KIK/KMKP is managed by each branch which covers the procedures from customers' applications to appraisal, extension of loans, and monitoring and evaluation of loans. Based on the reports given by each branch, the head office analyzes the total figures of KIK/KMKP, makes loan policies, gives directions and advices to each branch whenever necessary.

Looking at the figures for KIK, 65% - 67% of the applications and 55% of the amount applied are being approved, while for KMKP the figures are about 70% and 42 - 46% respectively (Table A-6.29). As for KIK/KMKP as total, the ratio of approvals/applications are 65% - 70% in number of cases and 42% - 55% in the amount of loan. According to BNI's explanation, the disapprovals are caused either by incompletion of application forms and lack of the project feasibility, while those are cases of approval by reducing the original amount applied because of overestimation. BNI explained that each disapproval or delay has its own reasons and it is not their policy to limit approvals. There seems to be a considerable number of projects being carried over to the next fiscal year on account of the delay of appraisal procedures. One of the causes of this delay is imcompletion of financial data and so forth in the application forms.

Table A-6.29 also shows, the average amount applied for either KIK or KMKP is as small as Rp.6 million. Considering that the applications are numerous and that the operation takes time, KIK/KMKP is inefficient in terms of profit. Both large- and small-scale credits require almost the same amount of time and labor to screen loan applications, and it seems that KIK/KMKP is carried out in line with the guidelines of the Government and BI. Since 75% of KIK/KMKP are automotically insured by P.T. Askrindo, little consideration is given to collateral security. Following BI's policy of developing small-scale industries, BNI attaches more importance to the contents of a project rather than to the security.

The standard procedure, forms and operation manuals for loan application, extension of credits, and monitoring and evaluation of loans are being established for all lending operations including KIK/KMKP.

The managers and assistance managers of regional offices and the managers of branch offices are authorized to appraise and approve loans with limitation in types and amount thereby making management of credits more efficient. Power of Decision on loans in BNI are given on Table A-6.30 which specifies the capacity of managers in the resional/branch offices.

(3) Outstandings in arrears of KIK/KMKP

Table A-6.30 shows outstanding arrears of KIK/KMKP.

The arrears ratio has been increasing these past years, and that of KIK/KMKP together reached 10.6% as of December 1984. This figure, however, does not include the amount already subrogated by P.T.Askrindo and therefore it is hardly possible to gauge an accurate outstandings in arrears. Nevertheless, it cannot be ignored that the rate of bad loans is considerably high. The slump of the economy has possibly made borrowers' cash flow deteriorate, but it can also be observed that the system of automatic 75% insurance by P.T. Askrindo is a cause for laxness in screening of loan applications as well as supervisions of disbursed loans.

(4) Profitability of KIK/KMKP and its breakdown

According to BNI, the BNI current (late in July 1985) average own funding cost is about 11% p.a. excluding the funds from BI issued as institutional credits, while the Bank's general and administrative expenses are about 3% p.a. Consequently the profitability of KIK/KMKP and its specification are calculated as the following.

BI liquidity credit (55%)	@ 3% p.a.	:	1.65% p.a.
World Bank funds (25%)	@10.1% p.a.	:	2.525% p.a.
Self-mobilized funds (20%)	@11% p.a.	:	2.2% p.a.
Cost of funds for KIK/KMKP		:	6.375% p.a.
Sub-loan interest		:	12.0% p.a.
Costs of borrowing		:	6.375% p.a.
Interest margin		:	5.625% p.a.
Bank's general and administrative expenses		:	3.0% p.a.
Insurance expense		:	0.5% p.a.1/
Profit ratio		:	2.125% p.a.

Note: 1 Average loan period of KIK/KMKP is 3 years and the quarantee cost to P.T. Askrindo is 1.5%, therefore the annual rate of quarantee expense is 1.5% x 1/3 = 0.5% p.a.

The profit ratio 2.125% p.a. shown above is calculated without the loss caused by bad loans. Taking the high rate of unpaid loans into consideration, therfore, according to the Bank, KIK/KMKP is not at all attractive in terms of profit. (Supposing 10% of bad loans are total loss, 75% are collected from the subrogation of P.T. Askrindo and none of collaterals are redeemed, the rate of loss caused by unpaid loans would be colculated as the following: 10% x 25% = 2.5%. As a result, the profit margin shown above would become minus 0.375% p.a.)

6.5.3 Bank Rakyat Indonesia (BRI)

(1) Outline of BRI

BRI's operations are mainly conducted based on agricultural and fishery cooperatives, agicultural and fishery-related industries, and farmers and fisherman. Therefore, the Bank transact mostly with agricultural and fishery sectors. But it has been active in expanding transactions with other than the mentioned sectors in these years. Nevertheless the amount transacted in industrial sector is still comparatively small at present.

As Table A-6.26 shows, the BRI ranks next to BNI in total assets. But it ranks first in terms of organizational units totaling more than 3,900; of which branch offices are 292, village units whose operations include small-scale lending operations are 3,617, and cash offices are 30. Using the network of its organizational units, the Bank is developing a wide range of lending operations such as institutional credits. However, its inefficient operations are unavoidable, because of numerous small-scale loans to many small- and medium-scale borrowers.

(2) Lending operations and KIK/KMKP

The BRI manages many operations of government-based program loans mainly to small-scale agricultural and fishery sectors, and KIK/KMKP holds the biggest share of about 50% among its handling banks, although both the amount of outstandings and the share have been declining (Table A-6.32).

In addition, although the ratio of KIK/KMKP to the BRI's total loans outstanding amount is decreasing, it still holds 10 - 20% which is higher compared to the other banks which hold 5% or less (See Table A-6.28).

Since the Bank manages more institutional credits, whose source of fund is liquidity credit from BI, its borrowing costs are smaller than those of the other branks.

75% of the total loans outstandings are to agricultural and commer cial sectors. As for the objectives of borrowings, 90% of the total loans are for working capital fund (Table A-6.33). The average amount per loan for working capital is less than Rp.1 million, while that for investment fund is Rp.2 - 3 million. An average amount of most of the loans is as small as less than Rp.1 million, while the KIK/KMKP loans of BNI and BBD are more than Rp.1 million.

As noted earlier, the BRI's customers of KIK/KMKP are mostly from the low-income groups: namely, the agricultiral sector and retailing segment from the commercial sector. Therefore, although the Bank manages huge amount of KIK/KMKP loans, the amount of bad loans seems to be considerably high. The rate of outstandings in arrears of KIK/KMKP is less than 13% according to BRI, but another report shows that it has reached about 35%. It is presumed that the loss caused by unpaid loans as well as the inefficiency in lending operations are reasons for depressing the profit.

BRI has been actively developing and expanding institutional credits in line with the quidelines of the Government and BI. Nevertheless, in responding to such circumstances as the increase in the rate of unpaid loans to KIK/KMKP and the possible decline of profit caused by the dereguration of interest rates after the financial reform in 1983, BRI has upgrated its personnel, made its operations more efficient, and reduced administrateive expenses, changing its policy of managing government-based program loans to more cautious and deliberate one. This is confirmed by the decrease in the outstandings of KIK/KMKP as shown in Table A-6.28.

Since the volume of KIK/KMKP handling and its bad loans are numerous, BRI independently receives World Bank loans which are the base for KIK/KMKP programs. BRI receives them through BI for tech nical assistance, which includes personnel training for appraisal and monitoring of projects.

As well as the training program mentioned above, BRI has been active in improving the quality of personnel by establishing specialized divi- sions and departments within the head office and in every regional office. However the tangible results of these trainings are not clear.

For the qualification of a lending officer in i) the head office, and in ii) the regional office, the following conditions are applied: i) a candidate must be a university graduate and receive one-year training including 10-month OJT; ii) a candidate must at least be a high school graduate, experienced lending operations at branch offices for 3 years, and receive group training and OJT for 3 months each, total of 6 months.

6.5.4 Bank Bumi Daya (BBD)

(1) Outline of BBD

As BBD has been established to provide services for the plantation and forestry sectors, most of its transactions are with agricultural and forestry sectors and their allied industries.

BBD is operating with 75 branch offices (including 1 overseas branch), 18 sub-branch offices and 29 cash offices, a total of 122 offices with 6,835 personnel (December 1983), which is as large as Bank Dagang Negara (Table A-6.26).

(2) Lending operations and KIK/KMKP

BBD ranks third to BRI and BNI in total loans outstanding which is Rp.3,133.9 billion as of December 1984, and it also ranks third in loan outstandings of KIK/KMKP (Tables A-6.26 and A-6.32).

Among the banks which deal in KIK/KMKP, BBD holds a share of a little less than 10% in terms of outstanding balance (Table A-6.32). And as of December 1984, KIK/KMKP is only 3.7% of the BBD's total loan outstandings (Table A-6.28).

Each amount of both KIK/KMKP applied for and approved is small. Especially for KMKP, an average amount of loan applied is within the range of Rp.1.0 - 1.9 million (Table A-6.34).

As Table A-6.35 shows, most of the Bank's KIK/KMKP are for plantation-related industries, transportation and commercial sectors.

Although figures on outstandings in arrears, are not obtained, forms and instruments for loan applications, extension of credits, and monitoring and evaluation of loans are completely equipped, indicating they have effective office management in accordance with the operation

manual. Each branch manager is authorized to issue up to Rp.200 million of export-related loans and up to Rp.75 million of other loans. For loans beyond these, it is the head office that approves.

According to BBD, its personnel training is sufficiently carried out, being active not only in periodic training within the bank but also in sending its personnel for training outside of the bank which includes training abroad.

Concerning problems of loans to small- and medium-scale enterprises, then said that technical assistance to educate and develop small-scale enterprises is most important; especially in order to improve their technology and quality of the products.

6.5.5 Bank Dagang Negara (BDN)

(1) Outline of BDN

Although BDN was founded originally for the porpose of developing mining sector, the loans to this sector are small at present because of the low demand. On the other hand, BDN has been active both in small scale loans to the industrial sector and in lending to joint ventures.

As of December 1983, BDN is operating with 93 branch offices and 6,649 personnel, which is about the same scale as BBD (Table A-6.26).

(2) Lending operations and KIK/KMKP

As of December 1983, 3/4 of the Bank's total loans are for industrial sector.

Forms and instruments for lending operations are complete and the lending activities are carried out by the operation manual. In order to make office management smoother and more efficient, managers of regional and branch offices are authorized to appraise and approve loans of certain types of credits as shown in Table A-6.36.

As Table A-6.37 shows, BDN outstandings balance of KIK/KMKP has been about Rp.95 million. Because the total loans outstandings of the bank has been increasing, the ratio of KIK/KMKP respect to the total has been decreasing, 3.4% as of December 1984. Within the sectors

borrowing KIK/KMKP, the commercial sector has most of share which can be as high as 68% as of December 1984. The average amount of outstandings of KIK/KMKP per project is within the range of Rp.4 - 5 million except for transportation sector whose average borrowing in KMKP is Rp.8 million. Application and approval of KIK/KMKP are shown in Table A-6.38. The average amount appllied was Rp.5 million for KIK and Rp.7 million for KMKP.

BDN explains that problems of loans to small- and medium-scale enterprises are: difficulties in supervision and monitoring, time and labor consuming lending operations inefficiency and lower profit. The period needed for appraising KIK/KMKP is two weeks when customer's documents are properly provided, and about one month if otherwise. The criteria for appraisal are;

- Past performance within 3 years
- Future prospect
- Experience
- Entrepreneurship
- Capability of management
- Marketing ability

Like other banks, BDN does not attach importance to collateral in KIK/KMKP.

As personnel trainings for lending operations, BDN actively sends its personnel to BI and the University of Indonesia or some private training programs, as well as BDN's own training program which takes three times a year.

6.5.6 Bank Expor Impor Indonesia (BEII)

(1) Outline of BEII

BEII's basis of operations has been to promote trade-related activities. At present, however, BEII is actively developing other operations mainly in the commercial and industrial sectors. These are the same kind of operations carried out by other state commercial banks. As of December 1983, BEII was operating with 44 branch offices and 4,214 personnel. Although the Bank ranks last in terms of operational scale among the five state commercial banks, its profit ratio is the highest (Table A-6.26). Sice the financial reform in June 1983, however, this profit ratio has been decreasing slightly because of the increase in the bank's funding costs, caused by soaring interest rates.

(2) Lending operations

Most of BEII's loans are for industrial, commercial and agricultural sectors. The Bank does not have a large share of small-and medium-scale loans, and ranks last in outstanding balance of KIK/KMKP.

The Bank is screening small-scale loans including KIK/KMKP in accordance with the guideline of BI, giving no priority to collaterals, and appraising both feasibility of projects applied for and cash flow projection of borrowers.

As to problems of loans to small- and medium-scale enterprises, it can be observed as that they lack management capabilities (bookkeeping, administration, personnel management), marketing ability and information gathering, and that the capital is small and the quality of products is low.

In programming new financial scheme, it was mentioned that it is essential to use the low-cost funds as financial source, and the program is attached with technical assistance to cover the above-mentioned problems of small- and medium-scale enterprises, and the simplest procedure has to be adopted in order to achieve efficiency in manpower allocation in each handling bank.

From application to extension of KIK/KMKP BEII requires at the earliest 1 - 2 weeks, but usually about 2 weeks.

(3) Borrowing costs and bank's expenses

BEII's current (late July 1985) borrowing costs excluding the funds for program loans are about 12%, and general and administrative expenses including personnel costs are about 2 - 2.5%.

As a result, the profitability of KIK/KMKP is calculated as the following.

BI liquidity credit (55%)	@ 3.0% p.a.	:	1.65%	p.a.
World Bank funds (25%)	@ 10.1% p.a.	:	2.525%	p.a.
Self-mobilized funds (20%)	@ 12.0% p.a.	:	2.40%	p.a.
Cost of funds for KIK/KMKP		:	6.575%	p.a.
Sub loan interest		:	12.0%	p.a.
Cost of borrowing		:	6.575%	p.a.
Interest margin		:	5.425%	p.a.
Bank's general and administrative expenses		:	2.5 - 2.0%	p.a.
Guarantee expense		:	0.5%	p.a. 1/
Profit ratio		:	2.425 - 2.925%	p.a.

Note: 1/ Average loan period of KIK/KMKP is 3 years and the guarantee cost to P.T.Askrindo is 1.5%, therefore the annual rate of guarantee expense is 1.5% x 1/3 = 0.5% p.a.

As shown above, the Bank's profit ratio would be 2.425 - 2.925% without considering the loss caused by unpaid loans.

6.5.7 Bank Pembangunan Indonesia (BAPINDO)

(1) Outline of BAPINDO

BAPINDO is the only state development bank, providing mainly medium- and long-term funds in industrial, transport and tourism (esp. hotels) sectors for development projects, while the most of the loans are for large-scale investment. BAPINDO is operating with 21 branch offices and 971 personnel (each figure is as of December 1983). Although BAPINDO is the smallest in size among the state banks (Table A-6.26), it intends to develop operations to all areas within the country through co-financing loans with regional development banks and consortium loans with other non-bank financial institutions. The Bank is making efforts to improve regional development banks by means of giving various kinds of technical assistance through co-financing for development finance.

BAPINDO holds a difficult problem in gathering funds due to the small number of its organizational units. Since the dereguration of interest rates in June 1983, this difficulty has become more and more prominent, and with the depression, new projects as well as demand for medium- and long-term investment funds decreased. This depression

also generated bad loans, therby reducing the profitability. The financial reform of June 1983, as one of its measures, shrank BI's liguidity credit and this also affected the bank badly in terms of both financial sources and costs.

(2) Lending operations

Since it is a development bank, most of BAPINDO lendings are long-term loans which are mainly for investment funds (over 35% share of all six state banks - Table A-6.39). More than 75% of the Bank's loans are long-term loans.

All of BAPINDO's KIK/KMKP are co-financed with regional development banks (BPDs). As noted earlier, the purposes of this co-financing are to nurture BPDs and to provide financial and technical assistance. This co-financing is inefficient, however, because both BPDs and BAPINDO appraise it despite the fact that only BPDs can accept applications, thus administrative operations are time-consuming. The total operations of BAPINDO have been increasing rapidly since 1980, and in order to meet the increasing demand BAPINDO is now implementing action program with the cooperation of the World Bank, which are i) to solve the problem of shortage of specialists, and ii) to reform the internal administrative system.

(3) Credit funds from international financial organizatoins and other financial institutions

BAPINDO is managing various kinds of program loans by acquiring funds from the World Bank, Asia Development Bank, KFW and so forth. The summery of each program is shown as the following.

1) World Bank/IDA

Basic L/A	:	IDA-Government of Indonesia (GOI) (L/A dated June 1972)
Subsidiary L/A	:	GOI-BAPINDO (L/A dated June 1972)

L/A amount and interest rate

Basic L/A	:	- US$10 million, interest rate 7.5% p.a. - US$8.5 million, interest rate 7.5% p.a.
Subsidiary L/A	:	- US$10 million, interest 6.5% p.a. or sub-loan interest minus 4% p.a., whichever is higher

- US$7 million, interest 7.25% p.a. or sub-loan interest minus 4% p.a., whichever is higher

Purpose of funds

US$10 million	:	Credit component for sub-loans to investment project.
US$8.5 million		
US$7.0 million	:	Credit component for sub-loans to rehabilitation and improvement to the inter island fleet.
US$1.3 million	:	Technical assistance component for GOI
US$0.2 million	:	Others

2) World Bank/IBRD

Basic L/A	:	IBRD-GOI
Subsidiary L/A	:	GOI-BAPINDO

L/A amount and interest rate

Basic L/A	:	$50 million, interest 8.0% p.a. (L/A dated Nov. 1974) $40 million, interest 8.20% p.a. (L/A dated Jun. 1976) $50 million, interest 7.90% p.a. (L/A dated Jan. 1979)	
Bussidiary L/A	:	US$50 million US$40 million US$50 million	interest: sub-loan exceeding Rp.75 million ... sub-loan interest minus 4% p.a. less than Rp.75 million ... sub-loan interest minus 2.5% p.a. less than Rp.10 million ... 8% p.a. or sub-loan interest minus 4% p.a., whichever is higher.

Purpose of funds : Investment project financed against 60% for machinery and equipment and 40% to 50% for civil works, vehicles and services.

3) Kreditanstalt Fur Wiederauflau (KFW)

Basic L/A : KFW-BI (based on Government to Government Agreement dated July 1972 and December 1973)
Subsidiary L/A : BI-BAPINDO (L/A dated April 1977)

L/A amount and interest rate
Basic L/A : DM22 million (interest: n.a.)
Subsidiary L/A : DM11 million, interest: sub-loan interest minus 4% p.a.

Purpose of funds:
- For sub-loans to small- and medium-scale enterprises of manufacturing and processing industries
- For small- and medium-size projects for shipyards, harbour installation and local shipments.

4) Asian Development Bank (ADB)

Basic L/A : ADB-GOI (L/A dated Dec. 1977)
Subsidiary L/A : GOI-BAPINDO (L/A dated Jan. 1978)

L/A amount and interest rate
Basic L/A : $30 million, interest 8.3% p.a.
Subsidiary L/A : $30 million, interest 9.5% p.a. (8.3% if sub-loan is below Rp.100 million)

Purpose of funds : For sub-loan to socio-economic development projects.

5) World Bank/IBRD

Basic L/A : IBRD-GOI
Subsidiary L/A : GOI-BAPINDO

L/A amount and interest rate
Basic L/A : US$208.9 million, interest-not exceeding 11% p.a.
Subsidiary L/A : US$203.3 million, interest-same as above

Usage and purpose of funds:
US$5.6 million : Technical assistance for GOI
US$200.0 million : Credit component for sub-loans for develop-

ment of medium- and large-scale projects

US$2.8 million : Technical assistance for BAPINDO for institution building of BAPINDO

Sub-loan sector:

Industrial sector (textile, cement, wood-processing, metals, construction, food, etc.)

Maritime sector (shipbuilding, shipyard)

Sub-loan ceiling : $6 million per individual sub-loans

Disbursement against:

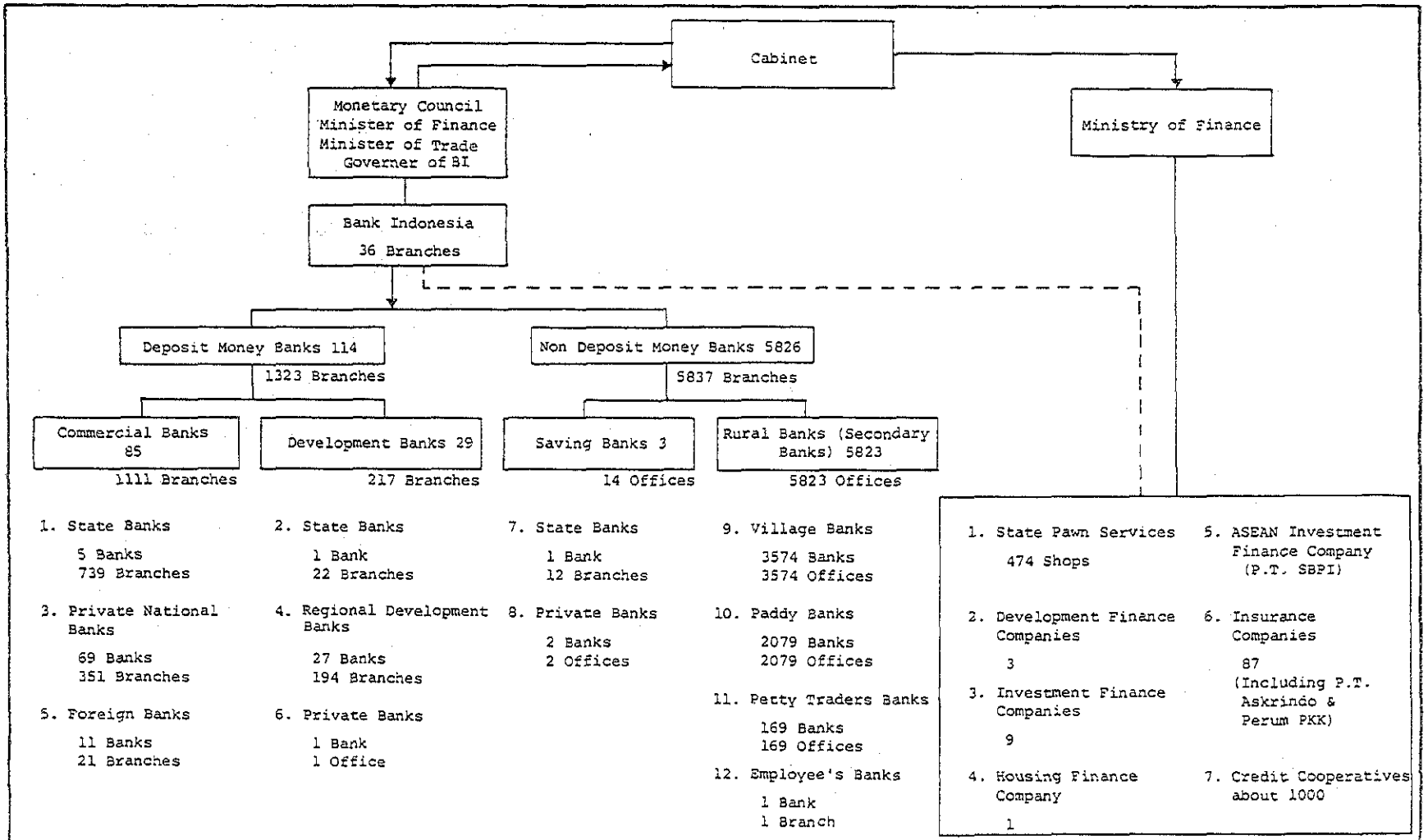
100% of the foreign exchange cost of directly imported goods.

60% of the invoice of domestically procured capital goods.

50% of estimated cost of civil work.

100% of expenditures of consultants and overseas training.

Figure A-6.1 STRUCTURE OF ORGANIZED FINANCIAL SYSTEM IN INDONESIA



Note: Showing the number of banks and pown services as of March 31, 1984, and others as of December 31, 1983.

Source: Bank Indonesia

Table A-6.1 OUTSTANDING CREDITS OF BANKS AT YEAR-END 1979 - 1984

(Rp. billions)

	Sector	1979 Amount	(%)	1980 Amount	(%)	1981 Amount	(%)	1982 Amount	(%)	1983 Amount	(%)	1984 Amount	(%)
I	Deposit Money Banks												
1	State Banks 1/	3,270	(79.1)	4,301	(78.7)	5,881	(77.8)	8,031	(77.9)	9,787	(75.2)	13,345	(74.1)
2	Private National Banks	406	(9.8)	566	(10.4)	834	(11.0)	1,197	(11.6)	1,883	(14.5)	3,042	(16.9)
3	Rural Development Banks 2/	87	(2.1)	145	(2.7)	247	(3.3)	357	(3.5)	411	(3.2)	510	(2.8)
4	Foreign Banks 3/	342	(8.3)	414	(7.6)	548	(7.2)	666	(6.5)	862	(6.6)	1,046	(5.8)
II	Villaged Paddy Banks	5	(0.1)	7	(0.1)	10	(0.1)	12	(0.1)	15	(0.1)	16	(0.1)
III	State Pawn Services	23	(0.6)	30	(0.5)	42	(0.6)	44	(0.4)	54	(0.4)	62	(0.3)
	Sub-total	4,134	(100.0)	5,463	(100.0)	7,562	(100.0)	10,307	(100.0)	13,012	(100.0)	18,021	(100.0)
	BI's liquidity credit provided to banks and percentage to outstanding	1,127	(27.3)	1,722	(31.5)	2,548	(33.7)	3,742	(36.3)	4,365	(33.5)	6,938 5/	(38.5)
IV	BI's direct credit	2,163	[34.4]	2,454	[31.0]	2,649	[29.5]	2,771	[21.2]	2,356	[15.3]	870 5/	[4.6]
	Total (I+II+III+IV)	6,297	[100.0]	7,917	[100.0]	10,211	[100.0]	13,078	[100.0]	15,368	[100.0]	18,891	[100.0]
	BI's credit provided and percentage of total 4/	3,292	[52.3]	4,176	[52.7]	5,197	[50.9]	6,513	[49.8]	6,721	[43.7]	7,808	[41.3]

Notes: 1/ Including State Development Bank (BAPINDO).
2/ Including 1 Private Development Bank.
3/ Including 1 Joint-Venture Bank (Bank Perdania).
4/ BI's Credit consisting of liquidity credit and direct credit.
5/ BI's direct credit provided to BULOG and PERTAMINA was transferred to liquidity credits respectively since April 2 and November 30, 1984.

Source: Bank Indonesia

Table A-6.2 BANK CREDITS BY ECONOMIC SECTORS (End of March, 1979 - 1984)

(Rp. billions)

	1979 Amount	(%)	1980 Amount	(%)	1981 Amount	(%)	1982 Amount	(%)	1983 Amount	(%)	1984 Amount	(%)
I Consolidated Credits												
1 Agriculture	379	(6.8)	412	(6.5)	615	(7.5)	898	(8.4)	1,154	(8.4)	1,305	(8.1)
2 Mining	1,755	(31.3)	1,801	(28.5)	1,819	(22.3)	1,644	(15.3)	1,215	(8.9)	670	(4.2)
3 Manufacturing industry	1,551	(27.7)	1,909	(30.2)	2,338	(28.7)	2,980	(27.8)	4,602	(33.6)	5,714	(35.4)
4 Trade	1,153	(20.6)	1,246	(19.7)	2,026	(24.8)	3,263	(30.4)	4,135	(30.2)	5,297	(32.8)
5 Service rendering industry	582	(10.4)	695	(11.0)	1,007	(12.3)	1,458	(13.6)	1,947	(14.2)	2,418	(15.0)
6 Others	187	(3.3)	264	(4.2)	349	(4.3)	492	(4.6)	652	(4.8)	731	(4.5)
Total Banks Credits	5,607	(100.0)	6,327	(100.0)	8,154	(100.0)	10,735	(100.0)	13,705	(100.0)	16,135	(100.0)
II Specified by Maturity												
		[51.8]		[50.6]		[56.3]		[61.5]		[63.4]		[66.1]
(1) Short-term credits	2,904	(100.0)	3,201	(100.0)	4,594	(100.0)	6,602	(100.0)	8,685	(100.0)	10,659	(100.0)
1 Agriculture	306	(10.5)	315	(9.8)	441	(9.6)	583	(8.8)	675	(7.8)	651	(6.1)
2 Mining	9	(0.3)	3	(0.1)	12	(0.3)	20	(0.3)	32	(0.4)	37	(0.3)
3 Manufacturing industry	875	(30.1)	1,139	(35.6)	1,397	(30.4)	1,755	(26.6)	2,601	(29.9)	3,315	(31.1)
4 Trade	1,100	(37.9)	1,180	(36.9)	1,930	(42.0)	3,111	(47.1)	3,929	(45.2)	4,974	(46.7)
5 Service rendering industry	438	(15.1)	330	(10.3)	542	(11.8)	791	(12.0)	1,104	(12.7)	1,390	(13.0)
6 Others	176	(6.1)	235	(7.3)	272	(5.9)	342	(5.2)	345	(4.0)	292	(2.7)
		[48.2]		[49.4]		[43.7]		[38.5]		[36.6]		[33.9]
(2) Investment credits	2,703	(100.0)	3,126	(100.0)	3,560	(100.0)	4,133	(100.0)	5,019	(100.0)	5,476	(100.0)
1 Agriculture	73	(2.7)	97	(3.1)	174	(4.9)	315	(7.6)	479	(9.5)	654	(11.9)
2 Mining	1,746	(64.6)	1,798	(57.5)	1,807	(50.8)	1,624	(39.3)	1,183	(23.6)	633	(11.6)
3 Manufacturing industry	676	(25.0)	771	(24.7)	941	(26.4)	1,225	(29.6)	2,001	(39.9)	2,399	(43.8)
4 Trade	53	(2.0)	66	(2.1)	96	(2.7)	152	(3.7)	206	(4.1)	323	(5.9)
5 Service rendering industry	144	(5.3)	365	(11.7)	465	(13.1)	667	(16.1)	843	(16.8)	1,028	(18.8)
6 Others	11	(0.4)	29	(0.9)	77	(2.2)	150	(3.6)	307	(6.1)	439	(8.0)
Total Banks Credits	5,607	[100.0]	6,327	[100.0]	8,154	[100.0]	10,735	[100.0]	13,705	[100.0]	16,135	[100.0]

Note: Excludes interbank credits, credits to Government, credits to non-residents, special liquidity credits and foreign exchange component of project aid.

Source: Bank Indonesia

Table A-6.3 CREDITS FROM THE BANKING SYSTEM, 1979 - 83

(RP. billions; end December)

		1979	1980	1981	1982	1983
A.	Public enterprises	3,167	3,655	4,247	4,979	5,040
B.	Private sector	3,159	4,339	6,095	8,312	10,683
C.	Total domestic credit	6,326	7,994	10,342	13,291	15,723
	Private sector % (B/C)	49.9	54.3	58.9	62.5	67.9

Source: Bank Indonesia

Table A-6.4 GROWTH OF DEPOSITS WITH THE BANKING SYSTEM, 1979 - 1983

(Rp. billions; end December)

	1979	1980	1981	1982	1983
Bank Indonesia					
Central Govt. deposits	1,643	3,125	3,903	3,931	4,218
Other non-bank deposits	317	365	421	352	415
Deposits money banks					
Demand deposits	1,737	2,795	3,847	4,134	4,177
Time deposits	1,140	1,481	2,033	2,491	4,694
Foreign exchange deposits	670	1,174	1,094	1,406	2,269
Central Gov. deposits	373	735	914	691	778
Total banking system	5,880	9,675	12,212	13,005	16,571
Public sector deposits % to total banking system deposits 1/	50.5	56.3	57.8	52.1	43.5

Note: 1/. Public sector comprising Central and Local Government, official entities and public enterprises

Source: Bank Indonesia

Table A-6.5 DEPOSITS-LOAN RATIO IN OUTSTANDING BALLANCE OF DEPOSIT MONEY

BANKS BY BANKING GROUP

(Rp. billions)

Sector	March 31														
	A 1982			B 1983			C 1984			B - A			C - B		
	Deposit a	Loan b	a/b(%)	Deposit a	Loan b	a/b(%)	Deposit a	Loan b	a/b(%)	Deposit a'	Loan b'	a'/b'(%)	Deposit a'	Loan b'	a'/b'(%)
State banks 1/	5,056	5,863	86.2	5,088	7,847	64.8	6,788	9,115	74.5	32	1,984	1.6	1,700	1,268	134.1
Private national banks	887	871	101.8	1,137	1,312	86.7	2,019	2,109	95.7	250	441	56.7	882	797	110.2
Rural development banks 2/	326	261	124.9	356	367	97.0	496	423	117.3	30	106	28.3	140	56	250.0
Foreign banks	455	546	83.3	626	669	93.6	794	859	92.4	171	123	139.0	168	190	88.4
Total	6,724	7,541	89.2	7,207	10,195	70.7	10,097	12,506	80.7	483	2,654	18.2	2,890	2,311	125.1

Note: 1/ Includes State Development Bank (BAPINDO)
2/ Includes one Private Sevelopment Bank

Source: Bank Indonesia

Table A-6.6 SHARE OF LIQUIDITY CREDITS PROVIDED IN BANK LENDING TO THE PRIVATE SECTOR, 1979 - 1983

	1979	1980	1981	1982	1983	1983 Working Capital	1983 Investment Credit
Bank lending to private sector	3,115	4,270	5,987	8,127	10,498	7,479	3,019
(Of which liquidity credits)	645	1,043	1,394	2,284	3,289	1,898	1,391
Share of liquidity credits (%)	20.7	24.4	23.3	28.1	31.3	25.3	46.0

Source: Bank Indonesia

Table A-6.7 CLASSIFICATION OF LENDING PROGRAMS BEFORE FINANCIAL SECTOR REFORM IN 1983 (LENDING INTEREST RATES; BI REFINANCE INTEREST RATES; BI REFINANCE PROPORTION; JAN., 1982)

Classification	Category	Lending Interest Rates (% p.a.)	Refinance Interest Rates (% p.a.)	Refinance Proportion (%)
I. Investment credits by category				
1. Up to Rp. 75 million	I	10.5	3	80
2. Above Rp. 75 million - Rp. 200 million	II	12	4	75
3. Above Rp. 200 million - Rp. 500 million	III	13.5	4	70
4. Above Rp. 500 million	IV	13.5	4	65
II. Small investment credits (KIK)	-	10.5	3	80
III. Permanent working capital credits (KMKP)	-	12	4	75
IV. Short term credits of state bank by category				
1. Supply and distribution of rice, paddy and corn by BUUDs/KUDs	I	9	3	100
2. Bimas and Inmas credits for rice and secondary crops	II	12	3	100
3. Collection and distribution of smallholder salt by BUUDs/KUDs and PN Garam and working capital credits for PN Garam	II	12	4	75
4. Operation of wheat flour mills	II	12	4	75
5. Export and production of of export goods				
a. Pre shipment				
-Strong export commodities	II	9	3	75
-Others commodities	II	6	3	75
b. Past shipment (all exports commodities)	II	6	3	75
6. Production, import and distribution fertilizer and insecticides for use by smallholder	II	12	4	75
7. Aid financed import and distribution of non food commodities	II	12	4	75
8. Collection and distribution of agricultural produce, animal husbandry and fishery by BUUDs/KUDs and cooperatives	II	12	4	75
9. Smallholders agriculture and handicraft	II	12	4	75
10. Smallholders animal husbandry poultry farming and fishery	II	12	4	75
11. Manufacturing and service rendering industries:				
a. Rice mills/hullers	III	13.5	6	70
b. Sugar mills	III	13.5	6	70
c. Coconut oil and palm oil	III	13.5	6	70
d. Textile	III	13.5	6	70
e. Agricultural equipment	III	13.5	6	70
f. Paper	III	13.5	6	70
g. Cement	III	13.5	6	70
h. Public transportation	III	13.5	6	70
i. Printing and publishing	III	13.5	6	70
j. Tourism	III	13.5	6	70
12. Other production activities	III	13.5	6	70
13. Import and distribution of supervised goods	III	13.5	6	70
14. Sugar stock	III	13.5	6	70
15. Domestic Trade	III	13.5	6	70
16. Contractors of DIP, INPRES and local government financial projects and contractors of low-cost housing project	III	13.5	6	70
17. Other contractors	IV	15	6	60
18. Imports and distribution of other import goods	V	18	6	40
19. Other	VI	21	6	25

Source: Bank Indonesia

Table A-6.8 CHARACTERISTICS OF CREDIT SCHEMES IN INDONESIA

(1/3)

Name of Schemes (1)	Date of Commence-ment (2)	Category of Use (3)	BI's Credit for High Priority Sector (4)	Handling Bank (HB) (5)	Maximum Loan Amount(Rp.) (6)	Source of Funds (7)	Minimum Self Financing (8)	Maximum Lending Term (9)	Interest Rate p.a. (10)	BI's Fund Interest Rate p.a. (11)	Collateral Require-ment (12)	Insurance Coverage (13)
1. Kredit candak kulak (KCK)	Apr. '76	Working Capital(WC)	-	Village Co-operatives (KUD)	2,000 15,000	Government Budget	0%	5days-7months	12%	-	-	Government
2. General rural credit (KUPEDES)	Feb. '84	Investment(I)		BRI	1MM	BI 100%	-do.-	3years	-do.-	3%	Assets created	BI/BRI
		W.C.		-do.-	1MM	-do.-	-do.-	2years	18%	15%	-do.-	-do.-
Of which mini credit	(Apr. '74)	I	-	-do.-	200M	Government	-do.-	3years	12%	-	-do.-	Gov't/BRI
midi credit	(Jun. '80)	I		-do.-	500M	BI 100%	-do.-	5years	-do.-	3%	-do.-	BRI
3. BIMAS/INMAS credit	'64	W.C.		-do.-	Package	-do.-	-do.-	7months	-do.-	-do.-	Land certi-ficate/Other assets	Gov't 50% BI 25% BRI 25%
4. Small invest-ment credit (KIK)	Jan. '74	I		National banks	15MM	BI55% WB25% HB 20%	-do.-	8years	-do.-	BI 3% WB 10.1%	Assets created+max 50% of loan	Askrindo75% HB 25%
5. Permanent working capital credit (KMKP)	Jan. '74	W.C.		-do.-	15MM	-do.-	-do.-	5years	-do.-	BI 3% WB 10.1%	-do.-	-do.-
6. Investment credit up to Rp.75MM	Jun. '83	I		-do.-	75MM	BI 80% HB 10%	10%	10years	-do.-	3%	Assets created+ additional collateral	-
7. Working capital credit up to Rp.75MM	May '84	W.C.		-do.-	75MM	BI 70% HB 20%	-do.-	1year	15%	-do.-	Assets created	Askrindo70% HB 30%
8. Working capital credit for gov't project (Keppres 29/'84)	May '84	W.C.		-do.-	200MM	-do.-	-do.-	-do.-	-do.-	-do.-	Assets created/ project concerned	-do.-

Table A-6.8 (Continued)

(2/3)

Name of Schemes (1)	Date of Commence-ment (2)	Category of Use (3)	BI's Credit for High Priority Sector (4)	Handling Bank (HB) (5)	Maximum Loan Amount(Rp.) (6)	Source of Funds (7)	Minimum Self Financing (8)	Maximum Lending Term (9)	Interest Rate p.a. (10)	BI's Fund Interest Rate p.a. (11)	Collateral Require-ment (12)	Insurance Coverage (13)
9. Credits for agricultural specific sector for binas program	Nov. '69	W.C.		State commercial banks	unlimitted	BI 75%	25%	-do.-	12%	-do.-	Commodities concerned	-
10. Export credit	Jan. '82	W.C.		National banks	-do.-	BI 60% HB 40%	0%	-do.-	9%	-do.-	-do.-	Askrindo85% BI 7.5% HB 7.5%
11. Cooperatives credits												
a. For the members & for supply of high priority goods	Sept.'81	I		-do.-	15MM	BI 90% HB 10%	-do.-	10years	12%	-do.-	Assets created	PerumPKK90% BI5% BRI5%
		W.C.		-do.-		-do.-	-do.-	3years	-do.-	-do.-	-do.-	-do.-
b. For the farmers under inten-sification program of paddy & crops	Apr. '85	W.C.		BRI/KUD	Package	BI 100%	-do.-	1year	-do.-	-do.-	Assets created/ other assets	PerumPKK95% BRI 5%
12. Paddy field formation	Sept. '79	I		Channelled thru. Dept. of agriculture	unlimited	-do.-	-do.-	1-2years	-do.-	-do.-	Gov't guarantee	Government
13. Plantation credits												
a. Estate smallholder		I		National banks	-do.-	BI 80%	un-identified	20years	-do.-	-do.-	un-identified	un-identified

Table A-6.8 (Continued)

(3/3)

Name of Schemes (1)	Date of Commence-ment (2)	Category of Use (3)	BI's Credit for High Priority Sector (4)	Handling Bank (HB) (5)	Maximum Loan Amount(Rp.) (6)	Source of Funds (7)	Minimum Self Financing (8)	Maximum Lending Term (9)	Interest Rate p.a. (10)	BI's Fund Interest Rate p.a. (11)	Collateral Require-ment (12)	Insurance Coverage (13)
b.Replanting rehabilita-tion & development of export commodity plants		I		-do.-	-do.-	-do.-	-do.-	-do.-	-do.-	-do.-	-do.-	-do.-
c.Private national plantation (PSN)		I		-do.-	-do.-	BI 85%	-do.-	10years	-do.-	-do.-	-do.-	-do.-
		W.C.		-do.-	-do.-	BI 75%	30%	un-identified	-do.-	-do.-	-do.-	-do.-
14. Credits for house owner-ship (KPR)												
a.Public housing	Nov. '78	I	-	BTN	3.5MM	Gov't budget	10-20%	20years	5-9%	-	House	Gov't/BTN
b.Non-public housing		I		-do.-	7.5MM	BI 90%	-do.-	-do.-	9%	3%	-do.-	BTN
15. Student loan												
a.For Indonesian students(KMI)	May '82	W.C.		BNI'46	750M	BI 100%	0%	10years	6%	-do.-	Diploma	Askrindo75% BI18.75% BNI6.25%
b.For student dormitories for 5 universities		I		un-identified	5.5billion	BI 80% HB 20%	-do.-	20years	5%	un-identified	un-identified	un-identified

Notes:
1/ Investment credits; 9 categories, of which 2 schemes for industrial sector: KIK and investment credit up to RP. 75MM.
2/ Working capital credits; 11 categories, of which 3 schemes for industrial sector; KMKP, working capital credit up to RP. 75MM, and working capital credit for government project (keppers 29/1984).
3/ Other credits; 4 categories
4/ No.12; excluding the credit channelled through the government.

Source: Bank Indonesia

Table A-6.9 STRUCTURE OF INCREASED DEPOSITS IN BANKING SECTOR

(Unit; billion Rp.)

Sector	March 31 Outstandings 1983 A	1984 B	B - A	B - A (%) A
I State Banks depsits 1/	5,088	6,788	1,700	33.4
Time deposits & Saving deposits	1,752	3,495	1,743	99.5
Demand deposits	3,336	3,293	-43	-1.3
II Private National Banks deposits	1,137	2,019	882	77.6
Time deposits & Saving deposits	628	1,287	659	104.9
Demand deposits	509	732	223	43.8
III Rural Development Banks deposits 2/	356	496	140	39.3
Time deposits & Saving deposits	62	88	26	41.9
Demand deposits	294	408	114	38.8
IV Foreign Banks deposits	626	794	168	26.8
Time deposits & Saving deposits	442	592	150	33.9
Demand deposits	184	202	18	9.8
Deposit Money Banks deposits	7,207	10,097	2,890	125.1
Time deposits & Saving deposits	2,884	5,462	2,578	89.4
Demand deposits	4,323	4,635	312	7.2

Source: BI

Table A-6.10 TRANSITION OF INTEREST RATE IN TIME DEPOSITS

(In percent)

Maturity	1983, March 31 (Before Deregulation)		1984, March 31 (After Deregulation)	
	State Banks	Private National Banks	State Banks	Private National Banks
3 months	-	14.5 - 17	15.5 - 16.5	15.5 - 19.5
6 months	6	15 - 18	16 - 18	16.5 - 20
12 months	9	16 - 18	18 - 18.75	18 - 20
24 months	12, 15	16.5 - 18	16 - 18.75	18 - 20

Source: Bank Indonesia

Table A-6.11 TRANSITION IN COMPOSITION OF TIME DEPOSITS MOBILIZED BY STATE BANKS

(Rp. billions)

Sort of Time Deposit	1983, March 31 (Before Deregulation) Outstandings (%)	1984, March 31 (After Deregulation) Outstandings (%)
1 month	240 (17.8)	593 (19.5)
3 months	47 (3.5)	251 (8.2)
6 months	124 (9.2)	554 (18.2)
12 months	89 (6.6)	1,112 (36.5)
24 months	844 (62.7)	496 (16.3)
Others	3 (0.2)	38 (1.2)
Total	1,347 (100.0)	3,044 (100.0)

Source: Bank Indonesia

Table A-6.12 INTEREST RATES ON NONPRIORITY LOANS, 1983-85

(In percent)

Year/ Month	State Banks												Private National Foreign Exchange Banks	Foreign Banks	Nonbank Financial Insti-tutions
	BRI		BBD		BDN		BBII		BNI 1946		BAPINDO				
	Working Capital Credits	Invest-ment Credits	Working Capital Credits	Invest-ment Credits	Working Capital Credits	Invest-ment Credits	Working Capital Credits	Invest-ment Credits	Working Capital Credits	Invest-ment Credits	Working Capital Credits	Invest-ment Credits			
1983															
July	18-24	12	18-24	16.5	16-21	18	18	16.5	14-21	18	18-21	15-18	18-36	16-30	12-20
Sept.	21-24	19	18-24	16.5	16-21	18	18	16.5	15-21	18	17-20	15-18	18-32.5	14-29	17-20
Dec.	18-24	17-24	18-24	16.5	16-21	18	18	16.5	15-21	18	17-21	15-18	18-33	14-29	18-20
1984															
Mar.	18-24	17-24	18-24	16.5-17	16-21	18	16-23	18	18-21	18	17-21	15-18	18-32.4	14-30	17-20
June	18-24	1 -24	18-24	.16.5-17	18-21	18	16-23	18	18-21	18	17-21	15-18	20-32.5	12-29	16-20
Sept.	18-24	17-24	18-24	16.5-17	18-21	18	16-23	18	18-21	18	17-21	15-18	20-38	14-42	16-20
Dec.	18-24	17-24	20-24	16.5-17	18-21	18	16-24	18	19.5-24	18	18-24	15-18	21-34	14-33	16-21
1985															
Jan.	18-24	17-24	18-24	16.5-18	18-21	18	16-24	18	19.5-24	18	18-24	15-18	21-32.4	14-31.5	16-21
Feb.	18-24	17-24	18-24	19.2-21	18-21	18	16-24	18	19.5-24	19.5	18-24	15-18	21-32.4	16.5-31.5	16-21

Source: Bank Indonesia

A-6.13 TWO-STEP LOAN PROGRAMS BASED ON FOREIGN AIDS

(Under Implementation or Preparation)

Foreign Aid	Target Sectors to be developed	Loan Ceilings		Handling Institutions		Limit of Lending Term		Interest Rate p.a.	
		1st Step Loan	2nd Step Loan	1st Step Loan	2nd Step Loan	1st Step Loan	2nd Step Loan	1st Step Loan	2nd Step Loan
1. OECF	Manufacturing of basic consumers goods	¥360MM	¥10-300MM	GOI--BI (= 2nd step)	6 State banks	20 years including 5 year-grace period	12 years including 3 year-grace period	3.5%	12% 15%
2. World Bank (KIK/KMKP III)	Small enterprises	$776MM	RP15MM	GOI--BI (= 2nd step)	National banks	20 years including 5 year-grace period	Investment 8 years includ. 4 year-grace p. Working Cap. 5 years includ. 1 year-grace p.	10.1%	12%
3. World Bank (BAPINDO)	Medium/large scale industrial & maritime projects	$200MM	$6MM	GOI-- BAPINDO	BAPINDO	20 years including 5 year-grace period	15 years including 2 year-grace period	11%	10.5% 13.5%
4. World Bank (export)	Medium/large scale export oriented industries	not fixed	expected to $7MM	GOI-- 2nd step	5 State Comercial banks	not fixed	not fixed	11%	18%
5. ADB	Fishery industries including fishery processing, cold storage	$64MM	not fixed	GOI-- 2nd step	4 State Commercial banks (excluding BEII)	not fixed	not fixed	not fixed	not fixed

Source: Team's collection

Table A-6.14 OUTSTANDING INVESTMENT CREDITS
(1979 - 1984, end March)

(Rp. billions)

Specification	1979 Amount	(%)	1980 Amount	(%)	1981 Amount	(%)	1982 Amount	(%)	1983 Amount	(%)	1984 Amount	(%)
I Investment credits under Bank Indonesia Scheme												
Agriculture	56	(14.9)	74	(13.0)	117	(15.4)	219	(18.1)	383	(17.8)	573	(17.8)
Mining	10	(2.7)	13	(2.3)	11	(1.4)	31	(2.6)	43	(2.0)	58	(1.8)
Manufacturing	215	(57.3)	182	(31.9)	253	(33.2)	348	(28.8)	769	(35.8)	1,190	(37.0)
Trade	35	(9.3)	38	(6.7)	39	(5.1)	67	(5.5)	99	(4.6)	209	(6.5)
Service rendering industry	51	(13.6)	237	(41.6)	270	(35.5)	406	(33.6)	543	(25.3)	747	(23.2)
Others	8	(2.1)	26	(4.6)	71	(9.3)	139	(11.5)	301	(14.0)	436	(13.6)
Sub-total	375	(100.0)	570	(100.0)	761	(100.0)	1,210	(100.0)	2,146	(100.0)	3,213	(100.0)
II KIK scheme												
Agriculture	17	(25.0)	23	(19.5)	57	(22.9)	96	(25.7)	90	(21.7)	81	(20.9)
Mining	1	(1.5)	1	(0.8)	1	(0.4)	1	(0.3)	1	(0.2)	1	(0.3)
Manufacturing	8	(11.8)	13	(11.0)	24	(9.6)	35	(9.4)	43	(10.4)	44	(11.4)
Trade	18	(26.5)	28	(23.7)	57	(22.9)	85	(22.7)	107	(25.8)	114	(29.5)
Service rendering industry	21	(30.9)	50	(42.4)	104	(41.8)	146	(39.0)	167	(40.3)	144	(37.2)
Others	3	(4.4)	3	(2.5)	6	(2.4)	11	(2.9)	6	(1.4)	3	(0.8)
Sub-total	68	(100.0)	118	(100.0)	249	(100.0)	374	(100.0)	414	(100.0)	387	(100.0)
III Others consisting of loans to several state enterprises												
Agriculture	-		-		-		-		-		-	
Mining	1,735	(76.8)	1,784	(73.2)	1,795	(70.4)	1,592	(62.5)	1,139	(46.3)	574	(30.6)
Manufacturing	453	(20.0)	576	(23.6)	664	(26.0)	842	(33.0)	1,189	(48.4)	1,165	(62.1)
Trade	-		-		-		-					
Service rendering industry	72	(3.2)	78	(3.2)	91	(3.6)	115	(4.5)	131	(5.3)	137	(7.3)
Others	-		-		-		-					
Sub-total	2,260	(100.0)	2,438	(100.0)	2,550	(100.0)	2,549	(100.0)	2,459	(100.0)	1,876	(100.0)
Grand-total	2,703		3,126		3,560		4,133		5,019		5,476	

Source: Bank Indonesia

Table A-6.15 GROWTH OF / OUTSTANDINGS OF INSTITUTIONAL CREDITS UNDER SMALL ENTERPRISE DEVELOPMENT PROJECT (1979 - 1984; end December)

(Rp. billions)

	1979		1980		1981		1982		1983		1984	
	Outstandings	%	Outstandings	%	Outstandings	%	Outstandings	%	Outstandings	%	Outstandings	%
KIK	99	-	210	112.1	353	68.0	405	14.7	393	-3.0	357	-9.2
KMKP	154	-	321	108.4	635	97.8	791	24.5	858	8.5	871	1.5
Total	253	-	531	109.8	988	86.0	1,196	21.0	1,251	4.6	1,228	-1.8

Note: % of increases in the outstanding from the previous year.

Source: Bank Indonesia

Table A-6.16 APPROVALS OF CREDITS UNDER SMALL ENTERPRISE DEVELOPMENT PROJECT

(SEDP) - KIK/KMKP DISTRIBUTION BY REGON

(Rp. billions)

	1974 - 78		1979		1980		1981		1982		1983		Cumulative	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
I. KIK														
Jakarta	7.7	7.2	7.5	11.9	13.5	9.2	16.4	9.5	20.4	14.1	12.8	14.9	78.2	10.9
West Java	14.9	14.0	10.7	17.0	28.2	19.1	31.6	18.3	22.9	15.8	15.3	17.8	123.5	17.2
Central Java	12.3	11.5	7.4	11.7	14.3	9.7	16.9	9.8	12.2	8.4	9.3	10.8	72.3	10.0
East Java	19.2	18.0	10.8	17.2	25.6	17.4	21.5	12.5	16.4	11.4	7.7	9.0	101.3	14.1
Others	52.6	49.4	26.6	42.2	66.1	44.7	85.8	49.8	72.4	50.2	40.7	47.4	344.1	47.8
Total	106.5	100.0	63.0	100.0	147.7	100.0	172.3	100.0	144.3	100.0	85.7	100.0	719.5	100.0
II. KMKP														
Jakarta	5.7	4.2	4.8	4.2	11.2	4.8	14.9	4.0	17.9	4.9	12.8	5.5	67.4	4.6
West Java	14.8	11.0	14.2	12.5	38.2	16.4	80.3	21.6	71.3	19.5	42.9	18.5	261.6	18.1
Central Java	22.9	17.0	19.8	17.4	43.5	18.6	62.4	16.8	52.9	14.5	43.6	18.8	245.1	16.9
East Java	29.5	22.0	23.5	20.6	35.0	15.0	58.3	15.7	66.9	18.3	35.3	15.3	248.6	17.2
Others	61.4	45.4	51.5	45.2	105.6	45.2	155.1	41.8	156.1	42.7	96.8	41.8	626.4	43.2
Total	135.4	100.0	113.8	100.0	233.4	100.0	371.0	100.0	365.1	100.0	231.3	100.0	1,499.1	100.0

Source: World Bank, AEP Project Department

Table A-6.17 APPROVALS OF CREDITS UNDER SMALL ENTERPRISE DEVELOPMENT PROJECT

(SEDP) - KIK/KMKP DISTRIBUTION BY SECTOR

(Rp. billions)

	1974 - 78		1979		1980		1981		1982		1983		Cumulative	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
I. KIK														
Agriculture	19.8	18.6	10.2	16.2	22.2	15.0	23.9	13.9	17.0	11.8	8.3	9.7	101.5	14.1
Industry	17.6	16.6	7.7	12.3	15.8	10.7	20.8	12.1	17.6	12.2	11.2	13.1	90.8	12.6
Trade	26.9	25.2	20.8	33.0	42.3	28.7	53.9	31.2	53.9	37.4	34.7	40.4	232.4	32.3
Transportation	33.7	31.6	16.6	26.3	47.7	32.3	48.2	28.0	30.6	21.2	16.3	19.0	193.1	26.8
Others	8.5	8.0	7.7	12.3	19.7	13.3	25.4	14.8	25.1	17.4	15.2	17.8	101.8	14.2
Total	106.5	100.0	63.0	100.0	147.7	100.0	172.3	100.0	144.3	100.0	85.7	100.0	719.5	100.0
II. KMKP														
Agriculture	12.0	8.9	8.1	7.1	13.0	5.6	16.6	4.5	25.1	6.9	13.8	6.0	88.6	6.1
Industry	31.1	23.0	15.5	13.6	27.4	11.7	36.0	9.7	32.4	8.9	22.0	9.5	163.5	11.3
Trade	81.2	59.7	79.3	69.7	169.8	72.7	265.2	71.5	240.5	65.9	157.8	68.2	993.8	68.6
Transportation	2.4	1.7	1.1	1.0	1.9	0.8	2.4	0.6	2.1	0.5	1.3	0.6	11.2	0.8
Others	8.7	6.4	9.8	8.6	21.5	9.2	50.8	13.7	64.9	17.8	36.4	15.7	192.1	13.2
Total	135.4	100.0	113.8	100.0	233.4	100.0	371.0	100.0	365.1	100.0	231.3	100.0	1,449.1	100.0

Source: World Bank, AEP Project Department

Table A-6.18 OUTSTANDINGS OF INSTITUTIONAL CREDITS UNDER SMALL ENTERPRISE DEVELOPMENT PROJECT (SEDP) BY INDIVIDUAL STATE BANKS AND OTHER GROUP OF BANKS (1981 - 1983; end December)

(Rp. billions)

Bank	1981				1982				1983			
	KIK	KMKP	Total	%	KIK	KMKP	Total	%	KIK	KMKP	Total	%
BRI	162	402	565	57.1	171	463	634	53.0	168	478	647	51.7
BNI 1946	52	85	137	13.8	56	109	165	13.8	41	121	162	12.9
BBD	51	49	100	10.1	56	62	118	9.9	52	68	120	9.6
BDN	30	40	71	7.2	37	57	94	7.8	33	63	95	7.6
BEII	12	19	31	3.2	13	30	43	3.6	11	33	44	3.5
BAPINDO	7	5	11	1.2	8	6	14	1.2	7	7	14	1.2
Rural Development Banks	21	23	43	4.4	34	39	73	6.1	39	52	92	7.3
National Private Banks	18	12	30	3.0	30	25	55	4.6	42	36	78	6.3
Total	353	635	988	100.0	405	791	1,196	100.0	393	858	1,251	100.0

Source: World Bank, AEP Project Department

Table A-6.19 BREAKDOWN OF BY KIND OF USE AND COLLECTIBILITY FOR BANKS
END OF APRIL 1985

(Unit million RP.)

	Sournd		Not Smooth		Doubtful		Bad Debt		Others		Total	
	No.	Out-standings	No.	Out-standings	No.	Out-standings	No.	Out-standings	No.	Out-standings	No.	Out-standings
I Investment credits	296,408	5,728,240	23,067	294,533	33,409	378,521	8,422	47,247	722	150	364,028	6,448,691
A KIK	125,775	272,226	15,184	38,540	17,448	46,165	6,401	24,230	713	108	165,521	381,269
B BANTUAN PROYEK	53,796	1,838,127	1,577	15,662	458	45,412	8	6,316			55,839	1,905,516
C Mini credit	27,268	69,345	2,278	5,944	12,332	1,729	1,333	156	9	1	43,220	77,174
D Midi credit	14,368	3,473	1,065	250	1,221	332	77	15			16,731	4,069
E DLBS	1,482	14,465	18	507	13	400	5	265			1,518	15,637
F CREDIT DALAM RANGKA KEPPRES	4,398	59,094	128	3,362	158	4,310	41	611			4,726	67,377
G CREDIT KELAYAKAN EKN KEPPRES	826	19,444	114	2,819	116	3,963	87	2,405		35	1,143	28,666
H Old KIB #1-W	2,142	1,534,569	259	113,129	294	103,258	59	5,958		6	2,753	1,756,920
I Others	68,353	1,917,498	2,443	114,321	13,663	5,985	3,018	2,362			72,577	2,212,063
II Working capital	1,486,076	11,681,401	397,340	566,567	798,594	565,793	55,219	191,946	3,618	2,977	2,740,847	13,008,685
A KMKP	331,555	690,694	50,105	84,388	51,108	88,561	11,530	35,348		27	444,319	899,019
B BIMAS/INMAS	201,184	9,979	288,945	14,465	617,045	30,617	24,641	936	48	369	1,131,863	56,365
C Mini credit	122,041	30,589	20,349	2,017	52,938	4,281	7,521	513	2,848	492	205,697	37,892
D Midi credit	93,552	18,012	8,267	1,825	5,497	1,322	512	105	79	13	107,907	21,278
E Credit KEPPRES/APUN	7,487	123,163	288	6,372	1,048	12,827	396	4,651	1	196	9,220	147,210
F Credit KELAYAKAN BKN KEPPRES	776	19,635	218	2,556	477	6,382	557	5,623	1	24	2,029	34,220
G Credit KEGIATAN Export	1,791	873,150	185	55,570	154	39,427	74	6,129		32	2,204	974,308
H Others	727,690	9,916,177	28,983	399,375	70,327	382,375	9,988	138,640	620	1,824	837,608	10,838,391
III Others	624,404	539,117	17,589	8,831	24,808	15,234	3,540	6,928	18,161	9,180	688,502	579,289
Grand total	2,408,888	17,948,758	437,996	869,931	856,811	959,547	67,181	246,121	22,501	12,308	3,793,377	20,036,665

Source: Bank Indonesia

Table A-6.20 QUALITY OF LOAN PORTFOLIO CLASSIFIED BY

FOUR CATEGORIES, IN FOUR INSTITUTIONAL CREDITS

(%)

Loan Scheme	Sound		Not Smooth		Doubtful		Bad Debt		Total	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount
BIMAS/INMAS	17.8	17.7	25.5	25.7	54.5	54.3	2.2	1.7	100.0	100.0
KIK	76.0	71.4	9.2	10.1	10.5	12.1	3.7	6.4	100.0	100.0
KMKP	74.6	76.8	11.3	19.0	11.5	10.0	2.6	3.9	100.0	100.0
KIB	77.8	87.3	9.4	6.4	10.7	5.9	2.1	0.3	100.0	100.0

Source: Team's estimate based on the figures shown in Table A-7.3.7

Table A-6.21 AMOUNT OF CREDIT GUARANTEE/INSURANCE BY ECONOMIC SECTOR

(Rp. millions)

Sector	1982	1983	1984
1. Agriculture	86,959.1	43,816.1	26,303.3
2. Industry	61,128.0	31,824.9	33,795.1
3. Trade	401,474.7	316,675.4	338,195.2
4. Services	119,849.0	73,691.5	87,272.1
5. Others	37,707.3	32,450.7	42,041.4
Total	707,118.1	498,458.6	527,607.1

Source: P.T. Askrindo

Table A-6.22 AMOUNT OF CREDIT GUARANTEE/INSURANCE BY INSTITUTIONAL CREDITS AND ECONOMIC SECTOR

(Rp. millions)

Institutional Credit	1982	1983	1984
1. KIK - Agriculture	55,393.2	21,503.2	5,993.5
- Industry	22,091.0	11,201.0	10,617.3
- Trade	65,542.1	46,596.0	42,220.9
- Services	82,246.3	45,869.0	34,515.7
- Others	4,229.6	1,203.7	1,196.8
Sub-total	229,502.2	126,372.9	94,544.2
2. KMKP			
- Agriculture	28,325.2	19,854.1	17,951.9
- Industry	37,978.6	19,956.6	21,070.5
- Trade	301,798.7	246,099.8	265,620.2
- Services	34,353.2	25,479.9	34,145.4
- Others	7,626.3	1,213.7	750.4
Sub-total	410,082.0	312,604.1	339,538.4
3. KEB - Agriculture	3,240.6	2,456.4	2,150.7
- Industry	1,058.4	667.3	679.5
- Trade	34,134.0	23,979.6	23,039.1
- Services	3,249.5	2,342.7	2,546.1
- Others	25,851.4	20,824.8	23,635.1
Sub-total	67,533.9	50,270.8	52,050.5
4. KREDIT MAHASISWA INDONESIA			
- Graduate (S1)	-	8,837.7	12,948.0
- Post Graduate (S2)	-	281.4	824.8
- Doctor (S3)	-	29.4	291.7
- Non Degree (S03)	-	33.0	75.8
Sub-total	-	9,181.5	14,140.3
5. KREDIT LISTRIK PEDESAAN (KLP)	-	26.9	2,248.6
6. PROYEK PEMBINAAN PENINGKATAN - PENDAPATAN PETANI KECIL (P4K)	-	2.4	177.2
7. KREDIT MODAL KERJA (KMK)			
- Agriculture	-	-	40.0
- Industry	-	-	1,232.9
- Trade	-	-	6,175.5
- Services	-	-	2,011.0
- Others	-	-	70.0
Sub-total	-	-	9,529.4
8. KEPPRES NO. 29/84			
- Agriculture	-	-	-
- Industry	-	-	185.0
- Trade	-	-	1,139.5
- Services	-	-	14,054.0
- Others	-	-	-
Sub-total	-	-	15,378.5
GRAND TOTAL	707,118.1	498,458.6	527,607.1

Source: P.T. Askrindo

Table A-6.23 OUTSTANDING OF SUBROGATED CREDITS AND COLLECTED AMOUNT OF CLAIMS ON SUBROGATED CREDITS

(Rp. millions)

		1982	1983	1984
Outstanding subrogation	- KIK/KMKP	20,791.7	40,350.8	88,133.6
	KEB	5,775.4	6,652.4	7,735.3
	Total:	26,567.1	47,003.2	95,868.9
Recoveries	- KIK/KMKP	1,933.4	3,541.8	9,109.5
	KEB	653.3	857.4	1,056.7
	Total:	2,586.7	4,399.2	10,166.2
Outstanding subrogation end of the year (A - B)	- KIK/KMKP	18,858.3	36,809.0	79,024.1
	KEB	5,122.1	5,795.0	6,678.6
	Total:	23,980.4	42,604.0	85,702.7

Source: P.T. Askrindo

Table A-6.24 INCOME STATEMENT 1982 - 1983

(Rp. millions)

	1982	1983
Operating earning:		
I. Credit insurance		
Premiums	20,886.8	15,159.6
Claims	(20,086.2)	(58,784.8)
Recoveries	2,975.3	4,853.9
Allocation to technical reserves	(6,893.1)	(10,218.2)
	(3,117.2)	(48,989.5)
II. Reinsurance		
Premiums	5,253.4	7,198.4
Claims	(3,240.2)	(4,668.2)
Comissions	(1,458.4)	(2,600.0)
Allocation to technical reserves	(122.7)	(480.6)
	432.1	(550.4)
Underwriting results (I + II)	(2,685.1)	(49,539.9)
III. Interest on deposits	5,332.9	6,447.1
Total operating earning	2,647.8	(43,092.8)
Operating expenses	1,804.1	2,216.5
Operating income	843.7	(45,309.3)
Miscellaneous earning	324.7	469.1
Miscellaneous expense	(21.8)	(64.6)
Net profit (Loss)	1,146.6	(44,904.8)

Source: P.T. Askrindo

Table A-6.25 TERMS AND CONDITION OF CREDIT INSURANCE/GUARANTEE

(P.T. Askrindo)

Description	Credit Insurance				Credit Guarantee
	KIK	KMKP	KMK/KEPPRES	KEB 2 Million	KEB more than 2 million Rp. and other credit
1. Credit limit	15 million	15 million	75 million /200 million	2 million	variable
2. Sources of fund					
2.1 Bank Indonesia	55 %	55 %	70 %	-	-
2.2 Handling Banks	20 %	20 %	30 %	-	100 %
2.3 World Bank	25 %	25 %	-	-	-
3. Rate of interest of credit liquidity					
3.1 Bank Indonesia	3 % p.a.	3 % p.a.	3 % p.a.	-	-
3.2 World Bank	10.1 % p.a.	10.1 % p.a.	-	-	-
4. Rate of interest to borrower	12 % p.a.	12 % p.a.	15 % p.a.	up to 24 % p.a.	variable
5. Term of credit	8 years	5 years	1 year	1 year	variable
6. Self financing	10 %	-	10 %	-	-
7. PT ASKRINDO resention	75 %	75 %	70 %	75 %	55 % - 75 %
8. Handling Bank resention	25 %	25 %	30 %	25 %	25 % - 45 %
9. Rate of premium 1/					
9.1 Up to 6 months	-	-	1.5 %	1 %	1.5 %
9.2 More than to 12 months	-	-	2 %	1 %	2 %
9.3 More than 12 to 60 months	-	-	-	-	3 %
9.4 UP to 5 years	3 %	3 %	-	-	-
9.5 More than 5 years	5 %	-	-	-	5 %
10. Premium share					
10.1. Bank Indonesia	50 % / 67 %	50 %	50 %	-	-
10.2 Handling Bank	50 % / 33 %	50 %	50 %	-	-

1/ The premium rates are applicable to the duration of coverage stipulated in covernote.

Source: P.T. Askrindo

Table A-6.26 SUMMARIZED OUTLINE AND PERFORMANCE

(in Rp.billions)

	BNI	BRI	BBD	BDN	BEII	BAPINDO	BPD-WEST JAVA	BPD-EAST JAVA	BDE	OEB
(as of Dec. 1983)								(as of Mar. 1984)		
Total Assets	4,984.7	2,887.3	3,467.3	4,015.9	2,011.9	970.2	65.7	48.4	268.4	98.3
Capital Reserve and Surplus	272.1	59.3	229.8	144.8	174.1	108.6	4.1	6.4	14.5	7.7
Deposit (D/D, Savings, T/D)	3,238.3	1,027.7	1,309.5	1,747.8	1,314.5	73.6	45.2	27.4	176.8	39.3
Loan	3,048.0	2,370.4	2,387.8	2,300.9	908.0	836.3	34.3	21.6	139.4	57.4
Profit (Before Tax)	79.5	15.4	20.2	64.8	160.7	12.2	0.7	1.0	8.1	1.1
Net Profit	41.9	8.5	N.A.	35.4	88.4	5.6	0.5	0.6	4.5	0.6
No. of Personnels	12,812	31,777	6,835	6,649	4,214	971	636	511	N.A.	970
No. of Branches	241 (Overseas 5)	Br. 294 Village unit 3,617 Cash office 30	Br. 77 (Overseas 1) Sub branch 18 Cash office 29	78	49	21	21	13	7	9
(as of Dec. 1984)										
Total Assets	7,063.8	5,299.1	4,515.4	4,286.8	2,601.7	1,290.2	88.4		392.2	154.2
Capital, Reserve and Surplus	362.4	224.5	270.1	314.8	216.8	197.4	5.3		28.0	10.6
Deposit	(1,808.7)*	(1,581.5)*	(1,782.3)*	(1,151.0)*	(1,387.3)*	(100.1)*	65.3		230.1	67.8
Loan	3,849.2	4,075.8	3,133.9	2,813.6	1,376.8	1,172.4	44.4		232.8	94.5
Profit (before Tax)	92.1	46.9	25.7	68.1	70.5	9.1	1.4		N.A.	2.1
Net Profit	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.		N.A.	N.A.

Note: * Demand deposit, savings and time deposit in rupiah currency.

Source: Annual Reports of the above banks

Table A-6.27 SPECIFICATION OF DOMESTIC LOANS OF BNI BY ECONOMIC SECTOR
AS OF DEC. 1983

(In thousand rupiahs)

No.	Sector	Short Term	%	Long Term	%	Total	%
1.	Agriculture	3,389,389	0.14	7,964,598	0.32	11,353,987	0.46
2.	Mining	36,921	-	417,036	0.02	453,957	0.02
3.	Industry	485,065,032	19.42	521,968,712	20.90	1,007,033,744	40.32
4.	Electricity, gas and water supply	525,387	0.02	113,653,975	4.54	114,179,362	4.56
5.	Construction	74,604,036	2.99	29,060,291	1.16	103,664,327	4.15
6.	Trade, catering and hotels	701,236,936	28.07	103,415,876	4.14	804,652,812	32.21
7.	Transportation, warehousing and communication	10,226,672	0.41	375,364,631	15.03	385,591,303	15.44
8.	Services of financial institution	13,936,886	0.56	3,921,350	0.16	17,858,236	0.72
9.	Services of government/public institution	1,849,821	0.07	8,478,148	0.34	10,327,969	0.41
10.	Others	3,056,849	0.12	39,751,913	1.59	42,808,762	1.71
	Total	1,293,927,929	51.80	1,203,996,530	48.20	2,497,924,459	100.00

Source: BNI Annual Report 1983

Table A-6.28 TOTAL LOANS AND KIK/KMKP OUTSTANDING

(in Rp.billion)

	December, 1981			December, 1982			December, 1983			December, 1984		
	Total Loans	KIK/KMKP	%	Total Loans	KIK/KMKP	%	Total Loans	KIK/KMKP	%	Total Loans	KIK/KMKP	%
BNI	1,270.6	136.7	10.8	1,869.6	166.1	8.9	3,048.0	163.2	5.4	3,849.2	174.8	4.5
BRI	1,643.2	540.6	32.9	2,036.3	614.6	30.2	2,370.4	613.6	25.9	4,075.8	567.1	13.9
BBD	1,472.0	99.1	6.7	1,982.0	121.6	6.1	2,388.0	121.7	5.1	3,133.9	117.4	3.7
BDN	1,513.7	73.5	4.9	1,985.0	95.3	4.8	2,299.0	94.9	4.1	2,742.3	95.6	3.5
BEII	527.3	31.2	5.9	772.5	43.0	5.6	910.1	43.5	4.8	1,376.8	n.a.	n.a.
BAPINDO	362.5	11.5	3.2	584.4	14.0	2.4	778.8	14.4	1.8	935.3	n.a.	n.a.
State banks total	6,789.3	892.6	13.1	9,229.8	1,054.6	11.4	1,794.3	1,051.3	8.9	16,113.3	n.a.	n.a.

Source: Each Banks Manual Report

Table A-6.29 BNI APPLICATION AND AMOUNT OF KIK/KMKP

(in Rp.million)

	1982	1983	1984
(KIK)			
Application			
Number	33,652	36,945	40,151
Amount	189,760	216,155	244,109
Ave. Amount	5.6	5.9	6.1
Approval			
Number (% of Appr./Appl.)	22,092 (65.6%)	24,550 (66.5%)	26,851 (66.9%)
Amount (% of Appr./Appl.)	104,801 (55.2%)	118,752 (54.9%)	135,075 (55.3%)
Ave. Amount	4.7	4.8	5.0
(KMKP)			
Application			
Number	68,394	82,172	96,038
Amount	396,414	497,362	610,942
Ave. Amount	5.8	6.1	6.4
Approval			
Number (% of Appr./Appl.)	47,146 (68.9%)	57,963 (70.5%)	68,430 (71.3%)
Amount (% of Appr./Appl.)	168,181 (42.4%)	219,068 (44.0%)	282,520 (46.2%)
Ave. Amount	3.6	3.8	4.1

Source: BNI

Table A-6.30 POWER OF DECISION ON LOANS IN BNI

For Regional Office (in Rp.million)

	General Credits				Kelayakan	
	in Jakarta		Others		in Jakarta	Others
Regional manager	(W)	400	(W)	300	200	150
	(I)	200	(I)	200		
	(EX)	200	(EX)	200		
Vice manager	(W)	250	(W)	100	75	50
	(I)	0	(I)	0		
	(EX)	150	(EX)	150		

(W): Working Capital Credits
(I): Investment Credits
(EX): Export Credits

For Branch Office (in Rp.million)

	Class I branch	Class II branch	Class III branch
KIK/KMKP	15	15	15
Kelayakan	40	30	20
General working capital credits	20	15	10
Investment credit	40	30	20
Export credit	100	75	20

Note: Classification of Branch Offices depending on its size and volume of operation.

Source: BNI

Table A-6.31 BNI KIK/KMKP OUTSTANDING IN ARREARS

(in Rp.million)

	Dec., 1981	Dec., 1982	Dec., 1983	Dec., 1984
(KIK)				
less than 3 m/s	2,287	4,312	2,143	1,522
(%)	(4.5%)	(7.7%)	(5.2%)	(4.1%)
3 m/s and more	2,936	5,882	4,373	4,284
(%)	(5.8%)	(10.6%)	(10.6%)	(11.5%)
Total KIK in Arrears	5,223	10,194	6,516	5,806
(%)	(10.3%)	(18.3%)	(15.8%)	(15.6%)
Outstanding of KIK	50,628	55,727	41,289	37,314
(KMKP)				
less than 3 m/s	2,201	3,970	3,207	3,057
(%)	(2.6%)	(3.6%)	(2.6%)	(2.2%)
3 m/s and more	2,354	4,350	6,723	9,763
(%)	(2.7%)	(3.9%)	(3.5%)	(7.1%)
Total KMKP in Arrears	4,555	8,320	9,930	12,820
(%)	(5.3%)	(7.5%)	(6.1%)	(9.3%)
Outstanding of KMKP	86,068	110,325	121,912	137,480
(KIK/KMKP)				
less than 3 m/s	4,488	8,282	5,350	4,579
(%)	(3.3%)	(5.0%)	(3.3%)	(2.6%)
3 m/s and more	5,294	10,232	11,096	14,047
(%)	(3.9%)	(6.1%)	(6.8%)	(8.0%)
Total KIK/KMKP in Arrears	9,782	18,514	16,446	18,626
(%)	(7.2%)	(11.1%)	(10.1%)	(10.6%)
Outstanding of KIK/KMKP	136,696	166,049	163,201	174,794

Source: BNI

Table A-6.32 KIK/KMKP OUTSTANDING BY HANDLING BANKS

(in Rp.billion)

	December, 1981			December, 1982			December, 1983			December, 1984		
	KIK Amount (%)	KMKP Amount (%)	KIK/KMKP Amount (%)	KIK Amount (%)	KMKP Amount (%)	KIK/KMKP Amount (%)	KIK Amount (%)	KMKP Amount (%)	KIK/KMKP Amount (%)	KIK Amount	KMKP Amount	KIK/KMKP Amount
BRI	162.2 (45.9)	402.4 (63.3)	564.6 (57.1)	171.2 (42.3)	463.0 (58.6)	634.2 (53.0)	168.3 (42.8)	478.2 (55.8)	645.5 (51.6)	141.0	426.1	567.1
BNI	52.2 (14.8)	84.6 (13.3)	136.8 (13.8)	55.7 (13.8)	109.1 (13.8)	164.8 (13.8)	41.0 (10.4)	120.6 (14.1)	161.6 (12.9)	37.3	137.5	174.8
BBD	50.9 (14.4)	49.3 (7.8)	100.2 (10.1)	55.9 (13.8)	62.0 (7.8)	117.9 (9.9)	52.0 (13.2)	67.7 (7.9)	119.7 (9.6)	47.2	70.2	117.4
BDN	30.4 (8.6)	40.3 (6.3)	70.7 (7.1)	36.5 (9.0)	57.2 (7.2)	93.7 (7.8)	32.6 (8.3)	62.5 (7.3)	95.1 (7.6)	29.4	66.3	95.6
BEII	11.9 (3.4)	19.3 (3.1)	31.2 (3.1)	13.3 (3.8)	29.6 (3.7)	42.9 (3.6)	11.0 (2.8)	32.5 (3.8)	43.5 (3.5)	n.a.	n.a.	n.a.
BAPINDO	6.9 (1.9)	4.6 (0.7)	14.5 (1.4)	7.7 (1.9)	6.3 (0.8)	14.0 (1.2)	7.1 (1.8)	7.3 (0.8)	14.4 (1.2)	n.a.	n.a.	n.a.
RDBs	20.7 (5.9)	22.7 (3.6)	43.4 (4.4)	34.2 (8.5)	39.2 (5.0)	73.4 (6.1)	39.4 (10.0)	52.2 (6.1)	91.6 (7.3)	n.a.	n.a.	n.a.
Private Banks	17.8 (5.1)	12.2 (1.9)	30.0 (3.0)	30.4 (7.4)	24.7 (3.1)	55.1 (4.6)	41.9 (10.7)	36.5 (4.2)	78.4 (6.3)	n.a.	n.a.	n.a.
All Handling Banks	353.0 (100)	635.4 (100)	988.4 (100)	405.0 (100)	791.1 (100)	1,196.1 (100)	393.3 (100)	857.6 (100)	1,250.9 (100)			

Source: World Bank SEDP (III)

Table A-6.33 BRI NUMBER AND OUTSTANDING OF LOANS

(in Rp.million)

	1982	1983	1984
Working capital credit	1,863,040 (91.4%)	2,152,380 (92.5%)	3,843,550 (95.4%)
No. of loans	5,673,356	5,606,513	5,201,851
Ave. loan amount	0.33	0.38	0.74
Investment credit	175,550 (8.6%)	165,490 (7.5%)	186,870 (4.6%)
No. of loans	80,626	75,571	67,354
Ave. loan amount	2.18	2.19	2.77
Loan Total	2,038,590 (100%)	2,327,870 (100%)	4,030,420 (100%)
No. of loans	5,753,982	5,682,084	5,269,205
Ave. loan amount	0.35	0.41	0.76

Source: BRI

Table A-6.34 BBD APPLICATION AND APPROVAL OF KIK/KMKP

(in Rp.million)

	1982	1983	1984
(KIK)			
Application			
Number	31,562	34,648	37,412
Amount	165,976	194,407	216,777
Ave. Amount	5.3	5.6	5.8
Approval			
Number	22,508	24,777	26,386
Amount	98,304	114,080	125,628
Ave. Amount	4.4	4.6	4.8
(KMKP)			
Application			
Number	66,001	88,553	109,522
Amount	180,003	223,878	255,799
Ave. Amount	2.7	2.5	2.3
Approval			
Number	57,332	78,421	98,319
Amount	92,652	112,285	130,912
Ave. Amount	1.6	1.4	1.3
(KIK/KMKP)			
Application			
Number	97,563	123,201	146,934
Amount	345,979	418,285	472,576
Ave. Amount	3.5	3.4	3.2
Approval			
Number	79,840	103,198	124,705
Amount	190,956	226,365	256,540
Ave. Amount	2.4	2.2	2.1

Source: BBD

Table A-6.35 KIK/KMKP OUTSTANDING BY ECONOMIC SECTOR IN BBD

(in Rp.million)

	Dec., 1982	Dec., 1983	Dec., 1984
(KIK)			
Agriculture	5,257	4,867	4,127
Mining	185	312	97
Manufacturing	5,512	5,513	5,428
Trade	13,409	13,972	12,256
Transportation	26,457	22,941	18,328
Others	7,277	6,059	6,972
(KIK sub-total)	58,097	53,664	47,208
(KMKP)			
Agriculture	4,521	3,912	3,293
Mining	56	366	237
Manufacturing	12,186	13,420	13,085
Trade	41,399	44,894	46,128
Transportation	1,878	2,073	1,866
Others	3,455	3,362	5,613
(KMKP sub-total)	63,495	68,027	70,222
(KIK/KMKP)			
Agriculture	9,778	8,779	7,420
Mining	241	678	334
Manufacturing	17,698	18,933	18,513
Trade	54,808	58,866	58,384
Transportation	28,335	25,014	20,194
Others	10,732	9,421	12,585
(KIK/KMKP total)	121,592	121,691	117,430
Total loans outstanding	1,981,890	2,387,800	3,133,860
% of KIK/KMKP	6.1%	5.1%	3.7%

Source: BBD

Table A-6.36 BDN POWER ON LOAN

(in Rp.million)

	Regional Office	Branch Office
Program Credit		
- KMK (Working capital)	150	100
- KI (Investment credit)	75	50
- KIK/KMKP	-	15
- Keppres & KMK75	0	0
Non Program Credit		
- KMK		
- Contractor	150	50
- Others	100	50
- KI (Investment credit)	0	0

Source: BDN

Table A-6.37 BDN KIK/KMKP OUTSTANDING BY ECONOMIC SECTOR

(in Rp.million)

	Dec., 1982			Dec., 1983			Dec., 1984		
	Amount	No. of loans	Ave. Amount	Amount	No. of loans	Ave. Amount	Amount	No. of loans	Ave. Amount
(KIK)									
Agriculture	2,260	1,061	2.1	2,162	1,045	2.1	2,121	968	2.2
Mining	78	15	5.2	52	10	5.2	43	8	5.4
Manufacturing	3,640	884	4.1	3,114	843	3.7	3,182	777	4.1
Trade	16,733	4,945	3.4	15,291	4,750	3.2	14,452	4,046	3.6
Transportation	6,972	3,284	2.1	4,910	1,888	2.6	3,452	1,023	3.4
Others	7,239	1,429	5.1	6,822	1,491	4.6	6,103	1,308	4.7
(KIK sub-total)	36,922	11,618	3.2	32,351	10,027	3.2	29,353	8,130	3.6
(KMKP)									
Agriculture	1,075	302	3.6	1,289	289	4.5	1,057	229	4.6
Mining	98	23	4.3	99	23	4.3	120	22	5.5
Manufacturing	5,001	1,427	3.5	4,972	1,422	3.5	5,324	1,427	3.7
Trade	43,831	12,805	3.4	47,576	13,071	3.6	50,392	12,739	4.0
Transportation	490	64	7.7	446	57	7.8	272	34	8.0
Others	7,850	1,530	5.1	8,187	1,593	5.1	9,128	1,557	5.9
(KMKP sub-total)	58,345	16,151	3.6	62,569	16,455	3.8	66,293	16,008	4.1
(KIK/KMKP)									
Agriculture	3,335	1,363	2.4	3,451	1,334	2.6	3,178	1,197	2.7
Mining	176	38	4.6	151	33	4.6	163	30	5.4
Manufacturing	8,641	2,311	3.7	8,086	2,265	3.6	8,506	2,204	3.9
Trade	60,563	17,750	3.4	62,867	17,821	3.5	64,844	16,785	3.9
Transportation	7,462	3,348	2.2	5,356	1,945	2.8	3,724	1,057	3.5
Others	15,090	2,959	5.1	15,009	3,084	4.9	15,231	2,865	5.3
(KIK/KMKP total)	95,267	27,769	3.4	94,920	26,482	3.6	95,646	24,138	4.0
Total loans	1,984,528			2,300,938			2,813,625		
% of KIK/KMKP in BDN loans	4.8%			4.1%			3.4%		

Source: BDN

Table A-6.38 BDN APPLICATION AND APPROVAL OF KIK/KMKP

(in Rp.million)

	1982	1983	1984
(KIK)			
Application			
Number	21,903	23,742	25,372
Amount	100,237	113,011	128,554
Ave. Amount	4.6	4.8	5.1
Approval			
Number	17,564	18,760	20,292
Amount	66,038	74,200	85,494
Ave. Amount	3.8	4.0	4.2
(KMKP)			
Application			
Number	32,963	37,574	42,856
Amount	213,867	253,396	300,257
Ave. Amount	6.5	6.7	7.0
Approval			
Number	25,468	29,314	33,868
Amount	95,211	116,111	145,988
Ave. Amount	3.7	4.0	4.3
(KIK/KMKP)			
Application			
Number	54,866	61,316	68,228
Amount	314,104	366,407	428,811
Ave. Amount	5.7	6.0	6.3
Approval			
Number	43,032	48,074	54,160
Amount	161,249	190,311	231,482
Ave. Amount	3.7	4.0	4.3

Source: BDN

Table A-6.39 BAPINDO'S LONG TERM INVESTMENT LOANS

(in Rp.billion)

	BAPINDO (%)	All State Banks
1980	167.2 (30.1)	555.0
1981	261.4 (32.0)	816.0
1982	445.7 (36.3)	1,227.0
1983	617.0 (35.4)	1,742.0

Source: BAPINDO annual report 1983

Section 7 ANALYSIS OF COST STRUCTURE ON LOCALLY MANUFACTURED PRODUCTS

Section 7 ANALYSIS OF COST STRUCTURE ON LOCALLY MANUFACTURED PRODUCTS

7.1 Introduction

The products of import-substitution industries, are generally said to be priced higher than imported products, in all developing countries of which Indonesia is no exception.

This section attempts to analyze the cost structure and competitiveness of local-made metalworking products.

As one of the means to analyze the cost competitiveness, Japan was taken up here as an example of the advanced industrial nation, and the manufacturing costs of the metalworking factories in Japan and Indonesia were calculated in a model for a comparative study of their cost composition on the assumption that completely identical metalworking factories were to be newly constructed in both countries.

7.2 Premises for Comparing the Factory Construction Costs

The three basic processes of metalworking, namely;

1) foundry shop of 12,000 t/y capacity

2) forging shop of 4,600 t/y capacity, and

3) pressworking shop (of small articles) of 1,380 t/y capacity

were taken up here as examples. Each shop that was taken up here as a model belongs to the category of large-scale factories picked up in Section 9 as promising types of industries.

(Note) Shipbuilding, which belongs to the assembly-type industries, was also taken up for the sake of approximate cost comparison as a reference.

The project costs for constructing these shops in Japan were estimated for the purpose of calculating the manufacturing costs on the basis of the project costs estimated in Section 9 for constructing the same shops in Indonesia.

(1) Plant direct cost

1) Equipment and material

In the case of Indonesia, it was assumed that all equipment and material would be imported so that these were estimated on the basis of f.o.b. Japan. In the case of Japan, since Japanese-made equipment is used, export crating cost, customs clearance cost and transportation cost to port are unnecessary. These are said to amount to 5% to 8% of the f.o.b. cost of equipment. Here, the cost of equipment and material in Japan were assumed to be 5% lower than in Indonesia, or, in other words, 95% of that of Indonesia.

2) Spare parts

Indonesia stocks about two years' supply of spare parts as reserve. As only a short period is required from ordering until receiving in Japan, it was assumed that Japan would stock the spare parts about a year's supply. In other words, the cost of spare parts was assumed to be 50% of that of Indonesia.

3) Ocean freight, insurance and inland transportation

Both ocean freight and marine insurance are unnecessary in case of constructing a plant in Japan so that these were assumed to be zero. As for inland transportation (from port to plant site in Indonesia and from the equipment supplier to plant site in Japan), it was assumed that the same amount would be incurred in both countries.

4) Civil and erection

A rough estimation of the civil costs, which are the costs of land improvement, foundation of buildings and machinery, and erection costs which are the costs for installation of machinery, piping and wiring showed that they were not largely different in either country so that, here, they were assumed to be the same. The unit cost of factory labor is cheaper in Indonesia but the required man-hour is larger because of inferior working efficiency. The results of multiplying the unit cost with efficiency would probably be somewhat cheaper in Indonesia but the local material costs are more expensive, so that when averaged overall, the costs would be approximately the same.

5) Office accommodation and facility

Office furnitures and supplies, trucks and passenger cars and other vehicle costs. These were assumed to be the same in both countries.

6) Engineering and supervision

The design fee for the entire plant, and expenses for supervision of civil and building works, equipment installation and trial run.

In Japan, the plant has a certain degree of capability so that design, installation and trial run can be accomplished with only a brief period of supervisory service. Indonesia will incur additional expenses for airfare and lodging for supervisors. With due consideration to the foregoing, the cost of engineering and supervision in Japan was deemed to be 50% of that of Indonesia.

7) Overhead expenses

Various expenses incurred on the part of the plant owner during the construction period, such as the cost of hiring employees until commerical operation, training and expenses incurred for operation. The same amounts were assumed for both countries.

(2) Tax and duty

1) Import tax
2) Import sales tax
3) Value added tax

These are taxes imposed for imported equipment, counted only for Indonesia.

(3) Working capital

Roughly estimated on the basis of unit prices of raw materials, etc. of each country.

(4) Contingency and others

Physical contingency and price contingency, or, in other words, reserves. Most of it is to provide for price rises due to inflation, but as the prevalent unit prices are used for other cost factors, this item was considered unnecessary for the purpose of calculating the unit manufacturing cost and was therefore omitted for both countries.

Project costs estimated for foundry shop, forging shop and presswork shop in Section 9 for Indonesia and Japan were tabulated in Tables A-7.1, A-7.2 and A-7.3.

7.3 Premises for Calculating Manufacturing Cost

Table A-7.4 compares the premises for calculating the manufacturing cost in Indonesia and Japan. Prices for Indonesia were based on the data collected during the field survey.

(1) Variable cost

1) Raw material

Steel scrap, iron scrap and pig iron are the raw materials used in the foundry shop. In the case of Indonesia, all these were assumed to be locally produced. The price of pig iron is the domestic product price in Lampung which is about 30% higher than the import from Japan or elsewhere.

SC, SCM and SNCM are the raw materials used in the forging shop. Since Indonesia does not produce any of these except SC, the prices of imported materials were used for cost calculation. Steel plate is the raw material used in the presswork shop and the cost was assumed to be the same as for SC.

2) Utilities

Foundry shops in Japan use town gas. LPG will be used in Indonesia as town gas is not available yet.

3) Other variable costs

Please refer to Table A-7.5 for cost accounting method of each plant for chemcials, lubricants, packaging and other variables.

(2) Fixed cost and semi-variable cost

1) Labor cost

Labor cost was divided into three ranks: Rank A is the cost incurred for the plant manager and assistant plant manager, Rank B is the average for the manufacturing department manager, engineers, foremen, chiefs of clerical departments. Rank C is the cost required mainly for machine operators but also includes the cost for administrative staff and clerical personnel.

Labor cost containes cash wages including bonuses.

2) Overhead

Employee fringe benefits and welfare, commuting allowance, payments in kind such as working clothes and expendable supplies. Also includes entertainment expenses, travel expenses and research and development expenses. In Indonesia, overhead was assumed to be 50% of total labor cost, and in Japan, 75%.

3) Interest rate

The interest rate in Indonesia was assumed to be 2.2% per month and 26.4% per year and, in Japan, 9% per year. As for the amount of borrowing, it was assumed that 70% of the total project cost would be financed by borrowings in both countries.

In cost accounting, it is supposed that half of the borrwing have already been paid back. In other words, the interest expense was obtained by multiplying the above interest rate to 35% of the total project cost.

4) Maintenance cost

Two percent of the erected plant cost of equipment was appropriated as annual cost for parts and expendable supplies and for repairs and maintenance of machinery consigned to outside vendors. This item 4) and ensuing items were assumed to be the same in both countries.

5) Tax and insurance

0.5% of the erected plant cost was appropriated for fixed property tax, stamp duty and fire insurance premium.

6) Depreciation

Depreciable life was assumed to be 10 years for equipment and machinery (10% per year of the invested amount), 5 years for intangible fixed properties like indirect expenses (20% per year of the invested amount), and 30 years for civil and architectural structures such as buildings (3.3% per year of the invested amount). Fixed amount depreciation (straight line method) was adopted for all properties.

7) Administration and sales expenses

For various expenses associated with sales, such as sales expenses, advertising and promotion expenses, etc., 3% of the manufacturing cost was appropriated as annual expenses.

8) Return of investment

20% of the total project cost was appropriated as an annual return on investment before tax.

(3) Other considerations

In constructing and starting a new modern plant in Indonesia, it is advisable that foreign operation advisers are invited for a certain length of time so that they might offer guidance for transfer of technology. In this cost calculation, however, the expenses required for this was not included on the assumption that the necessary technology would have been adequately transferred by then.

The difference in manufacturing cost between the two countries can be calculated from the differences in project costs shown in Tables A-7.1 through A-7.3 and also the differences in unit prices shown in Table A-7.4. The differences in yield rate of raw materials and the difference in the fraction defective of products are also reflected in the unit prices. The yield rate of raw materials refers to the ratio of raw materials converted into products. The defect rate refers to the ratio of unsalable products due to defects found by product inspection to the total quantity of finished products.

For concrete cost accounting method for each of foundry shop, forging shop and pressworking shop, can be referred to Table A-7.5.

7.4 Calculation Result

The calculation results are listed on six tables from Table 7.6 to 7.11. The unit manufacturing cost per ton is as follows:

	Indonesia (US$/ton)	Japan (US$/ton)	Ratio
Casting	966.5	1,211.9	0.80
Forging	1,796.0	1,724.2	1.04
Presswork	1,249.2	1,146.7	1.09

Table A-7.1 COMPARISON OF PROJECT COST BETWEEN INDONESIA AND JAPAN (CASTING: 12,000 T/Y BY 2 SHIFTS OPERATION)

(Unit: US$ 1,000)

	Indonesia	Japan
1. Erected plant cost		
(1) Equipment & material	5,452 1/	5,179 2/
(2) Spare parts	168	84 3/
(3) Ocean freight, insurance and inland transportation	277	40 4/
(4) Erection	346	346
Sub-total	6,243	5,649
(5) Tax and duties on equipment (Import tax and sales tax)	1,171	-
Erected plant cost	7,414	5,649
2. Civil works		
(1) Buildings, foundation, etc.	3,298	3,298
(2) Value added tax on local contract	400	-
Civil works	3,698	3,298
3. Indirect expenses and misc.		
(1) Office accommodation & facilities	98	98
(2) Engineering & supervision	167	84 5/
(3) Overhead expenses	981	981
Indirect expenses	1,246	1,163
4. Working capital	2,174	1,344
Total project cost	14,532	11,454

Notes: 1/ Assumed as F.O.B. Japan
2/ 95% of F.O.B.
3/ 50% of Indonesia
4/ Inland transportation cost only
5/ 50% of Indonesia

Table A-7.2 COMPARISON OF PROJECT COST BETWEEN INDONESIA AND JAPAN (FORGING: 4,600 T/Y BY 2 SHIFTS OPERATION)

(Unit: US$ 1,000)

	Indonesia	Japan
1. Erected plant cost		
(1) Equipment & material	3,135 1/	2,978 2/
(2) Spare parts	73	37 3/
(3) Ocean freight, insurance and inland transportation	140	20 4/
(4) Erection	257	257
Sub-total	3,605	3,292
(5) Tax and duties on equipment (Import tax and sales tax)	666	-
Erected plant cost	4,271	3,292
2. Civil works		
(1) Buildings, foundation, etc.	754	754
(2) Value added tax on local contract	117	-
Civil works	871	754
3. Indirect expenses and misc.		
(1) Office accommodation & facilities	63	63
(2) Engineering & supervision	153	77 5/
(3) Overhead expenses	457	457
Indirect expenses	673	597
4. Working capital	980	968
Total project cost	6,795	5,611

Notes: 1/ Assumed as F.O.B. Japan
2/ 95% of F.O.B.
3/ 50% of Indonesia
4/ Inland transportation cost only
5/ 50% of Indonesia

Table A-7.3 COMPARISON OF PROJECT COST BETWEEN INDONESIA AND JAPAN (PRESSWORK: 1,380 T/Y BY 2 SHIFTS OPERATION)

(Unit: US$ 1,000)

	Indonesia	Japan
1. Erected plant cost		
(1) Equipment & material	468 1/	445 2/
(2) Spare parts	17	9 3/
(3) Ocean freight, insurance and inland transportation	25	4 4/
(4) Erection	30	30
Sub-total	540	488
(5) Tax and duties on equipment (Import tax and sales tax)	98	-
Erected plant cost	638	488
2. Civil works		
(1) Buildings, foundation, etc.	258	258
(2) Value added tax on local contract	32	-
Civil works	290	258
3. Indirect expenses		
(1) Office accommodation & facilities	10	10
(2) Engineering & supervision	18	9 5/
(3) Overhead expenses	83	83
Indirect expenses	113	102
4. Working capital	366	184
Total project cost	1,405	1,032

Notes: 1/ Assumed as F.O.B. Japan
2/ 95% of F.O.B.
3/ 50% of Indonesia
4/ Inland transportation cost only
5/ 50% of Indonesia

Table A-7.4 UNIT COST AND ASSUMPTION FOR PRODUCTION COST CALCULATION

	Indonesia	Japan
1. Variable cost		
1.1 Raw material (US$/t)		
Steel scrap	117	128
Pig iron	198	213
SC (Carbon steel)	495	383
SCM (Alloy, Cr+Mo)	673	511
SNCM (Alloy, Ni+Cr+Mo)	826	638
Steel plate	495	383
1.2 Utilities		
Electricity ($/kWH)	0.072	0.096
Industrial water ($/m3)	0.18	0.86
Fuel (City gas) ($/m3)	-	0.50
(Heavy oil) ($/l)	0.27	0.51
(LPG) ($/kg)	0.36	0.485
2. Fixed cost and semi-variable cost		
2.1 Labor cost ($/Year)		
Rank A (Plant manager)	5,000	25,500
Rank B (Manager, foreman)	2,750	17,000
Rank C (Worker, clerk)	1,500	12,800
2.2 Overhead	50% of labor cost	75% of labor cost
2.3 Interest rate	26.4% per annum	9% per annum
2.4 Maintenance cost	2% of erected plant cost	
2.5 Tax & insurance	0.5% of erected plant cost and civil works	
2.6 Depreciation	10 years for the erected plant cost, 5 years for intangible cost and 30 years for civil works in straight-line method	
2.7 Administration & sales expenses	3% of total production cost	
2.8 Return on investment	20% of total project cost	

Note: 1 US$ = 1,110 Rp.= 235 Yen (as of August, 1985)

Table A-7.5 PRODUCTION DATA FOR EACH FACTORY

	Casting		Forging		Press Work	
	Indonesia	Japan	Indonesia	Japan	Indonesia	Japan
1. Raw material consumption (t/t)						
Pig iron	0.384	0.40	-	-	-	-
Steel scrap	0.566	0.594	-	-	-	-
Return (Recycle)1/	0.594	0.55	-	-	-	-
	1.544	1.544				
SC	-	-	0.325	0.325	-	-
SCM	-	-	0.455	0.455	-	-
SNCM	-	-	0.520	0.520	-	-
			1.300	1.300		
Steel plate	-	-	-	-	1.33	1.18
2. Auxiliary materials						
Chemicals ($/t)	2.1	2.0	1.7	1.7	0.5	0.5
Materials ($/t)	104.1	99.1	3.4	10.6	6.0	15.0
3. Utilities consumption						
Electricity (KWH/t)	1,155	1,100	560	560	700	700
Water (m^3/t)	10	10	2	2	-	-
Fuel	147 l/t2/	140 l/t2/	194 kg/t3/	170 m^3/t4/	-	-
4. Employees						
Rank A	2	2	3	2	1	1
Rank B	25	22	17	12	6	5
Rank C	245	172	82	64	18	12
	272	196	102	78	25	18
5. Ratio of off-grade products	FC: 10%	FC: 5%	7%	2%	7.5%	1%
	SC: 3%	SC: 1%				

Notes: 1/ Re-use of unused materials and off-grade products
2/ Fuel oil
3/ LPG
4/ City gas

Table A-7.6 DEVELOPMENT OF LINKAGE-TYPE INDUSTRY

- CASTING (12000T/Y) -

- INDONESIA -

	ANNUAL COST (USD1000/Y)	UNIT COST (USD/TON)	COMPOSITION (PER CENT)
STEEL SCRAP	794.7	66.22	6.9
PIG IRON	912.4	76.03	7.9
RAW MATERIALS	1707.0	142.25	14.7
ELECTRICITY	997.9	83.16	8.6
INDUSTRIAL WATER	21.6	1.80	0.2
FUEL (HEAVY OIL)	476.3	39.69	4.1
UTILITIES	1495.8	124.65	12.9
CHEMICALS	25.2	2.10	0.2
MATERIALS	1249.2	104.10	10.8
AUXILIARY MATERIALS	1274.4	106.20	11.0
A:VARIABLE COST	4477.2	373.10	38.6
LABOR COST	446.3	37.19	3.8
OVERHEAD	223.1	18.59	1.9
MAINTENANCE COST	148.3	12.36	1.3
TAX & INSURANCE	55.6	4.63	0.5
DEPRECIATION	1113.9	92.82	9.6
B:FIXED & SEMI VARL	1987.1	165.59	17.1
C:LOSS FR OFF-GRADE	670.7	55.89	5.8
D:FACTORY CO (A+B+C)	7135.0	594.58	61.5
INTEREST	1342.8	111.90	11.6
ADMI & SALES EXP.	214.1	17.84	1.8
E:OPERAT'G EXP.	1556.8	129.73	13.4
F:TOTAL PROD CO(D+E)	8691.8	724.32	74.9
G:R.O.I.(20%)	2906.4	242.20	25.1
H:TOTAL CO & RE(F+G)	11598.2	966.52	100.0

RATED CAPACITY	12000.00
OPERATION LOAD	1.00
ANNUAL PRODUCTION	12000.00
ERECTED PLANT COST	7414.00
CIVIL WORKS	3698.00
INDIRECT EXPS & MISC	1246.00
WORKING CAPITAL	2174.00
TOTAL PROJECT COST	14532.00

Table A-7.7 DEVELOPMENT OF LINKAGE-TYPE INDUSTRY

- CASTING (12000T/Y) -

- JAPAN -

	ANNUAL COST (USD1000/Y)	UNIT COST (USD/TON)	COMPOSITION (PER CENT)
STEEL SCRAP	912.4	76.03	6.3
PIG IRON	1022.4	85.20	7.0
RAW MATERIALS	1934.8	161.23	13.3
ELECTRICITY	1267.2	105.60	8.7
INDUSTRIAL WATER	103.2	8.60	0.7
FUEL (HEAVY OIL)	856.8	71.40	5.9
UTILITIES	2227.2	185.60	15.3
CHEMICALS	24.0	2.00	0.2
MATERIALS	1189.2	99.10	8.2
AUXILIARY MATERIALS	1213.2	101.10	8.3
A:VARIABLE COST	5375.2	447.93	37.0
LABOR COST	2626.6	218.88	18.1
OVERHEAD	1969.9	164.16	13.5
MAINTENANCE COST	113.0	9.41	0.8
TAX & INSURANCE	44.7	3.73	0.3
DEPRECIATION	907.4	75.62	6.2
B:FIXED & SEMI VARL	5661.7	471.81	38.9
C:LOSS FR OFF-GRADE	508.0	42.33	3.5
D:FACTORY CO (A+B+C)	11544.9	962.07	79.4
INTEREST	360.8	30.07	2.5
ADMI & SALES EXP.	346.3	28.86	2.4
E:OPERAT'G EXP.	707.1	58.93	4.9
F:TOTAL PROD CO(D+E)	12252.0	1021.00	84.2
G:R.O.I.(20%)	2290.8	190.90	15.8
H:TOTAL CO & RE(F+G)	14542.8	1211.90	100.0

RATED CAPACITY	12000.00
OPERATION LOAD	1.00
ANNUAL PRODUCTION	12000.00
ERECTED PLANT COST	5649.00
CIVIL WORKS	3298.00
INDIRECT EXPS & MISC	1163.00
WORKING CAPITAL	1343.80
TOTAL PROJECT COST	11453.80

Table A-7.8 DEVELOPMENT OF LINKAGE-TYPE INDUSTRY

- FORGING (4600T/Y) -

- INDONESIA -

	ANNUAL COST (USD1000/Y)	UNIT COST (USD/TON)	COMPOSITION (PER CENT)
SC CARBON STEEL	740.0	160.87	9.0
SCM ALLOY CR+MO	1408.6	306.21	17.0
SNCM ALLOY NI+CR+MO	1975.8	429.52	23.9
RAW MATERIALS	4124.4	896.61	49.9
ELECTRICITY	185.5	40.32	2.2
INDUSTRIAL WATER	1.7	0.36	0.0
FUEL (LPG)	321.3	69.84	3.9
UTILITIES	508.4	110.52	6.2
CHEMICALS	7.8	1.70	0.1
MATERIALS	15.6	3.40	0.2
AUXILIARY MATERIALS	23.5	5.10	0.3
A:VARIABLE COST	4656.3	1012.23	56.4
LABOR COST	184.8	40.16	2.2
OVERHEAD	92.4	20.08	1.1
MAINTENANCE COST	85.4	18.57	1.0
TAX & INSURANCE	25.7	5.59	0.3
DEPRECIATION	590.7	128.42	7.2
B:FIXED & SEMI VARL	979.0	212.82	11.8
C:LOSS FR OFF-GRADE	456.9	99.33	5.5
D:FACTORY CO (A+B+C)	6092.2	1324.38	73.7
INTEREST	627.9	136.49	7.6
ADMI & SALES EXP.	182.8	39.73	2.2
E:OPERAT'G EXP.	810.6	176.22	9.8
F:TOTAL PROD CO(D+E)	6902.8	1500.60	83.6
G:R.O.I.(20%)	1359.0	295.43	16.4
H:TOTAL CO & RE(F+G)	8261.8	1796.04	100.0

RATED CAPACITY	4600.00
OPERATION LOAD	1.00
ANNUAL PRODUCTION	4600.00
ERECTED PLANT COST	4271.00
CIVIL WORKS	871.00
INDIRECT EXPS & MISC	673.00
WORKING CAPITAL	980.00
TOTAL PROJECT COST	6795.00

Table A-7.9 DEVELOPMENT OF LINKAGE-TYPE INDUSTRY

- FORGING (4600T/Y) -

- JAPAN -

	ANNUAL COST (USD1000/Y)	UNIT COST (USD/TON)	COMPOSITION (PER CENT)
SC CARBON STEEL	572.6	124.47	7.2
SCM ALLOY CR+MO	1069.5	232.50	13.5
SNCM ALLOY NI+CR+MO	1526.1	331.76	19.2
RAW MATERIALS	3168.2	688.74	39.9
ELECTRICITY	247.3	53.76	3.1
INDUSTRIAL WATER	7.9	1.72	0.1
FUEL (CITY GAS)	391.0	85.00	4.9
UTILITIES	646.2	140.48	8.1
CHEMICALS	7.8	1.70	0.1
MATERIALS	48.8	10.60	0.6
AUXILIARY MATERIALS	56.6	12.30	0.7
A:VARIABLE COST	3871.0	841.52	48.8
LABOR COST	1074.2	233.52	13.5
OVERHEAD	805.6	175.14	10.2
MAINTENANCE COST	65.8	14.31	0.8
TAX & INSURANCE	20.2	4.40	0.3
DEPRECIATION	473.7	102.99	6.0
B:FIXED & SEMI VARL	2439.7	530.36	30.8
C:LOSS FR OFF-GRADE	128.8	28.00	1.6
D:FACTORY CO (A+B+C)	6439.4	1399.88	81.2
INTEREST	176.7	38.42	2.2
ADMI & SALES EXP.	193.2	42.00	2.4
E:OPERAT'G EXP.	369.9	80.42	4.7
F:TOTAL PROD CO(D+E)	6809.4	1480.29	85.9
G:R.O.I.(20%)	1122.1	243.95	14.1
H:TOTAL CO & RE(F+G)	7931.5	1724.24	100.0

RATED CAPACITY	4600.00
OPERATION LOAD	1.00
ANNUAL PRODUCTION	4600.00
ERECTED PLANT COST	3292.00
CIVIL WORKS	754.00
INDIRECT EXPS & MISC	597.00
WORKING CAPITAL	967.75
TOTAL PROJECT COST	5610.75

Table A-7.10 DEVELOPMENT OF LINKAGE-TYPE INDUSTRY

- PRESSWORK (1380T/Y)

- INDONESIA -

	ANNUAL COST (USD1000/Y)	UNIT COST (USD/TON)	COMPOSITION (PER CENT)
STEEL PLATE	908.5	658.35	52.7
RAW MATERIALS	908.5	658.35	52.7
ELECTRICITY	69.6	50.40	4.0
INDUSTRIAL WATER	0.0	0.00	0.0
FUEL	0.0	0.00	0.0
UTILITIES	69.6	50.40	4.0
CHEMICALS	0.7	0.50	0.0
MATERIALS	8.3	6.00	0.5
AUXILIARY MATERIALS	9.0	6.50	0.5
A:VARIABLE COST	987.0	715.25	57.3
LABOR COST	48.5	35.14	2.8
OVERHEAD	24.3	17.57	1.4
MAINTENANCE COST	12.8	9.25	0.7
TAX & INSURANCE	4.6	3.36	0.3
DEPRECIATION	95.7	69.32	5.5
B:FIXED & SEMI VARL	185.8	134.65	10.8
C:LOSS FR OFF-GRADE	102.0	73.90	5.9
D:FACTORY CO (A+B+C)	1274.8	923.80	74.0
INTEREST	129.8	94.07	7.5
ADMI & SALES EXP.	38.2	27.71	2.2
E:OPERAT'G EXP.	168.1	121.79	9.7
F:TOTAL PROD CO(D+E)	1442.9	1045.59	83.7
G:R.O.I.(20%)	281.0	203.62	16.3
H:TOTAL CO & RE(F+G)	1723.9	1249.22	100.0

RATED CAPACITY	1380.00
OPERATION LOAD	1.00
ANNUAL PRODUCTION	1380.00
ERECTED PLANT COST	638.00
CIVIL WORKS	290.00
INDIRECT EXPS & MISC	111.00
WORKING CAPITAL	366.00
TOTAL PROJECT COST	1405.00

Table A-7.11 DEVELOPMENT OF LINKAGE-TYPE INDUSTRY

- PRESSWORK (1380T/Y)

- JAPAN -

	ANNUAL COST (USD1000/Y)	UNIT COST (USD/TON)	COMPOSITION (PER CENT)
STEEL PLATE	623.7	451.94	39.4
RAW MATERIAL	623.7	451.94	39.4
ELECTRICITY	92.7	67.20	5.9
INDUSTRIAL WATER	0.0	0.00	0.0
FUEL	0.0	0.00	0.0
UTILITIES	92.7	67.20	5.9
CHEMICALS	0.7	0.50	0.0
MATERIALS	20.7	15.00	1.3
AUXILIARY MATERIALS	21.4	15.50	1.4
A:VARIABLE COST	737.8	534.64	46.6
LABOR COST	264.1	191.38	16.7
OVERHEAD	198.1	143.53	12.5
MAINTENANCE COST	9.8	7.07	0.6
TAX & INSURANCE	3.7	2.70	0.2
DEPRECIATION	77.8	56.38	4.9
B:FIXED & SEMI VARL	553.5	401.06	35.0
C:LOSS FR OFF-GRADE	13.0	9.45	0.8
D:FACTORY CO (A+B+C)	1304.3	945.15	82.4
INTEREST	32.5	23.57	2.1
ADMI & SALES EXP.	39.1	28.35	2.5
E:OPERAT'G EXP.	71.7	51.92	4.5
F:TOTAL PROD CO(D+E)	1376.0	997.07	87.0
G:R.O.I.(20%)	206.5	149.63	13.0
H:TOTAL CO & RE(F+G)	1582.5	1146.70	100.0

RATED CAPACITY	1380.00
OPERATION LOAD	1.00
ANNUAL PRODUCTION	1380.00
ERECTED PLANT COST	488.00
CIVIL WORKS	258.00
INDIRECT EXPS & MISC	102.00
WORKING CAPITAL	184.45
TOTAL PROJECT COST	1032.45

Section 8 TECHNICAL ASSISTANCE INSTITUTIONS FOR THE MATALWORKING INDUSTRY IN INDONESIA

Section 8 TECHNICAL ASSISTANCE INSTITUTIONS FOR THE METALWORKING INDUSTRY IN INDONESIA

8.1 Technical Assistance Institutions under the Jurisdiction of the Ministry of Industry

The Agency for Industrial Research and Development (BPPI) of the Ministry of Industry was established in 1978 as an organization to oversea research and development institutions related to industries by sectors and by areas.

The following research and development institutions are currently under the control of BPPI.

(1) Central Research and Development Institutes (9 institutions by sector)

1) Chemcial Industry Development Institute (located in Jakarta)

2) Agroindustry Development Institute (Bogor)

3) Metal Industries Development Center (MIDC) (Bandung)*

4) Textile Industry Development Institute (Bandung)

5) Paper & Pulp Industry Development Institute (Bandung)

6) Institute for Research and Development of Industrial Materials and Technical Products (Bandung)*

7) Ceramics Industry Development Institute (Bandung)

8) Leather & Plastics Industry Development Institute (Yogyakarta)

9) Handicrafts and Batik Industry Development Institute (Yogyakarta)

(2) Industrial Research Laboratories (9 research laboratories by area)

1) Industrial Research Laboratory, Banda Aceh (Sumatra)

2) Industrial Research Laboratory, Medan (Sumatra)

3) Industrial Research Laboratory, Palembang (Sumatra)

4) Industrial Research Laboratory, Semarang (Java)

5) Industrial Research Laboratory, Surabaya (Java)*

6) Industrial Research Laboratory, Banjar Braru (Kalimantan)

7) Industrial Research Laboratory, Ujungpandang (Sulawesi)

8) Industrial Research Laboratory, Manado (Sulawesi)

9) Industrial Research Laboratory, Ambon (Ambon)

The aforesaid Central Development Institutions are national organizations, each of them being engaged in research and development of industries of each sector for the whole nation. The Industrial Research Laboratories are engaged in inspection and research activities for their respective local resource-oriented industries, and they mainly cover food and chemical-related fields. Out of these, the Metal Industries Development Center, the Institute for Research and Development of Industrial Materials and Technical Products and the Industrial Research Laboratory of Surabaya (marked with *) have been picked up as the institutions relevant to the machine and metalworking industries which are the main theme of this survey. These institutes are outlined below.

8.1.1 Metal Industries Development Center (MIDC)

MIDC was established in 1976 with the assistance of Belgium which is still providing equipment and technical assistance. It is also receiving technical assistance from Japan in the form of sending trainees. MIDC purports to offer mainly technical support to the medium and small scale machine and metalworking industries by engaging itself mostly in the following two activities.

(1) Research on metal materials and production process, fabrication of jigs and trial products for medium and small firms, preparation of industrial standards (SII).

(2) Sponsoring of training programs, seminars and exhibitions, and publication of periodicals, "Metal Indonesia", for dessimination of technologies.

Various activities such as given above are performed by Government assistance for the benefit of the medium and small industries, but training and other programs are also made available to the large firms on contract basis. The facilities are the following workshops, besides classrooms and administrative facilities.

(1) Machining workshop

(2) Casting workshop

(3) Sheetworking and welding workshop

(4) Heat treatment workshop

The number of personnel is 250 (as of November 1985), of which 16 are post-graduate engineers and 10 are graduate engineers.

Regarding guidance on product specifications, quality inspection and improvement which constitute critical links between the linkage-type industries and the large industries, MIDC is directly responsible for establishing the Indonesian Industrial Standards (SII) on machinery and metal products. It drafts the SII which is deliberated among Government, research institutes and private enterprises in Jarkarta before it is finally promulgated. Quality inspection and inspection certification, however, are the responsibilities of BBBBT (B4T) which is a pararell organization of MIDC. MIDC is concerned more with development and guidance for improving quality than with B4T. Accordingly, MIDC may be regarded as the government organization that plays the leading role both in laying down the Industrial Standards and improving product quality for the development of the linkage-type industries. MIDC is an organization that is supposed to serve the whole nation, but because of its location in Bandung, it is not easy for the medium and small machine and metal industries in Jakarta and Surabaya and also those in outside of Java Island to have regular contacts. Further expansion of activities of MIDC seems to be required in this respect.

8.1.2 Institute for Research and Development of Industrial Materials and Technical Products (BBBBT, B4T)

The Metal Testing Laboratory established in Batavia in 1909 is the original body of B4T. It was relocated to Bandung in 1920 and renamed as Materials Testing Laboratory, then further expanded to become B4T in 1980. Historically, B4T has been known to be a testing organization of metals, metal products and construction materials. Its current major functions are as follows.

(1) Basic research, testing and inspection of industrial materials.

(2) Non-destructive test of technical products (metal parts, metal products).

(3) Research, development, testing and inspection of construction materials.

(4) Examination of technical skill of welding engineers.

(5) Research and development of industrial pollution prevention technology.

(6) Research on prevention of corrosion of industrial materials and products.

(7) Calibration of various inspection apparatus and instruments.

Its number of personnel is 250, of which 22 are engineers who have graduated from universities.

In relation to the machine and metal working industries, B4T is an organization that certifies matters concerning quality inspection and authorizes SII. Nevertheless, as compared in Table A-8.1, the present facilities equipped with B4T are not adequate enough to cover all of the tests and inspection on metal products nor easily accessible to all who need its services in medium and small metalworking industries. At present B4T and MIDC are seem to maintain a close relationship with each other. The functions of these two institutions should be combined to contribute to the development of the linkage-type industries.

8.1.3 Industrial Research Laboratory, Surabaya (BPIS)

While the aforesaid MIDC and B4T are both institutions for research and development of each sector throughout the nation, the industrial research laboratory of each area engages in activities more closely related to resource oriented local industries in each respective area. It mainly engages in testing and research on foodstuffs and chemicals. BPIS, among the institutes for industrial research, is the only one with a metal division.

BPIS was established in 1955. Initially, its areas of responsibility were testing and research on chemicals, foodstruffs and water, and industrial water, but in 1982, testing and inspection of strength and metallography of metal materials also entered in its coverage with the personnel dispatched from MIDC.

The current major duties of BPIS are as follows.

(1) Testing of mechanical strength and metallography of metal materials.

(2) Chemical testing and inspection.

(3) Inspection of water and industrial water.

(4) Inspection of construction materials and concrete.

(5) Other inspections requested by manufacturers of agricultural machinery, chemicals and metal working processors.

Its number of personnel is 135, of which 17 are engineers who have graduated from universities. It possesses inspection apparates as shown in Table A-8.1. These apparates are only good for elementary tests and inpsection of metal materials. They cannot be used for, for example, quality inspection of products manufactured by the medium and small industries under subcontract. If this Institute is to contribute to the promotion of the machining and metalworking linkage-type industries in Surabaya region, further improvement and expansion of its facilities, personnel and operation are necessary.

8.2 Technical Assistance Institutions Other Than Those of the Ministry of Industry

As other technical assistance institutions closely relevant to inspection and testing of products and parts of the machine and metalworking industries, (1) Bandung Institute of Technology and Surabaya Institute of Technology, and (2) Laboratory for Strength and Material Component and Structure (under the jurisdiction of the Agency for Application and Assessment of Technology) are described below.

8.2.1 Bandung Institute of Technology (ITB) and Surabaya Institute of Technology (ITS)

Mechanical engineering, shipbuilding and relevant departments of both institutes possess facilities for testing the strength of metal materials and inspecting the accuracy of metal products for research purposes. They even do testing and inspection for firms upon request, but such services are considered only a part of research or of the curriculum for the students so they cannot be considered as the main body to support the development and promotion of the linkage-type industries. However, at present ITB in particular has the most testing and inspection apparates than the other institutions such as MIDC and B4T, the industries sometimes have to come to these academic institutes to carry out the certain kinds of test. The apparates and equipment owned by ITB and ITS are shown in Table A-8.1, while their department and research laboratories are listed below.

(1) Bandung Institute of Technology (ITB)

1) Institute for Research of Measuring Instruments ... Precision measurement and calibration of metal products.

2) Metallurgy laboratory ... Strength test and compostion analysis of metal materials.

3) Casting laboratory ... Testing of sand for casting.

(2) Surabaya Institute of Technology (ITS)

1) Shipbuilding Department ... Strength test and composition analysis of metal materials.

2) Mechanical Engineering Department ... Strength test and measurement of metal products.

8.2.2 Laboratory for Strength and Material Component and Structure (LUK)

LUK is located in the national project, called as the National Center for Research Science and Technology Project (PUSPIPTEK), which is to develop a group of research laboratories and housings on an area of 1,000 ha in Serpong, West Java in the suburbs of Jakarta. So far, 12 research institutes have already been developed on a site of 350 ha. In PUSPIPTEK, laboratories affiliated to the following four institutions are planned to be established.

(1) Indonesian Institute of Science (LIPI)

(2) National Aviation and Aerospace Institution (LAPAN)

(3) National Atomic Agency (BATAN)

(4) Agency for the Assessment and Application of Technology (BPPT)

LUK was established here as a laboratory under BPPT with assistance from West Germany. The number of personnel is 140 of which 40 engineers are graduates of universities.

LUK was established to make its contributions to the fields of materials technology, material testing, mechanical and structural engineering to support the development of industries related to general machinery, metals and plastic production, architectural construction and civil engineering, shipbuilding and marine structures including aircraft, automobile, railway, heavy industrial plants and equipment.

Its major service functions are as follows.

(1) Research, experiment and assessment of basic data of materials, parts and structures necessary for new design.

(2) Residual strength and attenuation analysis or specified machinery and apparatus.

(3) Testing of products according to SII or international standards and issuance of test results.

(4) Research and development of new testing and designing methods to contribute to Indonesia's standard specifications.

(5) Compilation of data and provision of information services in the field of testing of materials, components, parts and structures.

(6) Provision of training in the field of testing and quality control.

LUK is able to cover various functions with its facilities (see Table A-8.1). It can test not only precision processed parts and products but static and dynamic strengths of large structures and components and their durable life under different using conditions.

Fatigue and strength tests of aircrafts made by P.T. Nurtanio, a state-run aircraft manufacturing company, is LUK's most important job, but it also receives tests from other large industries. Inspections of metal parts produced by medium and small industries are not the main job for LUK. Unlike the organizations affiliated to the Ministry of Industry such as MIDC and B4T, LUK's role is not that of a technical assistance institution for the medium and small industries but may be said to be that of a research and testing organization for the development of advanced industrial technology in Indonesia, such as aircraft industry.

8.3 Limitations of the Present Facilities and Required Functions

8.3.1 Functional Limitations of Facilities of Indonesia's Metalworking Products Inspection Institutions

The major organizations capable of inspecting metalworking products in Indonesia and their major inspection and measurement equipment are summarized in Table A-8.1. As has been discussed, the functional limitations of these institutions are summarized here in light of availability of services for linkage-type industries.

(1) The academic institutions, ITB and ITS, have more facilities for inspection than the institutions under the Ministry of Industry.

(2) MIDC, B4T and ITB are in Bandung, and LUK and BPPT in Jakarta. The firms in and around Jakarta and Bandung are able to utilize these institutions. Firms in other areas, however, are uneasy to utilize them because of the locational disadvantage.

(3) Equipment for inspection and testing at BPI, Surabaya is not yet enough to be able to satisfy the required level of assembly-type industries.

(4) MIDC is engaged in research and development of the castings technology, but the transfer of technology to each firm is a difficult task. In the field of cast steel, the inducement of technology from the advanced nations and reinforcement of inspection facilities for its manufacturing technology and quality control are necessary, which are not yet covered by any institution.

(5) Metalworking industries in Indonesia are not yet developed in the field of precision processing of metals, and lacks machine tools for precision working, cutting and grinding tools and milling machine for tools. The inspection equipment of precision processed products and tools in particular high precision screws and gear, need to be equipped to stimulate its development.

(6) An inspection equipment and instrument for overall judgement of operating performance of metalworking products are not yet equipped to any institution. The performance of rotary machine and other dynamic equipment cannot be tested without them.

(7) The present work-hour schedule of the inspection institutions in Indonesia is not suitable for quick inspection services, one week and within ten days at the most, required by the assembly-type industries.

8.3.2 Required Functions and Facilities for Testing and Inspection

(1) Major functions

Major works entrusted by the metalworking industries to product inspection institutions are broadly grouped as follows.

1) Materials testing

Materials strength test, hardness test, train test, metallographic test and internal stress measurement.

2) Chemical test of materials

Quantitative and qualitative analyses of materials and corrosion test.

3) Analysis with the use of instrument

Atomic absorption analysis and X-ray diffraction.

4) Precision measurement of product

Measurement of length, angle, outer diameter, inside diameter, out-of-roundness, surface roughness and three dimensional measurement.

5) Defect and flaw detecting test

Flaw detecting test by magnetic force, ultrasonic wave and X-ray.

6) Others

Provision of technical consultation, guidance, itinerant technical guidance, provision of information on market and technology and information exchange between assembly-type industries and linkage-type industries, use of equipment and facilities as necessary, technical training courses to develop technical staff, etc.

(2) Detail function of testing equipment and inspection facilities

The required equipment and facilities, listed in the Table 8-1, are explained in detail by each item.

1) Testing machine, universal type

Capable of testing tensile strength, compressive strength, bending strength, torsional strength of steel materials and breaking resistance of castings.

2) Testing machine, conventional type

The following specialized testing machines are available.

a) Tension tester, vertical type
b) Tension tester, horizontal type
c) Compression tester
d) Tension tester
e) Shearing tester

3) Fatigue testing machine

The following testing machines are available.

a) Rotational bending fatigue testing machine
b) Plane bending fatigue testing machine
c) Tension and compression fatigue testing machine
d) Tension fatigue testing machine
e) Combined stress fatigue testing machine

4) Hardness tester

The following typical testers are available.

a) Vickers hardness tester
b) Micro vickers hardness tester

Although its testable load is small, it can be used to check the distribution of hardness and to measure the hardness of any desired place in the structure with the use of a high magnification microscope.

c) Brinell hardness tester
d) Rockwell hardness tester
e) Shore hardness tester
f) Others (instruments to measure Meyer's hardness, Neup's hardness, and Monotron's hardness are also available.)

5) Charpy impact tester

In the Charpy test, the energy required for cutting the test piece (E kg.m) is divided by the original sectional area (A cm^2) of the notch to obtain the value of impact. The Charpy Impact Tester is an equipment for measuring this value of impact (E/A).

6) Magnetic particle inspection equipment

It is an equipment for detecting defects by passing a magnetic line of force through weld or any defective part and having the turbulent flow or leakage of magnetic flux caused by the defect absorb iron dust. It is particularly effective in discovering cracks and porosity in butt welding.

7) Ultrasonic flaw detector

It detects defects by reflection wave, transmission wave and resonance wave of ultrasonic wave applied. Ultrasonic wave loses very little engergy in physical objects so that it is almost perfectly reflected on the plane intersecting the direction of its propagation. It is highly reliable because it is perfectly reflected even by a microfine crack. It is used in detecting flaws in casting, forging and welding.

8) X-ray inspection equipment

It is an equipment to check the internal flaw of physical objects by radiating X-ray by the X-ray generator. In general, the presence or absence of a flaw in most cases is checked by taking photographs on X-ray films. In casting, blow holes, sand inclusion, ingot piping, foreign matter inclusions, cracks, welding blow holes, slag inclusions, etc. are checked.

9) Metallurgical microscope with photomicrographic attachment

It is a microscope to investigate metallurgical structure.

10) Scanning microscope for observing microstructure

It is a microscope designed for quick flaw detection.

11) Electron probe micro analyzer

It is an electronic analyzer for qualitative and quantitative analyzes of metals and the like.

12) X-ray stress measuring equipment

When under no stress, atoms of ordinary metal materials are arranged in a specific way. When some external force is applied to the material, its outer shape changes and the relative position among atoms also changes accordingly, whereupon stress is generated by the movement of atoms wanting to return to their original position. It is an equipment to measure this stress by measuring the displacement of lattice points by means of the X-ray diffraction method.

13) X-ray diffractor

It is an equipment to transmit wave of X-ray to various places inside the physical object and to generate phenomena unique to X-ray wave; in other words, to intensify or attenuate X-ray in specific directions.

14) Three dimension measuring device

It is an equipment which detects the measurement points of products by means of a probe and reads off three dimensional Cartesian coordinates for three dimensional precision measurement of cubic products.

15) Projector

A projector of various sorts of films.

16) Profile projector

It is an equipment to project an enlarged image of thread or other micro fine parts for checking.

17) Roundness tester

It is an equipment to measure out-of-roundness of internal and external diameters of round parts. Out-of-roundness is indicated by the difference between measured radii of circumscribed circle and inscribed circle.

18) Surface roughness tester

One of the surface roughness testers not only traces the irregular shape of the surface by means of a probing needle and directly indicates its roughness but is also capable of recording it.

19) Measuring microscope

It is a microscope which measures standard scale graduated by the units of 1 mm or small objects to be measured by the units of microns. Various models are available, such as monocular, binocular, angled ocular.

20) Modularity detector for measuring graphite spheroidizing ratio

A device to meansure graphite spheroidizing ratio of ductile cast iron, etc. It is a device necessary for quality control of ductile cast iron and the like.

21) Carbon equivalent meter with 3E meter

It is used to measure the carbon and silicon contents in castings and to infer their solidifying temperatures.

22) Gear inspecting testers, involute and helix tester, pitch tester, tooth micrometer

These are specialized instruments for inspection of thread and gears. Involute and Helix Tester is sometimes referred to as Universal Tester. It is used in measuring errors in tooth profile, tooth knot, pitch, and tooth thickness of threads and gears.

23) Hob tester

It is used to check the tooth face of gear cutting tool after grinding. Hob tester is sometimes called hob tooth face tester, too.

24) Others (test piece manufacturing equipment and their measurement tools)

Various machine tools, such as precision grinder and universal tool grinder, various cutting and grinding tools and various measuring instruments for working out test pieces.

Table A-8.1 EXISTING MAIN FACILITIES FOR MATERIAL/PRODUCT TESTING MEASURING AND INSPECTION

Item No.	Description	MIDC	B4T	BPI Surabaya	BPPT LUK	ITB	ITS	
						Mechanical	Mechanical	Shipbuilding
1.	Testing machine, Universal type	x	x	-	x	x	x	x
2.	Testing machine, Conventional type	-	x	x	x	x	x	-
3.	Fatigue testing machine	-	-	-	x	x	-	-
4.	Hardness tester,							
	Vickers hardness	x	x	-	x	x	x	x
	Micro vickers hardness	u	x	-	x	x	u	u
	Brinell hardness	x	x	x	x	x	x	x
	Rockwell hardness	x	x	-	x	x	x	x
	Shore hardness	u	u	-	u	x	u	u
5.	Charpy impact tester	x	x	x	x	x	x	x
6.	Magnetic particle inspection equipment	x	x	-	x	x	u	x
7.	Ultrasonic flaw detector	x	x	x	x	x	u	x
8.	X-Ray inspection equipment	x	x	x	x	x	u	x
9.	Metallurgical microscope with photomicrographic attachments	Univeral type x	x	x	x	x	u	x
10.	Scanning microscope for observing microstructure	-	Stereo type x	-	x	x	u	u
11.	Electron probe micro analyser	-	x	-	x	x	u	-
12.	X-Ray stress measuring equipment	-	-	-	Photo elastic mach. x	x	-	-
13.	X-Ray diffractor	-	-	-	-	x	-	-
14.	Three dimension measuring device	-	-	-	-	x	u	-
15.	Projector	x	x	-	x	x	x	x
16.	Profile projector	x	x	-	-	x	x	-
17.	Roundness tester	u	u	-	-	x	u	-
18.	Surface roughness tester	x	x	-	-	x	u	-
19.	Measuring microscope	Universal Type x	u	-	u	x	u	-
20.	Nodularity detector for measuring graphite spherioid	-	-	-	-	-	-	-
21.	Carbon equivalent meter	u	-	-	-	-	-	-
22.	Gear inspecting testers, Involute and helix tester Pitch testers Tooth micrometers	Universal Type x	u	-	-	x	u	-
23.	Hob tester	-	-	-	-	-	-	-
24.	Others (facilities for preparing test specimens and measuring tools)	x	x	x	x	x	x	x

Notes: x: equipped
u: uncertaine
-: none

Section 9 TECHNICAL DATA OF PROMISING INDUSTRY

Section 9 TECHNICAL DATA OF PROMISING INDUSTRY

9.1 The Subcontract Industries Equipped with Modern Facilities

(1) Casting factory

Unless high quality casting products are available as a fundamental components, machinery and equipment which are assembled by those components cannot cope with imported ones in quality. The quality of casted products mostly owe to the quality of raw materials. For this reason, a modern casting workshop should have a melting section to control feeds of scrump, pig iron, etc. The higher technology in the casting industry create the bigger market size in this industry in Indonesia.

1) Site and factory area

Site area	:	15,000 sq. m
Building area	:	9,010 sq. m

The factory layout is shown in Figure A-9.2.

2) Outline of products and production performance

The products of the factory includes automotive parts, construction equipment parts, agricultural machine parts, machine tool parts, pumps, valves and others. The production facility manufactures 660 T/M cast iron products (including DIC) by die casting line and non-mass production type cast iron products of 140 T/M (including DIC) and caststeel products of 200 T/M by hand molding, a total of 1,000 T/M casted products. The melting is conducted by high frequency induction furnace. The products are processed up to rough processing (finish) for quality assurance. The production process is shown in Figure A-9.1 Production Flow Sheet.

3) Main production machinery of the foundry and project cost

This factory includes the facilities for casting and preliminary finish process. The production of wooden pattern is made out-house or by outside order but the facility includes the repairing facility for wooden pattern (main machinery refer to Figure A-9.3). The project cost is shown in Table A-9.8.

4) Organization and personnel

The organization and the number of employees are designed taking into account of the most modernized factories in Indonesia.

	Function	Employees
1.	Factory manager	1
2.	Assistant factory manager	1
3.	Administration & accounting section	8
4.	Pattern section	13
5.	Melting section	20
6.	Sand preparation & molding section	65
7.	Trimming section	101
8.	Machinery section	20
9.	Technical staff section	9
10.	Inpsection section	20
11.	Sales section	10
12.	Purchaisng section	4
	Total	272

(The organization chart refer to Figure A-9.3.)

(2) Forging factory

The production of shaft and gears, important component for driving system, is essential for the domestic manufacturing of driving and transmission system. At present, there is no factory manufacturing these parts and components, which affect remarkably on the performance of these products in Indonesia. Also, the production of large diametric bolts, which require durability, strength and precision, are not manufactured in Indonesia. In consideration of above fact, the followings are the plan of a model plant for manufacturing forged products.

1) Site and building area

Site area : 4,680 sq. m
Building area : 1,600 sq. m

The factory layout is shown in Figure A-9.6.

2) Outline of product and production capacity

a) Forged parts and components for automotive (crankshaft and connecting rod) and forged gear, forged flanges, and forged bolts are to be manufactured. The shape and the dimensions of products to be manufactured are as follows.

	Product		Material and Product Mix		Product Condition
	Max. Dimension	Max. Wight	Mild Steel	Tempered Steel	
Forged flange	300ϕ	70kg	30%	0	Completed product
Forged gear	500ϕ	100kg	0	30%	Roughly processed product
Forged automobile parts and components	-	100kg	0	30%	Roughly processed product
Fogred bolt	50ϕ	-	50%	50%	Complete product

Notes: 1/ The average weight of each product was assumed to be 15 kgs.

2/ The dimension of raw material: 50 - 200ϕ x 9 m

b) Production capacity

4,600 ton/year (production weight 2 shift)
Manufacturing process: Refer to production flow sheet Figures A-9.4 and A-9.5.

3) Main machinery of forging factory and project cost

This factory includes heat treatment facility, machining facility and X-ray inspection facility and can perform the production by a through process. (Main machinery refer to Table A-9.4.) The project cost is shown in Table A-9.9.

4) Organization and personnels

The plan on the organization and the personeels was made in consideration of the productivity of the industries in Indonesia.

Function	Employees
1. Factory Manager	1
2. Assistant Factory Manager	2
3. Forging Section	23
4. Machinery Shop Section	44
5. Packing & Transportation Section	16
6 Electrical Receiving maintenance	3
7. Inspection Section	6
8. Administration, Accounting & Sales Section	4
9. Purchasing Section	3
Total	102

(The organization chart refer to Figure A-9.7.)

(3) Machining Factory for precision machine parts process manufacturing plant

This model plant is a factory exclusively for precision machining of the driving parts and components such as axles and gears, which are preliminarily machined in foundry and forging factory.

For this purpose, the facilities including CNC turning lathe, precision measuring room, grinding room, gas atmosphere furnace for gear surface hardening carburization process and nitriding process, annealing furnace, cleaning bath and shot blashing machine are provided for the complete finish of parts and components.

1) Site and building area

Site area : 3,000 sq. m
Building area : 1,480 sq. m

The factory layout is shown in Figure A-9.9.

2) Outline of products and production capability

Driving parts for Mini- and Hand-Tractors:	800 sets/year (as Mini-Tractor)
Driving parts for machine tools:	200 sets/year (as small size lathe)

It is possible for the factory to manufacture construction equipment driving parts (Note: The capacity is approximately 639 tons equivalent in weight of products.)

The production flow sheet is indicated in Figure A-9.8.

3) Main machinery and project cost

CNC turning lathes and a machining center are provided in order to increase operational efficiency and product precision. (The list of main machines refer to Table A-9.4.) The project cost is shown in Table A-9.10.

4) Organization and personnel

The plan on personnels was made in consideration of the technical level in Indonesia.
(Technical Organization chart refer to Figure A-9.10.)

	Function	Employee
1.	Factory manager	1
2.	Assistant factory manager	1
3.	Administration manager	1
4.	Financial & cost control	4
5.	Sales	3
6.	Personal & general affairs	3
7.	Production department manager	1
8.	Production control	4
9.	Material procurement	4
10.	Machining shop	82
11.	Heat treatment shop	6
12.	Assembly shop	9
13.	Maintenance & repair	6
14.	Tools control	5
15.	Packing & transportation	4
16.	Engineering department manager	1
17.	Development of production technologies	3
18.	Design of tools and jigs	3
19.	Design of products	5
20.	Quality control department manager	1
21.	Product inspection	4
22.	material inspection	2
23.	Precision measurement	4
24.	Service for after sales	3
	Total	163

(4) Sheetwork/welding factory

This model plant is to manufacture mainly transmission gear cases, various covers of agricultural machines, of machine tools, of construction equipment etc. and steel plate products by the methods of bending, cutting, and welding.

1) Site and building area

Site area: 3,000 sq. m
Building area: 890 sq. m

The factory layout is shown in Figure A-9.12.

2) Outline of products and production capacity

a) Products are transmission gear cases, engine covers, various covers etc. with 2.3 mm - 16 mm thickness, and its production procedures are shown Production Flow Sheet Drawing Figure A-9.11.

b) Production capacity is 1,500 tons per year

3) Main machinery and project cost

The main machinery refer to Table A-9.5 and project cost is shown as per Table A-9.11.

4) Organization & personnel

Organization and staffs are prepared based on the actual conditions of Indonesia. The processing level of sheet work industry in Indonesia is in a certain level, but it is necessary to strengthen the divisions of quality control and of managerial control.
(Organization chart is shown as per Figure A-9.13.)

Function	Employee
1. Factory manager	1
2. Administration manager	1
3. General affairs & personal	4
4. Financial & accounting	4
5. Cost control	4
6. Production manager	1
7. Engineering section	12
8. Production section	59
9. Auxiliary facilities section	4
Total	90

(5) Press factory

Assembly-type industry is equipped with large-scale and high pressure press machines for their in-house production for critical components and parts, so that the press machine factory required by linkage-type industry should be able to cope to the demands on wide variety of small products.

Especially, the press factory, which can produce its own metal dies and can make high quality press products is almost none in Indonesia. The precision of pressed product is mainly decided by the accuracy of metal dies. The high precise metal dies are almost imported from abroad now.

This model plant is planned to install three press machine of different performance to cope with wide variety product demand. The plant incorporates the production facility of metal mold in the factory.

1) Site and building area

Site area: 1,500 sq. m
Building area: 596 sq. m

Figure A-9.15 indicates the layout.

2) Outline of product and production capability

a) Product: KWH meter and small meparts for automotive, boxes, covers etc.

b) Production capacity: 300 shot/hr per machine
(For KWH meter of 220 V x 15 A
: Approx. 360,000 sets/machine year)

Figure A-9.14 indicates the manufacturing process.

3) Main machinery and project cost

This plant was exclusively for press works and the production facility for metal mold (die) is added to it as an ancillary facility for the presswork.

The paint work of products is conducted on out-house basis, so the installation facility is omitted from the plan.
(Main machinery list refer to Table A-9.6.)
The project cost is shown in Table A-9.12.

4) Organization and personnel

Refer to Figure A-9.16 for organization chart.

Function	Employee
1. Factory manager	1
2. Administration and accounting	3
3. Purchasing	1
4. Full size drawing & shearing	5
5. Press	6
6. Die making	4
7. Welding	2
8. Inspection	2
9. Electric sub-station	1
Total	25

(6) Steel fabrication shop

This model plant is designed mainly as the linkage-type industry to shipbuilding and to plant machinery and equipment industry to manufacture steel structure, tanks, and other steel fabricated equipment. Though this section is presently situated inside of shipyards in Indonesia, it is to be separated from the shipyards as a linkage-type industry in the future as suggested in 4.2.2 in Section 4.

1) Site and building areas

Site area: 8,500 sq. m
Building area: 5,095 sq. m

The factory layout is shown in Figure A-9.12.

2) Outline of products and production capability

a) Ship outfittings

Mast, post, boom, ankering fiting, radder flue, air duct, air blow duct, chimney etc.

b) Iron structure products

Iron structures, iron frame, containers and tanks

c) Annual production: 1,500 ton

3) Production process:

For production, steel plates and profile steels are purchased, cut, bent and welded for the processing of steel pates and for the manufacturing cans.

The production process is indicated in Figure A-9.11 Production Flow Sheet.

4) Main machinery and project cost

This plant is planned mainly to conduct the production of the products made by the steel plates of 3.2 to 16 mm thickness, as the production facilities. This plant can apply to proceed the plates of the thickness less than 3.2 mm and more than 16 mm, but in that case the production efficiency slows down.
(The main machinery refer to Table A-9.7.) The project cost is shown in Table A-9.13.

5) Organization and personnel

In this plan, in consideration of the securenes of delivery term and the improvement of quality, a modernized organizational set-up is recommended. (Organization chart refer to Figure A-9.13.)

	Function	Employee
1.	Factory manager	1
2.	General affairs & accounting	2
3.	Production department manager	1
4.	Engineering section	3
5.	Inspection	2
6.	No.1 Shop section chief	1
7.	No.1 Shop fitter	40
8.	No.2 Shop section shief	1
9.	No.2 Shop fitter	40
10.	Business department manager	1
11.	Design section	3
12.	Business section	2
	Total	97

9.2 The New Project of Relatively Small Investment

(1) The small scale casting factory

An induction heater is recommended to be adopted since melting in the cupola requires a high degree of skill and the temperature of molten iron cannot be high enough due to low quality of coke available now. Employment of the Furan Resin Process will give sufficient mould strength and easy control of the water content. While casting sand will be revived by the reclaimer for repeated use, the amount of added resin should be halved. Cleaning will be done by shot blasting in order to facilitate easy inspection. This model foundry can be regarded as the pre-stage to become a full-scale sub-contractor foundry.

1) Outline of products and production capacity

a) Products

Automotive parts:	Flywheels
Industrial equipment:	Pump parts, valve parts
Machine tools:	Small parts
Electrical equipment:	Motor parts
Miscellaneous:	Gears, wheels, bearings

b) Production capacity: 420 ton/y (one shift)

The production flow sheet is indicated in Figure A-9.20 and the layout is shown in Figure A-9.21.

2) Site and factory area

Site area:	1,800 sq. m
Building area:	880 sq. m

3) Main equipment & machinery and project cost

The list of the main equipment and machinery is shown in Table A-9.14 (excluding the unfinished machinery). Refer to Table A-9.15 for information on the projects costs.

4) Organization and personnel

Function	Employees
1. Factory manager	1
2. Middle manager	1
3. Melting	2
4. Molding	10
5. Fettling	4
6. Others	1
Total	19

(Organization chart is shown as Figure A-9.22.)

(2) Screw/rivet factory (forging)

With regard to materials, although low-carbon steel bar is produced domestically, it must be reprocessed to make wire for cold forging. As high carbon steel, alloy steel, stainless steel and such non-ferrous metals as aluminium and brass are not produced domestically, they must be imported.

The production of screws and rivets involves hardly any manual operation and can be easily subject to mass production using a fully automatic multi-function machine and, therefore, there are good prospects for its localization.

1) Outline of products and production capacity

a) Products: Screws and rivets (small diameter: 2.6 - 6.0 mm, maximum length: 45 mm)

b) Production capacity: 17 million pieces/year or 68 tons/year (one shift)

The production process is shown in Figure A-9.23 and the factory layout is shown in Figure A-9.24.

2) Site and factory area

Site area: 195 sq. m
Building area: 100 sq. m

3) Main equipment & machinery and project cost

The list of the main equipment and machinery is shown in Table A-9.16. A cold header and a tumbling machine are critial machines in the factory. The project cost is shown in Table A-9.17.

4) Organization & personnel

Function	Employees
1. Factory manager	1
2. Administration and accounting	1
3. Purchasing	1
4. Production and maintenance	2
5. Inspection and delivery	2
Total	7

(Organization chart is shown in Figure A-9.25.)

(3) Small size press factory

In order to minimize the amount of investment, the manufacture and repair of dies should be subcontracted and the machine employed should have the minimum automatic control. In a factory of this kind, besides the maintenance and inspection skills for cutters and presses, the work process such as the drawing of parts, an efficient sheet cutting plan, pressing, drilling and welding to assembly will form an important technical factor.

1) Outline of products and production capacity

a) Products: Sheet processing products (upto 6 mm thick), i.e. lighting equipment, box-shaped products (lockers, etc.), window frames, kitchen equipment and parts for truck beds, etc.

b) Production capacity: 240 tons/year (one shift)

The production process is shown in Figure A-9.26 and the factory layout is shown in Figure A-9.27.

2) Site and building area

Site area: 360 sq. m
Building area: 300 sq. m

3) Main equipment & machinery and project cost

The main machinery refer to Table A-9.18. Two sets of 80 ton press are to be equipped for the factory. The project cost is shown in Table A-9.19.

4) Organization and personnel

Function	Employees
1. Factory manager	1
2. Administration and accounting	2
3. Purchasing	1
4. Production and maintenance	8
5. Assembling and delivery	5
Total	17

(Organization chart is shown in Figure A-9.28.)

(4) Electro-plating factory

A plating factory using zinc cyanide, with the view to carrying out the anti-corrosive plating of small steel products, is proposed as a business with good prospects. In addition, the factory should be able to carry out the three additional treatments, i.e. the chromate, unichromate and black chromate treatments, in order to improve the anti-corrosion performance of the zinc plating and to satisfy decorative requirements.

The subjects for plating include parts for electrical equipment, small automobile parts, steel furniture, metal fittings for wood furniture, kitchen equipment, metal fittings for buidings, screws, bolts, nuts and rivets, etc.

a) Products: Plating of small iron/steel products such as bolts, nuts and screws, etc.

b) Production capacity: 144 tons/year (one shift) in the case of plating bolts, nuts and screws.

The list of main machinery refer to Table A-9.29 and the project costs is shown in Table A-9.30.

2) Site and building area

Site area: 300 sq. m
Building area: 84 sq. m

3) Main equipment & machinery and project cost

The list of main machinery refer to Table A-9.20 and the project cost is shown in Table A-9.21.

4) Organization and personnel

Function	Employees
1. Factory manager	1
2. Administration and accounting	1
3. Zinc platingsection	2
4. Chromate treatment section	2
5. Inspection and packing	1
Total	7

(Organization chart is shown in Figure A-9.31.)

9.3 The Expansion and Moving Plan of Existing Factory

(1) Automotive filter factory

The main point of equipments expansion is the deep drawing press of sheet metal. The area of the factory site is adequate although it will be necessary to expand the building by approximately 500 square meters.

a) Products

Automotive air filters and oil filters

b) Production capacity

Existing:	400 - 500 pcs/day
After extension:	2,000 pcs/day

The after extension production flow sheet is shown in Figure A-9.32.

2) Site area and factory area

Site area:	(Existing)	1,000 sq. m
	(After extension)	1,000 sq. m
Building area:	(Existing)	500 sq. m
	(After extension)	1,000 sq. m

The after extension factory layout is shown in Figure A-9.33.

3) The required equipment and the project cost for the extension plan

With the addition of two 70-ton power press machines, the production capacity will increase 4 to 5 times from its present output. The list of the main machinery in the existing plant and the additional equipment names are shown in Table A-9.22. The required project cost for the expansion equipment is shown in Table A-9.23.

4) Number of employees

The firm presently employs 15 workers. For the sake of the growth of enterprise, it is necessary to employ 50 new employees for salesmen, designers and inspectors. The ideal organization chart is shown in Figure A-9.34.

(2) The relocation and expansion of the pump factory

The company concerned is currently manufacturing volute pumps, deep well pumps and hand pumps in Bandung. Its technology is above average and the manager has a high degree of entrepreneurship.

The expansion entails a move from the current location and the building of a modern factory based on the accumulated technological strength in Bogor which is near the market for these pumps.

1) Outline of products and production capacity

a) Products

Present:	Hand pumps, volute pumps, deep well pumps, turbine pumps and land-use screw pumps
After expansion:	Sea-water pumps and cast products, in addition to current products

b) Production capacity

Present:	Pumps =	200 tons/year
After expansion:	Pumps =	2,000 tons/year
	Cast products =	3,000 tons/year

The production flow sheet for the new casting factory of 3,000 tons/y is shown in Figure A-9.35. The flow sheet of the pump for the machinery processing and fabricating line is shown in Figure A-9.36. Some products of casting are worked into the final products and the other products of casting will be sold on the market.

2) Site area and factory area

Site area:	(Existing)	3,500 sq. m
	(After moving)	15,000 sq. m
Building area:	(Existing)	1,200 sq. m
	(After moving)	8,600 sq. m

The after moving factory layout is shown in Figure A-9.37.

3) The list of main machinery and the project cost

The list of machinery equipment for the casting line and pump manufacturing line which are required when the factory expands is shown in Table A-9.24. The machines are moved from the existing factory to the "after expansion factory".
(The project cost refer to Table A-9.26.)

4) Number of employees

The firm presently employs 44 workers. The number of employees in the new factory will increase to 110. The organization chart is shown in Figure A-9.38. The skilled labor in the existing factory will move to the new factory.

(3) The switch-gear factory

The main purpose of the expansion plan is to newly build a fabrication shop and a painting shop in anticipation of the future increase in the demand. The improvement of the efficiency of the marking and bending of the sheet metal by the provision of additional facilities to the press brake and the rationalisation of the painting process are also planned.

Although the present factory site will be used, the construction of an additional factory building and a change in the layout will be required.

1) Outline of products and production capacity

a) Products:	Low and medium voltage switch gears	
b) Production capacity:	Present;	1,200 sets/year
	After expansion;	6,000 sets/year

The production flow sheet is shown in Figure A-9.39.

2) Site area and fatory area

Site area:	(Existing)	10,500 sq. m
	(After moving)	10,500 sq. m
Building area:	(Existing)	3,490 sq. m
	(After moving)	5,970 sq. m

The layout of the before expansion factory is shown in Figure A-9.40 and the layout of after expansion factory is shown in Figure A-9.4.

3) The list of machinery equipment and the project cost

The list of the existing machinery equipment and the new main machinery equipment (press brake, painting and coating equipment) which will be procured is shown in Table A-9.27. The main plans are to improve the factory layout after the expansion of the building and to increase the efficiency in the manufacturing line.

4) The number of employees

A step-up of production will be performed when the worker increase from 202 to 250.

9.4 Method of Construction Cost Estimate

Estimated plant costs for each model plant are shown in Tables A-9.8 through A-9.18. The costs cover the equipment and machinery, ocean freight, buildings insurances, erection and installation, supervising and engineering services except land cost. The basis and assumption for plant cost estimation are as follows.

(1) Plant direct cost

1) Eequipment & machinery: f.o.b Japanese ports

2) Spares: Spare parts for 2 year-operation

3) Transportation and insurances:

Ocean freight is estimated as US$ 50/F.T. on the basis of milage from Japanese port(s) to Tanjung priok port. Inland transportation including custum clearance charge and port charges is estimated as US$ 20/F.T. assuming that a plant site would be in Pulogadung. Insurances for ocean transportation, erection and third party is assumed as 1.5% of f.o.b. of equipment and machinery cost.

4) Civil and erection:

a) Civil works

Civil works include the buildings for factory, offices and warehouse, site preparation, foundation of machinery and equipment, and necessary piling for heavy equipment.

b) Erection works

Installation of machinery and equipment, electrical wiring and charges for construction equipment are included.

5) Office accommodation and facilites

A rate of 2% of FOB cost is assumed as expenses for transportation vehicles, furniture and fixture, and miscellaneous consumables during construction period of the plant.

6) Engineering and supervising

Services provided by a plant supplier including expatriates are estimated multiplying man-day rate by man-days required for each plant.

7) Overhead expenses

Ten percent of the sum of 1) to 6) is assumed as overhead cost to cover miscellaneous expenses which are not estimated in other items.

(2) Tax and duties

The following rates are used:

1) Import duty : CIF x 10%

2) Import sales tax : CIF x 10%

3) Value added tax : 10% of local currency portion

(3) Working capital

Three months value of variable cost is estimated as an initial working capital.

(4) Contingencies and others

Contingencies which, include provisions fee price escalation and changes in design etc. are assumed as 20% of the sum of all the above costs.

Figure A-9.1 PRODUCTION FLOW SHEET OF CASTINGS SHOP

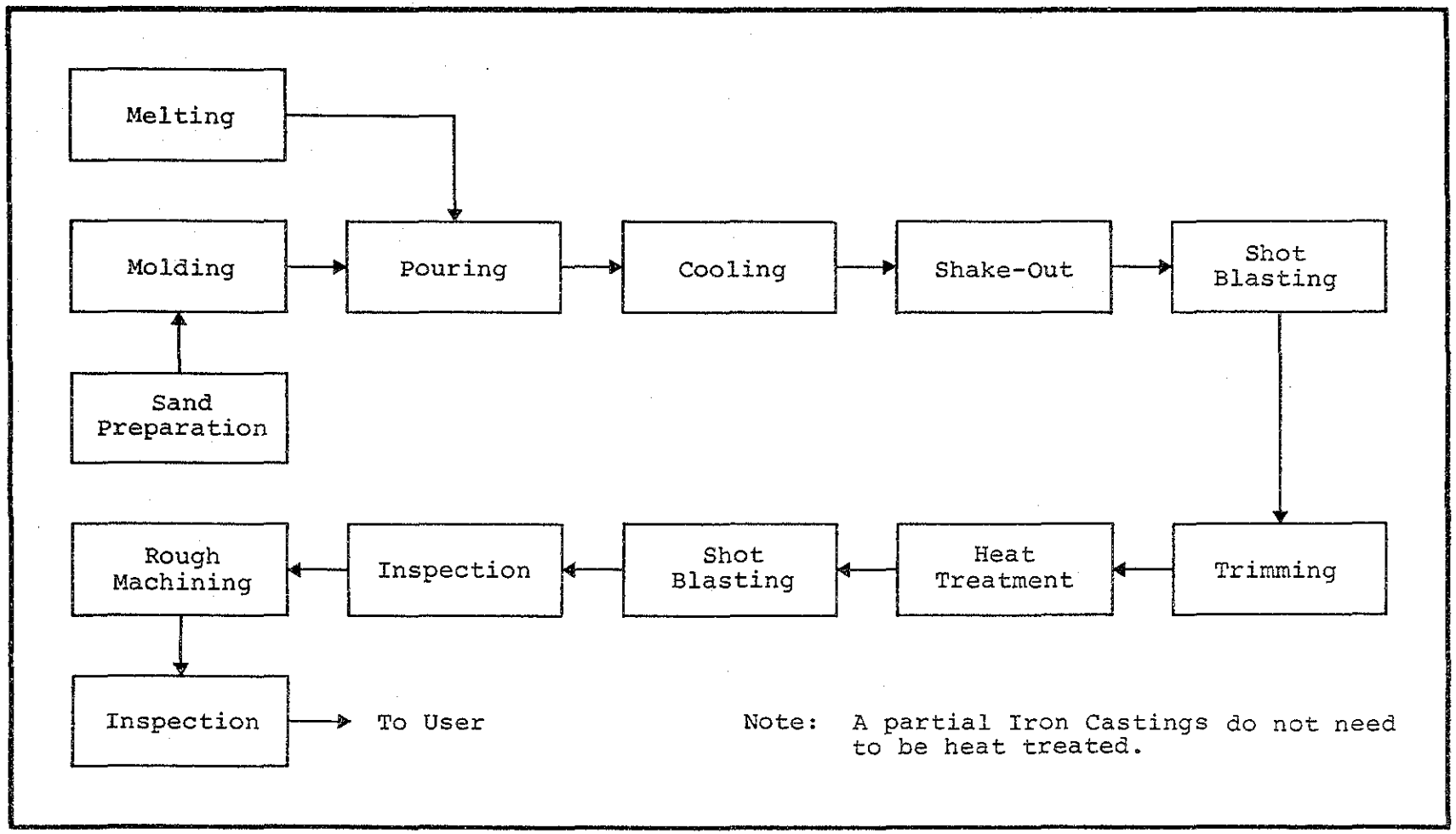


Figure A-9.2 LAY-OUT OF CASTING SHOP

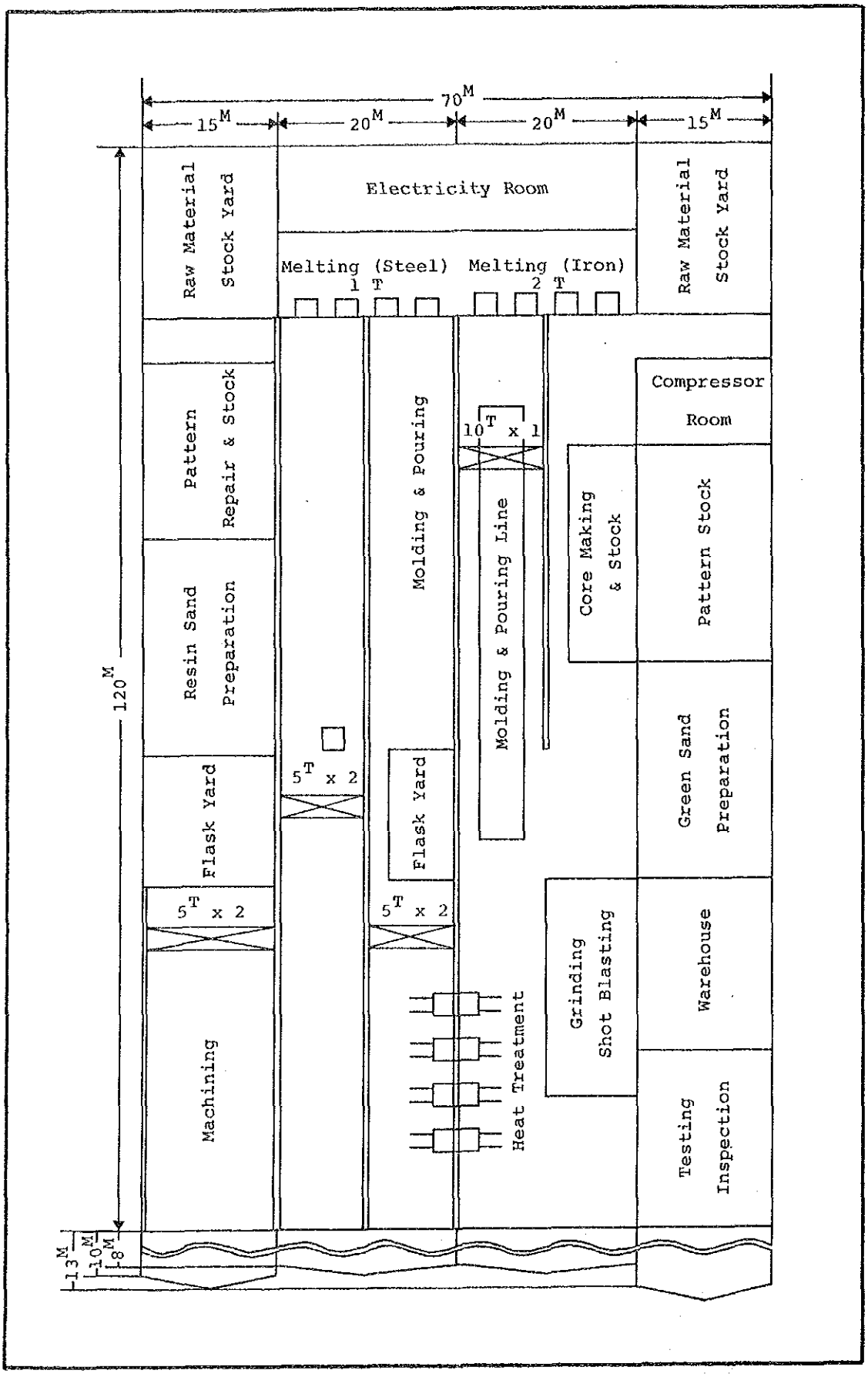


Figure A-9.3 ORGANIZATION OF CASTING SHOP

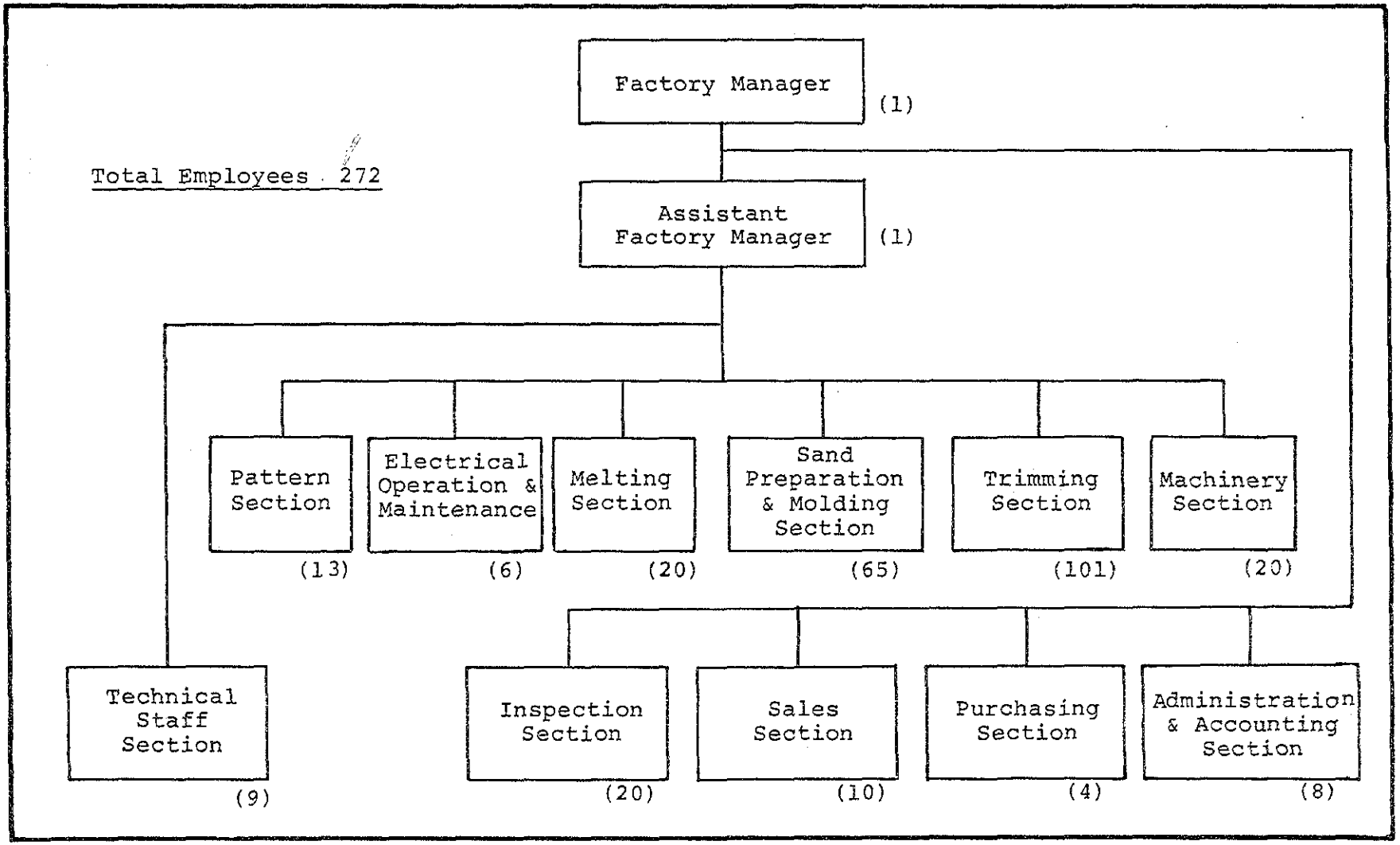


Figure A-9.4 PRODUCTION FLOW SHEET OF FORGING FLANGE

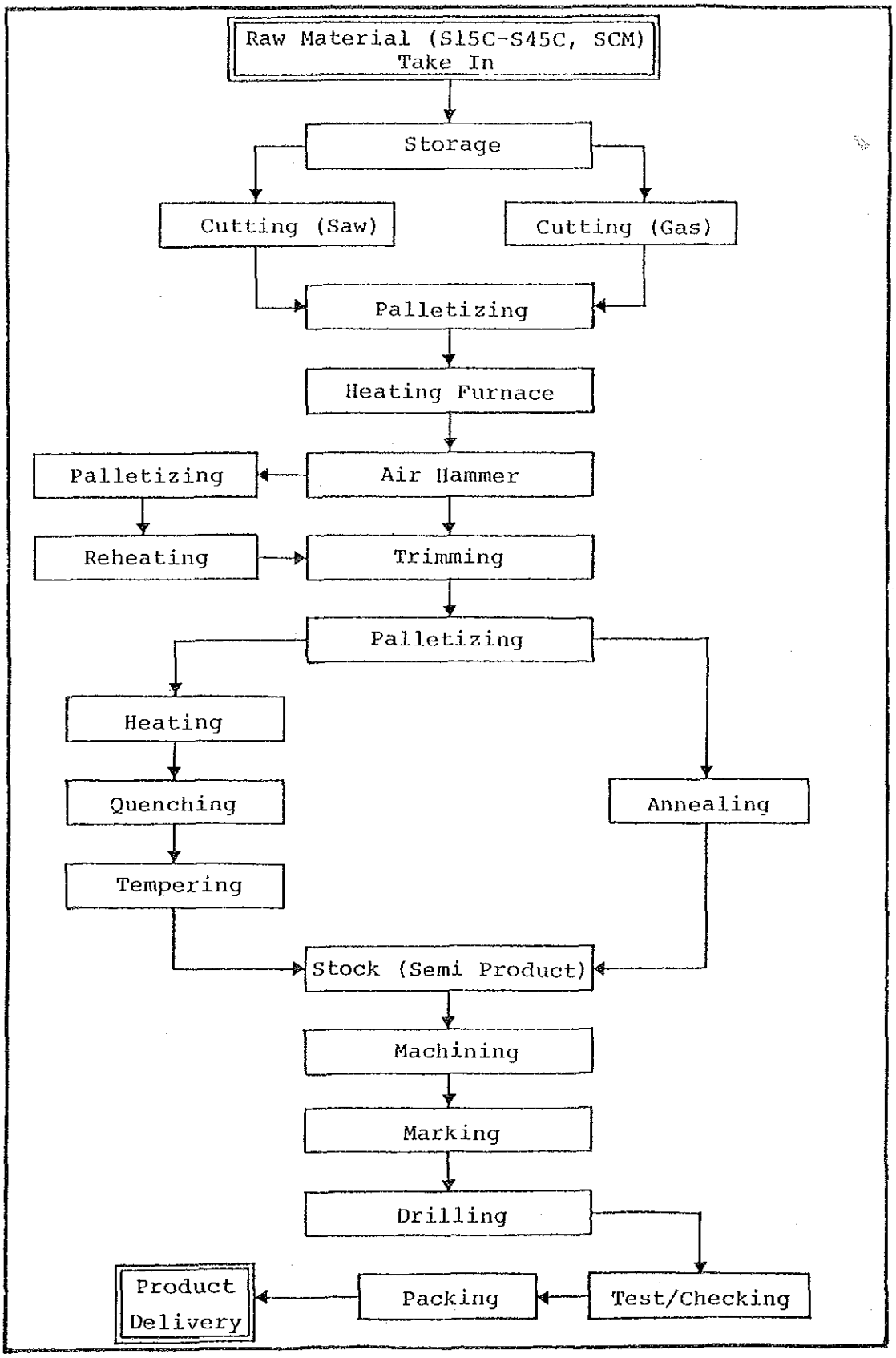


Figure A-9.5 PRODUCTION FLOW SHEET OF AUTO MOTIVE PARTS

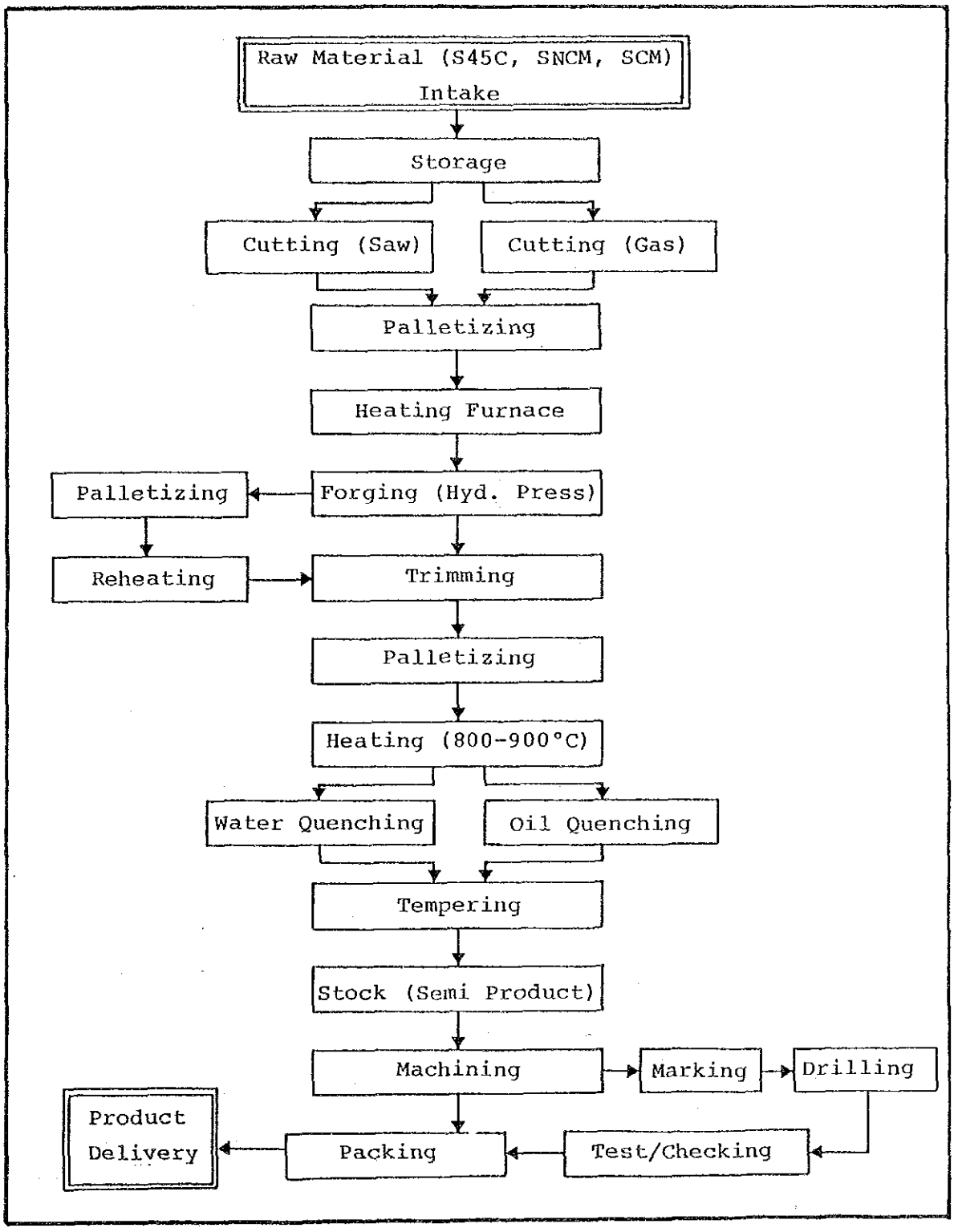
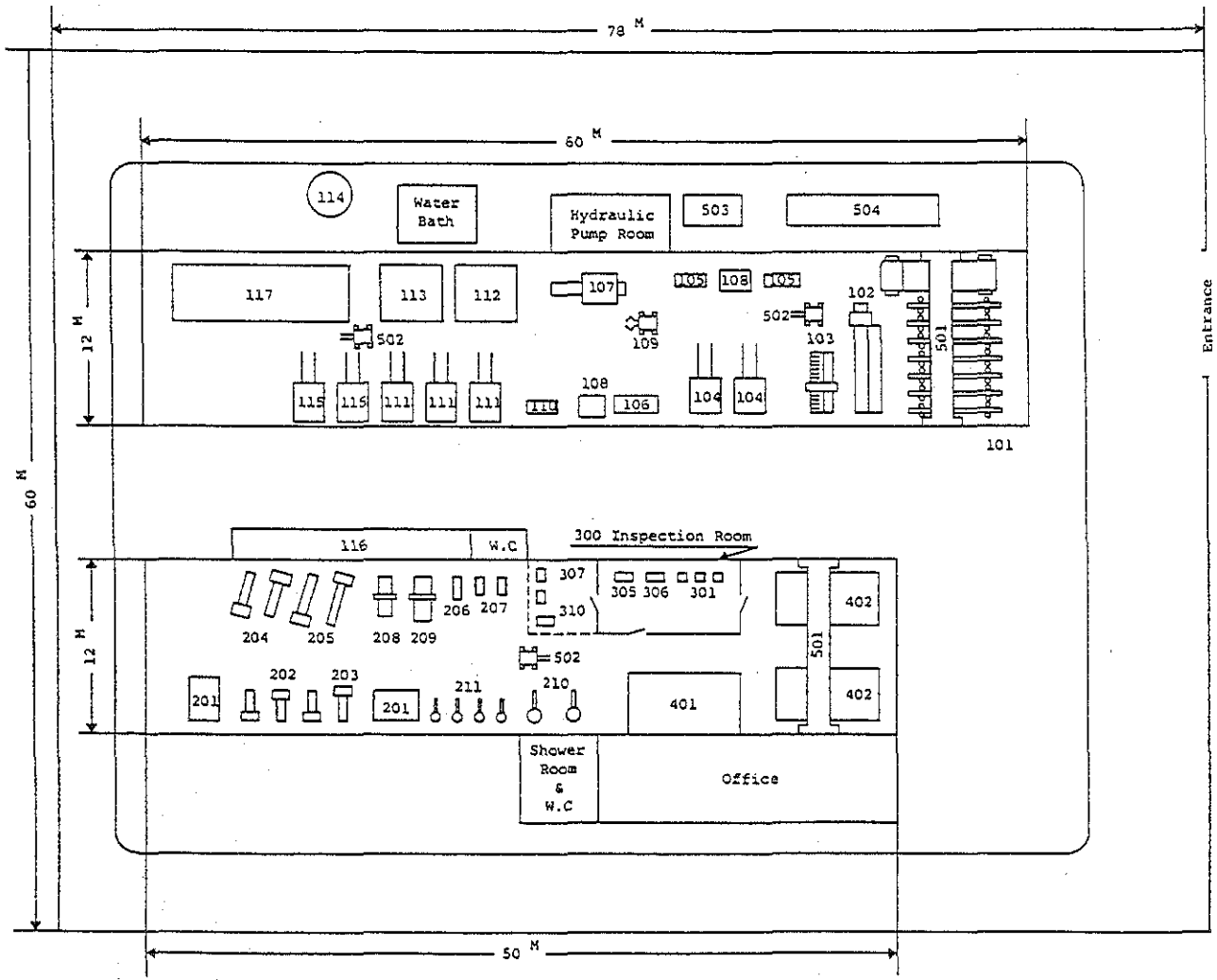


Figure A-9.6 LAY-OUT OF FORGING SHOP



No.	Equipment Name	Q'ty
100	Forging Section	
101	Material Stock Yard	1
102	Band Saw	1
103	Frame Planer	1
104	Furnace	2
105	1 ton Air Hammer	2
106	2 ton Air Hammer	1
107	800 ton Hydraulic Press	1
108	200 ton Trimming Press	2
109	Forklift with Manipulator	1
110	Friction Press	1
111	Quenching Furnace	3
112	Water Quenching Bath	1
113	Oil Quenching Bath	1
114	Cooling Tower	1
115	Tempering Furnace	2
116	Die	1
117	Work Stock Yard	
200	Machining Section	
201	Surface Table	2
202	NC Lathe A	3
203	NC Lathe B	1
204	Lathe C	2
205	Lathe D	2
206	Trimmer	2
207	Thread Rolling Machine	2
208	Shaper	1
209	Planomiller	1
210	Radial Drilling Machine	2
211	Radial Drilling Machine	4
300	Inspection Room	
400	Packing and Product Warehouse	
401	Product Stock Yard	1
402	Packing Yard	2
500	Facility	
501	5 ton Overhead Travelling Crane	2
502	2 ton Forklift	3
503	Compressor	1
504	Sub-station	1

Figure A-9.7 ORGANIZATION OF FORGING PLANT

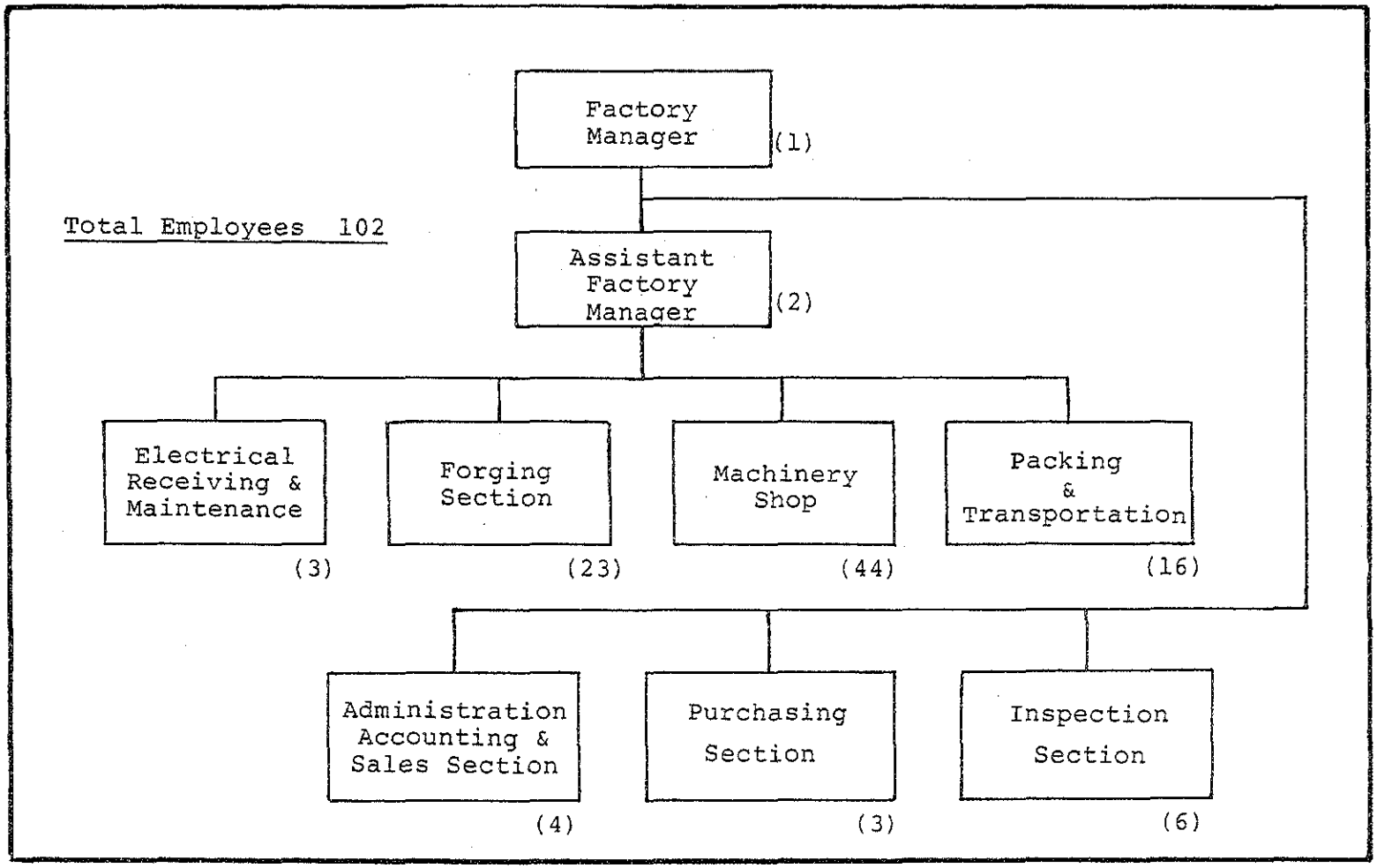


Figure A-9.8 PRODUCTION FLOW SHEET OF MACHINING SHOP FOR TYPICAL COMPONENTS

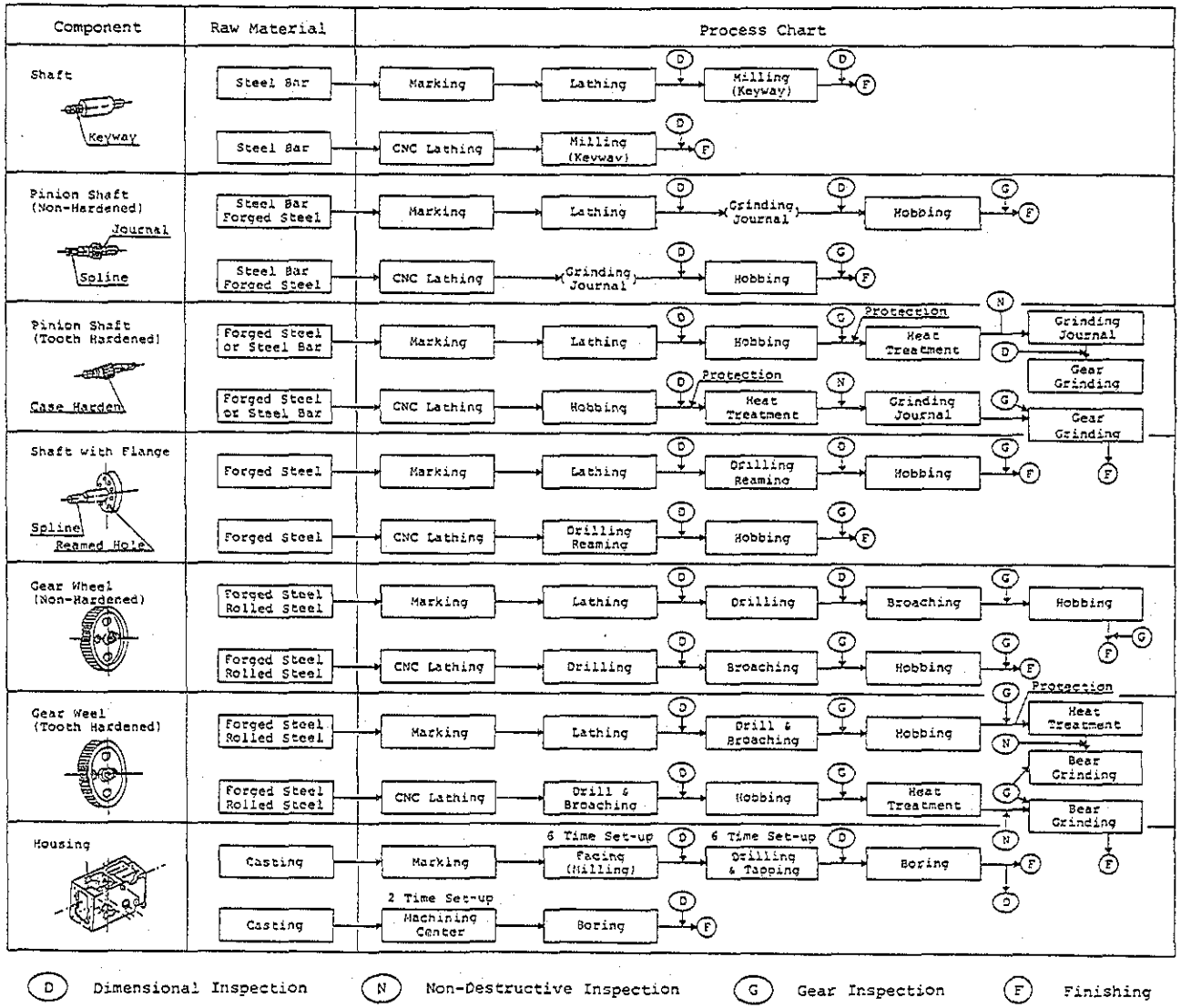
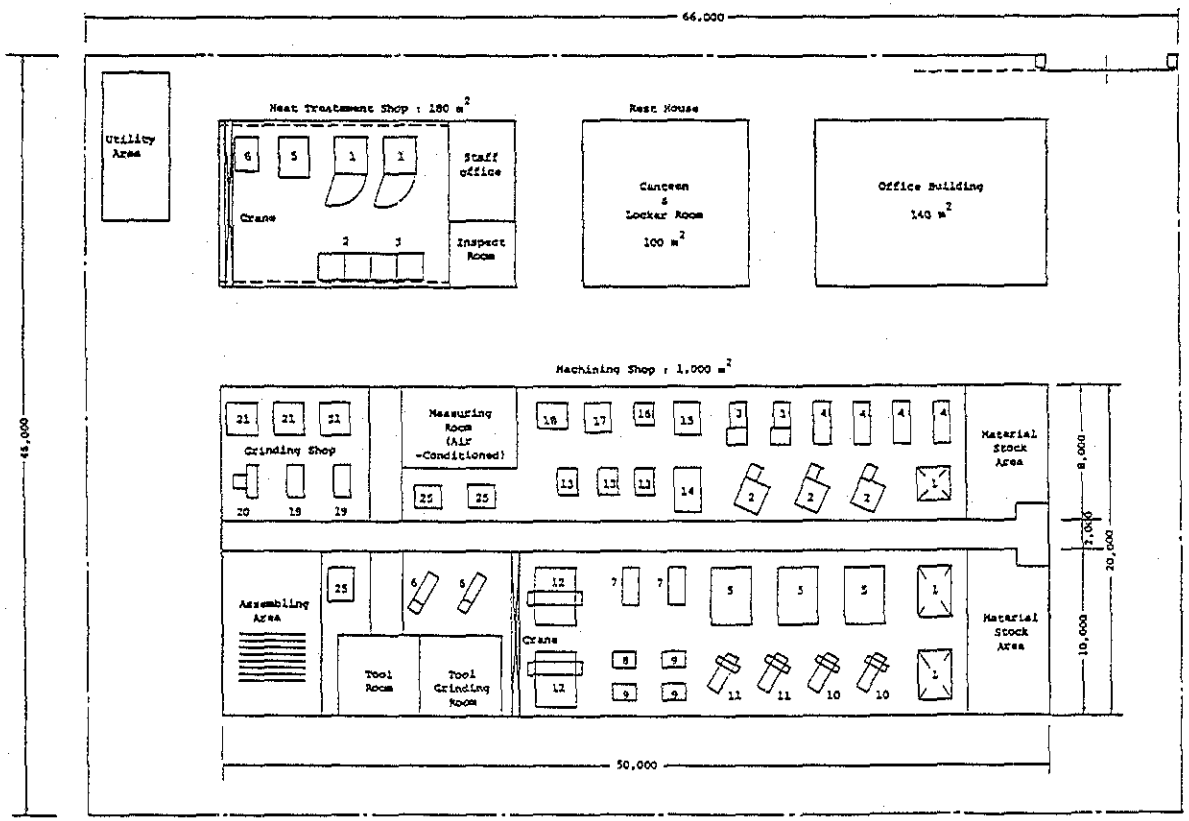


Figure A-9.9 LAY-OUT OF MACHINING SHOP



Product

- Transmission Components for Mini-tractor & Hand Tractor
- Driving Components for Simple Machine Tool

Main Facilities

- Machining Shop

1	Layout Machine	3
2	CNC Lathe	3
3	Turret Lathe	2
4	Lathe	4
5	Machining Center	3
6	Shaper	2
7	Radial Drill	2
8	Multi-Axis Drill	1
9	Drill	3
10	Vertical Milling	2
11	Horizontal Milling	2
12	Boring Machine	2
13	Hobbing M/C	3
14	Hobbing M/C	1
15	Gear Shaper	1
16	Straight Bevel M/C	1
17	Spiral Bevel M/C	1
18	Key Seater	1
19	Cylindrical Grinder	2
20	Plane Grinder	1
21	Gear Grinder	3
22	Surface Plate	4

- Heat Treatment Shop

1	Gas Atohos Furnace	2
2	Temparing Furnace	2
3	Wash Cleaning Tank	2
5	Shot Blaster	1
6	Universal Testing M/C	1

Figure A-9.10 ORGANIZATION OF MACHINING SHOP

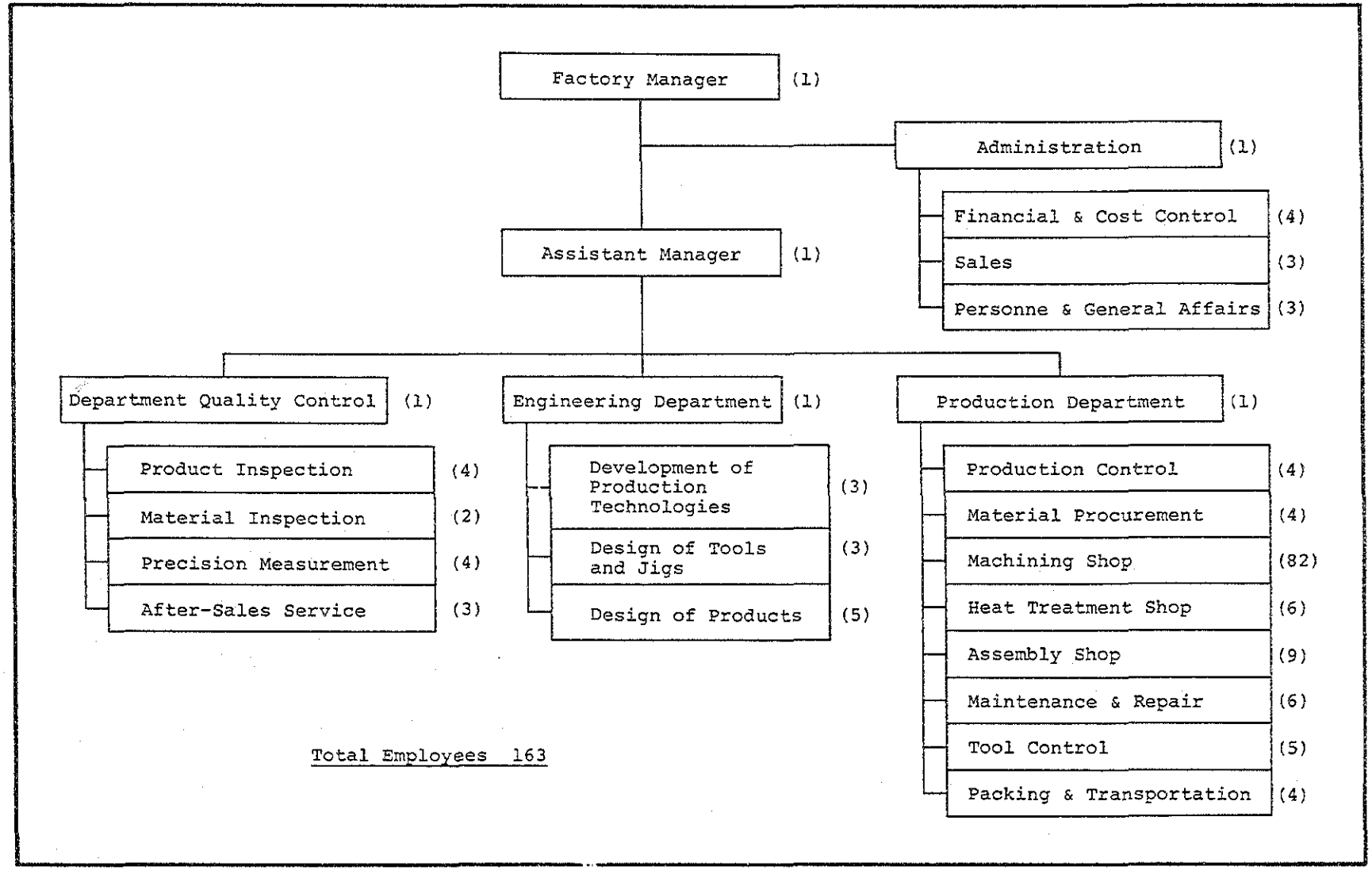


Figure A-9.11 PRODUCTION FLOW SHEET OF SHEET WORK SHOP

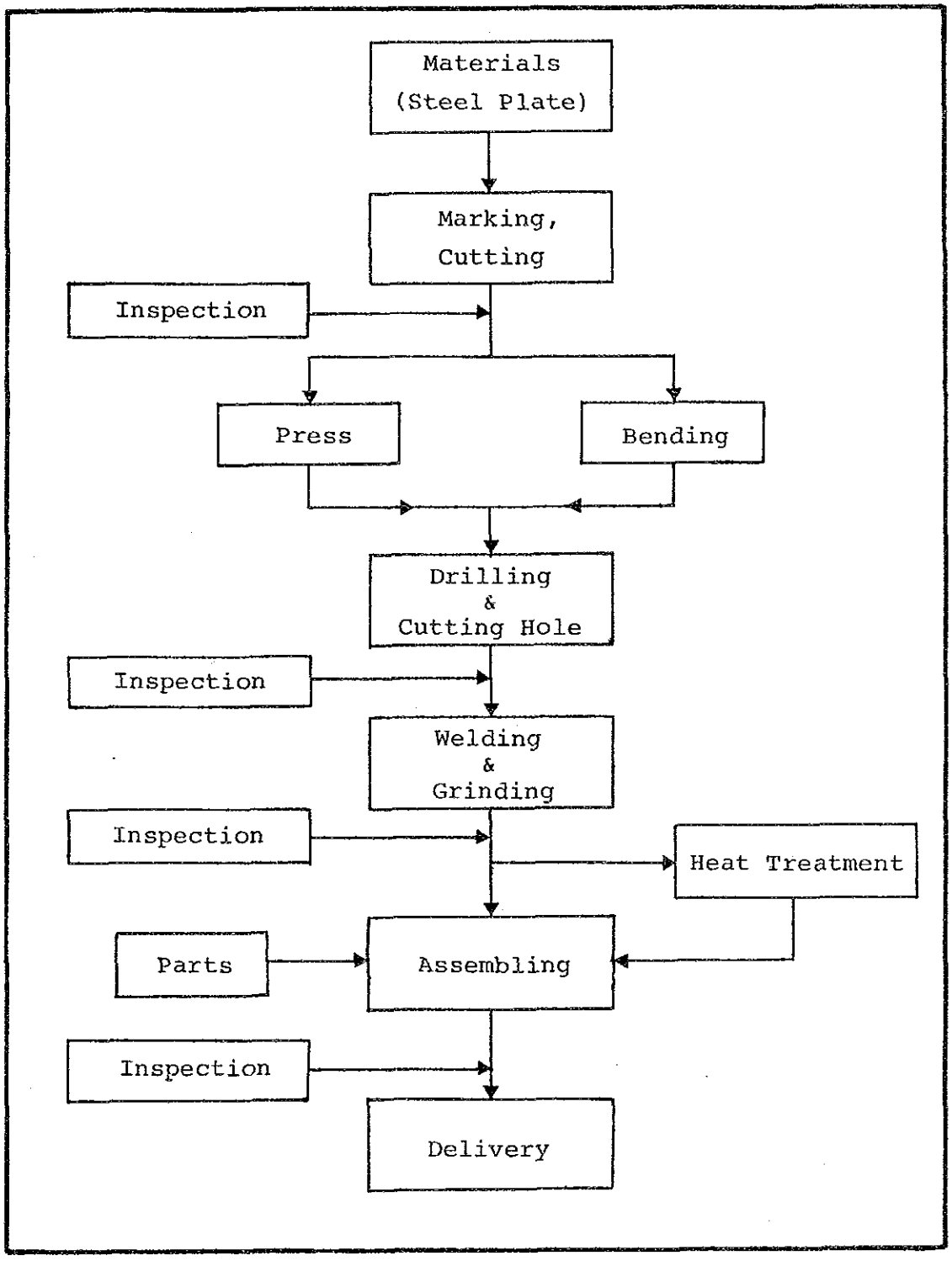


Figure A-9.12 LAY-OUT OF SHEET WORK SHOP

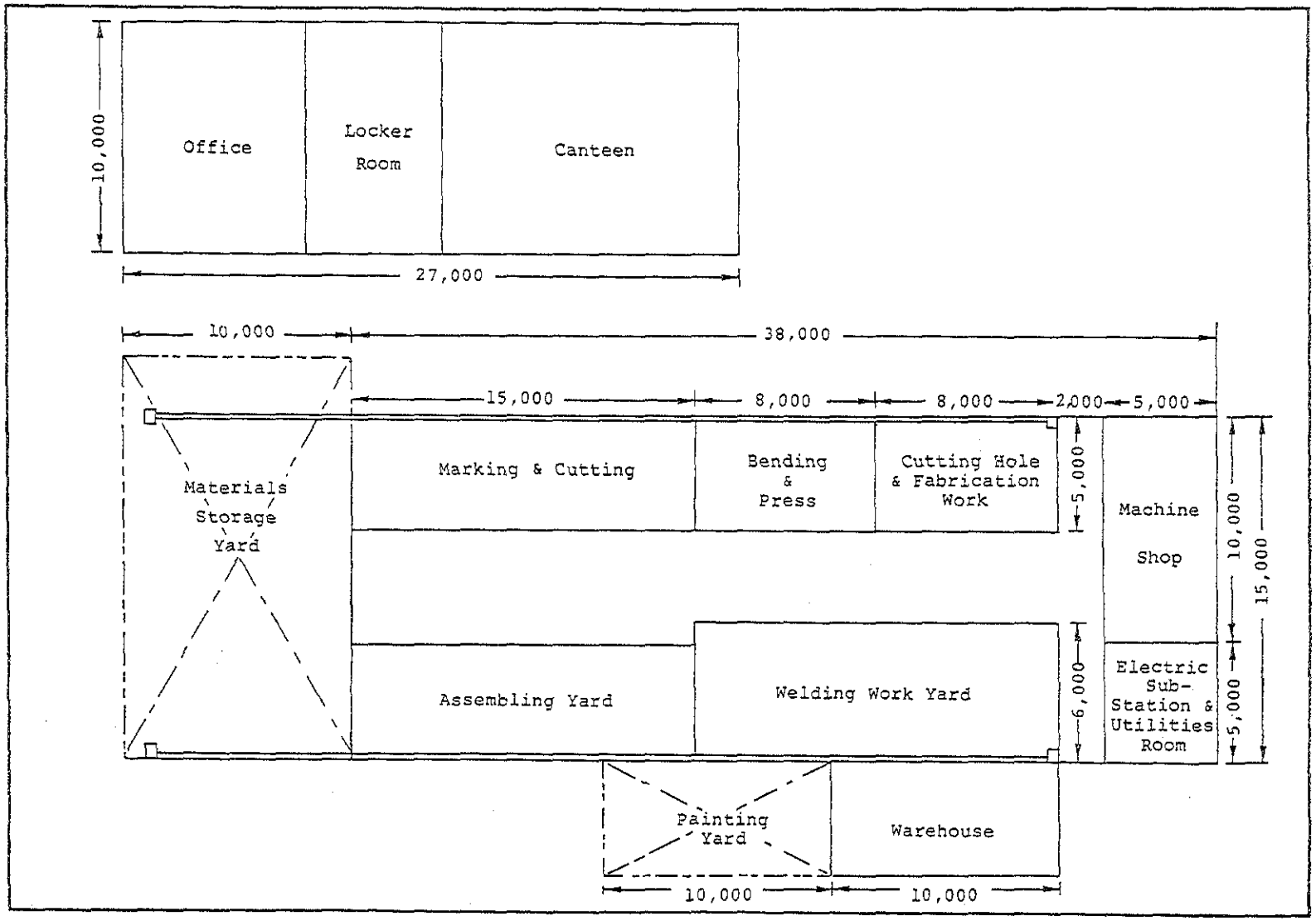


Figure A-9.13 ORGANIZATION OF SHEET WORK SHOP

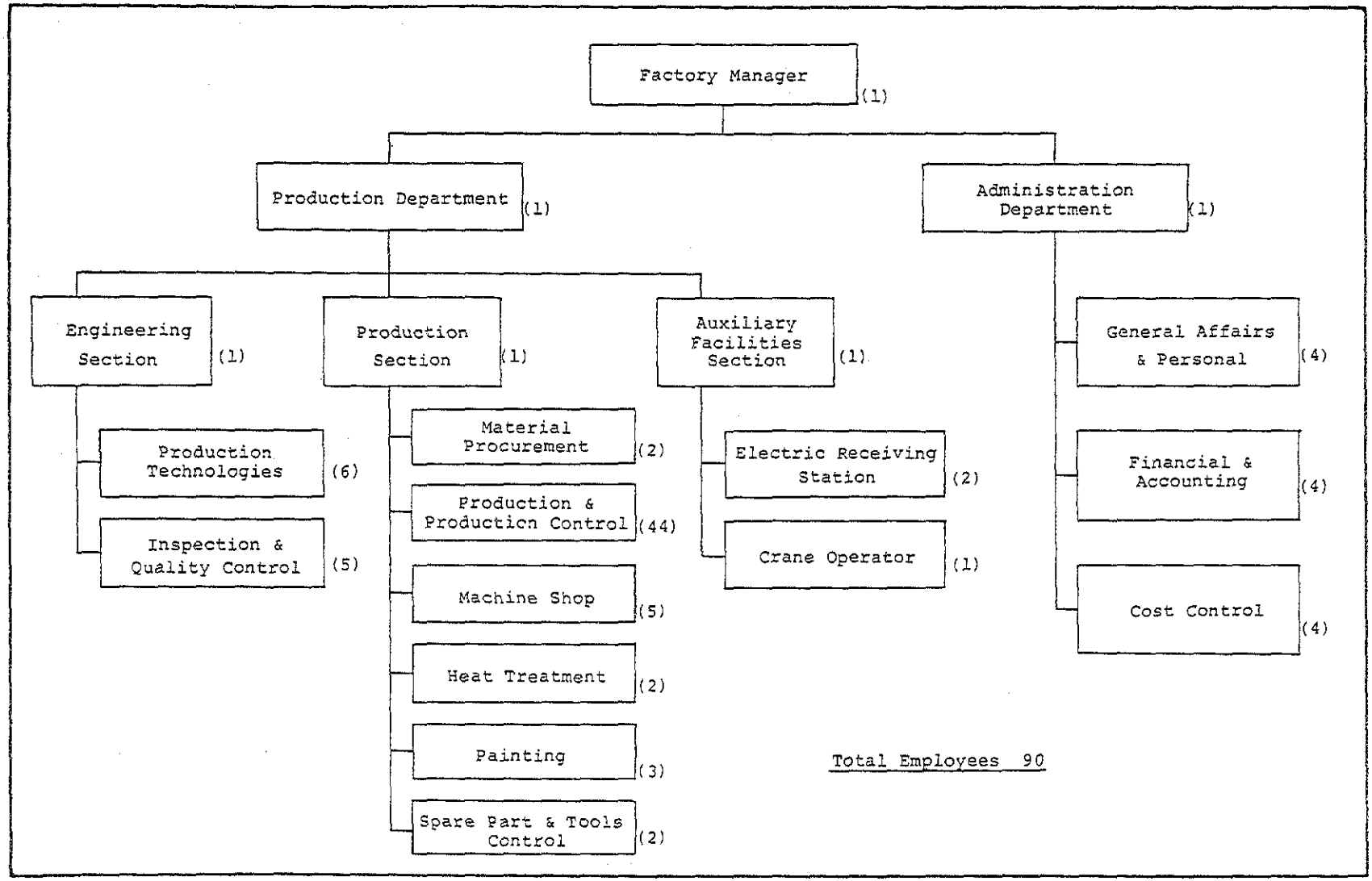


Figure A-9.14 PRODUCTION FLOW SHEET OF PRESS WORK

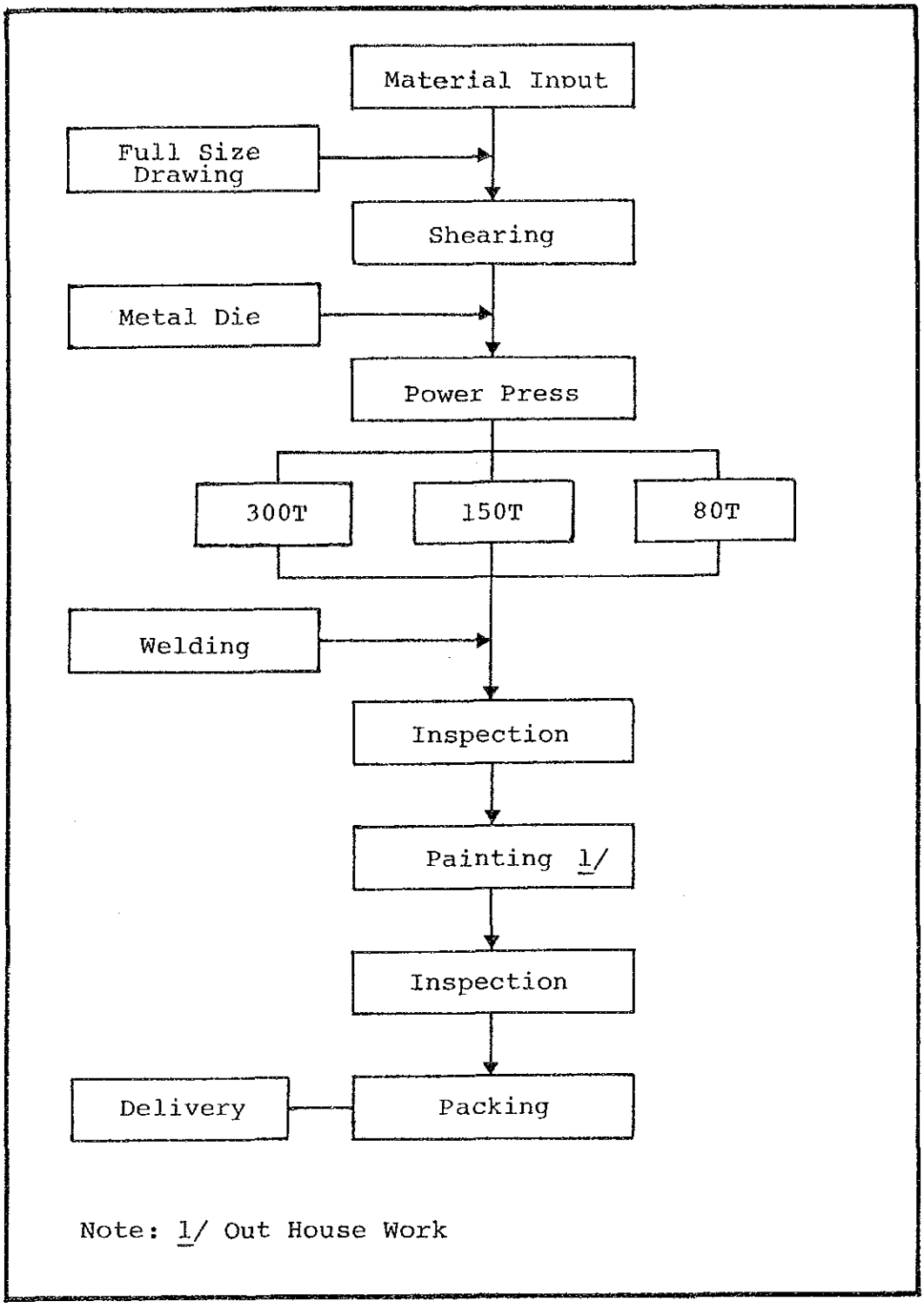


Figure A-9.15 LAY-OUT OF PRESS WORKSHOP

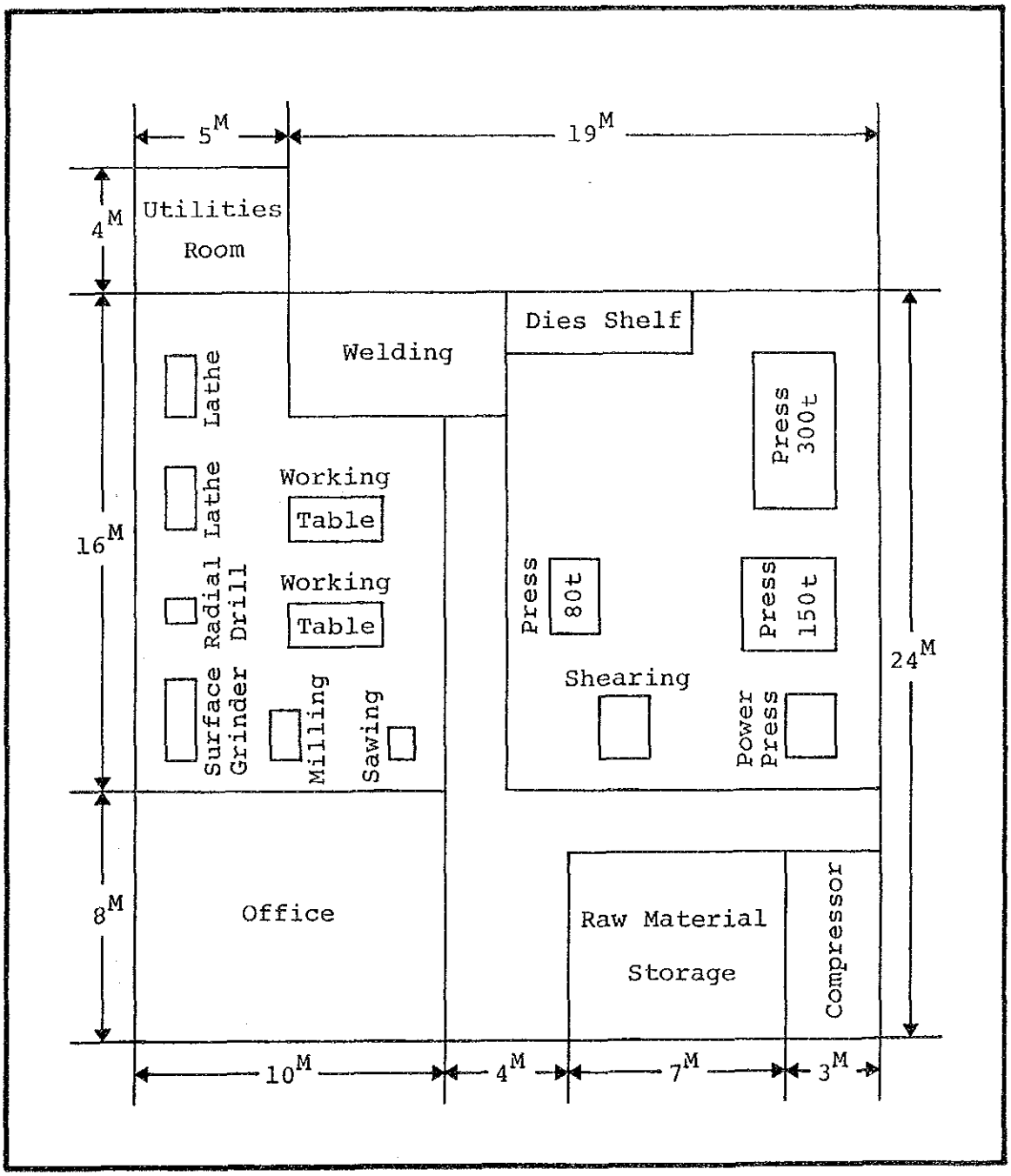


Figure A-9.16 ORGANIZATION OF PRESS WORKSHOP

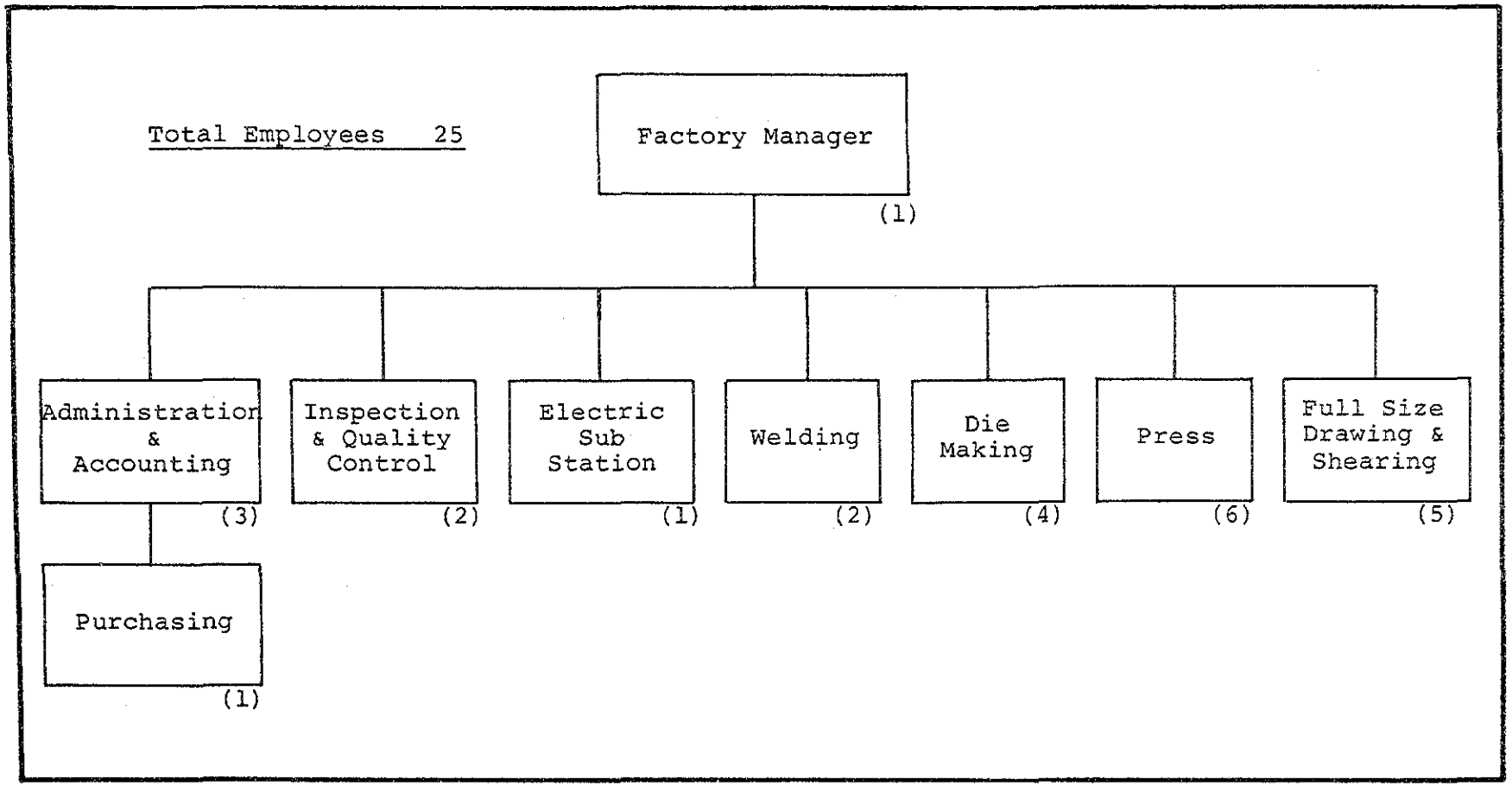


Figure A-9.17 PRODUCTION FLOW SHEET FOR MAIN HULL FITTINGS

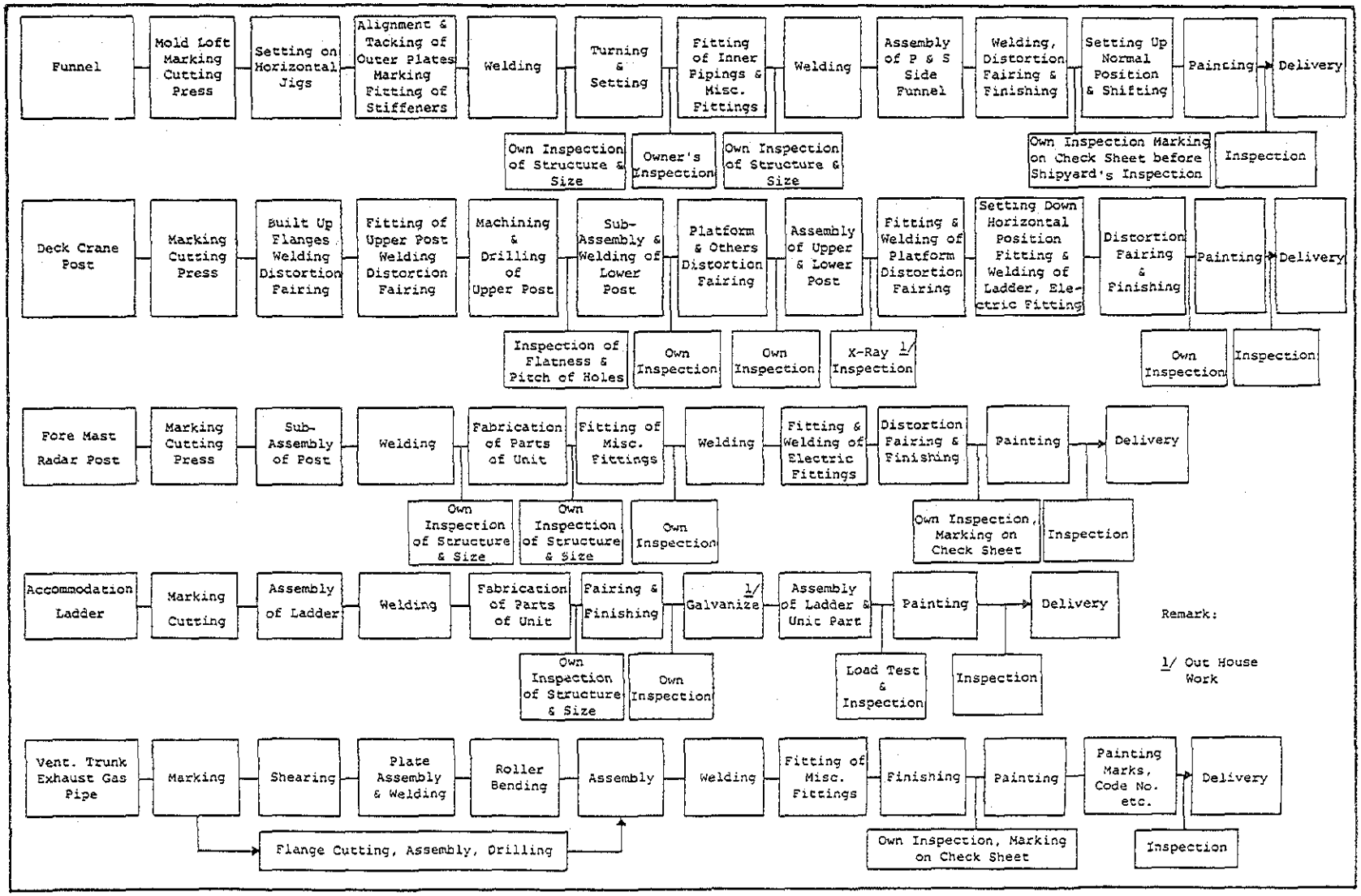
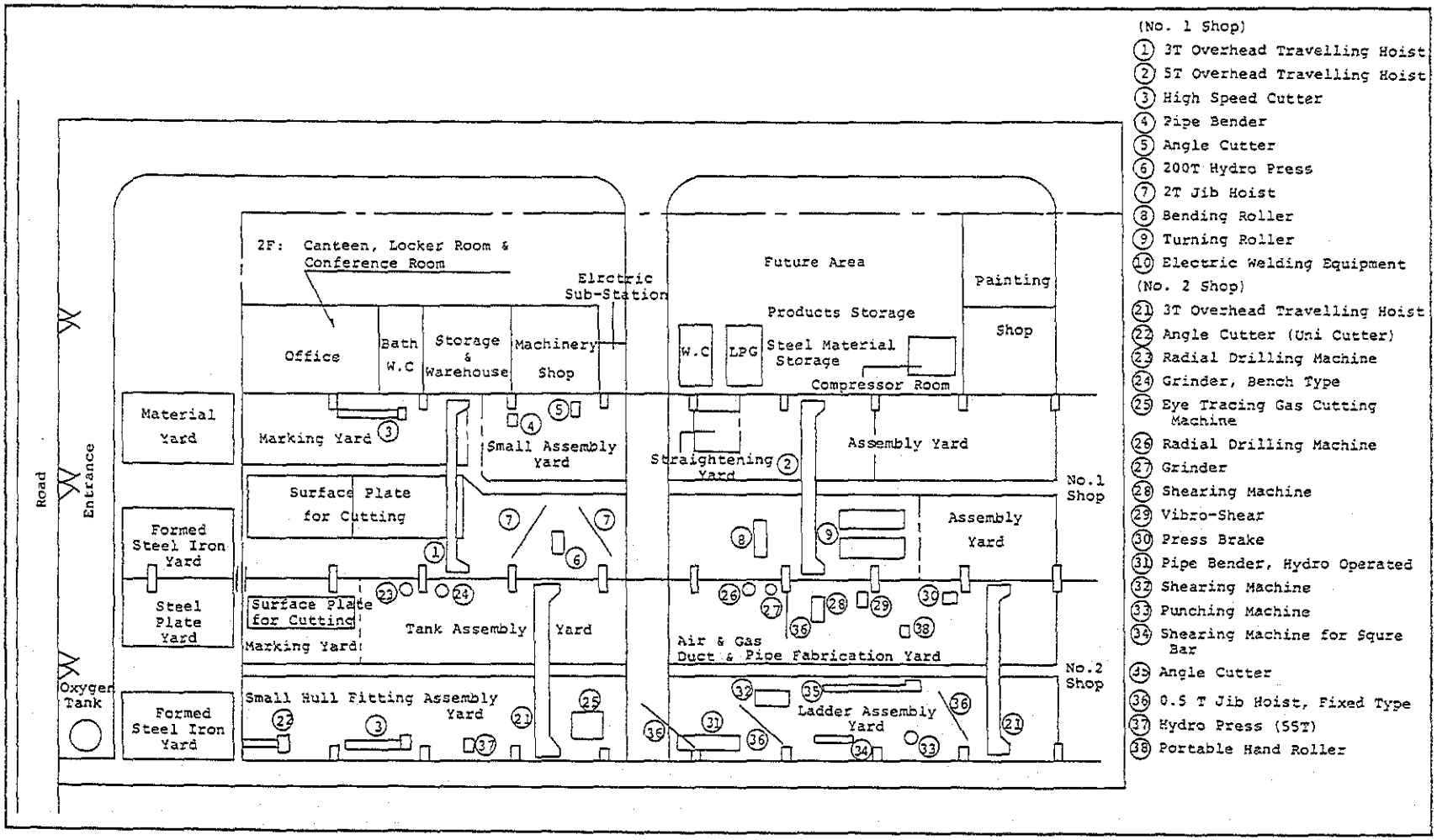


Figure A-9.18 LAY-OUT OF STEEL FABRICATION SHOP



(No. 1 Shop)
1. 3T Overhead Travelling Hoist
2. 5T Overhead Travelling Hoist
3. High Speed Cutter
4. Pipe Bender
5. Angle Cutter
6. 200T Hydro Press
7. 2T Jib Hoist
8. Bending Roller
9. Turning Roller
10. Electric Welding Equipment

(No. 2 Shop)
21. 3T Overhead Travelling Hoist
22. Angle Cutter (Uni Cutter)
23. Radial Drilling Machine
24. Grinder, Bench Type
25. Eye Tracing Gas Cutting Machine
26. Radial Drilling Machine
27. Grinder
28. Shearing Machine
29. Vibro-Shear
30. Press Brake
31. Pipe Bender, Hydro Operated
32. Shearing Machine
33. Punching Machine
34. Shearing Machine for Squre Bar
35. Angle Cutter
36. 0.5 T Jib Hoist, Fixed Type
37. Hydro Press (55T)
38. Portable Hand Roller

Figure A-9.19 ORGANIZATION OF STEEL FABRICATION SHOP

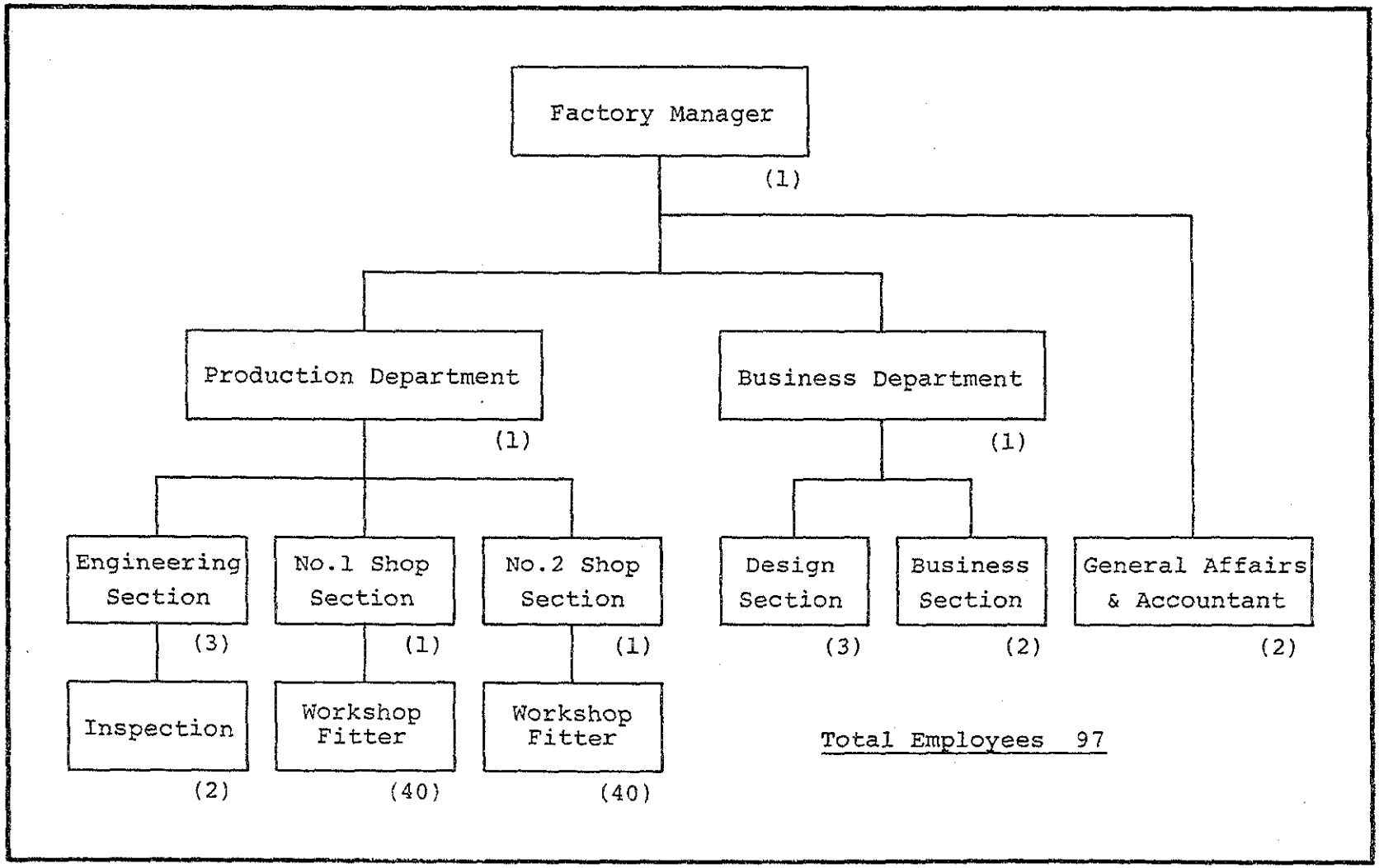


Figure A-9.20 PRODUCTION FLOW SHEET OF SMALL-SCALE CASTING

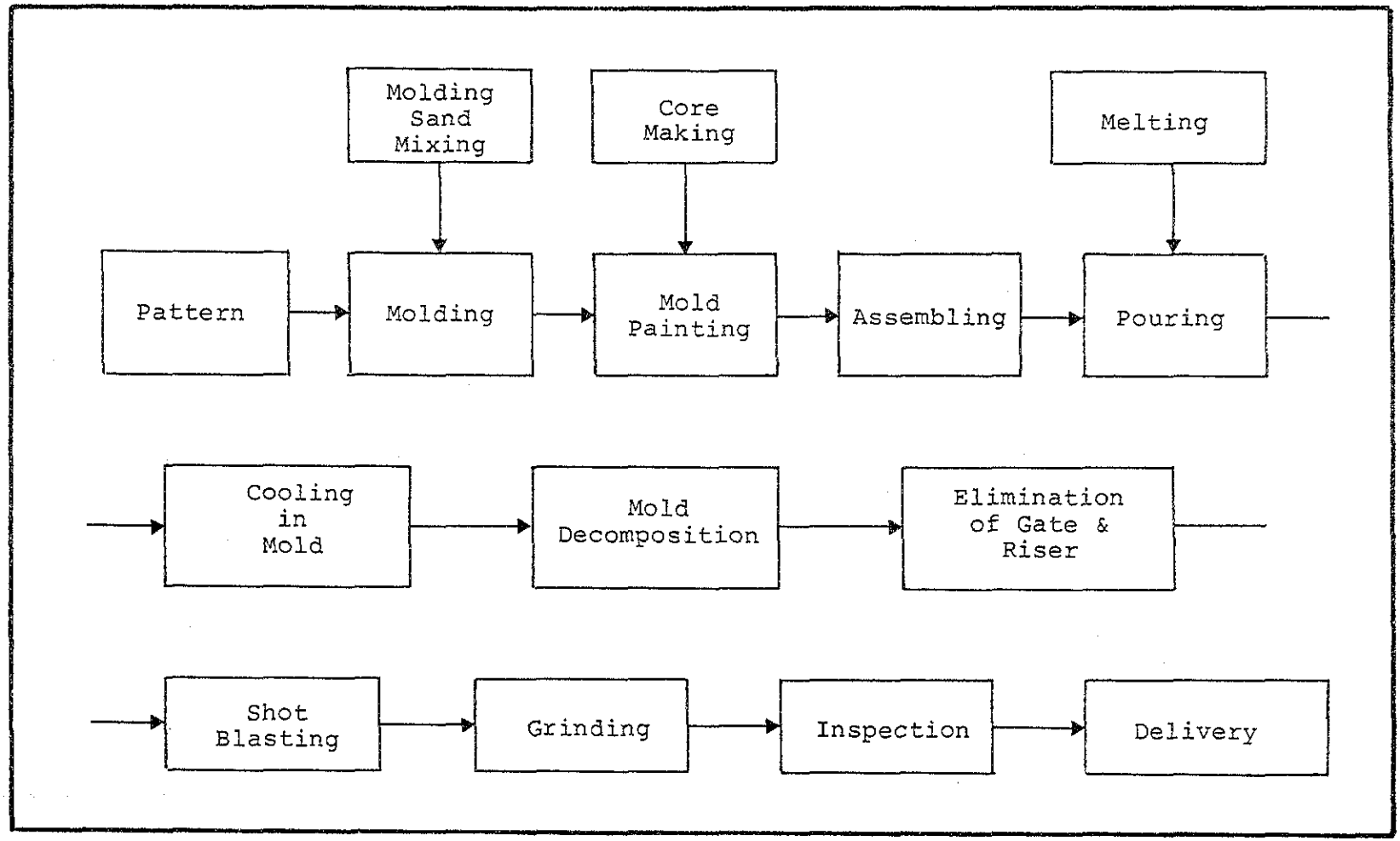


Figure A-9.21 LAYOUT OF SMALL-SCALE CASTING FACTORY

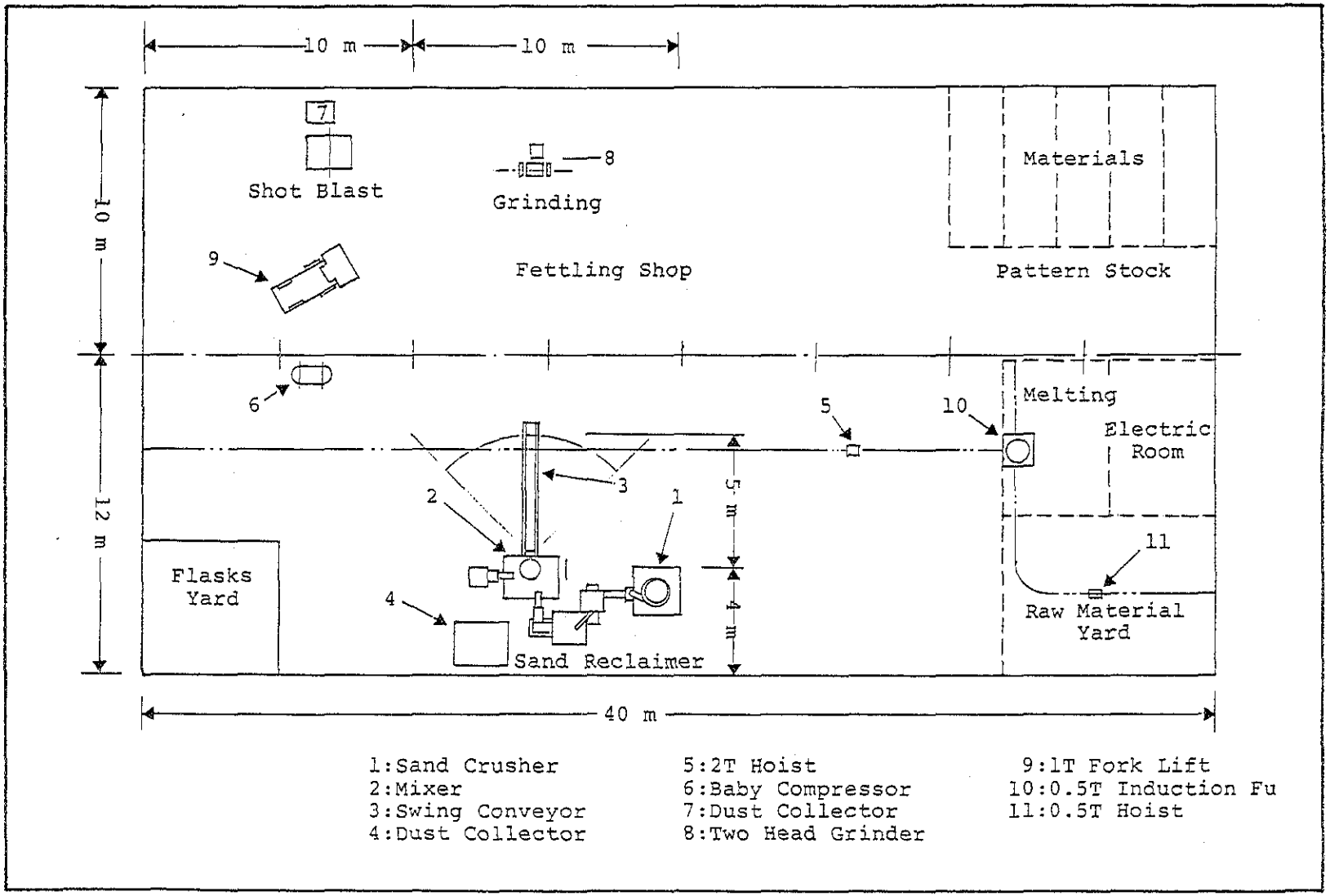


Figure A-9.22 ORGANIZATION OF SMALL SCALE CASTING

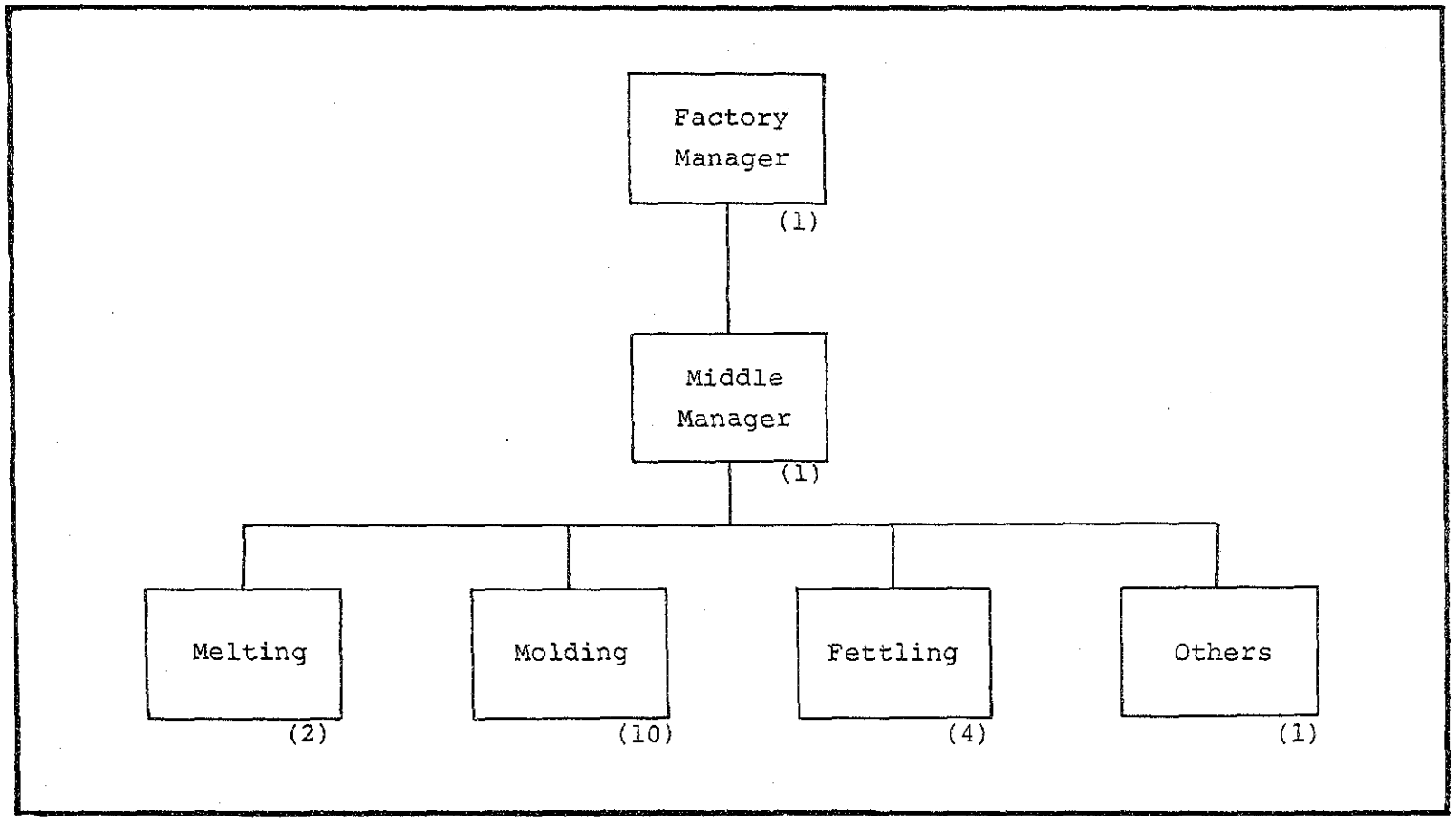


Figure A-9.23 PRODUCTION FLOW SHEET OF SCREW AND RIVET

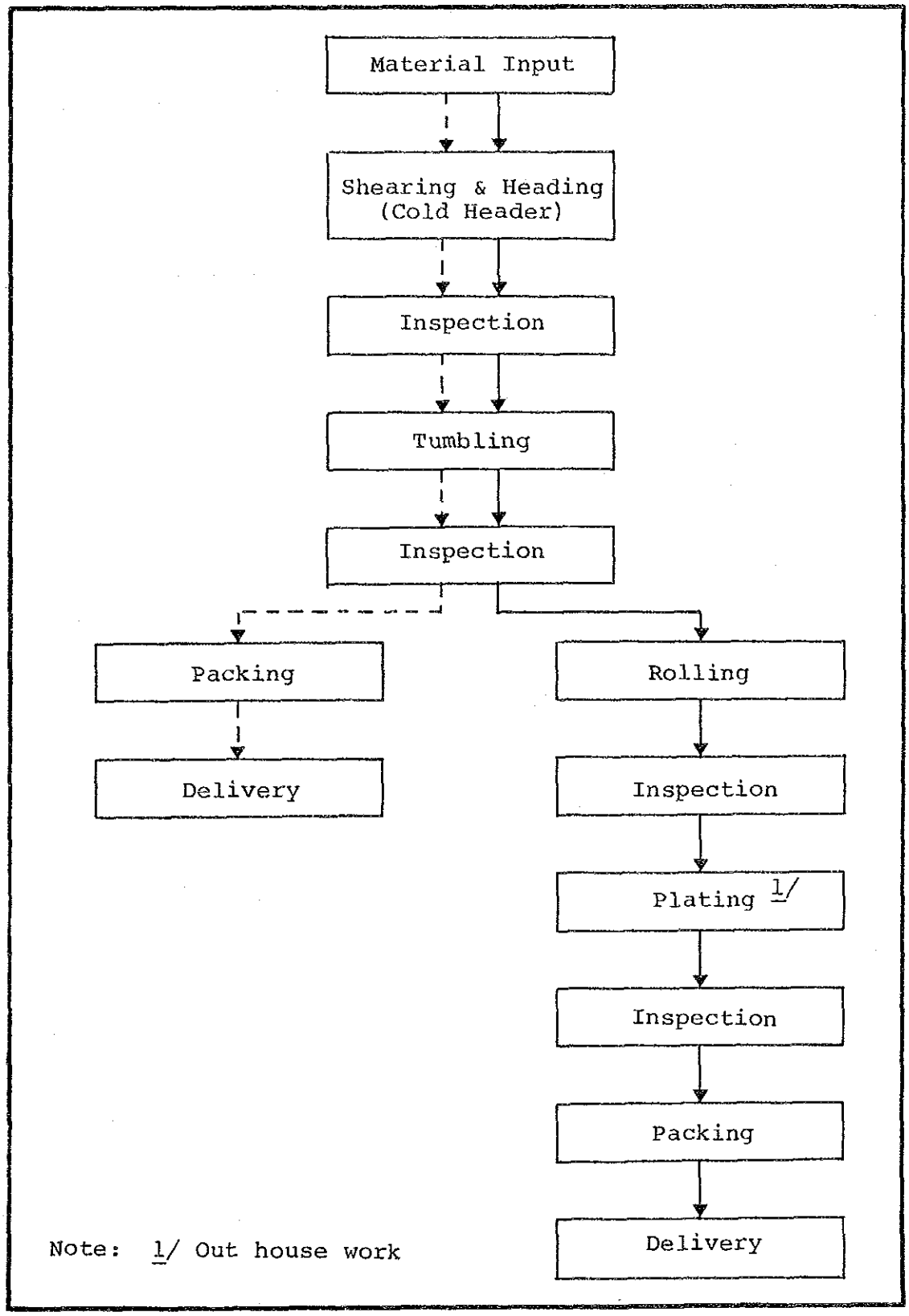


Figure A-9.24 LAYOUT OF CROSS-RECESSED HEAD MACHINE SCREW AND COLD HEADED RIVETS SHOP

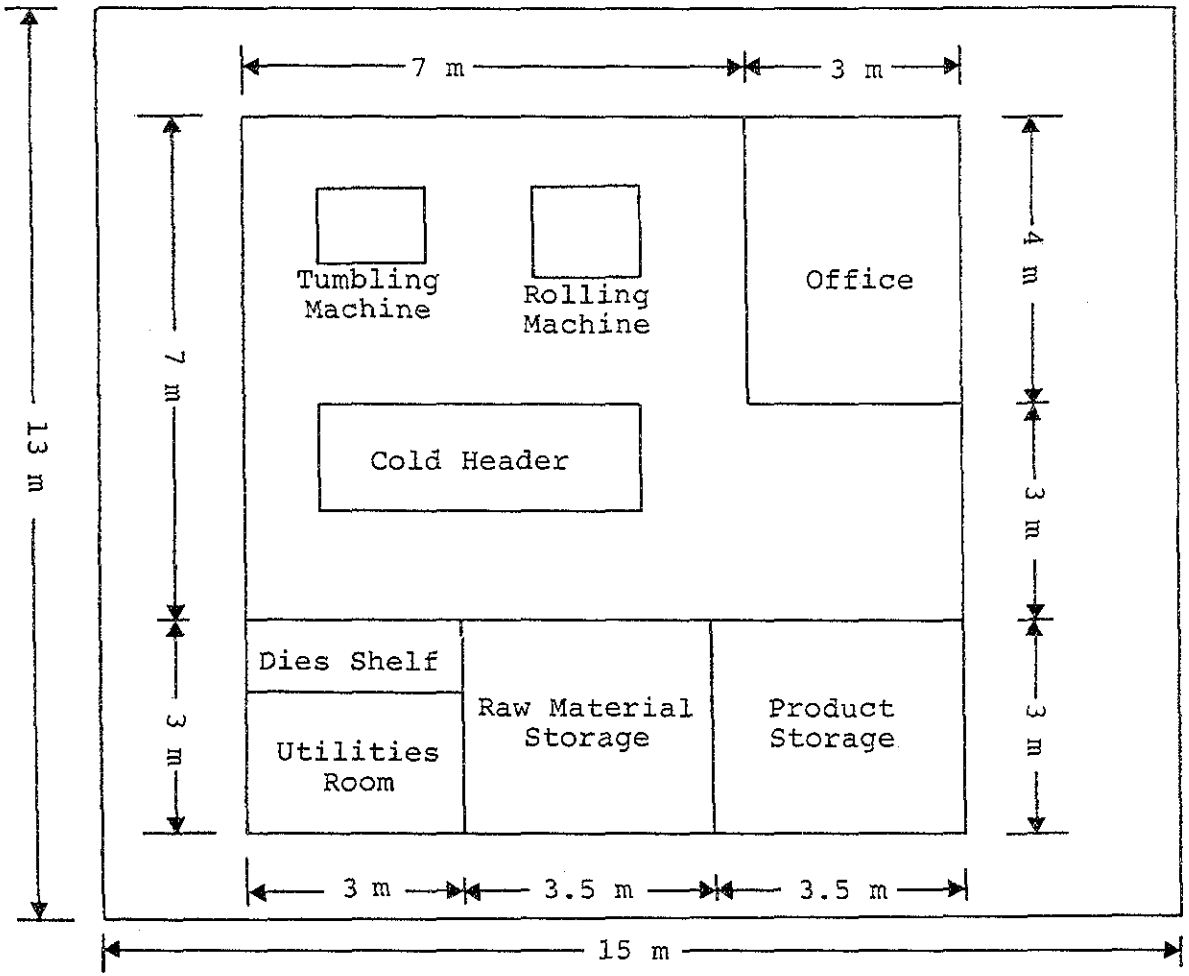


Figure A-9.25 ORGANIZATION OF SMALL-SCALE FACTORY FOR SCREW AND RIVET

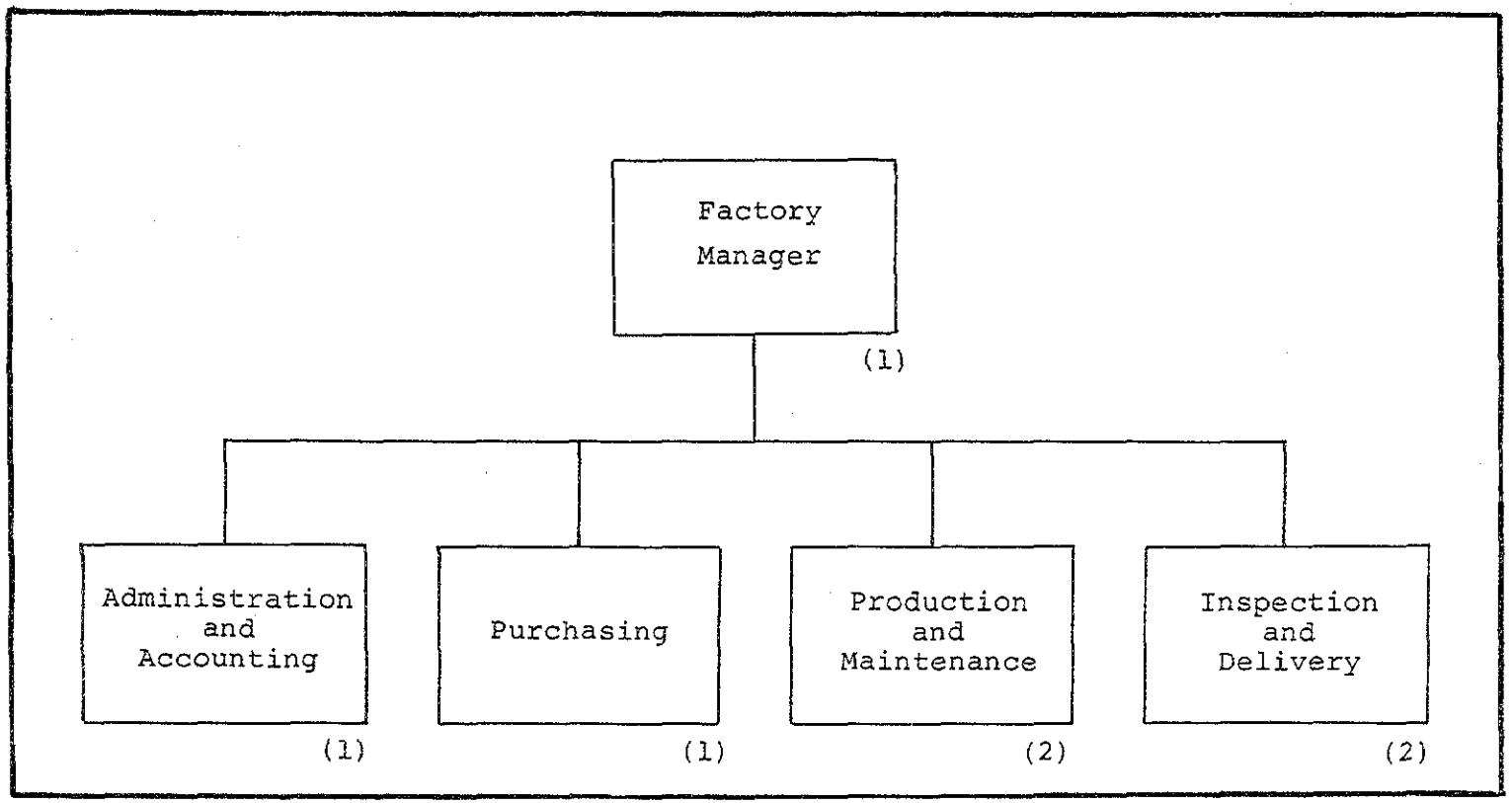


Figure A-9.26 PRODUCTION FLOW SHEET OF PRESSWORK

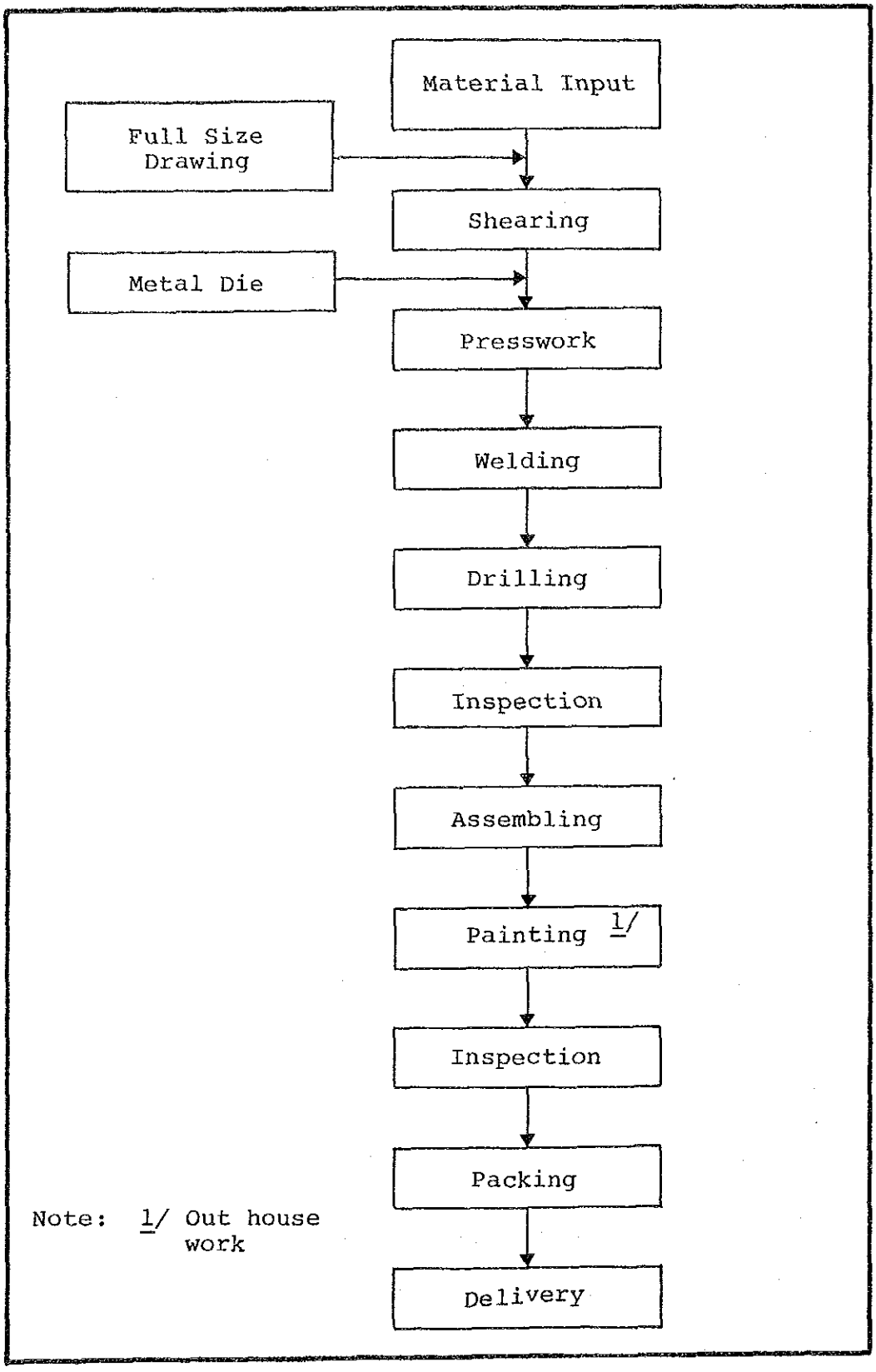


Figure A-9.27 LAYOUT OF PRESS WORK SHOP

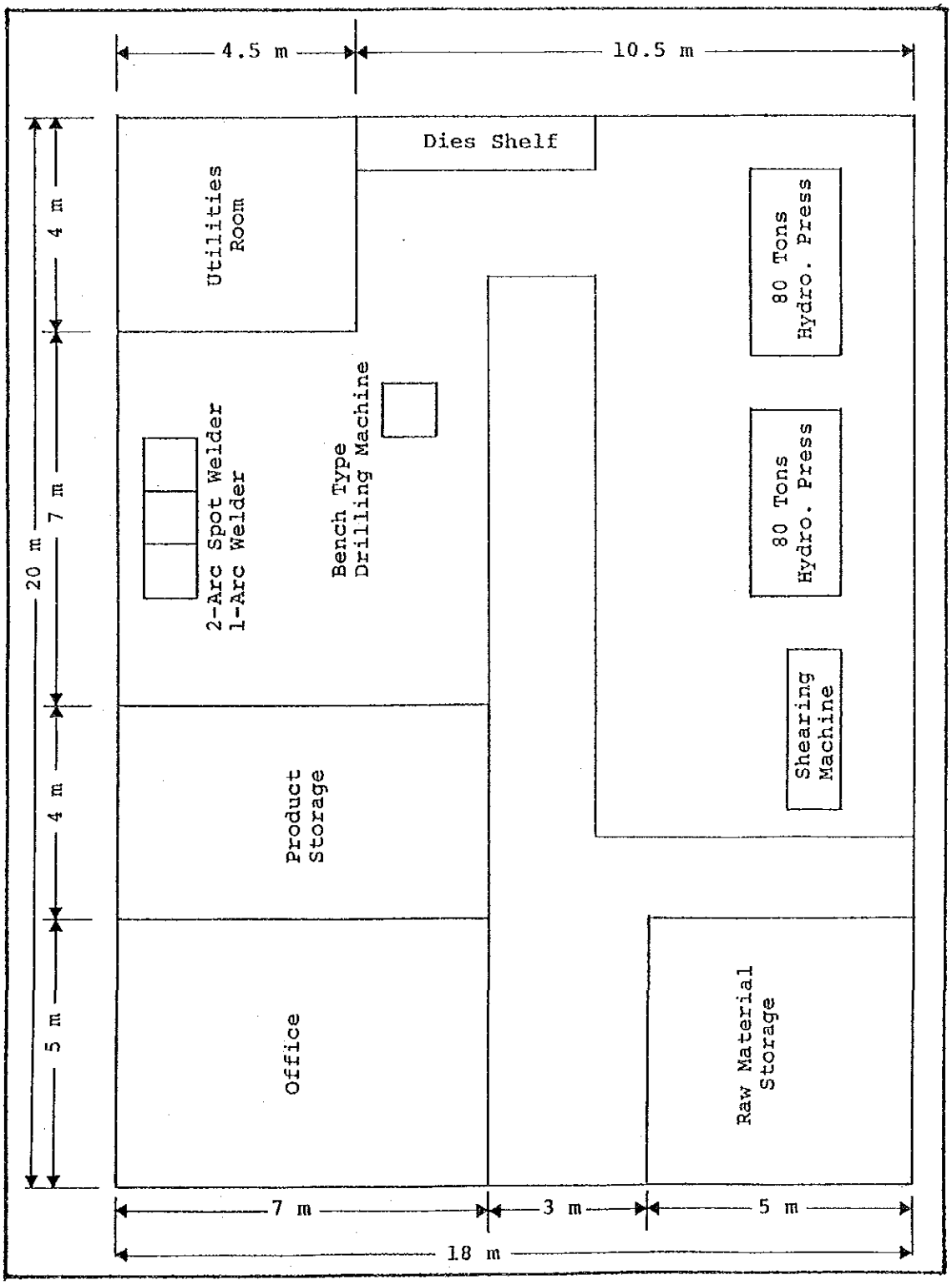


Figure A-9.28 ORGANIZATION OF SMALL SCALE PRESSWORK SHOP

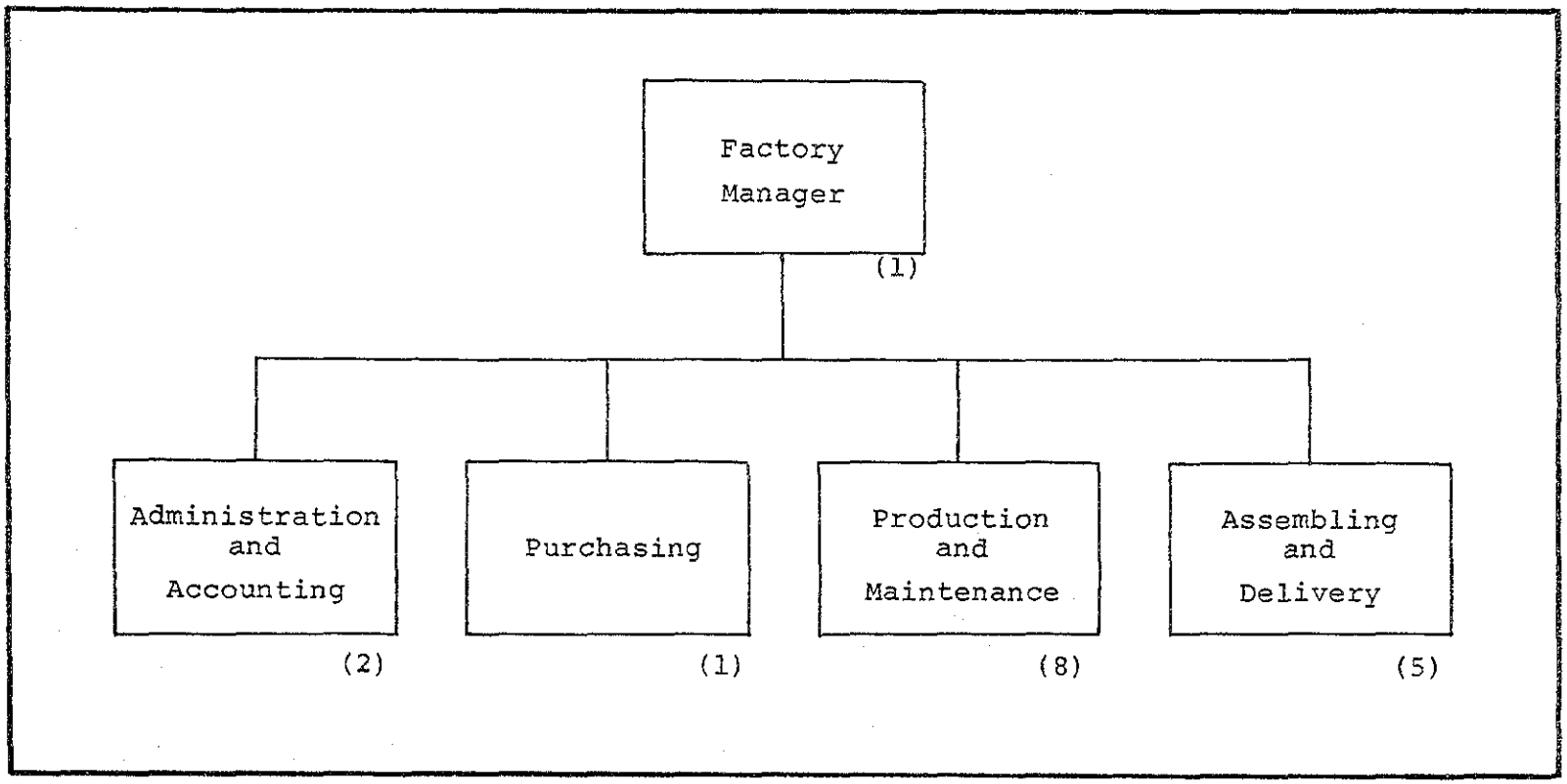


Figure A-9.29 PROCESS FLOW SHEET OF PLATING SHOP
(FOR ZINC PLATING FOLLOWED BY CHROMATE TREATMENT)

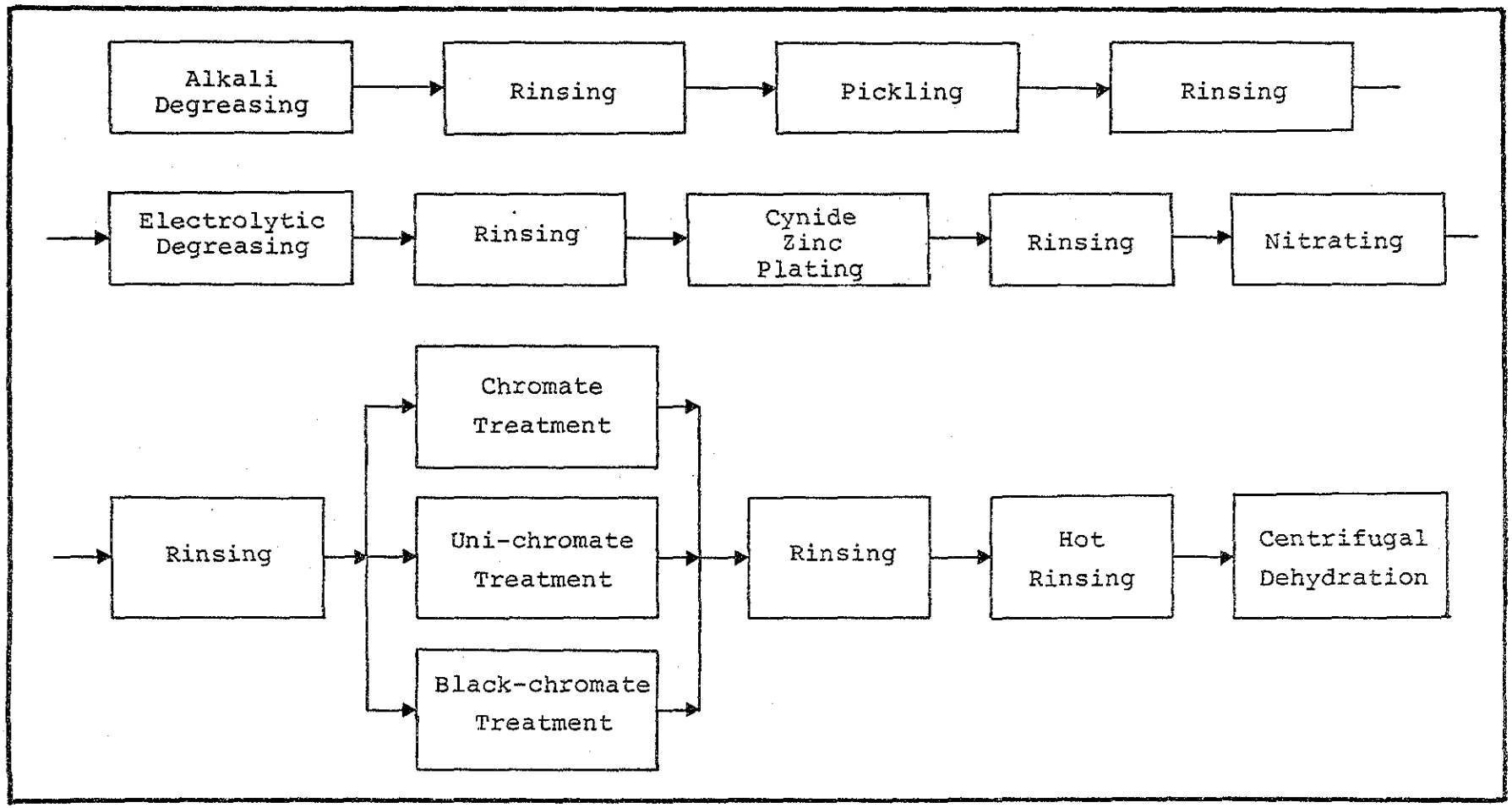
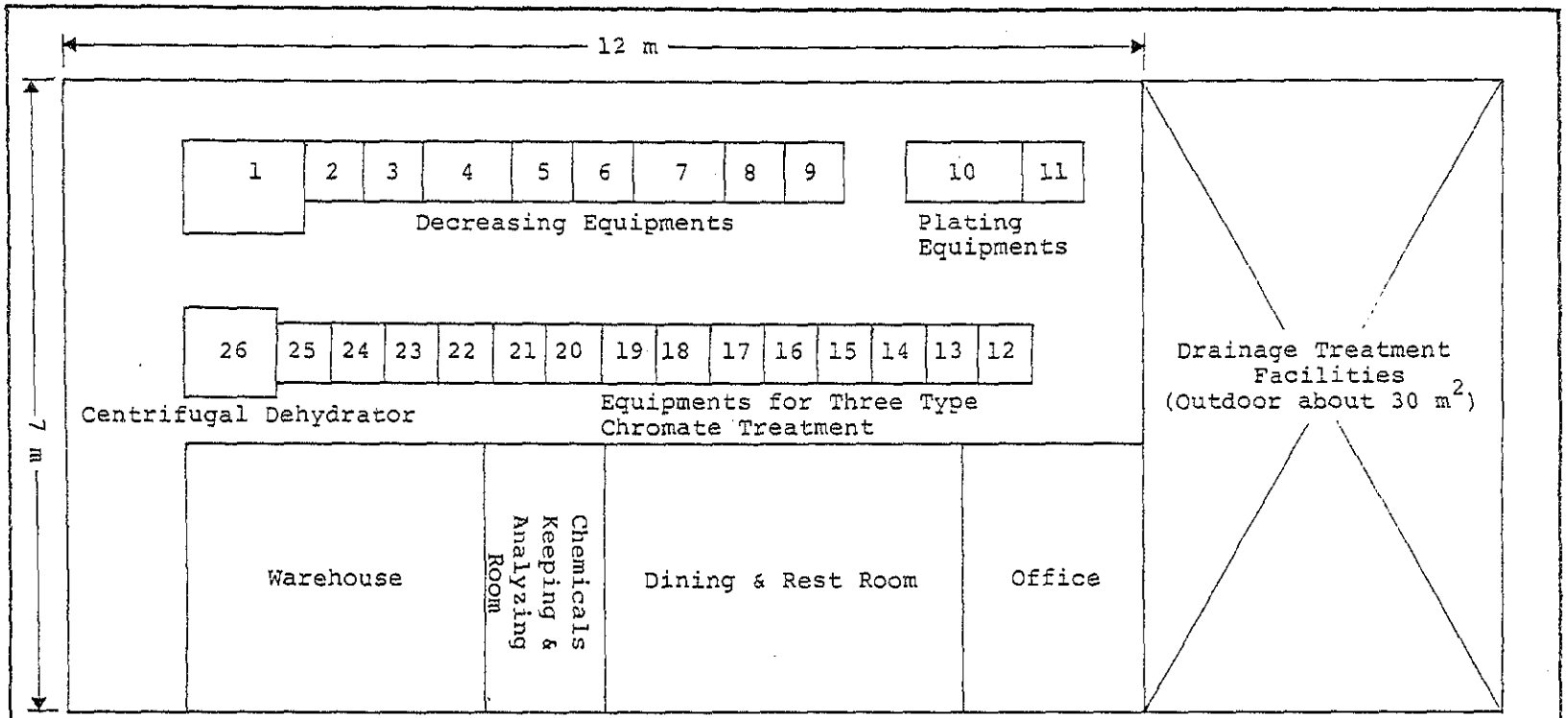


Figure A-9.30 LAYOUT OF PLATING SHOP



1:Alkali Decreasing
2,3,5,6,8,9,11,12,13,15,18,19,20,22,23,24:Ringing
4:Pickling
7:Electrolytic Decreasing
10:Cyanide Zinc Plating 14:Nitrating
16:Uni-chromate Treatment
17:Chromate Treatment
21:Black-chromate Treatment
25:Hot Rinsing

Figure A-9.31 ORGANIZATION OF SMALL SCALE PLATING SHOP

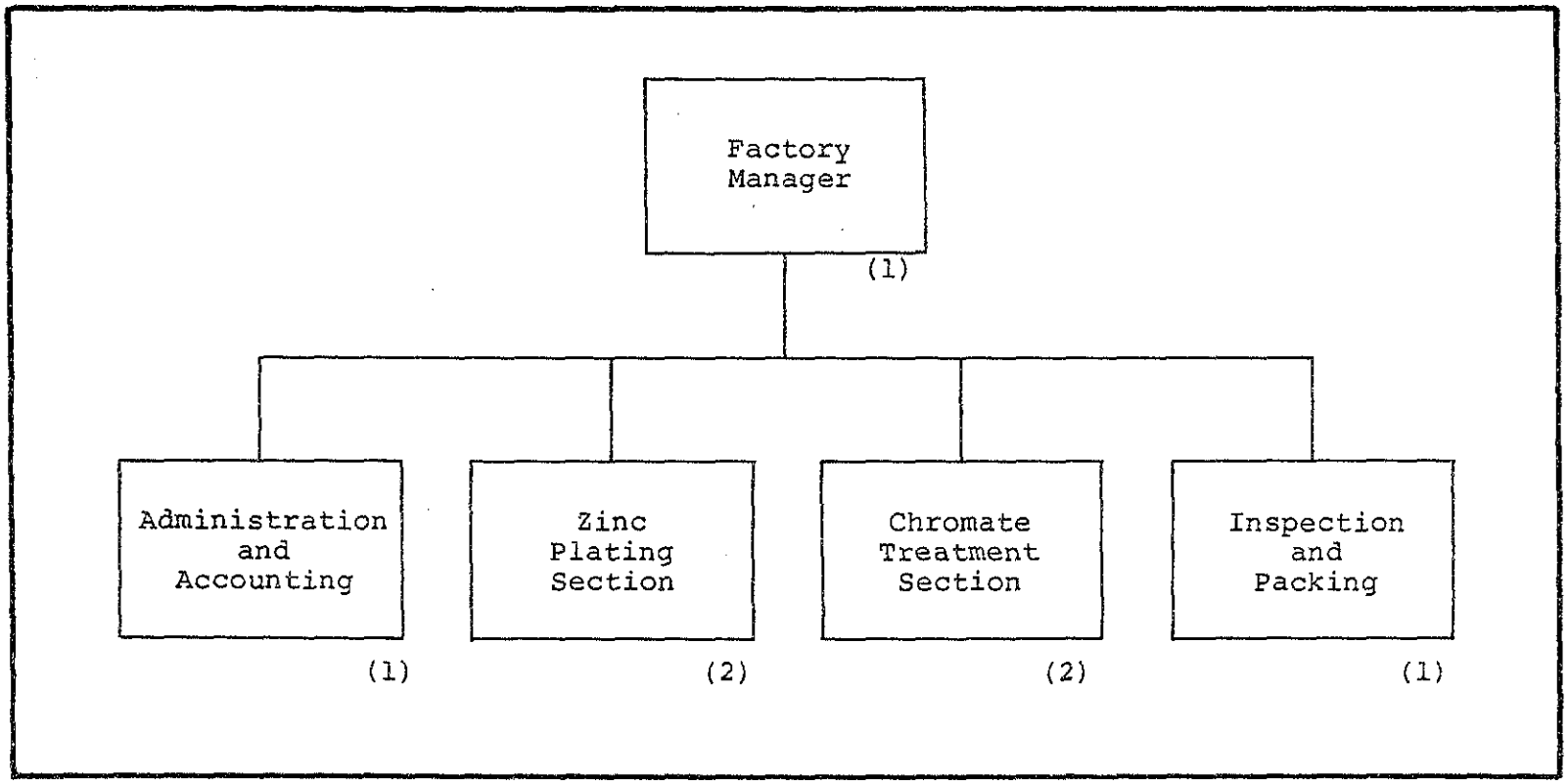


Figure A-9.32 PRODUCTION FLOW SHEET OF AIR & OIL FILTER

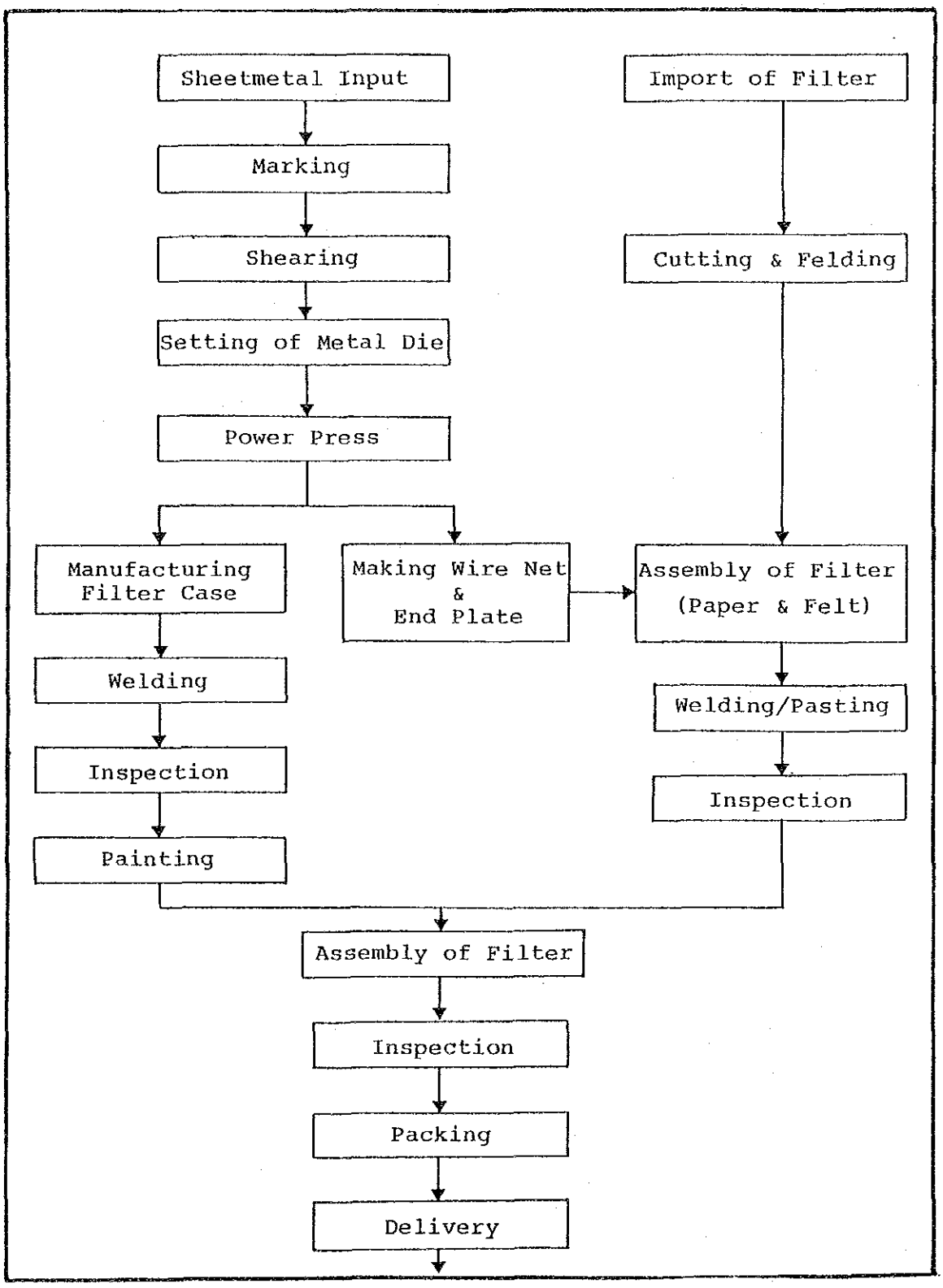


Figure A-9.33 LAYOUT OF FILTER MANUFACTURING FACTORY

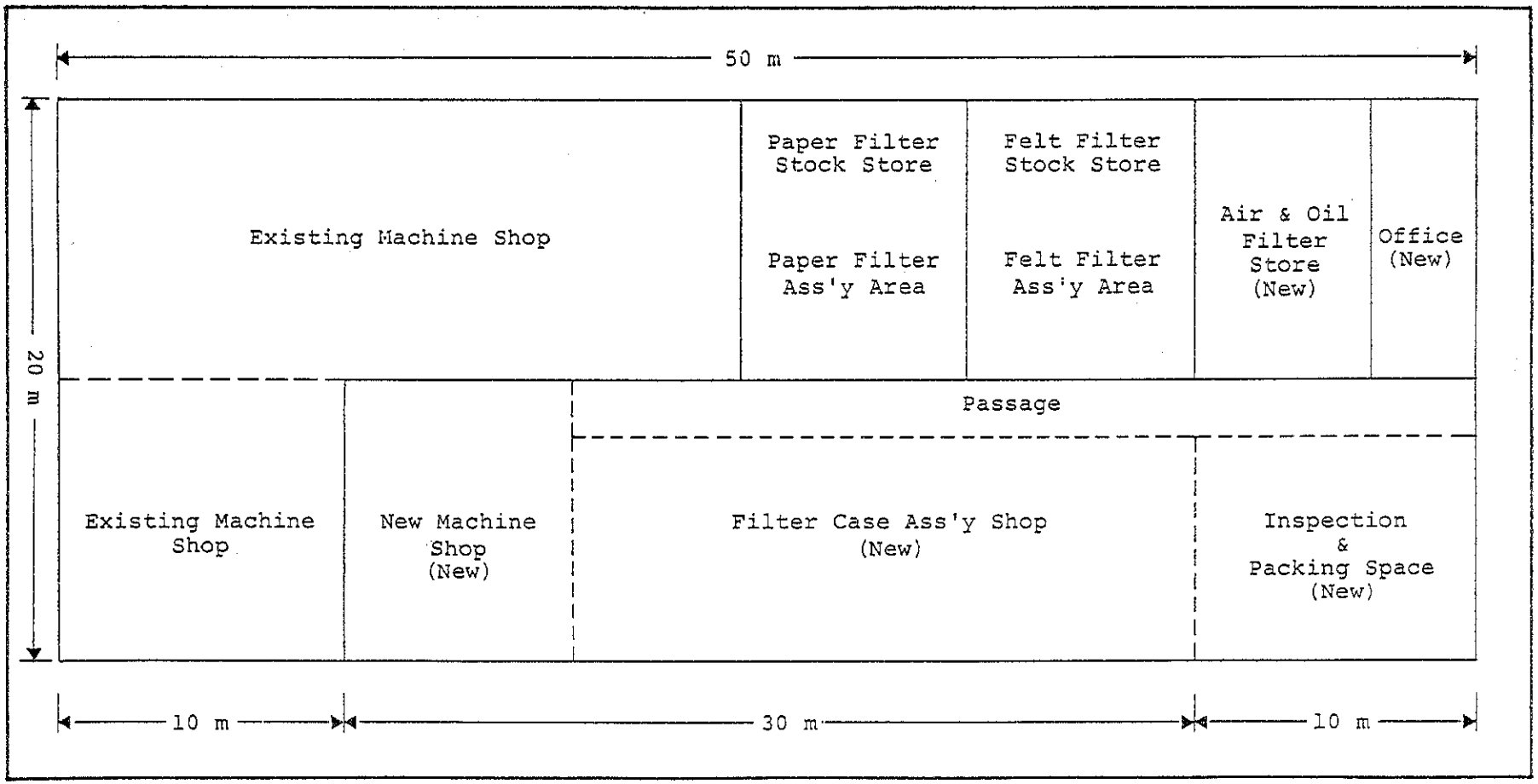


Figure A-9.34 ORGANIZATION OF FILTER MANUFACTURING FACTORY

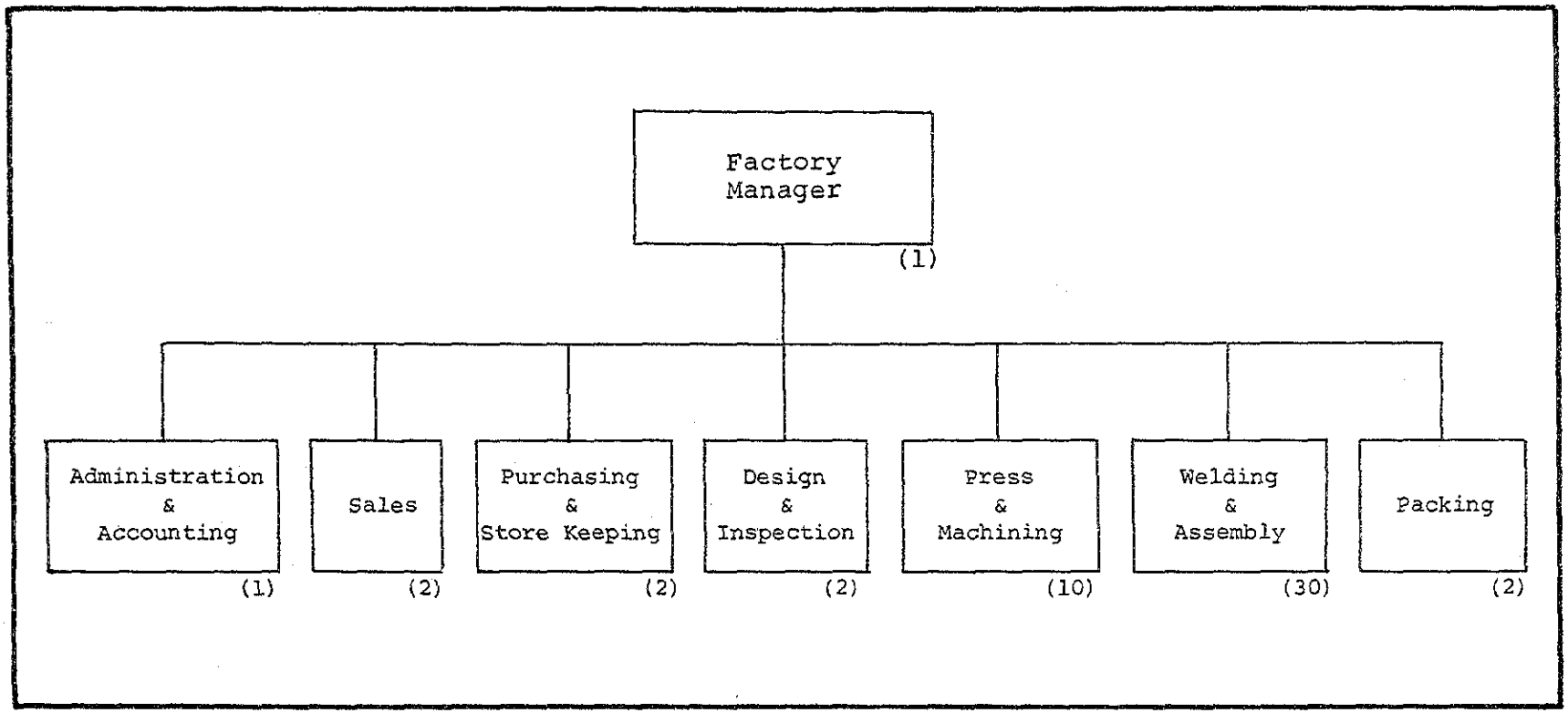


Figure A-9.35 PRODUCTION FLOW SHEET OF CASTING

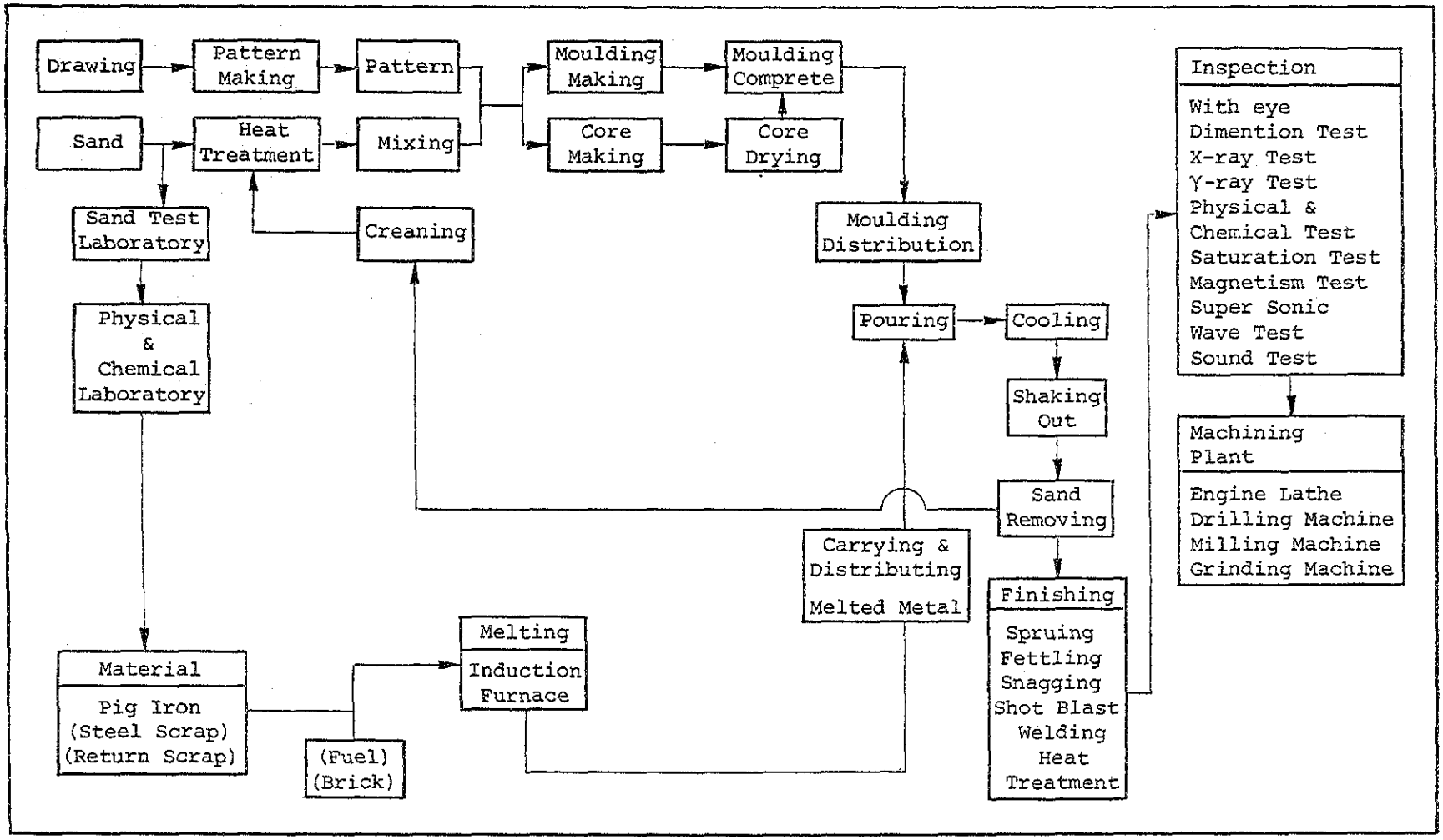


Figure A-9.36 PRODUCTION FLOW SHEET OF ASSEMBLY

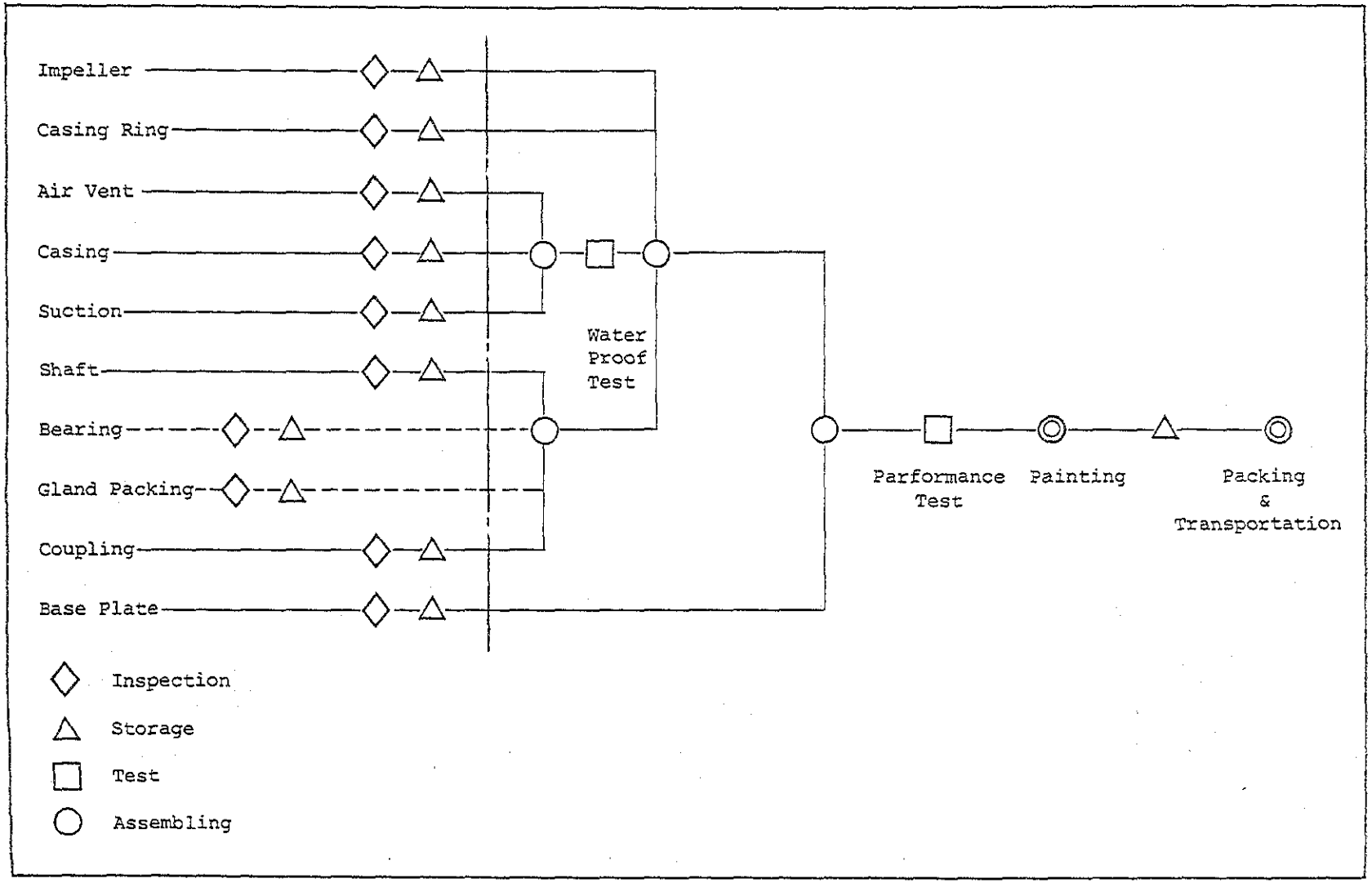


Figure A-9.37 LAYOUT OF PUMP MANUFACTURING FACTORY

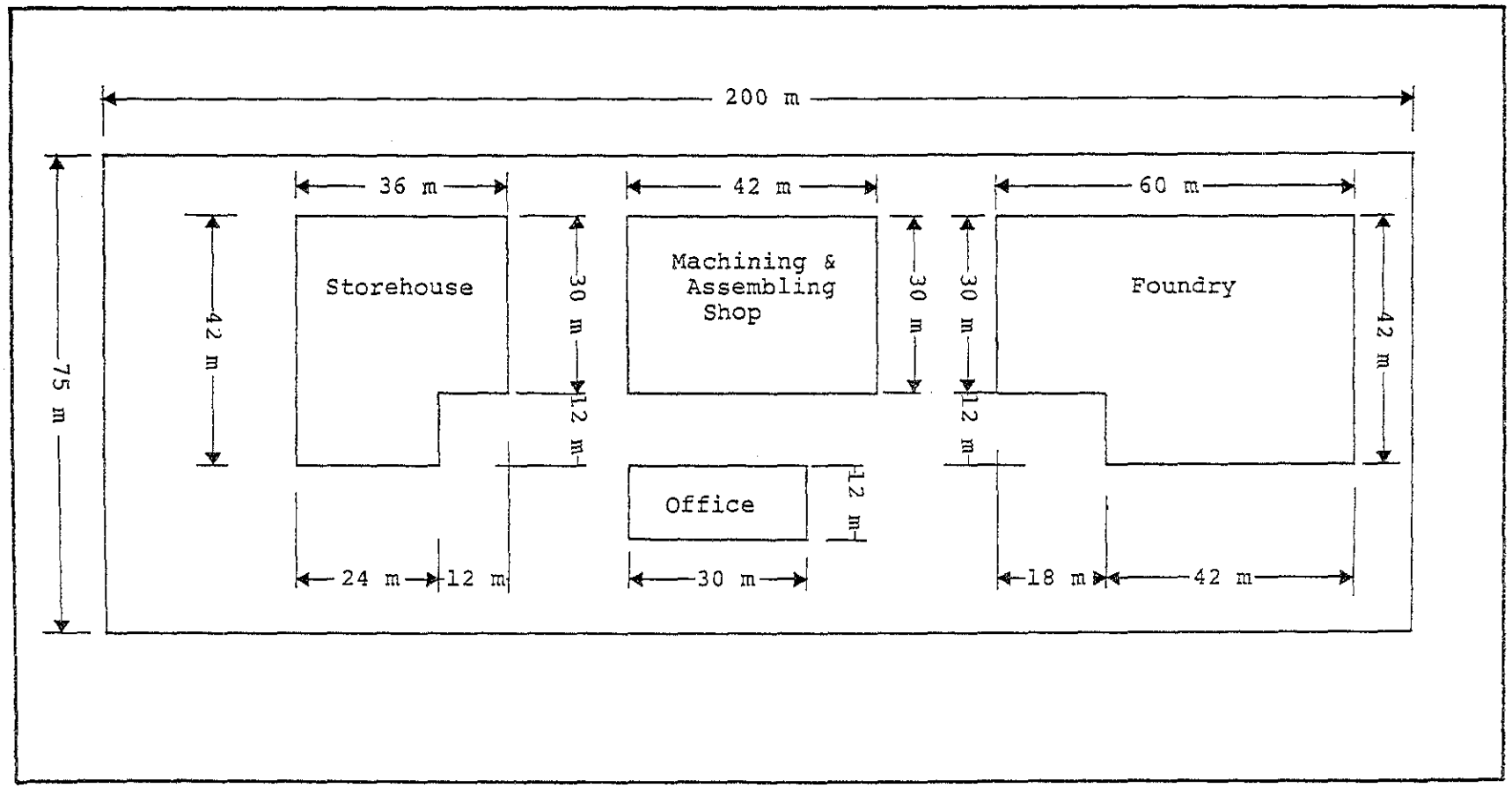


Figure A-9.38 ORGANIZATION OF PUMP MANUFACTURING FACTORY

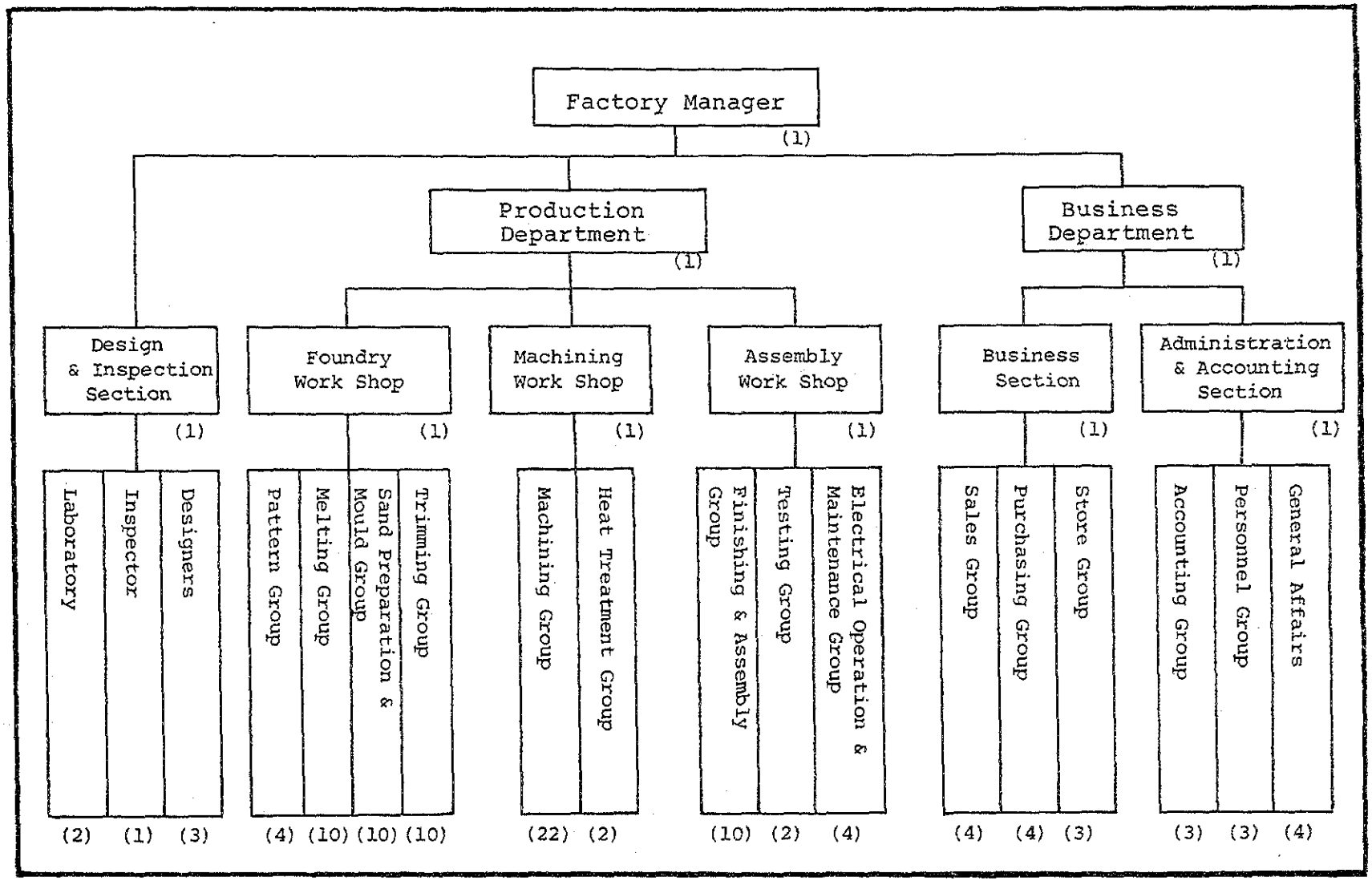


Figure A-9.39 PRODUCTION FLOW SHEET OF SWITCH GEAR BOX

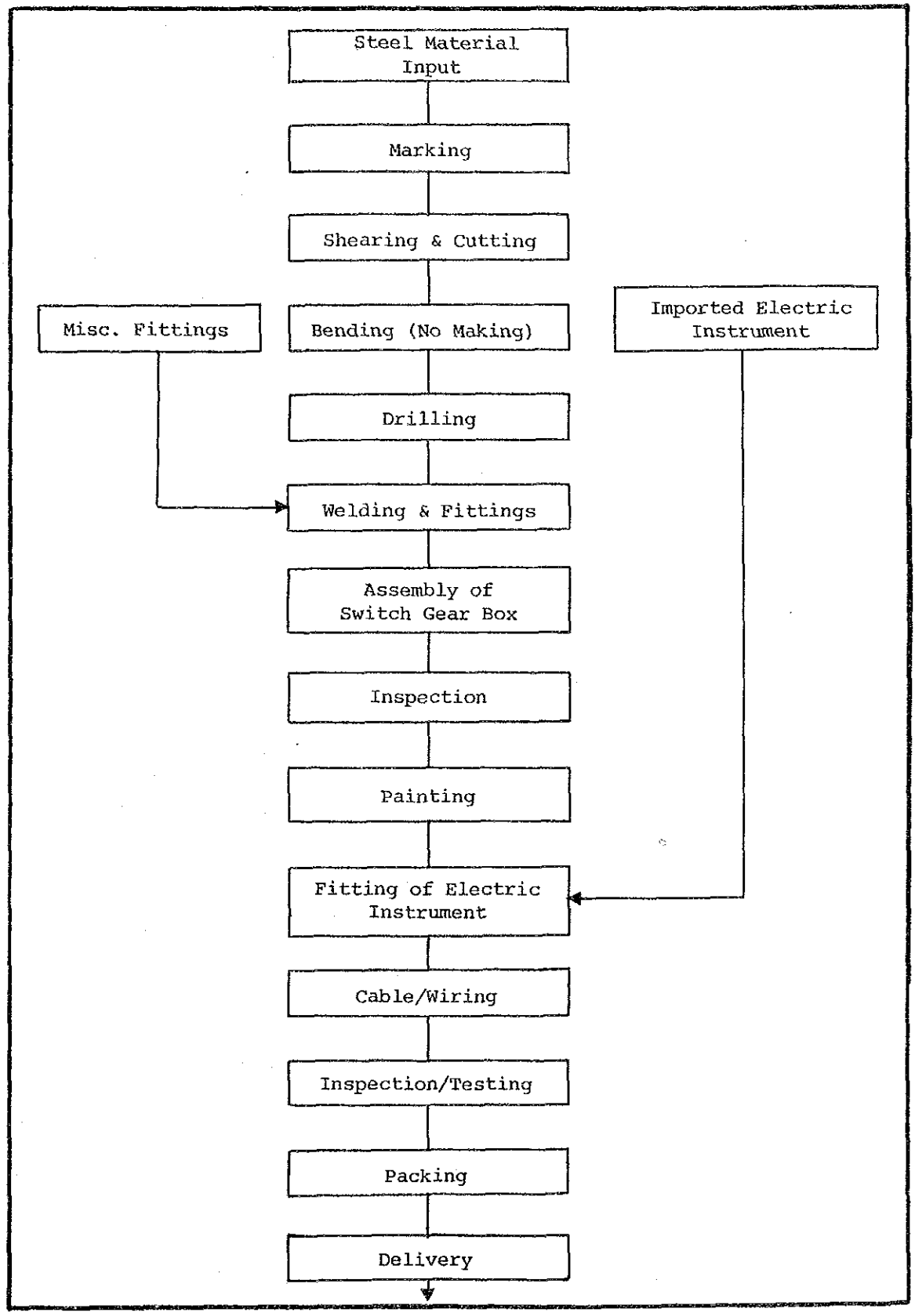


Figure A-9.40 LAYOUT OF EXISTING SWITCHGEAR MANUFACTURING FACTORY

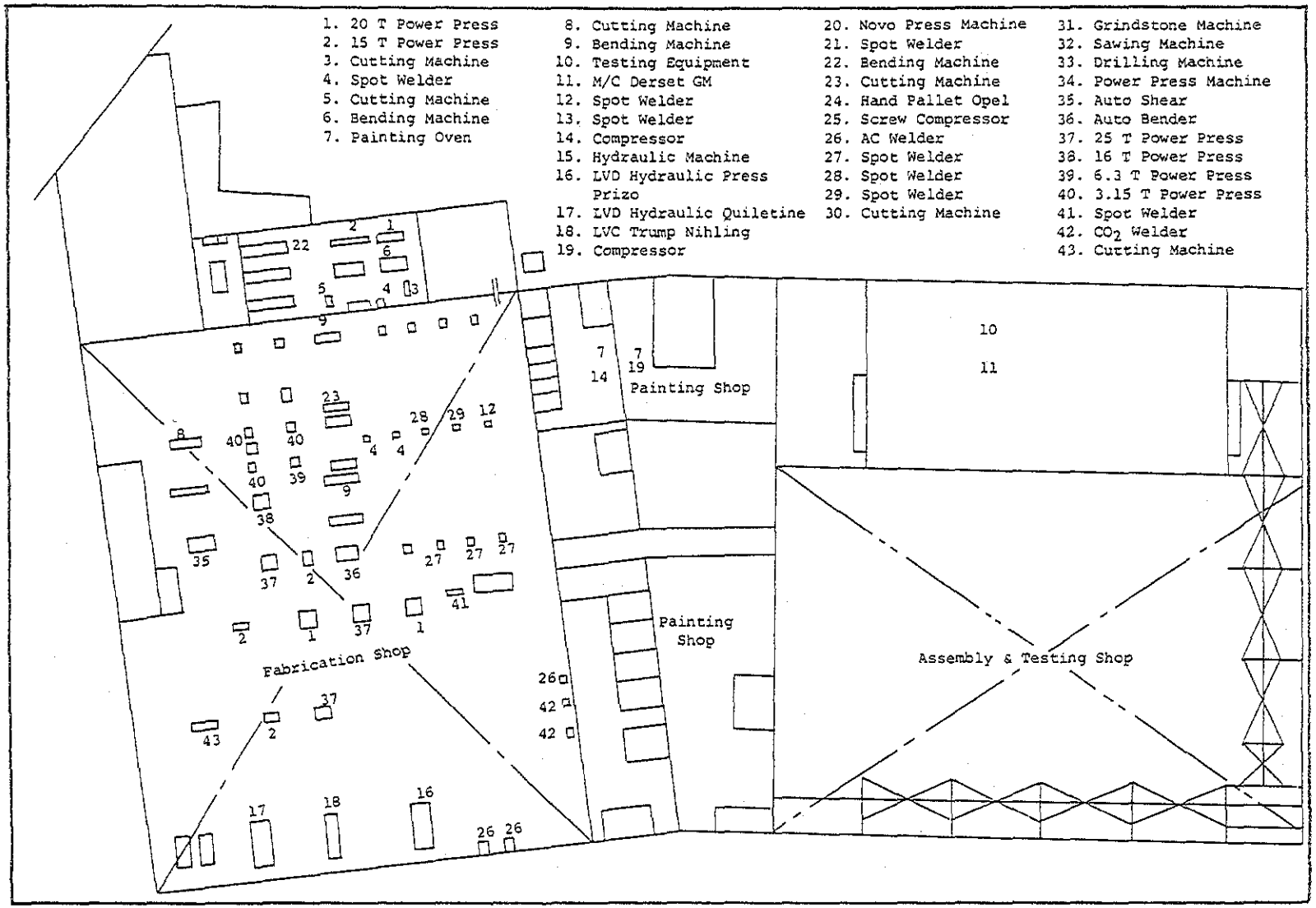


Figure A-9.41 LAYOUT OF EXPANDED FACTORY OF MANUFACTURING SWITCHGEAR

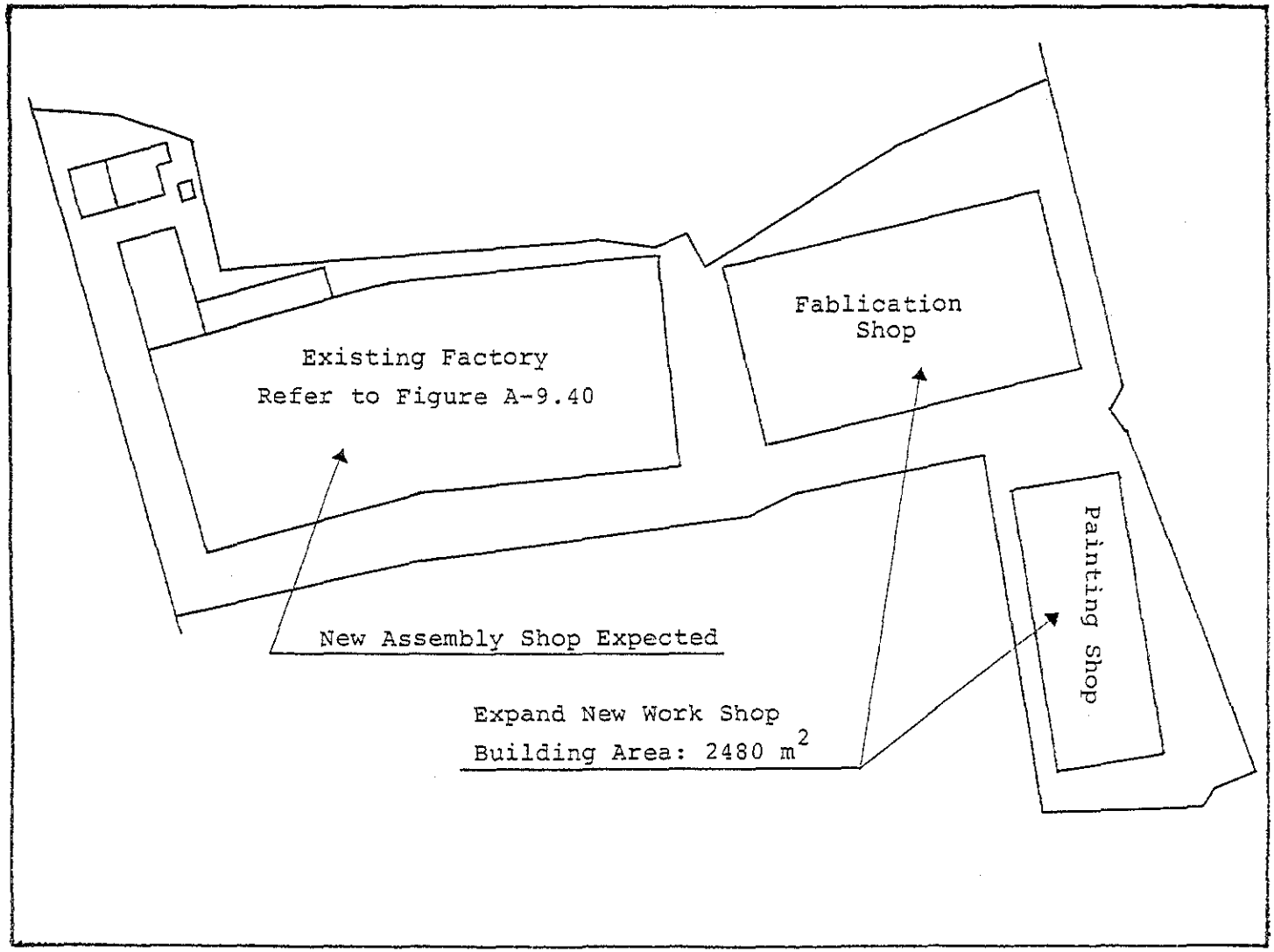


Table A-9.1 OUTLINE OF MODEL PLANT

Item	Casting Shop	Forging Shop	Machining Shop	Sheet Work Shop	Press Work Shop	Steel Fabrication Shop
Production capacity	1) Automobile & rotary parts (F.C. & DCI) 7,920T/Y 2) By order production (F.C. & DCI) 1,680T/Y 3) Hand molding (S.C.) 2,400T/Y	1) Flange 1,380T/Y 2) Gear 1,380T/Y 3) Automobile parts 1,380T/Y 4) Mild steel bolt 230T/Y 5) High tensile bolt 230T/Y	1) Transmission parts of mini tractor 800 sets/Y 2) Transmission parts of small lathe 200 sets/Y	1) Steel plate products 1,500T/Y	1) Steel press products 1,380T/Y	1) Steel products & steel struction 1,500T/Y
	Total 12,000T/Y	Total 4,600T/Y	Total 1,000 sets/Y	Total 1,500T/Y	Total 1,380T/Y	Total 1,500T/Y
Operation	2 shift	2 shift	2 shift	1 shift	2 shift	1 shift
Land area	15,000 m^2	4,680 m^2	3,000 m^2	3,000 m^2	1,060 m^2	8,500 m^2
Building area	9,010 m^2	1,600 m^2	1,480 m^2	890 m^2	656 m^2	5,095 m^2
Employees (Persons)	272	102	163	90	25	97
Electric receiving capacity	7,000 KVA	700 KVA	800 KVA	400 KVA	250 KVA	600 KVA

Table A-9.2 EQUIPMENT & MACHINERY LIST OF CASTING SHOP

Section	Name	Quantity	Specification
Pattern	Band saw	1	
	Side cutter	1	
	Automatic planer	1	
	Planer	1	
	Electric tools	1	
	Hand tools	4	
	Vise	4	
	Enlarged scale	1	
	Surface plate	2	$1^M x 2^M x 0.2^M$
Melting	High frequency induction furnace	2	2^T, two furnece
	High frequency induction furnace	2	1^T
	Upper ladle	6	2^T
	Lower ladle	4	1^T
	Weight machine	2	200 kg
	Lifting magnet	2	1^T
	Ladle drying barner	3	
Sand preparation & molding	Static pressure molding line	1	60 Mold/Hr $600^W x 700^L x 250^H$
	Green sand preparation system	1	
	Self setting sand preparation system	1	5 T/Hr
	Self setting sand molding conveyor line	2	$1M^W x 30M^L$
	Flasks for hand molding	60	$1,500^{SQ} x 300/300$
Trimming	Shot blast	1	Hanger type
	Shot blast	2	5^T, Table type
	Fixed grinder	20	350ø, double head type
	Swing grinder	5	400ø
	Hand grinder	15	5ø inner angle
	Welding machine	5	CO_2 semi auto type
	Gas cutting torch	5	Including hose
	Heat treatment furnace	2	10^T 2Mx4M
	Heat treatment furnace	2	5^T 2Mx3M
Machining	Horizontal turning mill	1	1M
	Lathe	4	6 feet length
	Lathe	4	8 feet length
	Floor type horizontal boring	1	120 m/m
	Horizontal boring machine	1	75 m/m
	Milling machine	1	Type 3
	Drilling machine	1	1,500 m/m
	Shaper	2	24 inch
Inspection & testing	Fluoresee x-ray spectro graph	1	
	C.S. analizer	1	
	CE meter	1	
	Tensile tester	1	30^T
	Hardness tester	1	
	Charpy impact tester	1	30 kg-m
	Ultrasonic tester	1	
	Magnetic perticle tester	1	
	X-ray tester	1	
	Metellographic micro scope	1	
	Pressure tester	1	30 kg/cm^2
	Standard sieving machine	1	
	Permeability tester	1	
	Compression strength tester (sand)	1	
	Inspection iron board	2	$1^M x 2^M x 0.2^M$
	Measuring apparatus	1	
Handling	Floor operating crane	1	10^T
	Floor operating crane	6	5^T
	Hoist crane	2	5^T
	Forklift	2	2^T
	Motrack	3	1.5^T
Utilities	Electric receiving unit	1	Capacity 7,000 KVA

Table A-9.3 EQUIPMENT & MACHINERY LIST OF FORGING SHOP

Section	Name	Quantity	Specification
Forging	Material stock yard	1	10^m x 1.5^{mH} x 10^{space}
	Band saw	1	Cap 50 cm^2/min
	Frame planer	1	Table 5^m x 1^m
	Furnace	2	Batch system direct heating furnace 1250°C, 2 ton 1.5^{mW} x 2^{mL} x 1.5^{mH}
	Pneumatic hammer (1)	2	Pneumatic hammer drop system C-frame type 1 ton
	Pneumatic hammer (2)	1	Pneumatic hammer drop system C-frame type 2 ton
	800t Hydraulic press	1	Effective area 1 m^2
	200t Trimming press	2	Crank mecha-press
	Forklift with manipulation	1	200 kg
	Friction press	1	25 ton, max 50mm ø
	Quenching furnace	3	2^{mW} x 2^{mL} x 1.5^{mH} Direct heating type 950°C, 3 ton
	Water quenching bath	1	3^m x 3^m x 3^m Pump 1000 L/min
	Oil quenching bath	1	3^m x 3^m x 3^m Pump 1000 L/min
	Cooling tower	1	50,000 Kcal/H water tank 125 m^3
	Tempering furnace	2	700°C 3 ton
	Die	1	Car flange & gear Die 170 (20 ton)
	Stock yard	1	Pallet for 2 ton
Machining	Surface table	2	2^m x 3^m
	NC Lathe	3	300ø x 600^L
	NC Lathe	1	500ø x $1,000^L$
	Lathe	2	5,000ø x $2,000^L$
	Lathe	2	1,000ø x $3,000^L$
	Trimmer	2	9ø ~ 30ø Bolt head
	Thread rolling machine	2	9ø - 30ø Bolt thread
	Shaper	1	Table 0.5^{mW} x 1.5^{mL}
	Plano miller	1	Table 1^{mW}x2^{mL}
	Radial drilling machine	2	Arm 0.5^m Bit dia < 50ø
	Radial drilling machine	4	Bit dia < 20ø
Inspection	Hardness tester	1	
	Ultrasonic testing machine	1	
	Magnetic particle testing machine	1	
	X-ray tester	1	
	Amsler universal testing machine	1	50 ton
	Impact testing machine	1	
	Grinding machine	1	
	Milling machine	1	
	Sawing machine	1	For test pice
	Lathe	1	For test pice
	Universal testing machine	1	With x-ray
Packing & store	Stencil machine	1	
	Product ware house	1	With pallet 25 units
Transport & service	Over hand travelling crane	2	5 ton x 12^m span
	Forklift	3	2 ton
	Air compressor	1	
	Electric receiving unit	1	Capacity 700 KVA

Table A-9.4 EQUIPMENT & MACHINERY LIST OF MACHINING SHOP

(1/2)

Section	Item	Q'ty	Specification
Machining Shop	Layout machine	3	Height 500
	CNC lathe	3	CC 500 ø200
	Turret lathe	2	
	Lathe	4	
	Machining center	3	
	Shaper	2	
	Radial drilling m/c	2	
	Multiaxis drilling m/c	1	
	Drilling m/c	3	
	Milling m/c	2	Vertical
	Milling m/c	2	Horizontal
	Boring m/c	2	
	Gear hobbing m/c	3	ø150
	Gear hobbing m/c	1	ø350
	Gear shaper	1	ø300
	Straight bevel generator	1	ø150
	Spriral bevel generator	1	ø300
	Key seater m/c	1	
	Cylindrical grinder	2	
	Plane grinder	1	
	Gear grinder	3	
	Surface plate	5	
	Universal grinder	1	
	Floor grinder	1	
	Tool grinder	2	
	Hob sharpener	1	
	Grinding wheel balancer	1	
	Cutting tool	1	
	Grinding wheel	1	
	Hand tool	1	
Measuring & Instrument	Involute tester	1	10 - 350ø
	Tooth pitch tester	2	M = 0.5 - 6
	Tooth micro meter	2	
	Hob tester	1	
	3-dimension coodinator	1	
	Roundness tester	1	
	Roughness tester	1	
	Measuring microscope	1	
	Block gauge	2	
	Height gauge	2	
	Parallel gauge	2	
	Flat gauge	2	
	Fxt. micrometer	3	
	Internal micrometer	2	
	Precision level	1	
	Square	2	
	Straight edge	2	
	V-block	4	

Table A-9.4 (Continued)

(2/2)

Section	Item	Q'ty	Specification
	Dial gauge	20	
	Dynamic balancer	1	
	Vibrometer	2	
	Other measuring tool	1	
Heat Treatment	Gas atomsphere furnace	2	
	Temparing furnace	2	
	Wash cleaning tank	2	
	Tool and jigs	1	
	Shot blaster	1	
	Universal testing m/c	1	
	Vickers hardness tester	1	
	Brinnel Hdn. tester	1	
	Rockwell Hdn. tester	2	
	Shore Hdn. tester	2	
	Magnetic particle detector	1	
	Ultrasonic detector	1	
	Microscope	1	
Utility Facilities	Overhead crane	1	1 ton
	Hoist crane	1	0.5 ton
	Compressor air	2	
	Fork lift	2	0.5 ton
	Motor vehicle	3	
	Electric receiving unit	1	800 KVA

Table A-9.5 EQUIPMENT & MACHINERY LIST OF SHEET WORKING SHOP

	Item	Specification	Quantities
1.	Surface plate	Marking 5 m x 8 m	1
2.	Surface plate	Welding 5 m x 10 m	1
3.	Automatic gas cutting machine		10
4.	Semi auto electric welding machine	arc type	3
5.	Semi auto electric welding machine	CO_2 gas type	7
6.	Hydro press	150 ton	1
7.	Bending roller	plate wide 1,500 mm plate thickness 12 mm	1
8.	Heat treatment furnace	4 m x 3 m x 4 m	1
9.	Sand blaster		1
10.	Lathe	3'-0" 5.5 kw	1
11.	Radial drilling machine	0.75 kw	1
12	Bench drilling machine	2.2 kw	1
13.	Shaper	2.2 kw	1
14.	Milling machine	5 kw	1
15.	Sawing machine	1.5 kw	1
16.	Grainder	double head type 1.0 kw	1
17.	Over head crane	3 ton	1
18.	Jib hoist	0.5 ton	2
19.	Hand cart	0.5 ton	10
20	Air compressoure		1
21.	Test & inspection tools	15 kw	1 Lot
22.	Hand tools		1 Lot
23.	Electric receiving & distribution equipment		1 Lot

Table A-9.6 EQUIPMENT AND MACHINERY LIST OF PRESS WORK SHOP

Section	Item	Q'ty	Specification
Press	Mechanical press	1	300t 30 KW
	Mechanical press	1	150t 22 KW
	Mechanical press	1	80t 7.5 KW
	Power press	1	45t 3.7 KW
	Shearing machine	1	4.5mm 3.75 KW
Metal die	Lathe 6 feet	2	5.5 KW
	Milling machine	1	type 2 5.5 KW
	Surface griner	1	(600x300) 5.5 KW
	Radial drilling machine	1	(950H) 5.5 KW
	Bench drilling machine	2	(3-11ø) 0.3 KW
	Contour machine	1	(350m/m) 1.56 KW
	Sawing machine	1	(250m/m) 1.5 KW
	Hand grinder	2	0.6 KW
	Disk grinder	2	0.3 KW
	Bench grinder	1	0.6 KW
	Vise	3	
	Surface plate	1	(500x750)
	Height gauge & other		
Service facilities	Welding machine	1	Argon 200V 6.8KVA
		2	Arc 200V 24.5KVA
	Compressor	1	(screw type) 37 KW
	Die transportation lifter	3	
	Steel rack	1	
	Pallet (folding type)	20	
	Pallet for transportation	3	
	Measuring tools and milling tools	1	
	Die	10	
	Electric receiving unit	1	250 KVA

Table A-9.7 EQUIPMENT AND MACHINERY LIST OF STEEL FABRICATION SHOP

Section	Name	Q'ty	Specification	
No. 1 Shop	3t overhead travelling hoist	1	span about 19m	3.9 KW
	5t overhead travelling hoist	1	span about 19m	6.5 KW
	High speed cutter	1	5HP	
	Pipe bender	1	pipe dia 65A, hydro-manual operation	
	Angle cutter	1	max. angle 13x100x100	2.2 KW
	200t hydro press	1	plate width: 2,500mm plate thickness: 16mm	18 KW
	2t jib hoist	2		2.6 KW
	Bending roller	1	plate thickness: 13mm plate width: 3,200mm	12.5 KW -
	Turning roller	2	max. load: 5t dia: 350mmø - 3,000mmø length: 2,000mm - 12,000mm	-
	Electric welding equipment	70 10 2	ARC - welder CO_2 - welder MIG - welder No. 1 & No. 2 shop	
No.2 Shop	High speed cutter	1	5HP	
	3t overhead travelling hoist	2	span about 19m	3.9 KW
	Angle cuttter (uni-cutter)	1	capacity: (1) Punching: 16mm x 19mmø (2) Shearing: 9mm x 300mm 13mm x 100mm Angle 13x100x100	2.2 KW
	Radial drilling machine	1	small type bite: 4mmø - 50mmø	0.75 KW
	Grinder	1	bench type, 255mmøx2	0.94 KW
	Eye-tracing gas cutting maching	1	1,200x400 4 burner	
	Radial drilling machine	1	22 KW brass: 110mmø, HT steel: 50ø	
	Grinder	1	bench type of item no. 24	0.94 KW
	Shearing machine	1	7.5HP shearing capacity: 6.0mm x 3,100mm	
	Vibro-shear	1	steel: 0.6-3.2mm sus: 0.6-1.0mm	1.5 KW
	Press brake	1	capacity: 4.5mm x 2,500mm	6.5 KW
	Pipe bender	1	hydro operated, 100ø pipe	15 KW
	Shearing machine	1	7.5HP, capacity 6mm x 3,100mm	
	Punching machine	1	32mmø x 8mm, 32mmsq x 8mm	2.2 KW
	Shearing machine for square bar	1	32mmsq, 32mmø	2.2 KW
	Angle cutter	1	punching 16mm x 19mmø shearing 9mm x 300mm 13mm x 100mm Angle 13 x 100 x 100	2.2 KW
	Hydro press	1	55t	2.2 KW
	Portable hand roller	1	plate width: 1,000mm	-
	0.5t jib hoist	4	fixed type	0.75 KW

Table A-9.8 ESTIMATED PROJECT COST OF CASTING

(UNIT: US$1,000)

Item	Foreign	Local	Total
1. Plant direct cost			
(1) Equipment, materials	5,451.6	-	5,451.6
(2) Spare parts	167.8	-	167.8
(3) Ocean freight,	100.0	-	100.0
Insurance	136.8	-	136.8
Inland transportation	-	40.0	40.0
(4) Civil & erection	145.1	3,498.4	3,643.5
(5) Office accommodation & facilities	-	98.4	98.4
(6) Engineering & supervising	167.1	-	167.1
(7) Over head expense (10%)	616.8	363.7	980.5
Sub-total	6,785.2	4,000.5	10,785.7
2. Tax and duty			
(1) Import tax (CIFx10%)	-	585.6	585.6
(2) Import sales tax (CIFx10%)	-	585.6	585.6
(3) Value added tax (Localx10%)	-	400.0	400.0
Sub-total	-	1,571.2	1,571.2
3. Working capital (3 months of variable cost)	-	2,174.2	2,174.2
4. Contingency & other (20%)	1,357.0	1,549.2	2,906.2
Grand-total	8,142.2	9,295.1	17,437.3
Production capacity (T/Y)			12,000
Investment cost per ton of product ($/T)			1,500

Table A-9.9 ESTIMATED PROJECT COST OF FORGING

(UNIT: US$1,000)

Item	Foreign	Local	Total
1. Plant direct cost			
(1) Equipment, materials	3,135	-	3,135
(2) Spare parts	73	-	73
(3) Ocean freight,	50.0	-	50.0
Insurance	69.5	-	69.5
Inland transportation	-	20.0	20.0
(4) Civil & erection	30.2	980.2	1,010.4
(5) Office accommodation & facilities	-	62.7	62.7
(6) Engineering & Supervising	153.0	-	153.0
(7) Over head expense (10%)	351.1	106.3	457.4
Sub-total	3,861.8	1,169.2	5,031.0
2. Tax and duty			
(1) Import tax (CIFx10%)	-	332.8	332.8
(2) Import sales tax (CIFx10%)	-	332.8	332.8
(3) Value added tax (Localx10%)	-	116.9	116.9
Sub-total	-	782.5	782.5
3. Working capital (3 months of variable cost)	-	979.6	979.6
4. Contingency & other (20%)	772.4	586.3	1,358.7
Grand-total	4,634.2	3,517.6	8,151.8
Production capacity (T/Y)			4,600
Investment cost per ton of product ($/T)			1,800