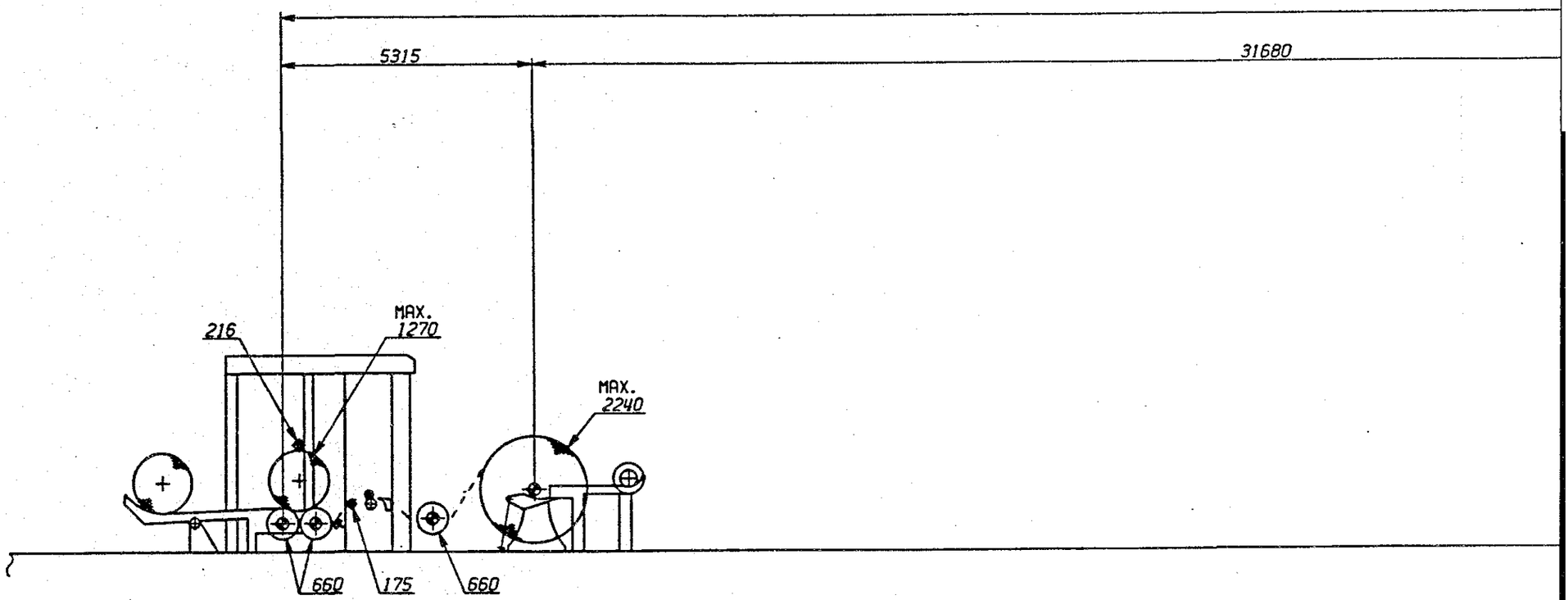
ATTACHMENT IV-1-1 SEKA-AKSU MILL PRODUCTION STUDY (Feb. 1- 28, 1990)

49 g/m² × 6.85m × 660m/min × 1,440 = 290T/D at REEL 100% EFF.

DATE	WINDER		REEL		TOTAL EFF. %	SHEET BREAK LOSS TIME (min)				Sheduled shut-down TIME (min)	Emergency shut-down LOSS TIME (min)	TOTAL LOSS TIME (min)	Stopped Time Rate (%)
	PRODUCTION T/D	EFF. % B	PRODUCTION T/D	EFF. % A		RESS	DRY.	CAL.	TOTAL				
2/ 1	215	86	250	86	74	25	35	—	60	60	60	180	12.5
2/ 2	266	98.5	270	93	91.6	—	50	—	50	60	—	110	7.6
2/ 3	267	99	270	93	92	40	35	—	75	—	—	75	5.2
2/ 4	245	98	250	86	84	30	60	—	90	60	—	150	10.4
2/ 5	254	97.7	260	89.6	87.5	15	45	—	60	75	—	135	9.4
2/ 6	260	*	240	83	*	—	30	—	30	—	195	225	16
2/ 7	249	94	265	91	86	—	15	—	15	—	75	90	6.3
2/ 8	265	*	252	87	*	15	15	—	30	#60	75	165	11.5
2/ 9	236	*	227	78	*	30	30	30	120	#60	45	225	16
2/10	281	*	260	89.6	*	—	60	—	60	#60	—	120	8.3
2/11	262	98	268	92	90	15	15	—	30	45	—	75	5.2
2/12	252	93	270	93	87	—	45	—	45	60	—	105	7.3
2/13	261	95	275	95	90	—	15	—	15	—	45	60	4.2
2/14	262	98.5	266	92	90	15	15	—	30	60	30	120	8.3
2/15	181	90	200	69	62	15	60	15	90	—	315	405	28
2/16	118	*	101	35	*	—	30	—	30	#870	45	945	65
2/17	77	*	60	21	*	15	15	—	30	#780	240	1,050	73
2/18	261	96	272	94	90	25	20	—	45	—	—	45	3.1
2/19	236	93	255	88	81	15	75	—	90	60	—	150	10.4
2/20	243	*	242	83	*	15	90	15	120	#60	—	180	12.5
2/21	247	97	255	88	85	40	35	—	75	90	—	165	11.5
2/22	217	90	240	83	75	—	60	—	60	45	180	285	19.8
2/23	246	94	261	90	85	15	65	10	90	45	—	135	9.4
2/24	123	*	114	39	*	40	80	—	120	#90	600	810	56
2/25	208	82	252	87	72	15	30	—	45	60	90	195	13.5
2/26	218	*	193	67	*	15	125	10	130	—	240	390	27
2/27	138	79	175	60	47	45	60	—	105	—	450	555	39
2/28	207	*	197	68	*	90	125	—	225	#120	90	435	30
TOTAL		excepting 93	6,440	79	excepting	530	1,395	60	1,985	2,820	2,775	7,580	
				excepting 87.2	82								

WINDER



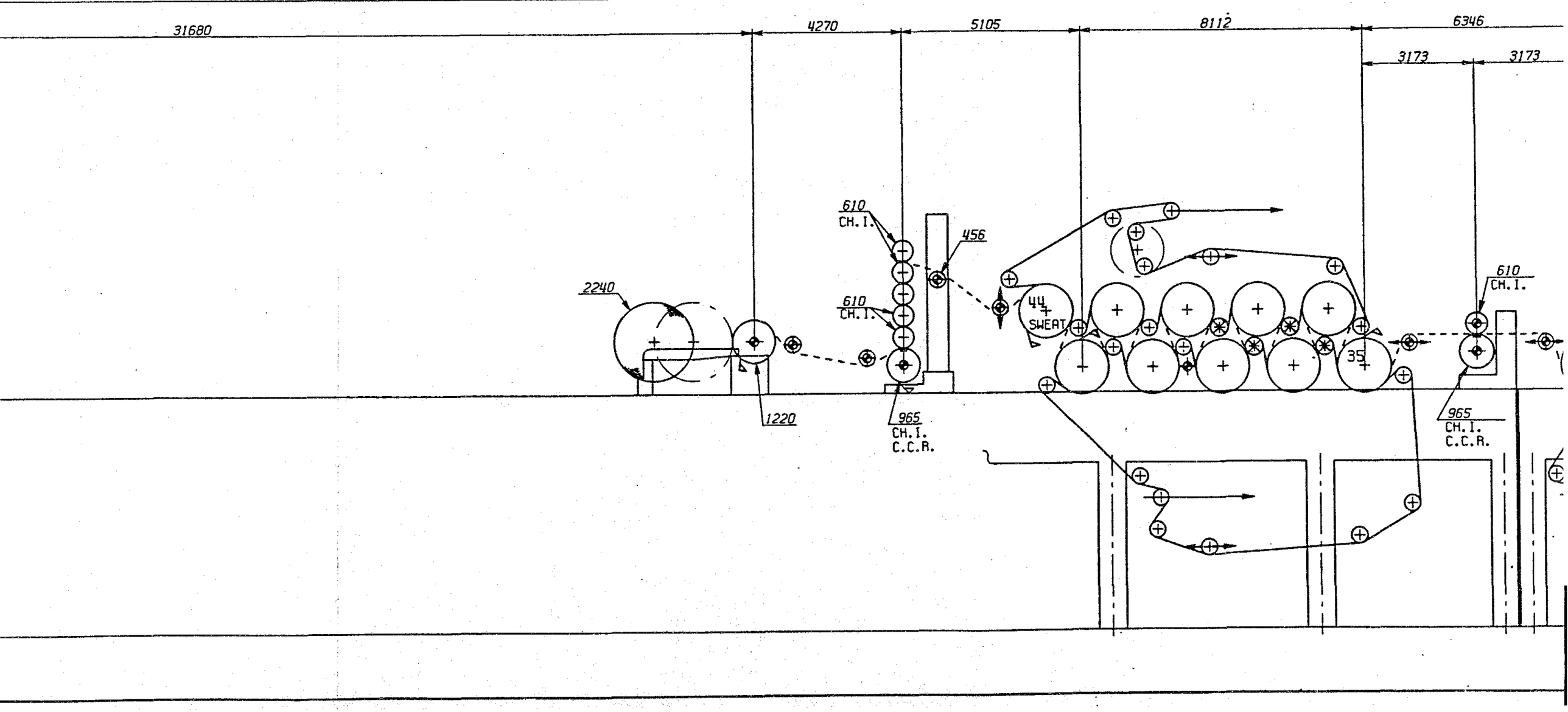
REEL

CALENDER

4TH DRYER

(9) PA.D.
(1) SWEAT D.
(2) DOCT.
(2) P.V.R.

BREAKER



4TH DRYER

(9) PA.D.
(1) SWEAT D.
(2) DOCT.
(2) P.V.R.

BREAKER

3RD DRYER

(12) PA.D.
(8) S.P.B.
(1) DOCT.
(8) P.V.R.

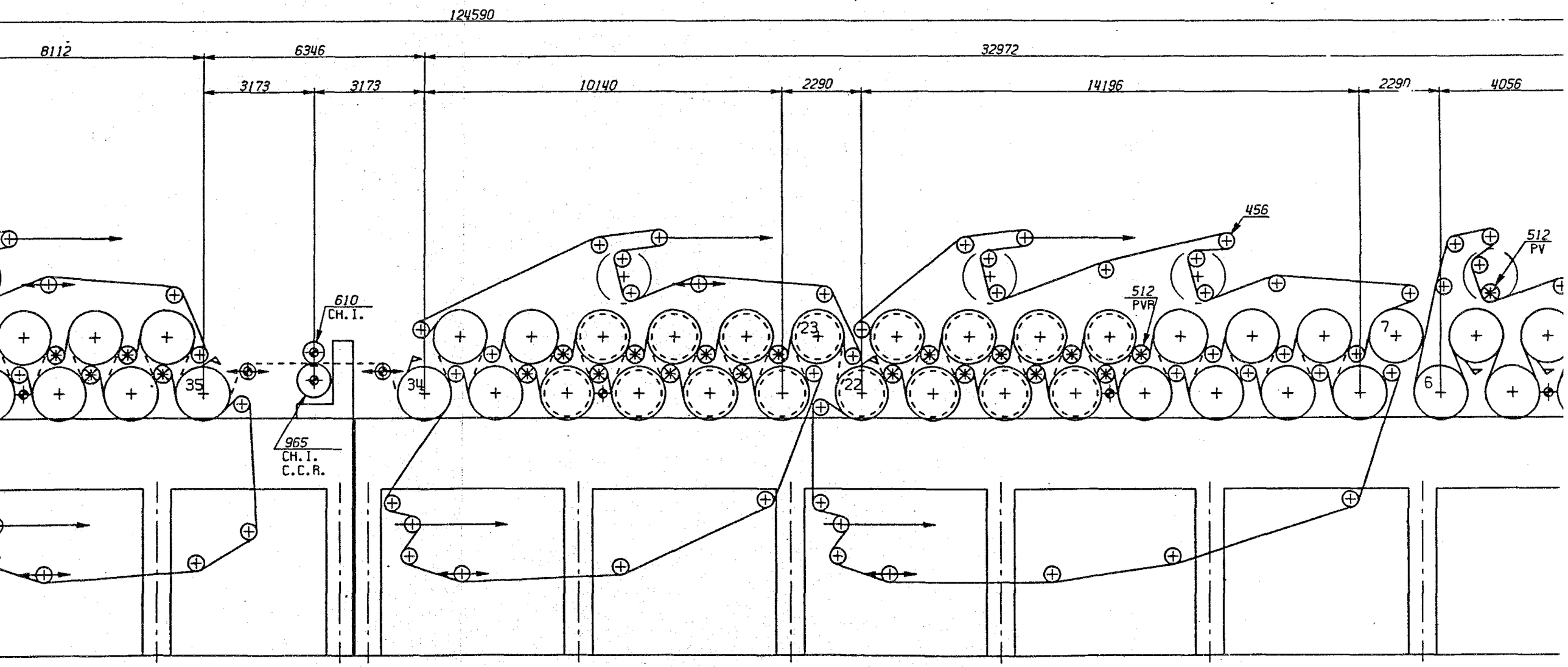
2ND DRYER

(16) PA.D.
(8) S.P.B.
(1) DOCT.
(8) P.V.R.

1ST DRY

(SINGLE FELT

(6) PA.D.
(3) DOCT.
(1) P.V.R.



) DRYER

PA.D.
S.P.B.
DOCT.
P.V.R.

1ST DRYER

(SINGLE FELTED)

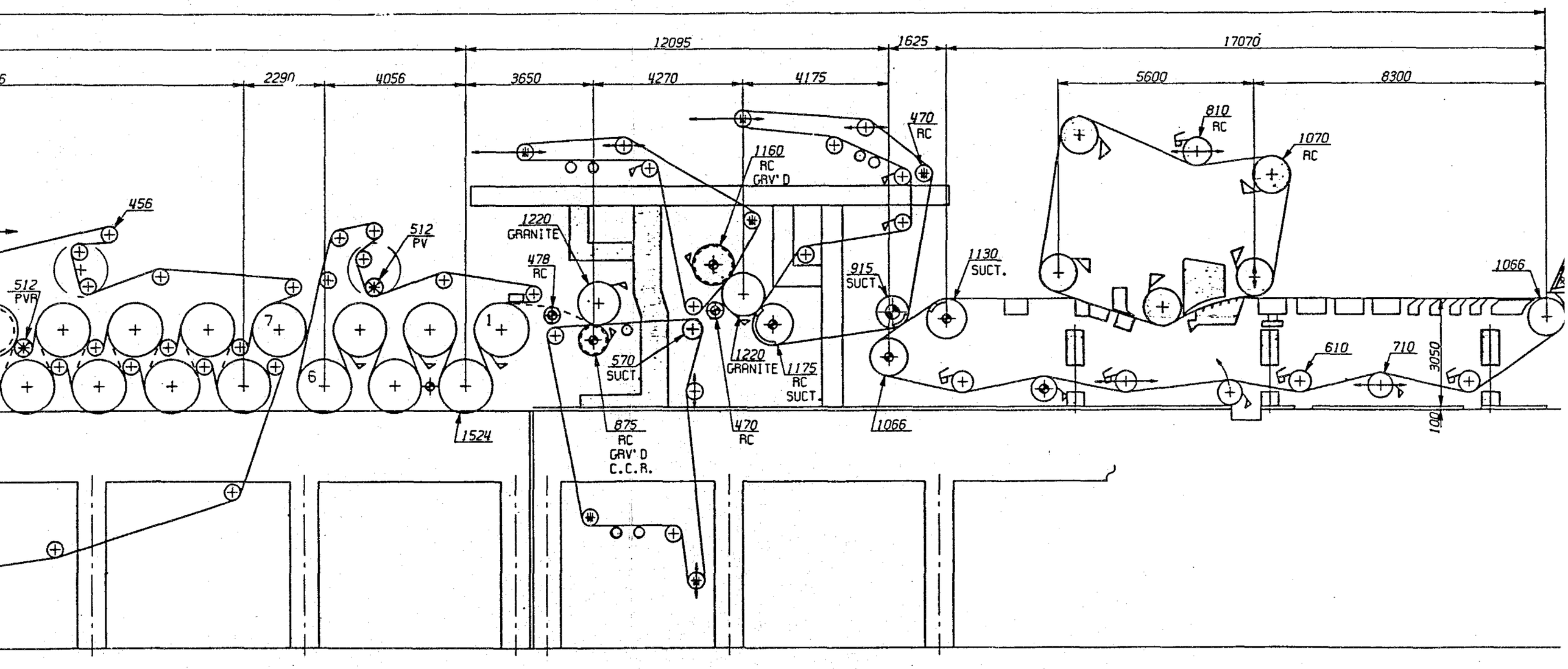
(6) PA.D.
(3) DOCT.
(1) P.V.R.

PRESS

1ST PRESS : 53.5kg/cm
2ND PRESS : 70 kg/cm
3RD PRESS : 100 kg/cm

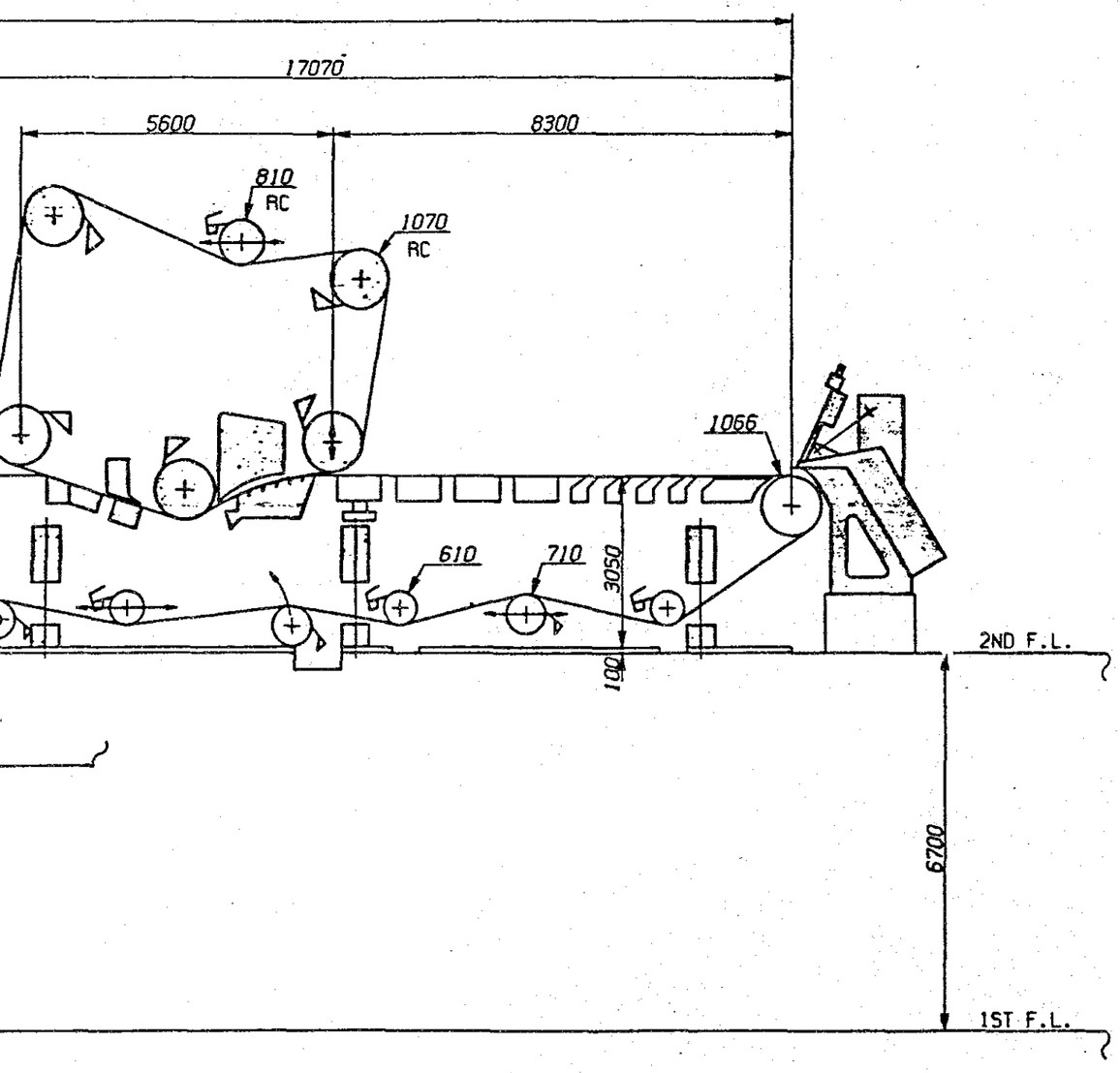
ON-TOP WIRE SYSTEM

HE



ON-TOP WIRE SYSTEM

HEADBOX



SPECIFICATION	
TYPE OF MACHINE	ON-TOP WIRE SYSTEM
HAND OF MACHINE	RIGHT HAND
TYPE OF PAPER	NEWSPRINT
BASIS WEIGHT	45 ~ 49 g/m^2
WIRE WIDTH	7520 mm
MAX. SHEET WIDTH	7000 mm MAX. ON REEL
DESIGN SPEED	760 m/min (ROLL BAL.760min)
OPERATING SPEED	760 m/min MAX.
MAX. PRODUCTION	345 tons/day ON REEL
(45 g/m^2 X 760 m/min X 7000 mm X 100%EFF.)	

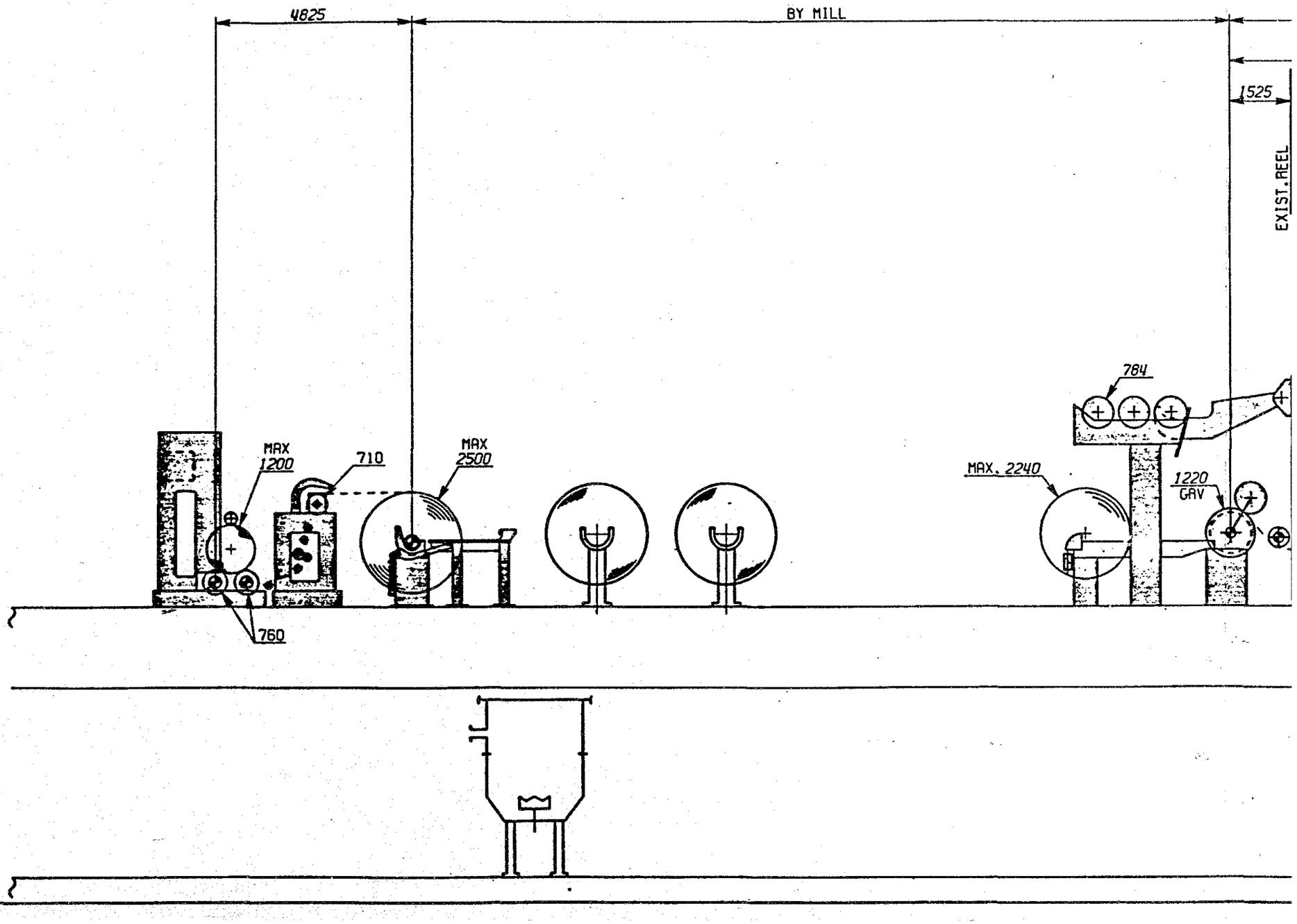
PAPER MACHINE
(CASE–1)

Attachment IV–3–1

JICA

WINDER

REEL


4825
BY MILL
1525
EXIST.REEL
MAX
1200
710
MAX
2500
784
MAX. 2240
1220
GAV
760

REEL

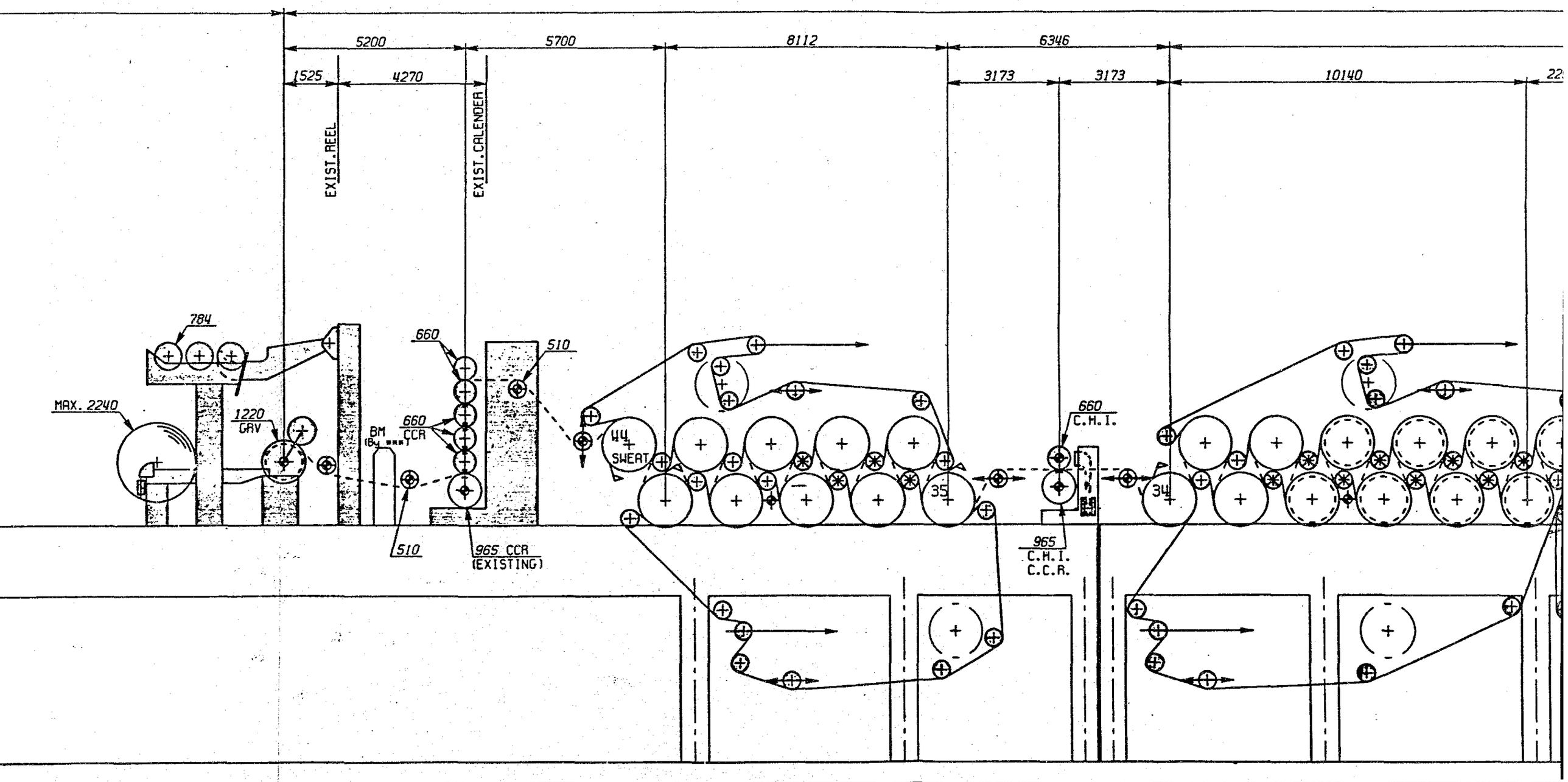
CALENDER

4TH DRYER

(9) PA. D.
(1) SWEAT D.
(2) DOCT.
(4) P.V.R.

3RD DRYER

(12) PA. D.
(8) S.P.B.
(1) DOCT.
(8) P.V.R.



3RD DRYER

(12) PA. D.
(8) S.P.B.
(1) DOCT.
(8) P.V.R.

2ND DRYER

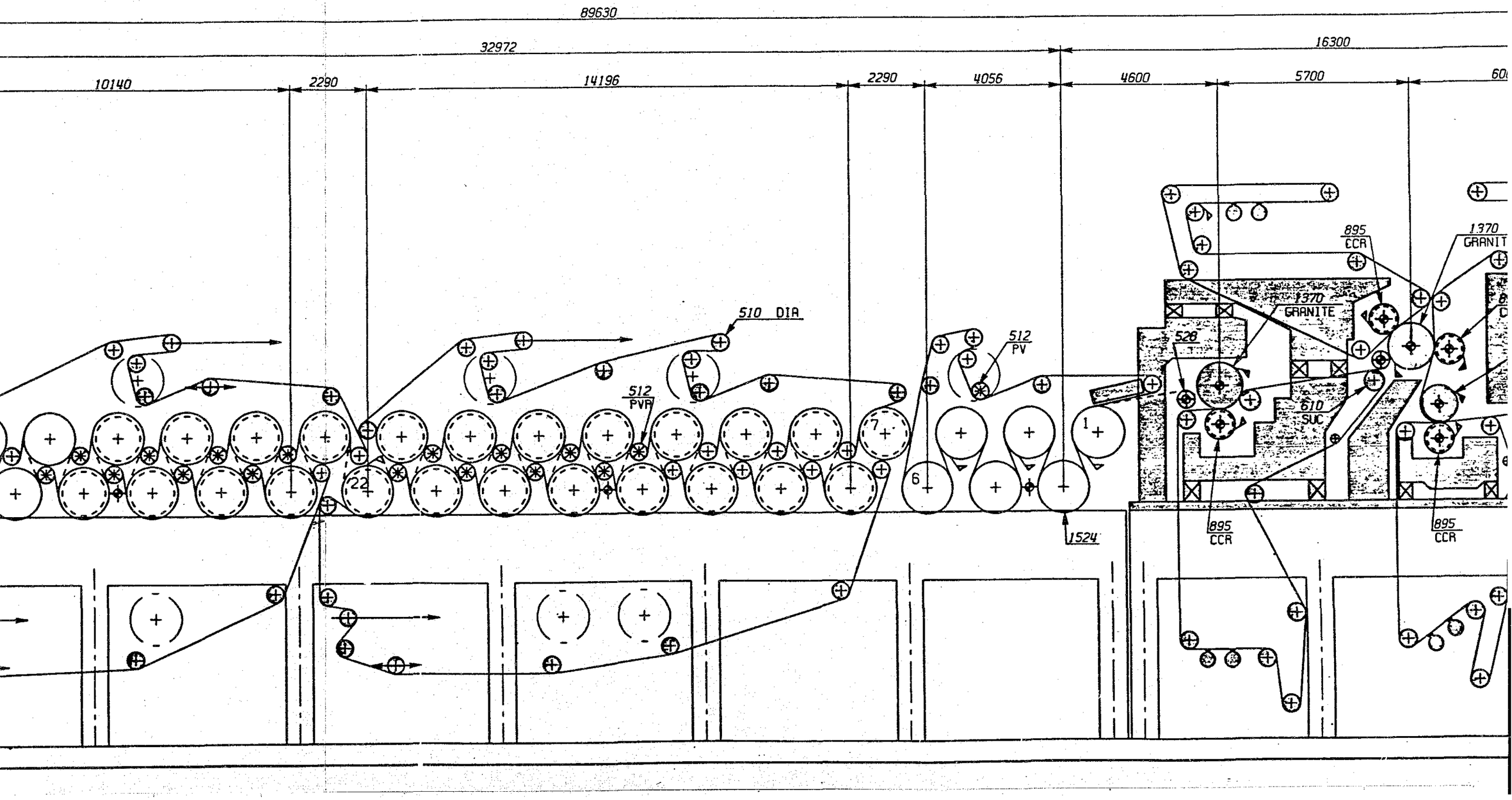
(16) PA. D.
(16) S.P.B.
(1) DOCT.
(8) P.V.R.

1ST DRYER
(SINGLE FELTED)

(6) PA.D.
(3) DOCT.
(1) P.V.R.

PRESS

1ST PRESS : 80K
2ND PRESS : 90K
3RD PRESS : 125K
4TH PRESS : 125K



TWIN WIRE SYSTEM

D DRYER

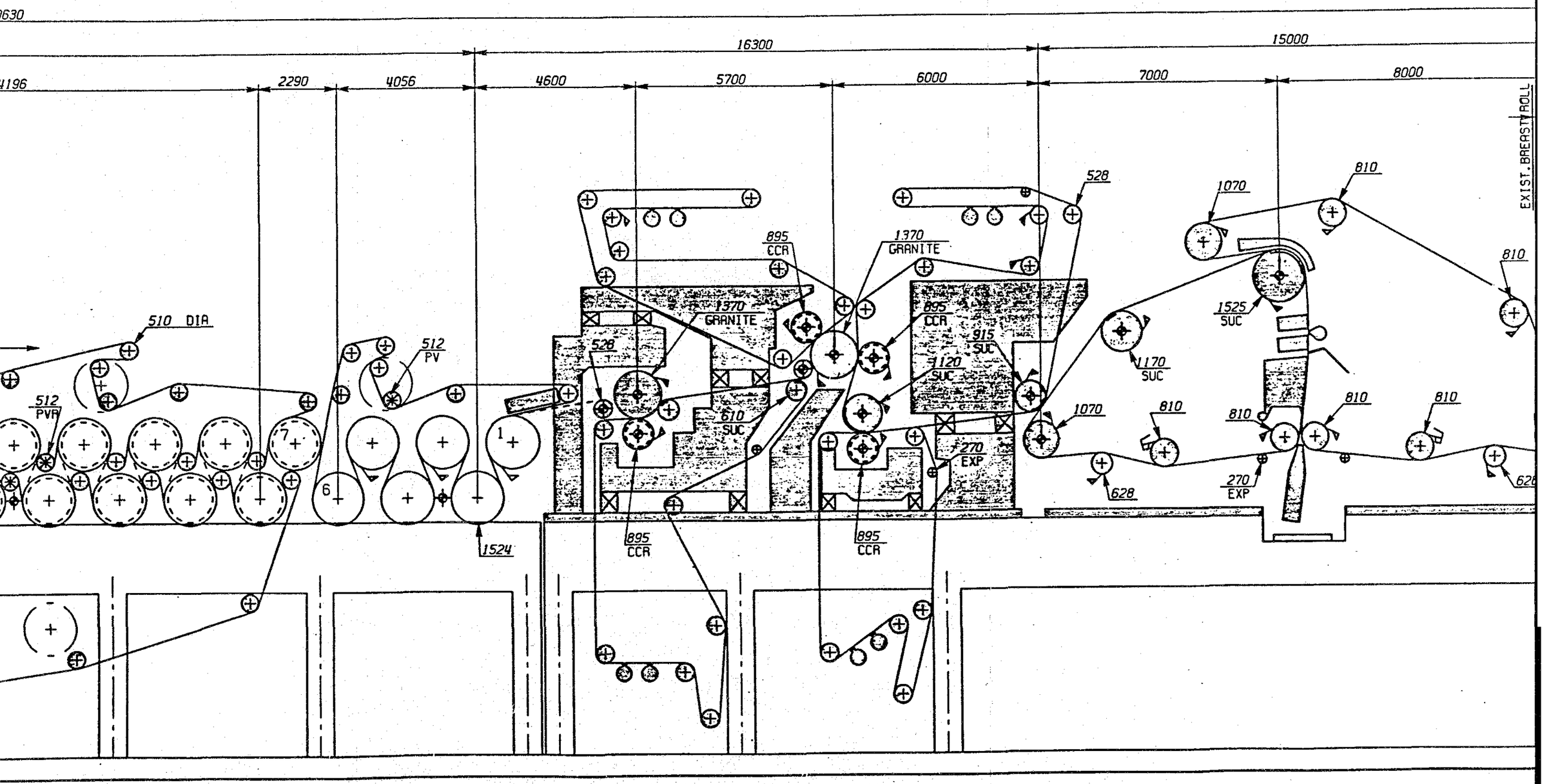
6) PA. D.
6) S.P.B.
) DOCT.
) P.V.R.

1ST DRYER
(SINGLE FELTED)

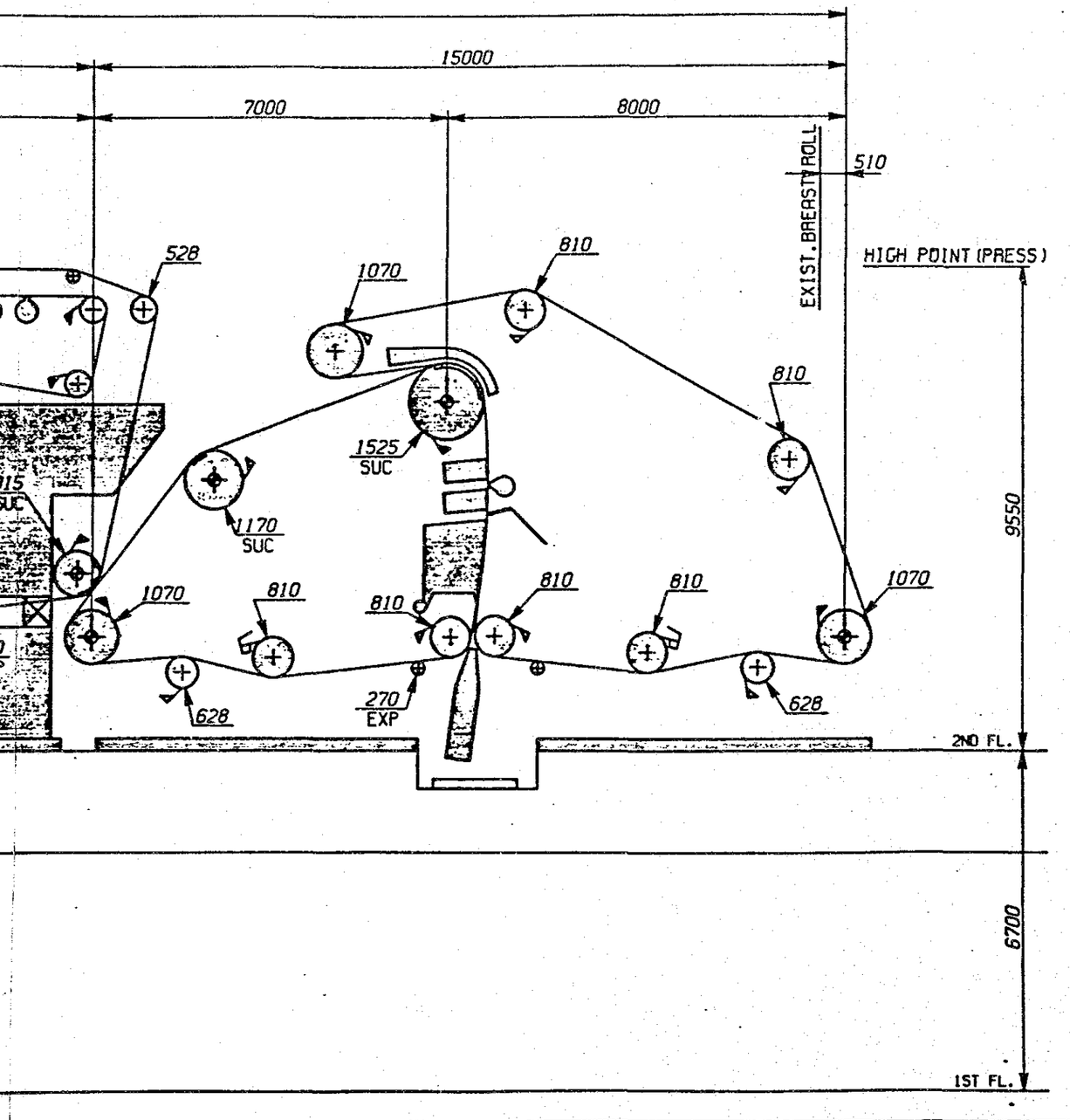
(6) PA.D.
(3) DOCT.
(1) P.V.R.

PRESS

1ST PRESS : 80Kg/cm
2ND PRESS : 90Kg/cm
3RD PRESS : 125Kg/cm
4TH PRESS : 125Kg/cm



TWIN WIRE SYSTEM

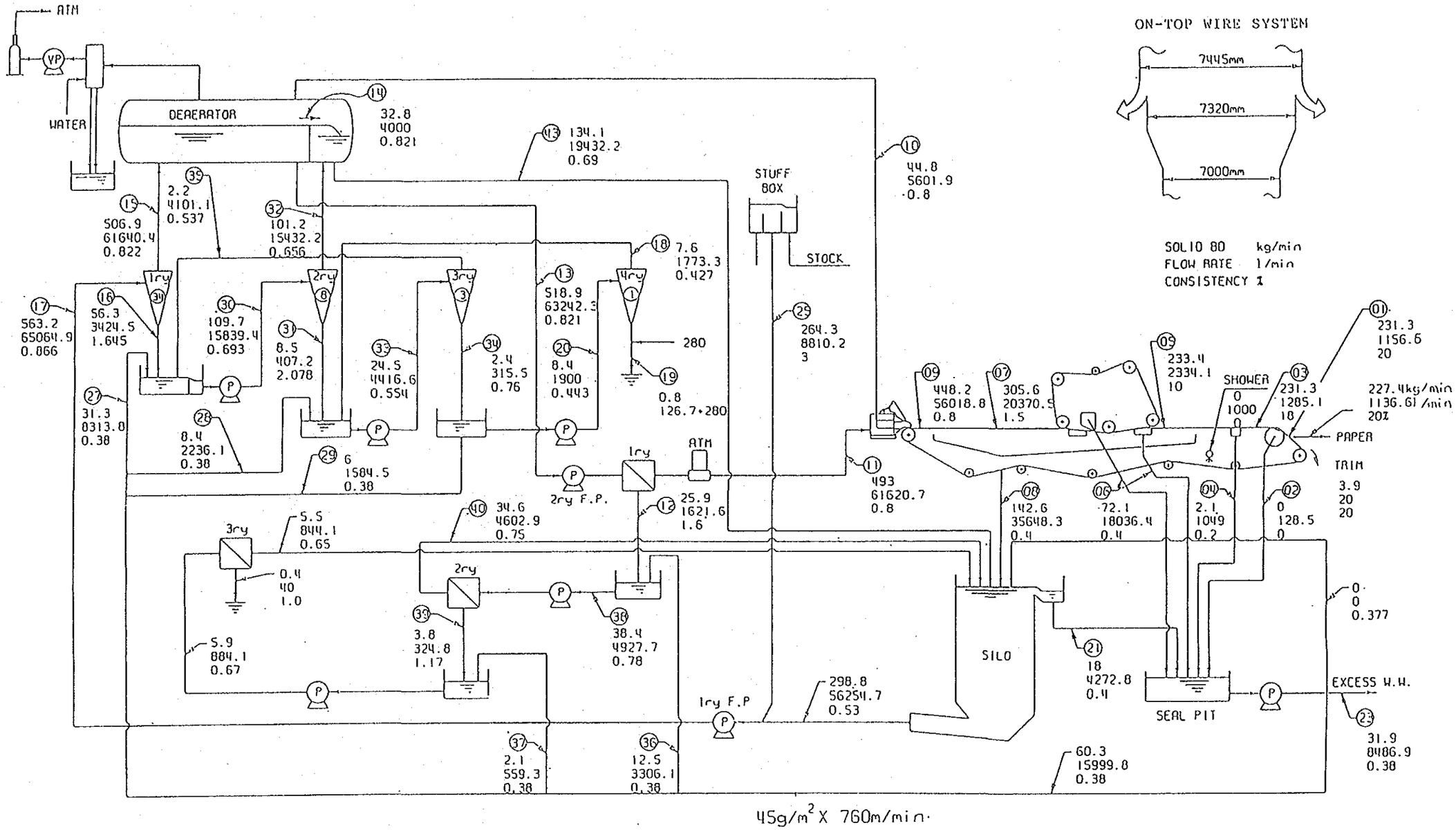


SPECIFICATION	
TYPE OF MACHINE	TWIN WIRE SYSTEM
HAND OF MACHINE	RIGHT HAND
TYPE OF PAPER	NEWSPRINT
BASIS WEIGHT	45 ~ 49 g/m²
WIRE WIDTH	7.700mm
MAX. SHEET WIDTH	7.000mm. MAX. ON REEL
DESIGN SPEED	1.100m/min (ROLL BAL. 760min
OPERATING SPEED	1.000m/min. MAX.
MAX. PRODUCTION	454 tons/24hrs ON REEL
45 g/m² X 1.000m/min X 7.000mm X 100%EFF.	

PAPER MACHINE
(CASE–2)

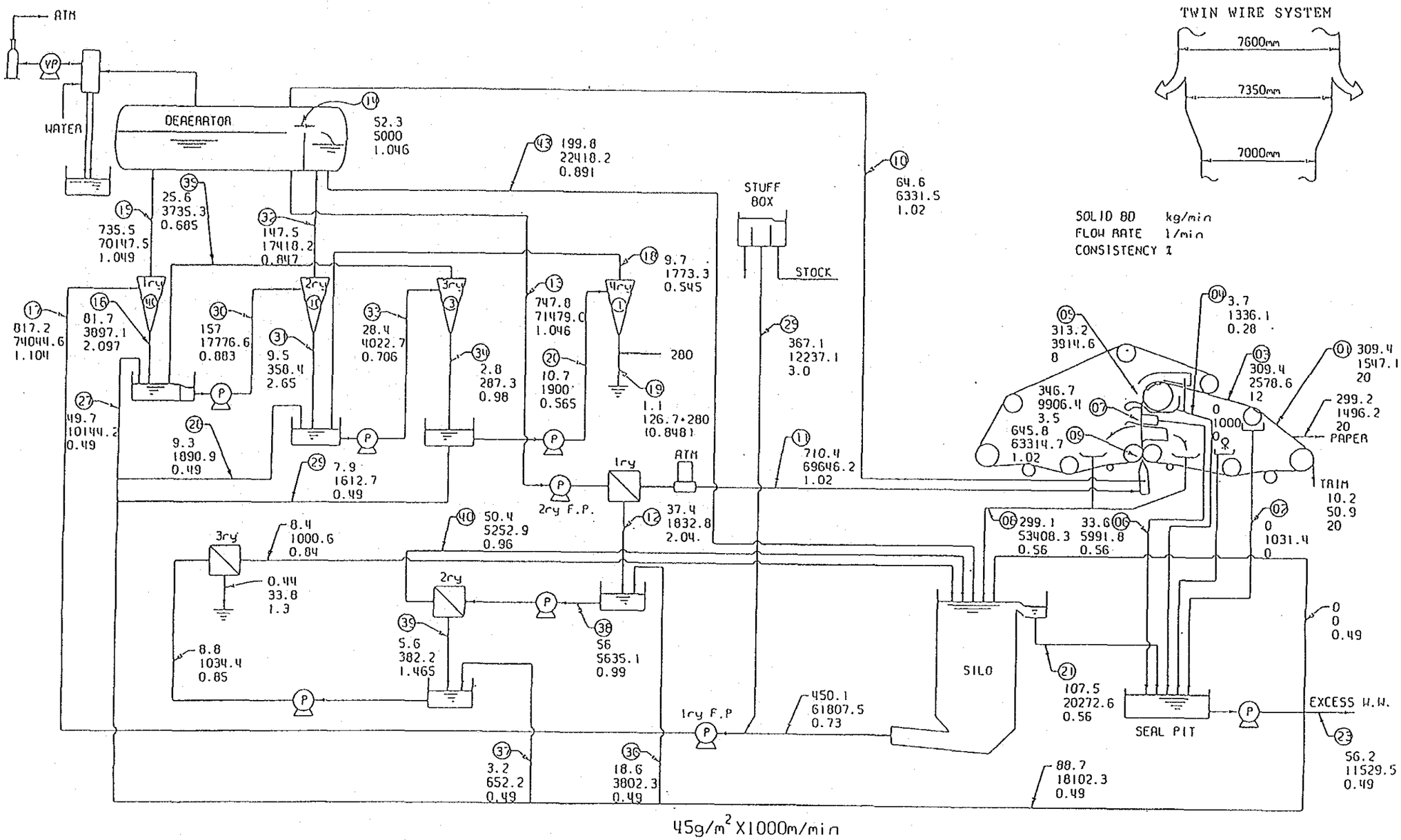
Attachment IV–3–2

JICA



45g/m² X 760m/min

STOCK CLEANING FLOW SHEET (CASE–1)
Attachment IV–3–3
JICA



STOCK CLEANING FLOW SHEET (CASE–2)
Attachment IV–3–4
JICA

ATTACHMENT IV-3-5 LABOR COSTS AND REQUIRED MAN-DAYS

1. Labor Costs

The annual increase rate of prices and labor costs is extremely large in Turkey. Consequently, unit wages of construction workers are greatly different between companies before and after giving raises. It is, for this reason, very difficult to determine average unit costs that are used for estimates of the construction cost.

Therefore, two major construction companies in Istanbul are picked, and their average labor costs as of the end of February 1990 are used for the estimate of this project.

Labor Costs List by Occupation

(Unit: Turkish Lira)

No.	Occupation	1,000 TL/worker Ñ day
1.	Engineer (reference)	300
2.	Assistant engineer (reference)	265.5
3.	Technician	240
4.	Foreman	225
5.	Shift supervisor (group leader)	187.5
6.	Clerk	135
7.	Typist	112.5

8.	Mechanic	135
9.	Canner	112.5
10.	Plumber	112.5
11.	Finisher	112.5
12.	Skilled welder	150
13.	Semiskilled welder	75
14.	Electrician	112,5
15.	Insulation worker	90
16.	Sheet metal worker	90
17.	Painter	90
18.	Carpenter	90
19.	Ironworker	90
20.	Cementer	90
21.	Truck driver	90
22.	Truck crane operator	112.5
23.	Handyman (regular worker)	67.5
24.	Unskilled handyman	45

2. Average Unit Cost of Labor for the Estimate

The average unit cost of labor is TL113,750/worker Ñ day = US$47.0/worker Ñ day (¥7,000/worker Ñ day) is determined by making a weighted mean from total man-days by

occupation and unit costs of labor by occupation of all the workers such as (1) workers for the dismantlement of the existing facilities, (2) workers for installation of the remodeled equipment and materials, (3) workers for civil engineering and construction work, (4) operators and drivers of construction machinery, and (5) clerks and typist working at the temporary field office, and so forth.

3. Required Man-Days

Required Man-Days List

No.	Division	Alt-1 (Worker Ñ day)	Alt-2 (Worker Ñ day)
1	Dismantlement of existing facilities	6,652	17,687
2	Installation of remodeled equipment and materials	80,194	127,408
3	Civil engineering and construction work	27,809	35,777
4	Operators and drivers of construction machinery*	5,280	8,460
5	Workers included in indirect field expenses+	10,798	14,783
6	Total	130,733	204,115

* The rental fee of the truck crane is included in the labor cost of the operator; therefore, the truck crane operator's man-day is not included. The truck crane operator's man-day is 450 workers Ñ day in the Alt-1 and 840 workers Ñ day.

+ These are total man-days of workers other than direct laborers such as workers assembling and disassembling temporary prefabricated houses before and after the construction, clerks, typist, and odd-jobbers (cleaners, etc.) working at the temporary field office, superintendents of warehouses, and so on.

ATTACHMENT IV-3-6 MAJOR CIVIL ENGINEERING AND CONSTRUCTION WORK

1) Dismantlement of the existing foundation and construction of the new ferro-concrete foundation accompanied by the remodeling of the equipment for each facilities
2) Construction of the new building (12 m x 40 m, 2-story) for the DIP facilities and main equipment and the connection to the existing building
3) Construction of the building (18 m x 40 m, 1-story) for installing the DIP facilities and fiber flow equipment
4) Adjustment facilities (Alt-2):
   Construction of the seal pit ($130m^3$) and D.B. chest ($240m^3$)
5) Paper machine facilities (Alt-2):
   Expansion construction of the building (4m x 42m, 1-story) for the added vacuum pump
6) Paper machine facilities (Alt-2):
   Renovation of the beams, columns, calendar pit, seal pit, couch pit, etc.
7) Replacement of broken window glass of the paper machine facilities and existing buildings (12,000 pieces appropriated in the budget)

8) Piling work of concrete piles for the buildings mentioned in 2), 3), and 5)

9) Repair work of the rough sections of the access rode from the Port of Giresun????? to Aksu River

10) Repair work of the concrete paved roads in Aksu Mill (700m^2 appropriated in the budget)

ATTACHMENT IV-3-7 MAJOR CONSTRUCTION MACHINERY

No.	Machine	Capacity	Alt-1		Alt-2	
			Unit	Total unit/month	Unit	Total unit/month
	For transporting and installing equipment					
1	Truck crane	150 Ton	1	1	1	2
2	〃	80 Ton	1	1	1	2
3	〃	30 Ton	1	3	1	6
4	〃	25 Ton	1	5	1	9
5	〃	10 Ton	1	5	1	9
6	Fork-lift	3 Ton	3	18	4	40
7	Truck	4 Ton	2	12	3	30
8	AC arc welder		20	80	20	160
	For civil engineering and construciton					
9	Pile drinver		2	4	3	6
10	Dump car	4 Ton	1	12	1	15
11	〃	2 Ton	1	12	1	15
12	Bulldozer	3 Ton	1	3	2	6
13	Shovel type excavator	0.3 m3	1	3	2	6
14	Concrete batcher		1	12	2	20
	plant		1		2	
15	Concrete mixer truck		1	12	2	20
16	Truck	4 Ton	2	24	2	30
17	〃	2 Ton	2	24	2	30

ATTACHMENT IV-3-8 WEIGHTS OF IMPORTED EQUIPMENT AND MATERIALS ACCORDING TO FACILITIES

Imported Equipment and Materials Weights List

No.	Facility	Weight: Freight Ton (FT)	
		Alt-1	Alt-2
1	Dip	1,929	1,929
2	Wood	0	0
3	GP	420	674
4	Adjustment	173	386
5	Paper machine	6,911	16,906
6	Finish	294	351
7	Utility	0	0
8	Ancillary	640	640
	Total	10,367	20,886

ATTACHMENT IV-3-9 TEMPORARY BUILDINGS

Temporary Building List

No.	Building	Alt-1		Alt-2	
		Floor area (m^2)	Capacity (persons)	Floor area (m^2)	Capacity (persons)
1	Temporary office	120	40	120	40
2	Temporary storehouse	200		200	
3	Temporary work section	200		200	
4	Camp for workers	300	60	350	70
5	Do.	2,500	550	2,500	550
	Total	3,320		3,370	

Notes:

o The temporary buildings are all prefabricated one-story houses.

o The floor ares of the temporary buildings are almost the same in the Alt-1 and Alt-2; however, the duration of use in the is longer the Alt-2 is longer than the Alt-1.

ATTACHMENT IV-3-10 REQUIRED NUMBERS, NUMBERS PER MONTH, AND UNIT COSTS OF VISITING GENERAL CONTRACTORS AND TECHNICAL CONTRACTORS AND LOCAL ENGINEERS

1. Required Numbers and Months

List of Required Numbers and Months

No.	Type of engineers	Alt-1		Alt-2	
		Number	Total number/mo.	Number	Total number/mo.
1	Visiting general contractors	25	136	30	282
2	Visiting technical contractors	33	42	41	81
3	Local engineers	10	109	15	220
	Total	68	287	86	583

2. Unit Costs

1) Visiting General Contractors and Technical Contractors

Foreign currency: Technical fee + International air fare
= US$15,000/person Ñ month

Domestic currency: Domestic transportation fee + Hotel charges + Daily allowance
= US$ 2,200/person Ñ month

Total: US$17,200/person Ñ month

2) Local Engineers
Domestic currency: US$ 4,000/person Ñ month

Attachment IV-4-1 Pitch Trouble and Preventive Measures (excerpted from reference materials prepared by Japan Pulp and Paper Research Institute, Inc.)

(1) What is "pitch trouble"?

Timber is the main material used in the production of paper. Although there are a wide variety of timber, all of them are suited for the production of paper. Of the ingredients of timber, only wood fibers are used in the production of paper, and lignin connecting them has to be removed. Many other substances are contained in timber, which sometimes cause problems in the processes of production of pulp and paper. The best known of these substances is pitch. There is no established definition of pitch, but it can be described as a substance extracted by means of organic solvents such as alcohol benzene.

Pitch contains resin acid, fatty acid, phenolic ingredients and alocohols in varying degrees. This substance causes various kinds of trouble or is

contained in paper, adversely affecting their quality.

The phenomenon called "pitch trouble" can be classified into the following three types.

The first type of pitch trouble is caused when a pitch-like sticky substance sticks to the machines and equipment in use in the processes of production of pulp and paper and hampers the production operations. This trouble occurs in washer screens, as well as deckers, pulp chests, cleaners in use in the bleaching process and wires and felt of machines.

The second type of pitch trouble is caused when particles of pitch contained in paper products become visible in the form of yellow spots.

The third type of pitch trouble resembles the second type. In this type of trouble, particles of pitch do not become visible in the form of spots, but it causes fading of the paper which is stored for a long time.

(2) Preventive measures

The following preventive measures can be taken against pitch trouble.

(2)-1 Seasoning or pretreatment

The simplest way of reducing pitch trouble is to use timber with a low pitch content. When this method cannot be used, pitch has to be reduced in some way or other. One of such alternative method is seasoning. It is a well-known fact that when timber is stored outdoors for some period of time, its pitch content is reduced. It is said that when logs are stored outdoors, their pitch content is reduced to the lowest level in a year or so.

When timber is stored in the form of chips, its pitch content is reduced satisfactorily in two to three months (six month at the longest). If stored for too long a time, however, timber will will rot, adversely affecting the quality of pulp. It is necessary, therefore, to select optimal storing conditions in terms of temperature and humidity. When logs are stored in water, there is no change in their pitch content.

Other similar methods include applying hot air or vapor to chips, removing terpene and the like by vapor distillation and treating chips with an oxidant like permanganate or hydrogen peroxide and decomposing pitch by the use of microorganisms.

(2)-2 Improving the pulpifying and bleaching methods

In alkali digester methods like the kraft digester process (in which NaOH+Na2S is used), pitch's ingredients are saponified and become water-soluble, as a result of which pitch is removed. In the case of some types of trees, however, pitch contains large quantities of ingredients which cannot be saponified and which cannot be removed even by an alkali digester method. As other methods of reducing pitch trouble, a digester process with excessive active alkali and rinsing pulp with an alkaline solution are proposed, but these methods are not practicable because they result in lower pulp quality. It should be noted that the quality of water used in the production of pulp, particularly its calcium content and temperature, is closely related to the occurrence

of pitch trouble. It is said that a proper calcium content and temperature of water will work to reduce pitch trouble.

It is reported that bleaching by the use of chlorine dioxide, alkaline oxygen and ozone is more effective in reducing pitch trouble than the ordinary bleaching method using chlorine or the like.

(2)-3 Addition of a pitch control agent

Various pitch control agents have come into the market. These agents can be classified broadly into the following two types.

The first type prevents pitch trouble by scattering fine pitch particles which are chemically stable and thereby preventing them from cohering, and the second type prevents pitch trouble by using an absorbent in the form of fine particles, which absorbs pitch.

Representative of the first type is the surface-

active agent. There are three kinds of surface-active agents--cation surface-active agent, anion surface-active agent and non-ion surface-active agent. Points to note in selecting a surface-active agent differ according to the process conditions. As ion surface-active agents are sensitive to changes in the pH value, non-ion surface-active agents have come into widespread use in recent years. Since addition of a surface-active agent tends to increase foaming in the system, however, it will be necessary to use an anti-foaming agent together with a surface-active agent in some cases. Chlorides of phosphoric acid, methaphosphoric acid and polyphosphoric acid are sometimes used as additives to promote scattering of pitch particles.

The most widely used pitch control agent is talc which has an affinity for pitch. It is said that in addition to talc, clay, asbestos and aluminum oxide (alumina) are also effective as pitch control agents. These additives are also effective in increasing the brightness and

smoothness of paper.

Addition of aluminum sulfate will also prevent pitch trouble. Aluminum sulfate, which is added to the machines in use in the processes of production of pulp and paper for the purpose of adjusting the pH value, is said to be effective also in preventing pitch from sticking to them. It should be noted, however, that exactly how aluminum sulfate prevents pitch from sticking to machines is still unknown. It works to scatter pitch particles in some cases, while in other cases it works to help an absorbent absorb pitch particles.

(2)-4 Other methods

Another method is separating pitch with a machine like a fractionator. But this method is likely to result in the loss of fine fibers. In addition to this, oxidizing pitch ingredients by the use of a catalyst and adding a compound containing ligninsulfonic acid are proposed. Furthermore, more emphasis has been placed on the concept of

factory-wide pitch control system in recent years.

According to a Japanese paper company which has developed a biotechnology-based lipase (enzyme) method, this method is effective in decomposing and thereby reducing triglyceride which is likely to accumulate. Addition of 150 ppm to 180 ppm of lipase is enough to achieve the desired pitch control effect. It seems the only problem with this method is the cost of production of lipase.

CHAPTER V
TOTAL PROJECT COSTS AND FINANCING PLAN

CHAPTER V TOTAL PROJECT COSTS AND FINANCING PLAN

1. Preconditions for Calculation of Total Project Costs

The total project costs can be broadly divided into the foreign currency category and the domestic currency category according to the source of supply for each item. The foreign currency and the domestic currency categories include the following items respectively. (Each item is detailed elsewhere in this report.)

a. Foreign currency

category -
- Costs for importation of equipment and materials, freight and insurance
- General contractor's fees for design, equipment procurement and supervision
- Consultant's fees and costs related to plant operation advisors

b. Local currency

category -
- Costs for local procurement of equipment and materials
- Costs for inland transportation of equipment and materials (including imported ones)
- Dismounting and erection costs
- Civil engineering and construction work costs
- Construction machinery costs

- Taxes payable to the government of Turkey

Each base cost was first calculated in relevant currency and then was converted to US dollars at the official exchange rate as of the end of February 1990.
The following official exchange rates were used.

US$=TL2417.6
US$=¥148.8

2. Total Capital Requirement

As descriptions of the costs related to the equipment, materials and construction work are given in Chapter IV, other costs are explained in this chapter.

2.1 Taxes

Under the existing Turkish tax system, the following four taxes should be taken into consideration in calculating the total project costs.

a. Corporate tax
b. Personal income tax
c. Value added tax
d. Import duties

In any country, there is a strong possibility that interpretation of actual application of the tax system to a project will vary according to the priority given to the project, the intent of the loan providing country, the procedures for filing applications and the negotiations concerning the implementation of the project. Here, the following assumptions are made concerning the four taxes applicable to this project on condition that the contract will be awarded on a semi-turkey basis.

2.1.1 Corporate Tax

The corporate tax is imposed on all profits in the case of business corporations which are headquartered in Turkey (full tax liability), and on only those profits whose sources exist in Turkey in other cases.

The corporate tax rate itself is 46 percent, but after addition of the following fund liabilities it amounts to 49.22 percent.

Corporate tax	46%
Defense industry support fund	5% of corporate tax
Social subsidy and solidarity support fund	1% of corporate tax
Apprenticeship professional and technical education promotion fund	1% of corporate tax

In the case of this project, as the main contract with the general contractor is offshore contract, it is assumed that only the local contractors will be subject to the corporate tax. And 5 percent of the presumed contract amount will be considered for the corporate tax. In other words, about 10 percent of the contract amount is considered profits subject to the corporate tax.

2.1.2 Personal Income Tax

The personal income tax is levied on incomes of not only the local contractors' employees but also the foreigners dispatched to Turkey by the general contractor for supervision of the construction work and the equipment erection work (incomes of the latter are considered to be derived from Turkey). The personal income tax rates are as shown in the following table.

Personal Income Tax Rates

Annual Income (TL)	Annual Income (US$)	Rate (%)
Up to 8 million	Up to 3,309	25
8 to 16 million	3,309 to 6,618	30
16 to 32 million	6,618 to 13,236	35
32 to 64 million	13,236 to 26,473	40
64 to 128 million	26,473 to 52,945	45
Above 128 million	Above 52,945	50

However, usually the personal income tax is only imposed on foreigners working in the country when they stay in the country longer than the period of time prescribed by the country's tax authorities. In this study, it is assumed that the personal income tax is imposed on foreigners who stay in the country for more than 12 months at a time.

The costs for the local workers and engineers, which are included in the costs for dismounting, erection and civil engineering/construction work, were estimated based on the pretax hourly rates verified in the on-site survey. Accordingly, the amounts for payment of the personal income tax in the above costs are not included in the item "taxes" of the total project costs. The foreigners who are to be dispatched to Turkey by the consultant and the general contractor for supervision of the construction work and assistance on operation of the plant and who are expected to stay in the country for more than 12 months at a time are:

Case 1

The general contractor's project engineer	18 months

Case 2

The general contractor project engineer	23 months
Two operation advisors	48 months
Total	71 months

Assuming that 40 percent of income of US$15,000/man-month is subject to the personal income tax, the amount of the personal income tax at the applicable tax rate will be US$2,600/man-month.

Therefore, US$47,000 is estimated as the personal income tax in Case 1, and US$185,000 in Case 2.

2.1.3 Value Added Tax

In Turkey, all goods and services (including imported goods and services) are subject to the value added tax. The tax rate is 10 percent with some exceptions. This tax is not imposed on export goods and services. The law stipulates that VAT shall be paid or refunded every month.

In the case of purchase of fixed assets as under this project, VAT paid to the purchaser (to the government in the case of importation) is to be refunded over a period of three years. As mentioned later, an incentive certificate is to be issued to this project. In that case, VAT can be refunded immediately after its payment. For this reason, VAT will not be taken into account in estimation of the total project costs.

2.1.4 Import Duties, etc.

The investment incentives presently offered by the government of Turkey will be described later in this report. When an incentive certificate, which forms a part of the investment incentives, is issued to a project, the project will be exempted from import duties (excepting fund payment). The fund payment rate ranges from 5 to 15 percent.

It is assumed that 10 percent of the CIF prices of the imported items of equipment will be included in the total project costs as the fund payment cost.

2.2 Project Management

2.2.1 Technical Advisers

Foreign consultants will be employed for preparation of ITB, evaluation of the tenders and management of the plant

construction work. The cost for this services is estimated as follows. Management of the plant construction work is premised on an assumption that full use will be made of the capabilities of the staff of the Aksu mill concerning especially the civil engineering/construction work and the related service.

Phase 1 (preparation of ITB through contracting)
30 M-M

Phase 2 (contracting through completion of construction work)

Case 1	20 M-M
Case 2	27 M-M

2.2.2 Operation Advisors

This is the cost for operation advisors after the start of commercial operation of the plant. This cost could have been included in the plant operation costs. However, as this cost, in combination with other investment costs, is often eligible for a long-term soft loan, it is included in the project management costs.

The number of operation advisors and the period of the operation advisors' stay in Turkey were estimated as follows in consideration of the capacity utilization rate after the start of operation of the plant.

	No. of operation advisors	Period (months)	Total
Case 1	2	3	6 M-M
Case 2	2	24	48 M-M

The costs for both the technical advisors and the operation advisors were calculated on the basis of US$15,000/man-month and were included in the foreign currency portion.

US$2,200/man-month was appropriated for advisors' daily expenses during their stay in Turkey, as part of owner's service.

The general overheads are to cover the costs related to employment of advisors, and its percentage is set at 50 percent.

2.3 Pre-operation Expenses

2.3.1 Training

This is the cost required for training the plant's employees to cope with the introduction of new technologies at the vendor's plant.

In this renovation project, as far as papermaking technologies are concerned, it will be satisfactory if the vendor's supervisor gives on-the-job training after completion of the erection of the equipment, as a plant of services within the scope of the general contractor's work.

However, the computer control system to be introduced under both cases will be new to them. It will be necessary to send two plant employees to the vendor's plant for a one-month on-the-job training. US$20,000 was estimated as their travel and other expenses and was included in the foreign currency portion.

2.3.2 Test Run Expenditures

In the two alternative cases a half-month and a one-month test run periods are incorporated in their respective construction schedules. The costs of wood, pulp and waste paper to be consumed during the test run period are not taken into account, since it is assumed that most of the products during the period will be sold as newsprint in

sheet and the remainder will be recovered as material for pulp.

The costs of electricity and heavy oil and consumables were calculated on the basis of the estimated daily output (110T/D in Case 1 and 140T/D in Case 2, both on the basis of a 40-percent capacity utilization rate) using unit costs of them, which will be described later. These costs were divided into the foreign currency and local currency portions.

2.4 Contingency

2.4.1 Physical Contingency

The physical contingency is to cover possible changes in the conceptual design, the estimating conditions and the method of implementation of the construction work. The percentage distribution of the physical contingency is as shown below.

Equipment	5%
Dismounting and installation of equipment	10%
Civil and Building works	15%
Others	5%

The physical contingency accounts for 5.8 percent of the base project cost (as of Feb. 1990) in Case 1, and 5.5 percent in Case 2.

2.4.2 Price Contingency

The price contingency is to cover possible rises in unit prices due to inflation during a period from the time of estimation of the base project cost (the end of February 1990) to the time of disbursement.

As to the time of disbursement, monthly payment for each cost item is assumed according to the two cases' respective project implementation schedules (see Fig. IV-3-15 and Fig. IV-3-16).

The inflation rate is estimated at 4.5 percent for the foreign currency portion and 3.0 percent for the local currency portion, both in US dollar terms. The background of, and the rationale for, this are elucidated in the next chapter.

Table V-2-1 and Table V-2-2 show the payment schedule for each cost item, which includes both the physical and price contingencies.

2.5 Interest during Construction

As mentioned in "3. Funding Plan," approximately 85 percent of the total project costs will be covered by long-term loans. The interest rate will be 4 percent (Case A) or 10 percent (Case B).

Case 1A (production: 100,000T/Y; interest rate on long-term loans: 4%)

Case 1B (production: 100,000T/Y; interest rate on long-term loans: 10%)

Case 2A (production: 130,000T/Y; interest rate on long-term loans: 4 percent)

Case 2B (production: 130,000T/Y; interest rate on long-term loans: 10 percent)

In calculating the interest, it was assumed that 85 percent of the yearly project costs are to be covered by loans and the middle point in time of the year during the project implementation period (from 1993 to the time of start of

commercial production) will be the time of borrowing. Interest will be charged on loans from the time of borrowing through the time of construction completion. The total amount of interest accrued during the above period is the interest during construction.

2.6 Additional Working Capital

As mentioned later in "Inventory Plan for Raw Materials," the additional working capital is to cover the variable costs excepting the electricity charges and the costs of consumables for one month period after start of commercial production. The costs of pulp and waste paper are included in the foreign currency portion and all the other variable costs in the local currency portion, both as part of the investment costs.

2.7 Sunk Cost

In case that a part of plant equipment which has long been out of use is to be put to reuse after a renovation with a small amount of investment, the cost of the equipment is normally deemed nil as sunk cost in the financial analysis of the renovation. However, if the equipment has a possibility of making any benefit by alternativeness, the opportunity cost of the equipment should be added up in the estimate of the investment cost.

The renovation scheme described in Chapter IV includes the reuse of the refiner in GP section. But, as the opportunity cost of the refiner could hardly be assessed, it was deemed sunk cost.

2.8 Scrap

The part of existing plant equipment to be replaced will be sold out. Taking the remote location of the mill into consideration, the expected revenue from sales is likely to be set off against transportation costs. Scrap value, therefore, was estimated nil.

2.9 Total Investment Costs

Estimated total investment costs are as follows.

Case-1A	US$	94,986,000
Case-1B	US$	99,600,000
Case-2A	US$	171,338,000
Case-2B	US$	181,838,000

Tables V-2-3 to V-2-6 show breakdown of total investment costs for Cases 1A, 1B, 2A and 2B.

3. Financing Plan

Although no decision has been made on the source of funds or terms of loan, the following financing plan for this project has been tentatively worked out. As a result of the government of Turkey's SEKA restructuring program implemented in January 1984, Aksu mill has no long-term debt at present.

3.1 Capital Increase

According to SPO, this project is eligible for the investment incentives, which are to be explained later in this report, by obtaining an incentive certificate. But it has to meet conditions concerning the ratio of planned capital increase to the total amount of investment in this project. This project has been incorporated into the government of Turkey's sixth five-year plan, and the ratio is expected to be set at 15 percent, which is an exceptionally low percentage for this type of project.

In this study, therefore, it is assumed that 15 percent of the total project costs will be covered by an capital increase in order to have incentive certificate issued.

3.2 Long-term Loans

As mentioned above, 85 percent of the total investment costs including interest during construction (the remaining 15 percent to be covered by an capital increase) will be covered by long-term loans.

Although the source of long-term loans is undecided, a soft loan arrangement with foreign official financial institutions and a commercial loan arrangement with private financial institutions are assumed here. Usually, the terms of a soft loan vary from one country to another, and from one institution to another, according to the nature

and period of the project concerned.

In this study, the following two sets of terms of loan are assumed.

Case A:

Interest rate:	4 percent per annum
Repayment term:	25 years, including a grace period of seven years
Method of repayment:	Equal installment payment method

Case B:

Interest rate:	10 percent per annum
Repayment term:	10 years after a grace period (construction period)
Method of repayment:	Equal installment payment method

Table V-2-1 ANNUAL DISBURSEMENT SCHEDULE (CASE-1)

[USD 1,000]

	1993		1994		1995		TOTAL		
	FOREIGN CURRENCY	LOCAL CURRENCY	FOREIGN CURRENCY	LOCAL CURRENCY	FOREIGN CURRENCY	LOCAL CURRENCY	FOREIGN CURRENCY	LOCAL CURRENCY	G. TOTAL
1. Site Preparation & Development	0	0	0	0	0	0	0	0	0
2. Plant Direct Cost	0	0	31,765	7,591	18,756	4,445	50,521	12,037	62,558
3. Ocean Freight & Insurance	0	0	2,175	285	1,284	167	3,459	452	3,910
4. Local Handling & Inland Transportation	0	0	0	234	0	137	0	372	372
5. Construction Equipment	0	0	0	1,074	0	629	0	1,702	1,702
6 Indirect Field Expenses	0	0	175	677	103	397	278	1,074	1,352
7. General Contractor's Services	0	0	5,887	632	3,476	370	9,363	1,002	10,365
8. Tax & Funds	0	0	0	3,714	0	2,175	0	5,889	5,889
9. Project Management	825	115	329	45	439	59	1,592	219	1,811
10. Pre-operation Expenses	0	0	0	0	66	285	66	285	351
TOTAL	825	115	40,331	14,252	24,124	8,665	65,279	23,032	88,311

Table V-2-2 ANNUAL DISBURSEMENT SCHEDULE (CASE-2)

[USD 1,000]

	1993		1994		1995		1996		TOTAL		
	FOREIGN CURRENCY	LOCAL CURRENCY	FOREIGN CURRENCY	LOCAL CURRENCY	FOREIGN CURRENCY	LOCAL CURRENCY	FOREIGN CURRENCY	LOCAL CURRENCY	FOREIGN CURRENCY	LOCAL CURRENCY	G. TOTAL
1. Site Preparation & Development	0	0	0	0	0	0	0	0	0	0	0
2. Plant Direct Cost	0	0	33,290	6,556	57,826	11,269	2,257	435	93,373	18,260	111,633
3. Ocean Freight & Insurance	0	0	2,471	325	4,293	559	168	22	6,932	906	7,838
4. Local Handling & Inland Transportation	0	0	0	267	0	460	0	18	0	745	745
5. Construction Equipment	0	0	0	1,004	0	1,725	0	67	0	2,796	2,796
6 Indirect Field Expenses	0	0	178	571	309	981	12	38	499	1,590	2,089
7. General Contractor's Services	0	0	6,268	736	10,887	1,265	425	49	17,579	2,051	19,630
8. Tax & Funds	0	0	0	3,873	0	6,657	0	257	0	10,787	10,787
9. Project Management	825	115	333	46	348	47	1,615	216	3,121	424	3,545
10. Pre-operation Expenses	0	0	0	0	26	0	112	725	139	725	864
TOTAL	825	115	42,540	13,378	73,690	22,964	4,589	1,828	121,643	38,284	159,927

Table V-2-3 TOTAL INVESTMENT COSTS (CASE-1A 100,000 T/Y)

[USD 1,000]

	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
1. Site Preparation & Development	0	0	0
2. Plant Direct Cost	38,867	9,441	48,308
(a) Plant Equipment & Materials	35,778	2,000	37,778
(1) Wood Handling Section	0	6	6
(2) GWP Section	4,382	242	4,624
(3) DIP Section	5,544	303	5,847
(4) Stock Preparation	590	50	640
(5) Paper Machine	21,467	1,198	22,665
(6) Finishing Section	2,192	65	2,257
(7) Utility Facilities	0	38	38
(8) Auxiliary Facilities	1,603	98	1,701
(b) Spare Parts	3,089	0	3,089
(c) Dismounting Works	0	317	317
(d) Erection & Installation Works	0	4,037	4,037
(e) Civil & Buiiding Works	0	3,087	3,087
3. Ocean Freight & Insurance	2,661	373	3,034
4. Local Handling & Inland Transportation	0	307	307
5. Construction Equipment	0	1,406	1,406
6 Indirect Field Expenses	212	887	1,099
7. General Contractor's Services	7,203	828	8,031
8. Tax & Funds	0	4,839	4,839
9. Project Management	1,260	185	1,445
(a) Owner's Services	0	123	123
(b) Technical Advisor	750	0	750
(c) Operation Advisor	90	0	90
(d) General Overheads	420	62	482
10. Pre-operation Expenses	49	230	279
(a) Training	20	0	20
(b) Test Run Expenditures	29	230	259
Total Project Cost (1990 Prices)	50,252	18,496	68,748
11. Physical Contingency	2,515	1,477	3,992
12. Price Contingency	12,512	3,059	15,571
13. Interest During Construction	2,918	0	2,918
14. Additional Working Capital	2,480	1,276	3,756
Total Project Cost (1995 Prices)	70,678	24,308	94,986

Table V-2-4 TOTAL INVESTMENT COSTS (CASE-1B 100,000 T/Y)

[USD 1,000]

		FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
1.	Site Preparation & Development	0	0	0
2.	Plant Direct Cost	38,867	9,441	48,308
	(a) Plant Equipment & Materials	35,778	2,000	37,778
	(1) Wood Handling Section	0	6	6
	(2) GWP Section	4,382	242	4,624
	(3) DIP Section	5,544	303	5,847
	(4) Stock Preparation	590	50	640
	(5) Paper Machine	21,467	1,198	22,665
	(6) Finishing Section	2,192	65	2,257
	(7) Utility Facilities	0	38	38
	(8) Auxiliary Facilities	1,603	98	1,701
	(b) Spare Parts	3,089	0	3,089
	(c) Dismounting Works	0	317	317
	(d) Erection & Installation Works	0	4,037	4,037
	(e) Civil & Building Works	0	3,087	3,087
3.	Ocean Freight & Insurance	2,661	373	3,034
4.	Local Handling & Inland Transportation	0	307	307
5.	Construction Equipment	0	1,406	1,406
6	Indirect Field Expenses	212	887	1,099
7.	General Contractor's Services	7,203	828	8,031
8.	Tax & Funds	0	4,839	4,839
9.	Project Management	1,260	185	1,445
	(a) Owner's Services	0	123	123
	(b) Technical Advisor	750	0	750
	(c) Operation Advisor	90	0	90
	(d) General Overheads	420	62	482
10.	Pre-operation Expenses	49	230	279
	(a) Training	20	0	20
	(b) Test Run Expenditures	29	230	259
	Total Project Cost (1990 Prices)	50,252	18,496	68,748
11.	Physical Contingency	2,515	1,477	3,992
12.	Price Contingency	12,512	3,059	15,571
13.	Interest During Construction	7,533	0	7,533
14.	Additional Working Capital	2,480	1,276	3,756
	Total Project Cost (1995 Prices)	75,292	24,308	99,600

Table V-2-5 TOTAL INVESTMENT COSTS (CASE-2A 130,000 T/Y)

[USD 1,000]

	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
1. Site Preparation & Development	0	0	0
2. Plant Direct Cost	70,893	14,250	85,143
(a) Plant Equipment & Materials	62,526	3,328	65,854
(1) Wood Handling Section	0	6	6
(2) GWP Section	5,999	298	6,297
(3) DIP Section	5,544	303	5,847
(4) Stock Preparation	1,440	85	1,525
(5) Paper Machine	45,438	2,391	47,829
(6) Finishing Section	2,502	72	2,574
(7) Utility Facilities	0	75	75
(8) Auxiliary Facilities	1,603	98	1,701
(b) Spare Parts	8,367	0	8,367
(c) Dismounting Works	0	837	837
(d) Erection & Installation Works	0	6,290	6,290
(e) Civil & Building Works	0	3,795	3,795
3. Ocean Freight & Insurance	5,263	742	6,005
4. Local Handling & Inland Transportation	0	610	610
5. Construction Equipment	0	2,289	2,289
6 Indirect Field Expenses	376	1,302	1,678
7. General Contractor's Services	13,347	1,679	15,026
8. Tax & Funds	0	8,797	8,797
9. Project Management	2,363	347	2,710
(a) Owner's Services	0	231	231
(b) Technical Advisor	855	0	855
(c) Operation Advisor	720	0	720
(d) General Overheads	788	116	904
10. Pre-operation Expenses	101	574	675
(a) Training	20	0	20
(b) Test Run Expenditures	81	574	655
Total Project Cost (1990 Prices)	92,343	30,590	122,933
11. Physical Contingency	4,620	2,302	6,922
12. Price Contingency	24,681	5,392	30,072
13. Interest During Construction	6,550	0	6,550
14. Additional Working Capital	3,405	1,456	4,861
Total Project Cost (1996 Prices)	131,598	39,740	171,338

Table V-2-6 TOTAL INVESTMENT COSTS (CASE-2B 130,000 T/Y)

[USD 1,000]

	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
1. Site Preparation & Development	0	0	0
2. Plant Direct Cost	70,893	14,250	85,143
(a) Plant Equipment & Materials	62,526	3,328	65,854
(1) Wood Handling Section	0	6	6
(2) GWP Section	5,999	298	6,297
(3) DIP Section	5,544	303	5,847
(4) Stock Preparation	1,440	85	1,525
(5) Paper Machine	45,438	2,391	47,829
(6) Finishing Section	2,502	72	2,574
(7) Utility Facilities	0	75	75
(8) Auxiliary Facilities	1,603	98	1,701
(b) Spare Parts	8,367	0	8,367
(c) Dismounting Works	0	837	837
(d) Erection & Installation Works	0	6,290	6,290
(e) Civil & Building Works	0	3,795	3,795
3. Ocean Freight & Insurance	5,263	742	6,005
4. Local Handling & Inland Transportation	0	610	610
5. Construction Equipment	0	2,289	2,289
6 Indirect Field Expenses	376	1,302	1,678
7. General Contractor's Services	13,347	1,679	15,026
8. Tax & Funds	0	8,797	8,797
9. Project Management	2,363	347	2,710
(a) Owner's Services	0	231	231
(b) Technical Advisor	855	0	855
(c) Operation Advisor	720	0	720
(d) General Overheads	788	116	904
10. Pre-operation Expenses	101	574	675
(a) Training	20	0	20
(b) Test Run Expenditures	81	574	655
Total Project Cost (1990 Prices)	92,343	30,590	122,933
11. Physical Contingency	4,620	2,302	6,922
12. Price Contingency	24,681	5,392	30,072
13. Interest During Construction	17,050	0	17,050
14. Additional Working Capital	3,405	1,456	4,861
Total Project Cost (1996 Prices)	142,098	39,740	181,838

CHAPTER VI
FINANCIAL ANALYSIS

CHAPTER VI FINANCIAL ANALYSIS

1. Present State of Aksu Mill

1.1 Production

Table VI-1-1 shows the trends in production and capacity utilization (as against the designed production capacity of 82,500 tons/year) at Aksu mill from 1972, when the mill went into operation, to 1989.

While it is customary for the paper mills in Scandinavia, North America and Japan to operate at more than 90 percent of capacity utilization, Aksu mill has been operating at 75 percent of capacity utilization, on average, since 1972, even given that the mill had to stop operations for four months due to a strike in 1988. The figure compares unfavorably with that for any other SEKA mill. It appears the frequent power failures before the power distribution network was improved last December are not the sole reason for this. This question is detailed in Chapter III(Factory Diagnosis).

1.2 Setting of Sales Prices and Production Costs

SEKA's newsprint was protected against imports by the Government's import control policies for nearly 10 years after 1972, when Aksu mill went into operation with import substitution for satisfying domestic demand as its main aim. A high tariff was imposed on imported newsprint, and at the same time foreign currency controls were imposed on newspaper companies.

In the early 1980s, the sales prices of newsprint tended to stay at low levels because the Government adopted a policy to curb further rises in newsprint prices in light of the acceleration of inflation. After that, however, the

newsprint market was increasingly liberalized. Since 1984, the Government's controls on newsprint prices have been eased, and SEKA has been urged to set newsprint prices in response to market forces. At the same time, the tariff on newsprint has been reduced drastically.

It was at that time that the Government shouldered SEKA's long-term debts as part of its SEKA restructuring program.

Although, in principle, the Government continues with this policy, barriers to imports of newsprint still exist. A tariff is still imposed on imported newsprint and there remain various types of funds. Thus it can be said that domestic newsprint is still protected against imported newsprint.

At present, SEKA's sales prices of newsprint are set on the basis of its production costs and the prices of imported newsprint. SEKA also takes into account the difference in quality between its newsprint and imported newsprint in setting its newsprint prices.

Shown in Table VI-1-2 are the record in Aksu mill's production costs and sales prices of newsprint since 1985, as well as the prices of imported newsprint (CIF) referred to in Chapter II.

Table VI-1-3 shows the record in percentage distribution of Aksu mill's production costs from 1985 to 1989. The figures are based on the data received from SEKA. Non-operating expenses, such as interest or subsidies from SEKA headquarters, are excluded. The fact that the ratio of the cost of pulp to the total variable cost has more than doubled over the five years seems to reflect the shift from domestic pulp to imported pulp in recent years.

1.3 Profit and Loss

Table VI-1-4 shows the record in operating profit and loss, as well as non-operating profit and loss, since 1985. The operating profit-and-loss account has been in deficit until 1988, when it moved into surplus. The cumulative profit as of the end of 1989 amounted to approximately TL3.7 billion.

2. Preconditions for Financial Analysis

2.1 Method of Financial Analysis

As in a green-field project, the financial analysis of a renovation project is on the basis of the internal rate of return (IRR) and the net present value (NPV). Unlike in a green-field project however, in a renovation project, the incremental cost and benefit of a case with renovation against those of a case without renovation are bases for the analysis. In other words, the value of IRR obtained as a result of the comparison in terms of the incremental cost and benefit between Case 1 and the case without renovation indicates the investment effect of Case 1.

In the case without renovation, the past conditions of production, sales and financial situation continue. If production is to be maintained at a constant level, therefore, the maintenance cost will have to rise from year to year as the equipment will become more and more obsolete. In the cases with renovation, on the other hand, the fixed cost (depreciation cost) will increase as a result of equipment investment to be made for renovation, while production will increase, and unit consumption of raw materials and utilities will improve.

Five sets of financial statements will be prepared for the case without renovation and the following four cases with renovation.

Case 1A (production: 100,000T/Y; interest rate on long-term loans: 4 percent)
Case 1B (production: 100,000T/Y; interest rate on long-term loans: 10 percent)
Case 2A (production: 130,000T/Y; interest rate on long-term loans: 4 percent)
Case 2B (production: 130,000T/Y; long-term interest rate on long-term loans:10 percent)

The financial statements and the internal rate of return will be calculated on the basis of the 1996 constant prices, which will include price escalation up to the time of start of commercial production of the renovated plant in Case 2 (1996). (Case 2 has the longer period of construction work.)

2.2 Relevant Currencies and Exchange Rates

The official exchange rates for the Turkish Lira and the Japanese yen against the US dollar as of the end of February 1990 will be used for conversion purposes.

US$1.00=TL2,417.6
US$1.00=¥148.8

2.3 Escalation Rate

The rate of price escalation to result from inflation during a period from February 1990, when an investigation was made of the estimated total project costs and the estimated purchase prices of raw material, to 1996, when commercial production of the plant is to start in Case 2, is estimated.

Table VI-2-1 shows the average annual percentage changes over previous year in GNP deflator, consumer price index and wholesale price index in Turkey for a period from 1989 (when a system of floating exchange rates was introduced in Turkey) to 1989. Over the past few years, the rise in the inflation rate has been a subject of serious discussion in Turkey. In 1988 and 1989, in particular, the inflation rate was far higher than in the years before 1988, as shown in Table VI-2-1.

It was decided to use the US dollar as the basic currency for use in the financial and economic analysis of this project. Accordingly, it is necessary to take into consideration the relations between the inflation rate in Turkey, the exchange rate for the Turkish Lira against the US dollar and the rate of devaluation of the US dollar. Shown below are the average annual percentage changes over previous year in the above-mentioned four economic the indicators and the US GNP deflator for 1980 to 1989.

Turkish GNP deflator	42.69 percent
Turkish consumer price index (CPI)	44.86 percent
Turkish wholesale price index (WPI)	42.01 percent
Exchange rage for Turkish Lira against US dollar	44.77 percent
US GNP deflator	4.58 percent

The average annual percentage change in the exchange rate for the Turkish Lira against the US dollar for the past ten years is 44.8 percent, which is nearly equal to that for the Turkish consumer price index (44.9 percent). The average annual rate of devaluation of the US dollar (percentage change in the US GNP deflator) for the same period is 4.6 percent. If it is assumed that the exchange rate of currencies of two countries is determined on the basis of purchasing power parity, it can be said that the value of the Turkish Lira has been underrated against the US dollar.

It should be noted that while the consumer price index rose by about 70 percent in 1989, the exchange rate for the Turkish Lira against the US dollar fell by only about 49 percent in the same year. Although it is feared that the country's foreign currency balance may worsen due to a temporary decline in exports, this trend is expected to continue backed partly by the Government's policy to curb inflation (defeat of inflation is one of the greatest challenges facing the Government).

The escalation rates for the foreign currency (US dollar)-denominated and the local currency (Turkish Lira)-denominated prices are estimated as follows.

2.3.1 Foreign Currency-Denominated Prices

The escalation rate for the foreign currency-denominated prices is estimated on the basis of the rate of devaluation of the US dollar and the rate of increase in the US dollar-denominated prices (MUV) of goods exported to developing countries from five developed countries (France, West Germany, Japan, Britain and the United States). Shown in the following table are the World Bank's projections for the rates of increase for the US GNP deflator and MUV for 1990 to 1996. The average annual rate of devaluation of the US dollar for 1990 to 1996 is projected at 5.0 percent, and the rate of increase in MUV for the same period at 4.4 percent. OECF's projections for the inflation rates in the member countries also indicate that, in the United States, the inflation rate has been on the rise for few years to come.

US GNP	Deflator	MUV
1990	5.30%	11.45%
1991	4.70	1.43
1992	5.20	2.68
1993	5.40	7.45
1994	5.00	5.05
1995	4.90	5.18
1996	4.80	4.41

Based on these data, the average annual inflation rate for the foreign currency (US dollar)-denominated prices is estimated at 4.5 percent, and this figure will be used in the financial and economic analyses.

2.3.2 Domestic Currency (Turkish Lira)-Denominated Prices

As mentioned above, the value of the percentage change in the exchange rate for the Turkish Lira against the US dollar is expected to come closer to the value obtained by subtracting the value of the rate of devaluation of the US dollar from the value of the domestic inflation rate. In this study, therefore, the average annual rate of increase in dollar terms for the local currency-denominated prices is estimated at 3 percent.

From reference, if it is assumed that the exchange rate for the Turkish Lira against the US dollar will change at the same rate as the domestic inflation rate, there will be no need to take escalation into consideration in connection with the local currency-denominated estimated value after it is converted into the US dollar at the current official exchange rate.

2.4 Investment Incentives

Since 1980, the Government of Turkey has been implementing various measures to promote economic activities, including a tax exemption measure, to actively promote investment projects such as introduction of foreign capital. The Government's investment incentives have been modified almost every year, and whether a project is eligible for the investment incentives is determined in the course of the negotiations at the time of making an application. As SEKA, which is to be responsible for the implementation of this project, is a state-operated corporation, it is difficult to grasp the details of its negotiations with the Government at this point in time.

In this study, the following assumption, which is based on the study team's consultations with SPO during its on-site investigation and SPO's "Foreign Investment Regulation and Application Forms" as amended in November 1989, is to be reflected in the financial analysis.

Whether the investment incentives are applicable to a project depends on the location of the site for the project. Aksu mill is located in a "Normal Region Non-Industrial Zone." In addition, the mill's amount of investment for fixed assets exceeds TL5 billion, and the amount of capital increase as assumed in the above-mentioned financing plan accounts for more than 15 percent of the total amount of investment. Thus, this project is eligible for the investment incentives, and an "incentive certificate" is to be issued for this project.

2.4.1 Import Duties

By obtaining an incentive certificate, this project will be exempted from import duties on imported equipment. As mentioned earlier, however, no preferential treatment is given to this project concerning the funds.

2.4.2 Investment Allowances

This is an incentive measure in which a project obtaining an incentive certificate is exempted from the corporate tax until a certain portion of the amount of investment is recovered as operating profit. As SEKA is a government-managed corporation, the foundation tax, not the corporate tax, is to be paid. But the rate for the foundation tax and various funds are the same as the corporate tax, the eventual tax rate being 49.22 percent.

This project will be exempted from the corporate tax until the accumulated profit after the start of operation exceeds 40 percent of the amount of fixed investment.

In the financial analysis, however, the two-year period from 1996 to 1997 is to be considered as a period of tax exemption in Case 1, and in Case 2 the five-year period from 1996 to 2000 is to be considered such a period, for purposes of convenience in calculation.

2.4.3 Resource Allocation Support Premium

This is a system in which an investment project obtaining an incentive certificate can receive a support premium of a certain percentage of the amount of equity investment from the Resource Allocation Support Fund established within the Central Bank of Turkey. In this project, the percentage is set at 15 percent, and this amount is entered in the financial statements as non-operating income. At the time of calculation of IRR, this amount is included in operating profit.

2.5 Plant Life

The equipment's life is set at 15 years after the start of operation. Since this project is scheduled to start operation in October 1995 in Case 1, or in May 1996 in Case 2, the equipment's life should end in 2010 in either case.

2.6 Production Plan

As mentioned earlier, Aksu mill's newsprint production had not been stable due in part to a strike up until last year. In February 1990, the existing wires were replaced with plastic wires. In this study, the mill's production in the case without renovation is estimated at 74,700 tons/year (300 working days/year), as shown in Attachment VI-1-1, on the basis of the data on daily output as of February 1990. Since the designed production capacity is 82,500 tons/year, the operating rate is 90.5 percent. In other words, when

no renovation project is implemented, it is assumed that an production level of 74,000 tons/year will be maintained until 2010, although the equipment maintenance cost may increase from year to year.

In the cases with renovation, the mill's production after renovation is estimated taking into account the learning curve of new operating techniques and the restrictions by the domestic market scale. As stated in Chapter II, from the standpoint of the scale of the domestic market, it is possible, in either case, for the mill to operate at capacity limits on condition that SEKA newsprint will reach the same level of quality as imported newsprint.

From the standpoint of acquisition of new equipment operating skills, the period of time required to attain 100 percent capacity utilization is estimated at three months in Case 1, and at two and a half to three years in Case 2 (as it will introduce a full- scale twin-wire system and the problem of machine speed will be involved), on the assumption that at least two operation advisors will stay at the mill for a certain period of time.

Accordingly, the mill's annual production volume in 1994 and beyond is estimated as follows, considering that the mill will stop operations from April to September, 1995 in Case 1, or from March 1995 to April 1996 in Case 2.

- Case 1

1994	74,700T/Y	
1995	41,180T/Y	74,700/12x3 (before renovation)+100,000/12x3x 0.9 (after renovation)
1996 -	100,000T/Y	100,000x1.0

- Case 2

1994	74,700T/Y	
1995	12,450T/Y	74,700/12x2 (before renovation)
1996	69,330T/Y	130,000/12x8x0.8 (after renovation)
1997	117,000T/Y	130,000x0.9
1998	123,500T/Y	130,000x0.95
1999 -	130,000T/Y	130,000x1.0

All the product will be newsprint in reel.

2.7 Sales and Inventory Management Plan

2.7.1 Sales and Inventory Management Plan

In Turkey, there are only two newsprint manufacturing mills, namely, Aksu mill and Balikesir mill. At present, there is no plan to construct another newsprint manufacturing mill. Judging from the scale of the domestic market, it will be possible to sell out the two mill's products in the domestic market even after the planned increases in Aksu mill's production.

In 1989, Aksu mill had two months' product (or one-sixth of the annual production volume), on average, in stock. This was partly because the mill was still affected by the increase in imports of newsprint due to the strike in 1988. More important, however, was the fact that the country's major newspaper companies, which had begun to use imported newsprint superior in quality to domestic newsprint, were still dependent on foreign supplies of newsprint even after the strike was brought to an end. In the case without renovation, the inventory level may likely be above that for last year. But one might be too optimistic if one expected the inventory return to the level prevalent before the strike occurred, for the quality of newsprint will

remain the same in this case. In view of the fact that the average inventory level for the three years before the occurrence of the strike was 0.9 month's production, the inventory level in the case without renovation is set at 1.5 months' production.

The inventory levels in the cases with renovation are set as follows in consideration of the planed operating rate after the start of commercial production.

- Case 1

1994	1.5 months (before renovation)
1995	no inventory
1996 -	0.5 month

- Case 2

1994	1.5 months (before renovation)
1995	no inventory
1996 -	0.5 month

As a matter of course, the sales volume will vary according to the inventory level.

2.7.2 Sales Prices

As mentioned earlier, at present, SEKA's sales prices of newsprint (ex-factory prices) are set 10 percent lower than the landed prices of imported newsprint. In some cases, the prices so set are further discounted by US$5.00 to US$10.00 (US$8.00 on average). The sales prices in the case without renovation are estimated on the assumption that this pricing policy will be continued.

In setting the sales prices after renovation in the cases with renovation, improvement in product quality must be taken into consideration. As mentioned in Chapter IV, the planned new product will be of the same quality as imported newsprint and the basis weight of the new product will be reduced from 48.8g/m^2 to 45g/m^2.

As for the possible effects of the reduction in weight, the present unit price per ton on the international market is inversely proportional to the basis weight. In this study, therefore, the selling prices of newsprint with a basis weight of 45g/m^2 are calculated on the basis of the international price (CIF Istanbul) projections (on a 48.8g/m^2 basis weight) mentioned in Chapter II.

In the case of home-made newsprint of the same quality as imported newsprint, it is reasonable to assume that its selling prices will be higher by five to ten percent than the landed prices of imported newsprint, given importation-related commercial charges and reduction in interest on inventory. In this study, however, the selling prices are set at the same level as the landed prices.

Tariffs imposed on imported goods in Turkey are as shown in Table VI-2-2. In the case of newsprint, the eventual tariff rate is 26 percent of CIF prices.

Table VI-2-3 shows the sales prices estimated for both the cases without and with renovation.

2.8 Variable Cost Items

Table VI-2-4 and Table VI-2-5 show the unit consumption and the unit prices in 1990 for the variable cost items such as raw materials, utilities, chemicals and consumables. The financial analysis will be carried out on the assumption that the prices of imported goods like pulp will rise at an average annual rate of 4.5 percent and the prices of

locally procured goods at an average annual rate of 3 percent, which is based on the escalation rates set earlier in this report. Described below are the main elements of the variable costs.

2.8.1 Pulpwood

In Turkey, a nationwide uniform price is set for pulpwood by the Ministry of Agriculture and Forestry, regardless of the place of felling and the type of pulpwood. Also, the Ministry, in principle, decides on the supply source of pulpwood to each mill based on its national policy. The users are responsible for the transportation of pulpwood from the place of felling to their mills. In the case of SEKA, each of its mills contracts out this job to transportation companies. In this case, the transportation cost is defrayed by the mill. So the distance from the source of supply of pulpwood to the mill directly affects the material cost at the mill.

Table VI-2-6 shows Aksu mill's sources of supply of pulpwood, their respective assignment volume and their distances from the mill in the past three years.

As can be seen from this table, the main sources of supply of pulpwood to the Aksu mill are located in and around Giresun area. The weighted average of the distance from the source to the mill by assignment volume were 287 km in 1987, 299 km in 1988 and 315 km in 1989. The distance tends to become longer from year to year, but there has been no drastic increase in the distance. It is unlikely that the distance pulpwood is transported to the mill will increase sharply in the near future. So the present unit price which includes the transportation cost will be used in the financial analysis.

2.8.2 Kraft Pulp

At Aksu mill, local kraft pulp supplied from the Dalaman mill has been used together with kraft pulp imported from the United States and other countries. There is a wide price differential between the two types of kraft pulp. According to the data obtained from SEKA, the price of imported kraft pulp is two to three times higher than that of Dalaman mill's kraft pulp. However, priority is given to imported kraft pulp at Aksu mill, mainly from the standpoint of quality. In 1989, no local kraft pulp was purchased at the mill. So the price of imported kraft pulp will be used in the financial analysis on the assumption that this trend will continue.

The average gate price of kraft pulp was US$956/ton in 1989, and it is assumed here that this price will continue to rise at an average annual rate of 4.5 percent in 1990 and after.

2.8.3 Chemicals

Chemicals can be divided broadly into the following four categories.

a. Chemicals for use in the papermaking process
b. Chemicals for use in GP bleaching
c. Chemicals for use in the DIP process
d. Chemicals for use in waste treatment facilities

(1) Chemicals for Use in the Papermaking Process

In principle, there is no difference in types of chemicals used and consumption per product ton between the case without renovation and those with renovation. So the estimated cost of chemicals was calculated on the basis of a 3 percent escalation rate starting at US$7.15 per product ton in 1989.

In the case of Case 2, however, it will be necessary to add the cost of talc which is used to treat pitch of the pine mixed with pulpwood. So US$4.14 per product ton which was obtained from its estimated consumption of 0.01 ton/product ton and the unit price of US$414/ton is added.

(2) Chemicals for use in GP bleaching

	Case 1	Case 2
NaOH	476T/Y	514T/Y
Na_2SiO_3	952T/Y	963T/Y
H_2O_2	714T/Y	835T/Y
DTPA	10T/Y	13T/Y
H_2SO_4	762T/Y	1,028T/Y

(3) Chemicals for Use in the DIP Process

The quantities of the chemicals used for 33,000BDT/year of waste paper are as follows.

NaOH	470T/Y
Na_2SiO_3	933T/Y
H_2O_2	11T/y
De-inking agent	12T/Y

All the above chemicals can be procured in Turkey, and their unit prices are as shown below.

NaOH	US$ 100/T
Na_2SiO_3	US$ 252/T
H_2O_2	US$ 931/T
De-inking agent	US$ 2,378/T
DTPA	US$ 18,145.8/T
H_2SO_4	US$ 202/T

The costs of these chemicals (based on prices in 1990) are shown in Table IV-2-5.

(4) Chemicals for Use in Waste Treatment

In both the case without renovation and those with renovation, the waste treatment plant which is to go into operation in 1993 will require 0.016tons/product ton of alum. In the cases with renovation, additional 0.012 tons/product ton of alum will be required for treatment of waste water from the DIP plant after the start of commercial production.

2.8.4 Electricity

Aksu mill is generating electric power with a steam turbine generator to cover part of its demand, while purchasing electricity from TEK.

As the cost of the electricity generated with its own power plant is included in the cost of heavy oil, here only the cost for purchase of electricity from TEK will be described.

The cost for power consist of the demand charge and the running charge. The power rates vary with the time zone. The present power rates are as shown below.

Demand charge	US$2.792/kW-month
Average power rates	US$0.064/kWh

Aksu mill's present power demand is 22MW. After renovation, it is expected to be increased to 23MW in Case 1 or 27MW in Case 2.

Accordingly, the demand charge as shown in Table VI-2-7 will be included in the cost of utilities, in addition to the power running charges.

2.8.5 Consumables

This is the cost of consumables such as grinder stones, wires and felt. This cost is detailed in Chapter IV.

While the average annual cost of consumables for 1985-89 was US$16.4/product ton, the present estimated total cost of consumables as mentioned in Chapter IV is US$17.5/product ton (Case 1) or US$19.4/product ton (Case 2).

The increase in the unit price per product ton is attributable mainly to the shift to twin-wire paper machine. It is assumed here that consumables are all imports. It is estimated that the cost of consumables will rise at an average annual rate of 4.5 percent.

2.8.6 Packing Materials

All packing materials are procured locally. The present US dollar-denominated price per product ton will be used in the financial analysis.

2.8.7 Unit Variable Costs

Table VI-2-8 shows the costs (which include escalation up to 1996) per product ton of the main elements of the variable cost.

2.9 Fixed Cost Items

2.9.1 Salary and Wages and Related Costs

Aksu mill presently has a personnel of 808. The present personnel should be maintained even at the period of plant shutdown because of the construction work under this project. After renovation, it will be possible to operate

the plant with the present personnel. Thus it is assumed that this project will require no increase in the number of staff.

However, the waste treatment facilities will go into operation in 1993, and in the cases with renovation, it will be necessary to install a waste treatment plant for DIP process. It is estimated that the operation of the former facilities require additional 12 workers--4 qualified workers and 8 plain workers--and the operation of the latter plant additional 4 plain workers.

The estimated personnel expenses based on the data obtained from Aksu mill in the cases with renovation and the case without renovation are as shown in Table VI-2-9.

Judging from the actual amounts in the past five years, the social charges account for 7 to 9 percent of the personnel expenses. In this analysis, the percentage is set at 10 percent. The social charges include travel expenses, medical expenses and food allowances.

Furthermore, 20 percent of the personnel expenses is appropriated for general overheads.

2.9.2 Maintenance Cost

It is expected that the plant maintenance cost will increase from year to year as the equipment becomes more and more worn-out. In the case without a renovation, it is assumed that production rate of 74,700 tons/year will be maintained. In this case, however, repair works in a large scale will be necessary every five or ten years.

Generally, the plant maintenance cost (which includes the cost of the above-mentioned major repair work) can be expressed as a ratio to the cost for purchase of equipment. If the ratio of the maintenance cost to the cost for

purchase of equipment (excluding price increases due to inflation) for the first year of operation is estimated at about 3 percent, and that 30 years after the start of operation at about 7 percent, the estimated average annual increase rate for the maintenance cost for the period is 3 percent.

It is assumed, therefore, on the basis of the average annual maintenance cost of US$1,167,000 for 1985-89, that the maintenance cost will increase at an average annual rate of 3 percent from 1990 on. However, the average annual increase rate until 1996 will be 6 percent since a 3 percent escalation rate is added every year until 1996.

In the cases with renovation, 3 percent of the cost for purchase of equipment (CIF prices) will be appropriated every year for maintenance of the new equipment during the 15-year period. For maintenance and repair of the existing equipment, 15 percent (Case 1) or 5 percent (Case 2) of the maintenance cost in the case without a renovation will be appropriated.

Table VI-2-10 shows the estimated maintenance cost in each case.

2.9.3 Depreciation

Table VI-2-11 shows the schedule for depreciation of the mill's existing equipment and the waste water treatment facilities to be constructed from 1990 and 1992, which was worked out in accordance with the legal provisions in Turkey and on the basis of the book value as of the end of 1989.

Is assumed that the new equipment will depreciated under a schedule as shown in Table VI-2-12. In tangible fixed assets is to be depreciated over a five-year period in a fixed installment method with no scrap value.

2.9.4 Tax and Insurance

It is assumed that 1.0 percent of the book value of the fixed assets will be considered for payment of the real estate tax and insurance premiums on the mill's equipment. It should be noted that the new equipment will be subject to the above-mentioned tax and insurance after the start of operation. Insurance during the construction period is to be covered by construction insurance.

2.9.5 Sales Expenses

The sales expenses are direct expenses for sales and promotion, and it is assumed that they will account for 1.0 percent of the sales revenue.

2.10 Inventory Management Plan for Raw Materials

In light of the past records of the mill's inventory management, the mill's future inventory level for raw materials is set at one month's stock of all elements of the variable costs, excepting electric power and consumables.

The following are proposed measures to cope with the shutdown of production during the construction work.

- To reduce the inventory volume to zero during a month immediately before the plant shutdown.
- To recover one month's stock of raw materials before operations are resumed. The costs required for this arrangement are included in the total project costs as the additional working capital.

2.11 Current Assets and Current Liabilities

Neither accounts receivable nor accounts payable are considered in this study as at present sales of products and purchases of raw materials are settled mainly in cash. The amount of cash at hand is set at a half-month proportion of the cash factory cost.

2.12 Short-Term Loans

Shortfalls of funds while the mill is in operation are to be covered by short-term loans. In the financial analysis, the interest rate on such loans is estimated at 7 percent.

3. Financial Analysis

3.1 Present Financial Condition of Aksu Mill

As this study is to investigate the profitability of a project to renovate the plant which is currently in operation, it is necessary to carry out financial projections on a continual basis with the present condition of the plant as the starting point. On the other hand, generally there are various situations particular to the state of an existing corporation. In the case of Aksu mill, which is a unit of a state-operated corporation, the Central Government shouldered its long-term debts, and also SEKA headquarters provided interest-free loans to support its fund position.

It is impossible to have all of these situations unique to Aksu mill reflected in the projections for its future, and such an attempt is not necessarily important for purposes of this study.

Aksu mill's balance sheet in US dollar terms as of the end of 1989 is shown in Attachment VI-3-1. Figures were converted into US dollars at the exchange rate for the Turkish Lira against the US dollar at the same time. (US$1.00=TL2,313.7).

In Turkey, assets have been revaluated at a rate close to the inflation rate at the end of each year since 1984. The balance sheet shown in the above-mentioned attachment was prepared after revaluation of assets. As financial analysis is carried out in US dollar terms in this study, revaluation of assets in 1990 and after is not taken into consideration.

The financial projections for 1990 and beyond were carried out on the basis of the above-mentioned preconditions starting with the current state of assets.

3.2 Financial Projection for Each Case

Five different financial statements will be prepared for the following five cases in accordance with the preconditions as mentioned in the preceding chapter.

- Case without a renovation (W/O case)
- Case 1A (production: 100,000T/Y; interest rate on long-term loans: 4 percent)
- Case 1B (production: 100,000T/Y; interest rate on long-term loans: 10 percent)
- Case 2A (production: 130,000T/Y; interest rate on long-term loans: 4 percent)
- Case 2B (production: 130,000T/Y; interest rate on long-term loans: 10 percent)

These financial statements are included in this report as Attachment VI-3-2 to 6.

a. Production and Sales Plan
b. Production Cost Statement
c. Working Capital Statement
d. Income (Profit and Loss) Statement
e. Funds Flow Statement
f. Balance Sheet
g. Financial Indicators (Financial Ratio)

Although projections were conducted for 1990 and beyond, the financial statements for 1993 through 2010 are attached to this report, since the projected first renovation-related disbursement will be made to the consultants for preparation of ITB in 1993.

3.3 Financial Analysis

3.3.1 Financial Internal Rate of Return

The incremental cash flow in each case is shown in Attachments VI-3-7 to 10. The financial internal rates of return (FIRR) for Cases 1A to 2B are as shown below.

FIRR (in 1996 constant price)

	Before tax	After tax
Case 1A	16.84%	13.02%
Case 1B	16.84%	13.42%
Case 2A	5.54%	4.69%
Case 2B	5.54%	5.51%

As IRR is calculated on the assumption that all investments were made by capital increase, the differences in conditions for provision of long-term loans between Case A and Case B are not reflected in the IRR so calculated. But the IRR after tax is affected by the interest rates because interest is regarded as cost to reduce profits. The IRR becomes higher if the interest rate is higher.

It is concluded that the implementation of Case-1 is fairly feasible under soft loans though FIRR of 16.84% may not be acceptable for commercial loans.

The IRR for Case 2 is lower than that for Case 1 for the following two reasons.

a. In Case 2 the period of plant shutdown is 14 months, while in Case 1 it is only 6 months.
b. It is in 1999, or four years after the start of operation, that the capacity utilization rate will reach 100 percent.

3.3.2 Production Costs

Table VI-3-1 shows a comparison of the unit production cost in the five cases, including the without case.

Shown in Table VI-3-2 is a comparison of the cash factory cost (excluding depreciation and interest).

In both tables, comparisons are made for 1997, when the plant will go into operation on a year-round basis in Case 2, and beyond. Furthermore, in all the cases excepting the W/O case, figures calculated based on a basis weight of 45 g/m^2 were converted into those in terms of 48 g/m^2 (in other words, the values of the production costs entered in the financial statements were multiplied by 45/48.8).

The following comments can be made on the renovation-related production costs.

a. As a result of an improvement in unit consumption of material/utilities, cash factory costs will be lower in Cases 1 and 2 than in the without case. They will be higher in Case 2 than in Case 1 because the maintenance costs will be relatively high in Case 2 although the personnel expenses per ton will be lower in Case 2.

b. Due to the depreciation and interest on the long-term loans, production cost in Case-1A will keep higher than the without case until 2005. But it should be noted that in 1996, for example, the sales price in the with-case will be USD 859/TON (BW 48.8g/m^2) whereas USD 765/TON in the without-case.

c. The trend of production cost in Case-1B is similar to Case-1A. The lightened burden of interest on the long-term loans will make the production cost with Case-1B lower than Case-1A in 2003 onward.

d. The production cost in Case-2 will be much higher than the without case and Case-1 because of high depreciation cost and interests on long-term loans. Interests on short-term loans are also included for Case-2B.

Table VI-3-3 shows the percentage distribution of production costs projected for 2003 in each case. For purposes of comparison with Table VI-1-3, interest payments were subtracted from the production costs.

3.3.3 Sensitivity Analysis

A sensitivity analysis of Case 1A was conducted to examine the effects of possible changes in the main cost items. The results of the analysis are as shown in the following table, and fig. VI-3-1.

FIRR before Tax (Case 1A)

	-20%	-10%	Base Case	10%	20%
Sales price	8.86%	13.11%	16.84%	20.22%	23.32%
Kraft pulp	17.75	17.30	16.84	16.37	15.88
Waste paper	18.49	17.67	16.84	16.01	15.16
Invest. cost	21.65	19.02	16.84	15.00	13.41

In this analysis, calculation was made on the basis of the incremental cost and benefit. When the cost of an element becomes 10 percent higher, the same element in the W/O case also made 10 percent higher.

Although the FIRR is greatly affected by changes in the sales prices and the investment costs, it is less sensitive to changes in the prices of kraft pulp and waste paper.

Table VI-1-1 PRODUCTION VOLUME RECORD

Year	Production Volume	Utilization Factor
	[Ton]	
1972	59,519	72.1%
1973	70,846	85.9%
1974	71,461	86.6%
1975	71,150	86.2%
1976	68,193	82.7%
1977	71,430	86.6%
1978	55,752	67.6%
1979	61,028	74.0%
1980	63,063	76.4%
1981	63,086	76.5%
1982	61,434	74.5%
1983	61,100	74.1%
1984	60,325	73.1%
1985	51,171	62.0%
1986	54,301	65.8%
1987	65,484	79.4%
*1988	49,742	60.3%
1989	57,888	70.2%
Average	62,054	75.2%

* Four(4) months shutdown due to strike.

Table VI-1-2 PRODUCTION COST / SALES PRICE RECORD

Year	Production Cost	Sales Price	Production Cost	Sales Price	CIF	Landed Price	Exchange Rate
	[TL/Ton]	[TL/Ton]	[USD/Ton]	[USD/Ton]	[USD/Ton]	[USD/Ton]	[TL/USD]
1985	237,683	281,600	455	539	410	517	522
1986	310,287	306,000	460	454	450	567	675
1987	371,873	636,000	434	742	544	685	857
1988	491,349	859,000	345	604	625	788	1,423
1989	1,194,564	1,300,000	563	613	630	794	2,122

Table VI-1-3 BREAKDOWN OF PRODUCTION COST (1985 - 1989)

	1985	1986	1987	1988	1989
VARIABLE COST	79.29%	79.65%	80.10%	74.16%	78.17%
1. RAW MATERIALS	28.06%	28.20%	34.28%	35.58%	40.94%
Wood	14.00%	11.46%	12.62%	10.34%	12.73%
Pulp	13.39%	15.58%	20.36%	23.82%	26.95%
Chemicals	0.40%	0.83%	1.00%	1.09%	0.96%
Other Materials	0.27%	0.33%	0.31%	0.33%	0.29%
2. UTILITIES	47.35%	48.69%	42.87%	34.63%	30.24%
Power	27.20%	30.70%	30.18%	25.18%	20.71%
Fuel-Oil	19.82%	17.77%	12.51%	9.29%	9.35%
Other Utilities	0.33%	0.23%	0.18%	0.16%	0.18%
3. PACKING MATERIALS	1.11%	0.69%	0.59%	0.84%	0.65%
4. CONSUMABLES	2.77%	2.07%	2.35%	3.11%	6.34%
FIXED COST	16.84%	15.60%	14.47%	18.90%	14.63%
1. Salary and Wages	10.62%	9.66%	9.75%	14.81%	11.37%
2. Social Charges	0.75%	0.73%	0.78%	1.07%	0.95%
3. Maintenance Cost	0.42%	0.45%	0.59%	0.98%	1.37%
4. Amortization	5.05%	4.76%	3.35%	2.05%	0.95%
OTHER COSTS	3.87%	4.74%	5.43%	6.94%	7.20%
1. Sales Expenses	0.70%	0.86%	0.96%	1.19%	1.31%
2. General Administration Ex.	2.87%	3.61%	3.94%	5.48%	5.69%
3. Taxes and Insurance	0.30%	0.27%	0.53%	0.27%	0.21%
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%

Table VI-1-4 PROFIT / LOSS RECORD

[TL 1,000]

Year	Operating Profit	Non-operating Profit	Non-operating Expenses	Periodic Profit/Loss	Net Periodic Profit/Loss	Accumulated Profit/Loss
1985	-1,298,877	26,379	509,840	-1,782,338	-1,782,338	-6,424,045
1986	-1,896,979	84,350	799,577	-2,612,206	-2,612,206	-9,036,251
1987	-651,824	535,203	910,452	-1,027,073	-1,027,073	-10,063,324
1988	12,768,980	3,466,370	2,716,601	13,518,749	9,194,329	-868,995
1989	9,198,915	1,457,809	2,187,413	8,469,311	4,519,278	3,650,283

Table VI-2-1 ECONOMIC INDICATORS OF TURKEY (1980 - 1989)

YEAR	*GNP DEFLATOR	*CPI	*WPI	EXCHANGE RATE
				[TL/USD]
1980				76.0
1981	41.9%	36.6%	36.8%	111.2
1982	27.5%	30.8%	25.2%	162.6
1983	28.0%	31.4%	30.5%	225.5
1984	50.1%	48.4%	50.3%	366.7
1985	43.9%	45.0%	43.2%	522.0
1986	30.9%	34.6%	29.6%	674.5
1987	38.3%	38.9%	32.0%	857.2
1988	65.8%	75.4%	68.3%	1,423.3
1989	63.3%	69.6%	69.6%	2,122.4

* Percent Change over Previous Year

Source-1 : International Financial Statistics (IMF)
Source-2 : Economic Outlook (OECD)

Table VI-2-2 TARIFF IN TURKEY

	Wire	Felt	Stone	Canvas	Chemicals	Newsprint	Waste Paper	Wood Chip	Kraft Pulp	Spare Parts	Machinery/ Equipment
Customs Duty (% of CIF Value)	2.5-5%	2.5-5%	15%	1%	1-5%	1%	-	-	-	1-10%	5-15%
Municipal Charge (% of Customs Duty)	15%	15%	15%	15%	15%	15%	-	-	-	15%	15%
Stamp Duty (% of CIF Value)	10%	10%	10%	10%	10%	10%	-	-	-	10%	10%
Support Fund (% of CIF Value)	10%	10%	10%	10%	10%	10%	3%	3%	3%	10%	10%
Housing Fund (% of CIF Value)	-	-	-	-	-	-	USD10/ton	-	-	USD1/kg	-
Port Tax (% of CIF + Other Taxes Above)	4%	4%	4%	4%	4%	4%	-	-	-	4%	4%

Table VI-2-3 SALES PRICE OF NEWSPRINT

[USD/TON]

Year	CIF [BW 48.8]	CIF [BW 45.0]	DUTY & FUNDS [BW 48.8]	DUTY & FUNDS [BW 45.0]	Landed Price [BW 48.8]	Landed Price [BW 45.0]	Sales Price W/O Case [BW 48.8]	Sales Price With Case [BW 45.0]
	A	B	A'	B'				
		A*48.8/45	A*0.26	B*0.26	A+A'	B+B'	(A+A')*0.9-8	B+B'
1990	541	587	141	153	682	739	605	739
1991	565	613	147	159	712	772	633	772
1992	595	645	155	168	750	813	667	813
1993	618	670	161	174	779	844	693	844
1994	641	695	167	181	808	876	719	876
1995	665	721	173	188	838	909	746	909
1996	682	740	177	192	859	932	765	932

Table VI-2-4 MATERIAL / UTILITIES UNIT CONSUMPTION

	W/O CASE (74,700 T/Y)		CASE-1 (100,000 T/Y)		CASE-2 (130,000 T/Y)	
Wood	2.37	CUM/P.Ton	1.44	CUM/P.Ton	1.50	CUM/P.Ton
Kraft Pulp	0.22	T/P.Ton	0.21	T/P.Ton	0.26	T/P.Ton
Waste Paper	0.00	T/P.Ton	0.37	T/P.Ton	0.28	T/P.Ton
Power (TEK)	1,398	KWH/P.Ton	1,247	KWH/P.Ton	1,350	KWH/P.Ton
Fuel Oil	0.415	T/P.Ton	0.301	T/P.Ton	0.253	T/P.Ton

P.Ton : Product Ton

Table VI-2-5 UNIT COST OF MATERIAL/UTILITIES (As of 1990)

		UNIT PRICE	W/O CASE (74,700 T/Y)	CASE-1 (100,000 T/Y)	CASE-2 (130,000 T/Y)
			[USD/P.Ton]	[USD/P.Ton]	[USD/P.Ton]
Wood		34.0 USD/CUM	80.58	48.96	51.00
Kraft Pulp	*	999.0 USD/Ton	219.80	209.80	259.70
Waste Paper	*	150.0 US$/Ton	0.00	55.50	42.00
Chemicals		-	11.23	33.00	34.53
Paper Making		-	7.36	7.36	11.50
GP Section		-	0.00	12.87	11.65
DIP Section		-	0.00	6.00	4.61
Waste Treatment		-	3.87	6.77	6.77
Power (TEK)		0.064 US$/KWH	89.47	79.81	86.40
Fuel Oil		198.9 US$/Ton	82.54	59.87	50.32
Other Utilities		-	1.09	1.09	1.09
Consumables	*	-	17.10	17.50	19.40
Packing Materials		-	3.80	3.80	3.80

* Price to be escalated by 4.5% p.a.
P.Ton : Product Ton

Table VI-2-6(1) WOOD RESOURCE AREA TO AKSU MILL

1987		
Wood Resource Area	Assignment Volume [CUM]	Distance [KM]
GIRESUN	9,100	58
DERELI	8,000	59
BULANCAK	10,000	73
ESPIYE	6,700	110
TIREBOLU	4,300	99
SEBINKARAHIS	1,600	114
KOYUKLHISAR	2,000	217
ORDU	2,000	97
MESUDIYE	6,100	181
TRABZON	3,000	123
MACKA	12,800	158
RIZE	4,000	248
PAZAR	3,000	297
SuRMENE	6,000	207
TORUL	9,200	133
GuMuSHANE	2,000	259
ARTVIN	22,150	380
ARDANUC	7,000	404
BORCKA	2,150	332
GOKTAS	1,200	336
SAVSAT	9,250	427
YUSUFELI	4,800	452
AKKUS	600	-
SINOP	5,950	386
AYANCIK	16,300	425
BOYABAT	3,800	-
TASKOPRu	4,600	485
ISKILIP	2,540	480
KARGI	3,700	483
INEBOLU	1,600	519
BOZKURT	1,100	497
CATALZEYTIN	2,900	472
KuRE	7,100	591
TOSYA	3,900	498
TuRKELI	4,900	461

Table VI-2-6(2) WOOD RESOURCE AREA TO AKSU MILL

1988 Wood Resource Area	Assignment Volume [CUM]	Distance [KM]
GIRESUN	10,000	53
DERELI	8,700	59
BULANCAK	8,900	73
ESPIYE	6,250	110
TIREBOLU	5,400	99
SE.KARAHISAR	1,300	124
ORDU	2,900	97
SAMSUN	-	159
MESUDIYE	3,550	181
KOYULHISAR	4,800	217
ISKILIP	3,500	487
KARGI	4,700	483
uNYE	-	143
AKDAGMADENI	-	578
ARTVIN	23,500	380
ARDANUC	8,900	404
BGORCKA	1,700	332
GOKTAS	1,100	336
SAVSAT	9,500	427
YUSUFELI	5,300	435
TRABZON	3,000	123
SURMENE	4,000	207
MACKA	13,000	158
TORUL	12,000	133
GuMuSHANE	6,000	259
RIZE	3,000	248
PAZAR	2,000	297
TOSYA	4,328	498
BOYABAT	1,923	432
SINOP	7,500	386
AYANCIK	12,000	487
CATALZEYTIN	3,800	472
TuRKELI	4,000	461
TASKOPRu	2,598	485
KASTAMONU	7,660	535
KuRE	5,238	595
ENKAYA	-	567

Table VI-2-6(3) WOOD RESOURCE AREA TO AKSU MILL

1989 Wood Resource Area	Assignment Volume [CUM]	Distance [KM]
GIRESUN	7,250	58
DERELI	8,000	59
BULANCAK	11,150	73
ESPIYE	8,850	110
TIREBOLU	3,550	99
S.K.HISAR	1,000	124
CRDU	3,800	97
SANSUN	700	220
BAERA	1,600	270
MESUDIYE	3,500	181
KOYULHISAR	3,000	217
ISKILIP	1,900	436
KARGI	1,100	447
ARTVIN	22,500	380
ARDANUC	11,000	404
BORCKA	2,000	332
GOKRAS	1,800	336
SAVSAT	11,500	427
YUSUFELI	5,000	435
TRABZON	1,800	123
SuRMENE	3,100	207
NACKA	7,000	158
RIZE	1,500	248
PAZAR	2,500	297
TORUL	7,350	220
SuLuSHANE	2,500	259
TOSYA	4,600	462
BOYABAT	3,400	429
SINOP	6,500	386
AYANCIK	11,500	436
CATALZEYTIN	2,300	481
GuRKELI	5,000	471
TASKOPRU	2,000	487
KASTAMONU	10,500	529
KuRE	4,200	594
BOZKURT	1,400	506
IHGANGAZI	3,700	566

Table VI-2-7 DEMAND CHARGE

[USD 1,000]

Year	W/O CASE	CASE-1	CASE-2
1990	737		
1991	759		
1992	782		
1993	805	805	805
1994	829	829	829
1995	854	864	854
1996	880	921	1,014
1997	880	921	1,081

Table VI-2-9 SALARY and WAGES

[USD 1,000]

Year	W/O CASE	CASE-1	CASE-2
1990	3,598		
1991	3,706		
1992	3,817		
1993	3,978	3,978	3,978
1994	4,097	4,097	4,097
1995	4,220	4,227	4,220
1996	4,346	4,362	4,362

Table VI-2-8 VARIABLE COST per PRODUCT TON

[USD/Product Ton]

	Wood	Kraft Pulp	Waste Paper	Chemicals	Power	Fuel Oil	Other Utilities	Consumables	Packing Materials
		*	*					*	
W/O CASE									
1990	80.58	219.80	0.00	11.23	89.47	82.54	1.09	17.10	3.80
1991	83.00	229.69	0.00	11.57	92.15	85.02	1.12	17.87	3.91
1992	85.49	240.03	0.00	11.91	94.92	87.57	1.16	18.67	4.03
1993	88.05	250.83	0.00	12.27	97.77	90.19	1.19	19.51	4.15
1994	90.69	262.12	0.00	12.64	100.70	92.90	1.23	20.39	4.28
1995	93.41	273.91	0.00	13.02	103.72	95.69	1.26	21.31	4.41
1996	96.22	286.24	0.00	13.41	106.83	98.56	1.30	22.27	4.54
CASE-1									
1993	88.05	250.83	0.00	12.27	97.77	90.19	1.19	19.51	4.15
1994	90.69	262.12	0.00	12.64	100.70	92.90	1.23	20.39	4.28
1995	56.76	261.45	69.16	38.26	92.52	69.41	1.26	21.81	4.41
1996	58.46	273.21	72.28	39.40	95.30	71.49	1.30	22.79	4.54
**1995	73.39	267.10	37.79	26.81	97.60	81.33	1.26	21.58	4.41
CASE-2									
1993	88.05	250.83	0.00	12.27	97.77	90.19	1.19	19.51	4.15
1994	90.69	262.12	0.00	12.64	100.70	92.90	1.23	20.39	4.28
1995	93.41	273.91	0.00	13.02	103.72	95.69	1.26	21.31	4.41
1996	60.90	338.20	54.69	41.23	103.17	60.08	1.30	25.26	4.54

* Cost escalated by 4.5% p.a.
** Weighted average by production volume of before and after plant shutdown.

Table VI-2-10 MAINTENANCE COST

[USD 1,000]

	W/O CASE	CASE-1			CASE-2		
Year		Existing	New	Total	Existing	New	Total
1990	1,237						
1991	1,311						
1992	1,390						
1993	1,473	1,473	0	1,473	1,473	0	1,473
1994	1,562	1,562	0	1,562	1,562	0	1,562
1995	1,655	476	602	1,078	276	0	276
1996	1,755	263	2,480	2,743	58	2,895	2,953
1997	1,807	271	2,480	2,751	90	4,342	4,432
1998	1,862	279	2,480	2,759	93	4,342	4,435
1999	1,917	288	2,480	2,768	96	4,342	4,438
2000	1,975	296	2,480	2,776	99	4,342	4,441
2001	2,034	305	2,480	2,785	102	4,342	4,444
2002	2,095	314	2,480	2,794	105	4,342	4,447
2003	2,158	324	2,480	2,804	108	4,342	4,450
2004	2,223	333	2,480	2,813	111	4,342	4,453
2005	2,290	343	2,480	2,823	114	4,342	4,456
2006	2,358	354	2,480	2,834	118	4,342	4,460
2007	2,429	364	2,480	2,844	121	4,342	4,463
2008	2,502	375	2,480	2,855	125	4,342	4,467
2009	2,577	387	2,480	2,867	129	4,342	4,471
2010	2,654	398	2,480	2,878	133	4,342	4,475

Table VI-2-11 DEPRECIATION SCHEDULE

[USD 1,000]

YEAR	EXISTING FIXED ASSETS	WASTE TREATMENT
1990	364	
1991	359	
1992	337	
1993	330	292
1994	321	292
1995	318	292
1996	318	292
1997	308	292
1998	129	292
1999	96	292
2000	94	292
2001	94	292
2002	91	292
2003	90	292
2004	86	292
2005	86	292
2006	80	292
2007	80	292
2008	80	292
2009	78	292
2010	78	0

Table VI-2-12 DEPRECIATION MODE FOR NEW EQUIPMENT AND BUILDINGS

	YEARLY RATIO	DEPRECIATION PERIOD	SALVAGE VALUE
	[%]	[Year]	[%]
A. Buildings			
A-1. Mill, Workshop, Boiler etc.			
a) Concrete, iron structure & others	4	25	0
A-2. Administrative, social, commercial build. Offices, Bank, School etc.			
a) Concrete, iron structure & others	2	50	0
B. Plant-Machinery-Equipment			
B-1. Machinery & Plant	6	17	0
B-2. Instrumentation Equipment	12	9	0
C. Vehicles			
C-1. Unmotorized (Crane etc.)	10	10	0
C-2. Heavy Vehicles	25	4	0
C-3. Bus, Car, Truck etc.	20	5	0
C-4. Pipes, Collectors etc.	6	17	0

Table VI-3-1 UNIT PRODUCTION COST

[USD/Product TON (BW=48.8)]

YEAR	WITHOUT CASE	CASE-1A	CASE-1B	CASE-2A	CASE-2B
1997	758	782	829	884	974
1998	756	780	819	869	954
1999	756	779	811	857	934
2000	757	776	798	856	928
2001	757	767	776	843	902
2002	758	765	768	834	885
2003	759	763	760	831	879
2004	760	761	752	829	871
2005	761	759	743	826	863
2006	761	757	737	823	855
2007	762	755	737	820	848
2008	763	753	736	817	843
2009	764	751	736	814	837
2010	761	746	733	809	829

Table VI-3-2 UNIT CASH FACTORY COST

[USD/Product TON (BW=48.8)]

YEAR	WITHOUT CASE	CASE-1	CASE-2
1997	742	683	736
1998	742	682	730
1999	743	682	724
2000	744	681	724
2001	745	681	723
2002	745	681	722
2003	746	680	722
2004	747	680	721
2005	748	679	720
2006	749	679	720
2007	750	679	719
2008	751	678	718
2009	751	678	718
2010	752	677	717

Table VI-3-3 BREAKDOWN OF PRODUCTION COST IN 2003

	WITHOUT CASE	CASE-1A	CASE-1B	CASE-2A	CASE-2B
Variable Cost	84.48%	80.93%	80.93%	80.72%	80.72%
Wood	12.68%	7.30%	7.30%	7.05%	7.05%
Kraft Pulp	37.72%	34.12%	34.12%	39.13%	39.13%
Waste Paper	0.00%	9.03%	9.03%	6.33%	6.33%
Utilities	28.79%	22.14%	22.14%	20.00%	20.00%
Other	5.30%	8.33%	8.33%	8.22%	8.22%
Direct Fixed Cost	13.84%	11.19%	11.19%	9.81%	9.81%
Depreciation	0.67%	6.71%	6.71%	8.40%	8.40%
Sales Expenses	1.01%	1.16%	1.16%	1.08%	1.08%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

Fig. VI-3-1 FIRR SENSITIVITY ANALYSIS
(CASE-1A 100,000T/Y)