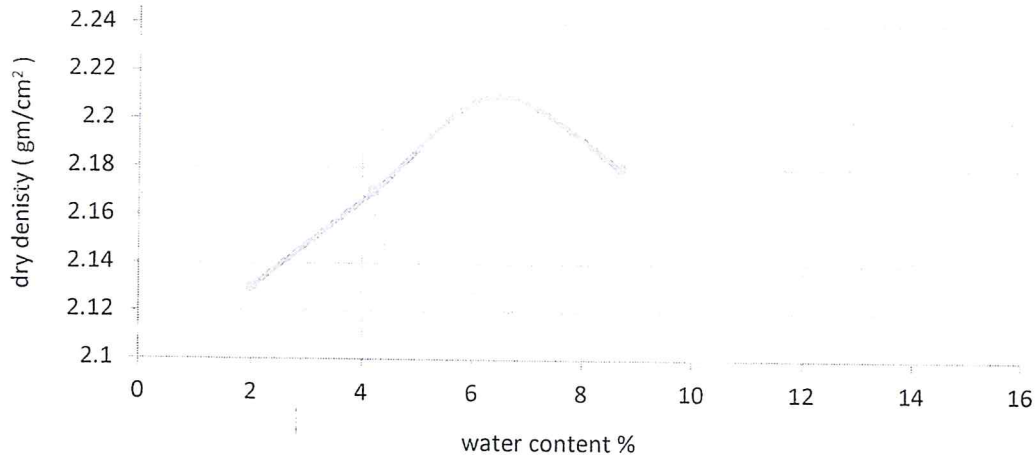
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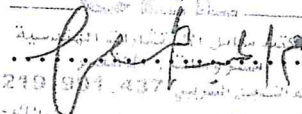


Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 661+500 E=482368.5864 N=2846989.3628  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 05

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



- Max dry density (gm/cm²) : 2.21
- Optimum moisture-content % : 6.4 %

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Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 661+500 E=482368.5864 N=2846989.3628  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
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Reporting No. : 05

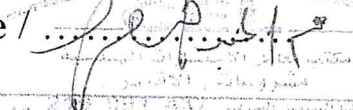
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.45                   |
| 1.27        | 0.050 | 1.27                   |
| 1.91        | 0.075 | 2.13                   |
| 2.54        | 0.100 | 3.04                   |
| 3.18        | 0.125 | 4.05                   |
| 3.81        | 0.150 | 5.06                   |
| 4.45        | 0.175 | 5.82                   |
| 5.08        | 0.200 | 6.33                   |
| 6.35        | 0.250 | 6.58                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 44 %  |
|                                   | 6.90         | 3.04           |       |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.21 (gm /cm<sup>3</sup>)  
At = 6.4 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

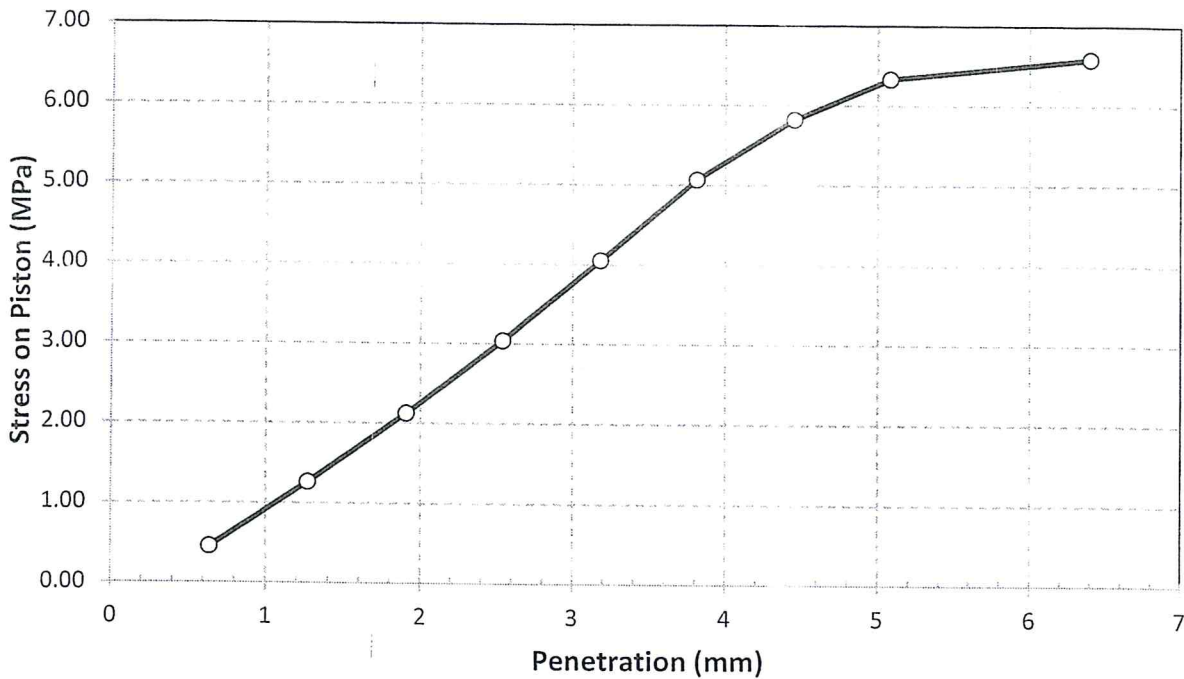
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Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 661+500 E=482368.5864 N=2846989.3628  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 05

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



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Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 11/10/2023  
Soil type : Middle Embankment  
Location : ST from 661+040 To 664+140  
Level : - 3 M  
Report No. : 57

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole Volume cm <sup>3</sup> | Bulk Density gm/ cm <sup>3</sup> | Moisture Content % | Dry Density (gm/ cm <sup>3</sup> ) | Degree of Compaction (%) | Acceptance |
|--------|---------|----------------------------------|----------------------------------|--------------------|------------------------------------|--------------------------|------------|
| 1      | 659+540 | 1443                             | 1.61                             | 6                  | 1.52                               | 68.4%                    | Comply     |
| 2      | 659+581 | 1639                             | 2.27                             | 6                  | 2.14                               | 96.5%                    | Comply     |
| 3      | 659+595 | 1688                             | 2.28                             | 6.4                | 2.14                               | 96.6%                    | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.22 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4%

Signature /  27369093  
المركز الرئيسي ٣ شارع الملك الأفضل - الزمالك - القاهرة  
رقم التسجيل الضريبي: ٢٧٣٦٩٠٩٣



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مكتب معامل الإستشارات الهندسية  
مشروعات محافظات الوجه القبلى

Company : شركة المستقل :

Project : Electric Express Train - Sector (5) – Qous to Arment.  
Subject : Determine the deformation and strength characteristics of soil by the plate loading test according specifications DIN 18134:2012-04 and project requirements  
Test Location : Station (660+300 to 660+500)  
Test Date : 02/09/2023  
Report Date : 03/09/2023  
Type of soil : Original earth  
Report No. : 1 : 2

Dear Gentleman,

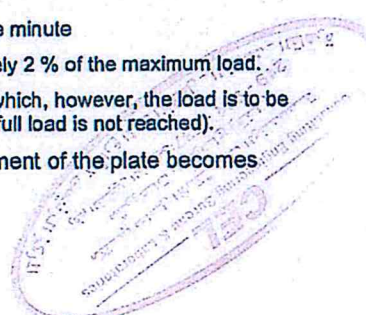
According to the above mentioned subject the test performed as follows:-

Apparatus

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (Enerbac)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

Test Procedure:

1. Clean the ground on test area to the required level with undisturbed soil
2. Install loading plates 300 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test applied preloading about 30 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 300 mm loading plate, the limit values are 5.0 kg/cm<sup>2</sup>
6. The load shall be applied in six stages, in approximately equal increments, until the required maximum normal stress is reached.
7. Each change in load (from stage to stage) shall be completed within one minute
8. The load shall be released in 3 stages, to 50 % , 25 % , and approximately 2 % of the maximum load.
9. Following unloading, a further (2<sup>nd</sup>) loading cycle shall be carried out, in which, however, the load is to be increased only to the penultimate stage of the first cycle (so that the full load is not reached).
10. At each stage the load shall be maintained until the rate of settlement of the plate becomes less than 0.02 mm/min.
11. Remove the loads



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#### Report

1. Evaluation and representation of results.
2. Load Settlement curve.
3. The test report content the following:-
  - location of test site - Dimension of loading plate.
  - Measuring device used - Type of soil.
  - Type of Bedding material below the plate -Weathering condition.
  - Time and date of measurements - Unusual observation made during test .
  - Dial gauge reading and corresponding normal stress - Loading-settlement curve.
  - Description of the soil condition below the plate after testing.

#### Report

- Type of soil : Original earth
- Job requirement :  $E_{v2} > 40 \text{ MPa}$

| Item                                                               | Descriptions   |
|--------------------------------------------------------------------|----------------|
| - Type of bedding material below the plate                         | Natural Soil   |
| - Plate Diameter (mm)                                              | 300            |
| - date of measurement                                              | 02/09/2023     |
| - Unusual observation made during test                             | NO             |
| - Description of the soil conditions below the plate after testing | No deformation |

#### Evaluation and representation of results

| Test No. | Station |         | Location | Level ( m ) | First Cycle      | Second Cycle     | $E_{v2}/E_{v1}$ Ratio |
|----------|---------|---------|----------|-------------|------------------|------------------|-----------------------|
|          | From    | To      |          |             | $E_{v1}$ ( MPa ) | $E_{v2}$ ( Mpa ) |                       |
| 1        | 660+300 | 660+400 | 660+340  | -2.5        | 94.3             | 112.0            | 1.19                  |
| 2        | 660+400 | 660+500 | 660+460  | -2.5        | 85.6             | 130.8            | 1.53                  |

Signature /

*[Handwritten Signature]*

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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 02/09/2023  
report date : 03/09/2023  
Location : Station (660+340 )  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

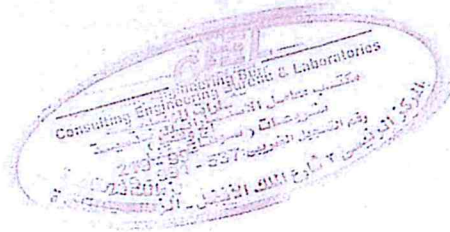
| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.78  | 0.22             | 19.80  | 0.20             | 0.21    |
| 2       | 1.66             | 19.56  | 0.44             | 19.63  | 0.37             | 0.41    |
| 3       | 2.50             | 19.32  | 0.68             | 19.48  | 0.52             | 0.60    |
| 4       | 3.33             | 19.17  | 0.83             | 19.24  | 0.76             | 0.80    |
| 5       | 4.17             | 19.00  | 1.00             | 19.01  | 0.99             | 0.99    |
| 6       | 5.00             | 18.89  | 1.11             | 18.90  | 1.10             | 1.11    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 18.98  | 1.02             | 19.00  | 1.00             | 1.01    |
| 2       | 1.25             | 19.21  | 0.79             | 19.26  | 0.74             | 0.76    |
| 3       | 0.100            | 19.62  | 0.38             | 19.67  | 0.33             | 0.35    |

**Loading Stage (2)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.83             | 19.50  | 0.50             | 19.53  | 0.47             | 0.48    |
| 1       | 1.66             | 19.47  | 0.53             | 19.39  | 0.61             | 0.57    |
| 2       | 2.50             | 19.32  | 0.68             | 19.24  | 0.76             | 0.72    |
| 3       | 3.33             | 19.12  | 0.88             | 19.05  | 0.95             | 0.91    |
| 4       | 4.17             | 18.97  | 1.03             | 18.88  | 1.12             | 1.08    |



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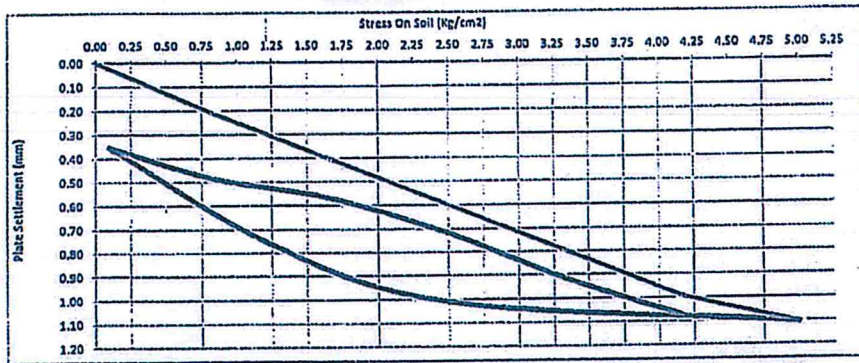


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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 02/09/2023  
report date : 03/09/2023  
Location : Station (660+340)  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.21 | 0.41   | 0.60   | 0.80   | 0.99   | 1.11   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 1.11 | 1.01 | 0.76  | 0.35 |

|                                                            |                |               |           |
|------------------------------------------------------------|----------------|---------------|-----------|
| D (mm) = 300                                               | S1 (mm) = 0.37 | S2(mm) = 0.84 | ΔS = 0.47 |
| Ev1 (MPa) = $(0.75 \cdot D \cdot \Delta\sigma) / \Delta S$ | 94.3           |               |           |

Ev2/Ev1 = 1.19

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.35 | 0.48    | 0.57   | 0.72   | 0.91   | 1.08   |

|                                                            |                |               |           |
|------------------------------------------------------------|----------------|---------------|-----------|
| D (mm) = 300                                               | S1 (mm) = 0.55 | S2(mm) = 0.95 | ΔS = 0.39 |
| Ev2 (MPa) = $(0.75 \cdot D \cdot \Delta\sigma) / \Delta S$ | 112.0          |               |           |

Ev1 = Modulus of deformation during the loading stage.  
Ev2 = Modulus of deformation during the Reloading stage.  
D = Plate diameter (mm)  
Ds = The difference between 0.3 and 0.7 from the maximum loading (amax) (kg/cm<sup>2</sup>)  
ΔS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 02/09/2023  
report date : 03/09/2023  
Location : Station (660+460 )  
Test No. : 02

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

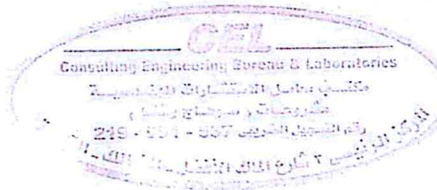
| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.78  | 0.22             | 19.76  | 0.24             | 0.23    |
| 2       | 1.66             | 19.64  | 0.36             | 19.58  | 0.42             | 0.39    |
| 3       | 2.50             | 19.42  | 0.58             | 19.36  | 0.64             | 0.61    |
| 4       | 3.33             | 19.20  | 0.80             | 19.12  | 0.88             | 0.84    |
| 5       | 4.17             | 19.00  | 1.00             | 18.98  | 1.02             | 1.01    |
| 6       | 5.00             | 18.86  | 1.14             | 18.81  | 1.19             | 1.17    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 18.94  | 1.06             | 18.89  | 1.11             | 1.09    |
| 2       | 1.25             | 19.12  | 0.88             | 19.06  | 0.94             | 0.91    |
| 3       | 0.100            | 19.49  | 0.51             | 19.44  | 0.56             | 0.54    |

**Loading Stage (2)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.83             | 19.37  | 0.63             | 19.30  | 0.70             | 0.66    |
| 1       | 1.66             | 19.20  | 0.80             | 19.17  | 0.83             | 0.82    |
| 2       | 2.50             | 19.08  | 0.92             | 19.00  | 1.00             | 0.96    |
| 3       | 3.33             | 18.92  | 1.08             | 18.88  | 1.12             | 1.10    |
| 4       | 4.17             | 18.81  | 1.19             | 18.76  | 1.24             | 1.22    |



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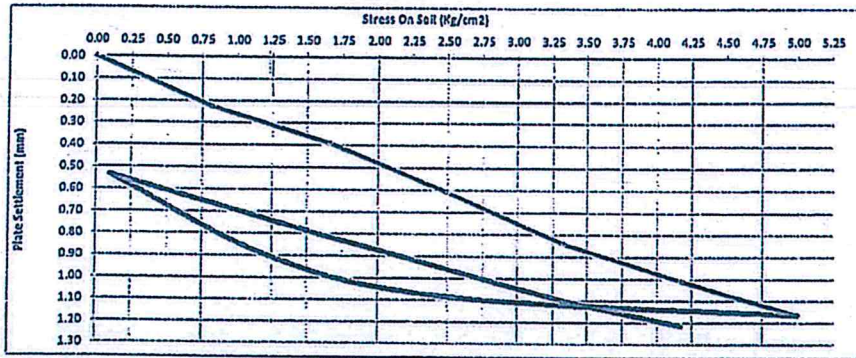


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Company Name : شركة المستنجل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 02/09/2023  
report date : 03/09/2023  
Location : Station (660+460)  
Test No. : 02

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm²) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.23 | 0.39   | 0.61   | 0.84   | 1.01   | 1.17   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm²) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 1.17 | 1.09 | 0.91  | 0.54 |

|             |                      |           |      |           |      |      |      |
|-------------|----------------------|-----------|------|-----------|------|------|------|
| D (mm) =    | 300                  | S1 (mm) = | 0.36 | S2 (mm) = | 0.87 | ΔS = | 0.52 |
| Ev1 (MPa) = | (0.75 * D * Δσ) / ΔS |           |      |           |      |      |      |
|             | 85.6                 |           |      |           |      |      |      |

$$Ev2/Ev1 = 1.53$$

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm²) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.54 | 0.00    | 0.82   | 0.90   | 1.10   | 1.22   |

|             |                      |           |      |           |      |      |      |
|-------------|----------------------|-----------|------|-----------|------|------|------|
| D (mm) =    | 300                  | S1 (mm) = | 0.79 | S2 (mm) = | 1.12 | ΔS = | 0.34 |
| Ev2 (MPa) = | (0.75 * D * Δσ) / ΔS |           |      |           |      |      |      |
|             | 130.8                |           |      |           |      |      |      |

Ev1 = Modulus of deformation during the loading stage.

Ev2 = Modulus of deformation during the Reloading stage.

D = Plate diameter (mm)

Δσ = The difference between 0.3 and 0.7 from the maximum loading (σmax) (kg/cm²)

ΔS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company : شركة المستقبل

Project : Electric Express Train - Sector (5) – Qous to Arment.  
Subject : Determine the deformation and strength characteristics of soil by the plate loading test according specifications DIN 18134:2012-04 and project requirements  
Test Location : Station (660+00 to 660+200)  
Test Date : 29/08/2023  
Report Date : 30/08/2023  
Type of soil : Original earth  
Report No. : 1 : 2

Dear Gentleman,

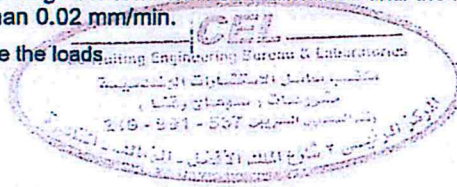
According to the above mentioned subject the test performed as follows:-

**Apparatus**

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (Enerbac)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

**Test Procedure:**

1. Clean the ground on test area to the required level with undisturbed soil
2. Install loading plates 300 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test applied preloading about 30 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 300 mm loading plate, the limit values are 5.0 kg/cm<sup>2</sup>
6. The load shall be applied in six stages, in approximately equal increments, until the required maximum normal stress is reached.
7. Each change in load (from stage to stage) shall be completed within one minute
8. The load shall be released in 3 stages, to 50 % , 25 % , and approximately 2 % of the maximum load.
9. Following unloading, a further (2<sup>nd</sup>) loading cycle shall be carried out, in which, however, the load is to be increased only to the penultimate stage of the first cycle (so that the full load is not reached).
10. At each stage the load shall be maintained until the rate of settlement of the plate becomes less than 0.02 mm/min.
11. Remove the loads



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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 29/08/2023  
report date : 30/08/2023  
Location : Station (660+075)  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.92  | 0.08             | 19.85  | 0.15             | 0.11    |
| 2       | 1.66             | 19.80  | 0.20             | 19.69  | 0.31             | 0.25    |
| 3       | 2.50             | 19.69  | 0.31             | 19.48  | 0.52             | 0.41    |
| 4       | 3.33             | 19.57  | 0.43             | 19.39  | 0.61             | 0.52    |
| 5       | 4.17             | 19.32  | 0.68             | 19.21  | 0.79             | 0.73    |
| 6       | 5.00             | 19.06  | 0.94             | 19.00  | 1.00             | 0.97    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 19.14  | 0.86             | 19.09  | 0.91             | 0.89    |
| 2       | 1.25             | 19.32  | 0.68             | 19.29  | 0.71             | 0.70    |
| 3       | 0.100            | 19.68  | 0.32             | 19.58  | 0.42             | 0.37    |

**Loading Stage (2)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.83             | 19.52  | 0.48             | 19.45  | 0.55             | 0.52    |
| 1       | 1.66             | 19.38  | 0.62             | 19.31  | 0.69             | 0.66    |
| 2       | 2.50             | 19.24  | 0.76             | 19.19  | 0.81             | 0.79    |
| 3       | 3.33             | 19.09  | 0.91             | 19.05  | 0.95             | 0.93    |
| 4       | 4.17             | 18.99  | 1.01             | 18.97  | 1.03             | 1.02    |



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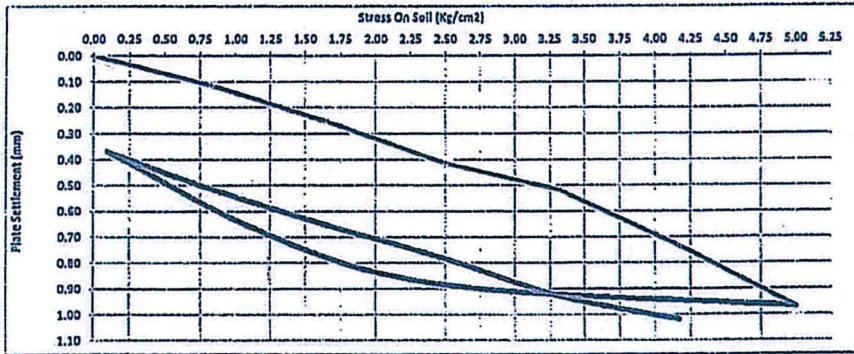


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مكتب معامل الاستشارات الهندسية  
مشروعات محافظات الوجه القبلي

Company Name : شركة المسكيت  
Project : Electric Express Train - Sector (5) - Qous to Armont.  
Test Date : 29/08/2023  
report date : 30/08/2023  
Location : Station (0601075)  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.6 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.11 | 0.25   | 0.41   | 0.52   | 0.73   | 0.97   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 0.97 | 0.89 | 0.70  | 0.37 |

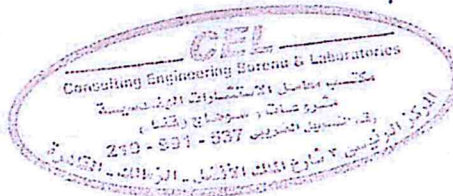
|             |                |           |      |           |      |      |       |
|-------------|----------------|-----------|------|-----------|------|------|-------|
| D (mm) =    | 300            | S1 (mm) = | 0.23 | S2 (mm) = | 0.56 | ΔS = | 0.34  |
| Ev1 (MPa) = | (0.75*D*Δσ)/ΔS |           |      |           |      |      | 131.5 |

$$Ev2/Ev1 = 1.05$$

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.37 | 0.52    | 0.66   | 0.79   | 0.93   | 1.02   |

|             |                |           |      |           |      |      |       |
|-------------|----------------|-----------|------|-----------|------|------|-------|
| D (mm) =    | 300            | S1 (mm) = | 0.63 | S2 (mm) = | 0.95 | ΔS = | 0.32  |
| Ev2 (MPa) = | (0.75*D*Δσ)/ΔS |           |      |           |      |      | 137.8 |

Ev1 = Modulus of deformation during the loading stage.  
Ev2 = Modulus of deformation during the Reloading stage.  
D = Plate diameter (mm)  
Ds = The difference between 0.3 and 0.7 from the maximum loading (σmax) (kg/cm<sup>2</sup>)  
DS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 29/08/2023  
report date : 30/08/2023  
Location : Station (660+140)  
Test No. : 02

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.88  | 0.12             | 19.81  | 0.19             | 0.16    |
| 2       | 1.66             | 19.71  | 0.29             | 19.65  | 0.35             | 0.32    |
| 3       | 2.50             | 19.64  | 0.36             | 19.47  | 0.53             | 0.45    |
| 4       | 3.33             | 19.49  | 0.51             | 19.29  | 0.71             | 0.61    |
| 5       | 4.17             | 19.31  | 0.69             | 19.12  | 0.88             | 0.79    |
| 6       | 5.00             | 19.10  | 0.90             | 18.98  | 1.02             | 0.96    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 19.17  | 0.83             | 19.07  | 0.93             | 0.88    |
| 2       | 1.25             | 19.36  | 0.64             | 19.22  | 0.78             | 0.71    |
| 3       | 0.100            | 19.74  | 0.26             | 19.62  | 0.38             | 0.32    |

**Loading Stage (2)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.83             | 19.61  | 0.39             | 19.50  | 0.50             | 0.45    |
| 1       | 1.66             | 19.49  | 0.51             | 19.46  | 0.54             | 0.53    |
| 2       | 2.50             | 19.38  | 0.62             | 19.32  | 0.68             | 0.65    |
| 3       | 3.33             | 19.24  | 0.76             | 19.19  | 0.81             | 0.79    |
| 4       | 4.17             | 19.09  | 0.91             | 19.02  | 0.98             | 0.95    |



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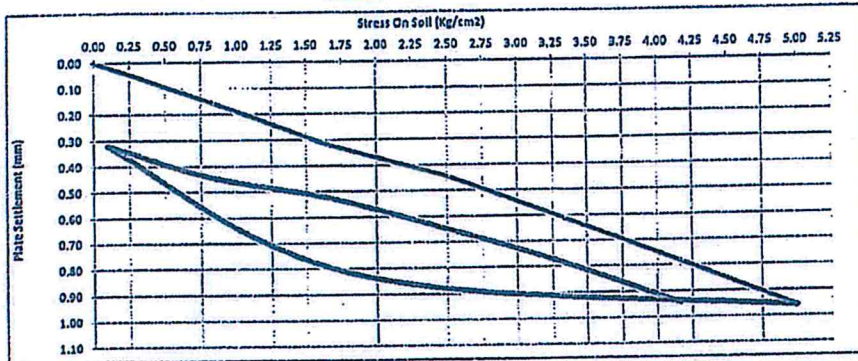


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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 29/08/2023  
report date : 30/08/2023  
Location : Station (600+140)  
Test No. : 02

### Nonrepetitive Static Plate Load Tests of Soils DIN 18134



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.16 | 0.32   | 0.45   | 0.61   | 0.79   | 0.95   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 0.96 | 0.88 | 0.71  | 0.32 |

|             |                |           |      |           |      |      |      |
|-------------|----------------|-----------|------|-----------|------|------|------|
| D (mm) =    | 300            | S1 (mm) = | 0.29 | S2 (mm) = | 0.65 | ΔS = | 0.36 |
| Ev1 (MPa) = | (0.75*D*Δσ)/ΔS |           |      |           |      |      |      |
|             | 123.5          |           |      |           |      |      |      |

$$Ev2/Ev1 = 1.16$$

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.32 | 0.45    | 0.53   | 0.65   | 0.79   | 0.95   |

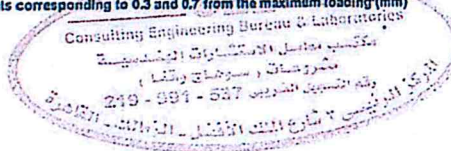
|             |                |           |      |           |      |      |      |
|-------------|----------------|-----------|------|-----------|------|------|------|
| D (mm) =    | 300            | S1 (mm) = | 0.51 | S2 (mm) = | 0.92 | ΔS = | 0.31 |
| Ev2 (MPa) = | (0.75*D*Δσ)/ΔS |           |      |           |      |      |      |
|             | 143.3          |           |      |           |      |      |      |

Ev1 = Modulus of deformation during the loading stage.  
Ev2 = Modulus of deformation during the Reloading stage.

D = Plate diameter (mm)

Δσ = The difference between 0.3 and 0.7 from the maximum loading (σmax) (kg/cm<sup>2</sup>)

ΔS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company : شركة المستقبل

Project : Electric Express Train - Sector (5) – Qous to Arment.  
Subject : Determine the deformation and strength characteristics of soil by the plate loading test according specifications DIN 18134:2012-04 and project requirements  
Test Location : Station (660+200 to 660+300)  
Test Date : 30/08/2023  
Report Date : 31/08/2023  
Type of soil : Original earth  
Report No. : 1

Dear Gentleman,

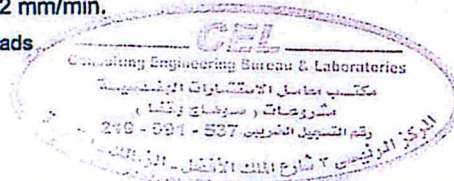
According to the above mentioned subject the test performed as follows:-

**Apparatus**

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (Enerbac)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

**Test Procedure:**

1. Clean the ground on test area to the required level with undisturbed soil
2. Install loading plates 300 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test applied preloading about 30 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 300 mm loading plate, the limit values are 5.0 kg/cm<sup>2</sup>
6. The load shall be applied in six stages, in approximately equal increments, until the required maximum normal stress is reached.
7. Each change in load (from stage to stage) shall be completed within one minute
8. The load shall be released in 3 stages, to 50 % , 25 % , and approximately 2 % of the maximum load.
9. Following unloading, a further (2<sup>nd</sup>) loading cycle shall be carried out, in which, however, the load is to be increased only to the penultimate stage of the first cycle (so that the full load is not reached).
10. At each stage the load shall be maintained until the rate of settlement of the plate becomes less than 0.02 mm/min.
11. Remove the loads



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#### Report

1. Evaluation and representation of results.
2. Load Settlement curve.
3. The test report content the following:-
  - location of test site - Dimension of loading plate.
  - Measuring device used - Type of soil.
  - Type of Bedding material below the plate -Weathering condition.
  - Time and date of measurements - Unusual observation made during test .
  - Dial gauge reading and corresponding normal stress - Loading-settlement curve.
  - Description of the soil condition below the plate after testing.

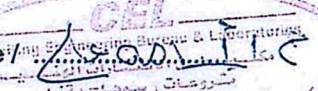
#### Report

- Type of soil : Original earth
- Job requirement :  $E_{v2} > 40$  MPa

| Item                                                               | Descriptions   |
|--------------------------------------------------------------------|----------------|
| - Type of bedding material below the plate                         | Natural Soil   |
| - Plate Diameter (mm)                                              | 300            |
| - date of measurement                                              | 30/08/2023     |
| - Unusual observation made during test                             | NO             |
| - Description of the soil conditions below the plate after testing | No deformation |

#### Evaluation and representation of results

| Test No. | Station |         | Location | Level (m) | First Cycle    | Second Cycle   | $E_{v2}/E_{v1}$ Ratio |
|----------|---------|---------|----------|-----------|----------------|----------------|-----------------------|
|          | From    | To      |          |           | $E_{v1}$ (MPa) | $E_{v2}$ (Mpa) |                       |
| 1        | 660+200 | 660+300 | 660+240  | -2.0      | 81.6           | 125.6          | 1.54                  |

Signature:   
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البريد الإلكتروني: info@cel-egypt.com

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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 30/08/2023  
report date : 31/08/2023  
Location : Station (660+240)  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.00             | 20.00  | 0.00             | 20.00  | 0.00             | 0.00    |
| 1       | 0.83             | 19.79  | 0.21             | 19.72  | 0.28             | 0.25    |
| 2       | 1.66             | 19.54  | 0.46             | 19.49  | 0.51             | 0.49    |
| 3       | 2.50             | 19.27  | 0.73             | 19.21  | 0.79             | 0.76    |
| 4       | 3.33             | 19.09  | 0.91             | 19.00  | 1.00             | 0.96    |
| 5       | 4.17             | 18.94  | 1.06             | 18.91  | 1.09             | 1.08    |
| 6       | 5.00             | 18.84  | 1.16             | 18.76  | 1.24             | 1.20    |

**Unloading Stage (1)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 1       | 2.50             | 18.91  | 1.09             | 18.84  | 1.16             | 1.13    |
| 2       | 1.25             | 19.09  | 0.91             | 19.00  | 1.00             | 0.96    |
| 3       | 0.100            | 19.56  | 0.44             | 19.50  | 0.50             | 0.47    |

**Loading Stage (2)**

| Loading | Stress<br>Kg/cm2 | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---------|------------------|--------|------------------|--------|------------------|---------|
| 0       | 0.83             | 19.41  | 0.59             | 19.44  | 0.60             | 0.63    |
| 1       | 1.66             | 19.29  | 0.71             | 19.20  | 0.80             | 0.76    |
| 2       | 2.50             | 19.12  | 0.88             | 19.08  | 0.92             | 0.90    |
| 3       | 3.33             | 18.97  | 1.03             | 18.91  | 1.09             | 1.06    |
| 4       | 4.17             | 18.86  | 1.14             | 18.81  | 1.19             | 1.17    |



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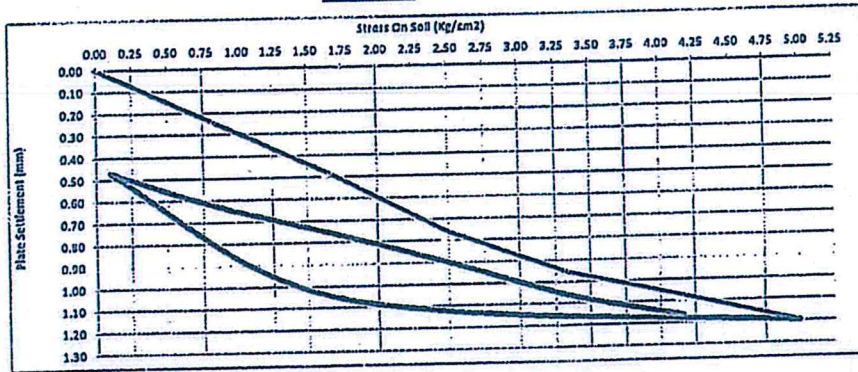


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Company Name : شركة المسكيت  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 30/08/2023  
report date : 31/08/2023  
Location : Station (660+240)  
Test No. : 01

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.25 | 0.49   | 0.76   | 0.96   | 1.08   | 1.20   |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 1.20 | 1.13 | 0.96  | 0.47 |

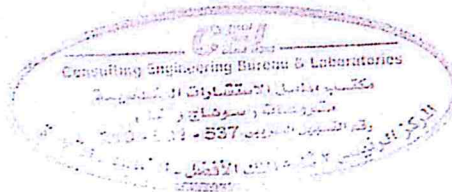
|                                                               |                |                |           |
|---------------------------------------------------------------|----------------|----------------|-----------|
| D (mm) = 300                                                  | S1 (mm) = 0.44 | S2 (mm) = 0.96 | ΔS = 0.54 |
| Ev1 (MPa) = $(0.75 \cdot D^2 \cdot \Delta \sigma) / \Delta S$ | 81.6           |                |           |

$$Ev2/Ev1 = 1.54$$

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.47 | 0.63    | 0.76   | 0.90   | 1.06   | 1.17   |

|                                                               |                |                |           |
|---------------------------------------------------------------|----------------|----------------|-----------|
| D (mm) = 300                                                  | S1 (mm) = 0.73 | S2 (mm) = 1.08 | ΔS = 0.35 |
| Ev2 (MPa) = $(0.75 \cdot D^2 \cdot \Delta \sigma) / \Delta S$ | 125.6          |                |           |

Ev1 = Modulus of deformation during the loading stage.  
Ev2 = Modulus of deformation during the Reloading stage.  
D = Plate diameter (mm)  
Ds = The difference between 0.3 and 0.7 from the maximum loading (smax) (kg/cm<sup>2</sup>)  
ΔS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 19/9/2023  
Soil type : Middle Embankment  
Location : ST from 659+980 to 660+100  
Level : - 1.75 M  
Report No. : 34

**Compaction test by using Sand – Cone Test Method**  
**ASTM D- 1556**

| Test # | Station | Test Hole Volume cm <sup>3</sup> | Bulk Density gm/ cm <sup>3</sup> | Moisture Content % | Dry Density (gm/ cm <sup>3</sup> ) | Degree of Compaction (%) | Acceptance |
|--------|---------|----------------------------------|----------------------------------|--------------------|------------------------------------|--------------------------|------------|
| 1      | 660+000 | 1908                             | 2.23                             | 6.4                | 2.09                               | 96.0%                    | Comply     |
| 2      | 660+040 | 1184                             | 3.50                             | 64                 | 2.14                               | 98.0%                    | Comply     |
| 3      | 660+080 | 1460                             | 2.27                             | 5.8                | 2.15                               | 98.6%                    | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.18 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

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Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature





Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 97.7      |
| 37.5               | 1.5                | 90.8      |
| 25                 | 1                  | 80.6      |
| 19                 | $\frac{3}{4}$      | 71.0      |
| 12.50              | $\frac{1}{2}$      | 58.1      |
| 9.50               | $\frac{3}{8}$      | 47.4      |
| 4.75               | 4                  | 36.0      |
| 2.00               | 10                 | 24.6      |
| 0.425              | 40                 | 15.8      |

Signature

3 El Malek El Afral Street  
Zamalek, Cairo  
Tel/Fax : 27367231 - 27369093

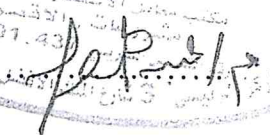


مكتب معامل الاستشارات الهندسية  
القاهرة - الجيزة  
تلفون : 27367231 - 27369093

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 5.6            |

Signature /   
219.991.43



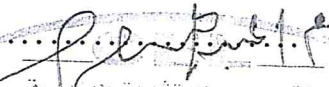


Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 24.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 15.8           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 5.6            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature / 

مكتب محامل الاستشارات الهندسية  
مشاريع و محامل  
213 991 437  
3 شارع النيل الأمامي - الزمالك - القاهرة

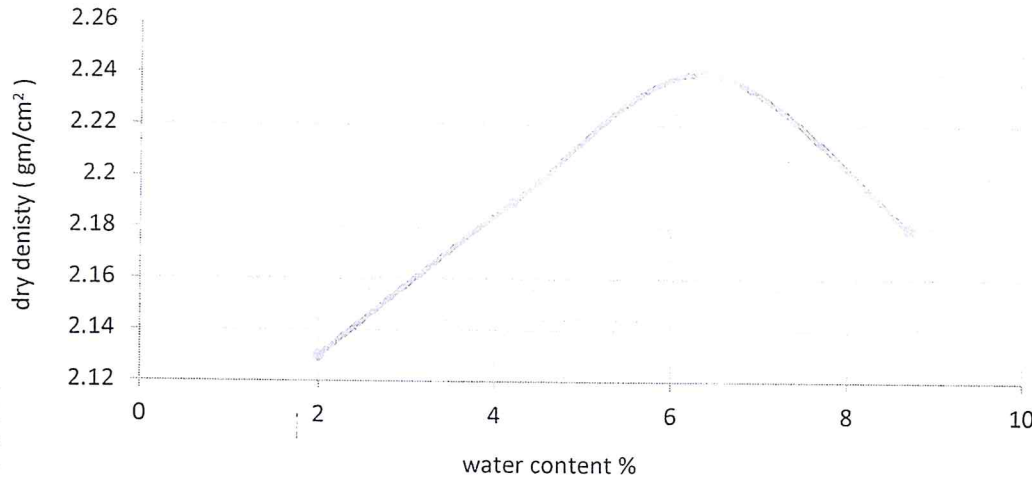
3 El Malek El Agha Street  
Zamalek, Cairo  
Tel/Fax 27367231 27369093



شركة محامل الاستشارات  
مشاريع و محامل  
213 991 437

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

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



- Max dry density (gm/cm²) : 2.24
- Optimum moisture content % : 5.8 %

Signature:   
م.م. المهندس  
مستشار  
رقم التسجيل المهنى 219.994.437  
المركز الرئيسى 3 شارع الملك الافضل - الهرم - القاهرة

3 El Malek El Afrlal Street  
Zamalek, Cairo.  
Tel& Fax : 27367231 - 27363693



مركز الملك الافضل  
الزمالك القاهرة  
تليفون : 27367231  
فاكس : 27363693



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

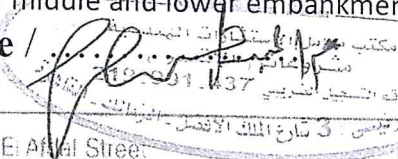
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.31                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48 %  |
|                                   | 6.90         | 3.31           |       |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.24 (gm /cm<sup>3</sup>)  
At = 5.8 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

**Signature** /   
مكتب معامل الاستشارات الهندسية  
شركة المستقبل للمقاولات العامة  
رقم التسجيل الهندسي 19001-437  
الترخيص 3 شارع الملك الأفندي - برج التحرير

3 El Malek El Afyal Street  
Zamalek, Cairo  
Tel & Fax 27369237 27369093

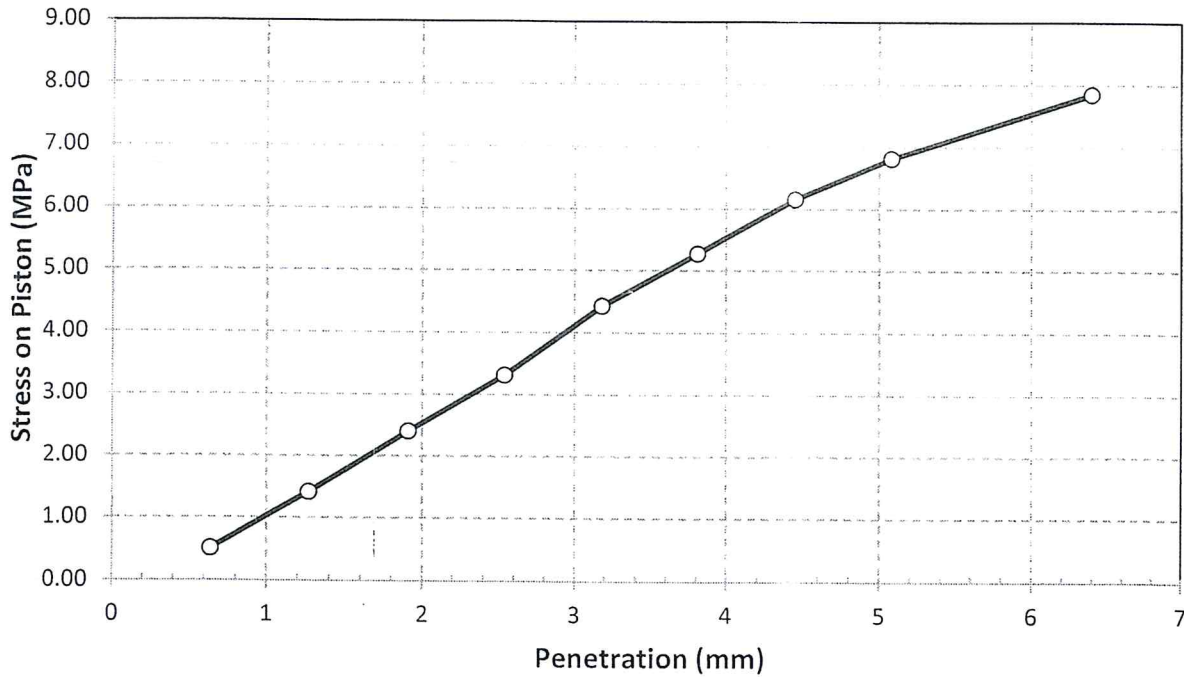


في حالة الاختبار  
الرمال الباردة  
المواد الحبيبية

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Load Penetration Curve of CBR Test**

**ASTM D-1883**



Signature

أ. م. محمد الجبوري  
مهندس استشارات الهندسية  
مشاريع الطرق والبنية التحتية  
249.994.437  
3 شارع الملك الأفضل - الزمالة - القاهرة

3 El Malek El Afral Street  
Zamalek, Cairo.  
Tel & Fax : 27367231 - 27363093



إدارة مكتب الاستشارات  
الزماملة - القاهرة  
الهاتف : 27367231 - 27363093

18

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 10/9/2023  
Soil type : طبقه استبدال  
Location : ST from 660+320 To 660+400  
Level : - 2.5 M  
Report No. : 26

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole Volume cm <sup>3</sup> | Bulk Density gm/ cm <sup>3</sup> | Moisture Content % | Dry Density (gm/ cm <sup>3</sup> ) | Degree of Compaction (%) | Acceptance |
|--------|---------|----------------------------------|----------------------------------|--------------------|------------------------------------|--------------------------|------------|
| 1      | 660+340 | 1469                             | 2.34                             | 5.6                | 2.22                               | 99.3%                    | Comply     |
| 2      | 660+380 | 1369                             | 2.25                             | 6                  | 2.12                               | 95.2%                    | Comply     |

• Degree of compaction based on proctor test dated At

• Max. dry density = 2.23 gm/cm<sup>3</sup>

• At optimum moisture content = 6.4 %

Signature





Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature

  
مكتب معامل الاستشارات الهندسية  
رقم التسجيل التجاري 27363003  
المركز الرئيسي 3 شارع الملك الأفندي - الزمالك - القاهرة

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 97.7      |
| 37.5               | 1.5                | 90.8      |
| 25                 | 1                  | 80.6      |
| 19                 | $\frac{3}{4}$      | 71.0      |
| 12.50              | $\frac{1}{2}$      | 58.1      |
| 9.50               | $\frac{3}{8}$      | 47.4      |
| 4.75               | 4                  | 36.0      |
| 2.00               | 10                 | 24.6      |
| 0.425              | 40                 | 15.8      |

Signature

3 El Malek El Afrtal Street  
Zamalek, Cairo  
Tel & Fax: 27367231 - 27363092

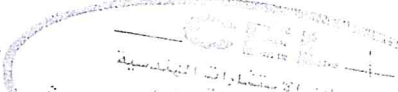
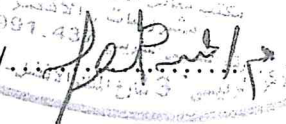


مكتب معامل الاستشارات  
الهندسية - القاهرة  
219/991.437 - 27363092

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 5.6            |

  
مكتب معامل الاستشارات الهندسية  
ش.م.ك. - القاهرة - الجيزة  
210.991.43  
Signature / 

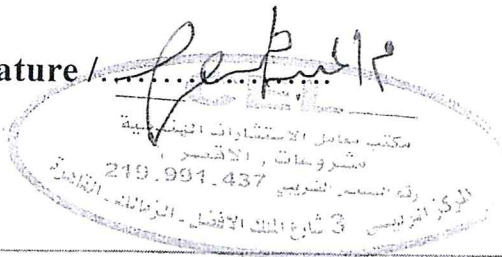


Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results<br>(%) |
|------------------|----------------|
| Liquid Limit     | 0              |
| Plastic Limit    | 0              |
| Plasticity Index | 0              |

Signature /



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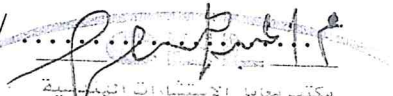
إلى السيد مدير  
الهيئة العامة  
للبحاثل الهندسية  
القاهرة

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 24.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 15.8           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 5.6            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature /   
مكتب معامل الاستشارات الهندسية  
شروعات ، الأقصر  
رقم التسجيل المميز 2491991.437  
البريد الإلكتروني 3 شارع الملك الأفندي الزمالة

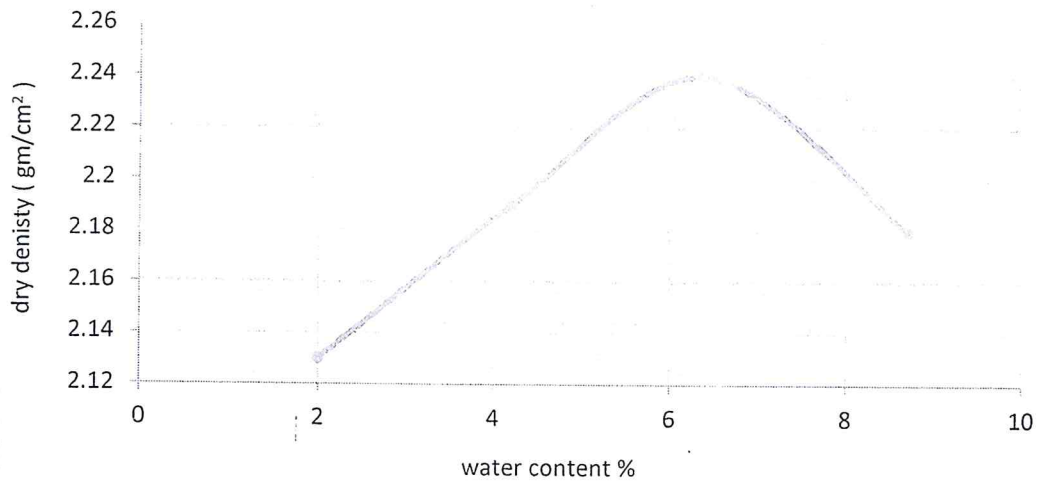
3 El Malek El Afdel Street  
Zamalek, Cairo  
Tel & Fax 27367231 - 27369093



شركة الاستشارات  
الهندسية  
مكتب  
القاهرة

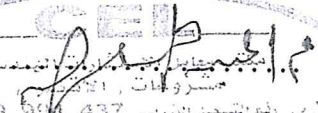
Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

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



- Max dry density (gm/cm²) : 2.24
- Optimum moisture content % : 5.8 %

Signature

  
م. المهندس  
مستشار  
رقم التسجيل 219.994.437  
المركز الرئيسي 3 شارع الملك فيصل - القاهرة

3 El Malek El Afrjal Street  
Zamalek, Cairo.  
Tel & Fax : 27367231 - 27363093



شركة الملك فيصل  
القاهرة العامة  
م. المهندس



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

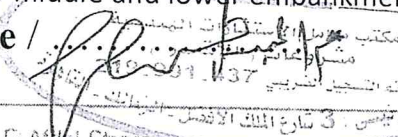
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.31                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48 %  |
|                                   | 6.90         | 3.31           |       |

**Notes:**

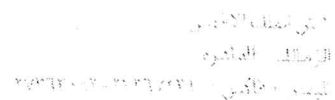
- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.24 (gm /cm<sup>3</sup>)  
At = 5.8 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

**Signature** / 

3 El Malek El Ahal Street,  
Zamalek, Cairo  
Tel & Fax: 27369031 - 27369093



إشهاد الاعتماد  
الهيئة العامة  
للمقاييس والمواصفات  
بمصر



Company Name : شركة الكرم  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 21/09/2023  
Soil type : Middle Embankment  
Location : ST from 660+300 TO 660+480  
Level : - 1.75 M  
Report No. : 89

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole Volume<br>cm <sup>3</sup> | Bulk Density<br>gm/ cm <sup>3</sup> | Moisture Content<br>% | Dry Density<br>(gm/ cm <sup>3</sup> ) | Degree of Compaction<br>(%) | Acceptance |
|--------|---------|-------------------------------------|-------------------------------------|-----------------------|---------------------------------------|-----------------------------|------------|
| 1      | 660+330 | 1196                                | 2.22                                | 6.4                   | 2.09                                  | 95.8%                       | Comply     |
| 2      | 660+360 | 1385                                | 2.27                                | 5.8                   | 2.14                                  | 98.4%                       | Comply     |
| 3      | 660+380 | 1370                                | 2.26                                | 6                     | 2.13                                  | 97.7%                       | Comply     |
| 4      | 660+405 | 1534                                | 2.23                                | 6.4                   | 2.10                                  | 96.1%                       | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.18 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

Signature / .....

Consulting Engineering Bureau & Laboratories  
مكتب معامل الاستشارات الهندسية  
شركات استشارات هندسية  
رقم التسجيل المبرمج 537 - 531  
3 El Malek El Malek Street  
Zamalek, Cairo  
Tel & Fax : 27367231 - 27363093



٢ ش الملك الأفضل  
الزمالك - القاهرة  
تليفون : ٢٧٣٦٧٢٣١ - ٢٧٣٦٧٢٣١



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

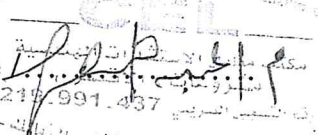
Signature

  
مكتب معامل الاستشارات الهندسية  
رقم التسجيل العدلي 27369093  
المركز الرئيسي 3 شارع الملك الافضل - الهرم - القاهرة

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 97.7      |
| 37.5               | 1.5                | 90.8      |
| 25                 | 1                  | 80.6      |
| 19                 | $\frac{3}{4}$      | 71.0      |
| 12.50              | $\frac{1}{2}$      | 58.1      |
| 9.50               | $\frac{3}{8}$      | 47.4      |
| 4.75               | 4                  | 36.0      |
| 2.00               | 10                 | 24.6      |
| 0.425              | 40                 | 15.8      |

Signature   
219.991.437  
3 شارع الملك الافضل - الزمالة - القاهرة

3 El Malek El Afrlal Street  
Zamalek, Cairo  
Tel/Fax: 27367231 - 27363092

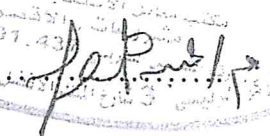


شركة المستقبل  
الزماملة القاهرة  
تليفون 27367231 - 27363092

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 5.6            |

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219.991.43

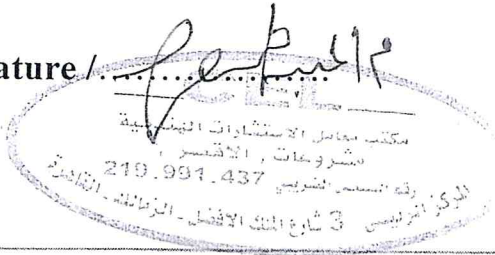


Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results (%) |
|------------------|-------------|
| Liquid Limit     | 0           |
| Plastic Limit    | 0           |
| Plasticity Index | 0           |

Signature /



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Tel & Fax 27367231 - 27363093



مركز الاختبار  
البيانات  
2023-08-12

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 24.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 15.8           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 5.6            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature / .....

مكتب معامل الاستشارات الهندسية  
مشاريع وخدمات الاستشارات  
219 991 437  
3 شارع النيل الأوفى - زمايك - القاهرة

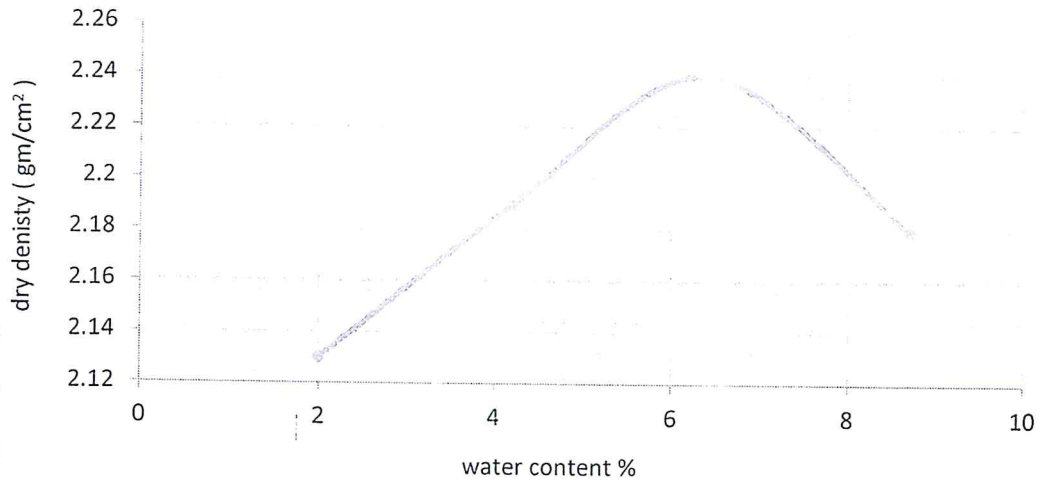
3 El Malek El Afdel Street  
Zamalek, Cairo  
Tel/Fax 27367231 - 27369093



شركة المستقبل للمقاولات العامة  
الزمامك - القاهرة  
مكتب معامل الاستشارات الهندسية

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

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



- Max dry density (gm/cm²) : 2.24
- Optimum moisture content % : 5.8 %

Signature

  
م. المهندس  
م. المهندس  
219.994.437  
الرقم التسجيل المهنى  
3 شارع الملك الأفندي - الهرم - القاهرة - 12071

3 El Malek El Afrlal Street  
Zamalek, Cairo.  
Tel & Fax : 27367231 - 27363093

**IAS**  
ACCREDITED  
Testing Laboratory

م. المهندس  
الزمالك القاهرة  
تسجيل : 219.994.437



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

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

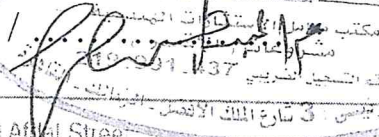
| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.31                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48 %  |
|                                   | 6.90         | 3.31           |       |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.24 (gm /cm<sup>3</sup>)  
At = 5.8 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

**Signature /** 

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Zamalek, Cairo  
Tel: 21365723 27369093



إشادات الاعتماد  
المرتبطة بالاختبار  
أحمد محمد



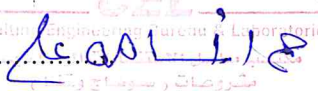
Company Name : شركه المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 2/9/2023  
Soil type : طبقه استبدال  
Location : ST from 660+180 To 660+200  
Level : - 2.5 M  
Report No. : 3

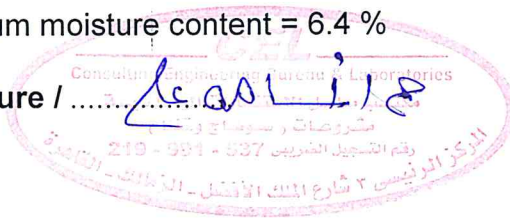
**Compaction test by using Sand – Cone Test Method**  
**ASTM D- 1556**

| Test # | Station | Test Hole Volume<br>cm <sup>3</sup> | Bulk Density gm/<br>cm <sup>3</sup> | Moisture Content % | Dry Density (gm/ cm <sup>3</sup> ) | Degree of Compaction (%) | Acceptance |
|--------|---------|-------------------------------------|-------------------------------------|--------------------|------------------------------------|--------------------------|------------|
| 1      | 660+190 | 1640                                | 2.35                                | 5.8                | 2.22                               | 99.0                     | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.24 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

Signature / ..... 





Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

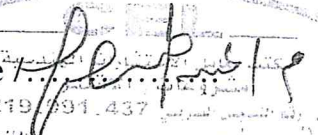
Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

#### Materials test

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature   
219/991.437  
المركز القومي للمعايير 3 شارع الميثاق الافضل - الزمالك - القاهرة

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 98.0      |
| 37.5               | 1.5                | 90.0      |
| 25                 | 1                  | 79.9      |
| 19                 | ¾                  | 70.1      |
| 12.50              | ½                  | 57.8      |
| 9.50               | 3/8                | 47.0      |
| 4.75               | 4                  | 35.1      |
| 2.00               | 10                 | 30.6      |
| 0.425              | 40                 | 20.3      |

Signature

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Zamalek, Cairo  
Tel/Fax: 27367231 - 27363090



إدارة المختبر  
مكتب  
مكتب

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ m (No.200) | 6.2            |

Signature 



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results (%) |
|------------------|-------------|
| Liquid Limit     | 0           |
| Plastic Limit    | 0           |
| Plasticity Index | 0           |

Signature 

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 30.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 20.3           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 6.2            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature /

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Zamalek, Cairo  
Tel & Fax 27367231 - 27363093



شركة المستقبل للمقاولات العامة  
مكتب معامل الاستشارات الهندسية  
رقم التسجيل التجاري 219.991.437  
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة





Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

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

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.55                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR %  |
|-----------------------------------|--------------|----------------|--------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 51.4 % |
|                                   | 6.90         | 3.55           |        |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.23 (gm /cm<sup>3</sup>)  
At = 6.4 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

**Signature / ...**

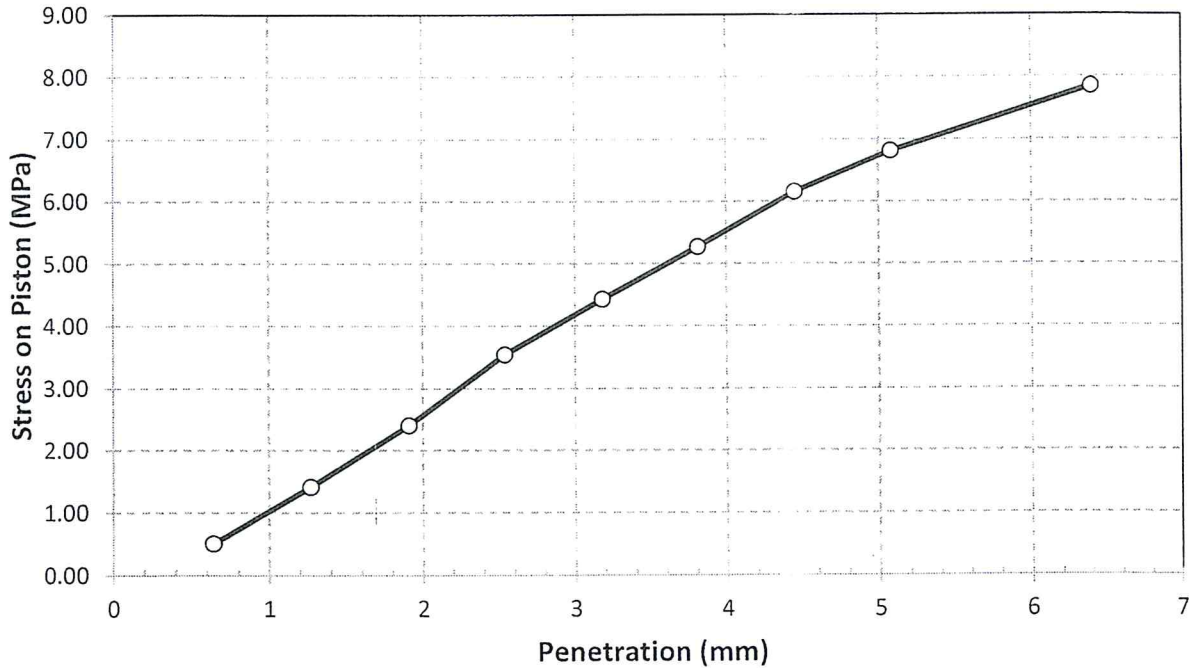
3 El Malek E Afdar Street  
Zamalek, Cairo  
Tel & Fax 27367231 - 27363093

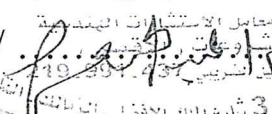


Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Load Penetration Curve of CBR Test**

**ASTM D-1883**



Signature /   
مكتب معامل الاستشارات الهندسية  
رقم الترخيص 19-2014-0001  
المركز الرئيسي - 3 شارع الملك الافضل - الهرم



Consulting Engineering Bureau & Laboratories  
مكتب معامل الاستشارات الهندسية

Company Name : شركه المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 10/9/2023  
Soil type : طبقه استبدال  
Location : ST from 660+780 to 660+800  
Level : - 3 M  
Report No. : 23

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole<br>Volume<br>cm <sup>3</sup> | Bulk<br>Density gm/<br>cm <sup>3</sup> | Moisture<br>Content % | Dry Density<br>(gm/ cm <sup>3</sup> ) | Degree of<br>Compaction<br>(%) | Acceptance |
|--------|---------|----------------------------------------|----------------------------------------|-----------------------|---------------------------------------|--------------------------------|------------|
| 1      | 660+795 | 1267                                   | 2.33                                   | 6.4                   | 2.19                                  | 98.3%                          | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.23 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

Signature



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Zamalek, Cairo  
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٣ ش الملك الافضل  
الزمالك القاهرة  
تليفون / فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٩٠٩٣



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

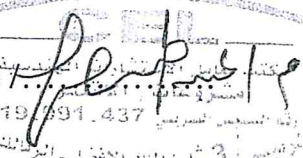
Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature   
219/991.437  
مركز الاختبارات  
3 شارع النيل - القاهرة - الجيزة

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 98.0      |
| 37.5               | 1.5                | 90.0      |
| 25                 | 1                  | 79.9      |
| 19                 | ¾                  | 70.1      |
| 12.50              | ½                  | 57.8      |
| 9.50               | 3/8                | 47.0      |
| 4.75               | 4                  | 35.1      |
| 2.00               | 10                 | 30.6      |
| 0.425              | 40                 | 20.3      |

Signature

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Zamalek, Cairo  
Tel Fax 27367231 - 27363093

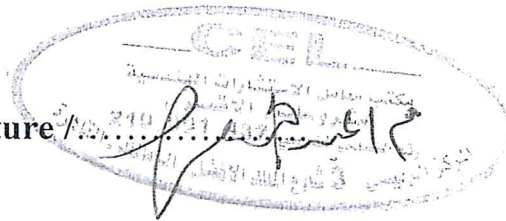


مكتب معامل الاستشارات الهندسية  
الزمالك - القاهرة  
تليفون 27367231 - 27363093

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                             | Results (%) |
|------------------------------------------------------------------|-------------|
| Percentage of material finer than Sieve Size 75 $\mu$ m (No.200) | 6.2         |

Signature 



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Results of liquid limit and plasticity index  
of soils according to ASTM D-4318**

| Test             | Results<br>(%) |
|------------------|----------------|
| Liquid Limit     | 0              |
| Plastic Limit    | 0              |
| Plasticity Index | 0              |

Signature: 

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 30.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 20.3           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 6.2            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature /

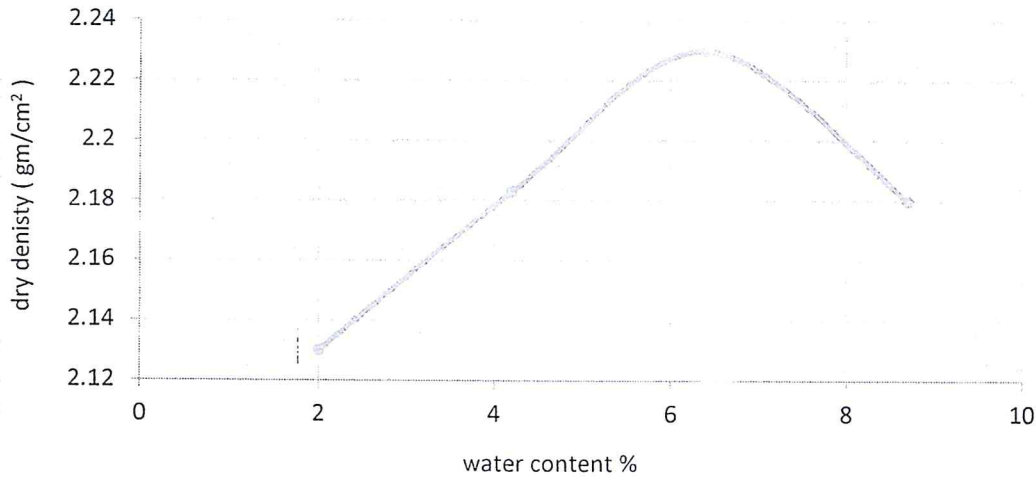
3 El Malek El Afral Street  
Zamalek, Cairo  
Tel & Fax 27367231 - 27369093



شركة المستقبل  
المركز الرئيسي  
3 شارع الملك الافضل - الزمالك - القاهرة

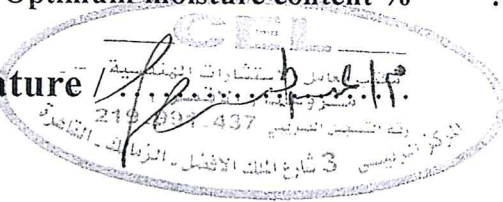
Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

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



- Max dry density (gm/cm²) : 2.23
- Optimum moisture content % : 6.4 %

Signature

  
مهندس محامل الاستشارات الهندسية  
219 497 437  
المركز الرئيسي 3 شارع الملك الافضل - الزمالة - القاهرة

3 El Malek El Afdal Street  
Zamalek, Cairo  
Tel & Fax : 27363231 - 27363093



مكتب محامل الاستشارات  
الزمانية - القاهرة  
تليفون : 27363231 - 27363093



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

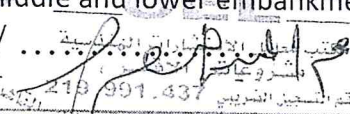
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.55                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR %  |
|-----------------------------------|--------------|----------------|--------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 51.4 % |
|                                   | 6.90         | 3.55           |        |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.23 (gm /cm<sup>3</sup>)  
At = 6.4 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

**Signature /** 

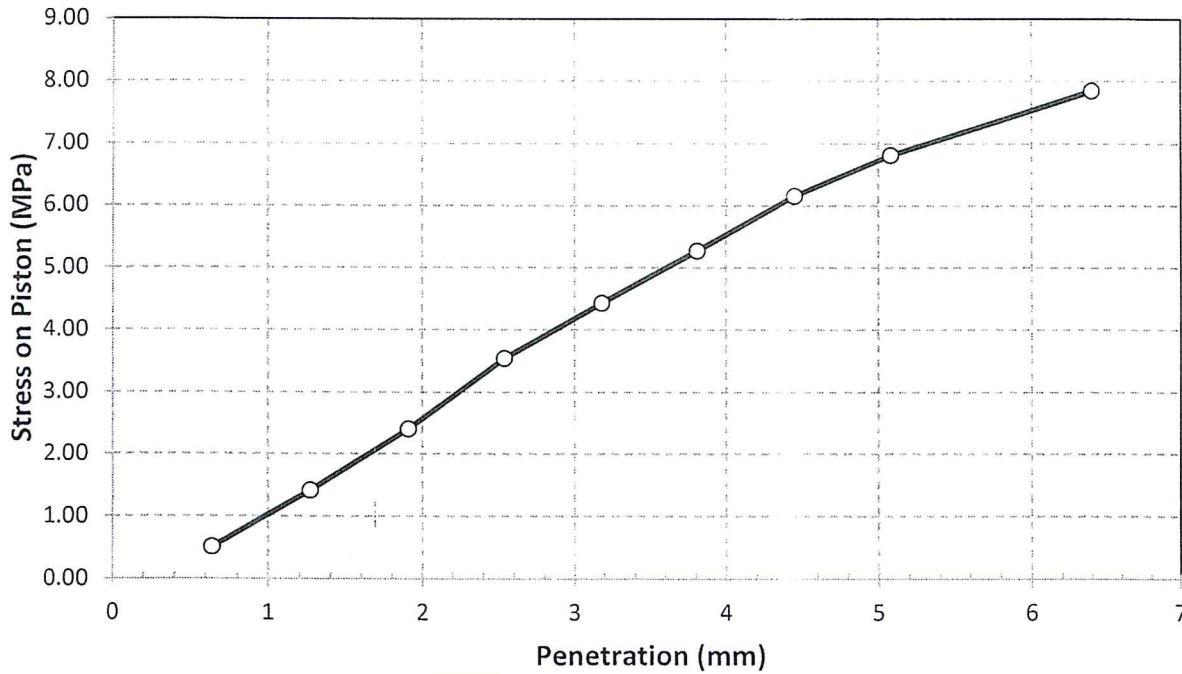
3 El Malek E' Afdal Street  
Zamalek, Cairo  
Tel & Fax 27367291 - 27363093



3 شارع الملك الافدال  
زمالك القاهرة  
الهاتف 27367291 - 27363093

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

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



Signature /

**CEL**  
مكتب معامل الاستشارات الهندسية  
ش.م.م  
رقم الترخيص: 1994437  
المركز الرئيسي: 3 شارع الملك الافضل - الزمالك  
القاهرة

3 El Malek El Afdal Street  
Zamalek, Cairo.  
Tel & Fax 27367231 - 27369093



أش. الملك الأفضل  
الزمالك، القاهرة  
ليسانس - 1994437

**CEL**  
Consulting Engineering Bureau & Laboratories  
مكتب معامل الاستشارات الهندسية

Company Name : شركه المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 16/9/2023  
Soil type : Middle Embankment  
Location : ST from 660+300 to 660+400  
Level : - 2 M  
Report No. : 31

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole Volume cm <sup>3</sup> | Bulk Density gm/ cm <sup>3</sup> | Moisture Content % | Dry Density (gm/ cm <sup>3</sup> ) | Degree of Compaction (%) | Acceptance |
|--------|---------|----------------------------------|----------------------------------|--------------------|------------------------------------|--------------------------|------------|
| 1      | 660+320 | 1368                             | 2.35                             | 6                  | 2.22                               | 99.2%                    | Comply     |
| 2      | 660+360 | 1408                             | 2.28                             | 5.6                | 2.16                               | 96.3%                    | Comply     |
| 3      | 660+380 | 1417                             | 2.28                             | 5.8                | 2.16                               | 96.3%                    | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.24 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

Signature /



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٢ ش الملك الأفضل  
الزمالك القاهرة  
تليفون : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature / ...  
مكتب معامل الاستشارات الهندسية  
مشاريع , القاهرة  
رقم الترخيص : 219.991.437  
المركز الرئيسي : 3 شارع الملك الأشرف - الزمالة - القاهرة

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 97.7      |
| 37.5               | 1.5                | 89.1      |
| 25                 | 1                  | 78.8      |
| 19                 | $\frac{3}{4}$      | 70.0      |
| 12.50              | $\frac{1}{2}$      | 57.9      |
| 9.50               | $\frac{3}{8}$      | 47.6      |
| 4.75               | 4                  | 38.0      |
| 2.00               | 10                 | 25.4      |
| 0.425              | 40                 | 15.4      |

Signature /



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Zamalek, Cairo  
Tel& Fax : 27367231 - 27363693



إلى السيد المهندس  
مهندس  
المهندس

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 7.1            |

Signature /



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results<br>(%) |
|------------------|----------------|
| Liquid Limit     | 0              |
| Plastic Limit    | 0              |
| Plasticity Index | 0              |

Signature

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 25.4           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 15.4           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 7.1            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature / .....

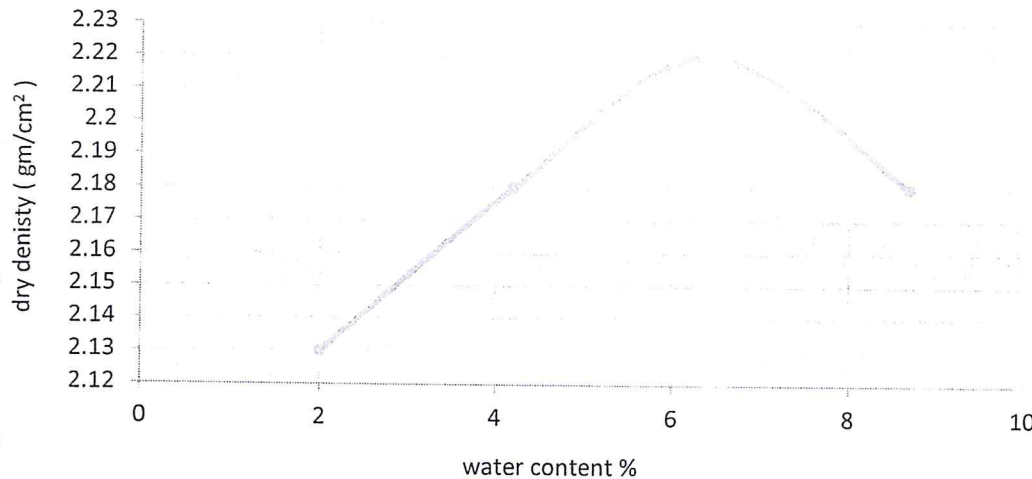
3 El Malek El Afdal Street  
Zamalek, Cairo.  
Tel& Fax : 27367231 - 27363093



إلى السيد المهندس  
الزمالك - القاهرة  
تاريخ: 12/08/2023

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

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



- Max dry density (gm/cm³) : 2.22
- Optimum moisture content % : 6.4 %

Signature /

مكتب معامل الاستشارات الهندسية  
3 شارع الملك الأفدال - الزمالك - القاهرة  
CEL  
Consulting Engineering Bureau & Laboratories

3 El Malek El Afdal Street  
Zamalek, Cairo  
Tel & Fax : 27367231 - 27363093



إلى السيد المهندس  
السيد المهندس  
السيد المهندس



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

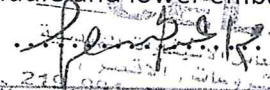
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.34                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR %  |
|-----------------------------------|--------------|----------------|--------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48.4 % |
|                                   | 6.90         | 3.34           |        |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.22 (gm /cm<sup>3</sup>)  
At = 6.4 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

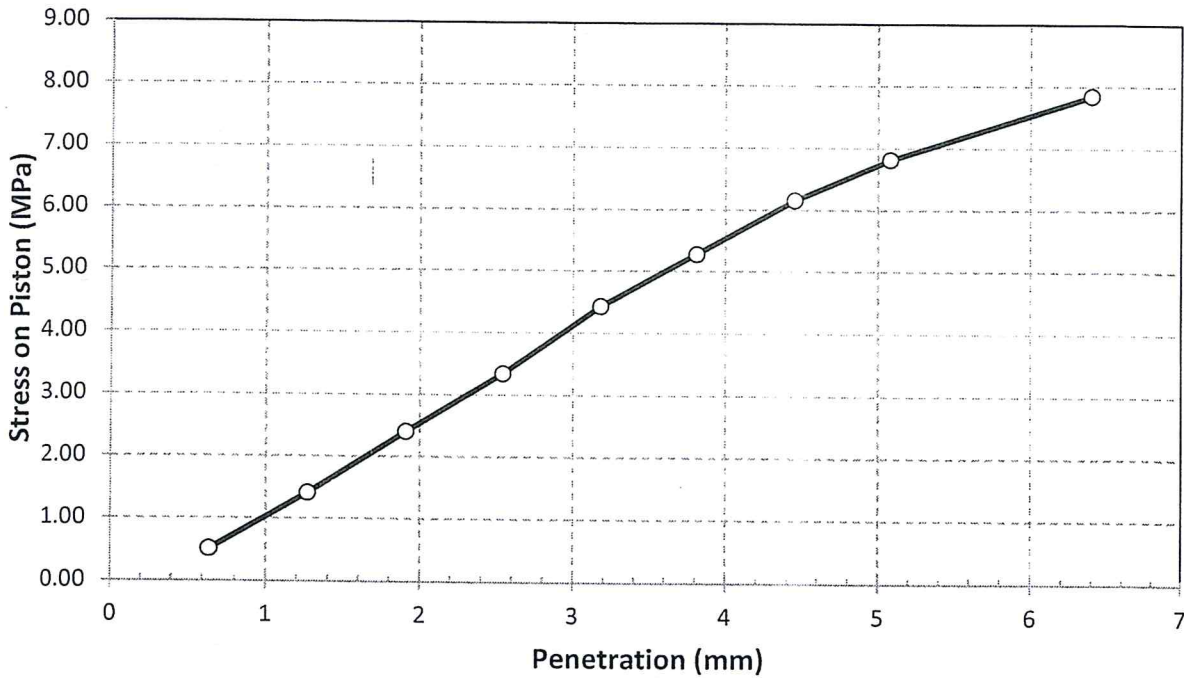
**Signature /** 

3 El Malek E. Afdal Street  
Zamalek, Cairo  
Tel & Fax 2736723 27363093



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

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



Signature



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Zamalek, Cairo  
Tel & Fax : 27367231 - 27363093



إلى لهات الامتداد  
الرمالک الباصرة  
تليفون فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 12/9/2023  
Soil type : Middle Embankment  
Location : ST from 659+980 to 660+040  
Level : - 2. M  
Report No. : 28

**Compaction test by using Sand – Cone Test Method**  
**ASTM D- 1556**

| Test # | Station | Test Hole<br>Volume<br>cm <sup>3</sup> | Bulk<br>Density gm/<br>cm <sup>3</sup> | Moisture<br>Content % | Dry Density<br>(gm/ cm <sup>3</sup> ) | Degree of<br>Compaction<br>(%) | Acceptance |
|--------|---------|----------------------------------------|----------------------------------------|-----------------------|---------------------------------------|--------------------------------|------------|
| 1      | 660+020 | 2136                                   | 2.26                                   | 6.4                   | 2.13                                  | 95.0%                          | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.24 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

**Signature**  
Consulting Engineering Bureau & Laboratories  
مكتب معامل الإستشارات الهندسية  
مشاريع ( سوهاج وقنا )  
رقم التسجيل الضريبي 537 - 991 - 219  
المركز الرئيسي ٢ شارع الملك الأفضل - الزمالك - القاهرة

3 El Malek El Afdal Street  
Zamalek, Cairo  
Tel& Fax : 27367231 - 27363093



٢ شارع الملك الأفضل  
الزمالك - القاهرة  
هاتفون : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature / ...   
مكتب محامل الاستشارات الهندسية  
مشاريع ، الأحياء  
رقم الترخيص 219.991.437  
المركز الرئيسي 3 شارع الملك الأفندي - الزمالك - القاهرة



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

Materials finer than 75  $\mu$ m (no.200) sieve  
By washing ASTM D-1140.

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 7.1            |

Signature /







Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 25.4           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 15.4           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 7.1            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit                                         | -----          | -----                              | -----    | -----    |
| Plasticity index                                     | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature /

*[Handwritten Signature]*  
مكتب معامل الاستشارات الهندسية  
27367231 27369003  
المركز الرئيسي 3 شارع الملك المؤسس - الزمالة - القاهرة

3 El Malek El Afdal Street  
Zamalek, Cairo.  
Tel& Fax 27367231 27369003



إس إس إل  
الزمالة الجديدة  
القاهرة - مصر





Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

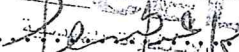
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.34                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR %  |
|-----------------------------------|--------------|----------------|--------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48.4 % |
|                                   | 6.90         | 3.34           |        |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.22 (gm /cm<sup>3</sup>)  
At = 6.4 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

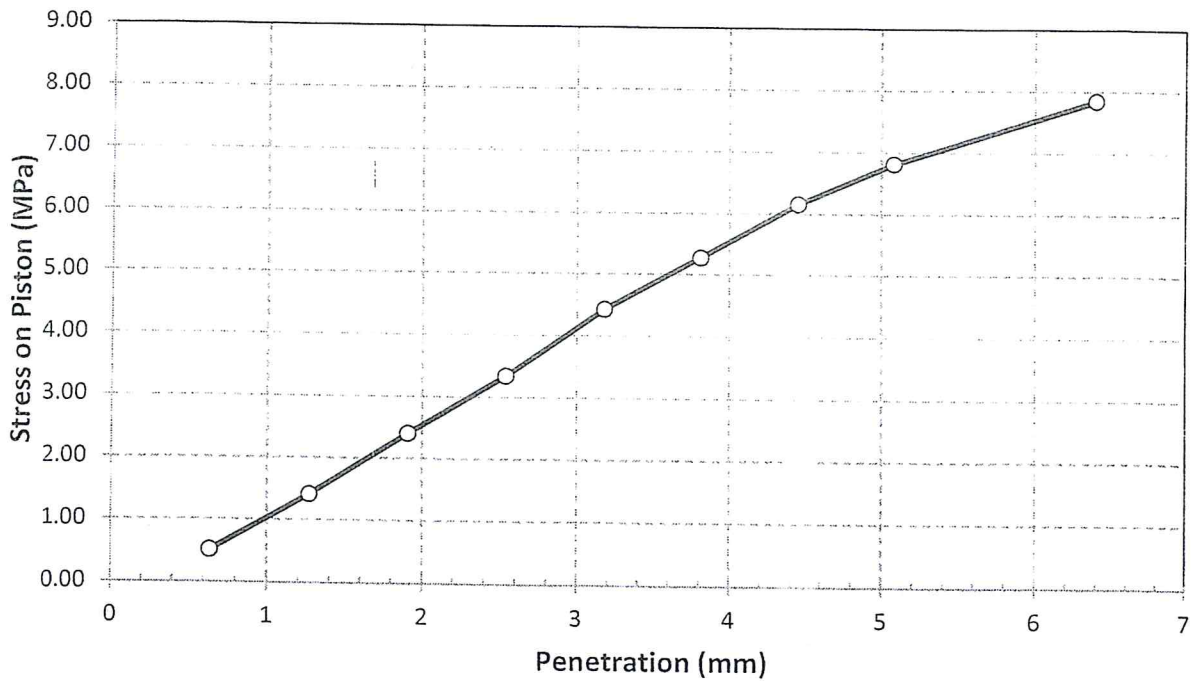
**Signature /** 

3 El Malok E-Elkhayma  
Zamalek, Cairo  
Tel & Fax 2736722 2736309



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

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



Signature



E. Matok E. Afraji Street  
Zamalek, Cairo  
Tel & Fax 2736723 27363093



مكتب معامل الاستشارات الهندسية  
التمثيل الاداري  
للمهندسين والاعمال

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 4/9/2023  
Soil type : طبقه استبدال  
Location : ST from 660+300/660+320  
Level : - -3 M  
Report No. : 4

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole<br>Volume<br>cm <sup>3</sup> | Bulk<br>Density gm/<br>cm <sup>3</sup> | Moisture<br>Content % | Dry Density<br>(gm/ cm <sup>3</sup> ) | Degree of<br>Compaction<br>(%) | Acceptance |
|--------|---------|----------------------------------------|----------------------------------------|-----------------------|---------------------------------------|--------------------------------|------------|
| 1      | 660+310 | 1544                                   | 2.33                                   | 6.4                   | 2.19                                  | 98.1                           | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.23 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

Signature /

Consulting Engineering Bureau & Laboratories  
مكتب معامل الاستشارات الهندسية  
رقم التسجيل المهنى 213 - 214 - 215  
المركز الرئيسى 3 شارع الميقاتى - 213 - 214 - 215



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

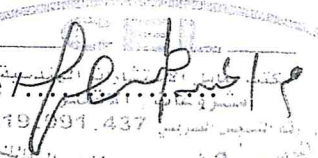
Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

### Materials test

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature   
219 694 437  
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3 شارع النيل - النيل - القاهرة

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 98.0      |
| 37.5               | 1.5                | 90.0      |
| 25                 | 1                  | 79.9      |
| 19                 | ¾                  | 70.1      |
| 12.50              | ½                  | 57.8      |
| 9.50               | 3/8                | 47.0      |
| 4.75               | 4                  | 35.1      |
| 2.00               | 10                 | 30.6      |
| 0.425              | 40                 | 20.3      |

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Zamalek, Cairo.  
Tel. Fax 27367231 - 27363093



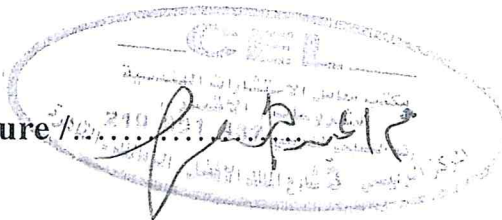
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الهندسية  
مركز الاختبارات  
مركز الأبحاث

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 6.2            |

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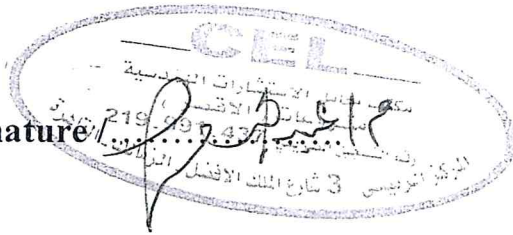


Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Results of liquid limit and plasticity index  
of soils according to ASTM D-4318**

| Test             | Results<br>(%) |
|------------------|----------------|
| Liquid Limit     | 0              |
| Plastic Limit    | 0              |
| Plasticity Index | 0              |

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القاهرة

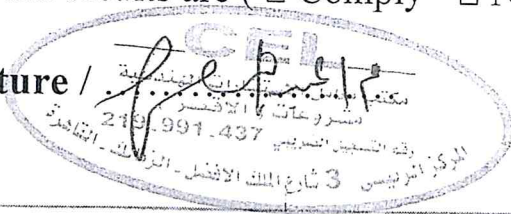
Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 30.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 20.3           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 6.2            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit                                         | -----          | -----                              | -----    | -----    |
| Plasticity index                                     | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature /

  
مهندس  
محمود محمد  
219.991.437  
المركز الرئيسي 3 شارع الملك الأفندي - الزمالك - القاهرة

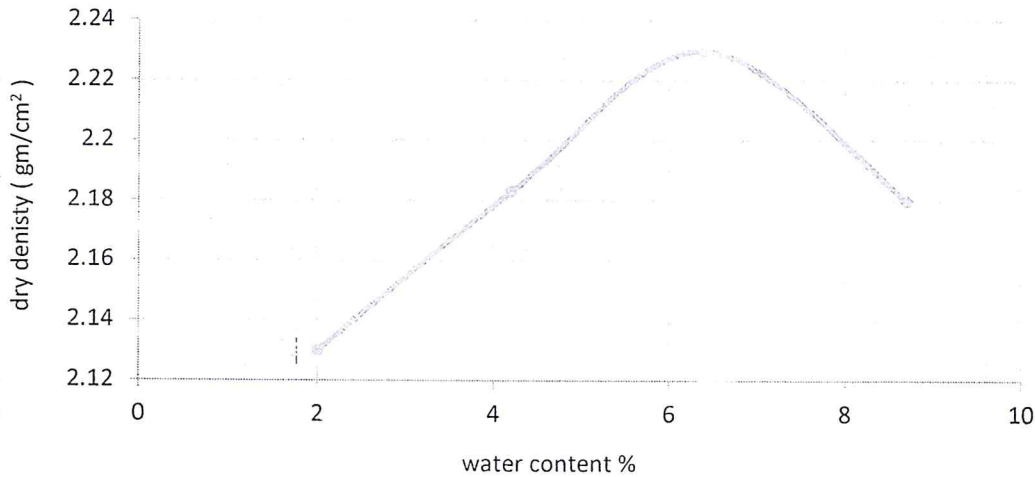
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محمود محمد  
219.991.437  
المركز الرئيسي 3 شارع الملك الأفندي - الزمالك - القاهرة

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

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



- Max dry density (gm/cm²) : 2.23
- Optimum moisture content % : 6.4 %

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3 El Malek E. Afdal Street  
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الزماملة، القاهرة  
27365093 - 27365093



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

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

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.55                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR %  |
|-----------------------------------|--------------|----------------|--------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 51.4 % |
|                                   | 6.90         | 3.55           |        |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.23 (gm /cm<sup>3</sup>)  
At = 6.4 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

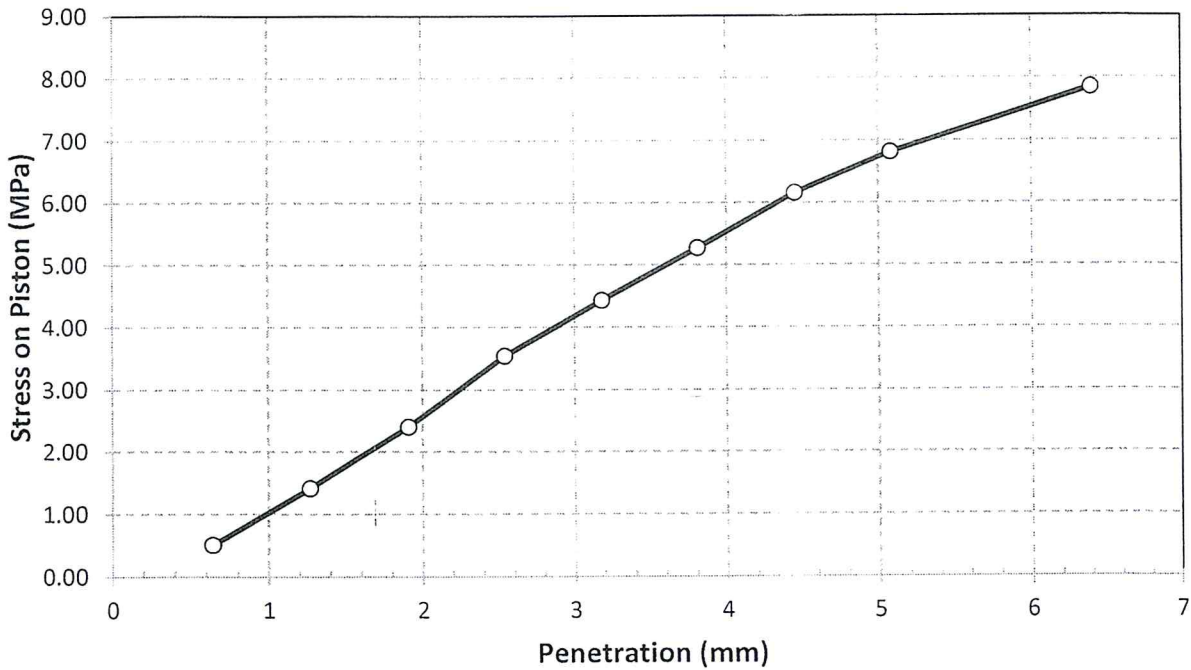
**Signature /** 

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Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+500 E=482567.0777 N=2847847.7656  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 8/8/2023  
Reporting Date : 12/8/2023  
Reporting No. : 04

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



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اشاد الملك الافضل  
الوزارة القاهرة  
البريد : 11444



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**مكتب معامل الإستشارات الهندسية  
مشروعات محافظات الوجه القبلي**

**Company :** شركة المستقبل

**Project :** Electric Express Train - Sector (5) – Qous to Arment  
**Subject :** Determine the deformation and strength characteristics of soil by the plate loading test according specifications DIN 18134:2012-04 and project requirements  
**Test Location :** Station 660+800 to 660+900  
**Station :** 660+850  
**Level :** -2.5  
**Test Date :** 04/09/2023  
**Report Date :** 07/09/2023  
**Type of soil :** Original earth  
**Report No. :** 1

Dear Gentleman,

According to the above mentioned subject the test performed as follows:-

**Apparatus**

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (Enerbac)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

**Test Procedure:**

1. Clean the ground on test area to the required level with undisturbed soil
2. Install loading plates 300 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test applied preloading about 30 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 300 mm loading plate, the limit values are 5.0 kg/cm<sup>2</sup>
6. The load shall be applied in six stages, in approximately equal increments, until the required maximum normal stress is reached.
7. Each change in load (from stage to stage) shall be completed within one minute
8. The load shall be released in 3 stages, to 50 % , 25 % , and approximately 2 % of the maximum load.
9. Following unloading, a further (2<sup>nd</sup>) loading cycle shall be carried out, in which, however, the load is to be increased only to the penultimate stage of the first cycle (so that the full load is not reached).
10. At each stage the load shall be maintained until the rate of settlement of the plate becomes less than 0.02 mm/min.
11. Remove the loads



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#### Report

1. Evaluation and representation of results.

2. Load Settlement curve.

3. The test report content the following:-

- location of test site - Dimension of loading plate.
- Measuring device used - Type of soil.
- Type of Bedding material below the plate -Weathering condition.
- Time and date of measurements - Unusual observation made during test .
- Dial gauge reading and corresponding normal stress - Loading-settlement curve.
- Description of the soil condition below the plate after testing.

#### Report

- Type of soil : Original earth
- Job requirement :  $E_{v2} > 40 \text{ MPa}$

| Item                                                             | Descriptions   |
|------------------------------------------------------------------|----------------|
| Type of bedding material below the plate                         | Natural Soil   |
| Plate Diameter (mm)                                              | 300            |
| date of measurement                                              | : 04/09/2023   |
| Unusual observation made during test                             | NO             |
| Description of the soil conditions below the plate after testing | No deformation |

#### Evaluation and representation of results

| Test No. | Station |         | Location | Level<br>( m ) | First Cycle      | Second Cycle     | $E_{v2} / E_{v1}$<br>Ratio |
|----------|---------|---------|----------|----------------|------------------|------------------|----------------------------|
|          | From    | To      |          |                | $E_{v1}$ ( MPa ) | $E_{v2}$ ( Mpa ) |                            |
| 1        | 660+800 | 660+900 | 660+850  | -2.5           | 97.5             | 162.1            | 1.66                       |

Signature /

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مشروعات محافظات الوجه القبلي

Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 04/09/2023  
report date : 07/09/2023  
Station : 660+850  
Test No. : 1

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**

**Loading Stage (1)**

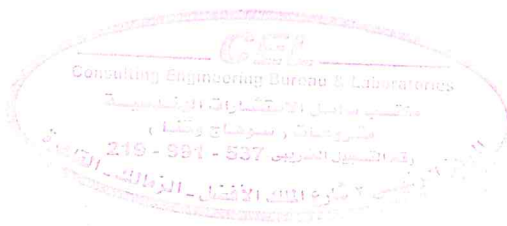
| Loading | Stress | Dial 1 | Settlement | Dial 2 | Settlement | Average |
|---------|--------|--------|------------|--------|------------|---------|
|         | Kg/cm2 |        | mm         |        | mm         |         |
| 0       | 0.00   | 20.00  | 0.00       | 20.00  | 0.00       | 0.00    |
| 1       | 0.83   | 19.90  | 0.10       | 19.89  | 0.11       | 0.11    |
| 2       | 1.66   | 19.79  | 0.21       | 19.71  | 0.29       | 0.25    |
| 3       | 2.50   | 19.61  | 0.39       | 19.46  | 0.54       | 0.47    |
| 4       | 3.33   | 19.42  | 0.58       | 19.29  | 0.71       | 0.65    |
| 5       | 4.17   | 19.30  | 0.70       | 19.12  | 0.88       | 0.79    |
| 6       | 5.00   | 19.16  | 0.84       | 19.00  | 1.00       | 0.92    |

**Unloading Stage (1)**

| Loading | Stress | Dial 1 | Settlement | Dial 2 | Settlement | Average |
|---------|--------|--------|------------|--------|------------|---------|
|         | Kg/cm2 |        | mm         |        | mm         |         |
| 1       | 2.50   | 19.24  | 0.76       | 19.09  | 0.91       | 0.84    |
| 2       | 1.25   | 19.36  | 0.64       | 19.19  | 0.81       | 0.73    |
| 3       | 0.100  | 19.69  | 0.31       | 19.59  | 0.41       | 0.36    |

**Loading Stage (2)**

| Loading            | Stress | Dial 1 | Settlement | Dial 2 | Settlement | Average |
|--------------------|--------|--------|------------|--------|------------|---------|
|                    | Kg/cm2 |        | mm         |        | mm         |         |
| 0                  | 0.83   | 19.50  | 0.50       | 19.48  | 0.52       | 0.51    |
| approximately equ  | 1.66   | 19.36  | 0.64       | 19.30  | 0.70       | 0.67    |
| stress is reached. |        |        |            |        |            |         |
| 2                  | 2.50   | 19.25  | 0.75       | 19.19  | 0.81       | 0.78    |
| 3                  | 3.33   | 19.14  | 0.86       | 19.09  | 0.91       | 0.89    |
| 4                  | 4.17   | 19.00  | 1.00       | 18.97  | 1.03       | 1.02    |



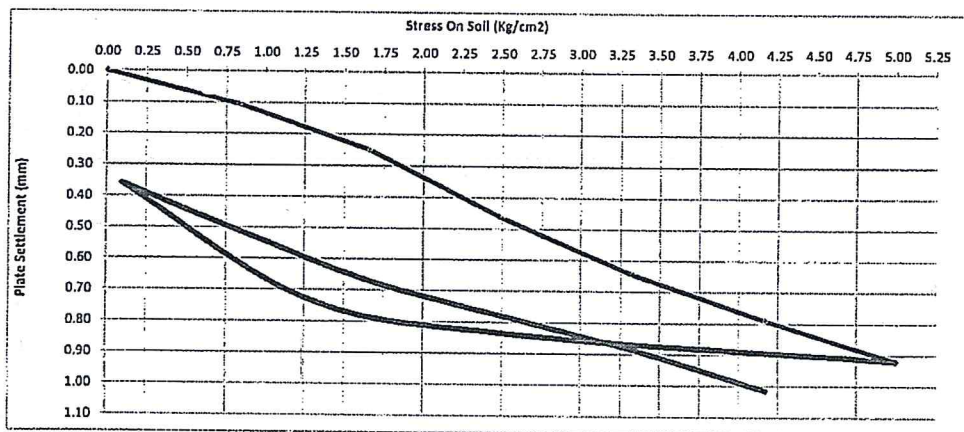
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Company Name : شركة المستقبل  
Project : Electric Express Train - Sector (5) - Qous to Arment.  
Test Date : 04/09/2023  
report date : 07/09/2023  
Station : 6601850  
Test No. : 1

**Nonrepetitive Static Plate Load Tests of Soils**  
**DIN 18134**



| Loading (1)     | 0    | 1    | 2      | 3      | 4      | 5      | 6      |
|-----------------|------|------|--------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586  | 1172.8 | 1766.3 | 2352.6 | 2946.1 | 3532.5 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66   | 2.50   | 3.33   | 4.17   | 5.00   |
| Settlement (mm) | 0.00 | 0.11 | 0.25   | 0.47   | 0.65   | 0.79   | 0.92   |

|                                                            |                |                |           |
|------------------------------------------------------------|----------------|----------------|-----------|
| D (mm) = 300                                               | S1 (mm) = 0.22 | S2 (mm) = 0.67 | ΔS = 0.45 |
| Ev1 (MPa) = $(0.75 \cdot D \cdot \Delta\sigma) / \Delta S$ | 97.5           |                |           |

| Loading (2)     | 0    | 1       | 2      | 3      | 4      | 5      |
|-----------------|------|---------|--------|--------|--------|--------|
| Stage(Kg)       | 0    | 586.395 | 1172.8 | 1766.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83    | 1.66   | 2.50   | 3.33   | 4.17   |
| Settlement (mm) | 0.36 | 0.51    | 0.67   | 0.78   | 0.89   | 1.02   |

|                                                            |                |                |           |
|------------------------------------------------------------|----------------|----------------|-----------|
| D (mm) = 300                                               | S1 (mm) = 0.64 | S2 (mm) = 0.91 | ΔS = 0.27 |
| Ev2 (MPa) = $(0.75 \cdot D \cdot \Delta\sigma) / \Delta S$ | 162.1          |                |           |

| UnLoading (1)   | 1    | 2    | 3     | 4    |
|-----------------|------|------|-------|------|
| Stage(Kg)       | 3533 | 1766 | 884   | 71   |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 0.92 | 0.84 | 0.73  | 0.36 |

Ev2/Ev1 = 1.66

Ev1 = Modulus of deformation during the loading stage.

Ev2 = Modulus of deformation during the Reloading stage.

D = Plate diameter (mm)

DS = The difference between 0.3 and 0.7 from the maximum loading (smax) (kg/cm<sup>2</sup>)

DS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)



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Company Name : شركه المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 16/9/2023  
Soil type : Middle Embankment  
Location : ST from 660+400 to 660+480  
Level : - 2 M  
Report No. : 32

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole Volume<br>cm <sup>3</sup> | Bulk Density gm/<br>cm <sup>3</sup> | Moisture Content % | Dry Density (gm/ cm <sup>3</sup> ) | Degree of Compaction (%) | Acceptance |
|--------|---------|-------------------------------------|-------------------------------------|--------------------|------------------------------------|--------------------------|------------|
| 1      | 660+410 | 1366                                | 2.30                                | 6                  | 2.17                               | 96.7%                    | Comply     |
| 2      | 660+430 | 1397                                | 2.26                                | 5.5                | 2.15                               | 95.8%                    | Comply     |
| 3      | 660+470 | 1501                                | 2.28                                | 6.4                | 2.14                               | 95.6%                    | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.24 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

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رقم الترخيص 537 - 991 - 219  
المرکز الرئيسي ٣ شارع الملك الأفضل - الزمالك - القاهرة

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الزمالك - القاهرة  
تليفون : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣ فاكس :

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature /...



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 97.7      |
| 37.5               | 1.5                | 89.1      |
| 25                 | 1                  | 78.8      |
| 19                 | $\frac{3}{4}$      | 70.0      |
| 12.50              | $\frac{1}{2}$      | 57.9      |
| 9.50               | $\frac{3}{8}$      | 47.6      |
| 4.75               | 4                  | 38.0      |
| 2.00               | 10                 | 25.4      |
| 0.425              | 40                 | 15.4      |

Signature /



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Zamalek, Cairo  
Tel & Fax : 2736723 - 27363093



مركز اختبار المعايير  
بمبنى  
الزراعة - القاهرة



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 7.1            |

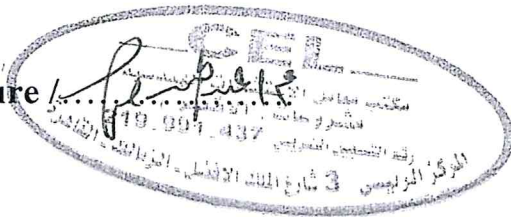
Signature /

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results<br>(%) |
|------------------|----------------|
| Liquid Limit     | 0              |
| Plastic Limit    | 0              |
| Plasticity Index | 0              |

Signature

  
مكتب محامل الاستشارات الهندسية  
رقعة التسجيل: 437 - 19.094  
المركز الرئيسي: 3 شارع الملكة افرات - الجيزة - القاهرة

3 El Malek El Afral Street  
Zamalek, Cairo  
Tel/Fax: 27369723 - 27369093



إلى السيد المهندس  
محمود الناصر  
مهندس  
مكتب محامل الاستشارات الهندسية

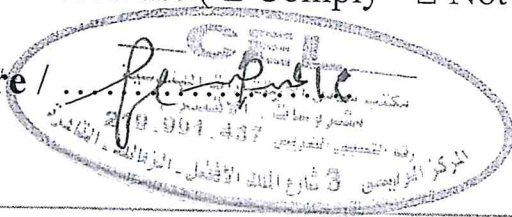
Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 25.4           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 15.4           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 7.1            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

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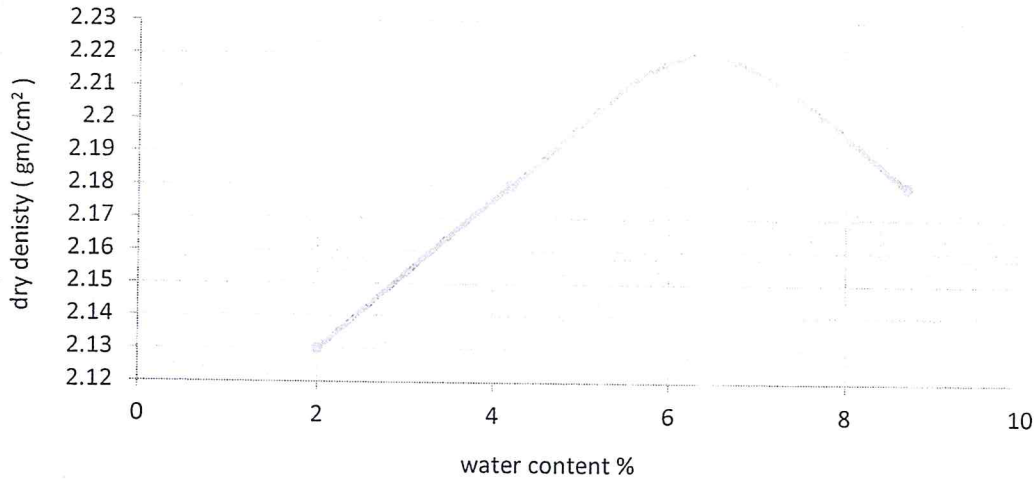


إلى السيد المهندس  
المرافق العامة  
للمشروعات



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

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



- Max dry density (gm/cm³) : 2.22
- Optimum moisture content % : 6.4 %

Signature /

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Zamalek, Cairo  
Tel & Fax : 27367231 - 27363093



إدارة المختبر  
لرصد الجودة  
مكتب  
مكتب

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

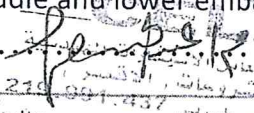
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.34                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR %  |
|-----------------------------------|--------------|----------------|--------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48.4 % |
|                                   | 6.90         | 3.34           |        |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.22 (gm /cm<sup>3</sup>)  
At = 6.4 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

**Signature /** 

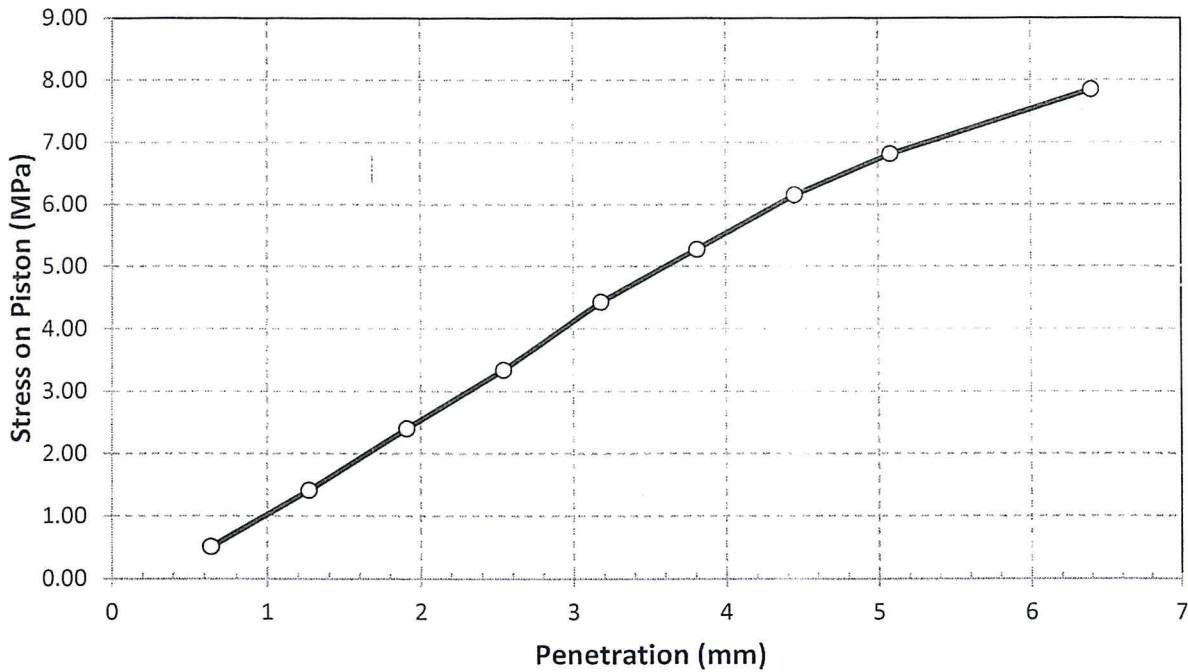
3 El Malek El Farafra Street  
Zaralek, Cairo  
Tel & Fax 2736723 27363093



شركة المستقبل  
للمحكمة  
مكتب معامل الاستشارات الهندسية

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

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



Signature



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Zamalek, Cairo  
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3 شارع الملك الافضل  
الزمالك - القاهرة  
تليفون : 2736723 - 27363093



**CEL**  
Consulting Engineering Bureau & Laboratories  
مكتب معامل الاستشارات الهندسية

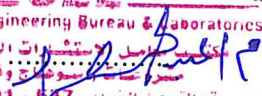
Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 12/9/2023  
Soil type : طبقه استبدال  
Location : ST from 560+860 to 661+020  
Level : - 3 M  
Report No. : 29

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole Volume cm <sup>3</sup> | Bulk Density gm/ cm <sup>3</sup> | Moisture Content % | Dry Density (gm/ cm <sup>3</sup> ) | Degree of Compaction (%) | Acceptance |
|--------|---------|----------------------------------|----------------------------------|--------------------|------------------------------------|--------------------------|------------|
| 1      | 560+880 | 1921                             | 2.37                             | 6                  | 2.23                               | 99.8%                    | Comply     |
| 2      | 560+930 | 1886                             | 2.29                             | 5.5                | 2.17                               | 96.9%                    | Comply     |
| 3      | 560+010 | 1986                             | 2.29                             | 5.8                | 2.16                               | 96.4%                    | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.24 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

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Tel& Fax : 27367231 - 27363093



ش الملك الافضل  
الزمالك - القاهرة  
تليفون : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature / ...



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 97.7      |
| 37.5               | 1.5                | 89.1      |
| 25                 | 1                  | 78.8      |
| 19                 | ¾                  | 70.0      |
| 12.50              | ½                  | 57.9      |
| 9.50               | 3/8                | 47.6      |
| 4.75               | 4                  | 38.0      |
| 2.00               | 10                 | 25.4      |
| 0.425              | 40                 | 15.4      |

Signature /



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Zamalek, Cairo  
Tel & Fax : 2736723 - 27363093



مركز الاختبار  
مركز الاختبار  
مركز الاختبار

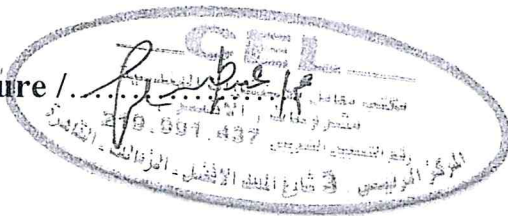


Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 7.1            |

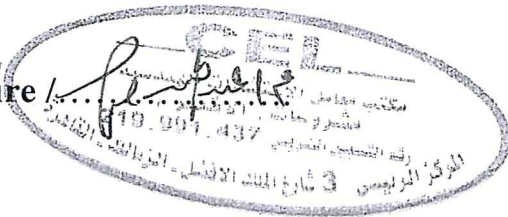
Signature /



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results (%) |
|------------------|-------------|
| Liquid Limit     | 0           |
| Plastic Limit    | 0           |
| Plasticity Index | 0           |

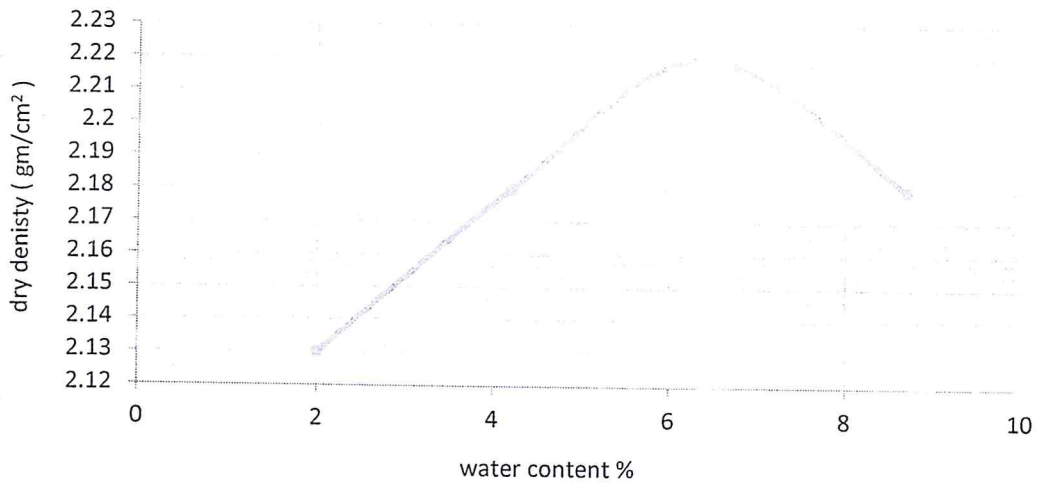
Signature / 





Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

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



- Max dry density (gm/cm²) : 2.22
- Optimum moisture content % : 6.4 %

Signature /

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Zamalek, Cairo  
Tel & Fax : 2736723 - 27363093



إلى السيد المهندس  
مهندس الاستشاري  
مهندس الاستشاري  
مهندس الاستشاري

Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

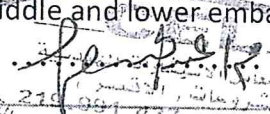
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.34                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR %  |
|-----------------------------------|--------------|----------------|--------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48.4 % |
|                                   | 6.90         | 3.34           |        |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.22 (gm /cm<sup>3</sup>)  
At = 6.4 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

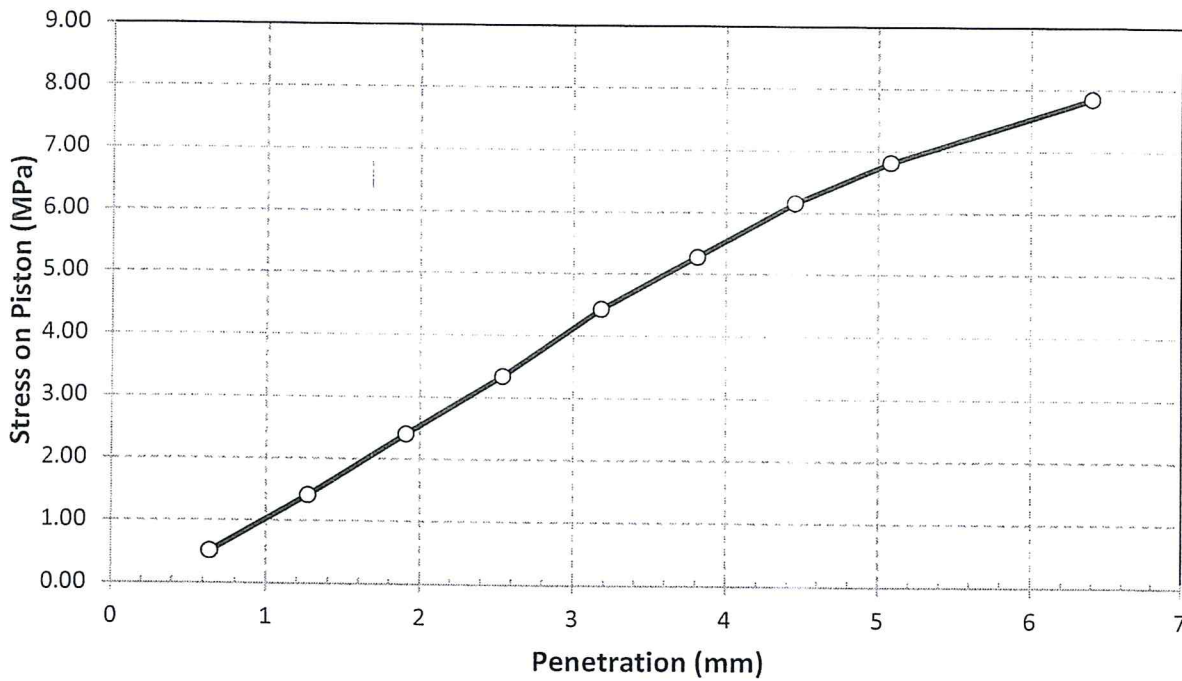
**Signature /** 

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Zuralek, Cairo  
Tel & Fax 2736723 27363093



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 659+800 E=482835.0901 N=2848386.8939  
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 02

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



Signature



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Zamalek, Cairo  
Tel & Fax : 2736723 - 27363093



إس إس إم إيل  
الزمالك - القاهرة  
الهاتف : ٢٧٣٦٧٢٣ - ٢٧٣٦٣٠٩٣



Company Name : شركة المستقبل  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 19/9/2023  
Soil type : Middle Embankment  
Location : ST from 660+580 to 660+700  
Level : - 2.5 M  
Report No. : 33

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole Volume<br>cm <sup>3</sup> | Bulk Density gm/<br>cm <sup>3</sup> | Moisture Content % | Dry Density (gm/ cm <sup>3</sup> ) | Degree of Compaction (%) | Acceptance |
|--------|---------|-------------------------------------|-------------------------------------|--------------------|------------------------------------|--------------------------|------------|
| 1      | 660+620 | 1521                                | 2.25                                | 5.5                | 2.13                               | 97.6%                    | Comply     |
| 2      | 660+650 | 1517                                | 2.30                                | 6.4                | 2.16                               | 99.2%                    | Comply     |
| 3      | 660+680 | 1876                                | 2.20                                | 6                  | 2.08                               | 95.4%                    | Comply     |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.24 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

Signature: /

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

مشروعات ( سوهاج وقفا )

رقم التسجيل الضريبي: 537 - 991 - 219

المركز الرئيسي ٣ شارع الملك الأفطيل - الزمالة - القاهرة

3 El Malek El Afdal Street  
Zamalek, Cairo.

Tel& Fax : 27367231 - 27363093



٣ شارع الملك الأفطيل

الزمالة - القاهرة

تليفون : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Signature



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 97.7      |
| 37.5               | 1.5                | 90.8      |
| 25                 | 1                  | 80.6      |
| 19                 | 3/4                | 71.0      |
| 12.50              | 1/2                | 58.1      |
| 9.50               | 3/8                | 47.4      |
| 4.75               | 4                  | 36.0      |
| 2.00               | 10                 | 24.6      |
| 0.425              | 40                 | 15.8      |

Signature

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Zamalek, Cairo  
Tel & Fax : 27367231 - 27363093



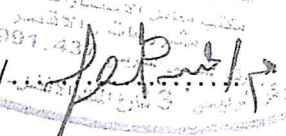
شركة المستقبل للمقاولات العامة  
الرملة، القاهرة  
الهاتف : 27367231 - 27363093



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 5.6            |

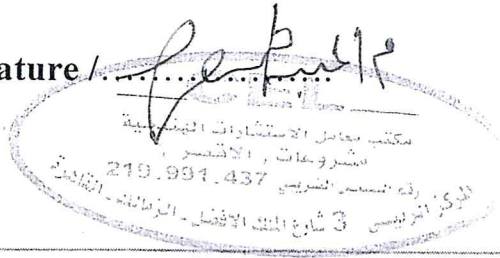
Signature /   
219.991.43

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results<br>(%) |
|------------------|----------------|
| Liquid Limit     | 0              |
| Plastic Limit    | 0              |
| Plasticity Index | 0              |

Signature /



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Zamalek, Cairo  
Tel & Fax 27367231 - 27363093



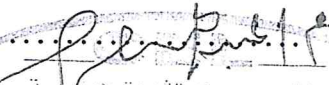
"في العالم كله"  
لخدمات المعايير  
لجميع فئات

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 24.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 15.8           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 5.6            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature / 

3 El Malek El Agha Street  
Zamalek, Cairo  
Tel & Fax 27367231 - 27369093

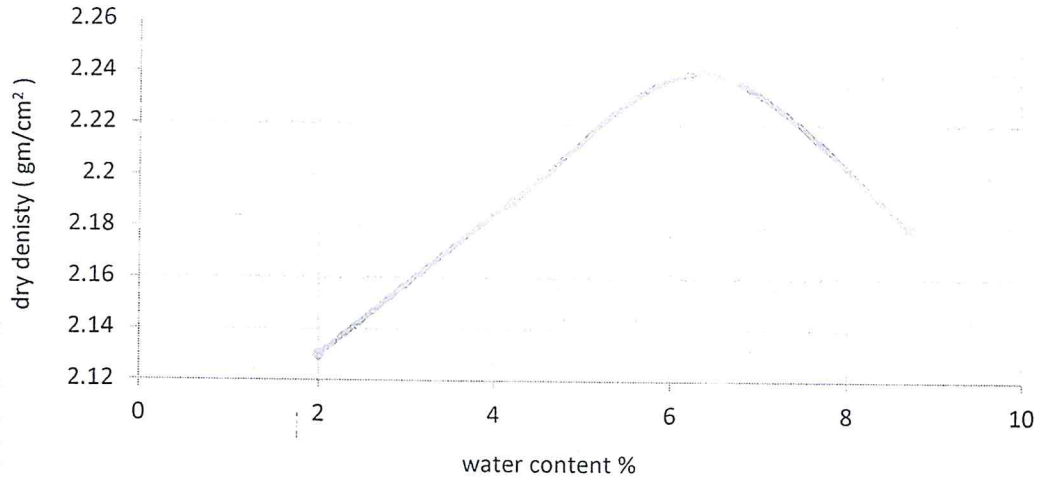


شركة المستقبل للمقاولات العامة  
مكتب معامل الاستشارات الهندسية  
3 شارع الملكة الازهرية - الدقي  
القاهرة - مصر



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

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



- Max dry density (gm/cm²) : 2.24
- Optimum moisture content % : 5.8 %

Signature

  
م. المهندس  
مستشار  
رقم التسجيل 219, 994, 437  
الحياتى - القاهرة  
3 شارع الملك فيصل - الزمالك - القاهرة

3 El Malek El Afridi Street  
Zamalek, Cairo.  
Tel & Fax : 27367231 - 27363093



ش.م.م. الملك فيصل  
الزمالك - القاهرة  
تليفون : 27367231 - 27363093

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

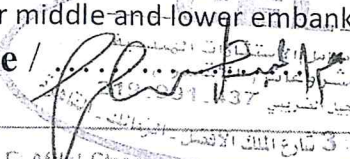
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.31                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48 %  |
|                                   | 6.90         | 3.31           |       |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.24 (gm /cm<sup>3</sup>)  
At = 5.8 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

**Signature /** 

3 El Malek El Afval Street  
Zamalek, Cairo  
Tel & Fax: 2/366231 27369093



شركة محامل الاستشارات الهندسية  
الرمز: 0000000000  
الرقم: 0000000000





Company Name : شركة الكرم  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 17/09/2023  
Soil type : Middle Embankment  
Location : ST from 659+820 to 659+840  
Level : - 4-5 M  
Report No. : 52

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole<br>Volume<br>cm <sup>3</sup> | Bulk<br>Density<br>gm/ cm <sup>3</sup> | Moisture<br>Content<br>% | Dry<br>Density<br>(gm/ cm <sup>3</sup> ) | Degree of<br>Compaction<br>(%) | Acceptanc<br>e |
|--------|---------|----------------------------------------|----------------------------------------|--------------------------|------------------------------------------|--------------------------------|----------------|
| 1      | 659+830 | 1528                                   | 2.21                                   | 6.4                      | 2.08                                     | 95.5%                          | Comply         |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.18 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

Signature /



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

Dear Gentleman,

Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

### Materials test

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

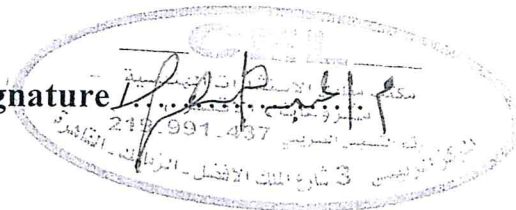
Signature

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 97.7      |
| 37.5               | 1.5                | 90.8      |
| 25                 | 1                  | 80.6      |
| 19                 | $\frac{3}{4}$      | 71.0      |
| 12.50              | $\frac{1}{2}$      | 58.1      |
| 9.50               | $\frac{3}{8}$      | 47.4      |
| 4.75               | 4                  | 36.0      |
| 2.00               | 10                 | 24.6      |
| 0.425              | 40                 | 15.8      |

Signature

  
2147991437  
3 شارع الملك الافضل - الزمالة - القاهرة

3 El Malek El Afdal Street  
Zamalek, Cairo  
Tel. Fax : 27367231 - 27363090



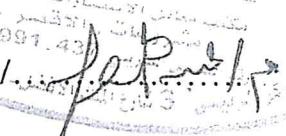
شركة المستقبل  
الزماملة القاهرة  
للمقاولات العامة



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 5.6            |

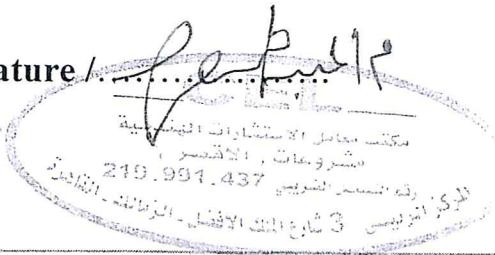
Signature /   
219.991.43  
مكتب محامل الاستشارات الهندسية

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results (%) |
|------------------|-------------|
| Liquid Limit     | 0           |
| Plastic Limit    | 0           |
| Plasticity Index | 0           |

Signature /



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Zamalek, Cairo

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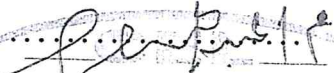
مكتب محامل الاستشارات الهندسية  
شروعات, الأقمصر  
رقم الترخيص: 219.994.437  
الدكتور أمجد زكي

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 24.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 15.8           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 5.6            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature / 

مكتب معامل الاستشارات الهندسية  
مشروعات ، الأتمتة  
رقم التسجيل الرئيسي 2191991.437  
البريد الإلكتروني : info@cel.com.eg  
3 El Malek El Agha Street  
Zamalek, Cairo  
Tel & Fax 27367231 - 27369093

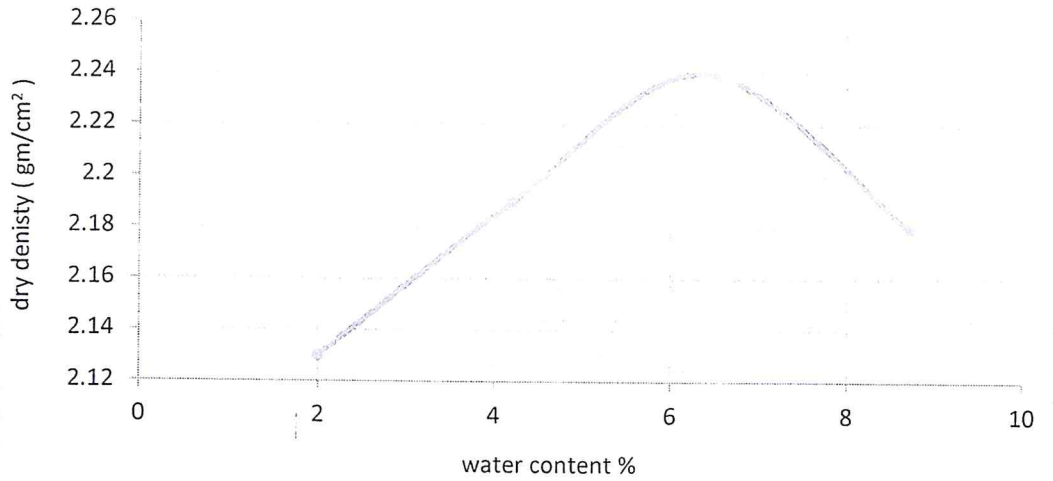


شركة الاستشارات الهندسية  
مكتب معامل الاستشارات الهندسية  
رقم التسجيل الرئيسي 2191991.437  
البريد الإلكتروني : info@cel.com.eg



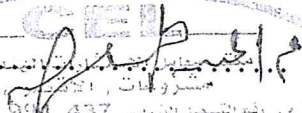
Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

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



- Max dry density (gm/cm²) : 2.24
- Optimum moisture content % : 5.8 %

Signature

  
م. الجبار  
مستشار  
رقم التسجيل المهنى 219.994.437  
المركز الرئيسى 3 شارع الملكة العزيزة - الزمالك - القاهرة

3 El Malek El Afrtal Street  
Zamalek, Cairo.  
Tel & Fax : 27367231 - 27363093



ش. الملكة العزيزة  
الزمالك - القاهرة  
الهاتف - الفاكس : 27367231 - 27363093

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

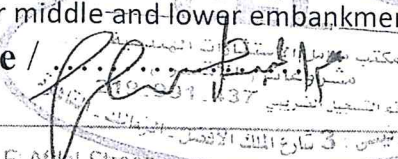
**Test Results of California Bearing Ratio on Base Materials**  
**ASTM D 1883**

| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.31                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48 %  |
|                                   | 6.90         | 3.31           |       |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.24 (gm /cm<sup>3</sup>)  
At = 5.8 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle and lower embankments according project spec page No 36.

**Signature /** 

3 El Malek El Ahal Street  
Zamalek, Cairo  
Tel & Fax : 2/365731 - 27369093



مكتب محامل الاستشارات الهندسية  
الرمضان - القاهرة  
رقم الترخيص : 10591437





Company Name : شركة الكرم  
Project : Electric Express Train – HSR From Qous To Armant  
Testing Date : 17/09/2023  
Soil type : Middle Embankment  
Location : ST from 659+860 to 659+880  
Level : - 4 M  
Report No. : 53

**Compaction test by using Sand – Cone Test Method  
ASTM D- 1556**

| Test # | Station | Test Hole<br>Volume<br>cm <sup>3</sup> | Bulk<br>Density<br>gm/ cm <sup>3</sup> | Moisture<br>Content<br>% | Dry<br>Density<br>(gm/ cm <sup>3</sup> ) | Degree of<br>Compaction<br>(%) | Acceptanc<br>e |
|--------|---------|----------------------------------------|----------------------------------------|--------------------------|------------------------------------------|--------------------------------|----------------|
| 1      | 659+870 | 1606                                   | 2.22                                   | 6                        | 2.09                                     | 95.9%                          | Comply         |

• Degree of compaction based on proctor test dated At

- Max. dry density = 2.18 gm/cm<sup>3</sup>
- At optimum moisture content = 6.4 %

Signature



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

Dear Gentleman,

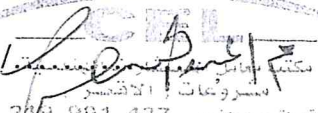
Attached here with the delivered on 8 / 8 / 2023

This sample is representative for 5.000 M<sup>3</sup>

**Materials test**

1. Sieve analysis according to ASTM D-422.
2. Material finer than sieve No. 200 according to ASTM D-1140.
3. Liquid limits and plasticity index of soil according to ASTM D-4318.
4. Soil classification according to Project Specs.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

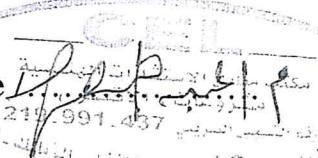
Signature

  
مكتب معامل الاستشارات الهندسية  
رقم التسجيل 27363093  
3 شارع الملك الأفندي - الزمالك - القاهرة

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**RESULTS OF SIEVE ANALYSIS According to ASTM D-422.**

| Sieve Size<br>(mm) | Sieve Size<br>(IN) | Passing % |
|--------------------|--------------------|-----------|
| 50                 | 2                  | 97.7      |
| 37.5               | 1.5                | 90.8      |
| 25                 | 1                  | 80.6      |
| 19                 | $\frac{3}{4}$      | 71.0      |
| 12.50              | $\frac{1}{2}$      | 58.1      |
| 9.50               | $\frac{3}{8}$      | 47.4      |
| 4.75               | 4                  | 36.0      |
| 2.00               | 10                 | 24.6      |
| 0.425              | 40                 | 15.8      |

Signature   
219.991.437  
3 شارع الملك الأفطال - الزمالك - القاهرة

3 El Malek El Afrtal Street  
Zamalek, Cairo  
Tel & Fax : 27367531 - 27363093



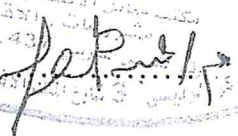
شركة المستقبل للمقاولات العامة  
الزمالك - القاهرة  
تليفون : 27367531 - 27363093



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Materials finer than 75  $\mu$ m (no.200) sieve**  
**By washing ASTM D-1140.**

| Test                                                                | Results<br>(%) |
|---------------------------------------------------------------------|----------------|
| Percentage of material finer than<br>Sieve Size 75 $\mu$ M (No.200) | 5.6            |

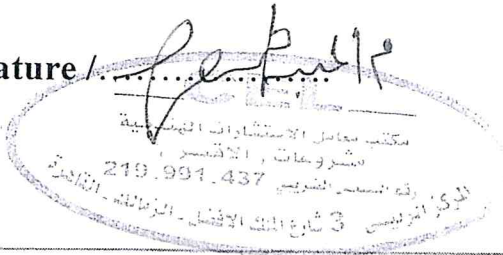
Signature /   
219.997.43  
2023/08/12

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Results of liquid limit and plasticity index**  
**of soils according to ASTM D-4318**

| Test             | Results (%) |
|------------------|-------------|
| Liquid Limit     | 0           |
| Plastic Limit    | 0           |
| Plasticity Index | 0           |

Signature /



2 El Malek El Afridi Street  
Zamalek, Cairo.  
Tel & Fax 27367231 - 27363093



إشعار القبول  
شهادة الاعتماد  
رقم الترخيص الفني 219.994.437

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

**Soil Classification According To Project Specs :**

| TEST                                                 | Results<br>(%) | Limits according<br>Projects Specs |          |          |
|------------------------------------------------------|----------------|------------------------------------|----------|----------|
| • Group Classification                               | (A-1-a)        | (A-1-a)                            | (A-1-b)  | (A-2-4)  |
| 2.00 mm (No.10).                                     | 24.6           | Max 50 %                           | -----    | -----    |
| 0.425 mm (No. 40).                                   | 15.8           | Max 30 %                           | Max 50 % | -----    |
| 0.075 mm (No. 200).                                  | 5.6            | Max 15 %                           | Max 15 % | Max 15 % |
| Characteristics of fraction passing 0.425 mm (No.40) |                |                                    |          |          |
| Liquid Limit<br>.....                                | -----          | -----                              | -----    | -----    |
| Plasticity index<br>.....                            | 0              | Max 6 %                            | Max 6 %  | Max 10 % |

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

Signature / .....  
مكتب معامل الاستشارات الهندسية  
مشاريع و دراسات  
رقم التسجيل المرفوض 219991437

3 El Malek El Agha Street  
Zamalek, Cairo  
Tel & Fax 27367231 - 27369493

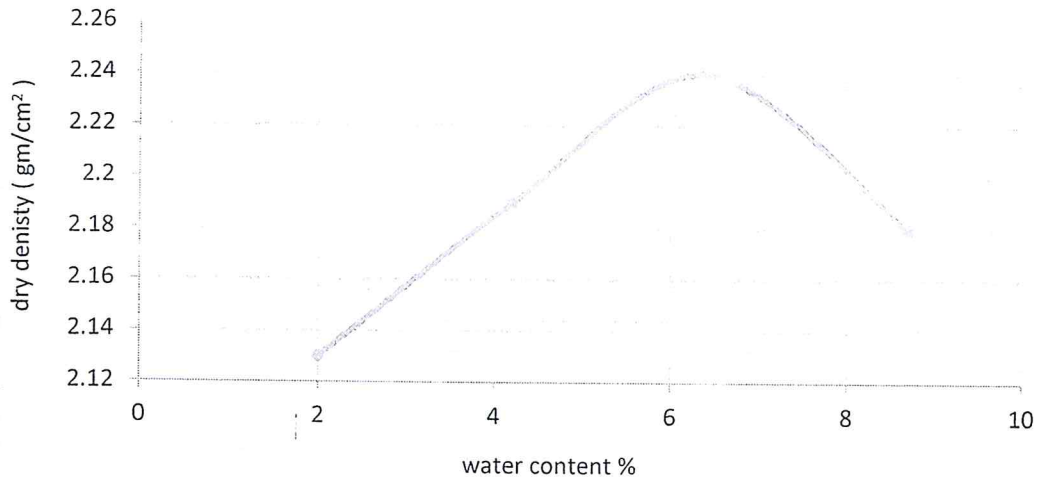


شركة المستقبل  
مكتب معامل الاستشارات الهندسية  
مشاريع و دراسات



Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

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



- Max dry density (gm/cm²) : 2.24
- Optimum moisture content % : 5.8 %

Signature

  
م. المهندس  
م. المهندس  
رقم التسجيل المهنى 219.504.437  
المركز الرئيسى 3 شارع الملك الافضل - الزمالك - القاهرة

3 El Malek El Afrtal Street  
Zamalek, Cairo.  
Tel & Fax: 27367231 - 27369093



ش.م.م. الملك الافضل  
الزمالك القاهرة  
للمسحور

Company Name : شركة المستقبل للمقاولات العامة  
Project : Electric Express Train – HSR From Qous To Armant  
Location : st: 660+000 E=482747.8852 N=2848238.3271  
Type of sample : Soil Embankment ( upper Embankment 0.0 M )  
Delivery Date : 08/08/2023  
Reporting Date : 12/08/2023  
Reporting No. : 03

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

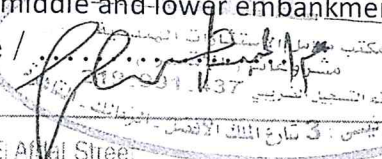
| penetration |       | stress on piston (Mpa) |
|-------------|-------|------------------------|
| mm          | Inch  |                        |
| 0.64        | 0.025 | 0.51                   |
| 1.27        | 0.050 | 1.42                   |
| 1.91        | 0.075 | 2.41                   |
| 2.54        | 0.100 | 3.31                   |
| 3.18        | 0.125 | 4.43                   |
| 3.81        | 0.150 | 5.28                   |
| 4.45        | 0.175 | 6.15                   |
| 5.08        | 0.200 | 6.81                   |
| 6.35        | 0.250 | 7.85                   |

| CBR Result                        | Stress (Mpa) |                | CBR % |
|-----------------------------------|--------------|----------------|-------|
| At 0.1 inch (2.54 mm) penetration | St. Value    | Sample results | 48 %  |
|                                   | 6.90         | 3.31           |       |

**Notes:**

- 1- Attached graph shows penetration resistance versus penetration magnitude.
- 2- The sample was compacted to dry density of = 2.24 (gm /cm<sup>3</sup>)  
At = 5.8 % optimum water content.
- 3- Surcharge load 4.50 Kg.
- 4- CBR > 10 for middle-and-lower embankments according project spec page No 36.

**Signature** / 

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