

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR THE CONSTRUCTION OF
KAMAN-KALEHÖYÜK ARCHAEOLOGICAL MUSEUM
IN
THE REPUBLIC OF TURKEY

JULY 2005

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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PREFACE

In response to a request from the Government of the Republic of Turkey, the Government of Japan decided to conduct a basic design study on the Project for the construction of Kaman-Kalehöyük Archaeological Museum and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Turkey a study team from February 20 to March 17, 2005.

The team held discussions with the officials concerned of the Government of Turkey, and conducted a field survey at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Turkey in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Turkey for their close cooperation extended to the team.

July 2005

Seiji Kojima
Vice President
Japan International Cooperation Agency

July 2005

Letter of Transmittal

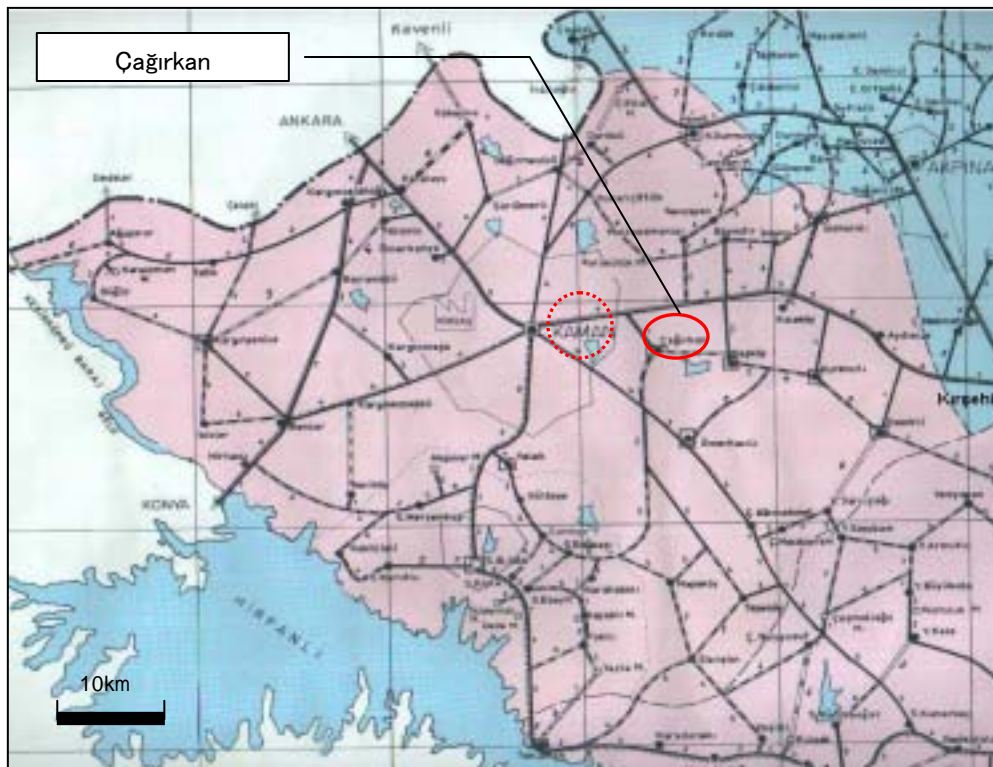
We are pleased to submit to you the basic design study report on the Project for the construction of Kaman-Kalehöyük Archaeological Museum in the Republic of Turkey.

This study was conducted by Ishimoto Architectural & Engineering Firm, Inc., under a contract to JICA, during the period from February to August, 2005. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Turkey and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

Shinji Nakazawa
Chief Consultant,
Basic Study Team on
The Project for the construction of Kaman-Kalehöyük Archaeological Museum
Ishimoto Architectural & Engineering Firm, Inc.



LOCATION

Kaman



KAMAN-KALEHÖYÜK ARCHAEOLOGICAL MUSEUM BIRD'S-EYE VIEW

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SUMMARY

Summary

From its ancient past the Republic of Turkey has prospered as an important crossroads of East and West, and there are innumerable ruins remaining from many peoples of pre-historic times scattered all over the country. It is said the number of ruins within the country reaches 20,000, and only 1% of them have been excavated and surveyed. Currently 93 locations are being excavated and explored including those being done by foreign survey groups.

The Kaman-Kalehöyük ruins are located 140 km southeast of the capital Ankara (in Çağırkan village, Kaman County, Kırşehir prefecture) and they are historically highly valuable ruins with layers of artifacts from as long as 5,500 years ago. The Middle East Cultural Center of Japan has been excavating the site since 1985 and only some of the artifacts are collected at Turkish government facilities including the Kırşehir Museum but the rest are stored without being exhibited under the management of the Turkish government.

The Middle East Cultural Center of Japan built the Japanese Institute of Anatolian Archaeology 1.5 km away from the excavation site in 1997, and since then it has conducted research on the historical and cultural materials. However, the existing prefabricated facility was not appropriate for preservation of excavated items and training researchers, so they decided to build new facilities including a research building and repository which are now under construction with funds contributed from Japan (planned for completion in October 2005).

Turkish researchers are working with foreign researchers at the excavation site and institute, and through restoration and conservation of cultural assets they have fostered consciousness of the importance of preserving ruins among Turkish researchers and local residents. The government of the Republic of Turkey requested Grant Aid from the Japanese government to build a facility

adjacent to the above mentioned institute and to provide necessary equipment in order to exhibit and collect artifacts from the Kaman-Kalehöyük ruins and to conduct training on archeology.

In response to the request the Japanese government decided to conduct a study and the Japan International Cooperation Agency (JICA) sent a Basic Design Study Group to the country from February 20 through March 17 2005.

The Basic Design Study Group held repeated discussions with people associated with the Turkish government followed by analysis conducted in Japan and presentation of the Basic Design Outline in Turkey which took place from June 5 to 15 2005, to create a Basic Design Study Report.

In this Project the Museum will be built in a location adjacent to the Japanese Institute of Anatolian Archeology which is near the Kaman-Kalehöyük ruins, and it will systematically display the artifacts excavated from the ruins and the status of excavation, while at the same time providing news on cultural heritage from all over the country, and new information on the Kalehöyük ruins in a special exhibition corner. The Museum's preservation and restoration laboratory will obtain the cooperation of the Institute to provide training and practice in the field of archeology primarily for Turkish researchers and curators (30 people each year) with the objective of forming a base for restoration and conservation of their cultural heritage by Turkish nationals. Currently Turkish researchers are active at the Japanese Institute of Anatolian Archeology but it is primarily a base for foreign researchers' activities. On the other hand, it is expected that the facility to be built in this Project will play a role in raising the level of Turkish archeology by conducting exhibition and research activities while receiving support from the Institute next door. The Japanese Garden (the Mikasanomiya Memorial Garden) built in 1993 is also next to the Institute. This garden is a tourist attraction that has more than 30,000 visitors annually, and it is expected that even more people will be attracted when the Museum is completed and there is a synergetic effect between the Museum,

the Japanese Garden next door and the Kaman-Kalehöyük ruins. The Embassy of Japan and the Government of the Republic of Turkey highly evaluate the excavations of the Kaman-Kalehöyük ruins that have been conducted by the Middle East Cultural Center of Japan since 1985, and expect that this facility, along with the previously existing Japanese Garden will strengthen the friendly relations between the two countries.

A Basic Design will be prepared for this Project that takes into consideration the Kalehöyük ruins and the Japanese Institute of Anatolian Archeology. The facilities and equipment are of an appropriate scale, easy to maintain and take the local climate into consideration. In principal all construction materials and equipment can be acquired locally in Turkey and local construction methods can be applied, so that it will be economical and maintenance management will be easy.

In summary the facilities will be:

- Museum: reinforced concrete structure, 1,308 m²

(Exhibition rooms, special exhibition corner, repository, library, conservation and restoration laboratory, offices)

10 items of equipment are planned for use in displays, repository and research.

The Turkish organization to manage operations and maintenance is the Directorate General for Cultural Heritage and Museums of the Ministry of Culture and Tourism. The Directorate administers 311 museums and cultural heritage sites, all sales revenues from museum entry fees go to the national treasury, and a budget is allocated every other fiscal year for each museum. The required expenses in the operating plan for this facility are estimated to be 61,000 YTL (about 4.6 million yen). This is equivalent to about 1% of the maintenance management budget of the Directorate for fiscal year 2004 (about 5,409,000 YTL = about 4.44 billion yen) and that is about the same level of expenses compared to similar sized facilities, so overall it should not be a problem.

It is estimated that the total operating expenses under this plan will be about 297 million yen (Japan to bear 288 million yen and Turkey to bear 9 million yen). In addition, the construction period is planned to be 5.5 months for detailed design and 10.0 months for construction including installation of equipment, for a total of 15.5 months after both countries sign the Exchange of Notes (E/N).

Implementation of this Project will enable artifacts that were excavated from the Kaman-Kalehöyük ruins that are now exhibited in the archeological department of the Kırşehir Museum (50 km southeast of Kaman) to be transferred and exhibited along with other Kaman-Kalehöyük artifacts that have not been publicly displayed before. Items from some other ruins in Kırşehir Prefecture will also be exhibited. Also, by providing training and practice for researchers and curators that work in the conservation and restoration center at the Kaman-Kalehöyük Museum to be built in this Grant Aid Project, the nation's archeological administration and human resources can be strengthened.

It is expected that the integrated exhibition rooms for artifacts excavated from Kaman-Kalehöyük, seminar rooms, repository and conservation and restoration room of this Museum will become a base for restoration and conservation of cultural heritage by Turkish people, as well as a significant influence to raise archeological interest in preservation of ruins and in cultural heritage among many local residents, students and children.

This Project is judged appropriate to be executed as a Cultural Grant Aid Project by Japan because it is expected to be very effective and to contribute to the broad development of the preservation of the Turkish cultural heritage. Furthermore we believe this Project will be more effective provided the facilities and equipment of the Museum are properly maintained and managed, and if the exhibit items and exhibit software contents are satisfactorily maintained so that the organization is established to receive more visitors.

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CHAPTER 1 BACKGROUND OF THE PROJECT

CHAPTER 1 BACKGROUND OF THE PROJECT

The Middle East Cultural Center of Japan has been conducting excavations of the Kaman-Kalehöyük ruins since 1985, and some of the major archeological artifacts that were excavated are stored or are being exhibited in the Kırşehir museum established by the Turkish government, but the rest are left in storage and not being exhibited under the control of the Government of Turkey.

The Middle East Cultural Center established the Japan Institute of Anatolian Archeology in 1997, located 1.5 km from the site of the excavation, where researchers from Turkey and other countries have been working on restoration and conservation of those cultural assets, and which has fostered awareness of the importance of preserving archeological remains among local residents through archeological educational activities for children, students and local residents at the research center. With this as the background the government of Turkey applied to the Japanese government in May 2004 for Grant Aid to construct a building adjacent to the above research center for archeological conservation and restoration and to exhibit archeological artifacts excavated from the Kaman-Kalehöyük ruins.

The facilities and equipment that were requested are described below.

(1) Requested Facilities

Museum and Conservation Center (2,400 m²)

Detached toilet (100 m²)

Official residence (100 m²)

Paved parking area

(2) Equipment

Exhibition cases, furniture, etc

The size of the museum facility (2,400 m²) was confirmed in the preliminary study of December 2004 to be “floor area of 1,000 m² in a one-storied building consisting of exhibition, conservation and office space.”

CHAPTER 2 CONTENTS OF THE PROJECT

2-1 Basic Concept of the Project

The policy of the Turkish Ministry of Culture and Tourism is to “exhibit excavated artifacts in a museum that is as close to the site of their excavation as possible,” but currently many of the artifacts that have been dug up at the Kaman-Kalehöyük ruins in excavation surveys since 1985 are stored in warehouses under the management and responsibility of the Government, with the exception of some that are stored at the Kırşehir Museum (about 50 km southwest of Kaman city), or that are on display there.

This Project will provide a complete exhibition of the artifacts excavated from the Kaman-Kalehöyük ruins that are currently on display in the Kırşehir Museum Archeological Section which will be transferred together with valuable excavated artifacts that have not been displayed in the past. Also, laboratory, repository and seminar rooms will be set up to give Turkish and foreign researchers the opportunity to continue receiving the training which has been provided in the past in conservation and restoration of cultural treasures, and to provide on-site education in archeological activities to local residents, students and children with the cooperation of the Japan Institute of Anatolian Archeology.

When this Project is completed it is expected to be a rare example of ruins, a research center and museum existing in close proximity, and it will be a base for restoration and conservation of cultural heritage in Turkey.

This Project consists of the construction of the Museum facilities (exhibition hall, special exhibit corner, library, laboratory, offices, repository, as well as public areas including entrance hall, corridor, machine rooms, toilets, etc) and procurement of equipment for the exhibit section, storage section, and for seminars and research.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Design Policy

- 1) This Project uses Cultural Grant Aid for the construction of the Kaman-Kalehöyük Archaeological Museum in Çağırkan village, Kaman County, Kırşehir prefecture of the Republic of Turkey where the Japanese Institute of Anatolian Archaeology has conducted excavations over the past 20 years. Since the maximum of the total assistance amount is determined by the framework of Cultural Grant Aid, the maximum scale of the institution is presumed to be 1,300 square meters based on examples of past assistance of the same kind. Turkey will undertake construction of the detached toilet, official residence and parking areas listed in the application as they are determined to be needed, in order that the Museum facility be given priority and is satisfactorily completed.
- 2) An agreement by both parties has been reached regarding the site adjacent to the ruins of Kaman-Kalehöyük for the following reasons.
 - a . It is the site which the government of Turkey was requesting from the beginning.
 - b . It adjoins the Japanese Institute of Anatolian Archaeology which releases the results of its research internationally and which is operated by staff led by Dr. Omura, so it can receive assistance and advice in the training of technical staff and operation of facilities.
 - c . It is midway between Ankara and Cappadocia and is suitable as a tourist attraction and as a destination for extracurricular visits from schools in the area.
- 3) Equipment under this plan will be limited to equipment necessary for the museum facilities to exhibit, report on and maintain artifacts, and will not include equipment for research.

Creation of exhibition software, imaging software, computer data processing software and search software, etc will be done at the expense of the Republic of Turkey. In addition, photographic and editing equipment are outside the scope of this agreement.

In order that maintenance of equipment is made easier in the future, general equipment that is readily available on the marketplace will be used.

(2) Natural Conditions

1) Temperature and Sunlight

There is a large variation in temperature between summer and winter, and between day and night, so the structure will be insulated to reduce the effect of heat from the sun's rays. By providing landfill around the building and on the roof, the building will achieve good resistance to the effects of heat from the sun's rays and have high insulation capability. Vinyl chloride pipes will be buried in the landfill surrounding the structure to act as "cooling tubes" for air exchange, routing in warm air in winter and cool air in the summer.

2) Rain

There is not a large volume of seasonal and annual rainfall in the area, but since there will be landfill on the roof and around the building there will be a waterproof layer of asphalt on the structure and there will be waterproof concrete on the roof. There will also be an adequate number of drains on the roof surface to drain off rain water, and there will be rubble, sand and drainage pipes to drain off rain water under the landfill around the exterior walls.

3) Wind

There is no record of strong winds exceeding 30 m/second throughout the year in this region. The building itself will be surrounded by landfill so there should be absolutely no problem with the strength of wind resistance, but the wind resistance strength of the fixtures will exceed the standards required by the Government of Turkey.

4) Lighting

Except for the exhibit rooms and entrance hall which will have a large screen corner, wherever there is no functional problem the plan is to utilize natural light as much as possible. In principle, light

windows will be on the northern and southern sides facing the central court, and where that is not possible lighting will be from the exterior and light courts.

5) Earthquakes

Turkey adopted earthquake-resistant design standards similar to Japan's new "Japanese Seismic Standard" 8 years ago. It is our judgement that safety can be satisfactorily achieved with an earthquake-resistant structural design based on local coefficients and the building standards laws of Turkey.

(3) Social Economic Conditions

The cost of construction has continued to climb sharply over the past years in Turkey, at an annual rate of 20 to 30%. The budget for this Project takes into account the economic situation in Turkey.

Since this Project is to build a museum at the Kaman-Kalehöyük ruins site it will be built to reflect the topography of the slopes near the Kaman-Kalehöyük ruins, and will be in harmony with the scenery of the Japanese Garden next door.

(4) Construction, Procurement, Materials and Equipment Usage

Official approval of construction in Turkey is based on the construction laws of Turkey. Qualified architects make application when the design is completed before construction, and an inspection of the completed construction is to be performed by the responsible authorities after it is finished. The construction standard laws as well as the procedures are similar to those of other advanced nations.

All construction materials and equipment can be purchased from those distributed in the local region.

Most of the materials and equipment that are planned to be used will be manufactured in the region and there shouldn't be any quality problems. However, some equipment such as electrical communications equipment, heaters and HVAC equipment is mostly imported from Europe and Japan, and can be purchased locally.

(5) Utilization of Local Workers

The construction standards in Turkey are high, and there are many design companies in Ankara that have the level of technology and experience to execute this Project. We will evaluate past experience and other factors carefully and decide on a design company to contract the detailed design to.

The level of construction technology is also high, and there are many construction companies, large and small, that have the level of technology to undertake this Project. We will list a number of high level companies from among them and select one to execute this Project.

(6) The Implementing Agency's Operations, Maintenance and Management Capability

The Directorate General for Cultural Heritage and Museums of the Ministry of Culture and Tourism of the Republic of Turkey operates, maintains and manages many museums in Turkey, and there are no problems regarding operations, maintenance and management.

Operations and maintenance management methods of the repository HVAC equipment and the cooling tube air exchange equipment, and of the sanitary equipment are not unusual, but we will create manuals explaining appropriate maintenance management when the equipment is handed over.

The exhibition model of the Kaman-Kalehöyük will be unusual in Turkey, so we will create a manual and explain maintenance management procedures when we hand it over.

We have confirmed that the Japanese Garden adjacent to the site of the Museum will continue to be maintained and managed by the Japanese Institute of Anatolian Archaeology as it has been in the past.

(7) Deciding Grade of Design of Facilities and Equipment

The scope of Grant Aid from Japan in this Project is construction of the archeological museum and procurement of necessary equipment for the archeological museum. We will consider the following when deciding on the grade of the facilities and equipment.

1) The specifications for equipment and materials will be completely within the current technical level

of the Directorate General for Cultural Heritage and Museums to operate and maintain.

- 2) The specifications for equipment and materials will be such that repair and maintenance are available locally.
- 3) Materials and equipment will be specified that are compatible with those at the Japanese Institute of Anatolian Archeology, under the assumption there will be interchange and support from the Institute.

(8) Construction Method, Procurement Method and Construction Period

This Project will utilize completely ordinary construction methods. The site is located in the suburbs of Kaman, and the roads in the area are good and should have no trouble accommodating construction processes. The overall construction period will be through finishing the single story building and installation of exhibition equipment to handover. Since the bearing ground level is shallow we can make a spread foundation, therefore 10 months is appropriate for the whole construction period. The last 2 months of this 10 month period will mostly be for installation, set up, test runs and adjustment of equipment, and for overlapping installation of exhibit equipment, so it can be budgeted in a single fiscal year.

There are local sales agencies with sufficient technology to maintain some of the equipment planned for this Project, such as computers and office equipment, so we plan to purchase them locally.

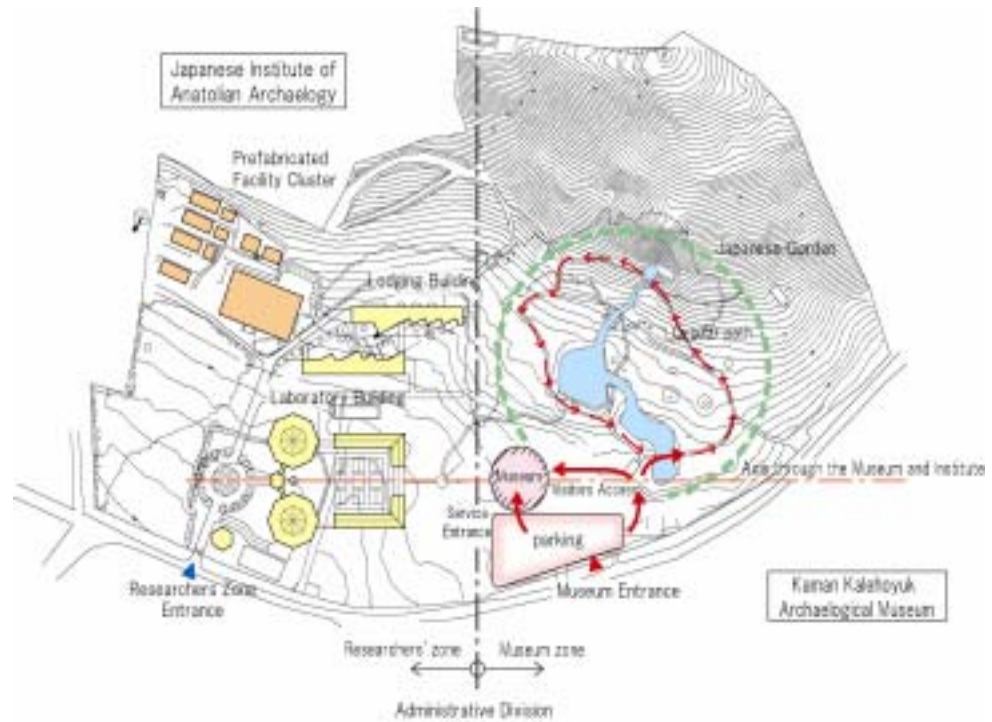
2-2-2 Basic Plan

(1) Site Usage and Layout Plan

The planned site for the Museum is adjacent to the Japanese Institute of Anatolian Archeology to the east and the Japanese Garden to the south. The Museum and Japanese Garden are in the public zone and are managed by the Government of Turkey, and are separate from the research zone the Japanese government is leasing and managing. However, we will place the Museum on the shared strong axis running from the Institute through the planned site, to create a structure with an overall feeling of unity.

The facility parking area will be located adjacent to the road on the north side. There will be one entry to the Museum and Japanese Garden for simpler management, and approach to the Museum will be easy from either side. We will set up back loading access directly from the parking area for trucks delivering exhibition items to the Museum, which will be separate from visitor access.

Diagram 2-1 Planned Site Usage and Facility Layout



(2) Architectural Plan

1) Floor Plan

The interior of the building will be separated into two zones, a “public zone” (about 830 m²) mainly consisting of an exhibit hall on the south side and a “back yard zone” (about 470 m²) on the north side.

The general public will enter the Museum through the west entrance from the parking area. The entrance hall obtains lighting through openings facing the inner courtyard, and at the same time it clearly expresses a visually open feeling and the structure of the facility. Visitors are guided along a route from the entrance hall to the screen corner, the library, exhibit hall, special exhibition corner to

the outside exhibit area. There is a direct exit from the exhibition hall to the inner courtyard, where there is a recreation of the actual ruins. In this way a facility is realized where visitors will not just see the exhibits, but can also experience the ruins.

The entrance for deliveries and employees will be located on the north side in the service yard. We will locate a loading dock for trucks delivering exhibition items in the service yard. The repository, photograph studio and laboratory will be located near the delivery entrance, which will enable continuous flow from delivery of excavated artifacts to photography, survey research and storage. The repository will utilize mezzanine shelving to increase storage capacity. The administrative office, Museum Director's office and laboratory will be located facing the inner courtyard to utilize the opening and to allow visibility of the entire facility to make management easier.

Room functions and floor areas for this facility are planned as shown in the table below, based on Turkish requests shown in Appendix 3 of the Minutes of Discussions on the Basic Design Study (February 2002).

Table 2-1 Room Functions and Floor areas

Exhibition hall	With an exhibit hall of 400 m ² , and special exhibit corner of 50m ² , It is planned to be a continuous space. The space for special exhibit is designed to be one corner.	447.1m ²
Library	It will be located in a place connected to the entrance hall, opening on the Japanese Garden side to give a bright ambience.	52.8m ²
Screen corner	It is planned as part of the entrance hall, and it will be a corner where as many as 50 people will be able to enjoy the large screen.	50.0m ²
Laboratory	This is planned to be a separate room where conservation and restoration are performed.(2 researchers) Seminars on conservation and restoration by lecturers invited by the Japanese Institute of Anatolian Archeology can be held here for 7 or 8 attendees.	105.4m ²
Museum Director's office, administrative office, security officers' room	The staff administrative office consists of these 3 rooms. Museum Director's office Administrative office (2 archaeologists, 1 accountant security officers etc. (3 to 5 people)	71.5m ²
Repository	Includes a photographic development room of 20 m ² . We will double the storage capacity of the repository area by making wooden frame mezzanine shelving.	99.8m ²
Others	Entrance hall includes a museum shop area of 30 m ² . In addition to the entrance hall there are machine rooms, corridors and restrooms.	481.8m ²
Total		1,308.4m ²

2) Elevation

We will reflect the Kaman-Kalehöyük excavation concept in the building exterior, which will be a mound modeled on the shape of the ruins. Excavated earth will be piled around the exterior walls of the building and on the roof slabs which will reduce finishing costs and the costs of operating air conditioning. Also, the landfill will occur at a site where there is a difference of 2.5m in height so the height difference will be absorbed and it will be integrated with the existing ground.

3) Section Plan

The first floor will be on the most economical level (+1097.0m) because the bearing layer is bedrock (level +1095.0 ~ 1096.7). The difference in height between the ground level and the floor will be resolved by providing a gentle slope. Also, each room will have sufficient and economical ceiling

height (3.5m ~ 4.2m).

(3) Structure Plan

1) Structure Plan

The main building structure will be constructed of steel reinforced concrete which is the most common in the region.

2) Structure

• Foundation structure

Soft rock which is 1m below the ground will be the bearing ground level for the spread foundation.

• Upper structure

It will be frame structure with earthquake-resisting walls (roof framing to be flat slab structure).

3) Material Specifications

Materials will meet local standards. However they are not to be far off of the following values.

Reinforcing steel bar yielding strength: approximately $300\text{N/mm}^2 \sim 390\text{N/mm}^2$

Concrete: Material strength approximately $21\text{ N/mm}^2 \sim 30\text{ N/mm}^2$

4) Design Loads

Live loads are to meet local standards and actual conditions. However they are not to be far off of the following Japanese standard values.

Table 2-2 Design Loads

For slab design	For small bracing design	For frame design	For earthquake loads	Room purpose
1800	1800	1300	600	Rooms
2900	2900	1800	800	Offices
2300	2300	2100	1100	Classrooms
2900	2900	2600	1600	Conference rooms
3500	3500	3200	2100	Corridors, entrance hall
3900	3900	2900	1600	Garage (passenger cars)
10000	10000	10000	4900	Exhibition hall *
5900	5900	5400	4900	Stack room (without mezzanine)
4900	4900	2400	1300	Machine rooms

Unit N/mm²

* This is the required value for this facility

Snow loads and earthquake loads must local standards.

(4) Mechanical Equipment Plan

The basic concept for mechanical plans is to provide easy maintenance and low energy consumption while considering the interior and surrounding environments.

- Creating a suitable Museum environment
 - Provide cooling tubes to pre-cool and pre-heat outside air.
 - Provide each room with naturally circulating hot water panel heaters for comfort in the winter.
- Consideration for the global and regional environments
 - Eliminate air conditioning by high insulation value of piled earth and cooling tubes.
 - Drainage will be treated in septic tanks and allowed to permeate the ground after treatment in consideration of the surrounding environment.
- Reduce maintenance tasks
 - Consider lower energy consumption and ease of maintenance when selecting equipment and systems.

1) HVAC System

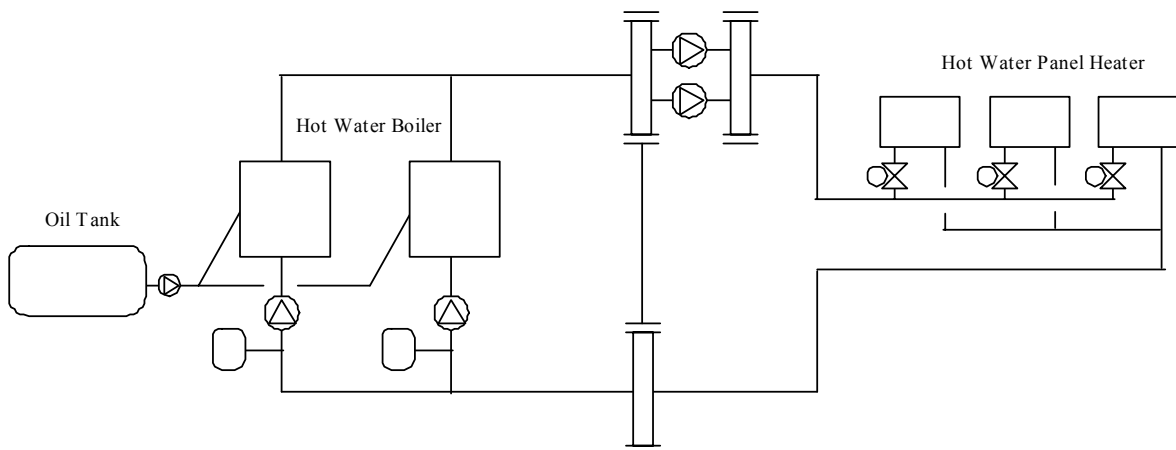
a . Heaters

We will utilize heavy oil burning boilers as heat sources in the winter time. We will set up 2 boilers which will be operated singly or together based the required load.

Other than heavy oil, we considered LP gas, light oil and natural gas as fuel for the boilers, but for the following reasons we selected heavy oil.

- It would be difficult to obtain a large supply of LP gas because there are no other large buildings that use it in large quantities.
- Light oil is expensive.
- There are no plans for a natural gas pipeline in the future.

Diagram 2-2 Diagram of the Heating System



b . HVAC system

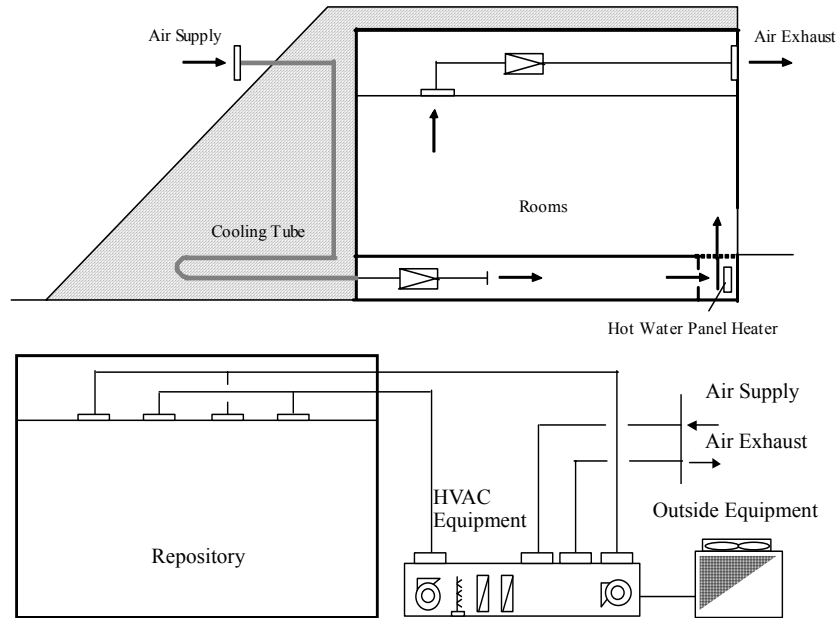
We will provide each room except the repository with naturally circulating hot water panel heaters for heating in the winter. Each panel heater will have a thermo-valve so the temperature can be adjusted individually.

The repository will be cooled and heated by a combination packaged type air conditioner which includes heating by hot water coils in the unit.

The photo studio will have air conditioning.

Refer to the Room Equipment Table for HVAC systems in each room.

Diagram 2-3 HVAC System Diagram



c . Ventilation System

Air intake will be to each room and the repository via cooling tubes buried in the ground through the pit. Throughout the year the stable ground temperature will be used to pre-cool and pre-heat outside air. Except for the repository, air conditioning will not be necessary because of the high insulation value of the piled earth and the cool air brought in through the cooling tubes.

Ventilation systems for each room will be as follows.

- Type 1 ventilation (air supply and exhaust): all rooms, storage * Outside air intake through cooling tubes
- Type 3 ventilation (exhaust only): men's and women's restrooms, kitchenette, museum shop
- Type 1 ventilation (air supply and exhaust): machine rooms 1 and 2, electrical room, oil tank location

d . Automatic control system

The major control systems are as follows.

- Control boilers to operate singly or together based on secondary load
- Control number of hot water pumps operating
- Control repository HVAC temperature

Plumbing and Sanitary Plumbing System

2) Water Supply, Drainage and Sanitary Systems

a . Water Supply System

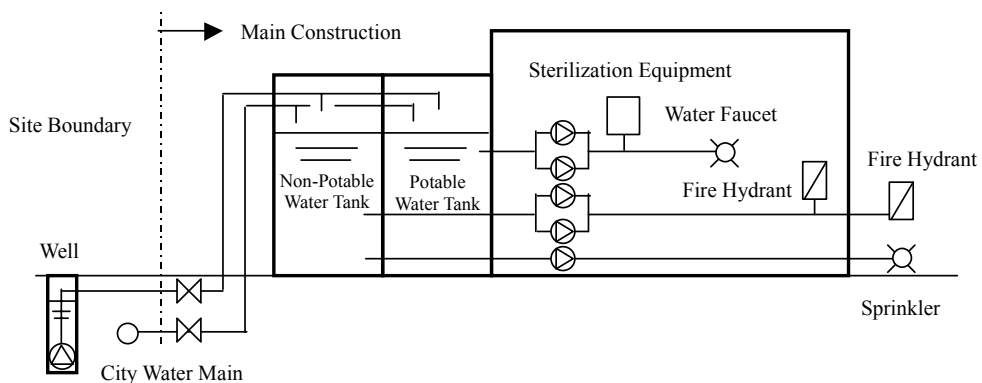
Water will be drawn from the city water main (2.5") that runs along the road in front of the site, and stored in a water tank.

We will provide tanks for potable water (30m³) and for fire and sprinkler systems (50m³). The potable water tank will have capacity to provide 3 days of daily consumption.

The city water supply frequently is interrupted, so we plan to provide an alternate water supply to be pumped from a well next to the ruins 1.5 km from the site, which will be accessible by a manual switch over valve.

Drain cocks and electric heaters will be located wherever it is necessary to prevent freezing.

Diagram 2-4 Water Supply System Diagram



b . Hot Water System

Hot water will be provided in the kitchenette by an electric instant water heater.

c . Drainage System

Drainage in the building will be separated into sewage (drainage from toilets) and miscellaneous drainage (others), and they will flow together outside the building. We will provide floor drainage in the men's and women's toilets and the kitchenette.

d . Sanitary Equipment

The following equipment will be installed.

- Western style toilets, urinals, washbasins, utility sinks, hot water taps, sprinklers

e . Fire Protection System

The system will be planned in compliance with Turkish laws, and the following equipment will be installed.

- Interior fire hydrants, exterior fire hydrants (around the site of this Project)

f . Drainage Water Treatment System

It has not been decided yet whether there will be a sewer main to the site, so drainage from the building will be treated in septic tanks and allowed to permeate into the ground.

We plan to meet EU standard values for treated water quality, which are stricter than Turkey's.

- Planned number of people: 50
- BOD: 25mg / L or less (Turkish standard is 50mg / L)
- COD: 125mg / L or less
- SS: 60mg / L or less

Table 2-3 Equipment for Each Room

Room	HVAC		Ventilation		Sanitary		
	Heating	Cooling	Air supply and exhaust	Notes	Water supply	Hot water supply	Drainage
Entrance Hall	Hot water panel heater		Type 1	Cooling tube			
Ticket Sales Window	Hot water panel heater		Type 3				
Museum Shop	Hot water panel heater		Type 3				
Library	Hot water panel heater		Type 1	Cooling tube			
Exhibition Hall	Hot water panel heater		Type 1	Cooling tube			
Special Exhibition Corner	Hot water panel heater		Type 1	Cooling tube			
Kitchenette			Type 3				
Director's Room	Hot water panel heater		Type 1	Cooling tube			
Administrative Office	Hot water panel heater		Type 1	Cooling tube			
Security Officers' Room	Hot water panel heater		Type 1	Cooling tube			
Photo Studio	Air conditioning		Type 1	HVAC ventilation fan			
Laboratory	Hot water panel heater		Type 1	Cooling tube			
Repository	HVAC		Type 1	Cooling tube			
Men's & Women's Rest room	Hot water panel heater		Type 3				
Corridor	Hot water panel heater						
Machine Room 1	Hot water panel heater		Type 1				
Machine Room 2	Hot water panel heater		Type 1				
Electric Room	Hot water panel heater		Type 3				
Oil Tank Space	Hot water panel heater		Type 1				

3) Electrical Systems

Electrical system basic concept:

- To provide stable electric power
- To provide a generator to supply power for building functions when there is a power outage
- Equipment and panels should be located so as not to obstruct maintenance
- Use equipment and systems that can be procured locally

- Electrical equipment, conduits and wiring should not interfere with the building structure

a . Power Receiving and Substation System

Power will be brought from the road in front by aerial wire. The voltage transformer will be installed on a pole by the road within the site. From there power will be brought through an underground cable to the generator room in the building.

Power load is presumed to be 73KW, so the voltage transformer will be 100KVA.

b . Electrical Generator

Emergency power in case of power outage will be supplied by a diesel generator. The generator will have fuel (light oil) capacity to allow it to run continuously for more than 50 hours.

- Loss of commercially supplied power should not affect operation of the facility (supply the entire load)
- There should be enough spare fuel (light oil) for continuous operations for more than 50 hours (underground tank)

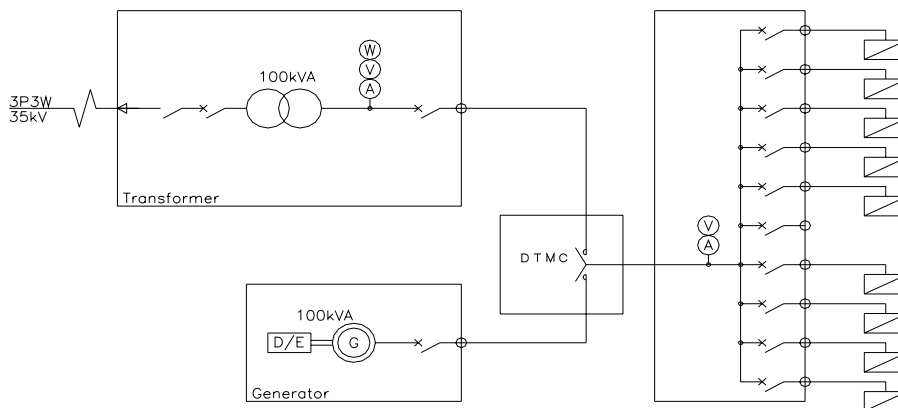
Generator specifications:

Generator output: 100 KVA

Motor: Diesel, Radiator air cooling

Starter: Electrical

Diagram 2-5 Skeleton Diagram



c . Electrical Main

Design conduits and wiring to each power and distribution panel after transformer secondary voltage. Wiring method is as shown below.

Between the transformer and generator rooms: Underground conduit (GL-300)

Inside building: In conduits or in the ceiling

d . Power System

Design conduits and wiring after power panel secondary to mechanical equipment.

e . Lighting System

Install lighting fixtures appropriate for the space in each room. Each room has independent switches. Also each room will have internal battery powered emergency lighting. Emergency exit guide lights (with built-in batteries) will be installed at emergency exits and in corridors.

f . Power Receptacle

Install power receptacles in the building where they are required.

g . Telephone System

Telephone connection will be brought from the road in front by aerial wire. It will be supplied to the security officers' room through underground wiring within the site. MDF and PABX will be installed in the security officers' room and telephones will be installed at all locations.

h . Public Address System

Purpose: A system that is able to make public announcements to the entire facility

Public address amplifier: Wall hanging type (installed in the security officers' room)

Speakers: Ceiling mounted

i . Intercom System

Install intercom between the security officers' room and service entrance for night time contact.

j . Monitoring Cameras

Color cameras will be installed in all locations for monitoring. Monitors will be installed in the

security officers' room.

k . Data Communications System

We plan to install network equipment, conduits and wiring, and LAN modular jacks to support use of LAN throughout the facility.

l . TV Reception System

We plan to install a system which will allow viewing of domestic Turkish broadcasts, CNN within the facility.

m . Security Alarm System

We plan to provide continuous monitoring by installing heat sensors in exhibit areas and the repository. The alarm will sound in the security officers' room. We will install card readers at the repository entrance to control access to the room.

n . Fire Alarm System

We will install a fire alarm system to quickly detect fires. The receiver will be in the security officers' room.

o . Lightning Protection System

We plan lightning protection system to protect the facility from lightning. The protection system will be a conductor mounted on the roof.

(5) Architectural Finish Plans

Architectural finishes will be as follows.

Table 2-4 Exterior Finish

	Finish
Exterior Walls	Land fill on top of dressed exposed concrete + waterproof asphalt Light coating finish of acrylic resin on top of exposed concrete
Roof	Levelling mortar + waterproof asphalt + insulation on top of concrete slab ; t=30 + protective concrete t=80 + gravel t=75 + landfill t=225
Entrance	Locally produced granite on top of slabs on grade t = 120
Light court 1	Back-filled
Light court 2	Slabs on grade t=120 pressed with wooden trowel
Light court 3	Locally produced granite on top of slabs on grade t = 120
Service yard	Slabs on grade t=120 pressed with wooden trowel
Outdoor exhibit area	Pathway : Locally produced granite on top of slabs on grade t = 120 Exhibition area : back-filled

Table 2-5 Fixtures

Room	Finish
Entrance hall	Entrance: insulated steel doors coated with epoxy resin + insulative glass, grille
All rooms	Windows : aluminum sash, partially steel grille or with security shutters Doors : wooden Entrance : insulated steel doors coated with epoxy resin + insulative glass
Machine rooms, repository	Doors : steel doors coated with epoxy resin

Fixtures : Exterior steel will be primed with an anti-rust coat.

Table 2-6 Interior Finishes

Room	Floor	Baseboard	Wall	Ceiling
Entrance hall, Museum shop, Vestibule, Screen corner	Locally produced granite, jet burner finish	None	Locally produced granite	Gypsum board + acrylic emulsion paint (AEP)
Ticket sales window	Ceramic tiles 300 square, glazed	H=60 Wooden H=60	Plaster	Same as above
Library Exhibition hall, Special exhibit corner, Corridor 1	Locally produced granite jet burner finish	t15 granite, polished finish H=60	Same as above	Same as above
Museum Director's office, administrative office, security officer's room	Ceramic tiles 300 square, glazed	Wooden H=60	Same as above	Same as above
Men's and women's rest room, Kitchenette	Ceramic tiles 150 square, glazed	None	Ceramic tiles 150 square, unglazed	Waterproof gypsum board + AEP
Laboratory, Photograph studio	Ceramic tiles 300 square, glazed	Wooden H=60	Plaster	Same as above
Repository	Ceramic tiles 150 square, unglazed	Same as above	Same as above	Gypsum board + AEP
Corridors 2	Ceramic tiles 300 square, unglazed	Same as above	Same as above	Same as above
Machine rooms 1, 2 Electric room, Oil tank location	Ceramic tiles 150 square, unglazed	None	Synthetic resin paint	Slab, as is
Water tank space	Epoxy resin waterproof application	None	Epoxy resin waterproof application	Epoxy resin waterproof application
Miscellaneous drainage water tanks	Asphalt waterproofing	None	Asphalt waterproofing	Asphalt waterproofing

All of the above are materials that are commonly used in the local area so there will be no problems regarding procurement and maintenance.

(6) Furniture

Turkey will bear the cost of ordinary furniture and furnishings as well as for office furniture (desks and chairs), chairs for the screen corner, work benches for the laboratory, etc, blinds and curtains.

(7) Exhibition Plan

The exhibition plan for this facility was created based on the ideas and concepts of the Japan Institute of Anatolian Archeology which is in charge of the Kaman-Kalehöyük ruins excavation.

This archeological Museum has the purposes to explain the multiple layers and cultural chronology of the Kaman-Kalehöyük ruins and to exhibit mainly the artifacts excavated from the site. The artifacts excavated from the Kaman-Kalehöyük ruins that are currently exhibited at the Kırşehir Museum will be transferred there and the exhibition facility will have the same functions as the Kırşehir archeological site museum.

The Kaman-Kalehöyük ruins do not have artifacts for the 1400 year period from the end of the Iron Age until the Ottoman Period (Hellenism, Roman, Byzantine, and Seljuk). Artifacts excavated from the plains in Kırşehir prefecture will be exhibited to represent those periods to enable the broad and comprehensive cultural chronology of central Anatolia to be exhibited.

Artifacts excavated from the area around the Kaman ruins are Hittite stone carvings and Roman stone columns, sculptures and panels.

The ruins are still being excavated 19 years after the survey began, and will continue to be studied for decades to come, therefore the exhibit plan should not be static but should be flexible to accommodate future changes.

Diagram 2-6 Exhibit Zoning

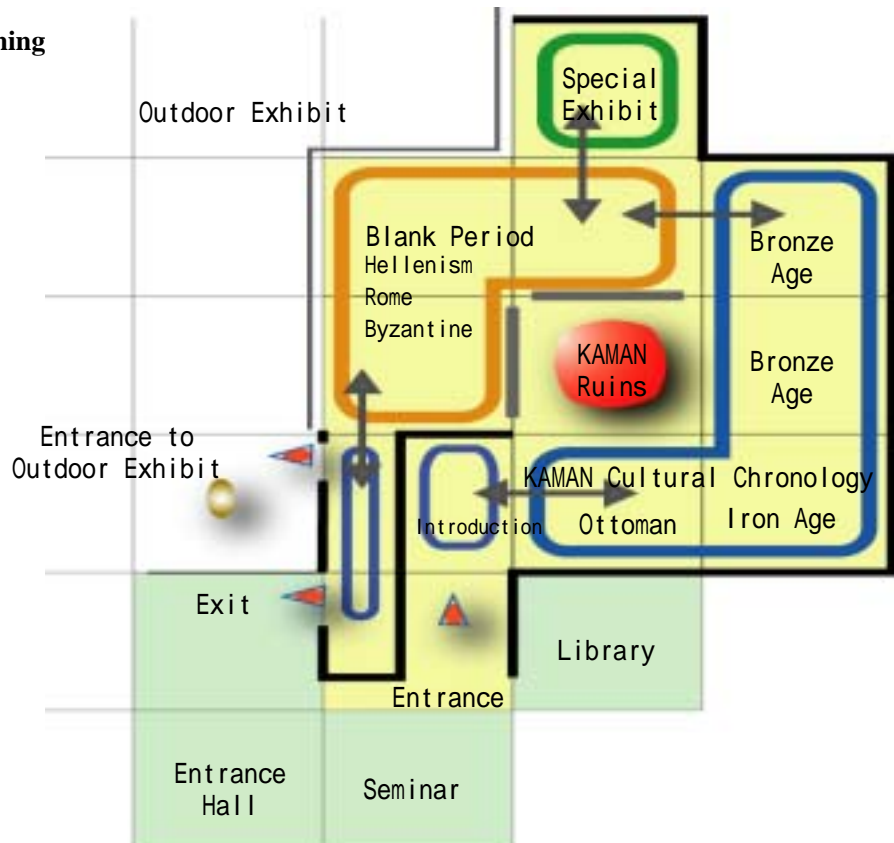


Table 2-7 Kaman-Kalehöyük Archaeological Museum - Artifact Exhibit Contents

	Theme	Items	Objective of Exhibit	Main Elements	Notes
Introduction	A 5,500 year accumulation	Kaman	Display the accurate location of the Kaman ruins within Central Anatolia	Satellite photographs Aerial photographs Maps	
Main Exhibit	Kaman ruins hill	Mound development Ruins hill structure Excavation methods	Explain development and structure of the ruins hill (mound form), centering on use of a model, as well as images, figures, illustrations and photographs, and explain the excavation methods to be used	Images Topographical model of ruins Satellite photographs Aerial photographs Maps Illustrations	The ruins model will be made and procured in Japan
Permanent Exhibit	Kaman ruins cultural chronology	. Ottoman Age (The Ottoman Empire)	Explain cultural layers identified by excavated items. Explain how different portions of the ruins mound developed using 3-dimensional perspective to obtain understanding of the cultural layers.	. Maps . Photographs . Illustrations . Explanatory text	
		. Iron Age	Same as above		
		. Late Bronze Age	Same as above		
		. Early Bronze Age	Same as above		
		Hellenism Rome Byzantine Seljuk Turkey	Exhibit for the period from 200 BC to around 1400 for which period no artifacts were excavated from the ruins mound. Exhibit artifacts excavated from the plains around the Kaman suburbs and Kirşehir prefecture, in order to make a continuous Kaman ruins cultural chronology for Central Anatolia.		
Special Exhibits	Annual excavation exhibit	Results of annual Kaman ruins excavations	This is a place to present research and exhibit the results of the excavation survey conducted every year from June to September, and to exhibit the results of restoration and preservation.	. Maps . Photographs . Illustrations . Explanatory text	
		Results of excavations in Kirşehir prefecture	Make special exhibitions which have news value such as excavation activities in places other than the Kaman ruins or new discoveries.		
Outdoor Exhibit	Experience of ruins excavation site	Ottoman Age Iron Age Bronze Age	Outside exhibit of reproduction of excavated layers showing characteristics of each period. The excavated layers are on top of each other so the top layers would be removed so the reproduction is useful	. Explanatory text	

(8) Equipment Plan

We will consider the following requested equipment in Appendix 3 of the Minutes of Discussions on the Basic Design Study (February 2005).

- Cases: There will be about 500 to 600 items (the items average size is about 10 to 15 cm² including the large and small items) displayed in cases, and each case will hold 30 items, so there will be about 17 cases.
- Computer equipment: We will not provide computers because the software for display has not been determined so we cannot select them.
- We will include the Kaman-Kalehöyük section topographical model as part of our support because it is informational equipment fundamental for the museum exhibit.

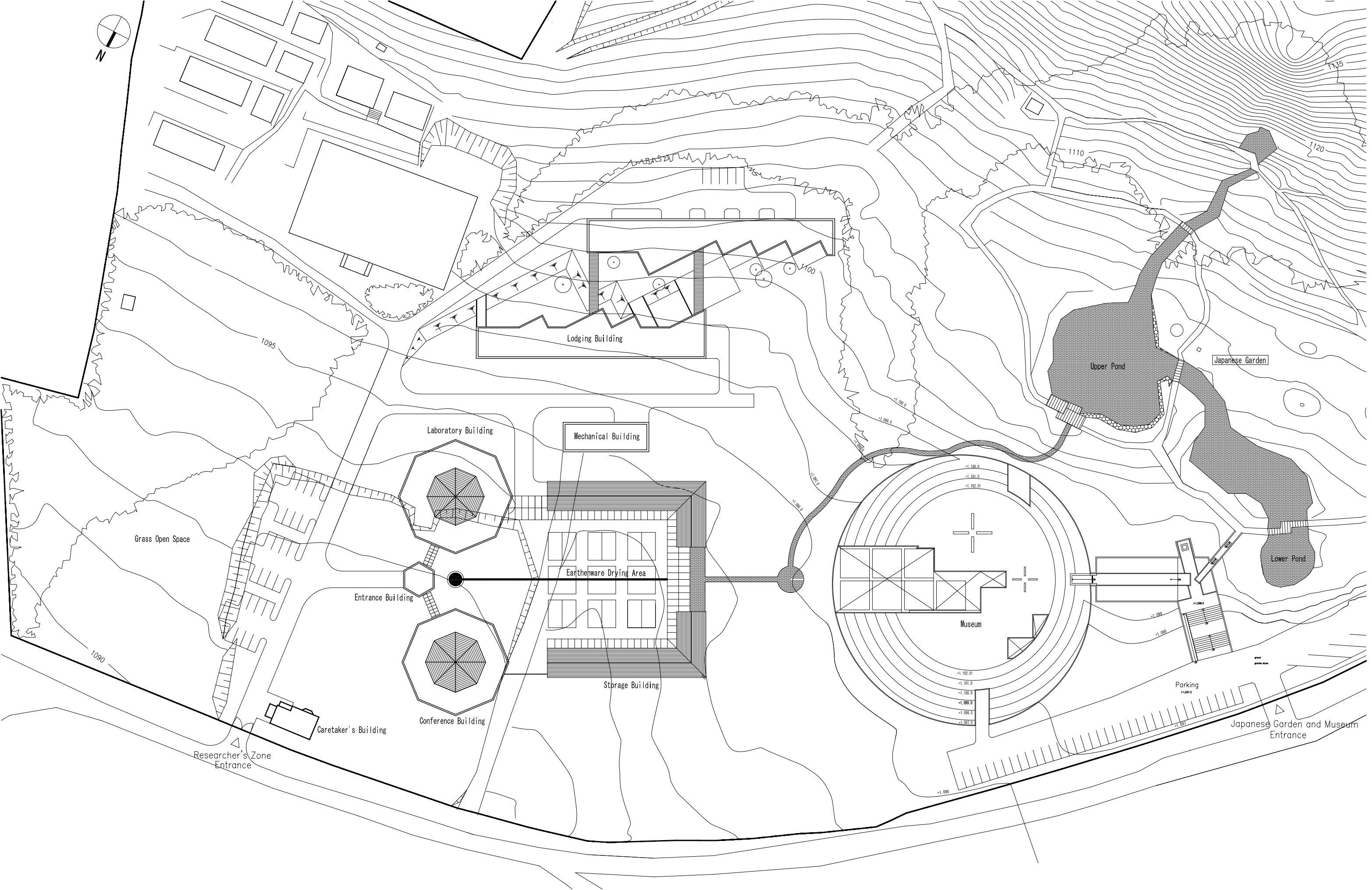
We will procure the required equipment for this Project in the following quantities according to the facility plan based on the previously described exhibit concept as well as the results of the above review.

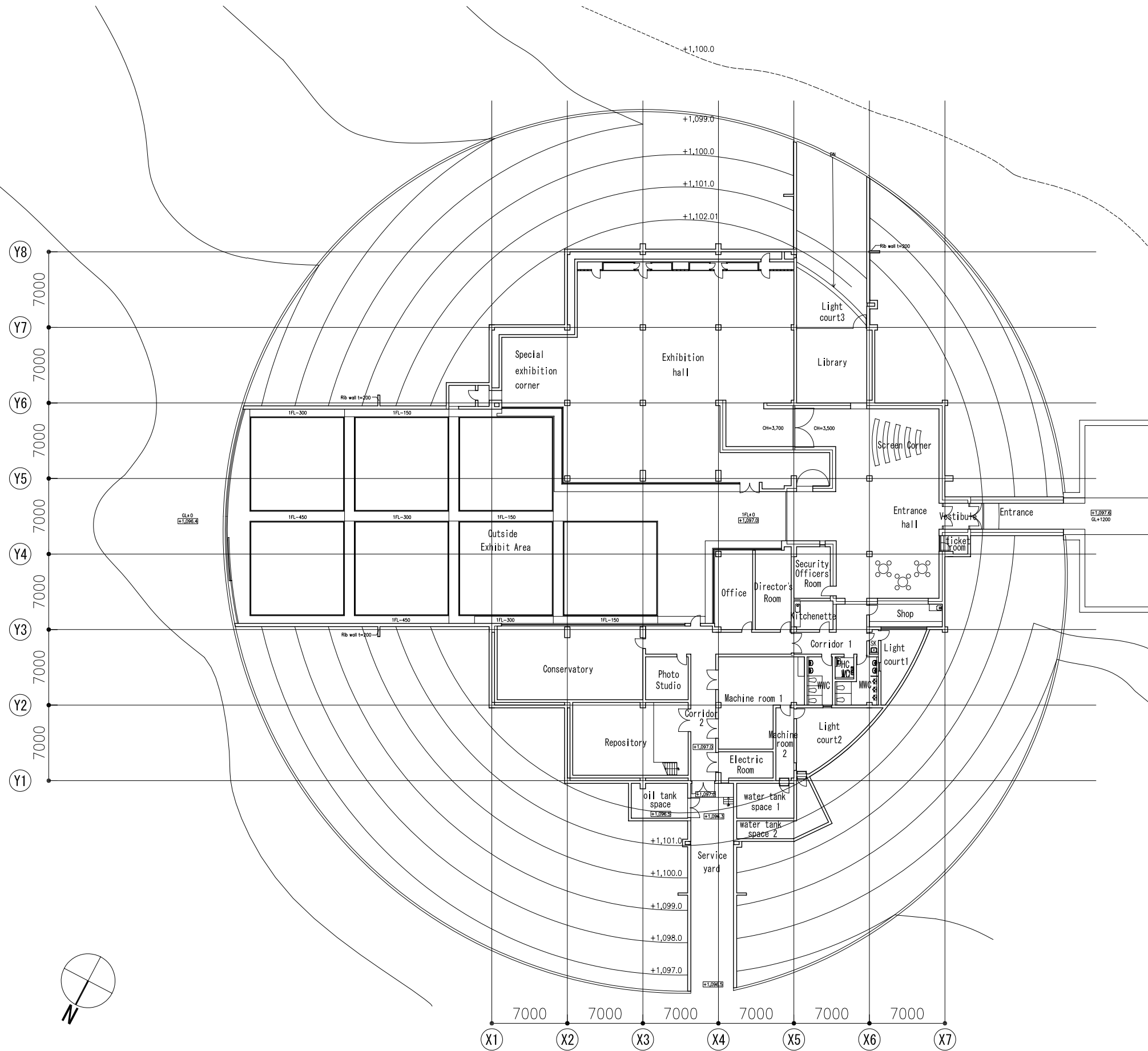
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| • Display cases | 17 units |
| • PC Projector | 1 unit (PC screen projector) |
| • Overhead projector | 1 unit |
| • Slide projector | 1 unit |
| • Screen system | 1 set |
| • DVD player | 2 units |
| • Video deck | 2 units |
| • 50” plasma monitor | 2 units for seminar use |
| • Repository safe (locker type) | 1 unit for valuables |
| • Ruins topographical model | 1 set to explain ruins structure |

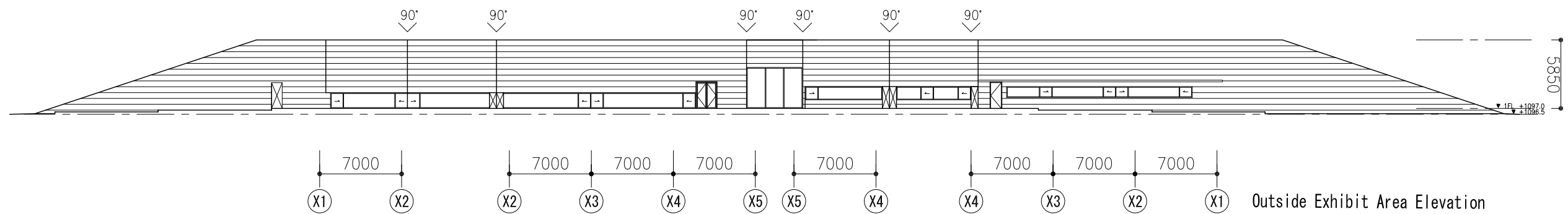
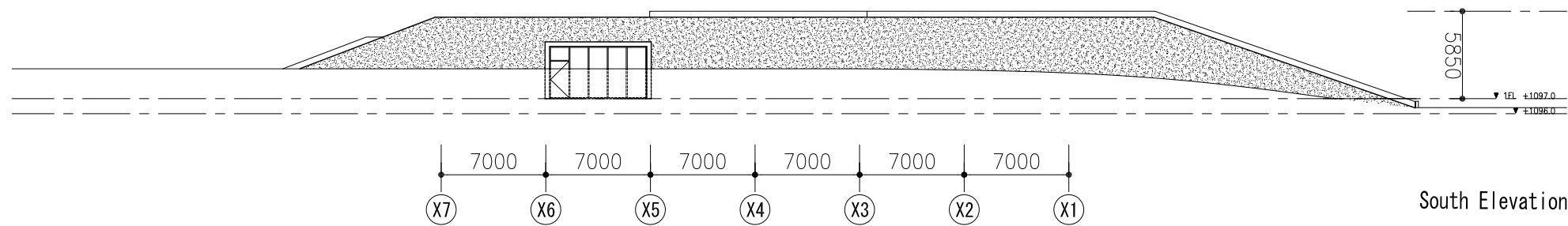
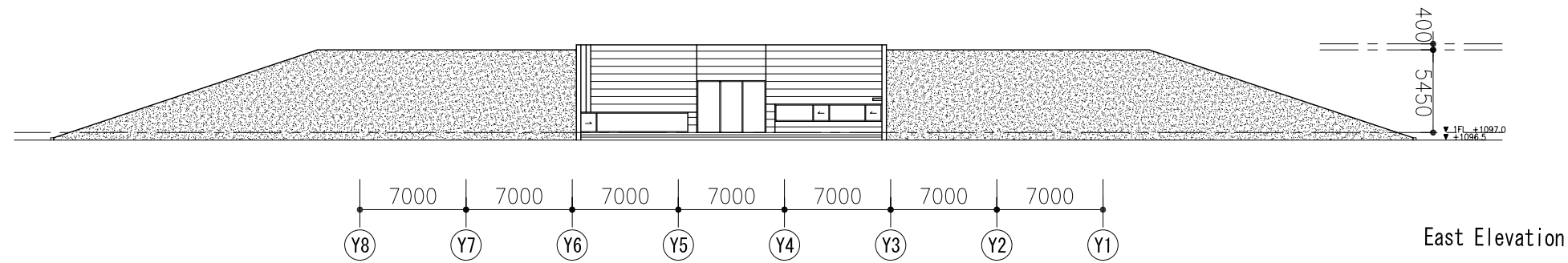
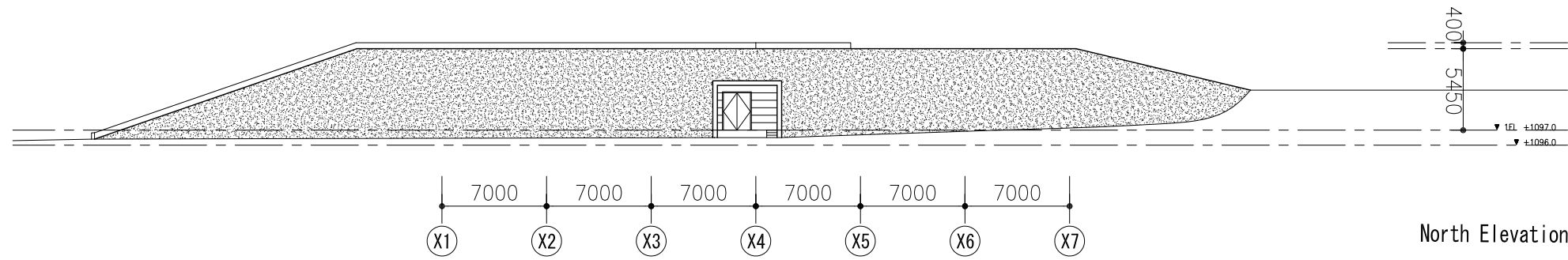
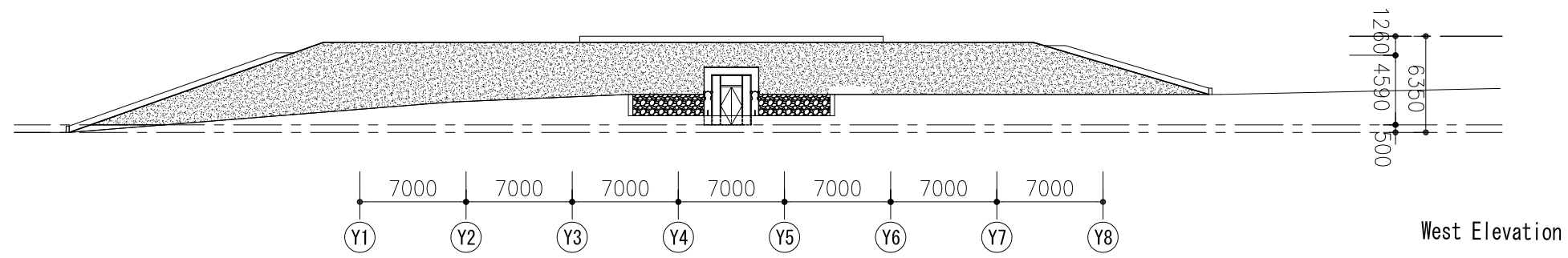
Table 2-8 Equipment Summary

Equipment	Major Specifications	Purpose	Quantity
Display cases	Steel frame, clear glass, case interior cloth covered plywood	To exhibit artifacts and explanatory materials	17 units
PC Projector	2000 lumens or more	To be used for educational visual lectures and visual aid for research	1 unit
Overhead projector	Compact type	For a variety of announcements by researchers. A variety of researchers can use it because it can be operated easily	1 unit
Slide projector	Tray for 50 or more slides	To present old and valuable material not available as digital data	1 unit
Screen system	Easy to assemble	For the PC projector, overhead projector and slide projector	1 unit
DVD player	Compatible with Turkish standards	To play educational DVDs presenting various activities and information relating to Turkish archeology	2 units
Video deck	Same as above	To play recorded images of the Kaman ruins from excavations made to date	2 units
Large flat TV monitor	50" plasma or LCD	To show visitors to the seminar corner and exhibition galleries the above images edited to several minutes to communicate and explain information	2 units
Repository safe	Quasi-fireproof, locker type	Used to store valuable excavated artifacts such as jewelry	1 unit
Ruins topographical model	Scale 1:100 resin molded, colored with some parts lighted and some moving parts	Used to explain the excavated ruins and their environment in detail at the site museum. This model has lighting and movement mechanisms in order to explain the multi-layered structure of the ruins in an easily understandable manner.	1 set

2-2-3 Basic Design Drawings and Equipment List







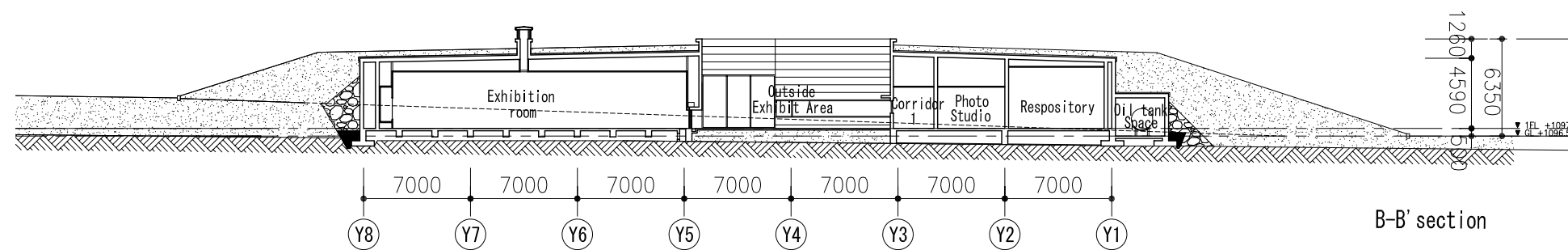
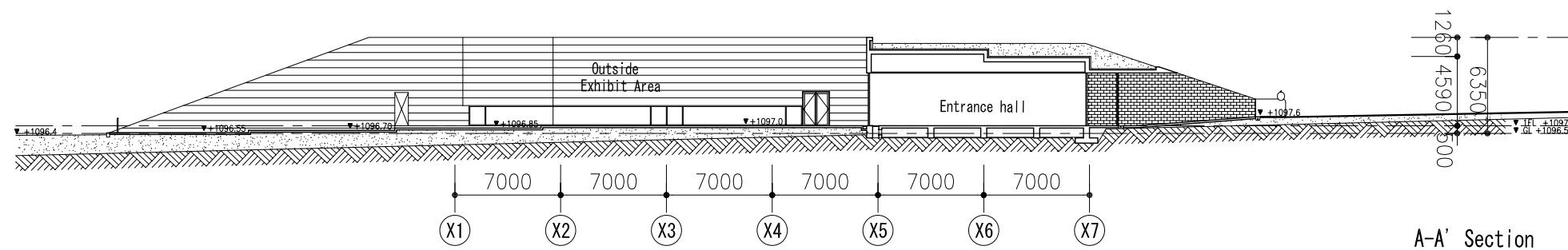
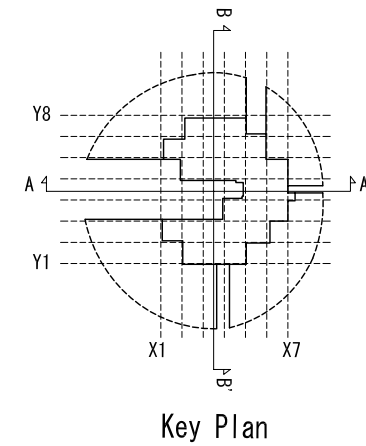


Table 2-9 Equipment List

Equipment	Major Specifications	Room	Quantity
Display cases	Steel frame, clear glass, case interior cloth covered plywood	Exhibition hall, Special exhibit corner	17 units
PC Projector	2000 lumens or more	Laboratory	1 unit
Overhead projector	Compact type	Same as above	1 unit
Slide projector	Tray for 50 or more slides	Same as above	1 unit
Screen system	Easy to assemble	Same as above	1 unit
DVD player	Compatible with Turkish standards	Exhibition hall(Screen corner), Special exhibit corner	2 units
Video deck	Same as above	Same as above	2 units
Large flat TV monitor	50" plasma or LCD	Same as above	2 units
Repository safe	Quasi-fireproof, locker type	Repository	1unit
Ruins topographical model	Scale 1:100 resin molded, colored with some parts lighted and some moving parts	Exhibition hall	1 set

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

(1) Basic Project Implementation

In order to implement this Project, a decision by the Cabinet of the Government of Japan is required, after related Japanese government organizations complete their reviews based on this report.

The Project, once approved by the Cabinet of the Government of Japan, moves to implementation after an Exchange of Notes (E/N) signed by the governments of both countries.

In this Project the Consultant, a Japanese corporation that is recommended by the independent government corporation Japan International Cooperation Agency (JICA), will create the detailed design and manage bidding, and the Contractor, also a Japanese corporation that is selected in the bidding, will construct the facility and procure equipment.

The Consultant and the Contractor will enter consulting and construction contracts respectively with the Turkish implementing agency according to the Japanese government Grant Aid system to execute the Project. These contracts must be approved by the Japanese government.

The Turkish government will make banking and tax exemption arrangements (sales tax, other taxation) in accordance with the Exchange of Notes signed by both countries.

(2) Project Implementation Structure

The Foreign Ministry of Turkey is responsible for signing the Exchange of Notes (E/N) between the two governments for Turkey to implement this Project.

The Turkish agency in charge that will execute this Project is the General Directorate for Cultural Heritage and Museums of the Ministry of Culture and Tourism. The agency will be responsible for the operations and maintenance management after it is implemented.

The Japanese Consultant will design the facility and inspect the construction while it is being performed.

The Japanese Contractor will perform construction, equipment procurement and installation.

(3) Consultant

The consulting company that enters a consulting contract with the Turkish implementing agency for this Project will be responsible for procedures required by the Japanese Grant Aid, facility design plans, bidding, and construction inspection.

Consultant's roles

- Design implementation of facilities (building and museum materials)
- Create necessary documents for bidding
- Execute bidding and confirm construction contract jointly with the Turkish implementing agency
- Inspect construction and delivery and installation of equipment for museum
- Prepare reports required for payment by the Japanese Grant Aid and execute handover of the completed facilities to Turkey.

(4) Contractor

A contractor will be selected from among Japanese contractors who bid under the observation of the Turkish implementing agency.

The selected contractor will enter the construction contract with the Turkish implementing agency.

Contractor's roles

- Construct facilities
- Deliver and install equipment
- Test run building and equipment to verify performance
- Transfer technology to operate equipment

2-2-4-2 Implementation Conditions

(1) General Construction Conditions and Local Characteristics

1) Construction Conditions

The Turkish construction industry is one that has accomplished significant growth lately, and the quality level is high due to construction investment from Europe and the U.S. However construction orders there are usually split up into small orders so the local construction companies have little experience as general contractors, and many are young companies that lack experience. There is no problem, however, to use them as subcontractors for a project like this Grant Aid Project which strictly requires accurate construction and meeting a construction schedule.

Public buildings are subject to Building Fire Protection Regulations. After completion of the building the Fire Department that has jurisdiction will confirm in writing fire protection and fire notification procedures when there is a fire.

2) Important Construction and Procurement Issues

The bearing ground level from 1.0 to 1.7m at the construction site consists of brown sandy-silt clay and granite gravel fill, and below 1.7m it is hard ground consisting of granite. We set the bearing ground level to be bedrock from 1.0 to 2.0m or below. Also, at the time of construction we will verify the bottom of the foundation.

We will gain an understanding of the technical level of manufacturers that will manufacture equipment to be procured locally, ensure that they understand the detailed designs, and instruct and supervise them. We will conduct quality inspections while equipment to be procured locally is being manufactured.

2-2-4-3 Scope of Works

In order to execute this Project with Japanese Grant Aid Japan and Turkey must perform their respective roles and cooperate closely. The allocation of roles of the two countries is as follows.

(1) Tasks to be Undertaken by Japan

Facility Construction

- Museum construction

Supply Equipment

- Supply Museum equipment

(2) Tasks to be Undertaken by Turkey

Preparations of site for construction

- Demolish and remove existing building foundations and underground utilities from within the site and level the site

Outdoor Work

- Prepare parking area
- Prepare detached toilet, etc (if required)

Display artifacts in exhibition hall

- Including exhibition software

Purchase and install furniture, fixtures and curtains that are outside the framework of Japan's Grant Aid

Tax exemption expenses: national taxes

Make arrangements between banks for payments of funds and fees for issuing A/P

Pay expenses outside the scope of the Japanese Grant Aid

- Expenses for inspections and supervision by Turkey

2-2-4-4 Consultant Supervision

(1) Basic Concepts and Important Issues regarding Detailed Design and Inspection

The Consultant, a Japanese corporation that has abundant experience in designing museum facilities and Grant Aid projects and that is capable of executing this Project will be recommended by the independent government corporation Japan International Cooperation Agency (JICA), and approved by the Government of the Republic of Turkey Ministry of Culture and Tourism to design facilities and

equipment for this Project. The Consultant will have repeated discussions with the Turkish government, conduct detailed design of the planned facility and museum equipment, create necessary bidding documents and select a contractor jointly with the responsible Turkish organization based on the basic design concept. During the inspection phase of construction it will dispatch full-time inspectors to inspect the contractors' quality and schedule management as well as to communicate with the Ministry of Culture and Tourism, Directorate General for Cultural Heritage and Museums and associated authorities.

Detailed Design

Create bidding documents (specifications, detailed drawings) for construction and equipment construction.

Perform Bidding and Construction Contract

Decide on construction contract guidelines, prepare construction contract draft, perform internal audits of construction cost breakdowns and select contractor (announce bidding, pre-qualify, evaluate bids and witness contract signing).

Examination and approval of shop drawings

Examine and approve shop drawings, construction plans, materials, finishing samples and facility and exhibition equipment submitted by the contractor.

Construction Guidance

Review construction plans and schedule plans and provide appropriate advice and guidance to the contractor.

Construction Progress Reports

Report construction progress to the owner and to related organizations, and call monthly meetings with Turkish parties and the contractor.

Assist in payment approval procedures

Assist in examination of construction invoices and procedures for payments to be made during and at

the completion of the construction.

Witness Inspections

Inspect the progress and quality of construction from the start to completion of construction.

One-year Defect Inspection

When one year passes after construction is completed, inspect the work the contractor performed for any defects and point out things to be repaired and confirm that the repair work is completed.

In order to perform the above-mentioned tasks the Consultant will have close communications and discussions with related Turkish and Japanese organizations, work to ensure the construction schedule progresses smoothly, and contribute to the exchange of construction and planning technology between Japan and Turkey. The Consultant will also provide appropriate advice and guidance on maintenance management after the handover.

(2) Construction Inspection System

The Consultant will provide one dedicated architect full-time during the construction period, and assign mechanical / electrical engineers for short periods according to the progress of construction to provide a full-time inspection system. The full-time inspector will inspect some of the procured equipment manufactured in Turkey. Meanwhile in Japan, the Consultant will perform inspection tasks including review and inspection of equipment procured in Japan, all types of communications and provide support to the on site full-time inspector. In addition, the Consultant will report the progress of this Project to the organizations related to the Japanese government.

2-2-4-5 Procurement Plan

Quality control will comply with the TSE (Turkish Standards Institution)

The consultant will decide the construction inspection policies, and clarify inspection schedule and

items.

The contractor will prepare construction plans prior to start of construction, obtain approval of the consultant and comply with the contents of the plans.

Limit the types of construction materials to be used in order to reduce the complexity of quality control.

2-2-4-6 Quality Control Plans

Use material and equipment that are locally available as much as possible for this Project so that maintenance management and replacement parts procurement will be easier. However, items will be procured from Japan in the following cases.

It is clear that quality control in the previous section will be hindered

It is not guaranteed that local products meet planned functions or performance

It is not possible to obtain a manufacturer's warranty locally

When the local price is clearly more expensive

Delivery

- There are 2 international trading ports in Istanbul, Turkey, Kumport and Haydarpaşa. Basically sea transport will be used to ship items from the countries where they are purchased.

Domestic ground transportation

- The planned site is located in Kaman, Kırşehir prefecture, and while ground transport distances from the port to the site is the long distance of 600km, there are no problems with the roads.

Major construction materials and equipment will be procured from the following countries.

Structural work

- Cement: made in Turkey

- Reinforcing steel bars: made in Turkey
- Aggregate: Purchased locally
- Mold forms: made in Turkey
- Concrete blocks: Made locally

Finishes, fixtures

- Tiles: made in Turkey
- Stone: made in Turkey
- Plastering material: made in Turkey
- Wooden fixtures: Locally manufactured with imported wood and made in Turkey
- Metal fixtures: made in Turkey
- Fixture hardware: made in Turkey
- Roof waterproofing: made in Turkey

Mechanical work

- Piping: Imported or made in Turkey
- Sanitary ware: made in Turkey

Electrical work

- Conduits and wiring material: Imported or made in Turkey
- Lighting fixtures: Imported or made in Turkey
- Panels and others: Imported or made in Turkey

Equipment work

Exhibition equipment consists mainly of display cases. Although some problems were detected in the finish of display cases when we surveyed them at similar facilities in Turkey, we decided to procure locally manufactured products. We decided to purchase AV equipment and projectors locally after reviewing maintenance, common availability in the market, abundance of types and quality, etc.

We decided to have the model, which is exhibition information equipment, procured in Japan because of problems in precision in manufacturing technology and for ease of inspection.

2-2-4-7 Implementation Schedule

If this Project is implemented with Japanese government Grant Aid, after an Exchange of Notes (E/N) is signed by the governments of both countries a design and supervision contract will be made between the Turkish government and the Consultant and then facility construction will be performed in 3 stages, including creation of detailed design drawings, bidding and construction contract, and construction work.

(1) Detailed Design Documents

The Consultant will prepare detailed design and bidding documents based on the contents of this basic design. That will include detailed design drawings, specifications and structural calculations. There will be close consultations with related Turkish organizations at the initial, mid-way and final stages of detailed design, and the bidding will start after the approval of the final document.

(2) Bidding

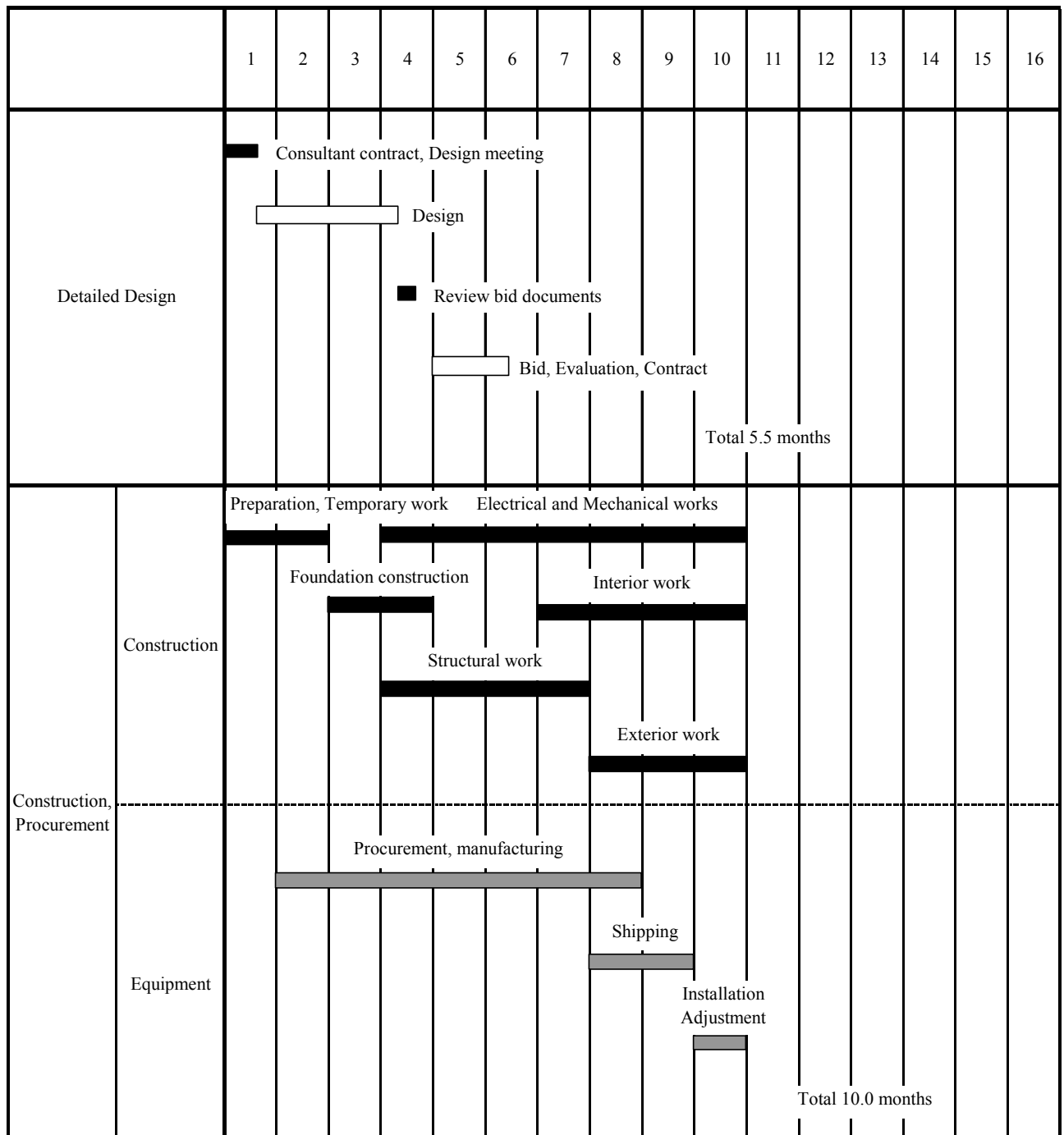
After the Consultant completes the detailed design, the Consultant will announce and perform qualification evaluation (P/Q) for participation in bidding in Japan on behalf of the implementing agency, the Ministry of Culture and Tourism, General Directorate for Cultural Heritage and Museums, and report results to them for approval. In this case equipment procurement will be included in the construction. Then based on the evaluation results, competitive bidding will be performed by the construction companies participating in the bidding in Japan, under the observation of related parties, and approval of the results will be obtained. After that, if the bid of the bidder that submitted the lowest bid is confirmed to be valid, then that bidder will be the winner, and will enter a construction contract with the above authority. The construction contract will become effective with the approval of the Japanese government. It will take approximately 5.5 months from the time the Consultant agreement is entered to complete.

detailed designs, bidding and to enter the construction contract.

(3) Construction Work (including procurement of equipment)

After the construction contract is concluded, construction will start with approval from the Japanese government. It is presumed that the period required for construction including procurement, delivery, installation and adjustment of equipment at the site will be approximately 10 months.

Table 2-9 Project Implementation Schedule



2-3 Obligations of Recipient Country

The tasks relating to implementation of this Project that are to be undertaken by the Republic of Turkey and their status are as follows.

Table 2-11 Tasks to be undertaken by the Republic of Turkey

	Responsibilities of the Republic of Turkey	Implementation Status
1	Secure land for the project.	Land has been secured.
2	Promptly remove structures on the land where construction of facilities is planned in order that there is no effect on the Project, and bear the entire cost of removal.	Removal of slabs on grade and other obstacles. (Planned for completion by December 2005)
3	Bear the entire cost of necessary infrastructure facilities to provide for equipment and construction of buildings (electricity, water supply, telephone connections etc).	Preparations completed
4	Build access roads as needed for construction.	Preparations completed
5	Construct site fencing, gates and parking areas as needed.	Fencing around the site is completed
6	Pay fees for Japanese banks such as advising commissions on authorization to pay (A/P) and payment commissions as determined by banking regulations.	
7	Provide for tariff exemption and other necessary procedures for the prompt customs clearance of materials needed for the Project.	
8	Exempt Japanese nationals or Japanese companies who are required to provide services or materials under verified contracts from payment of customs or national taxation or other fiscal levy in the Republic of Turkey.	
9	Guarantee Japanese nationals and personnel of Japanese companies who are required to provide services or materials under verified contracts the necessary permission to enter and stay in the Republic of Turkey.	
10	Issue the necessary permits and licenses for the Project.	
11	Prepare necessary supply and budget measures to implement this Project and deliberations correctly and effectively. In particular the Republic of Turkey will bear labor and other expenses for participation of counterparts in the deliberations.	
12	Secure personnel to conduct maintenance of existing and planned equipment, hold close discussions with the Study Group from the Study stage of this Project, and make efforts to acquire knowledge required for maintenance.	
13	Provide and assign increased number of capable teaching and other staff required to implement this Project smoothly.	
14	Bear all expenses not provided for by Japanese Grant Aid.	

2-4 Project Operation Plan

(1) Operations and Maintenance Management Organization

The operations and maintenance of this facility will be under the control of the Directorate General for Cultural Heritage and Museums, and the Museum Director will supervise daily management of operations and maintenance of the Kaman-Kalehöyük Archaeological Museum.

When this Project is completed the following new personnel will be required:

Museum Director (1), Curators (archeologists) (2), Researchers (2), Accountant (1), Security Officers (3), Secretary (1), Driver (1), Caretaker (1)

Total 12 personnel

These staff members to be assigned to the Kaman-Kalehöyük Archaeological Museum will be from the current staff of the Ministry of Culture and Tourism, or will be newly hired by the Ministry.

(2) Facility Maintenance Management

1) Facility Operations

It will be necessary to accommodate visitors to the Museum. The caretaker will be responsible for cleaning and other maintenance within the Museum under the direction of the Museum Director.

2) Building Maintenance Management

Periodic inspections will be required of the facilities including equipment, and consumables such as filters will need to be supplied and sometimes repairs will be necessary. Problems associated with technical maintenance management will be reported and implementation requested to the Ministry in Ankara. The Japanese Garden located nearby will continue to be managed by the Japan Institute of Anatolian Archeology as in the past.

3) Exhibit Maintenance Management

The permanent exhibits must be selected from a long-term point of view and must always be checked to make sure the contents of the exhibits are appropriate. Also, a system must be established to always be ready to

receive information on potential exhibition themes for special exhibit rooms, and it will be necessary to plan, create, exhibit and announce them.

2-5 Project Estimated Expenses

2-5-1 Grant Aid Estimated Expenses

A total of approximately 288 million yen is estimated to be the expense required when this Grant Aid Project is implemented, and an estimate of the expenses for both Japan and the Republic of Turkey based on the allocation of burden is shown in (3) below. This cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant.

(1) Expenses to be borne by Japan

Construction of the Museum and acquisition of equipment
(Museum floor area: about 1,308 m²)

Expense item		Estimated expense (million yen)	
Facilities	Museum construction	200	228
Equipment	Necessary equipment (Model of ruins, etc)	28	
Design and construction management		60	
Total		288	

(2) Expenses to be borne by the Republic of Turkey

Expense item	Estimated expense (YTL)
Site preparation, removal of obstacles	80,000
Spread gravel on parking area	15,000
Separate buildings (if necessary)	20,000
Total	115,000

(3) Cost estimate conditions

1) Date of estimate: March 2005

2) Currency conversion rate

1US\$ = 107.02 yen (average rate from September 1, 2004 to February 28, 2005)

1 new Turkish lira (YTL) = 75.36 yen (same conditions as above)

- 3) Construction period: Detailed design and construction period are shown in the Project implementation schedule.
- 4) Others: This plan is to be implemented in accordance with the Japanese Government Grant Aid system.

2-5-2 Operations and Maintenance Management Costs

The following are facility maintenance expenses that will be incurred after this Project is completed.

Table 2-12 Facility Maintenance Expenses

Item	Amount (YTL)	Remarks
Electricity	26,325	175,500kWh@0.15YTL/kWh
Water	3,150	15×80l + 300×10l×300/day @2.5YTL/m ³
Heating and hot water (heavy oil)	25,585	161,181 k Wh/year ÷10,080kWh/m ³ , @1,600YTL/m ³
Equipment maintenance expense	6,075	Boiler, transformer, generator etc.
Total	61,135	

Calculation basis: Museum to be open 300 days out of the year, from 9:00 AM to 5:00 PM

: The caretaker will do the cleaning so it is not included in this calculation.

The Treasury of the Republic of Turkey collects admission fees for admission to all of the museums and cultural heritage sites that it supervises, and it allocates an amount for the operating budget of all of the museums (187 museums in the country) each fiscal year.

The annual maintenance management expenses for this facility are estimated to be around 61,135 TYL . That is about 1.0 % of the annual operating maintenance management budget of the Directorate General for Cultural Heritage and Museums, but the maintenance management expenses are not the same for all museums, and furthermore the sum is not greatly different compared to that of other similar facilities, so overall it is determined that it is not a problem.

CHAPTER 3
PROJECT EVALUATION AND RECOMMENDATION

CHAPTER 3 PROJECT EVALUATION AND RECOMMENDATION

3-1 Project Effect

In Turkey despite the abundance of cultural assets, there are not sufficient budgetary and human resources to handle them, and there isn't any place to display artifacts excavated at the Kaman-Kalehöyük ruins yet. This Project will improve the situation by establishing Kalehöyük Museum which will be equipped with exhibit rooms and a conservation and restoration center, and will meet the objectives of protecting and developing the cultural heritage. It is very rare to have an archeological museum located next to ruins and an archeological research institute and it is expected that improved operations will be achieved taking advantage of synergetic effects.

The following benefits are expected when this Project is implemented.

Current situation and problems	Measures included in this Project (Grant Aid Project)	Extent of effects and improvements
1. The excavations of the Kaman-Kalehöyük ruins began nearly 20 years ago but most of the excavated artifacts have just been kept in storage and have never been exhibited.	<ul style="list-style-type: none">• Set up exhibition rooms.	<ul style="list-style-type: none">• The few artifacts that have been dug up from the Kaman-Kalehöyük ruins and exhibited at the Kırşehir Museum will be transferred and systematically exhibited.

<p>2. There have been few locations where archeologists and restoration specialists could be trained on site on most of the cultural heritage of Turkey.</p>	<ul style="list-style-type: none"> • Set up a laboratory (a room for preservation and restoration) within the Museum. 	<ul style="list-style-type: none"> • Training will be conducted regularly using the laboratory for On the Job Training (for 30 people each year). • By setting up a network with the Japanese Institute of Anatolian Archaeology actual research can be conducted at the excavation site.
<p>3. Even though local residents assist with the excavation they have no knowledge or information on the ruins or excavated artifacts.</p>	<ul style="list-style-type: none"> • Set up exhibition rooms, a special exhibition corner and a seminar corner. 	<ul style="list-style-type: none"> • The past and current excavation status of the Kalehöyük ruins and cultural chronicles will be displayed in the exhibition rooms. • Information on the ruins and artifacts will always be provided in the seminar corner. • The special exhibition corner will have new style themes on Turkey's cultural heritage, or will provide new information on the Kalehöyük ruins.

There will also be the following indirect effects

- (1) It is very important, especially for Turkey that has ruins everywhere close to where people live, to create interest in archeology from childhood among its people. That will foster each citizen's awareness of conservation of their cultural heritage in the future. The Japanese Institute of Anatolian Archeology has been providing elementary education on archeology to neighborhood children and there will be more effective education opportunities through exposure to exhibits of actual artifacts at the Museum.

- (2) There is now a Japanese Garden (The Mikasanomiya Memorial Garden) on the site of the Japanese Institute of Anatolian Archeology, in other words next to the site of this Museum. The garden has been a relaxing spot with its abundant greenery for neighborhood residents drawing 30,000 visitors annually since it opened in 1993 to commemorate excavation of the Kalehöyük ruins. Many local residents want a sightseeing development in the area and it is that expected that completion of the Museum near the Kalehöyük ruins will be effective in bringing in more visitors to Kaman and revitalizing it.

The following are Project result indicators listed in the preliminary evaluation.

- (1) Business objective result indicators

The number of people that obtain correct information on the Kaman-Kalehöyük ruins exceeds 30,000 after the Project is implemented (the number of people that visit the Japanese Garden annually).

There will be more comprehensive training for restoration and conservation (currently training is provided by JIAA and there are no museum results).

- (2) Result indicators to be used after the Project

The following numbers will be used as indicators for evaluation after the Project.

Number of visitors to the Kaman-Kalehöyük Museum

The numbers of seminars, days of training and trainees

It will be possible to conduct and verify a baseline study using the result indicators for the Museum and Institute. The timing of this evaluation will be after 2009.

3-2 Recommendation

We think that the following are issues that Turkey will need to address in order to realize and maintain the results of this Project.

(1) Exhibition Management

The Kaman-Kalehöyük Museum will have a special exhibit corner in addition to the permanent exhibit room and its theme must always be up to date. It is desirable that a network be established to get the latest information not just on the Kaman-Kalehöyük ruins, but on the cultural heritage of the nation and prefecture as well for special exhibits so that exhibits can be changed and information can always be kept up to date for museum visitors.

(2) Announcements and exhibitions of efforts to preserve the cultural heritage

It is desirable to announce and display the status all of the excavations and preservation surveys of cultural heritage that the Ministry of Culture and Tourism is currently conducting, for example as at the Museum of Anatolian Civilizations, to the general public and foreigners that visit the site. We believe that by understanding how the government is trying to preserve cultural heritage citizens' interest in their cultural heritage will deepen.

(3) Preventive maintenance management

It is necessary to secure personnel and budget to organize preventive maintenance systems under responsible persons in order to provide maintenance management of facilities and equipment set up under this plan.

APPENDICES

1. Member List of the Study Team

(1) The Basic Design Study (February 20 ~ March 18, 2005)

Name	Assignment	Present Post
Makoto ASHINO	Team Leader	Deputy Resident Representative, JICA Turkey Office
Nobutaka KONDO	Project Coordinator	Staff, Living Conditions Improvement Team, Grand Aid Management Department, JICA
Shinji NAKAZAWA	Chief Consultant / Construction Planning / Operation & Maintenance Planning	Ishimoto Architectural & Engineering Firm, Inc.
Shuji NOSE	Facility Designing / Construction Cost Estimate	Ishimoto Architectural & Engineering Firm, Inc.
Hirohumi NAGAKANE	Exhibition & Equipment Planning / Equipment Cost Estimate	Ishimoto Architectural & Engineering Firm, Inc.

(2) The Explanation of the Basic Design Study Report (June 5 ~ June 15 , 2005)

Name	Assignment	Present Post
Satoshi UMENAGA	Team Leader	Deputy Resident Representative, JICA Turkey Office
Shinji NAKAZAWA	Chief Consultant / Construction Planning / Operation & Maintenance Planning	Ishimoto Architectural & Engineering Firm, Inc.
Hirohumi NAGAKANE	Exhibition & Equipment Planning / Equipment Cost Estimate	Ishimoto Architectural & Engineering Firm, Inc.

2. Site Study Schedule

(1) The Basic Design Study

	Date		Project Coordinator	Chief Consultant Construction Planning Operation & Maintenance Planning	Facility Designing Construction Cost Estimate	Exhibition & Equipment Planning Equipment Cost Estimate	
			KONDO Nobutaka	NAKAZAWA Shinji	NOSE Shuji	NAGAKANE Hirofumi	
1	20-Feb	Sun	Narita Istanbul (14:25-19:55 [JL5091]) Istanbul Ankara (22:00-23:00 [TK160])				
2	21-Feb	Mon	(AM) Meeting with JICA Office, Courtesy call to EOJ (PM) Courtesy Call and Kick-off Meeting with the Ministry of Culture & Tourism (MCT)				
3	22-Feb	Tue	Inspection of Kaman-Kalehyok Site				
4	23-Feb	Wed	Discussion with MCT (Confirm Project position within Superordinate Plan, Confirmation of the Contents of the Request)				
5	24-Feb	Thu	Reassignment to local consultant, study cost estimate, create Maintenance Management Plan				
6	25-Feb	Fri	Reviewed and signed the Minutes				
7	26-Feb	Sat	Surveyed similar facilities (The Museum of Anatolian Civilization, etc)				
8	27-Feb	Sun	Surveyed similar facilities (Bogazkale area), internal meeting				Narita Ankara
9	28-Feb	Mon	Reported to EOJ and JICA Ankara Istanbul	Reported to EOJ and JICA, Studied The Museum of Anatolian Civilization	Reported to EOJ and JICA, Studied procurement and transportation of construction materials	Reported to EOJ and JICA, Studied The Museum of Anatolian Civilization	
10	1-Mar	Tue	Arrived Narita (12:25)	Discussion with local consultant	Studied procurement and transportation of construction materials	Studied procurement and transportation of equipment	
11	2-Mar	Wed		Surveyed similar facilities (Natural History Museum) Studied price of construction material and equipment			
12	3-Mar	Thu		Surveyed similar facilities (Kırşehir Museum, Kayseri Museum)			
13	4-Mar	Fri		Surveyed similar facilities (Ataturk Mausoleum), reassignment contract, discussion with Dr. Omura	Studied construction material prices, discussions with Dr. Omura	Surveyed similar facilities (Ataturk Mausoleum), discussion with Dr. Omura	
14	5-Mar	Sat		Facilities and equipment planning, exhibit planning, Operation & maintenance management planning			
15	6-Mar	Sun		Surveyed similar facilities (Gordion), internal meeting			
16	7-Mar	Mon		Planned operations & maintenance management, Planned facilities and equipment, studied construction material and equipment prices			
17	8-Mar	Tue		Toured Kaman site and Anatolian Research Institute, held discussions with Dr. Omura			
18	9-Mar	Wed		Organized materials	Discussions and confirmed cooperation plan, maintenance management and operation plans with MCT		
19	10-Mar	Thu		Organized Study results	Studied price and distribution of construction materials and equipment		
20	11-Mar	Fri		Organized materials, Discussions with MCT (collected questionnaire)	Studied procurement and transport of construction material	Studied unit price, procurement and transport of equipment	
21	12-Mar	Sat		Summarized Study results			
22	13-Mar	Sun		Summarized Study results, internal meeting			
23	14-Mar	Mon		Discussions with MCT (collected questionnaire)	Studied urban infrastructure, related regulations & laws	Studied unit price, procurement and transport of equipment	
24	15-Mar	Tue		Reported to JICA, held discussions with MCT (discussed and confirmed Grant Aid plans)			
25	16-Mar	Wed		Reported to EOJ, held discussions with MCT (discussed and confirmed Grant Aid plans)			
26	17-Mar	Thu		Organized materials Ankara Istanbul (15:00-16:00 [TK131])			
27	18-Mar	Fri		Arrived Narita (12:25)			

(2) The Explanation of the Basic Design Study Report

	Date (day)		Chief Consultant Construction Planning Operation & Maintenance Planning	Exhibition & Equipment Planning Equipment Cost Estimate
			NAKAZAWA Shinji	NAGAKANE Hirofumi
1	5-Jun	Sun	Narita Vienna (10 : 40 - 15 : 55 [OS052]) Vienna Ankara (17 : 00 - 20 : 30 [TK1890])	
2	6-Jun	Mon	(AM) Discussions at JICA office	(PM) Discussions at Ministry of Culture and Tourism
3	7-Jun	Tue	(AM) Courtesy call to EOJ	(PM) Discussions at Ministry of Culture and Tourism
4	8-Jun	Wed	(AM) Supplementary study	(PM) Discussions at Ministry of Culture and Tourism
5	9-Jun	Thu	(AM) Discussions at JICA office	(PM) Supplementary study
6	10-Jun	Fri	(AM) Discussions at Ministry of Culture and Tourism	(PM) Discussions at Ministry of Culture and Tourism
7	11-Jun	Sat	Visit Kaman site, meeting with Dr. Omura	
8	12-Jun	Sun	Study Museum of Anatolian Civilization	
9	13-Jun	Mon	(AM) Organize materials (PM) Discussions at Ministry of Culture and Tourism (regarding signing of minutes)	
10	14-Jun	Tue	Ankara Istanbul Istnbul Narita (13 : 00 - 14 : 00 [TK127]) (18:00 - 11:25 [JL5092])	
11	15-Jun	Wed	Narita (11:25)	

3. List of Parties Concerned in the Republic of Turkey

The Republic of Turkey

- 1) Prime Ministry Undersecretariat of State Planning Organization (SPO)

Mr. Haluk Sürel	Directorate General of Social Sectors and Coordination, Department of Social Research (in charge of JICA)
Ms. Semra Şen	Ditto (in charge of Culture)
- 2) Ministry of Culture and Tourism

Mr. Zeynel Koç	Deputy Undersecretary
Mr. Nadir Alpaslan	Deputy Undersecretary
Mr. Nadir Avcı	General Director, Directorate General for Cultural Heritage and Museums
Mr. Yalçın Kurt	Deputy Director General, (in charge of Maintenance Planning and Coordination; Restoration and Construction)
Mr. İlhan Kaymaz	Deputy Director General, (in charge of Museum and External Relation; Excavation and Research)
Ms. Şermin Özduvan	Advisor to the Minister
Ms. Zahide Olşen	Director, Division of Restoration and Construction
Mr. Hüseyin Öztürk	Director, Division of Museum and External Relation
Ms. Yıldız Berkkan	Acting Section Director, Ditto
Ms. Demet Gürol	Architect, Division of Restoration and Construction
Ms. Berna Görgün	Architect, Ditto
Mr. Hasan Fırat Diker	Assistant Architect, Ditto
- 3) The Museum of Anatolian Civilizations

Mr. Hikmet Denizli	Director
Mr. Mustafa Metin	Archaeologist

4) Kaman City / Kaman County

Mr. Suleyman Erdoğan County Governor

Mr. Turgut Aslan Meyer

5) Çağırkan Village

Mr. Halis Baş Village Chief

Japan

1) Embassy of Japan in Turkey

Mr. Tomoyuki Abe Ambassador

Ms. Sanae Yajima Attache

Mr. Mitsuhiro Toyama Second Secretary

2) Japan International Cooperation Agency Turkey Office

Mr. Mitsuo Nakamura Resident Representative

Mr. Makoto Ashino Deputy Resident Representative

Mr. Satoshi Umenaga Deputy Resident Representative

Ms. Mayumi Sakamoto Assistant Resident Representative

Mr. Emin Özdamar Head of Technical Cooperation Division

Ms. Eser Canalıoğlu

3) The Middle Eastern Culture Center in Japan

Dr. Sachihiko Omura Research Director

4) Japanese Institute of Anatolian Archaeology

Ms. Deniz Erbişim General Secretary

4. Minutes of Discussions

(1) The Basic Design Study

**Minutes of Discussions
on the Basic Design Study
on the Project for the Construction
of Kaman-Kalehöyük Archaeological Museum
in the Republic of Turkey**

In response to the request from the Government of the Republic of Turkey, the Government of Japan decided to conduct a Basic Design Study on "The Project for the Construction of Kaman-Kalehöyük Archaeological Museum" (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Turkey the Basic Design Study Team (hereinafter referred to as "the Team"), headed by Mr. Makoto Ashino, the Deputy Resident Representative of the JICA Turkey Office, and is scheduled to stay in the country from February 20 to March 17, 2005.

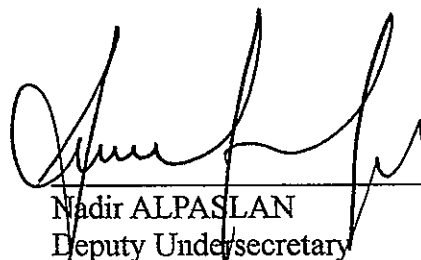
The Team held discussions with the officials concerned of the Government of Turkey and conducted a field survey at the study area.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets in principle. It is agreed that the required procedures will be executed when the further works and procedures are to be submitted to the Ministry of Culture and Tourism thorough the Japanese Embassy and the Turkish Ministry of Foreign Affairs. The Team will proceed to further works and prepare the Basic Design Study Report.

Ankara, 25 February, 2005

荻野 誠

Makoto ASHINO
Leader
Basic Design Study Team
Japan International Cooperation Agency



Nadir ALPASLAN
Deputy Undersecretary
Ministry of Culture and Tourism
Republic of Turkey

ATTACHMENT

1. Objective

The objective of the Project is to build a museum near Kaman-Kalehöyük Archaeological Site to conserve and interpret the cultural heritage of the site.

2. Project Site

The site of the Project is located about 1.5 km south from Kaman-Kalehöyük archaeological site adjacent to the Japanese Institute of Anatolian Archaeology as shown in Annex-1.

3. Responsible and Implementing Organizations

The responsible and implementing organization of the Project is the Ministry of Culture and Tourism (MCT). The organization chart of implementing agency is shown in Annex-2.

4. Items Requested by the Turkish Government

After discussions with the Team, the building of the museum and the equipment for the museum described in Annex-3 were finally requested by the Turkish side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

- (1) The Turkish side understands the Japan's Grant Aid scheme and the necessary measures to be taken by the Government of Turkey explained by the Team as described in Annex-4.
- (2) The Turkish side will take necessary measures, as described in Annex-5, for smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

6. Schedule of the study

- (1) The consultants will proceed to further study in Turkey by March 17, 2005.
- (2) JICA will prepare the draft report in English and dispatch a mission to Turkey in order to explain its contents around the end of May, 2005.
- (3) In case that the contents of the report is accepted in principle by the Government of Turkey, JICA will complete the final report and send it to the Government of Turkey by the end of August, 2005.

7. Other Relevant Issues

- (1) The Turkish side shall secure and allocate enough budget and qualified staff to operate and maintain the buildings and the equipment built and supplied by the Japan's Grant Aid

properly and effectively.

- (2) The museum to be constructed should not be a property of Province but a property of Turkish government according to the Grant Aid scheme. (Grant Aid can be provided only to a government.)
- (3) The Turkish side agrees that the museum would have the following functions:
 - To provide concise information on the archaeological site of Kaman-Kalehoyuk.
 - To hold seminars to the researchers/people or history classes to local students to enhance general archaeological level in Turkey.
 - To provide interactive exhibit in order that the visitors can touch some of the samples from the excavation site directly and experience ancient times.
- (4) The Turkish side guarantees that no archaeological relics exist under the planned construction site.
- (5) Both sides agree that the size of the museum cannot exceed 1,300 m².
- (6) Regarding exhibition in the museum, both sides agree on the following issues:
 - The exhibition scenario, policy and plan should be discussed during the stay of the study team.
 - The content of the exhibition (explanations, videos, photos, etc.) shall be prepared by the Turkish side.
 - The explanation in the exhibits will be described in Turkish, English and Japanese language.
- (7) The Turkish side shall remove the existing base in the planned construction site by the end of December, 2005.
- (8) The Turkish side shall ensure prompt tax exemption and customs clearance of the products at the terminal of disembarkation.
- (9) The Turkish side shall exempt from VAT concerning local procurement of goods and services under the Project to a Japanese contractor. The way of exemption should be determined by the middle of May, 2005.
- (10) The Turkish side understands that another official request on technical cooperation, etc. should be submitted through diplomatic channels such as the Embassy of Japan and/or the JICA Office.



Organization Chart of Implementing Agency

MINISTER

UNDERSECRETARY

Deputy
Undersecretary

Deputy
Undersecretary

Deputy
Undersecretary

Deputy
Undersecretary

MAIN SERVICE UNITS

Directorate General for
Fine Arts

Directorate General for
Cultural Heritage and
Museums

Directorate General for
Libraries and Publications

Directorate General for
Copyrights and Cinema

Directorate General for
Investments and
Establishments

Directorate General for
Research and Education

Directorate General for
Promotions

Headship for
National Library

Headship for
International Affairs and
European Union Coordination

UNITS FOR COUNSELLING AND SUPERVISION

Headship for
Inspection
Board

Headship for
Research,
Planning and
Coordination Board

Law
Consultancy

Minister
Counsellors

Consultancy of
Press and
Public Relations

SUBSIDIARY SERVICE UNITS

Personnel
Department

Administrative and
Financial Department

Secretariat of
Defence

Private
Secretariat

Tentative list of the content requested by the Turkish side

The design is to be discussed between the Turkish side and the study team and shall be determined during the stay of the team.

Basically, the Japanese side will provide the building with the equipment which the study team find necessary for the museum to operate in such manner that serves the main function of the museum and the design.

(Functions/Area size to be included in the Archaeological Museum)

Exhibition space: 450 m²

Multipurpose room for seminar, library and laboratory: 100 m²

Storage: 100 m²

Office space: 100 m²

Photography studio: 20 m²

Canteen: 30 m²

Others: 500 m²

(Equipment to be procured)

Showcase

Beamer

Overhead projector

Slide projector

DVD player

Video player

Television

Computer terminal for exhibition

Screen system

Touch panel computer

JAPAN'S GRANT AID

The Grant Aid scheme provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

Japan's Grant Aid scheme is executed through the following procedures:

- Application (Request made by the recipient country)
- Study (Basic Design Study conducted by JICA)
- Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet)
- Determination of Implementation
(The Note exchanged between the Governments of Japan and recipient country)

Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study) using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Scheme, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

(1) Contents of the study

The aim of the Basic Design Study (hereafter referred to as "the Study") conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.
- Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grant Aid scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA. The consultant firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

(1) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

(2) "The period of the Grant Aid" means the one fiscal year, which the Cabinet approves, the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as national disaster, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

(3) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, consulting, constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(4) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(5) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:

- a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction,
- b) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
- c) To secure buildings prior to the procurement in case the installation of the equipment,

- d) To ensure all the expenses and prompt excursion for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
- e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,
- f) To accord Japanese nationals, whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(6) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

(7) "Re-export"

The products purchased under the Grant Aid should not be re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.

Major undertakings to be taken by each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1.	To secure land		●
2.	To clear, level and reclaim the site when needed *1)		●
3.	To construct gates and fences in and around the site *2)		●
4.	To construct the parking lot		●
5.	To construct roads		
	1) Within the site	●	
	2) Outside the site *3)		●
6.	To construct the buildings	●	
7.	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distributing line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm, sewer and others) to the site		(●)
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		(●)
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
8.	To bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
9.	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
10.	To accord Japanese nationals, whose services may be required in connection with the supply of the products and the services under the verified contract, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.		●
11.	To exempt Japanese nationals from any internal tax and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.		●
12.	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant.		●
13.	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment.		●

(B/A: Banking Arrangement, A/P: Authorization to Pay)

Minutes of Discussions

(2) The Explanation of the Basic Design Study Report

Minutes of Discussions
on the Basic Design Study
on the Project for the Construction
of Kaman-Kalehöyük Archaeological Museum
in the Republic of Turkey
(Explanation of Draft Final Report)

In February 2005, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for the Construction of the Kaman-Kalehöyük Archaeological Museum (hereinafter referred to as the "Project") to the Republic of Turkey (hereinafter referred to as "Turkey"), and through discussions with the Directorate General for Cultural Heritage and Museums, the Ministry of Culture and Tourism, field survey, and technical examination of the results in Japan, JICA prepared a draft final report of the study.

In order to explain and to consult with concerned officials of Turkey on the components of the draft final report, JICA sent to Turkey the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Satoshi Umenaga, Deputy Resident Representative, JICA Turkey Office, from June 5 to June 14, 2005.

As a result of discussions, both sides confirmed the main items described on the attached sheet.

Ankara, 22 June, 2005

梅永 哲

Satoshi UMENAGA
Leader
Basic Design Study Team
Japan International Cooperation Agency



Zeynel KOÇ
Deputy Undersecretary
Ministry of Culture and Tourism
Republic of Turkey

ATTACHMENT

1. Components of the Draft Final Report

Both sides have discussed and compromised on the components of the draft final report explained by the Team. The exhibition concept was proposed referring to the scientific comments and information of experiences by the Japanese Institute of Anatolian Archeology.

The final decision will be made by the Government of Japan based on the examination of the result of the Basic Design Study.

2. Japan's Grant Aid Scheme

The Turkish side appreciates the Japan's Grant Aid scheme and the necessary undertakings to be taken by the Government of Turkey as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both sides on February 25, 2005, and Annex-1 and Annex-2 of this Minutes of Discussion.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of Turkey by the end of August, 2005.

4. Other Relevant Issues

- 4-1 The Turkish side has appreciated the schedule of the Project after the Exchange of Notes (E/N).
- 4-2 The Turkish side has guaranteed to establish a system to promote this project under the Directorate General for Cultural Heritage and Museums, the Ministry of Culture and Tourism.
- 4-3 The Turkish side shall allocate sufficient budget and qualified staff to properly and effectively operate/maintain the equipment and facilities.
- 4-4 Both sides have agreed to encourage that the museum would have the following special facilities in addition to the generally accepted museological values:
- To provide concise information on the archaeological site of Kaman-Kalehöyük.
 - To hold seminars to the researchers/people or history classes to students to enhance general archaeological level in Turkey.
 - To provide interactive exhibit in order that the visitors can touch some of the samples from the excavation site directly and experience ancient times.
- 4-5 The Turkish side will make the best effort to invite people to the museum in any way such as utilizing the report of Japanese side.
- 4-6 Taking into account allocated budget, Japanese side stated that in order to give priority

to the museum and maximize its scale, previously requested official residence, detached toilet and car parking pavement will not be undertaken by Japanese side.

4-7 The Turkish side shall complete the following works described below.

- Removal of the existing base in the planned construction site by the end of December, 2005.
- To develop car parking pavement.
- To develop other social facilities such as restroom, if necessary.
- To keep grass on the mound of the building in good condition, which will be sowed by Japanese side.

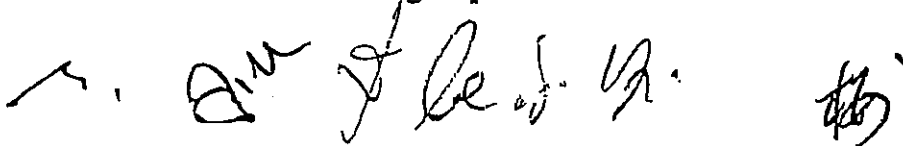
4-8 Regarding exhibition in the museum, both sides have agreed on the following issues:

- The Turkish side shall determine the exhibit objects (movable cultural properties) of the Blank Period referring to the exhibit zoning of the Draft Final Report (page 23), and the other objects to be exhibited shall be determined with mutual cooperation by both sides, by the end of October, 2005.
- The content of the exhibition (explanations, videos, photos, etc.) shall be prepared by the Turkish side in close cooperation with Japanese side by the end of December, 2006, and the exhibit will be installed within one month prior to the opening of the museum.
- The explanation in the exhibits will be described in Turkish, English and Japanese language. Turkish and English versions will be prepared by Turkish side and submitted to Japanese side by the end of October, 2006. The Japanese version of the explanation of exhibits will be prepared by Japanese side and submitted to Turkish side within two months. Panels in three languages will be prepared by Turkish side by the opening of the museum.

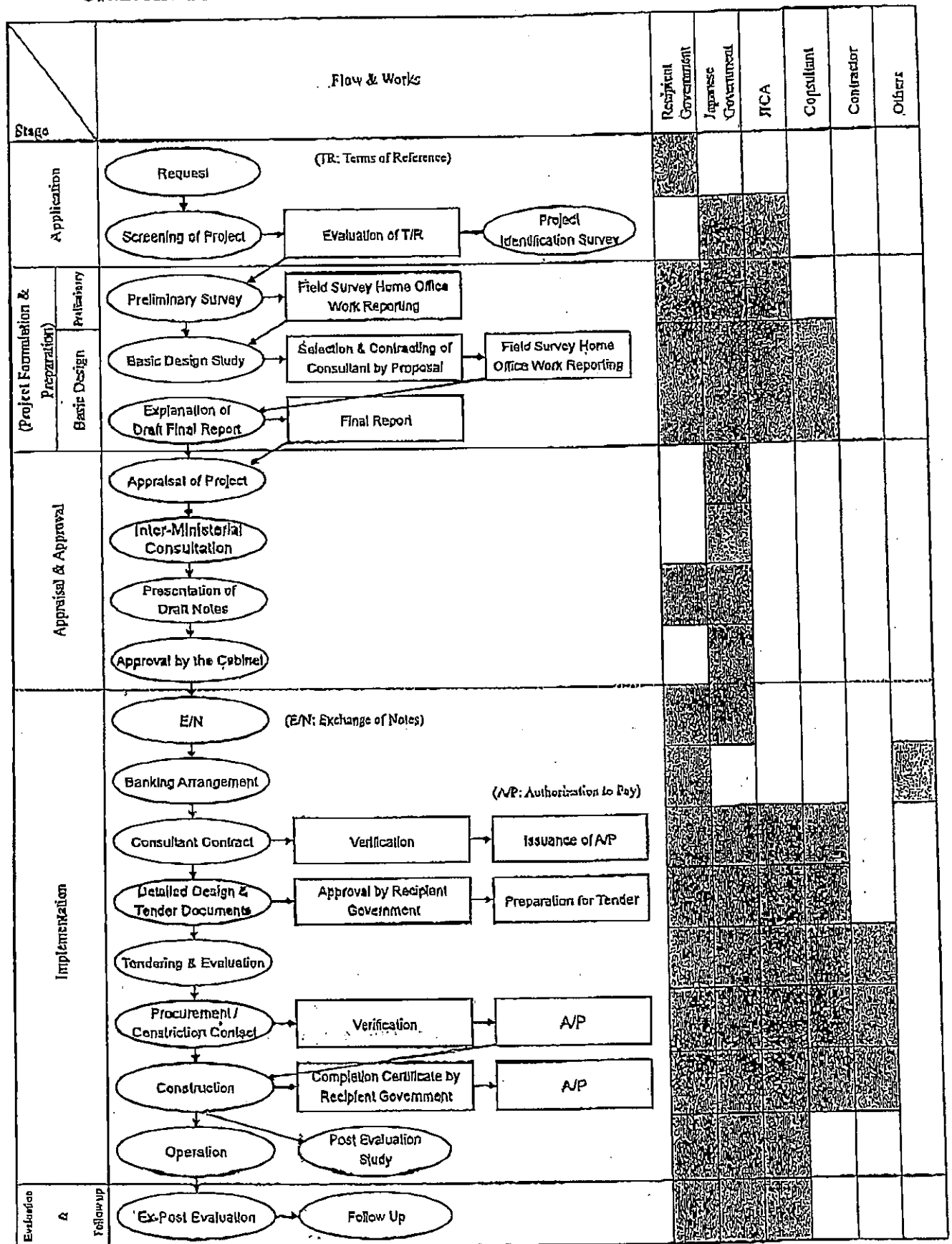
4-9. The Turkish side shall ensure the necessary facilities in respect of the construction permit and any other authorization required for construction of the museum in accordance with the schedule of the Project, under the Turkish laws and regulations.

4-10. The Turkish side undertakes to provide the necessary facilities within its reach with regard to taxes and custom duties for the implementation of the Japan's Grant Aid Project, in accordance with the Turkish laws and regulations.

4-11 Both sides have confirmed that another official request on technical cooperation, etc. should be submitted through diplomatic channels.



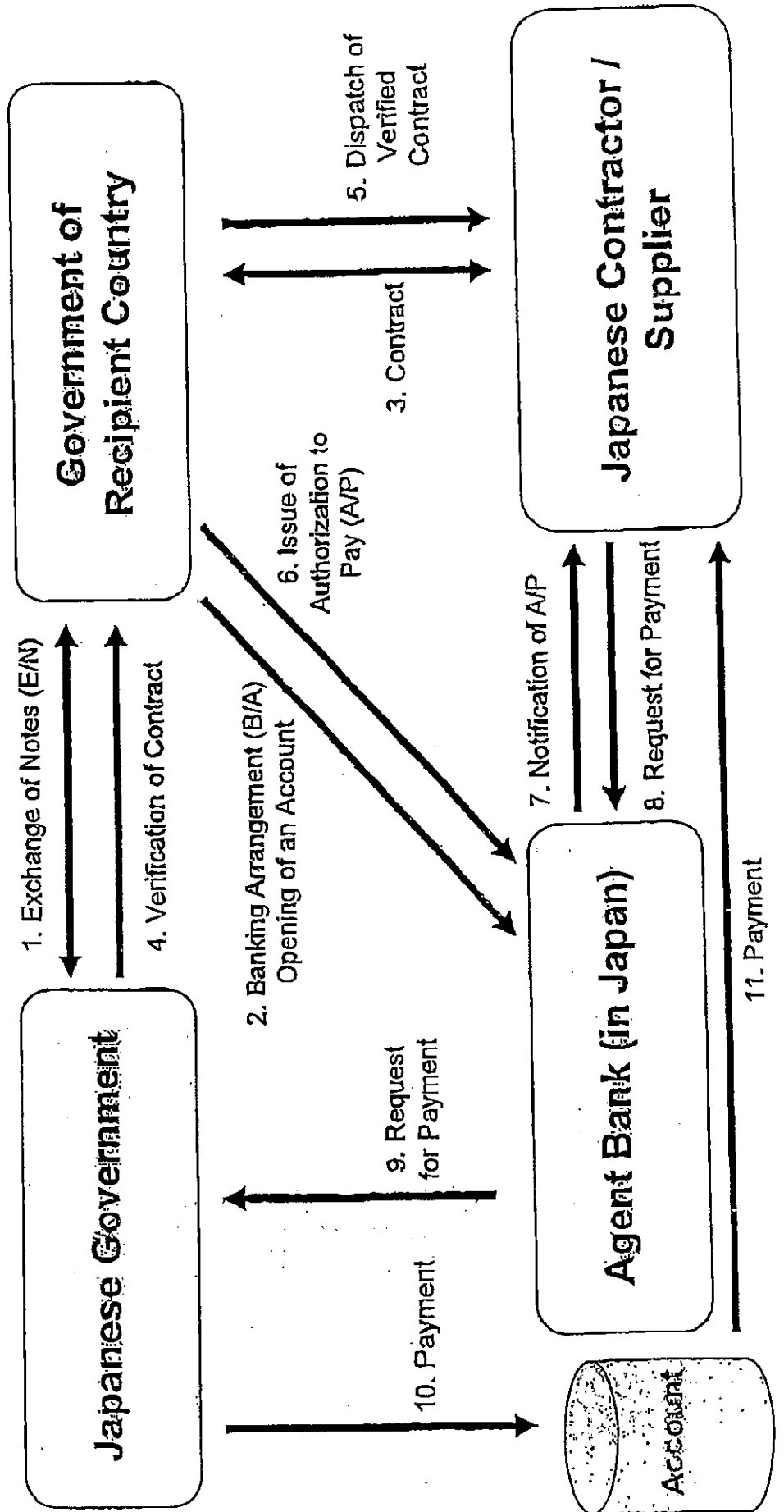
Grant Aid Procedures



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Procedure for the Payment of Japan's Grant Aid



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5. References

No.	Title	Format (Book, video, map, photograph, etc)	Original / Copy	Publisher	Year of publication
1	8TH FIVE YEARS DEVELOPMENT PLAN (2001 ~ 2005)	Book	Copy	STATE PLANNING ORGANIZATION	2001
2	UYGUN MÜZE NİTELİKLERİ	ditto	ditto	MINISTRY OF CULTURE AND TOURISM	2004
3	ANATOLIAN EXCAVATION RECORD	ditto	Original	JAPAN BROADCAST PUBLISHING CO., LTD.	2004
4	JAPANESE INSTITUTE OF ANATOLIAN ARCHAEOLOGY	ditto	ditto	JAPANESE INSTITUTE OF ANATOLIAN ARCHAEOLOGY	2003
5	ARC REPORT 2004 (REPUBLIC OF TURKEY)	ditto	Copy	WEIS	2005
6	THE SURVRY ON KAMAN ARCHEOLOGICAL SITE AND CENTRAL ANATOLIAN TOURISM DEVELOPMENT	ditto	Original	PAR CONSULTING	2005
7	TURKEY ROAD MAP (1 : 1,000,000)	ditto	ditto	ARKADAŞ	2003

Geo teknik

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

Geo teknik

CONTENT

- I. THE AIM AND THE CONTENT
- II. THE RESEARCH AREA AND THE METHOD OF THE STUDY
- III. GEOGRAPHICAL LOCATION AND MORPHOLOGY
- IV. CONSTRUCTION PLAN CONDITION
- V. GENERAL AND STRUCTURAL GEOLOGY
 - V.1 GENERAL GEOLOGY
 - V.2 STRUCTURAL GEOLOGY
 - V.3 THE GEOLOGY OF THE SITE
- VI. SOIL INVESTIGATIONS AND SITE TESTS
- VII. LABORATORY TESTS
- VIII. GROUNDWATER CONDITION
- IX. EARTHQUAKE CONDITION
- X. APPROPRIATENESS OF THE SITE FOR SETTLING
- XI. GEOTECHNICAL RESULTS
- XII. CONCLUSION AND PROPOSALS

Appendix:

App.1 : The Geological Map (scale :1/250) and the Location Plan of Boreholes

App.2 : The Borehole Logs

App.3: The Results of Laboratory Tests

App.4: The Geological Section

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

1/500000 (MTA)

EXPLANATIONS

Qy

Younger Alluvium (Holesen)

Qe

Older Alluvium (Pleistosen)

n

Continental, Un Sperated (Neojen)

nj

Gypsum Facies (Salty),(Neojen)

γ

Granit - Granodiyorit

olmj

Gypsum 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 Bıyıkşadır and Tepeköy, between Kargınvernice River and Taşlarık Tepe, in Burukluçataltepe, Köprüküy, 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 pheldispat 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 lensey.

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 lakey facies in the upper levels. The lakey 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 Kızılrnak 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 Derefaklı 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 Cabatabaşı 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 voicanism 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 overliapping: The verse over turnings which came into existence as a result of the Kasımağa 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 (İlcapınar and Bölükdağ) Formation and the overlapping of (İlcapınar 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;

$$q_u = 354 - 1285 \text{ kg/cm}^2$$

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) $A_0 = 0.4$

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.

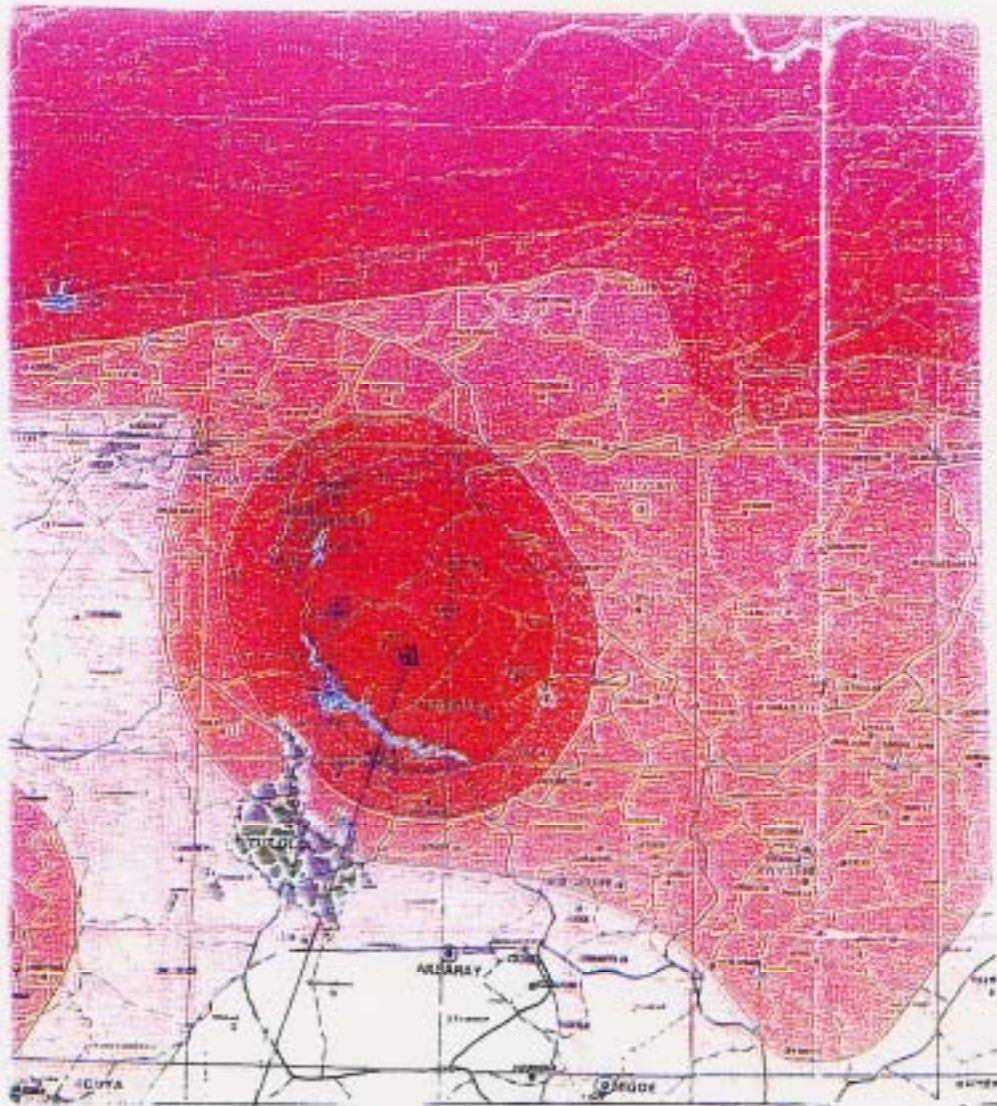
$T_B = 0.30$ sec.

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-proposais section.

XI. GEOTECHNICAL RESULTS

The investigation area in the borders of Kırşehir-Kaman-Çağırkan town is totally formed by the granite-granodiorite, 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/cm², in the condition that the top soil and/or fill material are removed.



Investigation area T.C.

BAYINDIRLIK ve İSKAN BAKANLIĞI
TURKEY EARTHQUAKE REGIONS

- | | | | |
|---|--------------------------------|---|-------------------|
|  | I. Degree Earthquake Regions |  | Government Office |
|  | II. Degree Earthquake Regions |  | City Center |
|  | III. Degree Earthquake Regions |  | District Center |
|  | IV. Degree Earthquake Regions |  | Corner Center |
|  | IV. Degree Earthquake Regions |  | Neighbours |
| | |  | Railroad |
| | |  | State Boundary |
| | |  | City Border |
| | |  | District Border |

Scale 1:1.000.000

10 20 30 40 50 60 70 80 k.m.
 1990

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;

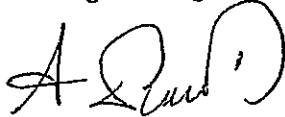
$$q_{all} = 3.00 \text{ kg/cm}^2$$

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.

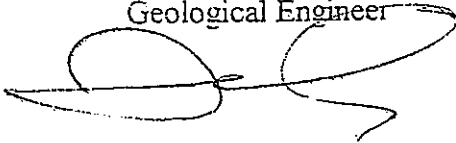
- d) There is no observed ground water.
- e) There is no liquefaction problem.
- g) The investigation area is in the 1st earthquake region. In the structural projects, the related standards should be taken into consideration.

Sincerely,

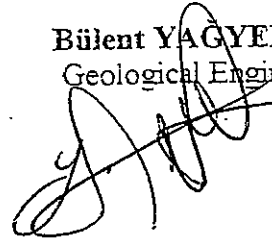
Atilla DUMLAR
Geological Engineer



Saban KAYGISIZ
Geological Engineer



Bülent YAĞYEMEZ
Geological Engineer

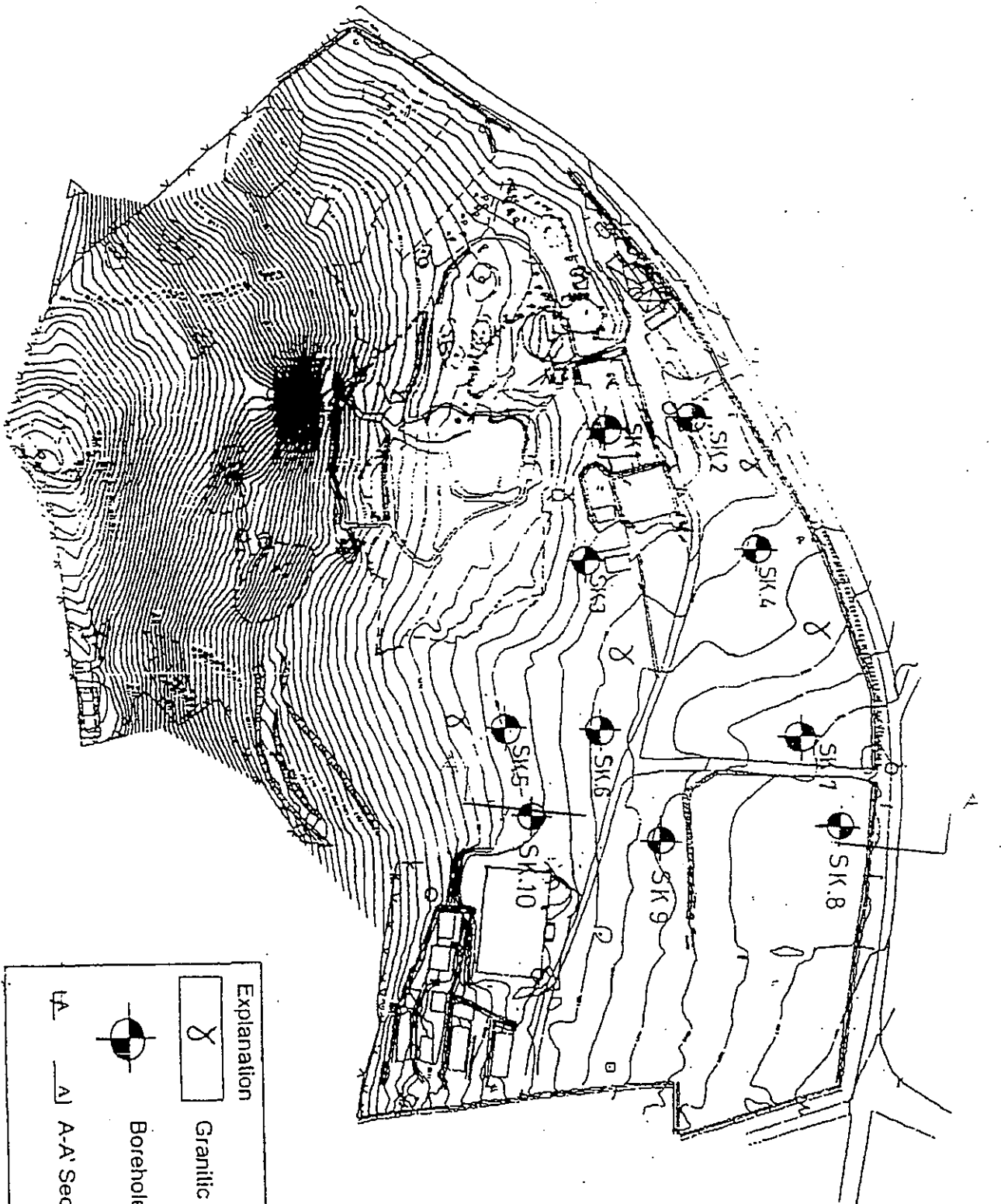




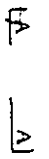
Ebru GÜROĞLU
Civil Engineer (M.S.)




APPENDIX

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



Explanation	
	Granitic rocks
	Borehole Location
	A-A' Section

1/2500


APP2 : THE BOREHOLE LOGS

PROJECT NAME : KAMAN SOIL INVESTIGATION BORINGS OF JAPANESE CULTURE CENTER

BOREHOLE DEPTH (m) : 7.00 START DATE : 07.03.2004

BOREHOLE ALTITUDE (m) : - END DATE : 07.03.2004

UNDERGROUND WATER (m) : — COORDINATE x :

TYPE OF MACHINE/METHOD: D-500 DIEZEL/ROTARY COORDINATE y :

Borehole Depth (m)	Sample Type	Sample No	STANDART PENETRATION TEST					Soil Type	SOIL DESCRIPTION	LITOLGY	CORE	TCR %	RQD %
			Stroke Number			Graph							
			0-15 cm	15-30 cm	30-45 cm	N	10						
1	1.50 SPT	1	9	15	15				Fill Material Brown sandy-silty clay and filling by gravel of granite				
2	1.95												
3									2.70 m				
4									Granite-Granadiorite Lightbrown-beige, alteration in the upper parts and very poor, transition to the strong layer at the deeper levels	1	30	0	
5										2	50	15	
6													
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	LOGGED BY	SIGNATURE	DATE
I FRESH	%0-25 VERY POOR	N=0-4 V. LOOSE	N=0-2 V. SOFT	Atilla DUMLAR		
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			
SPT : Standart Penetration Test	C : Core Sample					
D : Disturbed Sample	P : Pressiyometer Test					
UD : Undisturbed Sample	VST : Vane Test					

PROJECT NAME : KAMAN SOIL INVESTIGATION BORINGS OF JAPANESE CULTURE CENTER

BOREHOLE DEPTH (m) : 6.50 START DATE : 07.03.2004

BOREHOLE ALTITUDE (m) : - END DATE : 07.03.2004

UNDERGROUND WATER (m) : — COORDINATE x :

TYPE OF MACHINE/METHOD: D-500 DIEZEL/ROTARY COORDINATE y :

Borehole Depth (m)	Sample Type	Sample No	STANDART PENETRATION TEST							Soil Type	SOIL DESCRIPTION	LITOLOGY	CORE	TCR %	RQD %
			Stroke Number				Graph								
			0-15 cm	15-30 cm	30-45 cm	N	10	20	30						
1	1.50 SPT	1	9	15	25										
2	1.95														
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															

Fill Material
Brown sandy-silty clay and filling by gravel of granite
2.00 m

Granite-Granadiorite
Lightbrown-beige, alteration in the upper parts and very poor, transition to the strong layer at the deeper levels

END OF BOREHOLE : 6.50 m

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

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

PROJECT NAME : KAMAN SOIL INVESTIGATION BORINGS OF JAPANESE CULTURE CENTER

BOREHOLE DEPTH (m) : 6.50 START DATE : 06.03.2004

BOREHOLE ALTITUDE (m) : - END DATE : 06.03.2004

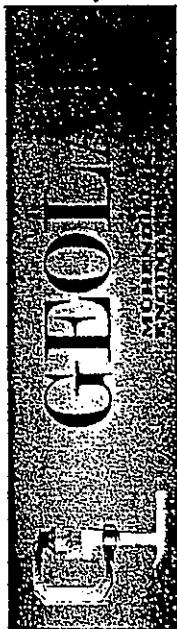
UNDERGROUND WATER (m) : --- COORDINATE x :

TYPE OF MACHINE/METHOD: D-500 DIEZEL/ROTARY COORDINATE y :

Borehole Depth (m)	Sample Type	Sample No	STANDART PENETRATION TEST					Soil Type	SOIL DESCRIPTION	LITOLOGY	CORE	TCR %	RQD %
			Stroke Number			Graph							
			0-15 cm	15-30 cm	30-45 cm	N	10						
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									2	58	22		
4										3	87	55	
5													
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	LOGGED BY	SIGNATURE	DATE
I FRESH	%0-25 VERY POOR	N=0-4 V. LOOSE	N=0-2 V. SOFT	Orhan PENİRCİ		
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			
SPT : Standart Penetration Test	C : Core Sample	LOGGED BY		SIGNATURE	DATE	
D : Disturbed Sample	P : Pressiyometer Test					
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

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 Strength) 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

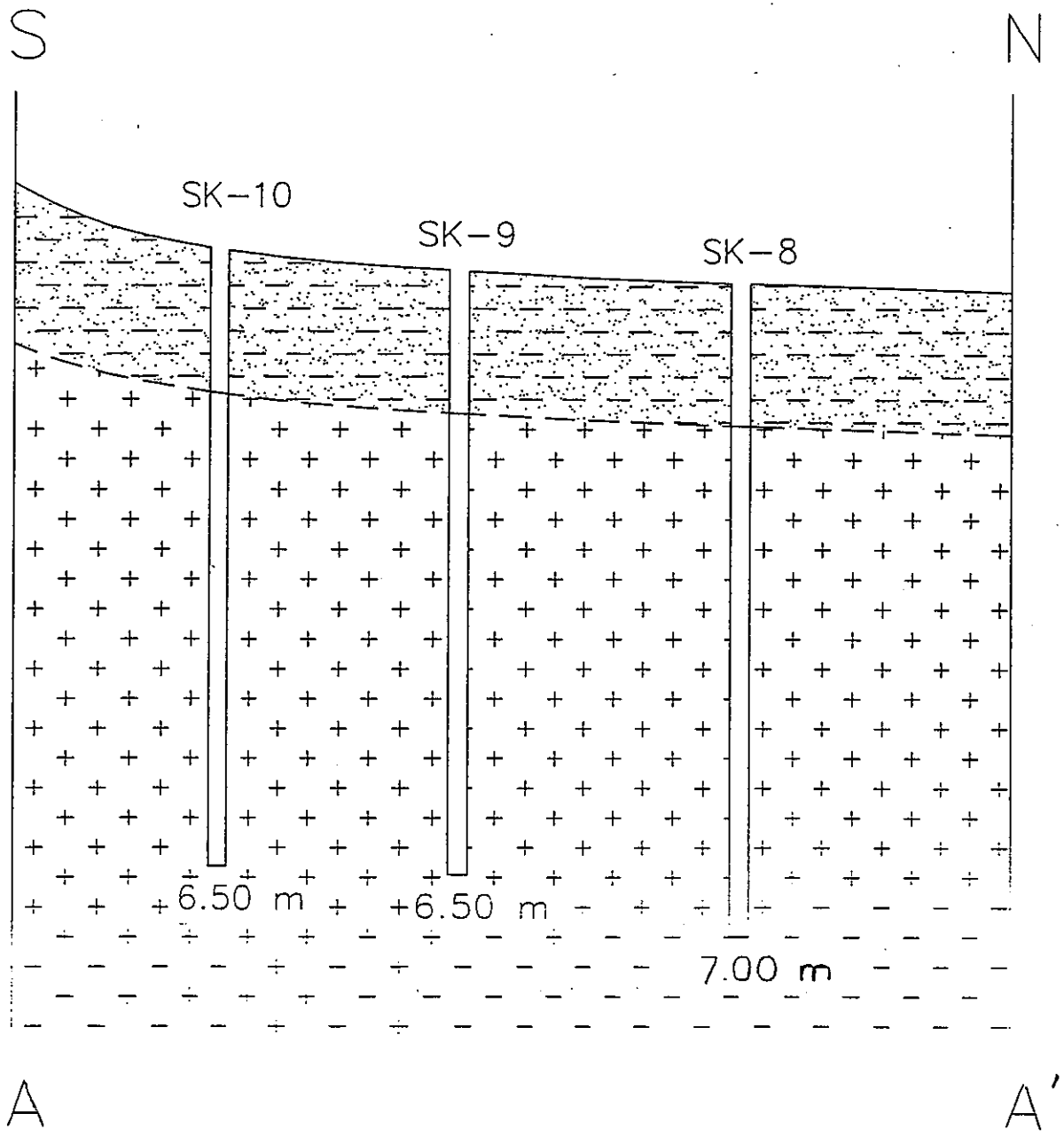
Sample Place

Date

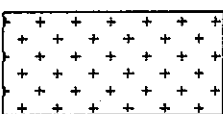
SPESİFİK GRAVITY and ADSORPTION of ROCK SAMPLE				
Drilling No	SK-8	Depth	4.10-4.23	S. No: 1
A	Weight of Dry Sample in Air , gr.			357.22
B	Weight of Saturated Sample in air , gr.			359.62
C	Weight of Saturated Sample in water , gr.			210.58
A/(A-C)	External Spesific Gravity			2.436
A/(B-C)	Volume Spesific Gravity G_k			2.397
$\frac{B-A}{A} * 100$	Absorbion (%)			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
$\frac{B-A}{A} * 100$	Absorbion (%)			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
$\frac{B-A}{A} * 100$	Absorbion (%)			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			
$\frac{B-A}{A} * 100$	Absorbion (%)			
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			
$\frac{B-A}{A} * 100$	Absorbion (%)			



APP4: THE GEOLOGICAL SECTION



Fill material



Granite, granodiorite

Section A - A' soil profile