

により処理することにし、左岸側には基礎処理トンネルをダム堤頂標高に設け、ダム天端で60m、左岸側河床部で90mのグラウトを行い計画である。また河床部から右岸側は標準的なグラウトとするが、取水口および洪水吐の基礎はやせ尾根のため若干深いグラウトを施工する計画である。

ダムの標準断面はDSⅠ第7地方局で建設または計画中のロックフィルダムを考慮し、上流側法面勾配を1:2.5、下流側法面勾配を1:2.0として概略設計した。

(2) 洪水吐の設計洪水量はKepez地点と同様の値を採用した。

洪水吐の幅はゲートの標準断面、単位メートル当りの越流量およびロネラーバケットの減勢能力を考慮して決定した。

(3) 仮排水路トンネルの設計洪水量はロックフィルダムであることを考慮し、25年確率洪水量に相当する1,630m³/secを採用し、仮排水路トンネルの直径はKepez地点と同じ方法により選定した。

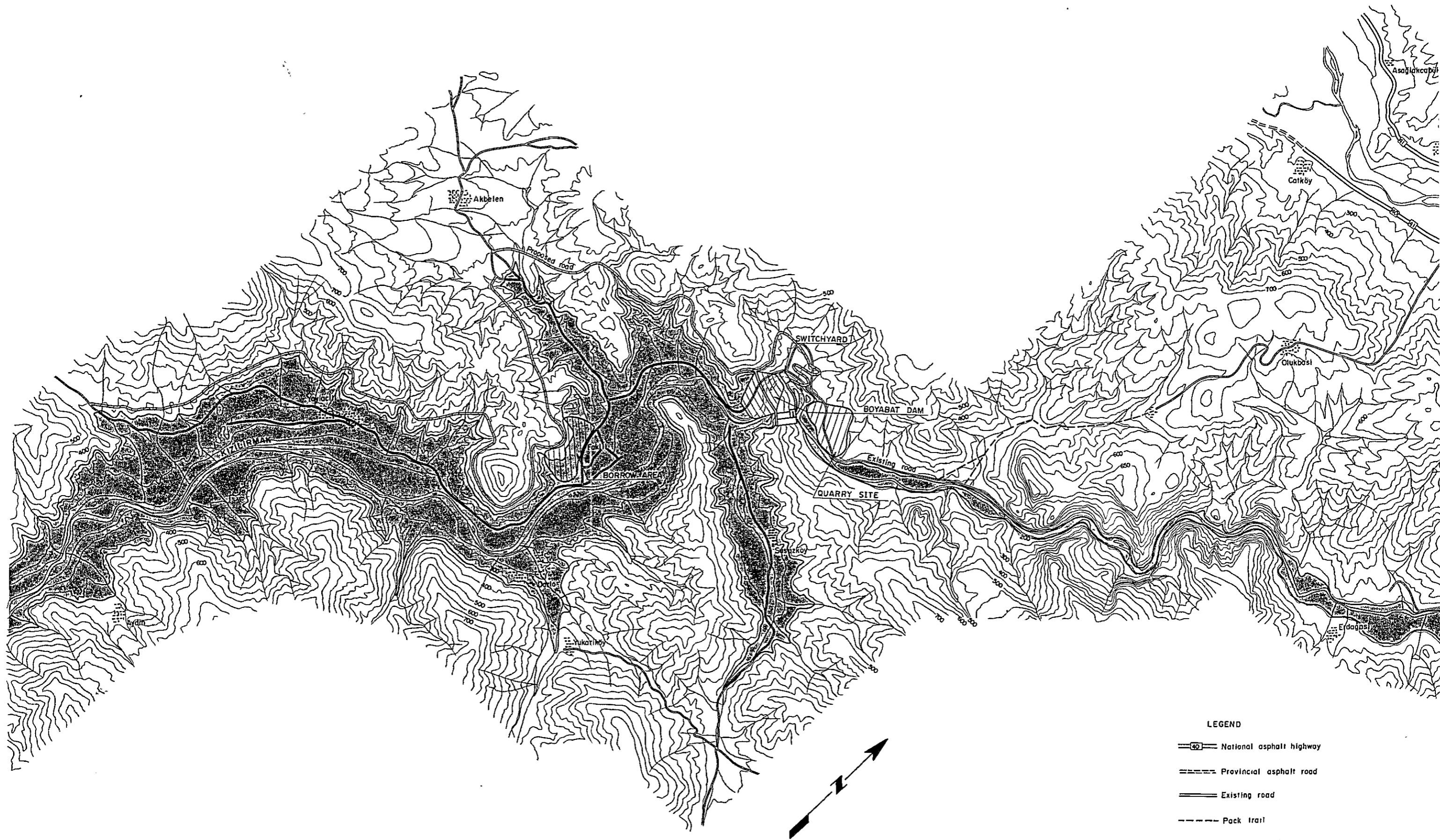
(4) 水圧鉄管の直径はKepez地点と同じ方法により選定した。

(5) 発電所および開閉所の基礎諸元は、機械装置の配置関係を考慮して選定した。






4.2 電気機器

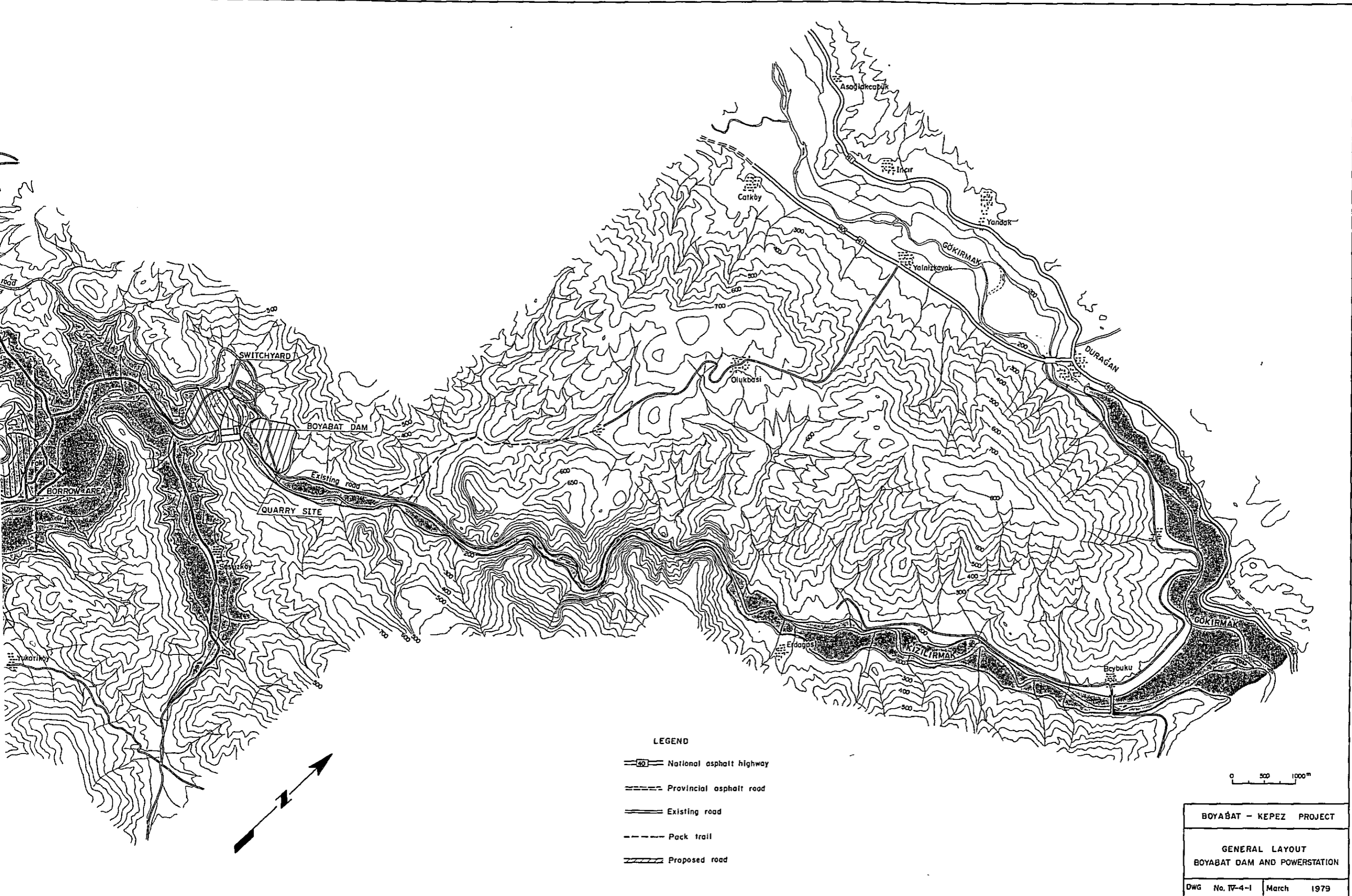
Boyabat発電所は、有効落差が112.9mで設備出力が459MWが最適開発規模である。選定主機は3台の153MWユニットが選定されるのが経済および運用の両観点から適当である。発電所はダム下流の右岸側に設けられ、発電所の上流側に屋外形式の3台の主要変圧器が設置されている。

主要変圧器および380kV開閉所との接続は500mのOFケーブルにより行われる。主回路および開閉所は、第Ⅲ部6.1で述べられているKepez発電所と全く同様に構成されるものとした。








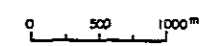
LEGEND

-  National asphalt highway
-  Provincial asphalt road
-  Existing road
-  Pack trail
-  Proposed road

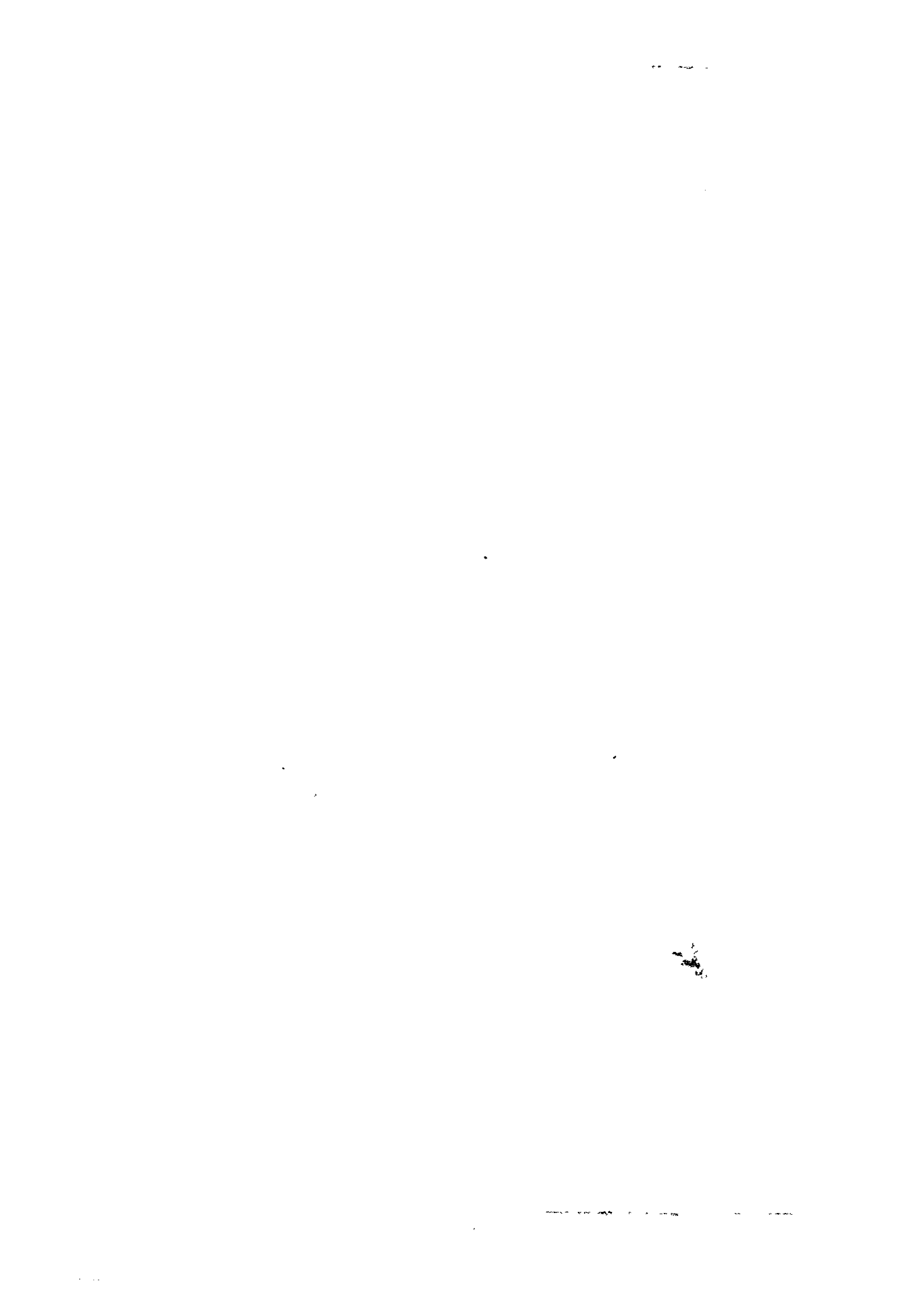


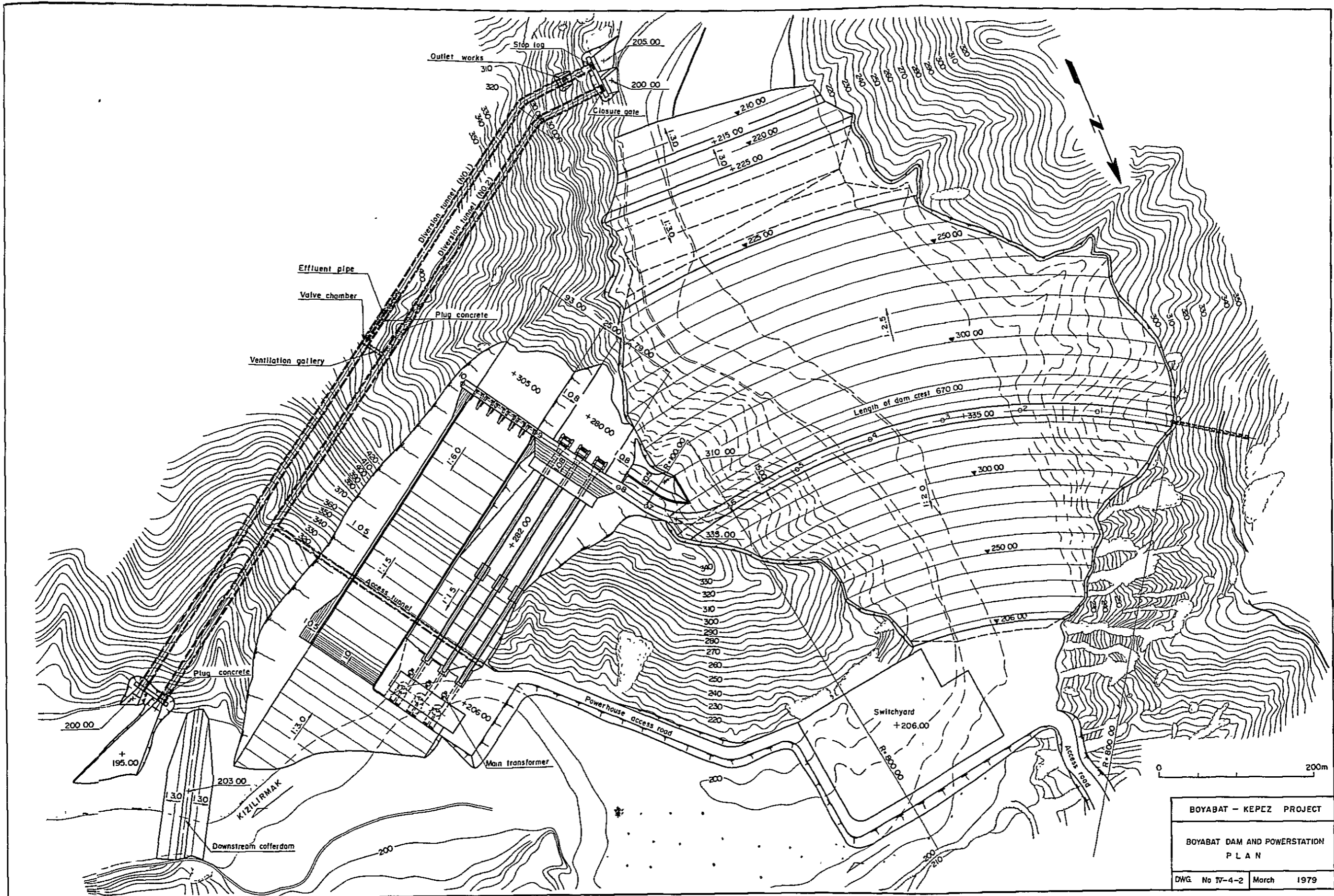
LEGEND

-  National asphalt highway
-  Provincial asphalt road
-  Existing road
-  Pack trail
-  Proposed road

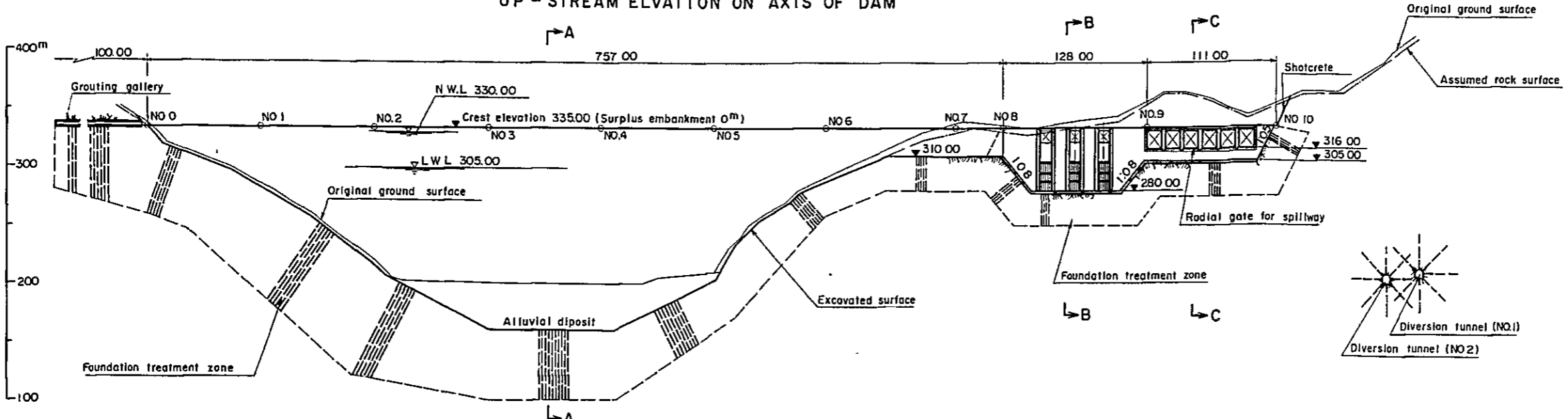


BOYABAT - KEPEZ PROJECT		
GENERAL LAYOUT BOYABAT DAM AND POWERSTATION		
DWG No. IV-4-1	March	1979

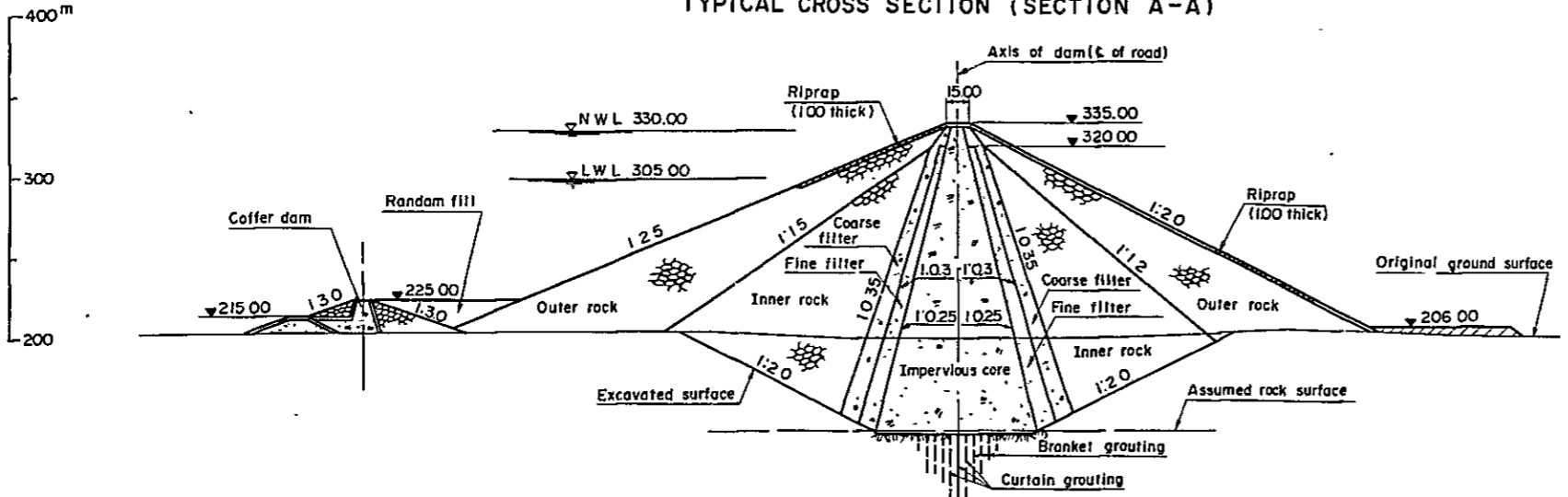




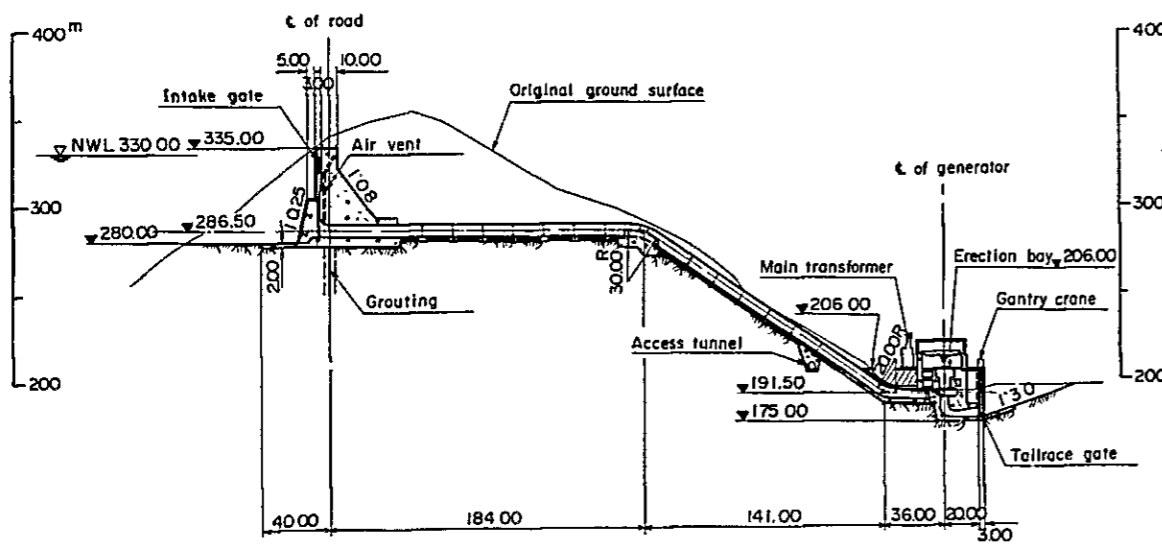
UP - STREAM ELEVATION ON AXIS OF DAM



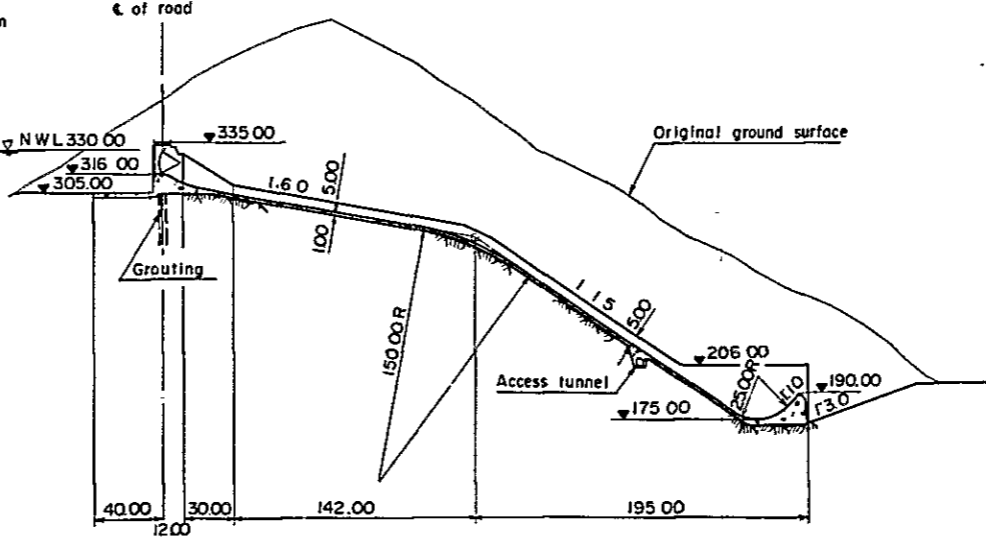
TYPICAL CROSS SECTION (SECTION A-A)



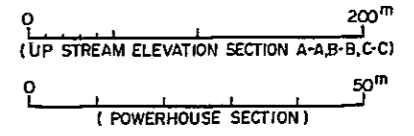
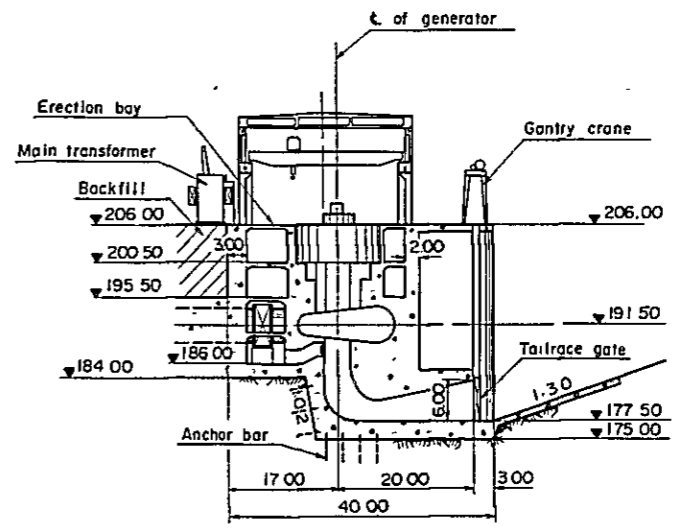
SECTION B-B



SECTION C-C

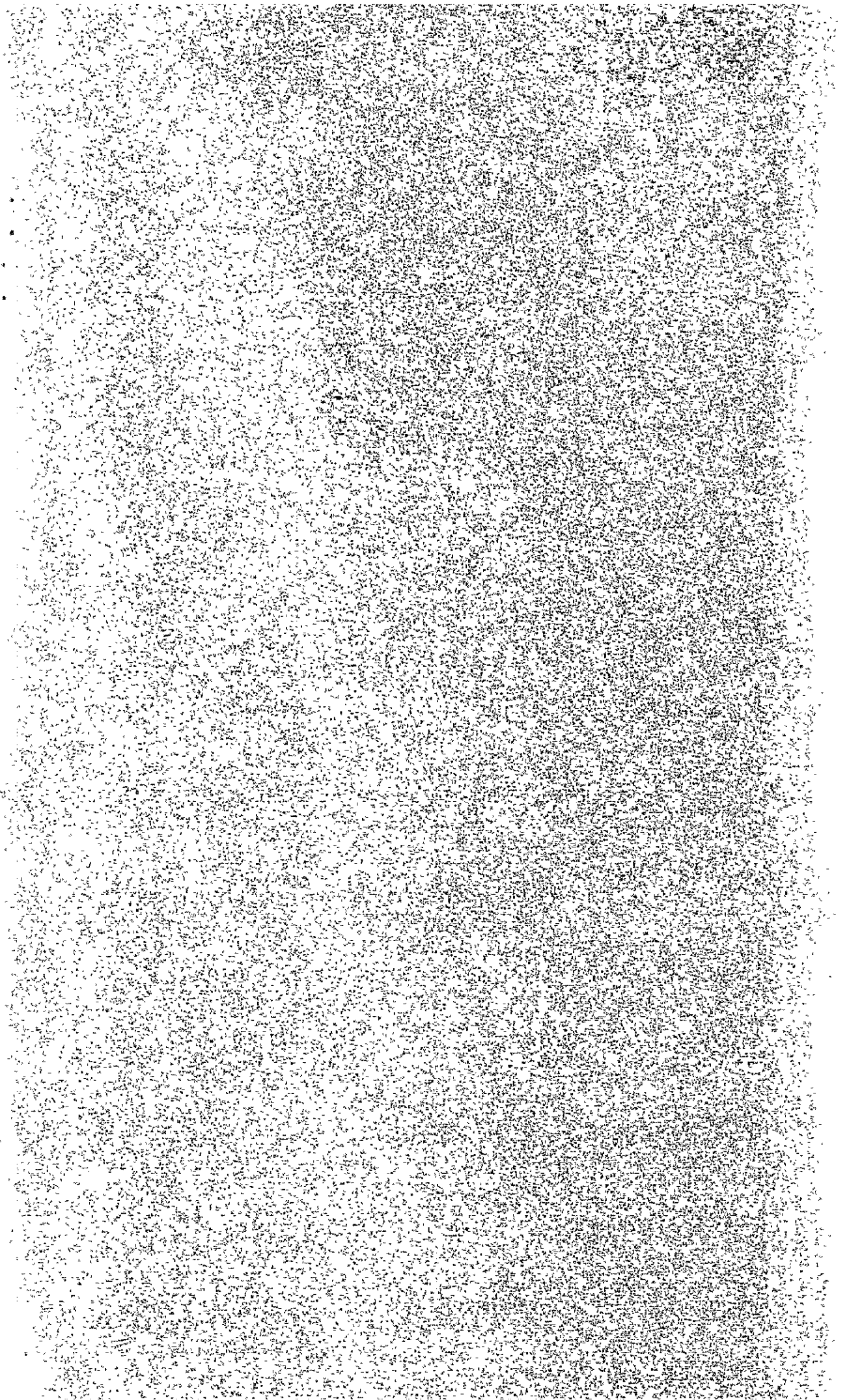


POWERHOUSE SECTION



BOYABAT - KEPEZ PROJECT	
BOYABAT DAM AND POWERSTATION PROFILE AND SECTION	
DWG No IX-4-3	March 1979

第5章 工事費



LIST OF TABLE

Table IV-5-1 Estimated Construction Cost

[The table content is extremely faint and illegible. It appears to be a list of items with associated costs, organized into columns. The text is too light to transcribe accurately.]

第 5 章 工 事 費

工事費算出のための基礎資料は、Kepez 地点の場合と同一とした。

Table IV-5-1 に Boyabat 地点の建設に必要な総工事費を示す。

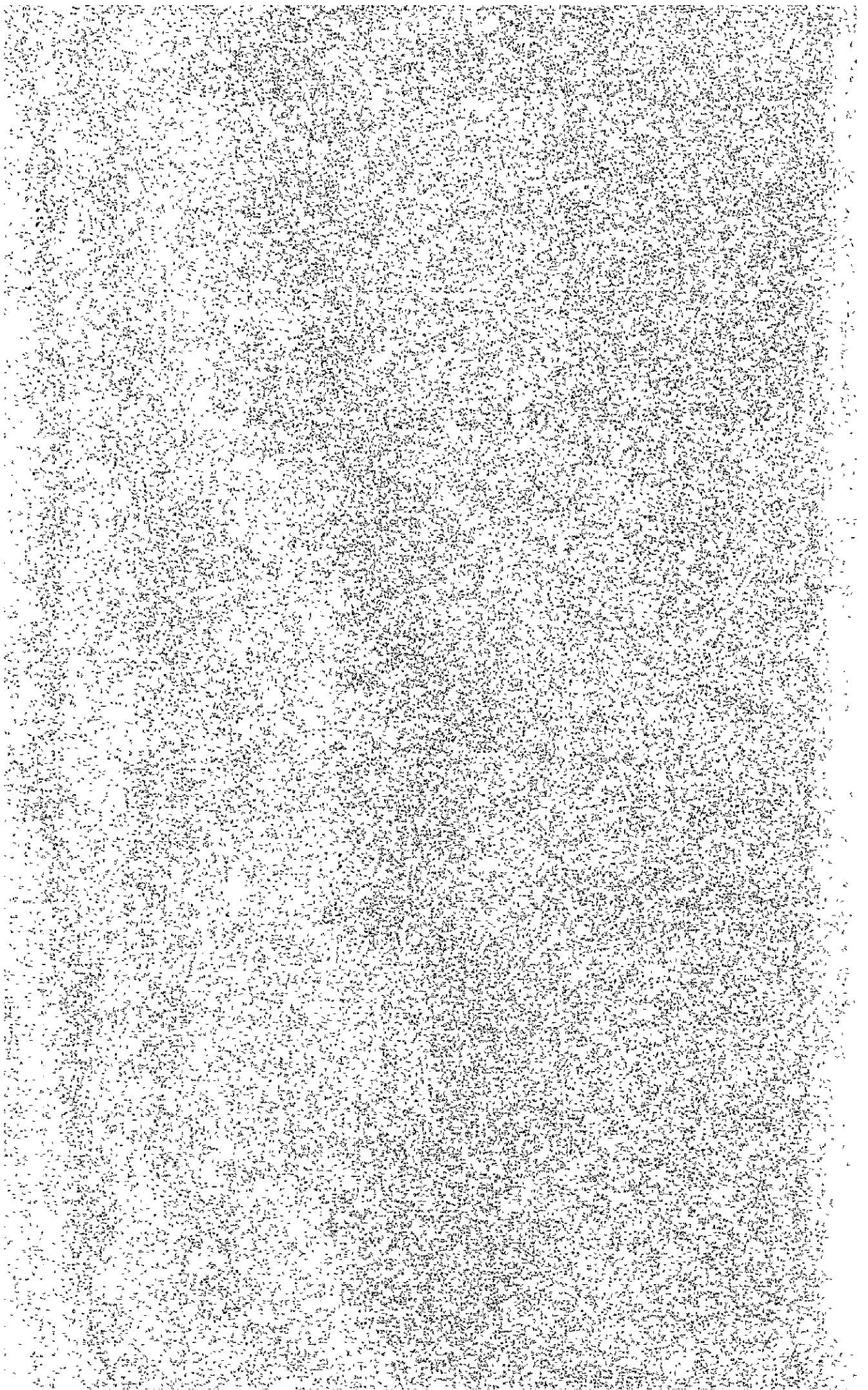
Table IV-5-1 Estimated Construction Cost Unit: 1,000 TL

Item	
Civil Works	
Cofferdam	195,200
Diversion Tunnel	336,500
Dam	4,220,100
Spillway	1,707,900
Outlet Works	25,600
Intake	109,300
Penstock	613,800
Powerhouse	252,600
Switchyard	27,300
Access road	154,600
Cement	117,000
Tailrace	11,200
Subtotal	7,771,100
Contingency (15%)	1,165,400
Total	8,936,500
Hydraulic Works	708,800
Mechanic and Electric Equipment	1,960,000
Transmission Line	1,000,000
Camp Facility	60,000
Relocation of Road	150,000
Project Controlling	1,922,000
Land Acquisition	961,000
Total	15,698,300
Interest during Construction Period (9.5%)	4,175,700
Grand Total	19,874,000

APPENDIX

- A-1 DSI により提供された資料
- A-2 計画地点流量算定に用いた測水所地点における測定流量資料
- A-3 計画地点付近の気象観測所における降雨資料
- A-4 計画地点付近の気象観測所における気温資料

A-1 DSIにより提出供された資料



List of Data Provided by DSI

The obtained fundamental data to study this project are as follows;

- 1.1 Power Demand/Supply and Electric Item
 1. Installed Generating Capacity
 2. Energy Generated
 3. Net Consumption
 4. Number of Ultimate Customers and Population
(Except number of ultimate customers)
 5. Monthly Maximum Demand
 6. Typical Actual Load Demand Curve in 1977
 7. Annual and Monthly Load Duration Curve Estimated in 1978
 8. Gross Economical Potential of River Basin in Turkey
 9. Total of Hydroelectric Power Stations Project in Turkey
 10. Total of Hydroelectric Power Potential in Turkey
 11. Electrical Energy and Power Estimates of Turkey
(1978-2000 years)
 12. Planning Data of Transmission Line
 13. Construction Cost of Transmission Line in Turkey
 14. Configuration of TEK's Standard Transmission Tower
 15. Single Line Diagram for Osmanaç Substation
 16. Data of Tosköprü Substation
 17. 800 KV and 400 KV Alternatives in Transmission Planning for Long Period
 18. Electrification Map of Turkey (1977)
 19. Karakaya Hydroelectric Power Development Supplementary Information to the Loan Application Report
 20. Catalan-Kavsak Hydroelectric Power Plant Project Equivalent Fill-Oil and Gas Turbine Power Plant Cost
 21. Hydroelectric Potential Energy in Turkey
 22. Report of Energy Production for Long Term in Turkey
(1982-2002)
 23. TEK's Energy Generated Analysis in 1976
 24. TEK's Energy Balance (1972-1977)

1.2 Economic Evaluation Data

1. Translation of Harsit Project
2. Facility Life and Replacement and Amortisation Factors
3. Table belonging to Calculation of Operation and Maintenance Costs
4. Data for Economic Evaluation

1.3 Geology and Construction Materials

A. KEPEZ

1. Seismic Map and General Plan
2. Stereographical Projection of Joint
3. Dam Axis Geological Section I. II.
4. Geological Section of Explanatory Adit 1~8
5. DENEY RAPORU 27, 9, 1978

KIZILIRMAK-KEPEZ BENT YERİ MÜHENDİSLİK JEOLJİSİ

ÇALIŞMALARİ CİLT 2 (KUYU LOGLARI)

6. Test Result of Aggregate

REPORTS

- (1) KIZILIRMAK-KEPEZ REZERVUARI JEOLJİ RAPORU 8, 1974.
- (2) KIZILIRMAK-KEPEZ BENT YERİ JEOLJİ ÖN RAPORU 7, 1972.
- (3) KIZILIRMAK-KEPEZ BENT YERİ VE CİVARININ

JEOLJİ RAPORU 1968

B. BOYABAT

1. Topographic Map (EK-12/1~4) 1/1000
2. Geological Plan (EK-11) 1/5000
3. Geological Section of Dam Axis (EK-13) 1/500
4. Geological Section of Spillway (EK-14) 1/500
5. Borehole Diagrams 1~148
6. Borehole Diagrams of Material Investigation 1~36
7. Test Result of Impervious Material

REPORTS

- (1) KIZILIRMAK-BOYABAT BARAJ YERİ JEOLÖJİK SONUÇ RAPORU 3, 1962
- (2) KIZILIRMAK-BOYABAT BARAJ YERİ CILT 2 3, 1962

1.4 Planning Data

1. Storage and Spillway Characteristics of Hirfanlı Dam
2. Storage and Spillway Characteristics of Kesikköprü Dam
3. Typical Cross Section and the Characteristics of Kızılırmak between Devres R. and Duragan
4. Storage Curve at Boyabat Dam
5. Storage Curve at Kepez Dam
6. Kızılırmak Power Development
7. Dimension of Hirfanlı Dam and Power Plant
8. Rating Curve at Kepez
9. Rating Curve at Boyabat
10. Key Plans of Developing Plan of Kızılırmak River
11. Catchment Area at the Appointed Places

1.5 Topographical Map

1. Topographical Map Covered Project Area
Scale 1/100,000
2. Topographical Map Covered Project Area
Scale 1/25,000
3. Topographical Map at Project Site
Scale 1/1,000

1.6 Hydrological and Meteorological Data

1. Run-off Data

- (1) Hydrometric Stations and Measured Discharges in Kızılırmak River Basin

(2) Monthly Flow at Kızılırmak gauging Stations

Inözü	1. '61~9. '76	Şahinkaya	10. '38~9. '73
Yahşihan	10. '73~9. '76	Gülşehir	10. '73~9. '76
Kuyuluş	12. '53~9. '76 (10. '60~9. '61)		
Durağan	10. '38~9. '73		
Yamula	10. '73~9. '76	Sarmısaklı	10. '53~9. '72 (10. '60~9. '61)

(3) Gauging Stations for which Measured Flow is Given

(4) Discharge at Hirfanlı Dam

1. '60~9. '72

(5) Subareas of Kızılırmak River Basin

(6) Measured Flow at Kızılırmak Gauging Stations

Inözü	10. '66~9. '68	10. '70~9. '76
Şahinkaya	10. '66~9. '67	10. '71~9. '72
Yahşihan	10. '66~9. '68	10. '70~9. '76
Gülşehir	10. '66~9. '68	10. '70~9. '76
Kuyuluş	10. '66~9. '68	10. '70~9. '76
Durağan	10. '67~9. '68	10. '70~4. '76
Yamula	10. '66~9. '68	10. '70~9. '76
Sarmısaklı	10. '66~9. '68	10. '70~9. '76

2. Flood Flow Data

(1) Isohyetal Pattern of Project Storm Rainfall

(2) Time Distribution of 36 Hours Mean Rainfall for Major Storms

(3) Derivation of Time Distribution of 36 Hour Rainfall

(4) Determination of Run-off Curve Numbers according to Observed Rainfall and Run-off Values

(5) Unit Hydrograph Characteristics of 8 Subbasins

(6) Superposition of Run-off Hydrographs of 8 Subbasins Resulted from Project Design Storm

(7) Max. Probable Temperatures and Snowmelt Rate

(8) Elevation Area Curve and Snowmelt Run-off Hydrograph for 1000 km²

(9) Maximum Probable Flood Hydrograph for Altinkaya Dam

- (10) Maximum Probable Flood Hydrograph for Kepez Dam
- (11) Statistic Flood for Kepez Dam

3. Sedimentation Data

- (1) Sediment Rating Curve of Kızılırmak Çetinkaya Gauging Station
Monthly Oct. ~ May
- (2) Sediment Rating Curve of Kızılırmak Çetinkaya Gauging Station
Monthly Jun. ~ Sep., total
- (3) Flow Duration Curves at Altinkaya
'61 ~ '73

4. Evaporation Data

- (1) Evaporation-Capacity Curves for Altinkaya, Derbent
Hirfanlı and Kesikköprü Reservoirs
- (2) Evaporation at Altinkaya and Hirfanlı
Altinkaya '62 ~ '73 Hirfanlı '52 ~ '73
- (3) Evaporation at Kastamonu
'62 ~ '76
- (4) Evaporation-Temperature Correlation Curve at Kastamonu

5. Precipitation Data

- (1) Isohyetal Map of Mean Annual Precipitation
- (2) Rain Gauging Stations and Measured Yearly Precipitations in
Kızılırmak River Basin
- (3) Areal Distribution of Storm Rainfall
27th. Jan. 1959, 16th. Jun. 1964, 4th. Feb. 1965, 4th. Apr. 1967,
13th. Mar. 1968, 29th. Nov. 1969, 5th. Jul. 1972.
- (4) Depth Area Relation of 24 Hour P. M. P.
- (5) Monthly Precipitation at Gauging Stations

Osmancık	'53 ~ '76	Kastamonu	'30 ~ '76
Kargı	'50 ~ '76	Boyabat	'50 ~ '76

6. Weather Data

(1) Monthly Maximum Temperature at Gauging Stations

Osmancık	7. '65~12. '76	Boyabat	1. '64~12. '76
Kargı	12. '64~12. '76	Kastamonu	1. '30~12. '76

(2) Monthly Minimum Temperature at Gauging Stations

Osmancık	7. '65~12. '76	Boyabat	1. '64~12. '76
Kargı	1. '65~12. '76	Kastamonu	1. '30~12. '76

(3) Monthly Average Temperature at Gauging Stations

Osmancık	7. '65~12. '76	Boyabat	1. '64~12. '76
Kargı	12. '64~12. '76	Kastamonu	1. '31~12. '76

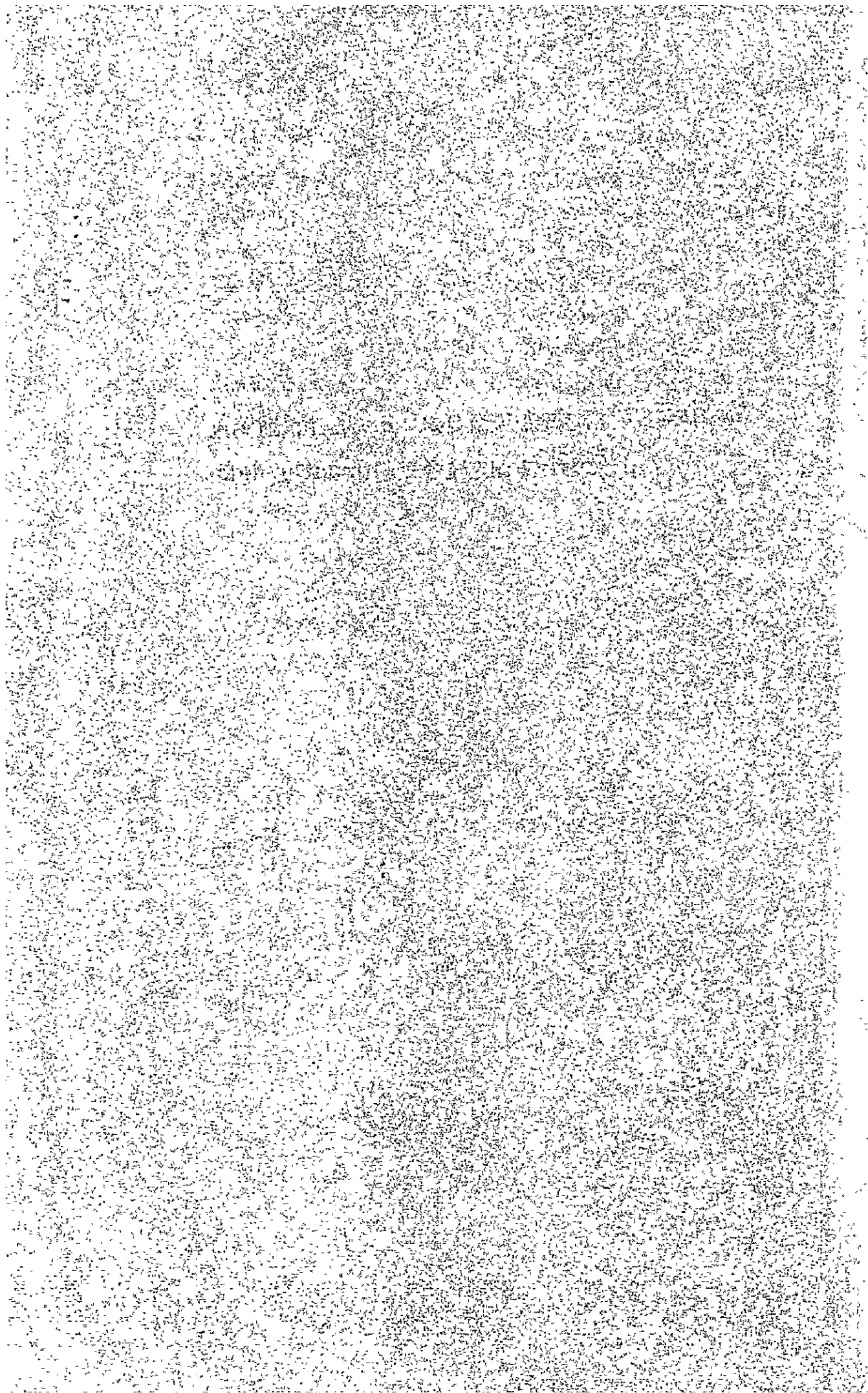
1.7 Inland Transportation Data

1. Transportation Fee
2. Crane Facilities at Samsun Harbour
3. Highway Bridges between Havza and Duragan
4. Road Map of Transportation Route
1/50,000

1.8 Cost Estimation Data

1. Land Acquisition and Compensation
2. Agricultural Loss
3. Road Relocation Cost

**A-2 計画地点流量算定に用いた測水所地点
における測定流量資料(monthly data)**



Monthly Flow at Yamula Gauging Station

Year	Catchment Area 15362 km ² (10 ⁶ m ³)												
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1938										55.7	63.0	86.4	
1939	90.6	87.8	238.3	491.3	272.2	125.7	62.3	53.1	52.6	63.2	56.9	79.0	1673.0
1940	108.8	198.8	373.7	884.1	315.7	190.6	92.5	53.1	44.8	68.1	94.0	128.1	2552.1
1941	137.6	270.6	754.5	847.3	362.9	114.8	83.1	60.9	49.8	62.5	81.3	62.5	2887.8
1942	85.9	120.2	436.1	923.4	440.7	149.8	65.2	45.6	45.5	67.0	124.3	212.5	2715.4
1943	127.5	111.4	209.7	1007.0	546.9	199.5	89.7	58.5	51.4	56.2	71.7	81.2	2610.7
1944	95.8	144.2	574.9	486.4	331.0	203.7	74.4	47.2	42.8	49.5	75.4	72.0	2197.7
1945	39.6	58.1	105.5	608.5	418.5	132.7	50.6	34.4	30.1	52.6	45.2	50.1	1645.9
1946	47.3	58.0	224.3	499.2	471.1	171.6	63.9	39.2	35.7	61.4	46.7	44.8	1763.2
1947	60.4	109.3	518.7	353.6	144.5	96.2	51.6	31.6	31.1	31.5	51.9	73.9	1554.3
1948	102.2	129.3	148.4	677.4	526.6	247.3	64.0	40.0	35.9	39.9	38.7	39.6	2089.3
1949	59.8	48.3	166.6	655.9	555.0	123.6	45.0	32.8	35.7	41.9	44.3	44.6	1853.5
1950	42.7	57.3	423.2	771.4	601.8	159.3	66.5	40.3	33.9	44.4	41.6	41.2	2422.6
1951	45.5	46.0	195.5	166.9	201.9	175.1	85.7	63.9	69.3	94.1	91.7	103.3	1339.4
1952	99.7	181.9	322.8	918.3	317.2	141.8	69.0	43.1	34.2	37.2	46.8	62.9	2274.9
1953	58.4	90.1	138.1	732.6	415.7	189.0	77.0	37.8	41.7	42.2	45.3	17.7	1885.6
1954	12.7	106.2	539.2	1143.8	686.9	218.0	93.8	65.7	52.2	52.8	57.5	71.2	3100.0
1955	101.4	124.0	224.0	224.2	223.3	65.7	27.4	26.1	28.8	29.4	34.1	63.1	1171.5
1956	79.2	150.2	282.7	659.0	357.4	130.4	42.5	28.8	28.6	31.9	39.4	43.5	1871.6
1957	42.6	75.0	452.3	316.1	408.5	265.4	81.8	32.5	31.0	40.9	52.3	50.4	1848.8
1958	63.3	92.1	287.0	506.8	287.1	227.7	52.0	28.4	25.4	30.8	33.4	51.5	1685.5
1959	70.7	61.9	258.6	472.6	293.4	196.3	56.7	36.7	33.0	44.0	55.3	56.1	1635.3
1960	66.7	123.2	303.9	795.5	392.9	134.1	64.3	35.1	33.0	41.7	45.7	49.1	2085.2
1961	54.1	62.3	130.5	346.3	128.3	100.4	38.0	32.7	33.5	29.7	39.1	88.8	1083.7
1962	106.6	128.4	627.2	358.5	198.7	82.3	32.2	24.4	22.4	34.5	39.4	83.9	1746.5
1963	276.1	381.1	476.8	661.6	481.6	447.8	131.9	67.1	64.9	70.6	80.6	93.9	3224.0
1964	61.7	88.6	389.5	433.0	218.6	196.7	54.1	27.4	33.6	35.6	42.8	60.5	1622.1
1965	74.4	67.2	364.0	575.5	387.0	143.1	61.7	31.8	28.7	46.9	64.2	118.2	1962.7
1966	403.5	391.0	480.1	554.6	291.8	139.5	69.6	42.5	45.4	52.6	53.2	97.0	2620.8
1967	107.1	93.2	240.3	1071.1	616.3	196.5	101.1	54.9	57.7	66.4	95.3	137.5	2837.4
1968	133.8	188.8	885.3	1140.4	507.3	278.3	99.5	72.1	70.5	92.3	119.6	153.1	3741.0
1969	158.1	131.7	741.9	963.8	638.6	207.1	117.3	68.4	51.3	73.4	72.9	110.4	3334.9
1970	120.8	202.1	437.1	404.9	161.2	84.0	44.8	34.8	32.6	46.9	60.1	103.6	1732.9
1971	101.0	73.3	208.2	401.0	254.5	171.1	42.4	54.0	40.1	42.7	55.3	106.3	1549.9
1972	80.4	93.7	344.7	589.2	522.0	316.6	111.1	55.0	52.5	61.6	62.3	53.0	2342.1
1973	49.4	58.5	119.6	300.4	237.5	108.4	49.0	22.2	21.5	24.8	28.4	42.3	1062.0
1974	40.2	56.9	288.2	271.5	258.5	63.0	20.9	19.1	36.7	22.2	50.3	50.4	1177.9
1975	58.0	58.4	391.0	617.9	720.8	184.6	72.8	38.6	34.7	44.0	49.1	52.6	2322.5
1976	61.7	63.4	302.7	1213.2	538.0	195.8	67.1	43.9	43.0				
Average	93.3	120.1	358.0	632.7	387.7	172.9	67.7	42.7	40.4	49.6	59.2	77.3	2084.4

Monthly Flow at Boğazköy Gauging Station

Year	Catchment Area 2339 km ² (10 ⁶ m ³)												Total
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1953										12.42	13.78	14.60	-
1954	18.65	29.29	29.05	32.18	19.76	9.55	10.43	10.05	9.87	11.70	11.91	16.05	208.49
1955	18.85	16.17	17.64	13.17	13.05	8.02	9.99	10.13	9.48	11.01	10.15	13.18	150.84
1956	15.85	17.72	18.49	15.65	10.36	8.47	10.08	10.69	10.88	12.77	12.77	14.09	157.82
1957	15.55	23.57	24.60	16.44	18.47	17.43	10.67	10.11	10.21	13.27	14.11	14.86	189.29
1958	18.58	16.30	18.08	19.62	13.82	16.97	9.85	9.76	10.75	13.18	12.63	14.15	173.69
1959	18.55	15.23	24.48	18.58	14.76	14.07	10.17	10.59	10.84	13.74	15.91	18.35	185.27
1960	18.00	19.03	20.54	23.39	14.14	11.24	10.14	10.03	10.79	-	-	-	-
1961	-	-	-	-	-	-	-	-	-	11.30	11.60	14.00	-
1962	15.00	13.80	17.30	12.90	10.60	6.89	7.79	7.82	9.04	10.10	9.19	12.10	132.53
1963	15.90	15.60	19.00	18.70	17.60	18.50	8.97	8.56	11.00	14.20	15.30	15.80	179.13
1964	15.80	18.00	22.00	16.80	11.70	13.20	8.14	8.64	9.92	13.30	12.00	14.70	164.20
1965	16.50	12.20	16.40	20.70	13.30	10.70	9.9	8.45	9.37	12.10	14.80	14.80	156.91
1966	24.80	20.70	22.10	20.00	12.00	10.00	8.47	8.75	9.76	12.20	9.55	17.10	175.43
1967	18.50	16.60	22.00	25.90	17.70	6.50	8.67	10.40	11.60	18.20	15.10	16.40	187.57
1968	14.80	16.20	25.60	27.70	14.70	18.40	9.35	10.20	11.80	16.20	15.30	15.10	195.35
1969	16.50	18.70	21.80	22.90	16.70	12.40	14.50	14.70	14.10	16.20	15.20	16.50	202.20
1970	17.60	15.30	18.10	12.70	10.50	11.30	9.66	8.64	10.40	16.00	15.70	15.80	161.70
1971	15.70	14.40	16.30	18.80	14.20	12.10	8.60	10.60	15.40	15.20	14.00	15.10	170.40
1972	14.00	16.00	19.80	17.20	19.30	18.60	14.60	12.50	15.70	13.00	16.40	11.40	190.50
1973	16.90	16.10	16.10	19.10	18.70	17.10	11.40	12.40	11.80	14.30	18.60	12.10	184.60
1974	11.20	19.00	16.90	16.60	14.80	11.00	9.30	9.24	12.30	14.00	13.20	11.70	160.64
1975	12.70	16.50	17.70	21.80	31.00	13.70	8.28	7.69	12.10	15.40	16.10	16.70	189.67
1976	15.80	14.60	19.20	30.00	22.30	12.80	10.40	10.30	12.50	-	-	-	-
Average	16.60	17.30	20.10	20.10	15.90	12.70	10.00	10.00	11.30	13.80	13.80	14.70	175.90

Monthly Flow at Gülşehir Gauging Station

Year	Catchment Area 20368 km ² (10 ⁶ m ³)												Total	
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
1959													151.2	-
1960	162.5	234.3	453.3	884.9	472.2	203.5	97.2	46.6	46.2	59.2	69.6	76.4	2806.4	
1961	72.8	90.6	156.8	364.0	137.3	131.2	45.3	28.3	35.1	45.0	51.3	105.8	1263.5	
1962	116.4	136.9	601.6	401.7	231.3	104.9	40.4	32.6	33.5	46.9	54.9	102.4	1903.5	
1963	281.6	379.1	485.3	702.5	538.0	516.2	160.0	78.7	78.9	95.2	103.5	116.2	3535.2	
1964	79.2	87.8	443.1	462.7	229.8	214.4	64.8	36.8	45.3	53.7	58.7	74.4	1850.7	
1965	81.9	76.2	376.4	586.1	391.0	158.5	70.9	42.7	41.6	64.1	77.1	121.8	2088.3	
1966	430.4	442.6	533.3	613.5	322.7	148.9	79.1	55.1	58.5	74.7	75.1	127.9	2961.8	
1967	130.3	113.3	287.4	1055.7	627.4	205.2	115.6	68.0	70.6	87.0	110.0	154.6	3025.1	
1968	166.7	208.6	968.6	1216.3	600.5	340.1	108.8	84.0	89.7	107.7	140.5	177.0	4208.5	
1969	183.6	152.2	759.1	919.6	635.7	205.1	131.4	82.2	76.7	98.7	91.5	140.5	3476.3	
1970	153.1	238.9	442.5	404.9	164.1	96.7	57.2	43.2	41.7	62.2	75.6	120.6	1900.7	
1971	118.5	90.0	220.8	438.7	278.5	191.4	58.6	71.4	55.4	58.2	69.6	116.8	1767.9	
1972	72.9	98.9	322.5	582.7	530.5	344.5	133.0	70.7	71.5	87.3	88.4	66.3	2469.2	
1973	65.4	85.8	159.9	323.3	268.5	147.5	55.7	35.2	34.3	40.4	47.8	59.9	1324.2	
1974	50.4	75.1	344.6	308.4	292.1	82.2	36.1	31.7	53.6	42.6	70.6	65.5	1453.1	
1975	67.3	78.4	454.6	732.8	811.0	253.2	99.9	51.5	43.3	56.7	68.9	70.6	2788.2	
1976	85.9	93.7	334.0	1153.0	536.4	214.0	86.3	60.4	58.4	-	-	-	-	
Average	136.5	157.8	432.0	656.0	415.7	209.3	84.7	54.1	55.0	67.5	78.3	108.7	2426.4	

Monthly Flow at Yahşihan Gauging Station

Year	Catchment Area 30923 km ² (10 ⁶ m ³)											Total	
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.		Dec.
1938										85.7	97.2	116.6	-
1939	135.8	129.0	250.2	524.4	325.6	145.1	74.1	65.7	70.1	96.3	78.3	113.1	1996.7
1940	163.4	248.2	401.7	1115.3	449.9	278.8	133.7	77.7	69.6	95.0	156.4	197.3	3387.0
1941	231.3	323.2	1002.1	1057.2	515.8	169.2	122.3	94.9	88.3	110.5	153.2	121.3	3989.3
1942	169.2	215.0	570.9	1170.8	604.6	224.9	97.2	75.3	93.5	121.7	177.4	319.4	3830.9
1943	209.8	187.7	289.2	1200.7	773.8	283.3	124.5	92.5	88.1	105.8	128.2	153.2	3635.8
1944	178.6	217.8	686.9	634.6	442.1	264.5	119.3	74.1	75.8	93.9	126.0	144.3	3057.9
1945	144.4	128.7	193.9	701.5	556.4	173.1	84.0	70.0	68.5	97.6	101.7	124.3	2444.3
1946	124.7	127.7	286.4	607.1	679.8	270.0	110.1	76.6	80.8	108.2	198.4	118.2	2698.6
1947	146.4	292.7	651.1	523.7	204.2	158.9	96.4	76.3	78.3	83.5	115.2	160.3	2497.0
1948	170.1	224.5	237.4	883.3	823.1	406.2	124.1	84.2	85.9	109.6	110.1	125.0	3383.5
1949	111.4	137.9	296.5	962.2	349.2	231.2	104.5	79.9	97.5	113.9	129.5	141.4	3234.1
1950	119.0	139.6	583.4	1033.2	935.0	271.7	142.7	104.7	90.3	119.0	124.3	134.6	3796.5
1951	155.6	141.5	301.0	273.6	304.6	248.8	136.5	75.5	79.1	116.8	126.8	149.9	2109.7
1952	145.0	259.9	289.3	1119.2	386.2	191.1	74.6	45.1	33.8	43.7	63.2	97.7	2749.0
1953	101.1	129.5	199.4	847.3	494.2	233.6	108.4	53.2	60.4	71.6	83.0	72.9	2455.5
1954	113.4	177.8	589.9	1450.7	819.3	273.7	131.2	93.8	78.3	96.5	95.6	125.0	4035.2
1955	159.9	156.0	237.0	281.1	244.1	87.9	40.9	35.9	40.6	48.2	53.8	86.8	1472.2
1956	108.0	171.9	310.0	658.6	393.2	167.8	86.7	53.7	37.2	64.9	77.7	79.3	2231.0
1957	83.3	101.9	448.3	322.1	464.2	314.2	129.2	59.0	54.5	69.4	62.3	20.3	2129.6
1958	19.4	16.5	21.9	22.2	21.4	21.6	19.8	22.4	23.8	22.3	21.8	21.7	254.8
1959	25.9	19.4	22.3	20.6	19.7	23.3	19.7	40.3	22.5	19.9	18.7	31.1	283.6
1960	33.5	7.9	14.1	17.8	62.0	46.0	68.5	100.3	116.7	-	-	-	-
1961	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	218.6	84.5	96.9	-
1963	88.0	80.1	168.0	238.9	205.3	502.1	312.6	185.9	187.9	305.6	322.1	287.3	2883.8
1964	347.7	358.0	260.2	198.3	236.3	235.7	159.2	96.3	189.3	216.1	263.9	179.7	2740.7
1965	165.4	119.4	62.3	54.2	108.0	97.9	201.3	173.6	292.2	311.5	267.9	197.1	2050.8
1966	23.5	69.6	142.7	178.1	229.6	142.5	179.1	149.4	199.9	255.0	247.8	248.3	2064.5
1967	238.2	270.1	188.9	230.7	403.3	231.4	250.8	210.7	203.6	273.6	263.7	309.4	3174.4
1968	209.8	91.4	203.8	648.0	767.8	535.1	308.6	304.7	254.5	366.6	419.0	347.9	4457.2
1969	286.7	311.6	325.5	520.9	530.3	400.9	263.5	278.8	272.8	-	-	-	-
1970	-	-	-	-	-	-	-	-	-	181.7	294.7	272.9	-
1971	297.8	215.8	211.8	107.8	88.1	79.0	92.9	133.7	138.6	194.7	53.9	51.2	1665.3
1972	66.7	144.1	184.2	228.2	276.6	245.1	209.8	246.3	296.4	326.2	284.9	336.2	2844.7
1973	317.4	242.5	218.1	100.9	84.7	95.8	153.7	130.0	186.2	160.4	170.3	84.4	1944.4
1974	70.0	56.1	44.9	23.0	91.2	137.4	169.5	169.2	114.0	118.2	151.8	101.5	1246.8
1975	91.7	88.0	29.2	71.3	55.1	98.6	83.7	132.1	172.0	124.0	288.0	314.2	1517.9
1976	209.3	282.1	265.7	238.2	240.9	185.9	225.9	263.3	231.1	-	-	-	-
Average	150.1	165.5	291.7	522.7	391.0	214.9	136.0	115.0	122.6	140.7	152.0	156.6	2572.3

Monthly Flow at Küyluş Gauging Stations

Year	Catchment Area 4189 km ²												Total
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1953												11.34	-
1954	9.95	22.07	107.30	74.34	79.21	60.25	13.53	6.63	10.29	9.18	9.11	10.31	412.17
1955	10.20	11.72	13.21	38.52	10.09	9.73	6.38	12.35	29.78	13.29	13.69	19.92	188.88
1956	20.28	50.51	75.08	106.01	54.46	44.58	11.28	2.66	3.95	5.17	7.38	6.02	387.34
1957	5.26	12.83	16.29	11.88	83.33	28.75	7.43	5.57	15.92	13.53	14.19	20.52	235.50
1958	21.10	31.53	85.80	143.11	62.21	80.36	16.48	13.52	19.84	13.36	13.26	16.03	516.60
1959	18.66	15.77	117.85	135.38	85.11	106.36	17.60	22.04	15.58	13.25	15.43	14.85	577.88
1960	13.13	20.37	24.79	101.68	46.19	35.88	11.44	8.85	9.08	-	-	-	-
1961	-	-	-	-	-	-	-	-	-	10.30	10.40	16.50	-
1962	15.60	29.80	109.40	70.20	40.10	13.80	1.43	0.32	19.00	13.70	9.54	40.20	363.09
1963	77.20	115.50	118.90	132.00	171.10	90.10	26.40	5.88	11.60	17.10	15.00	20.10	800.88
1964	12.40	23.90	78.80	50.80	83.80	138.10	24.30	12.30	14.20	10.80	14.20	40.60	594.30
1965	28.20	44.50	187.10	168.70	105.50	58.10	9.76	8.20	12.00	11.50	14.70	27.90	656.16
1966	76.50	61.60	73.10	183.30	82.90	49.00	8.30	7.57	7.57	9.59	10.10	11.60	581.51
1967	12.00	9.75	47.70	162.10	133.50	103.90	23.80	70.20	22.10	15.60	12.30	32.10	645.05
1968	46.90	78.70	138.80	142.80	57.20	19.20	9.01	17.10	38.70	24.10	19.60	20.00	612.31
1969	22.50	51.80	114.40	159.00	145.20	55.10	18.20	5.58	11.80	11.90	12.50	22.40	630.38
1970	30.50	51.10	76.70	66.60	35.40	34.60	3.71	2.46	3.48	6.56	8.43	11.90	331.45
1971	29.00	16.10	72.70	101.60	131.90	93.80	11.30	8.22	12.80	10.40	12.10	19.30	519.22
1972	21.20	27.60	80.00	118.30	133.20	48.48	65.10	31.40	21.40	46.90	45.00	29.00	667.78
1973	22.50	54.80	103.30	113.90	59.60	45.80	76.30	3.78	7.58	10.60	14.60	22.00	534.76
1974	14.90	16.60	54.70	41.00	58.40	13.40	7.45	5.47	4.74	4.65	7.05	9.03	237.39
1975	14.80	16.60	76.70	91.50	168.30	53.90	7.49	5.37	5.43	8.40	9.95	10.50	468.94
1976	14.50	13.70	108.20	90.40	34.80	28.20	7.13	5.72	5.56	-	-	-	-
Average	24.42	35.32	84.58	104.71	84.61	55.06	17.45	11.87	13.74	13.33	13.75	19.64	493.58

Monthly Flow at Şahinkaya Gauging Station

Year	Catchment Area 72936 km ²												Total
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1957										101.3	110.7	138.4	-
1958	166.7	206.5	545.1	573.5	230.6	352.4	95.4	75.3	120.3	41.2	44.0	67.0	2518.0
1959	149.6	114.3	500.9	440.0	245.5	330.3	64.7	87.1	91.1	124.6	124.6	152.7	2425.4
1960	174.6	164.3	253.4	442.6	258.9	184.3	145.9	155.0	216.7	175.0	200.0	-	-
1961	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-	368.2	263.3	386.5	-
1966	945.0	624.3	682.0	1017.3	589.6	282.2	239.0	226.8	263.1	336.1	352.0	432.3	5989.7
1967	496.8	438.3	843.8	1342.2	1233.8	567.3	387.0	268.3	294.6	-	-	-	-
1968	-	-	-	-	-	-	-	-	-	503.5	567.5	620.6	-
1969	640.0	764.2	1422.0	1447.1	1312.9	643.4	325.7	339.2	423.5	-	-	-	-
1970	-	-	-	-	-	-	-	-	-	-	-	-	-
1971	-	-	-	-	-	-	-	-	-	305.0	202.1	319.7	-
1972	215.1	327.5	657.3	663.5	779.8	488.9	407.8	344.6	462.3	-	-	-	-
Average	398.3	377.1	700.6	846.6	664.4	407.0	237.9	213.8	267.4	244.4	233.0	302.5	3644.4

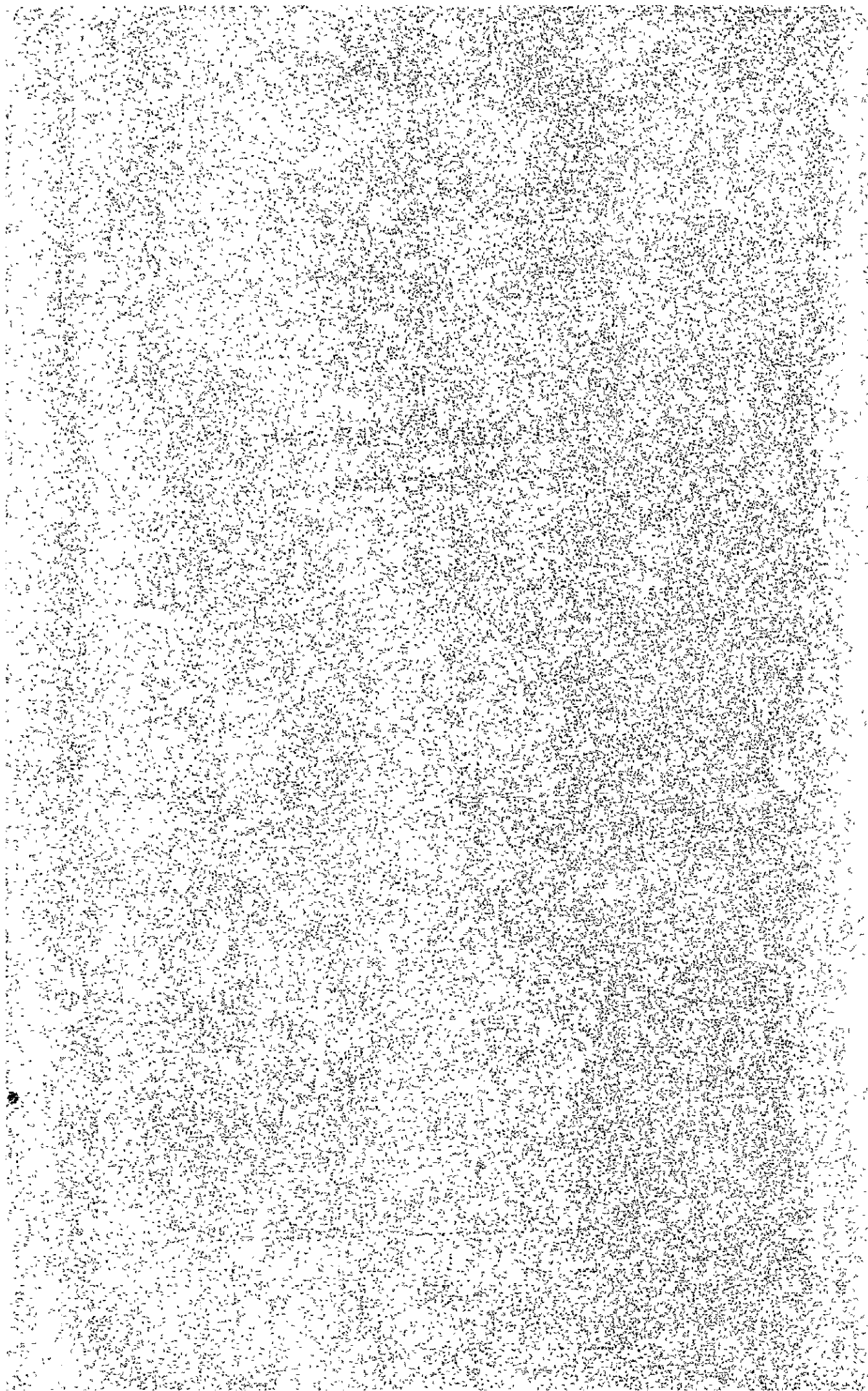
Monthly Flow at İnözü Gauging Station

Year	Catchment Area 72992 km ² (10 ⁶ m ³)												Total	
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
1960													319.3	-
1961	272.7	435.8	611.7	645.3	346.2	398.7	291.5	275.6	148.1	120.1	137.8	197.9	3881.4	
1962	175.4	392.5	737.9	335.2	115.9	83.1	87.2	83.1	160.5	271.0	154.5	376.8	2973.1	
1963	523.4	793.0	735.4	802.5	943.5	826.3	399.8	178.1	200.4	341.7	374.1	422.1	6540.3	
1964	396.0	546.0	684.5	381.6	380.7	709.5	214.9	105.5	170.0	240.0	314.2	385.6	4528.5	
1965	289.3	500.4	1273.6	821.2	508.9	297.0	232.1	231.2	319.6	351.3	265.8	381.3	5492.7	
1966	945.5	614.1	698.9	1031.3	595.5	309.2	264.8	232.4	278.6	328.3	317.0	398.6	6017.2	
1967	452.3	421.6	698.0	1472.3	1258.3	570.1	377.9	244.3	288.5	405.5	383.2	565.1	7337.1	
1968	717.6	676.5	1496.1	1453.4	1147.0	830.4	423.2	398.3	456.0	513.5	576.4	620.7	9314.1	
1969	643.3	780.4	1429.5	1539.1	1326.5	660.6	370.5	338.1	384.7	571.2	623.8	709.3	9376.0	
1970	639.1	985.0	1038.3	702.8	297.9	394.9	309.6	266.0	222.2	316.9	433.2	542.4	6148.4	
1971	638.5	417.7	737.3	810.2	594.0	535.5	143.6	160.4	279.4	320.0	216.8	349.6	5203.0	
1972	228.4	359.1	689.4	715.2	880.8	522.5	412.7	359.6	482.1	536.2	494.6	473.4	6154.0	
1973	474.7	511.0	768.7	622.9	315.0	283.9	169.9	120.2	242.6	229.2	249.0	238.4	4225.5	
1974	178.6	166.8	314.4	191.3	297.5	195.2	177.3	141.4	138.8	145.2	153.2	223.8	2323.5	
1975	215.8	232.2	557.2	496.2	1,318.1	378.5	121.3	140.1	225.5	273.5	430.0	484.9	4873.3	
1976	385.3	491.2	1,026.7	976.8	536.5	350.4	278.3	301.1	327.8					-
Average	448.5	520.2	856.1	812.8	678.9	459.1	267.2	223.5	270.3	310.2	321.5	418.1	5625.9	

Monthly Discharge from Hirfanlı Reservoir

Year	Catchment Area 26499 km ² (10 ⁶ m ³)												Total	
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
1960	22.4	-	7.73	13.3	68.1	68.4	89.3	114.9	122.5	104.5	170.6	218.6	-	
1961	161.1	141.8	160.8	137.2	143.4	124.8	187.2	219.4	72.2	40.1	77.6	60.8	1526.4	
1962	76.6	121.0	143.4	28.7	37.8	57.4	107.9	103.1	149.9	185.8	87.9	88.6	1188.1	
1963	77.2	58.0	148.7	191.6	166.1	449.9	275.7	165.0	195.6	308.9	318.2	277.4	2632.3	
1964	158.4	330.6	213.1	166.7	195.1	184.2	137.8	87.0	168.8	197.7	237.0	145.1	2219.5	
1965	134.1	100.4	57.5	46.1	104.8	98.8	199.6	176.8	263.7	244.6	242.9	161.3	1832.6	
1966	68.0	97.7	132.0	180.2	199.9	139.0	170.4	145.4	203.1	229.7	332.3	211.1	2108.8	
1967	208.9	218.8	155.2	245.2	338.9	254.7	234.3	192.5	186.2	246.3	221.8	280.0	2782.8	
1968	150.2	71.7	176.2	639.7	695.5	474.5	298.2	280.3	248.6	281.0	368.0	254.8	3938.7	
1969	186.4	180.6	241.9	392.6	458.0	350.1	249.7	249.2	258.6	387.2	428.9	280.0	3663.2	
1970	148.7	123.9	97.0	143.0	167.8	245.4	276.0	210.7	152.3	164.0	257.3	266.2	2252.3	
1971	275.5	199.4	191.9	85.8	72.4	81.1	109.9	123.3	143.4	161.8	27.7	43.0	1506.2	
1972	66.9	112.5	177.1	212.9	259.3	206.0	165.8	196.1	295.6	271.5	229.6	287.4	2480.7	
1973	298.4	210.5	179.1	79.7	76.8	100.3	113.5	113.5	170.9	160.2	147.5	83.3	1733.3	
1974	79.7	58.5	42.9	17.6	108.3	127.9	160.1	147.6	87.6	114.8	143.8	91.2	1180.0	
1975	99.1	103.8	17.5	61.6	27.5	87.3	93.9	122.8	184.7	160.7	274.8	246.1	1459.8	
1976	187.8	236.4	240.3	206.1	212.7	185.1	235.4	259.5	223.9	255.1	267.6	250.9	2760.8	
Average	141.0	147.9	140.1	167.7	196.0	190.3	182.1	171.0	182.8	206.7	225.5	190.9	2204.1	

**A-3 計画地点付近の気象観測所における
降雨資料 (monthly data)**



Monthly Total Precipitation at Kastamonu Meteorological Station

year	month												Total
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1930	11.0	6.7	26.2	19.5	104.3	125.7	19.6	62.3	16.7	43.9	47.7	43.1	526.7
1931	27.5	37.1	40.6	84.0	197.8	79.9	14.7	25.5	32.4	24.2	47.4	29.9	641.0
1932	35.7	53.9	51.4	48.4	58.7	76.1	9.9	31.2	11.0	10.6	31.3	20.7	438.9
1933	4.9	57.1	26.8	73.2	80.2	82.3	62.1	23.8	12.2	40.0	39.5	57.9	560.0
1934	17.7	14.0	10.8	23.4	72.5	45.6	53.9	16.0	16.2	27.7	17.6	13.2	328.6
1935	46.5	36.0	37.3	50.5	21.2	11.5	21.6	0.6	27.6	18.2	17.5	27.8	316.3
1936	12.3	23.7	24.3	58.0	117.1	115.8	34.4	51.5	28.3	47.0	38.6	20.5	571.6
1937	23.0	21.2	13.0	63.2	37.9	19.7	15.2	64.7	16.3	16.5	37.4	34.7	362.8
1938	16.3	15.1	26.2	71.6	108.6	5.5	58.7	23.7	51.4	13.1	12.1	26.1	428.4
1939	10.2	21.9	42.6	17.5	96.7	77.4	65.5	68.0	33.5	26.9	48.4	45.6	554.2
1940	28.4	20.7	21.5	35.8	141.0	105.0	35.6	103.0	6.1	37.1	22.5	55.9	610.4
1941	58.8	17.1	40.9	25.4	21.9	55.9	47.8	17.3	16.7	20.5	42.1	28.2	392.6
1942	25.0	2.4	18.6	47.7	61.8	24.9	9.1	20.6	88.1	57.4	32.3	10.4	398.3
1943	42.4	9.7	5.7	65.0	68.8	57.3	22.7	2.4	38.9	37.2	49.1	16.4	413.6
1944	5.3	31.3	58.4	48.6	66.6	24.1	16.0	0.4	5.8	31.2	12.4	13.7	311.8
1945	32.6	28.0	6.9	21.2	12.3	81.3	56.0	5.2	9.1	72.6	41.1	33.6	377.9
1946	16.0	52.6	55.2	57.1	114.2	46.3	25.4	42.0	17.6	32.7	36.6	31.1	526.8
1947	36.0	14.1	27.2	5.6	49.6	59.6	32.2	12.2	13.5	32.1	64.0	59.4	405.5
1948	11.6	44.5	57.8	61.4	107.4	123.8	1.2	24.7	19.2	49.6	28.5	4.2	533.9
1949	28.1	25.8	30.3	38.7	72.0	69.1	37.5	0.0	48.5	23.0	9.8	44.0	426.8
1950	39.3	28.5	30.0	43.7	55.2	30.7	13.0	4.5	10.9	38.2	24.6	8.6	327.2
1951	12.6	11.3	44.8	91.0	34.2	83.3	20.0	49.0	8.2	33.7	30.2	41.3	459.6
1952	27.6	28.3	17.7	33.5	117.8	32.7	21.8	2.5	24.5	22.9	15.2	3.8	408.3
1953	37.8	46.3	24.5	46.4	233.0	98.9	4.8	8.7	17.6	57.4	15.8	15.3	606.5
1954	71.2	30.3	24.9	35.1	63.4	104.5	7.8	19.2	20.5	10.5	31.0	23.4	441.8
1955	14.5	25.1	27.3	38.5	34.0	54.9	61.8	26.2	36.5	55.3	13.4	38.1	423.6
1956	27.3	46.3	73.6	9.4	45.3	51.6	6.7	0.1	12.7	8.3	28.8	10.7	320.8
1957	8.5	16.1	20.3	26.2	111.0	3.0	17.3	1.7	39.4	17.0	19.5	23.7	303.7
1958	23.6	10.2	90.5	60.9	28.4	96.0	21.3	10.4	24.0	18.8	5.9	32.2	422.2
1959	54.1	18.6	18.6	27.7	84.1	60.4	19.0	39.5	19.6	3.7	19.8	4.4	369.5
1960	18.7	25.3	44.4	76.0	41.1	97.1	15.8	19.2	33.0	29.3	28.6	19.6	446.1
1961	24.3	34.9	30.0	54.2	38.1	143.2	11.1	0.6	43.0	11.4	7.1	28.7	426.6
1962	21.6	82.9	29.1	29.7	37.7	20.1	24.3	0.6	70.2	66.7	12.1	77.3	452.3
1963	91.8	42.3	32.5	49.8	99.1	36.1	16.0	0.1	21.3	22.2	9.5	18.7	439.4
1964	5.0	35.3	20.2	34.1	66.5	119.9	38.1	69.3	19.5	3.4	70.8	30.1	512.2
1965	20.5	78.0	41.7	38.8	62.2	135.6	17.3	41.4	1.1	13.2	44.2	20.3	514.3
1966	60.4	2.2	51.3	71.2	47.4	50.6	11.7	57.6	1.6	26.7	26.2	14.4	421.3
1967	19.0	18.2	44.3	65.3	103.1	129.2	17.1	6.9	28.2	52.7	28.3	48.6	560.9
1968	57.4	18.0	46.5	24.9	34.6	64.5	19.9	87.2	67.0	67.6	23.3	25.8	536.7
1969	46.3	48.1	51.7	86.7	53.3	103.5	31.5	3.2	60.1	11.3	40.0	32.8	568.5
1970	34.9	37.9	33.7	12.5	51.6	60.2	11.2	3.6	19.7	30.5	11.8	45.4	353.0
1971	12.2	13.8	50.9	81.0	99.5	48.7	13.7	40.6	28.1	21.2	17.5	50.0	477.2
1972	15.1	12.4	20.4	112.3	72.9	82.1	121.8	30.6	47.6	83.8	19.0	19.1	617.1
1973	10.2	25.9	30.4	65.8	10.8	92.7	15.6	9.3	14.3	18.8	40.6	34.5	369.0
1974	10.2	13.0	29.1	36.4	58.0	28.0	36.8	76.4	8.6	33.0	8.9	43.2	381.6
1975	41.3	20.9	28.2	82.4	53.6	40.7	47.1	25.9	5.3	37.2	29.5	47.1	459.2
1976	50.6	22.9	8.2	42.8	32.4	39.3	25.4	18.2	21.3	58.6	21.4	42.9	384.0
Average	28.5	27.7	33.7	48.7	71.9	68.4	27.8	26.5	25.8	32.2	28.1	30.1	449.5

Monthly Total Precipitation at Kargı Meteorological Station

(mm)

month year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1950	25.2	20.1	42.6	41.8	29.3	19.1	-	4.3	-	9.5	-	17.5	-
1951	11.5	26.3	28.6	51.5	38.4	25.6	-	9.9	18.5	13.5	31.7	12.6	-
1952	33.1	31.0	15.1	23.7	76.8	86.4	3.2	-	21.5	12.7	42.4	2.4	-
1953	28.9	46.7	10.4	39.7	91.2	59.0	0.0	0.0	0.0	12.4	10.2	13.1	313.6
1954	76.0	40.9	14.5	28.8	48.4	57.6	-	8.3	35.0	14.2	28.0	23.4	-
1955	6.1	16.4	135.8	111.5	26.5	11.5	50.5	44.9	15.5	30.5	14.8	37.2	503.2
1956	7.0	59.6	47.0	6.0	48.7	39.5	-	-	50.0	4.0	11.0	22.3	-
1957	-	-	-	-	-	-	-	-	-	16.4	12.4	53.6	-
1958	36.1	32.1	109.1	43.4	7.6	65.7	4.4	1.7	33.0	20.8	3.0	26.3	374.2
1959	119.8	11.1	27.0	19.5	62.8	34.6	20.8	2.3	3.6	9.9	16.3	5.7	333.6
1960	30.0	19.2	43.0	47.4	32.7	42.8	34.2	10.9	8.6	13.9	9.6	13.9	306.2
1961	16.4	48.8	30.4	49.3	44.0	82.5	6.1	0.0	17.8	1.5	-	47.2	-
1962	14.7	51.3	23.4	12.7	27.6	25.8	8.0	-	19.8	42.0	7.4	77.5	-
1963	34.6	34.1	18.0	33.8	107.8	18.0	19.8	0.0	17.9	7.5	17.1	27.2	335.8
1964	2.5	17.6	15.0	8.4	66.5	68.0	16.3	69.3	1.6	0.0	45.2	20.0	330.4
1965	12.5	66.5	49.3	43.7	43.9	49.3	13.4	22.6	-	4.9	37.0	36.1	-
1966	72.2	3.9	31.0	36.6	67.9	15.1	12.7	40.0	8.9	0.0	17.1	25.2	330.6
1967	20.1	14.4	43.7	55.0	51.7	38.5	0.4	4.6	3.8	10.0	26.8	32.5	301.5
1968	13.8	66.9	93.3	47.1	46.1	113.8	35.7	99.7	96.8	370.9	93.5	195.8	1273.3
1969	41.6	79.0	42.9	97.2	84.0	57.3	6.3	0.0	8.9	0.7	53.8	57.1	508.8
1970	39.2	44.1	24.0	12.2	50.8	20.9	3.7	0.0	38.2	52.1	9.6	34.0	328.8
1971	4.0	20.2	44.0	45.2	71.2	47.8	17.1	14.4	23.5	9.8	31.9	61.6	390.7
1972	10.0	11.9	5.7	44.6	42.2	37.8	56.7	57.9	38.9	35.6	9.8	13.6	362.5
1973	7.8	21.3	34.2	68.2	30.3	38.7	13.8	2.2	14.7	13.4	29.9	13.9	288.4
1974	4.3	18.5	16.0	56.9	45.5	15.1	22.9	12.0	5.3	5.8	1.9	44.4	248.6
1975	40.4	8.1	22.8	98.6	102.0	30.4	28.5	11.9	4.3	13.5	13.5	28.5	402.5
1976	34.8	9.1	3.5	24.8	34.2	50.5	18.0	34.7	13.1	50.8	12.6	31.9	316.0
Average	28.7	32.3	37.0	44.1	52.2	44.3	17.8	19.6	20.7	28.8	23.5	36.1	549.1

Monthly Total Precipitation at Boyabat Meteorological Station

(mm)

year	month												Total
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1950	21.6	22.2	27.2	20.4	16.7	30.1	22.3	9.2	7.5	30.1	17.0	2.6	226.9
1951	12.7	-	36.9	56.2	33.9	53.0	3.5	14.9	9.6	20.6	31.1	33.8	-
1952	25.7	23.0	19.5	10.3	113.4	35.8	26.9	-	9.5	39.2	18.7	3.7	-
1953	17.7	40.2	20.4	28.3	119.9	64.9	39.9	2.8	15.3	20.8	11.5	13.6	395.3
1954	45.7	30.1	22.9	33.2	66.6	40.0	12.4	8.2	33.3	9.0	17.9	34.1	353.4
1955	6.1	17.7	36.4	34.9	60.8	18.1	55.1	45.3	53.4	42.0	20.6	25.4	415.8
1956	13.9	64.4	43.3	19.7	79.0	65.9	1.9	16.3	8.7	2.2	30.4	17.4	363.1
1957	7.9	15.3	12.5	25.8	111.4	3.7	9.7	-	62.0	20.4	12.1	35.5	-
1958	23.0	17.7	92.1	80.3	16.5	66.8	20.8	1.3	24.5	28.1	2.7	35.4	409.2
1959	82.1	23.0	35.2	50.7	71.5	56.2	40.6	49.1	21.6	11.1	10.1	6.9	458.1
1960	15.1	30.1	22.6	61.0	56.5	106.7	8.6	10.3	18.5	20.0	28.7	7.1	385.2
1961	15.1	34.4	27.1	58.9	60.2	94.7	6.1	4.9	32.7	3.5	13.2	25.4	376.2
1962	19.9	62.7	17.9	29.7	63.0	36.1	9.3	6.1	33.6	42.6	22.6	64.7	408.2
1963	58.6	24.0	34.0	71.3	75.5	27.6	24.9	0.4	37.8	12.6	12.1	19.8	399.2
1964	3.1	16.3	18.5	34.7	64.3	55.5	25.4	24.9	19.4	1.8	57.5	23.9	345.3
1965	3.6	48.4	48.3	51.2	55.0	49.5	44.8	31.4	0.0	16.9	40.6	15.2	402.9
1966	37.3	6.2	34.9	83.6	64.0	28.3	25.4	48.9	11.2	5.7	21.1	29.4	396.0
1967	12.0	7.8	42.9	69.0	30.6	109.0	2.8	3.5	33.7	33.2	20.9	32.1	397.5
1968	43.4	28.3	57.5	6.2	24.2	46.8	3.4	62.1	93.5	24.2	26.8	12.3	428.7
1969	42.2	51.8	63.8	99.6	26.5	49.8	17.6	-	38.4	4.5	64.2	36.2	-
1970	43.9	33.4	44.1	9.8	60.7	62.2	8.2	6.8	27.9	47.9	6.8	35.7	387.4
1971	4.4	21.6	58.8	53.4	101.9	60.0	24.1	39.1	38.0	17.5	23.7	41.1	483.6
1972	15.2	18.4	15.8	79.8	55.0	85.4	27.8	23.3	25.9	82.2	18.3	11.6	459.7
1973	6.6	21.3	44.6	80.0	28.1	20.0	38.9	0.3	9.8	13.8	53.0	18.9	335.3
1974	9.9	22.0	18.3	57.0	68.7	12.2	55.1	48.4	18.0	16.2	5.7	62.3	393.8
1975	38.7	11.1	15.7	82.3	88.7	11.4	36.2	10.4	10.8	31.5	31.5	32.3	400.6
1976	32.0	9.7	13.3	37.5	46.2	25.1	28.6	21.3	23.6	41.6	14.7	20.6	314.2
Average	24.4	26.9	34.2	49.1	61.4	48.7	23.0	20.4	26.6	23.7	23.5	25.8	388.5

Monthly Total Precipitation at Osmancık Meteorological Station

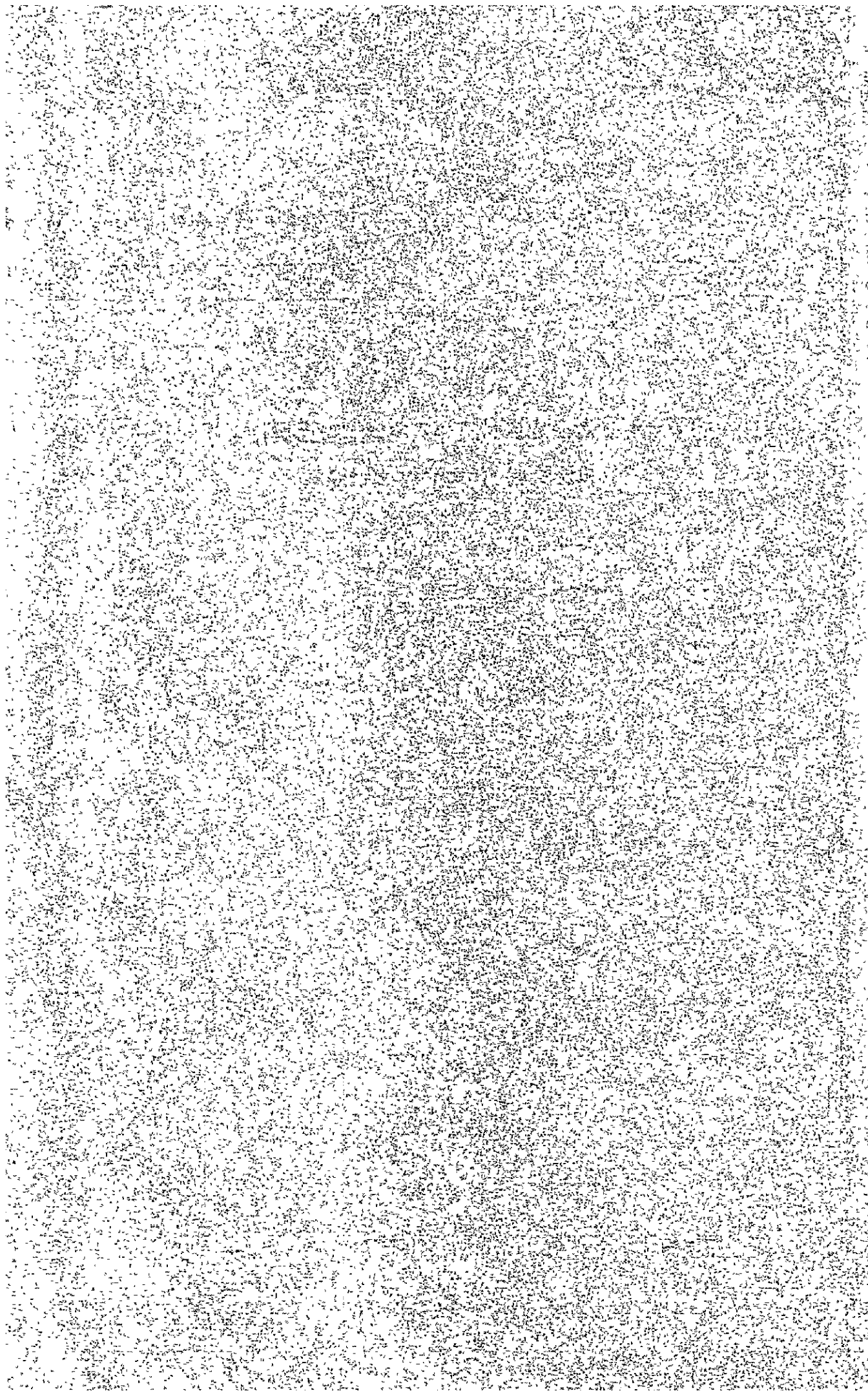
(mm)													
month year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1953	42.1	26.3	24.4	23.4	35.2	81.7	2.2	0.0	2.9	18.2	5.5	16.0	277.9
1954	75.7	34.2	21.1	15.7	22.4	9.0	1.2	14.0	-	0.0	14.9	42.8	-
1955	8.6	18.4	27.6	31.0	28.6	12.3	21.8	22.4	10.3	40.2	24.3	20.5	266.0
1956	12.8	50.5	59.1	14.8	34.5	25.5	0.4	2.6	8.9	10.9	7.4	7.8	235.2
1957	7.2	7.5	22.4	46.9	100.6	14.4	0.0	-	40.5	6.1	10.8	42.7	-
1958	-	-	-	28.3	17.8	56.4	5.7	2.1	13.7	17.3	2.5	31.1	-
1959	104.7	11.9	41.0	60.9	137.9	48.9	8.3	17.2	13.2	16.7	12.9	12.3	485.9
1960	28.6	31.1	34.6	52.7	54.5	50.5	33.6	41.2	13.9	14.8	17.6	14.5	390.6
1961	31.6	56.7	27.6	42.4	-	-	-	6.3	38.5	8.2	13.4	124.5	-
1962	66.9	70.1	40.8	26.6	51.3	30.1	17.3	4.1	23.1	68.9	8.8	122.3	530.3
1963	93.6	33.8	47.4	73.1	75.4	51.6	18.3	0.2	45.8	24.9	22.0	25.1	511.2
1964	7.1	79.7	31.8	50.0	50.8	106.7	19.2	8.2	11.5	0.2	60.6	45.1	470.9
1965	29.6	126.6	67.5	54.0	67.9	30.4	13.5	29.9	-	8.7	52.0	63.8	-
1966	104.6	15.1	47.5	76.1	85.8	68.1	19.7	47.6	2.4	1.0	25.5	-	-
1967	-	32.0	-	60.5	48.6	57.2	5.1	6.8	5.4	24.9	42.9	40.9	-
1968	60.7	21.4	46.0	17.8	27.3	34.2	33.8	17.4	64.6	39.2	20.2	24.3	406.9
1969	54.9	77.9	35.4	90.2	22.1	52.3	2.4	0.0	15.7	4.2	48.5	65.3	468.9
1970	45.6	56.2	27.3	12.4	27.7	46.7	0.0	0.0	38.0	75.9	16.9	39.4	386.1
1971	2.9	9.4	32.9	39.5	57.1	52.7	34.3	12.7	20.0	18.5	43.8	62.2	386.0
1972	11.6	15.9	11.3	55.9	85.5	35.6	48.1	21.8	40.6	37.5	10.4	16.8	391.0
1973	10.8	15.5	33.8	56.5	75.8	44.6	10.6	-	9.1	21.7	14.9	7.5	-
1974	7.9	17.2	7.8	56.6	60.5	15.5	34.1	6.4	1.8	0.8	0.0	63.6	272.2
1975	37.3	6.7	23.1	76.5	43.3	12.3	14.8	12.5	2.7	29.9	29.9	27.3	316.3
1976	39.0	5.8	7.9	25.8	28.8	23.2	10.7	11.9	15.4	38.0	15.6	22.9	245.0
Average	40.2	35.8	32.7	45.3	53.9	41.7	15.4	13.0	19.9	21.9	21.7	40.8	430.6

**A-4 計画地点付近の気象観測所における
気温資料 (monthly data)**

A-4-1 最高気温

A-4-2 最低気温

A-4-3 平均気温



Monthly Maximum Temperatures at Kastamonu Meteorological Station

month year	(°C)												Maximum
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1930	12.6	13.7	24.0	25.2	28.8	30.0	35.6	37.6	31.0	27.0	18.5	12.4	37.6
1931	10.2	15.4	21.0	24.0	31.0	30.0	35.6	35.0	35.0	26.4	15.5	6.9	35.6
1932	9.1	9.2	23.6	27.6	31.8	34.3	37.6	35.7	30.2	31.0	23.0	11.4	37.6
1933	8.6	12.6	17.9	25.6	27.3	31.9	31.7	35.8	29.8	26.1	20.8	10.4	35.8
1934	9.9	9.9	24.2	28.6	29.3	31.0	36.1	35.1	35.7	26.8	19.5	10.7	36.1
1935	5.3	14.6	20.6	24.0	32.1	30.7	35.4	34.8	31.9	25.2	16.5	16.8	35.4
1936	10.8	14.9	18.8	27.4	25.6	27.7	30.4	34.6	29.8	28.2	20.0	13.7	34.6
1937	9.7	13.8	25.3	25.8	27.8	29.8	34.1	31.8	33.4	27.8	20.1	16.8	34.1
1938	10.4	12.3	18.7	23.5	29.0	31.5	33.9	33.6	33.8	24.1	21.0	12.0	33.9
1939	13.7	11.9	18.6	25.0	29.1	29.7	34.0	32.3	29.8	27.5	14.1	12.0	34.0
1940	10.8	13.4	28.0	24.7	27.3	29.9	34.6	32.9	29.3	29.7	20.2	17.9	34.6
1941	11.6	17.0	20.4	26.9	31.3	32.9	33.1	34.6	33.2	24.2	22.0	7.1	34.6
1942	7.2	11.2	18.4	25.4	31.1	34.8	33.4	35.5	27.2	22.5	18.5	11.0	35.5
1943	12.0	4.9	20.4	26.7	29.6	29.9	33.7	32.2	32.4	30.8	20.4	12.4	33.7
1944	7.8	15.4	21.3	27.2	26.9	29.6	33.9	34.0	30.8	27.8	18.8	14.0	34.0
1945	10.2	12.0	21.5	21.1	33.6	31.7	34.6	37.7	34.0	27.0	20.8	6.8	37.7
1946	12.7	13.2	16.4	22.6	29.0	29.9	32.4	34.0	33.9	25.6	22.0	13.1	34.0
1947	3.8	17.4	27.8	27.6	27.8	31.9	32.2	32.8	27.6	26.6	19.0	14.2	32.8
1948	14.2	12.9	15.0	24.3	28.0	31.0	34.5	36.3	27.1	22.7	20.2	6.4	36.3
1949	10.1	6.6	17.7	24.0	28.4	30.6	30.2	35.0	27.5	24.6	21.4	11.8	35.0
1950	5.4	6.3	18.4	29.2	29.9	30.1	32.8	34.7	33.2	28.1	18.7	12.4	34.7
1951	12.3	14.8	22.8	27.4	29.8	31.0	35.3	36.1	32.8	22.8	19.0	10.3	36.1
1952	11.9	13.2	27.6	30.6	26.6	29.6	30.9	35.2	34.7	30.4	20.5	16.6	35.2
1953	13.4	13.9	18.1	24.5	26.7	28.9	32.8	33.8	29.7	26.6	16.5	10.7	33.8
1954	9.1	7.4	20.9	25.7	27.9	30.7	36.7	37.6	31.5	26.4	19.1	14.4	37.6
1955	15.5	18.4	22.5	26.3	28.4	33.8	36.2	29.5	31.4	27.2	17.8	15.0	36.2
1956	13.1	14.3	18.3	27.7	24.2	31.6	32.7	34.2	30.4	28.1	20.9	15.8	34.2
1957	7.6	18.8	24.2	31.4	29.7	32.4	38.7	37.7	30.5	26.2	19.3	17.3	38.7
1958	12.9	20.6	22.0	23.4	31.3	34.7	34.1	36.9	27.4	25.4	20.6	14.6	36.9
1959	12.2	4.7	18.1	27.2	25.7	27.4	32.6	31.4	27.9	22.7	21.2	13.4	32.6
1960	14.3	17.9	19.3	22.2	31.6	29.4	34.2	36.7	33.8	25.7	21.5	15.4	36.7
1961	9.8	11.8	17.0	27.0	29.4	28.6	35.2	35.9	30.4	23.7	24.7	21.1	35.9
1962	10.9	12.6	22.1	22.7	32.0	31.8	38.9	35.4	34.3	26.3	21.8	12.7	38.9
1963	15.6	16.2	18.5	23.9	23.7	30.9	30.7	35.3	33.7	27.3	18.7	18.5	35.3
1964	5.7	10.7	22.6	25.9	28.3	28.4	32.3	31.6	29.3	28.8	18.5	15.0	32.3
1965	10.3	11.8	17.3	24.3	28.4	32.2	33.4	35.3	30.9	27.0	19.4	16.1	35.3
1966	15.4	18.7	19.3	28.4	25.6	31.8	35.3	33.3	29.2	26.9	22.2	15.1	35.3
1967	11.6	10.3	20.4	24.8	27.7	29.3	28.9	32.5	28.3	25.4	19.9	16.1	32.5
1968	10.4	15.2	18.3	26.2	28.0	31.0	35.5	32.7	32.4	20.8	15.9	15.3	35.5
1969	8.0	14.9	18.7	25.1	31.6	32.7	34.2	36.8	31.3	26.3	17.9	15.7	36.8
1970	10.6	15.0	22.4	29.4	30.7	30.6	35.0	35.5	29.2	25.6	21.3	10.3	35.5
1971	15.5	14.6	21.0	25.2	29.8	30.7	34.0	33.6	32.6	24.2	16.1	12.7	34.0
1972	5.0	9.5	18.4	26.4	28.7	31.6	33.4	35.5	30.6	24.7	16.1	9.6	35.5
1973	10.4	15.0	18.6	24.0	31.7	33.3	34.9	29.2	29.8	28.3	15.6	14.5	34.9
1974	4.6	12.4	20.4	23.6	26.6	33.3	34.3	32.2	28.2	29.3	21.4	10.4	34.3
1975	10.4	11.9	25.5	29.0	27.2	32.2	33.6	34.6	30.0	23.0	15.3	6.7	34.6
1976	9.5	7.1	19.7	26.6	24.7	27.9	33.1	33.6	30.3	27.9	18.1	17.2	33.6
Maximum	15.6	20.6	27.8	31.4	33.6	34.8	38.9	37.7	35.7	31.0	24.7	21.1	38.9

Monthly Maximum Temperatures at Kargı Meteorological Station

(°C)

year	month												Maximum
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1964												18.0	-
1965	13.5	12.6	21.3	25.8	32.3	36.7	36.2	39.4	35.0	30.0	21.5	15.7	39.4
1966	13.0	18.9	21.5	32.0	29.5	34.0	38.3	36.9	32.9	31.2	25.4	17.4	38.3
1967	12.3	12.0	23.0	30.0	32.0	34.4	32.8	36.9	33.5	28.8	23.8	16.0	36.9
1968	14.4	14.3	20.4	29.9	31.5	34.0	40.0	36.5	38.8	28.3	19.5	17.7	40.0
1969	11.9	16.2	20.0	27.5	35.1	36.0	38.0	40.8	34.0	30.6	18.0	14.6	40.8
1970	13.9	17.2	25.0	32.3	34.0	34.0	40.0	39.5	31.9	27.0	20.0	10.6	40.0
1971	16.4	17.8	22.5	33.4	32.2	36.0	37.4	37.1	36.8	28.0	18.3	14.5	37.4
1972	6.4	14.5	22.4	29.7	31.9	36.2	39.0	39.4	34.1	28.6	19.7	10.3	39.4
1973	10.1	18.2	20.8	26.3	33.9	38.5	39.4	32.8	33.9	29.0	18.6	17.1	39.4
1974	9.9	16.0	22.0	27.2	29.9	37.3	37.9	35.6	33.1	32.5	22.4	14.7	37.9
1975	10.0	14.9	25.3	31.9	29.3	35.9	37.0	39.0	34.2	27.0	18.3	9.5	39.0
1976	9.0	10.4	22.2	31.0	28.9	33.4	38.4	37.8	34.9	30.9	20.8	19.4	38.4
Maximum	16.4	18.9	25.3	33.4	35.1	38.5	40.0	40.8	36.6	32.5	25.4	19.4	40.8

Monthly Maximum Temperatures at Boyabat Meteorological Station

(°C)

year	month												Maximum
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1964	7.5	16.5	23.5	30.0	31.0	32.5	36.8	34.0	31.0	28.5	19.5	20.0	36.8
1965	13.5	13.0	22.6	26.5	31.5	38.0	36.0	37.0	32.5	29.0	20.8	19.5	38.0
1966	15.0	20.0	21.5	31.0	30.5	33.5	38.5	36.0	31.6	30.0	23.5	18.7	38.5
1967	14.0	13.5	22.2	27.0	33.0	32.3	31.8	34.2	33.0	27.4	22.5	20.5	34.2
1968	15.0	17.0	20.2	28.2	31.0	33.0	41.0	36.0	32.5	23.5	17.2	18.5	41.0
1969	9.5	16.4	20.6	28.2	34.2	36.5	39.8	40.0	32.5	28.5	19.4	13.0	40.0
1970	14.0	19.0	27.5	32.5	33.5	33.5	38.5	37.5	31.0	26.0	19.0	10.5	38.5
1971	18.5	18.0	23.0	28.0	31.5	32.0	37.0	35.0	35.0	26.4	19.0	11.0	37.0
1972	5.6	13.0	21.0	29.5	31.0	33.5	37.0	38.5	33.0	27.5	17.0	9.6	38.5
1973	11.0	19.5	20.0	27.8	32.5	38.0	40.0	31.0	32.5	27.5	17.0	13.5	40.0
1974	6.7	15.0	23.0	27.5	29.5	37.0	37.5	33.0	30.5	31.0	22.0	15.0	37.5
1975	13.0	15.0	25.0	31.5	29.0	36.0	36.5	38.0	33.5	27.0	18.0	8.5	38.0
1976	12.0	11.5	21.5	30.3	28.5	32.0	37.0	36.5	31.0	29.5	21.0	20.5	37.0
Maximum	18.5	20.0	27.5	32.5	34.2	38.0	41.0	40.0	35.0	31.0	23.5	20.5	41.0

Monthly Maximum Temperatures at Osmancık Meteorological Station

(°C)

year \ month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Maximum
1965	-	-	-	-	-	-	37.0	39.0	34.0	31.0	21.9	17.9	39.0
1966	16.2	18.5	20.0	31.1	30.0	33.2	38.2	37.3	32.4	31.1	26.1	-	38.2
1967	-	-	-	27.5	33.4	34.1	32.4	36.5	30.6	27.6	24.1	19.0	36.5
1968	14.5	17.0	20.3	29.0	31.4	33.8	39.2	36.4	35.2	26.8	19.5	18.4	39.2
1969	12.0	14.9	19.9	28.1	34.6	35.4	38.9	40.4	36.1	29.8	19.9	15.1	40.4
1970	13.6	16.8	25.0	31.8	33.7	34.4	39.5	38.9	32.1	26.9	19.8	12.4	39.5
1971	17.8	19.0	22.9	27.4	32.2	33.1	37.3	37.0	36.4	27.4	17.9	14.1	37.3
1972	9.1	12.5	21.4	29.6	30.8	34.5	38.9	38.0	33.3	28.0	19.4	10.3	38.9
1973	9.6	19.1	20.0	26.1	32.9	37.9	38.8	32.8	33.2	28.5	17.5	15.1	38.8
1974	8.4	-	21.7	27.0	30.0	37.0	37.5	35.1	31.6	31.9	22.3	13.0	37.5
1975	13.0	13.6	22.3	31.3	29.2	36.2	37.5	38.5	34.5	27.1	17.2	8.1	38.5
1976	9.5	8.1	21.6	31.9	29.2	32.7	37.8	36.0	33.2	30.1	20.6	17.6	37.8
Maximum	17.8	19.1	25.0	31.9	34.6	37.9	39.5	40.4	36.4	31.9	26.1	19.0	40.4

Monthly Minimum Temperatures at Kastamonu Meteorological Station

(°C)

year	month												Minimum
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1930	-6.2	-8.2	-6.0	-1.3	2.3	5.6	10.7	9.9	5.0	2.3	-3.5	-5.4	-8.2
1931	-12.6	-5.2	-8.0	-7.2	3.4	8.4	9.9	10.5	0.8	0.2	-7.1	-10.3	-12.6
1932	-14.7	-13.2	-11.2	-3.9	1.7	6.7	6.7	7.6	4.0	4.5	-8.2	-8.2	-14.7
1933	-12.2	-11.2	-9.8	-5.0	2.3	4.5	9.4	8.9	4.8	-0.4	-4.7	-12.6	-12.6
1934	-12.1	-13.0	-3.5	-1.4	3.2	4.0	9.7	8.6	2.0	0.7	-2.0	-8.1	-13.0
1935	-26.9	-16.1	-11.7	-1.0	-0.4	3.0	5.2	7.9	2.6	1.0	-8.2	-13.6	-26.9
1936	-10.4	-14.4	-5.7	-2.6	-1.2	4.8	8.5	7.6	1.5	-0.1	-15.0	-14.4	-15.0
1937	-21.8	-12.1	-3.0	-4.4	0.6	3.0	8.5	9.2	7.5	-0.8	-1.6	-15.4	-21.8
1938	-15.6	-12.0	-10.6	-4.2	3.6	3.8	9.2	10.0	0.1	0.2	-5.8	-5.8	-15.6
1939	-13.6	-9.8	-10.0	-5.8	3.7	2.6	2.6	8.4	8.9	1.5	-7.4	-13.2	-13.6
1940	-20.9	-12.1	-14.6	-3.0	-1.9	5.1	9.6	8.0	2.4	-2.9	-4.6	-16.4	-20.9
1941	-20.0	-15.1	-14.3	-5.0	0.2	3.9	9.0	4.9	1.7	-4.8	-8.4	-23.7	-23.7
1942	-23.9	-9.9	-11.3	-5.6	1.3	2.8	5.6	4.9	3.0	-3.3	-5.7	-9.2	-23.9
1943	-12.7	-16.2	-13.2	-3.4	0.2	1.5	4.9	5.1	2.4	1.3	-3.1	-9.8	-16.2
1944	-12.7	-13.3	-7.1	-6.8	-0.3	4.1	7.0	0.9	0.7	0.4	-4.8	-7.1	-13.3
1945	-21.8	-16.6	-10.3	-6.6	-2.5	2.6	8.0	4.1	1.7	-1.8	-10.0	-17.7	-21.8
1946	-13.4	-12.3	-5.8	-3.4	2.3	5.2	6.8	7.2	1.0	-7.2	-3.2	-13.1	-13.4
1947	-20.6	-21.8	-7.8	-3.0	-0.5	6.1	8.5	5.9	2.4	-3.3	-3.8	-18.2	-21.8
1948	-7.8	-12.1	-10.4	-7.4	0.2	7.2	6.6	7.6	1.7	-3.9	-19.3	-14.1	-19.3
1949	-13.4	-14.4	-12.3	-5.2	-0.4	5.7	8.7	2.8	5.3	-1.9	-3.0	-13.0	-14.4
1950	-23.7	-21.9	5.6	0.6	0.8	0.2	6.1	6.1	5.1	-2.7	-7.9	-7.7	-23.7
1951	-7.8	-7.2	-3.0	-1.4	3.4	2.2	8.2	7.6	1.6	-4.9	-5.2	-9.6	-9.6
1952	-13.8	-8.9	-12.2	-2.5	0.3	3.9	6.6	7.9	3.9	0.9	-5.8	-5.1	-13.8
1953	-6.6	-12.3	-11.4	-2.4	3.0	6.3	7.0	8.0	2.1	-1.8	-12.5	-20.4	-20.4
1954	-19.5	-15.0	-9.1	-3.3	0.6	7.8	8.1	9.3	12.8	-0.4	-2.4	-4.5	-19.5
1955	-7.1	-7.5	-6.9	-2.6	0.2	5.5	9.2	7.8	2.4	3.0	-5.1	-9.0	-9.0
1956	-13.5	-15.9	-14.0	-4.7	1.5	2.7	6.2	6.8	-1.5	-4.6	-9.2	-11.6	-15.9
1957	-13.4	-9.0	-10.6	-5.4	2.7	4.2	5.2	8.4	8.7	-2.0	-7.4	-9.2	-13.4
1958	-10.4	-6.7	-5.9	-3.6	-0.2	2.5	6.3	6.2	2.4	-1.3	-8.5	-11.3	-11.3
1959	-9.0	-15.6	-12.5	-3.1	0.9	3.6	8.1	5.6	0.7	-4.6	-7.7	-8.0	-15.6
1960	-12.1	-22.3	-11.3	-0.3	1.4	5.6	6.7	8.5	1.3	-0.4	-2.6	-4.6	-22.3
1961	-19.6	-18.0	-11.5	-2.6	2.3	6.6	6.9	5.8	1.6	0.1	-3.4	-14.1	-19.6
1962	-7.3	-9.5	-7.9	-3.6	1.0	7.4	7.3	6.0	2.5	-0.3	-1.0	-7.0	-9.5
1963	-12.4	-10.5	-9.5	-4.5	1.2	6.3	7.8	5.7	2.0	-2.4	-4.7	-9.5	-12.4
1964	-20.6	-15.8	-6.8	-4.5	-1.9	8.7	5.5	7.3	2.7	-3.9	-10.4	-6.3	-20.6
1965	-11.6	-20.7	-6.6	-5.7	0.6	7.9	7.4	6.0	1.8	-4.6	-5.1	-3.5	-20.7
1966	-9.8	-10.1	-5.1	-3.6	-0.6	5.9	9.4	8.6	2.6	0.6	0.4	-12.4	-12.4
1967	-13.5	-16.0	-6.1	-6.8	2.0	0.8	7.9	7.3	2.6	1.4	-11.4	-8.6	-16.0
1968	-17.6	-11.7	-7.7	0.0	4.5	2.1	4.7	6.5	5.6	0.6	-1.6	-9.0	-17.6
1969	-16.1	-12.8	-5.6	-4.1	1.0	6.4	5.8	7.1	1.7	-4.3	-2.9	-4.1	-16.1
1970	-8.0	-6.2	-6.3	-2.3	3.0	6.4	8.8	3.2	1.8	-3.1	-2.9	-13.1	-13.1
1971	-10.1	-7.7	-7.2	-1.2	4.0	4.0	6.7	7.4	4.4	-2.8	-3.9	-14.0	-14.0
1972	-18.4	-16.6	-12.0	-4.6	3.3	9.1	8.0	11.0	4.7	-1.1	-6.0	-14.8	-18.4
1973	-16.0	-6.6	-10.0	-0.8	0.0	5.3	8.0	6.2	4.8	-7.5	-7.8	-11.6	-16.0
1974	-16.6	-15.0	-7.1	-3.5	1.8	6.0	7.7	6.4	1.0	0.8	-4.2	-13.2	-16.6
1975	-13.2	-10.4	-4.3	-0.8	3.8	7.0	9.8	5.5	3.7	-0.9	-5.9	-13.4	-13.4
1976	-18.9	-17.7	-9.5	-4.6	2.2	2.6	6.9	8.9	2.2	1.0	-1.0	-10.0	-18.9
Minimum	-25.9	-22.3	-14.6	-7.4	-2.5	0.2	2.6	0.9	-1.5	-7.5	-19.3	-23.7	-26.9

Monthly Minimum Temperatures at Kargı Meteorological Station

		(°C)												
year	month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Minimum
	1965		-5.8	-13.7	-1.0	-1.0	7.3	12.2	13.7	12.0	10.5	-0.1	-0.4	0.5
1966		-5.8	-3.6	0.2	2.3	5.9	11.0	15.5	12.6	10.9	5.7	4.3	-3.7	-5.8
1967		-6.7	-8.0	-2.5	0.2	7.9	7.2	14.7	15.0	9.9	6.5	-3.6	-6.4	-8.0
1968		-8.6	-3.8	-2.2	5.6	11.4	9.0	12.9	13.2	9.3	5.5	3.6	1.3	-8.6
1969		-7.2	-4.4	-1.5	0.9	9.1	14.3	13.4	14.0	8.4	0.7	1.1	0.0	-7.2
1970		-2.4	-2.2	-0.5	3.5	8.5	12.6	16.7	10.6	5.5	2.3	2.0	-4.5	-4.5
1971		-5.6	-6.0	-2.6	3.4	9.5	11.2	14.6	13.0	11.8	1.0	1.0	-5.2	-6.0
1972		-10.4	-11.0	-3.9	0.5	7.4	13.5	14.0	16.1	11.0	2.8	-2.6	-7.4	-11.0
1973		-12.5	-3.0	-3.5	5.0	6.5	11.0	13.5	11.6	9.5	-0.3	-2.5	-4.0	-12.5
1974		-8.0	-8.6	-1.2	1.9	7.8	13.0	13.2	13.6	7.7	5.9	-1.5	-3.0	-8.6
1975		-6.5	-5.6	-0.5	5.0	7.2	13.0	16.2	12.0	9.3	3.5	-2.7	-5.5	-6.5
1976		-15.0	-10.6	4.1	0.0	8.3	9.0	12.5	13.4	8.3	6.0	0.9	-3.5	-15.0
Minimum		-15.0	-13.7	-3.9	-1.0	5.9	9.0	12.5	10.5	5.5	-0.3	-3.6	-7.4	-15.0

Monthly Minimum Temperatures at Boyabat Meteorological Station

		(°C)												
year	month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Minimum
	1964		-10.0	-7.5	-1.5	0.0	5.0	13.0	12.4	11.0	9.0	0.5	-2.5	-3.3
1965		-6.5	-10.5	-2.0	-2.5	5.0	11.5	13.5	10.5	9.0	-2.0	-2.0	-2.0	-10.5
1966		-4.5	-5.0	-2.0	0.5	4.0	8.0	14.0	13.0	9.5	3.5	3.5	-5.0	-5.0
1967		-6.5	-10.5	-4.0	-1.2	6.6	5.6	13.6	13.4	9.5	4.0	-4.5	-5.5	-10.5
1968		-9.5	-5.2	-4.2	3.0	11.0	7.5	11.4	12.5	7.0	3.0	1.0	-2.5	-9.5
1969		-8.5	-4.6	-2.0	-0.6	7.0	12.5	11.0	12.2	7.5	-2.0	-1.0	-1.5	-8.5
1970		-3.3	-2.0	-1.0	1.0	7.0	11.5	14.5	9.0	2.5	0.4	-0.5	-6.0	-6.0
1971		-7.0	-5.0	-3.7	3.2	7.5	9.0	12.6	8.0	10.0	-1.0	-2.0	-8.0	-8.0
1972		-13.5	-11.5	-5.2	-1.5	5.5	12.0	13.0	14.6	10.5	3.5	-4.0	-6.0	-13.5
1973		-10.6	-3.5	-5.0	3.5	4.5	9.0	12.5	11.0	7.6	-2.6	-3.5	-5.0	-10.6
1974		-10.5	-8.0	-2.6	-0.4	6.5	11.2	11.0	12.3	6.0	3.3	-3.5	-5.0	-10.5
1975		-5.7	-7.0	-3.0	1.5	8.0	13.5	14.0	11.5	7.5	0.5	-4.4	-11.0	-11.0
1976		-16.5	-10.5	-6.0	-1.0	6.5	8.0	11.6	13.0	7.3	1.5	-0.5	-9.4	-16.5
Minimum		-16.5	-11.5	-6.0	-2.5	4.0	5.8	11.0	8.0	2.5	-2.6	-4.5	-11.0	-16.5

Monthly Minimum Temperatures at Osmancık Meteorological Station

(°C)

year \ month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Minimum
1965	-	-	-	-	-	-	13.1	21.0	5.0	-5.1	-5.8	0.4	-
1966	-8.4	-0.9	-1.4	4.5	7.0	14.0	17.4	14.0	10.0	4.0	4.0	-	-
1967	-	-	-	-0.9	4.6	7.4	12.4	14.0	5.6	1.9	5.6	-9.1	-9.1
1968	-12.4	-5.2	-4.0	1.3	8.4	4.4	12.3	9.9	6.8	1.7	-1.7	-4.5	-12.4
1969	-9.0	-7.5	-3.6	-1.7	4.4	13.0	12.4	11.9	4.0	-2.6	-2.4	-1.6	-9.0
1970	-3.3	-4.1	-2.4	0.4	6.4	10.0	14.8	8.9	5.4	0.4	-2.1	-5.5	-5.5
1971	-7.7	-9.6	-4.3	1.4	7.8	10.4	12.5	14.9	9.2	-1.8	-2.0	-6.6	-9.6
1972	-14.6	-18.1	-5.4	-1.1	7.4	11.8	13.4	14.9	9.4	-0.3	-5.0	-9.6	-18.1
1973	-16.6	-4.4	-4.1	3.3	4.4	10.0	11.5	10.4	6.5	-2.6	-5.8	-5.3	-16.1
1974	-12.0	-	-3.1	-0.4	7.6	11.5	12.1	12.4	5.4	3.2	-4.8	-4.2	-12.0
1975	-5.6	-9.4	-3.7	-3.2	6.6	12.5	14.8	10.3	7.3	1.2	-3.8	-6.9	-9.4
1976	-18.5	-10.7	-5.4	-1.4	6.7	8.5	11.4	11.6	5.8	2.8	0.4	-5.5	-18.5
Minimum	-18.5	-18.1	-5.4	-3.2	4.4	4.4	11.4	9.9	4.0	-5.1	-5.8	-9.6	-18.5

Monthly Average Temperatures at Kastamonu Meteorological Station

year	month												Average
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1931	0.3	4.2	8.4	8.7	15.1	18.9	22.3	21.5	18.1	12.0	3.4	-1.2	10.8
1932	-2.5	-2.5	5.0	9.9	15.0	19.4	20.9	20.0	17.4	16.3	5.8	0.9	10.5
1933	-1.7	1.3	3.2	6.9	14.5	16.2	19.5	20.3	14.9	11.7	8.5	-1.8	9.5
1934	-1.6	-1.3	8.7	11.6	15.9	18.0	21.2	20.5	16.9	12.4	7.3	1.4	10.9
1935	-6.3	0.1	2.6	9.5	15.6	18.7	19.5	20.6	16.6	11.9	4.5	2.2	9.6
1936	0.1	2.2	5.9	10.4	12.9	15.8	20.9	20.1	13.2	10.4	4.3	-1.9	9.5
1937	-4.6	2.1	8.3	10.1	14.3	16.7	22.0	20.2	18.8	11.1	6.6	2.1	10.6
1938	-1.5	-0.4	2.5	8.8	13.6	17.4	22.2	21.3	15.8	10.2	3.7	2.9	9.7
1939	1.6	0.2	2.6	9.9	15.4	17.3	19.9	19.3	15.1	12.6	3.4	1.9	9.9
1940	-3.5	2.0	2.8	10.1	12.2	17.4	21.1	13.1	14.6	11.5	5.3	2.4	9.6
1941	-1.1	3.1	3.1	11.0	15.1	18.4	20.4	18.7	13.9	8.0	2.5	-4.1	9.1
1942	-5.7	1.0	2.5	7.8	14.5	19.2	19.6	20.1	14.4	10.5	5.2	-1.0	9.0
1943	-2.2	-4.3	0.0	7.7	13.3	16.4	18.5	19.6	16.0	13.7	6.4	0.5	8.8
1944	-1.5	2.9	4.7	9.8	12.4	18.0	19.6	18.0	15.0	12.7	5.9	2.5	10.0
1945	-0.5	-2.5	1.4	7.0	15.6	16.5	19.5	20.9	16.0	9.2	4.5	-3.6	8.7
1946	-1.3	0.9	3.6	9.8	14.5	18.0	19.7	19.7	16.7	7.5	6.8	1.7	9.8
1947	-3.2	1.4	7.8	10.4	15.2	19.5	20.9	18.6	14.8	8.9	6.7	1.9	10.2
1948	3.3	0.2	-0.3	8.6	14.2	17.5	20.1	20.7	14.7	10.2	2.1	-2.4	9.1
1949	-3.0	-2.7	1.8	5.8	15.2	17.5	18.6	17.9	13.4	9.4	6.6	2.4	8.6
1950	-5.5	-4.2	3.1	13.7	15.1	16.7	19.3	18.7	17.8	9.0	5.0	1.5	9.2
1951	1.0	2.9	7.1	10.5	14.7	16.7	20.2	20.6	15.7	6.9	5.8	-1.2	10.1
1952	-0.3	2.1	4.0	10.1	12.7	15.7	19.3	21.0	18.4	12.2	6.5	3.9	10.5
1953	1.8	0.8	-0.2	9.5	13.7	18.0	20.1	20.0	14.5	10.6	2.3	-3.4	9.0
1954	-5.6	-2.9	4.9	7.3	14.4	18.1	21.5	21.4	16.2	11.9	7.4	2.8	9.8
1955	2.5	5.2	5.5	7.9	14.9	18.8	20.4	18.5	15.7	13.5	6.1	1.3	10.9
1956	0.8	-0.3	0.3	10.5	12.1	17.2	19.1	21.3	13.1	9.0	3.6	-1.6	8.7
1957	-2.4	2.8	3.9	11.0	13.8	19.4	22.1	22.3	18.3	11.4	6.1	2.0	10.9
1958	0.2	4.6	4.8	9.3	16.5	17.6	19.6	20.0	14.1	10.0	5.2	0.9	10.2
1959	1.2	-4.3	2.4	9.6	13.9	16.6	20.7	19.0	12.5	7.2	5.0	2.8	8.8
1960	1.8	-0.8	3.6	9.2	15.2	17.1	20.1	18.5	15.2	12.3	7.2	3.2	10.2
1961	-3.3	-0.3	3.5	11.3	14.8	17.6	19.7	19.7	13.0	10.3	7.4	2.7	9.7
1962	0.1	0.7	6.6	9.4	15.5	17.8	21.1	21.6	16.0	11.1	8.6	2.5	10.0
1963	0.4	2.8	2.8	8.8	13.6	17.5	19.7	20.3	16.8	11.3	5.8	1.8	10.1
1964	-4.7	-1.2	5.4	8.3	12.5	17.3	19.3	17.6	14.3	10.4	4.3	2.3	8.8
1965	-0.1	-2.5	5.2	8.2	13.6	17.7	19.2	19.0	15.7	7.3	5.8	3.6	9.4
1966	1.3	4.6	5.9	11.0	13.0	17.2	21.2	20.6	14.8	13.1	9.2	2.4	11.2
1967	1.8	-3.2	3.4	8.8	13.4	15.4	25.1	26.8	14.7	10.8	5.3	2.8	10.4
1968	-2.0	0.2	3.3	11.4	18.4	16.7	20.0	18.3	15.4	9.7	6.2	1.7	9.8
1969	-2.0	0.5	4.5	7.2	15.6	18.8	17.9	20.2	15.5	9.1	4.7	3.0	9.6
1970	1.7	3.3	6.1	12.2	13.2	16.9	21.2	18.7	14.7	9.2	5.4	-0.2	10.2
1971	1.1	1.2	5.6	9.1	14.1	16.7	20.1	19.4	16.3	8.2	6.1	0.0	9.4
1972	-2.8	3.5	2.7	9.5	13.9	15.7	20.0	18.3	16.1	10.9	3.0	-0.9	9.2
1973	-3.6	3.5	2.7	9.5	13.9	15.7	20.0	18.3	16.1	10.9	3.0	-0.9	9.1
1974	-3.6	1.3	6.0	7.3	13.8	18.6	19.3	18.6	14.2	13.6	5.0	0.1	9.5
1975	-1.5	0.6	6.6	11.7	13.6	19.2	21.1	19.9	15.4	10.2	4.7	-2.9	9.4
1976	-4.6	-3.3	3.4	9.6	13.9	16.5	19.4	18.3	14.5	11.6	5.9	0.9	8.4
Average	-1.3	0.6	4.0	9.5	11.3	17.5	20.3	19.9	15.5	10.7	5.1	0.8	

Monthly Average Temperatures at Kargı Meteorological Station

(°C)

month year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1964	-	-	-	-	-	-	-	-	-	-	-	6.1	-
1965	3.9	1.0	9.1	12.2	17.9	22.4	24.2	24.2	21.7	12.6	9.2	6.4	13.7
1966	4.0	8.3	9.7	14.9	17.6	21.9	25.9	25.3	20.3	18.8	12.9	5.8	15.5
1967	1.7	0.6	7.0	12.9	18.1	20.2	23.6	24.6	20.0	16.3	8.9	5.1	13.2
1968	1.1	4.0	7.7	15.9	21.1	21.9	25.1	23.7	20.6	14.4	10.7	5.2	14.3
1969	1.9	4.6	8.5	11.3	19.8	23.5	23.0	25.8	20.8	14.2	8.8	6.5	14.1
1970	5.5	6.8	10.2	16.9	17.7	21.9	26.1	23.9	20.2	13.2	9.1	3.5	14.6
1971	4.4	4.8	9.6	13.1	18.4	20.7	24.6	24.4	21.5	13.2	9.1	3.4	13.9
1972	-1.4	0.9	7.9	16.0	18.3	22.7	25.2	24.9	20.6	15.3	8.3	1.3	13.3
1973	-0.5	7.0	6.6	13.9	18.2	20.2	24.6	23.4	23.4	15.8	6.4	2.7	13.5
1974	0.5	4.7	10.1	11.2	18.0	23.6	24.2	23.6	19.8	19.0	9.3	2.6	13.9
1975	1.3	3.9	11.0	16.1	17.4	24.0	25.8	24.7	20.6	14.5	7.4	1.2	14.0
1976	-1.3	0.7	7.3	14.1	17.9	20.7	24.0	22.6	19.3	15.8	9.4	3.9	12.9
Average	1.9	3.9	8.7	14.0	18.4	22.0	24.7	24.3	20.7	15.3	9.1	4.1	

Monthly Average Temperatures at Boyabat Meteorological Station

(°C)

month year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1964	-0.9	3.5	9.2	12.2	15.9	21.6	23.1	21.7	18.8	15.8	7.6	5.4	12.8
1965	3.6	1.8	8.9	11.6	17.3	21.8	23.2	22.4	20.4	11.7	9.0	6.5	13.2
1966	4.5	8.2	9.6	14.4	16.5	20.8	25.1	24.6	13.0	17.7	12.5	5.5	14.4
1967	1.9	1.1	6.7	12.6	17.5	19.3	22.3	23.5	19.1	15.7	8.9	5.2	12.8
1968	1.2	4.0	7.0	14.9	20.2	20.7	23.8	21.9	19.2	15.6	9.6	4.5	13.6
1969	1.4	4.2	7.6	10.6	18.7	22.3	21.4	24.1	19.5	13.0	7.6	5.5	13.0
1970	4.8	6.6	9.6	15.8	16.8	20.2	24.7	22.4	18.8	12.7	8.3	2.8	13.6
1971	3.7	4.6	8.8	12.7	17.9	19.9	23.2	23.0	20.1	12.1	8.7	3.1	13.2
1972	-2.9	1.0	6.5	15.6	17.3	21.4	24.0	23.9	19.7	14.7	7.3	1.1	12.5
1973	0.0	6.6	6.0	12.9	15.7	19.5	22.9	21.7	19.6	14.3	5.5	2.7	12.3
1974	-0.2	4.5	8.7	10.3	16.9	22.0	21.8	21.6	18.4	17.6	8.7	2.5	12.7
1975	1.7	3.7	9.8	14.8	17.1	22.7	24.5	23.3	19.4	13.6	7.2	0.2	13.2
1976	-1.9	0.7	6.5	12.6	16.3	19.6	22.1	21.4	18.3	15.0	8.5	3.6	11.9
Average	1.3	3.9	8.1	13.2	17.2	20.9	23.2	22.7	18.6	14.6	8.4	3.7	

Monthly Average Temperatures at Osmancık Meteorological Station

(°C)

year \ month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1965	-	-	-	-	-	-	24.0	24.0	20.7	10.4	6.7	6.1	-
1966	4.1	6.8	6.2	13.3	18.4	22.0	27.2	26.2	19.6	15.5	10.5	-	-
1967	-	-	-	12.8	17.4	19.7	22.9	23.8	19.1	14.1	7.8	4.9	15.8
1968	0.8	3.2	6.7	14.8	20.4	21.1	24.1	22.7	19.4	12.8	8.8	4.5	13.3
1969	1.4	3.2	7.9	10.6	18.8	22.7	22.6	25.2	20.2	13.1	7.3	6.2	13.3
1970	5.1	6.5	9.4	16.1	17.5	21.4	26.1	23.6	19.5	12.4	8.1	6.0	14.3
1971	3.3	4.3	9.2	12.6	18.3	20.9	24.4	24.3	21.4	12.5	8.9	2.9	13.6
1972	-3.1	-1.7	7.1	15.8	18.0	22.3	25.4	25.2	15.0	20.4	7.2	3.4	12.9
1973	-2.0	6.1	5.7	14.0	17.9	20.9	24.9	23.4	21.1	15.6	6.3	2.4	13.0
1974	-1.1	-	9.4	11.1	17.9	23.3	23.5	23.3	19.1	18.2	6.4	2.3	-
1975	1.2	3.5	9.8	15.6	17.5	23.1	25.4	24.4	20.4	13.8	7.2	0.6	13.5
1976	-1.9	-0.7	6.0	12.9	17.3	20.3	23.5	22.3	18.8	15.6	8.4	3.7	12.2
Average	0.8	3.5	7.7	13.6	18.1	21.6	24.5	24.0	19.5	14.5	8.0	3.9	

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