



Jordan Industrial Estates Corp.

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Objectives

*Amman / Al-Hassan
Industrial Estates*

*Incentives &
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Jordan Industrial Estates Corporation (JIEC)

JIEC was established in 1980 as a corporate entity having financial and administrative autonomy with a capital of JD12 million .

The shares are subscribed as follows :

The Government	67.5 %
The Social Security Corporation	15.0 %
The Industrial Development Bank	8.3 %
The Housing Bank	8.3 %

JIEC was established to support and encourage the industrial sector , increase investment opportunities and safeguard environmental pollution through its planned organized services scheme of locating different industries in one estate .

The growing demand in Jordan for a well designed and fully serviced industrial sites made JIEC a reality and helped in achieving its following goals :

- Encourage the establishment and distribution of industrial projects within the Industrial Estates in various parts of the Kingdom
- Encourage the relocation of existing industries in the Industrial Estates
- Apply appropriate actions which may lead to the development and integration of industries within the Estate in order to direct them to overcome any difficulties facing them .

In order to implement its objectives

- (a) Exercise the powers and authorities of the Municipalities in the Kingdom within the Industrial Estates by issuing both profession and building licenses .
- (b) Provide managerial , financial and technical advice to new industries within the Industrial Estate and to industries planning to be located within .
- (c) Take necessary measures to protect environment against pollution caused by industries within Industrial Estates including pollution of water and air .

Amman Industrial Estate/Sahab (AIE)	Al-Hassan Industrial Estate / Irbid Governorate
<p>AIE is located (3 Km) south-east Greater Amman Municipality boundaries with an area of (2.5) million M2 .</p> <p>AIE accommodated (320) medium and small industries .</p> <p>Within the Industrial Estate there are (53) foreign , Arab and Joint Venture industries .</p> <p><i>Industrial Sectors consist of :</i></p> <p>Food sector , Pharmaceuticals , Engineering (Metal , Electrical & Electronic) , Chemicals , Plastics , Wood industries , Cotton & Weaving , Leather , Printing , Packing and Packaging and Construction industries .</p> <p>JIEC goals do not stop at accommodating industrial projects but also in trying to attract highly developed technological industries in order to create skillful and highly trained workers who will be able to contribute to the economical and social up growth of the Kingdom .</p>	<p>Located in the north of the Kingdom near-by the University of Science and Technology at Irbid Governorate with an area of (427000) M2 completed in mid of 1991 with well developed infrastructure services such as Electricity , Communications , Roads , Water and Sewage networks and Water treatment plant .</p> <p>In addition to the plots of land available , Standard Factory Buildings with an area ranging between (328 -2000) M2 are offered for leasing or buying .</p> <p>(44) projects have been established within this Industrial Estate and it has the capacity to accommodate another (60) industries .</p>

Incentives and facilities offered by the Industrial Estates

- 1- All plots of land are leveled and developed in different sizes supplied with all infrastructure services (*Electricity, Communications, Water and Sewage networks, Water treatment plant, Roads and Parking lots.*)
- 2- Area of land is the net area after the deduction of all roads and side walks with more flexibility in the usage of land.
- 3- Different sizes of ready made Standard Factory Buildings with high standards to meet the requirements of different industries.
- 4- The presence of many ancillary services backboning the industries such as : Vocational training center, secondary high school, petrol and maintenance stations, fire station, clinic, banks, shops, cafeteria, post office, labor office, insurance, advertising, auditing and marketing offices, exhibition for the industrial products, security services, social security offices, a branch to the development of Exports and Trade Center Corp., customs & clearance centers bonded and a free zone area.
- 5- In addition to the exemptions that may be granted to an industrial project under the Law of Encouragement of Investment, industrial projects established within the Industrial Estates are granted two years of income and social services tax exemptions, commencing from the date of production.
- 6- Exemptions from the building and land tax (property tax) for the whole life of the project.
- 7- Full or partial exemptions of most Municipalities and Planning fees.
- 8- Building license will be ready in less than a week from the date of submitting the plans.
- 9- Profession license and other licenses will be ready in the same day.
- 10- Saving time, effort and money on the industrial investor due to his dealing with the Corporation and the services it offers.
- 11- The industrial investor has the right to choose whether to lease or buy a plot of land or a standard factory building as follows :

Amman Industrial Estate / Sahab	Al-Hassan Industrial Estate / Irbid Governorate
Leasing of free developed plots of land : JD 1.50 / M2 / annum including all services	Leasing of free developed plots of land : JD 1.0 / M2 / annum including all services
Rent of Standard Factory Buildings : JD 12 / M2 / annum including all services	Rent of Standard Factory Buildings : JD 10 / M2 / annum including all services
Selling price of Land is : JD 16 / M2 provided with all necessary services	Selling price of Land is : JD 16 / M2 provided with all necessary services

For further information , please contact :

Investment Dept.

Amman Industrial Estate / sahab

Al-Hassan Industrial Estate

Irbid Governorate

Tel : 722101 -3
723399

Tel. : 02-295152/3

Firms Located at Amman Industrial Estate

According to Years

<i>Years</i>	<i>Number</i>	<i>Invested Capital</i>	<i>No. of Workers</i>
1981	1	1,500,000	55
1982	4	4,682,000	292
1983	9	16,500,000	377
1984	21	24,584,000	851
1985	15	13,204,000	492
1986	13	22,600,000	1,473
1987	17	23,084,000	762
1988 (untill 13/8)	15	3,970,000	198
1988 (after 13/8)	33	28,316,000	896
1989	33	26,657,000	1,157
1990	31	12,621,000	804
1991	42	65,965,000	2,076
1992	33	22,467,000	1,038
1993	45	38,577,000	1,601
1,994	8	2,148,000	113
Total	320	306,875,000	12,185

Firms Located at Amman Industrial Estate

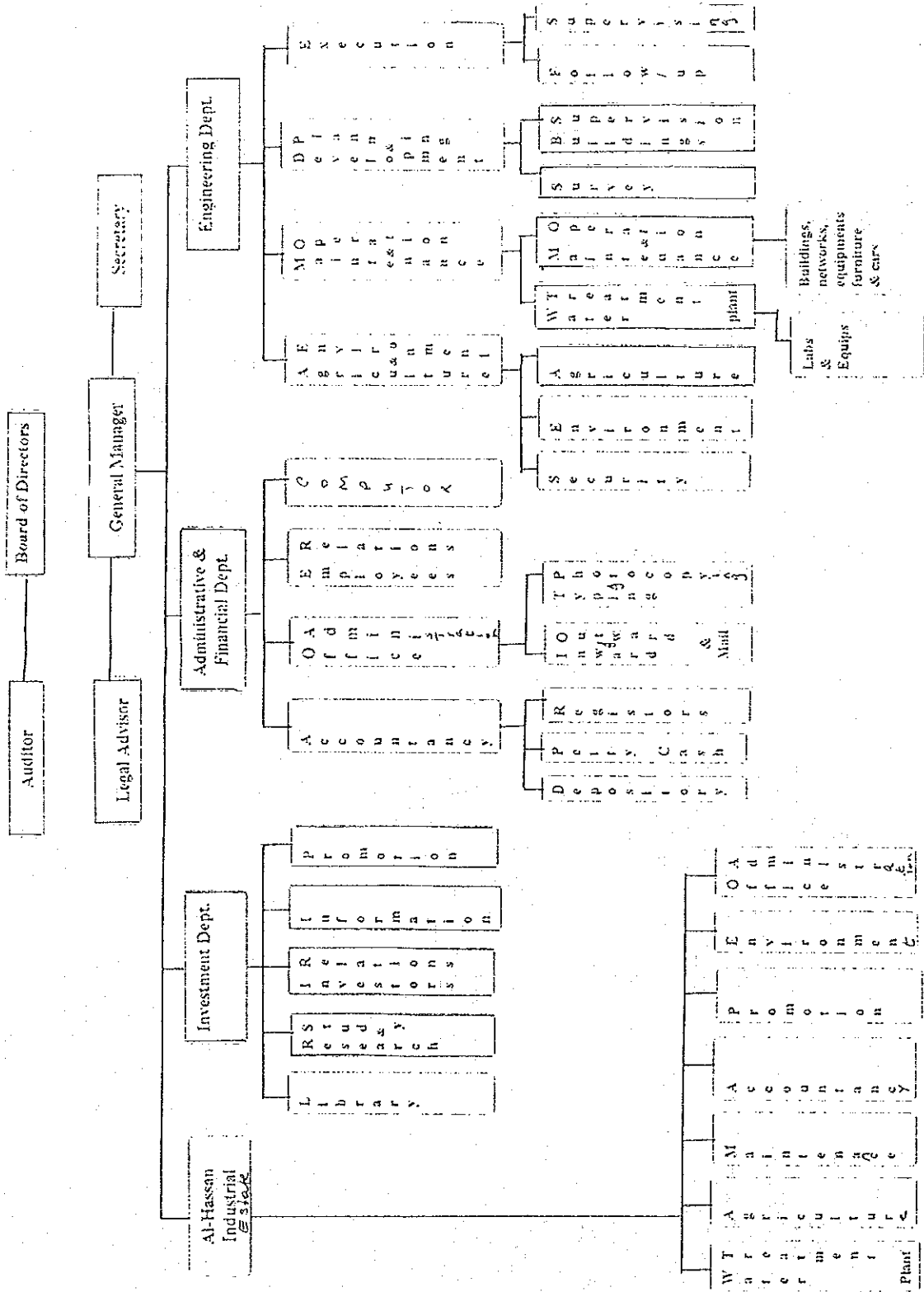
According to Sectors			
Sector Name	Number	Invested Capital /JD	Number of Workers
Food Industries	37	36,522,000	1,903
Pharmaceutical Industries	16	14,331,000	498
Engineering (Metal, Elec..)	78	71,749,000	2,868
Plastics & Rubber	43	37,758,000	1,374
Chemical	47	31,552,000	1,258
Cotton & Weaving	31	39,709,000	1,382
Furniture, Kitchen & Doors	27	14,816,000	589
Printing, Packing & Paper	26	49,209,000	1,882
Leather Industries	10	3,360,000	189
Construction Industries	5	7,869,000	242
Total	320	306,875,000	12,185

JORDAN INDUSTRIAL ESTATES CORPORATION

AMMAN - JORDAN

BALANCE SHEET AS AT 31 DEC. 1993

ASSETS		LIABILITIES & SHAREHOLDERS RIGHTS	
FIXED ASSETS		SHARE HOLDERS RIGHTS	1993/JD
	1993 JD	1992/JD	1992/JD
Fixed Asset At Cost	23776553	Capital	12000000
Less Accumulate Depreciation	1866653	Obligatory Reserved	648534
Net Value of Fixed		Special Provision	5018999
Assets	21909900	Share holders rights net	17667533
<u>work in progress</u>			
Lands	349980	Long term loans	7429733
Projects Expenditure	244614	<u>Current Liabilities</u>	
Advanced Payments	45163	Short Term Loans	1002866
Total Project	639757	Interest and principals on due loans	93022
Refundable Deposits	2256	Following years revenue	862472
Other Investments	10000	Creditors & Other	
	12256	credit Balances	3207233
<u>Current Asset</u>		Accured Expenses	1200
Materials At Cost	6018	Banks Creditors	34403
Debtors	540110	Retention	23636
Tenants Debtors After		Current Liabilities	
Doubtful Debts Provision	298638	Total	5224832
Post Dated cheques	47971		
Banks	6867448		
Current Asset Total	7760185		
TOTAL ASSETS	30322098	TOTAL LIABILITIES &	30322098
		SHARE HOLDERS RIGHTS	24333264



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Date: 04/07/94

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FOOD INDUSTRIES

No.	COMPANY NAME	PRODUCT	P.O. BOX	ADDRESS	PHONES	Fax. No.	MANAGER
1	MOH'D KHASAWNEH CO.	BISCUITS	(1261) IRBID	295265 / 240602	/		MOH'D KHASAWNEH
2	AL-RYASHI FOR FOOD STUFF	CANNED FOOD	(1944) AMMAN	295266 / 271726	/		MR. GSAMA AL-RAVASHI
3	FOLAD RIFA'EE & ALI-EL-MELAHI CO.	CONFECTIONARY	(650) IRBID	295267 / 279880	/		MR. ALI-EL-MALAH
4	AL-OMARA EST. FOR CONFECTIONARIES	KAMAREDDIN	(6500) AMMAN	295190 / 630407	/		MR. MOH'D WALID SHARIF
5	ADEL HASAN ABU-HASHISH & CO.	TAHINEH & HALAWA		270453 /	/		MR. ADEL ABU-HASHISH
6	ZAYTONA FOODSTUFF CO.	FILTRATION, PURIFICATION & FILLING OF OLIVE OIL	(926827) AMMAN		/ 699231 /		MR. NA'EM THEBYAN
7	MOH'D NOUR & BADRI EL-SHOUBOL CO.	DISCUIT CHOCOLATES & CHOCOLATES	(135) RONTIA		/ 219611 /		MR. MOH'D NOUR EL-SHOUBOL

ENGINEERING (METALIC & ELECTRIC)

No.	COMPANY NAME	PRODUCT	P.O. BOX	ADDRESS	PHONES	Fax. No.	MANAGER
1	QURBA INDUSTRIAL EST.	GALVANIZED WIRE	(850) IRBID	295295	/ 212180		MR. HAJER M. QURBA
2	FUAD KEDISAT & CO.	CHARCOAL	(961197) AMMAN	219950	/ 692811		MR. FOUAD KEDISAT
3	AL-MANSOURA INDUSTRIAL EST.	WASHING MACHINES, COOKERS, ELECTRIC MOTORS	(420) AMMAN	295211 / 625599 / 623881	/ 617121-3	623881	MR. ZEID J. SHA'ISHA
4	SAMI JA'RON EST FOR INDUSTRY & TRADE	BARBED WIRE	(687) IRBID	295323	/ 02-279375		MR. SAMI JA'RON
5	RAMI FOR BUILDING WIRE & NAILS FACTORY	STEEL WIRE & NAILS	(850) IRBID	242180	/ 272988	242180	MR. MOSEEQ KURBA
6	ADNAN K. DASOUQI	CHARCOAL	(961107) AMMAN	680702	/		MR. ADNAN DASOUQI
7	KAMEL SALAL & SONS CO.	DISPOSABLE LIGHTERS & SHAVING BLADES	(961278) AMMAN	698669	/	698126	MR. KAMEL SALAL
8	MOMANI, KHALIDY & TAHA CO.	CHANDELLIERS & PLASTIC ELECTRIC BOXES	(2349) IRBID	275131	/		MR. SAQR EL-MOMANI
9	ARAB ENGINEERING INDUSTRIES CO.	ENGINEERING TOOLS	(141101) AMMAN	810301	/ 813101		MR. ALI OBEIDAT
10	NATIONAL CO. FOR LIGHTING & GALVANIZATION	INTERIOR & EXTERIOR LIGHTING & FUSE BOXES	(895) IRBID	212003	/		MR. KHALDOON ZEFANI
11	AL-HADAF ELECTRICAL INDUSTRIES	BREAKERS & FUSES	(925225) AMMAN	661316 / 682218	/ 617679	618507	MR. TALEB HASAN

PLASTICS & RUBBER INDUSTRIES

No.	COMPANY NAME	PRODUCT	P.O. BOX	ADDRESS	PHONES	Fax. No.	MANAGER
1	JORDAN CO. FOR POLY PROPELENE MFG.	PLASTIC BAGS & ROPES	(925717) AMMAN	295287-10 / 683783	688536-7 / 02-244451	686802	DR. SALEH BARABSEH
2	BUSTAMI EST. FOR PLASTIC MFG.	PLASTIC BAGS	(211901) AMMAN	662284	/	665680	MR. GHASSAN K. BUSTAM
3	AL-AZRAQ PLASTICS	PLASTIC CUPS & CONTAINERS	(1066) SWEHEH	/	844298 /	756506	MR. HUSSEIN ABU-HAYDE H
4	AHMAD ALI DOKRANI CO.	PLASTIC BOKLS, BUCKETS AND GALLONS			243867 /		MR. AHMAD DOKRANI

CHEMICAL INDUSTRIES

No.	COMPANY NAME	PRODUCT	P.O. BOX	Address	PHONES	Fax. No.	MANAGER
1	AL-JIHAD FACTORY FOR DETERGENTS & DESINFECTANTS	DETERGENTS	(7) AL-MUGHIR	295294 / 246139	/ 246893		MR. IBRAHIM SHAKHATRA
2	SINIA FOR ELECTRONICS	EAU DE COLOGNE	(1027) AMMAN	295290	/ 688888		MR. NIDAL SURUTIAN
3	SHAHER QURQA EST.	SOAP	(850) Irbid	295295	/ 242180		MR. SHAHER M. QURQA'A
4	KHAWANEH & SAMARIE FOR CHEMICAL INDUSTRIES	PAINTS & PASTES	(-1) AL-NEAINEH	295200	/ 220057		MR. MUSTAFA SEWA'EE
5	ARAB CO. FOR AGRICULTURAL INSECTICIDES	AGRICULTURAL INSECTICIDES	(950617) AMMAN	295195	/ 605492		MR. SAMER AQEL OWETS
6	TECHNICAL MFG. CO. PAINTS & PUTTIES CO.	PAINTS & PUTTIES	(2572) Irbid	295234 / 279175	/ 272807	279175	MR. MOH'D FARIDEL-SHE TKH
7	FAHMI BARHOUMA EST.	COSMETICS & PERFUMES	(38954) AMMAN	771479	/		MR. FAHMI BARHOUMA
8	BARBELA FOR PAINTS & PUTTIES	PAINTS & PASTES		271067	/		MR. MUSTAFA SEWA'EE
9	EL-BARAKHI EST. FOR INDUSTRIAL & COMMERCIAL USE.	DETERGENTS, PUTTIES, COSMETICS, PERFUMES & SHAMPOO	(986) Irbid	270797	/	270797	MR. HANZEH HABIB
10	INSAIIRAT & MALLAWI CO.	SOAP	(797) Irbid		/ 245109		MR. ZEID NUSAIRAT
11	ARAB AGRICULTURE PESTICIDES INDUSTRIES	AGRICULTURAL PESTICIDE	(930103) AMMAN	295195	/ 683386	295222	MR. SAMIR OWETS
12	UNITED AGRICHEMICALS		(111337) AMMAN		/ 829203	821791	MR. NINER EL-NINER

COTTON & WEAVING

No.	COMPANY NAME	PRODUCT	P.O. BOX	ADDRESS	PHONES	Fax. No.	MANAGER
1	PHILADELPHIA FOR YARN MFG.	NYLON & POLYESTER THREADS		295273	/ 675377		MR. DIA T. BHANSIAL

FURNITURE / KITCHENS & DOORS

No.	COMPANY NAME	PRODUCT	P.O. BOX	ADDRESS	PHONES	Fax. No.	MANAGER
1	KASEM EL-KHUDARI & ABDAD REDEBAT CO.	FURNITURE (FIBER- GLASS)	(1151) IRBID	295299 / 215315	/ 249992		MR. KASEM EL-KHUDARI
2	NORTH EST. FOR METALLIC INDUSTRIES	METAL FURNITURE	(2647) IRBID	295300	/ 276914		MR. MO' D H. AL-ASSAM
3	JORDAN CO. FOR GREEN HOUSES-MFG.	WOODEN & METAL FURNITURE	(1027) ANNAN	694444	/	694446	MR. GHAYTH M. SUKHTYA
4	FARU-HUSSEIN INDUSTRIAL EST.	INDUSTRIAL SPONGE	(96) AIE		/ 840328		MR. MO' D ABC-HUSSEIN
5	BEHERS FACTORY FOR SPONGE	SPONGE	(574) IRBID	243958	/		MR. AMJAD BEHERS
6	ARYAN INDUSTRIAL EST.	SHOES	(3012) IRBID		/ 248072		MR. BADRY EL-ARYAN

PRINTING, PACKING & TISSUE PAPER

No.	COMPANY NAME	PRODUCT	P.O. BOX	ADDRESS	PHONES	Fax. No.	MANAGER
1	IBRAHIM OLOA CO.	STATIONARY & SCHOOL BAGS	(1282) IRBID		/ 242001 /		MR. IBRAHIM OLOA
2	AL-AHLYA CO. FOR CONTAINER TUBES MFG.	PLASTIC CONTAINERS & NATURAL FRUIT JUICE	(926651) AMMAN		660485 / 240181 /		MURKHALED BAKERIAN

CONSTRUCTION INDUSTRIES

No.	COMPANY NAME	PRODUCT	P.O. BOX	ADDRESS	PHONES	Fax. No.	MANAGER
1	ISLAMAT CERAMICS	CERAMIC GIFTS	(4180) IRBID		/ 244911 /		DR. MOH'D SALEH NOHA

ATTACHMENT 1

BACKGROUND INFORMATION

1. INTRODUCTION

In December 1989, a seminar and in November 1992, a one week training course were held by Japan Energy Conservation Center with the coordination of EIE in Ankara. In these seminar and courses Japanese experts introduced the Japan experience to Turkish counterparts. These presentations have received considerable interest from EIE and other Turkish experts and high level managers. Between 16-22 March 1992, a delegation from EIE visited to Japan to observe some excellent factories on energy conservation by the project of The Energy Conservation Center, Japan.

In the light of these observations, it is believed that it would be very beneficial to transfer technologies and experiences which have developed in Japan. Therefore, effectiveness of the initiated studies especially in industry in our country will be increased. In the 7th Five Year Development Plan it is also emphasized that from production to end use stage, efficient usage of energy will be encouraged. For these reasons, at the beginning of the 1993 National Energy Conservation Center (NECC) was established within the organization of EIE. With these objectives and observations, Turkish Government has intended to apply to Japan Government for assistance on energy conservations.

2. BACKGROUND OF EIE ON ENERGY CONSERVATION STUDIES

EIE has carried out the studies on rational and efficient use of energy and energy conservation studies since 1981. A brief summary of these studies are given below.

Energy conservation studies has been initiated at the industrial sector which is a second higher end use energy consumer in Turkey.

The first project supported by UNIDO was started in 1980 and energy audits at 6 plants in Iron Steel, Textile, Aluminium and Glass sectors were conducted by Hungarian experts.

Having completed above mentioned project, an energy conservation project which was financed by World Bank was carried out with the cooperation of EIE and foreign consultant firms between May 1983 and July 1984. The aim of this project was to identify potential saving in selected five major energy intensive industrial sectors. 11 plants were audited by three foreign firms, one of them was a Japan

firm (Nippon Steel Cooperation), at the feasibility stage.

At the end of the project identified energy saving potential in Iron Steel, Glass, Thermal Power Generation, Textile, Pulp Paper sectors was 294 000 TOE and an average saving potential was found as 13 %.

The second project financed by World Bank has been completed in January 1991 and comprised 15 plants of Turkish Industrial sectors namely Iron Steel, Chemicals, Cement, Electrometallurgy, Refractories, Ceramics, Beer, Textile at the level of detailed energy audit and feasibility studies. At the end of these studies, identified potential saving was 428.000 TOE and an average saving potential was found as 18.4 %.

In addition to these studies to promote energy conservation and create awareness various publications on the subject have been prepared and distributed country wide.

Furthermore upon the request of technical assistance from the industrial establishments, energy preaudits are carried out by EIE team, prepared reports have been submitted to the related plants in various sectors.

During all these above mentioned projects, EIE personnel has achieved the experience to conduct the energy preaudits in industry by carrying out both theoretical and practical studies with the technical assistance of foreign experts.

3. CAPABILITIES OF EIE FOR ENERGY CONSERVATION STUDIES

The Administration has four technical departments for different studies. One of the technical departments of EIE is Energy Resources Survey Department which has four divisions as Industrial Energy Conservation, Building and Transport Sectors Energy Conservation, Solar Energy and Wind Energy Divisions.

In Energy Conservation Divisions which conducts all above mentioned energy conservation studies, 20 engineers of various diciplines and supporting personnel are employed.

For the energy conservation studies, Energy Conservation Divisions have some measuring equipment, computers and vehicles.

This Division has the budget of 624 million Turkish Liras except for staff for the year of 1994.

Organization Chart of EIE is given in enclosed.

ATTACHMENT 2

1. OBJECTIVE OF THE STUDY

EIE has many activities which are mentioned before similar to the Japanese projects. However effectiveness of the implemented programs are not sufficient and energy conservation policy and measures have not been evaluated yet. In order to increase effectiveness at nation wide EIE has required technical assistance.

The objective of the project will be ;

1. To recommend national policy/program for the rational use of energy in Turkish manufacturing industry.
2. To recommend technical improvement measures without changing the existing production process, for rational use of energy in small/medium sized manufacturing industry.
3. To introduce the reference to formulate the technical guideline for rational use of energy in small & medium sized manufacturing industry.

2. SCOPE OF THE STUDY

In order to achieve these objectives the studies will be carried out in two categories as follows ;

2.1. Technical Studies

The main target of this project is to develop and increase the effectiveness of the energy conservation programs in Turkey with the assistance of Japanese experts.

In the scope of the project energy audits in various sectors such as cement, food (edible oils), metal (rolling mills and machinery production), chemicals (cleaning materials and dyes), textile sectors which will be good examples for process energy conservation audits, will be carried out with the assistance of Japanese experts.

A plant of each sector shall be audited by Turkish team with the assistance of Japanese experts who are experienced in above mentioned sectors. It is intended to realized energy audits in approximately 5 plants in Industrial sector during this project.

At the end of the plant audits, final reports will be prepared by using the various softwares which are commonly

used for such kind of studies in Japan.

After completion of these audit studies, it is believed that Turkish staff will gain experience in the various process and common technical improvement measures without changing the existing production process for rational use of energy in manufacturing industry.

Additionally, software experience in preparation of energy audit reports will be transferred to local counterparts thus Turkish staff will gain experience in speedy reporting.

In addition to Japanese experts studies in Turkey, it would be useful to give opportunity to the Turkish counterparts to be trained in Japan on energy audits in Industry.

2.2. Policy and Energy Situation Studies

One of the reasons of not reaching to satisfactory results in energy conservation activities in Turkey is the fact that energy conservation concept is not well known subject at nation wide .

Therefore, Japanese experience which is well known with their success will be required for the development of the Turkish Industrial Energy Conservation Program.

This study should be started with the general evaluation of the energy situation of country, then studies should be focussed on the subjects such as structure of the organizations, necessary regulations, education and qualification of personnel, financial and tax incentives for energy conservation.

3. STEPS AND SCHEDULE OF THE STUDY

3.1 Steps of the study

- Step 1 - Explanation of Inception Report
- Step 2 - Field work in Turkey
- Step 3 - Home office work in Japan
- Step 4 - Submission of Draft Final Report
- Step 5 - Discussion of the Draft Final Report
- Step 6 - Holding seminar
- Step 7 - Home office work in Japan
- Step 8 - Submission of Final Report

3.2 Schedule of the study

>Sep.1994

	1	2	3	4	5	6	7	8	9	10	11	12
Preparation Study	*											
Field work in Turkey	**	**	*									
Home office work			+	++	++	++	++	++	++			
Submission of DFR										o		
Discussion of DFR											*	
Holding seminars											*	
Home office work											+	++
Submission of FR												o

Remarks: *** : Work in Turkey
 +++ : Work in Japan
 o : Report

This project is envisaged as a one year project and commencement date of project is expected as September 1994.

REASONS THAT NECESSITATE DEVELOPMENT OF THE BERTA PROJECT

I - PRESENT STATUS OF POWER IN TURKEY

As of the end of 1993, the total installed capacity and annual generation approximately were 20 300 MW and 73 000 GWh respectively; about 9600 MW of total installed capacity being formed by hydropowerplants and the rest by thermal (lignite, petroleum, natural gas) powerplants.

II - DEMAND FORECAST

The system and the demand-supply studies for electricity in Turkey are performed by Turkish Electricity Authority (TEK). According to the demand forecasts made by TEK, the power and energy demand of Turkey are expected to be 43 590 MW and 271 450 GWh by the year 2010 at an annual growth rate of 8 %. More than 1/3 of the 60 000 MW (reserve capacity included) estimated installed capacity, is planned to be met by hydropower indicating the urgent necessity to develop the hydropower resources as soon as possible.

III - JUSTIFICATION OF THE BERTA PROJECT

1 - Demand and Supply Situation and Berta Project:

With 8 % annual growth of demand, as mentioned above, until the year 2010, each year approximately 4000 MW capacity is required to meet this demand and 1300-1400 MW of this demand is planned to be hydropower (In recent years this increment in demand has been met by construction of Karakaya and Atatürk Dams and Hydropowerplants. That was the main reason why investment for electricity supply has not been realized during those years).

The system and the demand-supply studies for electricity in Turkey are performed by using a computer program called "WASP III OPTIMIZATION MODEL GENERATION AND CONSUMPTION"

All hydropowerplants having installed capacity more than 10 MW are considered in this program, provided that their feasibility reports are completed. Therefore, if Berta Project

is to be put in WASP III program, feasibility study on Berta River should be completed.

2 - Benefit - Cost Ratio of Berta Project:

As a result of the studies executed in the master plan stage "The Benefit - Cost Ratio" of the project is about 1.20 which is well above the unity to be considered for the feasibility stage.

3 - Cost of the Project:

As it is well known, construction of dams and hydropowerplants generally entails huge amounts of investment which could be deemed to be the main problem in developing countries when undertaking projects at this size. Although Berta Project is not small from this aspect, it may rank as a "medium size project" when considering the size of some other hydropower projects in Turkey. Thus, it is believed that the total investment cost of the Berta Project will not be "discouraging factor" for the government and investors (At the master plan basis the project cost is 10 000 000 US Dollar). On the contrary, together with a fair B/C ratio, this moderate cost will pull the attention of decision makers.

4 - Compensation:

Since very little compensation and resettlement are involved in Berta Project, any problems is not expected as far as social environment and expenses for compansation are concerned.

5 - Transportation:

Since the proposed dams and powerplants in the Berta Project are located along the highway, transportation during construction will not create any particular problem.

6 - Environmental Impact:

In recent years, like in the world, Environment has become a prominent issue in Turkey and government has been forced to take legal and institutional measures to minimize adverse effects on environment especially in the course of realization and operation of large projects.

Parallel to the industrialization and development endeavour, people's conciousness for environment has rapidly grown, which in turn, has been the main factor in pushing govern-

ments to take measures.

As energy is indispensable in today's world, in other words, since we have to provide it from any resource, the question remains how to secure it in the most cleanest shape. At this point, everybody would admit that hydropower is unquestionably superior to any other alternatives which are commonly thermal power in Turkey.

A good example showing this fact is that just recently construction of a 1000 MW thermal power plant was cancelled by government. Another example is GÖKOVA Thermal Power plant, of which construction has already been completed, but due to reaction of people, operation of powerplant could not be started.

From the foregoing examples, it will not be so difficult to realize that in the future, decision makers will have to review demand-supply analysis (mostly the supply part) to modify it into "cleaner" shape which can be realized only by employing more hydropowerplants for electricity supply.

IV - CONCLUSION

From the foregoing, these conclusion can be drawn:

1. To meet the expected demand, each year 1200-1300 MW of hydropower on the average should be installed until the year 2010.
2. Considering its size, project cost, benefit-cost ratio and other advantages (transportation facilities, very low compensation cost etc.), Berta Project may be deemed to be a promising project among its competitors.
3. For Berta Project, extensive investigations have been executed by EIE which are supposed to be sufficient for feasibility stage. However, if required EIE is ready to execute further investigations.
4. From "Environmental" point of view, hydropower is by far superior to any other alternative which has been in recent years and which will be in the future the most outstanding point in making decision.

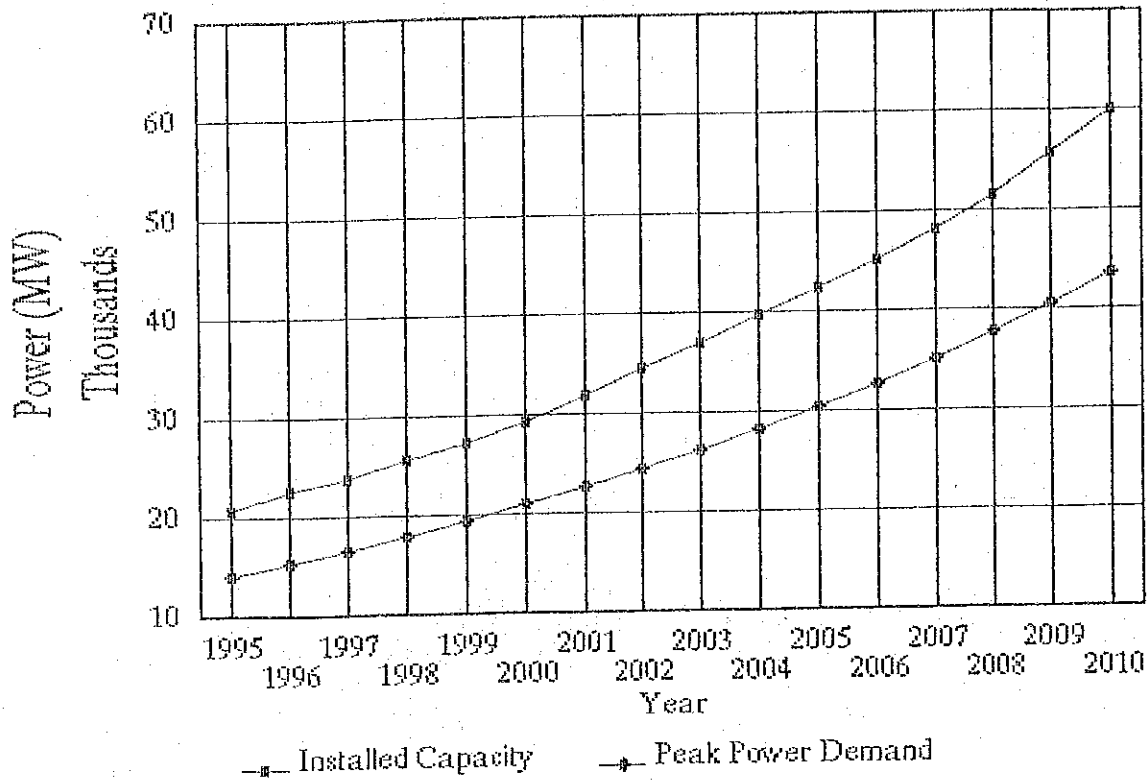
Power Demand Forecast and Demand Supply Balance (1996 to 2010) prepared by TEK in April 1994

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Power Balance (MW)																
Installed Capacity																
Thermal	10,414	11,595	12,275	14,085	15,745	16,725	18,085	19,105	20,465	21,635	23,785	26,145	28,655	31,785	34,105	36,985
Hydroelectric	10,282	10,954	11,483	11,483	11,483	12,522	13,821	15,401	16,488	18,082	18,602	19,952	19,504	19,698	21,592	23,049
Total	20,696	22,549	23,758	25,568	27,228	29,247	31,906	34,506	36,953	39,717	42,387	45,197	48,159	51,483	55,697	60,034
Peak Power Demand	14,065	15,235	16,505	17,880	19,375	20,990	22,610	24,360	26,240	28,260	30,445	32,710	35,145	37,760	40,570	43,590
Reserve capacity	6,631	7,314	7,253	7,688	7,853	8,257	9,296	10,146	10,713	11,457	11,942	12,487	13,014	13,723	15,127	16,444
Reserve ratio(%)	47	48	44	43	41	39	41	42	41	41	39	38	37	36	37	38
Energy Balance (GWh)																
Energy Generation																
Thermal	63,348	71,023	75,443	87,208	97,998	104,368	113,208	119,838	128,678	136,283	150,758	166,098	182,413	202,758	217,838	236,558
Hydroelectric	37,530	39,108	40,854	40,854	40,854	44,598	48,173	53,006	56,971	61,909	63,778	65,531	66,537	66,782	73,214	77,355
Total	100,878	110,131	116,297	128,062	138,852	148,966	161,381	172,844	185,649	198,192	214,536	231,629	248,950	269,540	291,052	313,913
Energy Demand	87,205	94,605	102,500	111,050	120,310	130,350	140,850	151,720	163,430	176,040	189,630	203,675	218,835	235,130	252,635	271,450
Reserve capacity	13,673	15,526	13,797	17,012	18,542	18,616	20,531	21,124	22,219	22,152	24,906	27,954	30,115	34,410	38,417	42,463
Reserve ratio(%)	16	16	13	15	15	14	15	14	14	13	13	14	14	15	15	16

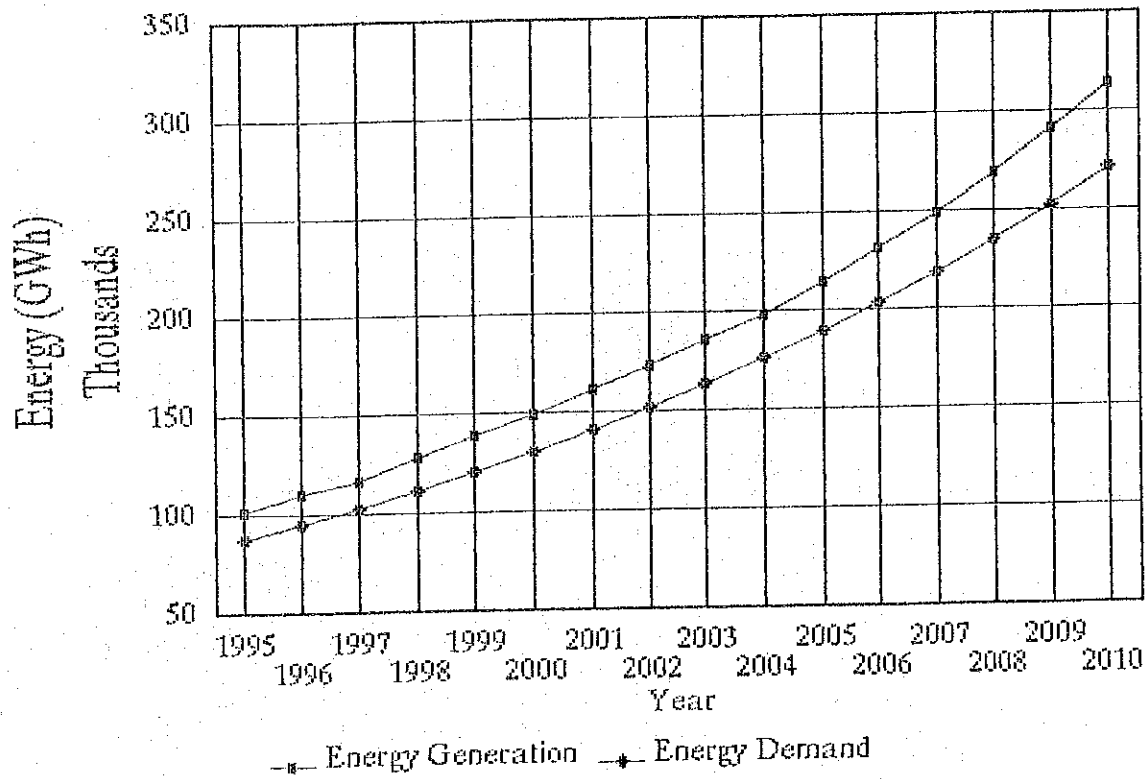
Installed Capacity and Trend of Component Ratio of Power Resources (1996 to 2010) prepared by TEK in April, 1994 (MW,%)

Year	Coal		Gas	Oil Thermal Total	Nuclear Hydroelectric Grand Total			
	Lignite/coal	Imported coal						
	Total							
1995	5,803 28.0	0 0.0	2,671 12.9	1,925 9.3	10,399 50.2	0 0.0	10,297 49.8	20,696 100
1996	6,304 28.0	0 0.0	3,351 14.9	1,925 8.5	11,580 51.4	0 0.0	10,969 48.6	22,549 100
1997	6,304 26.5	0 0.0	4,031 17.0	1,925 8.1	12,260 51.6	0 0.0	11,498 48.4	23,758 100
1998	7,434 29.1	0 0.0	4,711 18.4	1,925 7.5	14,070 55.0	0 0.0	11,498 45.0	25,568 100
1999	7,734 28.4	0 0.0	6,071 22.3	1,925 7.1	15,730 57.8	0 0.0	11,498 42.2	27,228 100
2000	8,714 29.8	0 0.0	6,071 20.8	1,925 6.6	16,710 57.1	0 0.0	12,537 42.9	29,247 100
2001	9,394 29.4	0 0.0	6,751 21.2	1,925 6.0	18,070 56.6	0 0.0	13,836 43.4	31,906 100
2002	9,734 28.2	0 0.0	7,431 21.5	1,925 5.6	19,090 55.3	0 0.0	15,416 44.7	34,506 100
2003	10,414 28.2	0 0.0	8,111 21.9	1,925 5.2	20,450 55.3	0 0.0	16,503 44.7	36,953 100
2004	10,904 27.5	0 0.0	8,791 22.1	1,925 4.8	21,620 54.4	0 0.0	18,097 45.6	39,717 100
2005	11,054 26.1	1,000 2.4	8,791 20.7	1,925 4.5	22,770 53.7	1,000 2.4	18,617 43.9	42,387 100
2006	11,734 26.0	2,000 4.4	9,471 21.0	1,925 4.3	25,130 55.6	1,000 2.2	19,067 42.2	45,197 100
2007	12,564 26.1	3,000 6.2	10,151 21.1	1,925 4.0	27,640 57.4	1,000 2.1	19,519 40.5	48,159 100
2008	13,014 25.3	4,000 7.8	10,831 21.0	1,925 3.7	29,770 57.8	2,000 3.9	19,713 38.3	51,483 100
2009	13,654 24.5	5,000 9.0	11,511 20.7	1,925 3.5	32,090 57.6	2,000 3.6	21,607 38.8	55,697 100
2010	14,854 24.7	6,000 10.0	12,191 20.3	1,925 3.2	34,970 58.3	2,000 3.3	23,064 38.4	60,034 100

POWER BALANCE



ENERGY BALANCE



6 : キョプリユ水力発電計画関連資料

REPUBLIC OF TURKkiye

MINISTRY OF PUBLIC WORKS AND SETTLEMENT

GENERAL DIRECTORATE OF STATE HYDRAULIC WORKS



MASTER PLAN STUDY ON KÖPRÜ DAM AND HPP

EXECUTIVE SUMMARY



JULY - 1994
ANKARA

DESCRIPTION OF PROJECT AREA

Geography

Location and Extension

Lower Seyhan project area is located in southern part of Turkey, in Eastern Mediterranean region, in the north of Adana province, in between the $36^{\circ}30'$ - $37^{\circ}50'$ North latitudes and $34^{\circ}45'$ - $37^{\circ}00'$ East longitudes. Lower Seyhan Basin is surrounded by Ceyhan Basin in the east, Konya and Berdan plains in the west, Develi and Upper Seyhan Basins in the north, and by Mediterranean Sea in the south.

The location of the project area, which covers $16\ 000\ \text{km}^2$ in the south of Feke district out of the total catchment area of $20731\ \text{km}^2$ of Seyhan River, is exhibited in Drawing No: SD-M501.

Topography

Mountains

The project area has a rough topography, which descends to zero elevation at the point where Seyhan River discharges into Mediterranean Sea, and reaches elevations 3500 m. at the Taurus Mountains in the North to Northwest.

Some of the neighbouring mountains are, Tekeli hill (1434 m) and Hopur hill (1444 m) in the North of Menge dam; Görbiyes mountain (1943 m), Boztaş hill (1480 m) and Ardiç hill (1567 m) in the Northwest of Menge dam; Akçakaya hill (1887 m) Karsaltızırtop hill (1884 m) and Bağtepe hill (1776 m) in the North of Göktas dam; Akinek mountain (2010 m)

Boskaya hill (1786 m) and Karakaya hill (1666 m) in the West of Kavşak weir, Ziyaret hill (1511 m) and Elmadağ (1497 m) in the East of Köprü dam; Akkaya hill (1554 m) in the East of Menge dam and Süzgeç mountain (2152 m) and Karafil mountain (3059 m) in the West of Yedigöze dam and Aşıtepe (3525) at Aladağlar, at the west of Göktaş dam.

Plains

The largest plain in the project area is Adana plain located between the downstream of Seyhan Dam and the Mediterranean Sea. Besides there are some plains with elevations 1000-1500 m. in the middle of the Lower Seyhan Basin. Presently, approximately 3000 km² of these plains are cultivated and 50 % of them are less than 10 hectares in size. The Kozan and Kirit plains, within the catchment of Ceyhan river and subject of this report, should be mentioned here.

Rivers

The main river in the project area is the Seyhan, which is formed by the confluence of Zamanti and Göksu sources which drain the Upper Seyhan Basin. The catchment area of Zamanti river is 8748 km² and its main branch, before the confluence with Göksu, is Değirmen creek. Göksu tributary, with a catchment area of 4300 km² joins with Salam creek and Balık creek mainly. Main creeks joining to the Seyhan river between junction of the two source rivers and the existing Seyhan dam are Doğançay, Eğlence creek, Körkün creek and Çakıl creek.

At Seyhan dam location, the catchment area of Seyhan river is 19 000 km² and the average annual inflow is 6297.4 million m³.

Köprü Dam

Dam Location and Access

Köprü dam site is on the Güksu tributary of Seyhan river and it is at 14 km. straight line distance, northwest of Kozan district which is in the vicinity of Adana province. At the time being the access to the dam site is provided by a 35 km. province road branching off from Adana-Kozan highway. The junction point is at 8 km to Kozan. 26 km of this road is stabilized with good standards. The rest of it is a forest road. Improvement of this last portion will be sufficient for the transportation of the construction equipment and the permanent equipment.

There is no necessity for access to the dam site from the right bank.

Selection of Location

The dam site was considered at Köprü I axis first for topographical reasons. But the geological conditions restrict the dam height, and makes it impossible to construct dams with reservoir elevations higher than 370.00. So for the higher dams an alternative axis have been searched for.

The topographical conditions necessitates larger fill volumes, Köprü II axis have been selected because of good and possible geological conditions.

Purpose of Dam

Köprü dam is considered for energy production only. After the development of the Lower Seyhan basin is completed, it will be natural that the dam will provide a flood protection benefit more or less, on the other hand, increase of power production downstream.

Geological Situation

Engineering Geology of Dam Site

The bedrock at the Köprü dam site the sandstone, siltstone complex of lower-Middle Cambrian unit is predominant on both banks.

There occur a disturbed zone and topsoil reaching up to a thickness of 1-2 m on the both dam sites.

Stability

Köprü dam site seems to be without problem by the stability point of view.

The slope wash occurring on the right bank, the disturbed zone and the topsoil on both banks should be stripped off.

The fractures occurring through the rock units at dam sites are considerably developed. Some unimportant ruptures and slides may occur during the construction stage and also after the filling of reservoir, but don't effect security of the dam body.

Watertightness

The reservoir area of proposed Köprü dam extends along the narrow and deep valley of Göksu river. According to the surface geological data, the reservoir area is not seem to be dangerous from the point of water leakage, whatever the maximum water elevation is.

Recommendations

- The geological map in scale of 1/1000 should be prepared for the Köprü dam site and surrounding areas, which exhibit more favourable engineering and geological conditions.

- Drilling holes should be planned on the right and left bank, at the thalweg in the spillway area and on the portal and outlet of diversion tunnel. The depth and position of boreholes should be determined in place. The purpose of these boreholes is to determine the engineering properties of rocks by means of core samples and by the application of water pressure tests.

- The stripping should be made in order to remove the disturbed zone of varying depth in both dam sites.

- The slope wash occurring on the right bank of Köprü dam site should be stripped off.

Material Situation

The investigated borrow areas are A-D for impervious material, E for pervious and T-1 and T-2 for rock quarry.

Whereas all the other areas are situated in the vicinity of the dam site, areas C and D are some 35 km apart in the vicinity of Kozan town.

Facilities and Characteristics of Dam

The maximum operation level of Köprü reservoir, being 445.00 corresponds to a storage volume of 260 million m³. As the result of sedimentation studies the dead volume was found as 84 million m³, and the corresponding elevation is 390.00.

At the dam axis, the thalweg elevation of Göksu river is 314.00. The slopes of the dam body are 2.2/1 and 2.1/1 for upstream and downstream faces respectively. The common excavation will be about 5 m. deep for Köprü dam site.

The 1025.00 m long diversion tunnel is at the left bank. Its cross section is horseshoe and diameter is 9.50 m. After the grout curtain there is a plug and after that a penstock with diameter 2.70 m. reaches to the valve chamber. The water is jetted to the river bed by means of a Howell Bunger valve with diameter 1.80 m.

The spillway is placed on the right bank. After an approaching channel at elevation 427.00, there is the sill whose crest elevation is 430.00. There are 4 radial gates on the sill with dimensions 12.00 x 15.00. At the end the water is jetted by a flip bucket into the riverbed without affecting the power plant. (see Drawing No: SD-M 743, 746, 749, 750). This equipment has to be studied in detail (Model test).

The characteristics of the storage facilities are given below.

Total reservoir volume (m ³)	260 x 10 ⁶
Active volume (m ³)	206 x 10 ⁶
Dead volume (m ³)	54 x 10 ⁶
Maximum operation level (m)	445.00
Normal water elevation (m)	438.95
Minimum operation elevation (m)	390.00
Flood elevation (m)	446.00
Annually regulated volume (m ³)	947 x 10 ⁶
Type of dam	Rockfill
Crest elevation (m)	450.00
Crest length (m)	565.00
Total fill volume (m ³)	10 361 400
impervious (m ³)	1 868 800
filter (m ³)	438 400
rockfill (m ³)	8 054 200
Capacity of diversion tunnel (m ³ /sec)	1265
Tunnel diameter (m)	9.50
Tunnel length (m)	1025
Crest el. of preliminary cofferdam (m)	330.00
Crest el. of upstream cofferdam (m)	347.00
Crest el. of downstream cofferdam (m)	319.00
Type of spillway	Controlled
Number of sectors	4
sector width (m)	12.00
Dimensions of the gates (m)	12.00 x 15.00
Crest elevation of sill (m)	430.00
Spillway capacity (m ³ /sn)	5305
Width of discharge channel (m)	55 ~ 30

Köprü Power Plant

Location and Access

Since Köprü power plant is arranged at the toe of the Köprü dam, the location and access to the powerplant is same as mentioned in Section (1.3.1).

The Cause of Selection

The location of the powerplant is selected depending on the dam site conditions.

Selection of Capacity

As a result of the operational studies done with 15 various installed capacities corresponding to 5 different reservoir elevations, the optimum solution existed by giving 189 MW capacity to the power plant. With this capacity Köprü power plant will produce a total of 480.9×10^6 kwh energy annually, 248.6×10^6 kwh of it being the firm and the remaining secondary.

Geological Situation

All the elements constituting the power facilities take place in Cambrian aged schists. This formation is capable to bear the power tunnel, surge tank, penstock and the powerhouse without causing any problems.

Characteristics of Plant

The power intake is at the left bank of Göksu river. In front of it there are 8 trashracks with dimensions 5.0×5.0 m. At 145 m. downstream of the intake there is the gate shaft. Both the bulkhead and service gates are in this structure. The platform elevation of the gate shaft is 450.00.

The power tunnel, circular in cross section and 7.0 m in diameter, continues with a slope of 0.002. At 575 m. downstream of the gate shaft the surge tank takes place. The power tunnel is steel lined after the surge tank and its total length is 820 m.

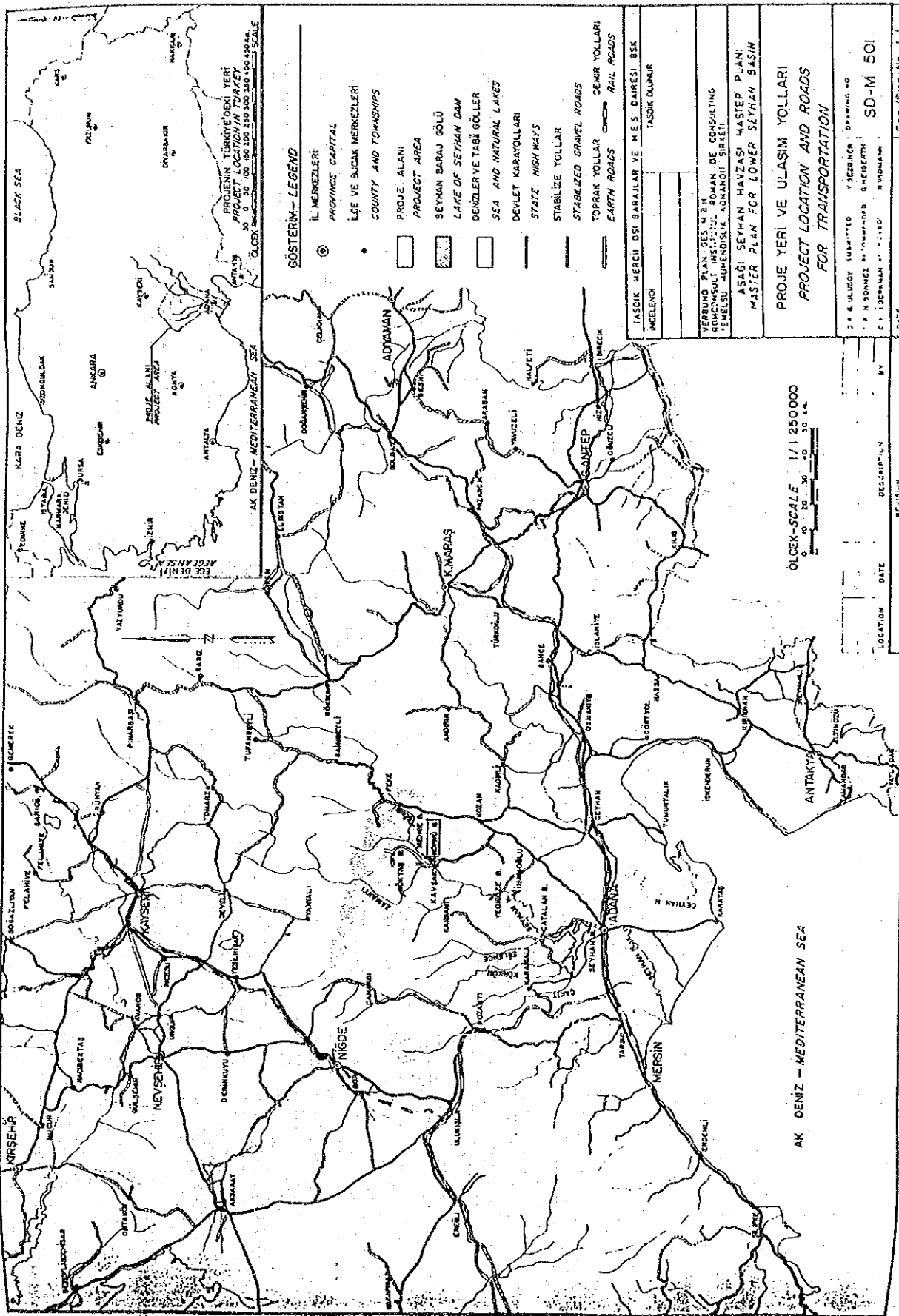
The surge tank being cylindrical, have an inner diameter of 19.20 m. 30 m of the surge tank is above ground while 54 m. portion is under the ground lined and sealed. Penstock starts at 100 m. downstream of the surge tank and after dropping 60 m. it enters into the powerhouse.

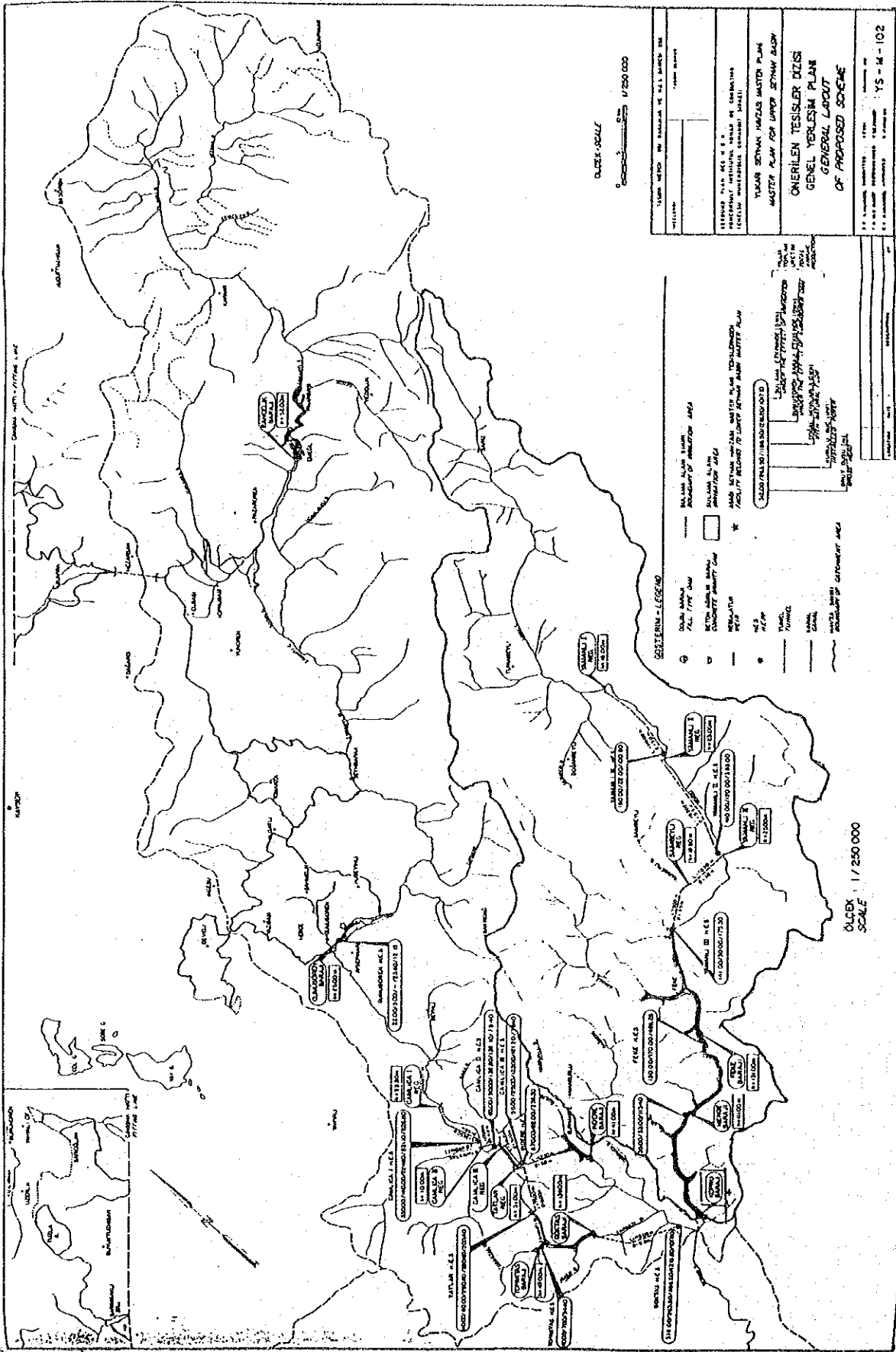
At the downstream face of the dam body there is random fill whose platform elevation is 320.00. On this platform the switchyard is located and its dimensions are 84×56 m. In front of this random fill, the power plant takes place.

Three penstocks with diameters 4.00 m. are connected to Francis turbines whose axis elevations are 310.50. Draft tubes coming from these turbines reach out with a slope of 1/10. At the exit of the power plant the tail-water elevation is 318.00; which is the maximum reservoir elevation of Kavşak weir. The transformers are also on the above mentioned platform in front of the switchyard.

Characteristics of the plant are listed below.

Installed capacity (MW)	189
Power tunnel length with concrete lining (m)	720.00
Power tunnel length with steel lining (m)	100
Power tunnel capacity (m ³ /sec)	186
Power tunnel diameter (m)	7.00
Lining thickness of power tunnel (m)	0.60
Average annual discharge (m ³ /sn)	27.9
Diameter of surge tank (m)	19.20
Number of penstocks	3
Diameter of penstocks (m)	4.00
length of penstocks (m)	190.00
Total head (m)	127.00
Net head (m)	118.10
Number of units	3
Capacity of units (Mw)	63
Type of turbine	Francis
Dimensions of powerhouse (m)	25.00x80.00
Annual firm energy (Gwh)	248,6
Annual secondary energy (Gwh)	232.3
Total annual energy (Gwh)	480.9
Firm power (Mw)	28.3

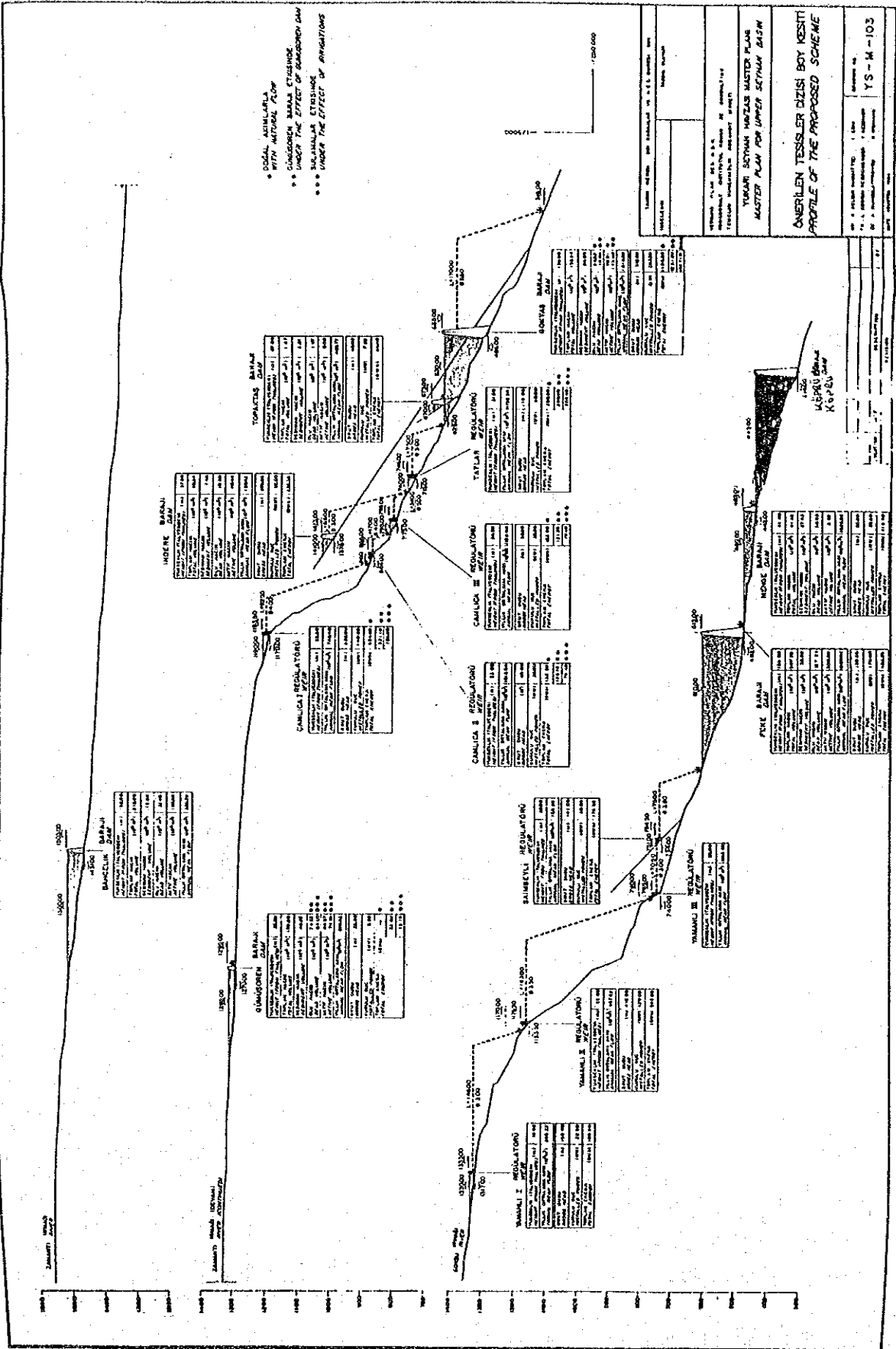




ÖLÇEK SKALASI 1/250.000

YASAR SETYAN HARJOS MASTER PLAN
 MASTER PLAN FOR YASAR SETYAN ALUMINUM
 ONERILEN TESISLER DİZİSİ
 GENEL YERLEŞİM PLANI
 GENERAL LAYOUT
 OF PROPOSED SCHEME

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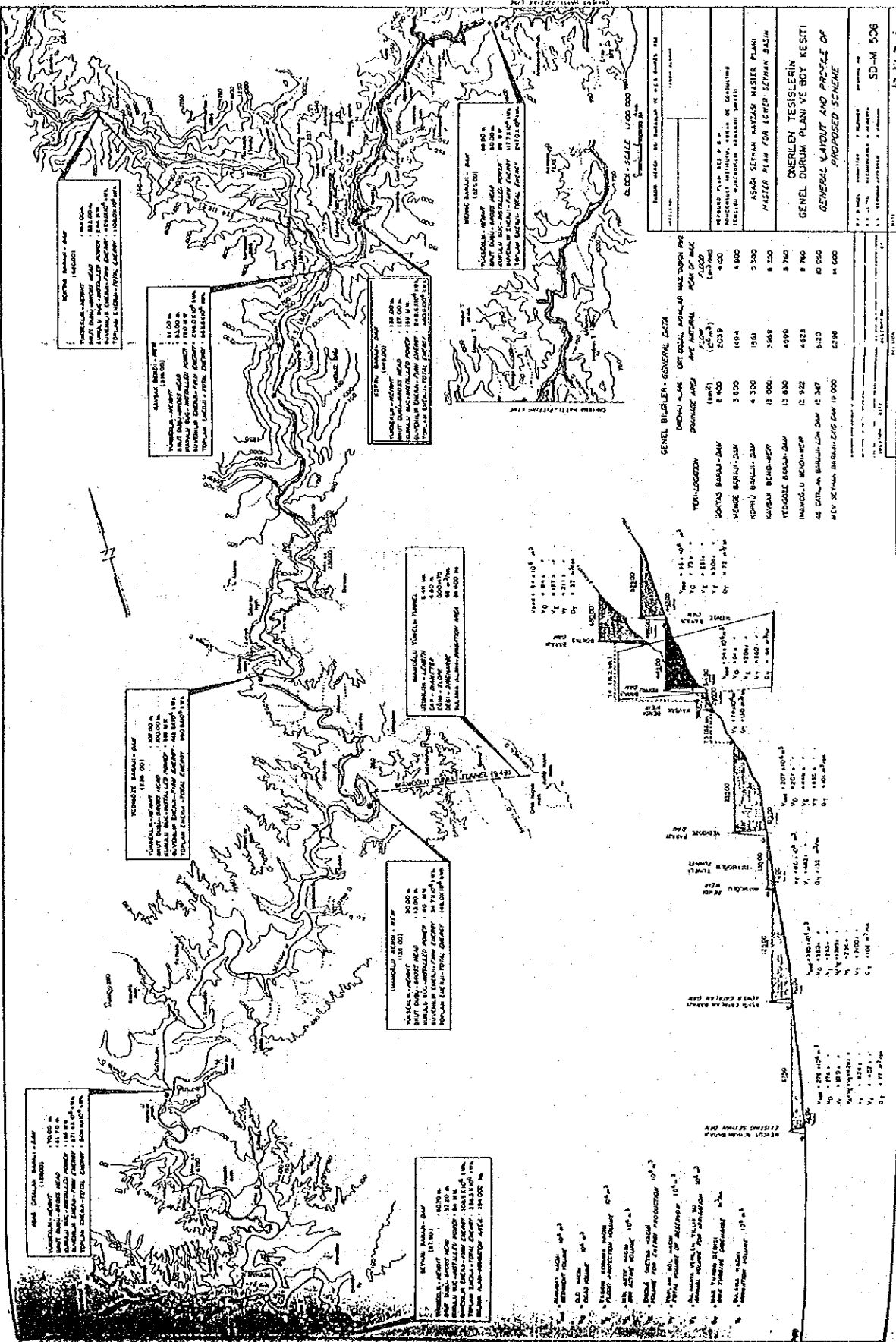
- DOKA ABILARLA WITH AUTOMATIC FLOW
- DAMBOEN DAMS ETUSISIDE UNDER THE EFFECT OF DAMBOEN DAM
- MALJANJALA ETUSISIDE UNDER THE EFFECT OF DAMBOEN DAM

1. DOKA ABILARLA WITH AUTOMATIC FLOW
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 3. MALJANJALA ETUSISIDE UNDER THE EFFECT OF DAMBOEN DAM

YEMAN SETYAN HARIZI MASTER PLAN
 MASTER PLAN FOR UPPER SETYAN BASIN

ONERILLEN DIZISI BOY KESITTI
 PROFILE OF THE PROPOSED SCHEME

YS-M-103



SEYHAN BARIŞLI DAM (18300)
 KURULUŞ YERİ: 18300 m
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MARSAZLI BARIŞLI DAM (18300)
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SEYHAN BARIŞLI DAM (18300)
 KURULUŞ YERİ: 18300 m
 SAĞLIKLI SUYU: 18300 m
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SEYHAN BARIŞLI DAM (18300)
 KURULUŞ YERİ: 18300 m
 SAĞLIKLI SUYU: 18300 m
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SEYHAN BARIŞLI DAM (18300)
 KURULUŞ YERİ: 18300 m
 SAĞLIKLI SUYU: 18300 m
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MARSAZLI BARIŞLI DAM (18300)
 KURULUŞ YERİ: 18300 m
 SAĞLIKLI SUYU: 18300 m
 SAĞLIKLI SUYU: 18300 m
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MARSAZLI BARIŞLI DAM (18300)
 KURULUŞ YERİ: 18300 m
 SAĞLIKLI SUYU: 18300 m
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SEYHAN BARIŞLI DAM (18300)
 KURULUŞ YERİ: 18300 m
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 KURULUŞ YERİ: 18300 m
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SEYHAN BARIŞLI DAM (18300)
 KURULUŞ YERİ: 18300 m
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GENEL BİLGİLER - GENERAL DATA

YERLEŞİM	ORJENEL ALAN (HEK)	ORT. DOKU AKIŞI (HEK)	MAKS. DOKU AKIŞI (HEK)	FLOOD (HEK)	YERİN DÜZLÜĞÜ (HEK)
YONKÖY	8 000	1094	4 000	4 000	18 000
YONKÖY BARIŞLI DAM	3 000	1094	4 000	4 000	18 000
MARSAZLI BARIŞLI DAM	4 000	1094	4 000	4 000	18 000
SEYHAN BARIŞLI DAM	13 000	1094	4 000	4 000	18 000
YONKÖY BARIŞLI DAM	13 000	1094	4 000	4 000	18 000
MARSAZLI BARIŞLI DAM	12 922	1094	4 000	4 000	18 000
SEYHAN BARIŞLI DAM	12 347	1094	4 000	4 000	18 000
MEY SEYHAN BARIŞLI DAM	19 000	1094	4 000	4 000	18 000

ÖNERİLEN TESİSLERİN
 GENEL DURUM PLANI VE BOY KESİTİ
 GENEL LAYOUT AND PROFILE OF
 PROPOSED SCHEME

1:50000
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ASAĞI SEYHAN HAVZASI GELİŞME PROGRAMI
 TIME SCHEDULE OF LOWER SEYHAN BASIN DEVELOPMENT

KONU ITEMS	YIL - YEARS																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
1 FİZİBİLİTE																																		
2 KATI PROJE																																		
3 İHALE																																		
4 İNŞAAT																																		
1 FİZİBİLİTE																																		
2 KATI PROJE																																		
3 İHALE																																		
4 İNŞAAT																																		
1 FİZİBİLİTE F/S																																		
2 KATI PROJE																																		
3 İHALE																																		
4 İNŞAAT																																		
1 FİZİBİLİTE																																		
2 KATI PROJE																																		
3 İHALE																																		
4 İNŞAAT																																		
1 FİZİBİLİTE																																		
2 KATI PROJE																																		
3 İHALE																																		
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2 KATI PROJE																																		
3 İHALE																																		
4 İNŞAAT																																		
1 FİZİBİLİTE																																		
2 KATI PROJE																																		
3 İHALE																																		
4 İNŞAAT																																		

- ① FEASIBILITY
- ② FINAL DESIGN
- ③ BIDDING
- ④ CONSTRUCTION

ASADIK MERICI DSI BARAJLAR VE A.E.S. DAİRESİ BSK
 İZMİR

TASKIN ÖZGÜR

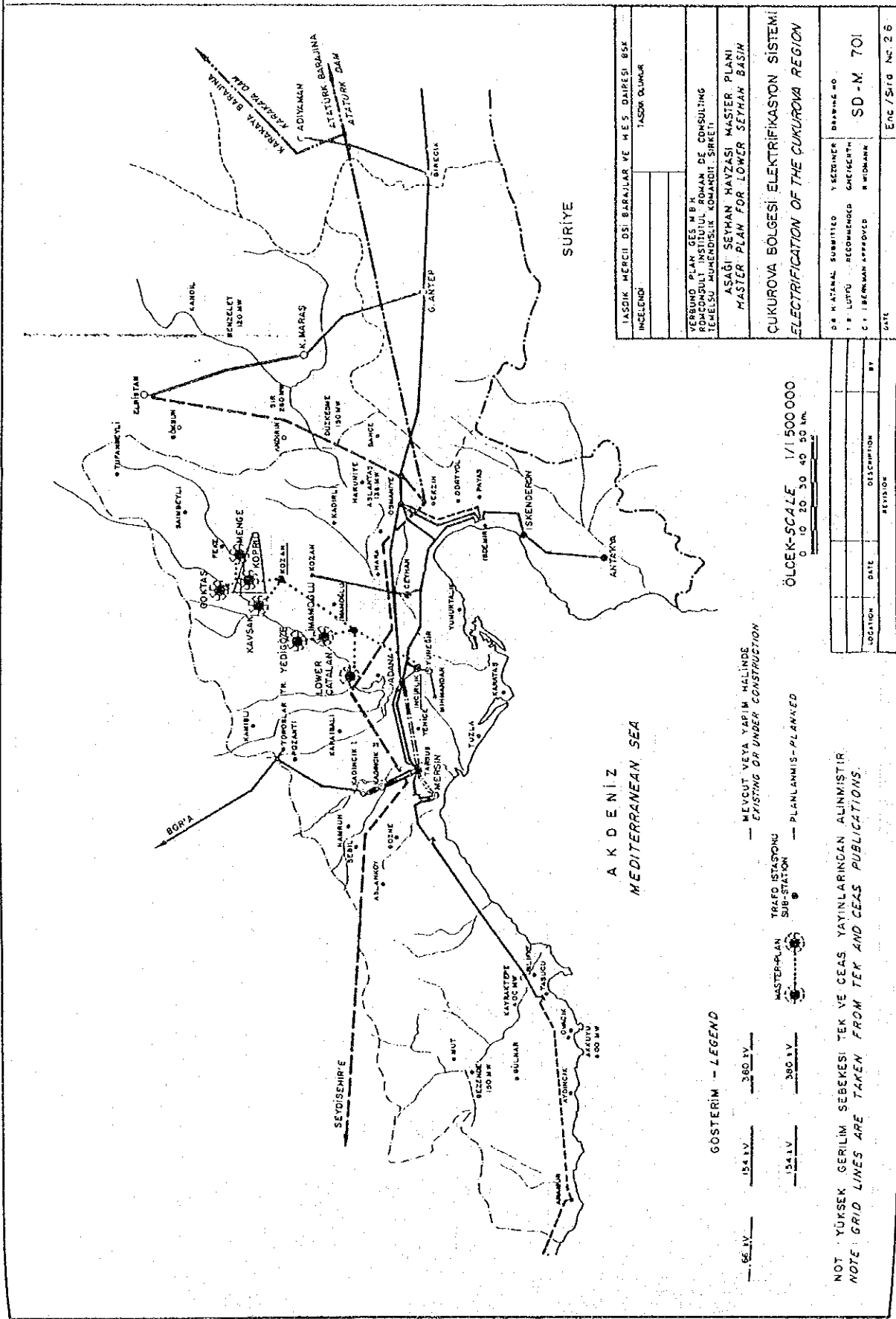
TEKİRNOVA PLAN GEŞ. M.B.
 KONSALT. İNSTITÜTÜ KÖMÜR VE KONSALTING
 TEPELİSU MÜHÜRİNDİRİ KÖMÜR İŞİ

ASAĞI SEYHAN HAVZASI MASTER PLAN
 MASTER PLAN FOR LOWER SEYHAN BASIN

ASAĞI SEYHAN HAVZASI GELİŞME PROGRAMI
 TIME SCHEDULE OF LOWER SEYHAN BASIN DEVELOPMENT

ETİS NO: 1000/1000 1. SEKTÖR 1000/1000
 10.000/1000 1. SEKTÖR 1000/1000
 10.000/1000 1. SEKTÖR 1000/1000

SD-N 1000



SURİYE

A K DENİZ
MEDITERRANEAN SEA

GÖSTERİM - LEGEND

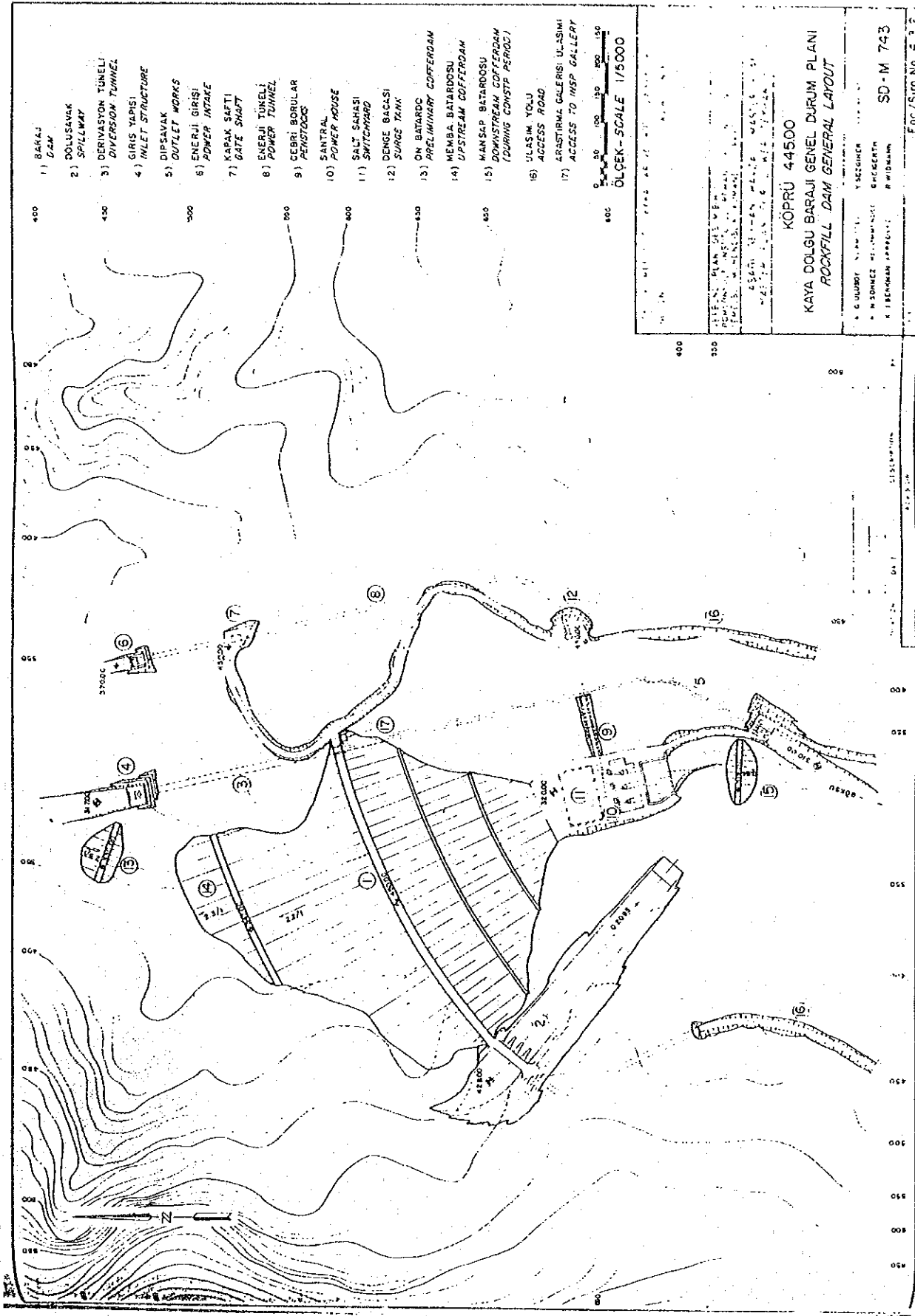
- 66 kV —
- - - 154 kV - - -
- · - · 380 kV - · - ·
- - - - 500 kV - - - -
- TRAFİK İSTASYONU
SUB-STATION
- MAESTRO PLAN
MASTER PLAN
- MEVCUT VEYA YAPIM HALİNDE
EXISTING OR UNDER CONSTRUCTION
- - - - PLANLANMIŞ - PLANNED

ÖLÇEK-SCALE 1/1 500 000
0 10 20 30 40 50 km

NOT : YÜKSEK GERİLİM SEBEKESİ TEK VE CEAS YATINLARINDAN ALINMIŞTIR
NOTE : GRID LINES ARE TAKEN FROM TEK AND CEAS PUBLICATIONS.

TASLAK MERCELİ Dİ. BAKIMLAR VE M.E.S. DAİRESİ BŞF		TASLAK ÖLÇÜMÜ	
İNCELENDİ			
YERLİND PLAN G.E.S. M.E.B.K. ROMCONSULT INSTITUTUL ROMAN DE CONSULTING TEMLİSU MUHENDİSLİK KOMANİTİ SİRKEETİ			
ASAĞI SEYHAN HAVZASI MASTER PLANI MASTER PLAN FOR LOWER SEYHAN BASIN			
CUKUROVA BOLGESİ ELEKTRİFİKASYON SİSTEMİ ELECTRIFICATION OF THE CUKUROVA REGION			
DR. M. ATANAL	SUBMITTED	Y. SEZGİNER	DRAWING NO.
Y. F. LUTU	RECOMMENDED	G. CİĞİRTM	SD-M. 701
C. İ. İBREMAN	APPROVED	M. WIDHANA	
DATE		DATE	ENC 7/519 NO. 26

LOCATION	DATE	DISCUSSION	BY



- 1) BARAJ DAM
- 2) DOLUSAVAK SPILLWAY
- 3) DERIVAYON TUNELI DIVERSION TUNNEL
- 4) GIRIS YAPISI INLET STRUCTURE
- 5) DIPSAVAK OUTLET WORKS
- 6) ENERJİ GIRISI POWER INTAKE
- 7) KAPAK SAFTI GATE SHAFT
- 8) ENERJİ TUNELİ POWER TUNNEL
- 9) CEBRİ BÖRÜLER PENSTOCKS
- 10) SANTRAL POWER HOUSE
- 11) SALT SAHASI SWITCHYARD
- 12) DENGE BACASI SURGE TANK
- 13) ON BATAROC PRELIMINARY COFFERDAM
- 14) MEMBA BATAROSU UPSTREAM COFFERDAM
- 15) MANSAP BATAROSU DOWNSTREAM COFFERDAM (DURING CONST. PERIOD)
- 16) ULASHIM YOLU ACCESS ROAD
- 17) ARKASTIRMA GALERİSİ ULASHIM ACCESS TO MSP GALLERY

ÖLÇEK - SCALE 1/5000

KÖPRÜ 445.00

KAYA DOLGU BARAJI GENEL DURUM PLANI
ROCKFILL DAM GENERAL LAYOUT

Y. SÖZÜMÇÜ Y. SÖZÜMÇÜ
M. SÖZÜMÇÜ M. SÖZÜMÇÜ
K. SÖZÜMÇÜ K. SÖZÜMÇÜ

SD-M 743

Enc / Site No 5.3.2

JICA