الهيئة العامة للطرق و الكباري (GARB)
وزارة النقل
الإدارة المركزية للمنطقة الثامنة بقنا

## السيد المهندس / رئيس قطاع التنفيذ والمناطق

**تحية طيبة و بعد .....**

**نتشرف أن نرفق لسيادتكم عدد ١ مقايسة معدلة ٢ لمشروع اعمال انشاء الجسر الترابي للقطار الكهربائي السريع ٦ أكتوبر**

**أبوسمبل (القطاع الخامس) من الكم ٠٥٧٩، ٦٤٠ حتي الكم ٦٤١،٢٣٦ على ان تراجع الأسعار بمعرفة الإدارة بالقاهرة .**

**اعداد المكتب الاستشاري سبكترم للاستشارات الهندسية وعلي مسئوليته .**

**تنفيذ شركة الذهبي للمقاولات**

**برجاء التكرم بالعلم والتوجيه باللازم**

**وتفضلوا بقبول وافر التحية والإحترام ....**

تحريرا في ٢٠٢٣/١٢/٢٦

المرفقات / عدد ( ١ )مقايسة

**رئيس الإدارة المركزية**

**مهندس / عماد حسين**

الهيئة العامة للطرق والكباري

وزارة النقل

مقايسة معدلة 2 ( جزئية لبنود لأعمال )

مشروع : الجسر الترابي للقطار السريع ( أكتوبر / أبو سمبل )

| | | | | | | |
|---|---|---|---|---|---|---|
| القطاع الخامس من الكم | 629 +110.13 | إلى الكم | 715+624.53 | بطول | 86.52 | كم |
| من إحداثي | E 489929.6671 | و | N 2874215.5671 | | | |
| الى إحداثي | E 440168.6522 | و | N 2817778.3175 | | | |

إستشاري القطاع سبكترم للإستشارات الهندسية د . م . / عماد الدين نبيل

تنفيذ الشركة: / الذهبي للمقاولات فئة : الرابعه بقيمة : مليون

| | | | | | |
|---|---|---|---|---|---|
| من الكم | 640+579 | إلى الكم | 641+236 | بطول | 657 م |

قيمة المقايسة 19,959,325 مليون

المقاول / الذهبي للمقاولات

الإستشاري / سبكترم للاستشارات الهندسية Spectrum consulting

المنطقة الثامنة بقنا /

الهيئة العامة للطرق والكباري - وزارة النقل - إدارة المشروعات

# مقايسه (معدلة 2)

أعمال إنشاء الجسر الترابي لقطار الكهرباء السريع ( أكتوبر / إيسمعيل )

من محطة 110.13 +629 حتى محطة 624.63 + 715 بطول 86.5145 كم

لتنفيذ شركة / الذهبي يوسف للمقاولات العمومية من محطة 640+579 الى 641+236 بطول 657 م

| رقم البند | البيان الأصلي | الوحدة | الكمية | سعر الوحدة | الاجمالي |
|---|---|---|---|---|---|
| 2 | إعمال الحفر | | | | |
| 2-1 | بالسعر المكتب اعمال حفر باستخدام المعدات الميكانيكيه لجميع أنواع التربة عدا التربة الصخرية وتسوية السطح بالات التسوية والرش بالمياه الأصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهزازات للوصول الى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ومحمل على النت تحميل ونقل الاتربة الزائدة لمسافة 500 متر من محور الطريق ويتم التنفيذ طبقا للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند يجمع مشتملاته طبقا لأصول الصناعة ومواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس المشرف.<br>-علاوة 1جنية/كم لمسافة نقل ناتج الحفر وتصبح 1.1 جنية/كم ابتداء من 4/5/2023<br>-علاوة زيادة السولار 0.6 جنية/م3 ابتداء من 4/5/2023<br>علاوة مسافة النقل 1 كم<br>علاوة زيادة السولار | م3 | 26,000 | 23.00 | 598,000 |
| | | م3 | 38 | 1.10 | 42 |
| | | م3 | 26,000 | 0.60 | 15,600 |
| 3 | أعمال الردم Embankment | | | | |
| 3-1 | أعمال تحميل وتوريد ونقل التربة مطابقة للمواصفات وتشكيلها باستخدام الات التسوية بسمك لا يزيد عن 50 سم على منسوب (-2 متر) اسفل منسوب القرمة و بسمك لايزيد عن 25سم اعلى من منسوب (-2 متر ) من منسوب القرمة لاستكمال المنسوب التصميمي لتشكيل الجسر والأكتاف (نسبة تحمل كاليفورنيا حتى 15%) ورشها بالمياه الأصولية للوصول إلى نسبة الرطوبة المطلوبة والدمك الجيد بالهزازات للوصول الى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقا للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند يجمع مشتملاته طبقا لأصول الصناعة ومواصفات الهيئة العامة للطرق والكباري وتعليمات المهندس المشرف.<br>- في حالة طلب جهاز الاشراف زيادة نسبة الدمك عن 95% يحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1%.<br>- مسافة النقل حتى 2 كم و يتم احتساب علاوة 1.4 جنيه لكل كم بالزيادة أو النقصان وتصبح 1.5 جنيه/كم ابتداء من 4/5/2023.<br>- السعر يشمل عمل تشوينات و تخليط و اختبارات و نقل لموقع العمل حتى مسافة 2 كم ،<br>-علاوة زيادة السولار 1.9 جنية/م3 ابتداء من 4/5/2023<br>-السعر لا يشمل قيمة المادة المحجرية. | م3 | 291,465 | 60.00 | 17,487,900 |
| | علاوة زيادة السولار 1.90جنية/م3 ابتداء من 4/5/2023 | م3 | 291,465 | 1.90 | 553,784 |
| 4 | طبقة تأسيس Prepared Subgrade | | | | |
| 4-1 | بالسعر المكتب أعمال توريد وفرش طبقة تأسيس (Prepared Subgrade) من الأحجار الصلبة المتدرجة ناتج تكسير الكسارات والمطابقة للمواصفات وأقصى حجم للحبيبات 100 مم وألا تزيد نسبة الغبار من منخل 200 عن 12% والتدريج الوارد بالاشتراطات الخاصة بالمشروع لا تقل نسبة تحمل كاليفورنيا عن 25% وألا تزيد نسبة الفقد بجهاز لوس انجلوس عن 30% وألا يزيد الامتصاص عن 15% وألا يقل معامل المرونة (Ev2) من تجربة لوح التحميل عن 80 ميجابسكال ويتم فردها على طبقتين باستخدام الات التسوية الحديثة على أن لا يزيد سمك الطبقة بعد تمام الدمك عن 25 سم ورشها بالمياه الأصولية للوصول الى نسبة الرطوبة المطلوبة والدمك الجيد بالهزازات للوصول إلى أقصى كثافة جافة قصوى (لا تقل عن 95%) من الكثافة المعملية والبند يشمل إجراء التجارب المعملية والحقلية ويتم التنفيذ طبقا لأصول الصناعة والرسومات التفصيلية والبند بجميع مشتملاته طبقا للمواصفات الفنية للمشروع وقرار الاستشاري وتعليمات المهندس المشرف.<br>- مسافة النقل لا تقل عن 20 كم<br>- يتم احتساب علاوة 1.2 جنيه لكل 1 كم بالزيادة أو النقصان وتصبح 1.3 جنيه/كم ابتداء من 4/5/2023.<br>- السعر لا يشمل قيمة المواد المحجرية.<br>علاوة زيادة السولار 1.8 جنيه/م3 ابتداء 4/5/2023 | م3 | 5,000 | 130.00 | 650,000 |
| | مسافة نقل 100 كم | م3 | 5,000 | 104.00 | 520,000 |
| | كارتة توريد الأساس | م3 | 5,000 | 25.00 | 125,000 |
| | علاوة زيادة السولار | م3 | 5,000 | 1.80 | 9,000 |
| | الأجمالي | | | | 19,959,325 |

يعتمد!!!
رئيس الإدارة المركزية
المنطقة الثالثة (قنا)
المدير المهندس / عماد حبشي
التوقيع /

مهندس هيئة الطرق والكباري
(المنطقة الثامنة - قنا)
المهندس/
التوقيع/

مدير المشروع (الاستشاري)
المهندس/
التوقيع/

مهندس الشركة المنفذة
المهندس/
التوقيع/

مشروع القطار الكهربائي السريع القطاع الخامس

تنفيذ شركة الذهبي للمقاولات

من الكم 637+952 الى 643+863

بيان اعمال توضيحي لمستخلص جاري (4) عقد (2024/2023/306)

| العقد | قيمة العقد | المستخلص | كميات حفر تربة عادية | كميات الردم |
|---|---|---|---|---|
| (2024/2023/306) | عشرون مليون | جاري 1 | - | 23100.00 |
| | | جاري 2 | 10000.00 | 121500.00 |
| | | جاري 3 | - | 34400.00 |
| | | جاري 4 | - | 30000.00 |
| | | كميات تم حصرها | - | 24219.30 |
| | | | 14051.66 | 128231.31 |
| | | | | 33745.88 |
| | | | - | 30262.98 |
| | | اجمالي كميات تم حصرها | 14051.66 | 216459.47 |
| | | كميات تم صرفها | - | 23100.00 |
| | | | 10000.00 | 121500.00 |
| | | | - | 34400.00 |
| | | | - | 30000.00 |
| | | اجمالي كميات تم صرفها | 10000.00 | 209000.00 |
| | | المتبقي من الكمية | 4051.66 | 7459.47 |

مهندس الشركة المنفذة /

استشاري المساحة مكتب برليانت /

استشاري اسبكترم /

وزارة النقل
الهيئة العامة للطرق والكباري

محضر اعتماد حصر كميات

التاريخ :30/1/2024
اسم المشروع :مشروع القطار الكهربائى السريع (6اكتوبر -اسوان -ابوسمبل )القطاع الخامس

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

باعتماد الكميات المنفذة الخاصة بشركة الذهبى للمقاولات

| م | من المحطة رقم | الى المحطة رقم | التصنيف | الكمية بالمتر المكعب | الملاحظات |
|---|---|---|---|---|---|
| 1 | 638+720 | 639+100 | اعمال الردم | 11823.3 | اعمال ردم على (REV07) |
| 2 | 639+580 | 639+940 | اعمال الردم | 7248.51 | اعمال ردم على (REV07) |
| 3 | 641+000 | 641+840 | اعمال الردم | 11191.17 | اعمال ردم على (REV07) |
| | | | اجمالى الكمية | 30262.98 | |

حصر جارى (4)
المرفقات :
استلام ميزانية شبكية
قطاعات عرضية
شيت اكسيل موضح به الكميات

مهندس الشركة المنفذة

استشارى المساحة / مكتب برليانت

برليانت كونسلت للاستشارات الهندسية
HSR - Line Line - SP.05
استشارى الاعمال المساحية لمشروع القاهرة

استشارى / مكتب سبكترم

سبكترم للاستشارات الهندسية
Spectrum Consulting
SPECTRUM
مشروع القطار السريع

الذهبى للمقاولات

حصر كميات الردم مستخلص جاري (4) شركة الذهبي (637+952-643+863) مشروع القطار السريع القطاع الخامس (قوص /ارمنت)

| Station | Fill Area (Sq.M.) | Fill Volume (Cu.M.) | Cum. Fill Vol. (Cu.M.) |
|---|---|---|---|
| 638+720.00 | 30.97 | 309.7 | 309.7 |
| 638+740.00 | 30.97 | 619.4 | 929.1 |
| 638+760.00 | 30.97 | 619.4 | 1548.5 |
| 638+780.00 | 30.97 | 619.4 | 2167.9 |
| 638+800.00 | 30.97 | 619.4 | 2787.3 |
| 638+820.00 | 30.97 | 619.4 | 3406.7 |
| 638+840.00 | 30.97 | 619.4 | 4026.1 |
| 638+860.00 | 30.97 | 619.4 | 4645.5 |
| 638+880.00 | 30.97 | 619.4 | 5264.9 |
| 638+900.00 | 30.97 | 619.4 | 5884.3 |
| 638+920.00 | 30.97 | 619.4 | 6503.7 |
| 638+940.00 | 29.47 | 604.4 | 7108.1 |
| 638+960.00 | 29.47 | 589.4 | 7697.5 |
| 638+980.00 | 29.47 | 589.4 | 8286.9 |
| 639+000.00 | 29.47 | 589.4 | 8876.3 |

شركة الذهبي

HSR-SLUCLINK

| Station | Fill Area (Sq.M.) | Fill Volume (Cu.M.) | Cum. Fill Vol. (Cu.M.) |
|---|---|---|---|
| 639+020.00 | 29.47 | 589.4 | 9465.7 |
| 639+040.00 | 29.47 | 589.4 | 10055.1 |
| 639+060.00 | 29.47 | 589.4 | 10644.5 |
| 639+080.00 | 29.47 | 589.4 | 11233.9 |
| 639+100.00 | 29.47 | 589.4 | 11823.3 |
| 639+580.00 | 21.49 | 214.87 | 12038.17 |
| 639+600.00 | 21.49 | 429.73 | 12467.9 |
| 639+620.00 | 21.49 | 429.73 | 12897.63 |
| 639+640.00 | 21.49 | 429.73 | 13327.36 |
| 639+660.00 | 21.49 | 429.73 | 13757.09 |
| 639+680.00 | 21.49 | 429.73 | 14186.82 |
| 639+700.00 | 21.49 | 429.73 | 14616.55 |
| 639+720.00 | 21.49 | 429.73 | 15046.28 |
| 639+740.00 | 21.49 | 429.73 | 15476.01 |
| 639+760.00 | 21.49 | 429.73 | 15905.74 |
| 639+780.00 | 17.36 | 388.47 | 16294.21 |
| 639+800.00 | 17.36 | 347.2 | 16641.41 |
| 639+820.00 | 17.36 | 347.2 | 16988.61 |

ترليانت كونسلت للإستشارات الهندسية
HSR/BLUE LINE/Sec.05

شركة

| Station | Fill Area (Sq.M.) | Fill Volume (Cu.M.) | Cum. Fill Vol. (Cu.M.) |
|---|---|---|---|
| 639+840.00 | 17.36 | 347.2 | 17335.81 |
| 639+860.00 | 17.36 | 347.2 | 17683.01 |
| 639+880.00 | 17.36 | 347.2 | 18030.21 |
| 639+900.00 | 17.36 | 347.2 | 18377.41 |
| 639+920.00 | 17.36 | 347.2 | 18724.61 |
| 639+940.00 | 17.36 | 347.2 | 19071.81 |
| 641+000.00 | 9.01 | 90.05 | 19161.86 |
| 641+020.00 | 9.01 | 180.1 | 19341.96 |
| 641+040.00 | 9.01 | 180.1 | 19522.06 |
| 641+060.00 | 9.01 | 180.1 | 19702.16 |
| 641+080.00 | 9.01 | 180.1 | 19882.26 |
| 641+100.00 | 9.01 | 180.1 | 20062.36 |
| 641+120.00 | 9.01 | 180.1 | 20242.46 |
| 641+140.00 | 9.01 | 180.1 | 20422.56 |
| 641+160.00 | 9.01 | 180.1 | 20602.66 |

درليانت كونسلت للإستشارات الهندسية
HGR: BLUE LINE Sec.03

شركة

| Station | Fill Area (Sq.M.) | Fill Volume (Cu.M.) | Cum. Fill Vol. (Cu.M.) |
|---|---|---|---|
| 641+180.00 | 9.01 | 180.1 | 20782.76 |
| 641+200.00 | 9.01 | 180.1 | 20962.86 |
| 641+220.00 | 9.01 | 180.1 | 21142.96 |
| 641+240.00 | 9.01 | 180.1 | 21323.06 |
| 641+260.00 | 9.01 | 180.1 | 21503.16 |
| 641+280.00 | 9.01 | 180.1 | 21683.26 |
| 641+300.00 | 9.01 | 180.1 | 21863.36 |
| 641+320.00 | 9.01 | 180.1 | 22043.46 |
| 641+340.00 | 9.01 | 180.1 | 22223.56 |
| 641+360.00 | 9.01 | 180.1 | 22403.66 |
| 641+380.00 | 9.01 | 180.1 | 22583.76 |
| 641+400.00 | 9.01 | 180.1 | 22763.86 |
| 641+420.00 | 9.01 | 180.1 | 22943.96 |
| 641+440.00 | 17.01 | 260.2 | 23204.16 |
| 641+460.00 | 17.01 | 340.29 | 23544.45 |
| 641+480.00 | 17.01 | 340.29 | 23884.74 |
| 641+500.00 | 17.01 | 340.29 | 24225.03 |
| 641+520.00 | 17.01 | 340.29 | 24565.32 |

برنيات كونسلت للإستشارات الهندسية
HSM BLUE LINE Spec.05
إستشارى الأعمال المساحية والقطاعات

| Station | Fill Area (Sq.M.) | Fill Volume (Cu.M.) | Cum. Fill Vol. (Cu.M.) |
|---|---|---|---|
| 641+540.00 | 17.01 | 340.29 | 24905.61 |
| 641+560.00 | 17.01 | 340.29 | 25245.9 |
| 641+580.00 | 17.01 | 340.29 | 25586.19 |
| 641+600.00 | 17.01 | 340.29 | 25926.48 |
| 641+620.00 | 17.01 | 340.29 | 26266.77 |
| 641+640.00 | 17.01 | 340.29 | 26607.06 |
| 641+660.00 | 17.01 | 340.29 | 26947.35 |
| 641+680.00 | 17.01 | 340.29 | 27287.64 |
| 641+700.00 | 17.01 | 340.29 | 27627.93 |
| 641+720.00 | 17.01 | 340.29 | 27968.22 |
| 641+740.00 | 17.01 | 340.29 | 28308.51 |
| 641+760.00 | 17.01 | 340.29 | 28648.8 |
| 641+780.00 | 17.01 | 340.29 | 28989.09 |
| 641+800.00 | 22.07 | 390.89 | 29379.98 |
| 641+820.00 | 22.07 | 441.5 | 29821.48 |
| 641+840.00 | 22.07 | 441.5 | 30262.98 |
| | | اجمالي الكمية | 30262.98 |

برليات كونسلت لاستشارات الهندسية
HOLIAUSLINE Co.
استشاري الاعمال المساحية بالقطاع الخاص

شركة

وزارة النقل
الهيئة العامة للطرق والكباري

محضر اعتماد حصر كميات

التاريخ :30/1/2024
اسم المشروع :مشروع القطار الكهربائى السريع (6اكتوبر -اسوان -ابوسمبل )القطاع الخامس

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

باعتماد الكميات المنفذة الخاصة بشركة الذهبي للمقاولات

| م | من المحطة رقم | الى المحطة رقم | التصنيف | الكمية بالمتر المكعب | الملاحظات |
|---|---|---|---|---|---|
| 1 | 638+720 | 639+100 | اعمال الردم | 78552.75 | اعمال ردم على (REV07) |
| 2 | 639+580 | 639+940 | اعمال الردم | 31543.52 | اعمال ردم على (REV07) |
| 3 | 641+000 | 641+840 | اعمال الردم | 65308.03 | اعمال ردم على (REV07) |
| 4 | 642+220 | 642+480 | اعمال الردم | 41055.17 | اعمال ردم على (REV07) |
| | اجمالى الكمية | | | 216459.47 | |

حصر الكميات حتي جارى (4)
المرفقات :
استلام ميزانية شبكية
قطاعات عرضية
شيت اكسيل موضح به الكميات

مهندس الشركة المنفذة

استشارى المساحة / مكتب برليانت

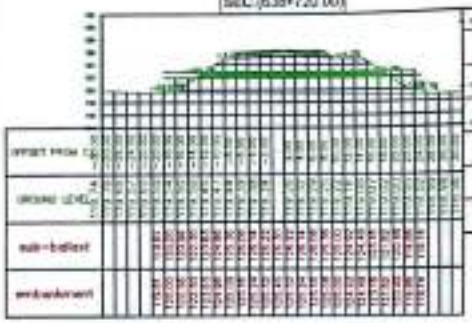
مكتب سبكترم

شركة الذهبي للمقاولات

برليانت كونسلت للاستشارات الهندسية
HSR - Blue Line - Sec.05
إستشارى الأعمال المساحية بالقطاع الخامس

SPECTRUM Consulting

EXPRESS TRAIN
SEC.(638+720.00)

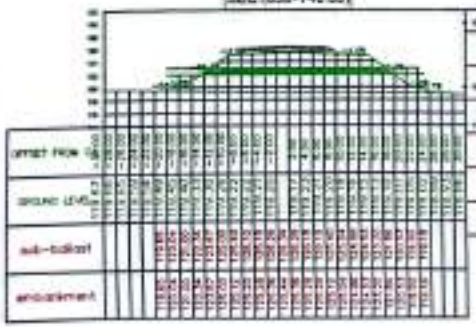



| Total Volume at Station 638+720.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 309.70 |
| cum fill vol | 309.70 |

EXPRESS TRAIN
SEC.(638+700.00)


| Total Volume at Station 638+700.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 1548.50 |

EXPRESS TRAIN
SEC.(638+740.00)




| Total Volume at Station 638+740.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 929.10 |

EXPRESS TRAIN
SEC.(638+780.00)


| Total Volume at Station 638+780.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 2167.90 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Owner
National Authority for Road, Bridge and Land Transport

Project Name
6 ACROSS EXPRESS TRAIN HIGH SPEED RAIL
SECTION (FROM QUS TO ARIANT)
STATION 629+120.13 - STATION 713+424.03

KEY PLAN

SECTION (FROM QUS TO ARIANT)
STATION 629+120.13 - STATION 713+424.03

| No. | Date | Description | Issued Revision |
|---|---|---|---|
| | 8/2023 | [illegible] | |

*All dimensions are in meters

List of cross-sec Expressrail

| Number | Existing Ground Level |
|---|---|
| Number | Proposed Sub-Ballast Level |

Owner consultant

DMJ & T Consultant

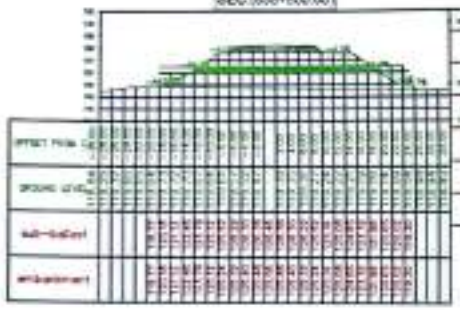
Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
HZ 1:1000
VZ 1:100

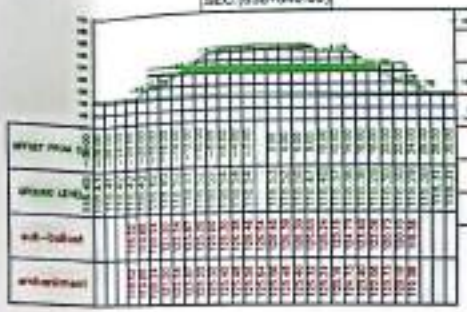
Drawing NO
HSR - SEC 5 - [illegible] - [1]

EXPRESS TRAIN
SEC.(638+800.00)



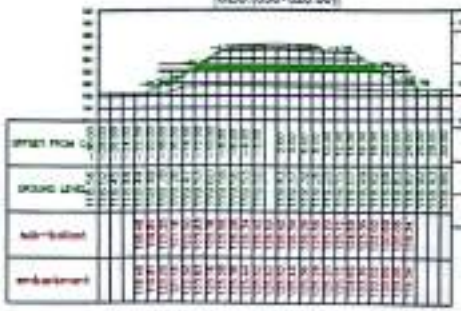
| Total Volume at Station 638+800.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 2787.30 |

EXPRESS TRAIN
SEC.(638+840.00)



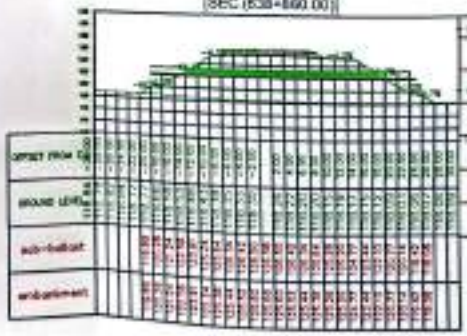
| Total Volume at Station 638+840.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 4026.10 |

EXPRESS TRAIN
SEC.(638+820.00)



| Total Volume at Station 638+820.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 3406.70 |

EXPRESS TRAIN
SEC.(638+860.00)



| Total Volume at Station 638+860.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 4645.50 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Project
General Authority for Roads, Bridges and Transport

Project Details
EXPRESS TRAIN (HIGH SPEED RAIL)
SECTION (FROM 6TH OCTOBER TO ASWAN)
VIA FOUR SUB-SECTIONS - STATION CHAINAGE

KEY PLAN

SECTION (FROM 6TH OCTOBER TO ASWAN)
STATION (CH 637.00 - STATION 743.424.00)

| No. | DATE | Drawing Date | |
|---|---|---|---|
| | SCALE | DRAWING | REMARKS |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| ------ | Existing Ground Level |
| ------ | Proposed Sub-Ballast Level |

Owner consultant

GOBRI T Consultants

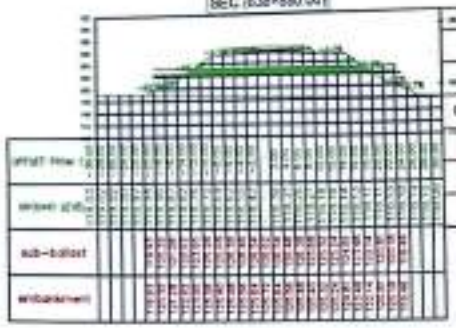
Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
HEC 1:2000
V.E 1:500

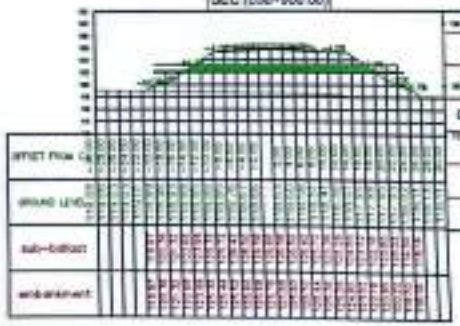
Drawing NO
HSR - SEC 5 - 00000-SEC- [1]

EXPRESS TRAIN
SEC (638+880.00)



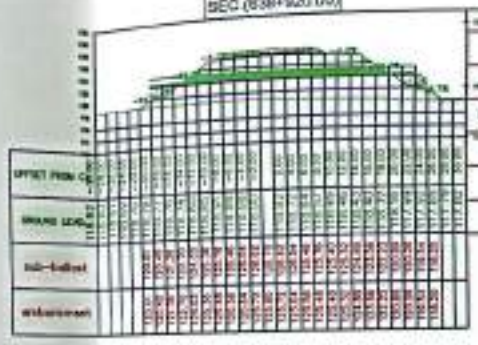

| Total Volume at Station 638+880.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 5264.90 |

EXPRESS TRAIN
SEC (638+900.00)



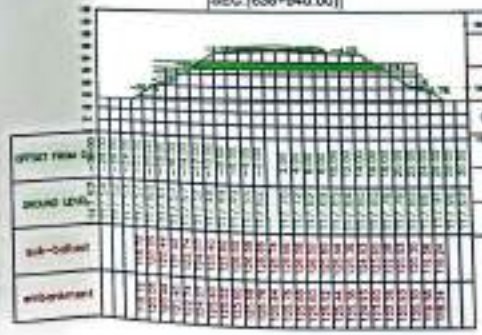

| Total Volume at Station 638+900.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 5884.30 |

EXPRESS TRAIN
SEC (638+920.00)




| Total Volume at Station 638+920.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 30.97 |
| Fill Vol | 619.40 |
| cum fill vol | 6503.70 |

EXPRESS TRAIN
SEC (638+940.00)




| Total Volume at Station 638+940.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 29.47 |
| Fill Vol | 604.48 |
| cum fill vol | 7108.10 |

Ministry of Transportation
National Authority for Tunnels (NAT)

KEY PLAN

SECTION (FROM QUS TO ARMANT)
STATION KM 630.10 - STATION TO KM 650.03

*All dimensions are in meters

List of cross-sec Expression

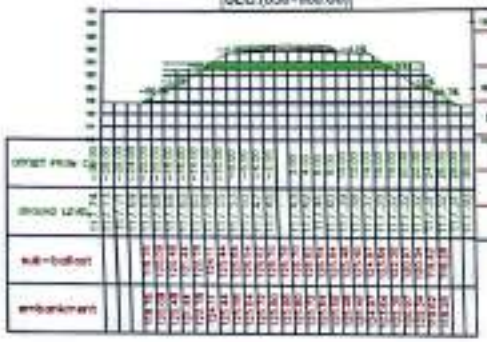
Contractor EL-ZAHABY

Drawing Name
cross-sec for KM OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
H: 1:2000
V: 1:200

Drawing NO
HSR - SEC 5 - cross-sec - (1)

EXPRESS TRAIN
SEC.(638+960.00)

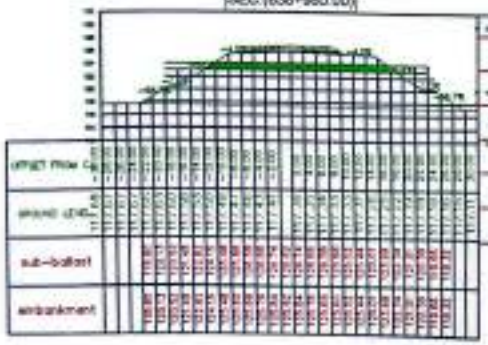



| Total Volume at Station 638+960.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 29.47 |
| Fill Vol | 589.40 |
| cum fill vol | 7697.50 |

EXPRESS TRAIN
SEC.(639+000.00)

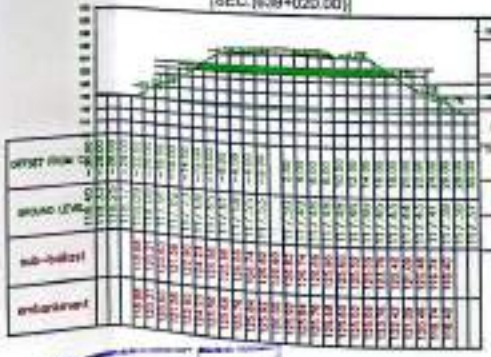

| Total Volume at Station 639+000.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 29.47 |
| Fill Vol | 589.40 |
| cum fill vol | 8876.30 |

EXPRESS TRAIN
SEC.(638+980.00)




| Total Volume at Station 638+980.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 29.47 |
| Fill Vol | 589.40 |
| cum fill vol | 8266.90 |

EXPRESS TRAIN
SEC.(639+020.00)




| Total Volume at Station 639+020.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 29.47 |
| Fill Vol | 589.40 |
| cum fill vol | 9465.70 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Project Name
ELECTRIC EXPRESS TRAIN (PHASE-I)
SECTION (FROM CAIRO TO AMMAN)
STATION 638+128.28 - STATION 720+828.00

KEY PLAN

SECTION (FROM CAIRO TO AMMAN)
STATION 638+128.28 - STATION 720+828.00

| No. | Date | Drawing Status | |
|---|---|---|---|
| | Issued | Issued for Approval | Issued for Approval |

*All dimensions are in meters

List of cross-sec Expansion

| Contractor | Existing Ground Level |
|---|---|
| Consultant | Proposed Sub-ballast level |

Owner consultant

NAT Consultant

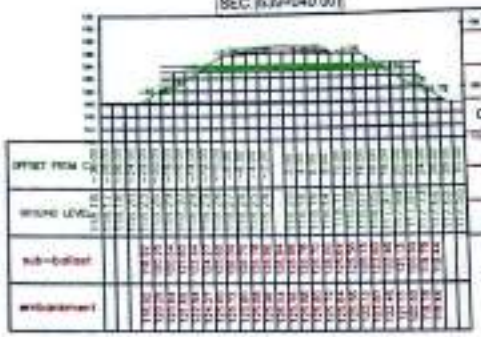
Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBRE - AMMAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
H(1:1000)
V(1:100)

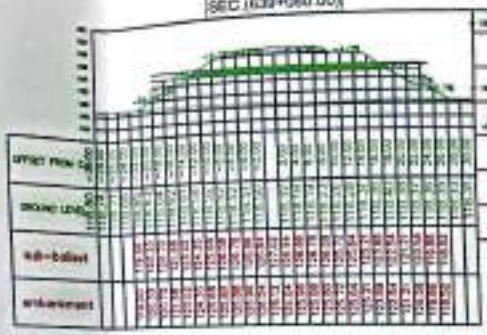
Drawing NO
HSR - SEC 5 - cross-sec - (2)

EXPRESS TRAIN
SEC (639+040.00)



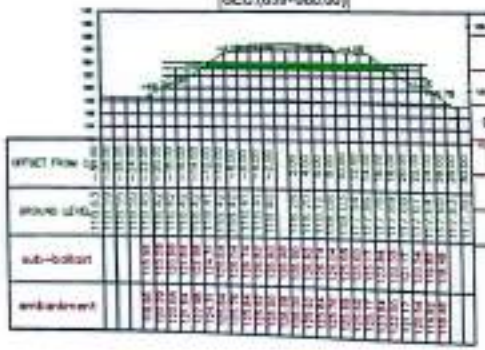

| Total Volume at Station 639+040.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 29.47 |
| Fill Vol | 589.40 |
| cum fill vol | 10055.10 |

EXPRESS TRAIN
SEC (639+060.00)



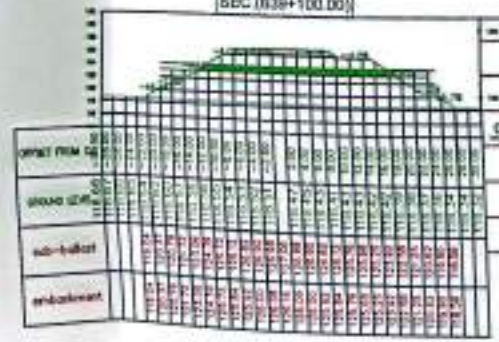

| Total Volume at Station 639+080.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 29.47 |
| Fill Vol | 589.40 |
| cum fill vol | 11233.90 |

EXPRESS TRAIN
SEC (639+080.00)




| Total Volume at Station 639+080.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 29.47 |
| Fill Vol | 589.40 |
| cum fill vol | 10644.50 |

EXPRESS TRAIN
SEC (639+100.00)




| Total Volume at Station 639+100.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 29.47 |
| Fill Vol | 589.40 |
| cum fill vol | 11823.30 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Owner
General Authority for Roads, Bridges and Land Transport

Project Name
SECTION (FROM QUS TO ARMANT)
STATION 639+000.00 - STATION 713+520.00

KEY PLAN

SECTION (FROM QUS TO ARMANT)
STATION 639+000.00 - STATION 713+520.00

| NO. | DATE | Description | |
|---|---|---|---|
| | 8/2013 | [illegible] | [illegible] |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| [illegible] | Existing Ground Level |
| [illegible] | Proposed Sub-Ballast level |

Owner consultant

Owner's Consultant

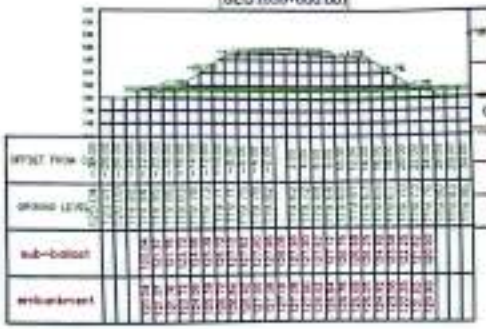
Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBRE - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
H.S.( 1:500)
V.S.( 1:100)

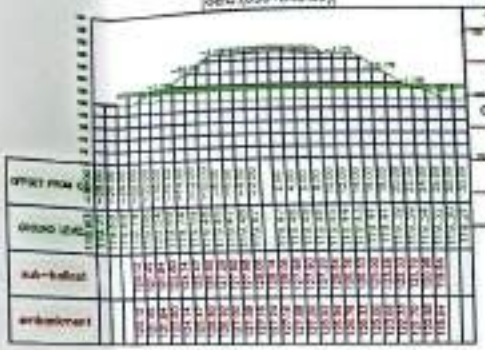
Drawing NO
HSR - SEC 5 - cross-sec - (1)

EXPRESS TRAIN
SEC (639+600.00)



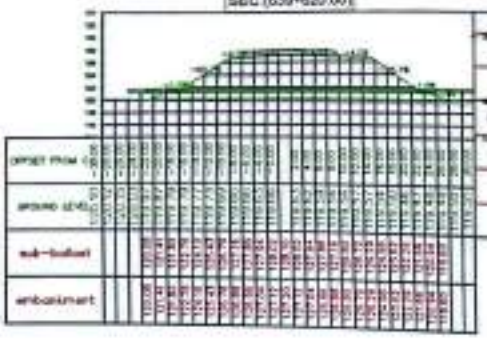

| Total Volume at Station 639+600.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 429.73 |
| cum fill vol | 12762.60 |

EXPRESS TRAIN
SEC (639+640.00)



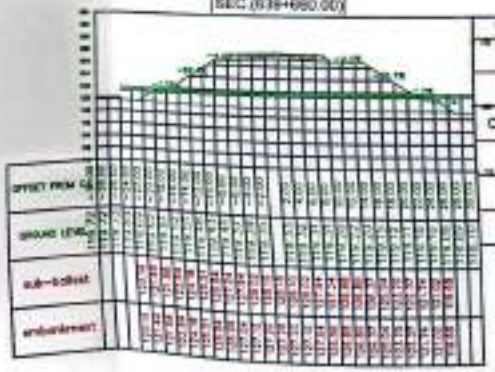

| Total Volume at Station 639+640.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 429.73 |
| cum fill vol | 13622.06 |

EXPRESS TRAIN
SEC (639+620.00)




| Total Volume at Station 639+620.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 429.73 |
| cum fill vol | 13192.33 |

EXPRESS TRAIN
SEC (639+660.00)




| Total Volume at Station 639+660.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 429.73 |
| cum fill vol | 14051.79 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Project
General Authority for Roads, Bridges and Land Transport

Project Name
[illegible]

KEY PLAN

SECTION (ROAD GATE TO ARMANT)
STATION 639+100.00 - STATION 716+424.83

| No. | Date | Description | Revised Sheets |
|---|---|---|---|
| | [illegible] | [illegible] | |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| [illegible] | Existing Ground Level |
| [illegible] | Proposed sub-ballast level |

Owner consultant

NAMA Consultant

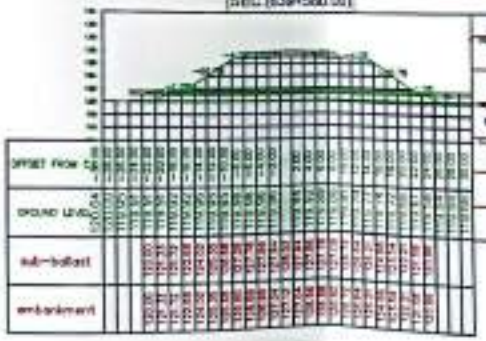
Contractor EL-ZAHABY

Drawing Name
[illegible] for HSR DETOURS - ADWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+883

Drawing scale
H(1:1000)
V(1:100)

Drawing NO
HSR - SEC 5 - [illegible] - (1)

EXPRESS TRAIN
SEC (639+560.00)




| Total Volume at Station 639+560.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 214.87 |
| cum fill vol | 12332.87 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Owner
National Authority for Roads, Bridges and Land Transport

Project Name
(LOT XIX, EXPRESS TRAIN LINE (PHASE ONE))
(SECTION (FROM QUS TO ASWAN))
(CHAINAGE 639+560.00 - STATION 753+424.68)

KEY PLAN

(SECTION (FROM QUS TO ASWAN))
(CHAINAGE 639+560.00 - STATION 753+424.68)

| No. | Date | Drawing Name | Remarks |
|---|---|---|---|
| | | | |

*All dimensions are in meters.

List of cross-sec Expression

| | |
|---|---|
| ——— | Existing Ground level |
| ——— | Proposed sub-ballast level |

Owner Consultant

NAT's Consultant

Contractor EL-ZAHABY

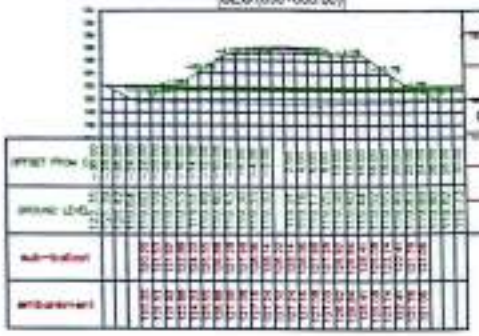
Drawing Name
cross-sec for KM OCTOBER - ASWAN section
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
HZ (1:1000)
V.(1:100)

Drawing NO
HGR - SEC 5 - cross-sec - (1)

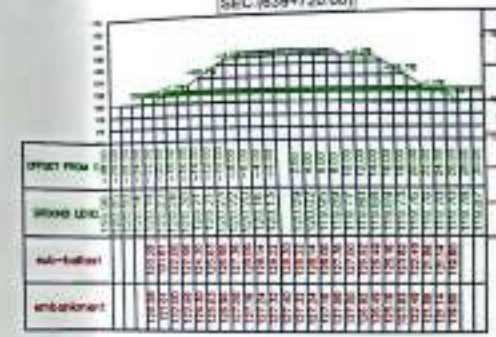
شركة الزهبي

EXPRESS TRAIN
SEC.(639+680.00)



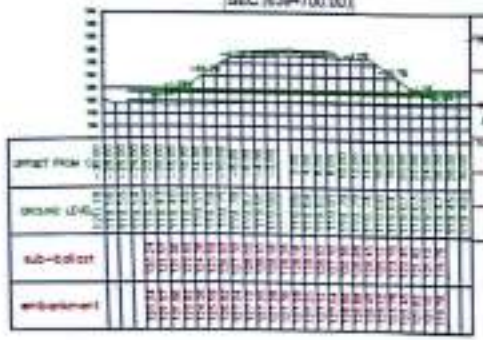

| Total Volume at Station 639+680.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 429.73 |
| cum fill vol | 14401.52 |

EXPRESS TRAIN
SEC.(639+720.00)



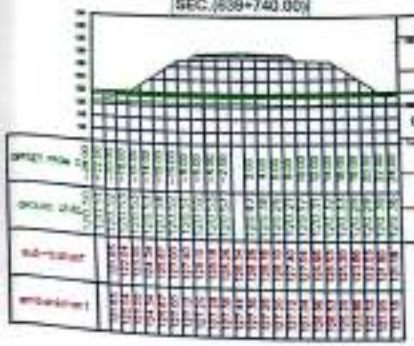

| Total Volume at Station 639+720.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 429.73 |
| cum fill vol | 15340.98 |

EXPRESS TRAIN
SEC.(639+700.00)




| Total Volume at Station 639+700.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 429.73 |
| cum fill vol | 14911.25 |

EXPRESS TRAIN
SEC.(639+740.00)




| Total Volume at Station 639+740.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 429.73 |
| cum fill vol | 15770.71 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Agency
General Authority for Roads, Bridges and Transport

Project Name
[illegible]
SECTION (FROM QUS TO ARMANT)
STATION 639+120.13 - STATION 723+434.65

KEY PLAN

SECTION (FROM QUS TO ARMANT)
STATION 639+120.13- STATION 723+434.65

| No | DATE | Drawing Name | Remarks |
|---|---|---|---|
| | [illegible] | [illegible] | [illegible] |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| [illegible] | Existing Ground level |
| [illegible] | Proposed sub-ballast level |

Owner's consultant

NRBL Y Consultant

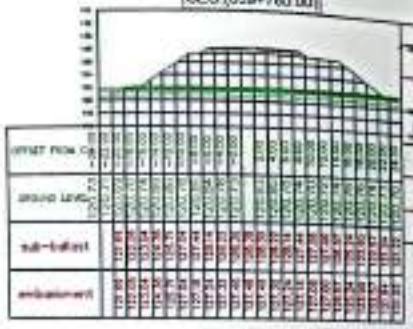
Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR DETOBRE - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
H(1:1000)
V.(1:100)

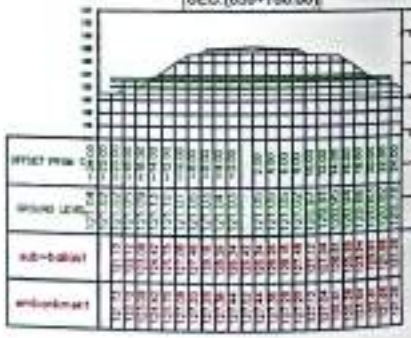
Drawing NO
HSR - SEC 5 - [illegible]

EXPRESS TRAIN
SEC.(639+760.00)




| Total Volume at Station 639+760.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 21.49 |
| Fill Vol | 439.73 |
| cum fill vol | 16200.44 |

EXPRESS TRAIN
SEC.(639+780.00)




| Total Volume at Station 639+780.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.36 |
| Fill Vol | 368.47 |
| cum fill vol | 16588.91 |

PROJECT
Ministry of Transportation
National Authority for Tunnels (NAT)

OWNER
General Authority for Roads , Bridges & Land Transport

Project Name
SECTION FROM QUS TO ASWAN )
STATION 639+000.00 - STATION 739+000.00

KEY PLAN

SECTION FROM QUS TO ASWAN )
STATION 639+000.00 - STATION 739+000.00

| No. | DATE | Issuing Date | Issued Sheets |
|---|---|---|---|
| | 10/2011 | 07/08/2011 | |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| ------ | Existing Ground Level |
| ------ | Proposed sub-ballast level |

Owner consultant

DHBL T.Consultant

Contractor EL-ZAHABY

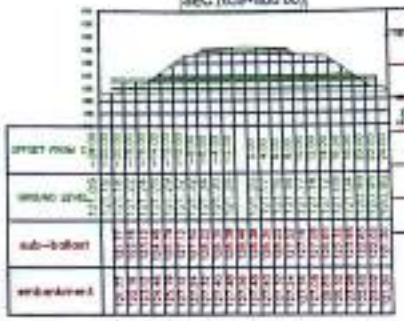
Drawing Name
cross-sec for HIGH DICTOBRE - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
HZ (1:1000)
VT (1:100)

Drawing NO
HSR - SEC 5 - 03003-000- (1)

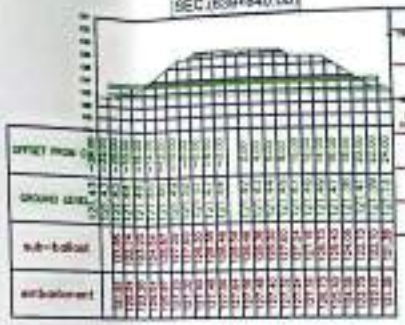
شركة الزهبي

EXPRESS TRAIN
SEC (639+800.00)



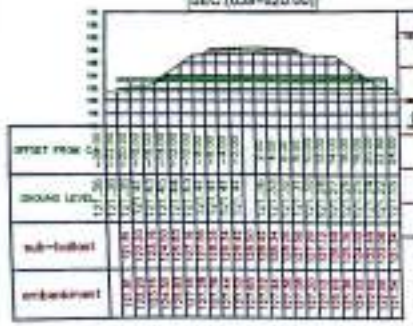

| Total Volume at Station 639+800.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.36 |
| Fill Vol | 347.20 |
| cum fill vol | 16916.11 |

EXPRESS TRAIN
SEC (639+840.00)



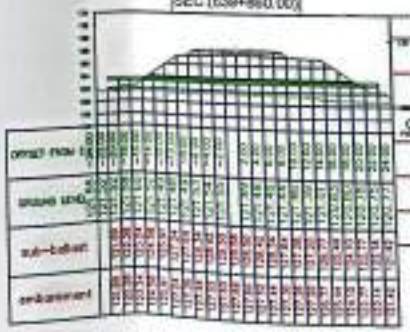

| Total Volume at Station 639+840.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.36 |
| Fill Vol | 347.20 |
| cum fill vol | 17530.31 |

EXPRESS TRAIN
SEC (639+820.00)




| Total Volume at Station 639+820.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.36 |
| Fill Vol | 347.20 |
| cum fill vol | 17283.31 |

EXPRESS TRAIN
SEC (639+860.00)




| Total Volume at Station 639+860.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.36 |
| Fill Vol | 347.20 |
| cum fill vol | 17977.71 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

KEY PLAN

SECTION (FROM 0.00 TO ARAMAIT)

*All dimensions are in meters

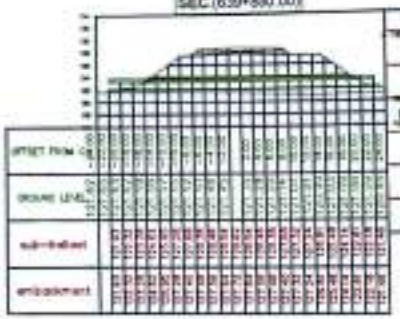
List of cross-sec Expression

Contractor EL-ZAHABY

Drawing Name
cross-sec for 6TH OCTOBER - ASWAN section
EL-ZAHABY COMPANY
from km 637+952 to 643+863

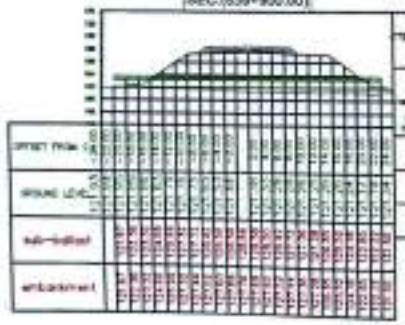
Drawing NO
HAR - SEC 5 - [illegible] (1)

EXPRESS TRAIN
SEC.(639+880.00)



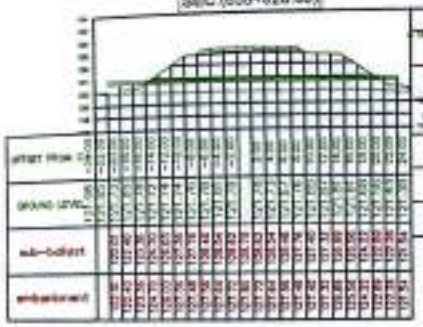

| Total Volume at Station 639+880.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.36 |
| Fill Vol | 347.20 |
| cum fill vol | 18326.91 |

EXPRESS TRAIN
SEC.(639+900.00)



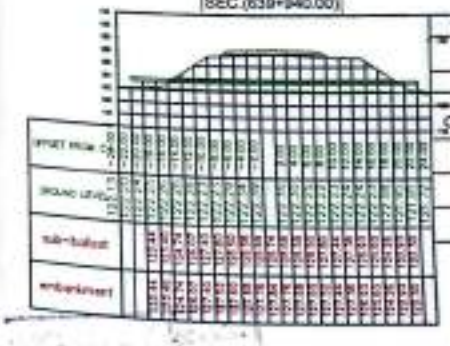

| Total Volume at Station 639+900.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.36 |
| Fill Vol | 347.20 |
| cum fill vol | 18672.11 |

EXPRESS TRAIN
SEC.(639+920.00)




| Total Volume at Station 639+920.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.36 |
| Fill Vol | 347.20 |
| cum fill vol | 19019.31 |

EXPRESS TRAIN
SEC.(639+940.00)




| Total Volume at Station 639+940.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.36 |
| Fill Vol | 347.20 |
| cum fill vol | 19366.51 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Project Name
ELECTRIC EXPRESS TRAIN (HIGH SPEED RAIL)
SECTION (FROM QUS TO ARMANT)
STATION 639+120.00 - STATION 753+620.00

KEY PLAN

SECTION (FROM QUS TO ARMANT)
STATION 639+120.00 - STATION 753+620.00

| No. | Date | Drawing Name | |
|---|---|---|---|
| | 2/2021 | STATION NAME | Official Remarks |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| | Existing Ground Level |
| | Proposed sub-ballast level |

Owner Consultant

GOBEL T Consultant

Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBRE - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

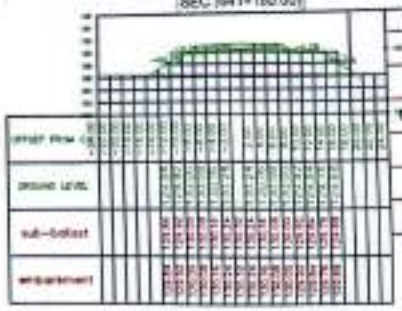
Drawing scale
H/Z 1:1000
V/Z 1:100

Drawing NO
HSR - SEC 5 - [illegible] - [1]

شركة الزهبي
T.E.A. 197.445

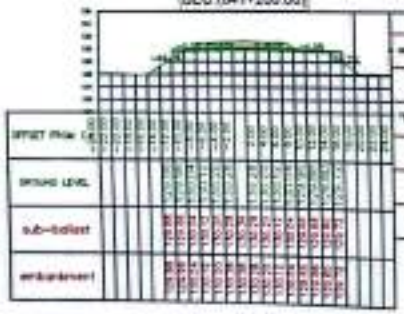
H.S.R. BLUE LINE Sec.05

EXPRESS TRAIN
SEC (641+180.00)



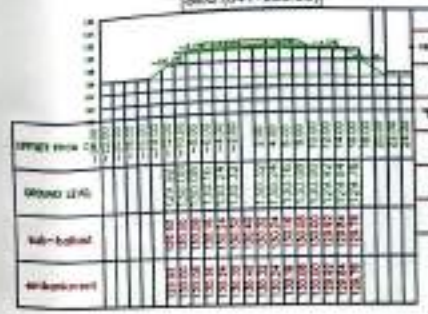

| Total Volume at Station 641+180.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 21251.08 |

EXPRESS TRAIN
SEC (641+200.00)



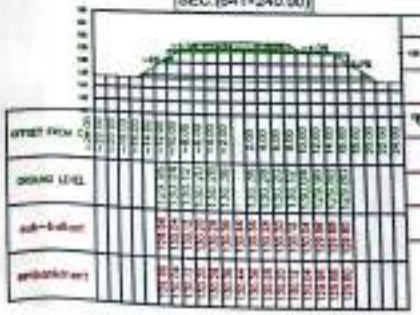

| Total Volume at Station 641+200.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 21431.18 |

EXPRESS TRAIN
SEC (641+220.00)




| Total Volume at Station 641+220.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 21611.29 |

EXPRESS TRAIN
SEC (641+240.00)




| Total Volume at Station 641+240.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 21791.39 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Project Name
ELECTRIC EXPRESS TRAIN (HIGH SPEED RAIL)
SECTION (FROM 6th TO ARIANT)
STATION (641+000.11 - STATION 704+000)

KEY PLAN

SECTION (FROM (6th TO ARIANT)
STATION (641+000.11 - STATION 704+000.00)

| No. | DATE | Drawing Name | |
|---|---|---|---|
| | 10-2021 | [illegible] | [illegible] |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| [illegible] | Existing Ground level |
| [illegible] | Proposed sub-ballast level |

Owner consultant

NATS T Consultant

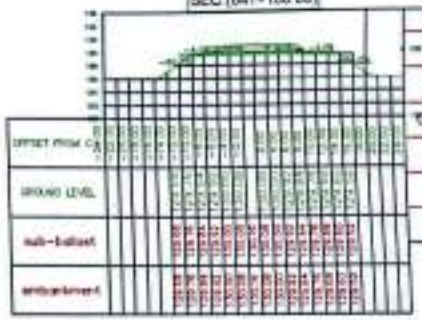
Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBER - ARIANA section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
HC 1:1000
VC 1:100

Drawing NO
HSR - SEC 5 - cross-sec - (1)

EXPRESS TRAIN
SEC (641+100.00)

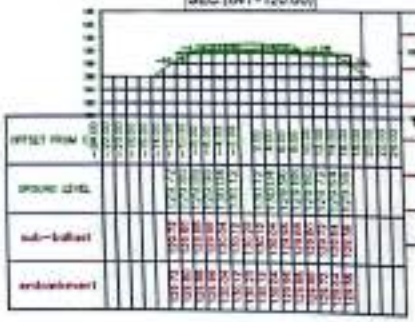



| Total Volume at Station 641+100.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 20530.67 |

EXPRESS TRAIN
SEC (641+140.00)

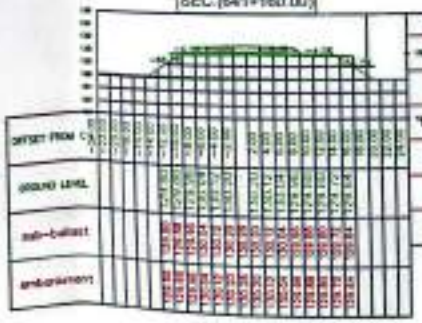

| Total Volume at Station 641+140.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 20890.88 |

EXPRESS TRAIN
SEC (641+120.00)




| Total Volume at Station 641+120.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 20710.77 |

EXPRESS TRAIN
SEC (641+160.00)




| Total Volume at Station 641+160.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 21070.98 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Partner
National Authority for Roads, Bridges and Rail Transport

Project Name
ELECTRIC EXPRESS TRAIN (HIGH SPEED RAIL)
SECTION (FROM QUS TO ARMANT)
STATION 639+000.00 - STATION 723+828.60

KEY PLAN

SECTION (FROM QUS TO ARMANT)
STATION 639+000.00 - STATION 723+828.60

| No. | Date | Drawing Name | |
|---|---|---|---|
| | Updates | 00-00-000 | Name/Remarks |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| | Existing Ground Level |
| | Proposed Sub-Ballast Level |

Owner consultant

Design Consultant

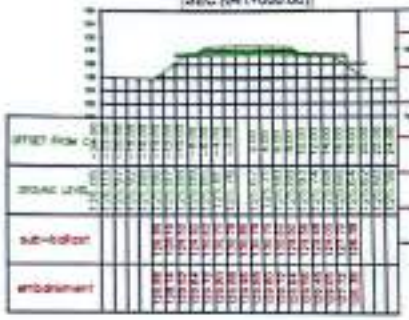
Contractor EL-ZAHABY

Drawing Name
Cross-sec for HSR OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+853

Drawing scale
H(1):1:2000
V(1):1:200

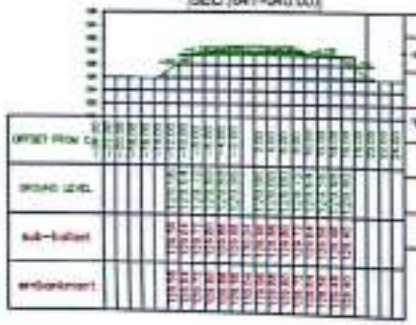
Drawing NO
HSR - SEC 5 - 07000-945 - (1)

EXPRESS TRAIN
SEC (641+000.00)



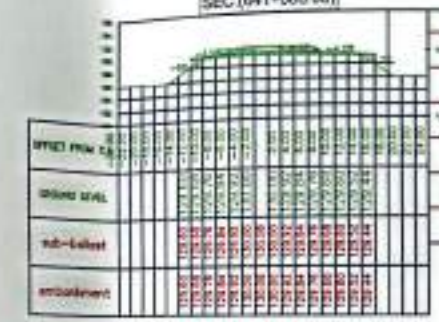

| Total Volume at Station 641+000.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 90.05 |
| cum fill vol | 19630.16 |

EXPRESS TRAIN
SEC (641+040.00)



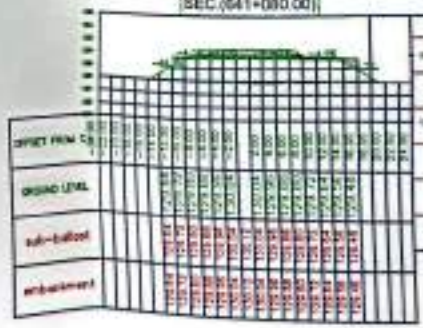

| Total Volume at Station 641+040.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 19990.36 |

EXPRESS TRAIN
SEC (641+060.00)




| Total Volume at Station 641+060.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 20170.46 |

EXPRESS TRAIN
SEC (641+080.00)




| Total Volume at Station 641+080.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 20350.57 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Owner
General Authority for Road, Bridge And Land Transport

Project Name
HIGH SPEED TRAIN WADI (PHASE-1)
SECTION (FROM QUS TO ABNAUT)
STATION 639+000.00 - STATION 720+424.00

KEY PLAN

SECTION (FROM QUS TO ABNAUT)
STATION 639+000.00 - STATION 720+424.00

| No. | DATE | Drawing Status | |
|---|---|---|---|
| | SCALE | STATION | Issued Status |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| | Existing Ground Level |
| | Proposed Sub-ballast level |

Owner consultant

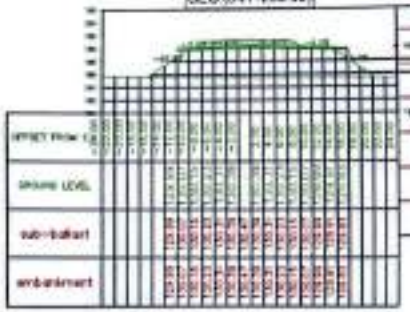
Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBER - ADWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
HE 1:1000
VU 1:100

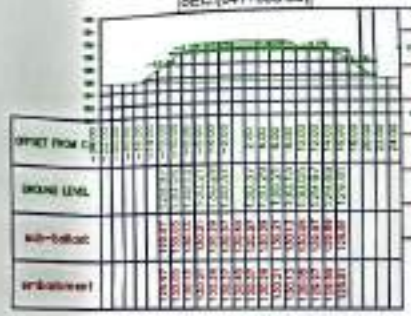
Drawing NO
HSR - SEC 5 - cross-sec - (1)

EXPRESS TRAIN
SEC.(641+260.00)



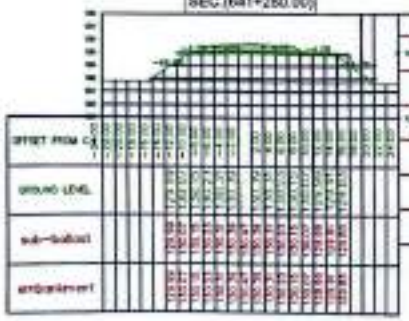

| Total Volume at Station 641+260.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 21971.40 |

EXPRESS TRAIN
SEC.(641+300.00)



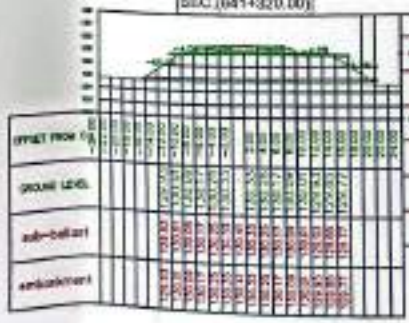

| Total Volume at Station 641+300.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 22331.70 |

EXPRESS TRAIN
SEC.(641+280.00)




| Total Volume at Station 641+280.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 22151.59 |

EXPRESS TRAIN
SEC.(641+320.00)




| Total Volume at Station 641+320.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 22511.80 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Partner
General Authority for Roads, Bridges and Transport

Project Name
EXPRESS TRAIN (HSR-LAPED-MAA)
SECTION (FROM QUS TO ARAWAT)
STATION 629+000.13 - STATION 725+424.88

KEY PLAN

SECTION (FROM QUS TO ARAWAT)
STATION 629+000.13 - STATION 725+424.88

| No. | Date | Drawing Name | Issued Issue |
|---|---|---|---|
| | 9/2023 | [illegible] | [illegible] |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| ——— | Existing Ground Level |
| ——— | Proposed Sub-ballast level |

Owner Consultant

Design & Consultant

Contractor EL-ZAHABY

Drawing Notes
cross-sec for HSR OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
H:1:1000
V:1:1000

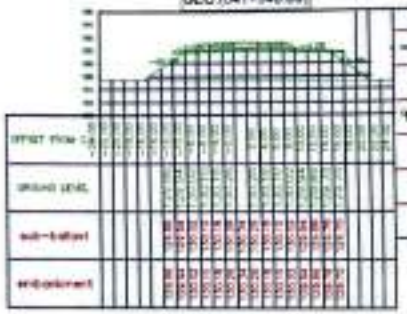
Drawing NO
HSR - SEC 5 - CROSS-SEC- (1)

برنامج كمساعد استشارات الهندسية
Spectrum Consulting Co.05
استشاري الأعمال الهندسية

مكتب الاستشارات الهندسية
Spectrum Consulting
مشروع القطار السريع

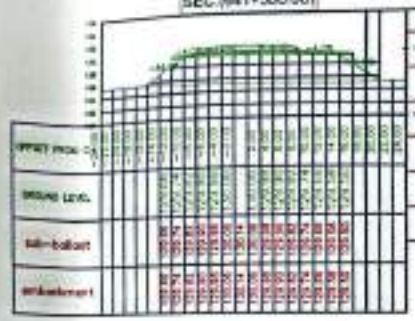
شركة الزهبي
EL-ZAHABY COMPANY

EXPRESS TRAIN
SEC.(641+340.00)



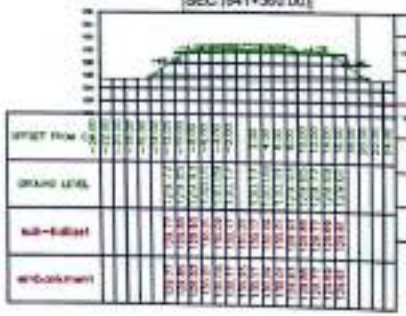

| Total Volume at Station 641+340.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 22691.90 |

EXPRESS TRAIN
SEC.(641+360.00)



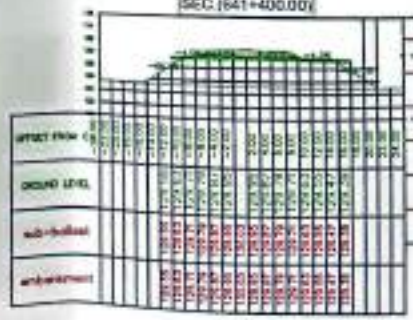

| Total Volume at Station 641+360.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 23052.11 |

EXPRESS TRAIN
SEC.(641+380.00)




| Total Volume at Station 641+380.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 23412.00 |

EXPRESS TRAIN
SEC.(641+400.00)




| Total Volume at Station 641+400.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| *CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 23772.21 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Partner
National Authority for Roads , Bridges & Land Transport

Project Name
ELECTRIC EXPRESS TRAIN HIGH SPEED RAIL (
SECTION (FROM Dub TO ASWAN) (
STATION 626+220.00 - STATION 725+424.00

KEY PLAN

SECTION (FROM DUB TO ASWAN) (
STATION 626+220.00 - STATION 725+424.00

| No. | Date | Drawing Status | |
|---|---|---|---|
| | | | |
| | | | |

* All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| ------ | Existing Ground Level |
| ------ | Proposed sub-ballast level |

Owner consultant

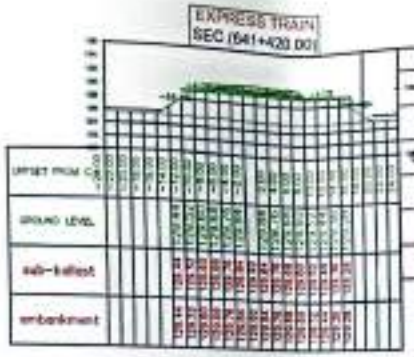
GHBL Consultant

Contractor EL-ZAHABY

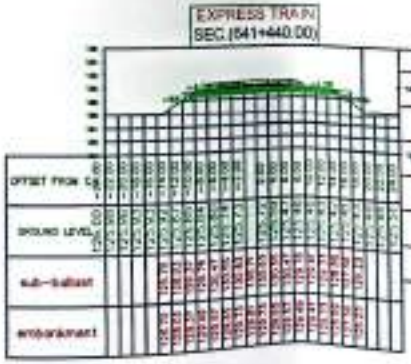
Drawing Name
cross-sec for HSR OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
H(1:1000)
V(1:1000)

Drawing NO
HSR - SEC 5 - cross-sec- (1)




| Total Volume at Station 641+420.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 9.01 |
| Fill Vol | 180.10 |
| cum fill vol | 23412.31 |




| Total Volume at Station 641+440.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 260.20 |
| cum fill vol | 23672.51 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Project
National Authority for Roads , Bridges and Land Transport

Project Name
ELECTRIC EXPRESS TRAIN (HIGH SPEED RAIL)
SECTION (FROM QUS TO ABRAMS)
(STATION 629+120.23 - STATION 723+620.00)

KEY PLAN

SECTION (FROM QUS TO ABRAMS)
(STATION 629+120.23 - STATION 723+620.00)

| No. | Date | Drawing Date | |
|---|---|---|---|
| | 10/2013 | 07/2013 - NAT | Mosad Elsawy |

*All dimensions are in meters

List of cross-sec Expression

| Solution | Existing Ground Level |
|---|---|
| Legend | Proposed Cut / Fill Level |

Owner consultant

ISMAIL T Consultant

Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
HOR 1:1000
VERT 1:200

Drawing NO
HSR - SEC 5 - cross-sec- (1)

EXPRESS TRAIN
SEC (641+480.00)


| Total Volume at Station 641+480.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 12.86 |
| Fill Vol | 257.20 |
| cum fill vol | 28994.91 |

EXPRESS TRAIN
SEC (641+480.00)


| Total Volume at Station 641+480.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 12.86 |
| Fill Vol | 257.20 |
| cum fill vol | 28737.71 |

EXPRESS TRAIN
SEC (641+500.00)


| Total Volume at Station 641+500.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 12.86 |
| Fill Vol | 257.20 |
| cum fill vol | 29252.11 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Project
General Authority for Roads, Bridges and Land Transport

Project Name
ELECTRIC EXPRESS TRAIN (HIGH SPEED RAIL)
SECTION (FROM QUS TO ARAISHA)
STATION 639+110.23 - STATION 703+624.43

KEY PLAN

SECTION (FROM QUS TO ARAISHA)
STATION 639+110.23 - STATION 703+624.43

| No. | Date | Drawing Name | Revised Remarks |
|---|---|---|---|
| | 10/2023 | EXPRESS TRAIN | |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| ——— | Existing Ground Level |
| ——— | Proposed Sub-Ballast Level |

Owner consultant

Design Consultant

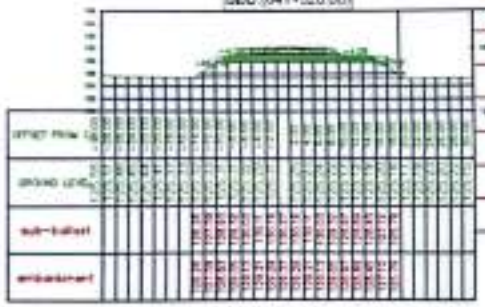
Contractor EL-ZAHABY

Drawing Title
cross-sec for HSR OCTOBER - ARAISHA section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing date
HE:11.2023
KU:2.2023

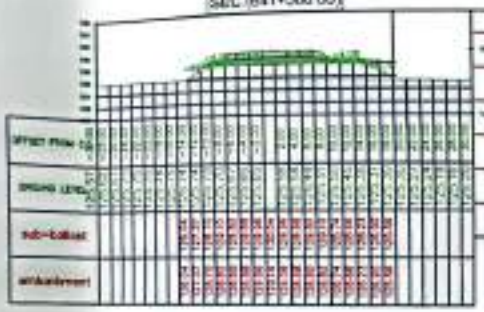
Drawing NO
NSR - SEC 5 - 0106-640- (1)

EXPRESS TRAIN
SEC (641+520.00)



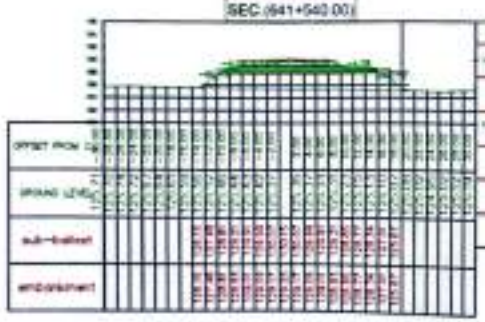

| Total Volume at Station 641+520.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 25033.67 |

EXPRESS TRAIN
SEC (641+560.00)



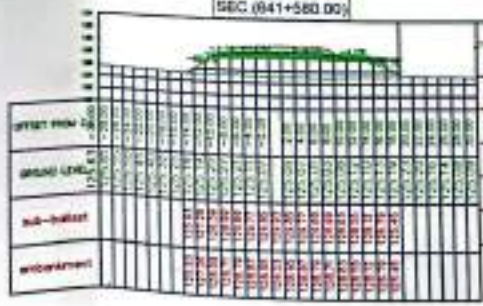

| Total Volume at Station 641+560.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 25714.25 |

EXPRESS TRAIN
SEC (641+540.00)




| Total Volume at Station 641+540.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 25373.96 |

EXPRESS TRAIN
SEC (641+580.00)




| Total Volume at Station 641+580.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 26054.54 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Project Name
ELECTRIC EXPRESS TRAIN (HIGH SPEED RAIL)
SECTION (ROM QUS TO ARMANT)
STATION 639+122.10 - STATION 723+424.93

KEY PLAN

SECTION (ROM QUS TO ARMANT)
STATION 639+122.10 - STATION 723+424.93

| No. | Date | Description | |
|---|---|---|---|
| | | | |
| | Initials | Drawn by | Checked by |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| | Existing Ground Level |
| | Proposed Sub Ballast level |

Owner consultant

Railway T.Consultant

Contractor EL-ZAHABY

Drawing Name
Cross-sec for KM OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

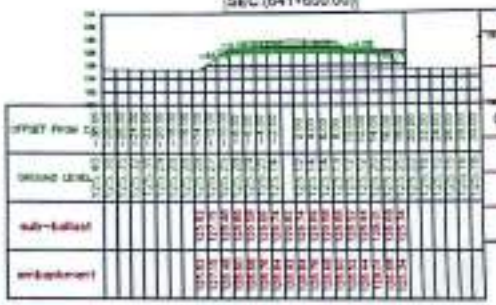
Drawing scale
H.: 1:1000
V.:1:100

Drawing NO
HSR - SEC 5 - CROSS-SEC- (1)

Spectrum Consulting
مشروع القطار السريع

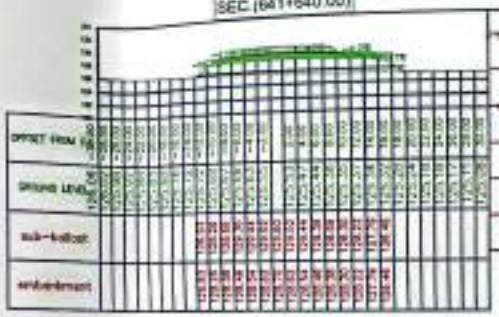
شركة

EXPRESS TRAIN
SEC.(641+600.00)



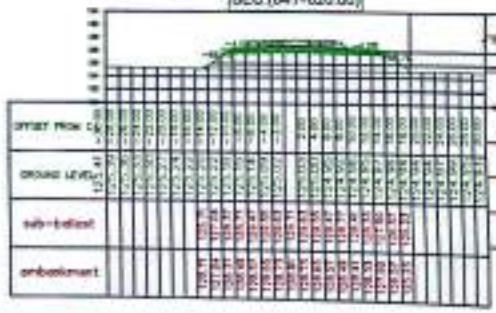

| Total Volume at Station 641+600.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 26394.83 |

EXPRESS TRAIN
SEC.(641+640.00)



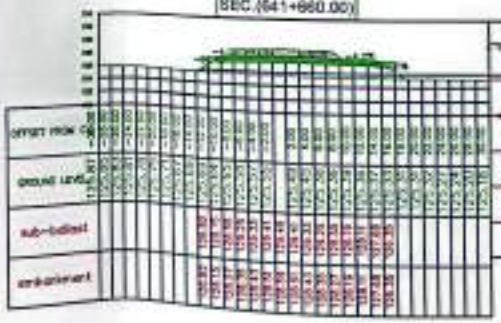

| Total Volume at Station 641+640.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 27075.42 |

EXPRESS TRAIN
SEC.(641+620.00)




| Total Volume at Station 641+620.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 26735.13 |

EXPRESS TRAIN
SEC.(641+660.00)




| Total Volume at Station 641+660.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 27415.71 |

Spectrum Consulting

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Owner
General Authority for Roads, Bridges and Transport

Project Name
ELECTRIC EXPRESS TRAIN (HSR) (FEED PKG.)
SECTION (FROM QUS TO ARMANT)
STATION 639+133.13 - STATION 715+626.63

KEY PLAN

SECTION (FROM QUS TO ARMANT)
STATION 639+133.13 - STATION 715+626.63

| no | DATE | Description | Checked |
|---|---|---|---|
| | 15/06/15 | FOR REVIEW | Ahmed Ramadan |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| | Existing Ground Level |
| | Proposed sub-ballast level |

Owner consultant

SMMS Consultant

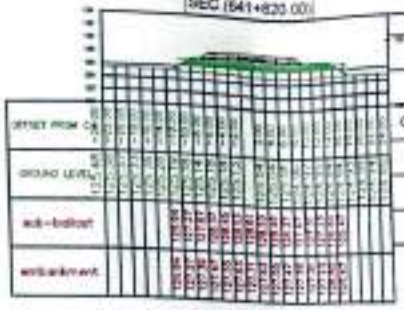
Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
H(1:1000)
V(1:100)

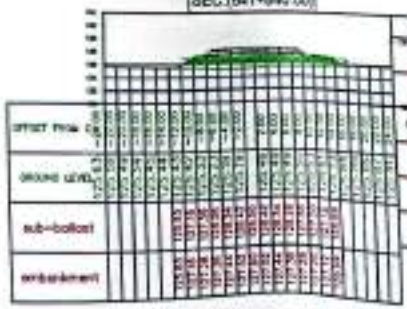
Drawing NO
HSR - SEC 5 - cross-sec- (1)

EXPRESS TRAIN
SEC (641+820.00)




| Total Volume at Station 641+820.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 22.07 |
| Fill Vol | 441.50 |
| cum fill vol | 30299.84 |

EXPRESS TRAIN
SEC (641+840.00)




| Total Volume at Station 641+840.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 22.07 |
| Fill Vol | 441.50 |
| cum fill vol | 30731.34 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Project Name
ELECTRIC EXPRESS TRAIN (HIGH SPEED RAIL)
SECTION (FROM QUS TO ARAWAT)
STATION 630+000.00 - STATION 710+000.00

KEY PLAN

SECTION (FROM QUS TO ARAWAT)
STATION 630+000.00 - STATION 710+000.00

| No. | Date | Drawing Name | Revised Details |
|---|---|---|---|
| | 10/2021 | CROSS-SEC | |

*All dimensions are in meters

List of cross-sec Expression

| Symbol | Description |
|---|---|
| | Existing Ground Level |
| | Proposed Sub-Ballast Level |

Design consultant

Supervision Consultant

Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBER - ASWAN section 1
EL-ZAHABY COMPANY
from km 637+952 to 643+863

Drawing scale
H: 1:1000
V: 1:200

Drawing NO
HSR - SEC 5 - CROSS-SEC - (1)

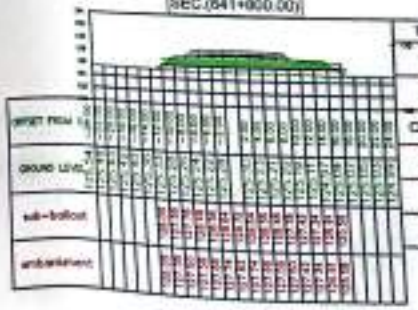
EXPRESS TRAIN
SEC.(641+700.00)


| Total Volume at Station 641+700.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.00 |
| Fill Vol | 340.29 |
| cum fill vol | 29337.16 |

EXPRESS TRAIN
SEC.(641+780.00)


| Total Volume at Station 641+780.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.00 |
| Fill Vol | 340.29 |
| cum fill vol | 29657.45 |

EXPRESS TRAIN
SEC.(641+800.00)




| Total Volume at Station 641+800.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 22.07 |
| Fill Vol | 390.89 |
| cum fill vol | 29848.35 |

Ministry of Transportation
National Authority for Tunnels (NAT)

Project
Tunnel Authority for Road, Bridge Road Transport

Project Name
TOSHKA EXPRESS TRAIN (HIGH SPEED RAIL)
SECTION (FROM QUE TO ABAWAT)
STATION 639+128.18 - STATION 723+424.60

KEY PLAN

SECTION (FROM QUE TO ABAWAT)
STATION 639+128.18 - STATION 723+424.60

| No. | DATE | Drawing Name | Description |
|---|---|---|---|
| | 10/2021 | | |

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| | Existing Ground level |
| | Proposed sub-ballast level |

Owner consultant

QA/QC Consultant

Contractor EL-ZAHABY

Drawing Name
cross-sec for HSR OCTOBER - ASWAN section 5
EL-ZAHABY COMPANY
from km 637+852 to 643+863

Drawing scale
H(1:1000)
V(1:100)

Drawing NO
HSR - SEC 5 - [illegible] - (1)

EXPRESS TRAIN
SEC.(641+680.00)


| Total Volume at Station 641+680.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 27356.00 |

EXPRESS TRAIN
SEC.(641+720.00)


| Total Volume at Station 641+720.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 28436.58 |

EXPRESS TRAIN
SEC.(641+700.00)


| Total Volume at Station 641+700.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 28096.29 |

EXPRESS TRAIN
SEC.(641+740.00)


| Total Volume at Station 641+740.00 | |
|---|---|
| Cut Area | 0.00 |
| CUT VOL | 0.00 |
| CUM CUT VOL | 0.00 |
| FILL AREA | 17.01 |
| Fill Vol | 340.29 |
| cum fill vol | 28776.87 |

Owner
Ministry of Transportation
National Authority for Tunnels (NAT)

Partner
General Authority for Roads, Underground Transport

Project Name
[illegible]

KEY PLAN

[illegible]

*All dimensions are in meters

List of cross-sec Expression

| | |
|---|---|
| [illegible] | [illegible] |
| [illegible] | [illegible] |

Owner consultant

GOBB-T Consultant

Contractor EL-ZAHARY

Drawing Name
cross-sec for HUR-OCTOBER - ADWAR section
EL-ZAHARY COMPANY
from km 637+952 to 643+863

Drawing scale
H(1:1000)
V(1:100)

Drawing NO
ASR - SEC 5 - [illegible] - (1)

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

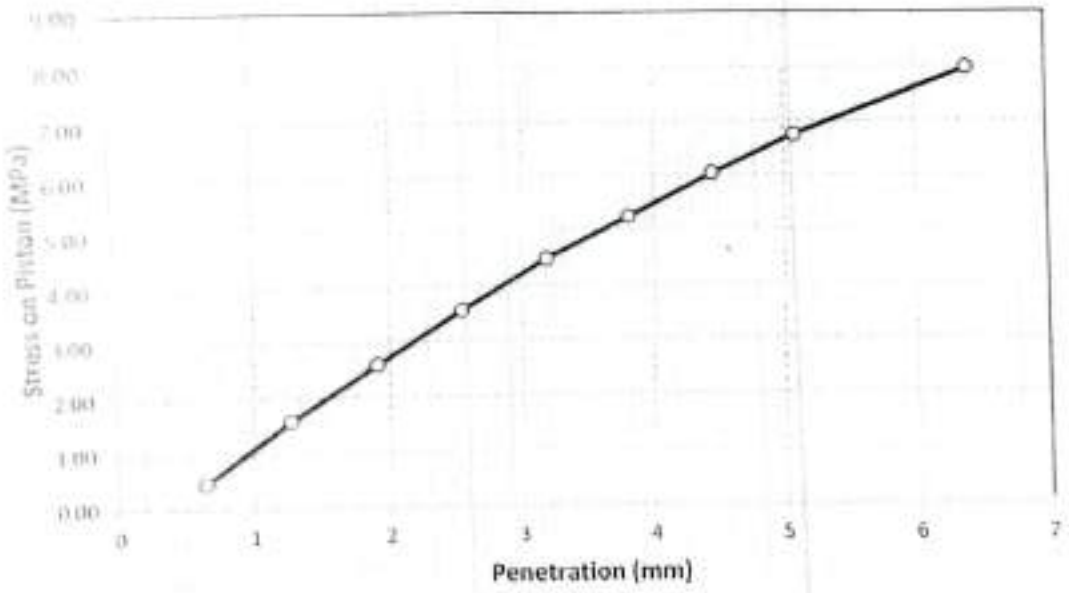
Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Load Penetration Curve of CBR Test

## ASTM D-1883




Signature / ..

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

IAS

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Test Results of California Bearing Ratio on Base Materials

### ASTM D 1883

| penetration | | stress on piston (Mpa) |
|---|---|---|
| mm | Inch | |
| 0.64 | 0.025 | 0.46 |
| 1.27 | 0.050 | 1.58 |
| 1.91 | 0.075 | 2.58 |
| 2.54 | 0.100 | 3.55 |
| 3.18 | 0.125 | 4.47 |
| 3.81 | 0.150 | 5.23 |
| 4.45 | 0.175 | 6.03 |
| 5.08 | 0.200 | 6.74 |
| 6.35 | 0.250 | 7.97 |

| CBR Result | Stress (Mpa) | | CBR 100 % |
|---|---|---|---|
| | St. Value | Sample results | 51.5 % |
| At 0.1 inch (2.54 mm) penetration | 6.90 | 3.55 | |

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.22 (gm /cm$^3$)
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 / ..

CEL
مكتب معامل الاستشارات الهندسية
• مشروعات • الاقصر •
219,991,437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

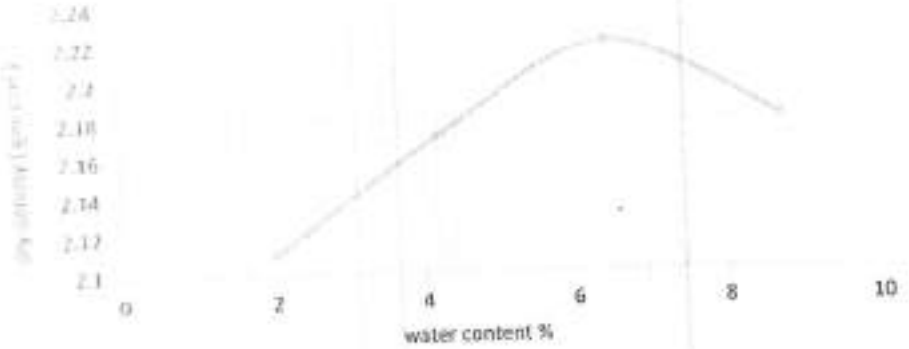
Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date :**08/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

**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 /**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS
ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date :**08/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

## Soil Classification

| TEST | Results (%) | Limits according Projects Specs | | |
|---|---|---|---|---|
| Group Classification | (A-1-a) | (A-1-a) | (A-1-b) | (A-2-4) |
| 2.00 mm (No.10). | 27.5 | Max 50 % | ------ | ------ |
| 0.425 mm (No. 40). | 15.6 | Max 30 % | Max 50 % | ------ |
| 0.075 mm (No. 200). | 9.1 | Max 15 % | Max 15 % | Max 15 % |
| | | | | |
| Liquid Limit | ---- | ------ | ------ | ------ |
| Plasticity index | 0 | Max 6 % | Max 6 % | Max 10 % |

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

Signature

CEL

219 991 437

3

IAS

ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## 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 /...

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Materials finer than 75 µm (no.200) sieve By washing ASTM D-1140.

| Test | Results (%) |
|---|---|
| Percentage of material finer than Sieve Size 75 µM (No.200) | 9.1 |

Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقسام
ت: 219,991,437
المركز الرئيسي: 3 شارع الشد الأفضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

| Sieve Size (mm) | Sieve Size (IN) | Passing % |
|---|---|---|
| 50 | 2 | 95.1 |
| 37.5 | 1.5 | 91.9 |
| 25 | 1 | 80.7 |
| 19 | ¾ | 72.2 |
| 12.50 | ½ | 64.1 |
| 9.50 | 3/8 | 45.8 |
| 4.75 | 4 | 34.6 |
| 2.00 | 10 | 27.5 |
| 0.425 | 40 | 15.6 |

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الأقصر
219,991,437
المركز الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **03/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

Dear Gentleman,

Attached here with the delivered on 08 / 01 / 2024

This sample is representative for 5.000 $M^3$

**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 /..

**Consultant Eng : Abderrahman Ahmed**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219 991 437
3 شارع الملك الافضل - الزمالك

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

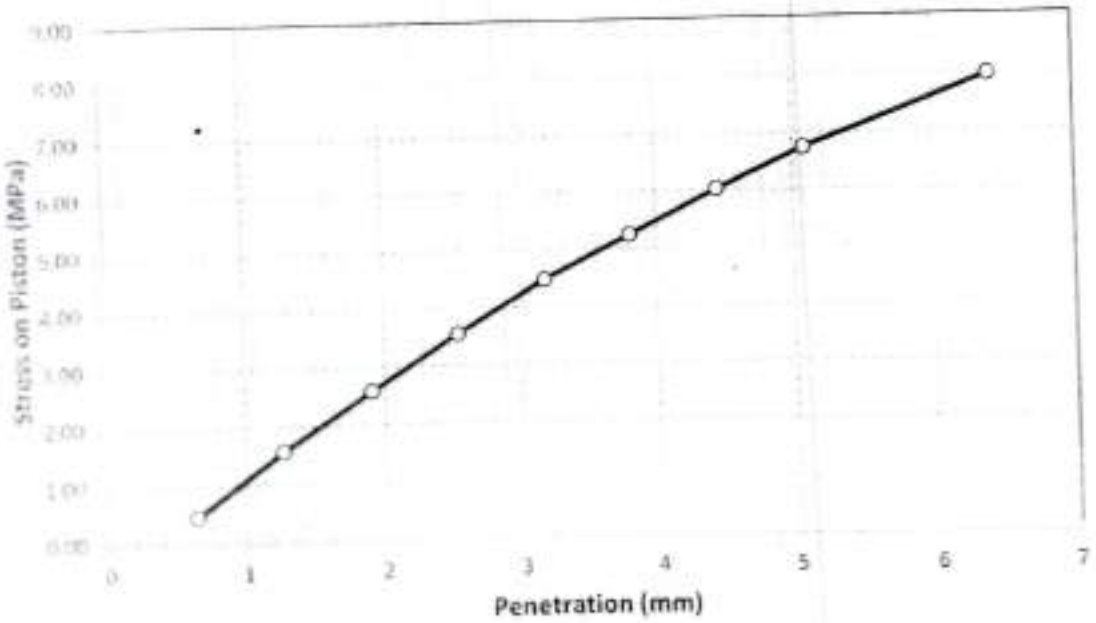
Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Load Penetration Curve of CBR Test

## ASTM D-1883




Signature / ..

CEL

مكتب معامل الاستشارات الهندسية

مشروعات ، الأقصر ،

ت: 219.991.437

المركز الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS

ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Test Results of California Bearing Ratio on Base Materials

### ASTM D 1883

| penetration | | stress on piston (Mpa) |
|---|---|---|
| mm | Inch | |
| 0.64 | 0.025 | 0.46 |
| 1.27 | 0.050 | 1.58 |
| 1.91 | 0.075 | 2.58 |
| 2.54 | 0.100 | 3.55 |
| 3.18 | 0.125 | 4.47 |
| 3.81 | 0.150 | 5.23 |
| 4.45 | 0.175 | 6.03 |
| 5.08 | 0.200 | 6.74 |
| 6.35 | 0.250 | 7.97 |

| CBR Result | Stress (Mpa) | | CBR 100 % |
|---|---|---|---|
| | St. Value | Sample results | |
| At 0.1 inch (2.54 mm) penetration | 6.90 | 3.55 | 51.5 % |

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of 2.22 (gm /cm³)
At 6.4 % optimum water content.
3- Surcharge load 4.50 Kg.

CBR = 10 for middle and lower embankment according project spec page No 36.

Signature / ..

CEL
مكتب معامل الاستشارات الهندسية
• مشروعات و الأسفلت •
التجمع الخامس 219.991.437
المركز الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

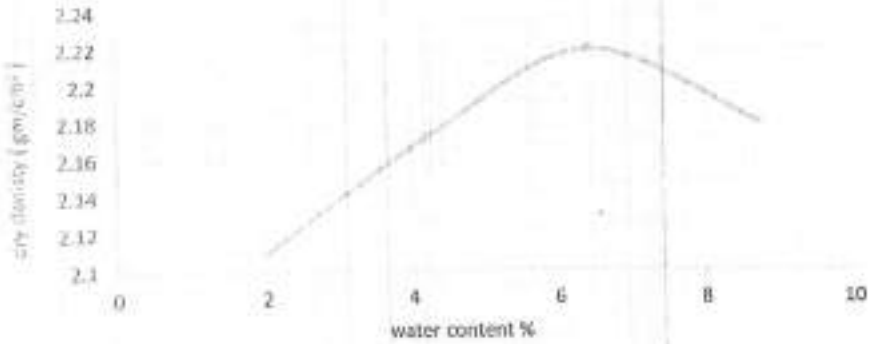
Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date :**08/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

**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 /**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقصر
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS
ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Soil Classification

| TEST | Results (%) | Limits according Projects Specs | | |
|---|---|---|---|---|
| Group Classification | (A-1-a) | (A-1-a) | (A-1-b) | (A-2-4) |
| 2.00 mm (No.10) | 27.5 | Max 50 % | ----- | ----- |
| 0.425 mm (No. 40) | 15.6 | Max 30 % | Max 50 % | ----- |
| 0.075 mm (No. 200) | 9.1 | Max 15 % | Max 15 % | Max 15 % |
| | | | | |
| Liquid Limit | ---- | ----- | ----- | ----- |
| Plasticity index | 0 | Max 6 % | Max 6 % | Max 10 % |

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

Signature / ..... CEL 219 591 437

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0,0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## 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 /...

CEL

مكتب معامل الاستشارات الهندسية

مشروعات : الأقصر

219 991 437

الرئيس 3 شارع الملك الأفضل

IAS

ACCREDITED

# CEL

[illegible]

| | |
|---|---|
| [illegible] | [illegible] |
| [illegible] | [illegible] |
| [illegible] | [illegible] |
| [illegible] | [illegible] |
| [illegible] | [illegible] |
| [illegible] | [illegible] |

**[illegible]**

**[illegible]**

| Test | Results (%) |
|---|---|
| [illegible] | [illegible] |

Signature: [illegible]

CEL

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

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

| Sieve Size (mm) | Sieve Size (IN) | Passing % |
|---|---|---|
| 50 | 2 | 95.1 |
| 37.5 | 1.5 | 91.9 |
| 25 | 1 | 80.7 |
| 19 | ¾ | 72.2 |
| 12.50 | ½ | 64.1 |
| 9.50 | 3/8 | 45.8 |
| 4.75 | 4 | 34.6 |
| 2.00 | 10 | 27.5 |
| 0.425 | 40 | 15.6 |

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاشراف
219.991.437
المركز الرئيسي 3 شارع النيل الأفضل - الزمالك

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **03/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

Dear Gentleman,

Attached here with the delivered on 08 / 01 / 2024

This sample is representative for 5.000 $M^3$

**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 /..

**Consultant Eng : Abderrahman Ahmed**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقليم
219 991 437
3 شارع

IAS
ACCREDITED

**CEL**

Company Name : [illegible]

Project : Electric Express Train - HSR From Qous To Armant

Testing Date : 27 / 1 /2024

Soil type : Upper Embankment

Location : ST From 641+780 To 641+880

Level : - 0.50 M

Report No. : 140

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

| Test # | Station | Test Hole Volume cm³ | Bulk Density gm/ cm³ | Moisture Content % | Dry Density (gm/ cm³) | Degree of Compaction (%) | Acceptance |
|---|---|---|---|---|---|---|---|
| 1 | 641+820 | 1504.2 | 2.25 | 5.3 | 2.14 | 96.4% | Comply |
| 2 | 641+840 | 1519.4 | 2.28 | 5.8 | 2.16 | 97.1% | Comply |
| 3 | 641+860 | 1527.1 | 2.23 | 5 | 2.13 | 95.9% | Comply |
| 4 | 641+876 | 1520.8 | 2.30 | 6.4 | 2.16 | 97.5% | Comply |

Degree of compaction based on proctor test dated At

Max. dry density = 2.22 gm/cm³

At optimum moisture content = 6.4 %

Signature / For CEL

CEL
219 991 437
3 شارع [illegible]

IAS
ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

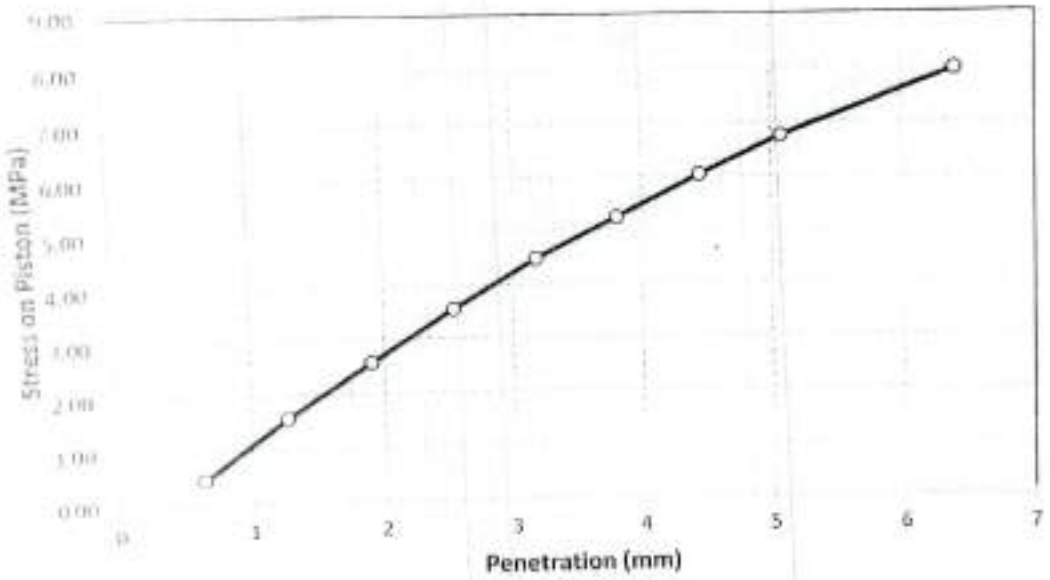
Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Load Penetration Curve of CBR Test

## ASTM D-1883




Signature / ..

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
219.901.437
3 شارع الملك الافضل - الزمالك - القاهرة

IAS
ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

| penetration | | stress on piston (Mpa) |
|---|---|---|
| mm | Inch | |
| 0.64 | 0.025 | 0.46 |
| 1.27 | 0.050 | 1.58 |
| 1.91 | 0.075 | 2.58 |
| 2.54 | 0.100 | 3.55 |
| 3.18 | 0.125 | 4.47 |
| 3.81 | 0.150 | 5.23 |
| 4.45 | 0.175 | 6.03 |
| 5.08 | 0.200 | 6.74 |
| 6.35 | 0.250 | 7.97 |

| CBR Result | Stress (Mpa) | | CBR 100 % |
|---|---|---|---|
| | St. Value | Sample results | |
| At 0.1 inch (2.54 mm) penetration | 6.90 | 3.55 | 51.5 % |

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.22 (gm /cm$^3$)
At = 6.4 % optimum water content.

3- Surcharge load 4.50 Kg.

4- CBR > 10 for middle and lower embankment according project spec page No 36.

Signature / ...

CEL
مكتب معامل الاستشارات الهندسية
• مشروعات و الاقمار •
219.991.437
3 شارع الملك الأفضل، الزمالك، القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

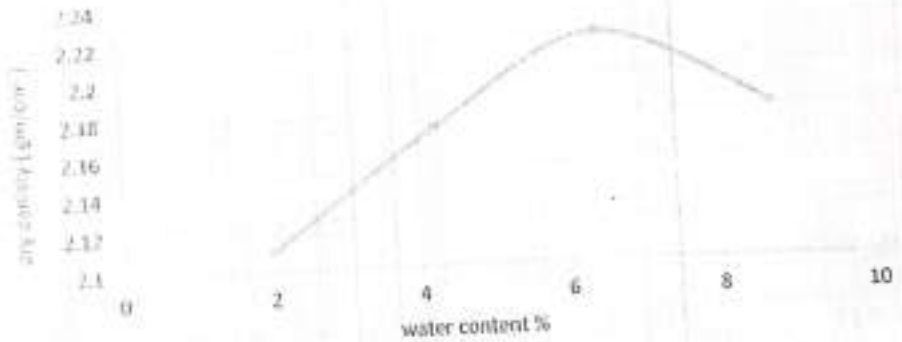
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

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




- Max dry density (gm/cm$^3$) : 2.22
- Optimum moisture content % : 6.4 %

Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاثمر
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Soil Classification

| TEST | Results (%) | Limits according Projects Specs | | |
|---|---|---|---|---|
| Group Classification | (A-1-a) | (A-1-a) | (A-1-b) | (A-2-4) |
| 2.00 mm (No.10). | 27.5 | Max 50 % | ------ | ------ |
| 0.425 mm (No. 40). | 15.6 | Max 30 % | Max 50 % | ------ |
| 0.075 mm (No. 200). | 9.1 | Max 15 % | Max 15 % | Max 15 % |
| Liquid Limit ..... | ----- | ------ | ------ | ------ |
| Plasticity index ..... | 0 | Max 6 % | Max 6 % | Max 10 % |

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

Signature / ..

CEL مكتب معامل الاستشارات الهندسية مشروعات و الاقتصاد 219.991.437 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## 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 /...

CEL
مكتب معامل الاستشارات الهندسية
مشروعات - الاقصر
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Materials finer than 75 µm (no.200) sieve By washing ASTM D-1140.

| Test | Results (%) |
|---|---|
| Percentage of material finer than Sieve Size 75 µM (No.200) | 9.1 |

Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

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

| Sieve Size (mm) | Sieve Size (IN) | Passing % |
|---|---|---|
| 50 | 2 | 95.1 |
| 37.5 | 1.5 | 91.9 |
| 25 | 1 | 80.7 |
| 19 | ¾ | 72.2 |
| 12.50 | ½ | 64.1 |
| 9.50 | 3/8 | 45.8 |
| 4.75 | 4 | 34.6 |
| 2.00 | 10 | 27.5 |
| 0.425 | 40 | 15.6 |

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاشراف
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **03/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

Dear Gentleman,

Attached here with the delivered on 08 / 01 / 2024

This sample is representative for 5.000 $M^3$

**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 /..

**Consultant Eng : Abderrahman Ahmed**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219 991 437
3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

# CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة التعهد

Project : Electric Express Train – ESSR From Qous To Armant

Testing Date : 21 / 1 /2024

Soil type : Upper Embankment

Location : ST From 640+780 To 640+860

Level : -0.75 M

Report No. : 138-2

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

| Test # | Station | Test Hole Volume cm³ | Bulk Density gm/cm³ | Moisture Content % | Dry Density gm/cm³ | Degree of Compaction (%) | Acceptance |
|---|---|---|---|---|---|---|---|
| 1 | 641+799 | 1543.1 | 2.27 | 6.4 | 2.13 | 96.0% | Comply |
| 2 | 641+820 | 1488.2 | 2.28 | 6.4 | 2.15 | 96.7% | Comply |
| 3 | 641+845 | 1481.3 | 2.26 | 6.4 | 2.13 | 95.9% | Comply |
| 4 | 641+855 | 1507.6 | 2.29 | 6.4 | 2.15 | 97.0% | Comply |

Degree of compaction based on proctor test dated At

Max. dry density = 2.22 gm/cm³

At optimum moisture content = 6.4 %

Signature

CEL

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

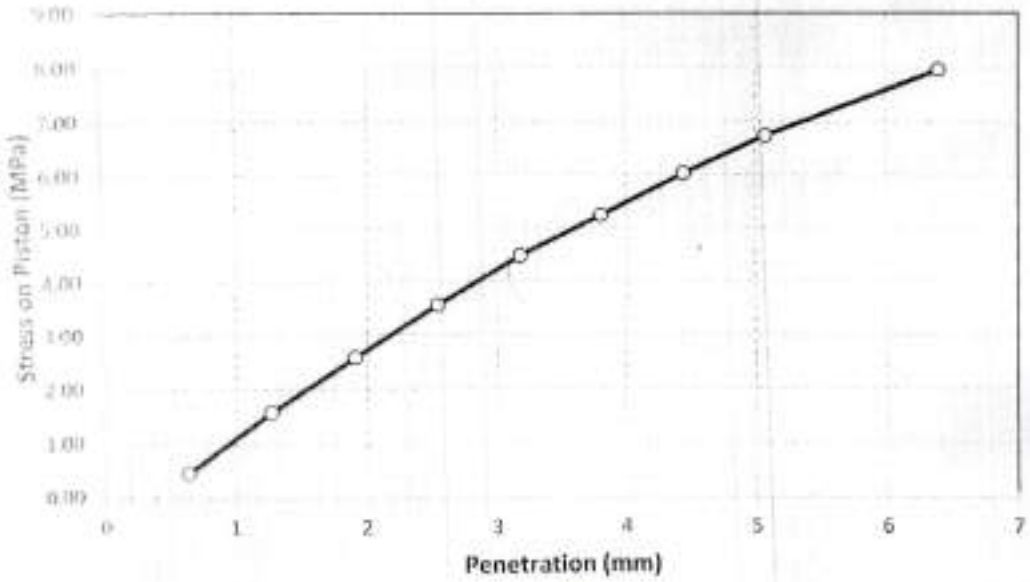
Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Load Penetration Curve of CBR Test

## ASTM D-1883




Signature / ..

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
تليفون 219.991.437
المركز الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : **Electric Express Train – HSR From Qous To Armant**
Location : **ST:641+400 E= 492410,088 N=2862759,57**
Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**
Delivery Date :**08/01/2024**
Reporting Date : **11/1/2024**
Reporting No. : **10-19**

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

| penetration | | stress on piston (Mpa) |
|---|---|---|
| mm | Inch | |
| 0.64 | 0.025 | 0.46 |
| 1.27 | 0.050 | 1.58 |
| 1.91 | 0.075 | 2.58 |
| 2.54 | 0.100 | 3.55 |
| 3.18 | 0.125 | 4.47 |
| 3.81 | 0.150 | 5.23 |
| 4.45 | 0.175 | 6.03 |
| 5.08 | 0.200 | 6.74 |
| 6.35 | 0.250 | 7.97 |

| CBR Result | Stress (Mpa) | | CBR 100 % |
|---|---|---|---|
| | St. Value | Sample results | |
| At 0.1 inch (2.54 mm) penetration | 6.90 | 3.55 | 51.5 % |

Notes:
1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.22 (gm /cm$^3$)
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 / ..

CEL
مكتب معامل الاستشارات الهندسية
• مشروعات و الاقمار •
219,991,437
3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

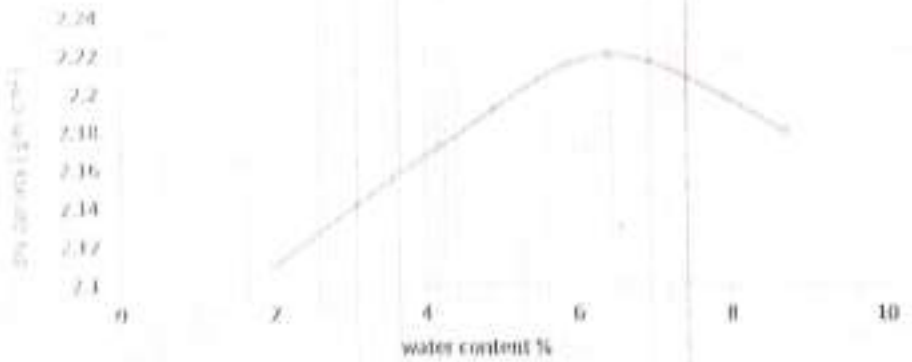
Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date :**08/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

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




- **Max dry density (gm/cm$^3$)** : **2.22**
- **Optimum moisture content %** : **6.4 %**

**Signature /**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاعمار
س.ت. رقم السجل التجاري 219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Soil Classification

| TEST | Results (%) | Limits according Projects Specs | | |
|---|---|---|---|---|
| Group Classification | (A-1-a) | (A-1-a) | (A-1-b) | (A-2-4) |
| 2.00 mm (No.10). | 27.5 | Max 50 % | ------ | ------ |
| 0.425 mm (No. 40). | 15.6 | Max 30 % | Max 50 % | ------ |
| 0.075 mm (No. 200). | 9.1 | Max 15 % | Max 15 % | Max 15 % |
| | | | | |
| Liquid Limit | ----- | ------ | ------ | ------ |
| Plasticity index | 0 | Max 6 % | Max 6 % | Max 10 % |

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

Signature / ..

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219,991,437
3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## 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 /...

CEL

مكتب معامل الاستشارات الهندسية

مشروعات ، الاقصر ،

219.991.437

المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Materials finer than 75 µm (no.200) sieve By washing ASTM D-1140.

| Test | Results (%) |
|---|---|
| Percentage of material finer than Sieve Size 75 µM (No.200) | 9.1 |

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

| Sieve Size (mm) | Sieve Size (IN) | Passing % |
|---|---|---|
| 50 | 2 | 95.1 |
| 37.5 | 1.5 | 91.9 |
| 25 | 1 | 80.7 |
| 19 | ¾ | 72.2 |
| 12.50 | ½ | 64.1 |
| 9.50 | 3/8 | 45.8 |
| 4.75 | 4 | 34.6 |
| 2.00 | 10 | 27.5 |
| 0.425 | 40 | 15.6 |

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS
ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **03/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

Dear Gentleman,

Attached here with the delivered on 08 / 01 / 2024

This sample is representative for 5.000 $M^3$

**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 / **Consultant Eng : Abderrahman Ahmed**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
219 991.437
3 شارع

IAS
ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهلي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 21 / 1 /2024

Soil type : Upper Embankment

Location : ST From 641+400 To 641+780

Level : - 0.25 M

Report No. : 138

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

| Test # | Station | Test Hole Volume cm³ | Bulk Density gm/ cm³ | Moisture Content % | Dry Density (gm/ cm³) | Degree of Compaction (%) | Acceptance |
|---|---|---|---|---|---|---|---|
| 1 | 641+425 | 1473.6 | 2.27 | 5.3 | 2.16 | 97.1% | Comply |
| 2 | 641+450 | 1553.5 | 2.27 | 6.4 | 2.13 | 96.0% | Comply |
| 3 | 641+475 | 1763.2 | 2.26 | 5.8 | 2.13 | 96.1% | Comply |
| 4 | 641+500 | 1281.3 | 2.29 | 5.8 | 2.17 | 97.5% | Comply |
| 5 | 641+525 | 1634.0 | 2.26 | 6.4 | 2.13 | 95.8% | Comply |
| 6 | 641+550 | 1404.2 | 2.31 | 5.8 | 2.19 | 98.5% | Comply |
| 7 | 641+575 | 1319.4 | 2.26 | 5.8 | 2.14 | 96.4% | Comply |
| 8 | 641+600 | 1450.7 | 2.25 | 5.8 | 2.13 | 95.8% | Comply |
| 9 | 641+625 | 1539.6 | 2.24 | 5.3 | 2.13 | 96.0% | Comply |
| 10 | 641+650 | 1548.6 | 2.29 | 5.3 | 2.17 | 97.9% | Comply |
| 11 | 641+675 | 1323.6 | 2.24 | 5.8 | 2.12 | 95.4% | Comply |
| 12 | 641+700 | 1512.5 | 2.28 | 6.4 | 2.15 | 96.7% | Comply |
| 13 | 641+720 | 1460.4 | 2.30 | 6.4 | 2.16 | 97.3% | Comply |
| 14 | 641+740 | 1472.9 | 2.35 | 6.4 | 2.21 | 99.3% | Comply |
| 15 | 641+760 | 1521.5 | 2.28 | 6.4 | 2.14 | 96.4% | Comply |
| 16 | 641+776 | 1412.5 | 2.30 | 6.4 | 2.16 | 97.2% | Comply |

Degree of compaction based on proctor test dated At

Max. dry density = 2.22 gm/cm³

At optimum moisture content = 6.4 %

Signature

CEL
219 991 437

IAS
ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST: 639+000 E=32°54′25.6″ N=25°53′59.1″**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

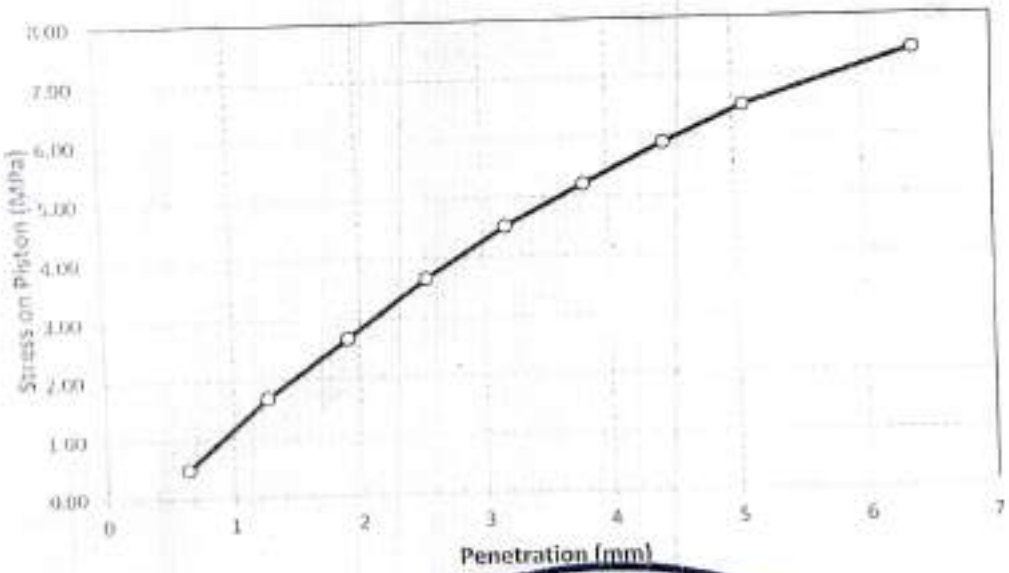
Delivery Date : **08/11/2023**

Reporting Date : **12/11/2023**

Reporting No. : **08-15**

## Load Penetration Curve of CBR Test

## ASTM D-1883




Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
تليفون 219 991.437
3 شارع الملك الافضل ، الزمالك ، القاهرة

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب هندسي للاستشارات والمختبرات

Company Name : شركة الظاهر

Project : Electric Express Tram – HSR From Qatar To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08.11.2023

Reporting Date : 12.11.2023

Reporting No. : 08-15

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

| penetration | | stress on piston (Mpa) |
|---|---|---|
| mm | Inch | |
| 0.64 | 0.025 | |
| 1.27 | 0.050 | |
| 1.91 | 0.075 | |
| 2.54 | 0.100 | |
| 3.18 | 0.125 | |
| 3.81 | 0.150 | |
| 4.45 | 0.175 | |
| 5.08 | 0.200 | |
| 6.35 | 0.250 | |

| CBR Result | Stress (Mpa) | | CBR 100 % |
|---|---|---|---|
| | St. Value | Sample results | 52.8% |
| 0.1 inch (2.54 mm) penetration | 6.90 | 3.65 | |

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude

2- The sample was compacted to 4D density (Max. = 1.7 g/cm³)

At = 6.4 % optimum water content

3- Surcharge load 4.50 kg

4- CBR = 10 for middle and lower [illegible]

Signature :

CEL

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST: 639+000 E=32°54'25.6" N=25°53'59.1"**

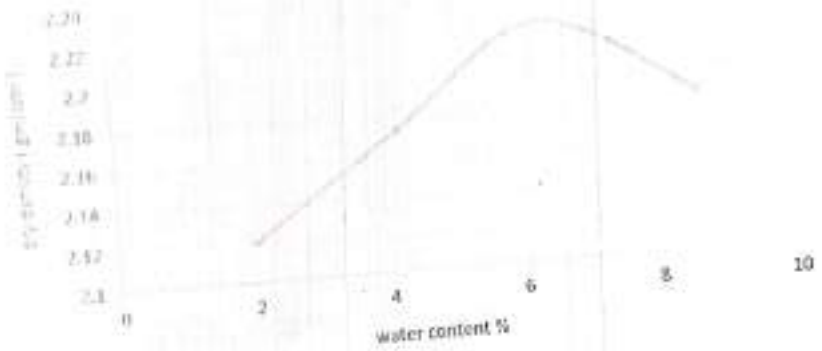
Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **08/11/2023**

Reporting Date : **12/11/2023**

Reporting No. : **08-15**

**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 /**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات . الاقصر
219 991 437
المركز الرئيسي : 3 شارع البنك الأهلي - الزمالك

IAS
ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST : 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## Soil Classification

| TEST | Results (%) | Limits according Projects Specs | | |
|---|---|---|---|---|
| Group Classification | (A-1-a) | (A-1-a) | (A-1-b) | (A-2-4) |
| 2.00 mm (No.10). | 47.7 | Max 50 % | ------ | ------ |
| 0.425 mm (No. 40). | 28.8 | Max 30 % | Max 50 % | ------ |
| 0.075 mm (No. 200). | 10.0 | Max 15 % | Max 15 % | Max 15 % |
| Liquid Limit ..... | --- | ------ | ------ | ------ |
| Plasticity index ..... | 0 | Max 6 % | Max 6 % | Max 10 % |

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

Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقصر
219.901.437
3 شارع الملك الأفضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## 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 /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات . الأقصر
219 991 437
المركز الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## Materials finer than 75 µm (no.200) sieve By washing ASTM D-1140.

| Test | Results (%) |
|---|---|
| Percentage of material finer than Sieve Size 75 µM (No.200) | 10.0 |

Signature /

CEL
مكتب معامل الاستشارات الهندسية
• مشروعات الأقصر
219 991 437
الفرع الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54′25.6″ N=25°53′59.1″

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

| Sieve Size (mm) | Sieve Size (IN) | Passing % |
|---|---|---|
| 50 | 2 | 97.5 |
| 37.5 | 1.5 | 92.7 |
| 25 | 1 | 84.2 |
| 19 | ¾ | 82.8 |
| 12.50 | ½ | 71.3 |
| 9.50 | 3/8 | 62.6 |
| 4.75 | 4 | 47.9 |
| 2.00 | 10 | 47.7 |
| 0.425 | 40 | 28.8 |

Signature /

CEL مكتب معامل الاستشارات الهندسية مشروعات و الاعمار 219.901.437 المركز الرئيسي : 3 شارع الملك الافضل - الزمالك

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **08/11/2023**

Reporting Date : **12/11/2023**

Reporting No. : **08-15**

Dear Gentleman ,

Attached here with the delivered on 8 / 11 / 2023

This sample is representative for 5.000 $M^3$

**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 / **Consultant Eng : Abderrahman Ahmed**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات : الأقصر
تليفون 219.991.437
المركز الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS ACCREDITED

# CEL

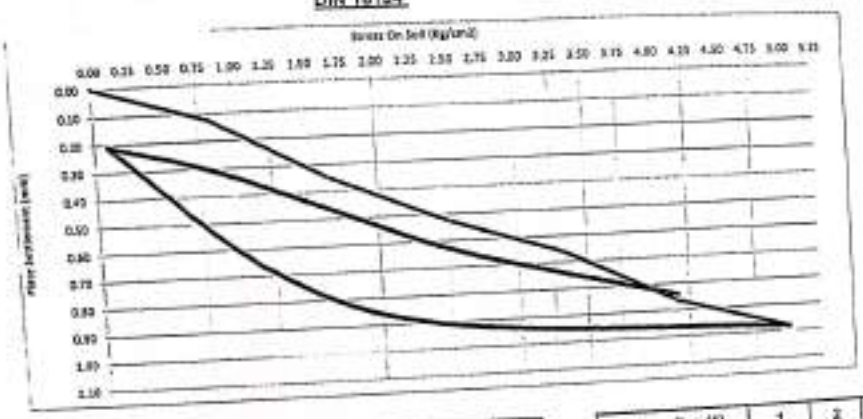
**Consulting Engineering Bureau & Laboratories**

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلى

Company Name : شركة الأهلى للمقاولات و التوريدات العمومية
Project : Electric Express Train - Sector (5) – Qous to Armant.
Test Date : 13/01/2024
report date : 16/01/2024
Station : 039+020
Test No. : 01

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




| Loading (1) | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Stage(Kg) | 0 | 585 | 1172.8 | 1758.3 | 2352.8 | 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 | 0.13 | 0.35 | 0.53 | 0.66 | 0.87 | 0.98 |

| 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) | 0.98 | 0.91 | 0.69 | 0.21 |

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= 0.31 | S2(mm)= 0.78 | ΔS = 0.39 | | |
| Ev1 (MPa) = (0.75*D*Δσ)/ΔS | 113.7 | | | | |

Ev2/Ev1 = 1.11

| Loading (2) | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Stage(Kg) | 0 | 586.395 | 1172.8 | 1758.3 | 2352.8 | 2946.1 |
| Stress (Kg/cm2) | 0.10 | 0.83 | 1.66 | 2.50 | 3.33 | 4.17 |
| Settlement (mm) | 0.21 | 0.31 | 0.47 | 0.63 | 0.74 | 0.84 |

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= 0.42 | S2(mm)= 0.78 | ΔS = 0.33 | | |
| Ev2 (MPa) = (0.75*D*Δσ)/ΔS | 135.3 | | | | |

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 (stress) (Kg/cm²)
ΔS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الأقصر
219.991.437
3 شارع الملك الأفضل - الزمالك - القاهرة


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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company Name : شركة الذهبى للمقاولات و التوريدات العمومية
Project : Electric Express Train - Sector (3) - Qous to Armant.
Test Date : 13/01/2024
report date : 15/01/2024
Station : 639+620
Test No. : 01

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

Loading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.00 | 20.00 | 0.00 | 20.00 | 0.00 | 0.00 |
| 1 | 0.83 | 19.95 | 0.05 | 19.80 | 0.20 | 0.13 |
| 2 | 1.66 | 19.70 | 0.30 | 19.60 | 0.40 | 0.35 |
| 3 | 2.50 | 19.46 | 0.54 | 19.49 | 0.51 | 0.53 |
| 4 | 3.33 | 19.30 | 0.70 | 19.38 | 0.62 | 0.66 |
| 5 | 4.17 | 19.11 | 0.89 | 19.16 | 0.84 | 0.87 |
| 6 | 5.00 | 19.00 | 1.00 | 19.04 | 0.96 | 0.98 |

Unloading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 1 | 2.50 | 19.10 | 0.90 | 19.08 | 0.92 | 0.91 |
| 2 | 1.25 | 19.37 | 0.63 | 19.25 | 0.75 | 0.69 |
| 3 | 0.100 | 19.80 | 0.20 | 19.78 | 0.22 | 0.21 |

Loading Stage (2)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.83 | 19.69 | 0.31 | 19.70 | 0.30 | 0.31 |
| Immediately equ | 1.66 | 19.48 | 0.52 | 19.59 | 0.41 | 0.47 |
| stress is reached. | | | | | | |
| 2 | 2.50 | 19.36 | 0.64 | 19.38 | 0.62 | 0.63 |
| 3 | 3.33 | 19.25 | 0.75 | 19.27 | 0.73 | 0.74 |
| 4 | 4.17 | 19.14 | 0.86 | 19.18 | 0.82 | 0.84 |

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى
219.991.437
3 شارع الملك الأفضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

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 : Lower Embankment
- Job requiremer : Ev2 > 30 MPa

| Item | Descriptions |
|---|---|
| Type of bedding material below the plate | Natural Soil |
| Plate Diameter (mm) | 300 |
| date of measurement | : 11/01/2024 |
| 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 | First Cycle | Second Cycle | $E_{V2}/E_{V1}$ Ratio |
|---|---|---|---|---|---|---|---|
| | From | To | | ( m ) | $E_{V1}$ ( MPa ) | $E_{V2}$ ( Mpa ) | |
| 1 | 639+580 | 639+660 | : 639+620 | : -5.5 | 111.7 | 135.3 | 1.21 |

Signature / CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقصر
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company : شركة الأهلى للمقاولات و التوريدات العمومية

Project : Electric Express Train - Sector (5) – Qous to Armant.
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 639+580 to 639+660
Station : 639+620
Level : -5.5
Test Date : 13/01/2024
Report Date : 15/01/2024
Type of soil : Lower Embankment
Report No. : 01

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 load 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 first values are 5.0 kg/cm $^2$
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 nd) 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

CEL مكتب معامل الإستشارات الهندسية مشروعات محافظات الوجه القبلى 219.991.437 المركز الرئيسى 3 شارع الملك الأفضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

# CEL

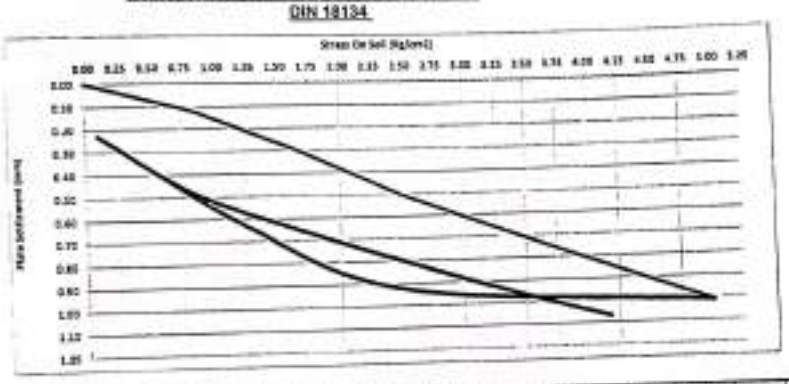
Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلى

Company Name : شركة الماهى للمقاولات و التوريدات العمومية
Project : Electric Express Train - Sector (5) – Qous to Aswan.
Test Date : 13/01/2024
report date : 15/01/2024
Station : 6391+100
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 | 3532.8 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66 | 2.50 | 3.33 | 4.17 | 5.00 |
| Settlement (mm) | 0.00 | 0.12 | 0.32 | 0.51 | 0.68 | 0.84 | 1.01 |

| 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) | 1.01 | 0.92 | 0.83 | 0.23 |

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= 0.37 | S2(mm)= 0.11 | ΔS = 0.44 | | |
| Ev1 (MPa) = (0.75*D*Δσ)/ΔS | 89.3 | | | | |

| Ev2/Ev1 = 3.27 |
|---|

| 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) | 0.23 | 0.46 | 0.65 | 0.80 | 0.94 | 1.07 |

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= 0.62 | S2(mm)= 0.07 | ΔS = 0.35 | | |
| Ev2 (MPa) = (0.75*D*Δσ)/ΔS | 128.4 | | | | |

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 (stress) (kg/cm²)
ΔS = Difference in settlements corresponding to the [illegible] loading (mm)

CEL
مكتب معامل الاستشارات الهندسية
مشروعات محافظات الوجه القبلى
أ.م. د. حسن الشرابى
219.991.437
3 شارع الملك الأفضل - الزمالك - القاهرة


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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

[illegible]

Company Name: [illegible]
Project: [illegible]
Test Date: [illegible]
Report date: [illegible]
Station: [illegible]
Test No.: [illegible]

## 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 |
|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

Unloading Stage (1)

| Loading | Stress<br>kg/cm² | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

Loading Stage (2)

| Loading | Stress<br>kg/cm² | Dial 1 | Settlement<br>mm | Dial 2 | Settlement<br>mm | Average |
|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | | | | | | |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

CEL

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

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 : Lower Embankment
- Job requiremer : Ev2 > 30 MPa

| Item | Descriptions |
|---|---|
| Type of bedding material below the plate | Natural Soil |
| Plate Diameter (mm) | 300 |
| date of measurement | : 13/01/2024 |
| 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 | 639+660 | 639+760 | : 639+700 | : -5.5 | 99.3 | 126.4 | 1.27 |

Signature / .....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات محافظات الوجه القبلى
3 شارع الملك الأفضل - الزمالك - القاهرة
219.991.437

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

Client: [illegible]

Project: [illegible]

Subject: [illegible]

Test Location: Station [illegible]

Station: [illegible]

Level: [illegible]

Test Date: [illegible]

Report Date: [illegible]

Type of test: [illegible]

Report No.: [illegible]

Test Conditions:

[illegible]

Apparatus:

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]
8. [illegible]

Test Procedures:

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]
8. [illegible]
9. [illegible]
10. [illegible]
11. [illegible]

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

| | |
|---|---|
| Company Name | : شركة الذهبي |
| Project | : Electric Express Train – HSR From Qous To Armant |
| Testing Date | : 13 / 1 /2024 |
| Soil type | : Lower Embankment |
| Location | : ST From 639+580 To 639+760 |
| Level | : - 5.5 M |
| Report No. | : 131 |

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

| Test # | Station | Test Hole Volume $cm^3$ | Bulk Density $gm/cm^3$ | Moisture Content % | Dry Density ($gm/cm^3$) | Degree of Compaction (%) | Acceptance |
|---|---|---|---|---|---|---|---|
| 1 | 639+610 | 1550.0 | 2.27 | 5.8 | 2.15 | 97.7% | Comply |
| 2 | 639+675 | 1441.7 | 2.25 | 5.8 | 2.12 | 96.5% | Comply |
| 3 | 639+710 | 1387.5 | 2.27 | 5.3 | 2.16 | 98.2% | Comply |
| 4 | 639+755 | 1325.7 | 2.27 | 6 | 2.14 | 97.4% | Comply |

Degree of compaction based on proctor test dated At

Max. dry density = 2.22 $gm/cm^3$

At optimum moisture content = 6.4 %

Signature / ...

Mark E. Abd Shaer

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

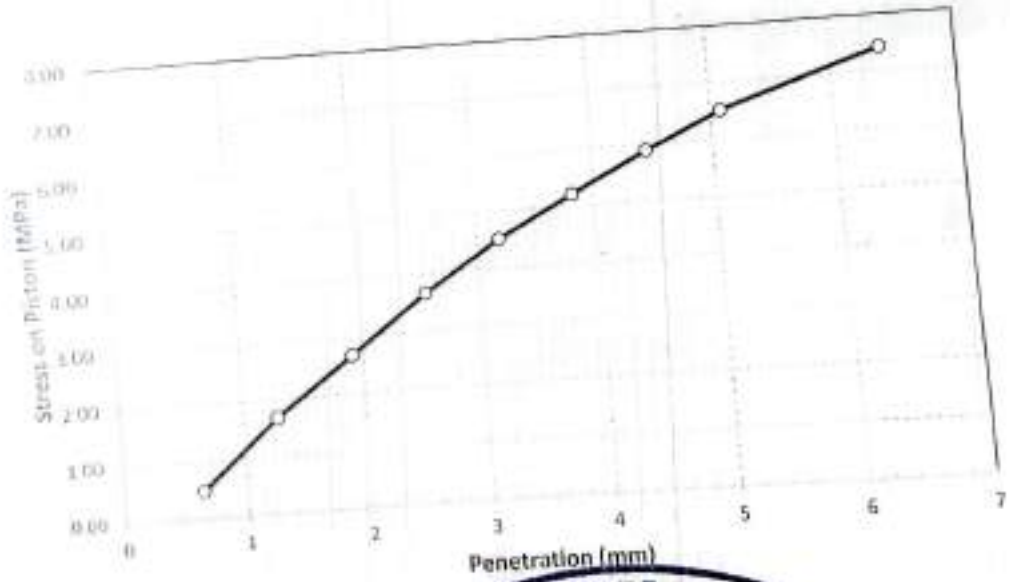
Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## Load Penetration Curve of CBR Test

## ASTM D-1883




Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات . الاقصر
تليفون 219 901 437
3 شارع الملك الافضل . الزمالك . القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

| penetration | | stress on piston (Mpa) |
|---|---|---|
| mm | Inch | |
| 0.64 | 0.025 | |
| 1.27 | 0.050 | |
| 1.91 | 0.075 | |
| 2.54 | 0.100 | |
| 3.18 | 0.125 | |
| 3.81 | 0.150 | |
| 4.45 | 0.175 | |
| 5.08 | 0.200 | |
| 6.35 | 0.250 | |

| CBR Result | Stress (Mpa) | | CBR 100 % |
|---|---|---|---|
| | St. Value | Sample results | |
| At 0.1 inch (2.54 mm) penetration | 6.90 | 3.65 | 52.8% |

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.22(gm /cm³)

At = 6.4 % optimum water content.

3- Surcharge load 4.50 Kg.

4- CBR > 10 for middle and lower embankments according to project page No 36.

Signature /

CEL

مكتب معامل الاستشارات الهندسية

الرقم الضريبي 3 شارع الملك الأشرف - الزمالك

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

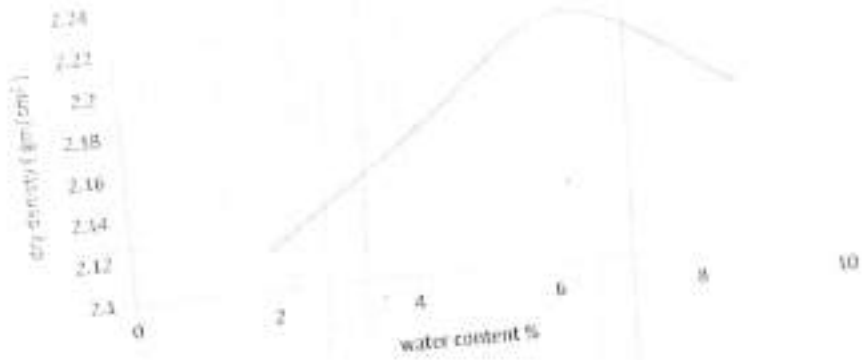
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

**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 /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات . الاقصر
719 931 437
3 شارع الثقة الاقصر - الزينية

IAS
ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## Soil Classification

| TEST | Results (%) | Limits according Projects Specs | | |
|---|---|---|---|---|
| Group Classification | (A-1-a) | (A-1-a) | (A-1-b) | (A-2-4) |
| 2.00 mm (No.10). | 47.7 | Max 50 % | ------ | ------ |
| 0.425 mm (No. 40). | 28.8 | Max 30 % | Max 50 % | ------ |
| 0.075 mm (No. 200). | 10.0 | Max 15 % | Max 15 % | Max 15 % |
| Liquid Limit ..... | --- | ------ | ------ | ------ |
| Plasticity index ..... | 0 | Max 6 % | Max 6 % | Max 10 % |

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

Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
219.991.437
3 شارع الملك الأفضل - الزمالك

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## 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 /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات - الاقصر
219 991 437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## Materials finer than 75 µm (no.200) sieve By washing ASTM D-1140.

| Test | Results (%) |
|---|---|
| Percentage of material finer than Sieve Size 75 µM (No.200) | 10.0 |

Signature /.

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقصر
219 991 437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST: 639+000 E=32°54′25.6″ N=25°53′59.1″**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **08/11/2023**

Reporting Date : **12/11/2023**

Reporting No. : **08-15**

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

| Sieve Size (mm) | Sieve Size (IN) | Passing % |
|---|---|---|
| 50 | 2 | 97.5 |
| 37.5 | 1.5 | 92.7 |
| 25 | 1 | 84.2 |
| 19 | ¾ | 82.8 |
| 12.50 | ½ | 71.3 |
| 9.50 | 3/8 | 62.6 |
| 4.75 | 4 | 47.9 |
| 2.00 | 10 | 47.7 |
| 0.425 | 40 | 28.8 |

Signature /..

CEL مكتب معامل الاستشارات الهندسية مشروعات والاقمار الصناعية رقم التسجيل الضريبي 215.991.437 المركز الرئيسي : 3 شارع الملك الافضل - الزمالك

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST: 639+000 E=32°54'25.6" N=25°53'59.1"**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **08/11/2023**

Reporting Date : **12/11/2023**

Reporting No. : **08-15**

Dear Gentleman,

Attached here with the delivered on 8 / 11 / 2023

This sample is representative for 5.000 $M^3$

**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 /... **Consultant Eng : Abderrahman Ahmed**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الأقصر
219.991.437
المركز الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبى

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 30 / 1 /2024

Soil type : Middli Embankment

Location : ST From 638+740 To 639+100

Level : - 2 M

Report No. : 144

## Compaction test by using Sand – Cone Test Method

### ASTM D- 1556

| Test # | Station | Test Hole Volume $cm^3$ | Bulk Density $gm/cm^3$ | Moisture Content % | Dry Density ($gm/cm^3$) | Degree of Compaction (%) | Acceptance |
|---|---|---|---|---|---|---|---|
| 1 | 638+762 | 1398.6 | 2.30 | 5.8 | 2.17 | 97.8% | Comply |
| 2 | 638+795 | 1348.6 | 2.29 | 5.3 | 2.17 | 98.0% | Comply |
| 3 | 638+830 | 1436.8 | 2.23 | 5.3 | 2.12 | 95.6% | Comply |
| 4 | 638+885 | 1486.8 | 2.25 | 5.8 | 2.13 | 95.8% | Comply |
| 5 | 638+930 | 1506.9 | 2.28 | 5.3 | 2.16 | 97.4% | Comply |
| 6 | 638+991 | 1534.0 | 2.27 | 5.8 | 2.14 | 96.5% | Comply |
| 7 | 639+045 | 1452.1 | 2.23 | 5 | 2.13 | 95.8% | Comply |
| 8 | 639+085 | 1511.8 | 2.25 | 6.4 | 2.11 | 95.2% | Comply |

Degree of compaction based on proctor test dated At

Max. dry density = 2.22 $gm/cm^3$

At optimum moisture content = 6.4 %

Signature / .....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقمار
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

3 C Malek E- Afdal Street
Zamalek, Cairo
Tel & Fax 2736723 - 2736360

IAS ACCREDITED Testing Laboratory

CEL

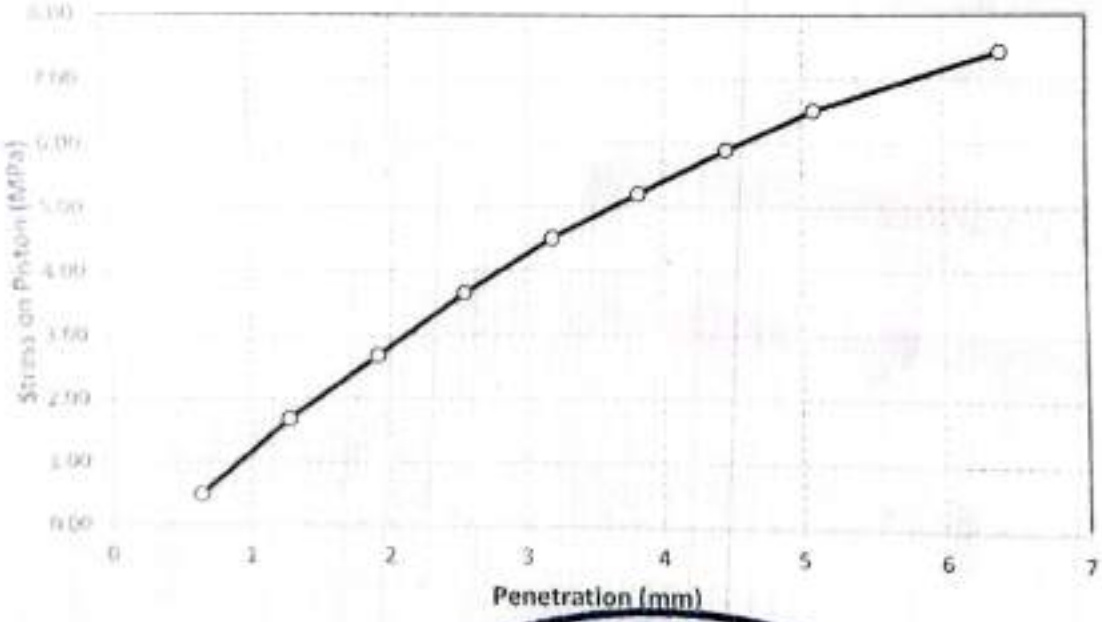
Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

| | |
|---|---|
| Company Name | : شركة الذهبي |
| Project | : Electric Express Train – HSR From Qous To Armant |
| Location | : ST: 639+000 E=32°54'25.6" N=25°53'59.1" |
| Type of sample | : Soil Embankment ( Upper Embankment 0.0 M ) |
| Delivery Date | : 08/11/2023 |
| Reporting Date | : 12/11/2023 |
| Reporting No. | : 08-15 |

## Load Penetration Curve of CBR Test

## ASTM D-1883




Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات . الاقصر
219 991.437
3 شارع الملك الافضل - الزمالك

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST: 639+000 E=32°54'25.6" N=25°53'59.1"**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **08/11/2023**

Reporting Date : **12/11/2023**

Reporting No. : **08-15**

## Test Results of California Bearing Ratio on Base Materials

**ASTM D 1883**

| penetration | | stress on piston (Mpa) |
|---|---|---|
| mm | Inch | |
| 0.64 | 0.025 | |
| 1.27 | 0.050 | |
| 1.91 | 0.075 | |
| 2.54 | 0.100 | |
| 3.18 | 0.125 | |
| 3.81 | 0.150 | |
| 4.45 | 0.175 | |
| 5.08 | 0.200 | |
| 6.35 | 0.250 | |

| CBR Result | Stress (Mpa) | | CBR 100 % |
|---|---|---|---|
| | St. Value | Sample results | 52.8% |
| At 0.1 inch (2.54 mm) penetration | 6.90 | 3.65 | |

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density 96= 2.22(gm/cm³)

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 /**

CEL

مكتب معامل الاستشارات الهندسية

المركز الرئيسي 3 شارع الملك الأفضل - الزمالك

IAS ACCREDITED

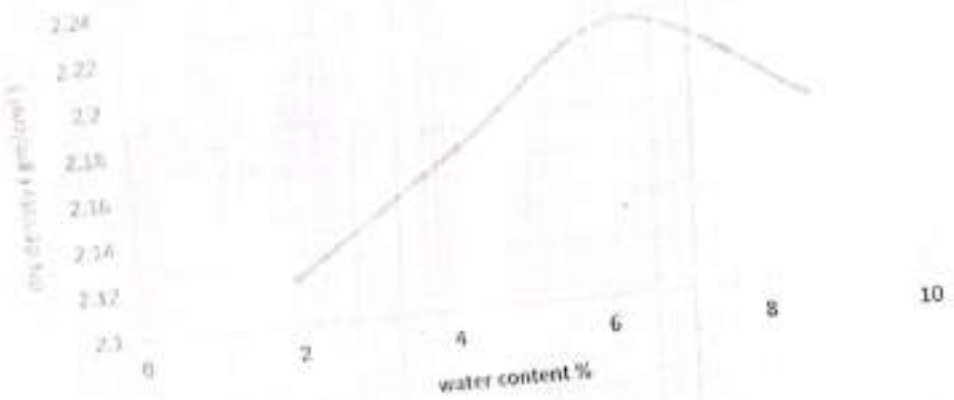
**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

| | |
|---|---|
| Company Name | : شركة الذهبي |
| Project | : Electric Express Train – HSR From Qous To Armant |
| Location | : ST: 639+000 E=32°54'25.6" N=25°53'59.1" |
| Type of sample | : Soil Embankment ( Upper Embankment 0.0 M ) |
| Delivery Date | : 08/11/2023 |
| Reporting Date | : 12/11/2023 |
| Reporting No. | : 08-15 |

**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 /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات . الاقصر
719 991 437
الموقع الرئيسي : 3 شارع الملك الأفضل - الزهراء

IAS
ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهلي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## Soil Classification

| TEST | Results (%) | Limits according Projects Specs | | |
|---|---|---|---|---|
| | | (A-1-a) | (A-1-b) | (A-2-4) |
| Group Classification | (A-1-a) | ------ | ------ | ------ |
| 2.00 mm (No.10). | 47.7 | Max 50 % | Max 50 % | ------ |
| 0.425 mm (No. 40). | 28.8 | Max 30 % | Max 15 % | Max 15 % |
| 0.075 mm (No. 200). | 10.0 | Max 15 % | | |
| Liquid Limit | --- | ------ | ------ | ------ |
| Plasticity index | 0 | Max 6 % | Max 6 % | Max 10 % |

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

Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الأقصر
219.901.437
3 شارع الملك الأفضل - الزمالك

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

## 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 /.

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقليم
219 991 437
المركز الرئيسي 3 شارع الملك الافضل - الزهراء

IAS ACCREDITED

# CEL

[illegible]

| | |
|---|---|
| Company Name | [illegible] |
| Project | Electric Express Train – HSR From Qatar To Armaar |
| Location | [illegible] |
| Type of sample | Soil Embankment / Upper Embankment 8.0 M |
| Delivery Date | 08/11/2023 |
| Reporting Date | 12/11/2023 |
| Reporting No. | 08.15 |

**Materials finer than 75 µm (no.200) sieve**
**By washing ASTM D-1140**

| Test | Results (%) |
|---|---|
| Percentage of material finer than Sieve Size 75 µM (No.200) | [illegible] |

Signature

CEL

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST: 639+000 E=32°54'25.6" N=25°53'59.1"

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date : 08/11/2023

Reporting Date : 12/11/2023

Reporting No. : 08-15

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

| Sieve Size (mm) | Sieve Size (IN) | Passing % |
|---|---|---|
| 50 | 2 | 97.5 |
| 37.5 | 1.5 | 92.7 |
| 25 | 1 | 84.2 |
| 19 | ¾ | 82.8 |
| 12.50 | ½ | 71.3 |
| 9.50 | 3/8 | 62.6 |
| 4.75 | 4 | 47.9 |
| 2.00 | 10 | 47.7 |
| 0.425 | 40 | 28.8 |

Signature /..

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
رقم التسجيل الضريبي 215.991.437
المركز الرئيسي : 3 شارع الملك الافضل - الزمالك

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST: 639+000 E=32°54'25.6" N=25°53'59.1"**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **08/11/2023**

Reporting Date : **12/11/2023**

Reporting No. : **08-15**

Dear Gentleman,

Attached here with the delivered on 8 / 11 / 2023

This sample is representative for 5.000 $M^3$

**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 /... **Consultant Eng : Abderrahman Ahmed**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
219.901.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك

IAS
ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 15 / 1 /2024

Soil type : Middle Embankment

Location : ST From 638+940 To 638+980

Level : - 4.5 M

Report No. : 134-2

## Compaction test by using Sand – Cone Test Method

### ASTM D- 1556

| Test # | Station | Test Hole Volume $cm^3$ | Bulk Density $gm/cm^3$ | Moisture Content % | Dry Density ($gm/cm^3$) | Degree of Compaction (%) | Acceptance |
|---|---|---|---|---|---|---|---|
| 1 | 638+955 | 1545.8 | 2.26 | 6.4 | 2.13 | 95.9% | Comply |
| 2 | 638+976 | 1568.1 | 2.30 | 6 | 2.17 | 97.8% | Comply |

Degree of compaction based on proctor test dated At

Max. dry density = 2.22 $gm/cm^3$

At optimum moisture content = 6.4 %

Signature /

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقصر
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

# CEL

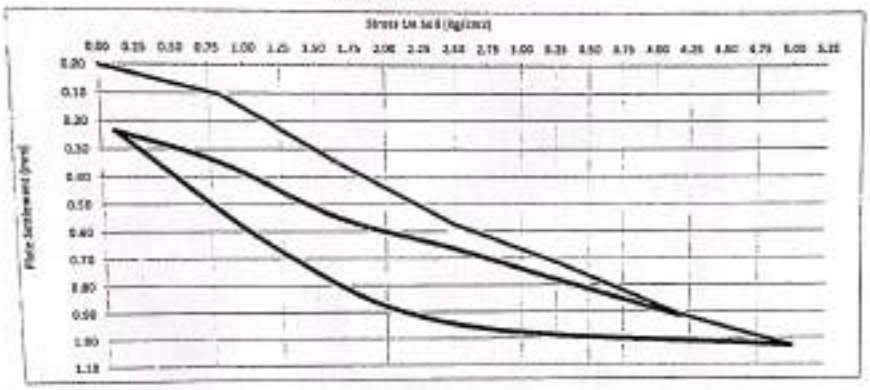
**Consulting Engineering Bureau & Laboratories**

**مكتب معامل الإستشارات الهندسية**

**مشروعات محافظات الوجه القبلى**

Company Name : شركة الدلعي للمقاولات و التوريدات العمومية
Project : Electric Express Train - Sector (5) – Qous to Armant.
Test Date : 23/01/2024
report date : 25/01/2024
Station : 641+180
Test No. : 91

## 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 | 0.35 | 0.57 | 0.73 | 0.91 | 1.03 |

| Unl.coding (1) | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Stage(Kg) | 3533 | 1766 | 884 | 71 |
| Stress (Kg/cm2) | 5.00 | 2.50 | 1.250 | 0.10 |
| Settlement (mm) | 1.03 | 0.95 | 0.67 | 0.23 |

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= | 0.30 | S2(mm)= | 0.77 | ΔS = 0.48 |
| Ev1 (MPa) = (0.75*D*Δσ)/ΔS | | 95.2 | | | |

| 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) | 0.23 | 0.35 | 0.55 | 0.67 | 0.79 | 0.91 |

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= | 0.51 | S2(mm)= | 0.93 | ΔS = 0.38 |
| Ev2 (MPa) = (0.75*D*Δσ)/ΔS | | 145.2 | | | |

Ev2/Ev1 = 1.53

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 (stress) (kg/cm²)
ΔS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)

CEL
مكتب معامل الاستشارات الهندسية
مشروعات محافظات الأقصر
219.991.437
الوكيل التنفيذي
3 شارع الملك الأفضل - الزمالك - القاهرة


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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

# CEL

**Consulting Engineering Bureau & Laboratories**

**مكتب معامل الإستشارات الهندسية**

**مشروعات محافظات الوجه القبلى**

Company Name : شركة الذهبى للمقاولات و التوريدات العمومية
Project : Electric Express Train - Sector (3) – Qous to Armant.
Test Date : 23/01/2024
report date : 25/01/2024
Station : 641+180
Test No. : 01

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

### Loading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.00 | 20.00 | 0.00 | 20.00 | 0.00 | 0.00 |
| 1 | 0.83 | 19.84 | 0.16 | 19.95 | 0.05 | 0.11 |
| 2 | 1.66 | 19.60 | 0.40 | 19.70 | 0.30 | 0.35 |
| 3 | 2.50 | 19.39 | 0.61 | 19.46 | 0.54 | 0.57 |
| 4 | 3.33 | 19.24 | 0.76 | 19.30 | 0.70 | 0.73 |
| 5 | 4.17 | 19.07 | 0.93 | 19.11 | 0.89 | 0.91 |
| 6 | 5.00 | 18.94 | 1.06 | 19.00 | 1.00 | 1.03 |

### Unloading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 1 | 2.50 | 19.02 | 0.98 | 19.09 | 0.91 | 0.95 |
| 2 | 1.25 | 19.30 | 0.70 | 19.35 | 0.65 | 0.67 |
| 3 | 0.100 | 19.73 | 0.27 | 19.80 | 0.20 | 0.23 |

### Loading Stage (2)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.83 | 19.61 | 0.39 | 19.69 | 0.31 | 0.35 |
| ximately acc | 1.66 | 19.42 | 0.58 | 19.48 | 0.52 | 0.55 |
| stress is reached. | | | | | | |
| 2 | 2.50 | 19.31 | 0.69 | 19.36 | 0.64 | 0.67 |
| 3 | 3.33 | 19.19 | 0.81 | 19.23 | 0.77 | 0.79 |
| 4 | 4.17 | 19.07 | 0.93 | 19.10 | 0.90 | 0.91 |

CEL
مكتب معامل الإستشارات الهندسية
مشروعات و الأقاليم
تليفون رئيس المجلس 219.991.437
المركز الرئيسى 3 شارع الملك الأفضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

**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 : Upper Embankment**
- **Job requiremer : Ev2 > 60 MPa**

| Item | Descriptions |
|---|---|
| Type of bedding material below the plate | Natural Soil |
| Plate Diameter (mm) | 300 |
| Date of measurement | : 23/01/2024 |
| 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 | First Cycle | Second Cycle | $E_{v2}/E_{v1}$ Ratio |
|---|---|---|---|---|---|---|---|
| | From | To | | ( m ) | $E_{v1}$ ( MPa ) | $E_{v2}$ ( Mpa ) | |
| 1 | 641+150 | 641+200 | : 641+160 | : 0.0 | 95.2 | 145.2 | 1.53 |

Signature / .....

CEL
مكتب معامل الإستشارات الهندسية
مشروعات الأقصر
219.991.437
3 شارع الملك الأفضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company : شركة الذهبى للمقاولات و التوريدات العمومية

Project : Electric Express Train - Sector (5) – Qous to Armant.
Subject : Determine the deformation and strength characteristics of soil by the plate loading test according specifications BIN 18134:2012-04 and project requirements
Test Location : Station 641+150 to 641+200
Station : 641+180
Level : 0.0
Test Date : 23/01/2024
Report Date : 25/01/2024
Type of soil : Upper Embankment
Report No. : 01

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 380 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 (Enerpac)
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 380 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 first values are 5.0 kg/cm $^2$
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 nd) 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

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى
219 991 437
3 شارع الملك الأفضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

# CEL

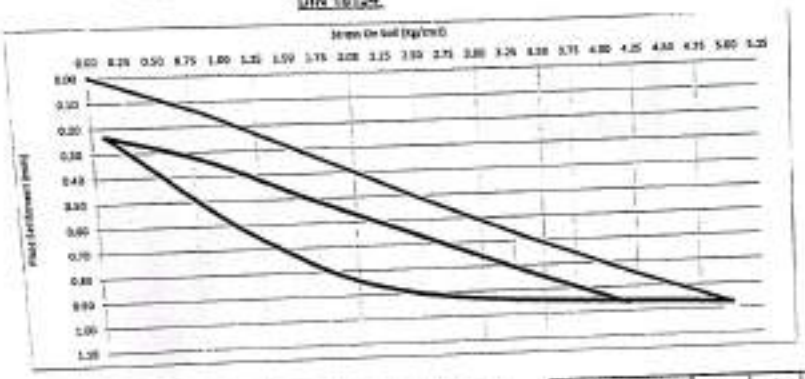
**Consulting Engineering Bureau & Laboratories**

**مكتب معامل الإستشارات الهندسية**

**مشروعات محافظات الوجه القبلى**

Company Name : شركة الأهلى للمقاولات و الإنشاءات الهندسية
Project : Electric Express Tolls - Sector (5) – Qous to Aswan.
Test Date : 23/01/2024
report date : 29/01/2024
Station : 641+120
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 | 1172.6 | 1759.3 | 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 | 0.15 | 0.33 | 0.51 | 0.68 | 0.83 | 0.99 |

| 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) | 0.88 | 0.50 | 0.00 | 0.33 |

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= | 0.33 | S2(mm)= | 0.71 | ΔS = 0.42 |
| Ev1 (MPa) = (0.75*D*Δσ)/ΔS | | 184.9 | | | |

Ev2/Ev1 = 1.33

| Loading (2) | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Stage)(Kg) | 0 | 586.395 | 1172.6 | 1759.3 | 2352.6 | 2946.1 |
| Stress (Kg/cm2) | 0.00 | 0.83 | 1.66 | 2.50 | 3.33 | 4.17 |
| Settlement (mm) | 0.00 | 0.33 | 0.60 | 0.66 | 0.82 | 0.97 |

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= | 0.47 | S2(mm)= | 0.81 | ΔS = 0.38 |
| Ev2 (MPa) = | (0.75*D*Δσ)/ΔS | 117.0 | | | |

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)

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى
219.991.437
3 شارع الملك الأفضل - الزمالك - القاهرة


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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

# CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلى

Company Name : شركة الأهلى للمقاولات و التوريدات العمومية

Project : Electric Express Train - Sector (3) – Qous to Armant.

Test Date : 23/01/2024

report date : 25/01/2024

Station : 641+120

Test No. : 01

## Nonrepetitive Static Plate Load Tests of Soils

## DIN 18134

Loading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.00 | 20.00 | 0.00 | 20.00 | 0.00 | 0.00 |
| 1 | 0.83 | 19.80 | 0.20 | 19.91 | 0.09 | 0.15 |
| 2 | 1.66 | 19.61 | 0.39 | 19.74 | 0.26 | 0.33 |
| 3 | 2.50 | 19.43 | 0.57 | 19.55 | 0.45 | 0.51 |
| 4 | 3.33 | 19.25 | 0.75 | 19.39 | 0.61 | 0.68 |
| 5 | 4.17 | 19.10 | 0.90 | 19.23 | 0.77 | 0.83 |
| 6 | 5.00 | 18.98 | 1.02 | 19.07 | 0.93 | 0.98 |

Unloading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 1 | 2.50 | 19.06 | 0.94 | 19.14 | 0.86 | 0.90 |
| 2 | 1.25 | 19.30 | 0.70 | 19.38 | 0.62 | 0.66 |
| 3 | 0.100 | 19.73 | 0.27 | 19.80 | 0.20 | 0.23 |

Loading Stage (2)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.83 | 19.64 | 0.36 | 19.69 | 0.31 | 0.33 |
| [illegible] equ | 1.66 | 19.46 | 0.54 | 19.53 | 0.47 | 0.50 |
| stress is reached. | | | | | | |
| 2 | 2.50 | 19.30 | 0.70 | 19.37 | 0.63 | 0.66 |
| 3 | 3.33 | 19.15 | 0.85 | 19.21 | 0.79 | 0.82 |
| 4 | 4.17 | 19.01 | 0.99 | 19.06 | 0.94 | 0.97 |

CEL
مكتب معامل الاستشارات الهندسية
مشروعات : الأقصر
219 991 437
المقر الرئيسى 3 شارع الملك الأفضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

**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 : Upper Embankment**
- **Job requiremer : Ev2 > 60 MPa**

| Item | Descriptions |
|---|---|
| Type of bedding material below the plate | Natural Soil |
| Plate Diameter (mm) | 300 |
| date of measurement | : 23/01/2024 |
| 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 | First Cycle | Second Cycle | $E_{v2}/E_{v1}$ Ratio |
|---|---|---|---|---|---|---|---|
| | From | To | | ( m ) | $E_{v1}$ ( MPa ) | $E_{v2}$ ( Mpa ) | |
| 1 | 641+100 | 641+150 | : 641+120 | : 0.0 | 104.8 | 117.0 | 1.12 |

Signature / .....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات محافظات الوجه القبلى
تليفون : 215.991.437
3 شارع الملك الأفضل - الزمالك - القاهرة

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company : شركة لتهى للمقاولات و التوريدات العمومية

Project : Electric Express Train - Sector (5) – Qous to Arment
Subject : Determine the deformation and strength characteristics of soil by the plate loading test according specification DIN 18134:2012-04 and project requirements
Test Location : Station 641+100 to 641+150
Station : 641+120
Level : 0.0
Test Date : 23/01/2024
Repot Date : 25/01/2024
Type of soil : Upper Embankment
Report No. : 01

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 (Enerpac)
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 first values are 0.0 kg/cm $^2$
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 nd) 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

CEL
مكتب الاستشارات الهندسية
مشروعات محافظات الوجه القبلى
214 1/11 437
3 شارع الملك الأفضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company : شركة لذهبى للمقاولات و التوريدات العمومية

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 641+100 to 641+150
Station : 641+120
Level : 0.0
Test Date : 23/01/2024
Repot Date : 25/01/2024
Type of soil : Upper Embankment
Report No. : 01

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 $^2$
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 nd) 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

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى
٣ ش الملك الأفضل - الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

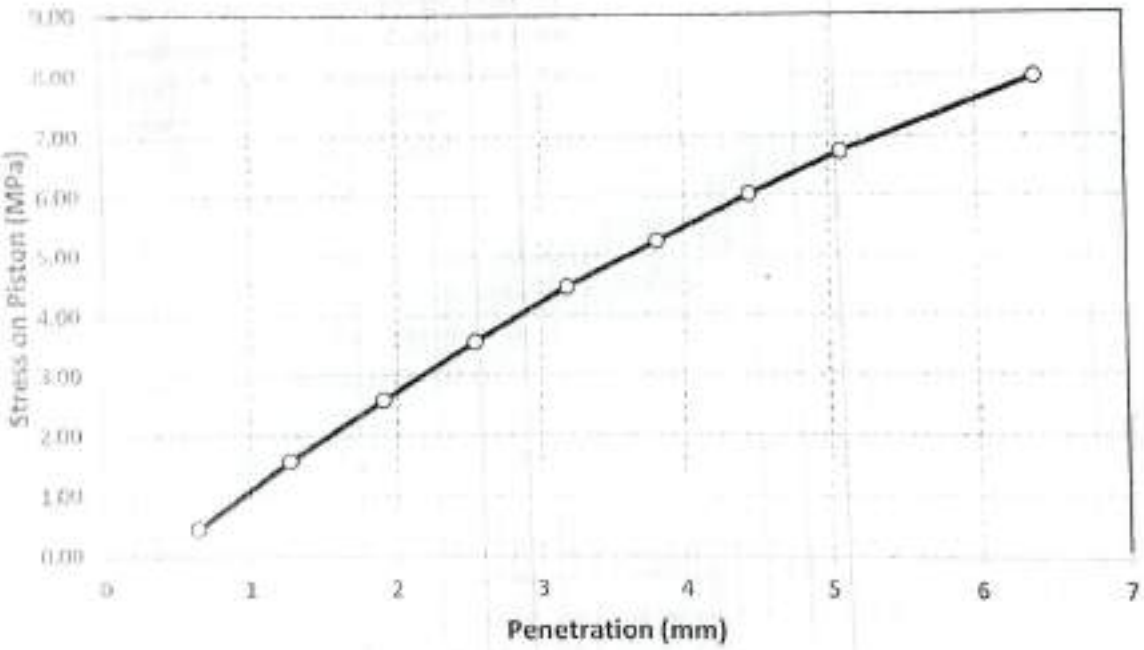
Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Load Penetration Curve of CBR Test

## ASTM D-1883




Signature / ..

CEL مكتب معامل الاستشارات الهندسية مشروعات ( الأقصر ) ت: 219.991.437 المركز الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS ACCREDITED

Designer Company
Engineering

# CEL

Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )
Delivery Date :08/01/2024
Reporting Date : 11/1/2024
Reporting No. : 10-19

## Test Results of California Bearing Ratio on Base Materials

### ASTM D 1883

| penetration | | stress on piston (Mpa) |
|---|---|---|
| mm | Inch | |
| 0.64 | 0.025 | 0.46 |
| 1.27 | 0.050 | 1.58 |
| 1.91 | 0.075 | 2.58 |
| 2.54 | 0.100 | 3.55 |
| 3.18 | 0.125 | 4.47 |
| 3.81 | 0.150 | 5.23 |
| 4.45 | 0.175 | 6.03 |
| 5.08 | 0.200 | 6.74 |
| 6.35 | 0.250 | 7.97 |

| CBR Result | Stress (Mpa) | | CBR 100 % |
|---|---|---|---|
| | St. Value | Sample results | 51.5 % |
| At 0.1 inch (2.54 mm) penetration | 6.90 | 3.55 | |

Notes:

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

Signature / ...

CEL
مكتب معامل الاستشارات الهندسية
• مشروعات و الاقمار •
219.991.437 المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

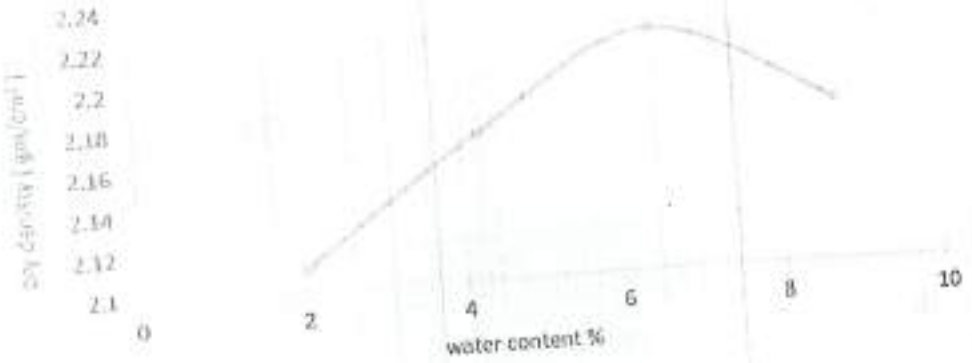
Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date :**08/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

## 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 /**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Soil Classification

| TEST | Results (%) | Limits according Projects Specs | | |
|---|---|---|---|---|
| Group Classification | (A-1-a) | (A-1-a) | (A-1-b) | (A-2-4) |
| 2.00 mm (No.10). | 27.5 | Max 50 % | ------ | ------ |
| 0.425 mm (No. 40). | 15.6 | Max 30 % | Max 50 % | ------ |
| 0.075 mm (No. 200). | 9.1 | Max 15 % | Max 15 % | Max 15 % |
| | | | | |
| Liquid Limit | ----- | ------ | ------ | ------ |
| Plasticity index | 0 | Max 6 % | Max 6 % | Max 10 % |

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

Signature / ..

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقصر
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## 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 /...

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقمار
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

El-Maer El-Abd Street
Nasr City
Cairo - Egypt

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date :**08/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

## Materials finer than 75 µm (no.200) sieve By washing ASTM D-1140.

| Test | Results (%) |
|---|---|
| Percentage of material finer than Sieve Size 75 µM (No.200) | 9.1 |

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقصر
219.991.437
المركز الرئيسي : 3 شارع الملك الأفضل - الزمالك - القاهرة

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

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

| Sieve Size (mm) | Sieve Size (IN) | Passing % |
|---|---|---|
| 50 | 2 | 95.1 |
| 37.5 | 1.5 | 91.9 |
| 25 | 1 | 80.7 |
| 19 | ¾ | 72.2 |
| 12.50 | ½ | 64.1 |
| 9.50 | 3/8 | 45.8 |
| 4.75 | 4 | 34.6 |
| 2.00 | 10 | 27.5 |
| 0.425 | 40 | 15.6 |

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاثمر
219.991.437
3 شارع الملك الافضل - الزمالك

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : **Electric Express Train – HSR From Qous To Armant**

Location : **ST:641+400 E= 492410,088 N=2862759,57**

Type of sample : **Soil Embankment ( Upper Embankment 0.0 M )**

Delivery Date : **03/01/2024**

Reporting Date : **11/1/2024**

Reporting No. : **10-19**

Dear Gentleman,

Attached here with the delivered on 08 / 01 / 2024

This sample is representative for 5.000 $M^3$

**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 /..

**Consultant Eng : Abderrahman Ahmed**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاعمار
215.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 29 / 1 /2024

Soil type : Upper Embankment

Location : ST From 641+200 To 641+400

Level : - 0.0 M

Report No. : 143

**Compaction test by using Sand – Cone Test Method**

**ASTM D- 1556**

| Test # | Station | Test Hole Volume $cm^3$ | Bulk Density $gm/cm^3$ | Moisture Content % | Dry Density ($gm/cm^3$) | Degree of Compaction (%) | Acceptance |
|---|---|---|---|---|---|---|---|
| 1 | 641+225 | 1513.2 | 2.31 | 6 | 2.18 | 98.3% | Comply |
| 2 | 641+250 | 1558.3 | 2.24 | 5.3 | 2.13 | 95.7% | Comply |
| 3 | 641+275 | 1535.4 | 2.26 | 5.8 | 2.14 | 96.4% | Comply |
| 4 | 641+300 | 1566.0 | 2.25 | 5.8 | 2.12 | 95.7% | Comply |
| 5 | 641+325 | 1484.7 | 2.33 | 5.8 | 2.21 | 99.4% | Comply |
| 6 | 641+350 | 1513.9 | 2.30 | 5.8 | 2.18 | 98.1% | Comply |
| 7 | 641+375 | 1511.1 | 2.25 | 5.8 | 2.13 | 95.8% | Comply |
| 8 | 641+395 | 1431.3 | 2.28 | 5.8 | 2.16 | 97.3% | Comply |

**Degree of compaction based on proctor test dated At**

**Max. dry density = 2.22 gm/cm3**

**At optimum moisture content = 6.4 %**

**Signature / .....**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقمار
219.991.437
المركز الرئيسي : 3 شارع الملك الافضل - الزمالك - القاهرة

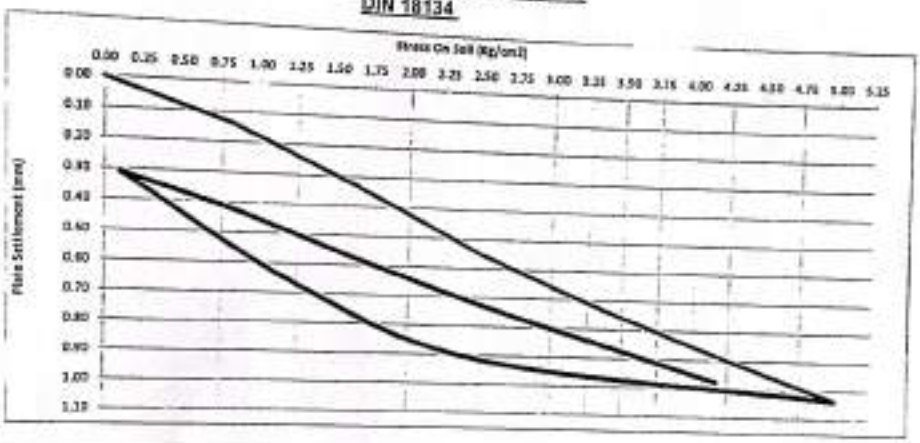
3 El Malek El Afdal Street
Zamalek, Cairo

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company Name : شركة الشامى للمقاولات و التوريدات العمومية
Project : Electric Express Train - Sector (5) – Qous to Armant.
Test Date : 23/01/2024
report date : 26/01/2024
Station : 641+020
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 | 0.14 | 0.33 | 0.55 | 0.73 | 0.89 | 1.04 |

| 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) | 1.04 | 0.92 | 0.67 | 0.31 |

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= 0.33 | S2(mm)= 0.76 | ΔS = 0.46 | | |
| Ev1 (MPa) = (0.75*D*Δσ)/ΔS | 95.9 | | | | |

| 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 | 0.42 | 0.58 | 0.73 | 0.86 | 0.98 |

Ev2/Ev1 = 1.41

| | | | | | |
|---|---|---|---|---|---|
| D (mm) = 300 | S1 (mm)= 0.55 | S2(mm)= 0.88 | ΔS = 0.33 | | |
| Ev2 (MPa) = (0.75*D*Δσ)/ΔS | 135.7 | | | | |

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 (smax) (kg/cm²)
ΔS = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company Name : شركة الذهبى للمقاولات و التوريدات العمومية
Project : Electric Express Train - Sector (5) – Qous to Armant.
Test Date : 23/01/2024
report date : 25/01/2024
Station : 641+020
Test No. : 01

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

### Loading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.00 | 20.00 | 0.00 | 20.00 | 0.00 | 0.00 |
| 1 | 0.83 | 19.83 | 0.17 | 19.89 | 0.11 | 0.14 |
| 2 | 1.66 | 19.64 | 0.36 | 19.69 | 0.31 | 0.33 |
| 3 | 2.50 | 19.43 | 0.57 | 19.47 | 0.53 | 0.55 |
| 4 | 3.33 | 19.25 | 0.75 | 19.30 | 0.70 | 0.73 |
| 5 | 4.17 | 19.09 | 0.91 | 19.14 | 0.86 | 0.89 |
| 6 | 5.00 | 18.94 | 1.06 | 18.99 | 1.01 | 1.04 |

### Unloading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 1 | 2.50 | 19.06 | 0.94 | 19.11 | 0.89 | 0.92 |
| 2 | 1.25 | 19.31 | 0.69 | 19.35 | 0.65 | 0.67 |
| 3 | 0.100 | 19.67 | 0.33 | 19.71 | 0.29 | 0.31 |

### Loading Stage (2)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.83 | 19.60 | 0.40 | 19.55 | 0.45 | 0.42 |
| oximately equ | 1.66 | 19.44 | 0.56 | 19.40 | 0.60 | 0.58 |
| stress is reached. | | | | | | |
| 2 | 2.50 | 19.29 | 0.71 | 19.26 | 0.74 | 0.73 |
| 3 | 3.33 | 19.17 | 0.83 | 19.13 | 0.87 | 0.85 |
| 4 | 4.17 | 19.04 | 0.96 | 19.01 | 0.99 | 0.98 |

CEL
مكتب معامل الاستشارات الهندسية
مشروعات محافظات الاقصر
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

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 : Upper Embankment
- Job requiremer : Ev2 > 60 MPa

| Item | Descriptions |
|---|---|
| Type of bedding material below the plate | Natural Soil |
| Plate Diameter (mm) | 300 |
| date of measurement | : 23/01/2024 |
| 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 | First Cycle | Second Cycle | $E_{v2}/E_{v1}$ Ratio |
|---|---|---|---|---|---|---|---|
| | From | To | | ( m ) | $E_{v1}$ ( MPa ) | $E_{v2}$ ( Mpa ) | |
| 1 | 641+000 | 641+050 | : 641+020 | : 0.0 | 95.9 | 135.7 | 1.41 |

Signature / .....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقصر
219,991,437 رقم السجل التجاري
3 شارع الملك الافضل - الزمالك - القاهرة

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

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون و فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company : شركة الذهبى للمقاولات و التوريدات العمومية

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 641+000 to 641+050
Station : 641+020
Level : 0.0
Test Date : 23/01/2024
Repot Date : 25/01/2024
Type of soil : Upper Embankment
Report No. : 01

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 $^2$
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 nd) 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

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقصر
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

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

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
٢٧٣٦٣٠٩٣ - ٢٧٣٦٧٢٣١

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company Name : شركة الأهلى للمقاولات و التوريدات العمومية
Project : Electric Express Train - Sector (5) – Qous to Armant.
Test Date : 23/01/2024
report date : 25/01/2024
Station : 641+080
Test No. : 01

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

### Loading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.00 | 20.00 | 0.00 | 20.00 | 0.00 | 0.00 |
| 1 | 0.83 | 19.87 | 0.13 | 19.79 | 0.21 | 0.17 |
| 2 | 1.66 | 19.66 | 0.34 | 19.62 | 0.38 | 0.36 |
| 3 | 2.50 | 19.45 | 0.55 | 19.41 | 0.59 | 0.57 |
| 4 | 3.33 | 19.27 | 0.73 | 19.23 | 0.77 | 0.75 |
| 5 | 4.17 | 19.08 | 0.92 | 19.05 | 0.95 | 0.94 |
| 6 | 5.00 | 18.94 | 1.06 | 18.90 | 1.10 | 1.08 |

### Unloading Stage (1)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 1 | 2.50 | 19.04 | 0.96 | 18.99 | 1.01 | 0.99 |
| 2 | 1.25 | 19.26 | 0.74 | 19.22 | 0.78 | 0.76 |
| 3 | 0.100 | 19.63 | 0.37 | 19.59 | 0.41 | 0.39 |

### Loading Stage (2)

| Loading | Stress Kg/cm2 | Dial 1 | Settlement mm | Dial 2 | Settlement mm | Average |
|---|---|---|---|---|---|---|
| 0 | 0.83 | 19.47 | 0.53 | 19.43 | 0.57 | 0.55 |
| pximately equ | 1.66 | 19.32 | 0.68 | 19.28 | 0.72 | 0.70 |
| stress is reached. | | | | | | |
| 2 | 2.50 | 19.18 | 0.82 | 19.13 | 0.87 | 0.85 |
| 3 | 3.33 | 19.03 | 0.97 | 19.00 | 1.00 | 0.98 |
| 4 | 4.17 | 18.91 | 1.09 | 18.88 | 1.12 | 1.11 |

CEL
مكتب معامل الإستشارات الهندسية
مشروعات و الأقصر
219.991.437 رقم التسجيل الضريبي
3 شارع الملك الأفضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

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 : Upper Embankment**
- **Job requiremer : Ev2 > 60 MPa**

| Item | Descriptions |
|---|---|
| Type of bedding material below the plate | Natural Soil |
| Plate Diameter (mm) | 300 |
| date of measurement | : 23/01/2024 |
| 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 | First Cycle | Second Cycle | $E_{V2}/E_{V1}$ Ratio |
|---|---|---|---|---|---|---|---|
| | From | To | | ( m ) | $E_{V1}$ ( MPa ) | $E_{V2}$ ( Mpa ) | |
| 1 | 641+050 | 641+100 | : 641+080 | : 0.0 | 95.1 | 130.4 | 1.37 |

Signature / .....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقصر
الرقم الضريبي 219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

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

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى

Company : شركة الذهبى للمقاولات و التوريدات العمومية

Project : Electric Express Train - Sector (5) – Qous to Arment.
Subject : Determine the deformation and strength characteristics of soil by the plate loading test accurding specifications DIN 18134:2012-04 and project requirements
Test Location : Station 641+050 to 641+100
Station : 641+080
Level : 0.0
Test Date : 23/01/2024
Repot Date : 26/01/2024
Type of soil : Upper Embankment
Report No. : 01

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 900 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 900 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 $^2$
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 nd) 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

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الاقصر
219.991.437 السجل التجاري
المركز الرئيسي 3 شارع الملك الأفضل - الزمالك - القاهرة

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

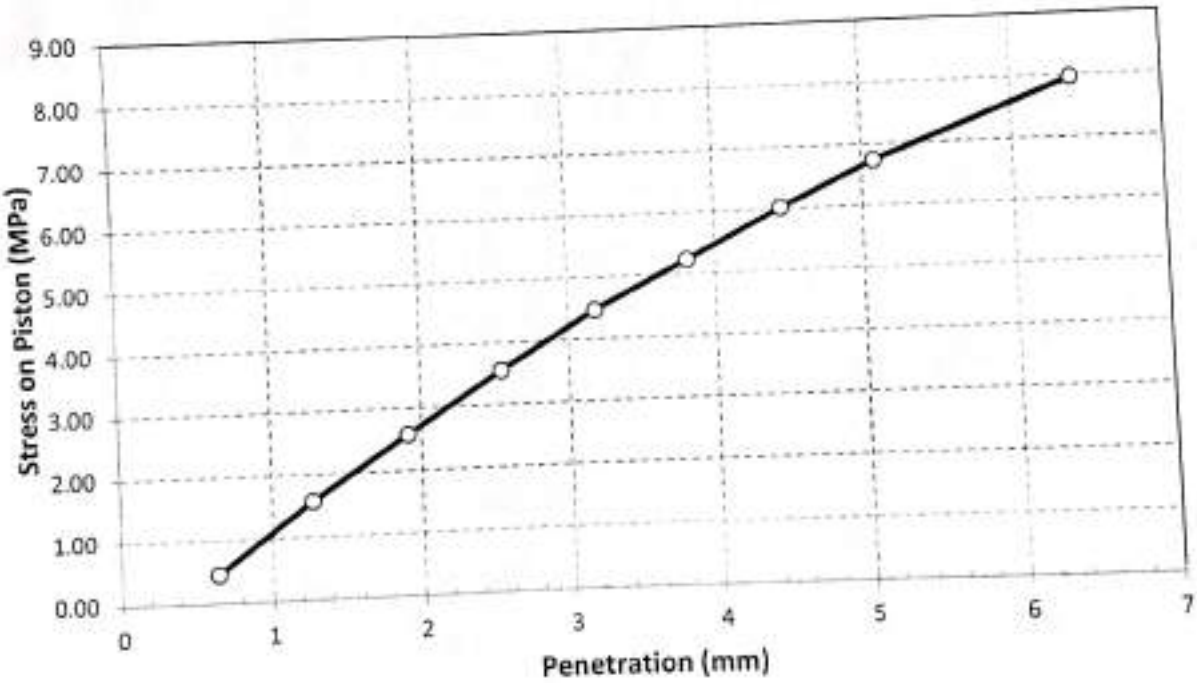
IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )
Delivery Date :08/01/2024
Reporting Date : 11/1/2024
Reporting No. : 10-19

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




Signature / ..

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ( الاقصر )
219,991,437
3 شارع الملك الافضل - الزمالك - القاهرة

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 27362231 - 27363033

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

**Company Name** : شركة الذهبي

**Project** : Electric Express Train – HSR From Qous To Armant

**Location** : ST:641+400 E= 492410,088 N=2862759,57

**Type of sample** : Soil Embankment ( Upper Embankment 0.0 M )

**Delivery Date** :08/01/2024

**Reporting Date** : 11/1/2024

**Reporting No.** : 10-19

## Test Results of California Bearing Ratio on Base Materials

### ASTM D 1883

| penetration | | stress on piston (Mpa) |
|---|---|---|
| mm | Inch | |
| 0.64 | 0.025 | 0.46 |
| 1.27 | 0.050 | 1.58 |
| 1.91 | 0.075 | 2.58 |
| 2.54 | 0.100 | 3.55 |
| 3.18 | 0.125 | 4.47 |
| 3.81 | 0.150 | 5.23 |
| 4.45 | 0.175 | 6.03 |
| 5.08 | 0.200 | 6.74 |
| 6.35 | 0.250 | 7.97 |

| CBR Result | Stress (Mpa) | | CBR 100 % |
|---|---|---|---|
| | St. Value | Sample results | |
| At 0.1 inch (2.54 mm) penetration | 6.90 | 3.55 | 51.5 % |

**Notes:**

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.22 (gm /cm$^3$)
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** / ..

CEL
مكتب معامل الاستشارات الهندسية
• مشروعات ( الاقصر )
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

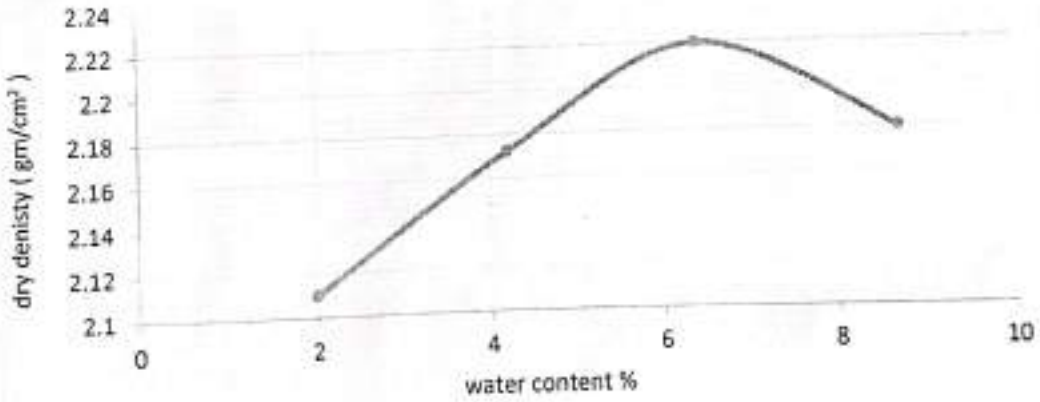
**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

| | |
|---|---|
| Company Name | : شركة الذهبي |
| Project | : Electric Express Train – HSR From Qous To Armant |
| Location | : ST:641+400 E= 492410,088 N=2862759,57 |
| Type of sample | : Soil Embankment ( Upper Embankment 0.0 M ) |
| Delivery Date | :08/01/2024 |
| Reporting Date | : 11/1/2024 |
| Reporting No. | : 10-19 |

## 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 / .....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
رقم التسجيل الضريبي 219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## Soil Classification

| TEST | Results (%) | Limits according Projects Specs | | |
|---|---|---|---|---|
| • Group Classification | (A-1-a) | (A-1-a) | (A-1-b) | (A-2-4) |
| 2.00 mm (No.10). | 27.5 | Max 50 % | ------ | ------ |
| 0.425 mm (No. 40). | 15.6 | Max 30 % | Max 50 % | ------ |
| 0.075 mm (No. 200). | 9.1 | Max 15 % | Max 15 % | Max 15 % |
| | | | | |
| Liquid Limit ..... | ----- | ------ | ------ | ------ |
| Plasticity index ..... | 0 | Max 6 % | Max 6 % | Max 10 % |

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

Signature / ..

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقتصاد
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

E. Malek E. Afdal Street
Zamalek, Cairo
Tel. & Fax: 2736293 - 2736293

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : ST:641+400 E= 492410,088 N=2862759,57

Type of sample : Soil Embankment ( Upper Embankment 0.0 M )

Delivery Date :08/01/2024

Reporting Date : 11/1/2024

Reporting No. : 10-19

## 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 /...

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
219.991.437
المركز الرئيسي 3 شارع الملك الافضل - الزمالك - القاهرة

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )
Delivery Date :08/01/2024
Reporting Date : 11/1/2024
Reporting No. : 10-19

## Materials finer than 75 µm (no.200) sieve By washing ASTM D-1140.

| Test | Results (%) |
|---|---|
| Percentage of material finer than Sieve Size 75 µM (No.200) | 9.1 |

Signature /...

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقصر
219.991.437
3 شارع الملك الافضل - الزمالك - القاهرة

5 El Malek El Afdal Street
Zamalek, Cairo.
Tel & Fax: 2736723 - 2736393

IAS ACCREDITED Testing Laboratory

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment ( Upper Embankment 0.0 M )
Delivery Date :08/01/2024
Reporting Date : 11/1/2024
Reporting No. : 10-19

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

| Sieve Size (mm) | Sieve Size (IN) | Passing % |
|---|---|---|
| 50 | 2 | 95.1 |
| 37.5 | 1.5 | 91.9 |
| 25 | 1 | 80.7 |
| 19 | ¾ | 72.2 |
| 12.50 | ½ | 64.1 |
| 9.50 | 3/8 | 45.8 |
| 4.75 | 4 | 34.6 |
| 2.00 | 10 | 27.5 |
| 0.425 | 40 | 15.6 |

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاتصال
219.991.437
3 شارع الملك الأفضل - الزمالك - القاهرة

5 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2736723 - 2736359

IAS ACCREDITED

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

| | |
|---|---|
| **Company Name** | : شركة الذهبي |
| **Project** | : **Electric Express Train – HSR From Qous To Armant** |
| **Location** | : **ST:641+400 E= 492410,088 N=2862759,57** |
| **Type of sample** | : **Soil Embankment ( Upper Embankment 0.0 M )** |
| **Delivery Date** | : **03/01/2024** |
| **Reporting Date** | : **11/1/2024** |
| **Reporting No.** | : **10-19** |

Dear Gentleman,

Attached here with the delivered on 08 / 01 / 2024

This sample is representative for 5.000 $M^3$

**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 /..** **Consultant Eng : Abderrahman Ahmed**

CEL
مكتب معامل الاستشارات الهندسية
مشروعات و الاقمار
219.991.437
3 شارع الملك الافضل - الزمالك

**CEL**

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 23 / 1 /2024

Soil type : Upper Embankment

Location : ST From 641+000 To 641+200

Level : - 0.0 M

Report No. : 139

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

| Test # | Station | Test Hole Volume $cm^3$ | Bulk Density $gm/cm^3$ | Moisture Content % | Dry Density ($gm/cm^3$) | Degree of Compaction (%) | Acceptance |
|---|---|---|---|---|---|---|---|
| 1 | 641+025 | 1465.3 | 2.27 | 5.3 | 2.15 | 97.0% | Comply |
| 2 | 641+050 | 1527.8 | 2.25 | 5 | 2.14 | 96.4% | Comply |
| 3 | 641+075 | 1575.0 | 2.29 | 5.3 | 2.18 | 98.1% | Comply |
| 4 | 641+100 | 1660.4 | 2.26 | 5.8 | 2.13 | 96.0% | Comply |
| 5 | 641+125 | 1575.0 | 2.29 | 5.8 | 2.16 | 97.3% | Comply |
| 6 | 641+150 | 1667.4 | 2.22 | 5.3 | 2.11 | 94.9% | Comply |
| 7 | 641+175 | 1552.8 | 2.26 | 5.3 | 2.15 | 96.7% | Comply |
| 8 | 641+198 | 1515.3 | 2.28 | 5.8 | 2.16 | 97.1% | Comply |

Degree of compaction based on proctor test dated At

Max. dry density = 2.22 $gm/cm^3$

At optimum moisture content = 6.4 %

Signature / CEL مكتب معامل الاستشارات الهندسية مشروعات الأقصر 219.991.437 3 شارع الملك الأفضل - الزمالك - القاهرة

1 E. Moaz E. Abyad Street
Zamalek, Cairo
Tel. Fax: 2736[illegible] - 2736[illegible]

IAS ACCREDITED