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THE GEOLOGICAL AND GEOTECHNICAL SOIL INVESTIGATION REPORT OF KAMAN (KIRŞEHİR) JAPANESE CULTURE CENTER REGION (ADDITIONAL)

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CONTENT

THE GEOLOGICAL AND GEOTECHNICAL SOIL INVESTIGATION REPORT OF KAMAN (KIRŞEHİR) JAPANESE CULTURE CENTER REGION (ADDITIONAL)

I. THE AIM AND CONTENT

The aim of this study consists of making an additional geological and geotechnical soil investigation of the site where the Japanese Culture Center is planned to be built and indicating the geological soil properties and geotechnical soil parameters of the construction site.

Within the content of this research, first of all, the geology of the mentioned area and its surroundings were analyzed and then 3 item additional ground boring process were made in various points. With the boring process, it is tried to determine the types and dispersions of the geological units in the area. Then, it is tried to be determined the physical, mechanical and engineering properties of the soil layers in the area by making the necessary laboratory tests on the samples which are taken during the boring process. Moreover, the indication of the seismic position of the site, ground water conditions etc. that affects of the infrastructure and superstructure during and after the construction of the planned structure are aimed. This report is prepared in the consequence of evaluation of all these studies together.

II. THE RESEARCH AREA AND THE METHOD OF THE STUDY

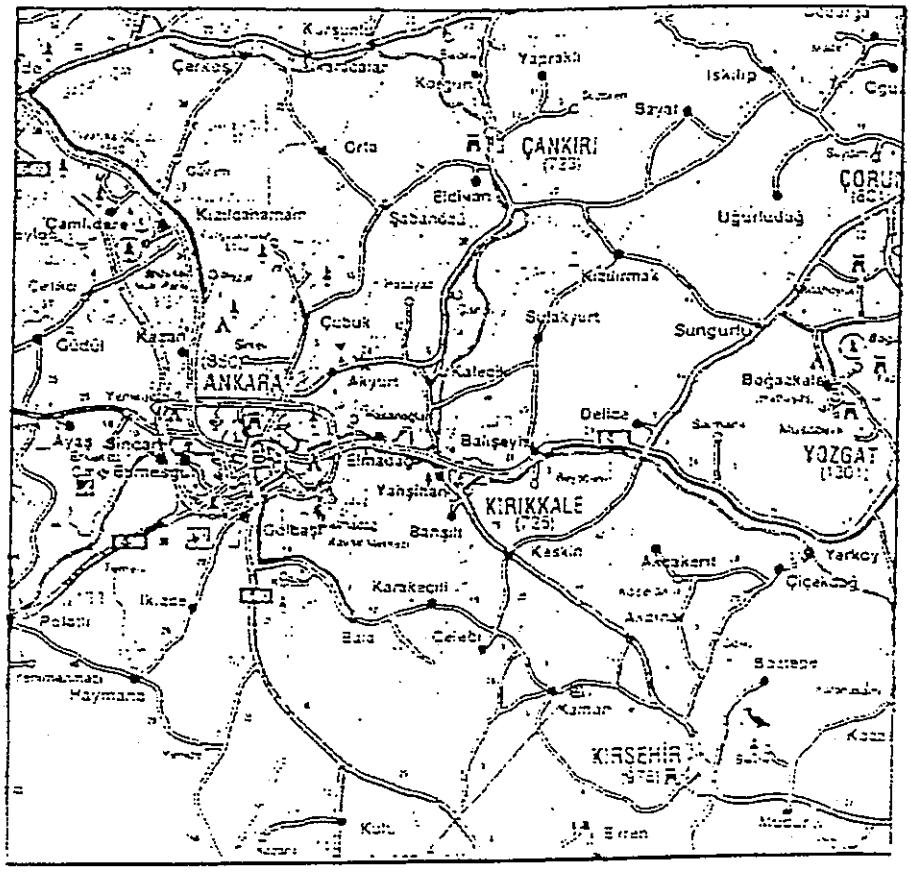
The research area is approximately 5km to Kaman from the intersection of Ankara-Kırşehir Highway. The research area is approximately 160km to Ankara. Found out Plan of the site is shown in Figure 1.

Boring process was started in 06.03.2004 (totally 20.00m in length). In the 3 points (of which the locations were shown in App1) the borehole are drilled between 6.50m and 7.00m in depths by the D-500 Drilling rig (rotary system).

III. GEOGRAPHICAL LOCATION AND MORPHOLOGY

The research area is nearly 1km far from Çağırkan town center. The topographic slope of the studied area is low. It changes between 5% and 10 %

Interior Anatolian climate conditions are dominant in the research area. In winter, it is cold and rainy and in summer, it is hot and dry.



Investigation AREA

Figure 1: The Found Out Plan of the Investigation Area

Investigation area

1/500000 (MTA)

EXPLANATIONS

Qy	Younger Alluvium (Holesen)
Qe	Older Alluvium (Pleistosen)
n	Continental, Un Sperated (Neojen)
nj	Gypsium Facies (Salty),(Neojen)
γ	Granit - Granodiyorit
olmj	Gypsium Facies (Oligo - Miosen)
ev	Volcanic Facies (Eosen)
ef	Flysch (Eosen)
Mof	Ophiolite, Mesozoik (Specially Kretase)
	Crystallized Limestone

Figure 2 : General Geological Map

IV. CONSTRUCTION PLAN CONDITION

The research area is in the border of Çağırkan Municipality but out of the borders of the reconstruction plan.

V. GENERAL AND STRUCTURAL GEOLOGY

V.1. GENERAL GEOLOGY

In the neighborhood of Kırıkkale-Kesikköprü-Çiçekdağı, different kinds of rocks exist from Paleozoic times to today. The general geological map of 1/500.000 of the region is shown in the Figure 2 (MTA).

V.1.1. Bozçaldağ Formation

It is composed of white-colored crystallized limestone. It's named by Seğmen (1982), depending on Tamadağ region.

In the region, it surfaces in Kesikköprü Plateau and Tepeköyyukarı Street, Ağapınar Village, Maden Region and in the east of Kesikköprü, in the south of Hacıyusuflu Village, in Maşattepe and in southwest of Kevenli and Sarıkaya Dere .

There's no place that can be a typical section in the region. It's always tectonically in position with other units. In the research area, it surfaces in the east of Ağapınar Village and Maden Region are the best.

Pattern surfaces are colored in black-like gray and the fractured surfaces are white colored. Furthermore, the neighborhood of Çip River are pink in color due to the effects of the ironed waters. Layering is uncertain in most of the places. Generally it is layered with medium-thickness. The joint structures are well developed. The marbles have a crystalloid mosaic pattern, generally as a result of the pressure depend metamorphism. The mineral compositions are calcite.

Marbles are cut by plutonic and surface rocks. The contact-metamorphism effect can be clearly seen in marbles. In the region, marbles are always seen tectonically with other units and out of the research area, they are settled transitively on the Tamadağ formation.On the upper parts, it is covered with mostly young units. Maşat region and the neighborhood of Keskin is covered by Kızılırmak Formation.

They are cut by plutonic and surface rock. Bozçaldağ Formation is older than Paleozoic formation.

V.1.2. Kasımağa Formation

In the region, the units that consist of gabbros, basalt, diabaz, tuff, limestone, rhyolite and mudstone had been added to the Ankara combination by Seğmen (1982). Due to the local characteristics of the area, upper Cretaceous volcanic set, the set with ophiolite, basic intruphysis, are given names. The unit seems like the regular stowage of the sedimentary rocks, with basic, volcanic distance-mixed. In the region, as it is

clearly seen in the southeast of Keskin, in the neighborhood of Kasımağa Village, it's called as Kasımağa Formation.

Formation can be observed in the region of Keskin and through a line towards the north from Keskin.

In the region, typical-section can be seen in the southeast of Keskin, in the neighborhood of Kasımağa village and Karadere and Çatalbaşdere.

Kasımağa Formation includes following units from bottom to top; Gabro-micro gabbros basalt begins with the diabaz daces, volcano splits towards the top and the gray and green basaltic tuffs. Throughout the top, tuffs are continued with increasing the rate of carbonate in wine-colored limestone layers and rhyolite bands. More, in the upper parts, the wine-colored banded limestone decreases and passes through the sandstone and siltstone with the yellow, brown and grayish volcanic elements.

Moreover, as a result of the overlapping of Bozçaldağ Formation to Kasımağa Formation, the parts of Bozçaldağ Formation are observed tectonically in Kasımağa Formation.

Kasımağa Formation belongs to the Upper Cretaceous Age.

V.1.3. Granite – Granodiorite Porphyries

In the region, granite, microgranite, cataclastic granite, granodiorite, micro granodiorite Quartzmicrodiorite, cataclastic granodiorite, monzodiorite and the granit porphyry are the porphyries of the below. It includes various units with the same phase in the region, so, it's analyzed under the name of granite-granodiorite and porphyries.

In the region, granite granodiarite and their porphyries are seen typical in most parts of the place. It is seen typically between Bıyıksağır and Tepeköy, between Karginyernice River and Taşlatık Tepe, in Burukluçataltepe, Köprüköy, Tilkili, Dönedağ and Yediler Tepe (highest hill in the region).

The granite, granodiarite and their porphyries are in dark and light gray, pinky gray colors due to their compositions and because of the lichens that they have, are in green and white colors. They represent much jointed structure. In most of the places such as Yediler Hill and in the neighborhood of Hasandede, they're subjected to alteration and they disperse like sand because of that.

Granites are granular in pattern and the grains ranges from small size to bigger. They sometimes represent micropegmatite and granophyres pattern properties.

Their mineralogical compositions are quartz, pheldispats and mafic minerals. Mafic minerals are biotite, muscovite and amphibole. Opaque minerals are iron oxide and hydroxides and they're structured as a fractured filling. Accessory minerals are sphen and zircon. In some examples, the traces of tectonic are seen as breaking, crusting and in minerals undulating extinction and cracks.

The decomposition products are as becoming clayey and cericit in pheldispats and in biotides, as becoming chlorites. These units aged as Pliocene.

V.1.4 Kartal Formation

It's generally a flat formation. In the below, it's made up of the sloped rubbles which become very badly long with an outlook of red, and through the top it's made up of the consecution of the conglomerate, sandstone, mudstone which were developed in canal and have crosswise lamina. Seğmen (1981) in his working area had separated Kartal Formation as Kartal I in between the Upper Cretaceous and Paleocene, and Kartal 2 formation at Inferior Eocene. In our area, since Kartal Formation is represented at Inferior Eocene, it's called as Kartal 2.

In the region, they surfaces in the neighborhood of Karadere where is in the north side of Hasandede – Keskin highway. And it presents a typical section in the west of Ahili village.

It begins with the slope rubbles which become irregularly settled and which are generally red colored, it passes through the stream and lake facies through the middle of the river basin. Formation is represented with the sandstones which came from a result of the flowing of the debris, in the parts that are slope-rubbles facies. The sandstones are various at size and origin and they exist in a small amount of mud, which is nearly red colored. The rate of the mud increases in some places. And no regularity exists in the units where debris is seen in the area. It's attached lowly and there's no grading. The structure of the layer is indefinite. The materials are all from the older units origin. They form as canal facies through the middle of the river basin. In these sections of formation, the units such as sandstone, conglomerates, mudstones which are sedimented with the water flows and which are consecutive and lensely.

They represent cross layering, carving, filling and pipe structured traces. In spite of their irregularity they're layered. The grains in the layers decrease from bottom to top and they display direction. As going through the middle of the river basin from the slope-rubble and stream facies, it's relatively passed to the lakely facies in the upper levels. The lakely sections are in the form of consecution as sandstone, mudstone and in somewhere in very low amounts conglomerate.

In the working area it is settled as discordan upon the older units (especially acidic magma). When it comes to the top limit, it is transitive with the Ceritkale and Çayraz Formations. Moreover, the top limit is irregularly covered with Kızılırmak Formation.

The thickness of Kartal 2 Formation is approximately 300m. In the formation of Kartal 2, no fossil is available. It can be clearly understood that it is inferior Eocene-aged, as it is relatively more lower and transitive.

The flow of formation as debris and mud, the existence of the gravels various in size, the bad grading indicates that this formation is formed under the dry-climate conditions, in rocks and in the foot of the slopes. Then, its transition to the sandstone, mudstone, and in these units carving fills, pipe trace structures, cross layering,

irregular layering and grading in layers indicates that they had passed through the mid-river basin, towards stream facies from debris facies.

V.1.5. Ceritkale Formation

In the working area it represents Eocene's shallow-sea parts. Beginning with the shallow-sea conglomerates in the bottom, it passes from the medium to thick layered sandstone from bottom to the top and with this sandstones, then it passes to the clay stone and in some places cross-layers are seen.

As it is mostly seen in Ceritkale region, it's called Ceritkale Formation.

In the region, it surfaces in the neighborhood of Yahşıyan, Kazıklı Village, Cabatabaşı Village, Üçtepe –Kızılgüney and Ceritkale, in the south of Derefakılı Village, in the ridge of Damlacık, in the east of Büyükteflek Village, in the west of Küçükteflek Village, in the neighborhood of Karacakaya Ridges.

In the region, it exists in the neighborhood of Ceritkale village and Cabatobası village.

Ceritkale Formation is represented with the shallow-sea part of Eocene in the region. It begins with the conglomerates at the bottom and through the top it passes to the sandstone and with sandstones it passes to the semi-mixed clay stone.

It includes conglomerates belonging to the various phases of acidic-magma and the conglomerates such as gabbros, basalt, pelagic limestone, tuff and marble conglomerates inside. Generally the gravels are dominant in upper layer origin. The gravels are various in size, approximately 3-10cm rolled, with a small amount of carbonate and mud. Towards the top, there is thin granular conglomerates and at the very top levels, it goes on with the consecution of sandstone, clay stone. Between the top levels, the levels of sandy limestone are observed. Sandstones are generally carbonate cemented. At the bottom sections, the grading and cross-layering are not definite.

In the region, Ceritkale Formation is transitive with Kartal Formation 2 at the bottom. But generally, it settles down on the older units, as discordan. At the top, it's transitive with the Çayraz Formation and it is covered by Incik and Kızılırmak formation as a discordan.

The thickness of this formation in the neighborhood of Çerikkale is approximately 110km long.

V.1.6 Kızılırmak Formation

It's composed of unattached slope-rubble, sandstone, mudstone and in some parts gypsum inter level and lenses. Furthermore in some places it contains tuff and limestone levels. It is seen nearly in every part of the region.

In the region, it surfaces in the south of Karakeçili town in Sarp River, between Yukarımahmutlar and Musluktepe, in the neighbourhood of Akkaş River takes part in

Acıözü River, Hacıömer Solaklısı Village and Gölyeli River, in the neighbourhood of Karalık River, between Kızılözü River and Çürükler, in the neighbourhood of Turhanlı Village and in many more places.

Kızılırmak formation is the youngest formation that was formed in the dry conditions in the working area. It precipitated in the hills, in river and lake region. In the hills, many materials exist in the mud from gavel to sand in size. The colour of the mud is red. This surfacing formation is generally red-colored. The gravels are originated from the old units according to the environment and mostly they are not attached. As going towards the middle of the river-basin, the sections are seen to be cross-layered, carving fill traces and also canal pattern. In these parts it is attached lowly. In the middle of the river-basin, there exists the lake facies. Unattached sandstone, generally mudstone and semi-additive gypsum and tuff and limestone levels in some places is observed. The structure of the layers become evident in lake facies and the becoming long and grading can be observed.

Kızılırmak formation is gradual transitive with İncik formation from bottom. In the high sections of the topography especially on the acidic magma and other older units, it settles as discordant. In the upper part, it is irregularly covered by alluviums. The thickness of the formation in the region is assumed to be approximately 100m thick.

The slopped rubbles, stream and lake facies are transitive laterally in between the units.

The existence of the gravels in the mud, and the existence of cross-layered conglomerates, sandstones and mudstones, the sandstone, mudstone in lateral direction and that consisting of gypsum, limestone, tuff and their lenses indicate that the formation had precipitated in a closed river basin. The dominant color of the units: the debris on the sides of the river basin, through the middle of the river basin, the stream precipitations: is being red and including gypsum and the observance of the calish structures show that the air conditions were hot and dry and sometimes the lakes were about to dry. In the precipitating phase, we can understand the existence of a volcanism in the region by means of the tuffs.

V.1.7. Quartens

In the region quartens are represented with alluvions. They specifically surface along the Kızılırmak River and other streams. It's composed of the mixture of the grayish-red colored soil, silt and clay. The units are not attached. They contain all other older units' materials.

V.2. STRUCTURAL GEOLOGY

Four significant tectonically events are seen in the region. The first one is that the metamorphides which made up the foundation by the previous searchers (Oktay 1981, Seymen 1982) were carved with the movements before Alpine; they were deformed and broken. The second one is; with the Meastrihtien before Alpine Orogenesis with Kasımağa Formation became tectonical position by metamorphits and the formation before Meastrihtien were all carved and broken. They are on Kırşehir metamorphites,

out of the Kasımağa Formation studying area (Seymen 1981). But in the region, the marbles belonging to Bozçaldağ formation are standing upon the Kasımağa formation, as clips and they show a certain arrangement towards the north. The third one is the location that affects the region and the most important movement of acidic magma in the period of the Upper Meastrihtien and Paleocene. In the rising process of acidic magma, it cut the old units and shouldered some of them and while rising, it caused reverse movements as a result of its making of the older units become tectonics with the younger units. The fourth one is, the Alpine movements that were effective after Paleocene.

The region was not more affected by these movements and no significant carving and breaking was seen. But Oktay (1981) mentions about the formation of verse-fractures.

V.2.1. Flaking And Layering

Flaking is better observed in Tamadağ and Kalkanlıdağ Formations. Both the layering surface and the flaking surface are better developed. Directions are also seen in Bozçaldağ Formation. Flaking is observed in Kasımağa Formation to some extent. Layering alters due to the lithology and facies of the tectonic units. Except the debris units facies, all sedimentary units are also well developed.

The directions and slopes show variation depending on the tectonically phases in the region. As a result of the orogenic movements before Alpine, methomorphites shows slopes in the direction towards east-west and north.

And as a consequence of the Alpine movements before Meastrithien, the directions are towards northeast-southwest and the slopes are towards northeast. As a result of the rising of the acidic magma in Paleocene, no more carving is seen as a result of the early Alpine movements. The directions and the slopes are various depending on the topography.

V.2.2. OVERLAPPINGS

In the region we can mention about the following overlapping: The verse over turnings which came into existence as a result of the Kasımaga Formation's surfacing upon the metamorphits with the movements before Meastrithien, and the overturning that the marbles belonging to Bozçaldağ Formation which came into existence upon Kasımağa Formation. The marble cilps which belongs to Bozçaldağ Formation and which exists upon the Kasımağa Formation can be shown as an example.

Locational overlappings exist in region as an outcome of the rising of acidic magma and the Alpine movements after Paleocene. The overlapping of upper Cretaceous aged river Formation on (Ilıcapınar and Bölükdağ) Formation and the overlapping of (Ilıcapınar and Bölükdağ) upon the Paleocene aged Dizilitaşlar Formation are the examples. In both of the examples they were pushed in the direction from north-west to south-east. Moreover we can add, the overlapping of older gabbros on basalts in Kasımağa Formation. The best example is the neighborhood of Kırdök.

V.2.3. Reverse faults

In the region, the reverse faults occurred during the rising process of acidic magma. The older units on the rising process come to the same level with the units younger than them. Example: The reverse fault laying through to Kaleevci Village from Akçakent.

Neither reverse faults nor normal vertical faults confirmed in the region. Furthermore, it's interesting that the Akpınar earthquake that razed the region's east part to the ground indicates the young- tectonism is effective in the region.

V.3. THE GEOLOGY OF THE SITE

The working area is in the borders of Kırşehir-Kaman, Çağırkan. Boring process were employed in depths between 6.50m and 7.00m at 3 locations in the site. The granite-granodiorite, a kind of rock in magmatic origin, covers the whole working area. The upper levels of the rock were subjected to alteration.

The geological map of the working site in scale 1/ 2500 is shown in App1 and the geological section is shown in App4.

VI. SOIL INVESTIGATIONS AND SITE TESTS

The boring process was started on 06.03.2004. The drilling process was performed at 3 points (from 6.50m to 7.00m in length) totally 20.000m (as shown in App1) by the D-500 Diesel drilling rig.

Since the whole working site was a rock formation, the drilling operation was done with rock coring and core samples had been taken. The laboratory tests on the rock samples were made between the dates on 16th -18th March 2004, by GEOLAB Co. and this geological and geotechnical soil investigation report was prepared by interpretation of the site, boring logs and laboratory data together. The logs of boring are shown in App2.

VII. LABORATORY TESTS

The point load tests and uniaxial compression tests were performed on the seven item core samples taken during the boring process in order to find rock strength parameters. The results of the rock tests are presented in App3 totally. The results of uniaxial compression tests results (q_u) are as follows;

$q_u = 354 - 1285$ kg/cm^2

VIII. GROUNDWATER CONDITION

No groundwater was observed during the boring process.

IX. EARTHQUAKE CONDITION

The region exists on the active (1st degree) earthquake region. There is no any other landslide or slope stability problem.

According to the Turkey Earthquake Region Map, prepared by the Public Works Ministry Institution of Earthquake Investigation, our working region is in the borders of 1st degree earthquake line. In the structural projects, the related parameters with earthquake should be taken into consideration. The earthquake map of the area is shown in Figure 3.

From the earthquake specification (02.09.1997);

Predominant ground acceleration	(Table 6.2)	Ao =0.4
Soil Group	(Table 12.1)	A
Soil Class	(Table 12.2)	Z1

Characteristic periods of the spectrum; (Table 6.4)

T_A = 0.10 sec.
T_B = 0.30 sec.

X. APPROPRIATENESS OF THE SITE FOR SETTLING

The area, located in the borders of Kırşehir-Kaman-Çağırkan town, is examined with observatory and bored studies. Our working area is determined to be appropriate for settlement in the case of commenting the data of site and laboratory and obeying the conditions that take part in conclusion-proposals section.

XI. GEOTECHNICAL RESULTS

The investigation area in the borders of Kırşehir-Kaman-Çağırkan town is totally formed by the granite-granadiorite, deep rock formation. In the boring process, there exists granite originated fill materials with conglomerates, sand, silt and clay materials 1.15 to 2.70m in thickness at the upper levels. Under the fill material granite-granodiorite rock, deep rock formation takes place. The top levels of granite-granodiorite in brown, beige, gray colored were altered. They have low rock quality in the upper levels and they are represented as durable structures as being gradual transition. On the rock core samples, the tests were performed in order to find strength parameters of rock. The values obtained from laboratory tests are taken from the massive rock parts, not misleading us. There is no bearing strength problem for the granite-granodiorite rock. The allowable strength of the rock must be taken as q_{all} = 3.00 kg/cm^2, in the condition that the top soil and/or fill material are removed.

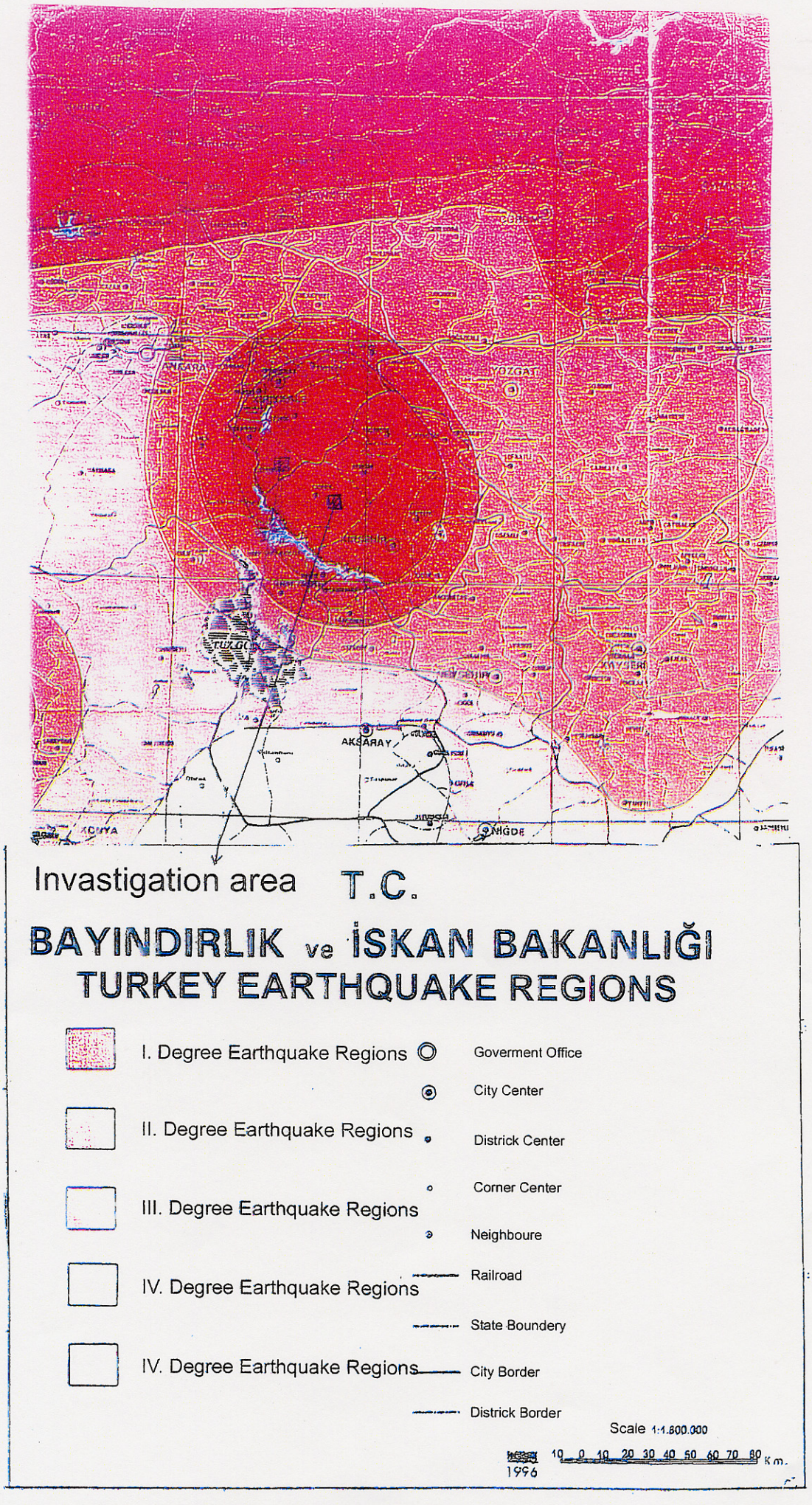


Figure 3 : EARTHQUAKE MAP OF REGION

XII. CONCLUSION AND PROPOSALS

a) The investigation area is located in Kırşehir-Kaman –Çağırkan. It is the low-sloped (5 – 10%) area.

b) In the area, soil investigation borings were done in 3 additional locations. At the upper parts approximately 2.00m top soil/fill material is observed. Under these, granite-granodiorite typed deep rock formation is continued.

c) The rock boring process is employed with rock cores. Core samples of the rock are tested in the laboratory. The strength parameters are determined in the rock- mechanics laboratory. According to the laboratory results, the data are in large span. The offered allowable strength of the rock;

$q_{all} = 3.00\ kg/cm^2$

after the removal of the top soil and/or fill material. Without removal of the top soil and/or fill material operation, the construction of the foundation must not be started.

d) There is no observed ground water.

e) There is no liquefaction problem.

g) The investigation area is in the 1st earthquake region. In the structural projects, the related standards should be taken into consideration.

Sincerely,

Atilla DUMLAR
Geological Engineer

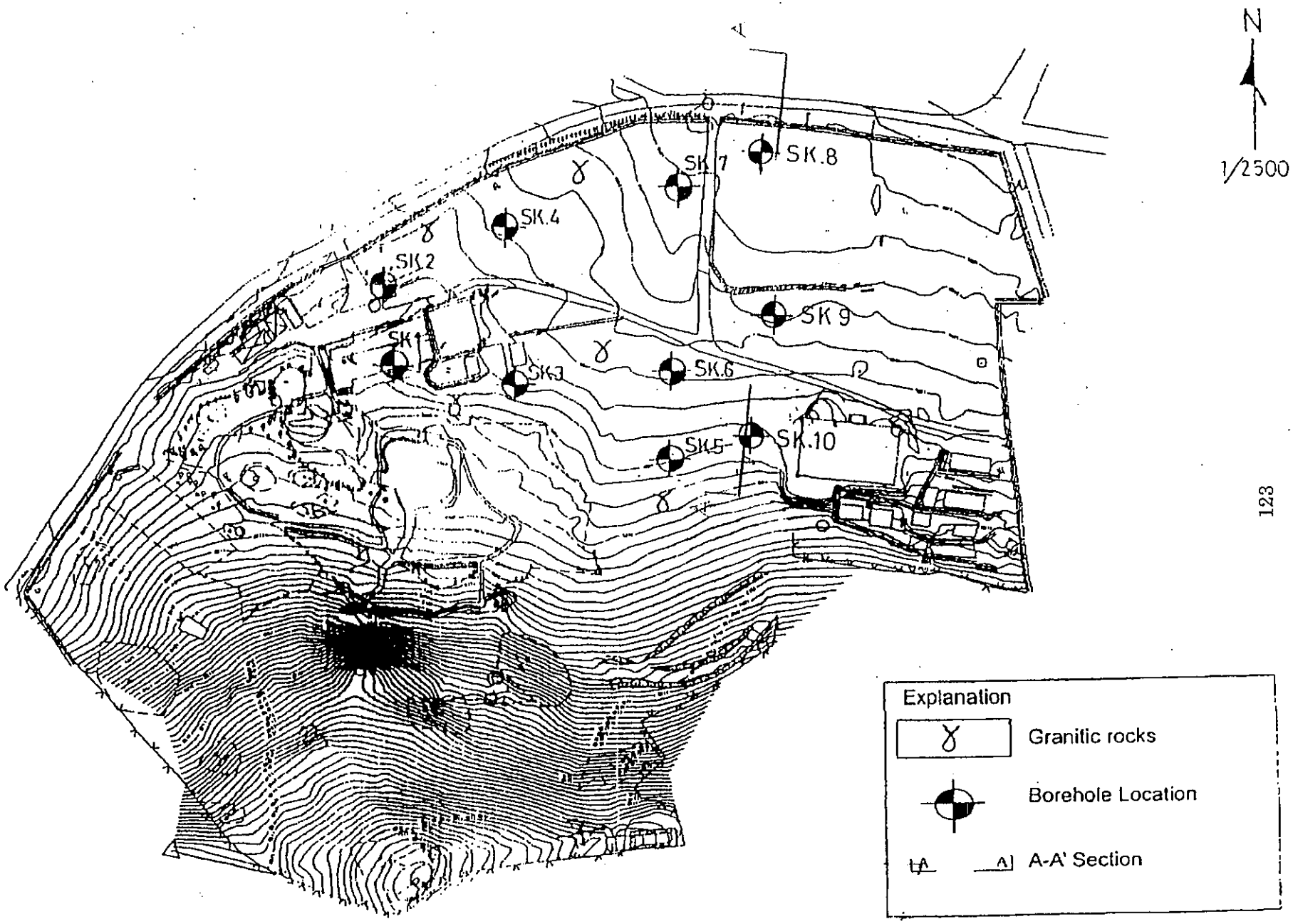
Bülent YAĞYEMEZ
Geological Engineer

Saban KAYGISIZ
Geological Engineer

Ebru GÜROĞLU
Civil Engineer (M.S.)

APPENDIX

APP1 : THE GEOLOGICAL MAP (SCALE :1/250) AND THE LOCATION PLAN OF BOREHOLES


A
SK.1
SK.2
SK.3
SK.4
SK.5
SK.6
SK.7
SK.8
SK.9
SK.10
A'
N
1/2500
Explanation
Granitic rocks
Borehole Location
A-A' Section

123

APP2 : THE BOREHOLE LOGS

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BOREHOLE LOG

PAGE NO : 1
BOREHOLE NO : SK-8
DRILLER : M.GÖKDAĞ

PROJECT NAME : KAMAN SOIL INVESTIGATION BORINGS OF JAPANESE CULTURE CENTER
BOREHOLE DEPTH (m) : 7.00
BOREHOLE ALTITUDE (m) : -
UNDERGROUND WATER (m) : ——
TYPE OF MACHINE/METHOD: D-500 DIEZEL/ROTARY
START DATE : 07.03.2004
END DATE : 07.03.2004
COORDINATE x :
COORDINATE y :

Borehole Depth (m)	Sample Type	Sample No	STANDART PENETRATION TEST: Stroke Number 0-15 cm	15-30 cm	30-45 cm	N	Graph 10 20 30 40 50	Soil Type	SOIL DESCRIPTION	LITOLOGY	CORE	TCR %	RQD %
1	1.50 SPT 1.95	1	9	15	15				**Fill Material** Brown sandy-silty clay and filling by gravel of granite				
2									2.70 m				
3									**Granite-Granadiorite** Lightbrown-beige, alteration in the upper parts and very poor, transition to the strong layer at the deeper levels		1	30	0
4													
5													
6											2	50	15
7									**END OF BOREHOLE : 7.00 m**				
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													

ALTERATION	ROCK QUALITY-RQD	COARSE GRAIN	FINE GRAIN
I FRESH	%0-25 VERY POOR	N=0-4 V. LOOSE	N=0-2 V. SOFT
II FEW DECOMPOSED	%25- 50 POOR	n=5-10 LOOSE	N=3-4 SOFT
III MIDDLE DECOMPOSED	%50-75 FAIR	N=11-30 M. TIGHT	N=5-8 M. STIFF
IV VERY DECOMPOSED	%75-90 GOOD	N=31-50 TIGHT	N=9-15 STIFF
V COMPLETELY DECOMPOSED	%90-100 EXCELLENT	N>50 V. TIGHT	N=16-30 V. STIFF
			N>30 HARD

		LOGGED BY	SIGNATURE	DATE
SPT : Standart Penetration Test	C : Core Sample	Atilla DUMLAR		
D :Disturbed Sample	P : Pressiyometer Test			
UD :Undisturbed Sample	VST :Vane Test			

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BOREHOLE LOG

PAGE NO : 1
BOREHOLE NO : SK-9
DRILLER : M.GÖKDAĞ

PROJECT NAME : KAMAN SOIL INVESTIGATION BORINGS OF JAPANESE CULTURE CENTER
BOREHOLE DEPTH (m) : 6.50
BOREHOLE ALTITUDE (m) : -
UNDERGROUND WATER (m) : ——
TYPE OF MACHINE/METHOD: D-500 DIEZEL/ROTARY
START DATE : 07.03.2004
END DATE : 07.03.2004
COORDINATE x :
COORDINATE y :

Borehole Depth (m)	Sample Type	Sample No	STANDART PENETRATION TEST: Stroke Number 0-15 cm	15-30 cm	30-45 cm	N	Graph 10 20 30 40 50	Soil Type	SOIL DESCRIPTION	LITOLOGY	CORE	TCR %	RQD %
1									**Fill Material** Brown sandy-silty clay and filling by gravel of granite				
	1.50 SPT 1.95	1	9	15	25				2.00 m				
2													
3									**Granite-Granadiorite** Lightbrown-beige, alteration in the upper parts and very poor, transition to the strong layer at the deeper levels		1	40	5
4													
5											2	74	46
6													
7									**END OF BOREHOLE : 6.50 m**				
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													

ALTERATION	ROCK QUALITY-RQD	COARSE GRAIN	FINE GRAIN
I FRESH	%0-25 VERY POOR	N=0-4 V. LOOSE	N=0-2 V. SOFT
II FEW DECOMPOSED	%25- 50 POOR	n=5-10 LOOSE	N=3-4 SOFT
III MIDDLE DECOMPOSED	%50-75 FAIR	N=11-30 M. TIGHT	N=5-8 M. STIFF
IV VERY DECOMPOSED	%75-90 GOOD	N=31-50 TIGHT	N=9-15 STIFF
V COMPLETELY DECOMPOSED	%90-100 EXCELLENT	N>50 V. TIGHT	N=16-30 V. STIFF
			N>30 HARD

		LOGGED BY	SIGNATURE	DATE
SPT : Standart Penetration Test	C : Core Sample			
D :Disturbed Sample	P : Pressiyometer Test	Atilla DUMLAR		
UD :Undisturbed Sample	VST :Vane Test			

Geo teknik
müh. inş. san. ve tic. ltd. şti.

BOREHOLE LOG

PAGE NO : 1
BOREHOLE NO : SK-10
DRILLER : M.GÖKDAĞ

PROJECT NAME : KAMAN SOIL INVESTIGATION BORINGS OF JAPANESE CULTURE CENTER
BOREHOLE DEPTH (m) : 6.50
BOREHOLE ALTITUDE (m) : -
UNDERGROUND WATER (m) : ——
TYPE OF MACHINE/METHOD: D-500 DIEZEL/ROTARY
START DATE : 06.03.2004
END DATE : 06.03.2004
COORDINATE x :
COORDINATE y :

Borehole Depth (m)	Sample Type	Sample No	STANDART PENETRATION TEST: Stroke Number 0-15 cm	15-30 cm	30-45 cm	N	Graph 10 20 30 40 50	Soil Type	SOIL DESCRIPTION	LITOLOGY	CORE	TCR %	RQD %
1									**Fill Material** Brown sandy-silty clay and filling by gravel of granite				
									1.15 m				
2									**Granite-Granadiorite** Lightbrown-beige, alteration in the upper parts and very poor, transition to the strong layer at the deeper levels		1	40	5
3													
4											2	58	22
5													
6											3	87	55
7									**END OF BOREHOLE : 6.50 m**				
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													

ALTERATION	ROCK QUALITY-RQD.	COARSE GRAIN	FINE GRAIN
I FRESH	%0-25 VERY POOR	N=0-4 V. LOOSE	N=0-2 V. SOFT
II FEW DECOMPOSED	%25- 50 POOR	n=5-10 LOOSE	N=3-4 SOFT
III MIDDLE DECOMPOSED	%50-75 FAIR	N=11-30 M. TIGHT	N=5-8 M. STIFF
IV VERY DECOMPOSED	%75-90 GOOD	N=31-50 TIGHT	N=9-15 STIFF
V COMPLETELY DECOMPOSED	%90-100 EXCELLENT	N>50 V. TIGHT	N=16-30 V. STIFF
			N>30 HARD

		LOGGED BY	SIGNATURE	DATE
SPT : Standart Penetration Test	C : Core Sample			
D : Disturbed Sample	P : Pressiyometer Test	Orhan PENİRCİ		
UD : Undisturbed Sample	VST : Vane Test			

APP3: THE RESULTS OF LABORATORY TESTS

TEST RESULTS of UNAXIAL TEST

Project :	JAPON KÜLTÜR MERKEZİ
Date :	16.03.2004

No	Drill. No	Depth (m)	Diameter (cm)	(cm^2)	Height (cm)	Volume (cm^3)	Wet Wei. (gr)	Un. Weigth (gr/cm^3)	q_u (*Uniaxial Strenth*) Kg/cm^2
1	SK-8	4.10-4.23	4.03	12.76	9.82	125.26	337.29	2.693	1140
2	SK-9	3.50-3.70	5.22	21.40	10.69	228.78	556.24	2.431	354
3	SK-10	2.49-2.60	5.20	21.24	10.75	228.30	596.83	2.614	1285

NOTE:

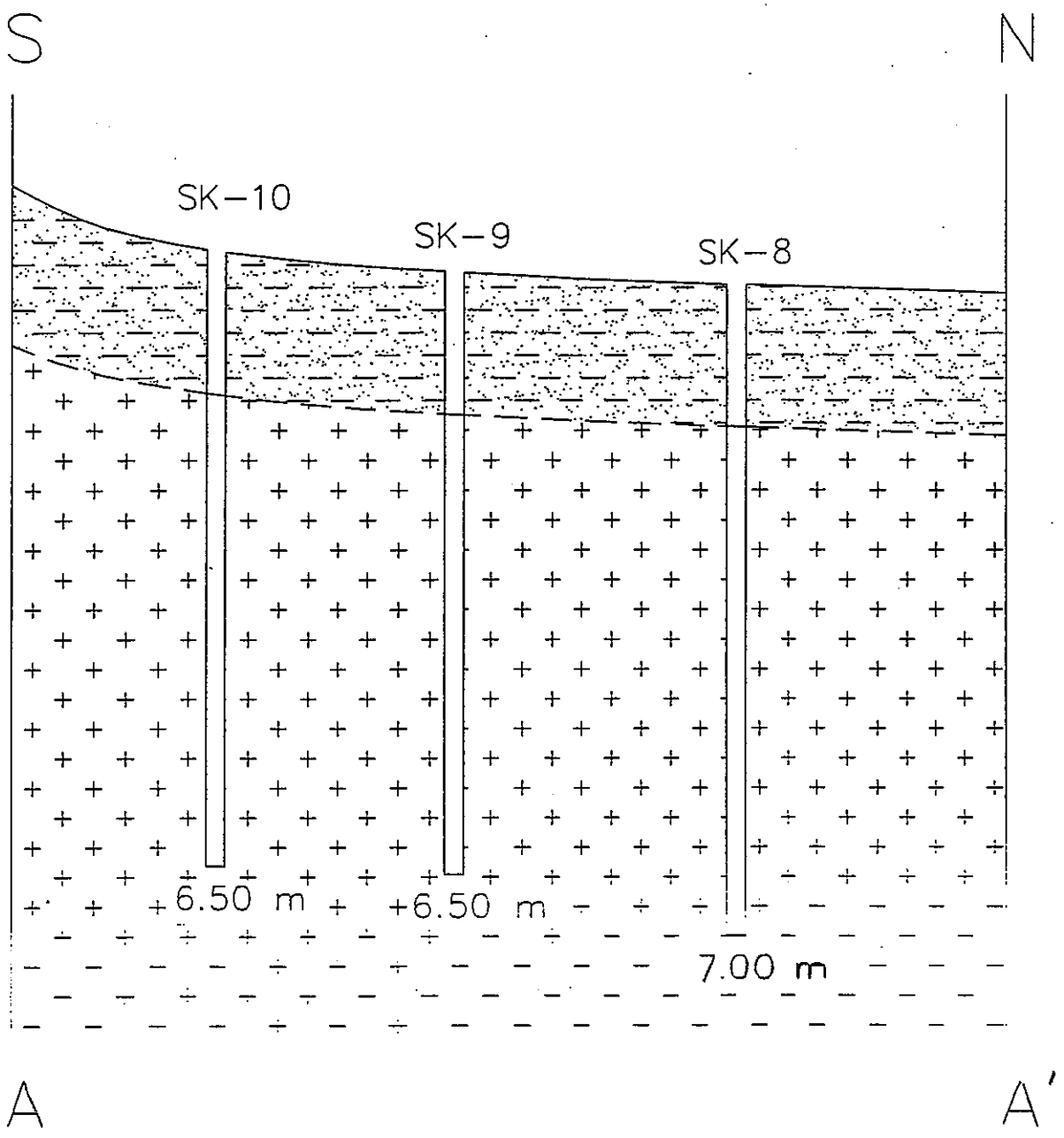
AGGREGATE TEST FOR ROCK-GRAVEL

PROJECT : JAPON KÜLTÜR MERKEZİ

Sample Place Date

SPESİFİC GRAVITY and ADSORPTION of ROCK SAMPLE					
Drilling No	**SK-8**	**Depth**	**4.10-4.23**	**S. No:**	**1**
A	Weight of Dry Sample in Air , gr.				357.22
B	Weight of Saturated Sample in air , gr.				359.62
C	Weight of Saturated Sample in water , gr.				210.58
A/(A-C)	External Spesific Gravity				2.436
A/(B-C)	Volume Spesific Gravity G_k				2.397
$\frac{B-A}{A}$ *100	Absorbtion (%)				0.7
Drilling No	**SK-9**	**Depth**	**3.50-3.70**	**S. No:**	**1**
A	Weight of Dry Sample in Air , gr.				405.29
B	Weight of Saturated Sample in air , gr.				409.14
C	Weight of Saturated Sample in water , gr.				258.73
A/(A-C)	External Spesific Gravity				2.765
A/(B-C)	Volume Spesific Gravity G_k				2.695
$\frac{B-A}{A}$ *100	Absorbtion (%)				0.9
Drilling No	**SK-10**	**Depth**	**2.49-2.60**	**S. No:**	**1**
A	Weight of Dry Sample in Air , gr.				345.89
B	Weight of Saturated Sample in air , gr.				348.79
C	Weight of Saturated Sample in water , gr.				212.65
A/(A-C)	External Spesific Gravity				2.596
A/(B-C)	Volume Spesific Gravity G_k				2.541
$\frac{B-A}{A}$ *100	Absorbtion (%)				0.8
Drilling No		**Depth**		**S. No:**	
A	Weight of Dry Sample in Air , gr.				
B	Weight of Saturated Sample in air , gr.				
C	Weight of Saturated Sample in water , gr.				
A/(A-C)	External Spesific Gravity				
A/(B-C)	Volume Spesific Gravity G_k				
$\frac{B-A}{A}$ *100	Absorbtion (%)				
Drilling No		**Depth**		**S. No:**	
A	Weight of Dry Sample in Air , gr.				
B	Weight of Saturated Sample in air , gr.				
C	Weight of Saturated Sample in water , gr.				
A/(A-C)	External Spesific Gravity				
A/(B-C)	Volume Spesific Gravity G_k				
$\frac{B-A}{A}$ *100	Absorbtion (%)				

APP4: THE GEOLOGICAL SECTION



Fill material

Granite, granodiorite

Section A – A' soil profile