الهيئة العامة
للطرق و الكبارى
(GARB)
وزارة النقل
الإداره المركزية للمنطقة الثامنة بقنا

السيد المهندس / رئيس قطاع التنفيذ والمناطق

تحية طيبة و بعد ،،،،،

نتشرف ان نرفق لسيادتكم عدد ١ مقايسة معدلة ٢ لمشروع اعمال انشاء الجسر الترابي للقطار الكهربائي السريع ٦ أكتوبر أبوسمبل (القطاع الخامس) من الكم ٥٧٩+ ٦٤٠ حتي الكم ٢٣٦+٦٤١ 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 فى ٢٠٢٣/١٢/١٩

المرفقات / عدد (١)مقايسة

رئيس الادارة المركزية

مهندس /

عماد حسين

الهيئة القومية للأنفاق

وزارة النقل

الهيئة العامة للطرق والكبارى

القطار الكهربائي السريع
Electric Express Train

SYSTRA SHAKER SPECTRUM

الهيئة العامة للطرق والكبارى

وزارة النقل

مقايسة معدلة 2 (جزئية لبنود لأعمال)

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

القطاع الخامس من الكم	629 +110.13	إلى الكم	715+624.63	بطول	86.52	كم
من إحداثى	E 489929.6671	و	N 2874215.5671			
الى إحداثى	E 440168.6522	و	N 2817778.3175			

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

تنفيذ الشركه: / الذهبى للمقاولات فنة : الرابعه بقيمة : مليون

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

قيمة المقايسة 19,959,325 مليون

المقاول /

الإستشارى /

المنطقة الثامنة بقنا /

شركة الذهبى للمقاولات

سبكترم للاستشارات الهندسية
Spectrum Consulting
مشروع القطار السريع

الهيئة العامة للطرق والكبارى
وزارة النقل
ادارة المشروعات

مقايسه تقديريه (معدلة) «2»

أعمال انشاء الجسر الترابي للقطار الكهربائي السريع (أكتوبر / أبوسمبل)

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

تنفيذ شركة / الذهبى يوسف للمقاولات العموميه من محطة 579+640 الي 236+641 بطول 657 م

م البند	بيان الأعمال	الوحدة	الكمية	سعر الفئة	الاجمالى
2	اعمال الحفر				
2-1	بالمتر المكعب 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 بالهراسات للوصول الى أقصى كثافة جافه (95% من الكثافة الجافة القصوى) ومحمل على البند تحميل ونقل الأتربة الزائدة لمسافة 500 متر من محور الطريق ويتم التنفيذ طبقاً للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاتة طبقاً لأصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس المشرف. -علاوة 1جنية /كم لمسافة نقل تاتج الحفر وتصبح 1.1 جنية/كم ابتداء من 4/5/2023 -علاوة زيادة السولار 0.7 جنية /م3 ابتداء من 4/5/2023	م3	25,000.000	23.00	575,000
	علاوة مسافة النقل 1 كم	م3	25.000	1.10	28
	علاوة زيادة السولار	م3	25,000.000	0.70	17,500
3	اعمال الردم Embankment				
3-1	اعمال تحميل وتوريد ونقل أتربة مطابقة للمواصفات وتشغيلها باستخدام آلات التسوية بسمك لا يزيد عن 50 سم حتى منسوب (-2 متر) اسفل منسوب الفرمه و بسمك لايزيد عن 25سم اعلي من منسوب (-2 متر) من منسوب الفرمه لاستكمال المنسوب التصميمى لتشكيل الجسر والأكتاف (نسبة تحمل كاليفورنيا حتى 15%) ورشها بالمياه الأصولية للوصول إلى نسبة الرطوبة المطلوبة والدمك الجيد بالهراسات للوصول إلى أقصى كثافة جافة (95% من الكثافة الجافة القصوى) ويتم التنفيذ طبقاً للمناسيب التصميمية والقطاعات العرضية النموذجية والرسومات التفصيلية المعتمدة والبند بجميع مشتملاته طبقاً لأصول الصناعة ومواصفات الهيئة العامة للطرق والكبارى وتعليمات المهندس المشرف. - فى حالة طلب جهاز الإشراف زيادة نسبة الدمك عن 95% يحسب زيادة 1 جنيه على زيادة نسبة الدمك لكل 1%. - مسافة النقل حتى 2 كم و يتم احتساب علاوة 1.4 جنيه لكل كم بالزيادة او النقصان وتصبح 1.5 جنيه /كم ابتداء من 4/5/2023. - السعر يشمل عمل تشوينات و تخليط و اختبارات و نقل لموقع العمل حتي مسافة 2 كم . -علاوة زيادة السولار 1.9 جنية /م3 ابتداء من 4/5/2023 -السعر لا يشمل قيمة المادة المحجرية.	م3	293,416.617	60.00	17,604,997
4	طبقة تأسيس Prepared Subgrade				
4-1	بالمتر المكعب أعمال توريد وفرش طبقة تأسيس (Prepared Subgrade) من الأحجار الصلبة المتدرجة ناتج تكسير الكسارات والمطابقة للمواصفات وأقصى حجم للحبيبات 100 مم وألا تزيد نسبة المار من منخل 200 عن 12% والتدرج الوارد بالاشتراطات الخاصة بالمشروع لا تقل نسبة تحمل كاليفورنيا عن 25% وألا تزيد نسبة الفاقد 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 آلات التسوية الحديثة على أن لا يزيد سمك الطبقة بعد تمام الدمك عن 25 سم ورشها بالمياه الأصولية للوصول إلى نسبة الرطوبة المطلوبة والدمك الجيد للهراسات للوصول إلى أقصى كثافة جافة قصوى (لا تقل عن 95%) من الكثافة المعملية والفنة تشمل إجراء التجارب المعملية والحقلية ويتم التنفيذ طبقاً لأصول الصناعة والرسومات التفصيلية والبند بجميع مشتملاته طبقاً للمواصفات الفنية للمشروع وتقرير الاستشارى وتعليمات المهندس المشرف. - مسافة النقل لا تقل عن 20 كم. - يتم احتساب علاوة 1.2 جنيه لكل 1 كم بالزيادة أو النقصان وتصبح 1.3 جنيه /كم ابتداء من 4/5/2023. - السعر لا يشمل قيمة المواد المحجريه. علاوة زيادة السولار 1.8 جنيه /م3 ابتداء 4/5/2023	م3	5,000.000	130.00	650,000
	مسافة نقل 100 كم	م3	8,500.000	104.00	884,000
	كارتة توريد الأساس	م3	8,500.000	25.00	212,500
	علاوة زيادة السولار	م3	8,500.000	1.80	15,300
	الأجمالي				19,959,325

مهندس الشركة المنفذة
المهندس/
أحمد شعبان حسين
التوقيع/

مدير المشروع (الاستشاري)
المهندس/
التوقيع/

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

يعتمد؟؟؟
رئيس الإدارة المركزية
المنطقة الثامنة (قنا)
السيد المهندس / عماد حسين
التوقيع/

شركة الذهبى للمقاولات
خاص بالقطار السريع
٦٤٨٠٤٧٢٠٩٩٦

وزارة النقل
الهيئة العامة للطرق والكباري

محضر أعمال حصر كميات

التاريخ: 25/11/2023
اسم المشروع: مشروع القطار الكهربائي السريع (HSR) -اسوان -خورسيل (القطاع السادس)

قامت شركة وليات كونسلت للاستشارات الهندسية المساحية (المستشاري الأعمال المساحية لهيئة الطرق والكباري)

بإعتماد الكميات المنفذة الخاصة بشركة الأمير للمقاولات

م	من المحطة رقم	الى المحطة رقم	التصنيف	الكمية بالمتر المكعب	الملاحظات
1	640+120	640+200	اعمال القطع	14051.66	اعمال قطع على (REV05)
			اجمالي الكمية	14051.66	

حصر جاري (2)
المرفقات:
استلام مزاليه شبكة
قطاعات عرضية
شيت الكشف موضح به الكميات

مهندس الشركة المنفذة

المستشاري المساحة / مكتب وليات

المستشاري / مكتب سيكارم

شركة المرهبي

وليات كونسلت للاستشارات الهندسية
HSR - Blue Line - Sec.05
إستشاري الأعمال المساحية بالقطاع الخامس

حصر كميات القطع مستخلص جاري (2) شركة الذهبي (637+952-643+863) مشروع القطار السريع القطاع الخامس (قوص /ارمنت)			
Station	Cut Area (Sq.M.)	Cut Volume (Cu.M.)	Cum. Cut Vol. (Cu.M.)
640+120.00	4.61	46.07	46.07
640+140.00	83.74	883.49	929.56
640+160.00	276.03	3,597.70	4,527.26
640+180.00	309.59	5,856.19	10,383.46
640+200.00	57.23	3,668.21	14,051.66
اجمالي الكمية بالمتر المكعب		14,051.66	

بوليالت كونسلت للاستشارات الهندسية
HSR - Blue Line - Sec.05
استشاري العمل المساحة بالقطاع الخامس

شركة الذهبي للمقاولات

UNIVERSAL INSPECTION REQUEST

Location Name	Contractor Company	Designer Company
From 640+120 to 640+200	EL-ZAHABY contraction	(SPECTRUM) Engineering Consulting Office

	Name	Sign	Date	Time
Issued by Contractor	Eng. Ahmed shoaib hussien		26/11/2023	10:00 AM
Contractor UIR Reference	ZF-AS-BUILT (01)			Revision 5

Received by EK				UIR	CC	CE	CI	DD	MM	YY	HH	MM
					KP	EW	OT					

Code 1	Code 2	Code 3	Code 4	Code 5
[illegible]	[illegible]	[illegible]	Work Activity	Sub Element of Activity

Area	Element	Item
	From 640+120 to 640+200	As-built (حصر كميات القطع)

Inspection Description: as-built (حصر كميات القطع)

Planned Inspection Date	Planned Inspection Time
	10:00 AM

Checklist Attached ☐	Test Results Attached ☐	Calibration Attached ☐	Other as Indicated ☐
Drawing Reference	ITP Reference	MS Reference	

Comments by: [Brilliant]	Comments by: [SPECTRUM]	Comments by: [Shoaib]
تم التسليم على الرفع المساحي للقطاع ولم يتم تعديل الاعمال بنسبة 00 %	تم الفحص الميداني وتطابق من الناحية المساحية والرفع	

INSPECTION RESULT					Approval Status	
Organisation	Name	Sign	Date	Time	A/A/C/R	
Brilliant Survey			27-11-2023			
SPECTRUM			28/11/23			
GAMI**						
Employer representative						

POINT NUM	NORTH	EAST	ELEVATION	DESCRIPTION	الوصف
127726	2863809.677	491427.092	128.183	CUT	قطع
127727	2863812.013	491431.401	128.162	CUT	قطع
127728	2863815.788	491436.124	128.021	CUT	قطع
127729	2863820.177	491441.846	127.859	CUT	قطع
127730	2863815.479	491454.198	128.232	CUT	قطع
127731	2863810.8	491450.1	128.227	CUT	قطع
127732	2863806.097	491446.327	128.229	CUT	قطع
127733	2863802.591	491440.038	128.307	CUT	قطع
127734	2863799.369	491434.905	128.287	CUT	قطع
127735	2863796.675	491430.99	128.207	CUT	قطع
127736	2863787.563	491433.001	128.48	CUT	قطع
127737	2863791.272	491438.223	128.376	CUT	قطع
127738	2863795.922	491443.9	128.301	CUT	قطع
127739	2863799.83	491448.952	128.299	CUT	قطع
127740	2863803.522	491454.215	128.258	CUT	قطع
127741	2863808.164	491459.979	128.468	CUT	قطع
127742	2863795.882	491464.712	128.545	CUT	قطع
127743	2863794.819	491459.746	128.379	CUT	قطع
127744	2863789.829	491455.165	128.443	CUT	قطع
127745	2863786.461	491449.987	128.471	CUT	قطع
127746	2863783.399	491443.95	128.608	CUT	قطع
127747	2863780.384	491438.582	128.655	CUT	قطع
127748	2863778.535	491434.527	128.646	CUT	قطع
127749	2863767.442	491439.542	128.504	CUT	قطع
127750	2863771.434	491445.25	128.448	CUT	قطع
127751	2863775.851	491450.751	128.531	CUT	قطع
127752	2863780.318	491456.828	128.224	CUT	قطع
127753	2863784.921	491462.655	128.341	CUT	قطع
127754	2863789.004	491467.754	128.268	CUT	قطع
127755	2863792.525	491471.712	128.514	CUT	قطع
127756	2863783.078	491477.783	128.55	CUT	قطع
127757	2863778.685	491472.714	128.214	CUT	قطع
127758	2863773.935	491468.15	128.211	CUT	قطع
127759	2863769.788	491464.735	128.133	CUT	قطع
127760	2863766.103	491457.087	128.318	CUT	قطع
127761	2863763.84	491451.866	128.319	CUT	قطع
127762	2863760.928	491446.015	128.463	CUT	قطع
127763	2863757.565	491442.09	128.512	CUT	قطع
127764	2863745.369	491446.122	128.104	CUT	قطع
127765	2863750.724	491450.92	128.335	CUT	قطع

وليات كونسلت للاستشارات الهندسية
HSR - Blue Line - Sec.05
استشاري الأعمال المساحية بالقطاع الخاص

أحمد

شركة الزهبي للمقاولات

تم الرفع للقطاع من 640+120 الى 640+200 بتاريخ 2023-11-26

POINT NUM	NORTH	EAST	ELEVATION	DESCRIPTION	الوصف
127766	2863755.879	491457.358	128.171	CUT	قطع
127767	2863760.439	491463.470	128.217	CUT	قطع
127768	2863764.516	491468.656	128.215	CUT	قطع
127769	2863768.729	491474.096	128.076	CUT	قطع
127770	2863772.85	491479.551	128.143	CUT	قطع
127771	2863775.839	491483.833	128.267	CUT	قطع
127772	2863767.969	491490.209	128.391	CUT	قطع
127773	2863762.068	491484.55	128.087	CUT	قطع
127774	2863756.568	491479.238	128.228	CUT	قطع
127775	2863751.201	491473.724	128.163	CUT	قطع
127776	2863746.832	491467.422	128.194	CUT	قطع
127777	2863743.566	491460.443	128.297	CUT	قطع
127778	2863739.827	491452.138	128.156	CUT	قطع
127779	2863735.393	491464.775	128.166	CUT	قطع
127780	2863739.93	491470.14	128.403	CUT	قطع
127781	2863745.535	491477.393	128.18	CUT	قطع
127782	2863750.11	491482.922	128.218	CUT	قطع
127783	2863755.134	491489.223	128.22	CUT	قطع
127784	2863761.728	491495.155	128.246	CUT	قطع
127785	2863753.746	491505.697	128.308	CUT	قطع
127786	2863748.842	491499.826	128.021	CUT	قطع
127787	2863744.393	491494.909	128.021	CUT	قطع
127788	2863738.556	491489.678	128.335	CUT	قطع
127789	2863735.246	491484.759	128.167	CUT	قطع
127790	2863734.2	491476.377	128.111	CUT	قطع
127791	2863734.547	491470.367	128.135	CUT	قطع
127792	2863735.692	491463.487	128.238	CUT	قطع
تم الرفع للقطاع من 640+120 إلى 640+200 بتاريخ 2023-11-26					

شركة الذهبي للمقاولات

تم الرفع للقطاع من 640+120 إلى 640+200 بتاريخ 2023-11-26

معمل انشاء مصر كابيتال

التاريخ: 25/11/2023
اسم المشروع: مشروع الخط الأزرق السريع (الكيلو صفر - الوصل الإنتاج الحلفي)

قامت شركة برليانت كونسلت للاستشارات الهندسية المدنية (مستشاري الأعمال المدنية لهيئة الطرق والكباري)

بأخذ القياسات المنفذة المنفذة بشركة الأمي للمقاولات

م	من المسطة رقم	الى المسطة رقم	التصنيف	الكمية بالمتر المكعب	الملاحظات
1	639+720	639+120	اعمال ردم	57555.35	اعمال ردم على (REV05)
2	639+580	639+730	اعمال ردم	4467.34	اعمال ردم على (REV05)
3	639+780	639+920	اعمال ردم	6450.58	اعمال ردم على (REV05)
4	641+350	641+700	اعمال ردم	43872.17	اعمال ردم على (REV05)
5	642+220	642+480	اعمال ردم	10635.97	اعمال ردم على (REV05)
			اجمالي الكمية	123081.31	

مصر هارون (2)
المرفقات:
اسكتش موازنة شبكة
لقطات فوتوغرافية
شيت الأسبلت موضح به الكميات

مهندس الشركة المنفذة

استشاري الهندسة المدنية برليانت

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

شركة الزهبي للمقاولات

حصر كميات الردم مستخلص جاري (2) 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	81.08	810.78	810.78
638+740.00	86.15	1,672.25	2,483.03
638+760.00	89.3	1,754.50	4,237.53
638+780.00	91.69	1,809.96	6,047.49
638+800.00	82.87	1,745.60	7,793.09
638+820.00	93.47	1,763.37	9,556.46
638+840.00	130.87	2,243.40	11,799.86
638+860.00	139.32	2,701.92	14,501.78
638+880.00	135	2,743.19	17,244.97
638+900.00	132.92	2,679.18	19,924.15
638+920.00	131.13	2,640.52	22,564.67
638+940.00	177.65	3,087.78	25,652.45
638+960.00	191.18	3,688.30	29,340.75
638+980.00	196.98	3,881.67	33,222.42

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

شركة الذهبي للمقاولات

Station	Fill Area (Sq.M.)	Fill Volume (Cu.M.)	Cum. Fill Vol. (Cu.M.)
639+000.00	204.27	4,012.56	37,234.98
639+020.00	190.9	3,951.73	41,186.71
639+040.00	165.5	3,564.07	44,750.78
639+060.00	166.94	3,324.41	48,075.19
639+080.00	154.71	3,216.42	51,291.61
639+100.00	154.15	3,088.56	54,380.17
639+120.00	163.37	3,175.19	57,555.36
639+580.00	12.79	127.86	57,683.22
639+600.00	20.01	327.93	58,011.15
639+620.00	27.24	472.45	58,483.60
639+640.00	34.28	615.2	59,098.80
639+660.00	45.98	802.61	59,901.41
639+680.00	41.84	878.13	60,779.54
639+700.00	31.64	734.79	61,514.33
639+720.00	19.19	508.36	62,022.69
639+780.00	44.98	449.76	62,472.45
639+800.00	38.63	836.06	63,308.51
639+820.00	32.93	715.59	64,024.10

HSR - Blue Line - Sec.05

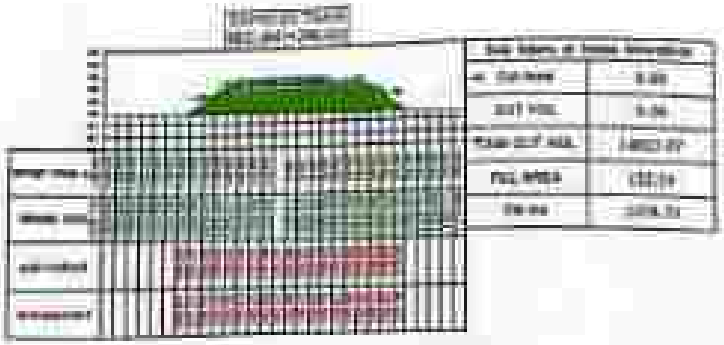
Station	Fill Area (Sq.M.)	Fill Volume (Cu.M.)	Cum. Fill Vol. (Cu.M.)
639+840.00	30.28	632.1	64,656.20
639+860.00	37.18	674.58	65,330.78
639+880.00	39.76	769.4	66,100.18
639+900.00	34.12	738.81	66,838.99
639+920.00	24.31	584.28	67,423.27
641+260.00	125.61	1,256.08	68,679.35
641+280.00	122.24	2,478.53	71,157.88
641+300.00	131.61	2,538.59	73,696.47
641+320.00	121.04	2,526.52	76,222.99
641+340.00	124.99	2,460.31	78,683.30
641+360.00	118.24	2,432.34	81,115.64
641+380.00	121.69	2,399.27	83,514.91
641+400.00	119.02	2,407.10	85,922.01
641+420.00	109.13	2,281.56	88,203.57
641+440.00	80.83	1,899.68	90,103.25
641+460.00	90.34	1,711.74	91,814.99
641+480.00	94.91	1,852.48	93,667.47
641+500.00	84.89	1,797.94	95,465.41
641+520.00	79.41	1,643.00	97,108.41

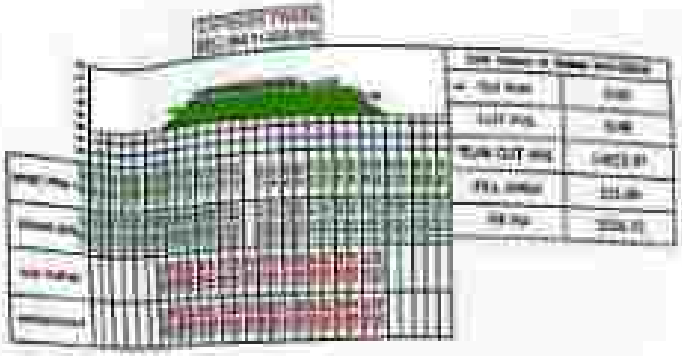
Station	Fill Area (Sq.M.)	Fill Volume (Cu.M.)	Cum. Fill Vol. (Cu.M.)
641+540.00	72.99	1,524.02	98,632.43
641+560.00	61.44	1,344.33	99,976.76
641+580.00	72.47	1,339.16	101,315.92
641+600.00	66.58	1,390.53	102,706.45
641+620.00	67.79	1,343.68	104,050.13
641+640.00	49.04	1,168.28	105,218.41
641+660.00	46.26	953.04	106,171.45
641+680.00	46.11	923.77	107,095.22
641+700.00	53.08	991.9	108,087.12
641+720.00	51.31	1,043.88	109,131.00
641+740.00	43.64	949.52	110,080.52
641+760.00	31.68	753.24	110,833.76
641+780.00	24.48	561.68	111,395.44
642+220.00	39.04	390.41	111,785.85
642+240.00	40.74	797.82	112,583.67
642+260.00	42.71	834.53	113,418.20
642+280.00	48.82	915.35	114,333.55
642+300.00	48.27	970.9	115,304.45

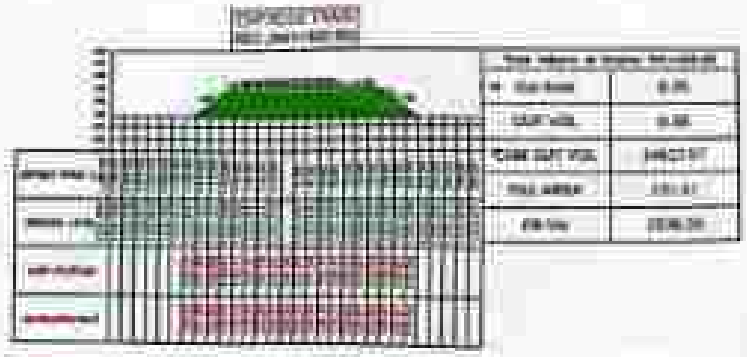
Station	Fill Area (Sq.M.)	Fill Volume (Cu.M.)	Cum. Fill Vol. (Cu.M.)
642+320.00	52.13	1,004.02	116,308.47
642+340.00	65.65	1,177.82	117,486.29
642+360.00	69.57	1,352.22	118,838.51
642+380.00	68.51	1,380.79	120,219.30
642+400.00	77.55	1,460.60	121,679.90
642+420.00	80.79	1,583.49	123,263.39
642+440.00	80.54	1,613.37	124,876.76
642+460.00	83.45	1,639.89	126,516.65
642+480.00	88.02	1,714.66	128,231.31
اجمالي الكمية بالمتر المكعب		128,231.31	

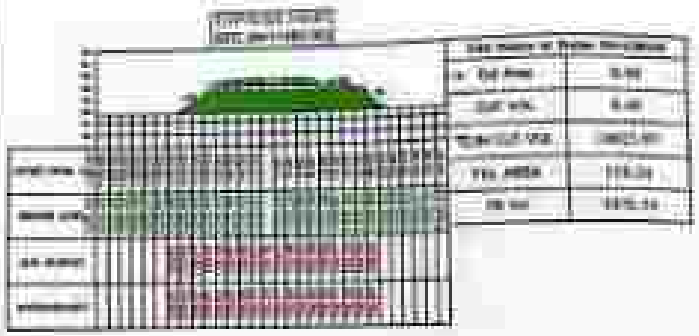
بلبات كونسلت للاستشارات الهندسية
H&R - Blue Line - Sec.05
استشاري أعمال الصناعة بالقطاع الخامس

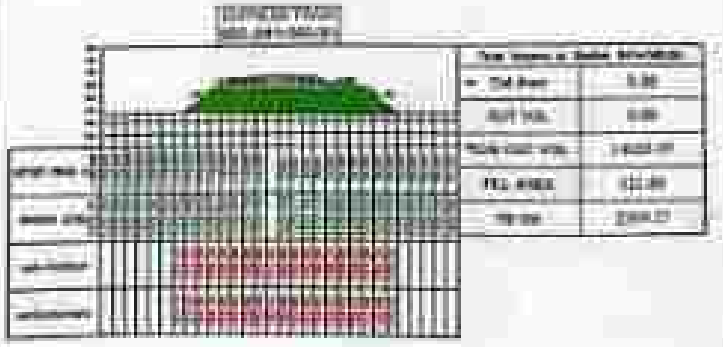
شركة الزهبي للمقاولات

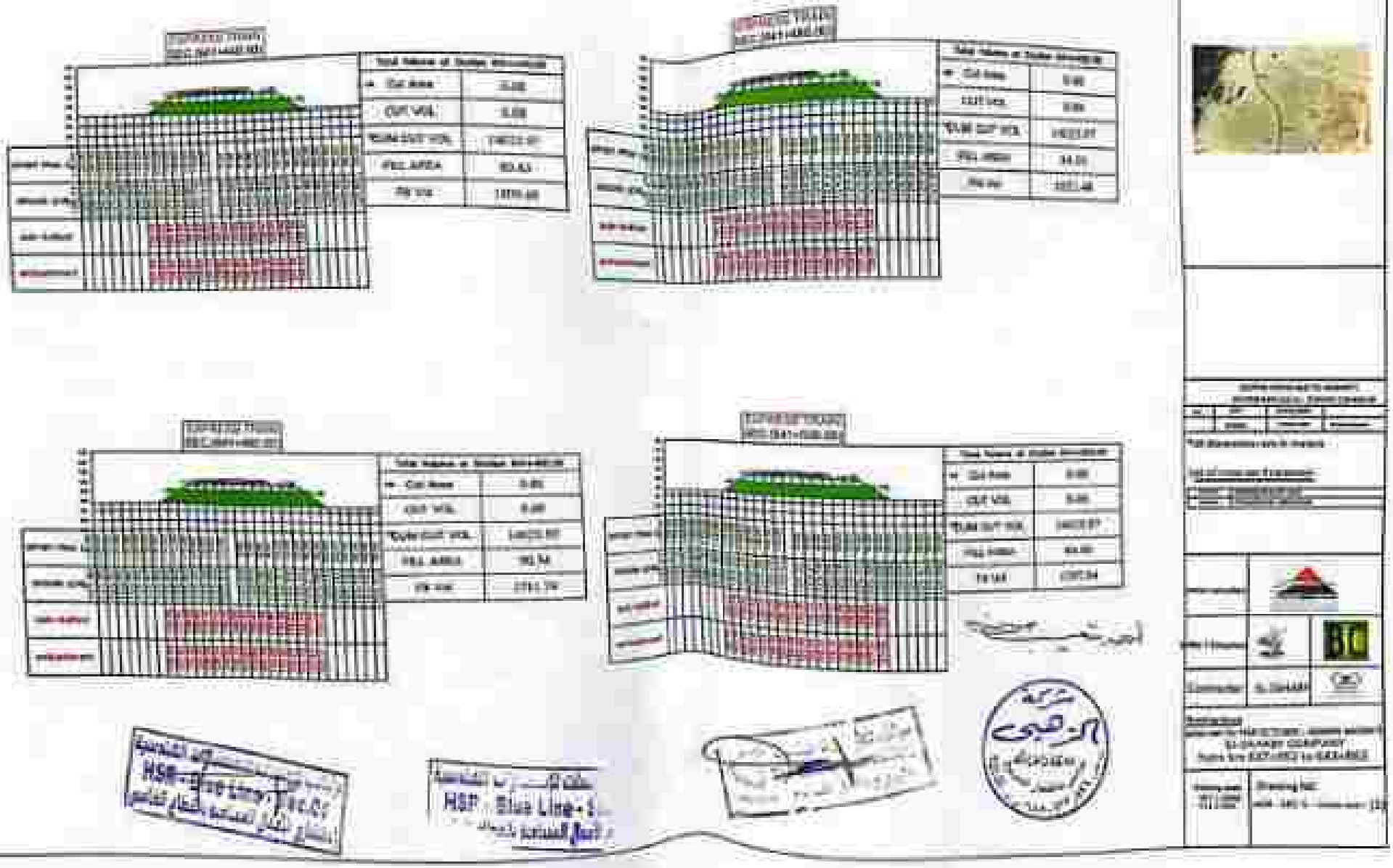


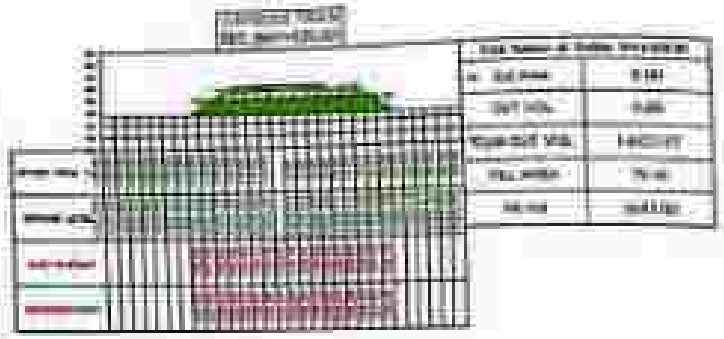


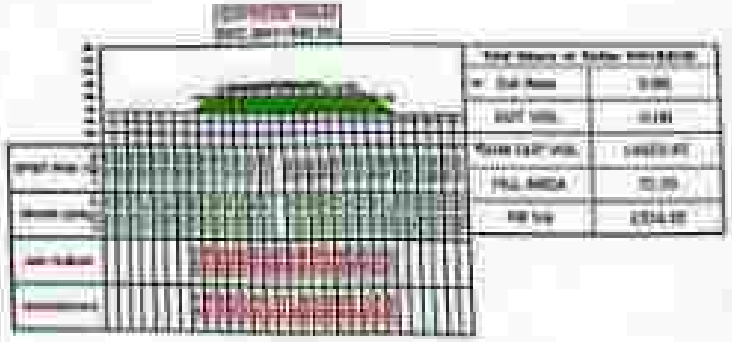


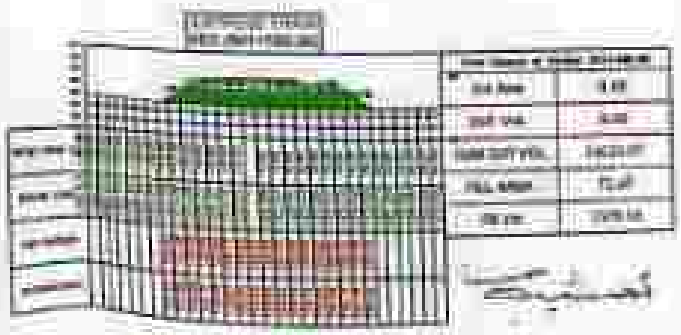


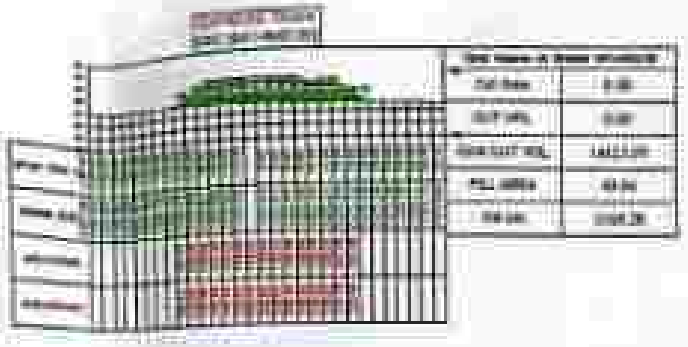


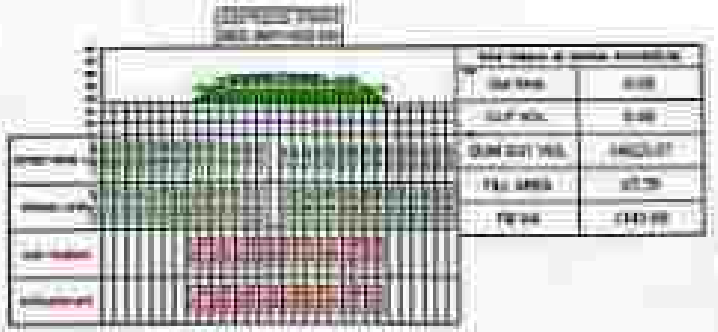


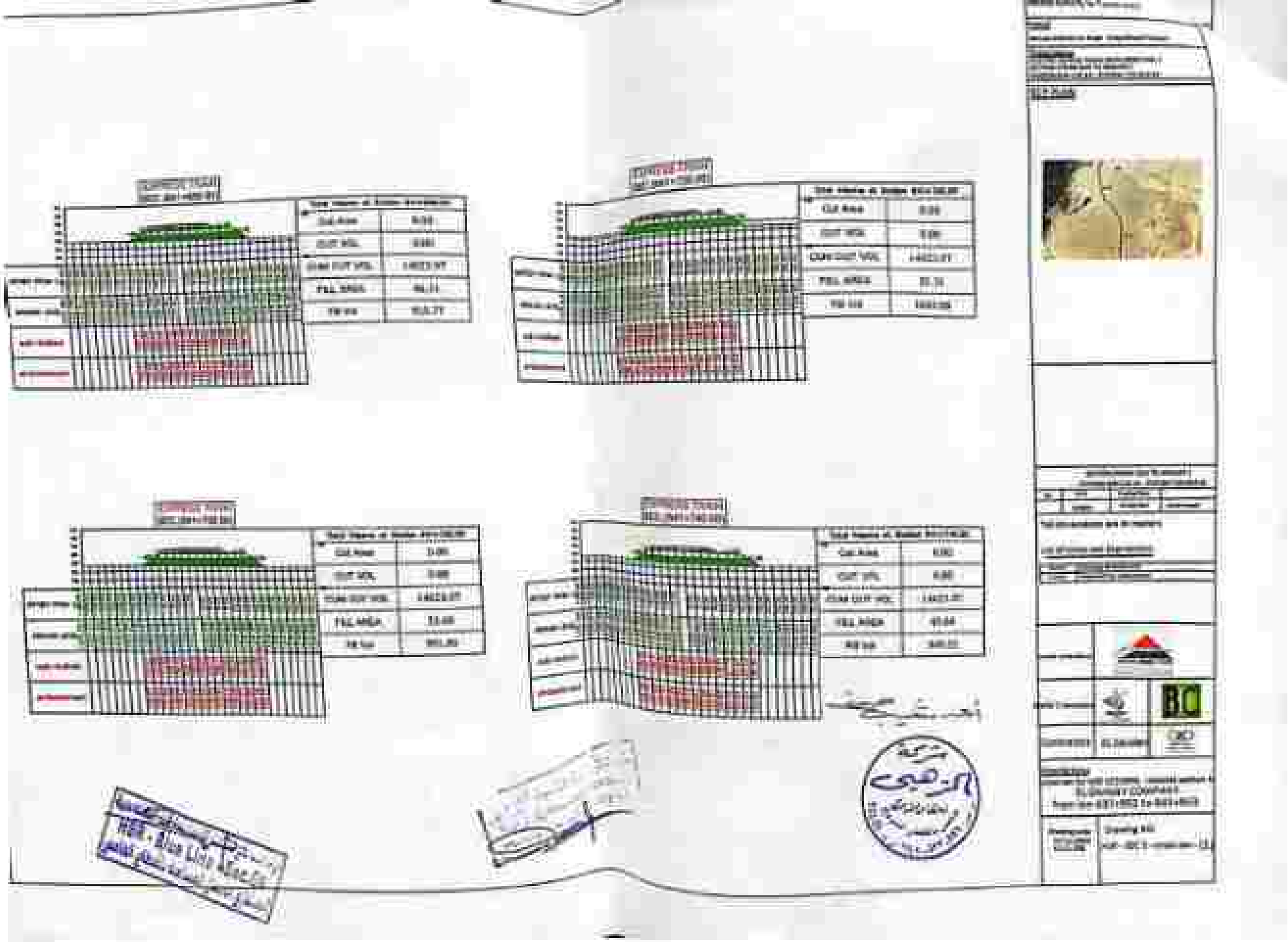


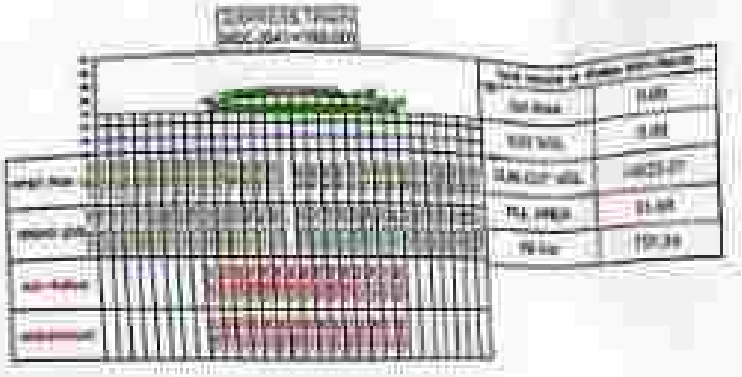


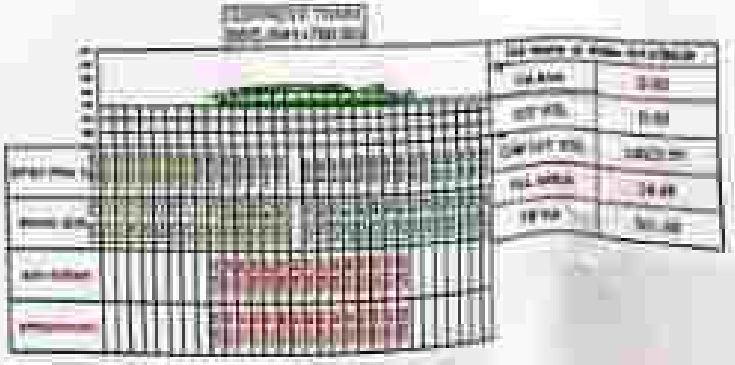




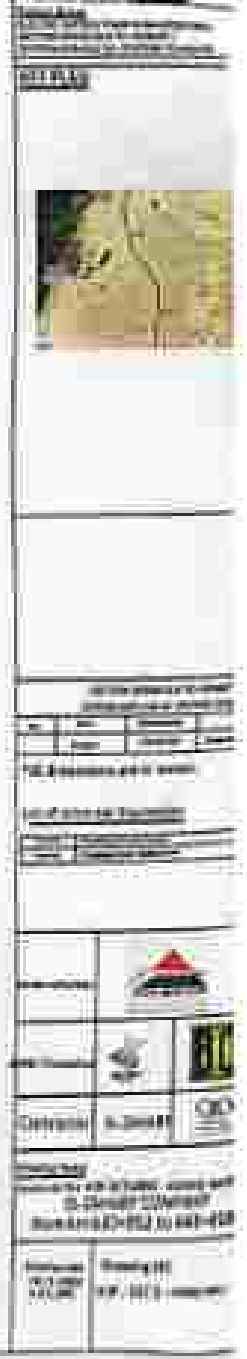


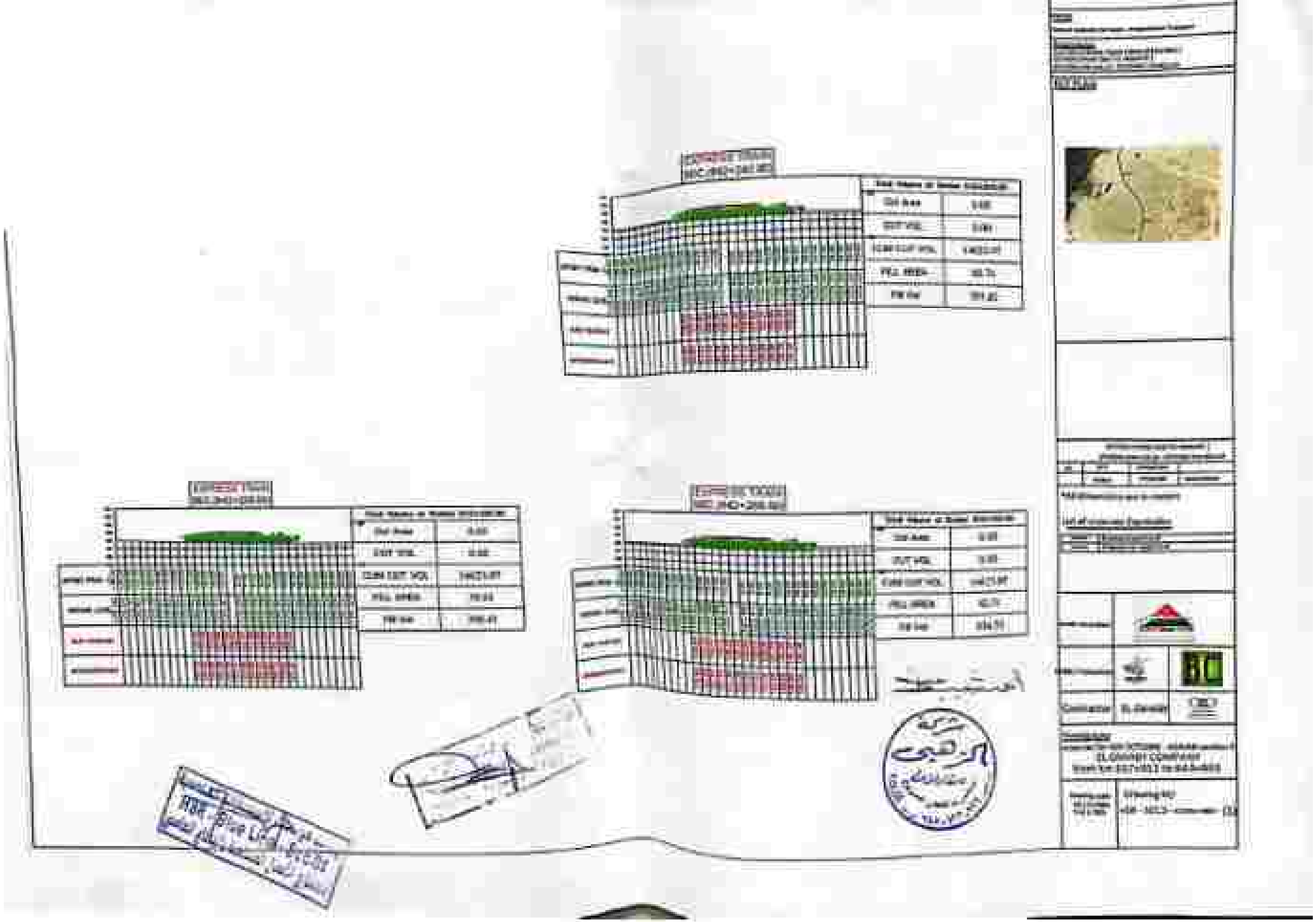


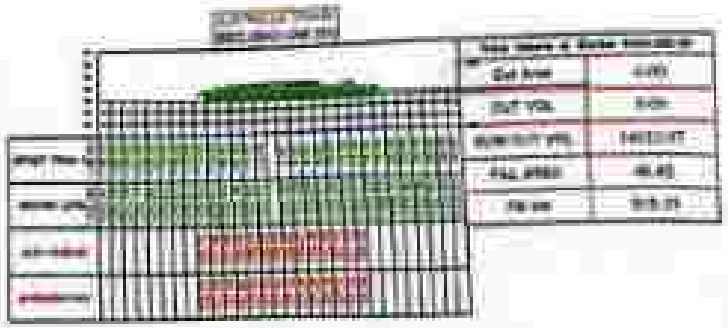


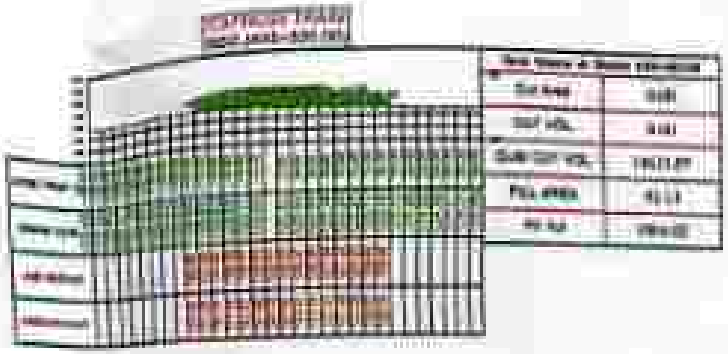


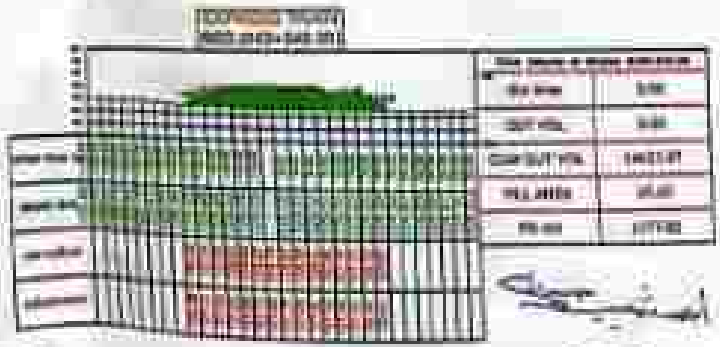
HSR - Blue Line | Sec.17

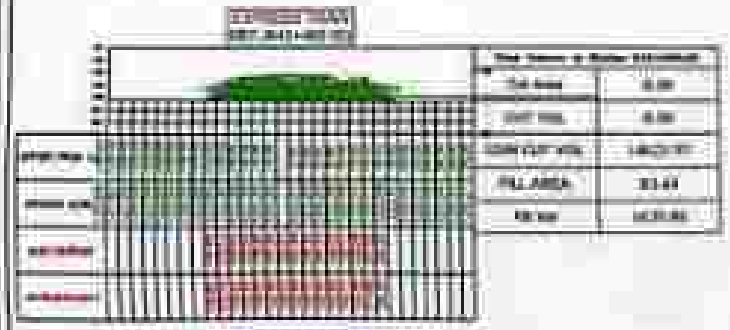


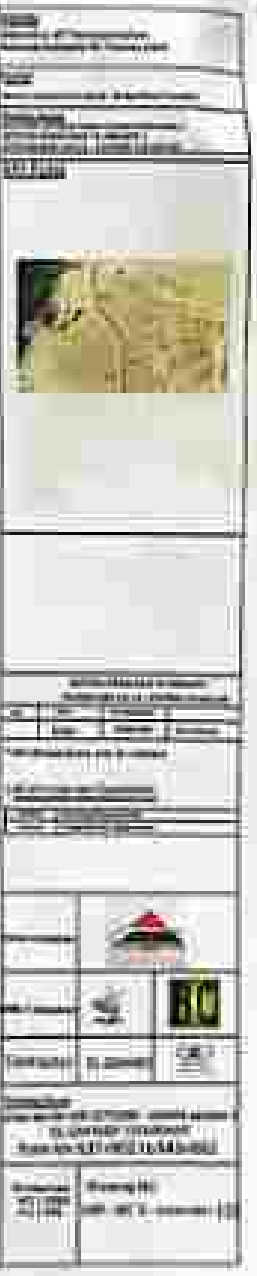


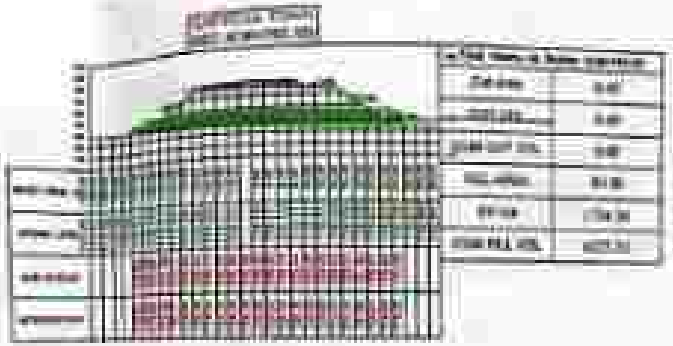


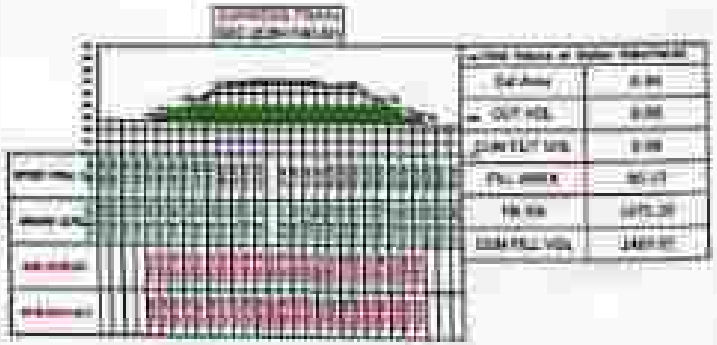


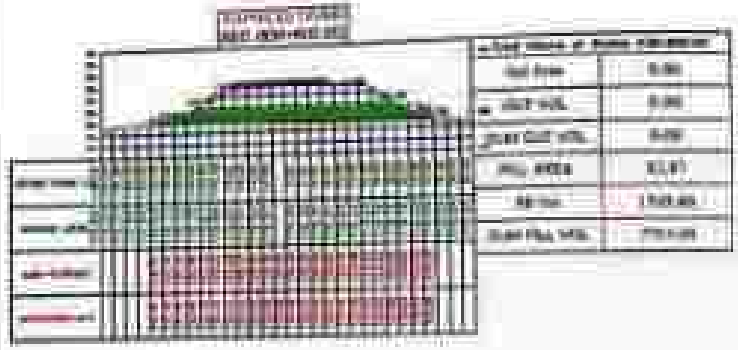


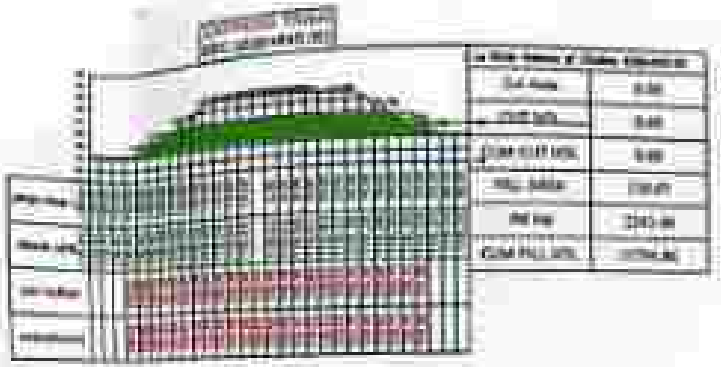


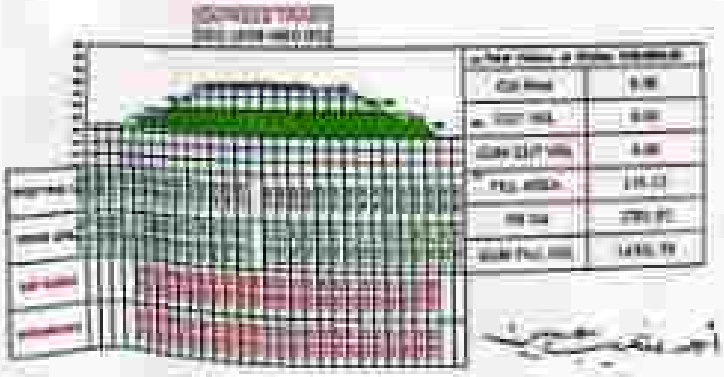


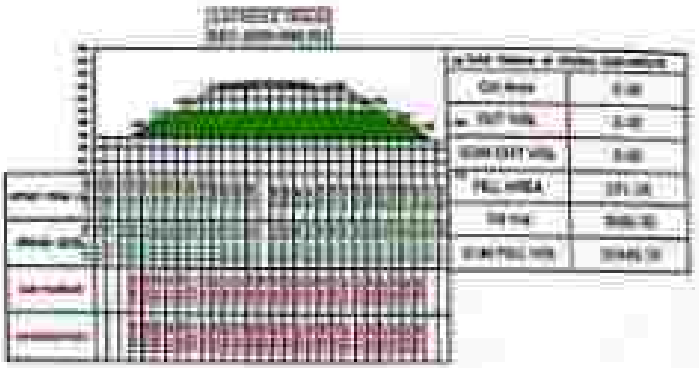


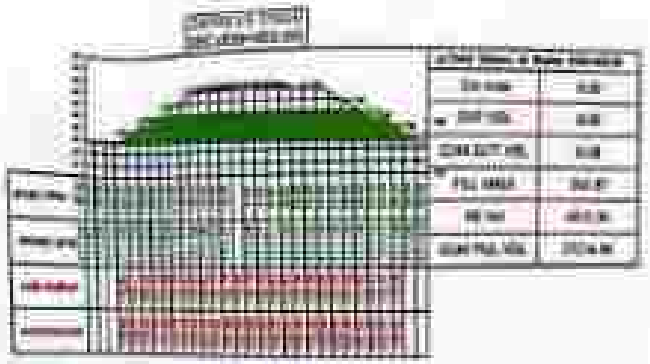


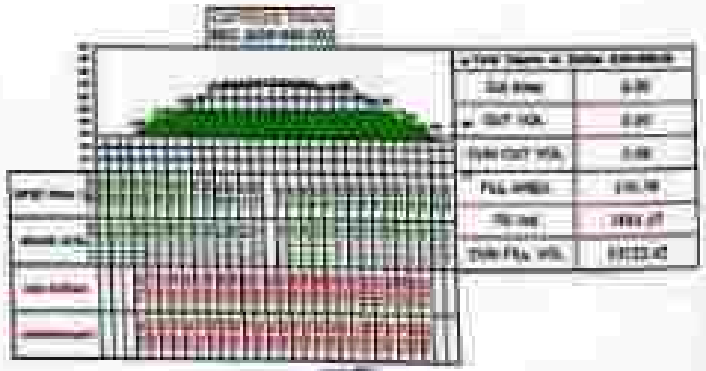


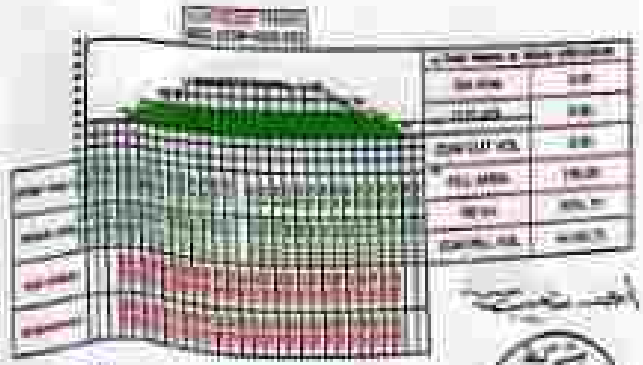


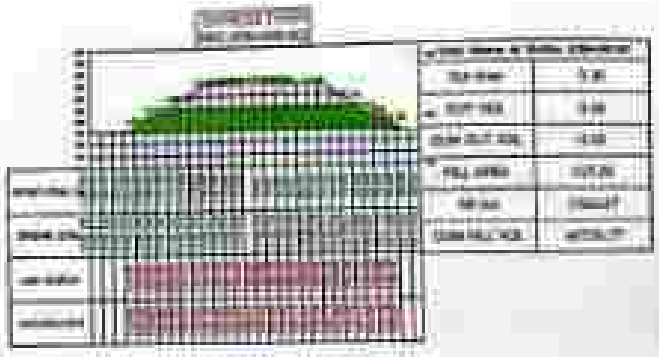


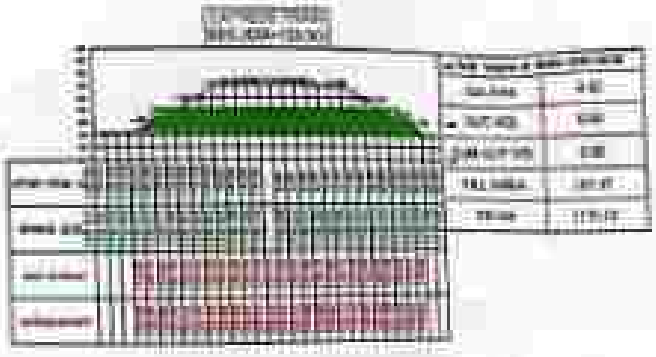


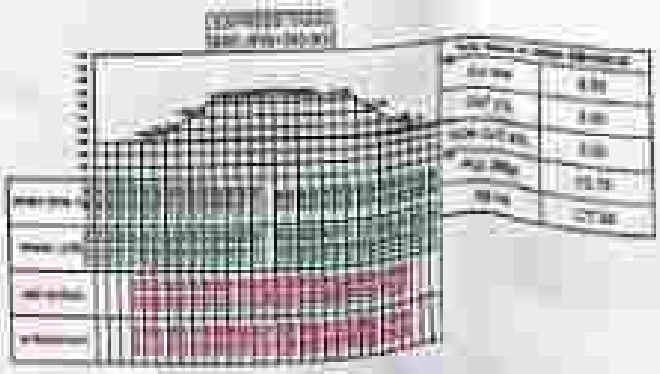


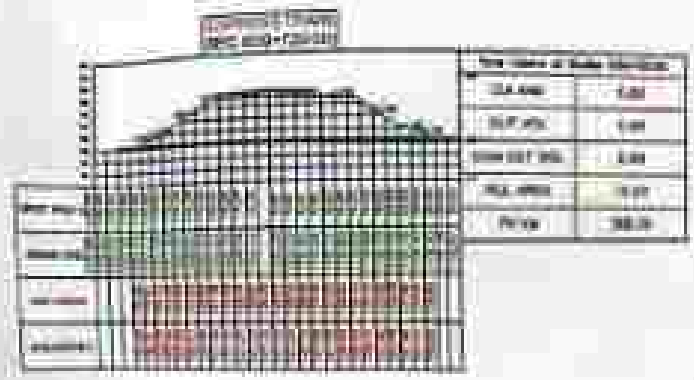


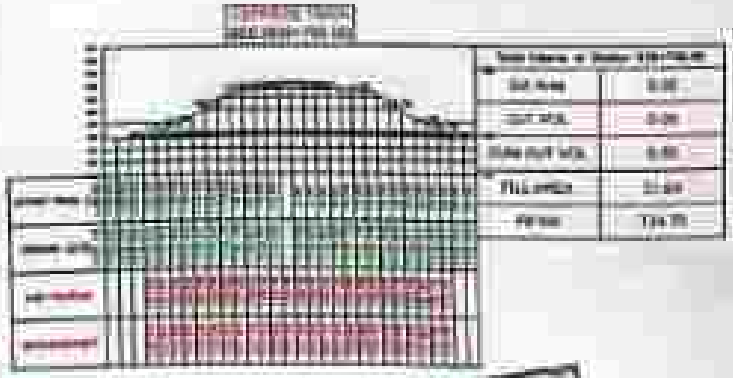


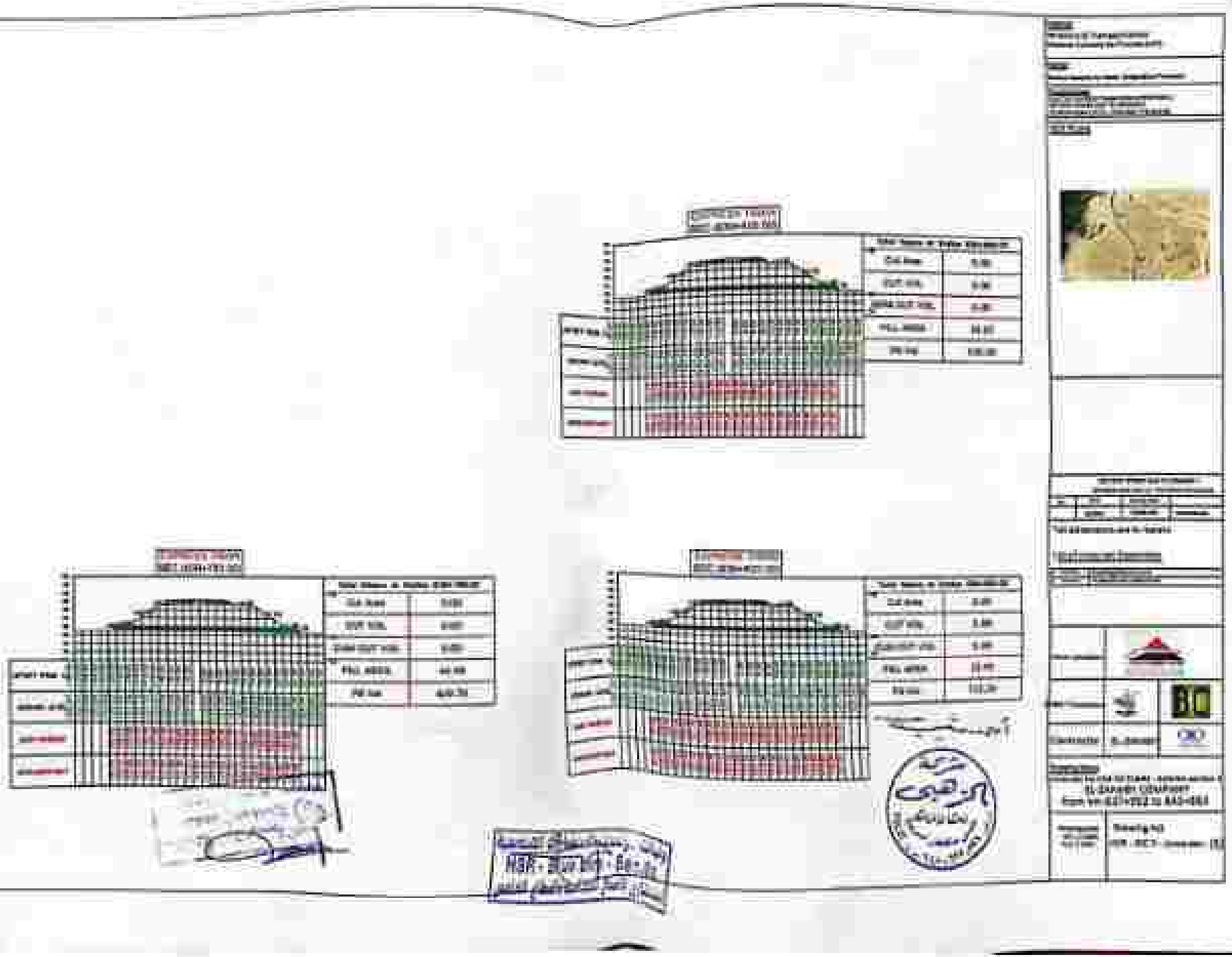


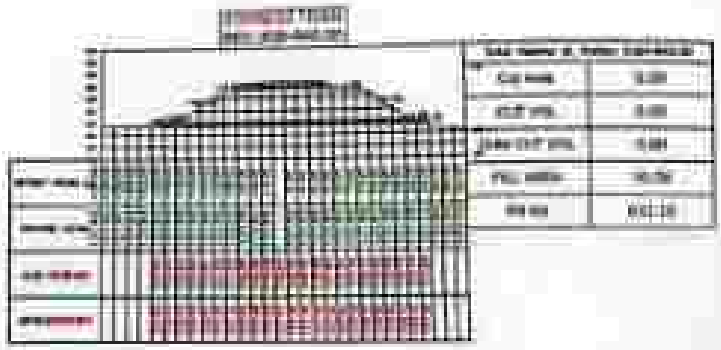


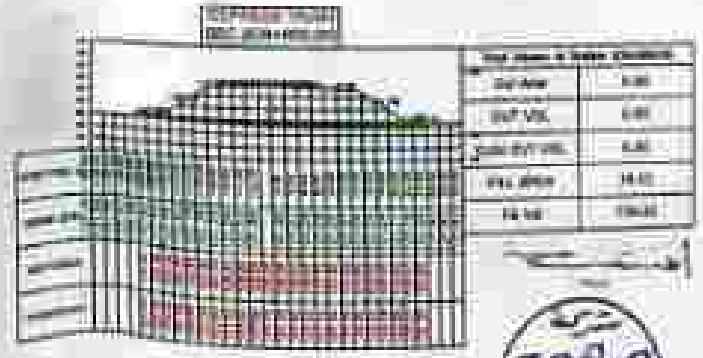


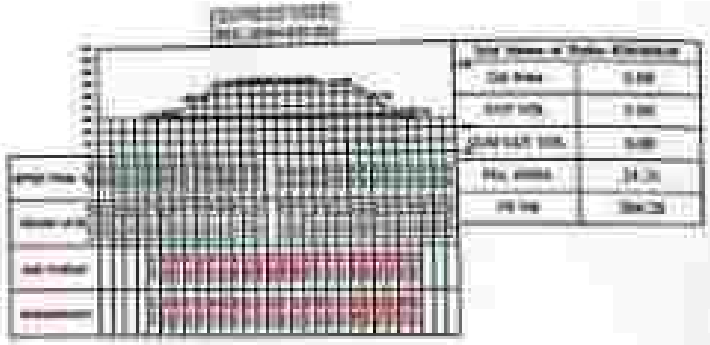


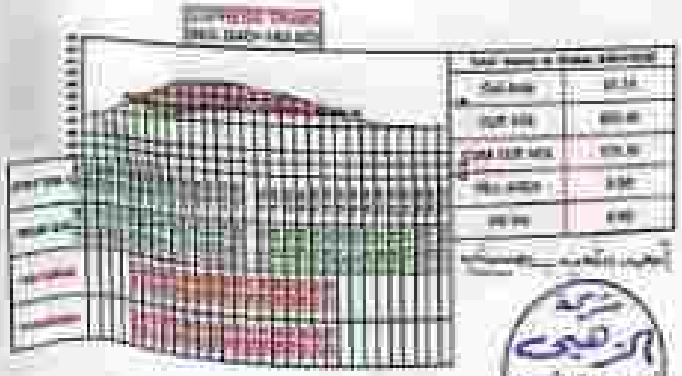


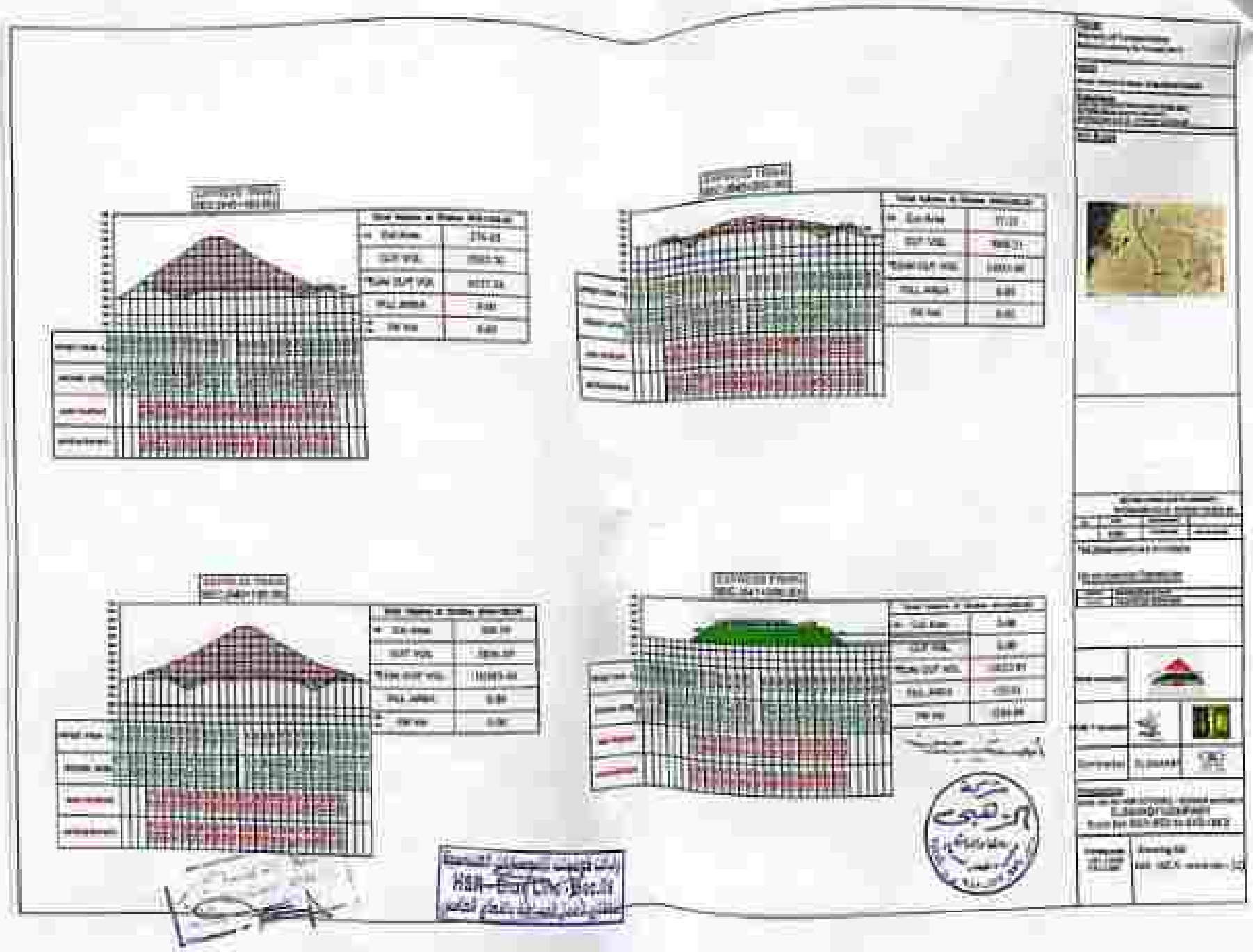












CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلي

Company : شركة الذهبي 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 (641+300 to 641+440)
Test Date : 25/07/2023
Report Date : 26/07/2023
Type of soil : Original earth.
Report No. : 1 : 2

Dear Gentleman,

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

Apparatus

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive loads to the loading plates
6. Dial indicator measuring device with scale capacity 700 Bar (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 limit values are 5.0 kp/cm²
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 (2nd) 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 الأقصر
تليفون وفاكس 212,951,437
٣ شارع الملك الأفضل - الزمالك - القاهرة

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax : 27367321 - 27363093

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون - فاكس : ٢٧٣٦٧٣٢١ - ٢٧٣٦٣٠٩٣
www.cel-egypt.com

Raport

1. Evaluation and representation of results.
2. Load Settlement curve.
3. The test report content the following:-

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

Report

- **Type of soil : Original earth**
- **Job requirement : Ev2 > 40 MPa**

Item	Descriptions
- Type of bedding material below the plate	Natural Soil
- Plate Diameter (mm)	300
- date of measurement	26/07/2023
- Unusual observation made during test	NO
- Description of the soil conditions below the plate after testing	No deformation

Evaluation and representation of results

Test No.	Station		Location	Level (m)	First Cycle	Second Cycle	Ev2/Ev1 Ratio
	From	To			Ev1 (MPa)	Ev2 (MPa)	
1	641+300	641+400	641+350	-4.5	79.4	140.8	1.77
2	641+400	641+440	641+420	-4.5	106.4	118.5	1.11

Signature / .....

CEL
مكتب معامل الإستشارات الهندسية
مشروعات ، الأقصر
219.991.437
3 شارع ...

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلي

Company Name	: شركة الأفق للمقاولات و التوريدات العمومية
Project	: Electric Express Train – Sector (3) – Group 10 Aswan
Test Date	: 25/07/2023
report date	: 26/07/2023
Location	: Station (641+366)
Test No.	: 01

Nonrepetitive Static Plate Load Tests of Soils
DIN 18134

Loading Stage (1)

Loading	Stress	Dial 1	Settlement	Dial 2	Settlement	Average
	Kg/cm2		mm		mm	
0	0.00	20.00	0.00	20.00	0.00	0.00
1	0.83	19.80	0.20	19.73	0.27	0.23
2	1.66	19.55	0.45	19.63	0.37	0.41
3	2.50	19.38	0.62	19.45	0.55	0.61
4	3.33	19.32	0.68	19.13	0.87	0.87
5	4.17	18.83	1.17	18.78	1.22	1.20
6	5.00	18.68	1.32	18.54	1.46	1.39

Unloading Stage (1)

Loading	Stress	Dial 1	Settlement	Dial 2	Settlement	Average
	Kg/cm2		mm		mm	
1	2.50	18.78	1.22	18.66	1.34	1.28
2	1.25	18.85	1.15	18.73	1.27	1.21
3	0.100	18.93	1.07	18.89	1.11	1.12

Loading Stage (2)

Loading	Stress	Dial 1	Settlement	Dial 2	Settlement	Average
	Kg/cm2		mm		mm	
0	0.83	18.80	1.20	18.71	1.29	1.25
1	1.66	18.66	1.34	18.58	1.42	1.38
2	2.50	18.51	1.49	18.40	1.60	1.55
3	3.33	18.44	1.56	18.28	1.72	1.64
4	4.17	18.35	1.65	18.10	1.90	1.78

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الأقصر
تليفون 219 991 437

CEL

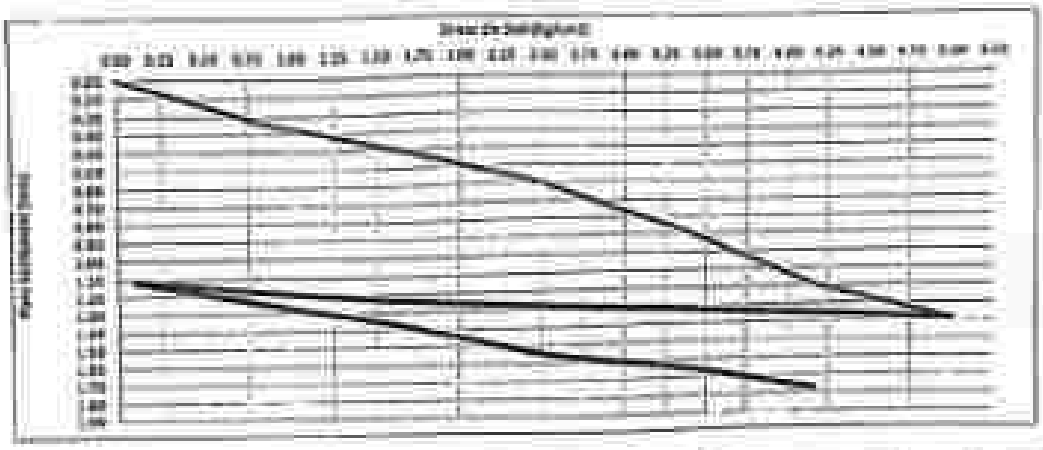
Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلي

Company Name	: قاعي شفرات و التوريدات العمومية
Project	: Electric Express Train - Sector (3) – Cairo to Aswan
Test Date	: 2020/10/23
report date	: 2020/10/23
Location	: Station (941+341)
Test No.	: 97

Nonrepetitive Static Plate Load Tests of Soils
DIN 18134



Loading (1)	0	1	2	3	4	5	6
Stage(Kg)	0	586	1172.8	1758.3	2312.6	2946.1	3522.5
Stress (Kg/cm2)	0.00	0.83	1.65	2.50	3.33	4.17	5.00
Settlement (mm)	0.00	0.23	0.41	0.61	0.87	1.20	1.36

UnLoading (1)	1	2	3	4
Stage(Kg)	3522	1758	954	21
Stress (Kg/cm2)	5.00	2.50	1.352	0.10
Settlement (mm)	1.36	1.29	1.23	1.13

D (mm) = 300		S1 (mm)= 0.38	S2(mm)= 0.93	S2/S1 = 2.45		
Ev2 (MPa) = 0.72*D/S2(mm)		19.4				

Loading (2)	0	1	2	3	4	5
Stage(Kg)	0	586.295	1172.8	1758.3	2312.6	2946.1
Stress (Kg/cm2)	0.00	0.83	1.65	2.50	3.33	4.17
Settlement (mm)	1.13	1.25	1.38	1.55	1.64	1.78

D (mm) = 300		S1 (mm)= 1.25	S2(mm)= 1.97	S2/S1 = 1.57		
Ev2(MPa) =	0.72*D/S2(mm)	45.5				

ExI/ExII =	1.31

Ev1 = Modulus of deformation during the loading stage.
Ev2 = Modulus of deformation during the Reloading stage.
D = Plate diameter (mm)
S1 = The difference between 0.3 and 0.7 from the maximum loading (mm) (kg/cm²)
S2 = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)

CEL
مكتب معامل الإستشارات الهندسية
مشروعات الأقصر
210.991.437
المركز الرئيسي 3 شارع الملك الأشرف - الزمالك - القاهرة

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

Company Name : شركة ذاتى للمقاولات و التوريدات العمومية
Project : Metro Express Train - Semi (5 – Sous to Armen)
Test Date : 25/07/2023
report date : 26/07/2023
Location : Station (441+430)
Test No. : 02

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	19.80	0.20	0.19
2	1.66	19.68	0.32	19.65	0.35	0.34
3	2.50	19.53	0.47	19.41	0.59	0.53
4	3.33	19.35	0.65	19.30	0.70	0.67
5	4.17	19.12	0.88	19.08	0.92	0.90
6	5.00	18.95	1.05	18.88	1.12	1.09

Unloading Stage (1)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
1	2.50	19.03	0.97	18.98	1.02	1.00
2	1.67	19.06	0.94	18.98	1.02	0.98
3	0.100	19.13	0.87	19.08	0.92	0.90

Loading Stage (2)

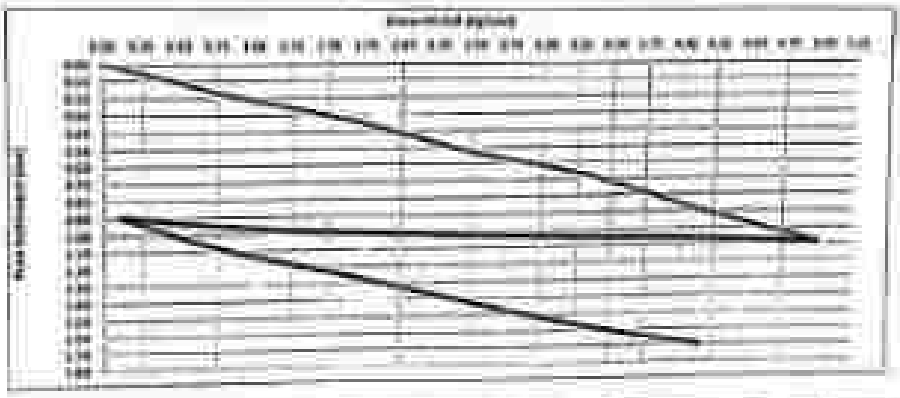
Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
0	0.83	18.90	1.10	18.90	1.10	1.10
1	1.66	18.75	1.25	18.73	1.27	1.26
2	2.50	18.60	1.40	18.55	1.45	1.43
3	3.33	18.45	1.55	18.40	1.60	1.58
4	4.17	18.31	1.69	18.28	1.72	1.71

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلى
219.901.432

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

Company Name : [illegible]
Project : [illegible]
Test Date : [illegible]
report date : [illegible]
Location : Station ([illegible])
Test No. : 02

Nonexcavation Static Plate Load Tests of Soils
DIN 18134



Loading (T)	0	1	2	3	4	5	6
Stage(Pa)	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stress (kg/cm2)	0.00	0.40	1.00	2.00	3.00	4.17	5.00
Settlement (mm)	0.00	0.16	0.34	0.61	0.97	0.40	1.03

Unloading (T)	1	2	3	4
Stage(Pa)	[illegible]	[illegible]	[illegible]	[illegible]
Stress (kg/cm2)	[illegible]	[illegible]	[illegible]	[illegible]
Settlement (mm)	[illegible]	[illegible]	[illegible]	[illegible]

D (mm) =	300	E1 (mm) =	1.31	Sdmax =	0.16
Ks (MPa) =	[illegible]		106.4	SS =	0.40

Loading (T)	0	1	2	3	4	5
Stage(Pa)	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stress (kg/cm2)	0.00	0.40	1.00	2.00	3.00	4.17
Settlement (mm)	0.00	1.10	1.29	1.43	1.58	1.71

D (mm) =	300	E2 (mm) =	1.22	Sdmax =	1.00
Ks (MPa) =	[illegible]		115.6	SS =	0.17

Pu(MPa) = [illegible]

Ed1 = Modulus of deformation during the loading stage
Ed2 = Modulus of deformation during the unloading stage
D = Plate diameter (mm)
Sd = The difference between S1 and S2 from the maximum loading stress (kg/cm²)
SS = Difference in settlements corresponding to S1 and S2 from the maximum loading stress

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الأقصر
تليفون: 219,951 437
[illegible] 3 شارع [illegible] - الزمالك - القاهرة

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax : 2736721 - 2736093

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢١ - ٢٧٣٦٠٩٣
www.cel-egypt.com

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

Company : شركة النصر للمقاولات و التوريدات العمومية

Project : Electric Express Train - Sector (5) – Qena 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 (641+440 to 641+540)
Test Date : 12/06/2023
Repet Date : 13/06/2023
Type of soil : Original Earth at level
Report No. : 1

Dear Gentleman,

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

Apparatus

1. Loading plates consists of two plates with 330 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 100 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 limit values are 5.0 kg/cm²
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 (2nd) 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
219.311.437

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax : 27367251 - 27363069

IAS ACCREDITED Testing & Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٥١ - ٢٧٣٦٣٠٦٩
www.ccl-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 : Original Earth**
- **Job requirement : Ev2 > 30 MPa**

Item	Descriptions
- Type of bedding material below the plate	Natural Soil
- Plate Diameter (mm)	300
- date of measurement	12/08/2023
- Unusual observation made during test	NO
- Description of the soil conditions below the plate after testing	No deformation

Evaluation and representation of results

Test No.	Station		Location	Level (m)	First Cycle	Second Cycle	E_{v2}/E_{v1} Ratio
	From	To			E_{v1} (Mpa)	E_{v2} (Mpa)	
1	641+440	641+540	641+500	-4.5	112.3	132.2	1.18

Signature :

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

Company Name : شركة الأهلي للمقاولات و التوريدات العمومية
Project : Electric Express Train - Sector (3) - Cairo to Ain-Sokhna
Test Date : 12/08/2023
report date : 13/08/2023
Location : Station (641+500)
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	25.00	0.00	25.00	0.00	0.00
1	0.83	19.89	0.11	19.20	0.80	0.46
2	1.66	19.65	0.35	19.00	1.00	0.68
3	2.50	19.43	0.57	18.82	1.18	0.88
4	3.33	19.28	0.72	18.77	1.23	0.98
5	4.17	18.06	0.94	18.05	1.31	1.13
6	5.00	18.94	1.06	18.27	1.73	1.40

Unloading Stage (1)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
1	2.50	19.07	0.93	18.36	1.64	1.29
2	1.25	19.20	0.80	18.69	1.31	1.18
3	0.100	19.53	0.47	18.78	1.22	0.84

Loading Stage (2)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
0	0.83	19.47	0.53	18.56	1.44	1.01
1	1.66	19.23	0.77	18.34	1.66	1.22
2	2.50	19.11	0.89	18.19	1.81	1.35
3	3.33	18.95	1.05	18.03	1.97	1.51
4	4.17	18.89	1.11	17.94	2.06	1.59

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلي
219 ش الملك الأفضل - الزمالك - القاهرة

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax : 27367211 - 27367893

IAS

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون و فاكس : ٢٧٣٦٧٢١١ - ٢٧٣٦٧٨٩٣

CEL

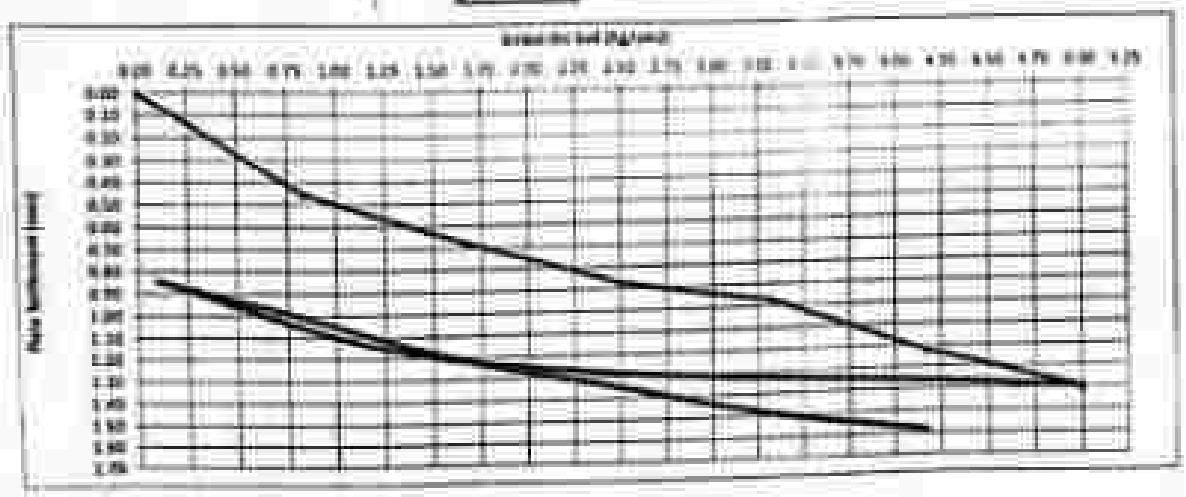
Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلي

Company Name	: الأهلي للمقاولات و الكوبريهات المصرية
Project	: Electric Express Train - Sector (3) - Cairo to Amreyi.
Test Date	: 11/08/2023
Report date	: 13/08/2023
Location	: Station (641+500)
Test No.	: 01

Nonrepetitive Static Plate Load Tests of Soils
DIN 18134



Loading (1)	0	1	2	3	4	5	6
Stage(Kg)	0	589	1172.8	1756.3	2352.8	2946.1	3533.9
Stress (Kg/cm2)	0.00	0.83	1.66	2.50	3.33	4.17	5.00
Settlement (mm)	0.00	0.46	0.69	0.88	0.99	1.23	1.40

UnLoading (1)	1	2	3	4
Stage(Kg)	3533	1756	584	71
Stress (Kg/cm2)	5.00	2.50	1.250	0.10
Settlement (mm)	1.40	1.29	1.16	0.94

D (mm) = 300		S1 (mm)=	0.46	S2(mm)= 1.40	ΔS = 0.94
Ev1 (MPa) =	(0.75*D*Δσ)/ΔS		113.3		

Loading (2)	0	1	2	3	4	5
Stage(Kg)	0	586.392	1172.8	1756.3	2352.8	2946.1
Stress (Kg/cm2)	0.10	0.83	1.66	2.50	3.33	4.17
Settlement (mm)	0.94	1.01	1.22	1.35	1.46	1.59

D (mm) = 300		S1 (mm)=	1.16	S2(mm)= 1.61	ΔS = 0.22
Ev2 (MPa) =	(0.75*D*Δσ)/ΔS		192.2		

Ev2/Ev1 = 1.70

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 [illegible] 0.3 and 0.7 [illegible] maximum loading (mm).

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلي
3 ش الملك الأفضل

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

مشروعات محافظات الوجه القبلي

Company : شركة الذهبي للمقاولات و الخدمات العمومية

Project : Electric Express Train - Sector (E) – Giza 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 (641+040 to 641+040)
Test Date : 17/08/2023
Report Date : 18/08/2023
Type of soil : Original Earth at level (-3.00)
Report No. : 1

Dear Gentleman,

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

Apparatus

1. Loading plates consists of two plates with 300 mm and 300 mm diameter
2. The thickness of plates 30 mm
3. Dial gauges with accuracy 0.01 mm to measuring the settlement
4. Steel straightedges with magnetic supports to fixed the dial gauges
5. Hydraulic jack with pump to transfer reactive force to the loading plates
6. Dial manometer measuring device with work capacity 700 Bar (Pressure)
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 150 mm and 300 mm diameter, hydraulic jack and 3 dial gauges
3. Prior to starting the test apply 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 5.5 kg/cm²
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 (2nd) 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

Report

1. Evaluation and representation of results
2. Load Settlement curve.
3. The test report content the following:-

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

Report

- **Type of soil : Original Earth**
- **Job requirement : Ev2 > 40 MPa**

Item	Descriptions
- Type of bedding material below the plate	Natural Soil
- Plate Diameter (mm)	300
- date of measurement	17/08/2023
- Unusual observation made during test	NO
- Description of the soil conditions below the plate after testing	No deformation

Evaluation and representation of results

Test No.	Station		Location	Level (m)	First Cycle	Second Cycle	Ev2/Ev1 Ratio
	From	To			Ev1 (Mpa)	Ev2 (Mpa)	
1	641+540	641+940	641+600	3.5	92.3	105.6	1.14
2	641+540	641+940	641+600	-3.0	86.6	106.0	1.22
3	641+540	641+940	641+600	-2.5	91.0	137.4	1.51

CEL

Signature

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

Company Name : شركة لتاهي للطرق و التوريدات العمومية
Project : Electric Express Train - Sector (2) - Giza to Ismail.
Test Date : 17/08/2023
report date : 18/08/2023
Location : Station (641+600)
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	19:00	0.00	19:00	0.00	0.00
1	0.63	19:01	0.13	19:01	0.17	0.15
2	1.05	19:08	0.34	19:01	0.39	0.37
3	2.50	19:38	0.63	19:42	0.58	0.60
4	3.33	19:23	0.79	19:24	0.74	0.76
5	4.17	19:23	0.97	19:09	0.92	0.95
6	4.50	18:59	1.11	19:02	1.07	1.09

Unloading Stage (1)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
1	2.50	18:15	1.05	19:00	1.00	1.03
2	1.25	18:19	0.86	19:17	0.78	0.82
3	0.100	18:30	0.41	19:03	0.39	0.40

Loading Stage (2)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
0	0.00	19:47	0.53	19:49	0.51	0.52
1	1.00	19:19	0.75	19:26	0.72	0.73
2	2.50	19:06	0.94	19:11	0.89	0.92
3	3.33	18:51	1.05	18:54	1.00	1.03
4	4.17	18:19	1.27	18:46	1.18	1.23

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلي
ت: 2191 371 432
3 ش الملك الأفضل - الزمالك - القاهرة

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax : 27367231 - 27363893

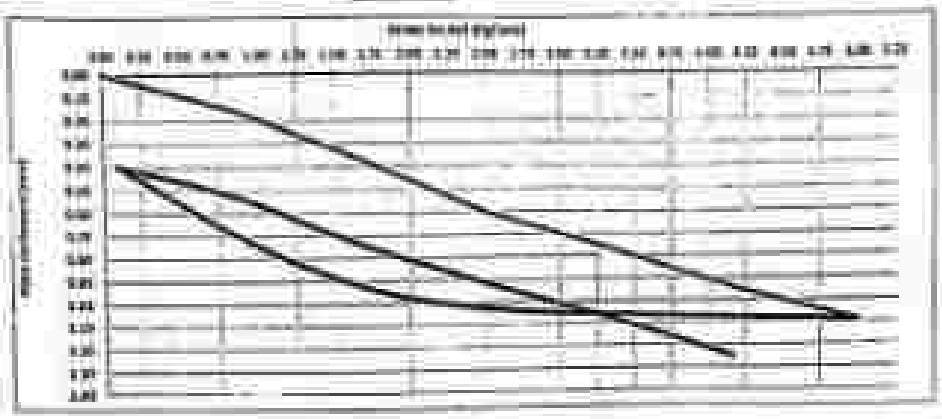
IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون - فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٨٩٣
www.cel-egypt.com

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

Company Name : [illegible]
Project : [illegible]
Test Date : [illegible]
report date : [illegible]
Location : Station (641+600)
Test No. : 01

Nonmonotonic Static Plate Load Tests of Soils
(BS 1377-9)



Loading (T)	0	1	2	3	4	5	6
Stress(Pa)	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stress (Kg/cm2)	0.00	0.60	1.00	2.00	3.33	4.17	5.00
Settlement (mm)	0.00	0.10	0.37	0.65	0.79	0.90	1.26

Unloading (T)	1	2	3	4
Stress(Pa)	[illegible]	[illegible]	[illegible]	[illegible]
Stress (Kg/cm2)	5.00	2.50	1.250	0.70
Settlement (mm)	1.26	1.03	0.82	0.40

D (mm) = [illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ev2 (MPa) = [illegible]			[illegible]			

Loading (T)	0	1	2	3	4	5
Stress(Pa)	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stress (Kg/cm2)	0.00	0.83	1.50	2.50	3.33	4.17
Settlement (mm)	0.40	0.62	0.72	0.92	1.08	1.25

D (mm) = [illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ev2 (MPa) =	[illegible]		[illegible]			

D = Plate diameter (mm)

(Ev = Plate Stiffness between 0.3 and 0.7 from the maximum loading period (kg/cm²))

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

CEL

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax : 2336723 - 2336093

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون + فاكس : ٢٣٣٦٧٢٣ - ٢٣٣٦٠٩٣
www.cel-egypt.com

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

Company Name : شركة النهي للمقاولات و التوريدات العمومية
Project : (Electric Express Train - Sector (2) - Giza to Aswan)
Test Date : [illegible]
report date : [illegible]
Location : Station (641+690)
Test No. : 02

Nonrepetitive Static Plate Load Tests of Soils
DIN 18134

Loading Stress (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	19.87	0.13	0.15
2	1.66	19.64	0.36	19.64	0.36	0.36
3	2.50	19.41	0.59	19.41	0.59	0.59
4	3.33	19.21	0.79	19.21	0.79	0.79
5	4.17	19.00	1.00	19.00	0.97	0.98
6	5.00	18.87	1.13	18.89	1.09	1.11

Unloading Stress (1)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
1	3.50	19.99	1.04	19.99	1.01	1.03
2	1.75	19.18	0.82	19.21	0.79	0.81
3	0.100	19.57	0.43	19.61	0.39	0.41

Loading Stress (2)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
0	0.83	19.95	0.05	19.96	0.04	0.05
1	1.66	19.23	0.77	19.24	0.76	0.76
2	2.50	19.08	0.92	19.27	0.73	0.83
3	3.33	18.91	1.09	18.93	0.98	1.04
4	4.17	18.83	1.17	18.91	1.09	1.13

CEL
مكتب معامل الإستشارات الهندسية
مشروعات المحافظات
210 501 637

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax : 27367231 - 27362003

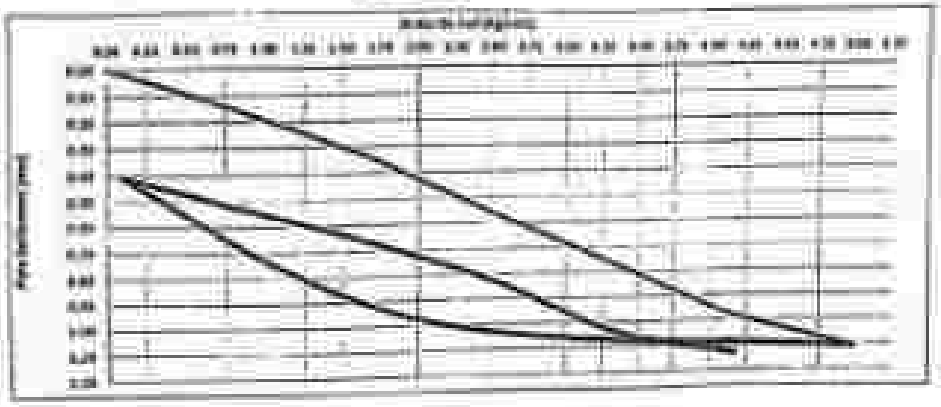
IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون - فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٢٠٠٣
www.cel-egypt.com

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

Company Name : [illegible]
Project : [illegible] Express Tram – Sector 05 – Group 12 Arrows
Test Date : [illegible]
Location : Station ([illegible])
Test No. : 05

Incremental Static Plate Load Tests of Soils
DIN 18134



Loading (T)	0	1	2	3	4	5	6
Stress (T/m²)	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stress (Kg/cm²)	0.00	0.83	1.66	2.50	3.33	4.17	5.00
Settlement (mm)	0.00	0.42	0.33	0.08	0.77	0.08	0.11

Unloading (T)	1	2	3	4
Stress (T/m²)	[illegible]	[illegible]	[illegible]	[illegible]
Stress (Kg/cm²)	[illegible]	[illegible]	[illegible]	[illegible]
Settlement (mm)	[illegible]	[illegible]	[illegible]	[illegible]

D (mm) = [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ks (MPa/m) = [illegible]		[illegible]			

Loading (T)	0	1	2	3	4	5
Stress (T/m²)	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stress (Kg/cm²)	0.10	0.87	1.66	2.50	3.32	4.17
Settlement (mm)	0.41	0.52	0.26	0.63	1.00	1.72

D (mm) = 300		[illegible]	0.04	[illegible] 1.00	0.43
Ks (MPa/m) =	[illegible]		105.0		

[illegible] = Maximum of deformations during the loading stage
[illegible] = Maximum of deformations during the unloading stage
D = Plate diameter (mm)
[illegible] = The difference between 0.3 and 0.7 from the maximum loading (mm) (highest)
[illegible] = Difference in settlements corresponding to 0.3 and 0.7 from the maximum loading (mm)

CEL
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلي

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

Company Name : شركة الأهلي للمقاولات و التوريدات العمومية
Project : Double Express Train – Realm (B) – Suez to Ashmun
Test Date : 17/08/2023
report date : 18/08/2023
Location : Station (941+000)
Test No. : 63

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	[illegible]	0.00	[illegible]	0.00	0.00
1	0.83	[illegible]	0.14	[illegible]	0.18	0.16
2	1.66	[illegible]	0.28	[illegible]	0.30	0.29
3	2.50	[illegible]	0.41	[illegible]	0.47	0.44
4	3.33	[illegible]	0.69	[illegible]	0.73	0.71
5	4.17	[illegible]	0.86	[illegible]	0.91	0.89
6	5.00	[illegible]	1.09	[illegible]	1.12	1.11

Unloading Stage (1)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
1	3.33	[illegible]	1.02	[illegible]	1.05	1.04
2	1.66	[illegible]	0.82	[illegible]	0.87	0.85
3	0.00	[illegible]	0.58	[illegible]	0.60	0.59

Loading Stage (2)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
0	0.83	[illegible]	0.71	[illegible]	0.76	0.74
1	1.66	[illegible]	0.88	[illegible]	0.94	0.91
2	2.50	[illegible]	1.06	[illegible]	1.08	1.07
3	3.33	[illegible]	1.16	[illegible]	1.19	1.18
4	4.17	[illegible]	1.25	[illegible]	1.30	1.28

CEL
مكتب معامل الإستشارات الهندسية
مشروعات الأهلي
210 001 437

CEL

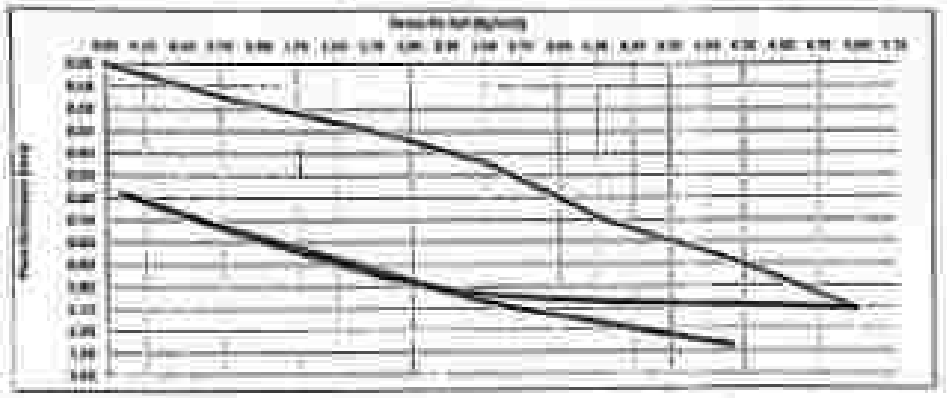
Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلي

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

Nonexpedition Static Plate Load Tests of Soils
DIN 18134



Loading (i)	0	1	2	3	4	5	6
Stage(Kg)	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stress (Kg/cm²)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Settlement (mm)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Unloading (i)	1	2	3	4
Stage(Kg)	[illegible]	[illegible]	[illegible]	[illegible]
Stress (Kg/cm²)	[illegible]	[illegible]	[illegible]	[illegible]
Settlement (mm)	[illegible]	[illegible]	[illegible]	[illegible]

D (mm) = [illegible]		[illegible]	[illegible]	[illegible]	[illegible] =	[illegible]
Ev1 (Kg) = [illegible]			[illegible]			

Loading (i)	0	1	2	3	4	5
Stage(Kg)	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stress (Kg/cm²)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Settlement (mm)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

D (mm) = [illegible]		[illegible]	[illegible]	[illegible]	[illegible] =	[illegible]
Ev2 (Kg) = [illegible]			[illegible]			

[illegible] = [illegible]

Ev1 = Modulus of deformation during the loading stage.
Ev2 = Modulus of deformation during the Reloading stage.
D = Plate diameter (mm)
Δs = The difference between 0.7 and 0.1 load the maximum loading (mm) (Kg/cm²).
Δs1 = Difference in settlements corresponding to 0.7 and 0.1 load for maximum loading (mm)

CEL
مكتب معامل الإستشارات الهندسية
مشروعات الأقصر
[illegible] 219, 001, 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

Testing date : 18/05/2023

Company Name : شركه الذهبي

Project : Electric Express Train – HSR From Sohag to Qena

Station : from 641+240 to 641+300

Level : -5.0 M

S. Description : Middle Embankment

Code : 05

- **Sieve Analysis:**

Sieve size (IN)	Passing %
2	100
1.5	100
1	98.8
¾	96.2
½	92.2
3/8	88.8
4	82.4
10	74.4
40	38.5
200	10.7

Test	Results	
Soil Classification	A-1-b	
Modified Proctor	Max Dry Density	2.06
	O.M.C	7.0 %
L.L	0	
P.I	0	
CBR	21.2 %	

Notes:.....

Lab (CEL)

Lab. Engineer /.....

Signature /.....

Consultant (Spectrum)

Engineer /.....

Signature /.....

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهلي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 18/7/2023

Soil type : Soil Embankment

Location : ST: From 641+240 To 641+300

Level : -5.0 M

Report No. : 05

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+260	1505	2.17	5.8	2.05	99.7%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density = 2.06 gm/cm^3
  - At optimum moisture content = 7.0 %

Signature :

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **18/5/2023**
Reporting Date	: **23/5/2023**
Reporting No.	: **05**

Dear Gentleman,

Attached here with the delivered on 18 / 5 / 2023

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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signatured

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 18/5/2023
Reporting Date : 23/5/2023
Reporting No. : 05

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	100
25	1	98.8
19	¾	96.2
12.50	½	92.2
9.50	3/8	88.8
4.75	4	82.4
2.00	10	74.4
0.425	40	38.5

Signature

Zamalek, Cairo
Tel/Fax: [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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 18/5/2023
Reporting Date : 23/5/2023
Reporting No. : 05

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)	10.7

Signature

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qaus To Armant

Location : (ST: 641+100) E=32.9226620 N=25.8862030

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

Delivery Date : 18/5/2023

Reporting Date : 23/5/2023

Reporting No. : 05

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

CEL

Signature:

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 18/5/2023

Reporting Date : 23/5/2023

Reporting No. : 05

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	74.4	Max 50 %	------	------
0.425 mm (No. 40).	38.5	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	10.7	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

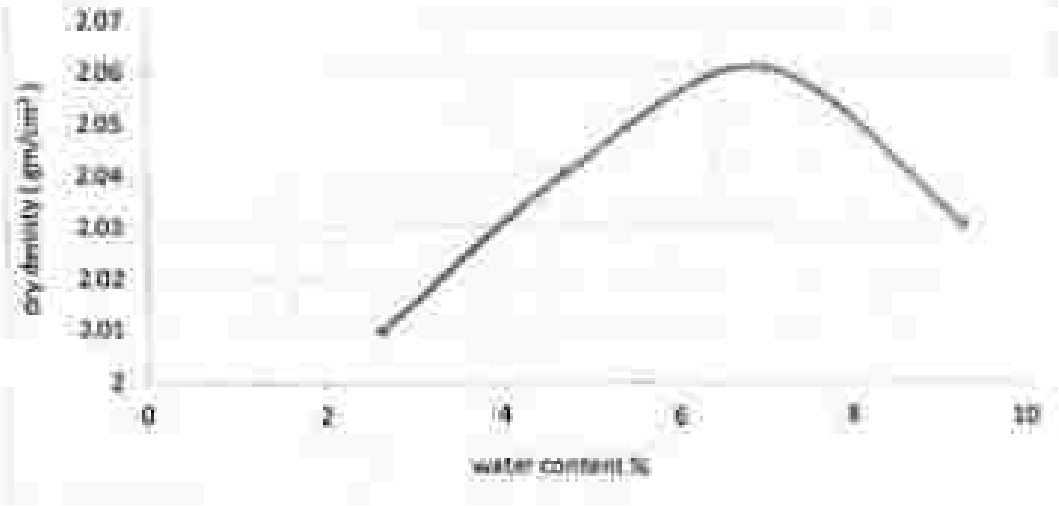
CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 18/5/2023
Reporting Date	: 23/5/2023
Reporting No.	: 05

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



- **Max dry density (gm/cm³)** : 2.06
- **Optimum moisture content %** : 7.0 %

Signature

CEL
210.931.437

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 18/5/2023
Reporting Date : 23/5/2023
Reporting No. : 05

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.22
1.27	0.050	0.61
1.91	0.075	1.01
2.54	0.100	1.46
3.18	0.125	1.74
3.81	0.150	1.85
4.45	0.175	1.76
5.08	0.200	1.58
6.35	0.250	1.19

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	St. Value	Sample results	21.2 %
	6.90	1.46	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.06 (gm /cm³)
At = [illegible] cent.
3- Surcharge load 4.50 Kg.
4- CBR > 10 for middle and lower embankments according project spec page No 36.

Signature

[illegible]

IAS ACCREDITED

CEL

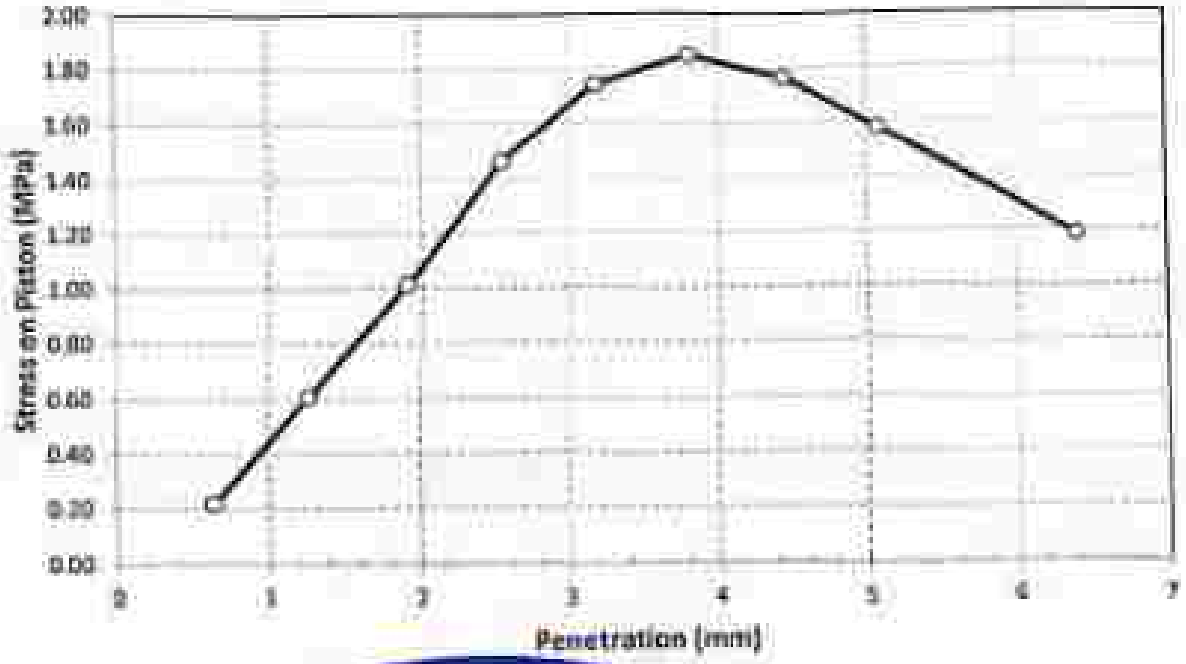
Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 18/5/2023
Reporting Date	: 23/5/2023
Reporting No.	: 05

Load Penetration Curve of CBR Test

ASTM D-1883



Signature :

CEL

5 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 27362021 - 27362151

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 : 25/7/2023

Soil type : Middle Embankment

Location : St From 641+220 To 641+300

Level : -4.5 M

Report No. : 11

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+240	1557	2.10	5.8	1.99	95.4%	Comply
2	641+280	1767	2.10	5.8	1.98	95.4%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density = 2.08 gm/cm^3
  - At optimum moisture content = 5.0 %

Signature /

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **20/7/2023**
Reporting Date	: **24/7/2023**
Reporting No.	: **05-2**

Dear Gentleman ,

Attached here with the delivered on 20 / 7 / 2023

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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature:

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 20/7/2023
Reporting Date : 24/7/2023
Reporting No. : 05-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	100
25	1	97.3
19	¾	95.4
12.50	½	91.6
9.50	3/8	87.4
4.75	4	81.5
2.00	10	71.3
0.425	40	36.8

Signature /

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+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 20/7/2023
Reporting Date	: 24/7/2023
Reporting No.	: 05-2

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)	11.4

Signature

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 20/7/2023
Reporting Date : 24/7/2023
Reporting No. : 05-2

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 / التوقيع

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 20/7/2023

Reporting Date : 24/7/2023

Reporting No. : 05-2

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	71.3	Max 50 %	——	——
0.425 mm (No. 40).	36.8	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	11.4	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 /

Zamalek, Cairo

IAS ACCREDITED

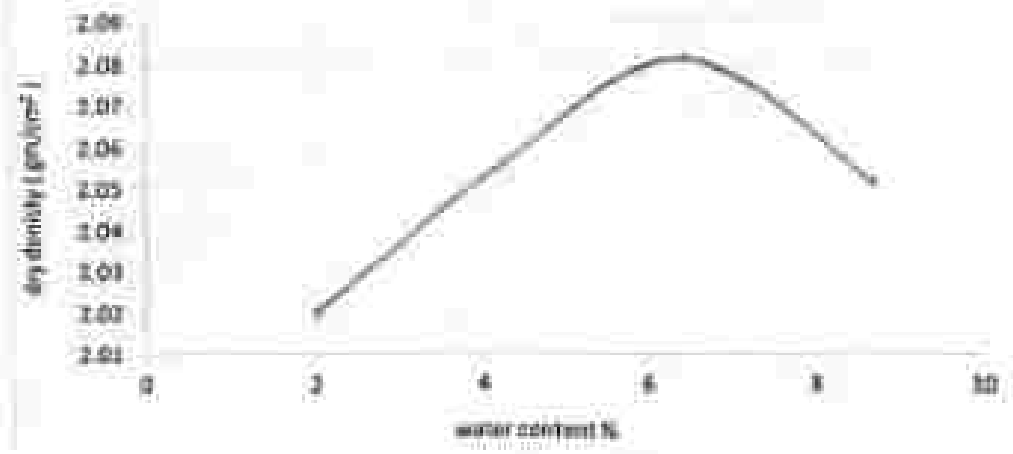
CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	**: شركة الذهبي**
Project	**: Electric Express Train – HSR From Qous To Armant**
Location	**: (ST: 641+100) E=32.9226620 N=25.8862030**
Type of sample	**: Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	**: 20/7/2023**
Reporting Date	**: 24/7/2023**
Reporting No.	**: 05-2**

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



- **Max dry density (gm/cm³)** **: 2.08**
- **Optimum moisture content %** **: 6.4 %**

Signature

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 20/7/2023

Reporting Date : 24/7/2023

Reporting No. : 05-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.25
1.27	0.050	0.66
1.91	0.075	1.07
2.54	0.100	1.52
3.18	0.125	1.78
3.81	0.150	1.88
4.45	0.175	1.77
5.08	0.200	1.56
6.35	0.250	1.12

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	St. Value	Sample results	22 %
	6.90	1.52	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.08 (gm /cm³)

At = 0.4 % optimum water content.

3- Surcharge load 4.5 kg

4- CBR > 10 for middle and upper embankments according project spec page No 36.

Signature / :

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: 641+100) E=32.9226620 N=25.8862030

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

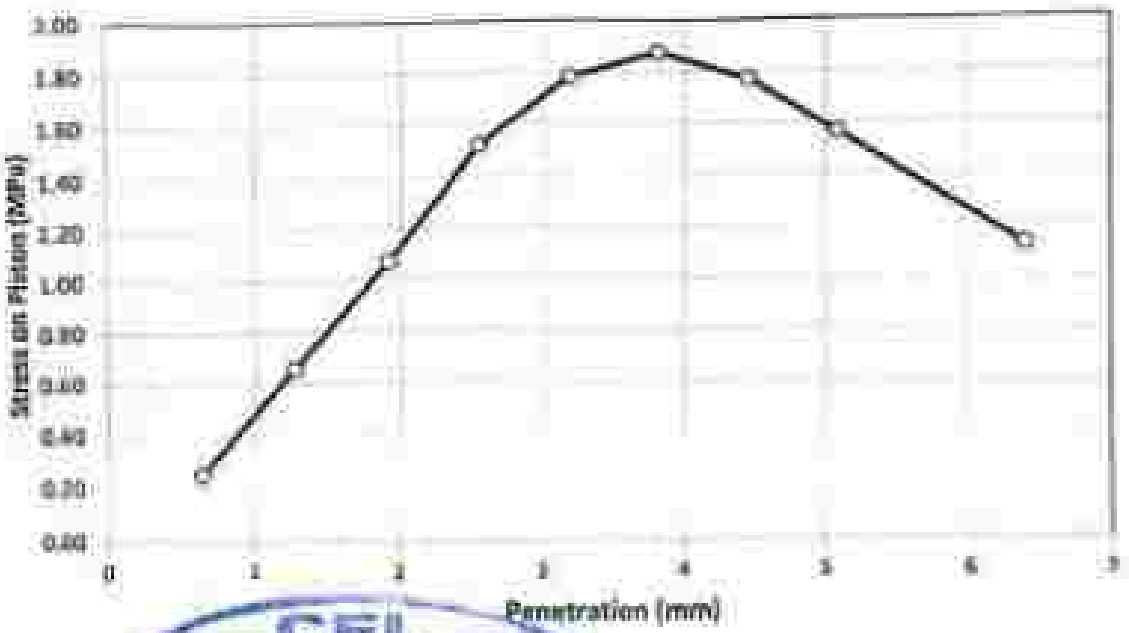
Delivery Date : 20/7/2023

Reporting Date : 24/7/2023

Reporting No. : 05-2

Load Penetration Curve of CBR Test

ASTM D-1883



CEL

Signature

IAS

Scanned with CamScanner

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 01/08/2023

Soil type : Middle Embankment

Location : St From 641+320 To 641+360

Level : -5 M

Report No. : 21

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+340	1426	2.24	5.8	2.12	99.6%	Comply

- Degree of compaction based on proctor test dated At :
  - Max dry density =2.13 gm/cm^3
  - At optimum moisture content = 6.4 %

Signature / _____

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **22/7/2023**
Reporting Date	: **26/7/2023**
Reporting No.	: **05-3**

Dear Gentleman,

Attached here with the delivered on 22 / 7 / 2023

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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature : م / محمد عثمان

CEL

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة النهي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	97.1
25	1	93.1
19	¾	90.0
12.50	½	85.5
9.50	3/8	81.6
4.75	4	77.6
2.00	10	72.9
0.425	40	39.9

Signature /..

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+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

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)	11.3

Signature /

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 22/7/2023
Reporting Date : 26/7/2023
Reporting No. : 05-3

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:

44 Mark E Wasif Street
Zeitoun, Cairo
Tel & Fax: 27500221 - 27500651

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : (ST: 641+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-3

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	72.91	Max 50 %	------	------
0.425 mm (No. 40).	39.87	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	11.3	Max 15 %	Max 15 %	Max 15 %
Liquid Limit		------	------	------
Plasticity index	9	Max 6 %	Max 6 %	Max 10 %

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

Signature

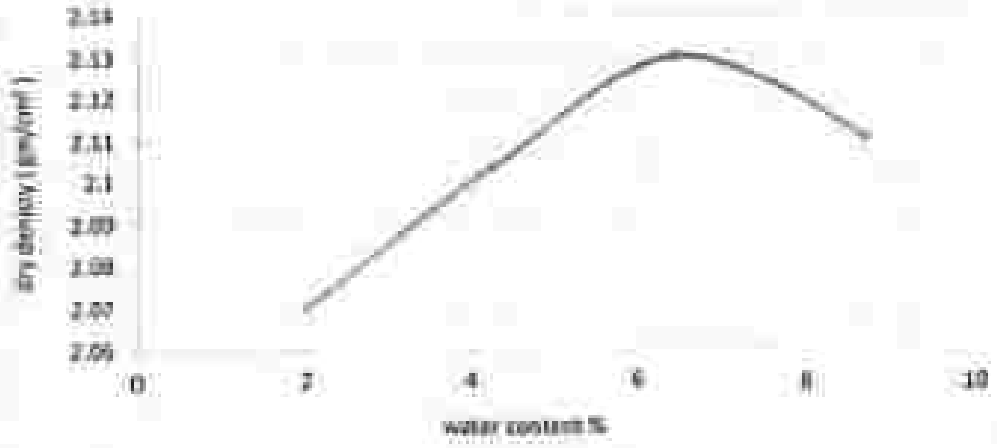
CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

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



- Max dry density (gm/cm³) : 2.13
- Optimum moisture content % : 6.4 %

Signature /

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 22/7/2023
Reporting Date : 26/7/2023
Reporting No. : 05-3

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.25
1.27	0.050	1.01
1.91	0.075	1.78
2.54	0.100	2.43
3.18	0.125	3.05
3.81	0.150	3.55
4.45	0.175	3.96
5.08	0.200	4.16
6.35	0.250	4.06

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	St. Value	Sample results	35.3 %
	6.90	2.43	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The samples were compacted to dry density of = 2.13 (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 38.

Signature

IAS ACCREDITED

CEL

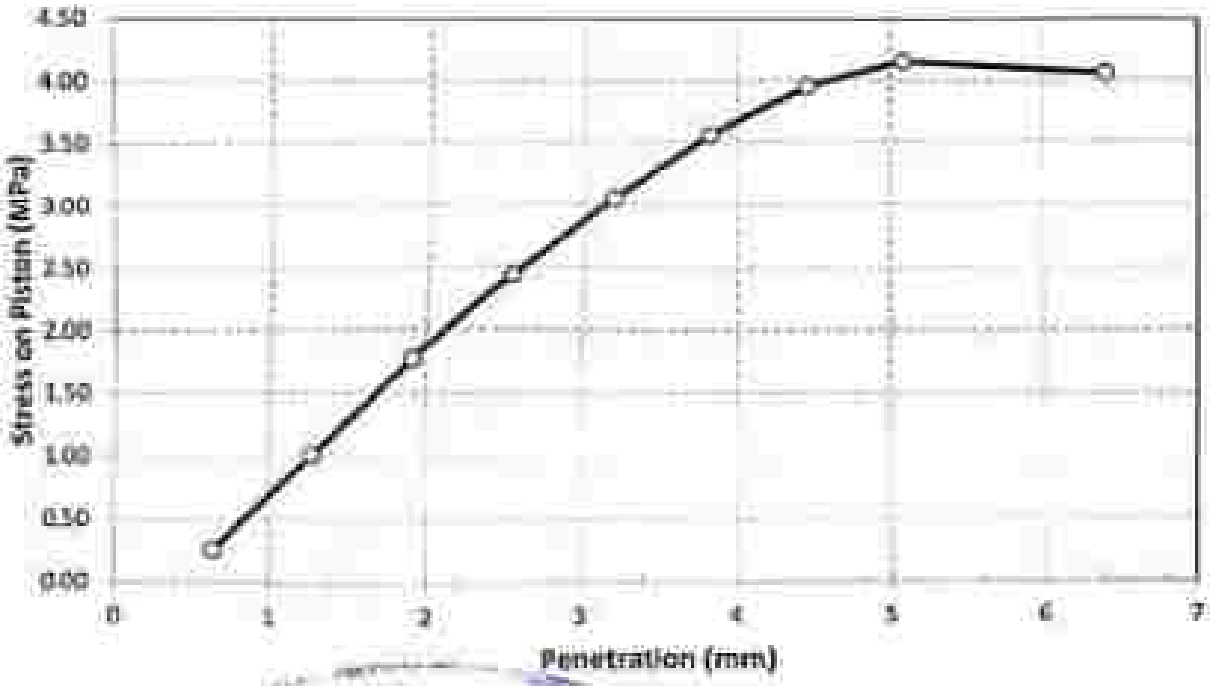
Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Testing Date	: 02/08/2023
Soil type	: Middle Embankment
Location	: St From 641+360/641+420
Level	: -4.5M
Report No.	: 24

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+390	1185	2.16	5.3	2.05	98.4%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density =2.08 gm/cm^3
  - At optimum moisture content = 6.4 %

Signature

IAS ACCREDITED

Scanned with CamScanner

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **22/7/2023**
Reporting Date	: **26/7/2023**
Reporting No.	: **05-2**

Dear Gentleman,

Attached here with the delivered on 22 / 7 / 2023

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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

CEL

Signature /...

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	100
25	1	97.3
19	¾	95.4
12.50	½	91.6
9.50	3/8	87.4
4.75	4	81.5
2.00	10	71.3
0.425	40	36.8

CEL

Signature

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-2

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)	11.4

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: 641+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 22/7/2023
Reporting Date : 26/7/2023
Reporting No. : 05-2

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

9 El Mirghani St. Abdel Ghani
Zamalek, Cairo
Tel&Fax: 2736721 - 2736569

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+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-2

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-3-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	71.3	Max 50 %	——	——
0.425 mm (No. 40).	36.8	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	11.4	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

3 El Nasr E Mini Road
Zenin Giza
Tel & fax 27707277 - 27703003

IAS ACCREDITED

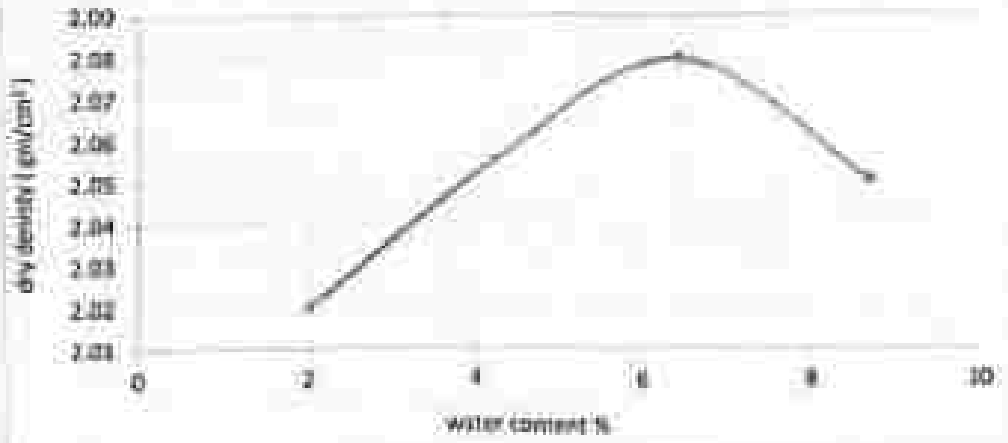
CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name	**: شركة الذهبي**
Project	**: Electric Express Train – HSR From Qous To Armant**
Location	**: (ST: 641+100) E=32.9226620 N=25.8862030**
Type of sample	**: Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	**: 22/7/2023**
Reporting Date	**: 26/7/2023**
Reporting No.	**: 05-2**

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



- **Max dry density (gm/cm³) : 2.08**
- **Optimum moisture content % : 6.4 %**

Signature :

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **22/7/2023**
Reporting Date	: **26/7/2023**
Reporting No.	: **05-2**

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.25
1.27	0.050	0.66
1.91	0.075	1.07
2.54	0.100	1.52
3.18	0.125	1.78
3.81	0.150	1.88
4.45	0.175	1.77
5.08	0.200	1.56
6.35	0.250	1.12

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	1.52	22 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The [illegible] corrected to dry density of = 2.08 (gm /cm³)

[illegible] Optimum water content.

Surcharge load 4.50 Kg.

4- CBR > 1[illegible] for middle and lower embankments according project spec page No 36.

Signature

[illegible]

IAS ACCREDITED

CEL

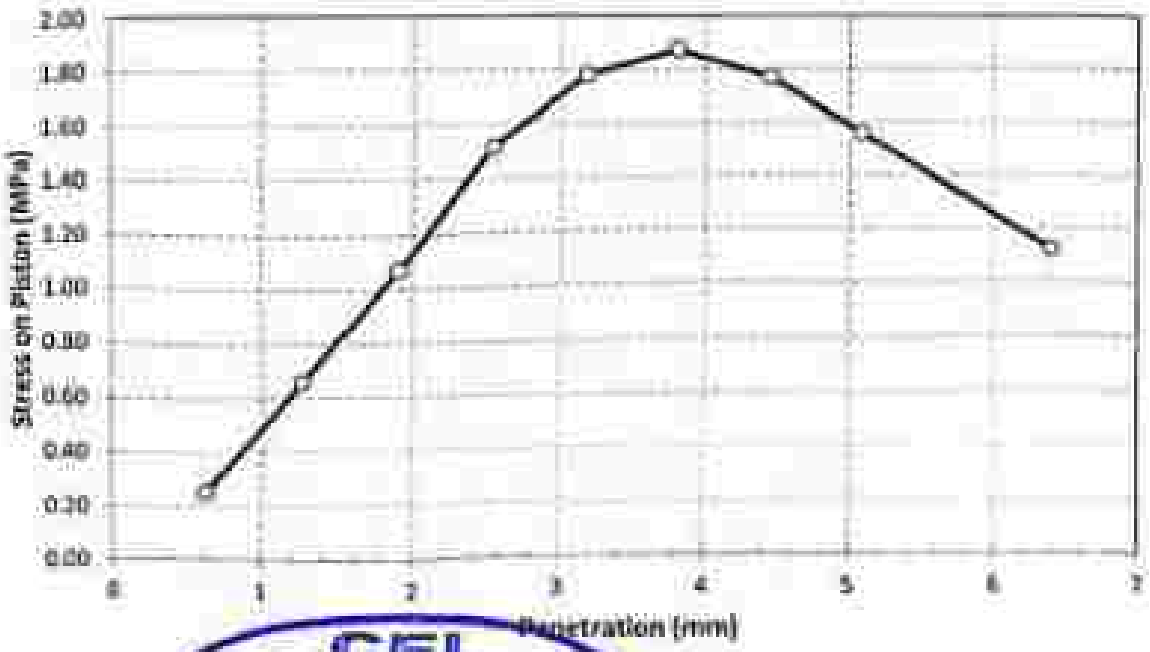
Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الأهلي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-2

Load Penetration Curve of CBR Test

ASTM D-1883



CEL

Signature

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Testing Date	: 05/08/2023
Soil type	: Middle Embankment
Location	: St From 641+300/641+360
Level	: -4.5 M
Report No.	: 28

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+250	1570	2.14	5.8	2.02	95.0%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density =2.13 gm/cm^3
  - At opamum moisture content = 6.4 %

CEL

Signature :

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **22/7/2023**
Reporting Date	: **26/7/2023**
Reporting No.	: **05-3**

Dear Gentleman,

Attached here with the delivered on 22 / 7 / 2023

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 Spees.
5. Proctor Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the quality it is taken*

Signature

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: 641+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 22/7/2023
Reporting Date : 26/7/2023
Reporting No. : 05-3

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	97.1
25	1	93.1
19	¾	90.0
12.50	½	85.5
9.50	3/8	81.6
4.75	4	77.6
2.00	10	72.9
0.425	40	39.9

Signature:

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+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

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)	11.3

Signature /

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 22/7/2023
Reporting Date : 26/7/2023
Reporting No. : 05-3

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

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : (ST: 641+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-3

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	72.91	Max 50 %	——	——
0.425 mm (No. 40).	39.87	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	11.3	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 /

Dr. Mark E. Abdelsayed
Zenith Cairo
Tel/Fax: [illegible]

IAS ACCREDITED

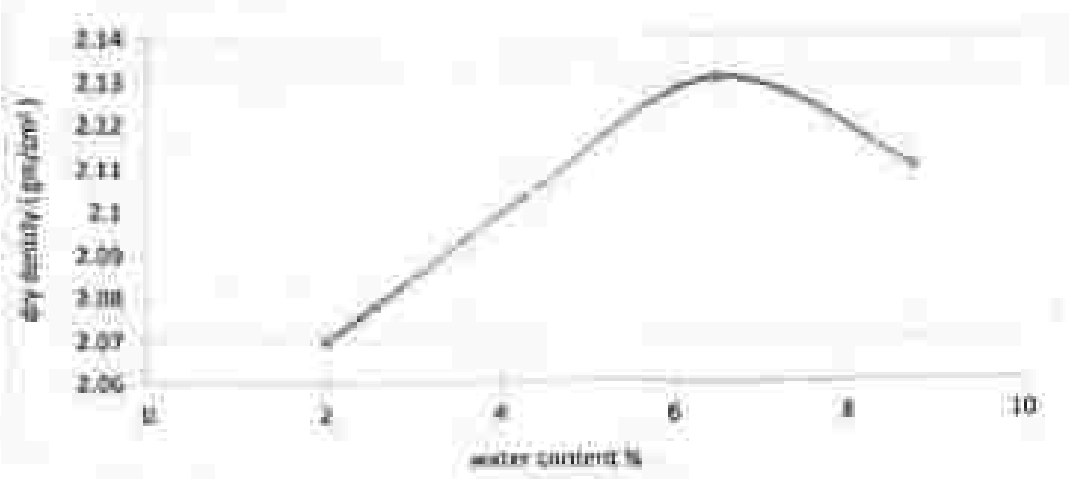
CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

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



- **Max dry density (gm/cm³)** : 2.13
- **Optimum moisture content %** : 6.4 %

Signature / .....

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-3

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.25
1.27	0.050	1.01
1.91	0.075	1.78
2.54	0.100	2.43
3.18	0.125	3.05
3.81	0.150	3.55
4.45	0.175	3.96
5.08	0.200	4.16
6.35	0.250	4.06

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	2.43	35.3 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.13 (gm /cm³)

At optimum water content.

3- Surcharge load 4.50 Kg.

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

Signature:

IAS ACCREDITED

CEL

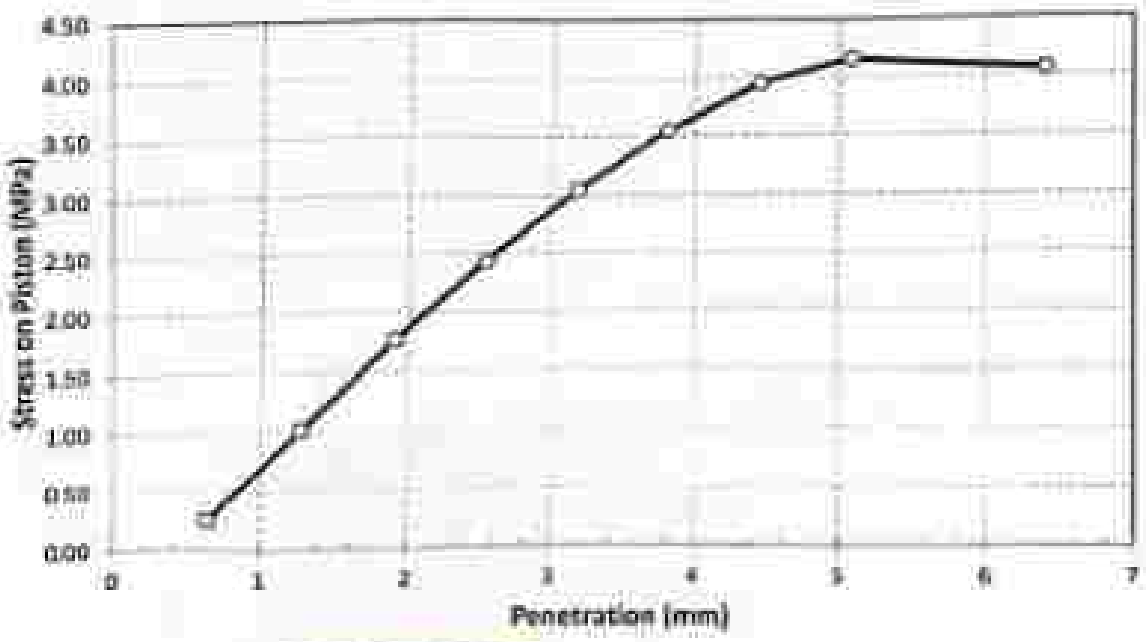
Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الأهلي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

CEL

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة النعيمي

Project : Electric Express Train – HSR From Qous To Arnaut

Testing Date : 05/08/2023

Soil type : Middle Embankment

Location : St From 641+220 To 641+300

Level : -4.0 M

Report No. : 26

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+250	1574	2.19	6.4	2.06	96.7%	Comply
2	641+280	1581	2.13	5.2	2.03	95.2%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density =2.13 gm/cm^3
  - At optimum moisture content = 6.4 %

Signature / Stamp

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **22/7/2023**
Reporting Date	: **26/7/2023**
Reporting No.	: **05-3**

Dear Gentleman,

Attached here with the delivered on 22 / 7 / 2023

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. Procter Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

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: 641+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 22/7/2023
Reporting Date : 26/7/2023
Reporting No. : 05-3

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	97.1
25	1	93.1
19	¾	90.0
12.50	½	85.5
9.50	3/8	81.6
4.75	4	77.6
2.00	10	72.9
0.425	40	39.9

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: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

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)	11.3

CEL

Signature /

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-3

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

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Location : (ST: 641+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-3

Soil Classification

TEST	Results (%)	Limits according Projects Spees		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	72.91	Max 50 %	———	———
0.425 mm (No. 40).	39.87	Max 30 %	Max 50 %	———
0.075 mm (No. 200).	11.3	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

IAS ACCREDITED

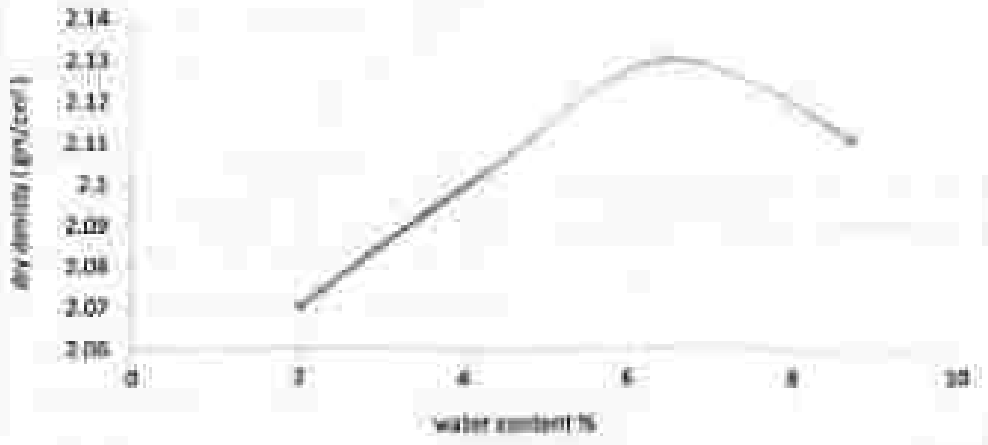
CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862830
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

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



- **Max dry density (gm/cm³)** : 2.13
- **Optimum moisture content %** : 6.4 %

Signature

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 22/7/2023
Reporting Date : 26/7/2023
Reporting No. : 05-3

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.25
1.27	0.050	1.01
1.91	0.075	1.78
2.54	0.100	2.43
3.18	0.125	3.05
3.81	0.150	3.55
4.45	0.175	3.96
5.08	0.200	4.16
6.35	0.250	4.06

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	SL Value	Sample results	35.3 %
	6.90	2.43	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.13 (gm /cm³)
At [illegible] optimum water content.
3- Surcharge load 4.50 Kg.
4- CBR > 10 for middle and lower embankments according project spec page No 30.

Signature

IAS ACCREDITED

CEL

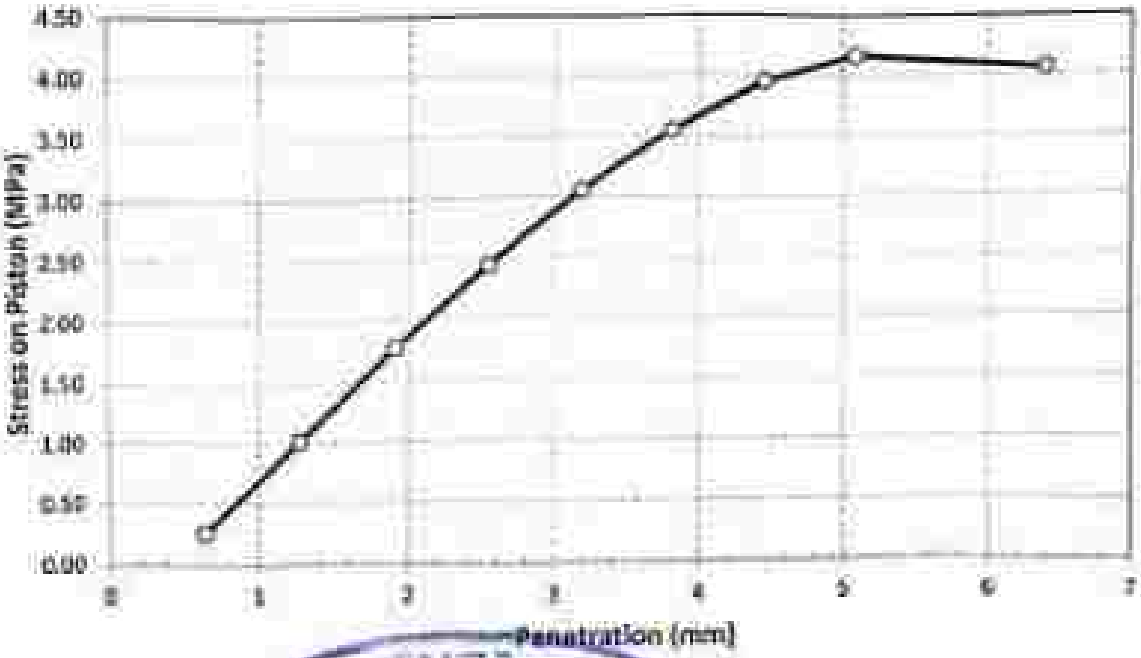
Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

[illegible]

CEL

[illegible]

Company Name	[illegible]
Project	[illegible]
Testing Date	[illegible]
Soil Type	[illegible]
Condition	[illegible]
Cycle	[illegible]
Report No.	[illegible]

[illegible]

Sample	Weather	Test Area Temperature (°C)	Wet Density (gm/cm³)	Moisture Content (%)	Dry Density (gm/cm³)	Degree of Compaction (%)	Acceptance
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

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

[illegible]

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **22/7/2023**
Reporting Date	: **26/7/2023**
Reporting No.	: **05-3**

Dear Gentleman,

Attached here with the delivered on 22 / 7 / 2023

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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

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: 641+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-3

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	97.1
25	1	93.1
19	¾	90.0
12.50	½	85.5
9.50	3/8	81.6
4.75	4	77.6
2.00	10	72.9
0.425	40	39.9

CEL

Signature

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+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

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)	11.3

CEL

Signature

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-3

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

CEL

Signature

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 22/7/2023
Reporting Date : 26/7/2023
Reporting No. : 05-3

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	72.91	Max 50 %	——	——
0.425 mm (No. 40).	39.87	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	11.3	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

IAS ACCREDITED

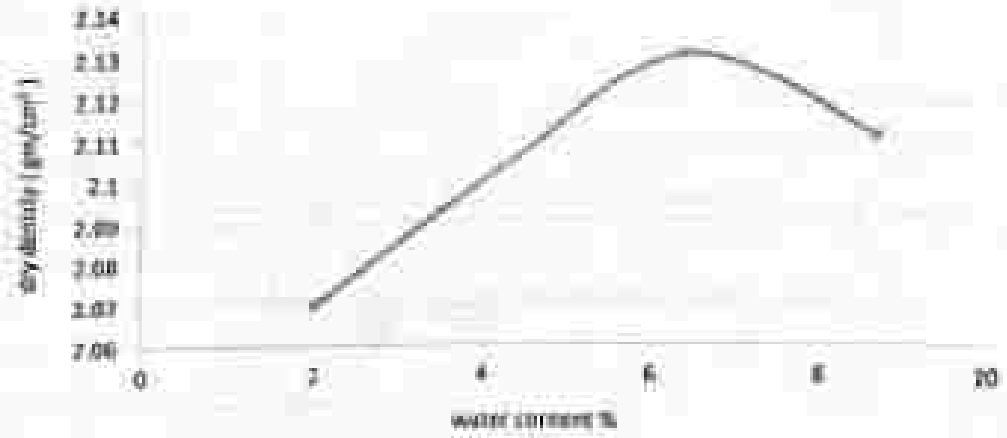
CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

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



- **Max dry density (gm/cm³)** : 2.13
- **Optimum moisture content %** : 6.4 %

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: 641+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-3

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.25
1.27	0.050	1.01
1.91	0.075	1.78
2.54	0.100	2.43
3.18	0.125	3.05
3.81	0.150	3.55
4.45	0.175	3.96
5.08	0.200	4.16
6.35	0.250	4.06

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	SC Value 6.90	Sample results	35.3 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.13 (gm /cm³)
At = 6.4 % optimum water content.

3- Surcharge load = 4.50 Kg.

4- CBR = 30 for middle and lower embankments according project spec page No 36.

Signature

IAS ACCREDITED

CEL

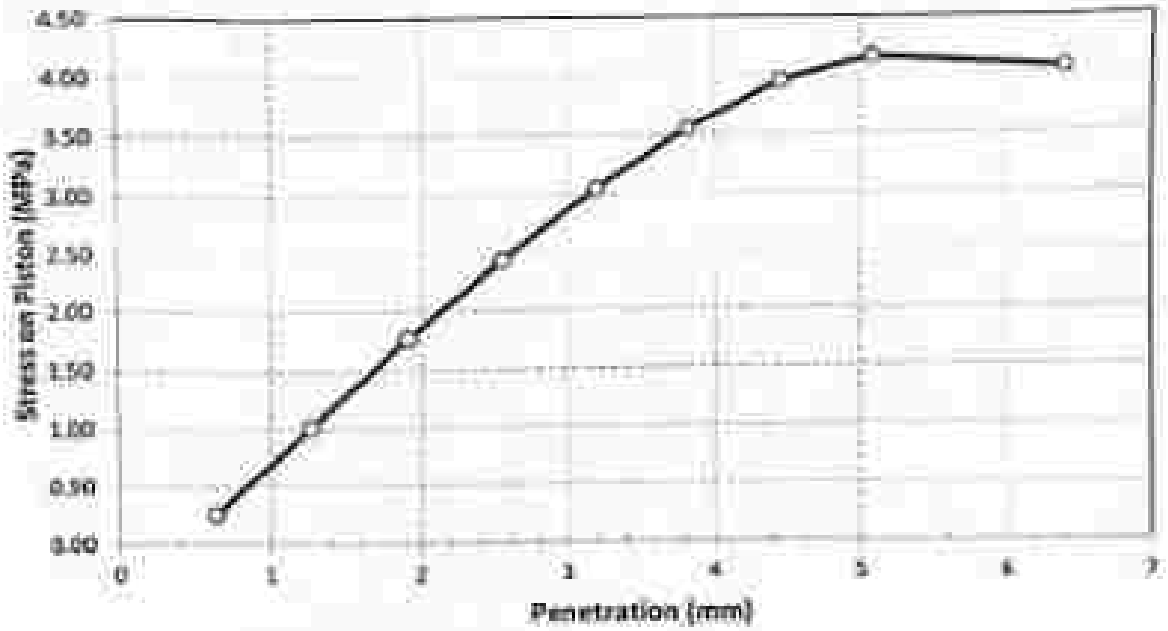
Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-3

Load Penetration Curve of CBR Test

ASTM D-1883



Signature:

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 : 12/08/2023

Soil type : Middle Embankment

Location : St From 641+180 To 641+300

Level : - 3.5 M

Report No. : 32

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+200	1352	2.17	5.5	2.06	96.1%	Comply
2	641+250	1468	2.20	5.5	2.09	97.6%	Comply
3	641+280	1369	2.20	5.5	2.09	97.5%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density =2.14 gm/cm^3
  - At optimum moisture content = 6.4 %
  - Signature :

CEL IAS

El Malek E. Abd Nour
Zamalek, Cairo.
Tel&Fax: 2736201 - 2736202

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **26/7/2023**
Reporting Date	: **30/7/2023**
Reporting No.	: **05-4**

Dear Gentleman,

Attached here with the delivered on 26 / 7 / 2023

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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

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: 641+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/7/2023
Reporting Date : 30/7/2023
Reporting No. : 05-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.2
37.5	1.5	95.2
25	1	91.5
19	¾	88.2
12.50	½	84.5
9.50	3/8	80.2
4.75	4	73.5
2.00	10	70.1
0.425	40	35.4

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: 641+100) E=32.9226620 N=25.8862030

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

Delivery Date : 26/7/2023

Reporting Date : 30/7/2023

Reporting No. : 05-4

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)	10.3

Signature

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+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 26/7/2023
Reporting Date	: 30/7/2023
Reporting No.	: 05-4

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

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/7/2023
Reporting Date : 30/7/2023
Reporting No. : 05-4

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	70.1	Max 50 %	——	——
0.425 mm (No. 40).	35.4	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	10.3	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

IAS ACCREDITED

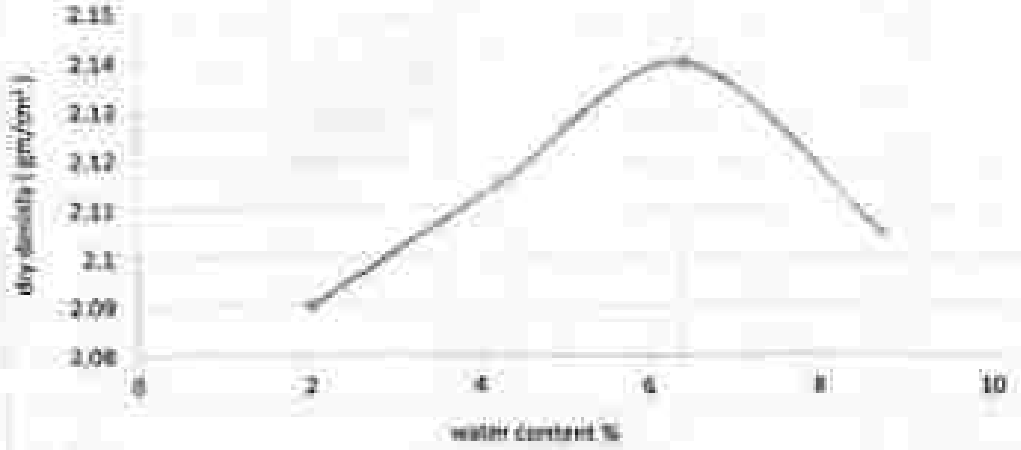
CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 26/7/2023
Reporting Date	: 30/7/2023
Reporting No.	: 05-4

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



- **Max dry density (gm/cm³)** : 2.14
- **Optimum moisture content %** : 6.4 %

Signature :

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-2

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	inch	
0.64	0.025	0.36
1.27	0.050	1.09
1.91	0.075	1.83
2.54	0.100	2.49
3.18	0.125	2.94
3.81	0.150	3.30
4.45	0.175	3.55
5.08	0.200	3.65
6.35	0.250	3.55

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 Inch (2.54 mm) penetration	6.90	2.49	36 %

Notes:

1- Attached graph shows penetration resistance versus penetrative magnitude.

2- The sample was compacted to dry density of = 2.14 (gm /cm³)
At = 6.4 % optimum water content.

3- Sample [illegible]

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

Signature

[illegible]

IAS ACCREDITED

CEL

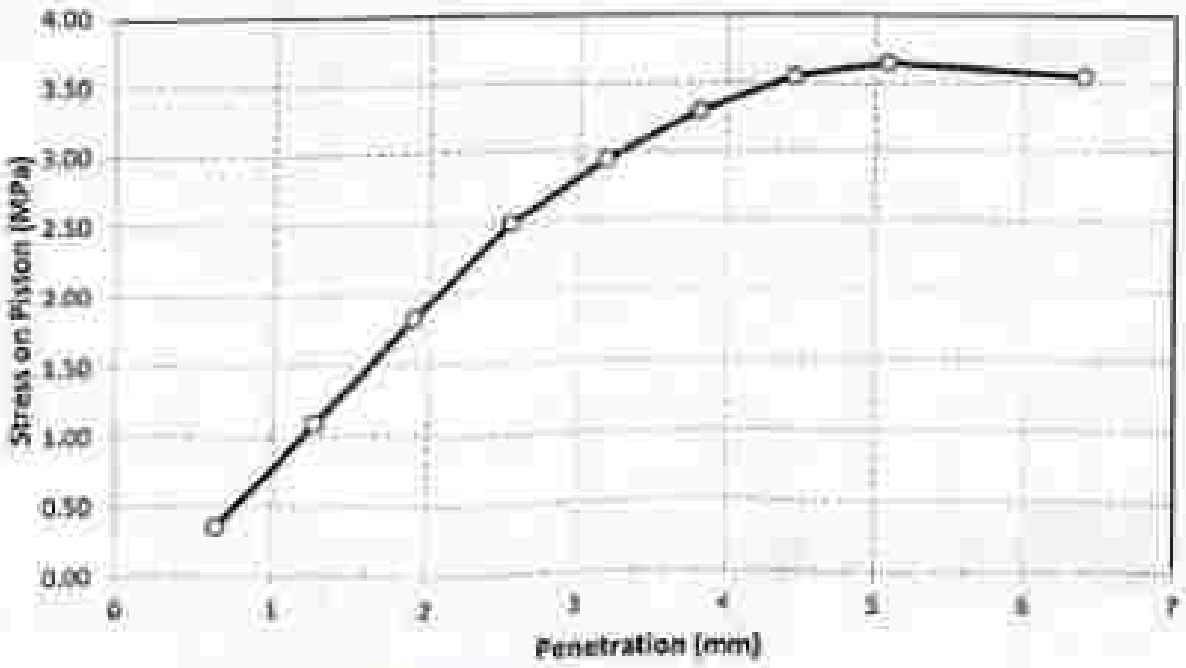
Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-2

Load Penetration Curve of CBR Test

ASTM D-1883



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

Testing Date : 14/08/2023

Soil type : Middle Embankment

Location : St From 641+000 To 641+160.

Level : - 2.5 M

Report No. : 34

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+020	1410	2.21	5.8	2.09	97.8%	Comply
2	641+070	1376	2.20	5.8	2.08	97.2%	Comply
3	641+150	1570	2.26	5.8	2.13	99.6%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density =2.14 gm/cm³
  - At optimum moisture content
  - 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+500) E= 492410,088 N=2862759,57**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **4/8/2023**
Reporting Date	: **8/8/2023**
Reporting No.	: **04-2**

Dear Gentleman,

Attached here with the delivered on 4 / 8 / 2023

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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature

CEL

Zamalek, Cairo.
Tel&Fax: 27362321 - 27362350

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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 4/8/2023
Reporting Date : 8/8/2023
Reporting No. : 04-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.6
37.5	1.5	89.6
25	1	83.4
19	¾	82.3
12.50	½	81.3
9.50	3/8	80.9
4.75	4	72.6
2.00	10	56.3
0.425	40	31.4

Signature /

3 El Monk E Abdel Sitar,
Zamalek, Cairo
Tel & Fax: [illegible]

IAS ACCREDITED Testing Laboratories

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهلي
Project : Electric Express Train – HSR From Qous To Armant
Location : (ST: 641+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 4/8/2023
Reporting Date : 8/8/2023
Reporting No. : 04-2

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)	13.8

Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 2735922 - 2735003

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية

Company Name : شركة النهي
Project : Electric Express Train – HSR From Qous To Armant
Location : (ST: 641+500) E= 492410,988 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 4/8/2023
Reporting Date : 8/8/2023
Reporting No. : 04-2

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

CEL

Signature / ..

17, Mark E. Pilot Street
Zamalek, Cairo
Tel/Fax: [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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 4/8/2023
Reporting Date : 8/8/2023
Reporting No. : 04-2

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	56.3	Max 50 %	——	——
0.425 mm (No. 40).	31.4	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	13.8	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

3 E. Mitwalli Street
Zamalek, Cairo
Tel & Fax: 2736711 / 2736230

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+500) E= 492410,088 N=2862759,57

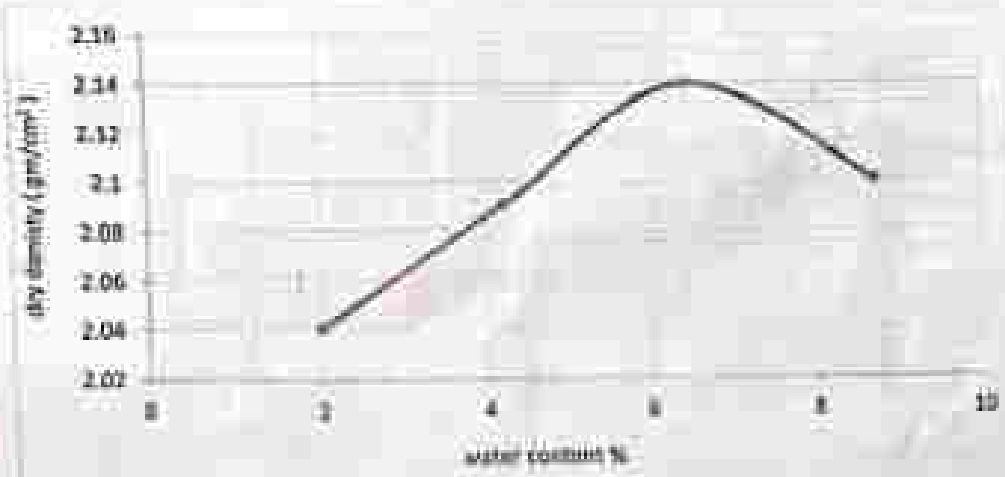
Type of sample : Soil Embankment (Upper Embankment 0.0 M)

Delivery Date : 4/8/2023

Reporting Date : 8/8/2023

Reporting No. : 04-2

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



- Max dry density (gm/cm³) : 2.14
- Optimum moisture content % : 6.4 %

Signature:

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهلي

Project : Electric Express Train – HSR From Qous To Armant

Location : (ST: 641+500) E= 492410,088 N=2862759,57

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

Delivery Date : 4/8/2023

Reporting Date : 8/8/2023

Reporting No. : 04-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.26
1.27	0.050	1.01
1.91	0.075	1.67
2.54	0.100	2.28
3.18	0.125	2.94
3.81	0.150	3.50
4.45	0.175	4.08
5.08	0.200	4.54
6.35	0.250	5.29

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 Inch (2.54 mm) penetration	St. Value 6.90	Sample results 2.28	33.1 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.14 (gm /cm^3)

At = 6.4 % optimum moisture content

3- Surcharge load 4.50 Kg

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

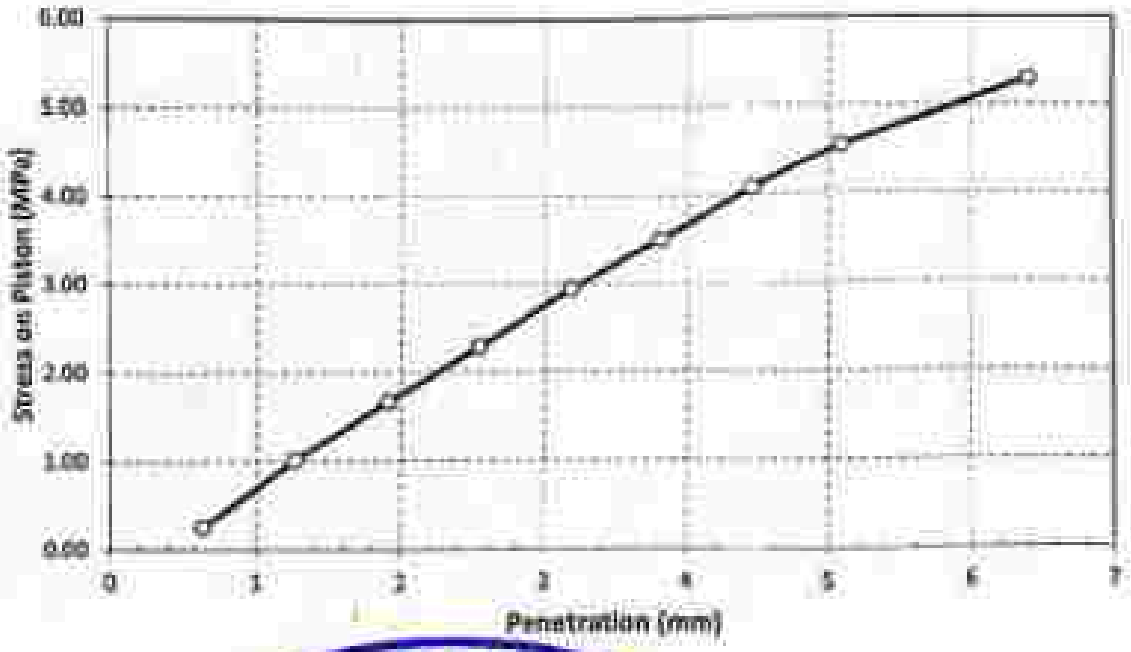
Signature /

5 El Mosta E Abbas Street
Zamalek, Cairo
Tel/Fax

IAS ACCREDITED

Company Name	: شركة الأضحى
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+500) E= 492410,088 N=2862759,57
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 4/8/2023
Reporting Date	: 8/8/2023
Reporting No.	: 04-2

Load Penetration Curve of CBR Test
ASTM D-1883



Signature

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 16/08/2023

Soil type : Middle Embankment

Location : St From 641+300 To 641+440

Level : - 3.5 M

Report No. : 36

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+330	1681	2.18	5.8	2.06	96.4%	Comply
2	641+380	1622	2.17	5.8	2.05	95.9%	Comply
3	641+420	1591	2.19	5.8	2.07	96.7%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density =2.14 gm/cm^3
  - At optimum moisture content = 5.4 %
  - Signature

CEL

Eng. Mohammed E. Abdel Sheer
Consultant, Cairo
Cell Tel: 27962... 27962...

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+100) E=32.9226620 N=25.8862030**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **26/7/2023**
Reporting Date	: **30/7/2023**
Reporting No.	: **05-4**

Dear Gentleman,

Attached here with the delivered on 26 / 7 / 2023

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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature /

CEL

15 Mohamed Abdelhaq
Ezbet Gan
Tel/Fax: 0206521 - 0206010

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+100) E=32.9226620 N=25.8862030

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

Delivery Date : 26/7/2023

Reporting Date : 30/7/2023

Reporting No. : 05-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.2
37.5	1.5	95.2
25	1	91.5
19	¾	88.2
12.50	½	84.5
9.50	3/8	80.2
4.75	4	73.5
2.00	10	70.1
0.425	40	35.4

Signature /

CEL

310 391 437

3 El Nasr El Arbi Street
Zeitoun, Cairo
Tel & Fax: 2785720 - 2785693

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+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 26/7/2023
Reporting Date	: 30/7/2023
Reporting No.	: 05-4

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)	10.3

Signature

CEL

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة النهي
Project : Electric Express Train – HSR From Qous To Armant
Location : (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/7/2023
Reporting Date : 30/7/2023
Reporting No. : 05-4

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
219.991.437

10 Mahl El Atar Street
Zamalek, Cairo
Tel/Fax: [illegible]

IAS ACCREDITED

Company Name : شركة الأهلي
Project : Electric Express Train – HSR From Qous To Armant
Location : (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/7/2023
Reporting Date : 30/7/2023
Reporting No. : 05-4

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	70.1	Max 50 %	———	———
0.425 mm (No. 40).	35.4	Max 30 %	Max 50 %	———
0.075 mm (No. 200).	10.3	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 / .....

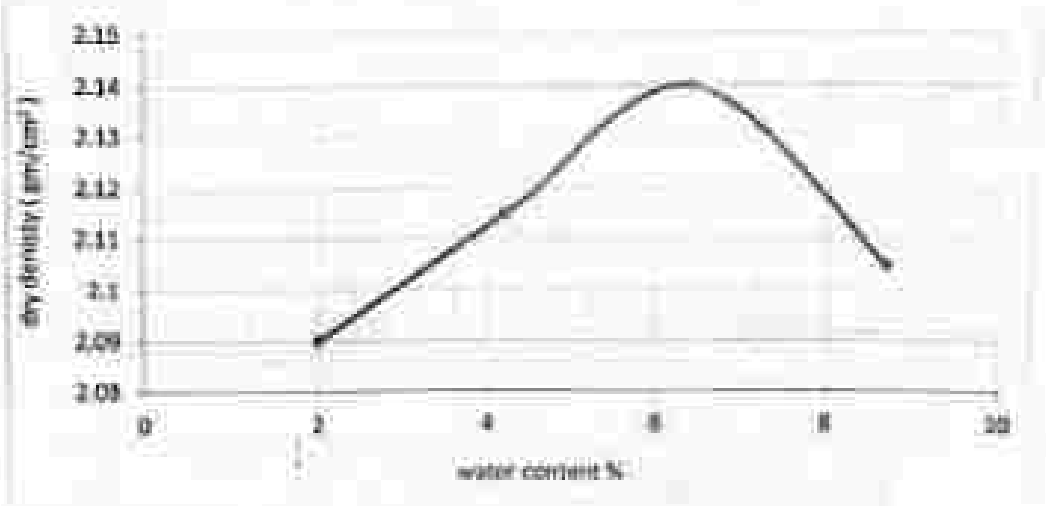
CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	**: شركة الذهبي**
Project	**: Electric Express Train – HSR From Qous To Armant**
Location	**: (ST: 641+100) E=32.9226620 N=25.8862030**
Type of sample	**: Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	**: 26/7/2023**
Reporting Date	**: 30/7/2023**
Reporting No.	**: 05-4**

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



- **Max dry density (gm/cm³)** **: 2.14**
- **Optimum moisture content %** **: 6.4 %**

Signature /

CEL

3 El Mokat El Nasr Street
Zamalek, Cairo
Tel/Fax: [illegible]

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.09
1.91	0.075	1.83
2.54	0.100	2.49
3.18	0.125	2.94
3.81	0.150	3.30
4.45	0.175	3.55
5.08	0.200	3.65
6.35	0.250	3.55

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	2.49	36 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.14 (gm /cm³)
At 7.4 % optimum water content.
3- Surcharge load 4.50 Kg
4- CBR > 10 for [illegible] Embankment according project spec page No 36.

CEL

[illegible] Road Sign
Zamalek, Cairo.
Tel & Fax [illegible]

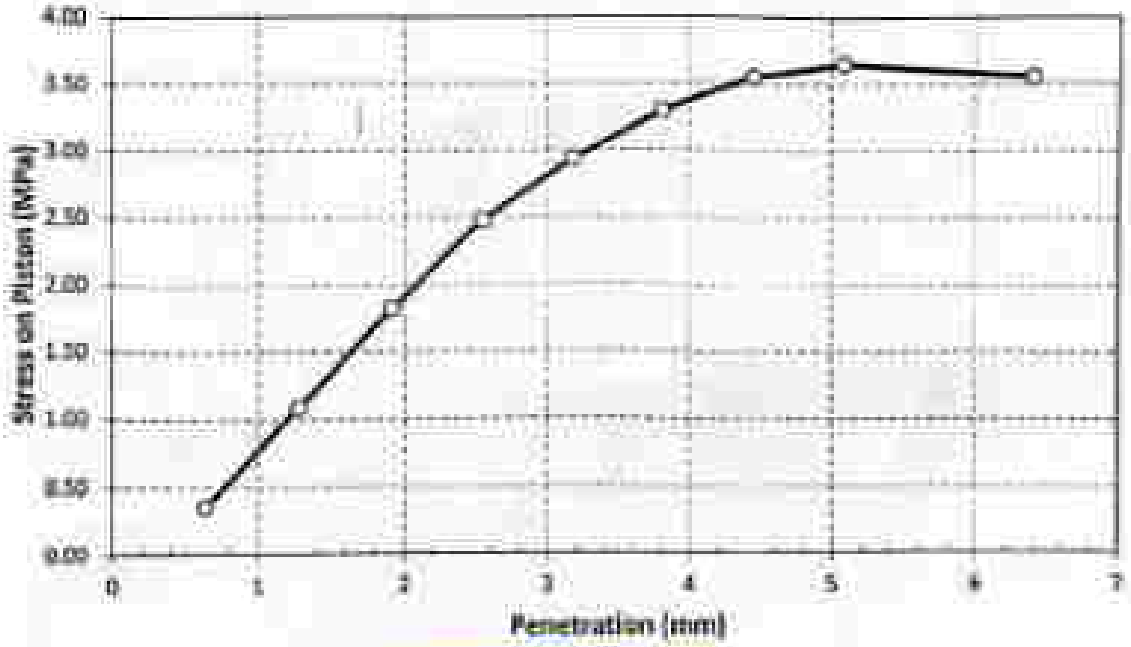
IAS ACCREDITED

[illegible]
[illegible]
[illegible]

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 22/7/2023
Reporting Date	: 26/7/2023
Reporting No.	: 05-2

Load Penetration Curve of CBR Test

ASTM D-1883



Signature / CEL

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Arinant

Testing Date : 16/08/2023

Soil type : Middle Embankment

Location : St From 641+440 To 641+500

Level : - 4.5 M

Report No. : 37

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+480	1100	2.18	5.8	2.06	96.4%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density =2.14 gm/cm^3
  - At optimum moisture content = 6.4 %
  - Signature /

CEL

2 F Mark E Mall Street
Zarqa, Jordan
Tel & Fax: [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+100) E=32.9226620 N=25.8862030**
Type of sample : **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date : **26/7/2023**
Reporting Date : **30/7/2023**
Reporting No. : **05-4**

Dear Gentleman,

Attached here with the delivered on 26 / 7 / 2023

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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature /.

CEL 219 331 437

3 E Mahl E Afini Street
Zamalek, Cairo
Tel & Fax: 27362127 - 2363309

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/7/2023
Reporting Date : 30/7/2023
Reporting No. : 05-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.2
37.5	1.5	95.2
25	1	91.5
19	¾	88.2
12.50	½	84.5
9.50	3/8	80.2
4.75	4	73.5
2.00	10	70.1
0.425	40	35.4

Signature .....

11 Mosk Ibrahim Street
Zamalek, Giza
Tel& Fax: 2736523 / 2736365

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/7/2023
Reporting Date : 30/7/2023
Reporting No. : 05-4

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)	10.3

Signature

3 E Malek E Afzal Street
Zamalek, Cairo.
Tel&Fax: 2736723 - 2736300

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/7/2023
Reporting Date : 30/7/2023
Reporting No. : 05-4

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 /

3 El Malek E Abdel Ghani
Zamalek, Cairo
Tel.& Fax: 2706722 - 2706000

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/7/2023
Reporting Date : 30/7/2023
Reporting No. : 05-4

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	70.1	Max 50 %	----	----
0.425 mm (No. 40).	35.4	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	10.3	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

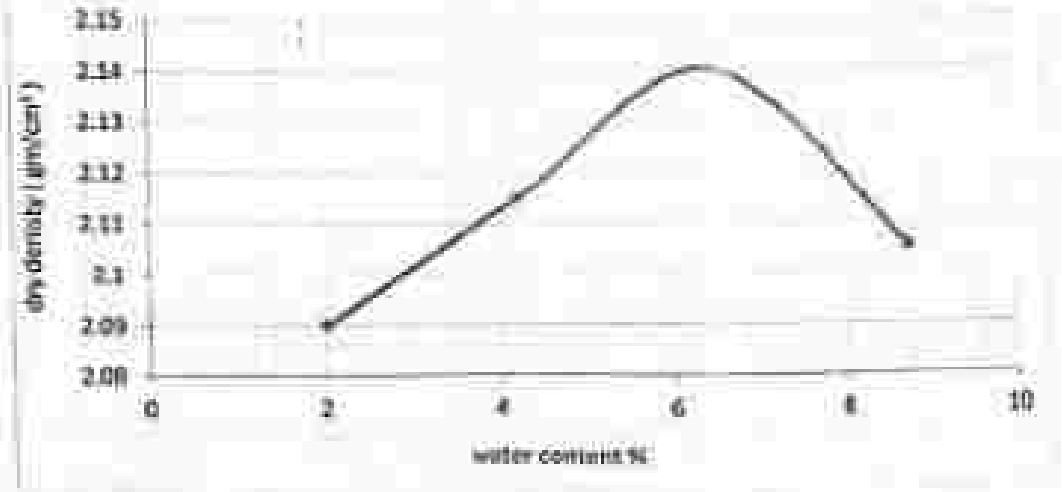
3 El Nile & Midi Street
Zamalek, Cairo
Tel & Fax: 2736721 - 2736339

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة شفي
Project : Electric Express Train – HSR From Qous To Armant
Location : (ST: 641+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/7/2023
Reporting Date : 30/7/2023
Reporting No. : 05-4

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



- **Max dry density (gm/cm²)** : 2.14
- **Optimum moisture content %** : 6.4 %

Signature

CEL

3 El Malek El Afzal Street
Zamalek, Cairo
Tel & Fax: 2736522 - 2736320

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: 641+100) E=32.9226620 N=25.8862030

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

Delivery Date : 22/7/2023

Reporting Date : 26/7/2023

Reporting No. : 05-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.09
1.91	0.075	1.83
2.54	0.100	2.49
3.18	0.125	2.94
3.81	0.150	3.30
4.45	0.175	3.55
5.08	0.200	3.65
6.35	0.250	3.55

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	2.49	36 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.14 (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.

CEL

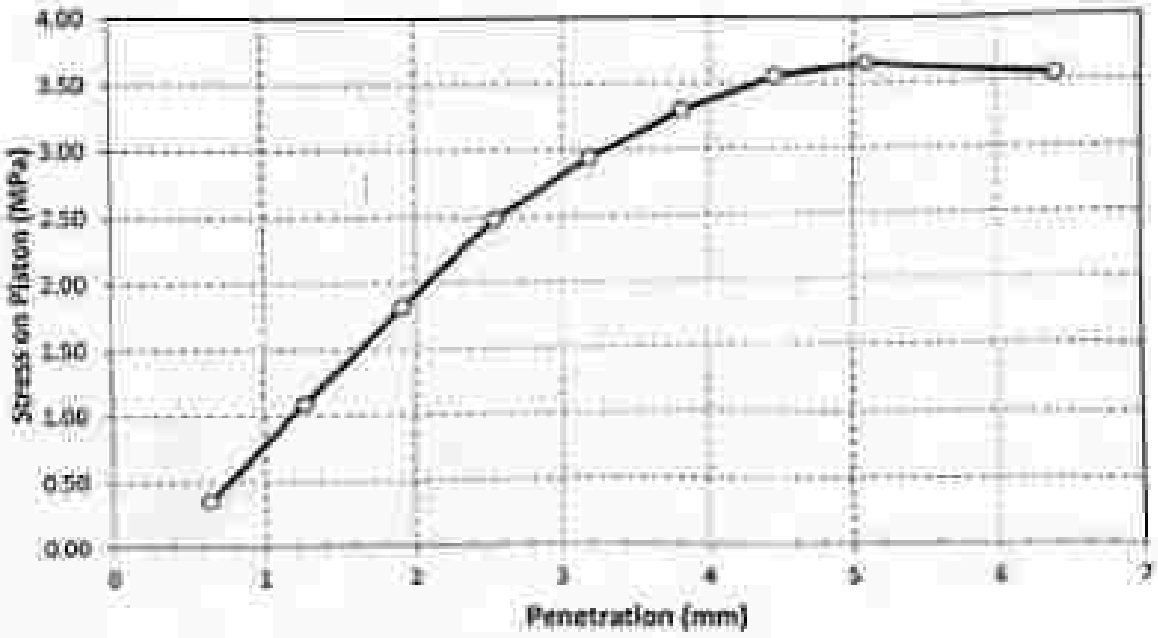
IAS ACCREDITED

Tel& Fax: 2736721 - 2736803

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+100) E=32.9226620 N=25.8862030
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 22/7/2023
Reporting Date : 26/7/2023
Reporting No. : 05-2

Load Penetration Curve of CBR Test
ASTM D-1883



Signature

3 E. Mark E. Abd Sayed
Zamalek, Cairo
Tel & Fax: 27362511 - 27362491

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 21/08/2023

Soil type : Middle Embankment

Location : St From 641+460 To 641+540

Level : - 4 M

Report No. : 41

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+490	1457	2.20	5.8	2.08	97.1%	Comply
2	641+520	1610	2.20	5.3	2.09	97.5%	Comply

- Degree of compaction based on proctor test dated At :
  - Max. dry density =2.14 gm/cm^3
  - At optimum moisture content = 5.4 %
  - Signature / جلال سامه علي

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax: 2736723 - 2736093

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+500) E= 492410,088 N=2862759,57**
Type of sample : **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date : **4/8/2023**
Reporting Date : **8/8/2023**
Reporting No. : **04-3**

Dear Gentleman,

Attached here with the delivered on 4 / 8 / 2023

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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature /

CEL

1 El Malek E Abd Sheer
Zamalek, Cairo
Tel & Fax: 27362207 - 27362209

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 : 06/09/2023

Soil type : Middle Embankment

Location : St From 641+440 To 641+620

Level : - 3 M

Report No. : 55

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+470	2046	2.22	5.3	2.10	95.2%	Comply
2	641+500	1856	2.22	5.5	2.10	95.2%	Comply
3	641+530	1353	2.22	5.5	2.11	95.4%	Comply
4	641+560	1544	2.22	5.3	2.10	95.2%	Comply
5	641+590	1398	2.21	5	2.11	95.3%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.21 gm/cm^3
- At optimum moisture content = 5.4 %
- Signature/

3 El Malek El Adel Street
Zamalek, Cairo
Tel& Fax: 2736723 - 2736350

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

Dear Gentleman,

Attached here with the delivered on 31 / 8 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature:

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax: 2736723 - 2736340

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.6
37.5	1.5	96.1
25	1	91.3
19	¾	87.2
12.50	½	79.2
9.50	3/8	71.2
4.75	4	56.9
2.00	10	41.2
0.425	40	28.2

Signature /.....

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax : 2736723 - 2736283

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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)	11.9

Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 2736723 - 2736363

IAS

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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
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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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).	41.2	Max 50 %	——	——
0.425 mm (No. 40).	28.2	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	11.8	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 / ....

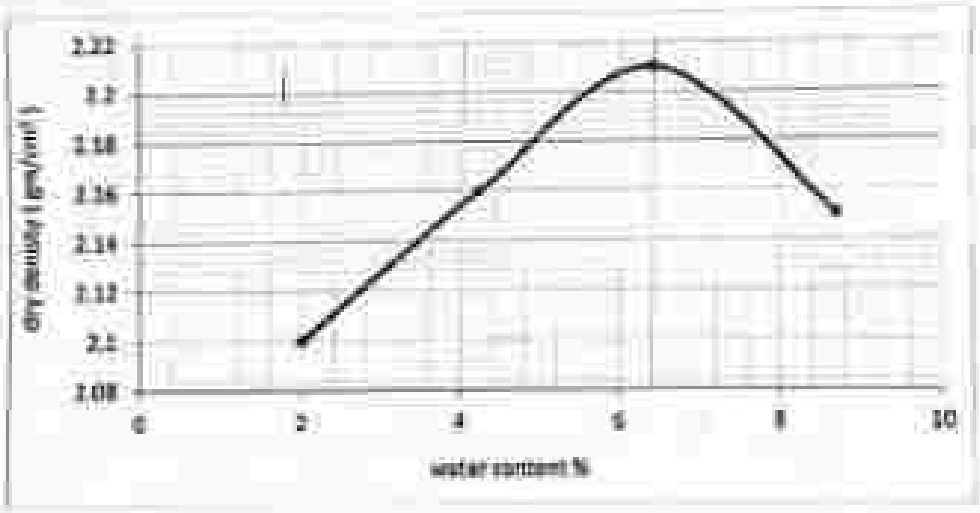
3 El Malek El Afdal Street
Zamalek, Cairo.
Tel/ Fax: 27361723 - 27362093

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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



- Max dry density (gm/cm³) : 2.21
- Optimum moisture content % : 6.4 %

Signature

3 El Masik El Atlal Street
Zamalek, Cairo.
Tel.Fax: 2736723 - 2736303

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:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.33
1.27	0.050	1.47
1.91	0.075	2.54
2.54	0.100	3.55
3.18	0.125	4.51
3.81	0.150	5.27
4.45	0.175	5.83
5.08	0.200	6.14
6.35	0.250	6.29

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

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.21 (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 /

3 El Malek El Afdal Street
Dokki, Cairo.
Tel.& Fax: 37606737 - 37606733

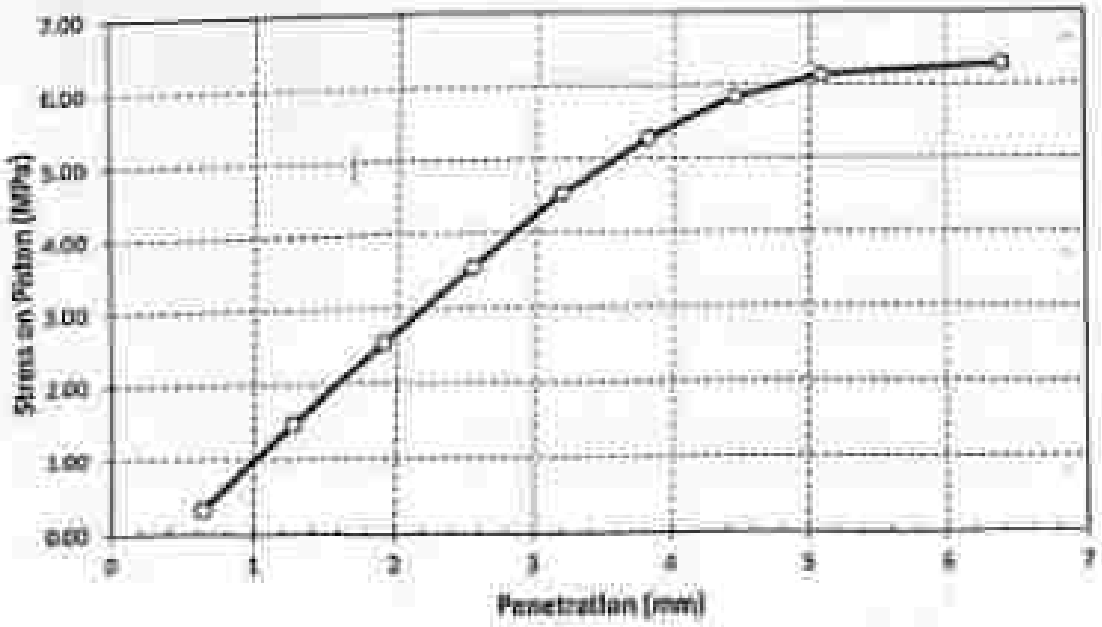
IAS ACCREDITED

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	: 31/08/2023
Reporting Date	: 04/09/2023
Reporting No.	: 10-2

Load Penetration Curve of CBR Test

ASTM D-1883



Signature /

3 El Malek El Afdal Street
Zeitoun, Cairo.
Tel/Fax: 2732723 - 2732800

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 07/09/2023

Soil type : Middle Embankment

Location : St From 641+160 To 641+300

Level : -2 M

Report No. : 58

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+180	1792	2.25	5.5	2.13	96.6%	Comply
2	641+230	1698	2.24	5.3	2.13	96.3%	Comply
3	641+260	1374	2.25	5.5	2.14	96.6%	Comply
4	641+290	1058	2.22	5.5	2.10	95.1%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.21 gm/cm^3
- At optimum moisture content = 6.4 %
- Signature/ [illegible]

CEL

[illegible]

[illegible] El Nile E Abdel Sabor
Dokki, Giza.
Tel & Fax: [illegible]

IAS ACCREDITED

[illegible]

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	: **31/08/2023**
Reporting Date	: **04/09/2023**
Reporting No.	: **10-2**

Dear Gentleman,

Attached here with the delivered on 31 / 8 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

CEL

Consulting Engineering Bureau & Laboratories

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهلي
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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.6
37.5	1.5	96.1
25	1	91.3
19	¾	87.2
12.50	½	79.2
9.50	3/8	71.2
4.75	4	56.9
2.00	10	41.2
0.425	40	28.2

Signature

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel & Fax :2736723 - 2736363

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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)	11.9

Signature /

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax: 2736722 - 2736363

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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:

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax : 2736723 / 2736000

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 : 31/08/2023

Reporting Date : 04/09/2023

Reporting No. : 10-2

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).	41.2	Max 50 %	------	------
0.425 mm (No. 40).	28.2	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	11.8	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 LTD

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

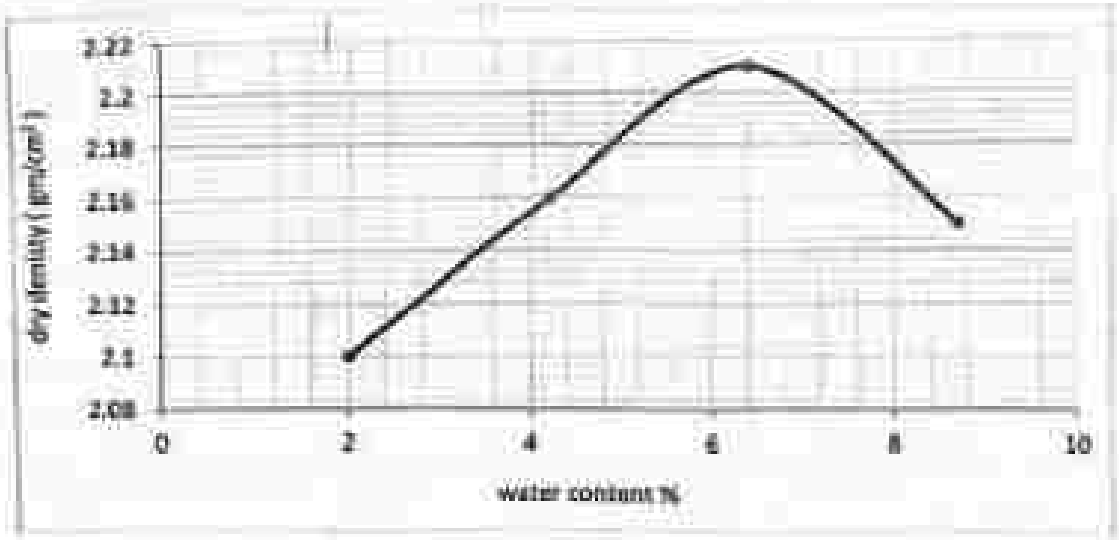
شروبات - سوهاج وقنا

ت ٢١٩ - ٣٩١ - ٥٣٢

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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



- **Max dry density (gm/cm³)** : 2.21
- **Optimum moisture content %** : 6.4 %

Signature / .....

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 : 31/08/2023

Reporting Date : 04/09/2023

Reporting No. : 10-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.33
1.27	0.050	1.47
1.91	0.075	2.54
2.54	0.100	3.55
3.18	0.125	4.51
3.81	0.150	5.27
4.45	0.175	5.83
5.08	0.200	6.14
6.35	0.250	6.29

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

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.21 (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 /

3 El Nasr E... Zamalek, Cairo
Tel& Fax: 27361231 - 27...

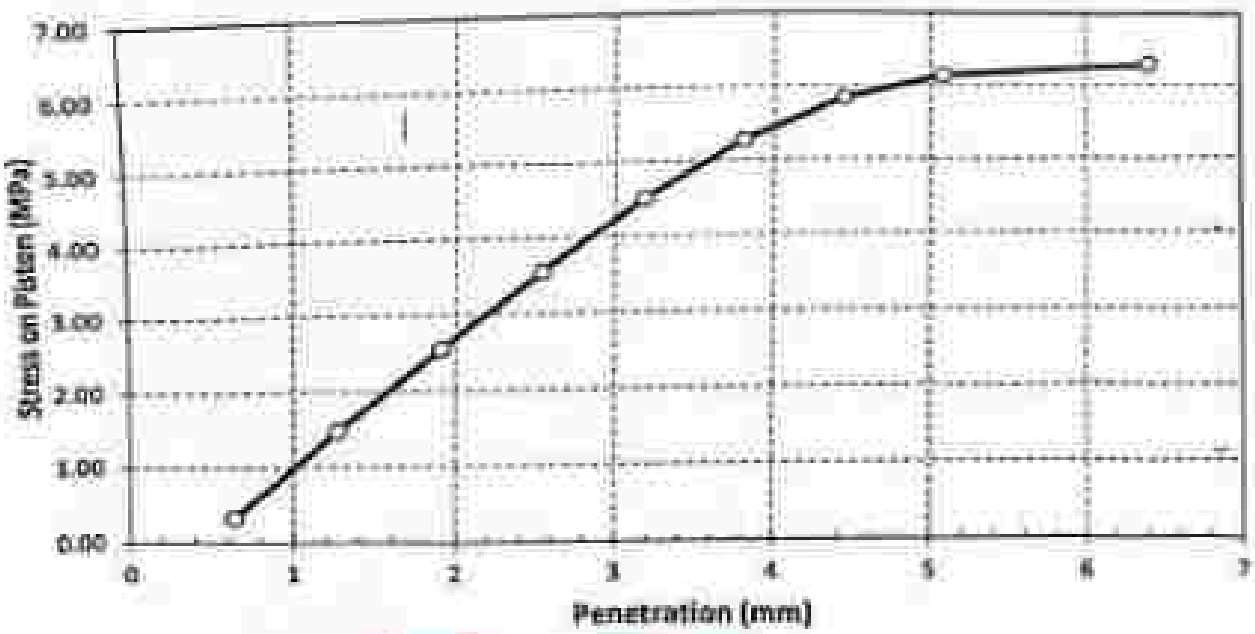
IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name	: شركة الأهلي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: ST:641+400 E= 492410,088 N=2862759,57
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 31/08/2023
Reporting Date	: 04/09/2023
Reporting No.	: 10-2

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax : 27362231 - 27363050

IAS ACCREDITED Testing Laboratory

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Testing Date : 12/09/2023
Soil type : Middle Embankment
Location : St From 641+160 To 641+300
Level : -2 M
Report No. : 58

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+180	1792	2.25	5.5	2.13	97.0%	Comply
2	641+230	1698	2.24	5.3	2.13	96.8%	Comply
3	641+260	1374	2.25	5.5	2.14	97.1%	Comply
4	641+290	1058	2.22	5.5	2.10	95.6%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.20 gm/cm^3
- At optimum moisture content = 6.4 %
- Signature :

1 El Mahdi St. Mag. Fikri
Zeitoun, Cairo
Tel & Fax : 2704720 - 2710001

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	: **7/09/2023**
Reporting Date	: **11/09/2023**
Reporting No.	: **10-3-2**

Dear Gentleman,

Attached here with the delivered on 7 / 9 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature /

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.Fax: 2736723 - 2736083

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	90.1
19	¾	84.2
12.50	½	77.2
9.50	3/8	71.5
4.75	4	59.9
2.00	10	46.3
0.425	40	28.0

Signature /

CEL
Consulting Engineering Bureau & Laboratories
219 - 888 - 327

3 El Malek El Afzal Street
Zamalek, Cairo
Tel& Fax: 27362723 - 27363093

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

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)	9.6

Signature /...

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax : 2736420 - 2735369

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٤٢٠ - ٢٧٣٥٣٦٩

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

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 /

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax : 2736721 - 2736093

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:641+400 E= 492410.088 N=2862759.57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

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).	46.3	Max 50 %	——	——
0.425 mm (No. 40).	28.0	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.6	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 /

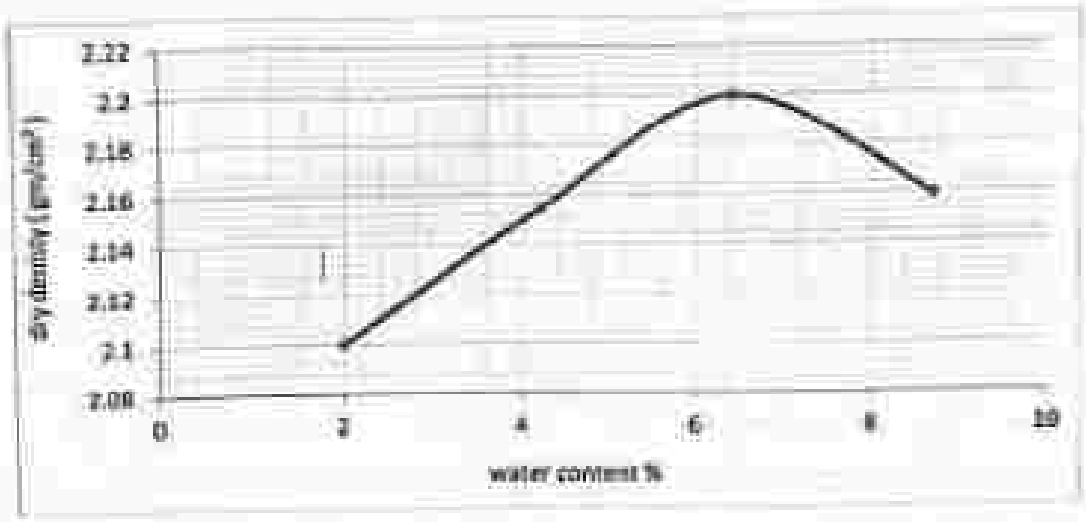
1 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 27362237 - 27362233

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

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



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature / .....

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax: 27367231 - 27363083

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٨٣

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 : 7/09/2023

Reporting Date : 11/09/2023

Reporting No. : 10-3-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.60
2.54	0.100	3.60
3.18	0.125	4.56
3.81	0.150	5.31
4.45	0.175	6.09
5.08	0.200	6.56
6.35	0.250	7.02

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.60	52.1 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.20(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 /

3 El Malik E Nasir St.
Zeitoun, Cairo
Tel & Fax: 2736721 - 2755361

Tel: 219 - 391 - 537

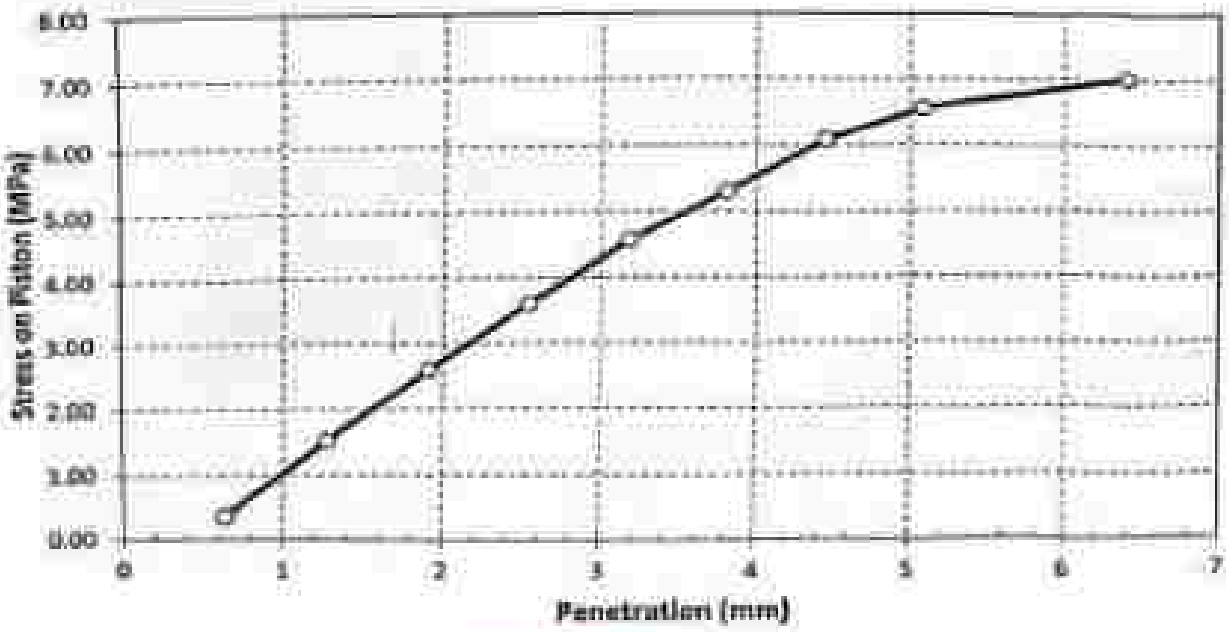
IAS ACCREDITED Testing Laboratories

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

Load Penetration Curve of CBR Test

ASTM D-1883



Signature /

3 El Mahdi El Attar Street
Zamalek, Cairo.
Tel.& Fax: 27362721 - 27362681

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الأنفي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 16/09/2023

Soil type : Middle Embankment

Location : St From 641+200 to 641+300

Level : -1.5 M

Report No. : 63

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+220	1826	2.24	6	2.11	95.9%	Comply
2	641+240	1440	2.23	6.4	2.10	95.2%	Comply
3	641+260	1633	2.23	6	2.11	95.7%	Comply
4	641+280	1042	2.28	5.8	2.16	98.1%	Comply

Degree of compaction based on proctor test dated At

Max. dry density =2.18 gm/cm³

At optimum moisture content = 6.15

Signature: CEL

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2736720 - 2736083

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون / فاكس: ٢٧٣٦٧٢٠ - ٢٧٣٦٠٨٣

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

Dear Gentleman,

Attached here with the delivered on 12 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

8 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax : 27362723 - 27362293

IAS ACCREDITED

٨ ش الملك الأفضل
الزمالك - القاهرة
تليفون - فاكس : ٢٧٣٦٢٧٢٣ - ٢٧٣٦٢٢٩٣

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

CEL
Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax: 2736023 - 2736003

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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)	9.9

CEL

Signature

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax : 27360731 - 27360651

IAS ACCREDITED

٣ش الملك الافضل
الزمالك - القاهرة
تليفون و فاكس : ٢٧٣٦٠٧٣١ - ٢٧٣٦٠٦٥١

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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

Test	Results (%)
Liquid Limit	0
Plastic Limit	0
Plastielty Index	0

CEL
Signature

3 El Nasr & Abbas Street
Zamalek, Cairo
Tel.& Fax: 2736727 - 2736363

IAS ACCREDITED

٣ ش النصر والعباس
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٧ - ٢٧٣٦٣٦٣

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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).	45.9	Max 50 %	——	——
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.9	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 /

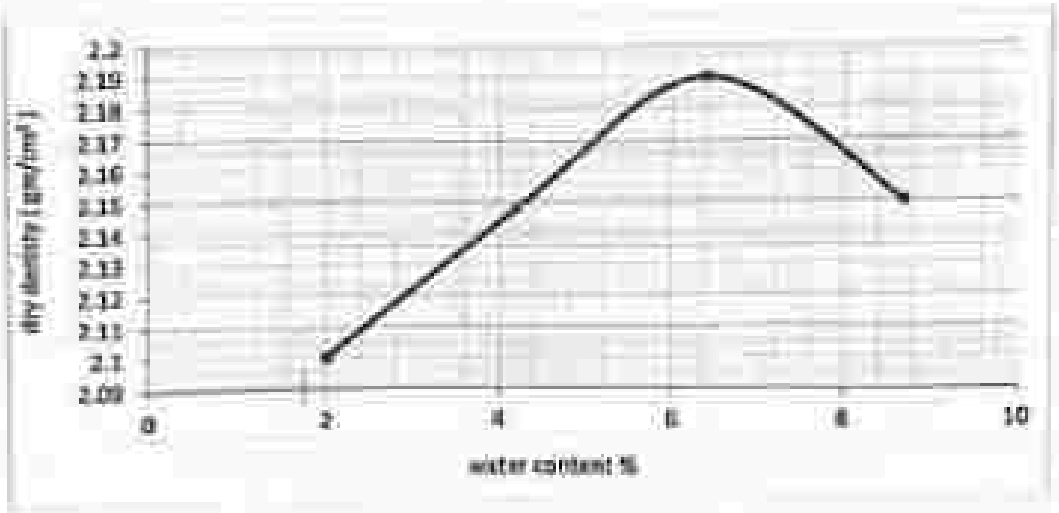
3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 2736723 - 2736363

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature /.....

3 El Maah El Alaa Street
Zamalek, Cairo.
Tel& Fax: 2736723 - 2736303

IAS ACCREDITED Testing Laboratory

٣ ش المعاه العلا
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٧٢٣ - ٢٧٣٦٣٠٣

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample result	
At 0.1 inch (2.54 mm) penetration	6.90	3.59	52 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.19(gm /cm³)

At = 6.4 % optimum water content.

3- Surcharge mo 4.50 Kg.

4- CBR > 10 for middle and top embankments according project spec page No 36.

Signature

1 D Mosli Street
Zamalek, Cairo
Tel.&Fax: 2736720 - 7765060

IAS ACCREDITED

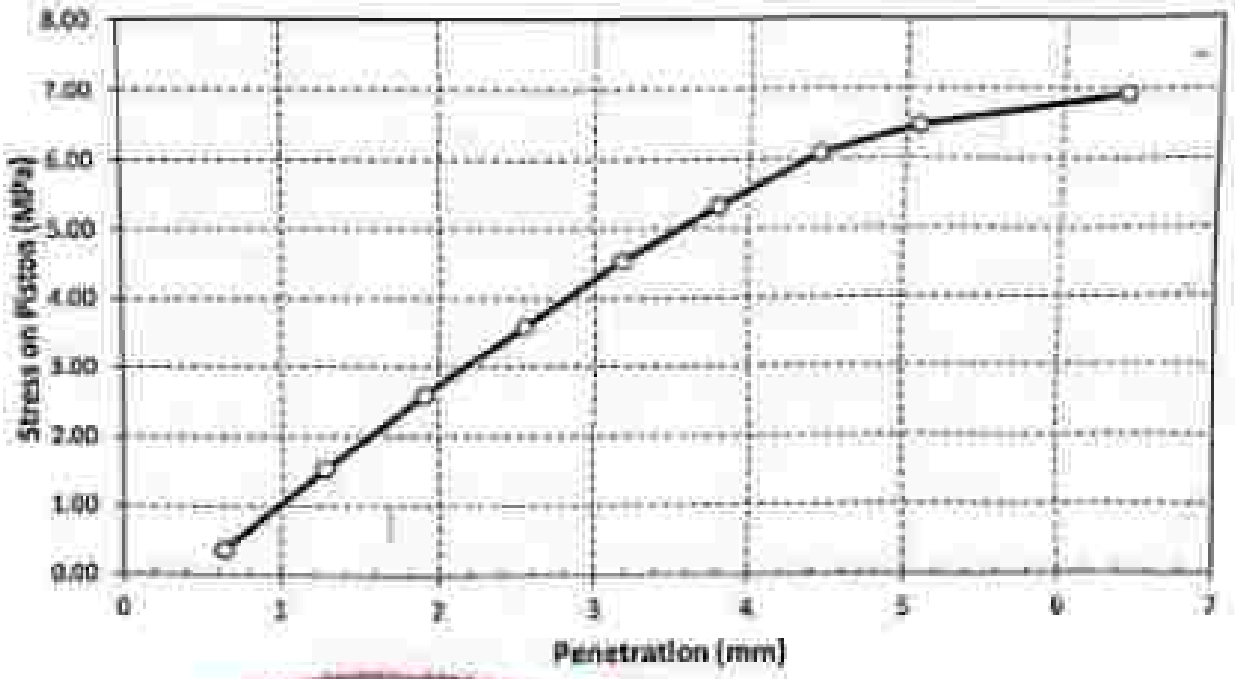
الزمالك - القاهرة

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

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

IAS ACCREDITED

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

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلي

Contents: شركة الأنفاق للمقاولات والتوريدات العمومية

Project : Electric Express Train - Sector (1) – Gaza to Amreyn.
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+020 to 641+300
Station: 641+240
Level : A.S
Test Date : 19/9/2023
Report Date : 19/9/2023
Type of soil : Original earth
Report No. : 1

Dear Gentlemen,

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

Apparatus

1. Loading plates consists of two plates with 330 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 (Proving)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

Test Procedure:

1. Clean the ground surface 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 testing the load applied preloading about 20 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 330 mm loading plate, the test values are 3.2 kg/cm²
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, i.e. 50 %, 25 %, and approximately 2 % of the maximum load.
9. Following unloading, a further (3 rd) 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
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلي
219 - 501 - 527
٣ شارع الملك الأفضل - الزمالك - القاهرة

Report

1. Evaluation and representation of results.
2. Load Settlement curve.
3. The test report contint the following:-

- location of test site - Dimension of loading plate.
- Measuring device used - Type of soil.
- Type of Building 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.

Based

- Type of soil : Original earth
- Job requirement : Ev3 = 40 MPa

Item	Descriptions
Type of building material below the plate	Natural Soil
Plate Diameter (mm)	300
Date of measurement	11/06/2023
Unusual observation made during test	Nil
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+200	641+300	641+240	-1.5	33.9	140.7	4.13

Signature

Company Name : شركة الذهبي للمقاولات و التوريدات العمومية
Project : Electric Express Train - Section (1) - Cross to Arrawi.
Test Date : 16/09/2023
report date : 19/09/2023
Station : 641+240
Test No. : 1

Nonrepetitive Static Plate Load Tests of Soils
D84 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	19.30	0.70	19.71	0.79	0.74
2	1.66	18.85	1.15	18.57	1.43	1.40
3	2.50	18.03	1.97	17.86	2.14	2.06
4	3.33	17.65	2.35	17.35	2.65	2.50
5	4.17	17.08	2.92	17.18	2.82	2.87
6	5.00	16.53	3.47	16.20	3.80	3.64

Unloading Stage (1)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
1	2.50	17.43	2.57	16.93	3.07	3.02
2	1.66	17.75	2.25	16.58	3.42	2.84
3	0.100	17.85	2.15	17.08	2.92	2.48

Loading Stage (2)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
0	0.83	17.82	2.18	15.83	3.17	2.68
[illegible]	1.66	17.79	2.22	15.61	3.39	2.80
stress is reached.						
2	2.50	17.64	2.36	15.45	3.55	2.96
3	3.33	17.58	2.42	15.31	3.69	3.05
4	4.17	17.41	2.57	15.17	3.83	3.23

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلي
219 - 919 - 537

CEL

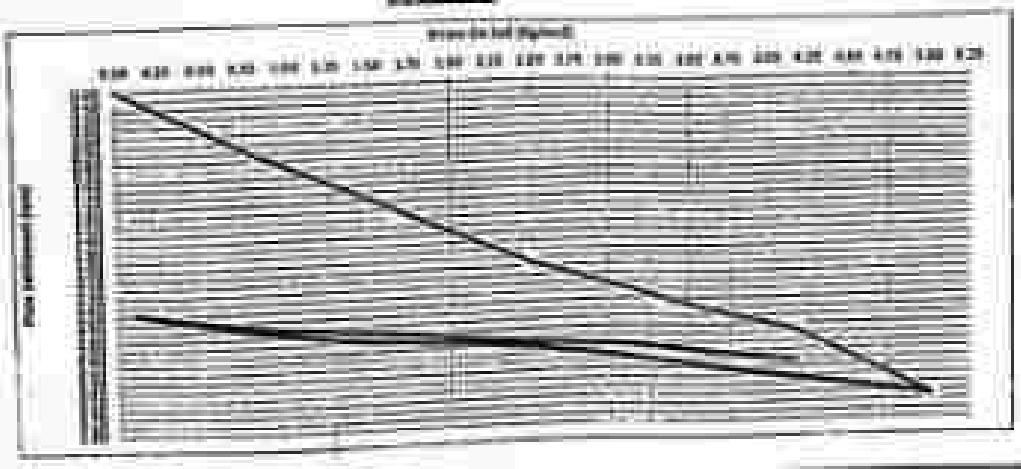
Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلى

Company Name : [illegible]
Project : Riyadh Express Train - Sector (5) - Dawa to Ismail.
Test Date : [illegible]
report date : [illegible]
Station : 041+245
Test No. : 1

Nonrepetitive Static Plate Load Tests of Soils
DIN 18134



Loading (T)	0	1	2	3	4	5	6
Stage(Kg)	0	586	1172.6	1758.3	2342.8	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	0.74	1.43	2.08	2.52	2.87	3.14

UnLoading (T)	1	2	3	4
Stage(Kg)	3525	1768	884	71
Stress (Kg/cm2)	5.00	2.50	1.250	0.10
Settlement (mm)	3.24	3.22	3.04	2.95

D (mm) = 300	B1 (mm) = 1.07	S1(mm) = 3.07	S2 = 1.20		
Ev1 (MPa) = [illegible]	53.8				

Profile = 3.24

Loading (T)	0	1	2	3	4	5
Stage(Kg)	0	586.305	1172.6	1758.3	2342.8	2946.1
Stress (Kg/cm2)	0.10	0.83	1.66	2.50	3.33	4.17
Settlement (mm)	3.49	3.08	2.81	2.59	2.68	2.25

D (mm) = 300	B1 (mm) = 0.78	S1(mm) = 1.08	S2 = 0.11		
Ev2 (MPa) = [illegible]	140.7				

Ev1 = Modulus of deformation during the loading stage.
Ev2 = Modulus of deformation during the Reloading stage.
D = Plate diameter (mm)
S1 = The difference between S.1 and S.2 from the maximum loading (mm) (Kg/cm²)
S2 = Difference in settlements corresponding to S.2 and S.7 from the maximum loading (mm)

CEL
Consulting Engineering Bureau & Laboratories

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 12/09/2023

Soil type : Middle Embankment

Location : St From 641+300 To 641+420

Level : -2 M

Report No. : 59

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+325	1644	2.29	5.2	2.17	98.7%	Comply
2	641+350	1053	2.23	5.8	2.11	95.7%	Comply
3	641+380	1051	2.26	5.8	2.14	97.3%	Comply
4	641+410	1387	2.24	5.8	2.11	96.0%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.20 gm/cm^3
- At optimum moisture content = 6.4 %
- Signature :

10 Malek E Ashtar St.
Dokki, Cairo
Tel & Fax: 3336521 - 3336303

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	: **7/09/2023**
Reporting Date	: **11/09/2023**
Reporting No.	: **10-3**

Dear Gentleman,

Attached here with the delivered on 7 / 9 / 2023

This sample is representative for 5.000 M^2

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. Procter Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 27362703 - 27362303

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	97.1
37.5	1.5	97.3
25	1	92.1
19	¾	86.2
12.50	½	78.2
9.50	3/8	72.5
4.75	4	57.9
2.00	10	44.3
0.425	40	26.0

CEL Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax: 2736721 - 2736303

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 : 7/09/2023

Reporting Date : 11/09/2023

Reporting No. : 10-3

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)	10.2

CEL

Signature

9 El-Mina El Atlal Street
Zamalek, Cairo
Tel.& Fax: 2736223 - 2736268

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3

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

CEL
Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 27362521 - 27362009

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3

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).	44.3	Max 50 %	------	------
0.425 mm (No. 40).	26.0	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	10.2	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

3 B Nidak El Abdd Street
Zamalek, Cairo
Tel & Fax: 27362721 - 27362723

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 : 7/09/2023

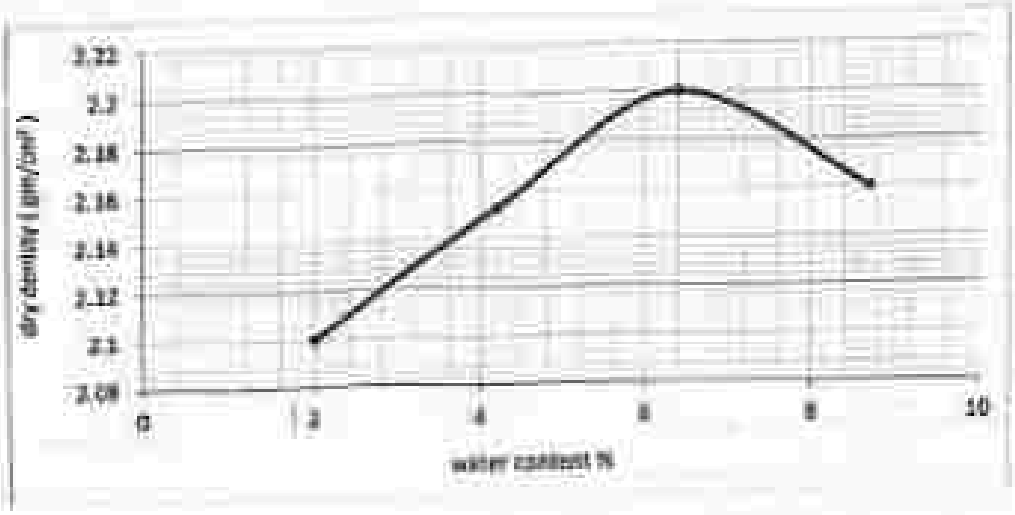
Reporting Date : 11/09/2023

Reporting No. : 10-3

Moisture – Density relation of soil

Test result (Modified proctor test)

ASTM D-1557



- Max dry density (gm/cm³) : 2.20
- Optimum moisture content % : 6.4 %

Signature / CEL

Company Name : شركة الذهبي

5 El Malek El Afdal Street
Zeraiba, Cairo.
Tel.& Fax: 2730721 - 2730303

IAS ACCREDITED

٥ ش الملك الأفضل
الزيتون - القاهرة
تليفون - فاكس : ٢٧٣٠٧٢١ - ٢٧٣٠٣٠٣

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.34
1.27	0.050	1.50
1.91	0.075	2.57
2.54	0.100	3.57
3.18	0.125	4.54
3.81	0.150	5.27
4.45	0.175	6.06
5.08	0.200	6.34
6.35	0.250	6.90

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.57	51.7 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.20(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

Eng. Malak E. Moaf Saber
Zamalek
Tel/Fax: 2356723 - 2356723

IAS

CEL

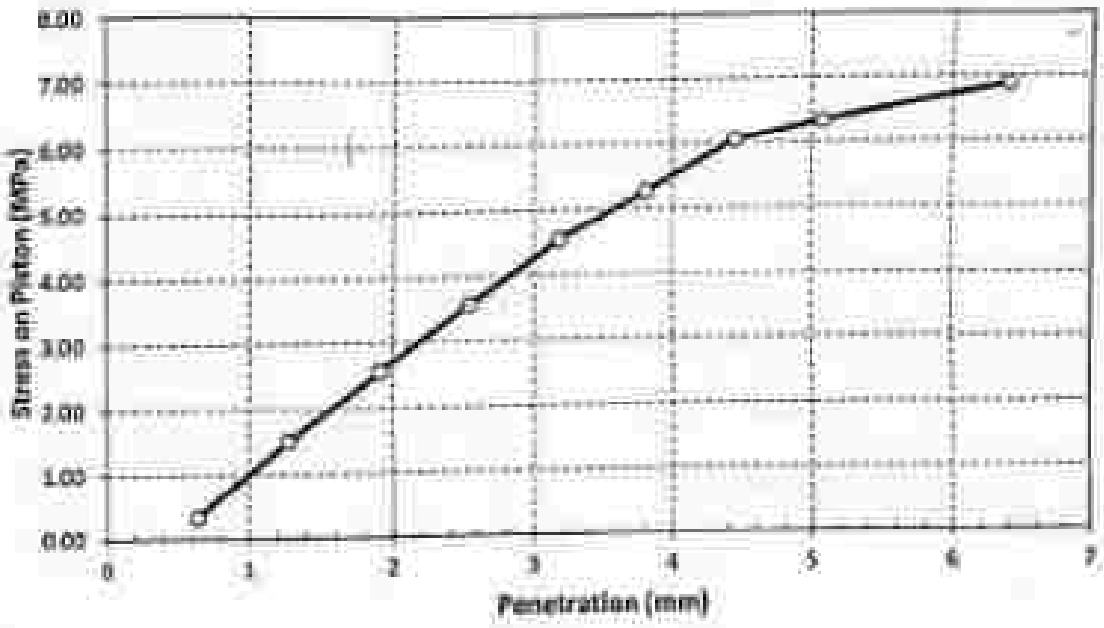
Consulting Engineering Bureau & Laboratories

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	: 7/09/2023
Reporting Date	: 11/09/2023
Reporting No.	: 10-3

Load Penetration Curve of CBR Test

ASTM D-1883



Signature:

3 El Nasr El Attal Street
Zamalek, Giza
Tel.& Fax: [illegible]

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name : شركة أذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 14/09/2023

Soil type : Middle Embankment

Location : St From 641+420 to 641+540

Level : -2.5 M

Report No. : 62

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+445	1418	2.29	6.4	2.15	97.8%	Comply
2	641+475	1698	2.24	6	2.12	96.1%	Comply
3	641+495	1404	2.20	6.4	2.07	94.2%	Comply
4	641+525	1058	2.22	6	2.09	95.1%	Comply

Degree of compaction based on proctor test carried At

Max. dry density =2.19 gm/cm³

At optimum moisture content =6.4 %

Signature

CEL

2 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 2736720 - 2736308

IAS ACCREDITED

٢ ش الملك الأفضل
الزمالك - القاهرة
التليفون والفاكس : ٢٧٣٦٧٢٠ - ٢٧٣٦٣٠٨

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الأهلي
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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Dear Gentleman,

Attached here with the delivered on 12 / 9 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature:

CEL

Consulting Engineering Bureau & Laboratories

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 27362727 - 27362703

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

CEL

Signature

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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)	9.9

Signature

3 El-Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax : 27362231 - 27362253

IAS ACCREDITED Testing Laboratory

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

18 Malak El Afdal Street
Zamalek, Cairo.
Tel & Fax: 27361722 - 27352303

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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).	45.9	Max 50 %	——	——
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.9	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

CEL

Signature /

3 El Masek St Ahad Street
Zamalek, Cairo
Tel.& Fax. 27361700 - 27353083

IAS ACCREDITED

٣ ش المسك الأحد
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦١٧٠٠ - ٢٧٣٥٣٠٨٣

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 : 08/09/2023

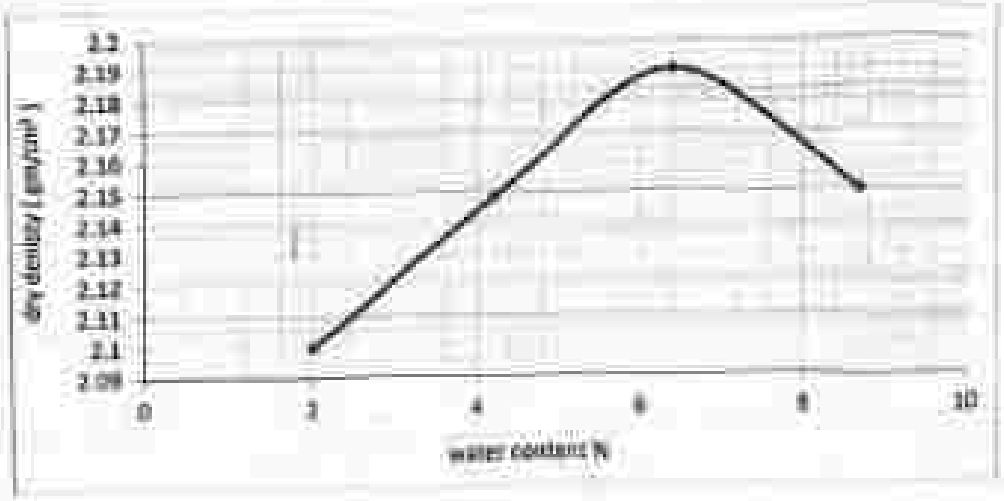
Reporting Date : 12/09/2023

Reporting No. : 10-4

Moisture – Density relation of soil

Test result (Modified proctor test)

ASTM D-1557



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature

3 El Malak El Afdal Street
Zamalek, Cairo.
Tel& Fax: 2736720 / 2736000

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.59	52 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.1%(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,

1 E Nasr St. Abbasia
Zeitoun, Cairo
Tel& Fax: 2776972/1 - 2785303

IAS ACCREDITED TESTING LABORATORY

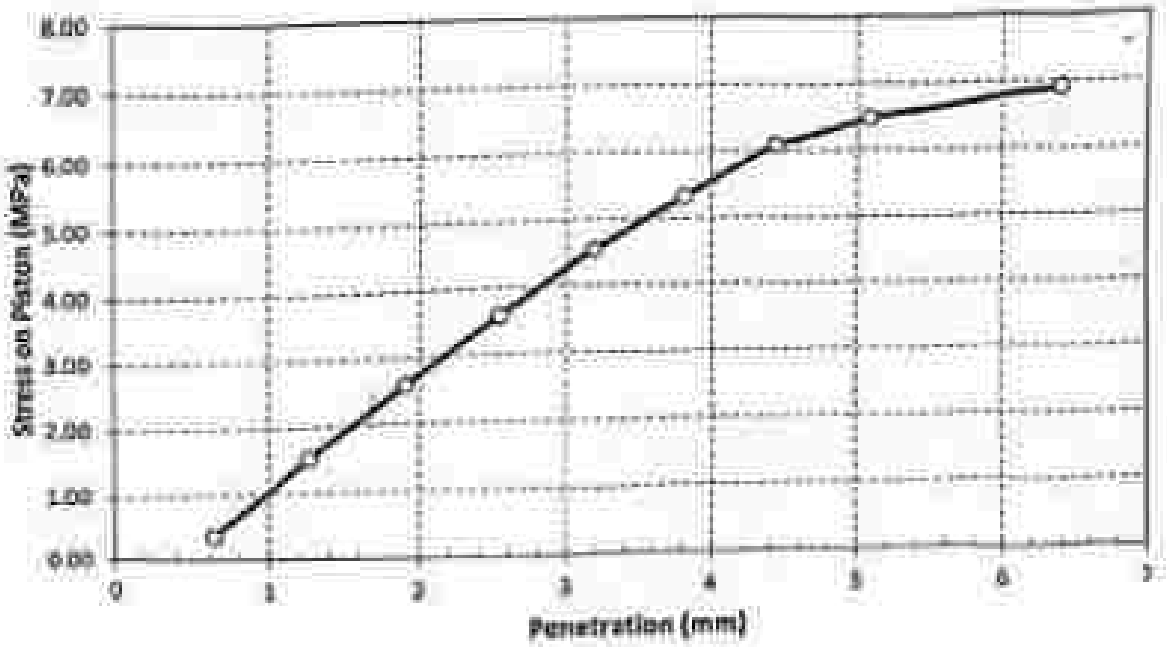
١ ش النصر العباسية
الزيتون - القاهرة
تليفون وفاكس: ٢٧٧٦٩٧٢/١ - ٢٧٨٥٣٠٣

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax : 2736723 - 2736303

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 : 26/09/2023

Soil type : Middel Embankment

Location : St + From 641+300 To 641+420

Level : - 1.75 M

Report No. : 72

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+330	1803.5	2.20	5.4	2.08	95.1%	Comply
2	641+350	1559.0	2.22	5.8	2.10	95.7%	Comply
3	641+360	1559.7	2.22	5.5	2.10	95.9%	Comply
4	641+380	1591.7	2.23	6.4	2.09	95.6%	Comply
5	641+400	1543.1	2.21	6	2.08	95.2%	Comply
6	641+410	1388.9	2.23	6.4	2.10	95.8%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.19 gm/cm^3

At optimum moisture content = 6.4 %

Signature

10 Musa E Abu Nasr
Zenin, Giza
Mob.no. 2126100 - 0100009

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	: **08/09/2023**
Reporting Date	: **12/09/2023**
Reporting No.	: **10-4**

Dear Gentleman,

Attached here with the delivered on 8 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

Signature

(E-Mail: E-Mail filter)
Zeitoun, Cairo
Tel/Fax: [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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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)	9.9

Signature /

Zeitoun, Cairo

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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 /

19 Mosk E Alaw Street
Cairo, Egypt
Tel.Fax: [illegible]

IAS ACCREDITED Testing Laboratory

[illegible]
[illegible]
[illegible]

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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).	45.9	Max 50 %	------	------
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	9.9	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 /

14 El Malek E-Afzal Street
Zamalek, Cairo
Tel & Fax: 27362221 – 27362003

IAS ACCREDITED

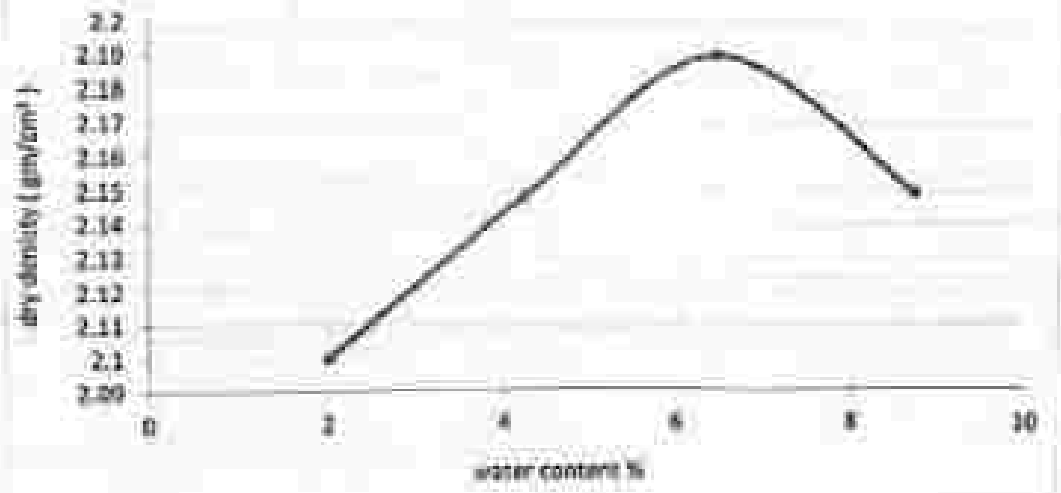
CEL

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

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



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature /

14 Mahmoud E. Riad Street
Zamalek, Cairo.
Tel & Fax: 2736522 - 2736583

IAS ACCREDITED

١٤ شارع محمود رياض
الزمالك - القاهرة
تليفون وفاكس : ٢٧٣٦٥٢٢ - ٢٧٣٦٥٨٣

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.59	52 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.19(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 / ...

18 Mohi E Alden Street
Zamalek, Cairo.
Tel & Fax: 27362321 - 27362063

IAS ACCREDITED

CEL

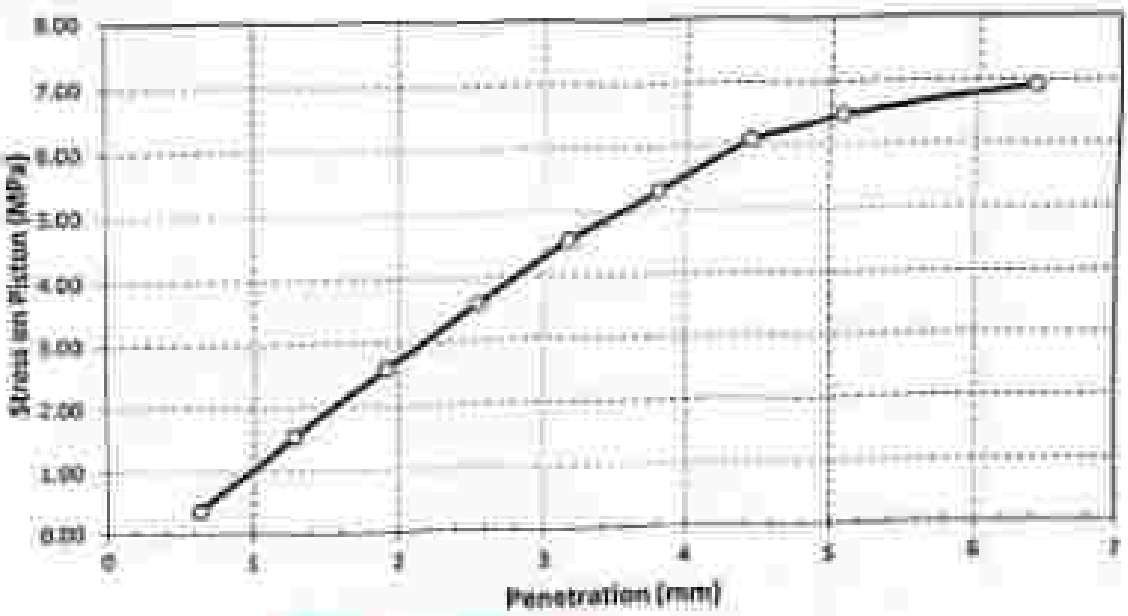
Consulting Engineering Bureau & Laboratories

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature /

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 27/09/2023

Soil type : Middel Embankment

Location : St + From 641+300 To 641+420

Level : - 1.5 M

Report No. : 73

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+320	1752.1	2.26	5.8	2.14	97.5%	Comply
2	641+340	1529.2	2.26	5.8	2.14	97.1%	Comply
3	641+360	1545.8	2.24	5.6	2.12	96.2%	Comply
4	641+380	1591.7	2.23	6.4	2.09	95.2%	Comply
5	641+400	1473.6	2.27	6	2.14	97.3%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.20 gm/cm^3

At optimum moisture content = [illegible] %

Signature :

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	: **19/09/2023**
Reporting Date	: **23/09/2023**
Reporting No.	: **10-5**

Dear Gentleman,

Attached here with the delivered on 19 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

CEL Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم التسجيل الضريبي 219 - 991 - 537
المركز الرئيسي : شارع [illegible] الأشلي - 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.4
37.5	1.5	96.5
25	1	90.2
19	¾	85.2
12.50	½	74.9
9.50	3/8	71.2
4.75	4	55.1
2.00	10	41.5
0.425	40	25.2

CEL
Signature
مكتب معامل الاستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي ٢ شارع ثابت الأفضل - 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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

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

CEL Signature

مكتب معامل الاستشارات الهندسية

مشروعات ، فحوصات ، أبحاث

رقم التسجيل الضريبي 537 - 991 - 219

المقر الرئيسي : شارع الملك الأفضل - 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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

CEL

Signature

مكتب معامل الاستشارات الهندسية

مشروعات (سوهاج وقنا)

رقم التسجيل الضريبي 537 - 091 - 219

المركز الرئيسي : شارع ... الأقصر - الزمالك - القاهرة

11 Mad E-Nile Street
Zamalek, Cairo
Tel/Fax: 2362 ... 2362 ...

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهبي

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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).	41.5	Max 50 %	——	——
0.425 mm (No. 40).	25.2	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	91	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 (صوفاج وقنا)
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي : شارع الملك الأفضل - الزمالك - القاهرة

IAS

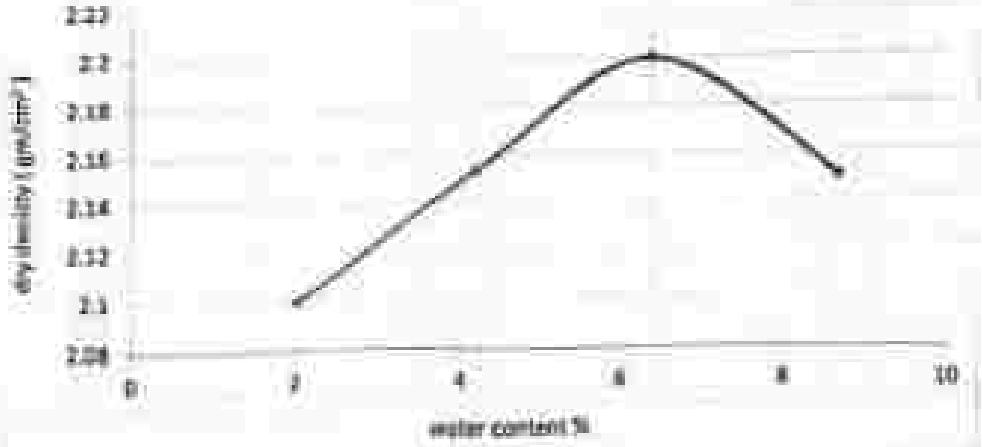
CEL

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reparting No.	: 10-5

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



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات : سوهاج وقنا
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي : شارع [illegible]

(1) Mahd El Abbd Street
Giza, Cairo
Tel & Fax [illegible]

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name : شركة الأهلي

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.38
1.27	0.050	1.57
1.91	0.075	2.69
2.54	0.100	3.73
3.18	0.125	4.64
3.81	0.150	5.43
4.45	0.175	6.09
5.08	0.200	6.54
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.73	54 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.20(gm /cm^3)
At = 6.4 % optimum water content.

3- Surcharge weight 4.50 kg.

4- CBR > 10 for minimum requirements as according project spec page No 36.

Signature

Consulting Engineers & Laboratories

مكتب معامل الاستشارات الهندسية

مشروع قنا - سوهاج - وقنا

رقم التسجيل بالسجل التجاري 537 - 001 - 219

المركز الرئيسي : شارع الملك الزاهر (الظاهر) القاهرة

Zaher, Cairo

Mob: 2010[illegible] - 2[illegible]

IAS ACCREDITED

المدير الفني

[illegible]

تليفون : [illegible]

CEL

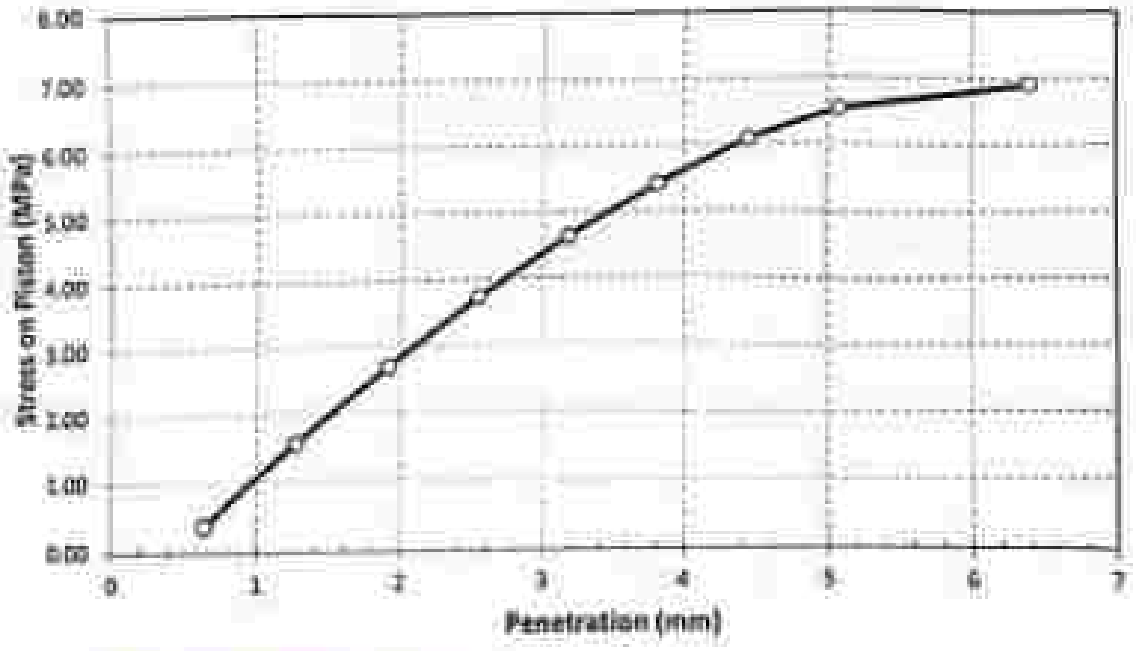
Consulting Engineering Bureau & Laboratories

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، صوفيا وفنا ،
219 - 091 - 537 رقم التسجيل الضريبي
المركز الرئيسي • شارع الله - الزمالك - القاهرة

CEL

Consulting Engineering Bureau & Laboratories

مكاتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 28/09/2023

Soil type : Middle Embankment

Location : St From 641+420 To 641+540

Level : - 2 M

Report No. : 78

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

RTest #	Station	Test Hole Volume cm^3	Bulk Density gm/cm^3	Moisture Content %	Dry Density (gm/cm^3)	Degree of Compaction (%)	Acceptance
1	641+410	1575.0	2.29	6.4	2.15	97.0%	Comply
2	641+435	1660.4	2.26	6	2.13	96.7%	Comply

Degree of compaction based on proctor test dated At

Max. dry density =2.20 gm/cm^3

At optimum moisture content = 6.4 %

Signature:

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات : صوفاج وقنا
رقم التسجيل الضريبي 537 - 091 - 219
المركز الرئيسي ٢ شارع الملك الأفضل - الزمالك - القاهرة

11, Malek E. Afzal Street
Zamalek, Cairo
Tel./Fax: [illegible]

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Dear Gentleman,

Attached here with the delivered on 19 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم التسجيل الضريبي 537 - 091 - 219
المركز الرئيسي : 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.4
37.5	1.5	96.5
25	1	90.2
19	¾	85.2
12.50	½	74.9
9.50	3/8	71.2
4.75	4	55.1
2.00	10	41.5
0.425	40	25.2

CEL
Consulting Engineering Bureau & Laboratories
Signature
219 - 095 - 537

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

مشروعات ، سوفاج والمنيا

رقم التسجيل الضريبي: 537 - 591 - 219

المركز الرئيسي : شارع [illegible] ، [illegible] ، 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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 ، سيوفا و والنا ،

يلزم التسجيل المشروعي 537 - 501 - 219

المركز الرئيسي ٢ شارع النيل الأعظم ، طوخ ، القليوبية

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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).	41.5	Max 50 %	------	------
0.425 mm (No. 40).	25.2	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	.91	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

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

مشروعات ، بسوفاج وقنا ،

رقم التسجيل الضريبي 537 - 091 - 219

المركز الرئيسي ٢ شارع الدكتور الأطرش ، الزمالك ، القاهرة

59 Mitek F. Abbd Street

Zamalek, Cairo

Tel/Fax 27362727 / 27362727

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

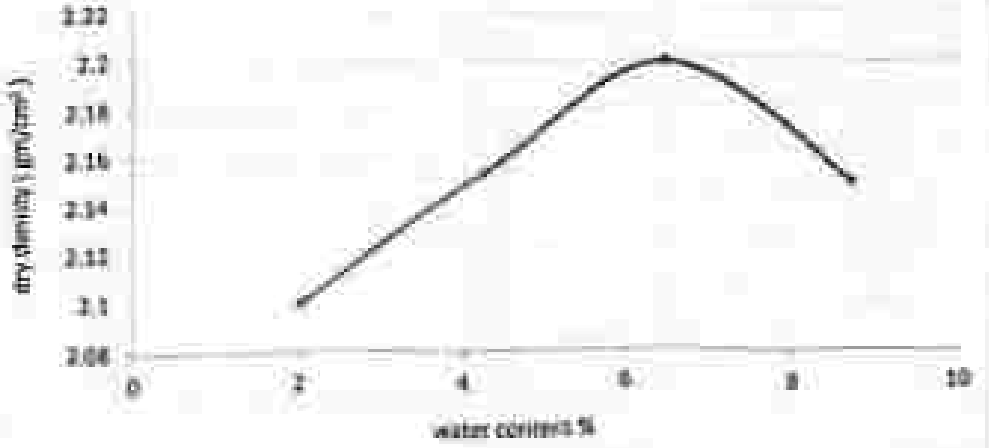
Type of sample : Soil Embankment (Upper Embankment 0.0 M)

Delivery Date : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي • شارع السد الأقليمي - 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.38
1.27	0.050	1.57
1.91	0.075	2.69
2.54	0.100	3.73
3.18	0.125	4.64
3.81	0.150	5.43
4.45	0.175	6.09
5.08	0.200	6.54
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.73	54 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.20(gm /cm³)
At = 6.4 % optimum water content.

4- CBR = 10 for unsuitable soil used in Embankments according project spec page No 36.

Signature

Zayed, Giza

Tel./Fax: 2316221 - 2316320

IAS ACCREDITED

CEL

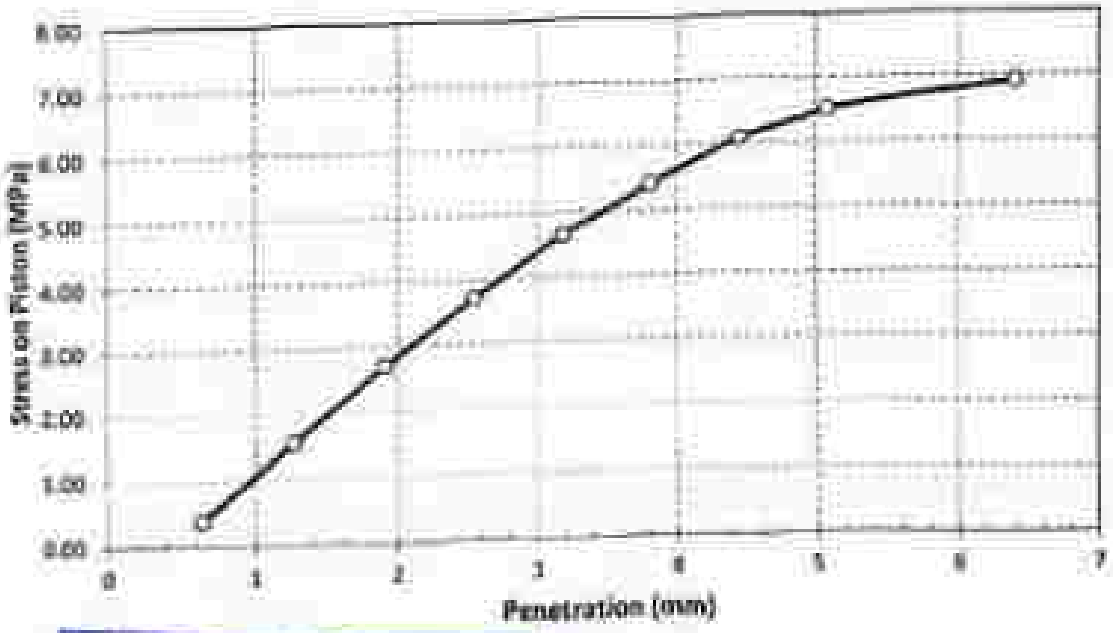
Consulting Engineering Bureau & Laboratories

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Load Penetration Curve of CBR Test

ASTM D-1883



CEL
Consulting Engineering Bureau & Laboratories
Signature
219 - 091 - 537

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 27/09/2023

Soil type : Middel Embankment

Location : St + From 641+540 to 641+780

Level : - 2 M

Report No. : 75

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+580	1450.7	2.24	5	2.13	96.9%	Comply
2	641+620	1319.4	2.26	5	2.16	98.0%	Comply
3	641+650	1450.7	2.25	5.3	2.14	97.2%	Comply
4	641+680	1556.3	2.22	5.5	2.10	95.7%	Comply
5	641+720	1548.6	2.29	5	2.18	99.1%	Comply
6	641+770	1332.6	2.23	5.3	2.11	96.1%	Comply

Degree of compaction based on proctor test dated At

Max. dry density =2.20 gm/cm^3

At optimum moisture content =6.4 %

Signature / CEL

11 Mahmoud Abd Elsattar
Zamalek, Cairo
T-Fax: 27362... / 27362...

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	: **19/09/2023**
Reporting Date	: **23/09/2023**
Reporting No.	: **10-5**

Dear Gentleman,

Attached here with the delivered on 19 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم السجل الضريبي 210 - 991 - 537
المركز الرئيسي ٣ 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 : 19/09/2023
Reporting Date : 23/09/2023
Reporting No. : 10-5

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.4
37.5	1.5	96.5
25	1	90.2
19	¾	85.2
12.50	½	74.9
9.50	3/8	71.2
4.75	4	55.1
2.00	10	41.5
0.425	40	25.2

Signature

Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات : سوهاج وقنا
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي : شارع الله الأفضل، الزمالك

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

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

CEL
Consulting Engineering Bureau & Laboratories
Signature
مشروعات ، مسوحات ، وتنفيذ
219 - 991 - 537 رقم التسجيل الضريبي
المركز الرئيسي ٥ شارع الملك الأفضل - الزمالك - القاهرة

34 Mark F Abd Shair
Zamalek, Cairo
Tel/Fax: 27362551

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 Embaukment (Upper Embankment 0.0 M)
Delivery Date	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

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

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 : 19/09/2023
Reporting Date : 23/09/2023
Reporting No. : 10-5

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).	41.5	Max 50 %	----	----
0.425 mm (No. 40).	25.2	Max 30 %	Max 50 %	----
0.075 mm (No. 200).	.91	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

Consulting Engineering Bureau & Laboratories

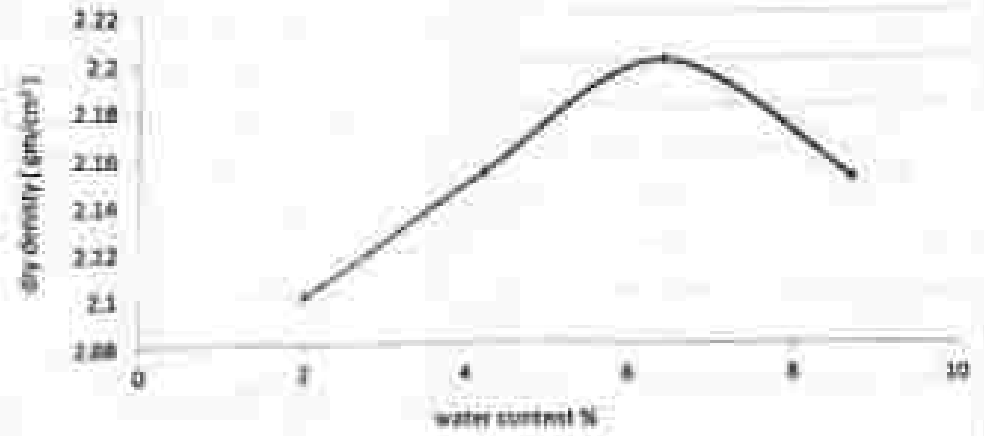
مكتب معامل الإستشارات الهندسية

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Moisture – Density relation of soil

Test result (Modified proctor test)

ASTM D-1557



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature

Consulting Engineers & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات - مواد وتربة
219 - 981 - 537 رقم التسجيل الضريبي
المركز الرئيسي : شارع الدكتور الأطلل - 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=2862739,57

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

Delivery Date : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.38
1.27	0.050	1.57
1.91	0.075	2.69
2.54	0.100	3.73
3.18	0.125	4.64
3.81	0.150	5.43
4.45	0.175	6.09
5.08	0.200	6.54
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0,1 Inch (2.54 mm) penetration	6.90	3.73	54 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.200(gm /cm³)

At = 0.4 optimum water content.

Under 4.50 Kg

4- CBR 10 Reqd. for overcrossing bridges according project spec page No 36.

Signature

J.I. Bank E. Abd Ouel
Zenden, Gen.
Tel.Fax: 2065[illegible] - 2[illegible]

IAS ACCREDITED

Scanned with CamScanner

CEL

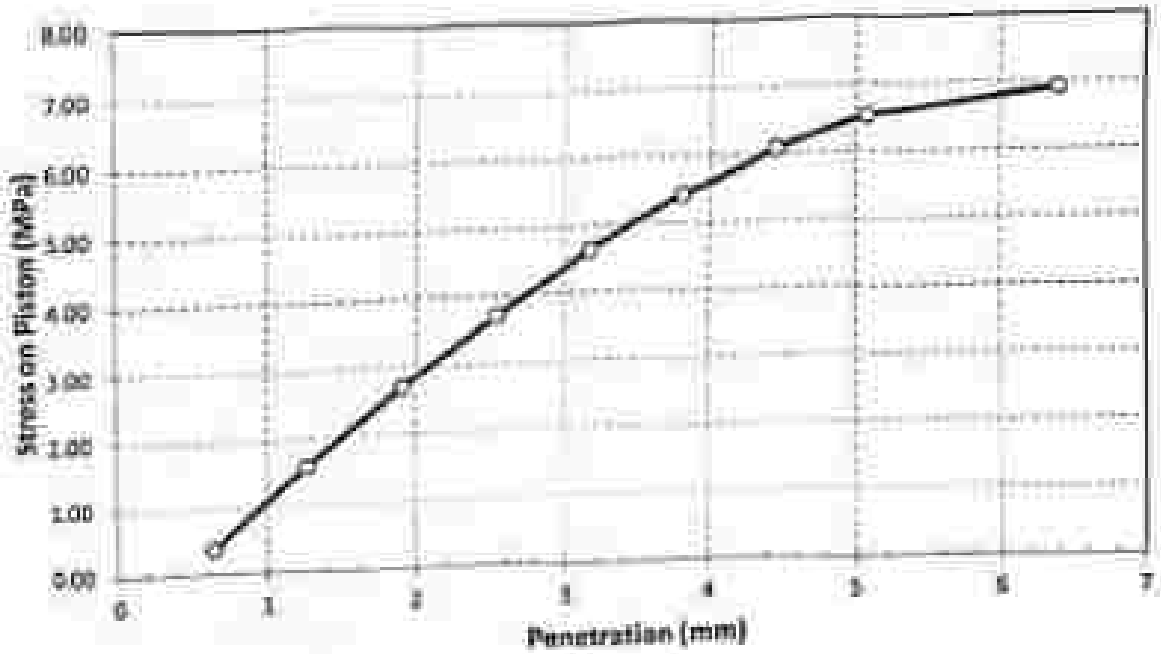
Consulting Engineering Bureau & Laboratories

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Load Penetration Curve of CBR Test

ASTM D-1883



Signature:

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، سيوفاج وكتبا
رقم التسجيل المشروعي 537 - 09/1 - 219
المركز الرئيسي ٣ شارع الشيخ دائل ، 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

Testing Date : 25/09/2023

Soil type : Upper Embankment

Location : St + From 641+200 To 641+300

Level : - 1.25 M

Report No. : 71

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+230	1788.9	2.23	6	2.11	96.2%	Comply
2	641+260	1716.7	2.25	6.4	2.11	96.4%	Comply
3	641+290	1770.8	2.23	6.4	2.09	95.6%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.18 gm/cm^3

At optimum moisture content = 6.4 %

Signature /

11 Gaber E. Abdo Street
Zamalek, Cairo
Tel & Fax: 27362231 - 27362001

IAS ACCREDITED Testing Laboratories

أمين أبو الفضل
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٢٠٠١ - ٢٧٣٦٢٢٣١

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	: **08/09/2023**
Reporting Date	: **12/09/2023**
Reporting No.	: **10-4**

Dear Gentleman,

Attached here with the delivered on 8 / 9 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature

CEL

Zamalek, Cairo
Tel./Fax: 27362521 - 27362521

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:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

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:041+400 E= 492410.858 N=2862759.57
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

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

Test	Results (%)
Percentage of material finer than Sieve Size 75 µM (No.200)	8.9

Signature

CEL

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة قاضي
Project	: Electric Express Train – HSR From Qsar To Armant
Testing Date	: 09 / 11 /2023
Soil type	: Middle Embankment
Location	: St From 638+850 To 639+000
Level	: -4 M
Report No.	: 101

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+900	1532.6	2.25	5.8	2.13	95.4%	Comply

Degree of compaction based on proctor test dated At

Max. dry density =2.23 gm/cm^3

At optimum moisture content = 6.4 %

Signature / .....

CEL

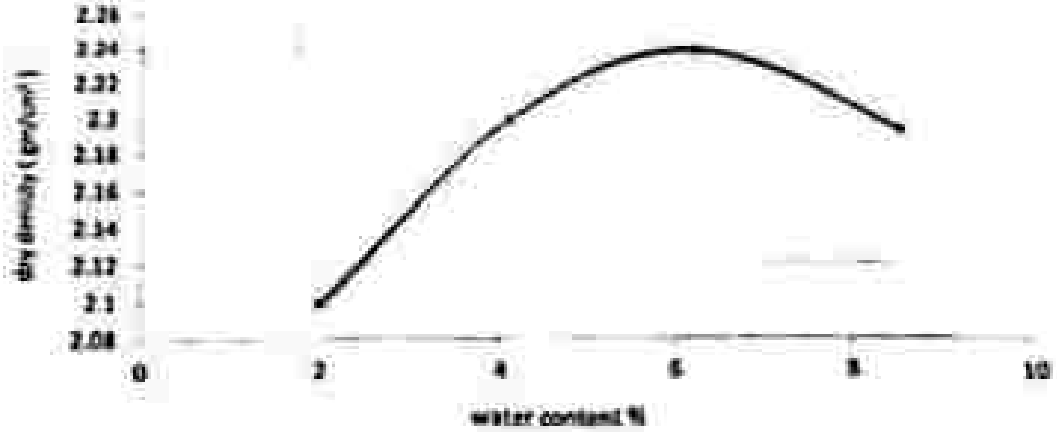
10 Mohamed Fathy Street
Zamalek, Cairo
Tel&Fax 2736722 – 2736395

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب صلاح الاستشارات الهندسية

Company Name	: شركة الخلجي
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	: 18/10/2023
Reporting Date	: 22/10/2023
Reporting No.	: 08-11

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



- Max dry density (gm/cm³) : 2.23
- Optimum moisture content % : 6.4 %

Signature / .....

CEL

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2736723 - 2736303

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكاتب مقابل للاستشارات الهندسية

Company Name	: شركة ذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Testing Date	: 09 / 11 /2023
Soil type	: Middle Embankment
Location	: St From 638+800 To 639+000
Level	: +4 M
Report No.	: 101

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

Station	Test Hole Volume cm^3	Bulk Density gm/cm^3	Moisture Content %	Dry Density (gm/cm^3)	Degree of Compaction (%)	Ac
638+900	1532.6	2.25	5.8	2.13	95.4%	I

Degree of compaction based on proctor test dated At

Max. dry density =2.23 gm/cm^3

At optimum moisture content = 6.4 %

Signature / .....

CEL

El Mabit E Abd Elsaw
Imbaba, Cairo
+(6 Fax 2236752 2232353

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب عامل 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	: 18/10/2023
Reporting Date	: 22/10/2023
Reporting No.	: 08-11

Dear Gentleman,

Attached here with the delivered on 18 / 10 / 2023

This sample is representative for 5,000 M³

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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature /.....

CEL

8 Makki El Abid Street
Qena, Egypt
Tel & Fax: 2736723 - 2736301

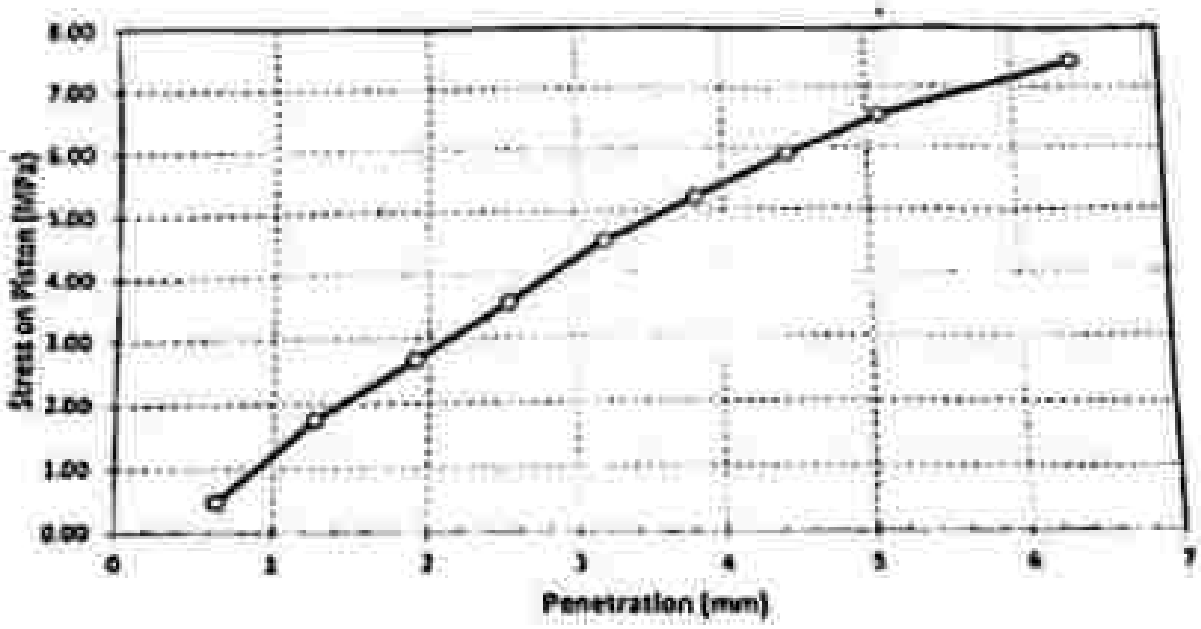
IAS ACCREDITED

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 0.9 M)
Delivery Date	: 18/10/2023
Reporting Date	: 22/10/2023
Reporting No.	: 08-11

Load Penetration Curve of CBR Test

ASTM D-1883



Signature / ..

3 D Malek E Afzal Street
Zamalek, Cairo
Tel & Fax: 27362223 - 27367(6)

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الهاني
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 : 18/10/2023
Reporting Date : 22/10/2023
Reporting No. : 08-11

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.5
37.5	1.5	94.3
25	1	89.4
19	¾	84.8
12.50	½	70.9
9.50	3/8	66.7
4.75	4	48.0
2.00	10	42.1
0.425	40	27.5

Signature /..

CEL

3 El Malek El Afzal Street
Zamalek, Cairo
Tel & Fax: 27361763 - 27361763

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة فاهي
Project	: Electric Express Train – HSR From Qous To Armant
Testing Date	: 12 / 11 /2023
Soil type	: Middle Embankment
Location	: 34 From 638+720 To 638+880
Level	: -4 M
Report No.	: 102

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 (%)	Acceptanc
1	638+760	1488.9	2.32	5.8	2.20	98.5%	Comply
2	638+810	1556.9	2.29	5.8	2.16	97.1%	Comply
3	638+860	1581.9	2.26	5.8	2.14	95.8%	Compl

Degree of compaction based on proctor test dated At

:Max. dry density =2.23 gm/cm^3

At optimum moisture content = 6.4 %

Signature /

CEL

212.701.417

3

IAS

ACCREDITED

Scanned with CamScanner

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

ompany Name : شركة فلهي
roject : Electric Express Train – HSR From Qous To Armant
ocation : ST: 639+000 E=32°54'25.6" N=25°53'59.1"
ype of sample : Soil Embankment (Upper Embankment 0.0 M)
elivery Date : 18/10/2023
eporting Date : 22/10/2023
eporting No. : 08-11

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)	10.9

gnature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات . الاقصر
ت 210.001.437
المركز الرئيسي . 3 شارع ...

El Malek El Afdal Street
Maadi, Cairo
el & Fax : 27[illegible]72.3 - 27[illegible]3563

IAS ACCREDITED Testing Laboratory

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 : 18/10/2023
Reporting Date : 22/10/2023
Reporting No. : 08-11

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).	42.1	Max 50 %	—	—
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	—
0.075 mm (No. 200).	10.9	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
219 021 437
3 شارع ...

3 El Nabi E Abd Street
Zamalek, Cairo
Tel & Fax: 2736721 - 2746163

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 : 18/10/2023
Reporting Date : 22/10/2023
Reporting No. : 08-11

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

3 El Malak El Afdal Street
Zamalek, Cairo
Tel & Fax : 27367237 - 27363303

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة ذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Testing Date	: 12 / 11 /2023
Soil type	: Middle Embankment
Location	: St From 639+000 To 639+100
Level	: -4 M
Report No.	: 103

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 (%)	Accept
1	638+025	1495.8	2.32	5.8	2.19	98.2%	Com
2	638+050	1536.1	2.29	5.8	2.16	96.9%	Com
3	638+085	1612.5	2.25	5.8	2.12	95.2%	Con

Degree of compaction based on proctor test dated At

Max. dry density =2.23 gm/cm^3

At optimum moisture content = 6.4 %

Signature /

CEL

219 991 437

3E Mark E Alexander
Zenobia, Cairo
Tel & Fax: 27362531 - 27362530

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب تعاملي للاستشارات الهندسية

Company Name	: شركة ذاهي
Project	: Electric Express Train – HSR From Qous To Armant
Testing Date	: 30 /10/2023
Soil type	: Middle Embankment
Location	: St. From 639+020 To 639+120
Level	: - 5 M
Report No.	: 97.2

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	639+050	1531.9	2.30	5.8	2.17	98.3%	Comply
2	639+080	1520.1	2.28	5.8	2.15	97.4%	Comply
3	639+110	1381.3	2.25	5	2.15	97.1%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.21 gm/cm^3

At optimum moisture content = 5.4 %

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

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

Delivery Date : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

Consulting Engineering Bureau & Laboratories

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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).	45.9	Max 50 %	——	——
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.9	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

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

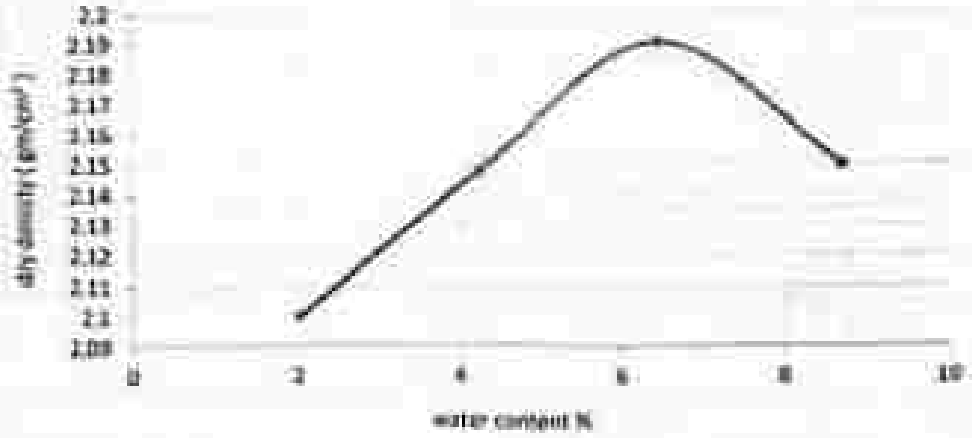
مكتب معامل الاستشارات الهندسية

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Moisture – Density relation of soil

Test result (Modified proctor test)

ASTM D-1557



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0,64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.59	52 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of =2.19(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 /

IAS ACCREDITED

CEL

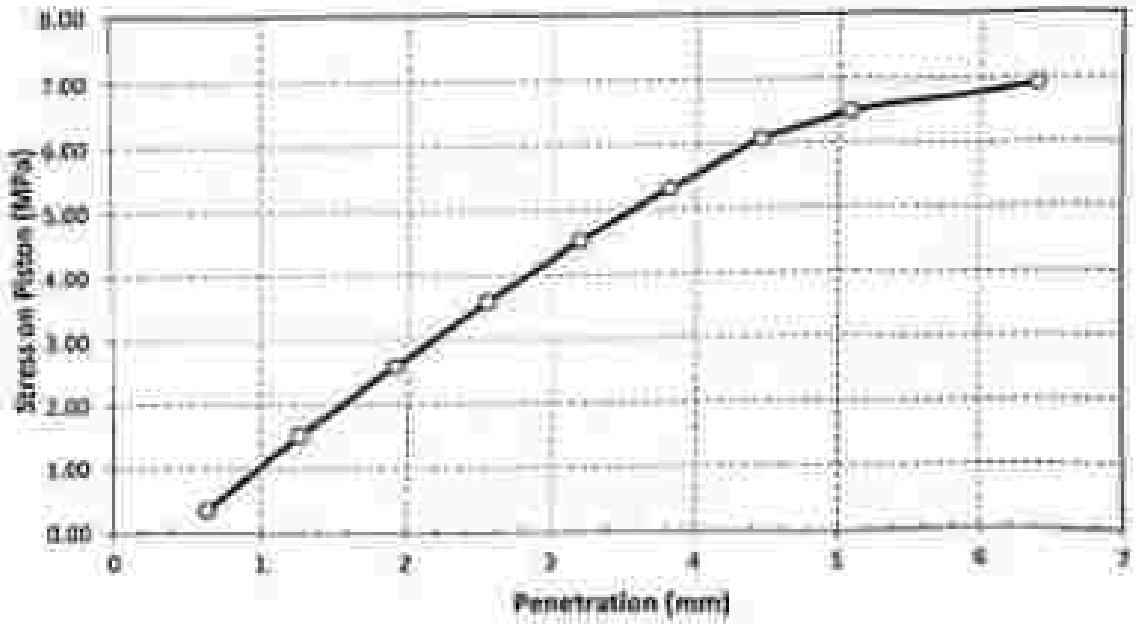
Consulting Engineering Bureau & Laboratories

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature:

CEL

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 25/09/2023

Soil type : Middle Embankment

Location : St + From 641+540 TO 641+760

Level : - 2.5 M

Report No. : 70

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+620	1490	2.23	5.5	2.1	96.6%	Comply
2	641+670	1335	2.30	5.8	2.2	99.1%	Comply
3	641+699	1610	2.21	6.4	2.1	95.1%	Comply
4	641+705	1413	2.29	5.8	2.2	98.9%	Comply
5	641+730	1535	2.25	6	2.1	97.0%	Comply
6	641+750	1490	2.28	6.4	2.1	97.8%	Comply
7	641+765	1525	2.27	6	2.1	97.6%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.19 gm/cm^3

At optimum moisture content = 6.4 %

Signature /

T.E. Bulos E-Abul Sheer
Zeitoun, Cairo
Tel Fax: 27905[illegible] - 27[illegible]

IAS ACCREDITED Testing Laboratory

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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	: **08/09/2023**
Reporting Date	: **12/09/2023**
Reporting No.	: **10-4**

Dear Gentleman,

Attached here with the delivered on 8 / 9 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature :

CEL

Consulting Engineering Bureau & Laboratories

219 - 991 - 527

1 E. Mosk E. Abdi Street
Zamalek, Cairo
Tel & Fax: 2356[illegible] - 2356[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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

Signature

CEL

18 Mohi E Din Street
Zamalek, Cairo
Tel & Fax: 2706223 - 2736300

IAS ACCREDITED

٢٨ شارع محي الدين
الزمالك - القاهرة
تليفون / فاكس: ٢٧٣٦٣٠٠ - ٢٧٠٦٢٢٣

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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)	9.9

Signature /

CEL

3 El Malik E Abdel Sheik
Zeitoun, Cairo
Tel.& Fax: 2786233 - 2786365

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

Signature

(E-Mail: E-Mail filter)
Zeitoun, Cairo
Tel/Fax: [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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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)	9.9

Signature /

Zeitoun, Cairo

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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 /

19 Mosk E Alaw Street
Cairo, Egypt
Tel.Fax: [illegible]

IAS ACCREDITED Testing Laboratory

[illegible]
[illegible]
[illegible]

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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).	45.9	Max 50 %	------	------
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	9.9	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 /

14 El Malek E-Afzal Street
Zamalek, Cairo
Tel & Fax: 27362221 – 27362003

IAS ACCREDITED

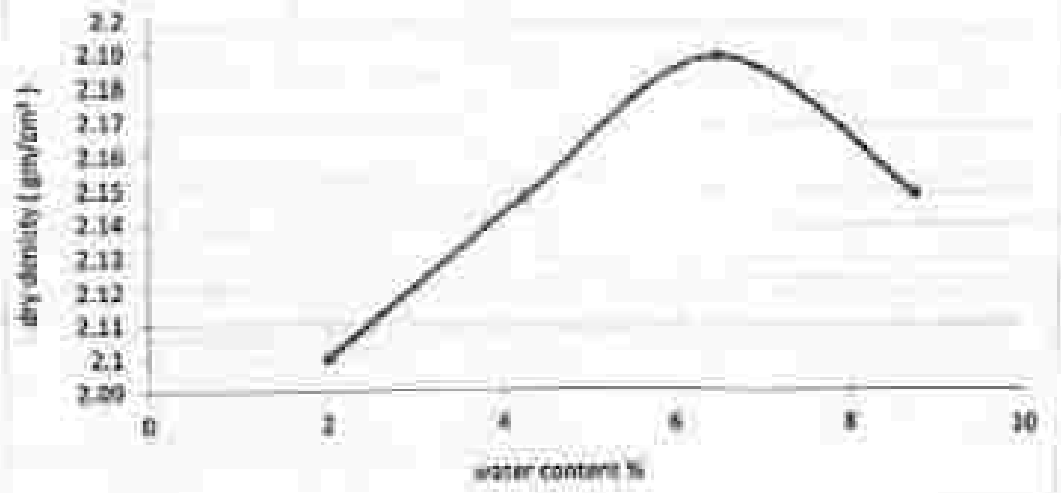
CEL

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

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



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature /

14 Mahmoud E. Riad Street
Zamalek, Cairo.
Tel & Fax: 2736522 - 2736583

IAS ACCREDITED

١٤ شارع محمود رياض
الزمالك - القاهرة
تليفون وفاكس : ٢٧٣٦٥٢٢ - ٢٧٣٦٥٨٣

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.59	52 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.19(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 / ...

18 Mohi E Alden Street
Zamalek, Cairo.
Tel & Fax: 27362321 - 27362063

IAS ACCREDITED

CEL

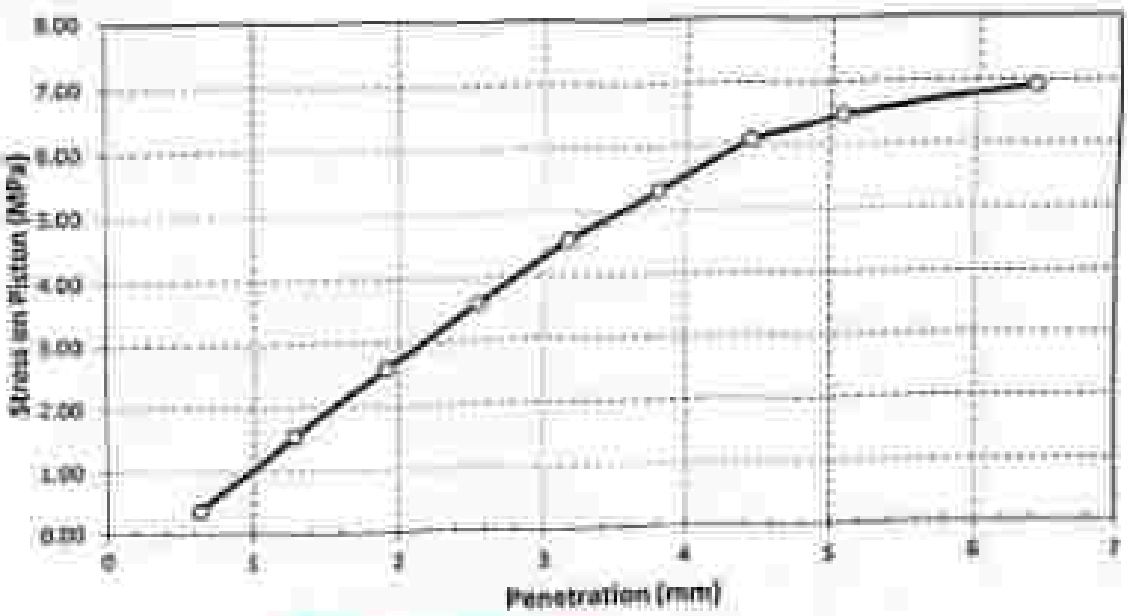
Consulting Engineering Bureau & Laboratories

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature /

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 27/09/2023

Soil type : Middel Embankment

Location : St + From 641+300 To 641+420

Level : - 1.5 M

Report No. : 73

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+320	1752.1	2.26	5.8	2.14	97.5%	Comply
2	641+340	1529.2	2.26	5.8	2.14	97.1%	Comply
3	641+360	1545.8	2.24	5.6	2.12	96.2%	Comply
4	641+380	1591.7	2.23	6.4	2.09	95.2%	Comply
5	641+400	1473.6	2.27	6	2.14	97.3%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.20 gm/cm^3

At optimum moisture content = [illegible] %

Signature :

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	: **19/09/2023**
Reporting Date	: **23/09/2023**
Reporting No.	: **10-5**

Dear Gentleman,

Attached here with the delivered on 19 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

CEL Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم التسجيل الضريبي 219 - 991 - 537
المركز الرئيسي : شارع [illegible] الأشلي - 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.4
37.5	1.5	96.5
25	1	90.2
19	¾	85.2
12.50	½	74.9
9.50	3/8	71.2
4.75	4	55.1
2.00	10	41.5
0.425	40	25.2

CEL
Signature
مكتب معامل الاستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي ٢ شارع ثابت الأفضل - 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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

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

CEL Signature

مكتب معامل الاستشارات الهندسية

مشروعات ، فحوصات ، أبحاث

رقم التسجيل الضريبي 537 - 991 - 219

المقر الرئيسي : شارع الملك الأفضل - 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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

CEL

Signature

مكتب معامل الاستشارات الهندسية

مشروعات (سوهاج وقنا)

رقم التسجيل الضريبي 537 - 091 - 219

المركز الرئيسي : شارع ... الأقصر - الزمالك - القاهرة

11 Mad E-Nile Street
Zamalek, Cairo
Tel/Fax: 2362 ... 2362 ...

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهبي

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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).	41.5	Max 50 %	——	——
0.425 mm (No. 40).	25.2	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	91	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 (صوفاج وقنا)
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي : شارع الملك الأفضل - الزمالك - القاهرة

IAS

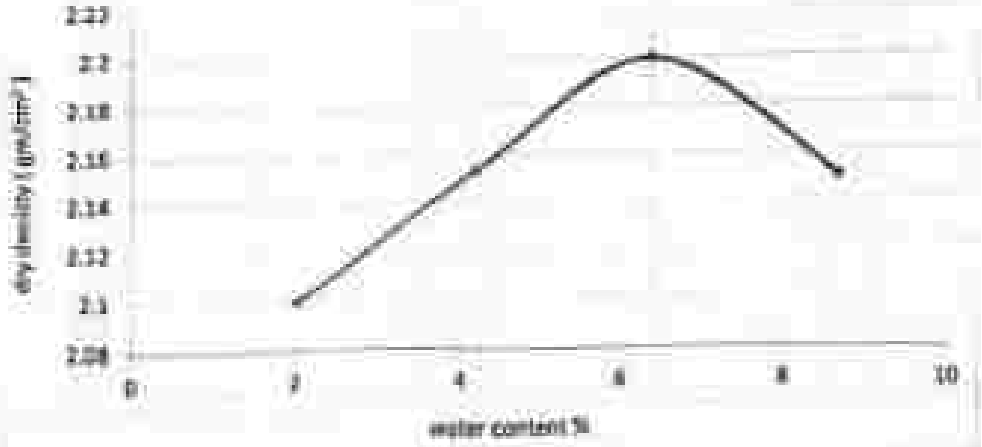
CEL

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reparting No.	: 10-5

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



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات : سوهاج وقنا
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي : شارع [illegible]

(1) Mahd El Abbd Street
Giza, Cairo
Tel & Fax [illegible]

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name : شركة الأهلي

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.38
1.27	0.050	1.57
1.91	0.075	2.69
2.54	0.100	3.73
3.18	0.125	4.64
3.81	0.150	5.43
4.45	0.175	6.09
5.08	0.200	6.54
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.73	54 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.20(gm /cm^3)
At = 6.4 % optimum water content.

3- Surcharge weight 4.50 kg.

4- CBR > 10 for minimum requirements as according project spec page No 36.

Signature

Consulting Engineers & Laboratories

مكتب معامل الاستشارات الهندسية

مشروع قنا - سوهاج - وقنا

رقم التسجيل بالسجل التجاري 537 - 001 - 219

المركز الرئيسي : شارع الملك الزاهر (الظاهر) القاهرة

Zaher, Cairo

Mob: 2010[illegible] - 2[illegible]

IAS ACCREDITED

المدير الفني

[illegible]

تليفون : [illegible]

CEL

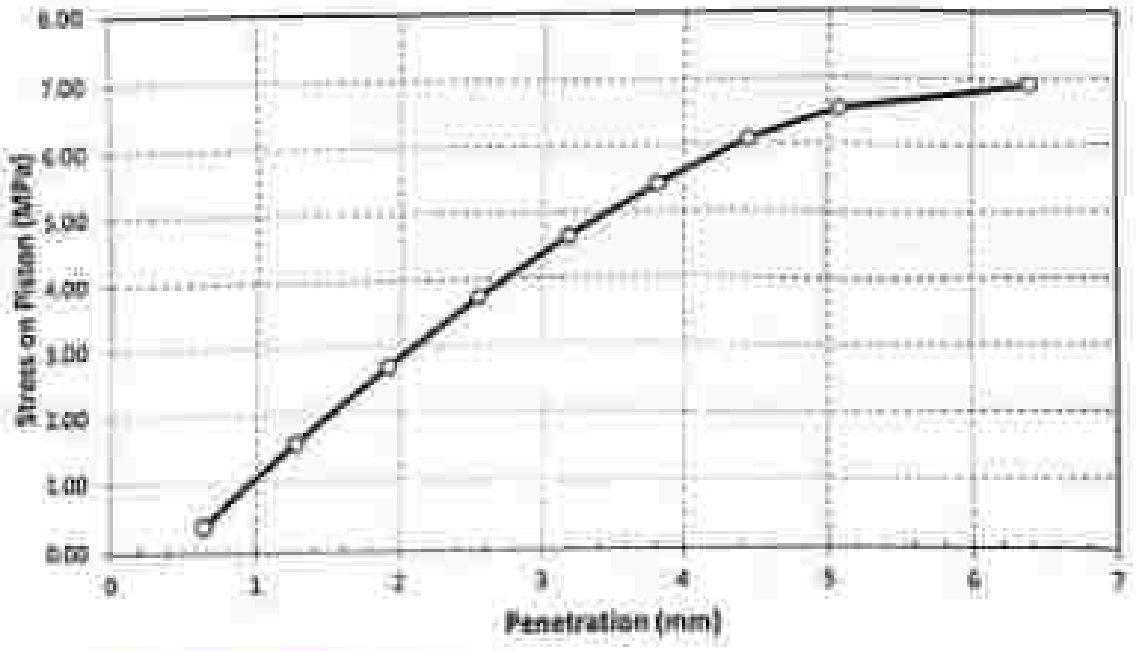
Consulting Engineering Bureau & Laboratories

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، صوفيا وفنا ،
219 - 091 - 537 رقم التسجيل الضريبي
المركز الرئيسي • شارع الله - الزمالك - القاهرة

CEL

Consulting Engineering Bureau & Laboratories

مكاتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 28/09/2023

Soil type : Middle Embankment

Location : St From 641+420 To 641+540

Level : - 2 M

Report No. : 78

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

RTest #	Station	Test Hole Volume cm^3	Bulk Density gm/cm^3	Moisture Content %	Dry Density (gm/cm^3)	Degree of Compaction (%)	Acceptance
1	641+410	1575.0	2.29	6.4	2.15	97.0%	Comply
2	641+435	1660.4	2.26	6	2.13	96.7%	Comply

Degree of compaction based on proctor test dated At

Max. dry density =2.20 gm/cm^3

At optimum moisture content = 6.4 %

Signature:

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات : صوفاج وقنا
رقم التسجيل الضريبي 537 - 091 - 219
المركز الرئيسي ٢ شارع الملك الأفضل - الزمالك - القاهرة

11, Malek E. Afzal Street
Zamalek, Cairo
Tel./Fax: [illegible]

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Dear Gentleman,

Attached here with the delivered on 19 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم التسجيل الضريبي 537 - 091 - 219
المركز الرئيسي : 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.4
37.5	1.5	96.5
25	1	90.2
19	¾	85.2
12.50	½	74.9
9.50	3/8	71.2
4.75	4	55.1
2.00	10	41.5
0.425	40	25.2

CEL
Consulting Engineering Bureau & Laboratories
Signature
219 - 095 - 537

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

مشروعات ، سوفاج والمنيا

رقم التسجيل الضريبي: 537 - 591 - 219

المركز الرئيسي : شارع [illegible] ، [illegible] ، 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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 ، سيوفا و والنا ،

يلزم التسجيل المشروعي 537 - 501 - 219

المركز الرئيسي ٢ شارع النيل الأعظم ، طوخ ، القليوبية

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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).	41.5	Max 50 %	------	------
0.425 mm (No. 40).	25.2	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	.91	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

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

مشروعات ، بسوفاج وقنا ،

رقم التسجيل الضريبي 537 - 091 - 219

المركز الرئيسي ٢ شارع الدكتور الأطرش ، الزمالك ، القاهرة

59 Mitek F. Abbd Street

Zamalek, Cairo

Tel/Fax 27362727 / 27362727

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

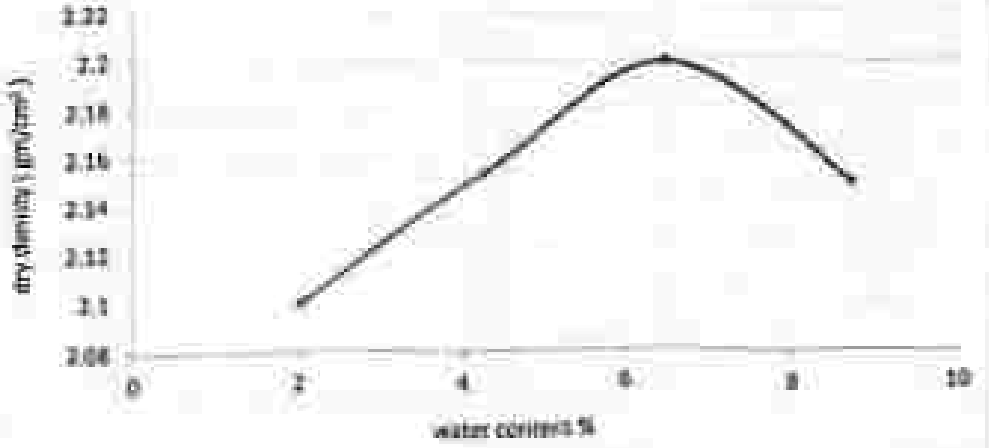
Type of sample : Soil Embankment (Upper Embankment 0.0 M)

Delivery Date : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي • شارع السد الأقليمي - 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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.38
1.27	0.050	1.57
1.91	0.075	2.69
2.54	0.100	3.73
3.18	0.125	4.64
3.81	0.150	5.43
4.45	0.175	6.09
5.08	0.200	6.54
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.73	54 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.20(gm /cm³)
At = 6.4 % optimum water content.

4- CBR = 10 for unsuitable soil used in Embankments according project spec page No 36.

Signature

Zayed, Giza

Tel./Fax: 2316221 - 2316320

IAS ACCREDITED

CEL

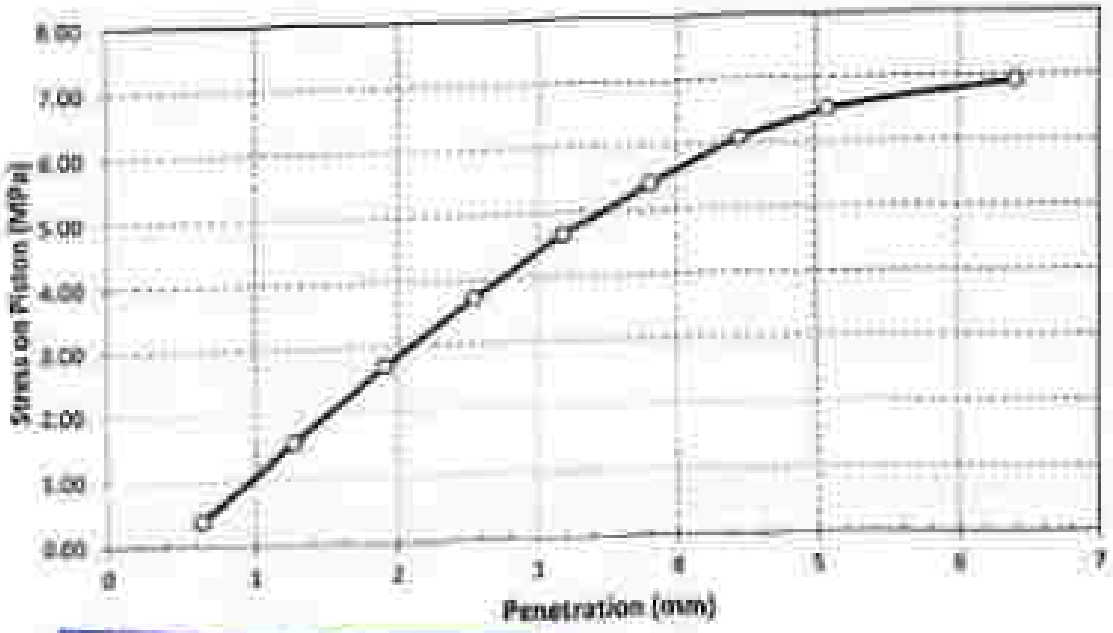
Consulting Engineering Bureau & Laboratories

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Load Penetration Curve of CBR Test

ASTM D-1883



CEL
Consulting Engineering Bureau & Laboratories
Signature
219 - 091 - 537

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 27/09/2023

Soil type : Middel Embankment

Location : St + From 641+540 to 641+780

Level : - 2 M

Report No. : 75

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+580	1450.7	2.24	5	2.13	96.9%	Comply
2	641+620	1319.4	2.26	5	2.16	98.0%	Comply
3	641+650	1450.7	2.25	5.3	2.14	97.2%	Comply
4	641+680	1556.3	2.22	5.5	2.10	95.7%	Comply
5	641+720	1548.6	2.29	5	2.18	99.1%	Comply
6	641+770	1332.6	2.23	5.3	2.11	96.1%	Comply

Degree of compaction based on proctor test dated At

Max. dry density =2.20 gm/cm^3

At optimum moisture content =6.4 %

Signature / CEL

11 Mahmoud Abd Elsattar
Zamalek, Cairo
T-Fax: 27362... / 27362...

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	: **19/09/2023**
Reporting Date	: **23/09/2023**
Reporting No.	: **10-5**

Dear Gentleman,

Attached here with the delivered on 19 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات (سوهاج وقنا)
رقم السجل الضريبي 210 - 991 - 537
المركز الرئيسي ٣ 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 : 19/09/2023
Reporting Date : 23/09/2023
Reporting No. : 10-5

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.4
37.5	1.5	96.5
25	1	90.2
19	¾	85.2
12.50	½	74.9
9.50	3/8	71.2
4.75	4	55.1
2.00	10	41.5
0.425	40	25.2

Signature

Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات : سوهاج وقنا
رقم التسجيل الضريبي 537 - 991 - 219
المركز الرئيسي : شارع الله الأفضل، الزمالك

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

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

CEL
Consulting Engineering Bureau & Laboratories
Signature
مشروعات ، مسوحات ، وتنفيذ
219 - 991 - 537 رقم التسجيل الضريبي
المركز الرئيسي ٥ شارع الملك الأفضل - الزمالك - القاهرة

34 Mark F Abd Shair
Zamalek, Cairo
Tel/Fax: 27362551

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 Embaukment (Upper Embankment 0.0 M)
Delivery Date	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

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

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 : 19/09/2023
Reporting Date : 23/09/2023
Reporting No. : 10-5

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).	41.5	Max 50 %	----	----
0.425 mm (No. 40).	25.2	Max 30 %	Max 50 %	----
0.075 mm (No. 200).	.91	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

Consulting Engineering Bureau & Laboratories

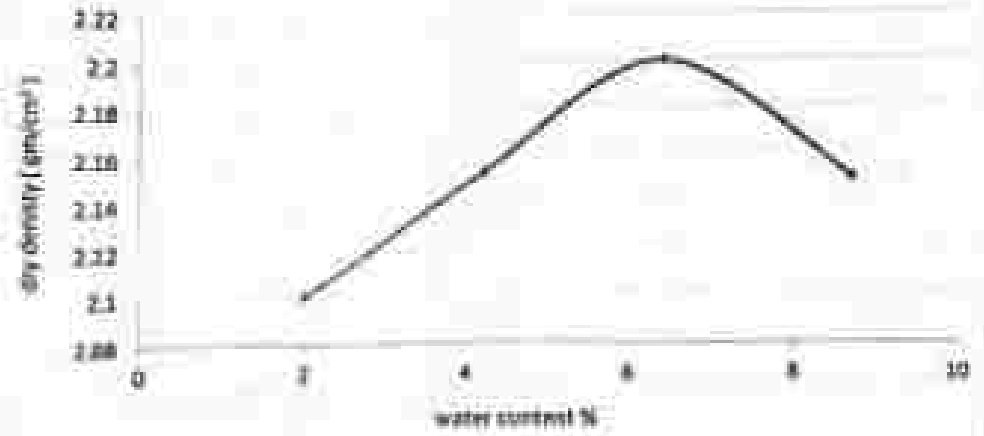
مكتب معامل الإستشارات الهندسية

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Moisture – Density relation of soil

Test result (Modified proctor test)

ASTM D-1557



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature

Consulting Engineers & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات - مواد وتربة
219 - 981 - 537 رقم التسجيل الضريبي
المركز الرئيسي : شارع الدكتور الأطلل - 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=2862739,57

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

Delivery Date : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.38
1.27	0.050	1.57
1.91	0.075	2.69
2.54	0.100	3.73
3.18	0.125	4.64
3.81	0.150	5.43
4.45	0.175	6.09
5.08	0.200	6.54
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0,1 Inch (2.54 mm) penetration	6.90	3.73	54 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.200(gm /cm³)

At = 0.4 optimum water content.

Under 4.50 Kg

4- CBR 10 Reqd. for overcrossing bridges according project spec page No 36.

Signature

J.I. Bank E. Abd Ouel
Zenden, Gen.
Tel.Fax: 2065[illegible] - 2[illegible]

IAS ACCREDITED

Scanned with CamScanner

CEL

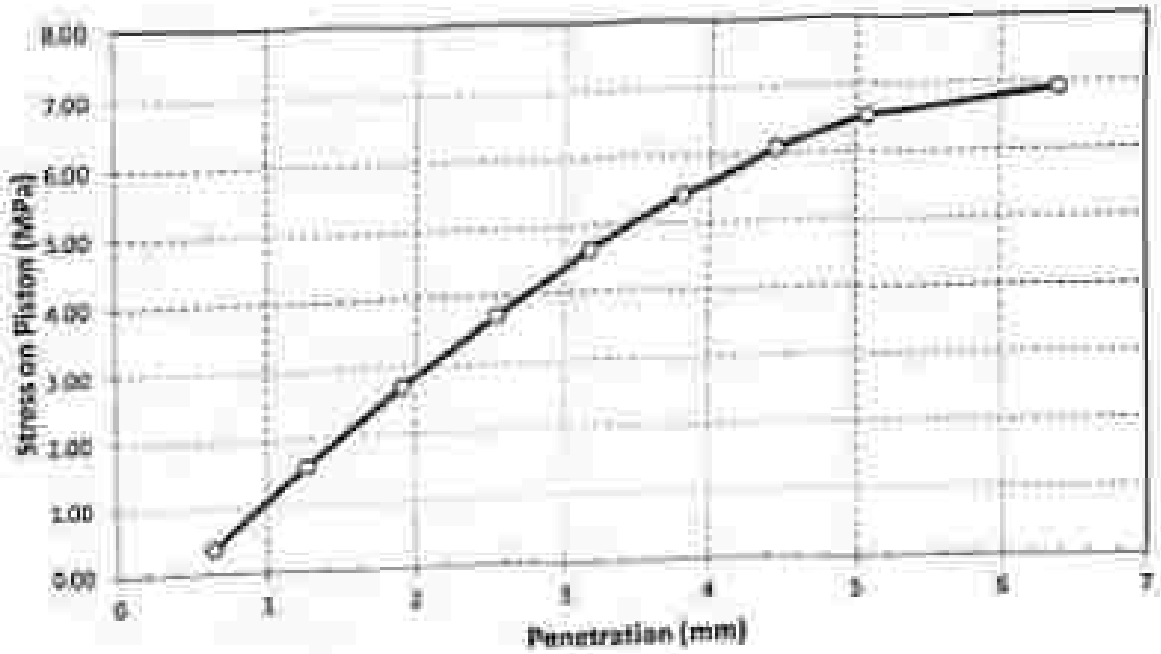
Consulting Engineering Bureau & Laboratories

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Load Penetration Curve of CBR Test

ASTM D-1883



Signature:

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، سيوفاج وكتبا
رقم التسجيل المشروعي 537 - 09/1 - 219
المركز الرئيسي ٣ شارع الشيخ دائل ، 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

Testing Date : 25/09/2023

Soil type : Upper Embankment

Location : St + From 641+200 To 641+300

Level : - 1.25 M

Report No. : 71

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+230	1788.9	2.23	6	2.11	96.2%	Comply
2	641+260	1716.7	2.25	6.4	2.11	96.4%	Comply
3	641+290	1770.8	2.23	6.4	2.09	95.6%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.18 gm/cm^3

At optimum moisture content = 6.4 %

Signature /

11 Gaber E. Abdo Street
Zamalek, Cairo
Tel & Fax: 27362231 - 27362001

IAS ACCREDITED Testing Laboratories

أمين أبو الفضل
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٢٠٠١ - ٢٧٣٦٢٢٣١

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	: **08/09/2023**
Reporting Date	: **12/09/2023**
Reporting No.	: **10-4**

Dear Gentleman,

Attached here with the delivered on 8 / 9 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature

CEL

Zamalek, Cairo
Tel./Fax: 27362521 - 27362521

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:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

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:041+400 E= 492410.858 N=2862759.57
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

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

Test	Results (%)
Percentage of material finer than Sieve Size 75 µM (No.200)	8.9

Signature

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

Consulting Engineering Bureau & Laboratories

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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).	45.9	Max 50 %	——	——
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.9	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

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

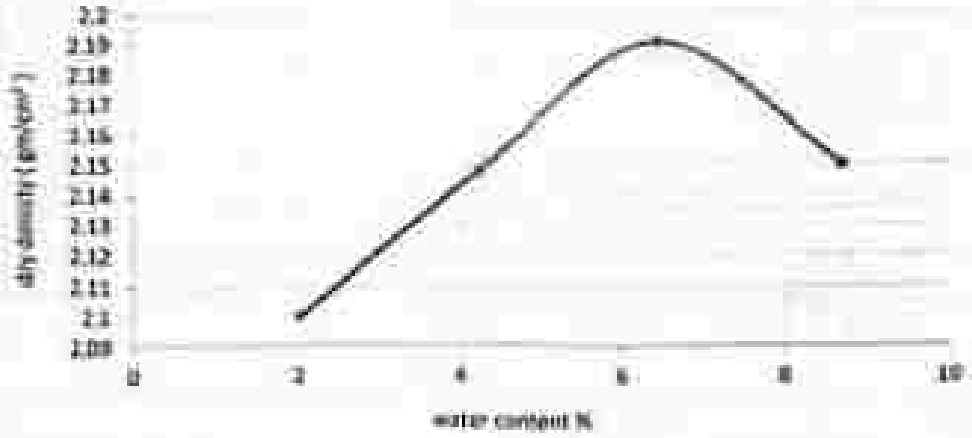
مكتب معامل الاستشارات الهندسية

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Moisture – Density relation of soil

Test result (Modified proctor test)

ASTM D-1557



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0,64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.59	52 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of =2.19(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 /

IAS ACCREDITED

CEL

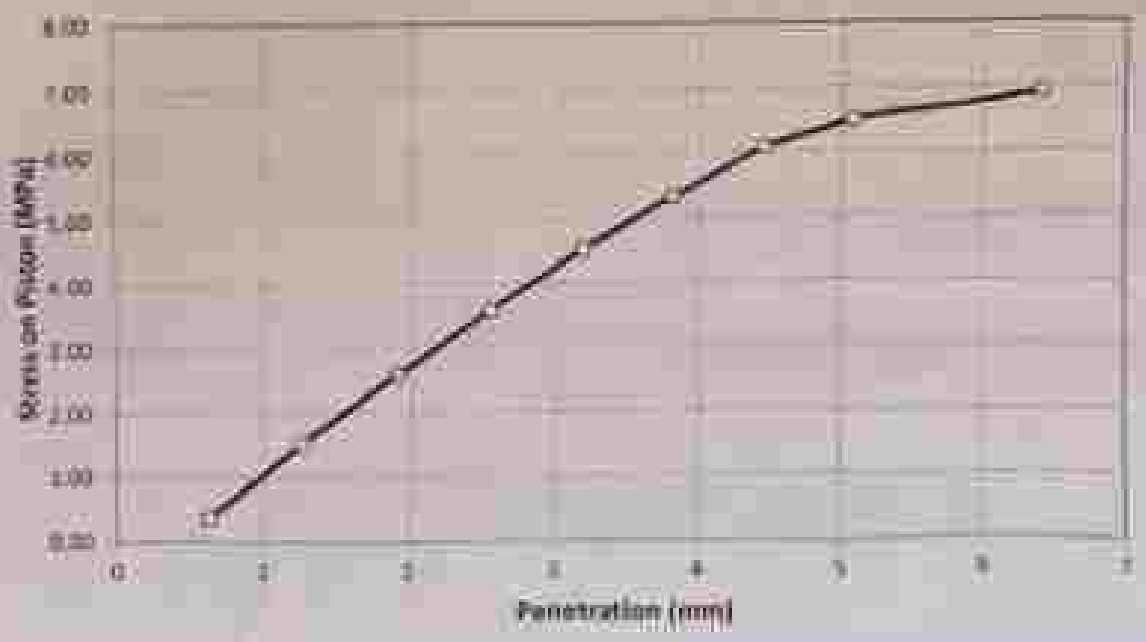
Consulting Engineering Bureau & Laboratories

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



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

Testing Date : 25/09/2023

Soil type : Middle Embankment

Location : St + From 641+540 TO 641+760

Level : - 2.5 M

Report No. : 70

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+620	1490	2.23	5.5	2.1	96.6%	Comply
2	641+670	1335	2.30	5.8	2.2	99.1%	Comply
3	641+699	1610	2.21	6.4	2.1	95.1%	Comply
4	641+705	1413	2.29	5.8	2.2	98.9%	Comply
5	641+730	1535	2.25	6	2.1	97.0%	Comply
6	641+750	1490	2.28	6.4	2.1	97.8%	Comply
7	641+765	1525	2.27	6	2.1	97.6%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.19 gm/cm^3

At optimum moisture content = 6.4 %

Signature /

T.E. Bulos E-Abul Sheer
Zeitoun, Cairo
Tel Fax: 27905[illegible] - 27[illegible]

IAS ACCREDITED Testing Laboratory

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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	: **08/09/2023**
Reporting Date	: **12/09/2023**
Reporting No.	: **10-4**

Dear Gentleman,

Attached here with the delivered on 8 / 9 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature :

CEL

Consulting Engineering Bureau & Laboratories

219 - 991 - 527

1 E. Mosk E. Abdi Street
Zamalek, Cairo
Tel & Fax: 2356[illegible] - 2356[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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

Signature

CEL

18 Mohi E Din Street
Zamalek, Cairo
Tel & Fax: 2706223 - 2736300

IAS ACCREDITED

٢٨ شارع محي الدين
الزمالك - القاهرة
تليفون / فاكس: ٢٧٣٦٣٠٠ - ٢٧٠٦٢٢٣

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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)	9.9

Signature /

CEL

3 El Malik E Abdel Sheik
Zeitoun, Cairo
Tel.& Fax: 2786233 - 2786365

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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).	45.9	Max 50 %	——	——
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.9	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

16 Mahmoud El Arabi Street
Dokki, Giza
Tel & Fax: [illegible]

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

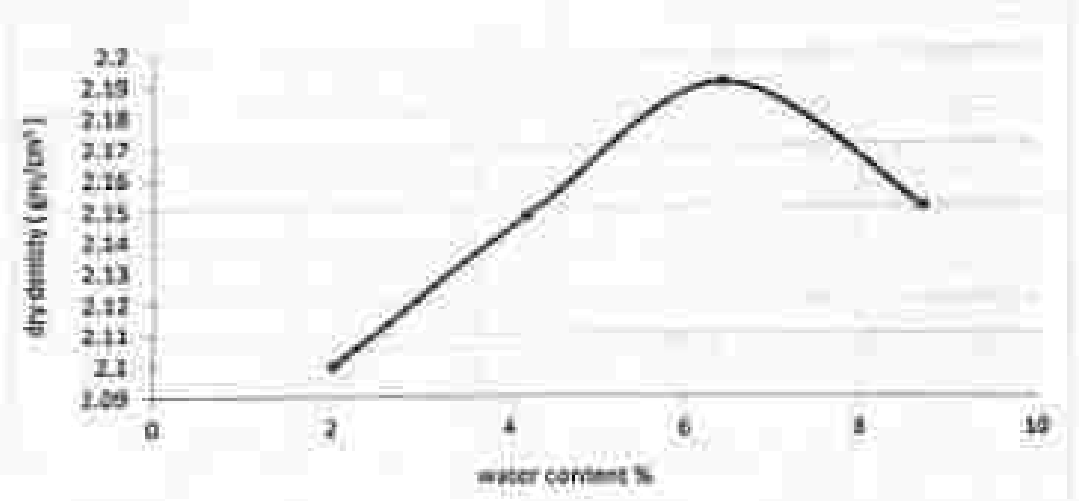
مكتب معامل الاستشارات الهندسية

Company Name	: شركة النخبي
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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Moisture – Density relation of soil

Test result (Modified proctor test)

ASTM D-1557



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature

18 Riad El Solh Street
Zarub, Cairo
Tel/Fax: 27962121 - 27962150

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	St. Value	Sample results	52 %
	6.90	3.59	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.19(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

IAS ACCREDITED

CEL

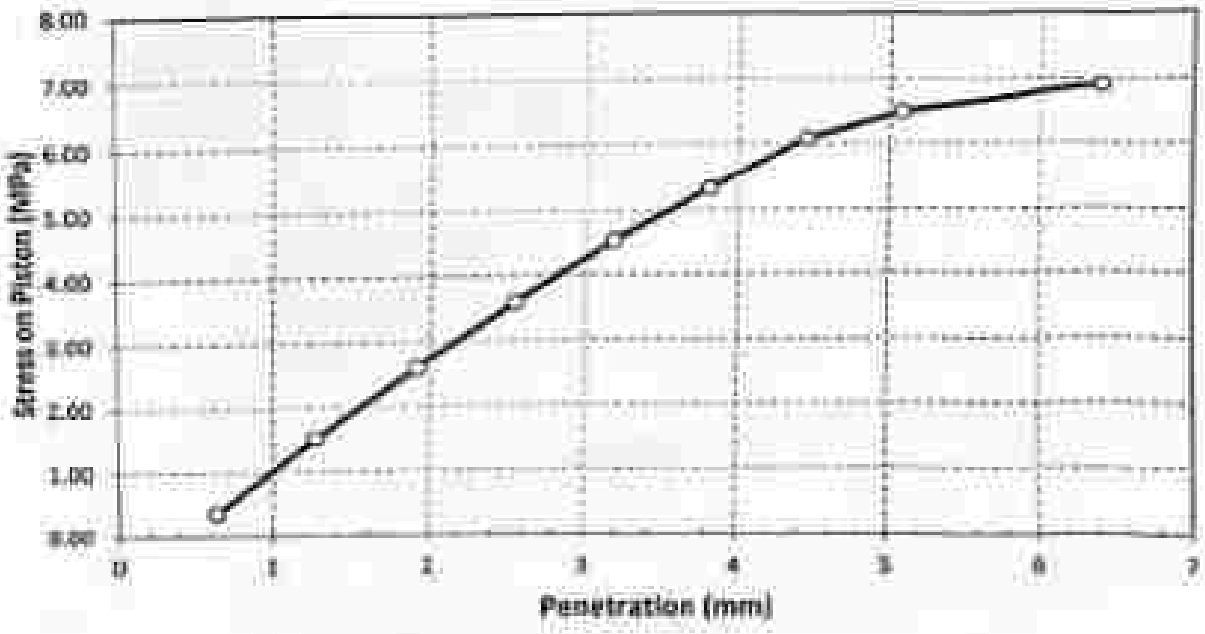
Consulting Engineering Bureau & Laboratories

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature / Laoa I.E

CEL

3 E Aziz Engineering

Zeitoun, Cairo.

Tel & Fax: 2010[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

Testing Date : 27/09/2023

Soil type : Lower Embankment

Location : St + From 641+200 To 641+300

Level : - 13 M

Report No. : 74

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+220	2106.9	2.23	6.4	2.09	95.1%	Comply
2	641+240	1763.2	2.26	5.8	2.13	97.0%	Comply
3	641+260	1281.3	2.29	5.6	2.17	98.6%	Comply
4	641+280	1658.3	2.23	6.4	2.10	95.3%	Comply

Degree of compaction based on proctor test dated At

Max. dry density =2.20 gm/cm^3

At optimum moisture content = 6.4%

Signature / ...

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	: **19/09/2023**
Reporting Date	: **23/09/2023**
Reporting No.	: **10-5**

Dear Gentleman,

Attached here with the delivered on 19 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature:

Consulting Engineers & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات - دعوات - عطاءات
رقم التسجيل الضريبي 215 - 981 - 537
المركز الرئيسي : شارع الملك الأشرف - طرابلس

3 E. Malek E. Ashraf Street
Ezbet El Nasr
Tel / Fax: [illegible]

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

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

Delivery Date : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.4
37.5	1.5	96.5
25	1	90.2
19	¾	85.2
12.50	½	74.9
9.50	3/8	71.2
4.75	4	55.1
2.00	10	41.5
0.425	40	25.2

Consulting Engineering Bureau

Signature

210 - 091 - 537

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

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

CEL

Signature

219 - 5/1 - 5.T

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

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

Consulting Engineer
Signature
219 - 991 - 537

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

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).	41.5	Max 50 %	——	——
0.425 mm (No. 40).	25.2	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	91	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 Consulting Engineers & Laboratories
مكتب معامل الاستشارات الهندسية
مشروعات - سيوفاج وفنه
219 - 091 - 537
المركز الرئيسي - شارع ... الأقصر - الإمارات - القاهرة

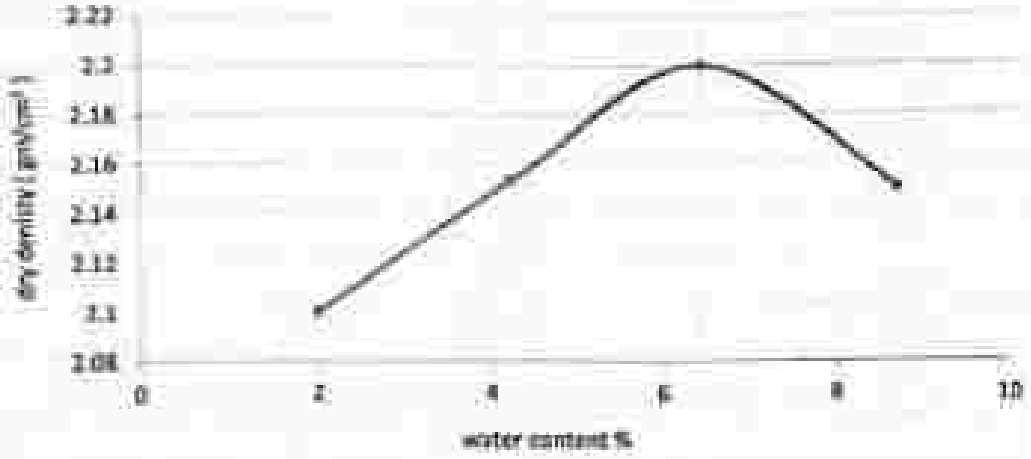
CEL

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

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



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature

Consulting Engineering
219 - 991 - 537

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 : 19/09/2023

Reporting Date : 23/09/2023

Reporting No. : 10-5

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.38
1.27	0.050	1.57
1.91	0.075	2.69
2.54	0.100	3.73
3.18	0.125	4.64
3.81	0.150	5.43
4.45	0.175	6.09
5.08	0.200	6.54
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.73	54 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.20(gm /cm³)

At = 6.4 % optimum water content.

3- [illegible] load 4.50 Kg.

4- C[illegible]th for mid[illegible] lower embankment[illegible]nts according project spec page No 36.

S[illegible]

IAS ACCREDITED

CEL

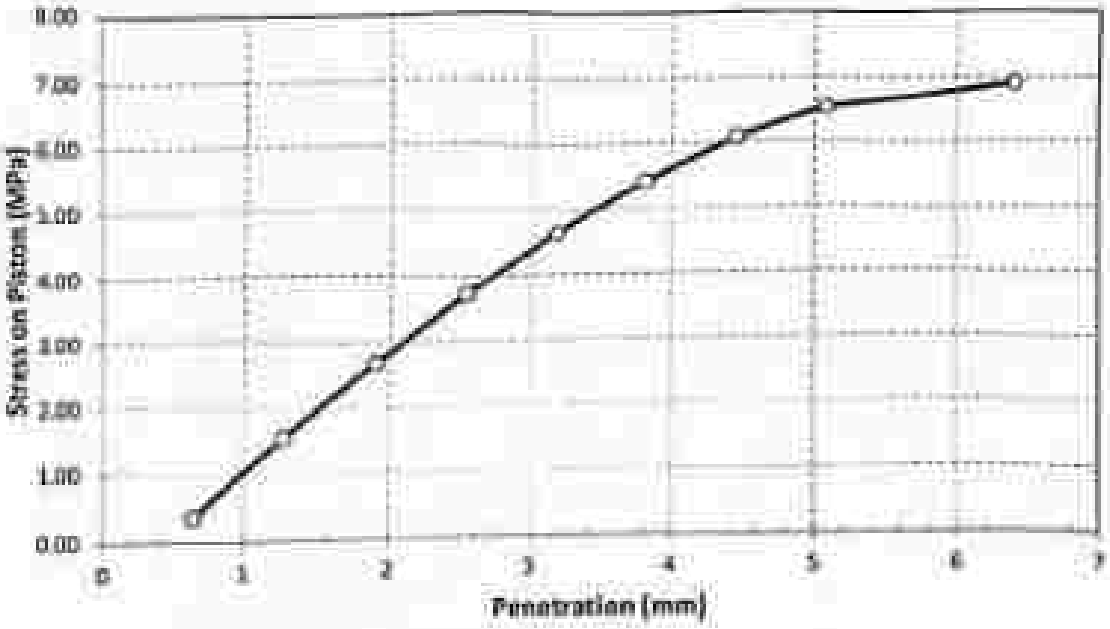
Consulting Engineering Bureau & Laboratories

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	: 19/09/2023
Reporting Date	: 23/09/2023
Reporting No.	: 10-5

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

219 - 9

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 03 /10/2023

Soil type : Upper Embankment

Location : St From 641+300 TO 641+420

Level : - 1.25 M

Report No. : 81-2

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	641+320	911.1	2.32	6.4	2.18	98.5%	Comply
2	641+340	1409.7	2.32	6	2.19	98.9%	Comply
3	641+360	1558.3	2.34	6.4	2.20	99.7%	Comply
4	641+380	1391.7	2.24	6	2.11	95.5%	Comply
5	641+400	1228.5	2.27	6.4	2.13	96.5%	Comply

Degree of compaction based on proctor test dated At

Max. dry density =2.21 gm/cm^3

At optimum moisture content = 9.4 %

Signature / .....

9 El Maa E Ritzi Street
Zamalek, Cairo,
Tel & Fax: 2736722 - 2736393

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 : 26/09/2023

Reporting Date : 30/09/2023

Reporting No. : 10-7

Dear Gentleman,

Attached here with the delivered on 26 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature /..

CEL

18 Nasr El Nile Street
Zamalek, Cairo.
Tel&Fax: 27361721 - 27363331

IAS ACCREDITED

Scanned with CamScanner

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 : 26/09/2023
Reporting Date : 30/09/2023
Reporting No. : 10-7

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.4
37.5	1.5	96.5
25	1	91.3
19	¾	85.1
12.50	½	74.9
9.50	3/8	71.4
4.75	4	52.7
2.00	10	35.0
0.425	40	20.9

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات الأقصر
210 931 439
3 شارع الملك الأشرف

3 El Malek El Ashraf Street
Zamalek, Cairo.
Tel.& Fax: 2736523 - 2736303

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 : 26/09/2023
Reporting Date : 30/09/2023
Reporting No. : 10-7

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)	9.2

Signature /...

CEL

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax 2736[illegible] - 2736[illegible]

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:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 26/09/2023
Reporting Date : 30/09/2023
Reporting No. : 10-7

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
شركة ذات مسئولية محدودة
219.901.437

3 B Malek El Afzal Street
Zamalek, Cairo
Tel.& Fax: 27362723 - 27362003

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 Embanlonent 0.0 M)
Delivery Date : 26/09/2023
Reporting Date : 30/09/2023
Reporting No. : 10-7

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).	35.0	Max 50 %	——	——
0.425 mm (No. 40).	20.9	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.2	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

1 El Malek E Afdal Street
Zamalek, Cairo
Tel & Fax : 2736723 - 2736808

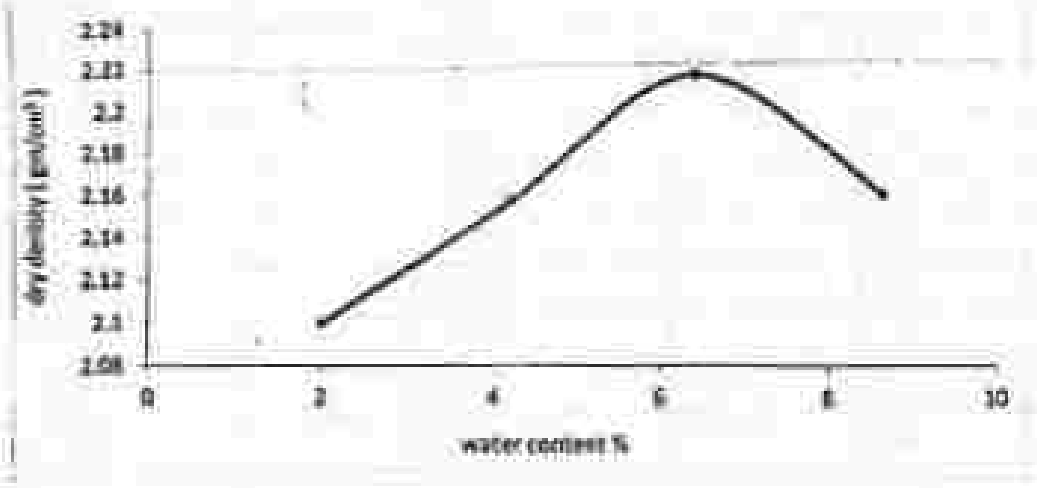
IAS
ACCREDITED

Scanned with CamScanner

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 : 26/09/2023
Reporting Date : 30/09/2023
Reporting No. : 10-7

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



- **Max dry density (gm/cm³)** : 2.21
- **Optimum moisture content %** : 6.4 %

Signature / ...

CEL
مكتب معامل الاستشارات الهندسية
شروط ، الأقسم
219,911,437

1 D Malek & Abad Street
Zamalek, Cairo
Tel& Fax: 2736523 - 2736300

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 : 26/09/2023
Reporting Date : 30/09/2023
Reporting No. : 10-7

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.48
1.27	0.050	1.61
1.91	0.075	2.73
2.54	0.100	3.76
3.18	0.125	4.67
3.81	0.150	5.47
4.45	0.175	6.14
5.08	0.200	6.59
6.35	0.250	6.96

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	St. Value	Sample results	54.5 %
	6.90	3.76	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.21(gm /cm³)
At = 6.4 % optimum water content.
3- Surcharge load 4.50 Kg.
4- CBR > 10 for middle and lower embankments according [illegible] page No 36.

Signature / [illegible]

3 El Malek El Afdal Street
Zamalek, Cairo.

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الفهي

Project : Electric Express Train – HSR From Qoos To Armant

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

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

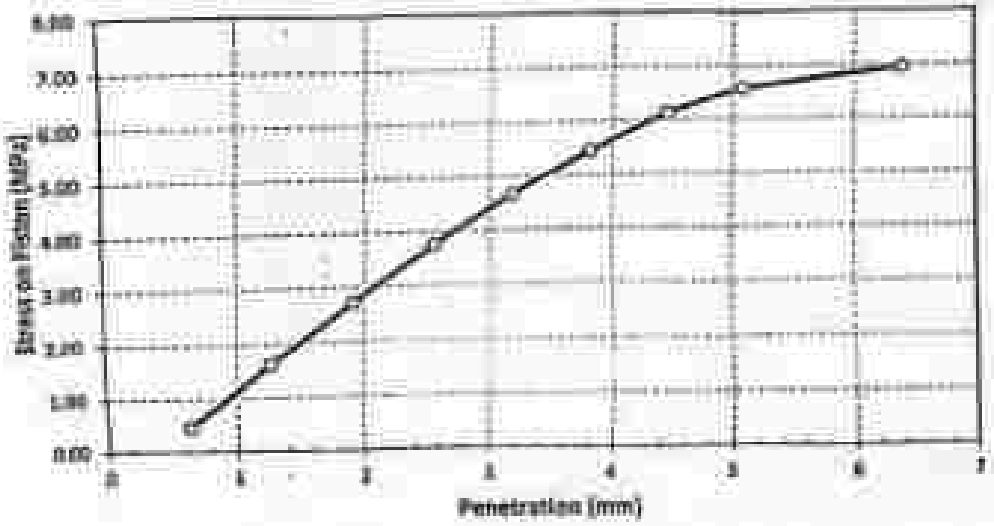
Delivery Date : 26/09/2023

Reporting Date : 30/09/2023

Reporting No. : 10-7

Load Penetration Curve of CBR Test

ASTM D-1883



Signature / التوقيع

CEL

IAS

5 El Nasr E Abbas Street
Zamalek, Cairo.
Tel & Fax: [illegible]

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الناهي
Project	: Electric Express Train – HSR From Qous To Armant
Testing Date	: 05 /10/2023
Soil type	: Middel Embankment
Location	: St. From 641+620 To 641+800
Level	: - 1.75 M
Report No.	: 85

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+640	1715.0	2.26	6.4	2.12	96.0%	Comply
2	641+680	1643.1	2.25	6.4	2.12	95.8%	Comply
3	641+700	1464.6	2.28	5.8	2.16	97.7%	Comply
4	641+720	1604.2	2.22	5.5	2.11	95.4%	Comply
5	641+740	1513.9	2.29	5.6	2.17	98.1%	Comply
6	641+760	1495.8	2.24	5.8	2.12	95.0%	Comply
7	641+780	1509.7	2.30	6	2.17	98.0%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.21 gm/cm^3

At optimum moisture contents = 5.4 %

Signature / .....

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2736723 - 2736000

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	: **27/09/2023**
Reporting Date	: **1/10/2023**
Reporting No.	: **10-8**

Dear Gentleman,

Attached here with the delivered on 27 / 9 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature /.

CEL

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2040707 - 2040707

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

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)	9.5

Signature /.....

CEL
مكتب معامل الاستشارات الهندسية
جيوتيكنيكا . الاقصر
تليفون شخصي 231 101 437
3 شارع الكامل - الزمالك

3 El Mdek El Adel Street
Zamalek, Cairo.
Tel& Fax: 2736723 - 2736383

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

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

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax : 2736723 - 2736729

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

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).	37.5	Max 50 %	-----	-----
0.425 mm (No. 40).	23.5	Max 30 %	Max 50 %	-----
0.075 mm (No. 200).	9.5	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

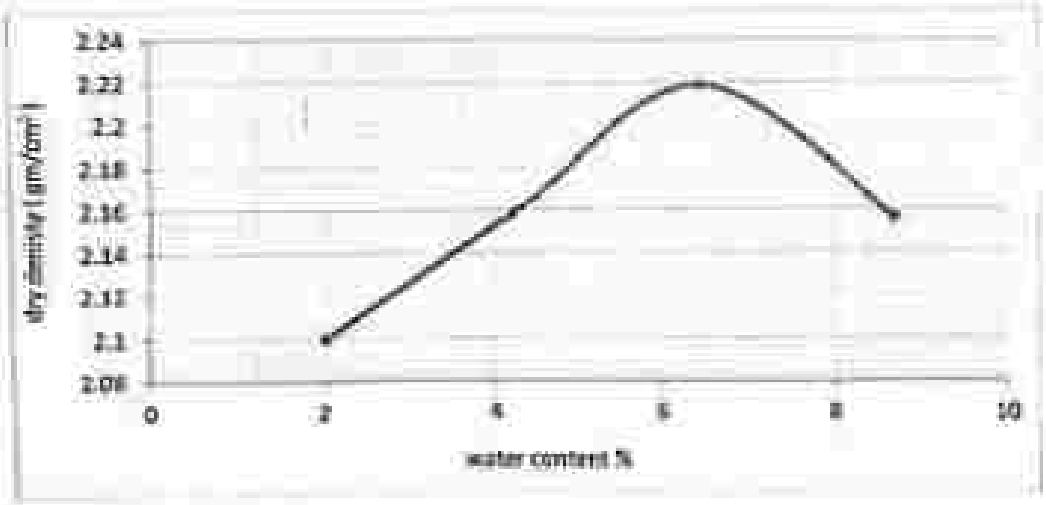
1 El Masa E Abdel Sawar
Zamalek, Cairo
Tel& Fax: 2336721 - 2362683

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

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



- **Max dry density (gm/cm³)** : 2.21
- **Optimum moisture content %** : 6.4 %

Signature / ....

CEL

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax: 27362721 - 27362820

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.51
1.27	0.050	1.64
1.91	0.075	2.74
2.54	0.100	3.79
3.18	0.125	4.68
3.81	0.150	5.48
4.45	0.175	6.16
5.08	0.200	6.60
6.35	0.250	7.01

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	St. Value	Sample results	55 %
	6.90	3.79	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.21(gm /cm³)
At = 6.4 % optimum water content.
3- Surcharge load 4.50 Kg.
4- CBR > 10 for middle and lower embankments according project specification 16.

Signature / ...

CEL
Consulting Engineering Bureau & Laboratories
Tel: 210 1001 437

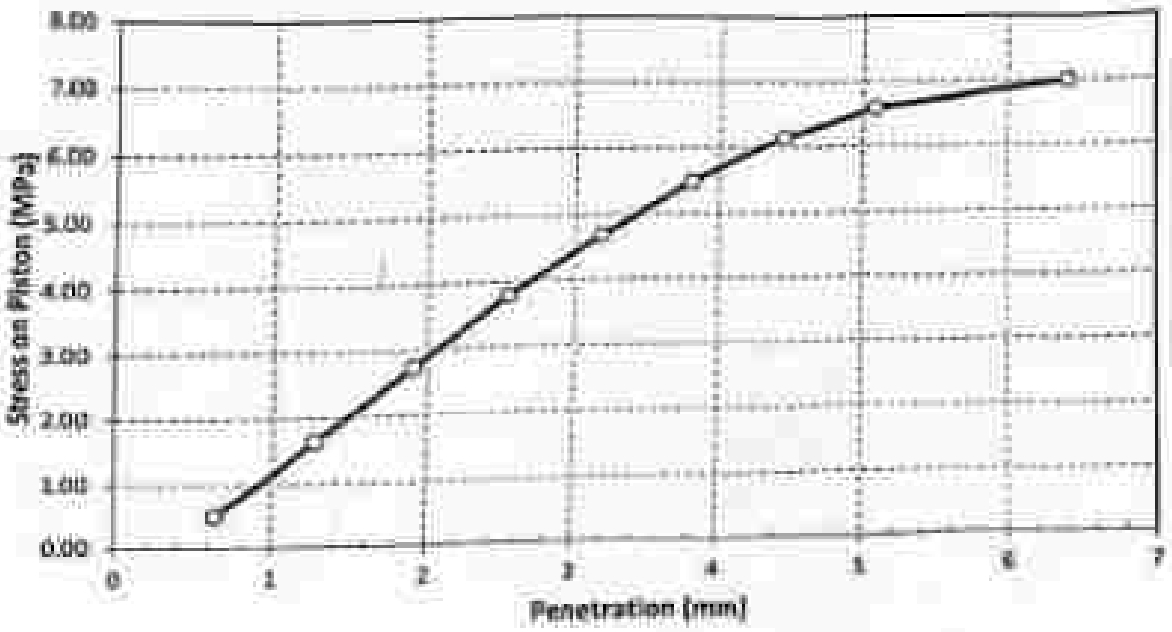
3 El Malek El Adil Street
Zamalek, Cairo
Tel & Fax: 27362021 - 27362009

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

Load Penetration Curve of CBR Test
ASTM D-1883



Signature / التوقيع

5 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 27362021 - 27362063

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 : 05 /10/2023
Soil type : Upper Embankment
Location : St From 641+300 To 641+420
Level : -1 M
Report No. : 87

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+320	1405.6	2.31	5.5	2.19	99.0%	Comply
2	641+340	1538.9	2.23	5.8	2.11	95.4%	Comply
3	641+360	1466.0	2.29	5.6	2.17	98.3%	Comply
4	641+380	1356.9	2.29	5.6	2.17	98.2%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.21 gm/cm^3

At optimum moisture content = 6.4

Signature / [illegible]

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 2736720 - 2736380

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 Embaalonent 0.0 M)**
Delivery Date	: **27/09/2023**
Reporting Date	: **1/10/2023**
Reporting No.	: **10-8**

Dear Gentleman,

Attached here with the delivered on 27 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature /.

CEL

مكتب معامل الاستشارات الهندسية

3 El Malek E Afzal Street
Zamalek, Cairo
Tel & Fax 27362605

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	99.6
37.5	1.5	97.4
25	1	95.3
19	¾	81.1
12.50	½	76.7
9.50	3/8	72.1
4.75	4	53.3
2.00	10	37.8
0.425	40	23.5

Signature /..

CEL

5 El Milaa El Abd Street,
Zamalek, Cairo.
Tel&Fax: [illegible]

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة للفهي
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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	99.6
37.5	1.5	97.4
25	1	95.3
19	¾	81.1
12.50	½	76.7
9.50	3/8	72.1
4.75	4	53.3
2.00	10	37.8
0.425	40	23.5

Signature /..

CEL

3 El Malek El Adel Street
Zamalek, Cairo
Tel & Fax: 2736721 - 2736284

IAS ACCREDITED

Scanned with CamScanner

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

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)	9.5

Signature /.....

CEL

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel & Fax: 27351723 - 27351763

IAS ACCREDITED

Scanned with CamScanner

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

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
210 1511 437

3 El Malek El Adel Street
Zamalek, Cairo.
Tel & Fax: 2736723 - 2736300

IAS ACCREDITED

٣ ش الملك العادل
الزمالك - القاهرة
تليفون و فاكس : ٢٧٣٦٧٢٣ - ٢٧٣٦٣٠٠

Scanned with CamScanner

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-8

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).	37.5	Max 50 %	------	------
0.425 mm (No. 40).	23.5	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	9.5	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 ، الأقصر

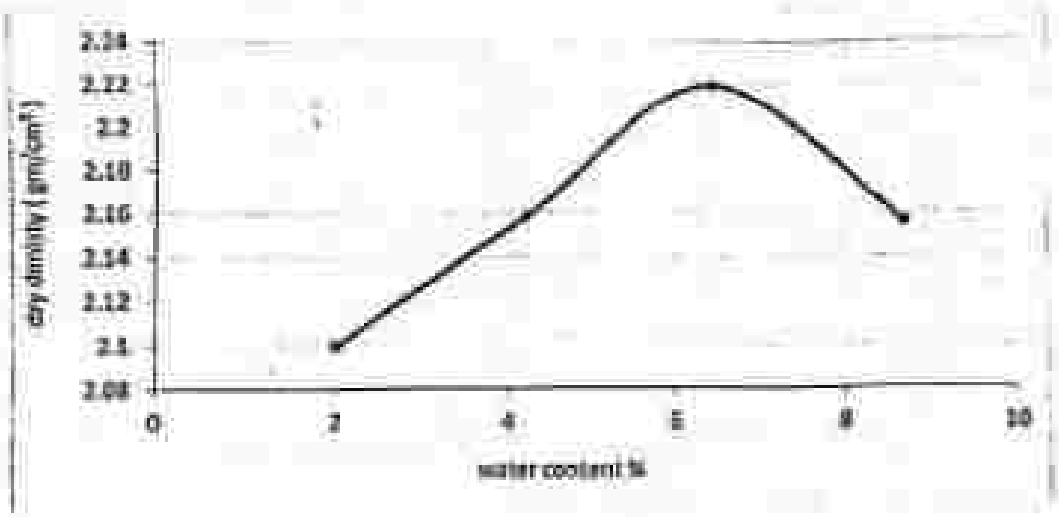
ت 211 991 437

3 شارع

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-8

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



- **Max dry density (gm/cm³)** : 2.21
- **Optimum moisture content %** : 6.4 %

Signature / ....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات القسم
الرقم الضريبي 219 891 437
الرقم الضريبي 3 شارع ... الزمالك ... القاهرة

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel & Fax: 2736423 - 2736303

IAS
ACCREDITED

٣ شارع الملك الأفضل
الزمالك - القاهرة
تليفون - فاكس ٢٧٣٦٤٢٣ - ٢٧٣٦٣٠٣

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-8

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.51
1.27	0.050	1.64
1.91	0.075	2.74
2.54	0.100	3.79
3.18	0.125	4.68
3.81	0.150	5.48
4.45	0.175	6.16
5.08	0.200	6.60
6.35	0.250	7.01

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	St. Value	Sample result	55 %
	6.90	3.79	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.21(gm /cm³)
At = 6.4 % optimum water content.

3- Surcharge load 4.50 Kg.

4- CBR > 10 for middle and lower embankments according project specifications.

Signature / ...

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2736[illegible] - 2736[illegible]

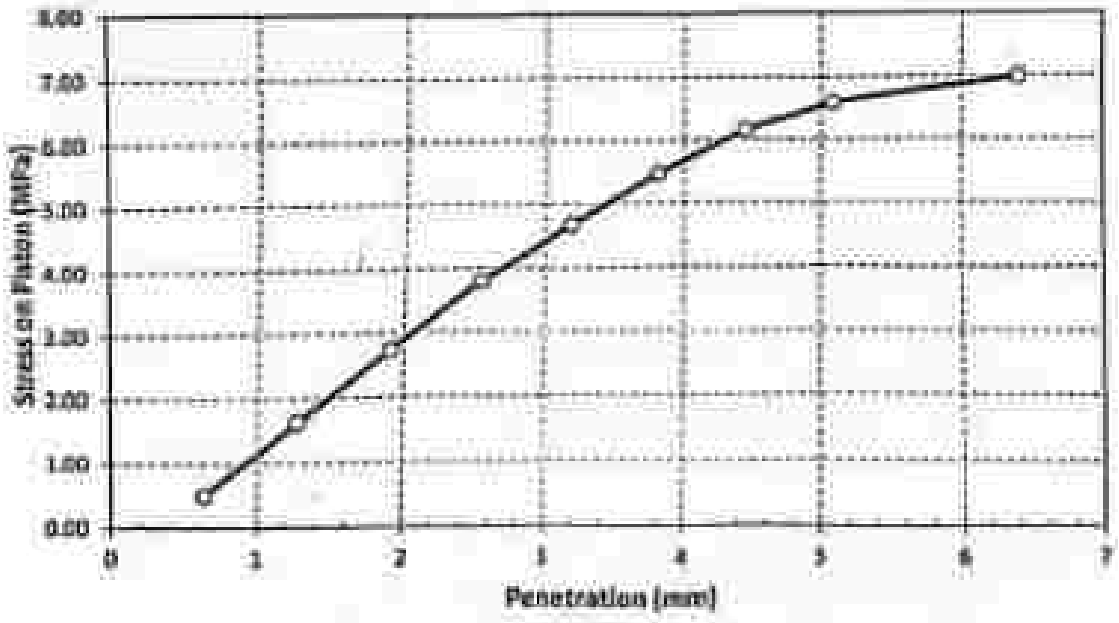
IAS ACCREDITED

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	: 27/09/2023
Reporting Date	: 1/10/2023
Reporting No.	: 10-8

Load Penetration Curve of CBR Test

ASTM D-1883



Signature / .م. المـــــــادة

CEL
مكتب معامل الاستشارات الهندسية
شركة ذهبي
210 991 437
3 شارع الملك الصالح

3 El Malek El Saleh Street
Zamalek, Cairo.
Tel.&Fax: 2736723 - 2736208

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الفهي

Project : Electric Express Train – IISR From Qous To Armant

Testing Date : 16 /10/2023

Soil type : Middle Embankment

Location : St From 641+420 TO 641+620

Level : - 1.75 M

Report No. : 89

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+440	1557.6	2.31	6.4	2.17	97.9%	Comply
2	641+460	1554.9	2.25	6.4	2.11	95.1%	Comply
3	641+480	1471.7	2.30	6	2.17	97.9%	Comply
4	641+500	1620.7	2.28	6.4	2.14	96.3%	Comply
5	641+520	1635.2	2.25	6.4	2.11	95.2%	Comply
6	641+560	1500.0	2.30	6.4	2.17	97.6%	Comply
7	641+580	1295.9	2.32	6	2.19	98.5%	Comply
8	641+600	1725.5	2.26	6	2.13	96.0%	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 219 991 437

3 El Masik El Abbd Street
Zamalek, Cairo
Tel& Fax: 2736 521 - 2736 080

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	: **27/09/2023**
Reporting Date	: **1/10/2023**
Reporting No.	: **10-9**

Dear Gentleman,

Attached here with the delivered on 27 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature .....

CEL
مكتب معامل الاستشارات الهندسية
مشروعات , الأقصر
219.991.437

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-9

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	97.4
37.5	1.5	94.6
25	1	90.2
19	¾	79.8
12.50	½	73.9
9.50	3/8	70.0
4.75	4	51.6
2.00	10	38.5
0.425	40	22.0

Signature /...

CEL
مكتب معامل الاستشارات الهندسية
مشروعات ، الاقصر
ت 219.091.437
الرقم الضريبي 3 [illegible]

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-9

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)	8.9

Signature /.....

CEL

3 El Nasr El Afifi Street
Dandeel, Cairo
Tel & Fax: 27760231 - 27760601

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهلي

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-9

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

1 El Malek El Afdal Street
Zamalek, Cairo.
Tel. Fax: 27362211 , 27362203

IAS

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-9

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).	38.5	Max 50 %	—	—
0.425 mm (No. 40).	22.0	Max 30 %	Max 50 %	—
0.075 mm (No. 200).	8.9	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 الإستشارات الهندسية
مشروعات ، الأقصر
219,951,437

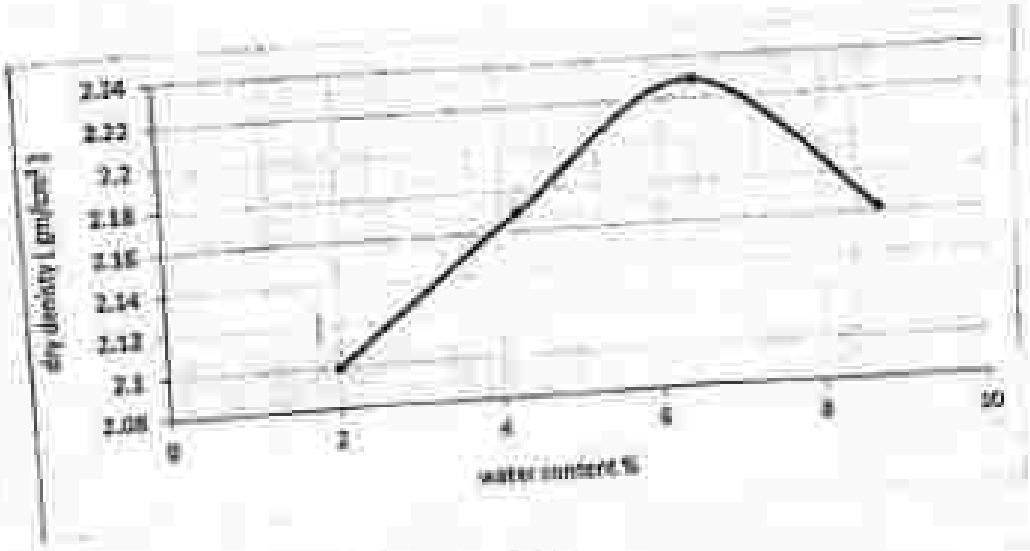
3 El Malek El Adil Street
Zamalek, Cairo.
Tel.Fax: 2736723 - 2736503

IAS

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-9

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

3 El Mitek St Abbas Street
Zamalek, Cairo
Tel.& Fax: 2736521 - 2736303

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-9

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.48
1.27	0.050	1.66
1.91	0.075	2.75
2.54	0.100	3.81
3.18	0.125	4.70
3.81	0.150	5.49
4.45	0.175	6.18
5.08	0.200	6.65
6.35	0.250	7.01

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	4.90	3.81	55.2 %

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 and [illegible]

Signature / ....

3 El Malek El Afdal Street
Zamalek, Cairo
Tel/Fax: 2736727 - 2736733

IAS ACCREDITED

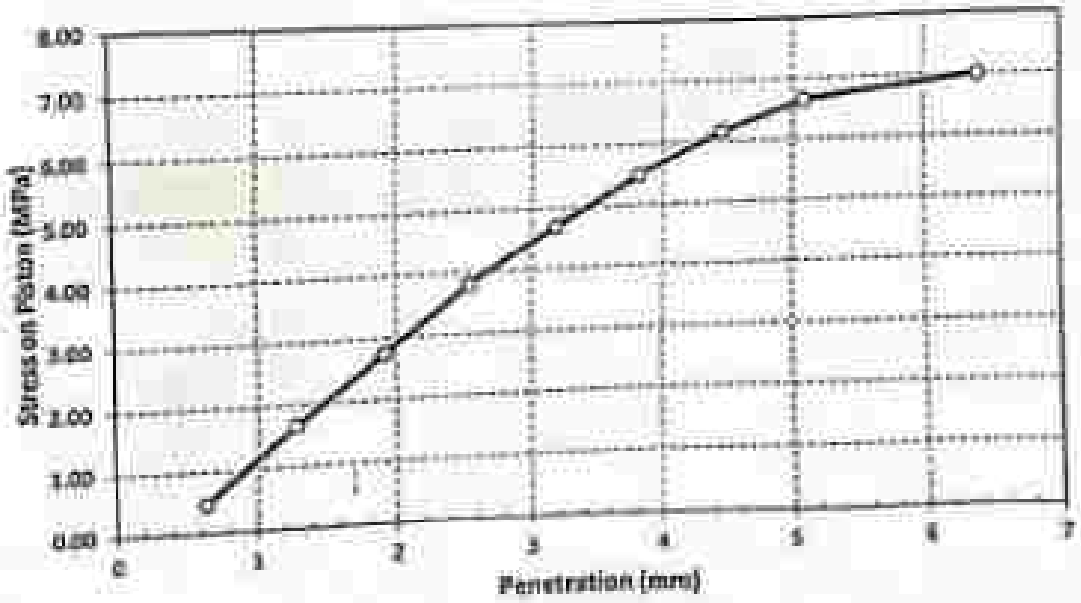
Scanned with CamScanner

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 : 27/09/2023
Reporting Date : 1/10/2023
Reporting No. : 10-9

Load Penetration Curve of CBR Test

ASTM D-1883



Signature / .

CEL
3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax (2736725) - 2719060

IAS ACCREDITED

Scanned with CamScanner

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة [illegible]

Project : Electric Express Train – HSR From Qasr To Ariesat

Testing Date : 17/10/2013

Soil type : Middle Embankment

Location : St From 641+420 To 641+780

Level : -1.2 M

Report No. : 90

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+440	1669.0	2.32	6.4	2.18	98.2%	Comply
2	641+460	1631.7	2.27	6	2.14	96.4%	Comply
3	641+480	806.2	3.48	6.4	2.12	95.6%	Comply
4	641+500	1593.1	2.24	6	2.11	95.1%	Comply
5	641+520	1503.4	2.31	6.4	2.17	97.6%	Comply
6	641+540	1617.5	2.27	5.8	2.14	96.6%	Comply
7	641+580	1585.5	2.32	5.6	2.19	98.8%	Comply
8	641+600	1476.6	2.27	5.6	2.15	97.0%	Comply
9	641+620	1453.1	2.31	5.8	2.18	98.3%	Comply
10	641+640	1485.5	2.33	6.4	2.19	98.8%	Comply
11	641+660	1538.6	2.25	6	2.13	95.9%	Comply
12	641+680	1517.9	2.28	5.8	2.16	97.2%	Comply
13	641+700	1549.0	2.26	6.4	2.12	95.6%	Comply
14	641+720	1476.6	2.27	6	2.15	96.7%	Comply
15	641+740	1485.5	2.33	6.4	2.19	98.8%	Comply
16	641+760	1631.7	2.27	5.5	2.15	96.8%	Comply

Degree of compaction based on proctor test dated At

Max dry density [illegible]

At optimum moisture content 5.4%

Signature/Stamp

CEL

Mazen E. [illegible] Street
Zamalek, Cairo
Tel & Fax: [illegible]

IAS
ACCREDITED

[illegible]
[illegible]
[illegible]

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	: 27/09/2023
Reporting Date	: 1/10/2023
Reporting No.	: 10-9

Dear Gentleman,

Attached here with the delivered on 27 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

CEL

3 El Nasr E Abbas Street
Zamalek, Cairo
Tel & Fax: 27362127 - 27361000

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-9

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	97.4
37.5	1.5	94.6
25	1	90.2
19	¾	79.8
12.50	½	73.9
9.50	3/8	70.0
4.75	4	51.6
2.00	10	38.5
0.425	40	22.0

Signature /...

CEL

3 El Malek El Afdal Street
Zeitoun, Cairo
Tel & Fax: 27102703 - 27102708

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-9

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)	8.9

Signature /.....

CEL

219 995 437

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax : 2736723 - 2736890

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-9

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

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 27362721 - 27362063

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-9

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).	38.5	Max 50 %	——	——
0.425 mm (No. 40).	22.0	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	8.9	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

5 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax: 2736723 - 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 : 27/09/2023

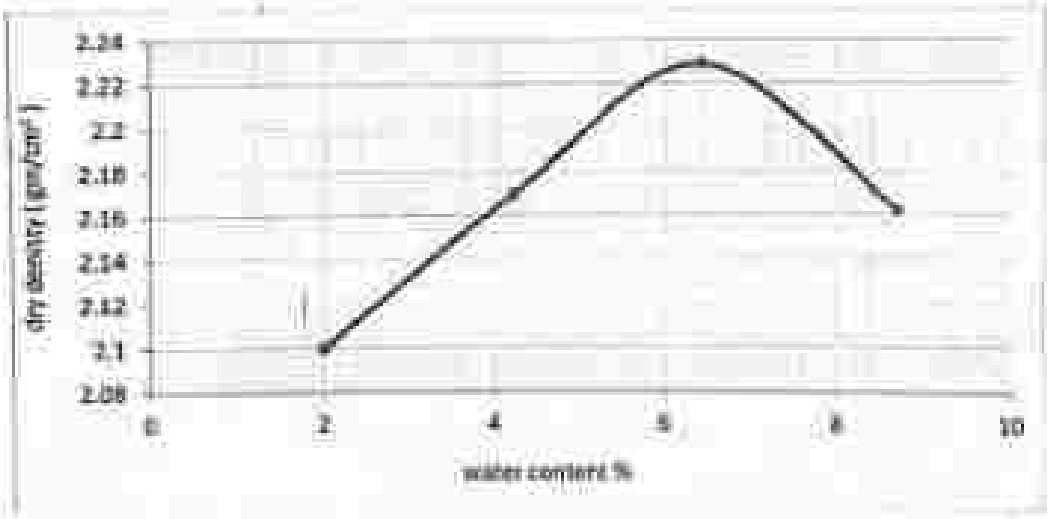
Reporting Date : 1/10/2023

Reporting No. : 10-9

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

15 Mitwa El Atta Street
Zamalek, Cairo
Tel.& Fax : 2736722 - 2740283

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 : 27/09/2023

Reporting Date : 1/10/2023

Reporting No. : 10-9

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.48
1.27	0.050	1.66
1.91	0.075	2.75
2.54	0.100	3.81
3.18	0.125	4.70
3.81	0.150	5.49
4.45	0.175	6.18
5.08	0.200	6.65
6.35	0.250	7.01

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.81	55.2 %

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 page No 56

Signature / ...

CEL

5 E Malik El Afdal Street
Zamalek, Cairo
Tel. Fax : 27367231 - 27368083

IAS ACCREDITED

CEL

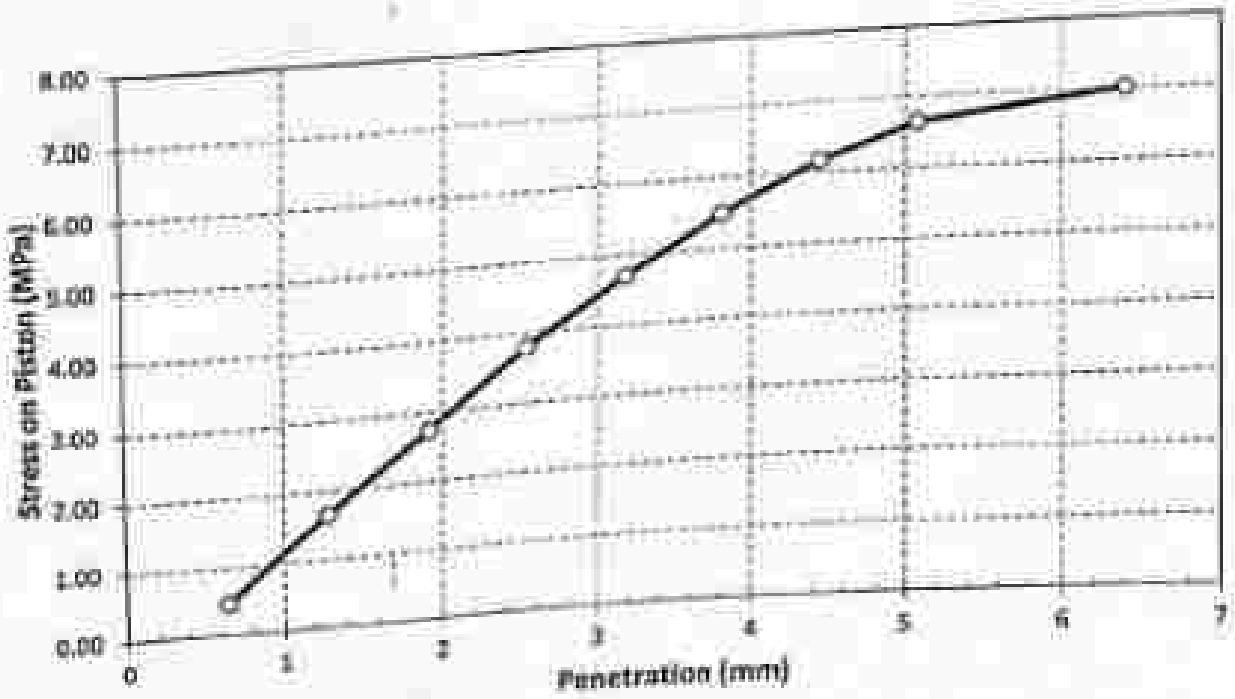
Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armaat
Location	: ST:641+400 E= 492410,088 N=2862759,57
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 27/09/2023
Reporting Date	: 1/10/2023
Reporting No.	: 10-9

Load Penetration Curve of CBR Test

ASTM D-1883



Signature /

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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 4/8/2023
Reporting Date : 8/8/2023
Reporting No. : 04-3

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	97
25	1	90
19	¾	85.4
12.50	½	77.2
9.50	3/8	73.3
4.75	4	69.6
2.00	10	58.5
0.425	40	40.7

CEL

Signature /...

18 Mark E Abd Sitter
Zamalek, Cairo
Tel & Fax: 2780621 - 2780609

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: 641+500) E= 492410,088 N=2862759,57
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 4/8/2023
Reporting Date	: 8/8/2023
Reporting No.	: 04-3

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)	14.0

Signature /

CEL

210 931 437

Sh. Mahmoud El Abd Street
Zamalek, Cairo
Tel& Fax: [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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 4/8/2023
Reporting Date : 8/8/2023
Reporting No. : 04-3

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

CEL

Signature /

3 E. Masik E. Ahlal Street
Zamalek, Cairo
Tel & Fax: 2736727 - 2736330

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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 4/8/2023
Reporting Date : 8/8/2023
Reporting No. : 04-3

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	58.5	Max 50 %	——	——
0.425 mm (No. 40).	40.7	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	14.0	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 /

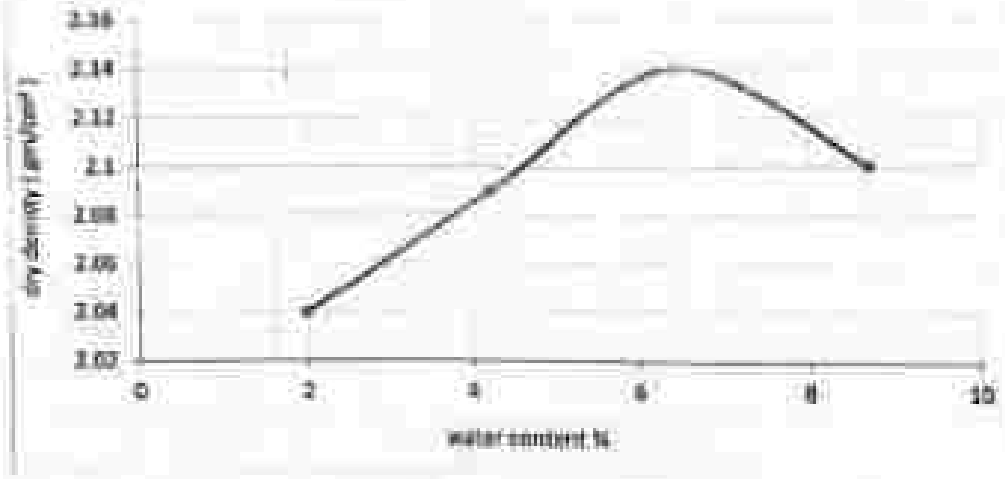
1 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax: 2736723 - 2736383

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+500) E= 492410,088 N=2862759,57
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 4/8/2023
Reporting Date	: 8/8/2023
Reporting No.	: 04-3

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



- Max dry density (gm/cm³) 2.14
- Optimum moisture content % 6.1 %

Signature /

CEL

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax

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+500) E= 492410,088 N=2862759,57

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

Delivery Date : 4/8/2023

Reporting Date : 8/8/2023

Reporting No. : 04-3

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.45
1.27	0.050	1.00
1.91	0.075	1.52
2.54	0.100	2.11
3.18	0.125	2.53
3.81	0.150	2.96
4.45	0.175	3.39
5.08	0.200	3.71
6.35	0.250	4.33

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	2.11	30.6%

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.14 (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

3 El Malek E. Abdel Sheer
Zeitoun, Cairo
Tel& Fax: 2736[illegible] - 2736[illegible]

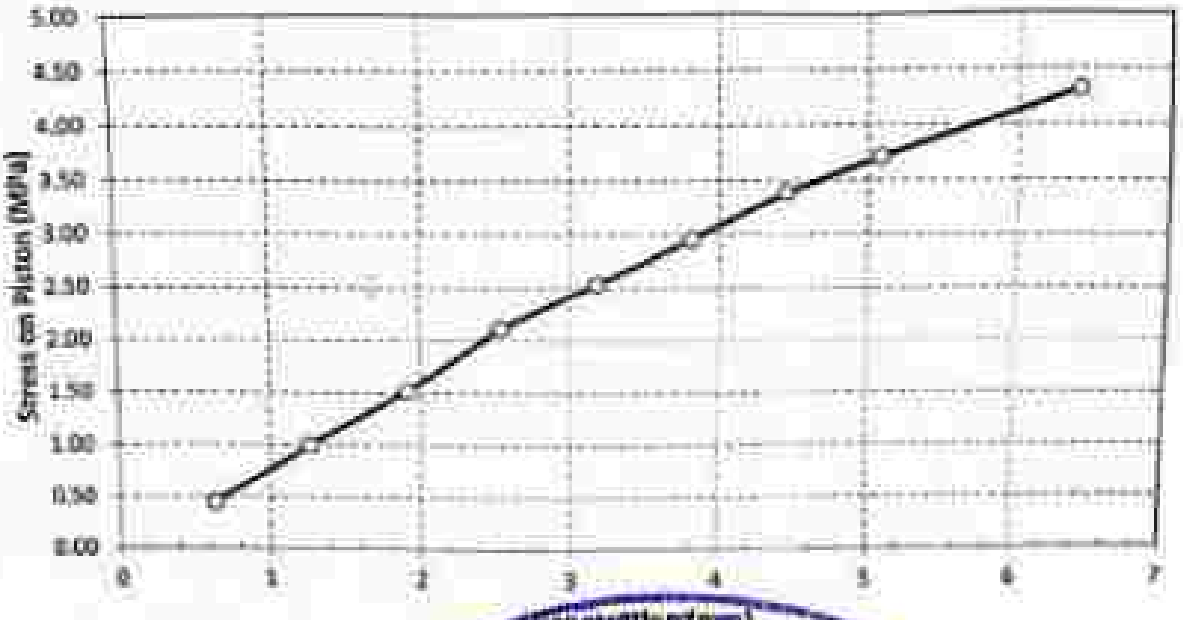
IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: (ST: 641+500) E= 492410,088 N=2862759,57
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 4/8/2023
Reporting Date	: 8/8/2023
Reporting No.	: 04-3

Load Penetration Curve of CBR Test

ASTM D-1883



Signature /

3 El Malek E Afzal Street
Zamalek Cairo
Tel & Fax: [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

Testing Date : 16/08/2023

Soil type : Middle Embankment

Location : St From 641+300 To 641+440

Level : - 3.0M

Report No. : 36

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+330	1681	2.18	5.8	2.06	96.0%	Comply
2	641+380	1622	2.17	5.8	2.05	95.5%	Comply
3	641+420	1591	2.19	5.8	2.07	96.2%	Comply

- Degree of compaction based on proctor test dated At : :
  - Max. dry density =2.15 gm/cm^3
  - At optimum moisture content 5.8
  - Signature/

181 Mark E. Abd Ghani
Zenith, Cairo
Tel/Fax: [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+500) E= 492410,088 N=2862759,57**
Type of sample	: **Soil Embankment**
Delivery Date	: **14/8/2023**
Reporting Date	: **19/8/2023**
Reporting No.	: **04-4**

Dear Gentleman,

Attached here with the delivered on 14 / 8 / 2023

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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature:.....

3 El Malek El Afzal Street
Zamalek, Cairo.
Tel & Fax: 2736721 - 2736009

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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment
Delivery Date : 14/8/2023
Reporting Date : 19/8/2023
Reporting No. : 04-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	98.5
25	1	88.3
19	¾	77.8
12.50	½	70.3
9.50	3/8	66.7
4.75	4	61.6
2.00	10	47.8
0.425	40	28.1

Signature

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax: 27362721 - 27362000

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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment
Delivery Date : 14/8/2023
Reporting Date : 19/8/2023
Reporting No. : 04-4

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)	13.5

CEL
Signature

3 El Malek El Afdal Street
Zamalek, Cairo.
Tell Fax : 2736707 - 2716303

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : (ST: 641+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment
Delivery Date : 14/8/2023
Reporting Date : 19/8/2023
Reporting No. : 04-4

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:

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 27361521 - 27362303

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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment
Delivery Date : 14/8/2023
Reporting Date : 19/8/2023
Reporting No. : 04-4

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
Group Classification	A-1-b	(A-1-a)	(A-1-b)	(A-2-4)
2.00 mm (No.10).	47.8	Max 50 %	----	----
0.425 mm (No. 40).	28.1	Max 30 %	Max 50 %	----
0.075 mm (No. 200).	13.5	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

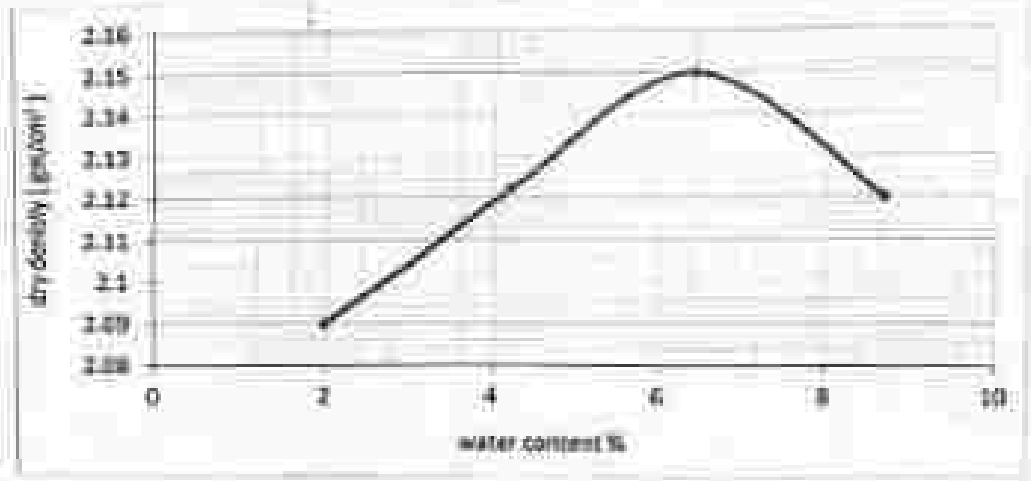
3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2736701 - 2736003

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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment
Delivery Date : 14/8/2023
Reporting Date : 19/8/2023
Reporting No. : 04-4

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



- **Max dry density (gm/cm³)** : 2.15
- **Optimum moisture content %** : 6.4 %

Signature

3 El Malek E' Ahlal Street
Zamalek, Cairo
Tel& Fax: 27362527 - 27363003

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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment
Delivery Date : 14/8/2023
Reporting Date : 19/8/2023
Reporting No. : 04-4

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.75
1.27	0.050	1.52
1.91	0.075	2.23
2.54	0.100	2.99
3.18	0.125	3.65
3.81	0.150	4.21
4.45	0.175	4.67
5.08	0.200	4.97
6.35	0.250	5.07

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	2.99	43.4 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.15 (gm /cm³)
At = 6.4 % optimum water content.
3- Surcharge used = 4.5 kg
4- CBR > 10 for middle and high embankments according project spec page No 36.

Signature /

3 El Masri St. Abbas Bridge
Zitoun, Cairo
Tel & Fax: 2730722 - 2730303

IAS ACCREDITED

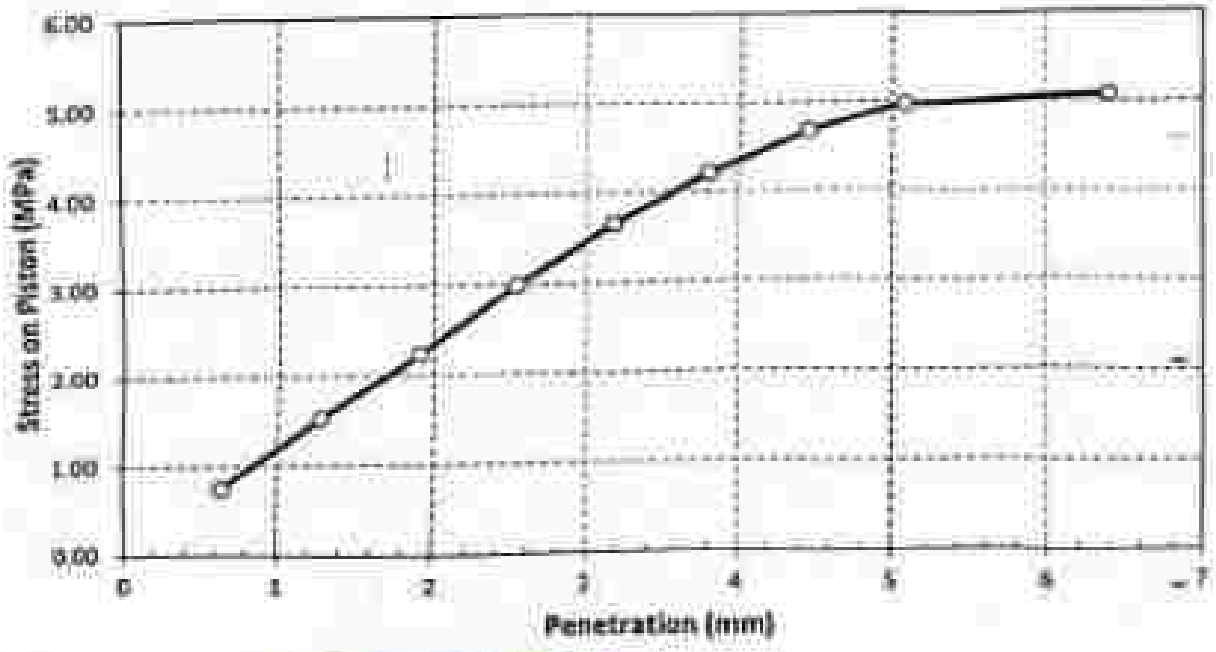
القاهرة
تليفون : ٢٧٣٠٣٠٣ - ٢٧٣٠٧٢٢

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+500) E= 492410,088 N=2862759,57
Type of sample : Soil Embankment
Delivery Date : 14/8/2023
Reporting Date : 19/8/2023
Reporting No. : 04-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

9 El Mawa St. Abbas Street
Zamalek, Cairo
Tel & Fax: 2736722 - 2736389

IAS ACCREDITED

٩ ش عباس الموا
الزمالك - القاهرة
تليفون وفاكس: ٢٧٣٦٧٢٢ - ٢٧٣٦٣٨٩

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 29/08/2023

Soil type : Upper Embankment

Location : St From 641+440/641+620

Level : - 3.5 M

Report No. : 47

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+480	1405	2.28	5.5	2.16	99.0%	Comply
2	641+520	1544	2.22	5.4	2.10	96.4%	Comply
3	641+560	835	2.28	5.8	2.16	98.9%	Comply
4	641+600	1516	2.22	5.6	2.10	96.3%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.18 gm/cm^3
- At optimum moisture content = 5.4 %
- Signature :

3 D Mare El Abd Street
Zamalek, Cairo
Tel & Fax: 2736031 - 2736303

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: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

Dear Gentleman,

Attached here with the delivered on 24 / 8 / 2023

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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

8 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax : 27367[illegible] - 27363[illegible]

IAS ACCREDITED

٨ ش الملك الأفضل
الزمالك - القاهرة
تليفون وفاكس : ٢٧٣٦٧[illegible] - ٢٧٣٦٣[illegible]

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	99.1
37.5	1.5	92.4
25	1	88.2
19	¾	83.4
12.50	½	78.5
9.50	3/8	70.1
4.75	4	56.2
2.00	10	37.9
0.425	40	15.2

Signature /.....

30 Mahk El Abid Street
Zamalek, Cairo.
Tel& Fax: 2736227 - 2736080

IAS ACCREDITED

٣٠ ش المحكمة العابد
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٠٨٠ - ٢٧٣٦٢٢٧

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

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)	4.5

Signature .....

3 El Malek El Afdal Street
Zamalek, Cairo
Tel./Fax: 2736723 - 2736080

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: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

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

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 27363721 - 27363063

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون وفاكس: [illegible]

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

Soil Classification

TEST	Results (%)	Limits according Projects Specs		
• Group Classification	(A-1-a)	(A-1-a)	(A-1-b)	(A-3-4)
2.00 mm (No.10).	37.9	Max 50 %	——	——
0.425 mm (No. 40).	15.2	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	4.5	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 /

1 El Mas El Aly Street
Zamalek, Cairo.
Tel& Fax: 2736727 - 2736063

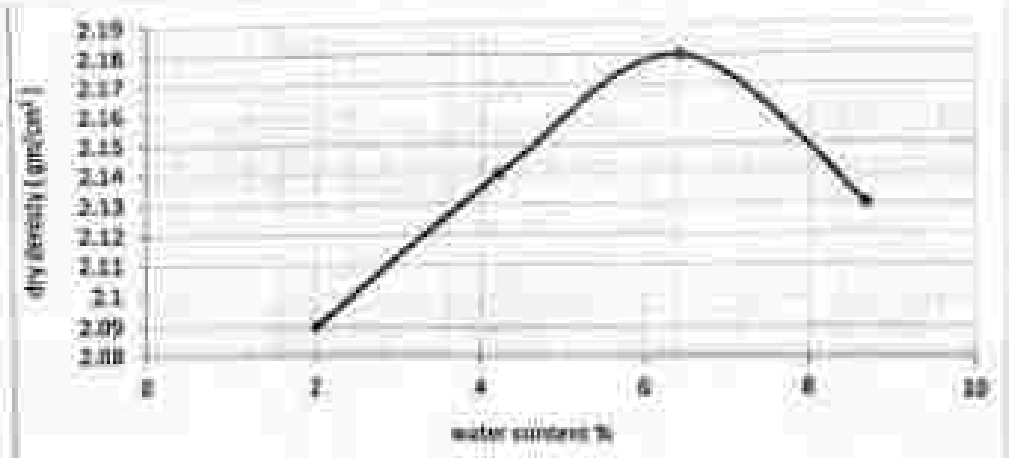
IAS ACCREDITED Testing Laboratory

٩ ش المساح العالي
الزمالك - القاهرة
تليفون / فاكس: ٢٧٣٦٧٢٧ - ٢٧٣٦٠٦٣

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

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



- **Max dry density (gm/cm³)** : 2.18
- **Optimum moisture content %** : 6.4 %

Signature / .....

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax : 27362721 - 27362763

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: 642+100 E=32.924959, N=25.877402

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

Delivery Date : 24/08/2023

Reporting Date : 28/08/2023

Reporting No. : 09-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.30
1.27	0.050	1.32
1.91	0.075	2.28
2.54	0.100	3.30
3.18	0.125	4.16
3.81	0.150	4.77
4.45	0.175	5.22
5.08	0.200	5.47
6.35	0.250	5.58

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	St. Value	Sample results	47.8 %
	6.90	3.30	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.18 (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 / ....

3 El Milek El Adel Street
Zamalek, Cairo
Tel & Fax: 2736922 - 2736083

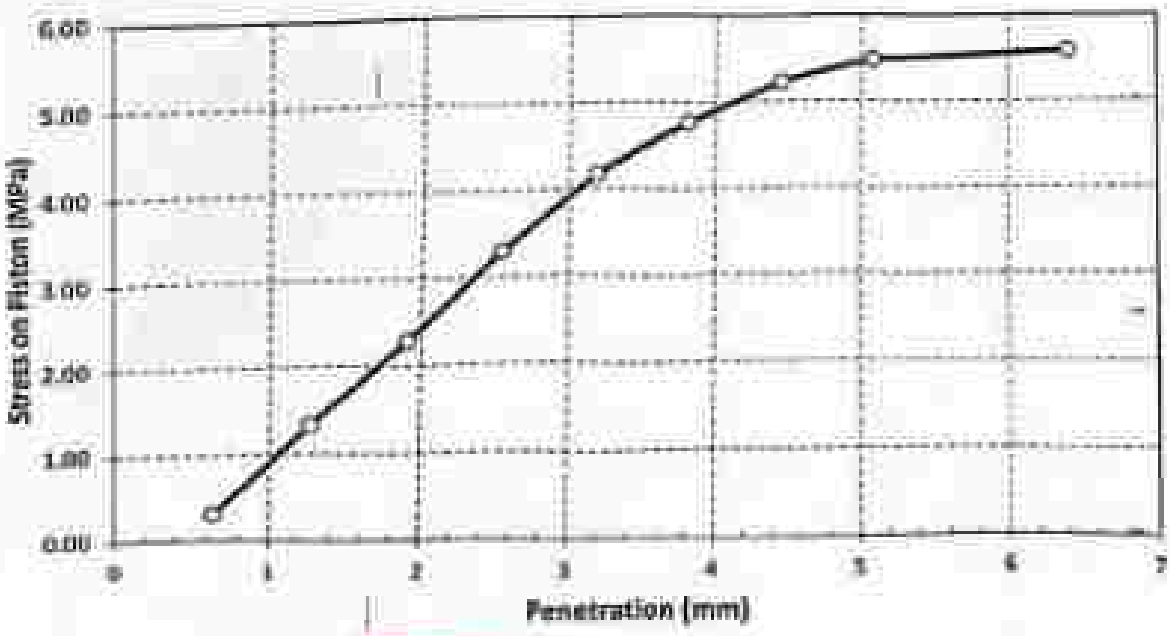
IAS ACCREDITED

٣ ش الملك العادل
الزمالك - القاهرة
تليفون / فاكس: ٢٧٣٦٩٢٢ - ٢٧٣٦٠٨٣

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: ST: 642+100 E=32.924959, N=25.877402
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 24/08/2023
Reporting Date	: 28/08/2023
Reporting No.	: 09-2

Load Penetration Curve of CBR Test
ASTM D-1883



Signature / ...

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax : 2736720 - 2736869

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٧٢٠ - ٢٧٣٦٨٦٩

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Quus To Armant
Testing Date : 30/08/2023
Soil type : Lower Embankment
Location : St From 641+300 To 641+420
Level : - 2.5 M
Report No. : 49

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+350	1315	2.20	5.3	2.09	95.7%	Comply
2	641+400	1647	2.20	5.5	2.08	95.5%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.18 gm/cm^3
- At optimum moisture content = 6.4 %
- Signature :

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 2736000 - 2736300

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: **Electric Express Train – BSR From Qous To Armant**
Location	: **ST: 642+100 E=32.924959, N=25.877402**
Type of sample	: **Soil Embankment (Upper Embankment 0.0 M)**
Delivery Date	: **24/08/2023**
Reporting Date	: **28/08/2023**
Reporting No.	: **09-2**

Dear Gentleman,

Attached here with the delivered on 24 / 8 / 2023

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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

3 El Ittihad El Arabi Street
Zamalek, Cairo.
Tel & Fax: 2736723 - 2736093

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: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	99.1
37.5	1.5	92.4
25	1	88.2
19	¾	83.4
12.50	½	78.5
9.50	3/8	70.1
4.75	4	56.2
2.00	10	37.9
0.425	40	15.2

Signature /.....

3 El Nasr El Abad Street
Zamalek, Cairo
Tel& Fax : [illegible]

IAS ACCREDITED

[illegible]
شبرا - القاهرة
[illegible]

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

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)	4.5

Signature /...

10 Mahe El Abid Street
Zamalek, Cairo.
Tel.& Fax : 2736723 - 2730369

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: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

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/

3-B Mahk E Abdi Street
Dokki, Giza.
Tel& Fax : 3736723 - 3736303

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: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

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).	37.9	Max 50 %	——	——
0.425 mm (No. 40).	15.2	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	4.5	Max 15 %	Max 15 %	Max 15 %
Liquid Limit	——	——	——	——
Plasticity index	8	Max 6 %	Max 6 %	Max 10 %

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

Signature / .....

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel/ Fax: 2736723 - 2736383

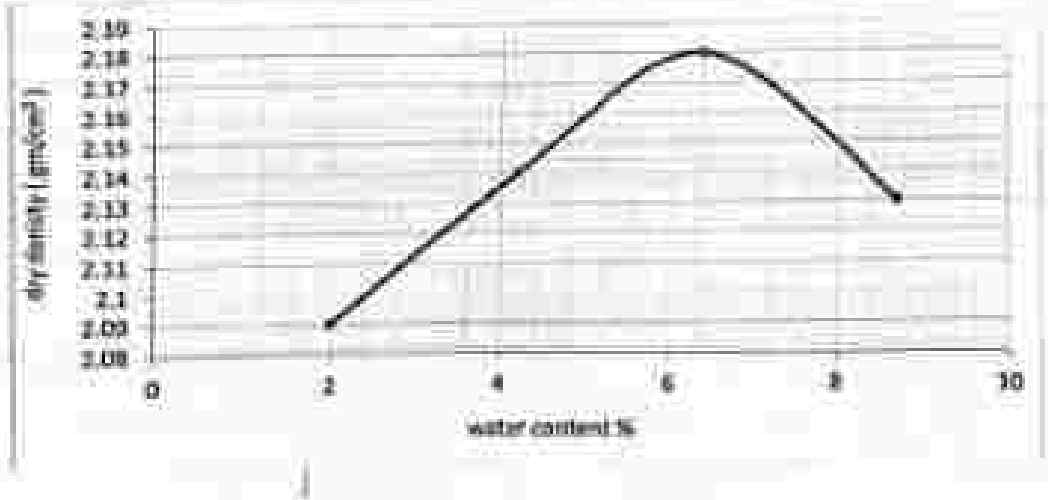
IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك القاهرة
تليفون فاكس : ٢٧٣٦٧٢٣ - ٢٧٣٦٣٨٣

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant -
Location : ST: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

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



- **Max dry density (gm/cm³)** : 2.18
- **Optimum moisture content %** : 6.4 %

Signature :

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax: 2736723 - 2736069

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون وفاكس : [illegible]

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Location : ST: 642+100 E=32.924959, N=25.877402
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 09-2

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

penetration		stress on piston (Mpa)
mm	inch	
0.64	0.025	0.30
1.27	0.050	1.32
1.91	0.075	2.28
2.54	0.100	3.30
3.18	0.125	4.16
3.81	0.150	4.77
4.45	0.175	5.22
5.08	0.200	5.47
6.35	0.250	5.58

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 inch (2.54 mm) penetration	St. Value 6.90	Sample results 3.30	47.8 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of= 2.18 (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 / .....

3 El Malek El Afzal Street
Zamalek, Cairo
Tel & Fax: 2736721 - 2736303

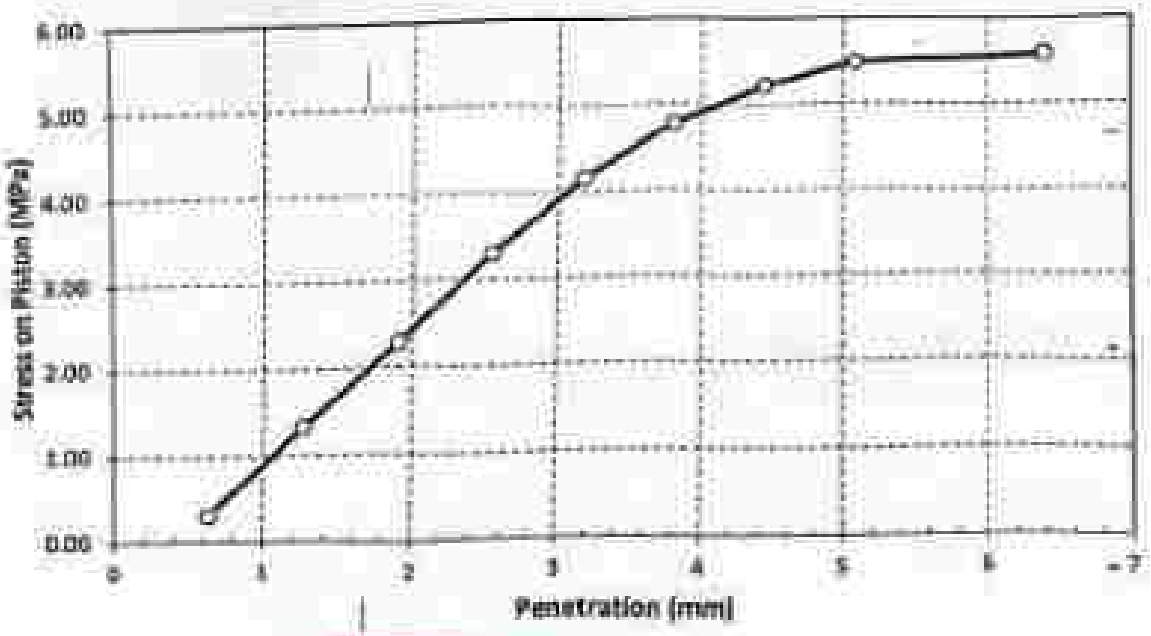
IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون وفاكس : [illegible]

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name	: شركة الذهبي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: ST: 642+100 E=32.924959, N=25.877402
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 24/08/2023
Reporting Date	: 28/08/2023
Reporting No.	: 09-2

Load Penetration Curve of CBR Test
ASTM D-1883



Signature / ....

3 El Sikek El Fidili Street
Zamalek, Cairo
Tel.& Fax: 3336722 - 3336808

IAS ACCREDITED

٣ ش السكة الفدلي
الزمالك - القاهرة
تليفون و فاكس : ٣٣٣٦٧٢٢ - ٣٣٣٦٨٠٨

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Arntant

Testing Date : 03/09/2023

Soil type : Middle Embankment

Location : St From 641+620 To 641+720

Level : - 3 M

Report No. : 54

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+650	1056	2.22	5.3	2.11	95.6%	Comply
2	641+680	1404	2.20	5.3	2.09	95.1%	Comply
3	641+710	1063	2.24	5.5	2.12	96.5%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.20 gm/cm^3
- At optimum moisture content = 6.4 %
- Signature :

3 El Mark E Abd Street
Zamalek, Cairo
Tel/Fax: [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 : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 10

Dear Gentleman,

Attached here with the delivered on 24 / 8 / 2023

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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature :

18 Mahd El Ahd Street
Zamalek, Cairo
Tel/ Fax: 27362231 - 27362232

IAS ACCREDITED

١٨ ش المهد الأحمد
الزمالك - القاهرة
تليفون / فاكس: ٢٧٣٦٢٢٣١ - ٢٧٣٦٢٣٢

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 : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 10

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	98.4
25	1	92.3
19	¾	89.1
12.50	½	80.6
9.50	3/8	70.6
4.75	4	59.4
2.00	10	40.9
0.425	40	25.1

Signature :

CEL

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax : 2736751 - 2763059

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 : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 10

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)	12.5

Signature

3 B Mahk El Afdal Street
Zamalek, Cairo.
Tel/ Fax: 2736721 - 2736263

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:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 10

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

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel & Fax : 2736721 - 2736069

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 : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 10

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).	40.9	Max 50 %	——	——
0.425 mm (No. 40).	25.1	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	12.5	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 /

3 El Mine E-Hod Street
Zamalek, Cairo.
Tel& Fax: 2736221 - 2736353

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 : 24/08/2023

Reporting Date : 28/08/2023

Reporting No. : 10

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.30
1.27	0.050	1.42
1.91	0.075	2.43
2.54	0.100	3.45
3.18	0.125	4.41
3.81	0.150	5.12
4.45	0.175	5.73
5.08	0.200	6.04
6.35	0.250	6.24

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.45	50 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.20 (gm /cm³)
At = 6.4 % optimum water content.

3- Surcharge load 4.50 K

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

Signature

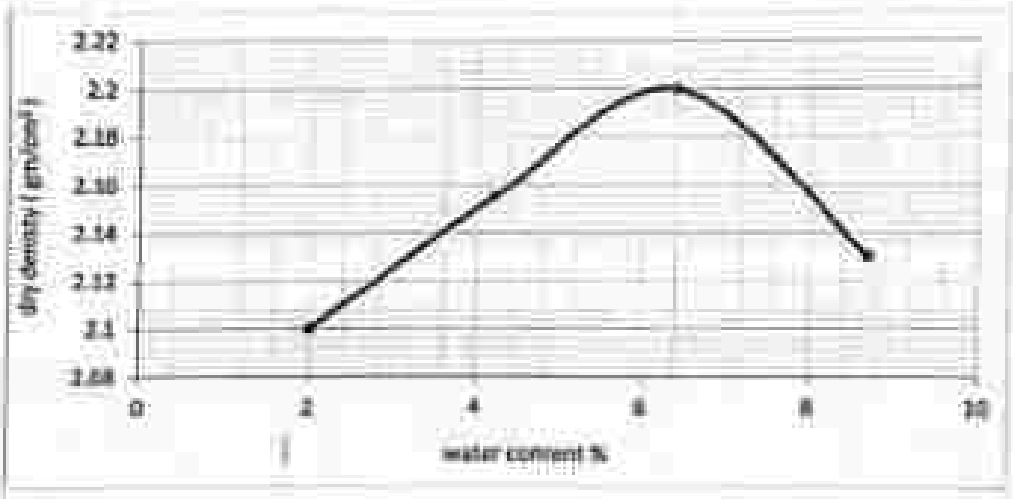
1 El Malek E. Abd Street
Zamalek, Cairo
Tel& Fax: 2736231 - 2736089

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	: 24/08/2023
Reporting Date	: 28/08/2023
Reporting No.	: 10

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



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature :

3 El Malek El Afdal Street
Dokki, Giza
Tel.& Fax : 2336720 - 2336060

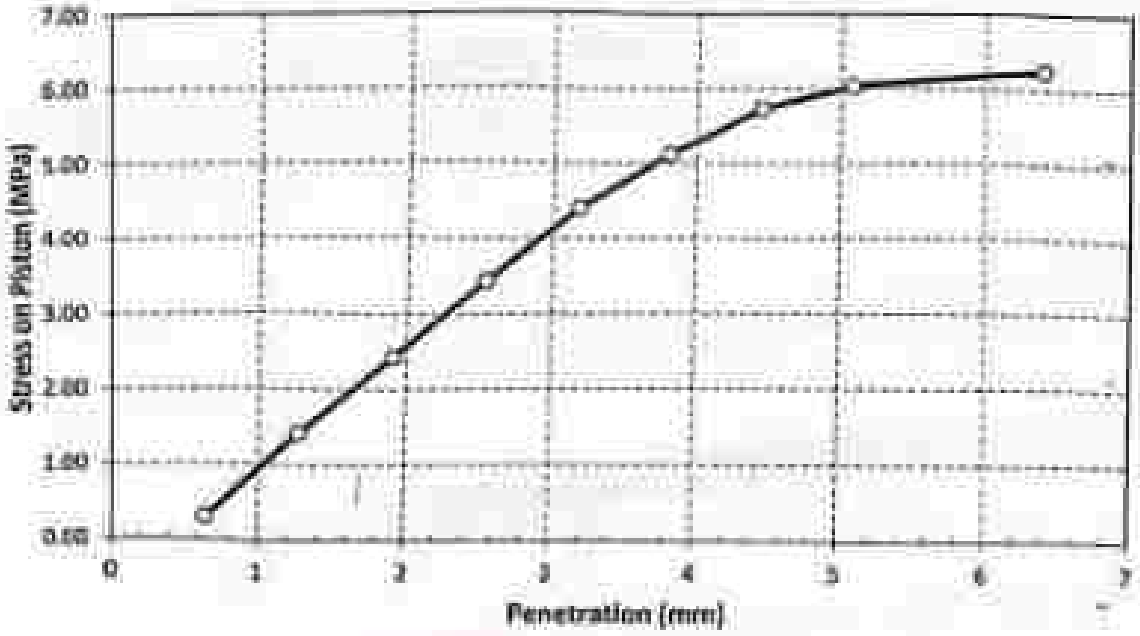
IAS ACCREDITED

الزمالك الأفضل
الزمالك الأفضل
الجيزة - مكتب : [illegible]

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية

Company Name : شركة الأنفي
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 : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 10

Load Penetration Curve of CBR Test
ASTM D-1883



Signature

3 El Maas El Atsy Street
Zamalek, Cairo
Tel/Fax: 2736523 - 2736380

IAS ACCREDITED

٣ ش المعاصر الأثري
الزمالك - القاهرة
تليفون / فاكس

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Testing Date : 03/09/2023
Soil type : Middle Embankment
Location : St From 641+000 To 641+160
Level : - 1.75 M
Report No. : 52

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+030	1644	2.29	5.5	2.17	98.4%	Comply
2	641+060	1058	2.22	5.3	2.11	95.8%	Comply
3	641+090	1065	2.23	5.5	2.12	96.3%	Comply
4	641+120	1404	2.20	5.5	2.09	95.0%	Comply
5	641+150	1647	2.20	5.3	2.09	95.0%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.20 gm/cm³
- At optimum moisture content = 6.4 %
- Signature :

3 El Malek E Atef Street
Zamalek, Cairo.
Tel./Fax: 2736727 - 2736269

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	**: 24/08/2023**
Reporting Date	**: 28/08/2023**
Reporting No.	**: 10**

Dear Gentleman,

Attached here with the delivered on 24 / 8 / 2023

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

Notes: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature

5 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax: 2736723 - 2736365

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 : 24/08/2023

Reporting Date : 28/08/2023

Reporting No. : 10

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	100
37.5	1.5	98.4
25	1	92.3
19	¾	89.1
12.50	½	80.6
9.50	3/8	70.6
4.75	4	59.4
2.00	10	40.9
0.425	40	25.1

Signature

Zamalek, Cairo.

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 : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 10

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)	12.5

Signature

1 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2736723 - 2736083

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 : 24/08/2023
Reporting Date : 28/08/2023
Reporting No. : 10

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 :

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel/ Fax : 27360721 - 27360080

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 : 24/08/2023

Reporting Date : 28/08/2023

Reporting No. : 10

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).	40.9	Max 50 %	——	——
0.425 mm (No. 40).	25.1	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	12.5	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 :

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2736721 - 2736300

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة النهي

Project : Electric Express Train – HSR From Qous To Armant

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

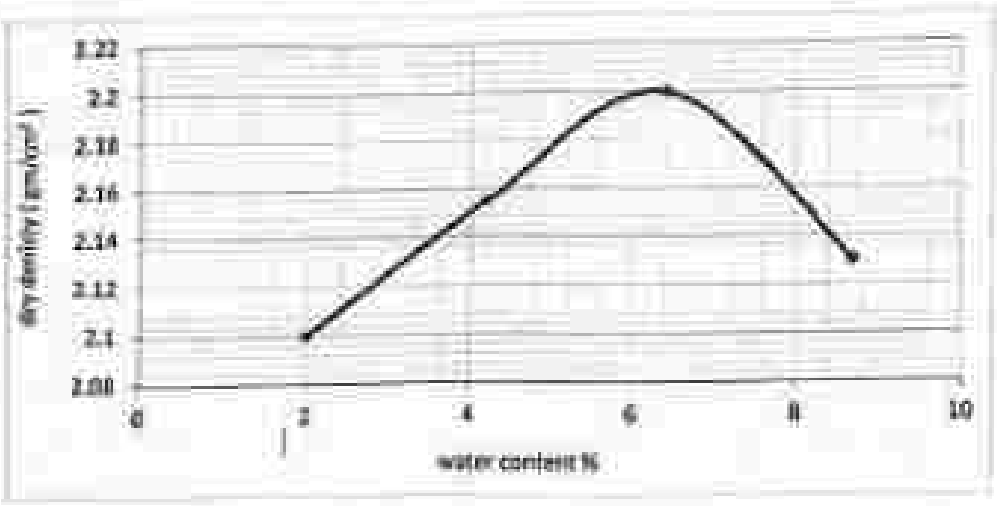
Type of sample : Soil Embankment (Upper Embankment 0.0 M)

Delivery Date : 24/08/2023

Reporting Date : 28/08/2023

Reporting No. : 10

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



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature / ...

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax: 2736723 - 2736365

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 : 24/08/2023

Reporting Date : 28/08/2023

Reporting No. : 10

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0,025	0.30
1.27	0,050	1.42
1.91	0,075	2.43
2.54	0.100	3.45
3.18	0.125	4.41
3.81	0.150	5.12
4.45	0.175	5.73
5.08	0.200	6.04
6.35	0.250	6.24

CBR Result	Stress (Mpa)		CBR 100 %
At 0.1 Inch (2.54 mm) penetration	St. Value	Sample results	50 %
	6.90	3.45	

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.20 (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 / .....

3 El Masa El Atal Street
Zamalek, Cairo
Tel & Fax : [illegible]

IAS ACCREDITED

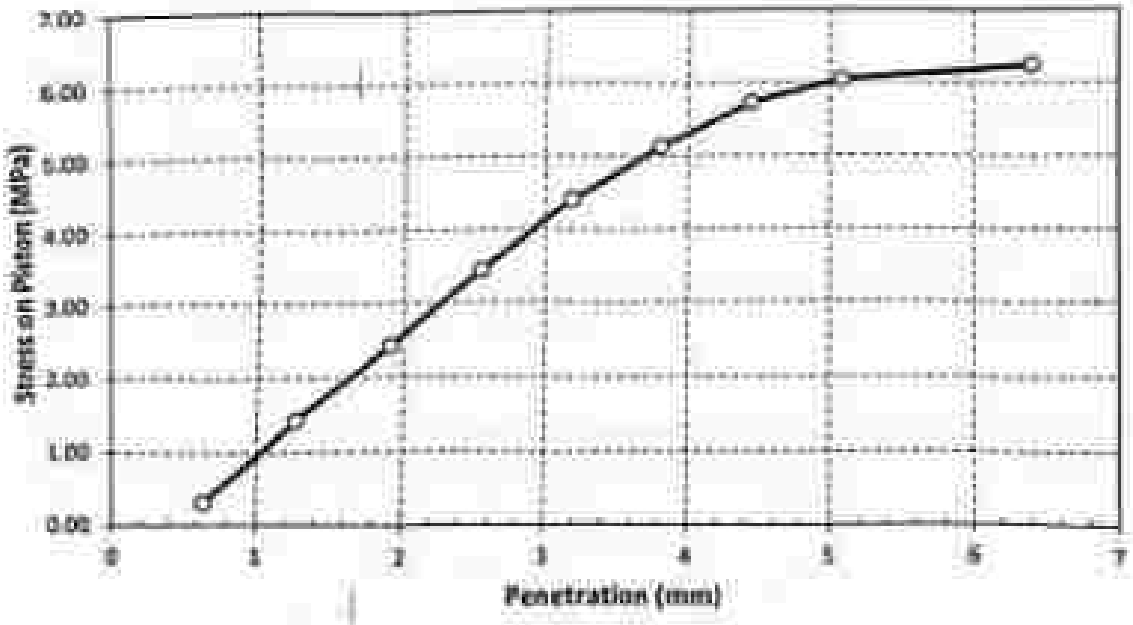
[illegible]

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	: 24/08/2023
Reporting Date	: 28/08/2023
Reporting No.	: 10

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

3 El Masik E Afdal Street
Zamalek, Cairo
Tel& Fax : 2736722 - 2736365

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون - فاكس : ٢٧٣٦٧٢٢ - ٢٧٣٦٣٦٥

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 06/09/2023

Soil type : Middle Embankment

Location : St From 641+440 To 641+620

Level : - 3 M

Report No. : 55

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+470	2046	2.22	5.3	2.10	95.2%	Comply
2	641+500	1856	2.22	5.5	2.10	95.2%	Comply
3	641+530	1353	2.22	5.5	2.11	95.4%	Comply
4	641+560	1544	2.22	5.3	2.10	95.2%	Comply
5	641+590	1398	2.21	5	2.11	95.3%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.21 gm/cm^3
- At optimum moisture content = 5.4 %
- Signature/

3 El Malek El Adel Street
Zamalek, Cairo
Tel& Fax: 2736723 - 2736350

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

Dear Gentleman,

Attached here with the delivered on 31 / 8 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature:

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax: 2736723 - 2736340

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.6
37.5	1.5	96.1
25	1	91.3
19	¾	87.2
12.50	½	79.2
9.50	3/8	71.2
4.75	4	56.9
2.00	10	41.2
0.425	40	28.2

Signature /.....

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax : 2736723 - 2736283

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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)	11.9

Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 2736723 - 2736363

IAS

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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
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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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).	41.2	Max 50 %	——	——
0.425 mm (No. 40).	28.2	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	11.8	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 / ....

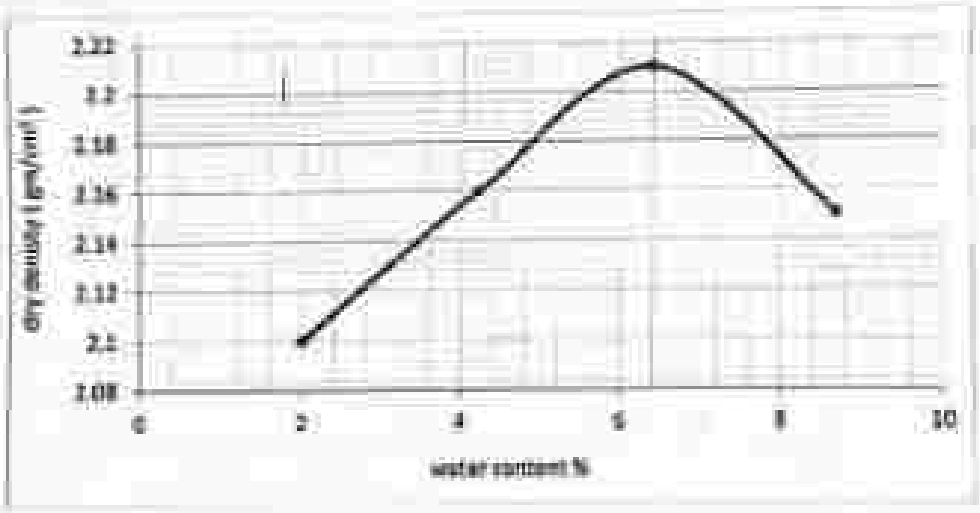
3 El Malek El Afdal Street
Zamalek, Cairo.
Tel/ Fax: 27361723 - 27362093

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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



- Max dry density (gm/cm³) : 2.21
- Optimum moisture content % : 6.4 %

Signature

3 El Masik El Atlal Street
Zamalek, Cairo.
Tel.Fax: 2736723 - 2736303

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:641+400 E= 492410,088 N=2862759,57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.33
1.27	0.050	1.47
1.91	0.075	2.54
2.54	0.100	3.55
3.18	0.125	4.51
3.81	0.150	5.27
4.45	0.175	5.83
5.08	0.200	6.14
6.35	0.250	6.29

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

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.21 (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 /

3 El Malek El Afdal Street
Dokki, Cairo.
Tel.& Fax: 37606737 - 37606733

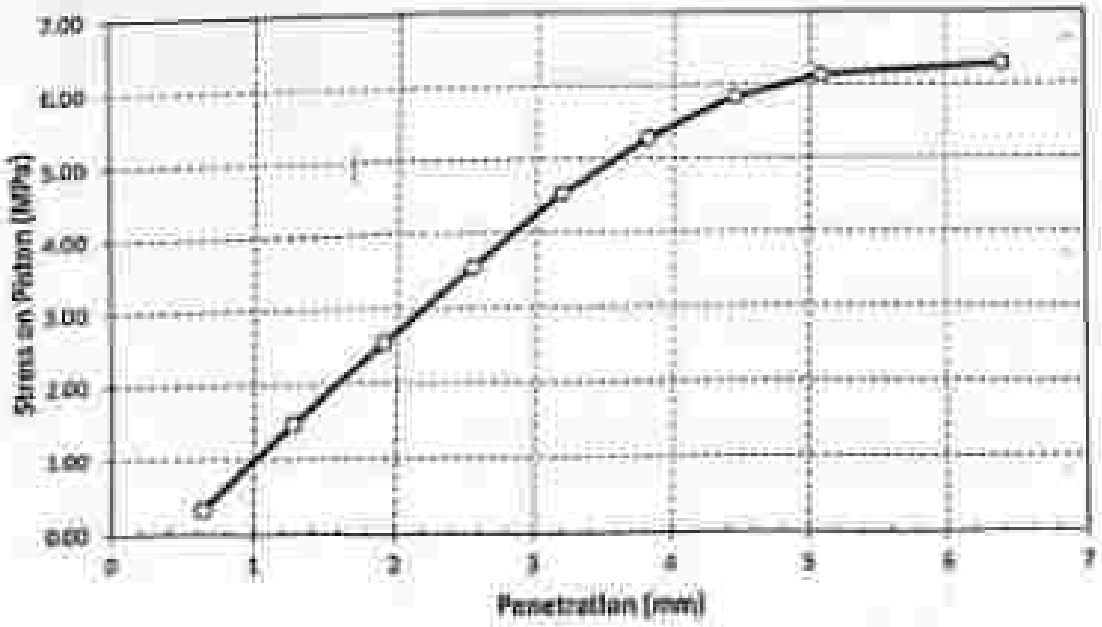
IAS ACCREDITED

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	: 31/08/2023
Reporting Date	: 04/09/2023
Reporting No.	: 10-2

Load Penetration Curve of CBR Test

ASTM D-1883



Signature /

3 El Malek El Afdal Street
Zeitoun, Cairo.
Tel/Fax: 2732723 - 2732800

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة النعيمي

Project : Electric Express Train – HSR From Qoiis To Armant

Testing Date : 07/09/2023

Soil type : Middle Embankment

Location : St From 641+160 To 641+300

Level : -2 M

Report No. : 58

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+180	1792	2.25	5.5	2.13	96.6%	Comply
2	641+230	1698	2.24	5.3	2.13	96.3%	Comply
3	641+260	1374	2.25	5.5	2.14	96.9%	Comply
4	641+290	1058	2.22	5.5	2.10	95.1%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.21 gm/cm³
- At optimum moisture content = 6.4 %
- Signature/ Stamp

CEL

IAS

Scanned with CamScanner

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	: **31/08/2023**
Reporting Date	: **04/09/2023**
Reporting No.	: **10-2**

Dear Gentleman,

Attached here with the delivered on 31 / 8 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

CEL

Consulting Engineering Bureau & Laboratories

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name : شركة الأهلي
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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.6
37.5	1.5	96.1
25	1	91.3
19	¾	87.2
12.50	½	79.2
9.50	3/8	71.2
4.75	4	56.9
2.00	10	41.2
0.425	40	28.2

Signature

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel & Fax :2736723 - 2736363

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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)	11.9

Signature /

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax: 2736722 - 2736363

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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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:

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.& Fax : 2736723 / 2736000

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 : 31/08/2023

Reporting Date : 04/09/2023

Reporting No. : 10-2

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).	41.2	Max 50 %	------	------
0.425 mm (No. 40).	28.2	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	11.8	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 LTD

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

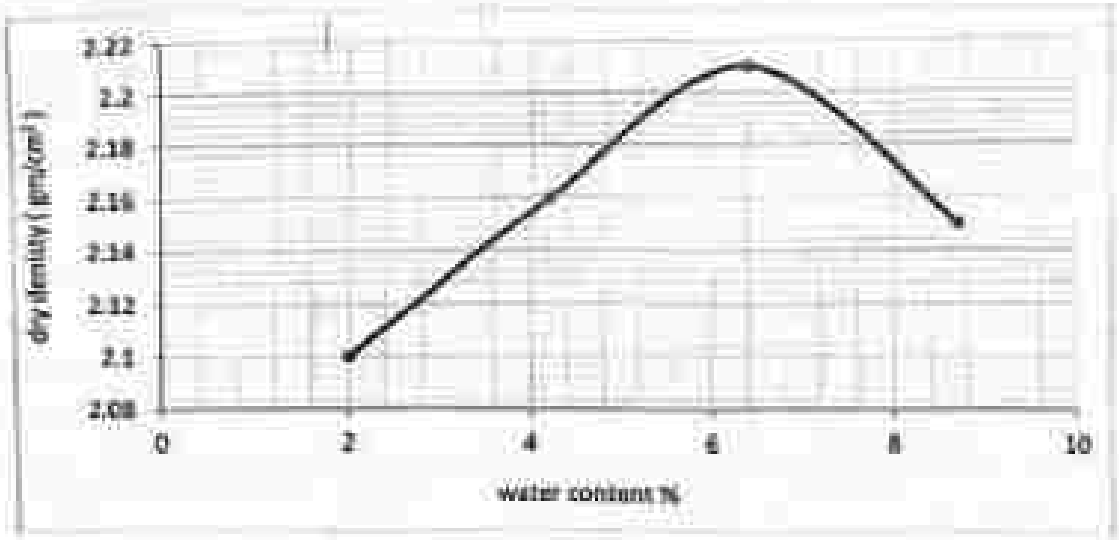
شروبات - سوهاج وقنا

ت ٢١٩ - ٣٩١ - ٥٣٢

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 31/08/2023
Reporting Date : 04/09/2023
Reporting No. : 10-2

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



- **Max dry density (gm/cm³)** : 2.21
- **Optimum moisture content %** : 6.4 %

Signature / .....

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 : 31/08/2023

Reporting Date : 04/09/2023

Reporting No. : 10-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.33
1.27	0.050	1.47
1.91	0.075	2.54
2.54	0.100	3.55
3.18	0.125	4.51
3.81	0.150	5.27
4.45	0.175	5.83
5.08	0.200	6.14
6.35	0.250	6.29

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

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.21 (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 /

3 El Nasr E... Zamalek, Cairo
Tel& Fax: 27361231 - 27...

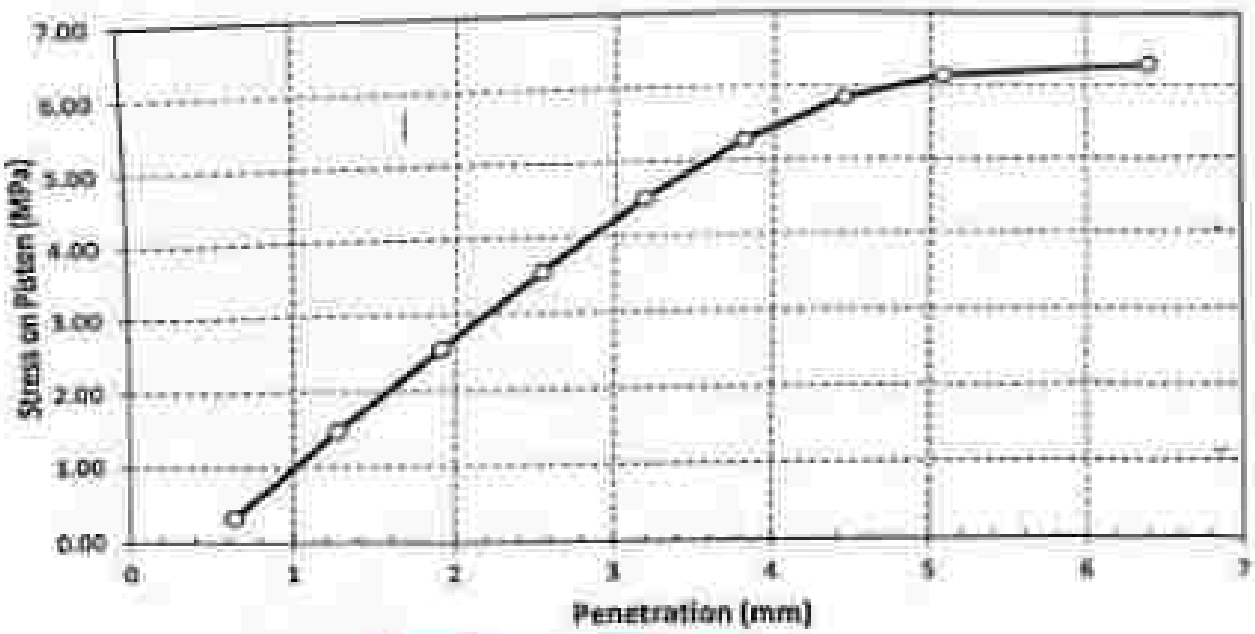
IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الاستشارات الهندسية

Company Name	: شركة الأهلي
Project	: Electric Express Train – HSR From Qous To Armant
Location	: ST:641+400 E= 492410,088 N=2862759,57
Type of sample	: Soil Embankment (Upper Embankment 0.0 M)
Delivery Date	: 31/08/2023
Reporting Date	: 04/09/2023
Reporting No.	: 10-2

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax : 27362231 - 27363050

IAS ACCREDITED Testing Laboratory

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية

Company Name : شركة الذهبي
Project : Electric Express Train – HSR From Qous To Armant
Testing Date : 12/09/2023
Soil type : Middle Embankment
Location : St From 641+160 To 641+300
Level : -2 M
Report No. : 58

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+180	1792	2.25	5.5	2.13	97.0%	Comply
2	641+230	1698	2.24	5.3	2.13	96.8%	Comply
3	641+260	1374	2.25	5.5	2.14	97.1%	Comply
4	641+290	1058	2.22	5.5	2.10	95.6%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.20 gm/cm^3
- At optimum moisture content = 6.4 %
- Signature :

1 El Mahdi St. Mag. Fikri
Zeitoun, Cairo
Tel & Fax : 2704720 - 2710001

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	: **7/09/2023**
Reporting Date	: **11/09/2023**
Reporting No.	: **10-3-2**

Dear Gentleman,

Attached here with the delivered on 7 / 9 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature /

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel.Fax: 2736723 - 2736083

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

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)	9.6

Signature /...

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax : 2736420 - 2735369

IAS ACCREDITED Testing Laboratory

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٤٢٠ - ٢٧٣٥٣٦٩

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	90.1
19	¾	84.2
12.50	½	77.2
9.50	3/8	71.5
4.75	4	59.9
2.00	10	46.3
0.425	40	28.0

Signature /

CEL
Consulting Engineering Bureau & Laboratories
219 - 888 - 327

3 El Malek El Afzal Street
Zamalek, Cairo
Tel& Fax: 27362723 - 27363093

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

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 /

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax : 2736721 - 2736093

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:641+400 E= 492410.088 N=2862759.57
Type of sample : Soil Embankment (Upper Embankment 0.0 M)
Delivery Date : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

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).	46.3	Max 50 %	——	——
0.425 mm (No. 40).	28.0	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.6	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 /

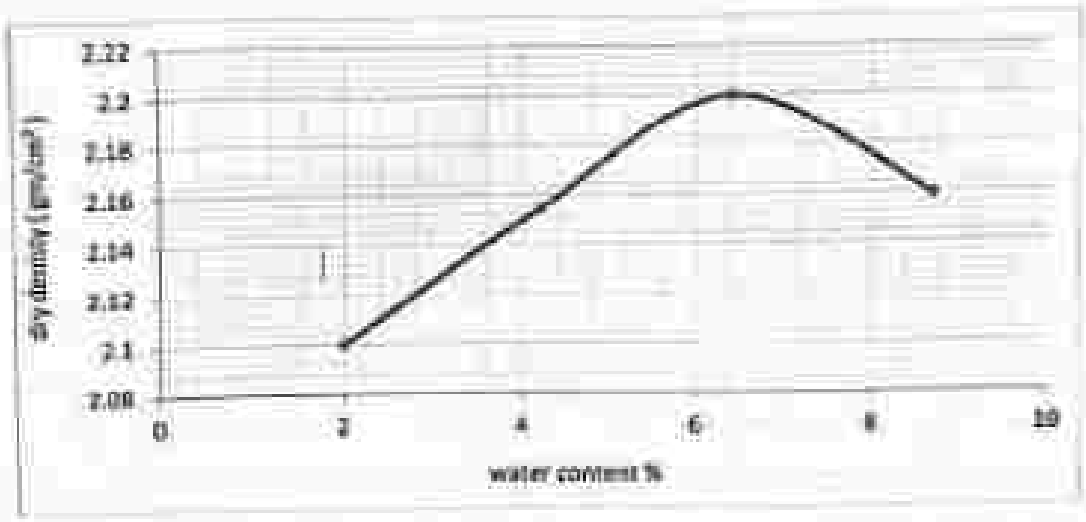
1 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 27362237 - 27362233

IAS ACCREDITED

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات 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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

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



- **Max dry density (gm/cm³)** : 2.20
- **Optimum moisture content %** : 6.4 %

Signature / .....

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax: 27367231 - 27363083

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٧٢٣١ - ٢٧٣٦٣٠٨٣

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 : 7/09/2023

Reporting Date : 11/09/2023

Reporting No. : 10-3-2

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.60
2.54	0.100	3.60
3.18	0.125	4.56
3.81	0.150	5.31
4.45	0.175	6.09
5.08	0.200	6.56
6.35	0.250	7.02

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.60	52.1 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.20(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 /

3 El Malik E Nasir St.
Zeitoun, Cairo
Tel & Fax: 2736721 - 2755361

Tel: 219 - 391 - 537

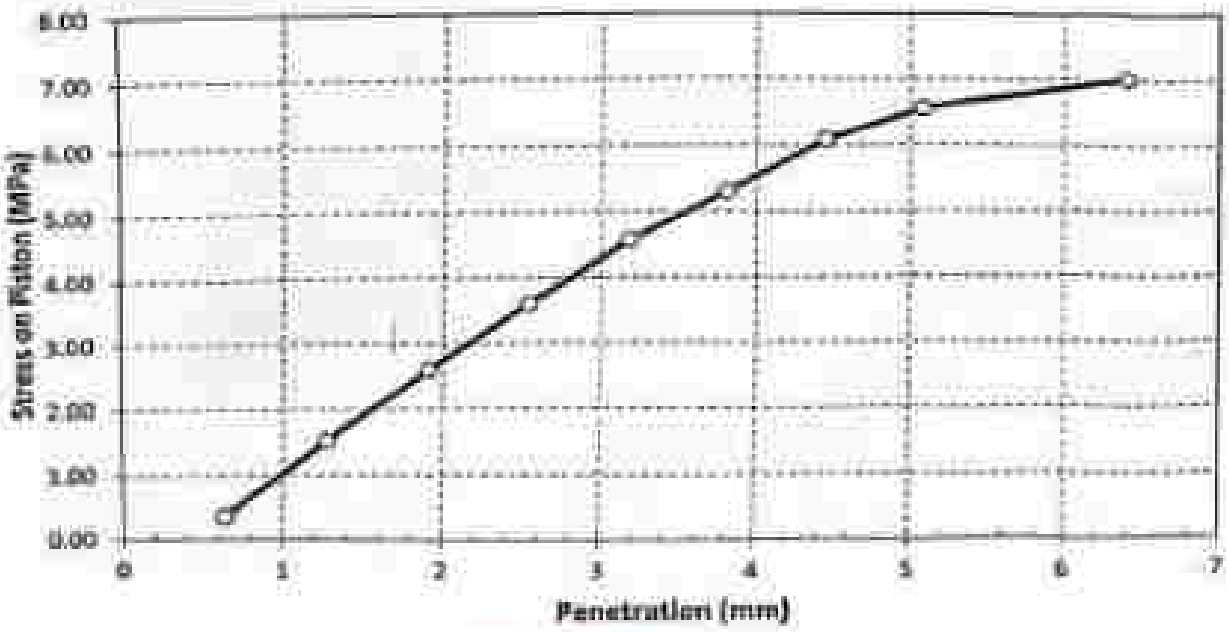
IAS ACCREDITED Testing Laboratories

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3-2

Load Penetration Curve of CBR Test

ASTM D-1883



Signature /

3 El Mahdi El Attar Street
Zamalek, Cairo.
Tel.& Fax: 27362721 - 27362681

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الأنفي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 16/09/2023

Soil type : Middle Embankment

Location : St From 641+200 to 641+300

Level : -1.5 M

Report No. : 63

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+220	1826	2.24	6	2.11	95.9%	Comply
2	641+240	1440	2.23	6.4	2.10	95.2%	Comply
3	641+260	1633	2.23	6	2.11	95.7%	Comply
4	641+280	1042	2.28	5.8	2.16	98.1%	Comply

Degree of compaction based on proctor test dated At

Max. dry density =2.18 gm/cm³

At optimum moisture content = 6.15

Signature: CEL

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 2736720 - 2736083

IAS ACCREDITED

٣ ش الملك الأفضل
الزمالك - القاهرة
تليفون / فاكس: ٢٧٣٦٧٢٠ - ٢٧٣٦٠٨٣

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

Dear Gentleman,

Attached here with the delivered on 12 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

8 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax : 27362723 - 27362293

IAS ACCREDITED

٨ ش الملك الأفضل
الزمالك - القاهرة
تليفون - فاكس : ٢٧٣٦٢٧٢٣ - ٢٧٣٦٢٢٩٣

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

CEL
Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax: 2736023 - 2736003

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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)	9.9

CEL

Signature

3 El Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax : 27360731 - 27360651

IAS ACCREDITED

٣ش الملك الافضل
الزمالك - القاهرة
تليفون و فاكس : ٢٧٣٦٠٧٣١ - ٢٧٣٦٠٦٥١

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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

Test	Results (%)
Liquid Limit	0
Plastic Limit	0
Plastielty Index	0

CEL
Signature

3 El Nasr & Abbas Street
Zamalek, Cairo
Tel.& Fax: 2736727 - 2736363

IAS ACCREDITED

٣ ش النصر والعباس
الزمالك - القاهرة
تليفون + فاكس : ٢٧٣٦٧٢٧ - ٢٧٣٦٣٦٣

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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).	45.9	Max 50 %	——	——
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.9	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 /

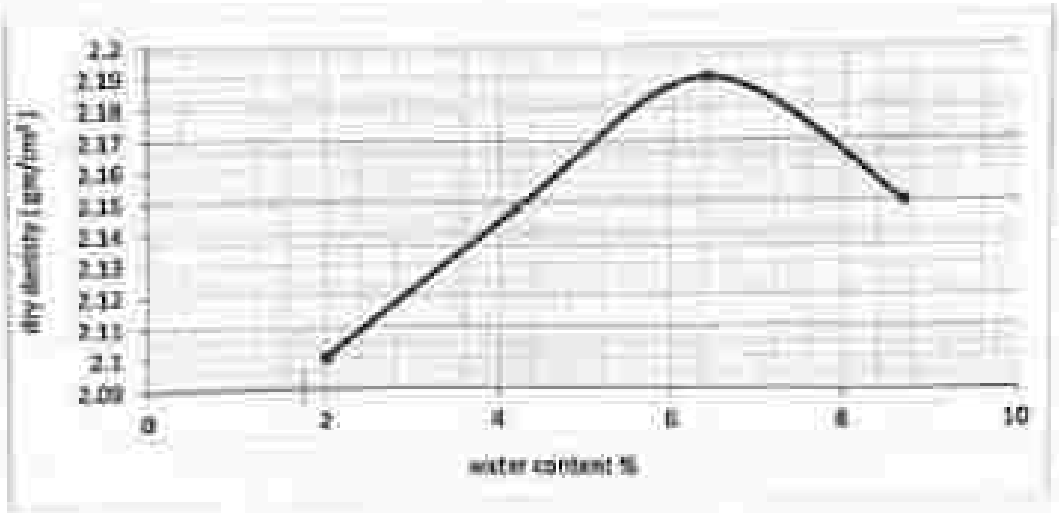
3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 2736723 - 2736363

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature /.....

3 El Maah El Alaa Street
Zamalek, Cairo.
Tel& Fax: 2736723 - 2736303

IAS ACCREDITED Testing Laboratory

٣ ش المعاه العلا
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦٧٢٣ - ٢٧٣٦٣٠٣

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

Test Results of California Bearing Ratio on Base Materials

ASTM D 1883

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample result	
At 0.1 inch (2.54 mm) penetration	6.90	3.59	52 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.19(gm /cm³)

At = 6.4 % optimum water content.

3- Surcharge mo 4.50 Kg.

4- CBR > 10 for middle and top embankments according project spec page No 36.

Signature

1 D Mosli Street
Zamalek, Cairo
Tel.&Fax: 2736720 - 7765060

IAS ACCREDITED

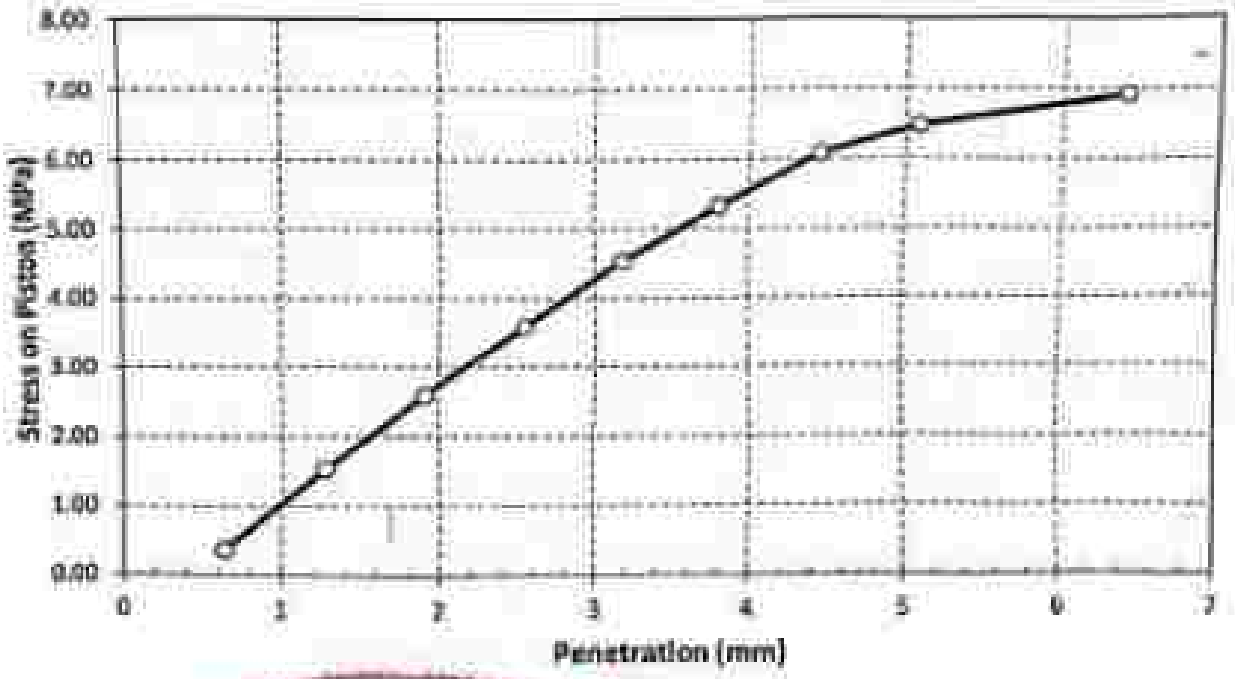
الزمالك - القاهرة

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

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

IAS ACCREDITED

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

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلي

Contents: شركة الأنفاق للمقاولات والتوريدات العمومية

Project : Electric Express Train - Sector (1) – Gaza to Amreyn.
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+020 to 641+300
Station: 641+240
Level : A.S
Test Date : 19/9/2023
Report Date : 19/9/2023
Type of soil : Original earth
Report No. : 1

Dear Gentlemen,

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

Apparatus

1. Loading plates consists of two plates with 330 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 (Proving)
7. Reaction loading system by roller compactor with weight approximately 15 ton.
8. Calibration certificates are attached.

Test Procedure:

1. Clean the ground surface 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 testing the load applied preloading about 20 seconds.
4. The strain gauge and the dial gauge shall be set to zero
5. For a 330 mm loading plate, the test values are 3.2 kg/cm²
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, i.e. 50 %, 25 %, and approximately 2 % of the maximum load.
9. Following unloading, a further (3 rd) 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
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلي
219 - 501 - 527
٣ شارع الملك الأفضل - الزمالك - القاهرة

Report

1. Evaluation and representation of results.
2. Load Settlement curve.
3. The test report contint the following:-

- location of test site - Dimension of loading plate.
- Measuring device used - Type of soil.
- Type of Building 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.

Based

- Type of soil : Original earth
- Job requirement : Ev3 = 40 MPa

Item	Descriptions
Type of building material below the plate	Natural Soil
Plate Diameter (mm)	300
Date of measurement	11/06/2023
Unusual observation made during test	Nil
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+200	641+300	641+240	-1.5	33.9	140.7	4.13

Signature

Company Name : شركة الذهبي للمقاولات و التوريدات العمومية
Project : Electric Express Train - Section (1) - Cross to Arrawi.
Test Date : 16/09/2023
report date : 19/09/2023
Station : 641+240
Test No. : 1

Nonrepetitive Static Plate Load Tests of Soils
D84 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	19.30	0.70	19.71	0.79	0.74
2	1.66	18.85	1.15	18.57	1.43	1.40
3	2.50	18.03	1.97	17.86	2.14	2.06
4	3.33	17.65	2.35	17.35	2.65	2.50
5	4.17	17.08	2.92	17.18	2.82	2.87
6	5.00	16.53	3.47	16.20	3.80	3.64

Unloading Stage (1)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
1	2.50	17.43	2.57	16.93	3.07	3.02
2	1.66	17.75	2.25	16.58	3.42	2.84
3	0.100	17.85	2.15	17.08	2.92	2.48

Loading Stage (2)

Loading	Stress Kg/cm2	Dial 1	Settlement mm	Dial 2	Settlement mm	Average
0	0.83	17.82	2.18	15.83	3.17	2.68
[illegible]	1.66	17.79	2.22	15.61	3.39	2.80
stress is reached.						
2	2.50	17.64	2.36	15.45	3.55	2.96
3	3.33	17.58	2.42	15.31	3.69	3.05
4	4.17	17.41	2.57	15.17	3.83	3.23

CEL
Consulting Engineering Bureau & Laboratories
مكتب معامل الإستشارات الهندسية
مشروعات محافظات الوجه القبلي
219 - 919 - 537

CEL

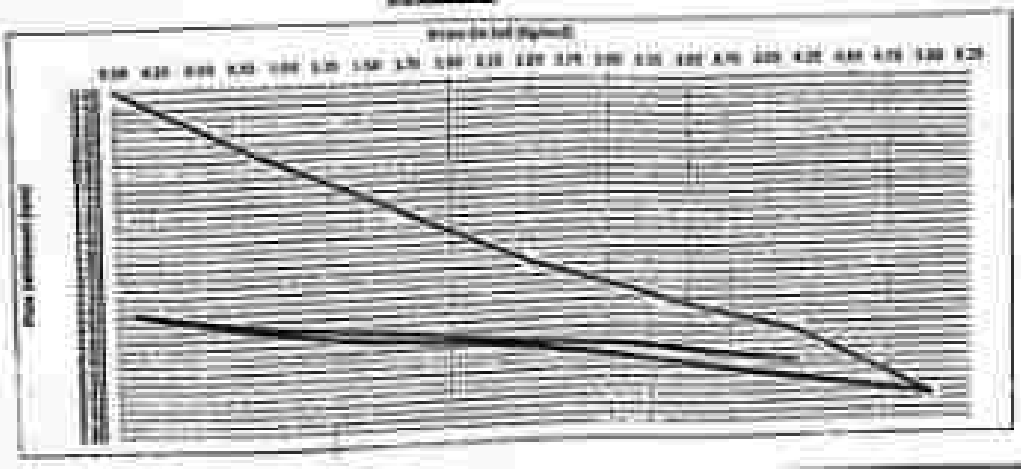
Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

مشروعات محافظات الوجه القبلى

Company Name : [illegible]
Project : Riyadh Express Train - Sector (5) - Dawa to Ismail.
Test Date : [illegible]
report date : [illegible]
Station : 041+245
Test No. : 1

Nonrepetitive Static Plate Load Tests of Soils
DIN 18134



Loading (T)	0	1	2	3	4	5	6
Stage(Kg)	0	586	1172.6	1758.3	2342.8	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	0.74	1.43	2.08	2.52	2.87	3.14

UnLoading (T)	1	2	3	4
Stage(Kg)	3525	1768	884	71
Stress (Kg/cm2)	5.00	2.50	1.250	0.10
Settlement (mm)	3.24	3.22	3.04	2.95

D (mm) = 300	B1 (mm) = 1.07	S1(mm) = 3.07	S2 = 1.20		
Ev1 (MPa) = [illegible]	53.8				

Profile = 3.24

Loading (T)	0	1	2	3	4	5
Stage(Kg)	0	586.305	1172.6	1758.3	2342.8	2946.1
Stress (Kg/cm2)	0.10	0.83	1.66	2.50	3.33	4.17
Settlement (mm)	3.49	3.08	2.81	2.59	2.68	2.25

D (mm) = 300	B1 (mm) = 0.78	S1(mm) = 1.08	S2 = 0.11		
Ev2 (MPa) = [illegible]	140.7				

Ev1 = Modulus of deformation during the loading stage.
Ev2 = Modulus of deformation during the Reloading stage.
D = Plate diameter (mm)
S1 = The difference between S.1 and S.2 from the maximum loading (mm) (Kg/cm²)
S2 = Difference in settlements corresponding to S.2 and S.7 from the maximum loading (mm)

CEL
Consulting Engineering Bureau & Laboratories

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 12/09/2023

Soil type : Middle Embankment

Location : St From 641+300 To 641+420

Level : -2 M

Report No. : 59

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+325	1644	2.29	5.2	2.17	98.7%	Comply
2	641+350	1053	2.23	5.8	2.11	95.7%	Comply
3	641+380	1051	2.26	5.8	2.14	97.3%	Comply
4	641+410	1387	2.24	5.8	2.11	96.0%	Comply

Degree of compaction based on proctor test dated At :

- Max. dry density =2.20 gm/cm^3
- At optimum moisture content = 6.4 %
- Signature :

10 Malek E Ashtar St.
Dokki, Cairo
Tel & Fax: 3336521 - 3336303

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	: **7/09/2023**
Reporting Date	: **11/09/2023**
Reporting No.	: **10-3**

Dear Gentleman,

Attached here with the delivered on 7 / 9 / 2023

This sample is representative for 5.000 M^2

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. Procter Test according to ASTM D-1557
6. CBR according to ASTM D-1883

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 27362703 - 27362303

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	97.1
37.5	1.5	97.3
25	1	92.1
19	¾	86.2
12.50	½	78.2
9.50	3/8	72.5
4.75	4	57.9
2.00	10	44.3
0.425	40	26.0

CEL Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel.& Fax: 2736721 - 2736303

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 : 7/09/2023

Reporting Date : 11/09/2023

Reporting No. : 10-3

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)	10.2

CEL

Signature

9 El-Mina El Atlal Street
Zamalek, Cairo
Tel.& Fax: 2736223 - 2736268

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3

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

CEL
Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 27362521 - 27362009

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3

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).	44.3	Max 50 %	------	------
0.425 mm (No. 40).	26.0	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	10.2	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

3 B Nidak El Abdd Street
Zamalek, Cairo
Tel & Fax: 27362721 - 27362723

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 : 7/09/2023

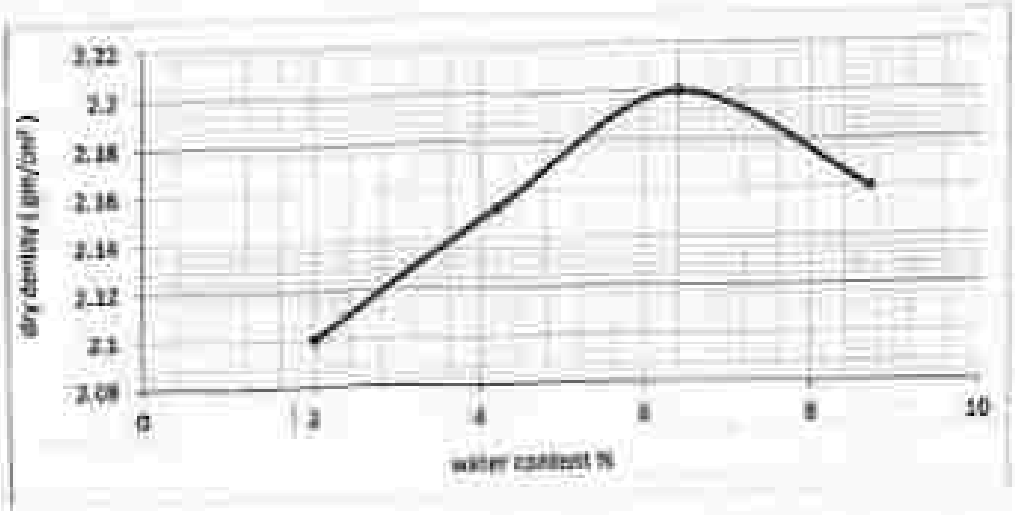
Reporting Date : 11/09/2023

Reporting No. : 10-3

Moisture – Density relation of soil

Test result (Modified proctor test)

ASTM D-1557



- Max dry density (gm/cm³) : 2.20
- Optimum moisture content % : 6.4 %

Signature / CEL

Company Name : شركة الذهبي

5 El Malek El Afdal Street
Zeraiba, Cairo.
Tel.& Fax: 2730721 - 2730303

IAS ACCREDITED

٥ ش الملك الأفضل
الزيتون - القاهرة
تليفون - فاكس : ٢٧٣٠٧٢١ - ٢٧٣٠٣٠٣

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 : 7/09/2023
Reporting Date : 11/09/2023
Reporting No. : 10-3

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.34
1.27	0.050	1.50
1.91	0.075	2.57
2.54	0.100	3.57
3.18	0.125	4.54
3.81	0.150	5.27
4.45	0.175	6.06
5.08	0.200	6.34
6.35	0.250	6.90

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.57	51.7 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.20(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

Eng. Malak E. Moaf Saber
Zamalek
Tel/Fax: 2356723 - 2356723

IAS

CEL

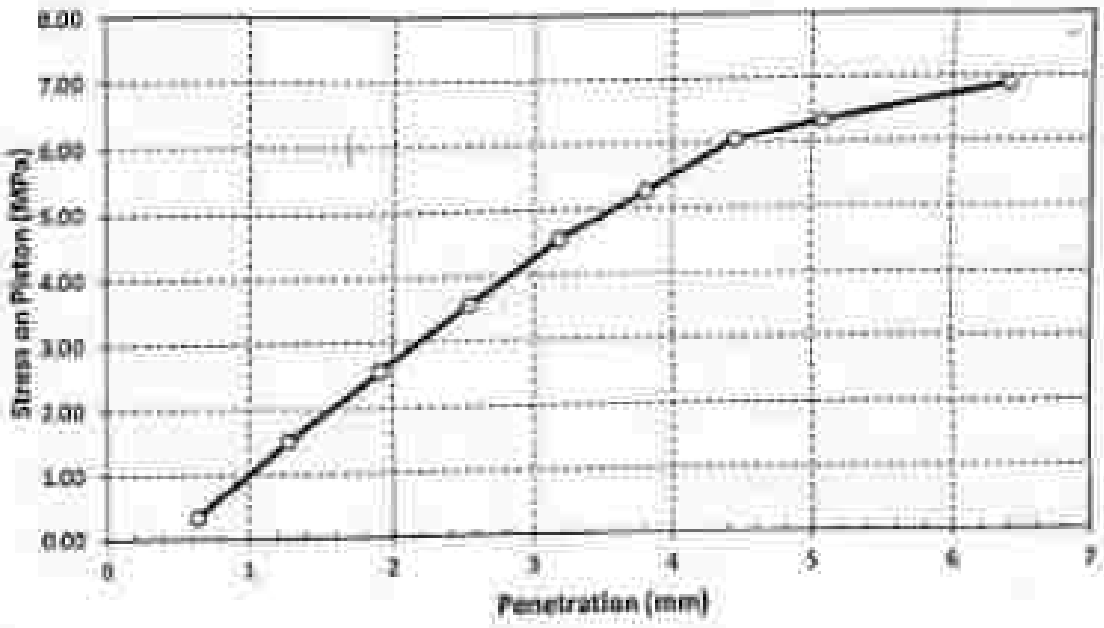
Consulting Engineering Bureau & Laboratories

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	: 7/09/2023
Reporting Date	: 11/09/2023
Reporting No.	: 10-3

Load Penetration Curve of CBR Test

ASTM D-1883



Signature:

3 El Nasr El Attal Street
Zamalek, Giza
Tel.& Fax: [illegible]

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات الهندسية

Company Name : شركة أذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 14/09/2023

Soil type : Middle Embankment

Location : St From 641+420 to 641+540

Level : -2.5 M

Report No. : 62

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+445	1418	2.29	6.4	2.15	97.8%	Comply
2	641+475	1698	2.24	6	2.12	96.1%	Comply
3	641+495	1404	2.20	6.4	2.07	94.2%	Comply
4	641+525	1058	2.22	6	2.09	95.1%	Comply

Degree of compaction based on proctor test carried At

Max. dry density =2.19 gm/cm³

At optimum moisture content =6.4 %

Signature

CEL

2 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax: 2736720 - 2736308

IAS ACCREDITED

٢ ش الملك الأفضل
الزمالك - القاهرة
التليفون والفاكس : ٢٧٣٦٧٢٠ - ٢٧٣٦٣٠٨

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name	: شركة الأهلي
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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Dear Gentleman,

Attached here with the delivered on 12 / 9 / 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

Note: *The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken*

Signature:

CEL

Consulting Engineering Bureau & Laboratories

3 El Malek El Afdal Street
Zamalek, Cairo
Tel & Fax: 27362727 - 27362703

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

CEL

Signature

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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)	9.9

Signature

3 El-Malek El Afdal Street
Zamalek, Cairo.
Tel& Fax : 27362231 - 27362253

IAS ACCREDITED Testing Laboratory

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

18 Malak El Afdal Street
Zamalek, Cairo.
Tel & Fax: 27361722 - 27352303

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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).	45.9	Max 50 %	——	——
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	——
0.075 mm (No. 200).	9.9	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

CEL

Signature /

3 El Masek St Ahad Street
Zamalek, Cairo
Tel.& Fax. 27361700 - 27353083

IAS ACCREDITED

٣ ش المسك الأحد
الزمالك - القاهرة
تليفون / فاكس : ٢٧٣٦١٧٠٠ - ٢٧٣٥٣٠٨٣

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 : 08/09/2023

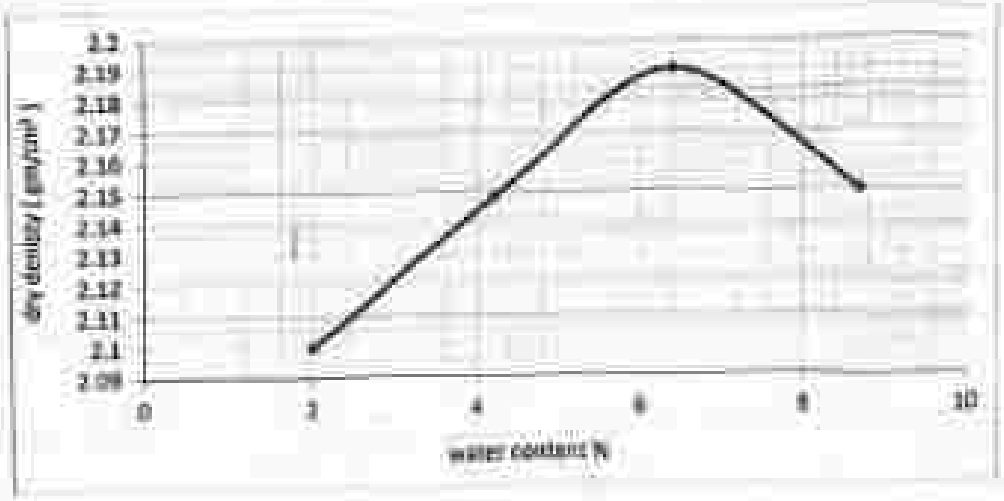
Reporting Date : 12/09/2023

Reporting No. : 10-4

Moisture – Density relation of soil

Test result (Modified proctor test)

ASTM D-1557



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature

3 El Malak El Afdal Street
Zamalek, Cairo.
Tel& Fax: 2736720 / 2736000

IAS ACCREDITED

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.59	52 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.
2- The sample was compacted to dry density of = 2.1%(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,

1 E Nasr St. Abbasia
Zeitoun, Cairo
Tel& Fax: 2776972/1 - 2785303

IAS ACCREDITED TESTING LABORATORY

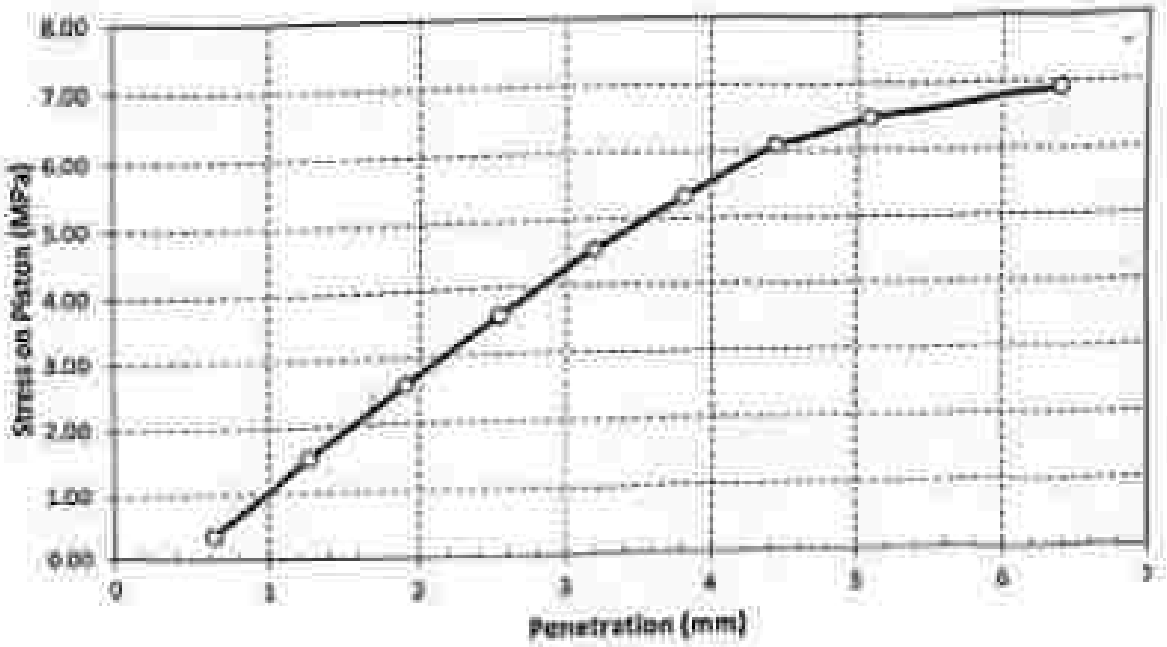
١ ش النصر العباسية
الزيتون - القاهرة
تليفون وفاكس: ٢٧٧٦٩٧٢/١ - ٢٧٨٥٣٠٣

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature

3 El Malek El Afdal Street
Zamalek, Cairo
Tel& Fax : 2736723 - 2736303

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 : 26/09/2023

Soil type : Middel Embankment

Location : St + From 641+300 To 641+420

Level : - 1.75 M

Report No. : 72

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+330	1803.5	2.20	5.4	2.08	95.1%	Comply
2	641+350	1559.0	2.22	5.8	2.10	95.7%	Comply
3	641+360	1559.7	2.22	5.5	2.10	95.9%	Comply
4	641+380	1591.7	2.23	6.4	2.09	95.6%	Comply
5	641+400	1543.1	2.21	6	2.08	95.2%	Comply
6	641+410	1388.9	2.23	6.4	2.10	95.8%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.19 gm/cm^3

At optimum moisture content = 6.4 %

Signature

10 Musa E Abu Nasr
Zenin, Giza
Mob.no. 2126100 - 0100009

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	: **08/09/2023**
Reporting Date	: **12/09/2023**
Reporting No.	: **10-4**

Dear Gentleman,

Attached here with the delivered on 8 / 9 / 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

Note: The sample was brought by the client to our laboratory and the laboratory is not responsible for the way it is taken

Signature

IAS

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الإستشارات 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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

RESULTS OF SIEVE ANALYSIS According to ASTM D-422.

Sieve Size (mm)	Sieve Size (IN)	Passing %
50	2	98.1
37.5	1.5	95.3
25	1	89.4
19	¾	84.4
12.50	½	77.7
9.50	3/8	73.3
4.75	4	58.4
2.00	10	45.9
0.425	40	27.5

Signature

(E-Mail: E-Mail filter)
Zeitoun, Cairo
Tel/Fax: [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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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)	9.9

Signature /

Zeitoun, Cairo

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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 /

19 Mosk E Alaw Street
Cairo, Egypt
Tel.Fax: [illegible]

IAS ACCREDITED Testing Laboratory

[illegible]
[illegible]
[illegible]

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 : 08/09/2023
Reporting Date : 12/09/2023
Reporting No. : 10-4

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).	45.9	Max 50 %	------	------
0.425 mm (No. 40).	27.5	Max 30 %	Max 50 %	------
0.075 mm (No. 200).	9.9	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 /

14 El Malek E-Afzal Street
Zamalek, Cairo
Tel & Fax: 27362221 – 27362003

IAS ACCREDITED

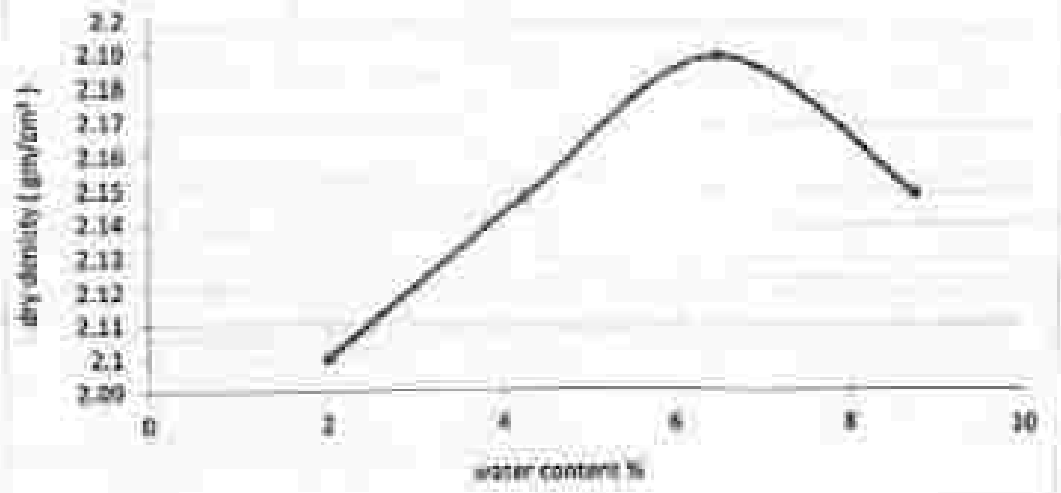
CEL

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

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



- **Max dry density (gm/cm³)** : 2.19
- **Optimum moisture content %** : 6.4 %

Signature /

14 Mahmoud E. Riad Street
Zamalek, Cairo.
Tel & Fax: 2736522 - 2736583

IAS ACCREDITED

١٤ شارع محمود رياض
الزمالك - القاهرة
تليفون وفاكس : ٢٧٣٦٥٢٢ - ٢٧٣٦٥٨٣

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 : 08/09/2023

Reporting Date : 12/09/2023

Reporting No. : 10-4

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

penetration		stress on piston (Mpa)
mm	Inch	
0.64	0.025	0.36
1.27	0.050	1.52
1.91	0.075	2.59
2.54	0.100	3.59
3.18	0.125	4.54
3.81	0.150	5.33
4.45	0.175	6.09
5.08	0.200	6.49
6.35	0.250	6.92

CBR Result	Stress (Mpa)		CBR 100 %
	St. Value	Sample results	
At 0.1 inch (2.54 mm) penetration	6.90	3.59	52 %

Notes:

1- Attached graph shows penetration resistance versus penetration magnitude.

2- The sample was compacted to dry density of = 2.19(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 / ...

18 Mohi E Alden Street
Zamalek, Cairo.
Tel & Fax: 27362321 - 27362063

IAS ACCREDITED

CEL

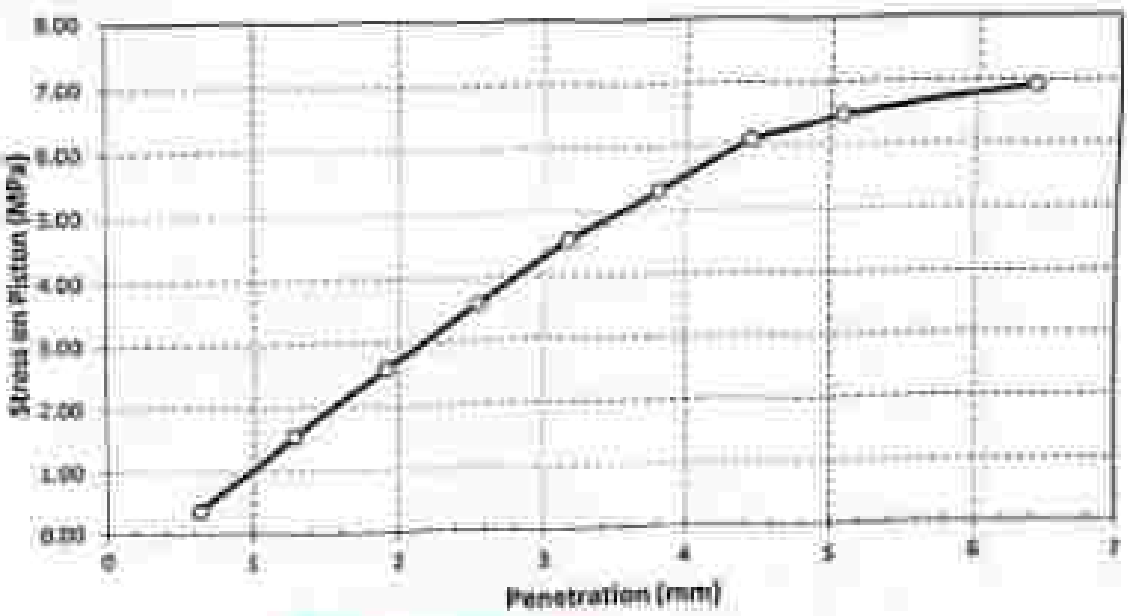
Consulting Engineering Bureau & Laboratories

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	: 08/09/2023
Reporting Date	: 12/09/2023
Reporting No.	: 10-4

Load Penetration Curve of CBR Test

ASTM D-1883



Signature /

CEL

Consulting Engineering Bureau & Laboratories

مكتب معامل الاستشارات الهندسية

Company Name : شركة الذهبي

Project : Electric Express Train – HSR From Qous To Armant

Testing Date : 27/09/2023

Soil type : Middel Embankment

Location : St + From 641+300 To 641+420

Level : - 1.5 M

Report No. : 73

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+320	1752.1	2.26	5.8	2.14	97.5%	Comply
2	641+340	1529.2	2.26	5.8	2.14	97.1%	Comply
3	641+360	1545.8	2.24	5.6	2.12	96.2%	Comply
4	641+380	1591.7	2.23	6.4	2.09	95.2%	Comply
5	641+400	1473.6	2.27	6	2.14	97.3%	Comply

Degree of compaction based on proctor test dated At

:Max. dry density =2.20 gm/cm^3

At optimum moisture content = [illegible] %

Signature :

IAS ACCREDITED