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INDUSTRIAL PERFORMANCE EVALUATION PROFILES STANDARD QUESTIONNAIRE FOR THE CEMENT INDUSTRY[1]

(with Explanatory Notes)

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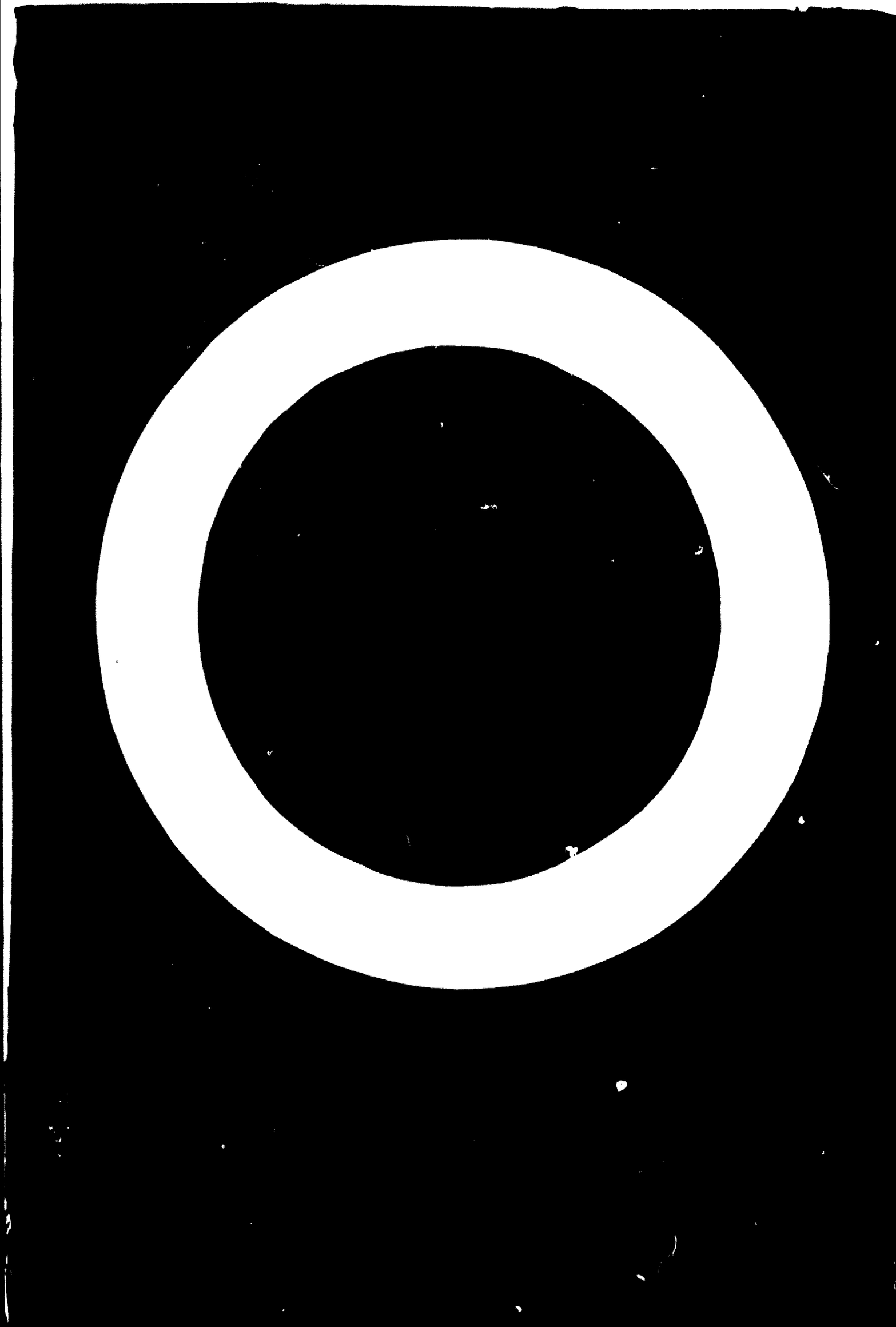
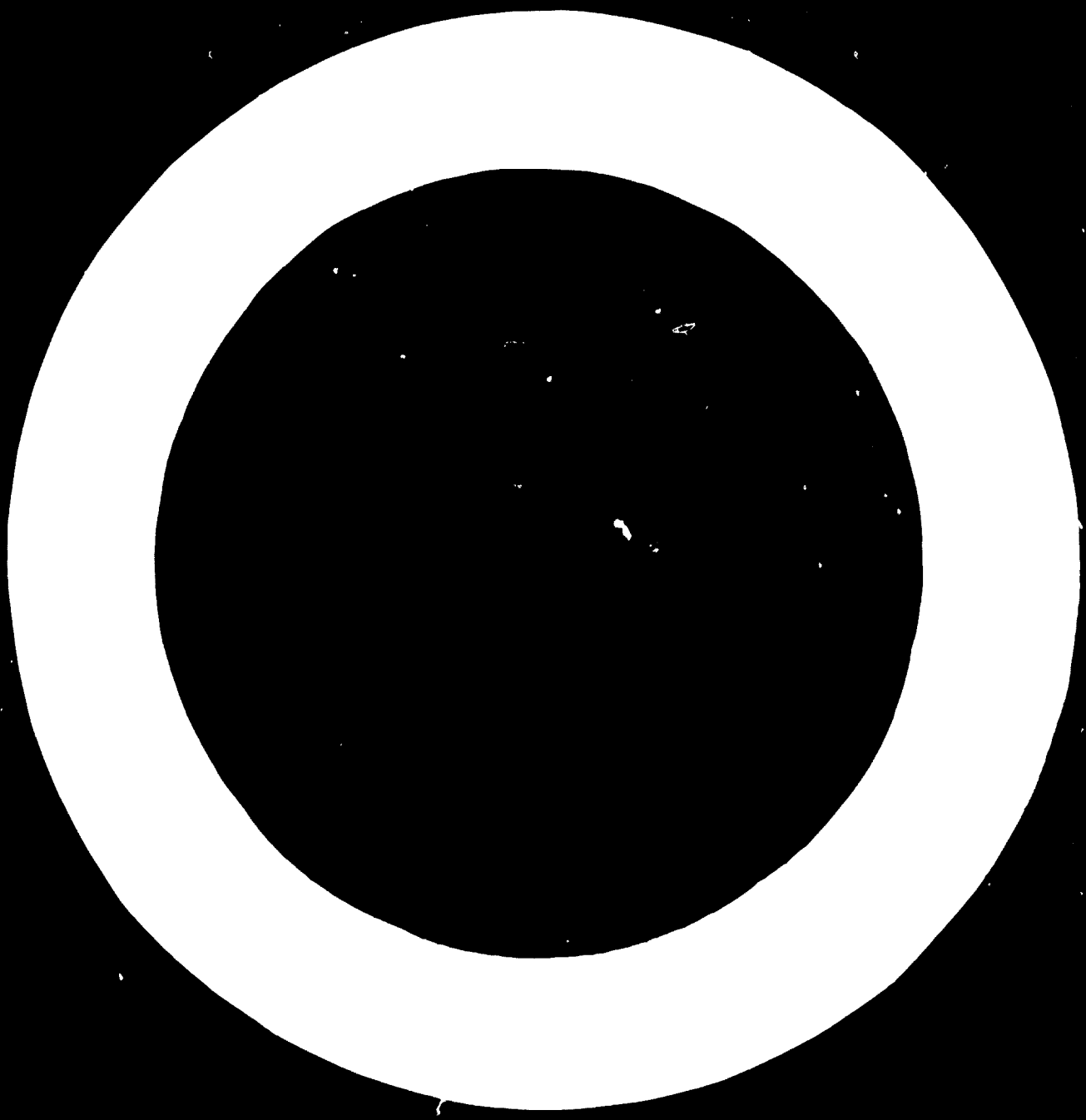




The Industrial Performance Evaluation Profile (IPEP) was designed by the Industrial Development Centre for Arab States (IDCAS) in cooperation with the United Nations Industrial Development Organization (UNIDO) in order to provide management with a comprehensive diagnostic system for evaluating the economic and technical performance of the establishment reviewed and to create a scheme for interfirm comparison for those establishments participating in the programme.

It has been noticed in the past that management frequently evaluates the performance of an industrial establishment either from an engineering or from an economic point of view. The IPEP tries to overcome this shortcoming by closely joining the economic and technical aspects of performance evaluation.

The IPEP questionnaire is divided into:

- PART A - : Economic and financial description of the establishment
- PART B - : Technical description of the establishment
- PART C - : Performance evaluation

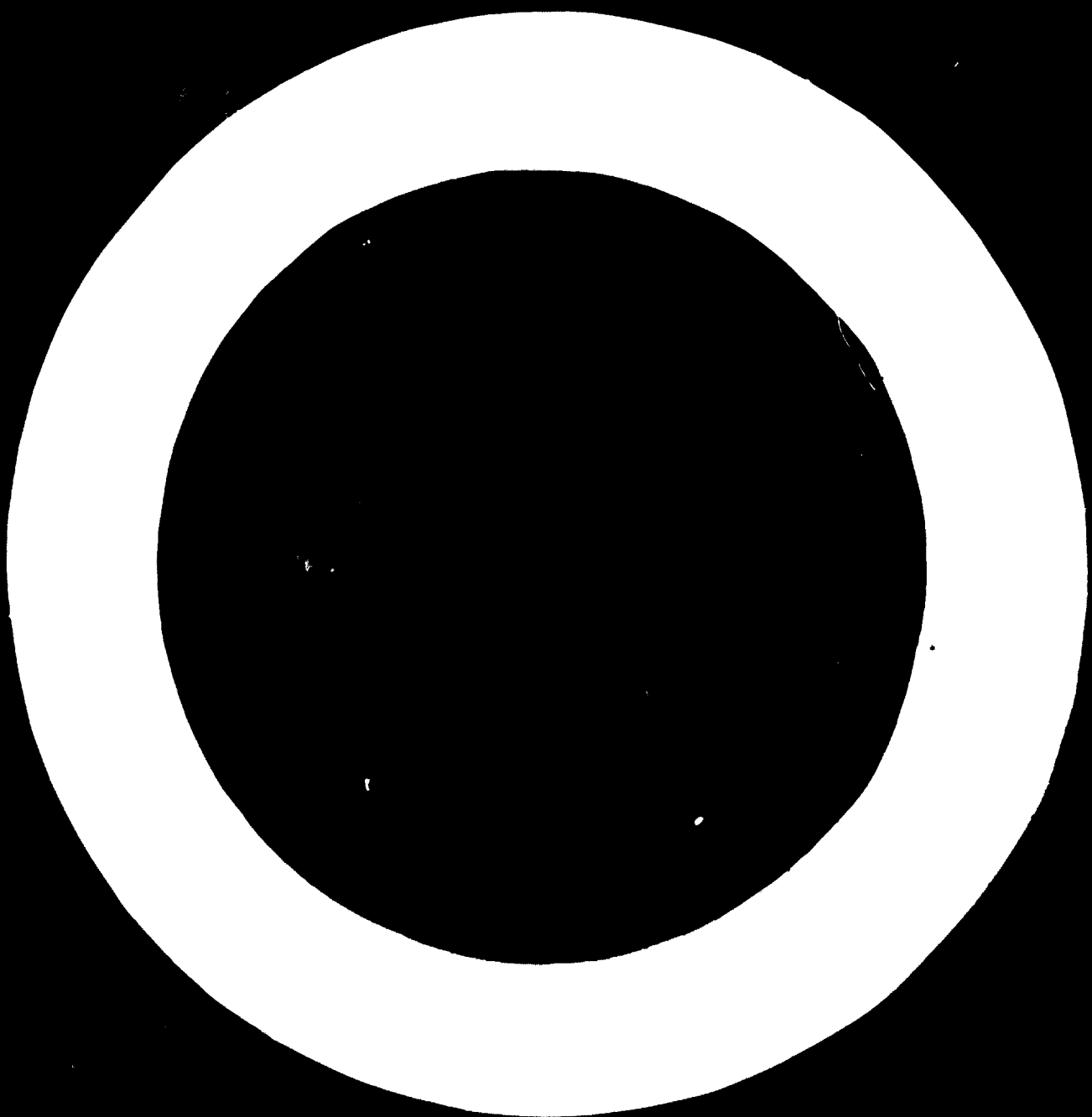
Although the suggested questionnaire is divided into three parts, it should always be kept in mind that they have to be read and filled in as one unit. Since the requested data are frequently not available at one central point of the company, close working relationships will have to prevail between the various technical, economic and accounting departments.

Some companies might not be in a position to supply all the information asked for in the standard questionnaire at the very beginning due to non-availability of data. However, management should feel that the IPEP will in the future prove useful to solve many managerial problems and that therefore measures should be taken to initiate improvements in the collection of technical and accounting data. It should also be recognized that the collected data could be of great importance for industrial planning.

It should be understood by the user of the IPEP questionnaire that this proposed version is only one way of looking at the problem of economic and technical performance evaluation. Many of the attached forms may have to be adapted to the conditions prevailing in the plant under study, since it is not possible to prepare a rigid questionnaire which can generally be applied to all firms.

The IPEP questionnaire for the cement industry is only one in a series which will gradually cover all major industries. The glass, vegetable oil and grain milling industries have already been covered and work is progressing for the food canning and fertilizer (nitrogenous and phosphorous) industries. Steel making, sugar refining, and tobacco and cigarette manufacturing will follow soon.

IDCAS intends to make wide use of the IPEP questionnaire in Arab countries through the General Organization of Industry, Industrial Unions or Federations, Management Development and Productivity Centres or Institutes and Industrial Development and Studies Centres.



ECONOMIC AND FINANCIAL DESCRIPTION OF THE ESTABLISHMENT

This part gives details about the overall economic, financial and cost structure of the establishment under review. It shows the history of investment, the products manufactured and sold in the reporting year, the required material inputs as well as contract and commission work since many industries may need this particular service. Value added should obtain the attention of the experts collecting the data for the standard questionnaire in the field. Fixed assets should be given in as much detail as possible focussing especially on the process equipment leaving, however, the information about existing capacities to Part B, the technical description of the establishment. The calculation of the desired working capital should take account of the actual requirements of the company which are frequently underestimated thus leading to severe liquidity problems during the daily operation of the company.

Of particular significance for a careful analysis of the economic performance are cost accounting data. Even if the establishment uses only financial accounting, efforts should be made to fill in the departmental cost sheet for the production and service cost centres as well as for the general overhead cost centres (distribution, selling and administration).

A summary presentation of the cost of production, the profit and loss account as well as of the financial statement should make it possible to obtain sufficient data which are not only needed for the economic performance evaluation but also for interfirm comparison.

Supplementary information on future plans of the establishments and governmental policies close this part.

Data indicated in Part A will not be repeated in the following parts even if required at each individual stage of the performance evaluation.

EXPLANATORY NOTES

Ad.I.A.: Kind of activity: Indicate the primary product group or the industry under which the establishment (or firm) is classifiable (e.g. in terms of the National Industrial Classification Code)

Year of reference: the year of 19.. is preferred; the years of 19.. and 19.. are acceptable. The business year, not necessarily confirming to the calendar year, is acceptable. Please note that the same year of reference should be maintained throughout the different sections of this study.

I.A. COUNTRY:

KIND OF ACTIVITY:

YEAR OF REFERENCE: from 19 to 19

OWNERSHIP:

( ) Wholly privately owned enterprise

( ) Wholly government-owned enterprise

( ) Semi-governmental enterprise (mixed ownership)

- governmental .....%
- private .....%

If it is a joint venture of foreign and domestic capital indicate the share of each party in the total capital stock:

Domestic .....%

- governmental .....%
- private .....%

Foreign .....%

EXPLANATORY NOTES

Ad. I.: Those business transactions which are not connected with the current productive activities should be excluded (revenue from re-sales, capital gains on investment, inventory revaluation, etc.).

Ad. II.A.: The classification of products in specific products (or group of products) should be given in order of importance of their outputs and in enough detail for a precise indication of the product-mix.
If the establishment (or firm) has a very extensive product-mix, use and additional sheet, if necessary, or classify the products by groups of products.
The following items should be specified under other sales (II.A.1.d.):

- Marketable by-products
- Marketable processing wastes
- Contract and commission work done by subcontractors (see Part A, III.D.)

However, the following items should be excluded from the annual output:

- Scales of scrapped capital assets
- Revenue from re-sales (goods purchased from outside and resold without receiving any further fabrication)

- Nominal capacity output may not be exactly identifiable for all individual products especially when the product-mix of the basic production processes is flexible. For the latter case, indicate approximate capacity output levels achievable with the same pattern of product-mix as the actual.

- Goods produced is defined as the amount of final and intermediate products produced for sale.

- Sales price (per unit e.g. ton) exclusive sales tax refers to the market price applicable to the delivery at factory, excluding any sales tax, no matter whether the latter is actually collected by the establishment (or firm) considered.

- Total value of goods produced in the value of all products which are produced for sale during the 12-month period. Sales tax should be excluded.

- Total value of goods sold: the value of goods actually sold during the 12-month period and which organised partly from annual production and partly from changes in inventories.

Ad.II.B.: Exports are to be listed as part of total sales as mentioned under II.A.

II. PRODUCTION, ANNUAL OUTPUT AND SALES

II. A. QUANTITY AND VALUE OF ANNUAL PRODUCTION AND SALES:

Specific product or group of products (1)	Nominal capacity output (2)	Goods produced (tons) (3)	Goods sold (tons) (4)	Sales price per ton (excl. sales tax) (5)	Total value of goods produced (6)=(3)x(5)	Total value of goods sold (7)=(4)x(5)
1. CLINKER (see Part B, III.A.)						
a - Ordinary Portland						
b - Rapid hardening						
c - Sea water						
d - Low heat						
e - Others (please specify only if more than 5% of sales value)						
....						
2. CEMENT (see Part B, III.B.)						
a - Ordinary Portland						
b - Rapid hardening						
c - Sea water						
d - Low heat						
e - Others (please specify only if more than 5% of sales value)						
.....						
3. OTHER SALES						
a - Crushed limestone						
b - Burned lime						
c - Revenue from contract and commission work for clinker grinding						
d - Others (please specify only if more than 5% of sales value)						
.....						
Total						.....

II. B. EXPORTS:

Total exports within the year of reference. ☐ (000)

Major export products	Unit price f.o.b. for export	Quantity exported	Total value

EXPLANATORY NOTES

Ad.III.: The information considered in this section relates to the material, energy and business service inputs required for the 12-month period considered. Of course, materials purchased on capital account, mainly investment expenditures especially the material used for production of own equipment within the establishment, if any, should not be included here.

Ad.III.A.: - Specific production materials should be listed in terms of normal commercial usage. In the event of particular industry involves packaging as a major process (i.e. food canning and bottling industry), packaging material should be treated as direct production materials. The same applies to petroleum and coal in the petro-chemical and coal chemical industries.
Fees paid for contract and commission work should be entered in III.D and not here.

- Unit of weight or measurement should be expressed in terms of the metric system. When various products are shown as a group, an approximation of the total weight or value is desired.
- Quantity consumed stands for the amount of material consumed within the year of reference, irrespective of whether it was purchased in that period or taken from stocks.
- Information on internal supply is requested only for those materials or semi-finished products which are partly acquired from outside and partly produced by the establishment.
- Unit price as paid by the establishment (or firm) is the price inclusive of freight and insurance costs plus import duties and taxes.
- Total value of purchase C.I.F. corresponds to that part of quantity consumed which has been purchased from external suppliers, excluding the value of internally supplied material (if any).

Ad.III.B.: - Ad.1: Describe in parentheses the major elements of packaging material involved. See also explanations under III.A.

Ad.2: Parts and supplies used for regular maintenance of production equipment (including miscellaneous hand tools not considered as capital assets) are distinguished from production materials and entered here.

Ad.3: Other materials and supplies used for non-manufacturing activities refer primarily to those used in administrative work.

Ad.III.C.: - For the column headings, see the notes for III.A.

Ad.III.D.: - If there is any <u>contract and commission work</u> performed by subcontractors on the materials supplied by you, enter the total fee paid during the year considered. See e.g. Part B.III.A.5.

Ad.III.E.: - Ad.2: Of this item, <u>other business services purchased may include</u>:

- legal and consulting costs
- insurance fees (other than those included in the c.i.f. costs of production materials)
- expenses for training services purchased
- executive expenses (e.g. business entertainment, staff travel allowances, etc.)

However, the following items should be <u>excluded</u> from this sub-section:

- non-wage, non-salary payments to workers (e.g. subsidies for housing, transportation, cafeteria and other welfare activities (IV A.4.)
- rentals (IV.A.5.)
- royalties paid (IV.A.6.)
- sales taxes and other indirect business taxes (IV.A.7.and 8.)
- income taxes withheld and to be paid
- dividends.

III. ANNUAL CONSUMPTION OF MATERIALS AND ENERGY

III. A. DIRECT PRODUCTION MATERIALS:

Specific production material	Unit	Quantity consumed		Unit price (000)	Total value of purchase c.i.f. (000)	% im-ported	Import duties (000)
		Purchase	Internal supply				
Total value							

III. B. OTHER MATERIALS AND SUPPLIES:

1. Auxiliary material (_____)
2. Factory supplies
3. Other materials and supplies for non-manufacturing activities (e.g. office supply)

Total value

III. C. ENERGY AND WATER:

Running materials	Unit	Quantity consumed		Unit price (000)	Total value of purchase c.i.f. (000)	% im-ported	Import duties (000)
		Purchase	Internal supply				
1. Electricity	000 kWh						
2. Solid fuels:							
- _____	t						
- _____	t						
- _____	t						
3. Liquid fuels and lubricants:							
- _____	t						
- _____	t						
- _____	t						
4. Gas	000 m3						
5. Steam	000 m3						X
6. Water	000 m3						
Total value							

III. D. CONTRACT AND COMMISSION WORK:

Total fee for commission and contract work performed by subcontractors

III. E. BUSINESS SERVICES PURCHASED:

1. Transport, storage, insurance
2. Communications (e.g. postal fees), advertisements and other business service purchased

Total value of business services purchased:

EXPLANATORY NOTES

Ad.IV.: In case the establishment is a branch of a larger enterprise and is dependent on the central office for some of the cost and financial data, it may not have adequate branch accounts on all the items in this section. Rents, interests, royalties, corporate income, etc. would then be estimated only on an imputation basis. But even such estimates, if crude, are important for the purpose of this study, i.e. to grasp the value added generated by the productive activities of the establishment.

Ad.IV.A. - Ad.1: The classification of workers and employees according to primary and secondary production cost centres as well as the service cost centres is given in part B of the questionnaire. Salaries and wages should be shown inclusive of income tax but exclusive of social security contributions.

Ad.3: All the social security contribution, whether they are wholly or partly included in the nominal gross wages and salaries, should be isolated here.

Ad.4: Non-wage, non-salary payments to workers and employees are payments for expenditures such as:
- Working clothes and similar supplies to workers
- Enterprise's subsidies on housing
- Transportation
- Other welfare activities

Ad.7: Sales tax normally includes:
- tax that accrues when sales take place, and
- tax that accrues as production takes place

In the event raw material taxes are charged as a part of production tax (or production tax is calculated on the basis of materials used or purchased), indicate this kind of tax accrual, if these values are not yet included in the purchase value, c.i.f. of the material (see III.A. and III.C.). It is particularly important that these taxes be adjusted to reflect the annual accrual over the year considered instead of the taxes actually paid during the year.

Ad.8: Other indirect business taxes include those that reflect neither current production nor profit as actually reported in the firm's profit and loss statement. But this study needs the figure representing the profitability of the firm's or establishment's productive activities, properly adjusted by excluding from the estimates of annual productive revenue and cost
- capital gains on investment
- re-sale of goods
- inventory revaluation, etc.

Ad.13: If there is any particular depreciation policy being followed (either to accelerate or to defer depreciation), please describe it in the footnote space at the bottom.

IV. VALUE ADDED

	Value in 000
1. Annual wages and salaries of (for ☐ persons) workers and employees of primary and secondary production cost centres	+
2. Annual salaries and wages of (for ☐ persons) employees and workers of service cost and general overhead cost centres	+
3. Social security contributions	+
4. Non-wage, non-salary payments to workers	+
5. Rents payable or borrowed capital assets	+
6. Interests on loans and royalties paid	+
7. Sales tax	+
8. Other indirect business taxes:	
- _____	+
- _____	+
- _____	+
9. Corporate income before tax	+
Subtotal	=
10. (-) Subsidies	-
11. Net value added	=
12. Annual depreciation:	
- Machinery and equipment	+
- Factory and office facilities	+
- Buildings	+
- Non physical capital assets	+
	=
Gross value added	+
	=

EXPLANATORY NOTES

Ad.V.: The section relates to the existing physical fixed capital assets in the establishment (or firm) whether purchased new or second hand or produced by the establishments on facilities.

- In the case of a branch establishment, which is dependent on the control office for the book-keeping of the data on assets, attempts should be made to produce the best estimates possible on the basis of the branches inventory as well as the records as may be kept at the firm's central office.

- Both total original and replacement value of each specific type of fixed capital assets should be given.

- The original purchase is defined here so as to provide an idea as to how much it would cost if the existing asset were replaced by new functional equivalent. The age of the asset and the speed at which the wholesale price of similar assets have been rising in the past will thus be the major factors responsible for the gap between the original purchase and replacement value. In some cases the fire insurance value may provide a basis for arriving at a sensible estimate for the replacement value. Even rough estimates are acceptable for our purposes. If the physical asset is so old that its functional equivalent can no longer be found in today's market write simply "Obsolete" under replacement value. If a given type of equipment involves two or more units of different age, indicate the average age.

Ad.V.A.: Land improvements are e.g. the levelling of the ground, clearing away of nettles, filling of holes, etc.

Ad.V.B.: The value of building should be accounted together with construction work involved but exclude insofar as possibles
- value of land (V.A.)
- value of operative auxiliary facilities (V.D.)

Ad.V.C.: For the purpose of this study each major process equipment should be itemised with a view to indicating the core processing equipment that is crucial in determining the capacity of each proceeding shop, and the quality of the products processed. For this purpose, it is advisable to select and list major items in order of the primary and secondary production cost centres as described in Part B. Such listing will be facilitated by distinguishing specialised processing equipment (to be listed under C.2.)
Note that the capitalised value of process equipment would include:
- duties and taxes paid at the time of its purchase
- transport and installation service costs. It is desirable to separate, if only by approximation, the transport and installation costs from the purchase price of the equipment and indicate it in V.C.4.

Ad.1: Specialised machines and equipment are those which are designed specifically for the use in a particular industry and are typical for the manufacturing of the group of products considered.

V. FIXED CAPITAL ASSETS

	Number	Total original purchase value in 000	Total replacement value in 000	Average age
V.A. LAND:				
1. Land (Total acreage: ____ m2)				X
2. Land improvements				X
V.B. BUILDINGS:				
1. Primary industrial buildings (Total floor space: ____ m2)				
2. Auxiliary buildings (power plant, laboratory, mechanical shops and garages etc.				
3. Warehouses				
4. Office and administration buildings				
5. Housing				
Total value of land and buildings:				X
V.C. PROCESS EQUIPMENT:				
1. Specialized machines and equipment:				
Subtotal				X

EXPLANATORY NOTES

Ad.V.C.- Ad.2: - Common type of machines and equipment, no matter if custom made, the type which can be widely used in many industries with limited modifications, such as:
- transporting solids (cranes, conveyors, hoists, etc.)
- power-drivers purchased separately
- industrial pumps, compressors, blowers, etc. of general types
- dressed lumber, tanks and other containers
- weighing, cleaning, packing equipment of general types
- machines and equipment in auxiliary facilities (e.g. power-driven hand tools, metal working, welding, cleaning machines for repair and maintenance shops)

- It is preferable to group major types of common equipment for each production cost centre

Ad.3: - Hand tools and small apparatuses refer here only to those which are considered as capitalized assets; miscellaneous hand tools and machine accessories treated similarly to consumable supplies should be excluded here (see III.B.2)

Ad.4: - Cost of installation relates to the part of the capitalized cost of equipment that occurred at the installation phase of machinery and equipment. It consists of the cost of labour and technical services as well as transportation and installation materials. These costs may not be readily available in older establishment. However, please attempt to provide an estimate of these costs wherever possible, and especially when such installation costs are believed to be an important part of the equipment value.

Ad.V.E.: Other fixed assets include all remaining items which are nowhere else listed (intangible capital assets; firms organizational costs, capitalized patents, etc.)

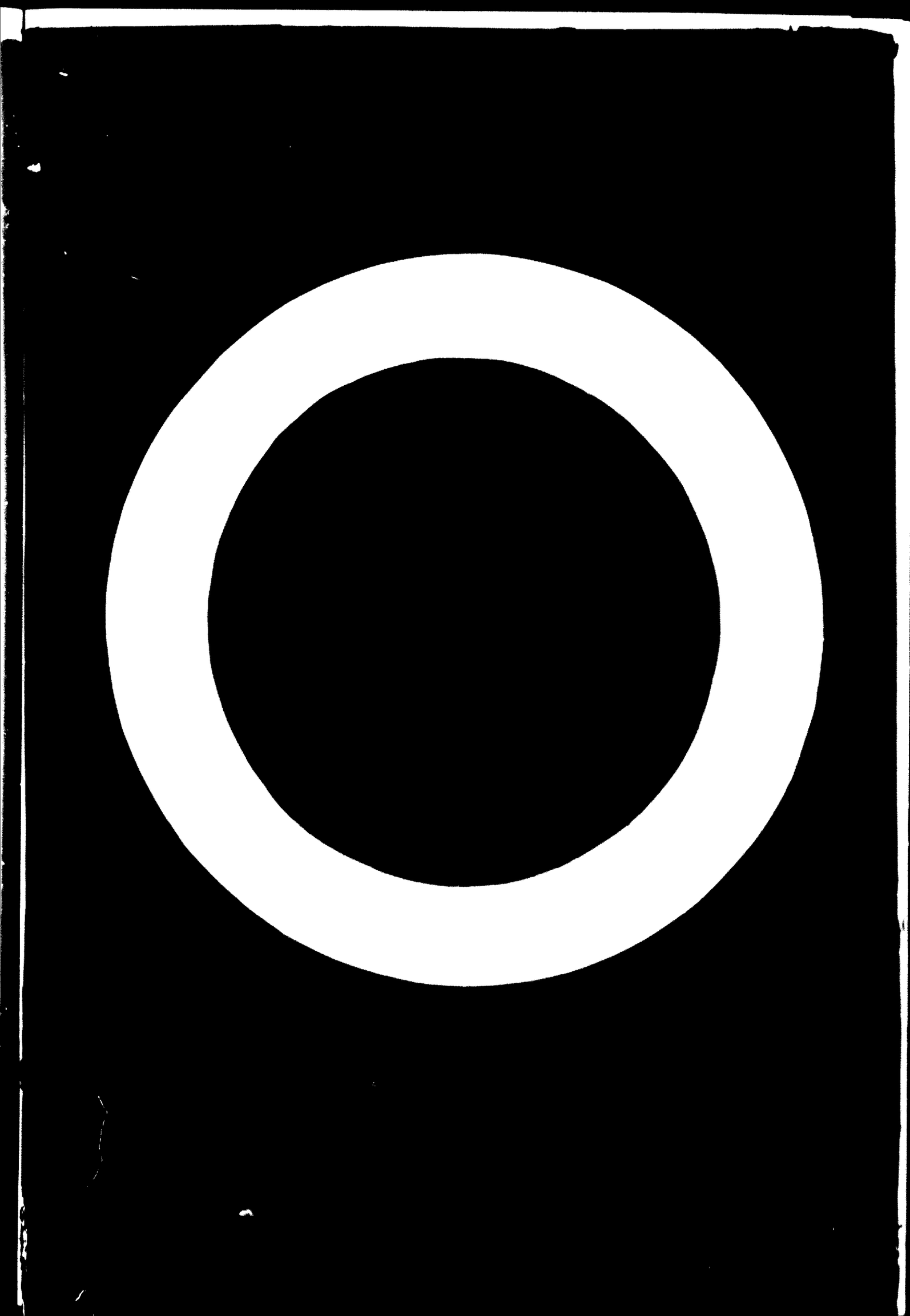
	Number	Total original purchase value in 000	Total replacement value in 000	Average age
Carry over				X
2. Common type of machines and equipment:				
3. Hand tools and small apparatuses:	X			X
4. Cost of installation (if separable):	X			X
Total value of process equipment:				X
V.D. AUXILIARY FACILITIES:				
1. Internal power equipment (excluding building) (Water, steam and/or electricity)				
2. Laboratory facilities (excluding building)				
3. Means of transportation				
Trucks and similar vehicles (Total load: ☐ t)				
Other vehicles (Total load: ☐ t)				
4. Office equipment (e.g. office furniture)				
V.E. OTHER FIXED CAPITAL ASSETS			X	X
Total V.A. to E.				

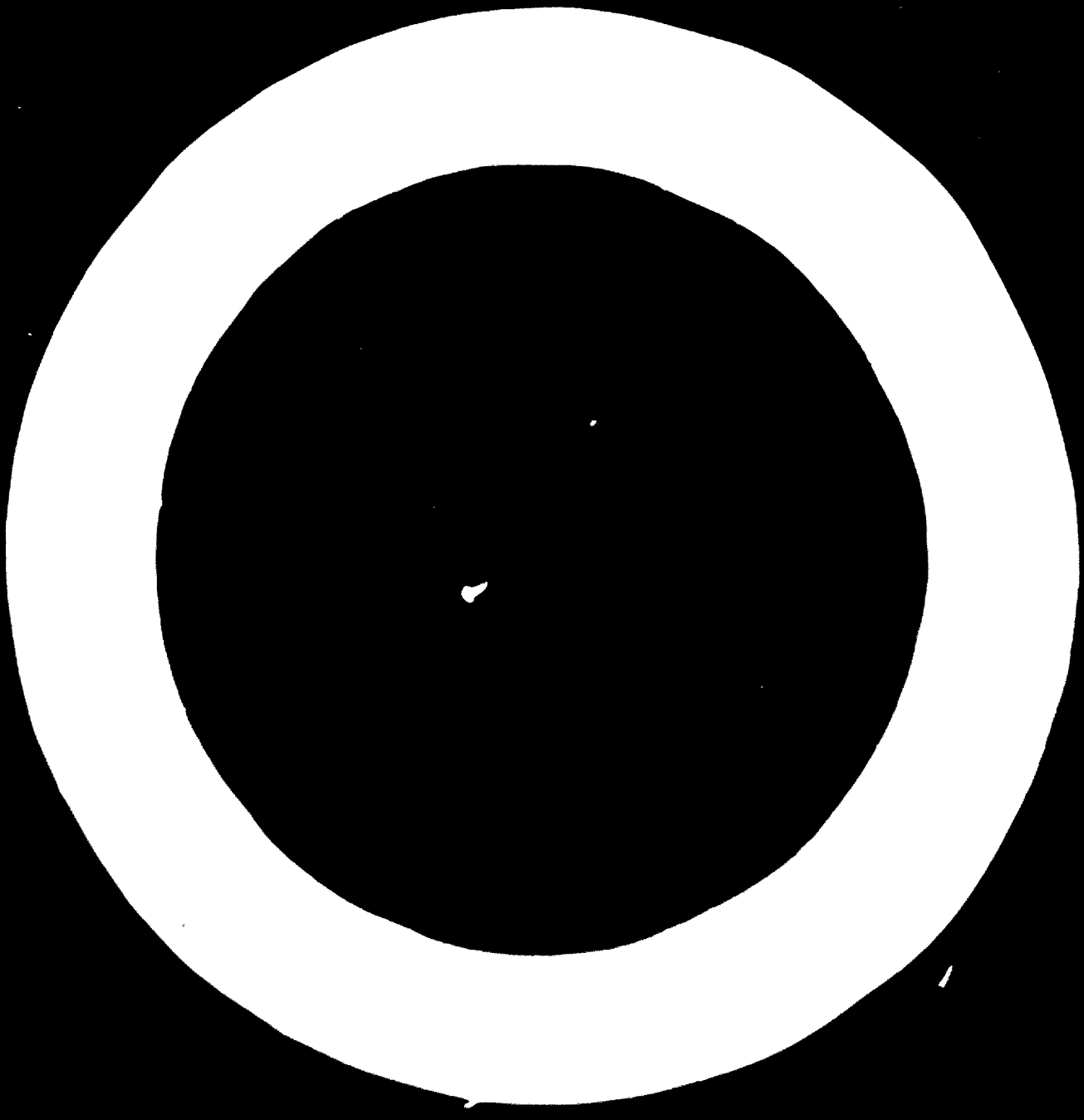
EXPLANATORY NOTES

Ad.VI. A. and B.: The annual average of inventories and liquid assets may be estimated from the records of the plant relating two or more points of time during the year (monthly, quarterly or half-yearly). If the records are available only for a particular date in the year considered, strike out "average" and indicate the date.

Ad.VI.C.: - Total working capital requirements may or may not deviate much from the total value of actual inventories and liquid assets. What is asked here is a diagnostic review of what ought to be considered as the normal working capital requirements for the current scale of production under the normally expected conditions of market in the country or region considered.

- The equivalent number of months refers to the magnitude of the desired working capital relative to the normal monthly allowances for respective items.





VI.A. INVENTORIES (average):

	Value in (000)
- Production materials	.....
- Other materials and supplies	.....
- Work-in-progress	.....
- Finished products	.....
Total average inventories	.....

VI.B. LIQUID ASSETS (average):

- Cash on hand and in bank	.....
- Marketable securities and bonds	.....
- Accounts receivable from delivery of goods and services	.....
- Other accounts receivable	.....
- Prepaid expenses	.....
Total average liquid assets	.....

VI.C. DESIRED WORKING CAPITAL:

Working capital requirements to be considered under current business conditions are as follows:

	Value in (000)	Equivalent number of months
- Production materials	.....	.....
- Other materials and supplies	.....	.....
- Finished products	.....	.....
- Wages for primary operative workers	.....	.....
- Other wages and salaries	.....	.....
- Training costs	.....	.....
- Administrative costs, sales costs and contingencies	.....	.....
- Other special items		
_____	.....	.....
_____	.....	.....
Total desired working capital	.....	

EXPLANATORY NOTES

VII. DEPARTMENTAL COST CENTRES: Table 1.

The production process should be broken down into the various production departments and auxiliary departments which for accounting purposes should correspond to production and service cost centres.

The example of the departmental cost sheet might not always correspond to the conditions prevailing in each plant and should therefore be changed accordingly particularly with regard to the break down into production and service cost centres. The situation might occur where proper cost accounting data are not available in the company but only data from the financial accounts. In this case it is suggested to first fill in the "total amount column" based on the financial accounting data. An attempt should then be undertaken to estimate the distribution of the different material, labour and overhead cost items on the production and service cost centres, distribution, selling, administration and finance existing in the plant. As a guide to this suggested distribution all those cost centres which should be charged with a proportion of the total amount of the various cost items are marked with "x". If this guide is followed it will be possible to distribute all cost items directly and to obtain a picture about the total costs accrued in each production cost centre, service cost centre, in the distribution, selling and marketing department as well as in the administration and finance department during the accounting period.

The attached proposal of a departmental cost sheet has been designed along the following lines:

- Horisontally, Table 1. lists the different cost centres which are responsible for production, services, distribution, selling and marketing, administration and finance.

- Vertically, Table 1. shows the cost items related to material, wages and overheads.

EXPLANATORY NOTES

(VII. Table 1.)

NOTES REGARDING COST ITEMS LISTED IN TABLE 1.

1. The cost of materials (items I: 1,2,3,6,7) issued to cost centres should be based on "net invoice price" for local purchases and CIF for imports plus custom duties and transport inwords.

2. Power, Heat and Light as well as water (item I: 5,6) purchased from local authorities should be charged to the respective cost centres at the actual prices charged by such authorities.

3. Temporary Labour (item II: 1) is usually compensated on the basis of global rates to which no labour-related costs are attached. Temporary labour cost should be stated separately for managerial purposes.

4. Expenses incurred for contractual maintenance (item III: 1) work may be directly charged to the specific cost centre with which it can be clearly identified. Otherwise, such expenses may be charged to the maintenance cost centre for subsequent apportionment.

5. Contractual freight expenses (item III:2) inourred for the transport of raw materials should be included in the purchasing price of this commodity. Contractual freight expenses incurred for the delivery of the final product should be charged to the distribution cost centre.

6. Insurance premium (item III: 3) should be apportioned to the various cost centres on the basis of the total value of assets insured in each centre. For simplicity reason they may be charged to Administration.

7. Depreciation (item III: 4) should be calculated on the basis of the original value of fixed assets according to the methods and rates adopted by management. Such methods and rates should be stated in a footnote.

8. Rent is normally limited to the rent of warehouses and offices and should accordingly be charged to these cost centres (e.g. Administration). In rare instances, however, the entire factory may be rented.

9. Travelling expenses (item III: 5) may be allocated to "Selling and marketing" and "Administration and Finance" according to the nature of the assignment.

10. Other expenses comprise all items not previously mentioned. These should be analysed and charged to the proper cost centres.

EXPLANATORY NOTES

(VII. Table 1.)

1. Production Cost Centres are those areas of activity within the cement factory where industrial operations are performed with the purpose of producing cement. These cost centres are:

a - Quarry
b - Crushing
c - Raw mix preparation
d - Clinker production
e - Cement grinding
f - Cement storage and handling

2. Service Cost Centres are those areas of activity which render the various services necessary for the smooth running of the plant.

The following service cost centres are commonly found in a cement factory:

a - Social Services: including housing, health service, canting, transport, company food stores, etc.

b - Plant Management: of production workshops

c - Off-site Transport: all transport activities which are not related to connected production processes

d - Purchasing: of raw material, spare parts and other supplies

e - Stores: for purchased raw materials, spare parts, packing materials, supplies and equipment

f - Repair and Maintenance: of machinery and equipment, buildings, vehicles, etc.

g - Power, Heat and Light: for productive and general use

h - Research and Development

i - Water supply: in case of company's own supply

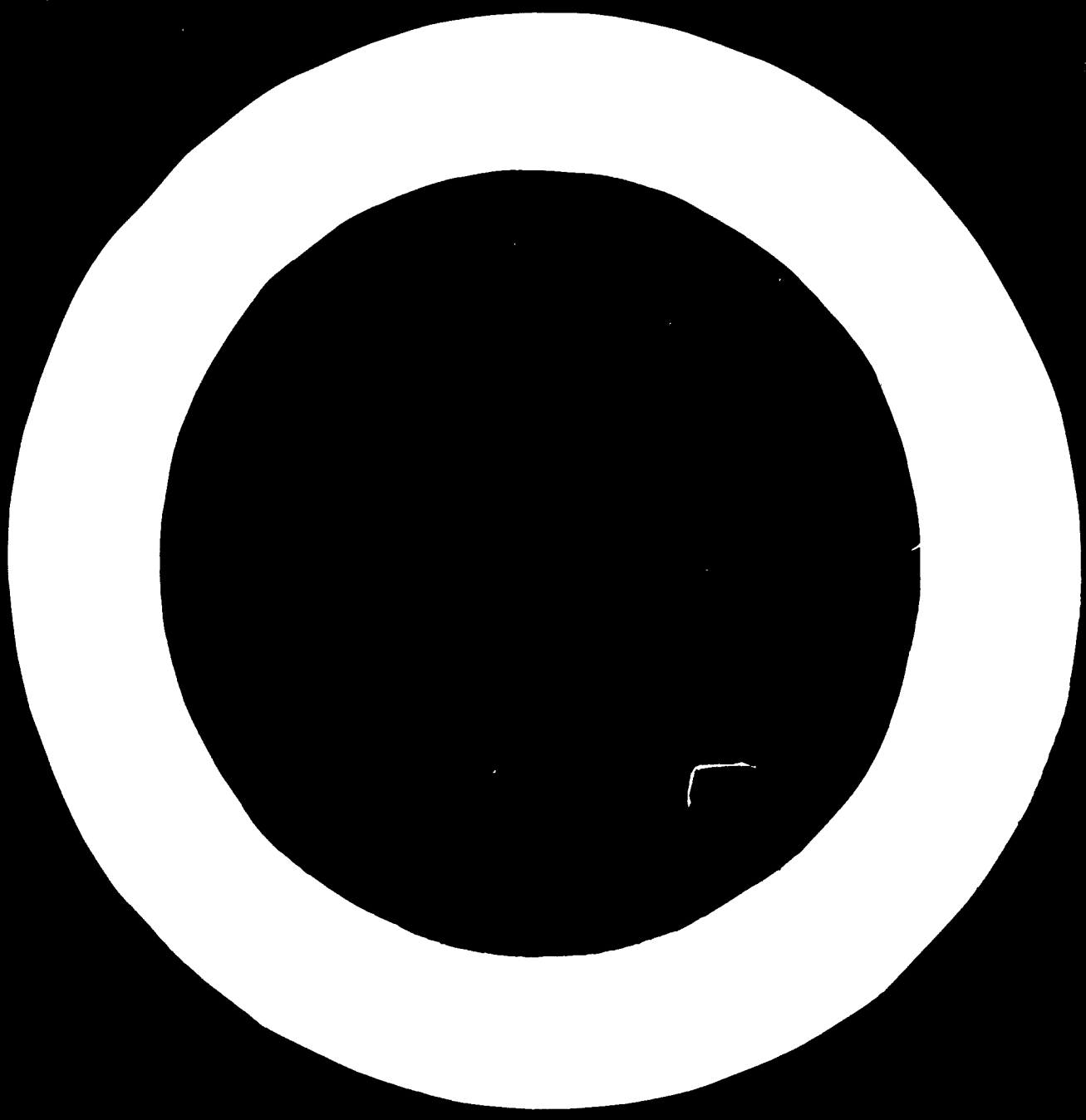
j - Laboratories: process control

Changes may be made according to the actual organisational structure of the factory under study.

3. Distribution, selling and marketing are responsible for all distributional activities from the time the cement products have been placed in a salable condition until they are converted into cash.

4. Administration and Finance comprise all activities related to managerial planning, control, and performance evaluation. Again, practice varies with respect to the number of centres to which these activities are actually assigned. Larger factories maintain specialised centres for planning, budgeting, costing, statistics, personnel training, accounting and finance. Smaller factories have a fewer number of such centres. Hence, it is suggested to accumulate all expenses related to administration and finance in one centre under this designation.

NOTE: Distribution, selling and marketing, as well as Administration and Finance may be considered as General Overhead Cost Centres.



CEMENT MILL Table 1

VII. DEPARTMENTAL COST SHEET

COST ITEMS	Total amount (a)-(f) + (1)-(1) + (h)-( )	[illegible] CENTRES							SERVICE					
		Quarry (a)	Crushing (b)	Raw mix preparation (c)	Clinker production (d)	Cement grinding (e)	Cement storage + handling (f)	Total prod. cost centres (a)-(f)	Social services (1)	Plant management (2)	Off-site transport (3)	Purchasing (4)	Stores (5)	[illegible] ( )
I. MATERIALS														
1. Direct prod. mat.														
Limestone			x											
Clay			x											
Sand														
Gypsum						x								
Iron oxyde														
2. Auxil. materials														
Explosives		x												
Refractory bricks					x									
Grinding media				x		x								
3. Factory supplies														
Lubricants		x	x		x	x	x				x			x
Spare parts+ mainten.		x	x	x	x	x	x				x		x	x
Other fact. supplies		x	x	x	x	x	x							
4. Power, heat + light														
Fuel (mazut)				x	x									
Fuel (gasoline)		x									x			x
Electricity		x	x	x	x	x	x		x	x	x	x	x	x
5. Water supply		x	x	x	x	x								x
6. Packing material							x							
7. Other material														
Office supplies										x				
II. LABOUR														
1. Production wages + salaries														
Basic wages)														
Social security)														
Health insurance)		x	x		x	x	x							
Prod. bonuses)														
Overtime)														
Temporary labour)														
2. Services, sales + administration wages and salaries														
Basic)														

SECTION 1

Period from ..... to .. ..

ITRES			SERV					COST CENTRES						GENERAL OVERHEAD COS			ENTRES
	Cement storage + handling	Total prod.cost centres	Social services	Plant management	Off-site transport	Purchasing	Stor	Repair + maintenance	Power, heat + light	Research + development	Water supply	Laboratories (process control)	Total service c.centres	Distribution	Selling and marketing	Admin. trat. fina.	Total general overhead cost centres
	(f)	(a)-(f)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(1)-(10)	(h)	(i)	(	(h)-(j)
	x				x			x	x	x	x	x					
	x				x		x	x	x	x	x	x					
	x																
					x			x						x	x	x	
	y		x	y	x	y	x	x	x	x	x	x		x	x	y	
								x		x	x	x					
	x																
				y										x	x	x	
	y																
			y	y	y	y	x	y	x	x	x	x		x	x	x	

SECTION 2

Social security)													
Health insurance)		x	x		x	x	x						
Prod. bonuses)													
Overtime)													
Temporary labour)													
2. Services, sales + administration wages and salaries													
Basic)													
Social security)								x	x	x	x		x
Health insurance)													
Bonuses)													
Overtime										x			x
II. OVERHEAD													
1. Maintenance (contr.)													x
2. Freight (contractual)													
3. Insurance													
4. Depreciation													
Buildings		x	x	x	x	x	x	x	x	x	x	x	x
Machinery + equipm.		x	x	x	x	x	x						x
Office equipment													
5. Admin. expenses													
Communication											x		
Travel											x		
Others													
6. Rent													
7. Taxes													
Sales tax													
Property tax													
Indir. business taxes													
Licences + fees													
8. Interest + other financial expenses													
9. Royalties													
10. Commissions													
Sales													
Purchasing											x		
11. Other expenses													
TOTAL (directly allocated costs)													

SECTION 3

SECTION 4

EXPLANATORY NOTES

VII. DISTRIBUTION OF SERVICE COST CENTRES: Table 2.

The amounts accumulated in each of the columns shown in the departmental cost sheet indicate the "directly allocated costs" for each centre. Such totals, however, do not represent the full cost of operations as performed by these centres.

Service cost centres do not take part in production, but only provide essential services to those centres performing the main functions of the plant. Consequently, the expenses incurred for the operation of service centres must first be distributed to those centres benefitting from their services. For this purpose Table 2. "Distribution of Service Cost Centres" should be used. The basis of distribution is indicated in the last column of this table.

Table 2. "Distribution of Service Cost Centres" is only an example, and will have to be changed according to the answers in section B trying to follow the principles laid down on page 1, part B and page 1, part C.

(CEMENT MILL)

VII. DISTRIBUTION OF SERVICE COST CENTRES Table 2

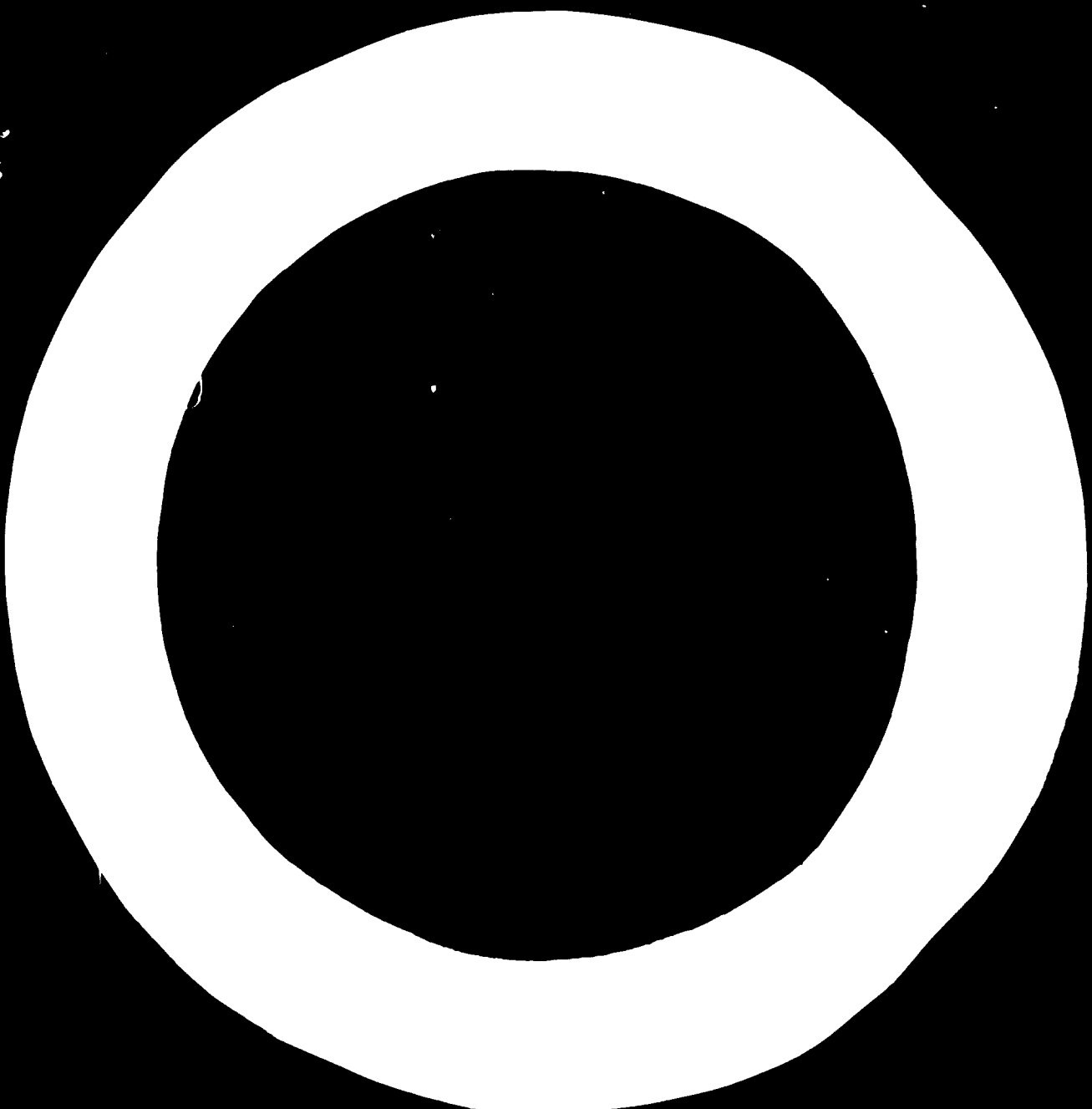
	SERVICE COST CENTRES							
	Social services	Plant management	Off-site transport	Purchasing	Stores	Repair + maintenance	Power, heat + light	Research + development
Directly allocated costs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Apportionment of service c. centres								
Social services	—	x	x	x	x	x	x	x
Plant management		—	x	x	x	x	x	x
Off-site transport			—					
Purchasing				—	x			
Stores					—	x	x	x
Repair + mainten.						—	x	x
Power, heat +light							—	x
Research + develop.t								—
Water supply								
Laboratories (process control)								

(CEMENT MILL)

VII. DISTRIBUTION OF SERVICE COST CENTRES Table 2

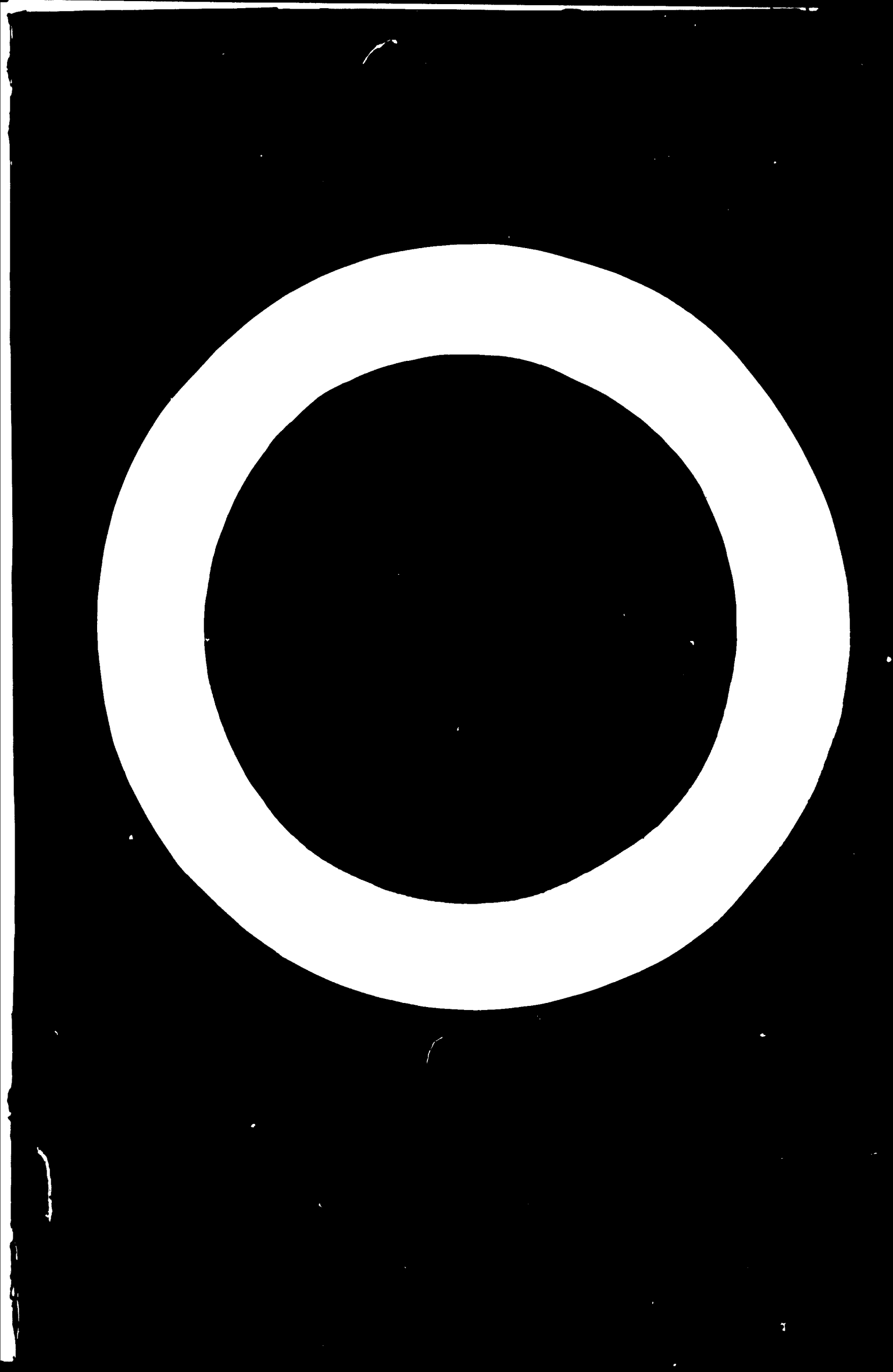
Period from ..... to .....

	SERVICE COST CENTRES										PRODUCTION COST CENTRES							GENERAL OVERHEAD COST CENTRES			
	Social services	Plant management	Off-site transport	Purchasing	Stores	Repair + maintenance	Power, heat + light	Research + development	Water supply	Laboratories (process control)	Quarry	Crushing	Raw material grinding	Raw mix	Clinker production	Cement grinding	Cement storage handling	Distribution	Selling and marketing	Administration + finance	Distribution basis
Directly allocated costs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	
Apportionment of service c. centres																					
Social services	—	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Number of employees
Plant management		—	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Number of employees
Off-site transport			—								x							x			Ton kilometer
Purchasing				—	x					x		x	x	x	x	x	x	x			Value of purchase
Stores					—	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Value of issued material
Repair + mainten.						—	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Maintenance man-hours
Power, heat +light							—	x	x	x	x	x	x	x	x	x	x	x	x	x	Kilowatt hours
Research + develop.t								—			x	x	x	x	x	x	x				Number of specimens examined
Water supply									—	x	x	x	x	x	x	x					Quantity consumed
Laboratories (process control)										—	x	x	x	x	x	x					Number of specimens examined



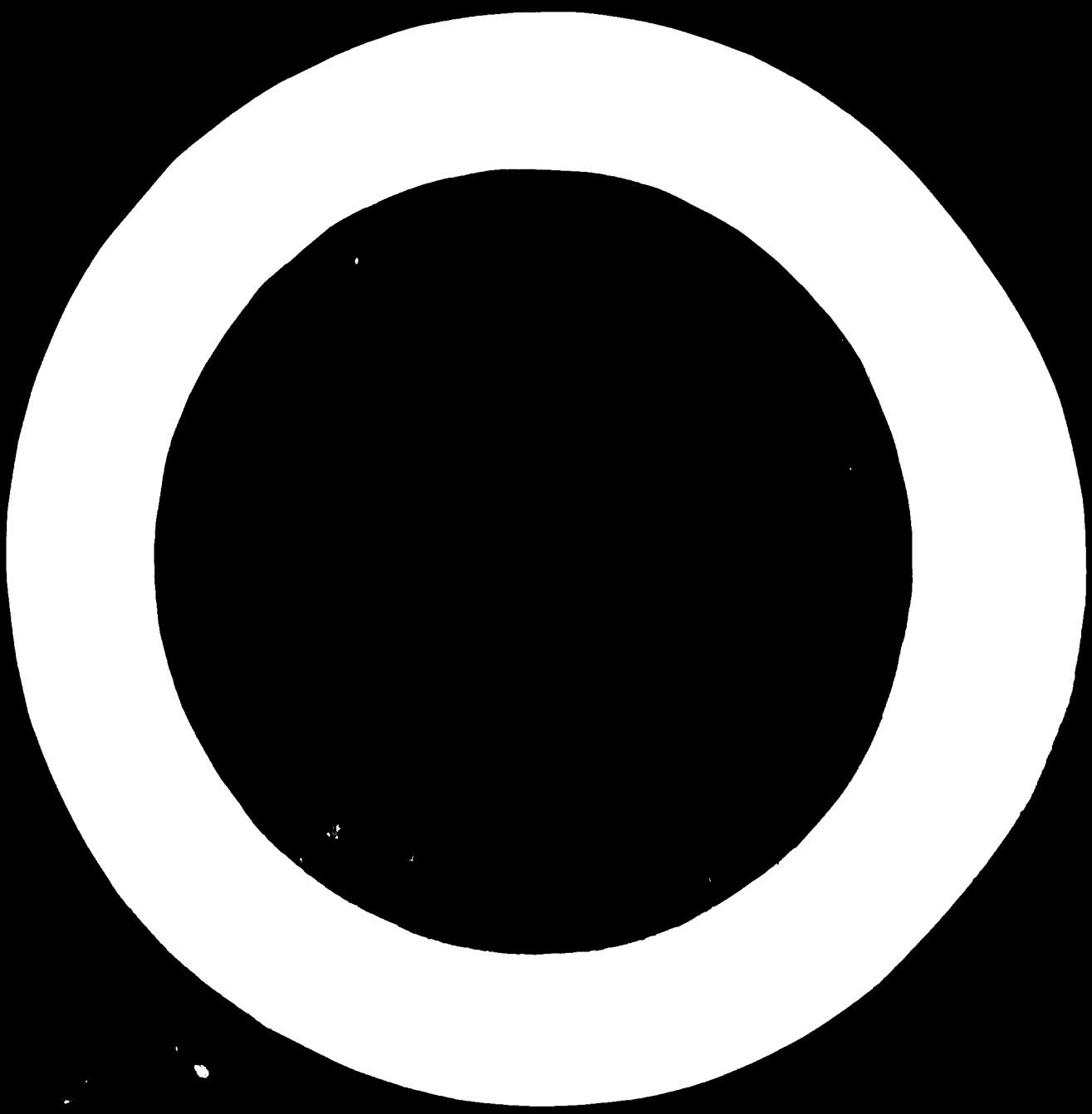
III. COST OF PRODUCTION

	Value in '000
1. Quarrying cost	+
2. Crushing cost	+
3. Raw mix preparation cost	+
4. Clinker production cost	+
5. Cement production cost	+
6. Packing and loading cost	+
7. Kraft bags	+
8. Total production cost of cement (1,2,.....7)	=
9. Add: Inventories of finished goods at beginning of the year	+
10. Subtotal (8 and 9)	=
11. Subtract: inventories of finished goods at the end of the year	-
12. Production cost of goods sold	=



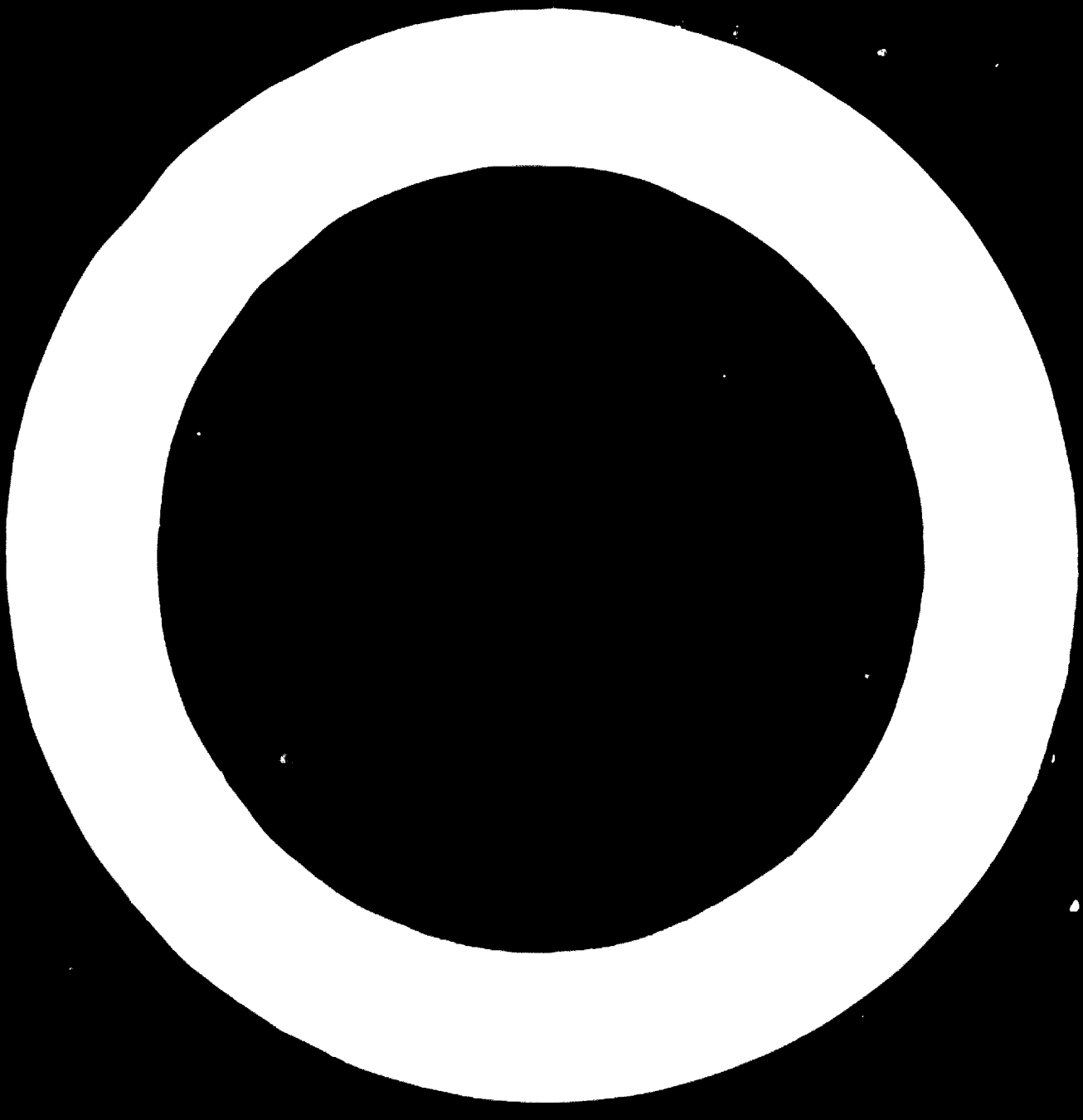
IX. SUMMARY PROFIT AND LOSS ACCOUNT

	Value in 000
1. Sales	+
2. Subtract production cost of goods sold (see Part A.VIII.12.)	−
3. Gross profit (1-2)	=
4. Warehousing and distribution costs	+
5. Selling costs	+
6. Administration costs	+
7. Subtotal (4+5+6)	=
8. Trading profit (3-7)	−
9. Subtract: Financial expenses	=
10. Subtotal (8-9)	−
11. Add: non-trading income	=
12. Net profit before taxes (10+11)	+
13. Subtract: taxes	=
14. Net profit after taxes (12+13)	−
	=



X. SUMMARY FINANCIAL STATEMENT

	Value in '000
ASSETS	
1. **Current Assets**	
a) Material inventory	+
b) Work-in-progress	+
c) Finished goods stocks	+
d) Debtors	+
e) Others	+
2. **Fixed Assets**	
a) Land and building	+
b) Machinery and equipment	+
c) Vehicles and other fixed assets	+
3. **Non Trading Assets**	+
4. **Total Assets**	=
SOURCES OF FINANCE	
1. Creditors	+
2. All other current liabilities	+
3. Long term debts	+
4. Net worth (i.e. owners' capital and reserves)	+
5. Total capital	=



XI. A. FUTURE PLAN:

Are major capital investments planned in the next five years? ( ) yes ( ) no

1. If yes; proposed investment period: [-]

2. Approximate amount of investment: [ ] (000)

3. Type of investment: (Check the relevant cell)

	Product mix	Process machinery and equipment	Other primary production facilities	Auxiliary production facilities	Administrative and welfare facilities
Replacement investment for		( )	( )	( )	( )
New additions to	( )	( )	( )	( )	( )
Technological improvement of	( )	( )	( )	( )	( )

4. Are these investments likely to be accompanied by an increase or decrease in man-years? ( ) yes ( ) no

a. If yes; how many man-years?

	First shift	Second shift	Third shift	
Primary operatives				man-years
Auxiliary operatives				man-years
Management and administration				man-years

XI. B. EXTERNAL CONDITIONS:

1. Use the following key to describe external conditions:

(a) excellent
(b) fair
(c) poor
(d) insignificant

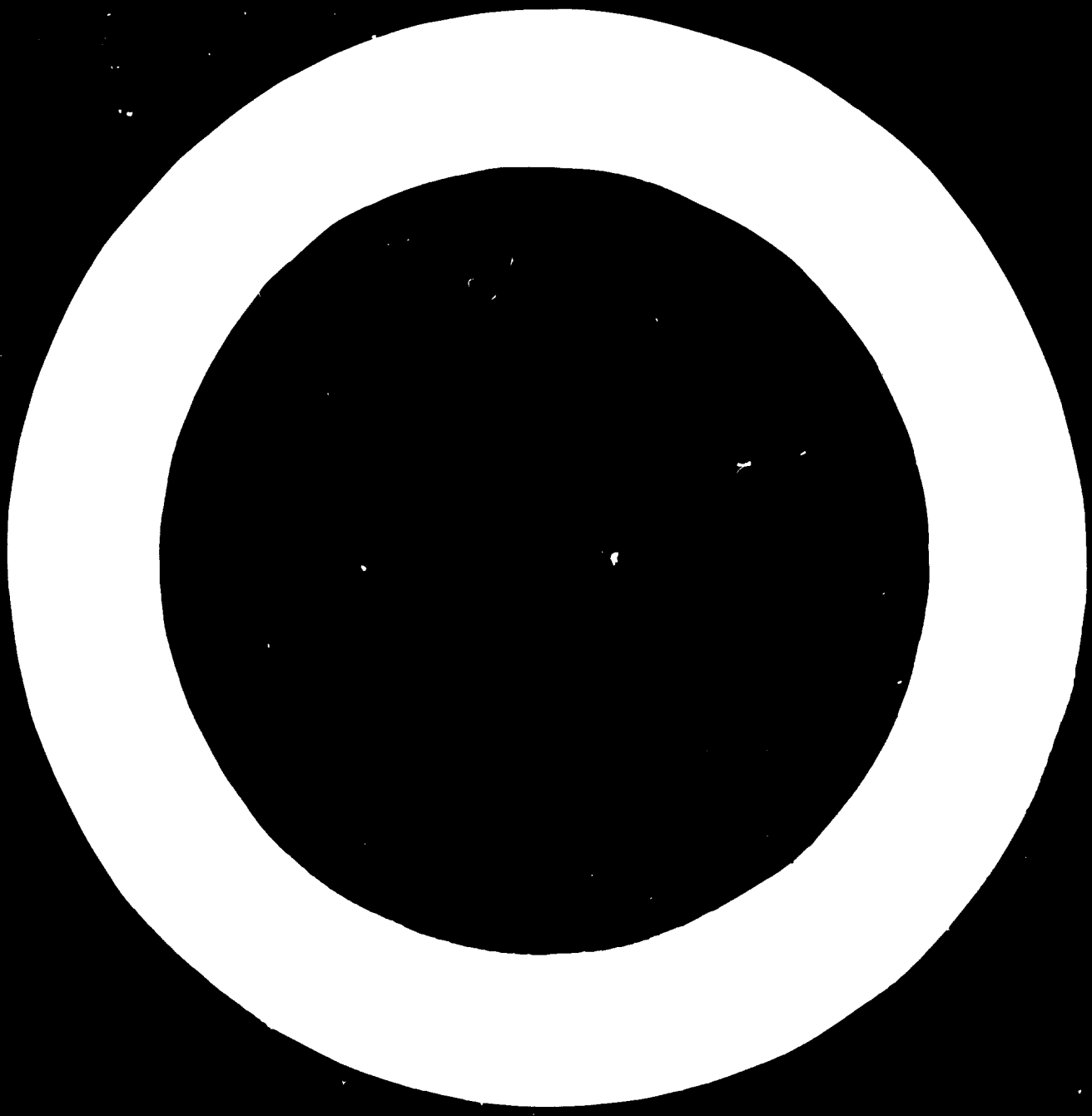
Transport		Outlets		Community	
External long distance	( )	Electricity	( )	Residents	( )
Internal long distance	( )	Water	( )	Health and recreation	( )
Local and city	( )	Gas	( )	Education	( )

2. If any of the above is rated "poor" describe the extent to which it adds to the enterprise's current operating costs: _____

XI. C. GOVERNMENTAL POLICIES:

1. Specific governmental policy measures, federal or local, particularly affecting the profitability of the enterprise: _____

2. Desirable and reasonable policy measures which, if effected, would affect more favourably the viability of your enterprise and related activities: _____



TECHNICAL DESCRIPTION OF THE ESTABLISHMENT

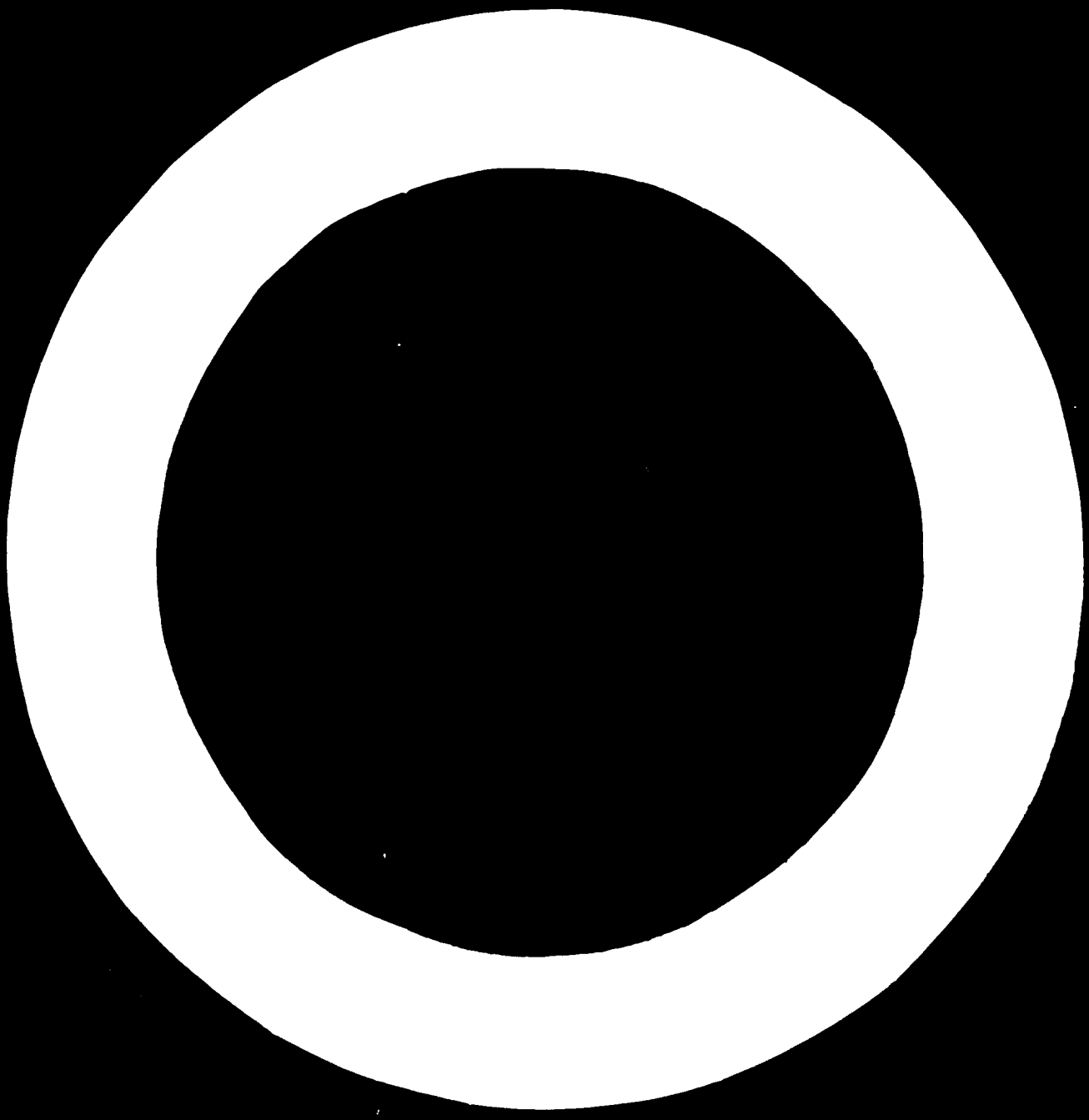
This part of the questionnaire is prepared for the collection of technological data on the plant. Keeping in mind that no two clinker and/or cement plants are identical, the management filling in the questionnaire should make the required additions or deletions to the various columns and lines of the questionnaire in order to provide a complete picture of the cement plant. In addition, management is encouraged to add any supplementary written information which might better show the technological characteristics of the cement plant.

The design of the questionnaire takes account of the flow of the production process breaking it down into cost centres and services cost centres. Since part of the questionnaire is only dealing with technological problems it is expected that no difficulties will be encountered in obtaining the desired data as it might perhaps be the case with the accounting data asked for in Part A.

GENERAL DESCRIPTION OF THE PLANT:

Give at first a short summary description of the major products (types of clinker and/or cement), actual output, production process (wet or dry process, vertical-horizontal kilns, etc.), numbers of kiln units and their nominal capacities, type of fuel(coal, oil, gas, etc.), power supply (power generation or outside supply), water supply, manpower, raw materials and markets furnished (quantity and distance from cement plant). This general description is required to give only a first comprehensive impression about the plant under study.

I. GENERAL DESCRIPTION:



II.A. SITE OF THE FACTORY

1. Location of plant in relation to major consumption areas: -

2. Is the factory close to a main road? What is the distance between the factory and the nearest main highway?: -

3. Is the factory connected to a railway system?: -

4. Distance between the factory and water way: -

5. Distance between the factory and the nearest harbour: -

6. Distance between the factory and raw material sources: -

7. Distance between the factory and the gypsum quarries: -

8. Distance between the factory and the main water supply sources: -

9. Height of the factory above the sea level: -

10. Source of power supply:-

II.B. CLIMATIC CONDITIONS

1. Maximum temperature: -

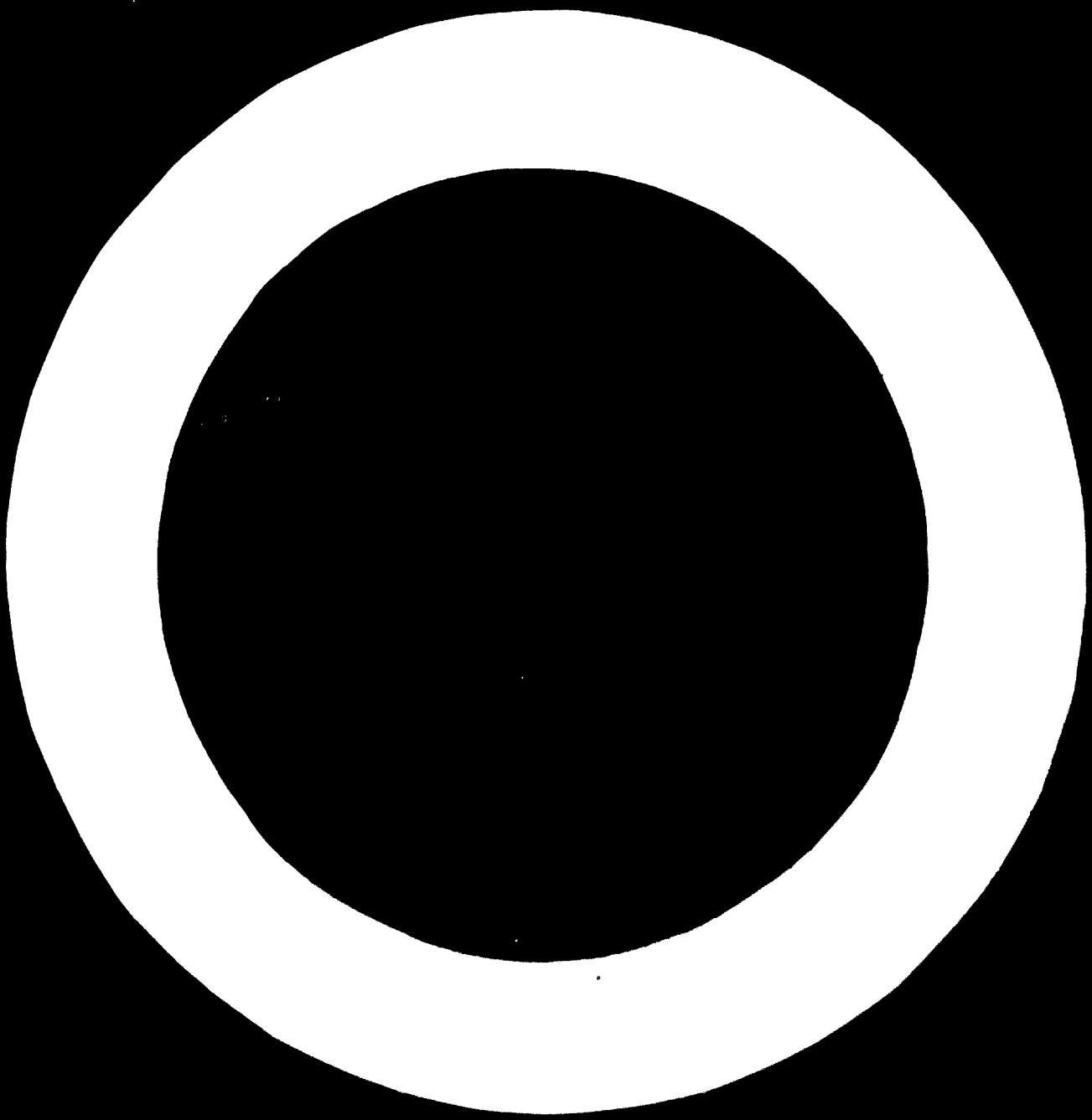
2. Minimum temperature: -

3. Maximum humidity: -

4. Minimum humidity: -

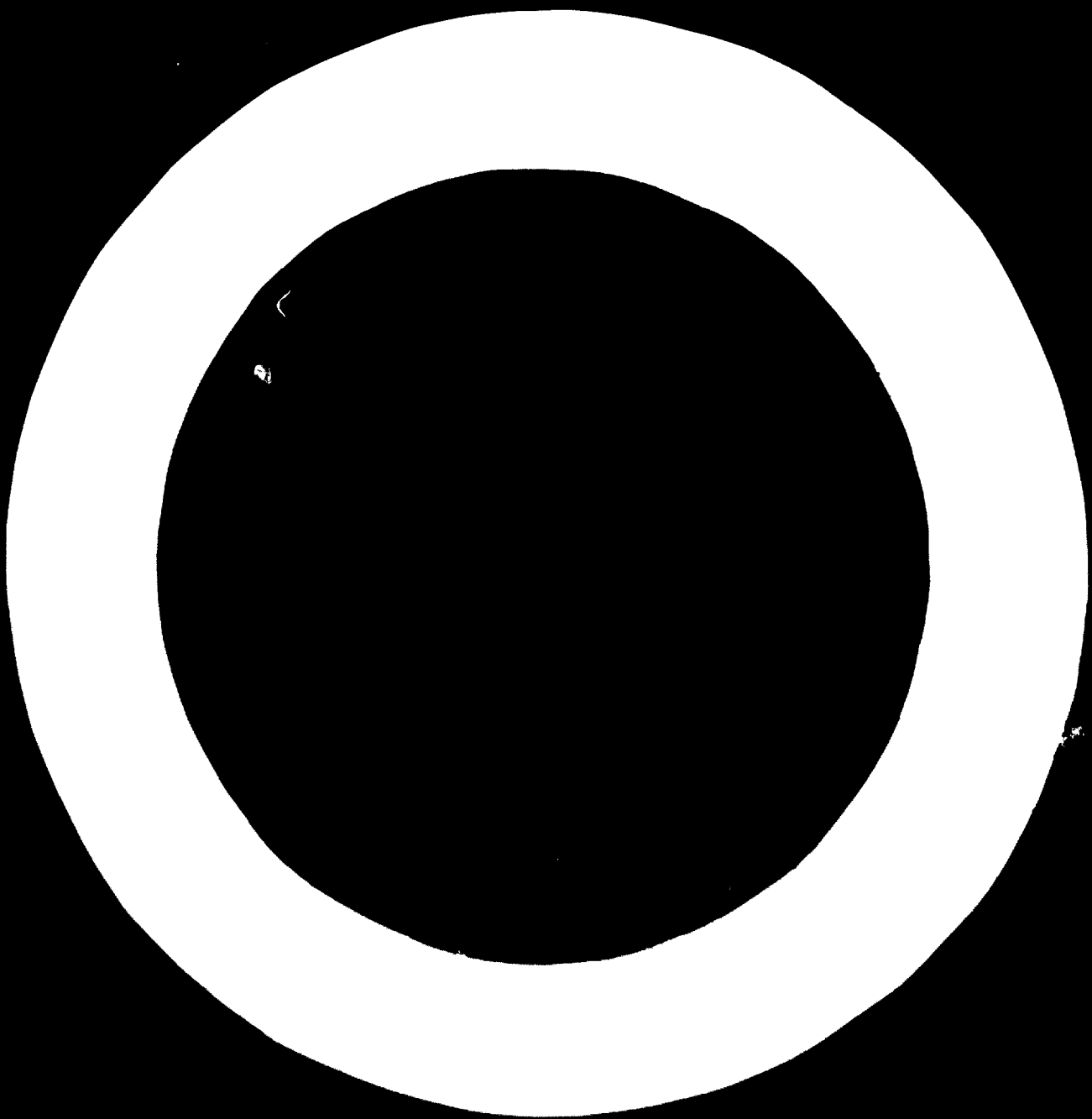
5. Prevailing wind direction: -

6. Rain and fall in mm.: -



III.A. PRODUCTION OF CLINKER (see Part A,II.A. and Part B,V.D.1.)

Clinker	Annual Production in tons(000) for the past 3 years		
	19..	19..	19..
III.A.1.(=III.A.2.+III.A.3.) Total Production: 1. Ordinary Portland Clinker 2. Sea Water Clinker 3. Low Heat Clinker 4. Others			
III.A.2. Clinkers used in the Factory: 1. Ordinary Portland Clinker 2. Sea Water Clinker 3. Low Heat Clinker 4. Others			
III.A.3. Clinkers sold: 1. Ordinary Portland Clinker 2. Sea Water Clinker 3. Low Heat Clinker 4. Others			
III.A.4.(see Part A,III.A.) Clinker purchased: 1. Ordinary Portland Clinker 2. Sea Water Clinker 3. Low Heat Clinker 4. Others			



Cements	Specifications *	Annual Production in thousand tons		
		19..	19..	19..
III.B.1. Total Production: 1. Ordinary Portland Cement 2. Rapid Hardening Cement 3. Sea Water Cement 4. Low Heat Cement 5. Other Cements a. b. c. d. e.				

* This column is to be filled according to the international specifications followed in the production phase.

3. 9. 74

2 OF 3

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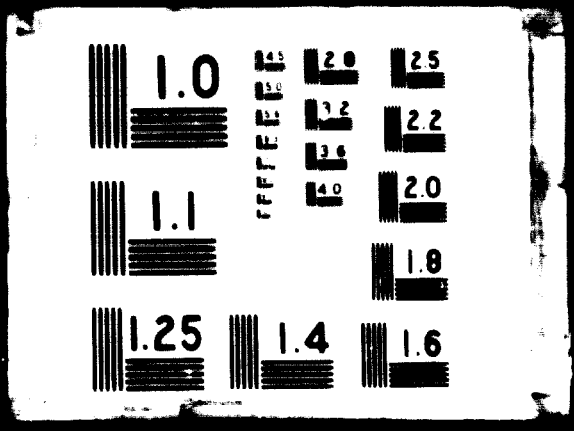
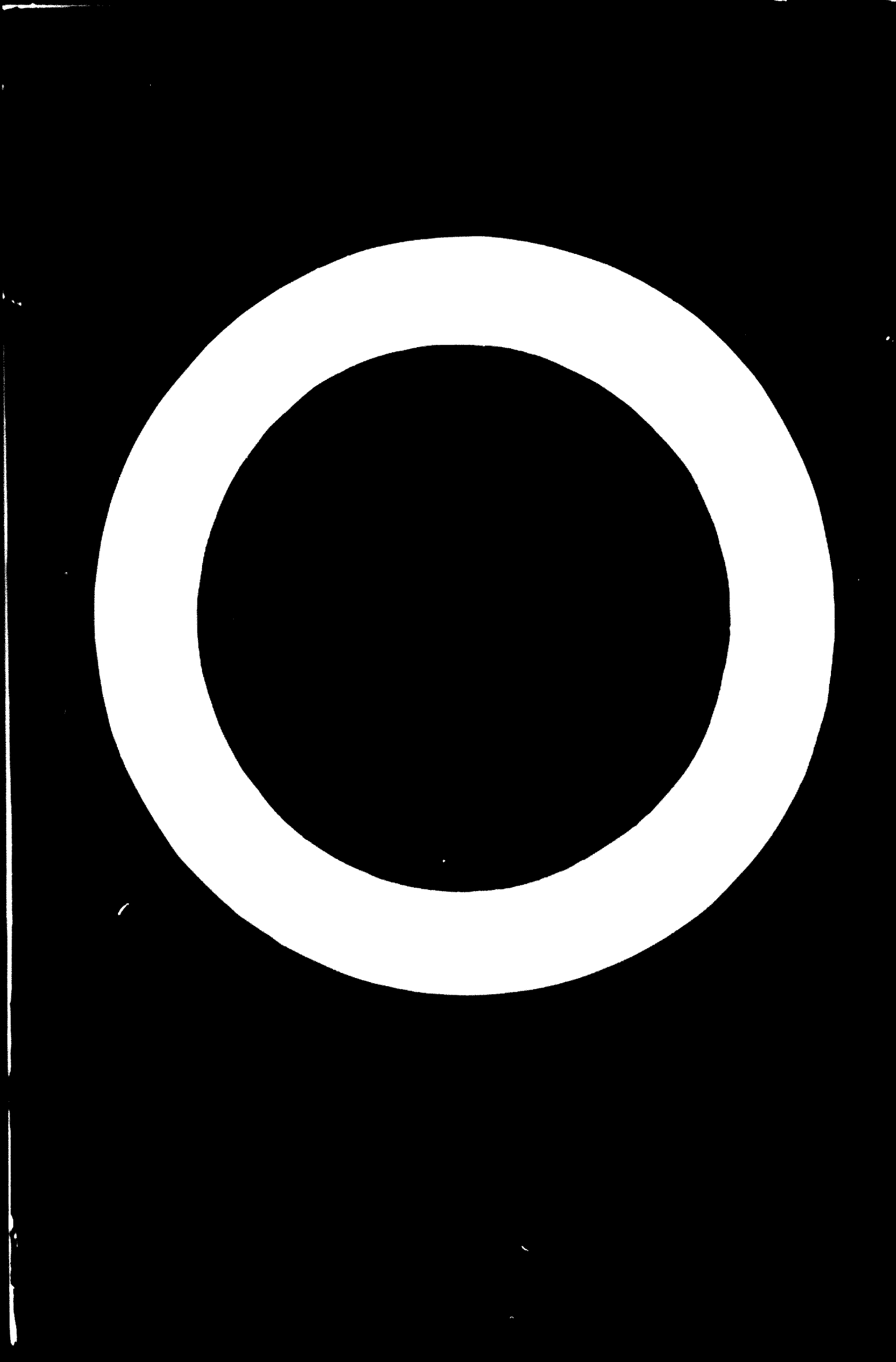
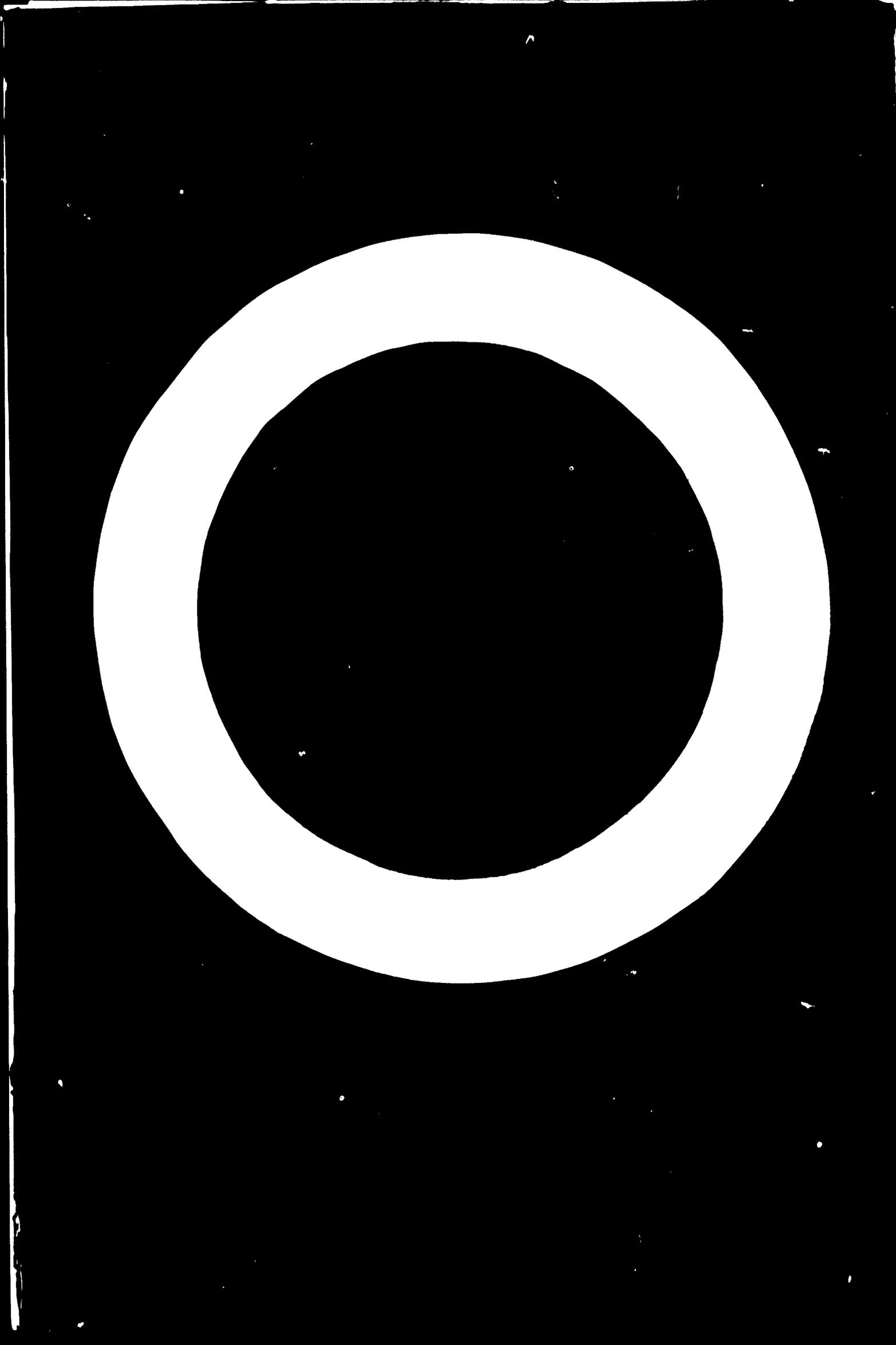




III.C. SPECIFICATIONS OF CEMENT MANUFACTURED (ANNUAL AVERAGE)

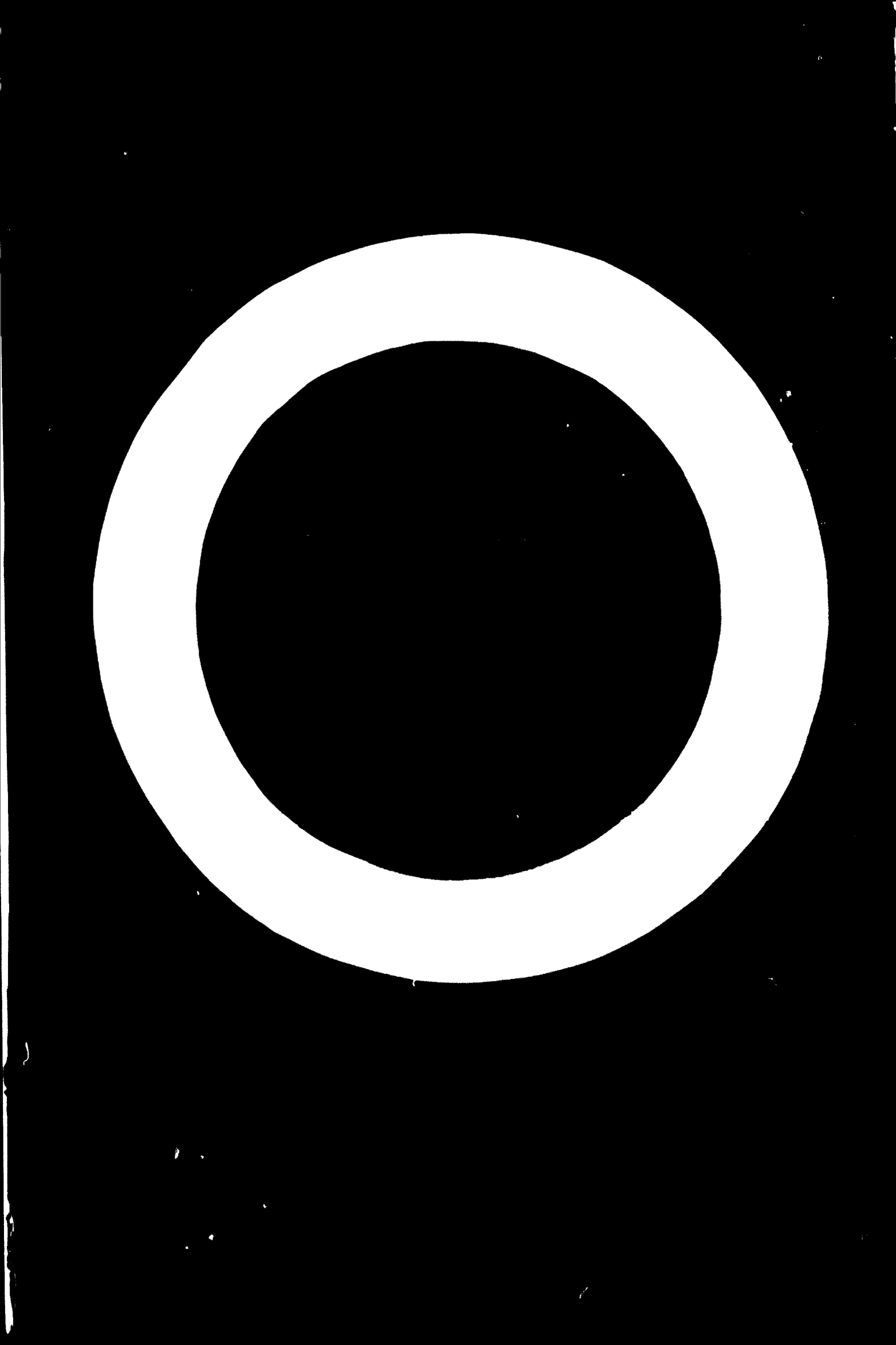
Kind of cement	Year	Production in thousand tons	kWh/t	Fineness		Soundness	CaO	SO_3	Compressive Strength			Bending Strength		
				Mesch	Surface				3 days	7 days	28 days	3 days	7 days	28 days



III.D. RAW MATERIAL EXTRACTION BY AREA AND AVERAGE RESULTS OF THE CHEMICAL ANALYSIS AND PHYSICAL TESTS (*)

SPECIFICATIONS	Limestone				Clay or clay matter				Sand or siliceous material	Iron oxids	Other additives
	Area 1	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 4			
A. Quantity extracted by area (Ton/Year)											
B. Chemical composition											
SiO_2											
Fe_2O_2											
Al_2O_3											
Ca O											
Mg O											
SD_3											
Loss on ignition											
Humidity percentage											
Alkalies in form of chlorides											
C. Physical characteristics											
Hardness											
Density											
Plasticity											

* Annual averages for the past year



Draw the Flow Process Chart (Flow Sheet) of the factory taking into consideration the flow of materials from "Raw Status" to "Final Products".

Mention the relevant capacities of the production and sorting equipment of each section. The following Flow Process Chart should be considered only as an example, leaving it up to the management of the establishment to design the Flow Process Chart according to the existing organizational arrangement.

EXAMPLE:

A. Extraction of raw materials (limestone, clay, sand, etc.)

Removal and depositing of overburden
Drilling and blasting
Digging and loading of raw materials
Transport to pre-crushers
Pre-crushing

B. Crushing

Crushing of raw materials (limestone, clay, etc.)
Washing and/or milling of clay (where applicable)
Product separation processes as trixing, screaning or centrifying
Handling of materials from one stage of upgrading to another (belt elevators)
Storage

C. Raw mix preparation

Mixing of raw materials
Grinding of raw materials
Drying process either by excess heat from kilns or by auxiliary furnaces (where applicable)
Process control
Homogenization, adjustment
Handling of processed material
Storage

D. Clinker production (kiln)

Burning
Clinker conveying and storage
Process control

E. Clinker grinding (cement mills)

Transportation of clinker to clinker hopper
Reception of gypsum, grinding and transportation to gypsum hopper
Grinding of cement (close circuit or straight grinding)
Cement transport
Dust filter installation

F. Cement handling (packing, or as bulk and dispatch)

Transportation to bulk loaders
Transportation to packing machines
Handling of bags

V. PRODUCTION DEPARTMENTS (COST CENTRES)

These explanatory notes apply to all production departments.

In line with the Flow Process Chart it is suggested to present further technical details of the establishment. The production process, which is divided into a number of production departments and which should be identical with production cost centres has to be made transparent. As an example it could be envisaged to have six major production departments:

a. Quarrying
b. Crushing
c. Raw mix preparation
d. Clinker production
e. Cement grinding
f. Cement storage and handling

The same breakdown into production cost centres has also been utilized in Part A, VII., Table 1, for the Departmental Cost Sheet. In the given example raw mixing, raw material grinding, drying and homogenization are taking place in one combined department (Cost Centre).

For each production department (Cost Centre) give a general description of the process and machinery applied. If possible also quantify the major inputs used during this production stage as well as the total output in order to be able to calculate the production costs accrued at each stage thus facilitating inter-firm comparison. For this purpose also refer to the Departmental Cost Sheet in Part A, VII., Table 1. Hence it should be possible to calculate e.g. figures on power consumption per ton produced, consumed wear and tear parts (grinding media, wear plates, liners, refractory bricks, etc.) per ton produced, labour cost per ton produced, etc. Through this approach, one can compare the performance of one plant with another without having to compare the total overall results which are strongly influenced by the special circumstances prevailing in each establishment.

The data on machine specifications and efficiency should reveal:

- the available equipment and its origin;
- the nominal capacity and the actual production of each equipment item in order to define the operational efficiency;
- the nominal capacity and the actual production of each production phase (department) in order to spot and diagnose any existing bottleneck;
- compare the actual production with the available (rated) capacity in order to define the losses in the working capacities;
- analyse the different stoppages and the reasons for each in order to find improvements.

V.A. QUARRY

The Quarry Department covers the handling of raw materials from extraction to crushing.

For example:

- Removal and depositing of overburden
- Raw materials, extraction and transportation
- Drilling and blasting
- Digging and loading of raw material
- Transportation to pre-crushing
- Pre-crushing

V.A.1. General description of the quarrying operations, the machinery and equipment as well as of inputs and outputs -(see explanatory notes to Part B,V.) of this production stage.

V.A.2. REMOVAL AND DEPOSIT OF OVERBURDEN

a. Limestone Quarry:

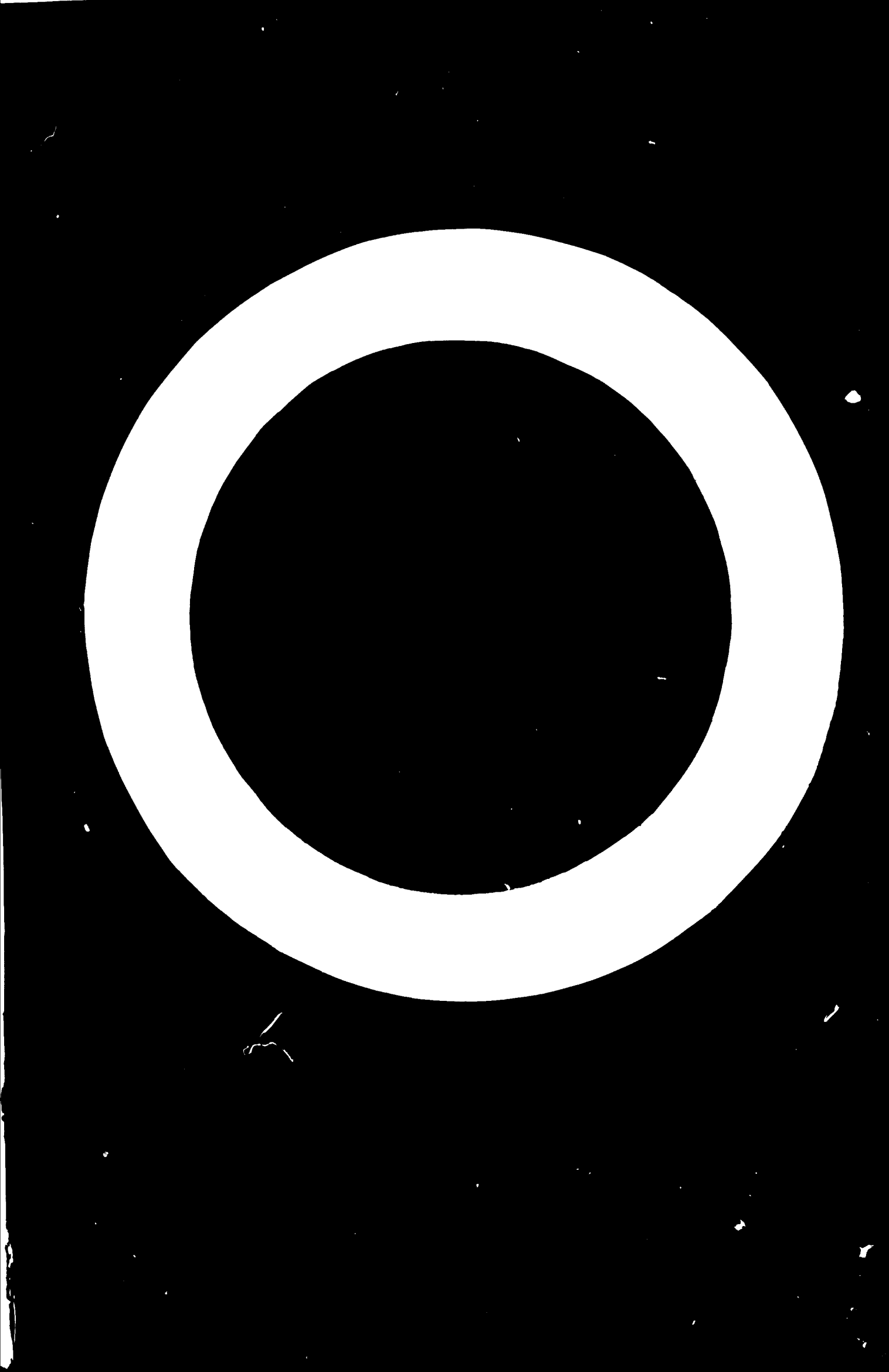
Overburden thickness m

Limestone face thickness m

b. Clay Quarry:

Overburden thickness m

Clay face thickness m

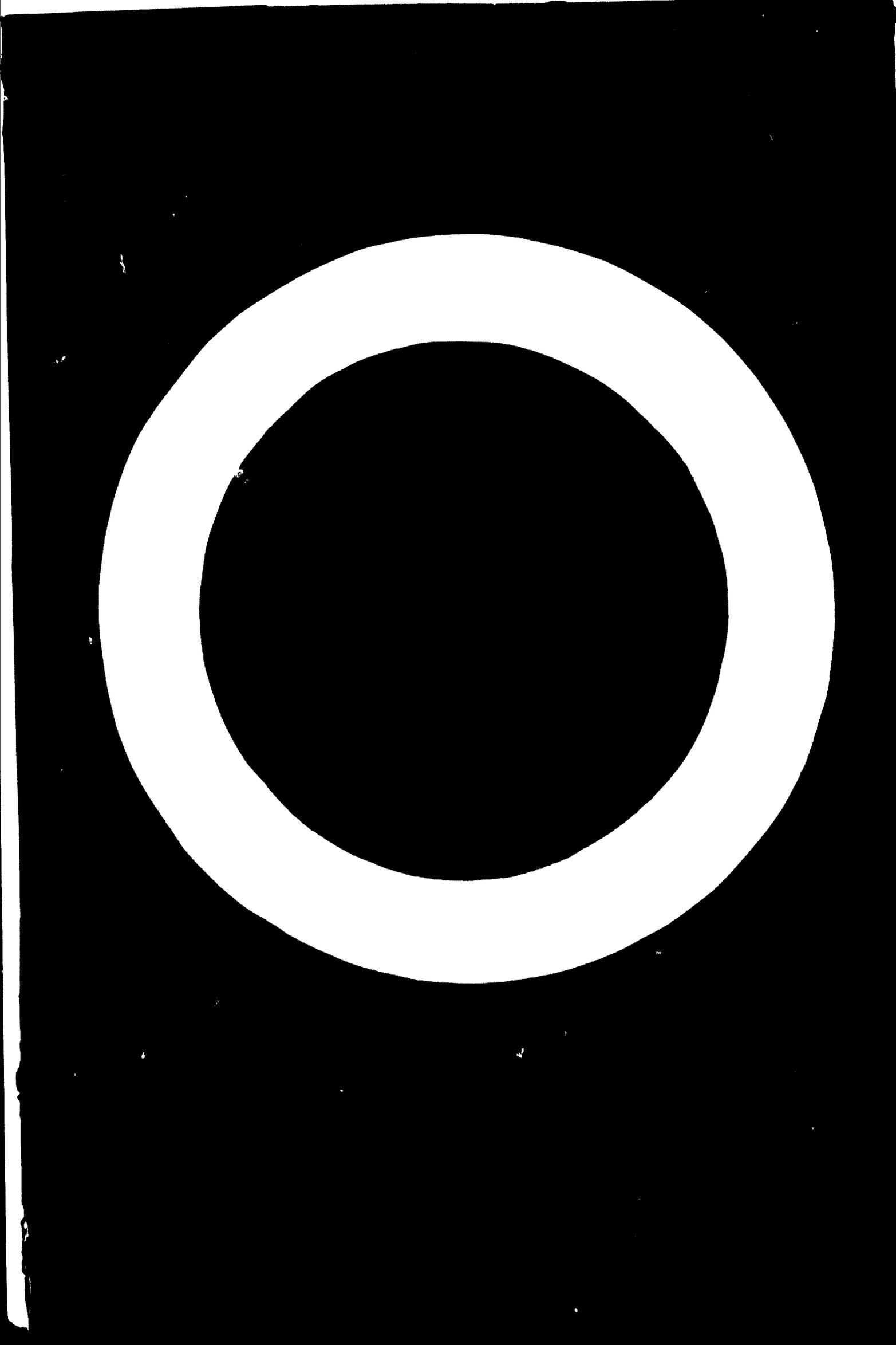


RAW MATERIALS	By own means (tons)	%	By contractors (tons)	%	Total own capacity
Limestone Clay Sand Gypsum Others					

V.A.4. QUARRY EQUIPMENT

EQUIPMENT	Number of machines	Type + supplier	Capacity Nominal	Capacity Actual	Annual working hours in (000) 19	19	19
Drilling machines							
Shovels							
Scrapers							
Tractor loaders							
Others (e.g. pre-crushing equipment)							

COMMENTS:



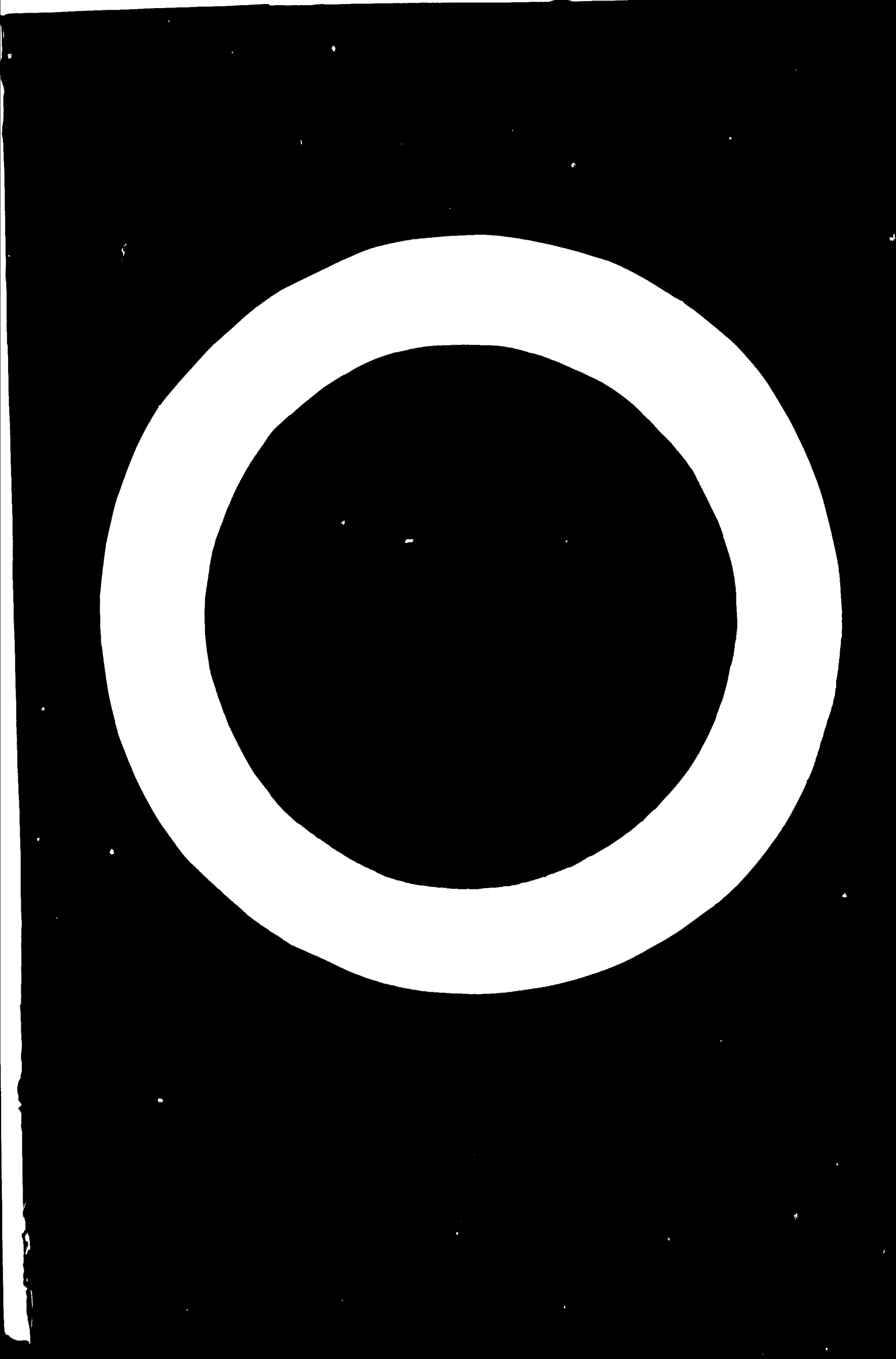
a) Transport equipment from extraction sites to pre-crusher

EQUIPMENT	Number	Raw materials transported *	Type and supplier	Capacity		Annual working hours in (000)		
				Nominal	Actual	19	19	19
Lorries								
Motor scrapers								
Railway								
Others								

* Use the following abbreviations:

Limestone	L	Gypsum	G
Clay	C	Siliceous	S

COMMENTS:



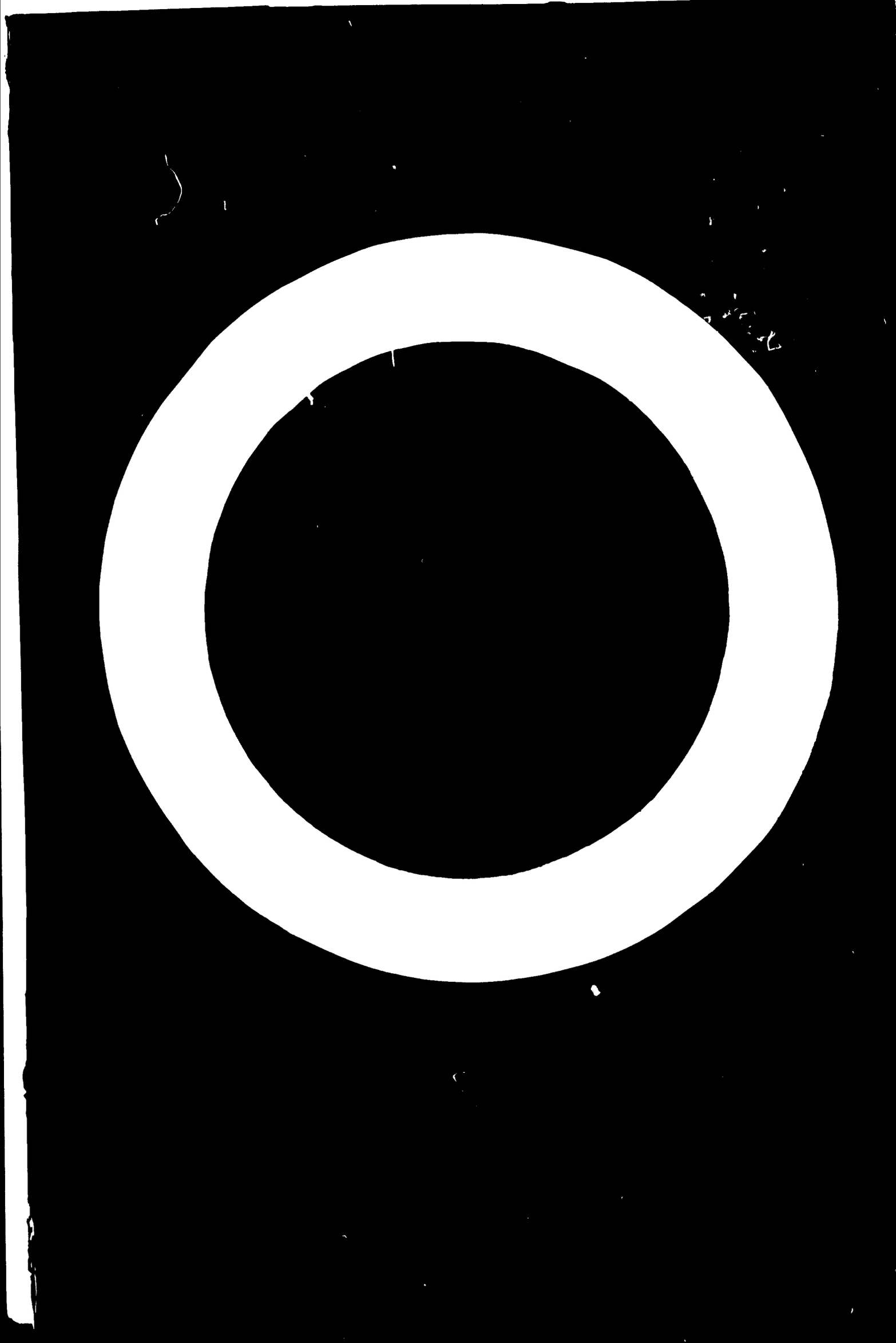
V.A.5. b) Transport equipment from pre-crusher to factory

EQUIPMENT	Number	Raw * materials transported	Type and supplier	Capacity		Annual working hours in (000)		
				Nominal	Actual	19..	19..	19..
Lorries								
Motor scrapers								
Belt conveyors								
Rope ways								
Railway								
Others								

* Use the following abbreviations:

Limestone	L	Gypsum	G
Clay	C	Silicecus	S

COMMENTS:

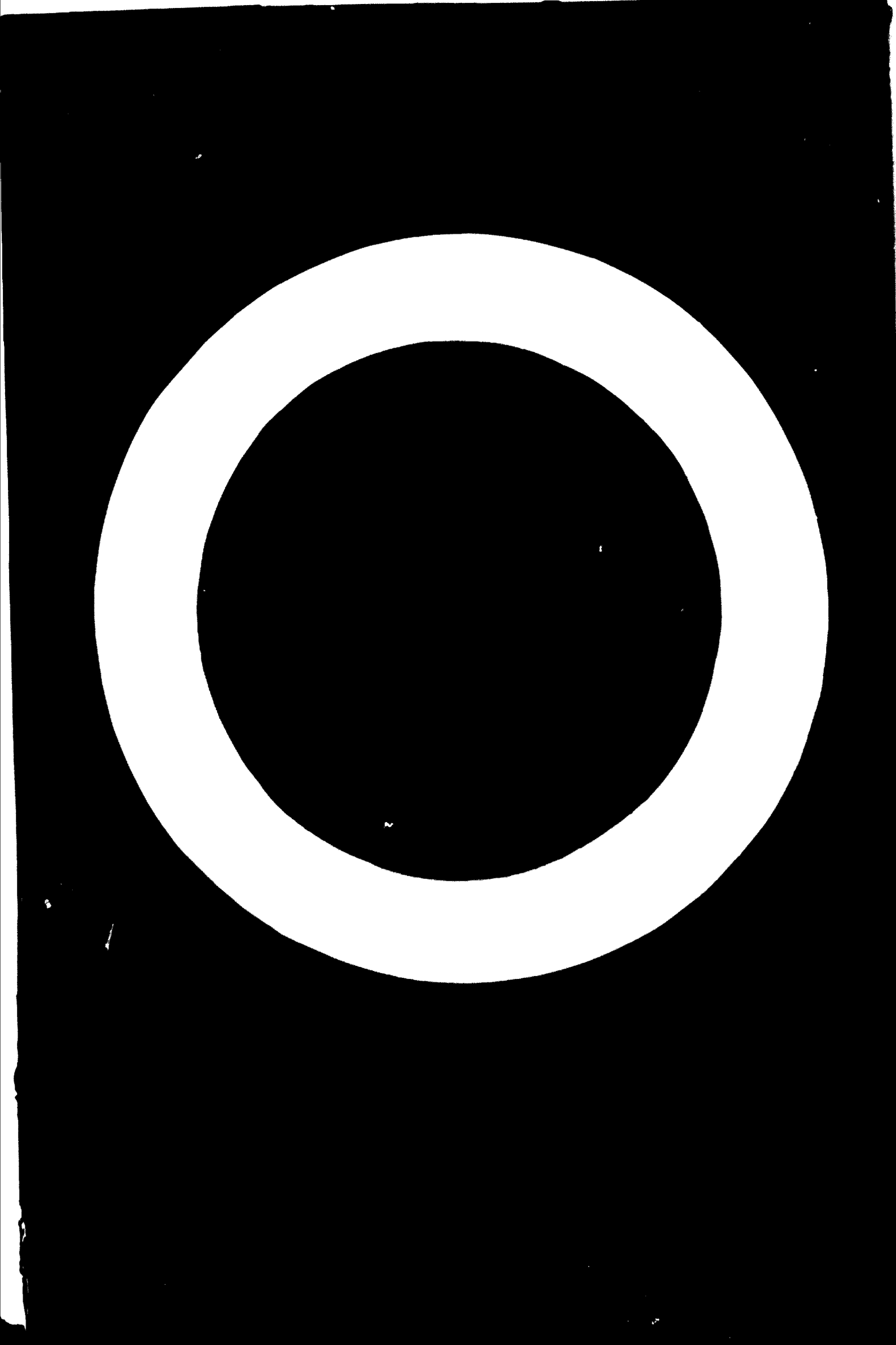


This department is responsible for the crushing, handling and storage of raw materials which were brought forward from the different raw material deposits.

For example:

- Crushing of raw materials (limestone, clay, etc.)
- Washing and/or milling of clay (where applicable)
- Product separation processes as trixing, screaning or centrifying
- Handling of materials from one stage of upgrading to another (belt elevators)
- Storage

V.B.1. General description of all crushing operations, as outlined, of the machinery and equipment as well as of inputs and outputs (see explanatory notes on Part B.V.)of this production stage.



V.B.2. CRUSHING EQUIPMENT

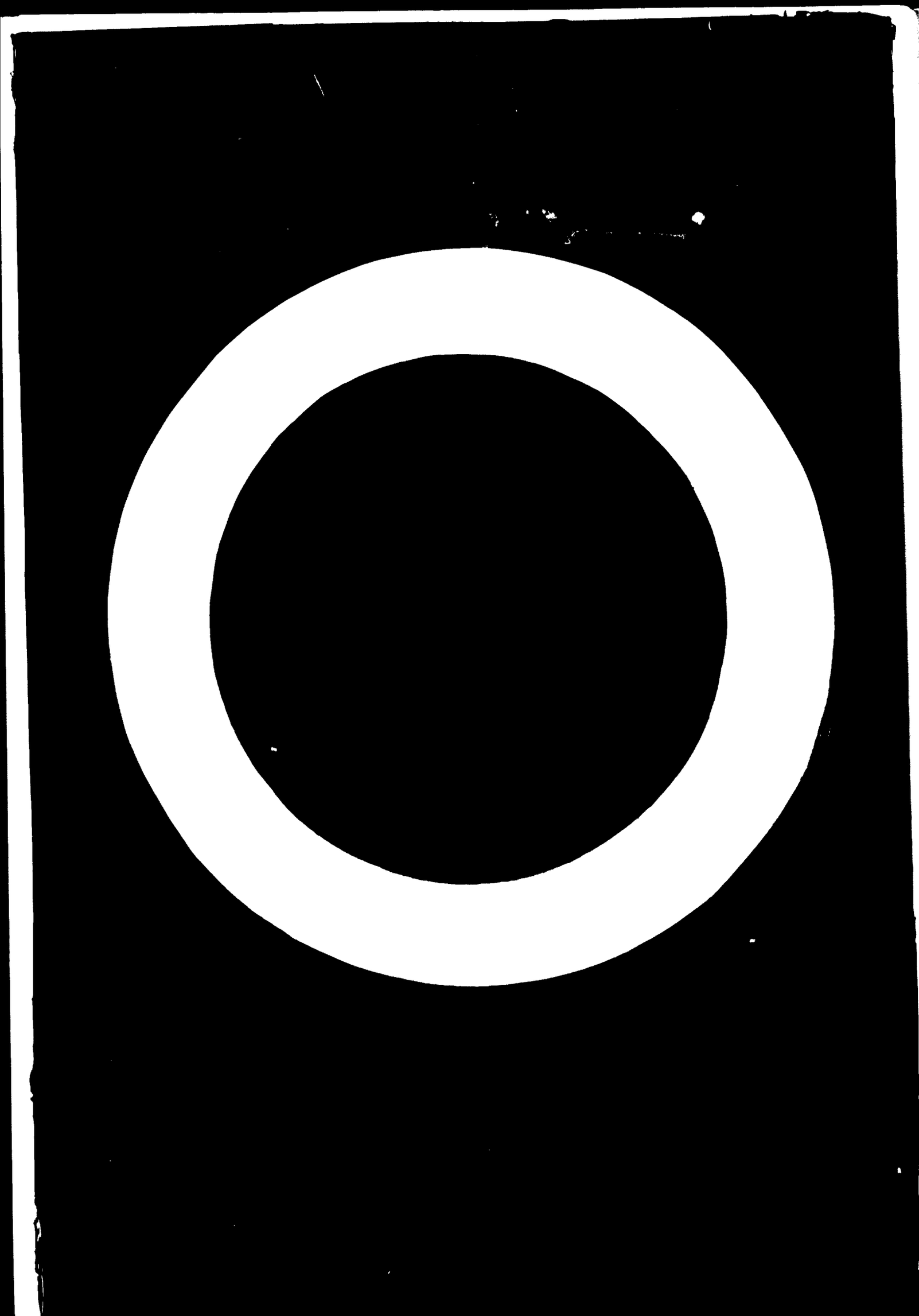
EQUIPMENT	Number	Material handled *	Type and supplier	Capacity		Annual working hours in (000)		
				Nominal	Actual	19..	19..	19..
Wash mill								
Crushers								
Others								

* Use the following abbreviations:

Limestone	L	Gypsum	G
Clay	C	Others	O

V.B.3. POWER CONSUMPTION OF CRUSHING DEPARTMENT

Type of energy	19..	19..	19..
kWh			
fuel (tons)			

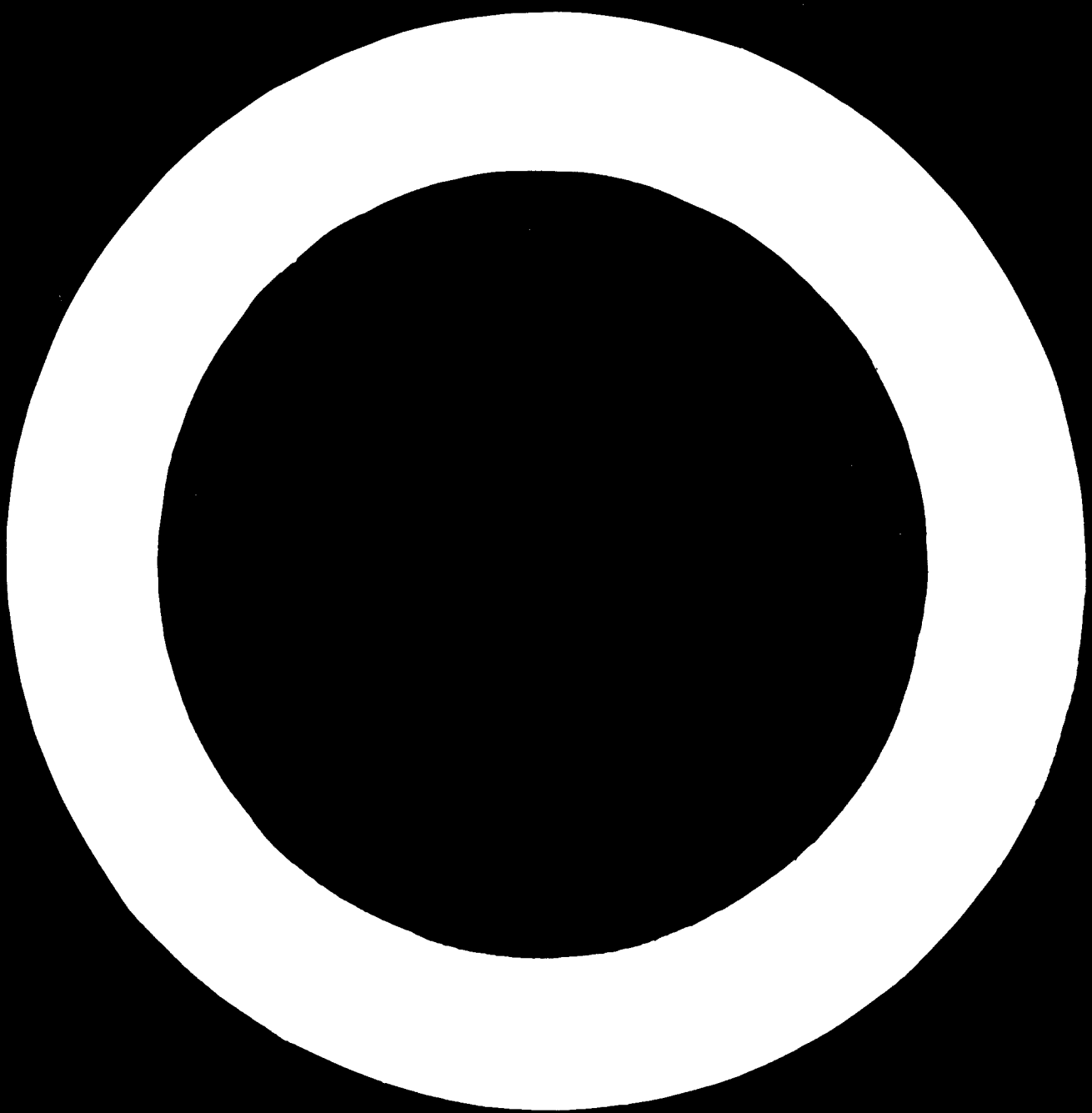


Raw mix preparation is comprised of mixing, grinding, homogenization, and handling of crushed raw material, received either from raw material stores (after crushing) or directly from pre-crushing as well as the storage of intermediate products before mixing and/or homogenization.

For example:

- mixing of raw materials
- grinding of raw materials
- drying process either by excess heat from kilns or by auxiliary furnaces (where applicable)
- process control
- homogenization, adjustment
- handling of processed material
- storage

V.C.1. General description of all grinding operations as outlined above, of the grinding machinery and equipment as well as of all inputs and outputs (see explanatory notes on Part B.V.) of this production stage.

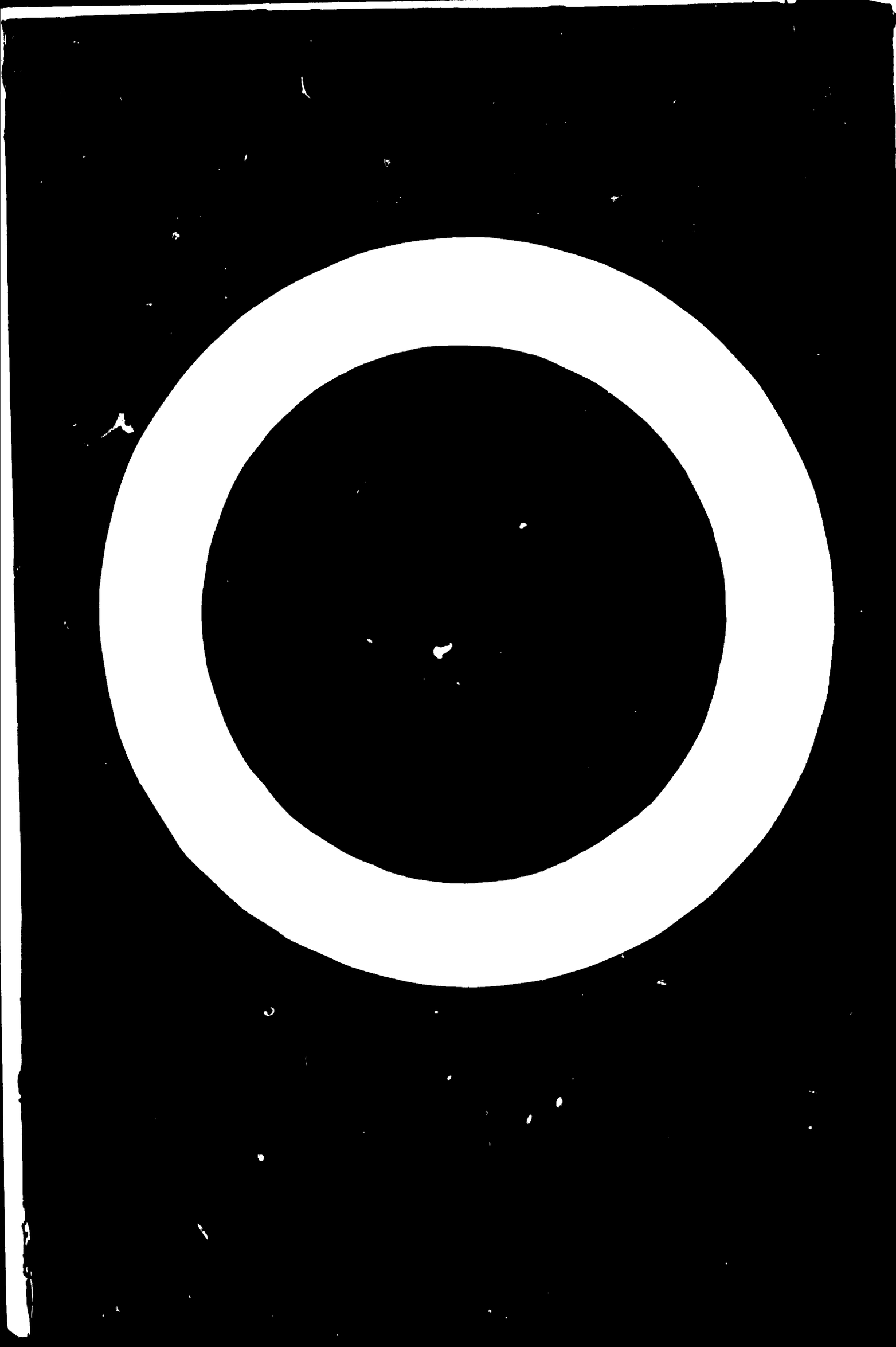


a) Wash mill (Wet process)

Wash mill	Type and supplier	Motor (in kW)	Capacity (in dry tons)		Annual working hours in (000)		
			Nominal	Actual	19	19	19

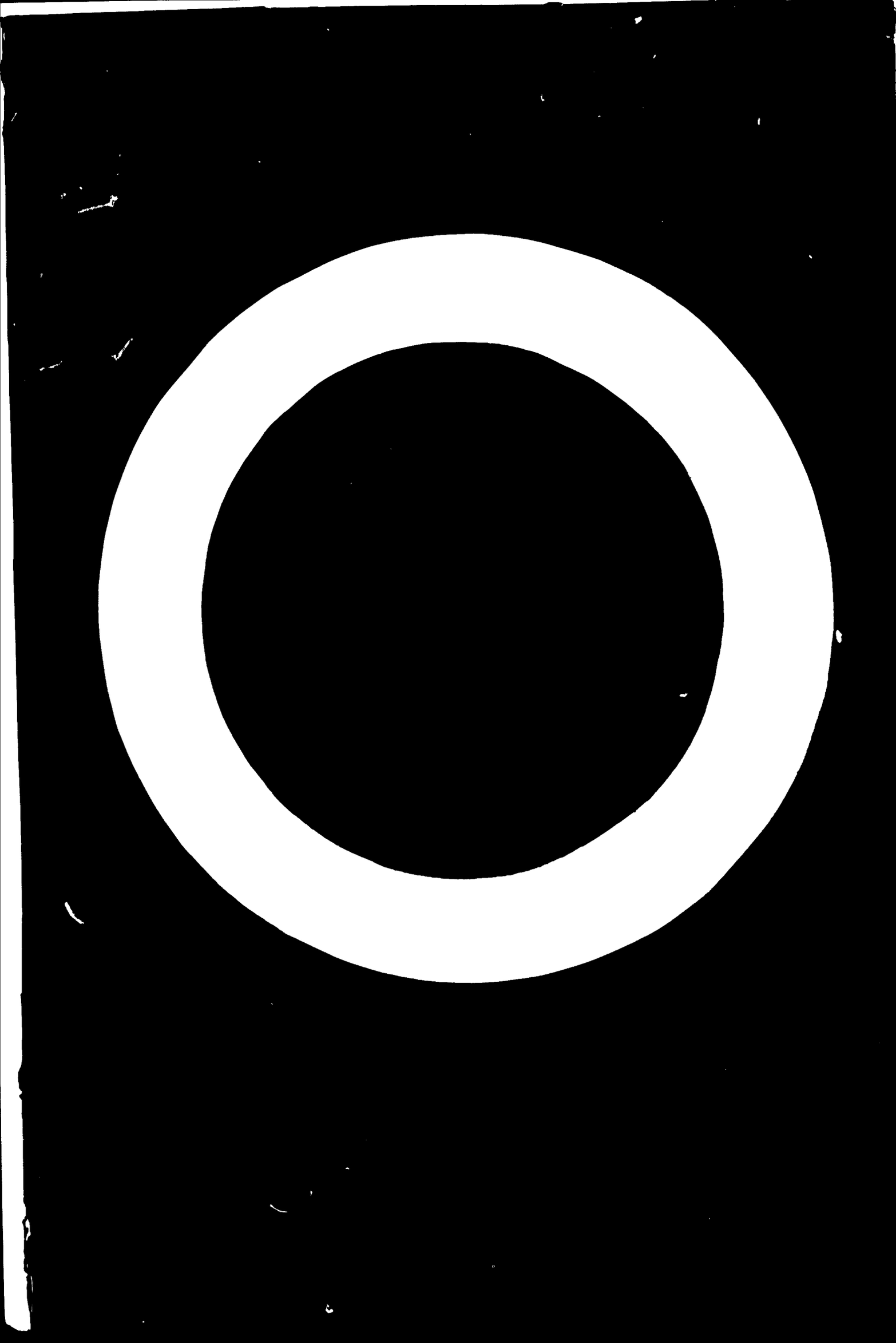
b) Raw material dryers (Dry process)

Dryer	Type and supplier	Consumption of fuel/ton



V.C.2.c. RAW MATERIAL GRINDING MILLS

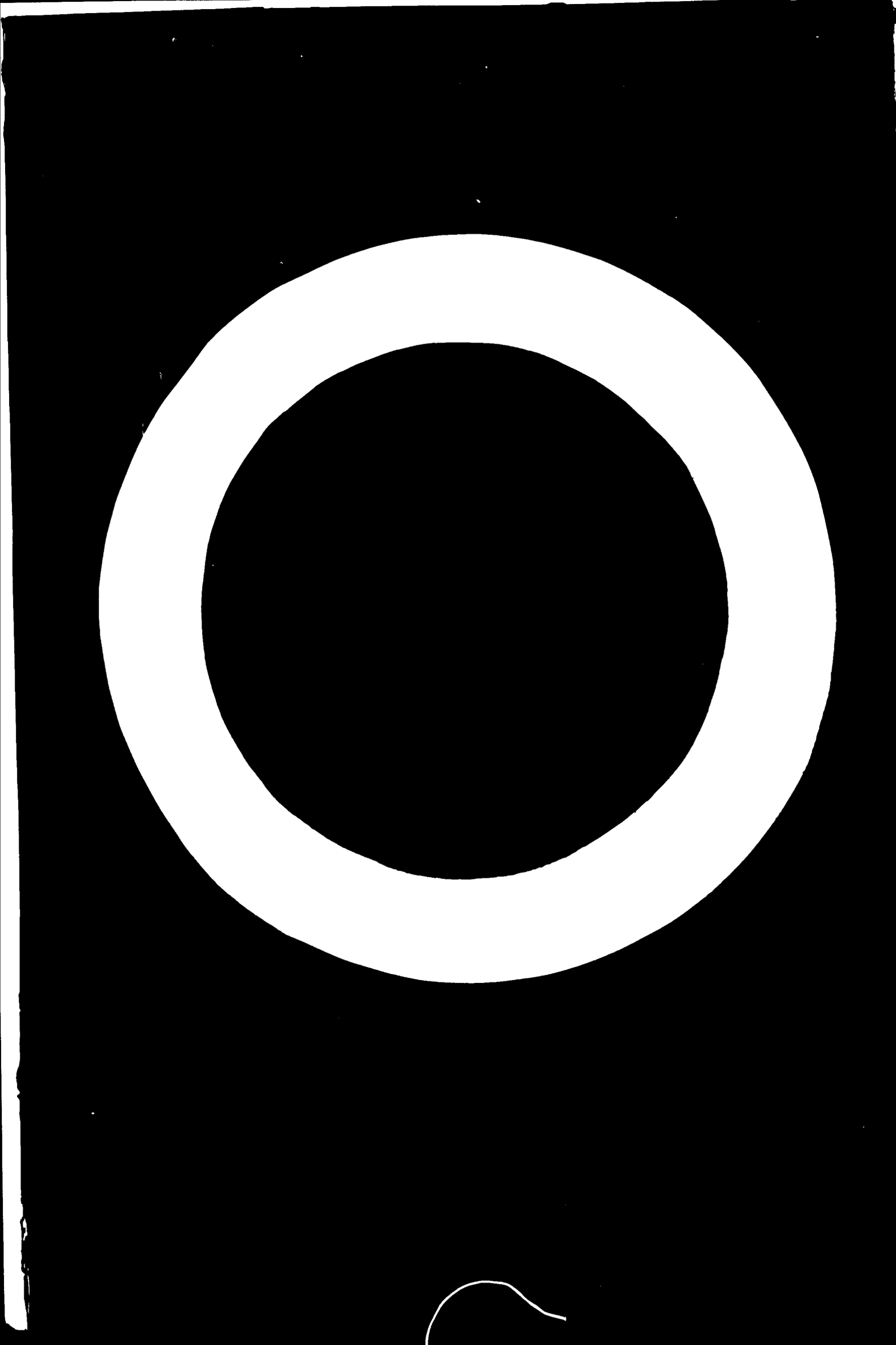
General specifications	Mill No. 1	Mill No. 2	Mill No. 3	Mill No. 4	Mill No. 5
Type of mill:					
With dryer (mention type)					
Without dryer					
Length					
Diameter					
Speed Rev./m					
Nominal capacity: Dry ton/hour					
Actual production: Dry ton/hour					
Mill motor (in kW)					
Dimensions of mill compartments in meters and charges:					
1.					
2.					
3.					
4.					
Power consumption per ton produced (in kWh/t):					
Consumption of grinding media and liners per ton produced:					
Annual capacity:					
Annual production:					



V.C.3. RAW MIX PREPARATION EQUIPMENT

(adjust equipment listed according to local conditions)

EQUIPMENT	Number	Type and supplier	Capacity		Annual working hours in (000)		
			Nominal	Actual	19	19	19
Compressor							
Slurrybasin							
Homogenization silos							
Handling equipment:							
Elevator							
Pumps							
Others							



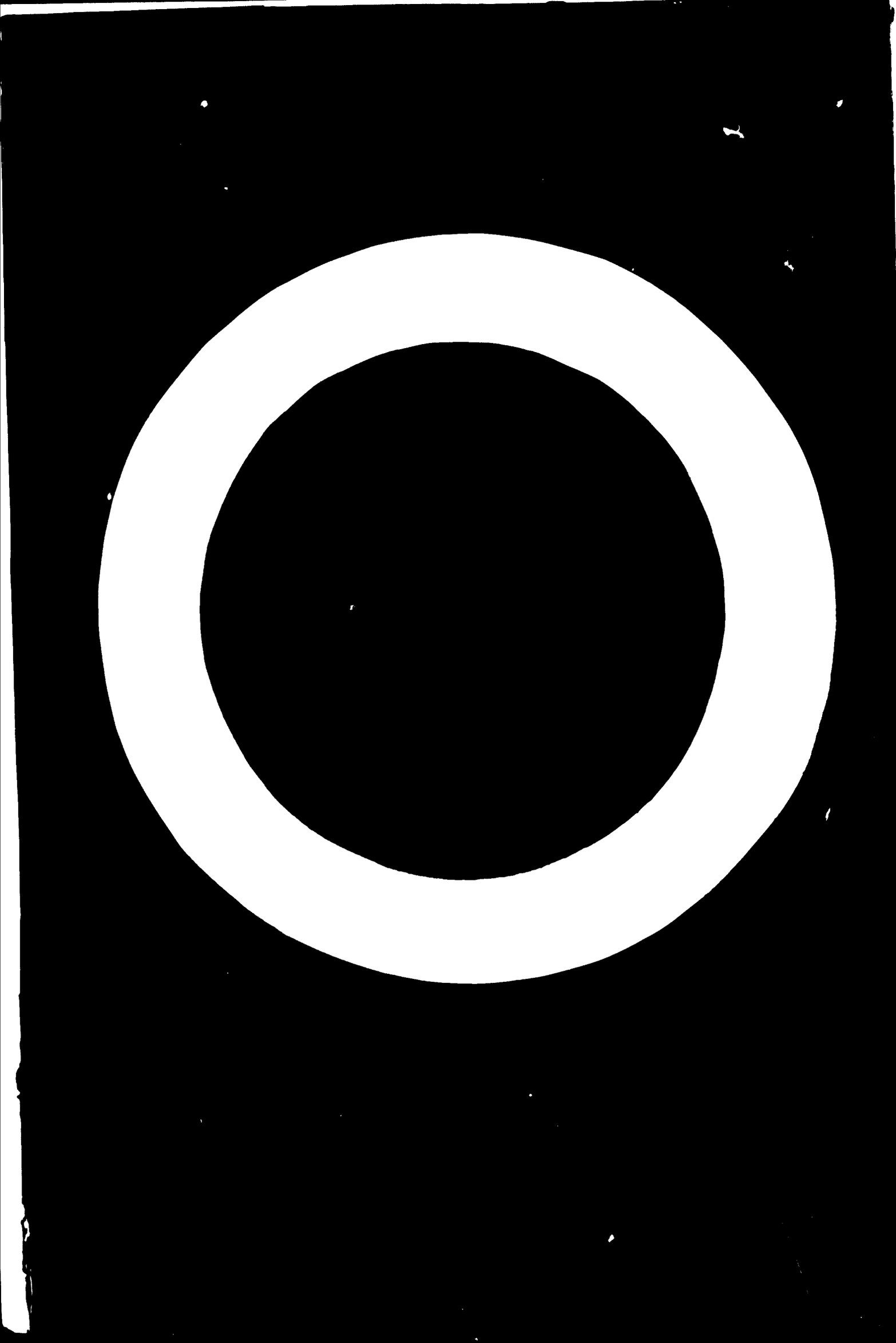
V.C.4. POWER CONSUMPTION OF RAW MIX PREPARATION DEPARTMENT

Type of energy	19	19	19
kWh			
fuel (tons)			

V.C.5. RAW MIX SPECIFICATIONS (as fed into the kiln)

Use one table for each kind of raw mix

Kiln	1	2	3	4	etc.
Physical analysis					
Fineness					
Water content					
Chemical analysis					



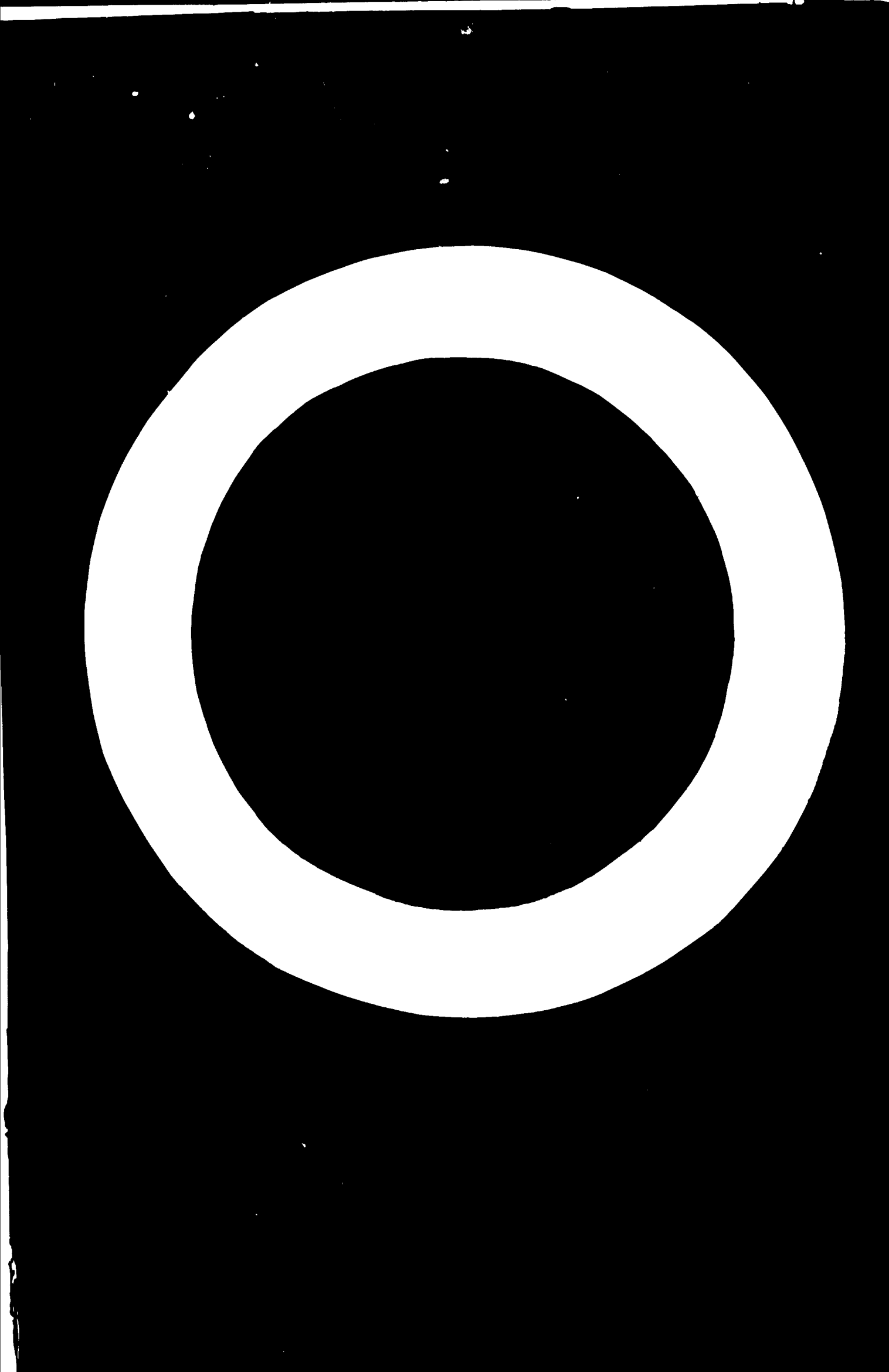
Clinker production comprises transportation of the raw slurry or meal from the storage basin or silos to the kilns, the burning of the raw material to clinker, storage and handling of fuel.

For example:

- Burning and cooling of clinker
- Dust filter installations
- Transportation of clinker to clinker storage
- Kiln linings
- Kiln fuel preparation including transportation of fuel from storage to kiln building
- Transportation of dust from kilns to dust deposits and/or feed-back

Give as detailed as possible a description of each kiln in use indicating not only their nominal capacity but also the actual capacity, power consumption, etc. With regard to kiln linings it is important to know the consumption of lining material per ton of produced clinker. Indicate the idle time (time kiln stopped for repair or other reasons which have to be stated) to be able to judge the effectivity of the installation. Fuel consumption and type of fuel used.

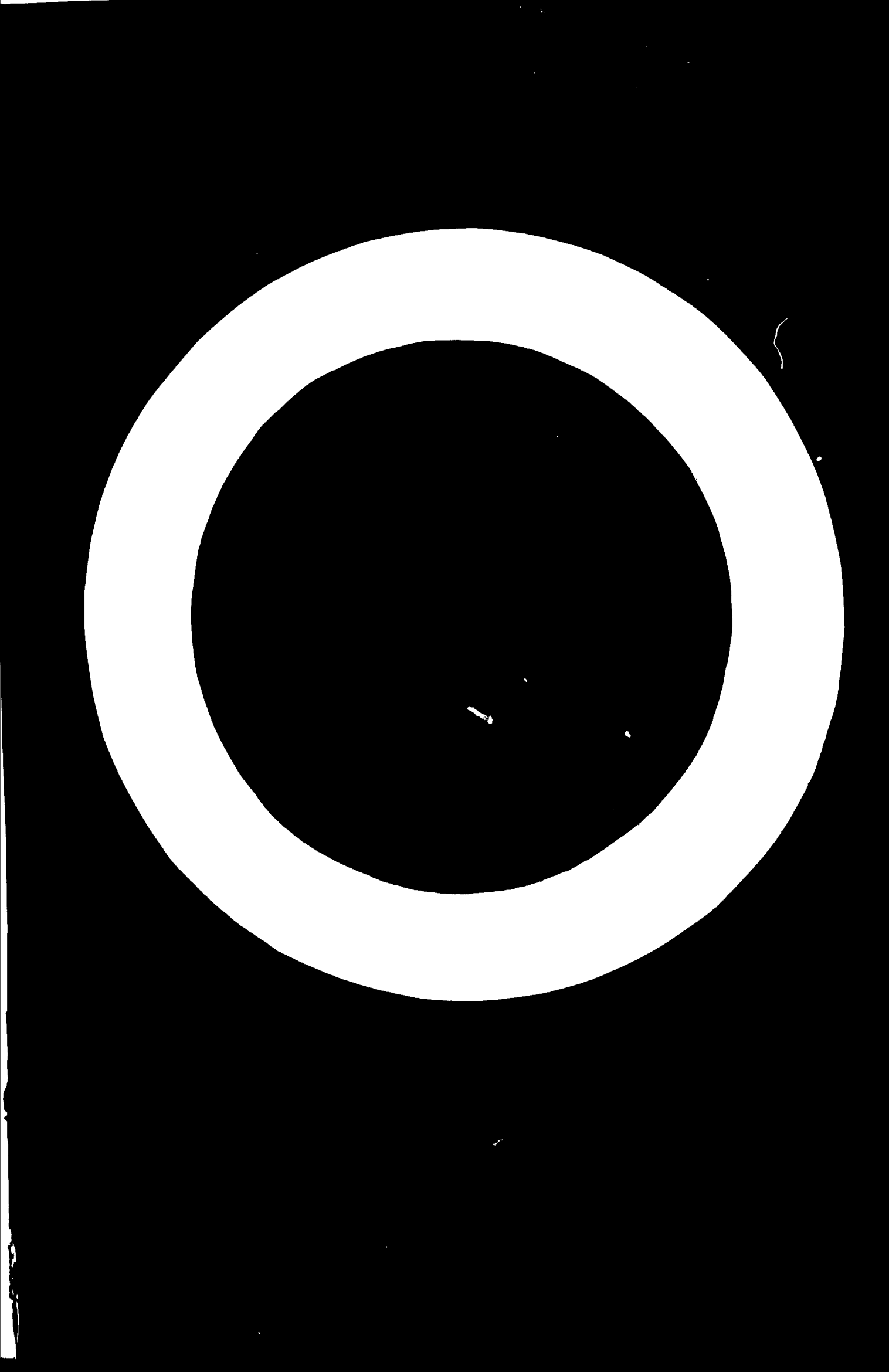
V.D.1. General description of the clinker production process as outlined above, of the machinery and equipment utilized as well as of all inputs and outputs (see explanatory notes on Part B.V.) of this production stage.



List of equipment	Number	Type and supplier	Motor power (in kW)	Capacity (either/or)	
				m^3/hour	ton/hour
Pumps					
Bucket elevator					
Screw conveyors					
Pneumatic pumps					

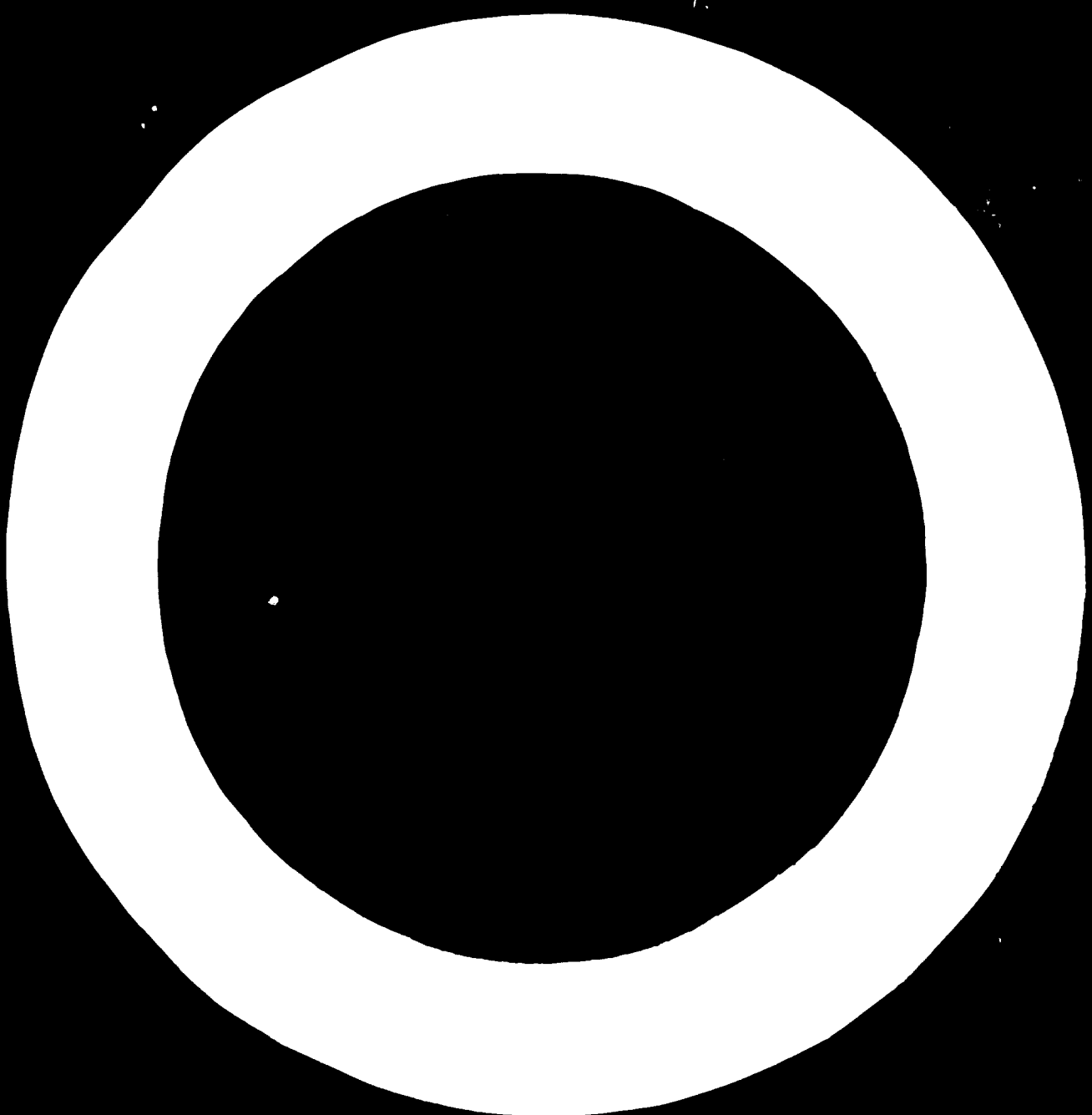
V.D.3. POWER CONSUMPTION OF CLINKER DEPARTMENT

Type of energy	19	19	19
kWh			
fuel (tons)			



V.D.4. KILN DEPARTMENT (clinker production)

General specifications	Mill No. 1	Mill No. 2	Mill No. 3	Mill No. 4	Mill No. 5
Manufacturing process (dry or wet)					
Equipment's supplier					
Daily clinker production					
Length of the kiln and of its different diameters					
Fuel Consumption/ton (including or excluding of drying of raw material)					
Brick lining Consumption/ton					
Filter, mechanical M electrical E					
Cooler, (type) planetary P tube T grate G					
Clinker transport to storage					
Annual capacity					
Annual production					



V.E. CLINKER GRINDING (CEMENT MILLING)

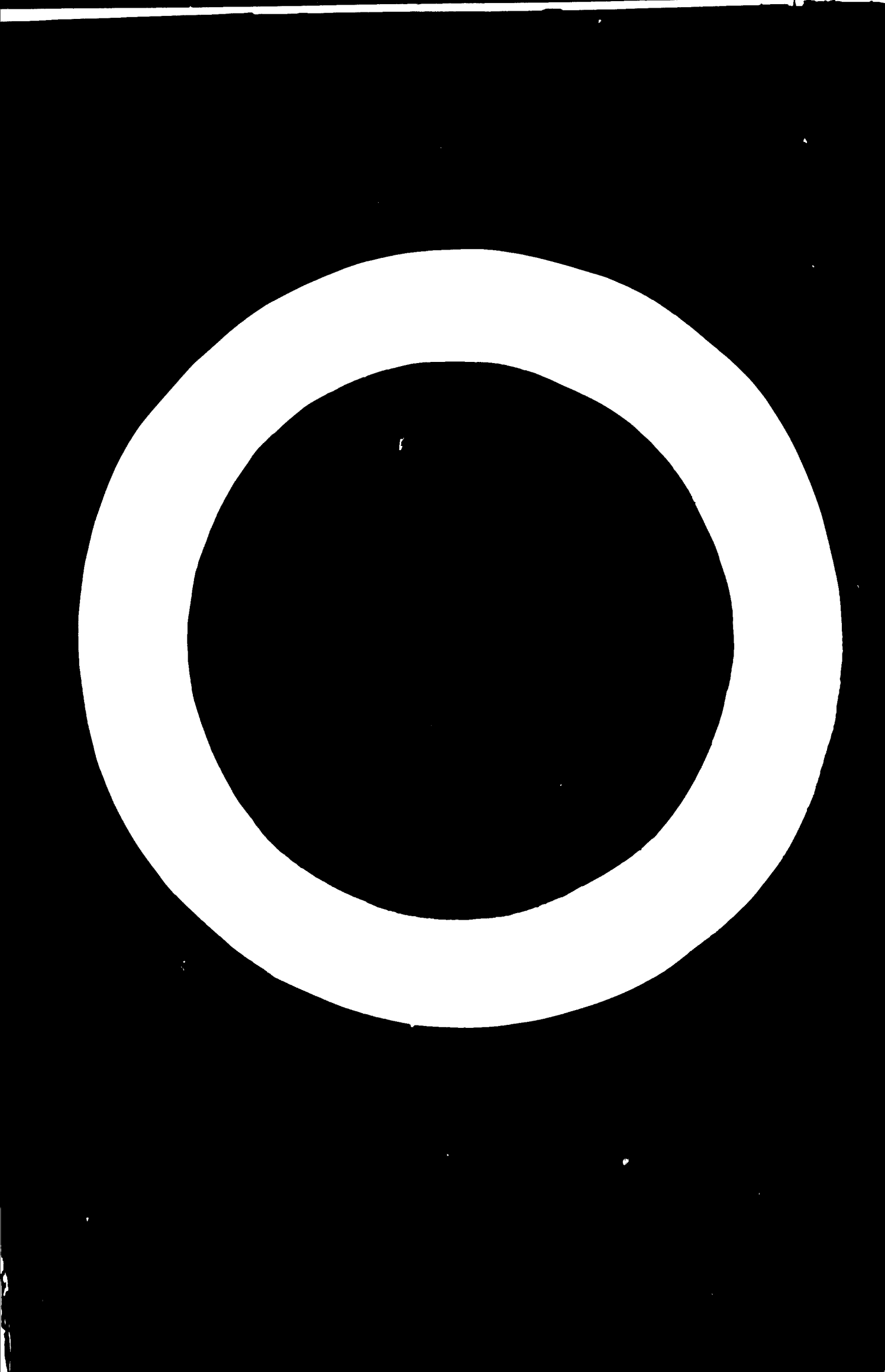
Clinker grinding comprises the transport of clinker from storage to mills, grinding, transport of the cement to cement silos. Storage, crushing and handling of gypsum.

For example:

- Transportation of clinker to clinker hopper
- Reception of gypsum, grinding and transportation to gypsum hopper
- Grinding of cement (close circuit or straight grinding)
- Cement transport
- Dust filter installation

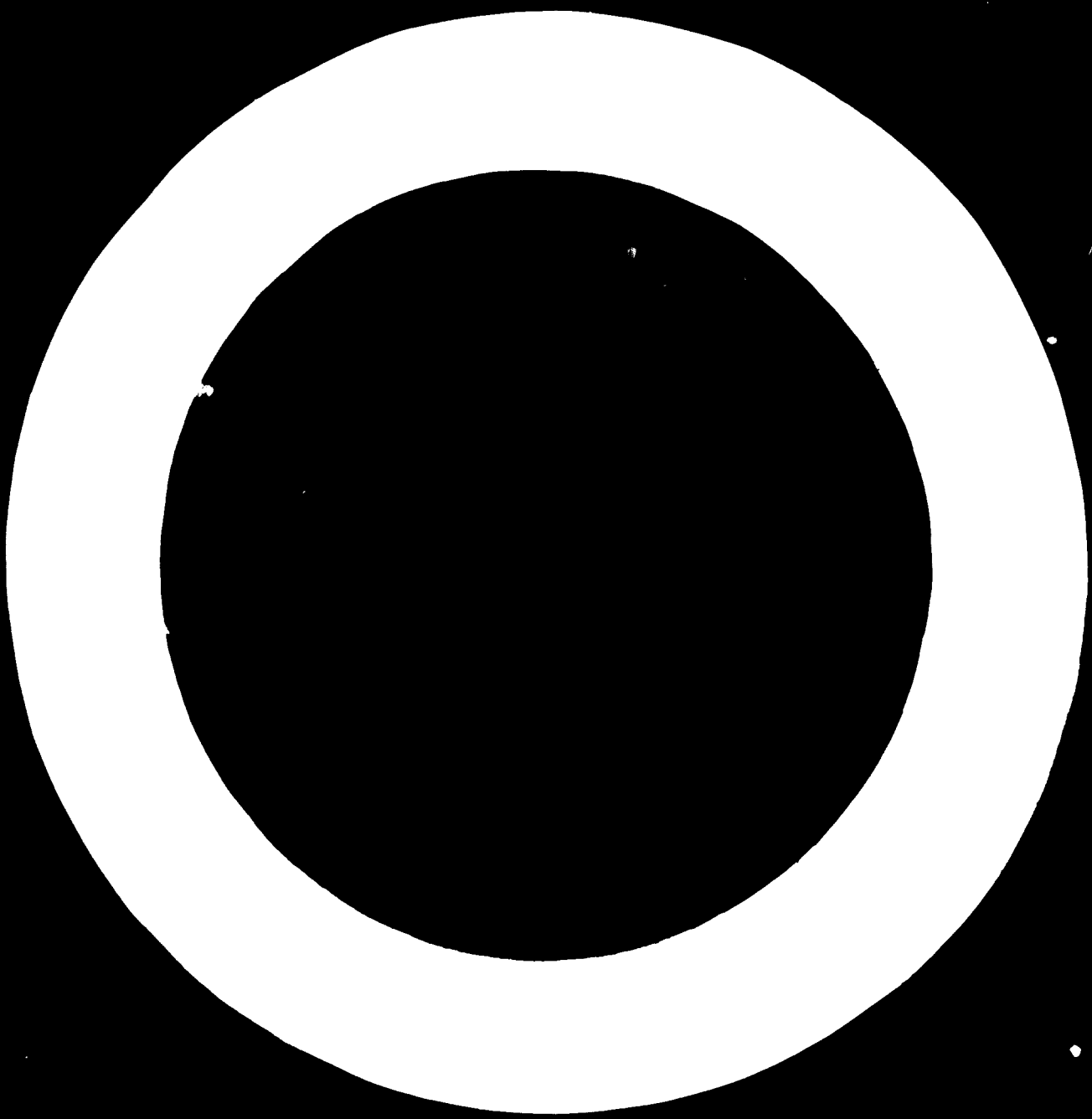
A plant does not necessarily have to grind its total clinker production. Part of the clinker may be ground by other cement plants on commission basis and may therefore sell the rest. Vice-versa it may also grind clinker for other companies on subcontract depending on the capacity of the kilns and cement mills.

V.E.1. General description of the clinker grinding process as outlined above, of the machinery and equipment utilized as well as of all inputs and outputs (see explanatory notes on Part B.V.) of this production stage.



V.E.2. CEMENT MILLS

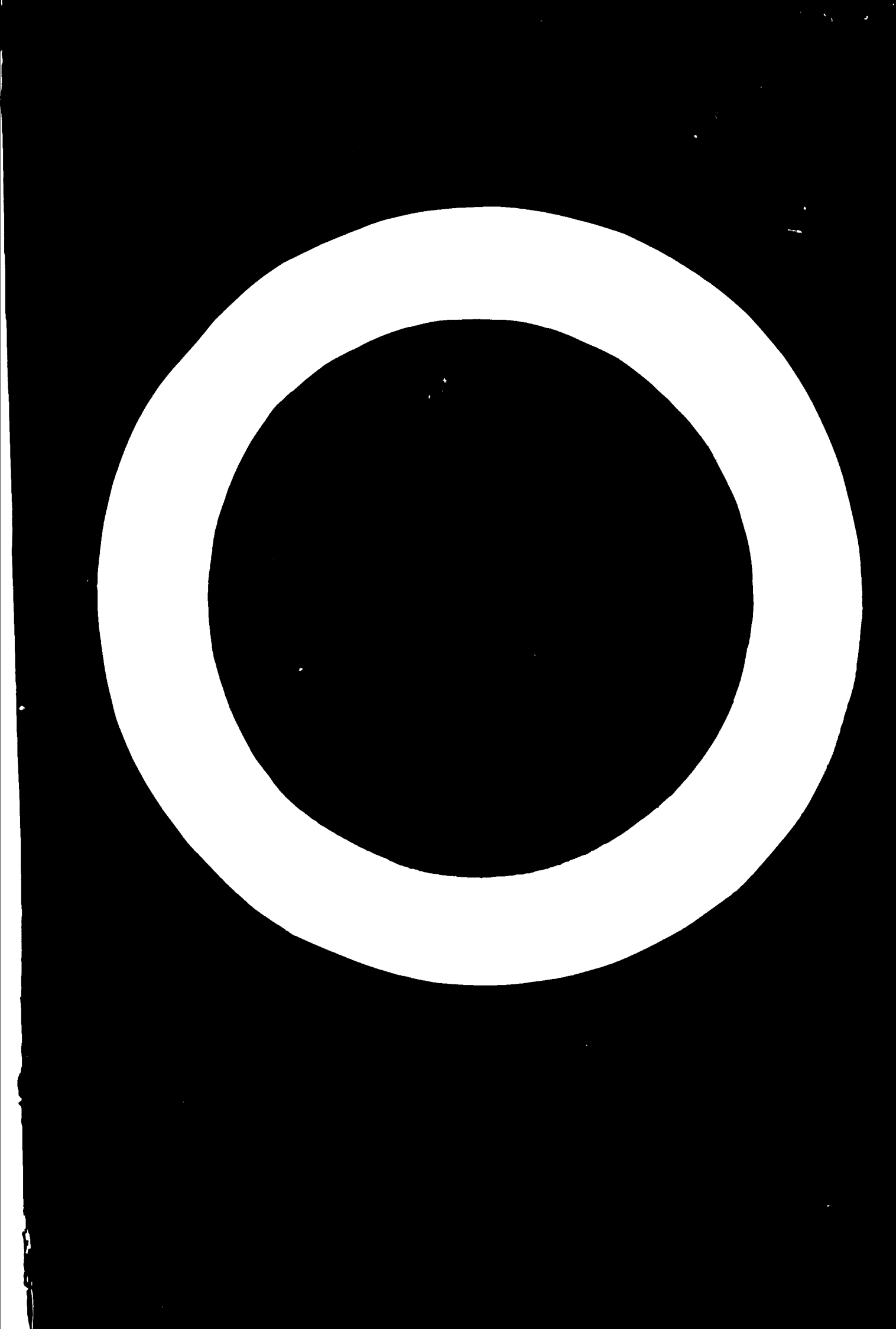
General specifications	Mill No. 1	Mill No. 2	Mill No. 3	Mill No. 4	Mill No. 5
Type of mill:					
Closed circuit					
Open circuit					
Length					
Diameter					
Speed Rev/m					
Nominal capacity: ton/hour					
Actual production: ton/hour					
Mill Motor (in kW)					
Dimensions of mill compartments in meters and charges:					
1.					
2.					
3.					
4.					
Power consumption per ton produced (in kWh/t):					
Consumption of grinding media and liners per ton produced:					
Annual capacity:					
Annual production:					



List of equipment	Number	Type and supplier	Motor power (in kW)	Capacity (either/or)	
				m^3/hour	ton/hour
Pneumatic pumps					
Bucket elevator					
Screw conveyors					
Others					

V.E.4. POWER CONSUMPTION OF CLINKER GRINDING DEPARTMENT

Type of energy	19	19	19
kWh			
fuel (tons)			

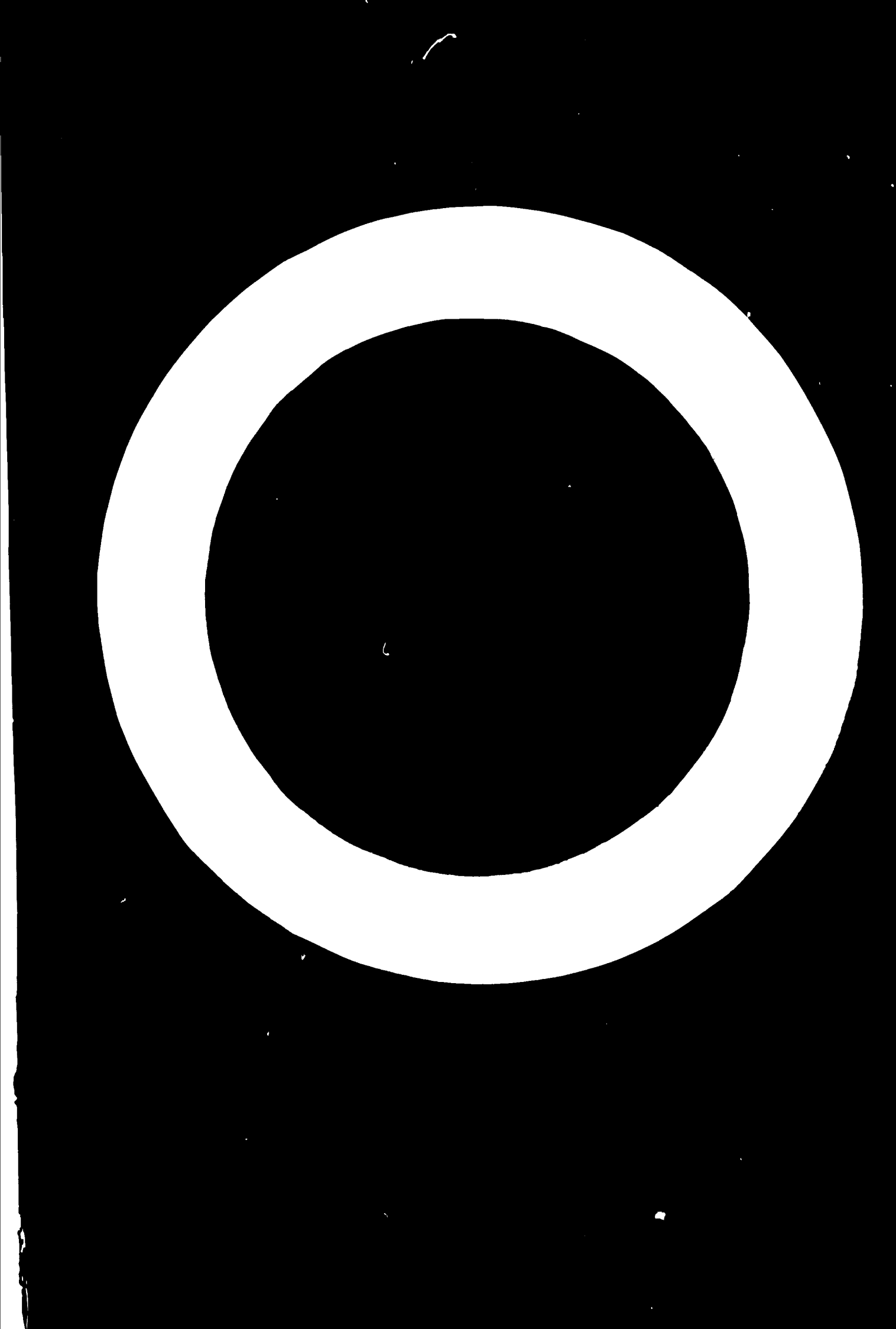


Cement storage and handling comprises storage of cement, extraction of cement from storage silos either for packing or bulk transport, until delivery from the plant.

For example:

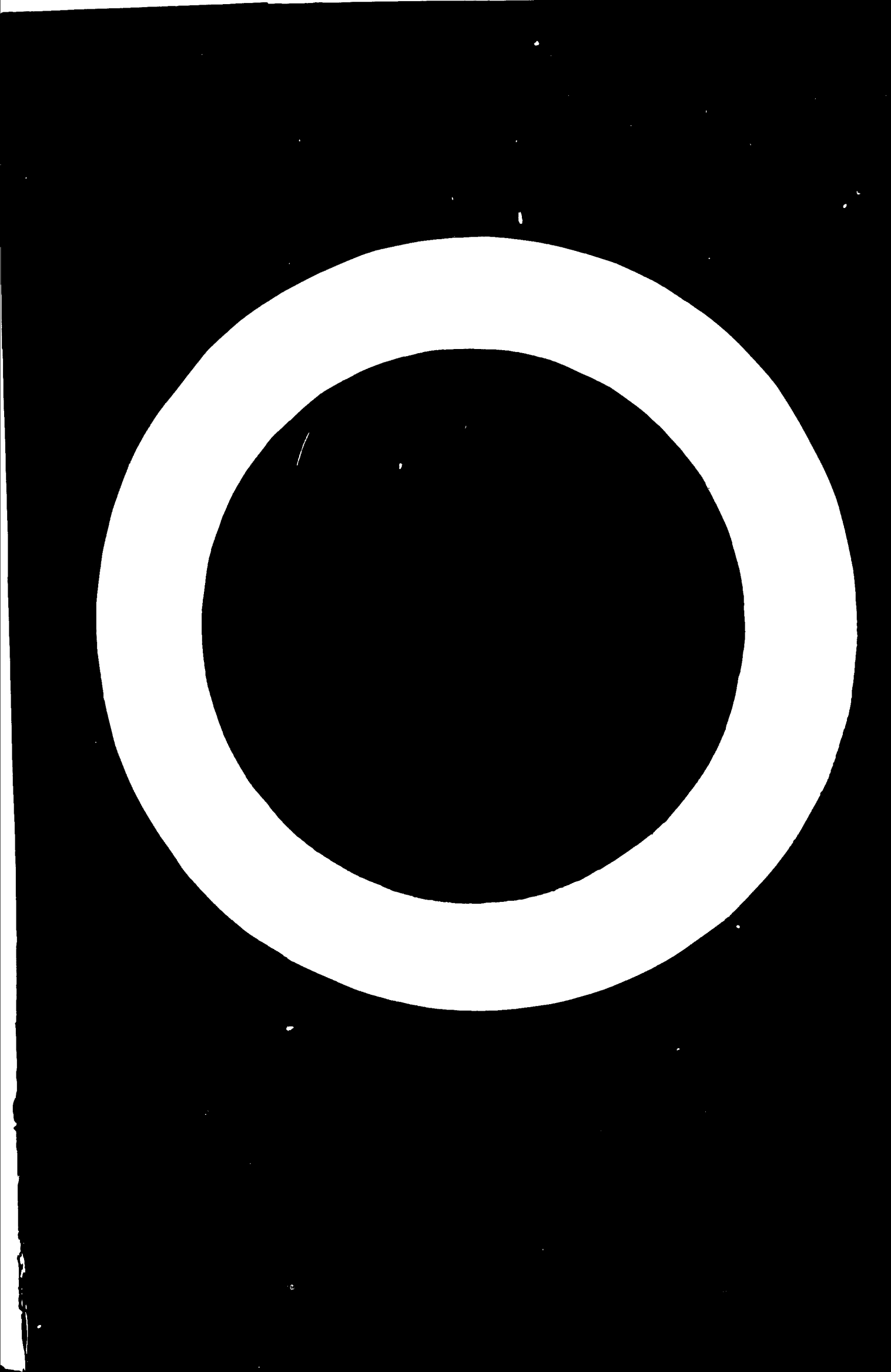
- Transportation to bulk loaders
- Transportation to packing machines
- Handling of bags

V.F.1. General description of the cement storage and handling process as outlined above, of the machinery and equipment utilized as well as of all inputs and outputs (see explanatory notes on Part B.V.) of this production stage.



Unit	Type and supplier	Capacity ton/hour
Packing machine		
No. 1		
No. 2		
No. 3		
No. 4		
No. 5		
No. 6		
No. 7		
No. 8		
No. 9		
No. 10		

Indicate whether the machine is rotary or stationary



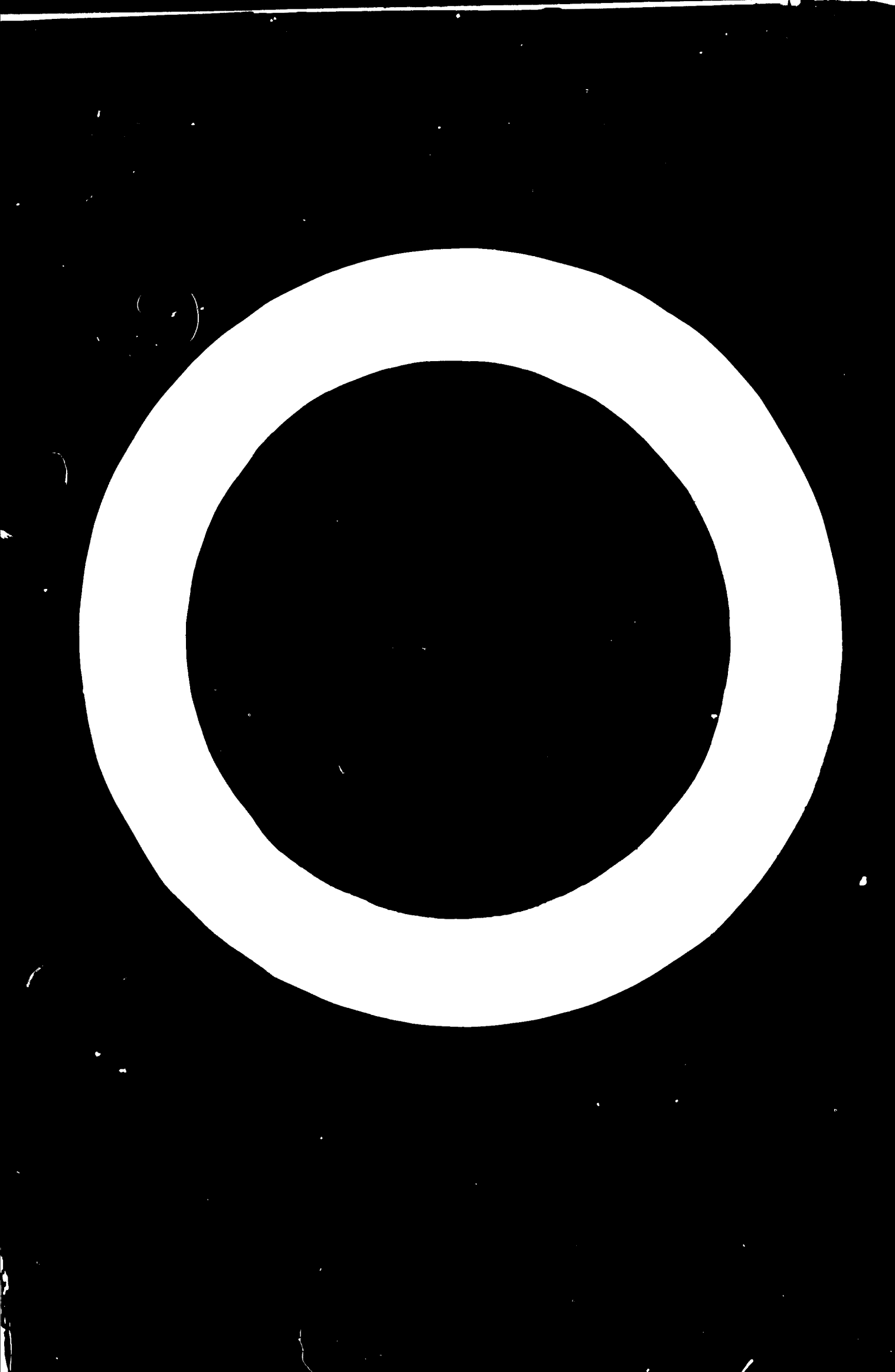
V.F.3. CEMENT DISPATCH: BAGS - BULK

Year	Railway		Lorries		River transport		Tons	%	Tons	%
	Tons	%	Tons	%	Tons	%				
19										
19										
19										
19										
19										
Total										

Total transport in tons:

a) by own means:

b) by contractor:

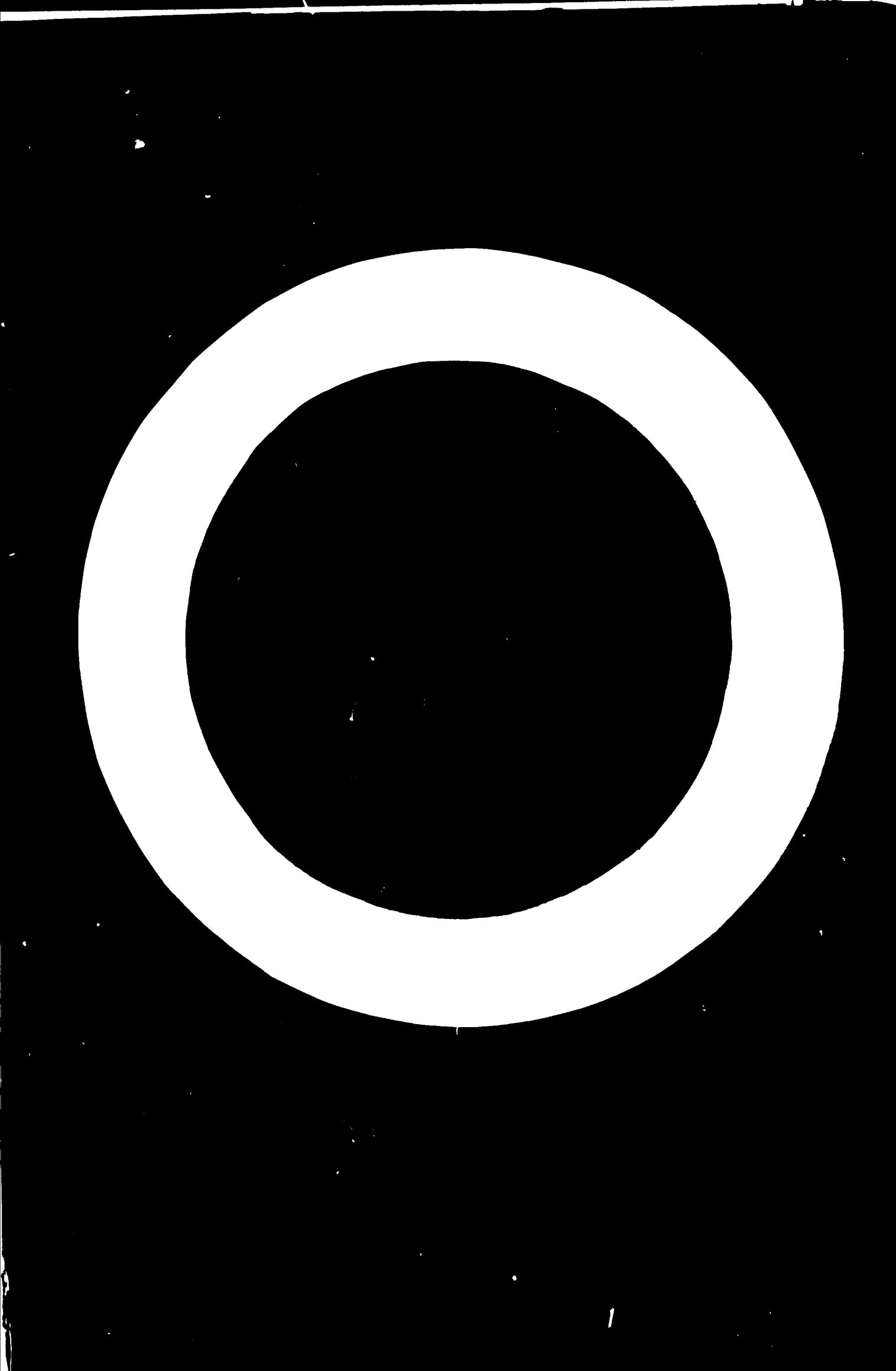


V.F.4. CEMENT SILOS

Serial No.	Number	Type of Silo	Capacity in Tons
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

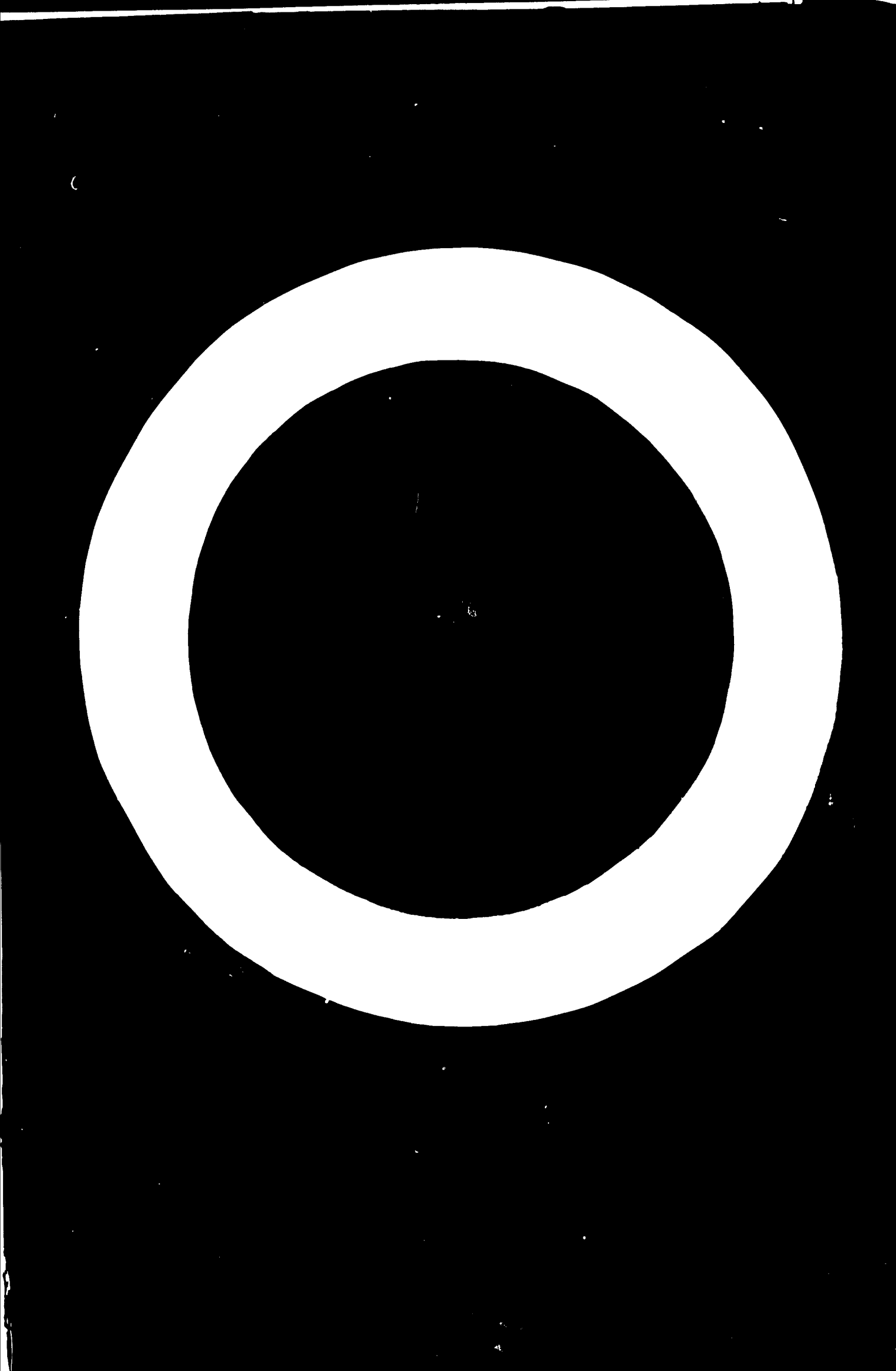
V.F.5. CEMENT TRANSPORTATION EQUIPMENT FROM THE SILOS TO THE PACKING SECTION

Unit	Number	Type and supplier	Capacity m^3/hour either - or	ton/hour
Pneumatic Pumps Bucket Elevators Screw Conveyors Others				



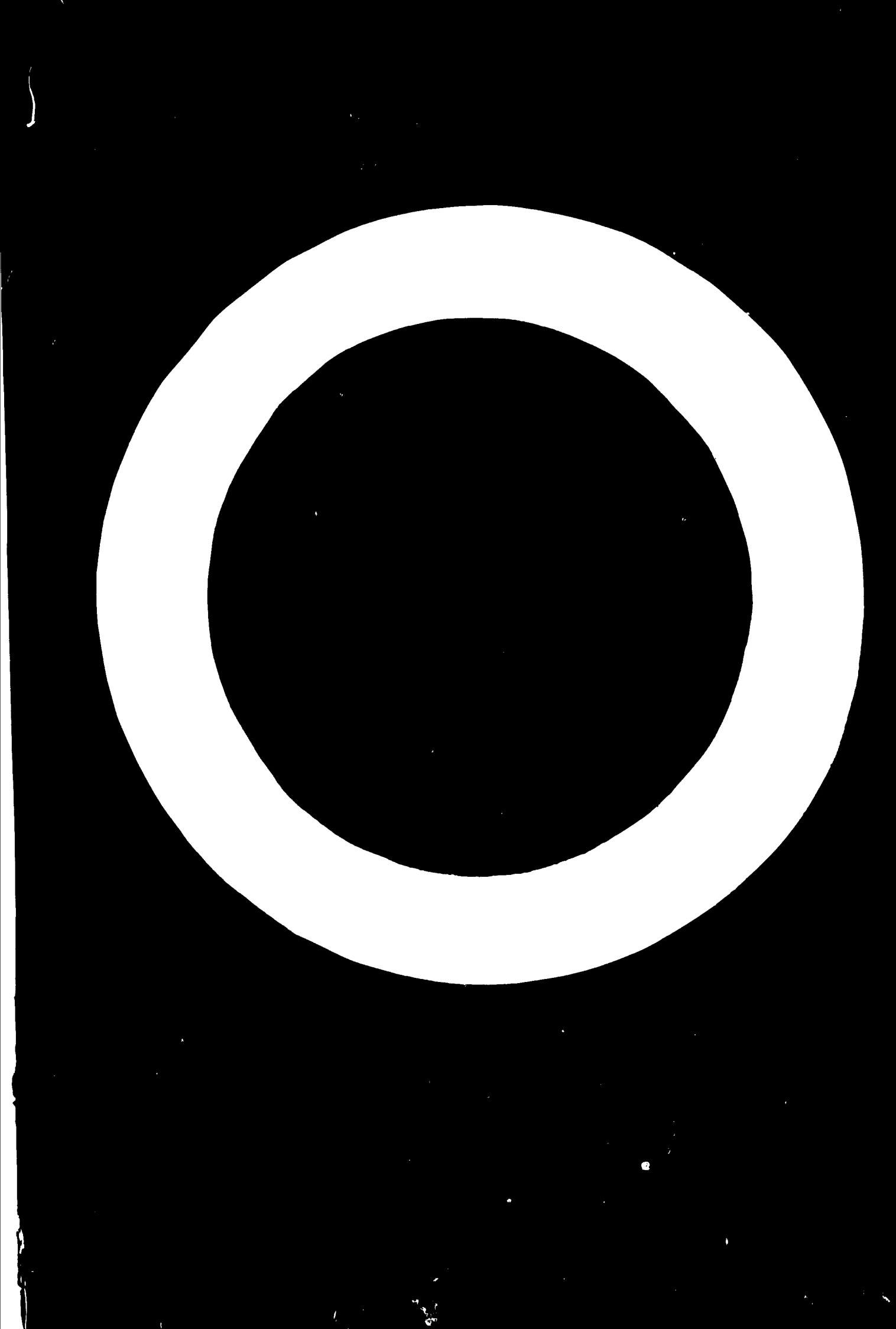
VI. MANNING TABLE AND WORKING TIME

COST CENTRES	NUMBER OF EMPLOYEES AND WORKERS (annual average)									
	Supervising staff and foremen	Day shift skilled	Day shift unskilled	First shift skilled	First shift unskilled	Second shift skilled	Second shift unskilled	Third shift skilled	Third shift unskilled	Total man hours
A. PRODUCTION COST CENTRES										
1 Quarry 2 Crushing 3 Raw mat. grinding 4 Raw mix 5 Clinker product. 6 Cement grinding 7 Cement storage and handling 8 Others										
SUBTOTAL A.										



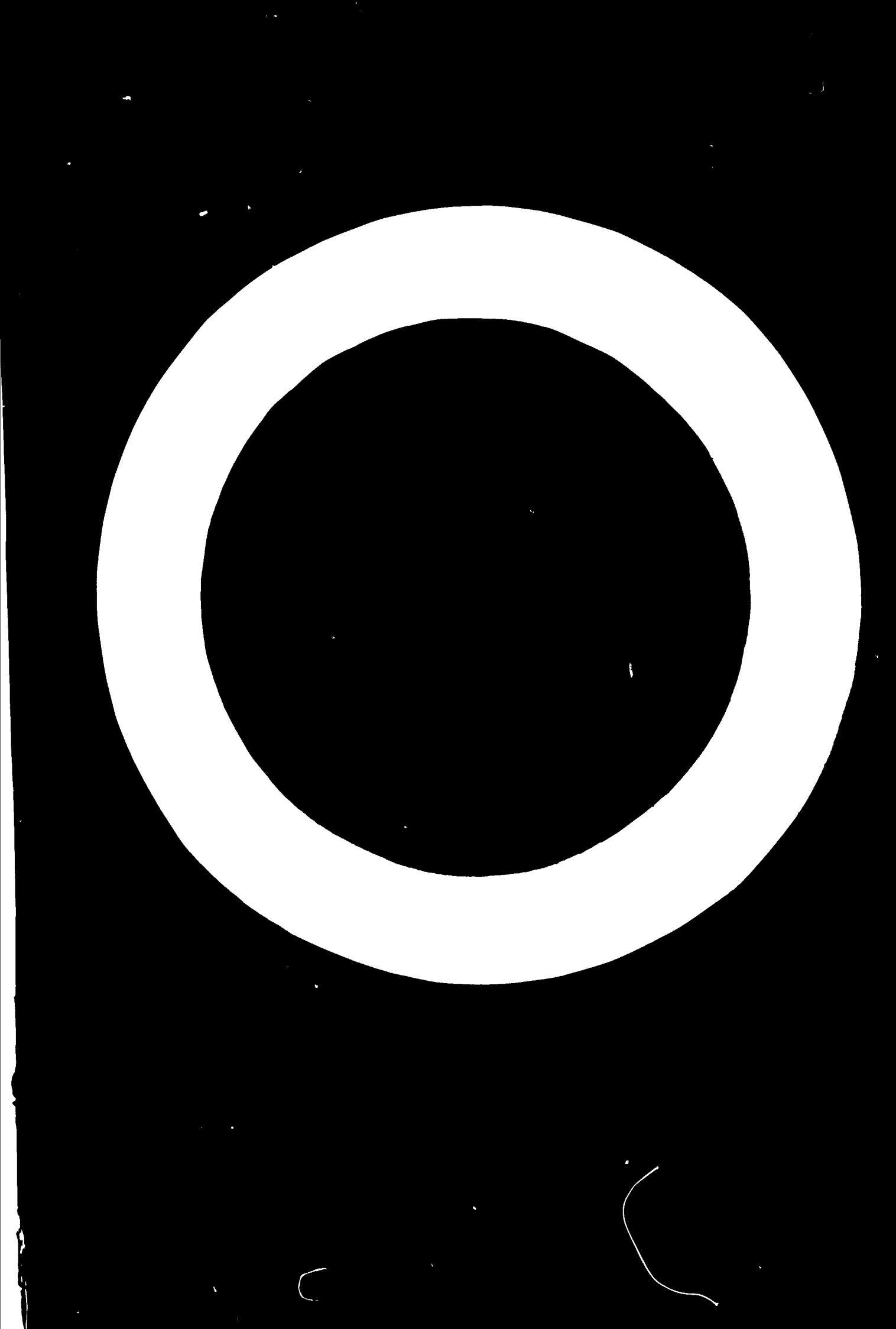
VI. MANNING TABLE AND WORKING TIME

B. SERVICE COST CENTRES	NUMBER OF EMPLOYEES AND WORKERS (annual average)									
	Supervising staff and foremen	Day shift skilled	Day shift unskilled	First shift skilled	First shift unskilled	Second shift skilled	Second shift unskilled	Third shift skilled	Third shift unskilled	Total man hours
1 Social services										
2 Plant management										
3 Off-site transp.										
4 Purchasing										
5 Stores										
6 Repair + mainten.										
7 Power, heat + light										
8 Research+develop.										
9 Water supply										
10 Labor. process control										
11 Others										
SUBTOTAL B.										
TOTAL A. + B.										
C. SALES *										
D. ADMIN.+ FINANCE										



VII. STORAGE CAPACITIES

	Tons
Limestone before crushing	.....
after crushing	.....
Clay	.....
Raw mix	.....
Clinker	.....
Gypsum	.....
Fuel	.....
Water	.....
Others	.....
	.....



VIII. PRODUCTION AND WORKING HOURS OF PRINCIPAL MACHINES

(first year)

19..							
Unit	Annual production	Capacity ton/hour	Annual working hours	Hours of Stoppages			
				Mechanical maintenance	Electrical maintenance	Lack of spare-parts	Others
Crushers							
1							
2							
3							
.							
.							
Wash mill							
1							
2							
3							
:							
:							
R. M. mills							
1							
2							
3							
.							
.							
Kilns							
1							
2							
3							
.							
.							
Cement mills							
1							
2							
3							
.							
.							
Packing machines							

Note: this table should be filled in for 3 years.

3. 9. 74

3 OF 3

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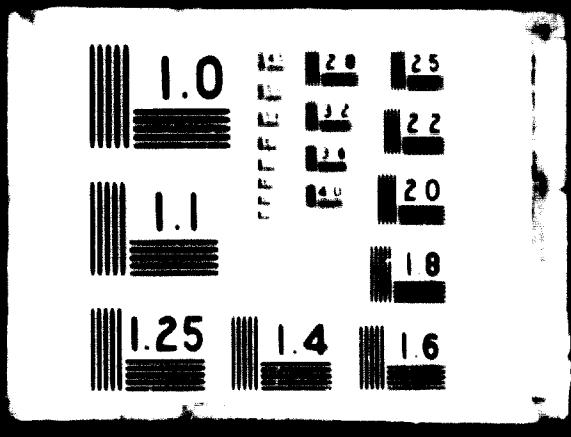
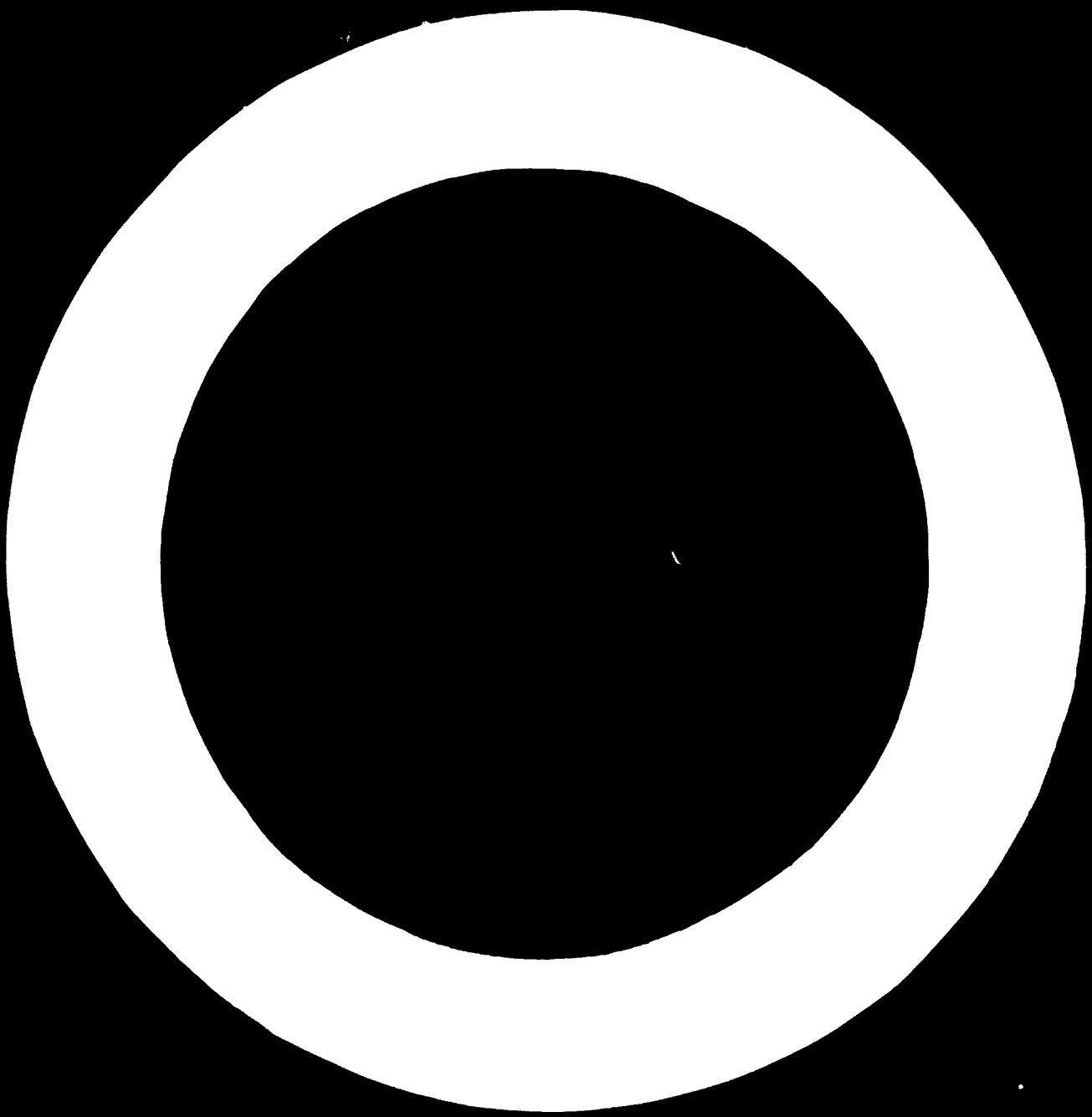


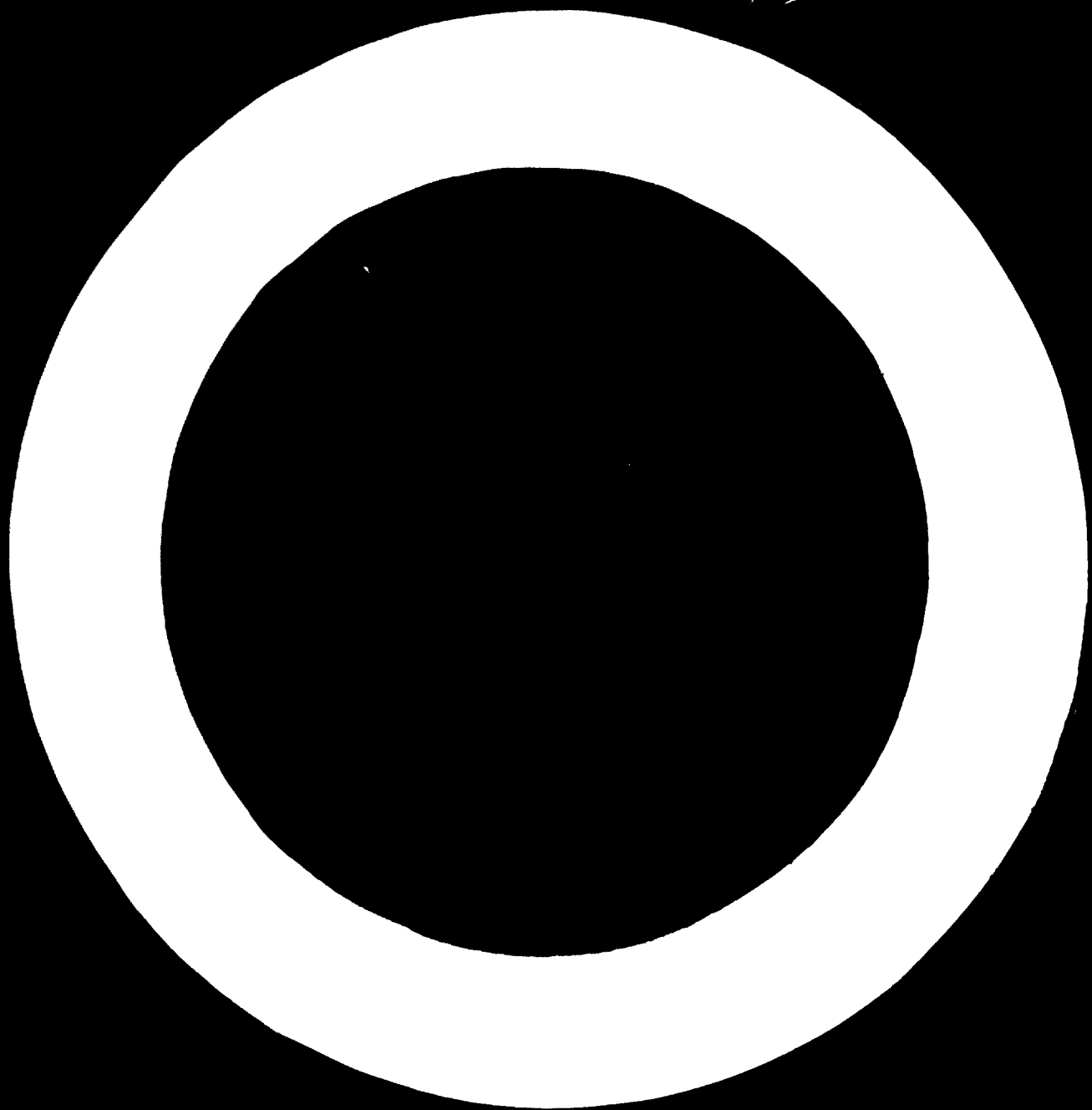


VIII. PRODUCTION AND WORKING HOURS OF PRINCIPAL MACHINES

(second year)

19..							
Unit	Annual production	Capacity ton/hour	Annual working hours	Hours of Stoppages			
				Mechanical maintenance	Electrical maintenance	Lack of spare-parts	Others
Crushers							
1							
2							
3							
.							
.							
Mash mill							
1							
2							
3							
.							
.							
R. M. mills							
1							
2							
3							
.							
.							
Kilns							
1							
2							
3							
.							
.							
Cement mills							
1							
2							
3							
.							
.							
Packing machines							

Note: this table should be filled in for 3 years.

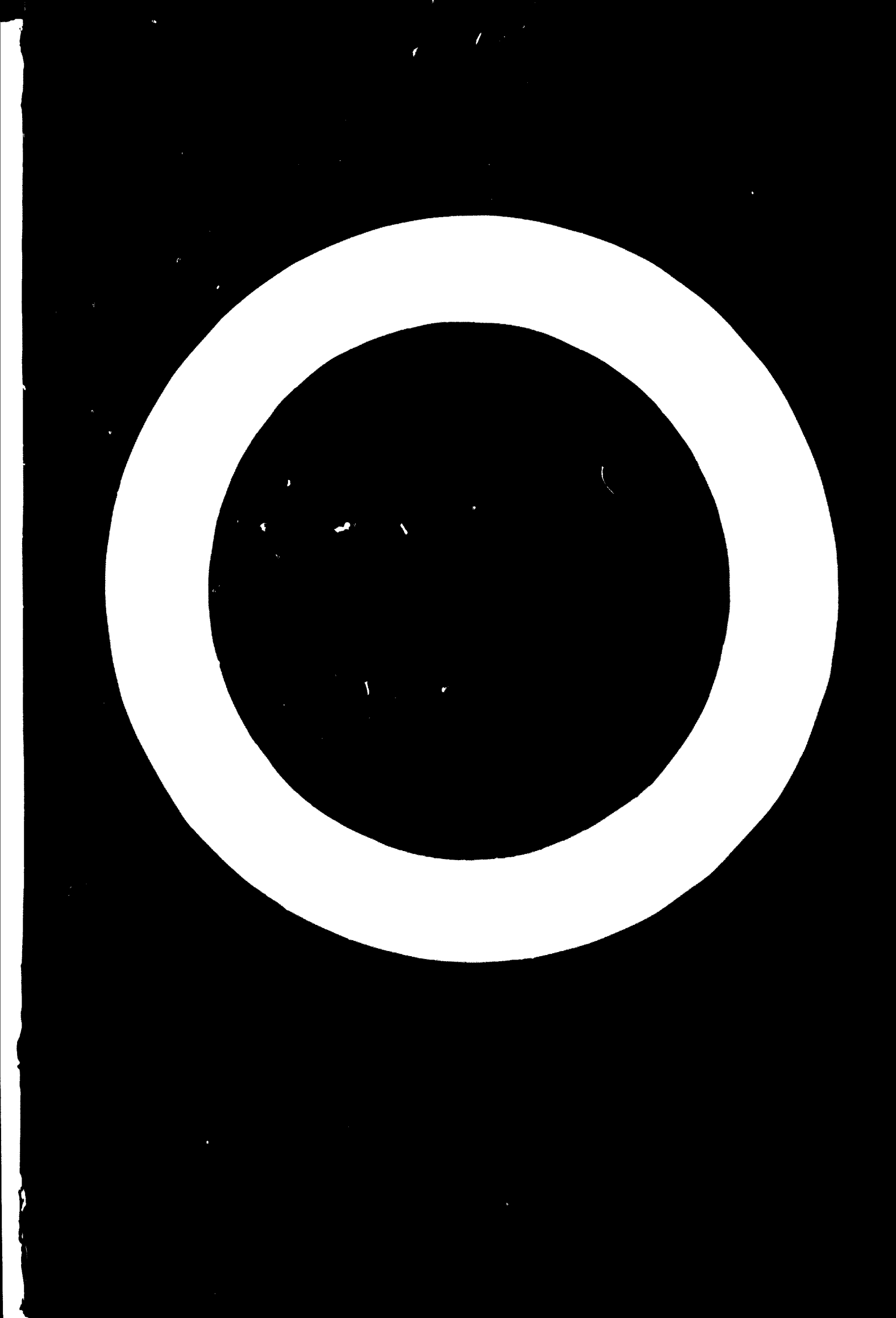


VIII. PRODUCTION AND WORKING HOURS OF PRINCIPAL MACHINES

(third year)

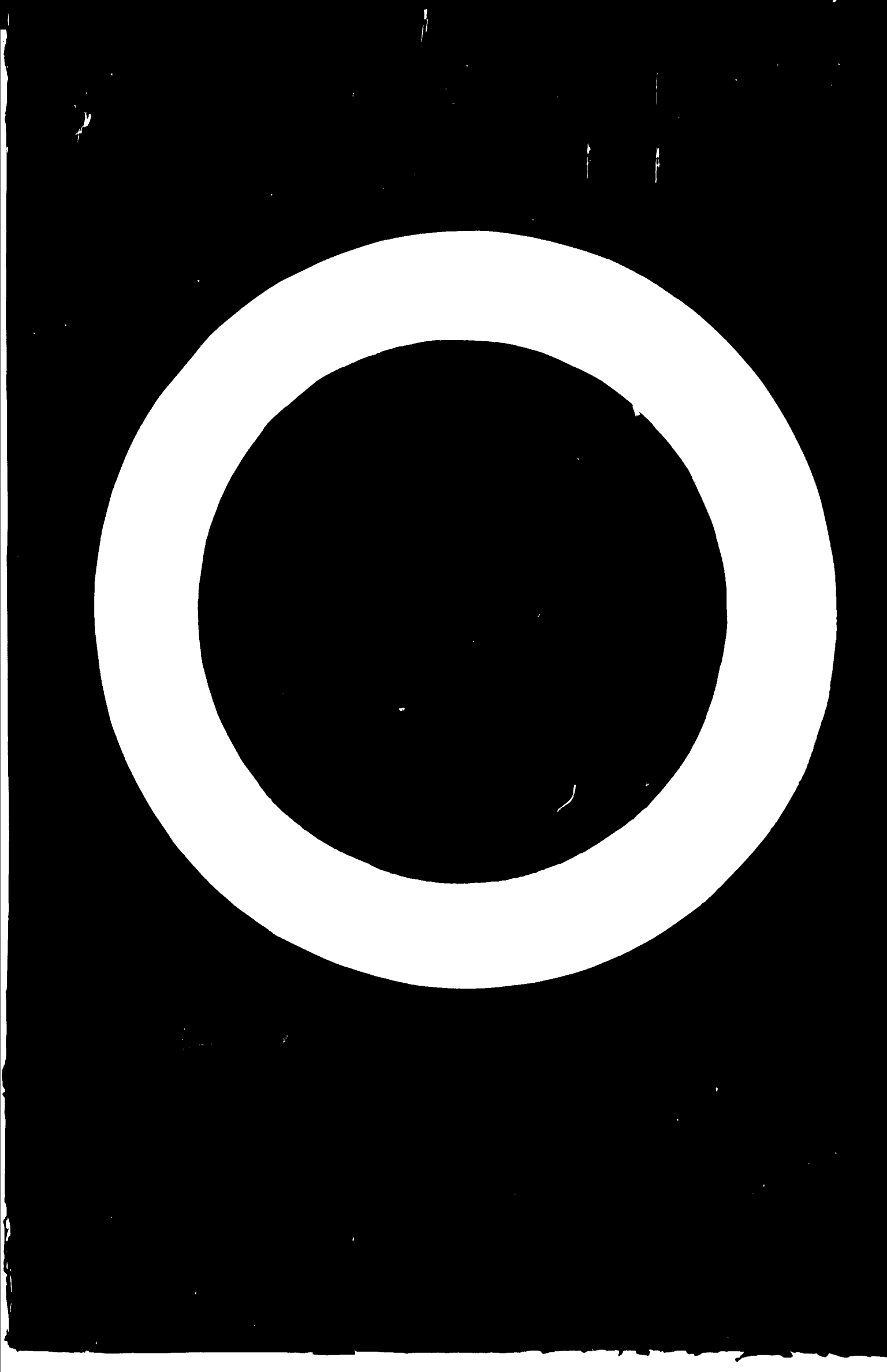
19..							
Unit	Annual production	Capacity ton/hour	Annual working hours	Hours of Stoppages			
				Mechanical maintenance	Electrical maintenance	Lack of spare-parts	Others
Crushers							
1							
2							
3							
.							
.							
Wash mill							
1							
2							
3							
.							
.							
R. M. mills							
1							
2							
3							
.							
.							
Kilns							
1							
2							
3							
.							
.							
Cement mills							
1							
2							
3							
.							
.							
Packing machines							

Note: this table should be filled in for 3 years.



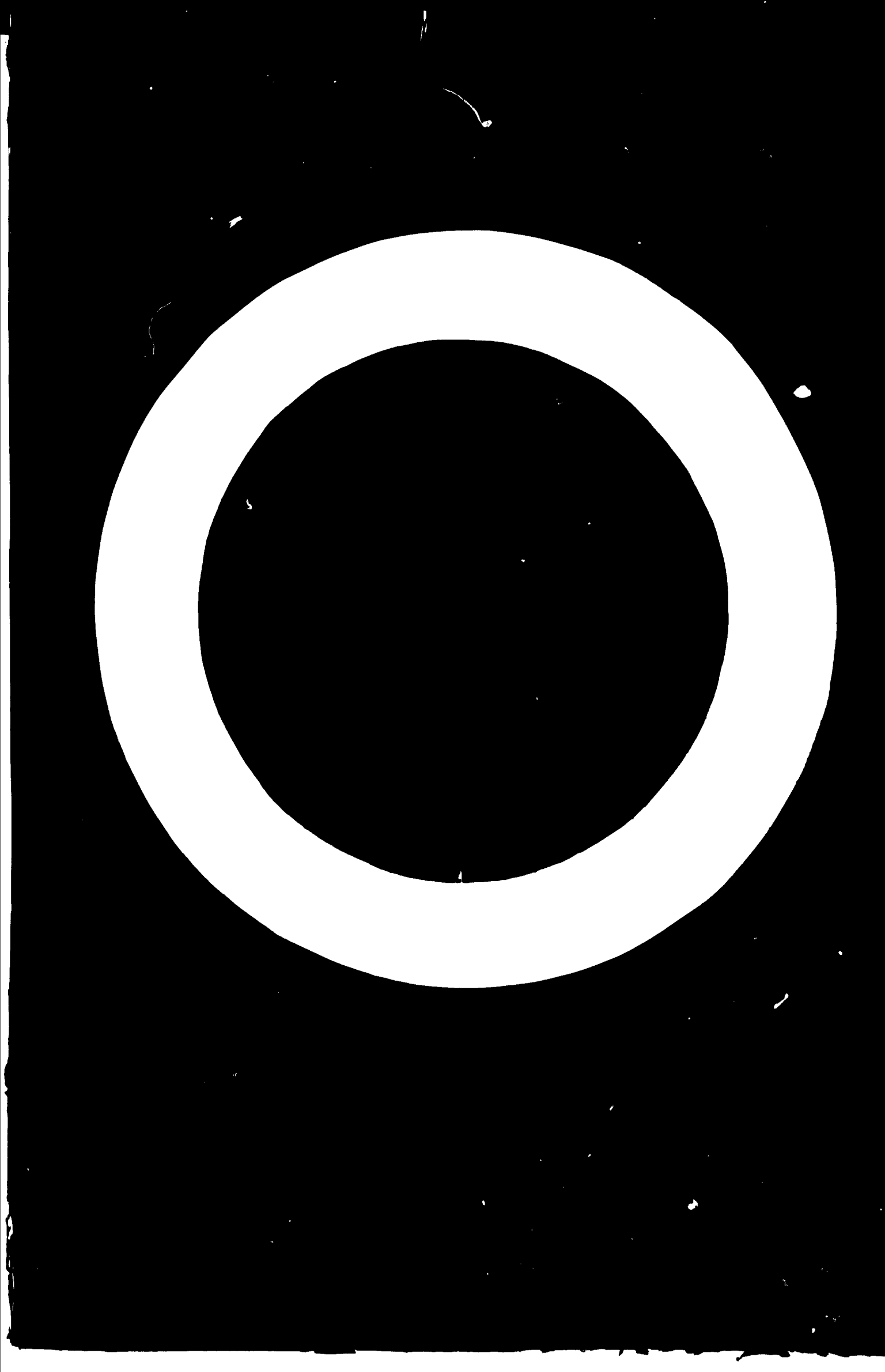
IX. MATERIAL PRODUCTIVITY

Kind	Unit per ton	Limestone	Clay	Raw mix preparation	Clinker	Cement preparation	Total for cement in silo
Explosives	kg/t	x	x				x
Grinding media	kg/t			x		x	x
Ref. bricks	kg/t				x		x
Fuel	net cal. per ton				x		
Power	kWh/t	x	x	x	x	x	x
Spare-parts	value/t	x	x	x	x	x	x
Dustloss	%						



X. LABOUR PRODUCTIVITY

	Extraction of raw mat.		Crushing		Raw mix		Kiln		Cement preparation		Packing		Cement
	man hour per ton r. m.	m.h./ ton cem.	m.h./ ton r.m.	m.h./ ton cem.	m.h./ ton r.m.	m.h./ ton cem.	m.h./ ton clinker	m.h./ ton cem.	m.h./ ton ground c.	m.h./ ton cem.	m.h./ ton cem.	m.h./ ton cem.	m.h./ ton
Operation													
Repair													
Total													



PART C: PERFORMANCE EVALUATION

The objective of this part of the Industrial Performance Evaluation Profile is to indicate methods by which management can evaluate the performance of the firm.

The data used should be calculated for the several accounting periods so that trends in performance can be identified: those moving adversely can therefore be investigated. The data used in Part A of the profile contain the basic information necessary to complete this section.

The performance evaluation should cover cost and productivity indices, financial ratios, fixed and variable costs.

I. COST AND PRODUCTIVITY INDICES

The starting point in cost efficiency evaluation is the calculation of a cost index which represents the average cost of the production process performed, or the service rendered by each cost centre. Such indices should be calculated for successive accounting periods and compared over time so that a cost trend can be established for each centre. Changes in these trends reflect the cost variation and provide the basis for managerial action towards cost reduction. In addition certain productivity and technical ratios can be divised which help to explain cost differences and can identify specific areas of inefficiency.

Besides, the availability of such indices facilitates the preparation of budgets and the implementation of budgetary control. For plants applying the advanced techniques of standard costing the calculation of actual or historical cost average is prerequisite.

From the stand point of the cement industry as a whole, the calculation of cost and productivity indices for each plant is the cornerstone of interfirm comparison within the cement industry.

The more important cost and productivity indices are explained in the following:

1. PRODUCTION COST CENTRES

1.1. Cost of limestone/Ton of cement

1.2. Cost of clay/Ton of cement

1.3. Cost of power and energy/Ton of cement

1.4. Cost of limestone (after crushing)/Ton of cement

1.5. Cost of clay (after crushing)/ Ton of cement

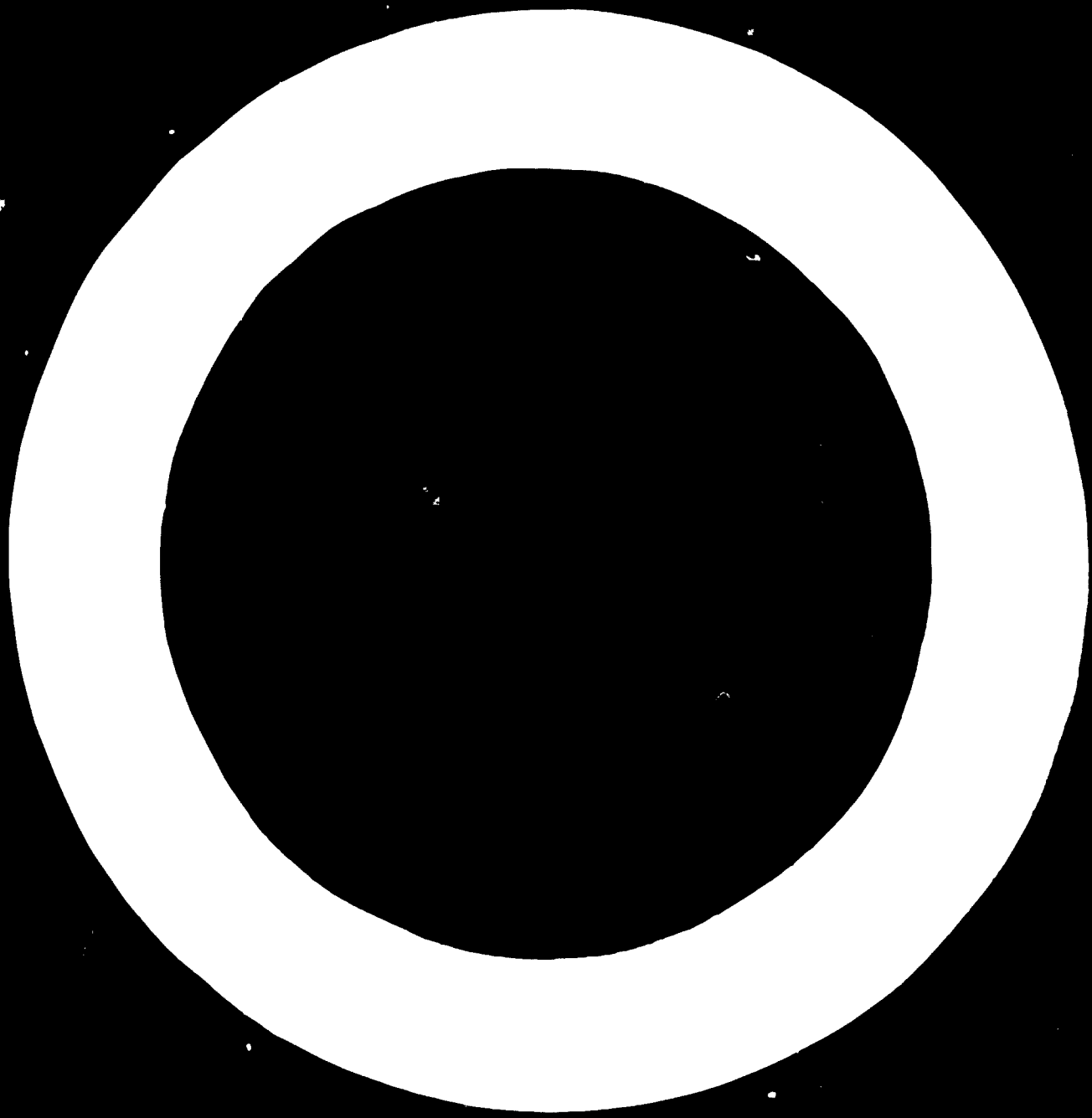
1.6. Cost of raw mix (including milling)/Ton of cement

1.7. Cost of clinker produced/Ton of cement

1.8. Cost of cement produced (including grinding)/Ton of cement

1.9. Cost of packing and shipment/Ton of cement

1.10. Cost of kraft bags/ Ton of cement



2. SERVICE COST CENTRES

2.1. Social services
The cost index for social services may be expressed as the share per employee of such services. Alternatively as a percentage of the total direct and indirect wages.

2.2. Plant Management
The share per employee in both production and service cost centres is a significant index.

2.3. Transport
The cost per ton/kilometer of the goods transported should be compared periodically with the rate charged by independent carriers.

2.4. Purchasing
The cost index for purchasing may be expressed as the share per pound (or other monetary unit) of purchases during the accounting period.

2.5. Repair and maintenance
The cost index for maintenance work should be expressed in the form of maintenance cost per production hour for the period.

2.6. Power, heat and light
The cost per kilowatt-hour of electric current generated by the plant should be compared periodically with the cost of current purchased from local authorities.

2.7. Warehouses
The cost index for warehousing may be expressed as the cost of storage per good ton of glass.

3. DISTRIBUTION, SELLING AND MARKETING (= sales cost)

The cost index may be expressed in one of the following forms:

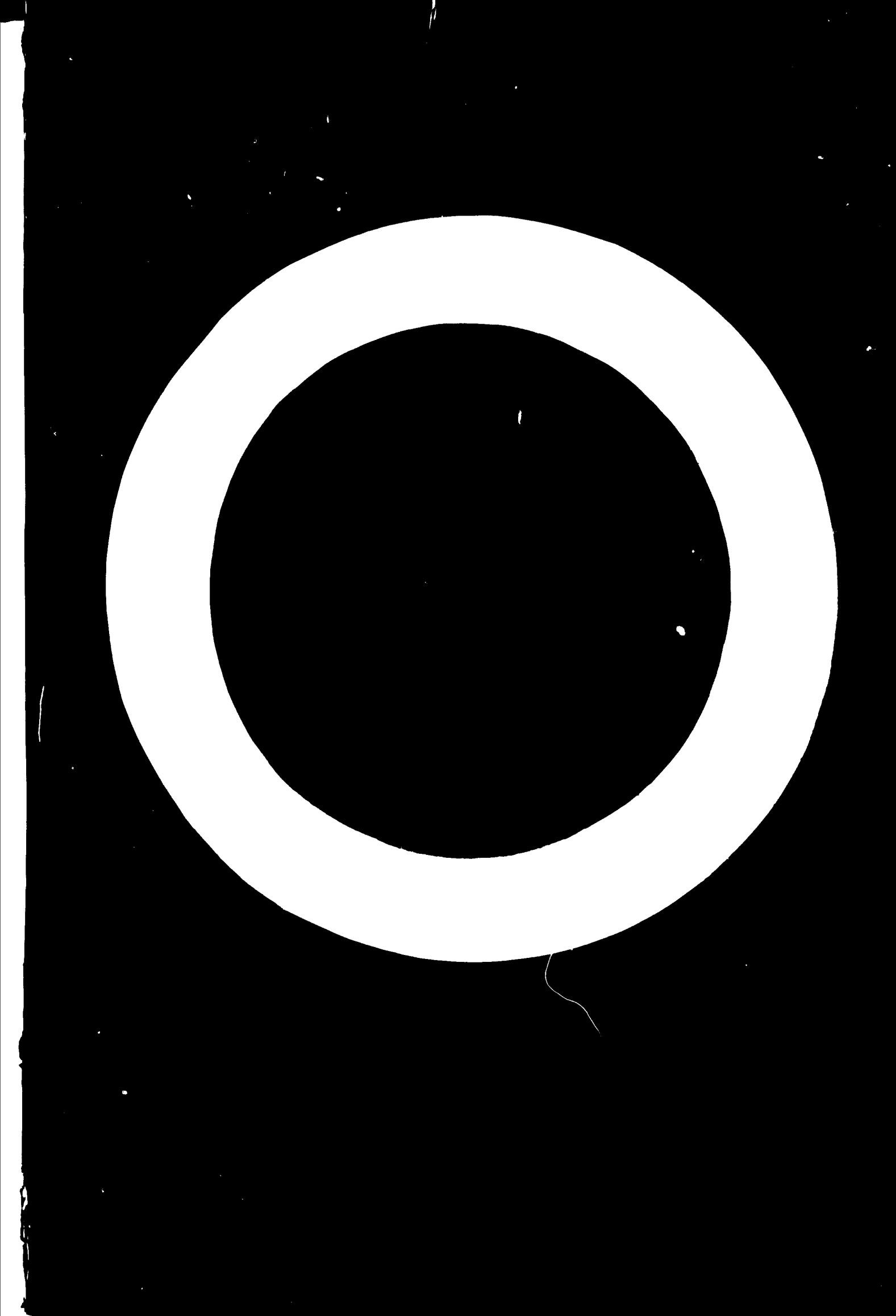
3.1. The cost per good ton of cement delivered

3.2. The cost per pound (or other monetary unit) of sales

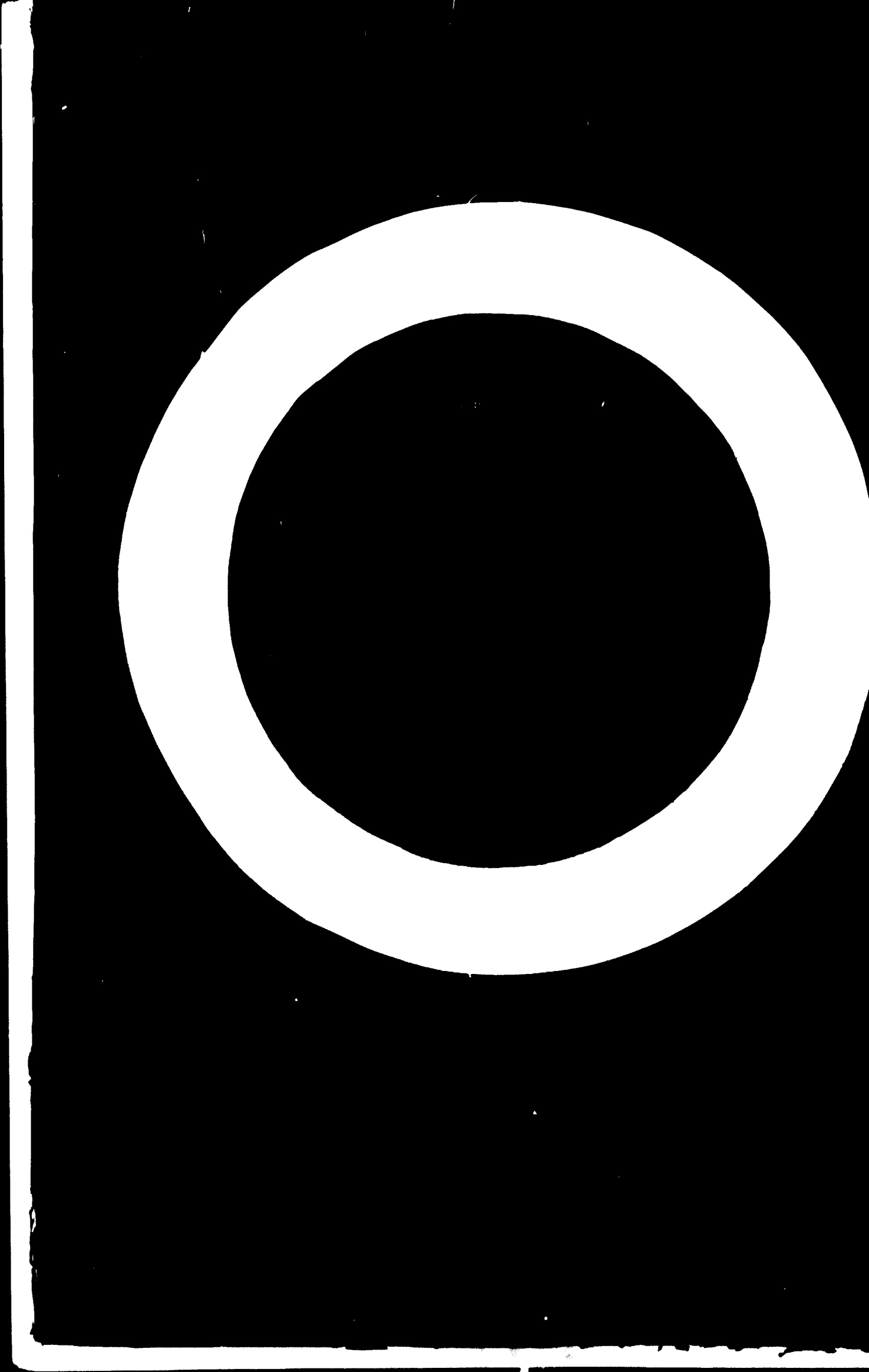
4. ADMINISTRATION AND FINANCE

The total expenses of administration and finance should be expressed as a percentage of the total annual expenses.

The data required for the calculation of the foregoing indices can be readily obtained from the "Departmental Cost Sheet" and the "Distribution of Service Costs". These indices should be computed for, at least, three years.



	Period		
	19	19	19
1. PRODUCTION COST CENTRES			
Cost of limestone/ton of cement produced			
Cost of clay/ton of cement produced			
Cost of power + energy/ton of cement produced			
Cost of crushed limestone/ton of cement produced			
Cost of crushed clay/ton of cement produced			
Cost of raw mix (incl.milling)/ton of cement produced			
Cost of clinker produced/ton of cement produced			
Cost of cement produced (incl.milling)/ton of cement			
Cost of packing + handling/ton of cement produced			
Cost of kraft bags/ton of cement produced			
2. SERVICE COST CENTRES			
Social service cost per employee			
Plant management as percentage of total production + service costs			
Transport cost per ton/km.			
Purchasing cost per monetary unit			
Maintenance cost per operating hour			
Power generated per kWh			
Warehousing per good ton of cement			
3. DISTRIBUTION, SELLING AND MARKETING			
Cost of sales per good ton of product			
Sales per monetary unit of sales			
4. ADMINISTRATION AND FINANCE			
Ratio of administrative and financial cost to total cost			



The ratios included in this table have been selected for the presentation and analysis of the following aspects of financial operation:

1) Ability to pay current debt

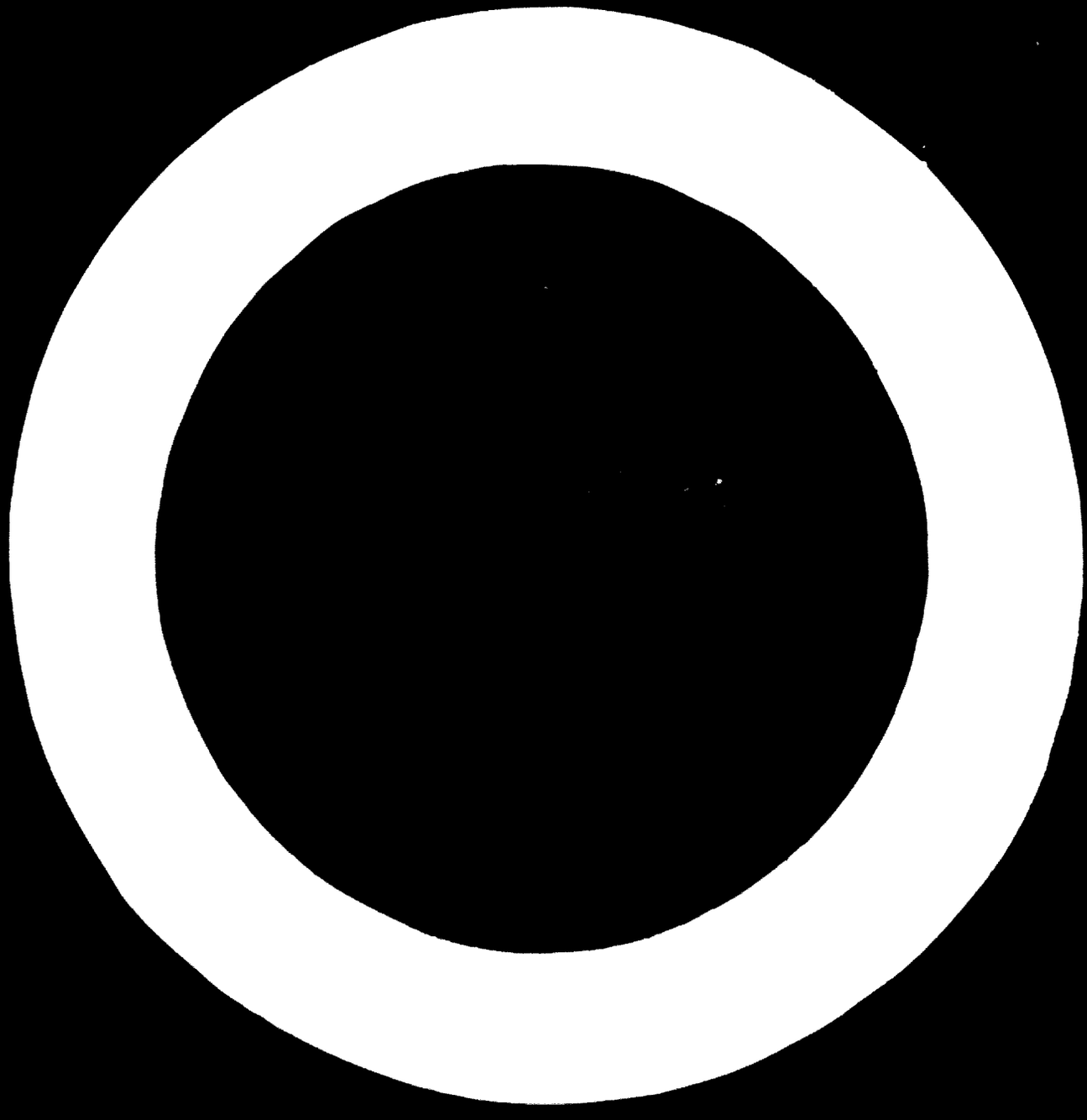
2) Asset utilization

3) Return on investment

4) Operating results

- Table 4 -

Financial Ratios	Period of Comparison		
	19..	19..	19..
1. **Ability to pay current debt**			
a) Current assets: Current liabilities			
b) Quick assets: Current liabilities (quick assets = current assets - inventory)			
c) Inventory turnover rate = Cost of goods sold: inventory of finished products			
d) Turnover of receivables = Net sales: receivables			
2. **Asset utilisation**			
a) Turnover of operating assets			
Fixed assets: sales			
Current assets: sales			
Total assets: sales			
b) Current asset utilisation			
Debtors: sales			
Inventory: sales			
3. **Return on investment**			
Net profit: total operating assets			
4. **Operating results**			
a) Net profit: sales			
b) Production cost of sales: sales			
c) Cost of distribution, selling and marketing: sales			
d) Administrative expenses: sales			
e) Financial expenses (inc. interest): sales			



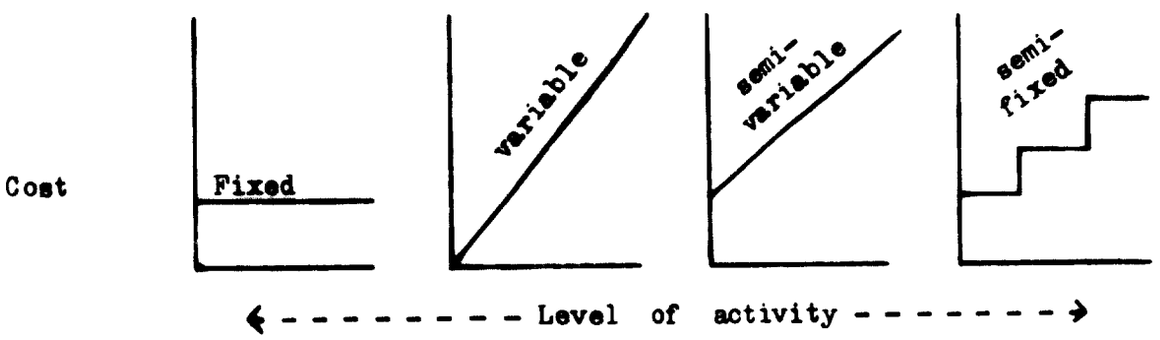
There are four main patterns of cost behaviour into which all cost items can be grouped:

1) Fixed costs: These costs remain unchanged regardless of changes in the level of activity. They are usually incurred on a time basis (examples: long-term contractual services, rents, admin. salaries)

2) Variable costs: These costs vary in direct proportion to the level of activity (examples: production materials, fuel, non-returnable containers)

3) Semi-variable costs: These vary with the level of activity but not in direct proportion (Maintenance costs are usually semi-variable since some maintenance work has to be done regardless of the level of activity, e.g. daily oiling of machines and periodical overhauling of plant and equipment)

4) Semi-fixed costs: These remain fixed within a certain range of the level of activity and increase by a given amount at a time, taking the form of a stepfunction (examples are: supervision, product inspection)



Segregation of cost items into the foregoing categories is based on the availability of actual cost data for each cost element over a fairly long period of time and for varying levels of activity.

Accurate classification of these costs should be done by statistical analysis of the recorded cost data after eliminating the distorting effects of changes due to other cost-determining factors (e.g. changes in the price level and managerial decision). The results of statistical analysis are usually supplemented by industrial engineering studies related to the variability of the various cost items in connection with the particular business conditions.

The presence of semi-variable and semi-fixed costs complicates the cost volume studies. To avoid such difficulties all cost items may, in practice, be only classified as fixed or variable.

EXPLANATORY NOTES

- Table 5 -

1. The cost of Spare parts has been classified as a fixed cost based on the assumption that proper maintenance is continuously provided.

2. The cost of Maintenance work done by outside contractors depends upon several factors such as: management policy, the age and physical condition of the plant and equipment, and the availability of outside contractors rather than the volume of activity.
   Maintenance costs should be carefully analyzed by each firm and classified as variable or fixed costs according to the prevailing conditions.

3. It should be noted that Insurance on stocks is fixed for short-term periods only.

4. Depreciation: Assuming that the straight line method is used. However, if the accelerated method is applied, depreciation allowances will vary with the level of activity and should, consequently, be classified as a variable cost.

5. Royalties are usually fixed unless they are payable per ton of output produced.

Results obtained from Table 5 can be usefully utilized by management for the following purposes:

1) Study of cost structure at the varying levels of activity.

2) Profit planning through the use of "break-even-charts" with its several variants, provided that the limitations of this technique are well realized.

Table 5 presents a tentative classification of cost items into variable and fixed costs for the production of cement. It should be emphasized that the suggested classification is only tentative and should be subject to statistical and engineering studies to be conducted by each individual firm in the light of its own cost data.

- Table 5 -

Period:

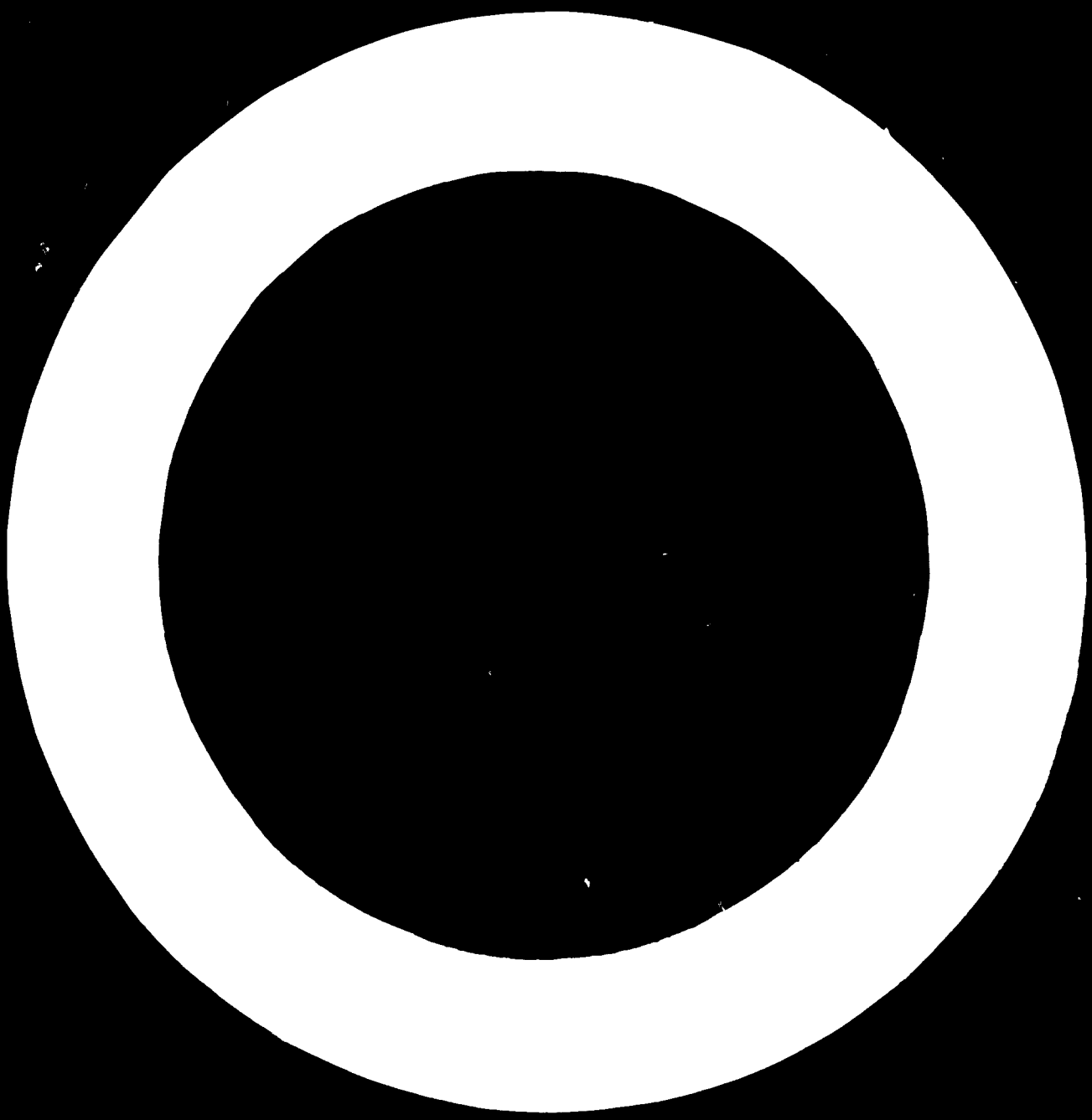
From: .....

To: .....

Level of activity - Volume of production .....
- Percentage of capacity utilized .....
- Number of operating hours .....

	£	£	%
Variable costs:			
Raw material			
Fuel oil (masut) and gas oil			
Packaging			
Motor fuel			
Electricity			
Water			
Production bonuses			
Overtime wages			
Temporary labour wages			
Freight			
Sales taxes			
Business taxes			
Sales commissions			
Purchasing commissions			
Total variable costs			
Fixed costs:			
Spare parts			
Maintenance supplies			
Office supplies			
Production wages and salaries:			
Basic wages			
Social security contributions			
Health insurance			

(cont...)



(cont. Table 5)

(Fixed costs):	£	£	%
Service wages and salaries:			
Basic wages			
Social security contributions			
Health insurance			
Selling and delivery wages:			
Basic wages			
Social security contributions			
Health insurance			
Maintenance			
Insurance			
Depreciation - buildings			
Depreciation - machin. and equipment			
Depreciation - transport equipment			
Amortisation of non-physical assets			
Communication expenses			
Travel			
Other admin. expenses			
Rent			
Property tax			
Interest			
Financial expenses			
Royalties			
Total fixed costs			
Total costs			

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