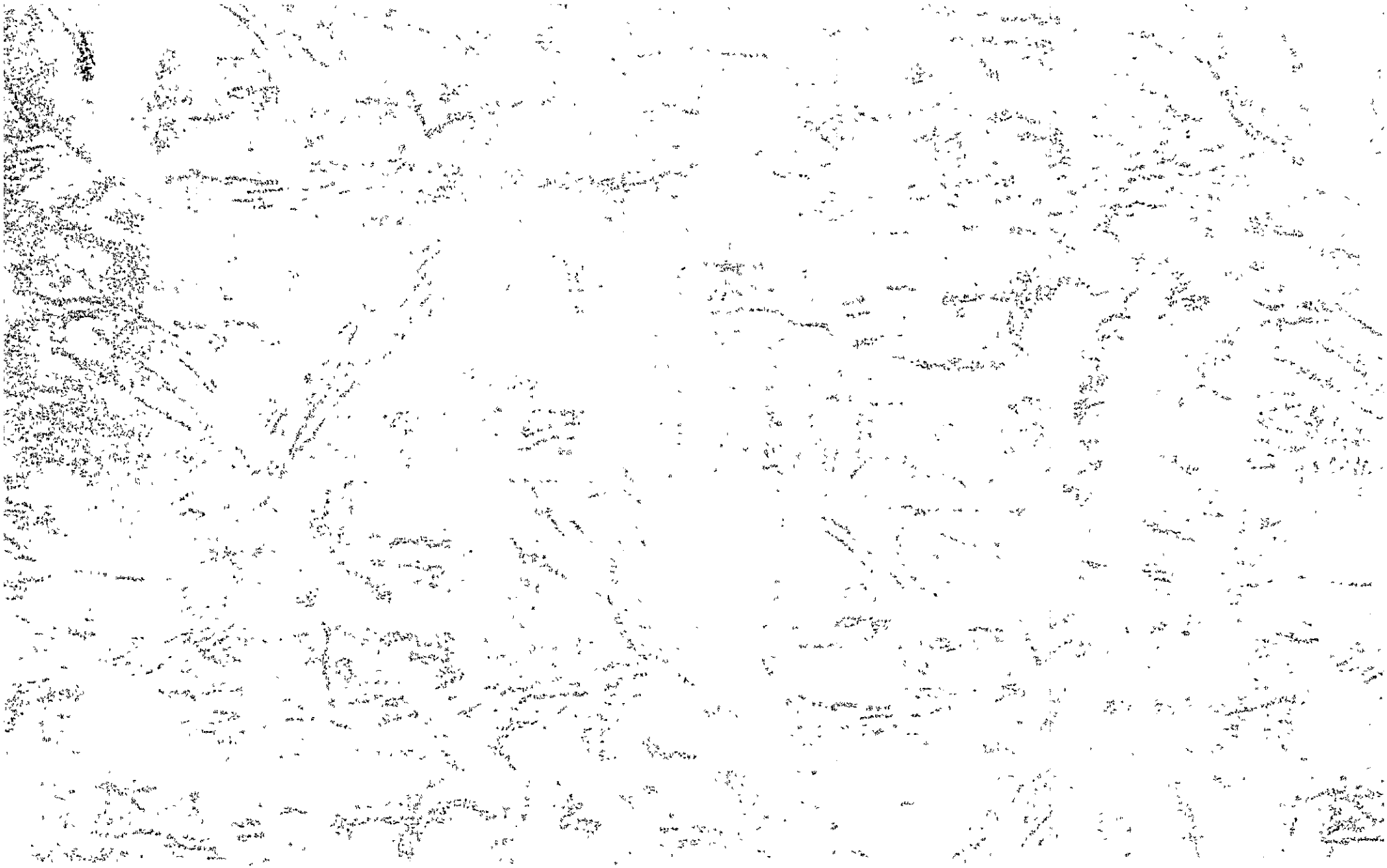
BASIC DESIGN STUDY REPORT
ON
SCHOOL TEXTBOOK PRINTING AND EXERCISE BOOK DEVELOPMENT PROJECT
IN
THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

JUNE, 1983

JAPAN INTERNATIONAL COOPERATION AGENCY



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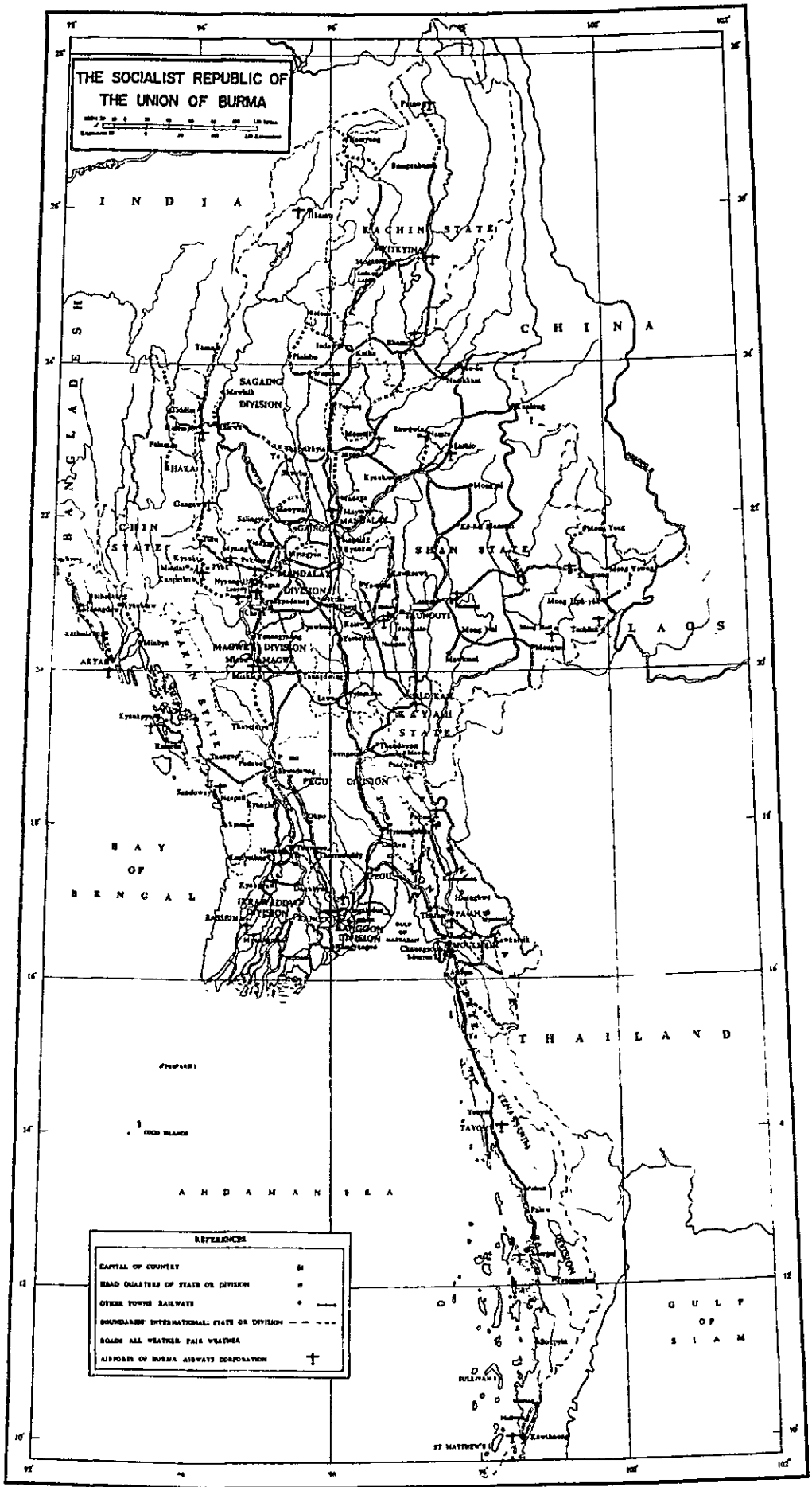

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PREFACE

In response to the request of the Government of the Socialist Republic of the Union of Burma, the Government of Japan decided to conduct a Basic Design Study for School Textbook Printing and Exercise Book Development Project and entrusted the study to the Japan International Cooperation Agency (JICA). The JICA sent to Burma a Study Team headed by Mr. Takaharu KAZAMA, Executive Director, JICA from April 3 to 13, 1983.

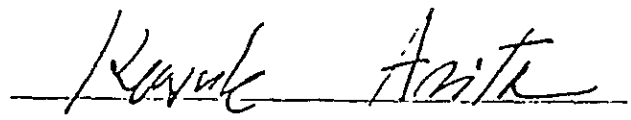
The team had discussions with the officials concerned of the Government of Burma and conducted a field study in Rangoon area.

After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Socialist Republic of the Union of Burma for their close cooperation extended to the team.

June 1983



Keisuke Arita
President
Japan International Cooperation Agency

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SUMMARY

Since its independence in 1948, the Government of the Socialist Republic of the Union of Burma has emphasized the importance of the education of the youth, who will play important roles in the development of the nation. It has abolished the educational system of the colonial period and established the existing educational system, consisting of 5-year primary school education, 4-year secondary school education, 2-year high school education and higher education. The purposes of the 11-year primary education are 1. to educate the people to build and protect Burmese socialism, and 2. to provide for vocational education required for building Burmese socialism. The Burmese Government is planning to put into effect the new educational system for upgrading the country's education, starting in 1984/1985. This new educational system includes a 1-year extension of high school education, upgrading of all primary education curricula (increase in number of textbook types), revision of school textbooks, preparation of teacher guidebooks and so on.

The production of textbooks and exercise books for primary education is under the control of the Ministry of Information, which distributes such books for purchase. These textbooks and exercise books are manufactured by the Printing and Publishing Corporation (PPC) at its three factories (all located in the city of Rangoon). The existing production capacity of these three plants is 11,160,000 textbooks (of 38 textbook types) and 50,000,000 exercise books per year. However, the above-mentioned new educational system will generate new demand of 13,420,000 textbooks (of 85 textbook types), 55,700,000 exercise books and 470,000 teacher's guidebooks per year, all of which cannot be met by the existing production capacity of the PPC. To make matters worse, the production facilities owned by the PPC have become obsolete, resulting in reduced printing capabilities and increased maintenance and control expenses. Under these circumstances, the Government of the Socialist Republic of the Union of Burma has worked out the "School Textbook Printing and Exercise Book Production Development Project" with the objective of increasing the capacity

of the PPC production facilities, and has asked the Japanese Government to extend grant aid which is one of Japan's economic cooperation to provide developing countries with nonreimbursible funds.

Upon receiving this request, the Japanese Government decided to conduct a study as to the basic design for this Project. The JICA dispatched the Basic Design Study Team from April 3 to 13, 1983 to study with Burmese officials and to study conditions in PPC printing factories. After returning to Japan, the Study Team analyzed collected information and data, then finally drafted the Fundamental Design Proposal for the Project.

As regards printing machines required for implementation of the Project, the Study Team concluded that the following plan would be adequate, based on the estimate of demand 5 years from now and on the assumption that the machines will be operated for 1.5 shifts (12-hour/day).

① Textbook production equipment:

Two-face, four-color offset rotary press printer	1
Binding machine (4 models)	5

② Exercise book production equipment:

Wire binding, semi-automatic exercise book manufacturing machine	2
Guillotine cutter for bookbinding	4

③ Others:

Forklift (for transportation)	1

The equipment provided by the Japanese Government under this Project would be best installed at the PPC Photolitho Press Factory, according to the study results.

The implementation of this Project will not only increase the PPC's capacity to produce textbooks and exercise books, thus contributing greatly to the upgrading of education through the new educational system to be put into effect in the 1984/1985 school year, but will also have other, secondary effects, including improvement of the technology of Burmese engineers through the introduction of new machines, and the expansion of employment. In view of the fact that the Project has these favorable effects and that is relates to education of the youth, or important human resources for the nation's future, the Project should be implemented, with the Japanese Government grant aid.

Before starting the Project, it is essential that the Government of the Socialist Republic of the Union of Burma make available space for installation of the machines, recruit personnel for operating the machines, secure the supply of electricity and procure funds for maintenance and control expenses. The past records of the PPC show that the engineers presently at the PPC will be able to operate the machines provided under the Project; nevertheless, it is recommended that, in this opportunity of introducing new machines, PPC personnel is to be sent to Japan and other foreign countries to acquire new skills and technologies in the field of printing. This would definitely have a great influence on the development of the printing industry in the Socialist Republic of the Union of Burma.

I. PURPOSES OF THE STUDY

In response to a request by the Government of the Socialist Republic of the Union of Burma, the Government of Japan decided to dispatch through the Japan International Cooperation Agency (JICA), a study team for the School Textbook Printing and Exercise Book Production Development Project.

The Study Team, headed by Mr. Takaharu Kazama, Executive Director of the JICA, conducted a study regarding the basic design of this Project in the city of Rangoon from April 3 through 13, 1983.

The objectives of the study were to ascertain the details of the request, to collect data and information necessary for drawing up the optimal basic design and administrative and control plans, and to examine the suitability of the Project in sociological and technical terms. To achieve these objectives, the Study Team classified the matters to be investigated in the following manner.

① Study regarding the background and contents of the request
   a. General social and economic conditions
   b. Administrative organizations related to education
   c. Education system and present status of education
   d. Priority among proposed projects and the details of projects related to this Project
   e. Details of the New Educational System
   f. Textbooks and exercise books supply and demand
   g. Data concerning population growth, population at school age, percentage of school attendance, etc.

② Study regarding the basic plan
   a. Product specifications for textbooks and exercise books
   b. Quality and supply of major and subsidiary materials
   c. Present conditions of factory administration (Administration and control, organization, labor, etc.)
   d. Present conditions of equipment control (Production conditions of existing equipment, manufacturing and maintenance technology, etc.)

③ Study regarding the basic design

a. Production system, space available, major machines, auxiliary machines, structure of factory, supply of electricity and water, etc.

b. Data for determining the method of technical training concerning operation and maintenance of the equipment as well as personnel plan

④ Study regarding conditions for transportation of equipment into factory and laws and regulations controlling delivery

As regards each of the above-mentioned matters, the Study Team visited the proposed factories, gathered information and data, exchanged opinions with people concerned in the Socialist Republic of the Union of Burma, and so on.

(For members of the Study Team, the study schedule and the Minutes of Discussion with the Burmese, refer to the annex.)

II. PRESENT SITUATION REGARDING TEXTBOOKS AND EXERCISE BOOKS IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

1. General Present Situation Regarding Textbooks and Exercise Books

Today in the Socialist Republic of the Union of Burma, textbooks and exercise books for primary school pupils through high school students are under the control of the Ministry of Information, and are distributed for purchase. The PPC is in charge of the production of textbooks and exercise books, which are sold by the Paper Stationary Printed Matter and Photographic Stores Trade Corporation (TC), through 40 outlets throughout the nation, to each school. In each school, teachers, students' cooperative and P.T.A. purchase textbooks and exercise books collectively, pay the price thereof to the TC, and distribute them to each pupil/student.

An example of the cost and selling price of textbooks and exercise books follows.

Table II-1

	Size	Number of Pages	Cost (kyats)	Price T.C. Pays (kyats)	Price Pupil/ Student Pays (kyats)
Textbook (A)	Large	64P	1.63	1.68	1.75
Textbook (B)	Small	64P	1.16	1.20	1.60
Exercise book		80P	1.02	1.16	1.25

It is clear that textbooks and exercise books are sold to pupils/students at fair prices, takig into consideration production volume and other factors.

Now, let us turn to supply/demand conditions regarding textbooks and exercise books in the Socialist Republic of the Union of Burma. At present, with an annual production of 11,160,000 textbooks and 50,000,000 exercise books, supply and demand are well balanced. However, the numbers of textbooks and exercise books provided to each pupil/student are 2.0 and 9.0 per year, respectively, as the number of pupils/students enrolled at primary, secondary and high schools stood at 5,525,096 according to the 1981/1982 statistics.

These figures are not satisfactory, in comparison with Japanese pupils/students, who receive 9.5 textbooks and 26 exercise books each per year.

With the new educational system of the Socialist Republic of the Union of Burma, which is to come into effect in 1984/1985, the demand for textbooks and exercise books is expected to grow drastically. As will be described in III-2-2, Estimation of Future Demand, the Government of the Socialist Republic of the Union of Burma expects that the demand for textbooks and exercise books will reach 26,500,000/year and 100,000,000/year in the near future, respectively.

2. Production System

The PPC, which is in charge of manufacturing textbooks and exercise books, manages and operates four factories in Rangoon. One of these factories is engaged in the printing of governmental publications alone, the other three factories, mentioned below, producing school textbooks and exercise books, governmental publications, quarterly and monthly magazines and forms. In these latter three factories, production of textbooks and exercise books accounts for about 60% of their total production.

Sarpay Beikman Press, Prome Road, Rangoon
Photolitho Press, Campbell Road, Rangoon
Form Printing Press, Aung San Myo, Rangoon

These three factories have 248 working days per year and 8-hour daily working time (8:00 ~ 12:00 and 12:30 ~ 16:30).

Normally, 1-shift (8 hours) is devoted to the production of textbooks, with 4-hour overtime added when there is large demand, while 2-shift (16 hours) are used for exercise books.

3. Present Conditions of the Facilities

3-1 Present Conditions of Equipment Control

Most of the production equipment now installed in the above-mentioned three factories was purchased in the 1960's, and has become obsolete. However, judging from the fact that it is still operated at a capacity close

to that it originally had, it is clear that Burmese technology for operating and maintaining such equipment may be deemed fairly high.

As regards the supply of electrical components, printing rubber rollers and other parts, the Socialist Republic of the Union of Burma is almost entirely dependent on import. Under such circumstances, it is almost impossible to seek a domestic supply of components and parts. Moreover, since the equipment is very old, procurement of the exact components is next to impossible.

For this reason, about 30% of the production equipment in the Socialist Republic of the Union of Burma is idle. Some printing machines are left inoperable in "scrap" condition, as parts have been removed for use in other machines of the same model.

As for 4 unit web offset printing machines, which were introduced in 1965 and 1970, parts of a 1-color unit are removed for use in another printing unit; as a result, such offset printing machines are operated for printing 2 $\sim$ 3 colors.

As for maintenance of equipment and machinery, each of these three factories has a repair section. One engineer is assigned in each of the Machinery and Electrical Divisions, and they are 30 years old on the average, having approximately 10 years of experience. Each of these engineers has 4 $\sim$ 5 assistants so that they can jointly carry out maintenance and repair.

The machine tools available in one factory include one lathe, one drilling machine, and one grinder. When one considers the size of the factory and the number of machines installed, these maintenance facilities are insufficient, and so is the number of maintenance workers.

3-2 Present Conditions of Factory Management

The Ministry of Information, which controls textbooks and exercise books in the Socialist Republic of the Union of Burma, establishes the policy of production (e.g. quantity and time of delivery), while the PPC works out the production schedules for the three factories. The manager of

each factory checks the progress of production from time to time, the operation of the three factories being comprehensively controlled by the PPC.

Individual factories have different production items or products. First, the Sarpay Beikman Press Factory is included in the organization of the PPC and has the Textbook Manuscript Editing Section and the Block Copy Section. It mainly manufactures school textbooks and exercise books and is favorably located, but does not have enough extra space for installation of new equipment. The Photolitho Press Factory is mainly engaged in offset printing and binding of textbooks and governmental publications. Like the Sarpay Beikman Press Factory, this factory is located in Rangoon. It has a spacious plant and building areas, thus offering enough extra space. Since the numbers of machines and employees are still limited, there is ample room for expansion in the future. The Form Printing Press Factory is unfavorably located, in geographical condition; it is more than 45 minutes' drive from Rangoon. Also, since the factory is built on a tableland, there is inconvenience as to the water supply. This is why offset printing is not carried out here; instead, letterpress machines and rubber plate printing machines are installed. This factory is engaged in the printing of forms and tickets and bookbinding. When emergency demand arises, employees' families are called to work to manufacture textbooks and exercise books.

Next, working conditions in these factories. Since the factory buildings are large, the equipment and machinery are laid out in an orderly fashion and every room is kept neat. In the printing room, however, it is recommended that the lighting will be improved for better maintenance of machines as well as for better quality control of printed matter.

Cost-consciousness at these factories seems rather low. The number of workers in charge of each machine is about double the number in Japanese factories, and this number should be reduced, although it may run counter to the promotion of employment. For example, about 10 workers operate one 4 unit web offset printing machine, 7 ~ 8 workers one wire binding machine, 5 workers one sheet-fed rotary offset printing machine, and so on.

The material loss is high. For example, the rate of paper loss during exercise book production to finishing dimensions is about 10%. In Japan, the figure is about 5%. In order to reduce such loss, which accounts for a major part of the cost of exercise books, commissions such as a Quality Control Commission and Cost Control Commission should be established for the purpose of reviewing the materials used and improving equipment and machinery.

3-3 Existing Problems

The PPC has the follwong problems.

(1) It has not enough know-how for improvement of equipment operating ratio.
(2) There are not enough skilled engineers or operators.
(3) Most of the equipment and machinery now available are obsolete, having exceeded their service life.
(4) Procurement of spare parts for the existing equipment and machinery is difficult.

The above problems (1) and (2) are commonly experienced by developing contries, and are not peculiar to the Socialist Republic of the Union of Burma. Though the PPC has sent its engineers to Europe and Japan for the purpose of improving its technical capability, the efforts have not borne satisfactory results. Moreover, even if such engineers acquire skills and learn new technologies, they are not fully used, since, there is a wide gap between theory and actuality in the Socialist Republic of the Union of Burma, where new equipment has not been introduced for more than a decade. The know-how needed to improve the efficiency of textbook and exercise book production is only won by accumulation of technology through the improvement and upgrading of equipment and machinery. In this regard, these problems seem difficult to resolve, especially for the Burmese, who have inadequate maintenance facilities and means of improvement.

Problems (3) and (4) are also serious, as already referred to in II-3-1, Present Conditions of Equipment Control.

III. BASIC PLAN

1. Basic Policy

The basic project shall be drawn up in accordance with the following policy, taking into consideration the textbook and exercise book quality and manufacturing technology in the Socialist Republic of the Union of Burma.

(1) The level of automation of production equipment and machinery shall be designed taking into account the need to expand employment and the existing levels of manufacturing and maintenance technique in the Socialist Republic of the Union of Burma.

(2) Products to be manufactured shall be textbooks and exercise books such as are now being produced in the Socialist Republic of the Union of Burma. Particularly in the case of exercise books, the equipment and machinery shall be capable of responding to future change in the content and size of exercise books.

(3) The scale of production of textbooks and exercise books hereunder is set at 13,500,000 textbooks and 50,000,000 exercise books per year, so as to fill the gap between supply and demand in future.

(4) Based on the findings of the research as to the conditions and surplus space of the three factories under the control of PPC, the production equipment shall be installed on the Photolitho Press site.

2. Study of the Project

2-1 Analysis of Request

Outline of Equipment List submitted by the Government of the Socialist Republic of the Union of Burma is as follows.

Table III-1

	Priority	Equipment Name	Capacity and Specifications		Quantity
Exercise book production equipment	1	Wire-stitching exercise book manufacturing machine	Production capacity	12,000 books/hr	3
	8	Guillotine cutter	Max. trimming dimension	1,070mm	6
Textbook production equipment	2	4 unit web offset printing machine	Max. reel width Plate cylinder circumference	889mm 578mm	1
	3	2 unit web offset printing machine	Max. reel width Plate cylinder cirumference	889mm 578mm	2
	4	2 color sheet-fed rotary offset printing machine	Max. sheet dimensions Capacity	711 × 1,016mm 10,000 sheets/hr	2
	7	Process camera	Film dimension	533 × 635mm	1
	5	Wire binding machine	Gathering ∿ Wire binding ∿ Three knife trimming		2
	6	Stitching machine			10
Auxiliary equipment	9	Fork lift	Diesel engine 5 ∿ 2 tons		5
	10	Knife grinding machine	Max. grinding length	1,170mm	1

If all the above-mentioned equipment is supplied, the production capacity can be estimated as follows.

Textbooks	Converted into large textbooks consisting of 96 pages	5 printing machines of three different models 1-shift operation	20,000,000 books/year
Exercise books	Converted into exercise books consisting of 80 pages	3 automatic production machines 1-shift operation	50,000,000 books/year

This estimation is based on the following conditions.

Number of working days : 248 days/year
Regular working hours : 8 hours
Equipment available rate: 70%

The future supply/demand gaps of textbooks and exercise books are 13,500,000/year and 50,000,000/year, respectively. The request made by the Government of the Socialist Republic of the Union of Burma is construed as aiming at the producrion of such quantities with a 1-shift operation. However, in view of the existing production conditions in the Socialist Republic of the Union of Burma, or 1.5- to 2-shift operation, the specifications of the proposed equipment seem excessive.

As for the details of the equipment, the proposed offset printing machine models (4 and 2 unit web) included in the textbook production equipment are not desirable, since they are of the same specifications, in terms of plate cylinder circumference, as the newspaper press owned by NPC; therefore, their use would result in considerable loss of materials if the existing textbook standards are maintained.

2-2 Estimation of Future Demand for Textbooks and Exercise Books

(1) Education-related data 1981/1982

Table III-2

	Number of Schools	Number of Teachers	Number of Pupils/ Students	Number of Pupils/Students of School Age	Percentage of School Attendance
Primary school	23,499	86,354	4,392,520	4,578,000	95.9%
Secondary school	1,422	23,227	910,177	3,944,000	23.1
High school	626	12,498	222,399	3,458,000	6.4
Total	25,547	122,079	5,525,096	11,980,000	46.1

(2) Additional demand for textbooks and exercise books due to the new educational system

Assuming that the new educational system is implemented in 1981/1982,

a) Estimated increase in number of teachers and pupils/students

Table III-3

	Number of Teachers	Number of Pupils/ Students	Number of Pupils/Students of School Age	Percentage of School Attendance
Primary school	86,354	4,392,520	4,578,000	95.9%
Secondary school	23,227	910,177	3,944,000	23.1
High school	[18,747]	[333,599]	3,458,000	[9.6]
Total	[128,328]	[5,636,296]	11,980,000	[47.0]

* Boxed figures are estimated.

b) Estimated increase in number of texbooks due to change in textbook types

Table III-4

	Present		After the New Educational System	
	Number of Types	Number of Textbooks	Number of Types	Number of Textbooks
Primary school	16	9,550,000	16	9,550,000
Secondary school	17	1,400,000	24	[1,980,000]
High school	5	210,000	45	[1,890,000]
Teacher's manuals and dictionaries	—	—	24	[470,000]
Total	38	11,160,000	109	[13,890,000]

(Assuming that these Teacher's Manuals and dictionaries are distributed to all secondary school and high school teachers)

* Boxed figures are estimated.

c) Number of textbooks per pupil/student

Present : 1,116/552.5 = 2.0 textbooks/year

After the new educational system : (955 + 198 + 189)/563.6 = 2.4 textbooks/year

d) Number of exercise books per pupil/student

Present : 5,000/552.5 = 9.0 exercise books/year

After the new educational system : 5,570/563.6 = 10.0 exercise books/year

Demand caused by increase in the number of pupils/students:

$90,000 \times 222,000 \times 1/2 \fallingdotseq 1,000,000$ books/year

Demand caused by increase in the types

$(910,000 \times 70,000 + 333,000 \times 400,000) \times 9/38$

$= 4,660,000$ books/year

$50,000,000 + 1,000,000 + 4,660,000 \fallingdotseq 55,700,000$ books/year

(3) Estimation of future demand

The future demand is estimated on an annual 2.8% increase in the number of pupils/students, which is calculated from statistic over the past decade (and which includes an annual 0.8% increase in the percentage of school attendance).

a) Estimation of demand, assuming 2.4 textbooks and 10 exercise books per pupil/student (Unit: million books)

Table III-5

	After 3 years	After 5 years	After 10 years
	1984/85	1986/87	1991/92
2.4 textbooks per pupil/student	14.7	15.5	17.8
10 exercise books per pupil/student	61.3	64.8	74.3

b) Number of books per pupil/student if the demand of 26,500,000 textbooks/year and 100,000,000 exercise books/year is assumed after 3, 5 and 10 years

Talbe III-6

	After 3 years	After 5 years	After 10 years
	1984/85	1986/87	1991/92
3.6 textbooks per pupil/student	22.1	23.3	26.5
13.4 exercise books per pupil/student	82.1	86.8	100.0
4.1 textbooks per pupil/student	25.1	26.5	
15.4 exercise books pupil/student	94.4	100.0	
4.3 textbooks per pupil/student	26.5		
16.3 exercise books per pupil/student	100.0		

Now let us consider the demand of 26,500,000 textbooks and 100,000,000 textbooks per year calculated by the Government of the Socialist Republic of the Union of Burma.

Assuming that the new educational system is put into effect in 1981/1982, the numbers of textbooks and exercise books per pupil/student will increase from the present 2.0 to 2.4 and from the present 9.0 to 10.0, respectively. If increase in the number of pupils/students is taken into account, the demand for textbooks and exercise books will reach 17,800,000/year and 74,300,000/year, respectively, in 10 years, which produces a considerable difference from the demand estimated by the Government of the Socialist Republic of the Union of Burma. In this regard, the estimate given by the Socialist Republic of the Union of Burma seems intended to provide about 4 textbooks and 15 ~ 16 exercise books per pupil/student 3 ~ 5 years from now, as indicated in the preceding table.

Incidentally, the numbers of textbooks and exercise books provided to pupils/students in Japan are as follows.

Table III-7

	Number of Schools	Number of Pupils/ Students	Number of Texbooks	Number of Exercise Books, Notebooks and Report Pads
Primary school	25,000	11,750,000	116,000,000	}
Secondary school	11,000	5,700,000	52,000,000	}
Total	36,000	17,450,000	168,000,000	450,000,000

From this table, it is clear that a Japanese pupil/student is provided with 9.5 textbooks and 26 exercise books (including notebooks and report pads) per year. In this connection, the estimated demand in the Socialist Republic of the Union of Burma is deemed reasonable, in comparison with the situation in Japan.

2-3 Standards of Textbooks and Exercise Books

1) Textbook standards

①	Size	
	o Large	175mm × 241mm
	o Small	124mm × 175mm
②	Number of pages	32P ~ 448P
③	Printing colors	1 ~ 4 colors
④	Bookbinding forms	
	o Thin book	Center binding (wire stitching)
	o Thick book	Side binding (wire stitching and partially thread binding) with glued-on cover
⑤	Materials	
	o Inside paper	55g/m^2 (lower-grade wood-free paper)
	o Cover paper	200g/m^2
	o Binding wire	Low carbon steel wire rod (copper-plated)
	o Glue for cover	Hot melt glue

2) Exercise book standards

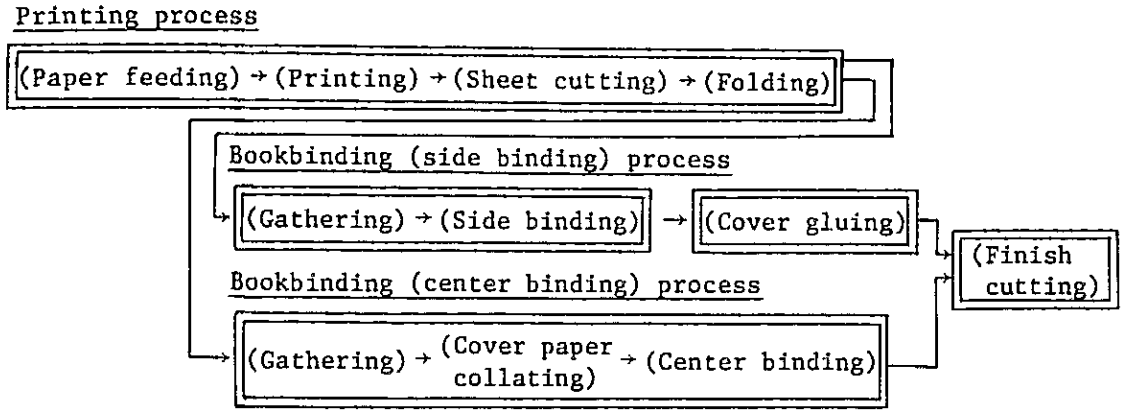
①	Size	160mm × 210mm
②	Number of pages	40P, 80P
③	Printing colors	1 ~ 2 colors
④	Bookbinding form	Wire stitching
⑤	Materials	
	o Inside paper	60g/m^2 (wood-free paper)
	o Cover paper	150g/m^2
	o Binding wire	Low carbon steel wire rod (copper-plated) 0.6ϕ (24#)

2-4 Production System and Scale

① Production system

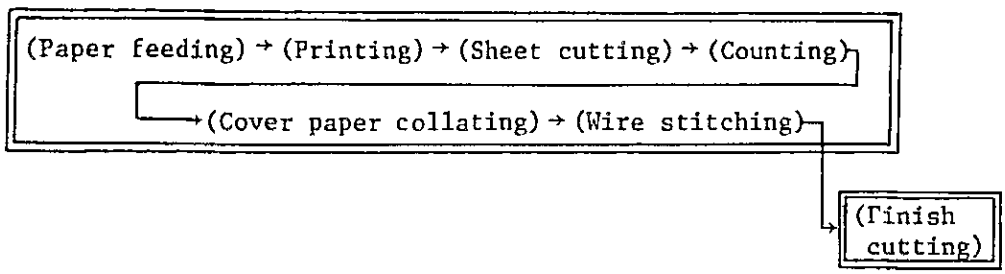
o Textbook production system

As shown in the flow chart below, the printing process from paper feeding to folding is carried out by one single-line automated machine unit; the bookbinding process is divided into two lines (center binding and side binding), in each of which single-function machines are used; finish cutting is carried out using a single-function machine.



o Exercise book production system

The process from paper feeding to wire stitching is carried out using a single-line automated machine; only finish cutting is carried out with a single-function machine.



Note: ( ): Name of process
▭: Machine unit

② Production scale

The production capacity of the proposed equipment is shown in Table III-8.

As regards textbooks of the total estimated demand of 26,500,000/year, about 7,400,000/year (approx. 28%) will be printed in four colors. If this quantity is all printed with new machines, the number of shifts will be about 1.15 (in the case of production large-size textbooks consisting of 96 pages). Given a 1.5-shift operation, an excess capacity of 0.35 shifts is capable of producing about 9,000,000 one-color, 96-page textbooks. In total, 16,400,000 additional textbooks will be produced per year if a 1.5-shift operation is adopted. Thus, the supply/demand gap of 13,500,000 books/year can be filled.

As for exercise books, the new equipment is capable of producing about 33,000,000 80-page books per year, when operated for one shift. Therefore, the supply/demand gap of 50,000,000/year can be filled by about a 1.5-shift operation.

Table III-8

Production

Product	Pruduct Specifications			Production Volume	
	Size	Number of Colors Used	Number of Pages	Daily	Yearly
Textbook	Large	1 color	96P	Approx. 104,000 books/day	Approx. 25,800,000 books/year
"	"	1 "	192	52,000	12,900,000
"	"	4 "	96	26,000	6,450,000
"	Small	1 "	192	104,000	25,800,000
"	"	4 "	64	78,000	19,300,000
Exercise book	160 × 210	1 "	80	134,000	33,000,000
"	"	2 "	40	268,000	66,000,000

* Based on: 8-hour/day
248 working days/year

2-5 Construction of Equipment

The Japanese Study Team proposes the following equipment and machinery.

①	Textbook manufacturing equipment	
	a. 4 unit web offset printing machine	1
	b. Side binding machine	1
	c. Casing in machine	1
	d. Center binding machine	1
	e. Guillotine cutter	2
②	Exercise book manufacturing equipment	
	a. Wire binding exercise book semi-automatic manufacturing machine	2
	b. Guillotine cutter	4
③	Transportation equipment	
	a. Fork lift	1
④	Spare parts (2-year supply)	1 set

IV. BASIC DESIGN

1. Machine Specifications

The specifications of each machine are shown below. Basically, these specifications have been determined taking into consideration the level of mechanical technology in the Socialist Republic of the Union of Burma, the level of production and maintenance technologies at PPC factories, and the results of analysis of printing paper and materials available.

1-1 Textbook Manufacturing Equipment

a. 4 unit web offset printing machine

(1) Process

o Paper feeding (4 units) ~ o Printing (4 units) ~ o Tension control ~ o Drying ~ o Folding (2 units) ~ o Delivery (2 units)

(2) Specifications

o Web paper width	:	Max. 813mm
o Rolled paper diameter	:	Max. 1,010mm
o Cross cut length	:	546mm
o Effective printing length	:	530mm
o Speed		
Folding into 8 B4 pages	:	Max. 500/min
Folding into 16 B5 pages	:	Max. 350/min
o Paper feeding unit		
Type	:	Single-reel paper feeding system (Built into the printing unit)
Tension control	:	Air disc brake
o Printing unit		
Type	:	B-B type (surface/back simultaneous printing)
Dampening arrangement	:	4-roller system with automatic water quantity regulator
Plate installation	:	One-touch system
Printing cylinder installation	:	Switch operation

o Tension control unit

Type	:	Powder clutch system (Air-cooled)
Control speed	:	Max. 300m/min Employed for 1-web 4-color printing
o Drying unit	:	Electric heat system
o Folding unit	:	2-cylinder rotary folder with longitudinal former
o Delivery unit	:	Belt discharge system

b. Side binding machine

(1) Process

o Gathering (10-feeder) ~ o Wire stitching (at two points) ~ o Delivery

(2) Specifications

o Gathering unit	:	Rotary drum system Automatic paper feeding using a vacuum pump
o Wire stitching unit	:	Stitcher head/product synchronized system Stitching at 2 or 3 points Stitchable thickness 3 ~ 30mm
o Delivery unit	:	Stand system (piling system)
o Machine speed	:	Max. 120 books/min
o Book size	:	Max. B5

c. Casing in machine

(1) Process

o Inside paper feeding ~ o Glue ~ o Cover paper feeding ~ o Cover gluing ~ o Pressing ~ o Delivery

(2) Specifications

o Inside paper feeding unit	:	Hand feeding (by two workers)
o Glue application unit	:	Application of glue (hot melt type) on spine and sides of book
o Cover paper feeding unit	:	Feeding from bottom of pile (Automatic feeding) Folding line marking device

- o Casing in unit : Timing synchronization of inside paper and cover
- o Pressing unit : Clamp press system
- o Delivery unit : Erection system
- o Machine speed : Max. 80 books/min
- o Book size : Max. B5

d. Center binding machine

(1) Process

o Gathering (10-feeder) ~ o Cover paper feeding ~ o Wire stitching ~ o Delivery

(2) Specifications

- o Gathering unit : Automatic signature feeding system
  Transformer line ... Saddle type
- o Cover paper feeding unit : Automatic cover paper feeding system
- o Wire stitching unit : Center binding system
  Stitcher head/product synchronized system
  Stitching at 2 points
  Stitchable thickness 2 ~ 8mm
- o Delivery unit : Belt system (Overlapped delivery)
- o Machine speed : Max. 150 books/min
- o Book size : Max. B5

e. Guillotine cutter

- o Type : Guillotine-type cutting machine
- o Cutting width : Max. 1,000mm
- o Cutting thickness : Max. 145mm
- o Size setting : Manual (with digital display)
- o Safety device : Photoelectric tube system
  (Reflection type)

1-2 Exercise Book Manufacturing Equipment

a. Wire binding exercise book semi-automatic manufacturing machine

(1) Process

o Paper feeding (2 units) ~ o Printing (2 units) ~ o Cross cut/counting ~ o Cover paper feeding ~ o Gathering ~ o Folding ~ o Wire stitching ~ o Pressing ~ o Delivery

(2) Specifications

o Web paper width	:	600 ~ 860mm
o Rolled paper diameter	:	Max. 1,100mm
o Cross cut length	:	305 ~ 430mm
o Speed		
Printing un	:	200m/min
Bookbinding unit	:	50 block/min
o Paper feeding unit		
Type	:	Turret type
Rewinding speed	:	Max. 220m/min
Tension control	:	Powder brake system
Paper edge control	:	Turn bar driving system
o Printing unit		
Type	:	Flexographic (aquatic) printing Disk ruling (Rubber plate may be used with minor modification.)
Number of colors	:	2 colors each for surface and back
Printing pressure control	:	Screw type
o Cross cut and counting unit		
Cutting length	:	305 ~ 430mm change gear system
Collating sysetm	:	Tape delivery
Number of accumulated sheets	:	10 ~ 30 sheets change gear system
o Cover paper feeding unit		
Type	:	Non-stop stream feeding
Cover paper size	:	Width ..... 305 ~ 430mm Length .... 600 ~ 860mm
Speed	:	Max. 50 sheets/min

o Gathering unit

Type	:	Continuous chain pusher feeding cover paper laying system

o Folding unit

Type	:	Link-type toggle joint
Folding length	:	Max. 860mm
Feeding	:	Gripper reciprocating mechanism

o Wire stitching unit

Head	:	Manufactured by Bostitch, U.S.A. A maximum of 12 sets can be installed. Head interval variable system

o Pressing unit

Type	:	Clamp type Equipped with edge shaping roller

o Delivery unit

Type	:	Belt type (Overlapped delivery)

o Electrical specifications

Voltage	:	440V (3-phase)
Frequency	:	50Hz

(3) Production capacity

o 80 pages	:	67,000 books/shift (Based on machine available rate of 70%)
o Book size	:	165 × 850mm (160 × 210mm 4 up)

1-3 Transportation Equipment

a. Fork lift

(1) Specifications

Diesel engine

2 tons

Equipped with rolled paper clamping attachment (of hydraulic system)

Lifting height: 3m

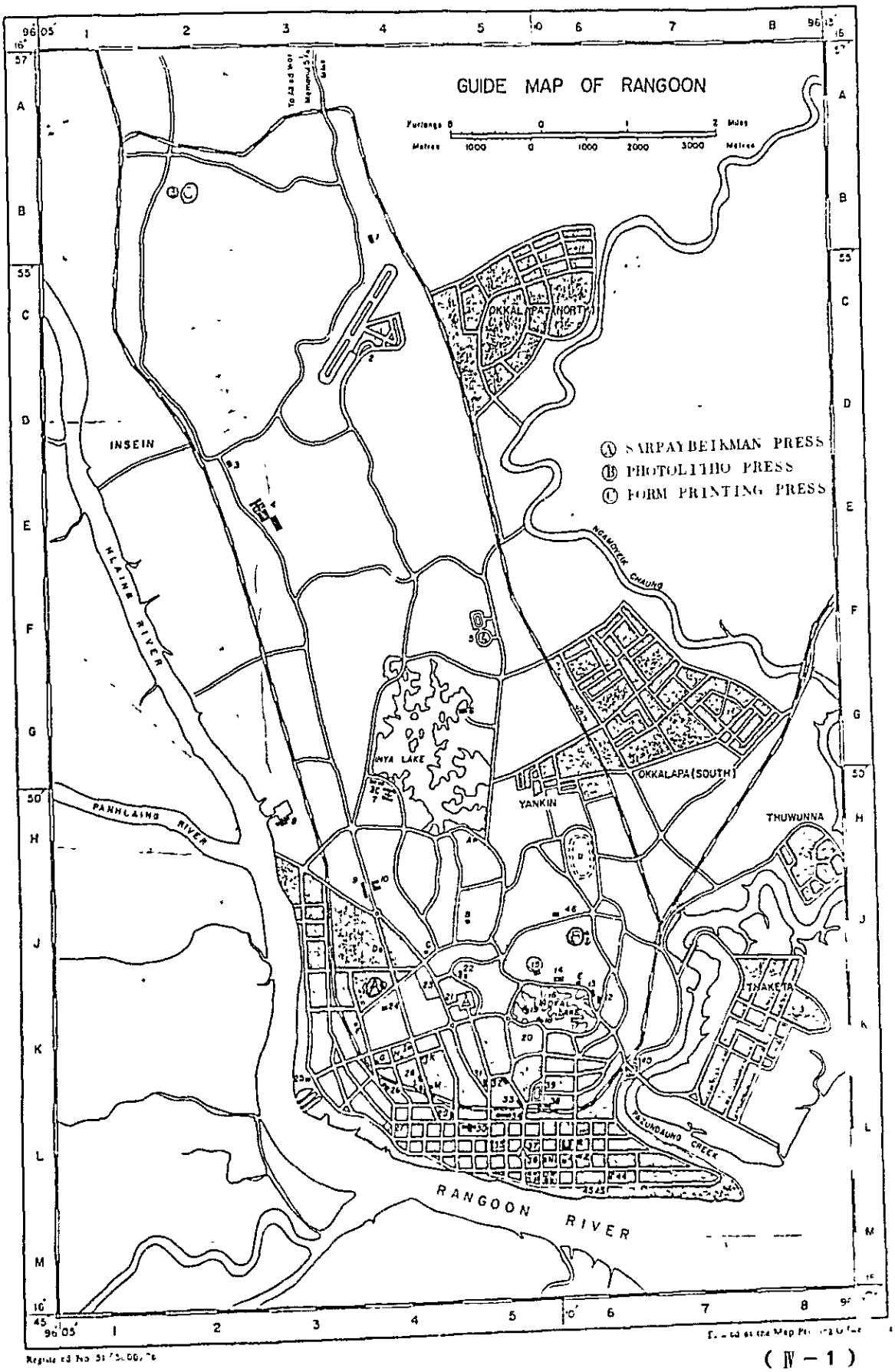
2. Arrangement Plan

It is most desirable that the equipment will be installed in the Photolitho Press Factory, 150 Campbell Road, Rangoon, one of the three factories owned by PPC, in view of the surplus space available.

The factory has been engaged in printing and bookbinding, particularly in the production of textbooks. It is located near the center of the city, and has abundant open space. As a result of consultation with PPC, the space including and around the Binding Room in the factory site will be used.

The Binding Room is divided into two blocks. The smaller block has an area of about 310m^2 where two center binding lines are installed. The block also has three knife trimmers. For this reason, it is rather difficult to install new equipment in this block. On the other hand, the larger 950m^2 block mainly accommodates single-function machines; therefore, these machines may be removed to provide free space. Technically speaking, the strength of the floor (in view of the present conditions, with guillotine cutters installed) and the height of the ceiling (or height of beams, since there is no ceiling), about 4.5m, seem adequate. For installation of the machines, about 950m^2 in the Binding Room and part of the adjacent free space, about 250m^2 (at present, part of this space is used for storing materials), a total floor space of about 1,200m^2 will be used.

The machines will be installed as illustrated in Fig. IV-2, the Machine Layout Plan. The machines will be carried into the site through the front gate of the factory and into the building through the door which is now used for paper material coming in and finished products goint out.
However, the packing dimensions of the machine will inevitably be restricted due to the size of the door. The packed machine must not measure over 2,700mm in width or over 3,200mm in height. The length should not be over 5,000mm.


GUIDE MAP OF RANGOON
Furlongs 0 0 1 2 Miles
Metres 1000 0 1000 2000 3000 Metres
OKKALAPA (NORTH)
INSEIN
HLAINE RIVER
NGAMOYEIK CHAUNG
INYA LAKE
OKKALAPA (SOUTH)
YANKIN
THUWUNNA
PANHLAING RIVER
THAKETA
PAZUNDAUNG CREEK
RANGOON RIVER
Ⓐ SARPAYBEIKMAN PRESS
Ⓑ PHOTOLITHO PRESS
Ⓒ FORM PRINTING PRESS

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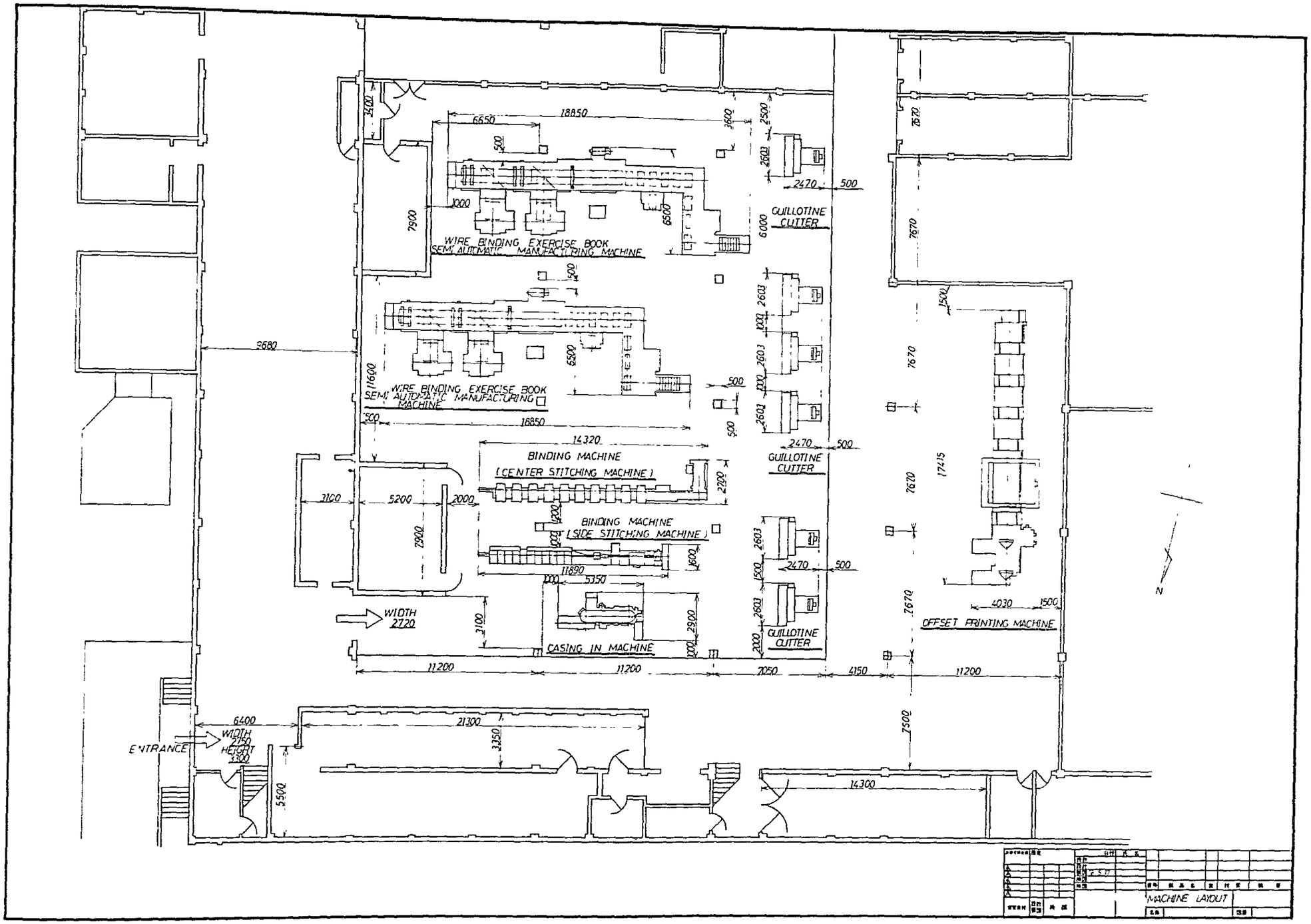
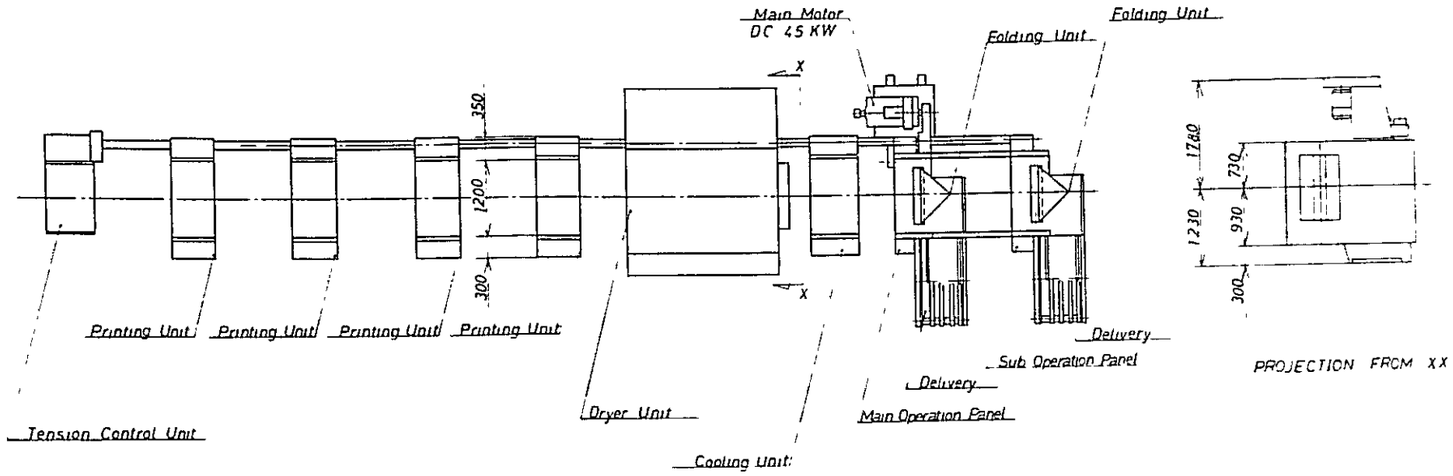
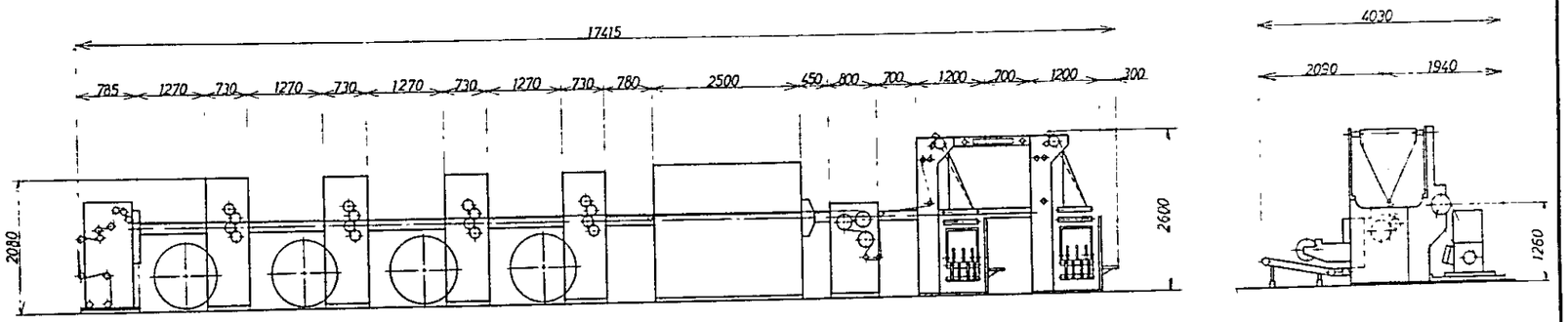

WIRE BINDING EXERCISE BOOK SEMI AUTOMATIC MANUFACTURING MACHINE
WIRE BINDING EXERCISE BOOK SEMI AUTOMATIC MANUFACTURING MACHINE
BINDING MACHINE (CENTER STITCHING MACHINE)
BINDING MACHINE (SIDE STITCHING MACHINE)
CASING IN MACHINE
GUILLOTINE CUTTER
GUILLOTINE CUTTER
GUILLOTINE CUTTER
OFFSET PRINTING MACHINE
ENTRANCE
WIDTH 2150 HEIGHT 2300
WIDTH 2720
MACHINE LAYOUT

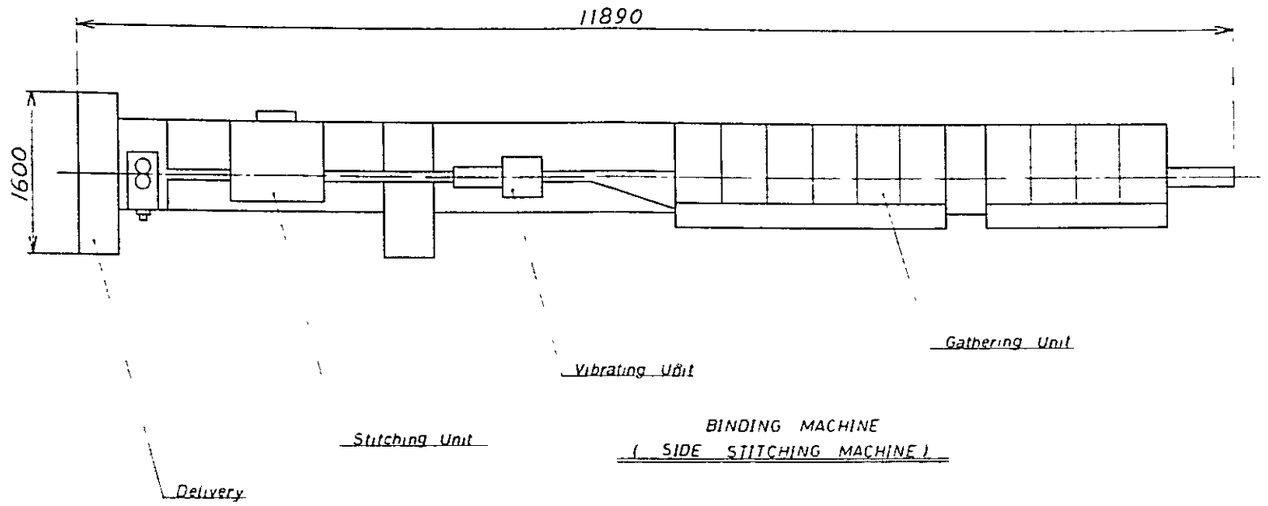




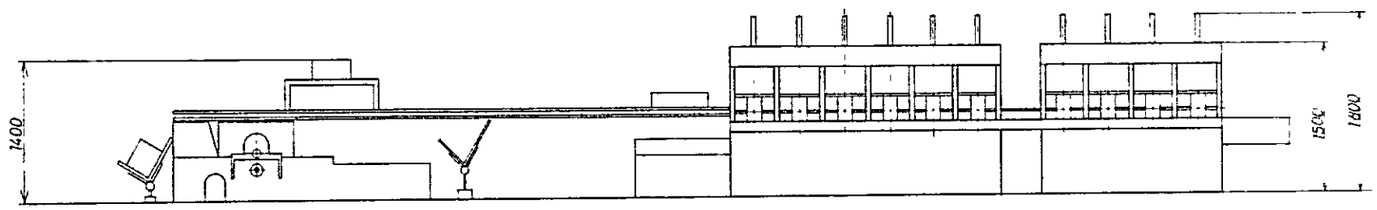
SPECIFICATIONS

Roll Paper Width	Max 880mm
Roll Paper Diameter	Max 1010mm
Cross Cut Length	546mm
Printing Useful Length	530mm
Printing Speed	B4 Max 500 copies/min
	B5 Max 350 copies/min
Electric Capacity	71 KVA

OFFSET PRINTING MACHINE

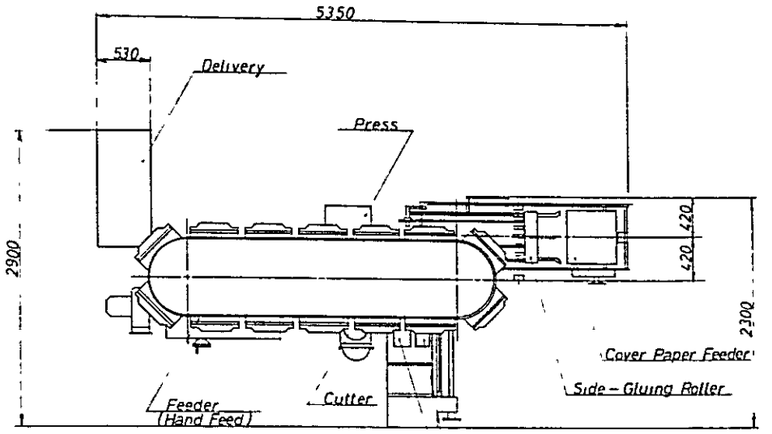


BINDING MACHINE
(SIDE STITCHING MACHINE)



SPECIFICATIONS

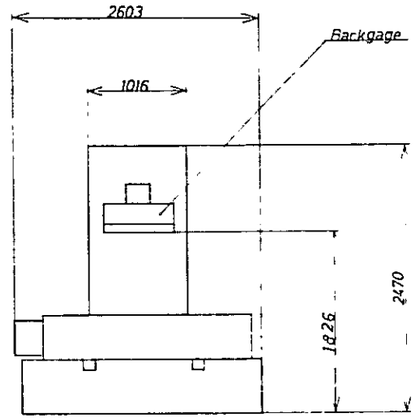
Book Size	Max 210 x 297 mm
	Min 128 x 182 mm
Gathering Method Rotary Drum	2 Signatures Per Rotation
Stitchable Thickness	3 - 30 mm
Speed	Max 120 books / min



SPECIFICATIONS

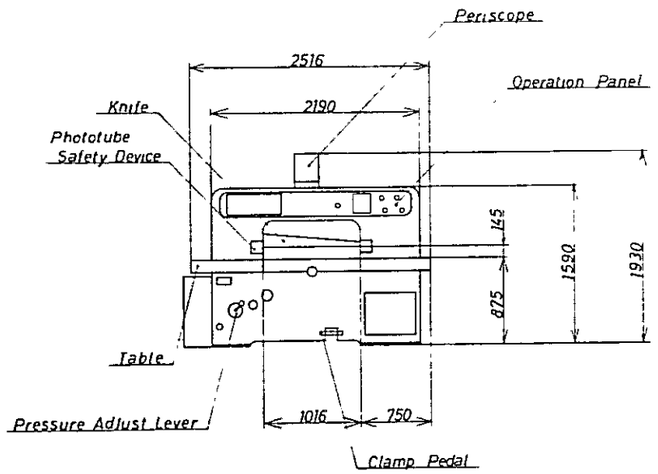
Book Size	Max B4 257 x 365mm
	Min A6 105 x 148mm
Thickness	2 - 40mm
Speed	Max 80 books / min.

CASING IN MACHINE

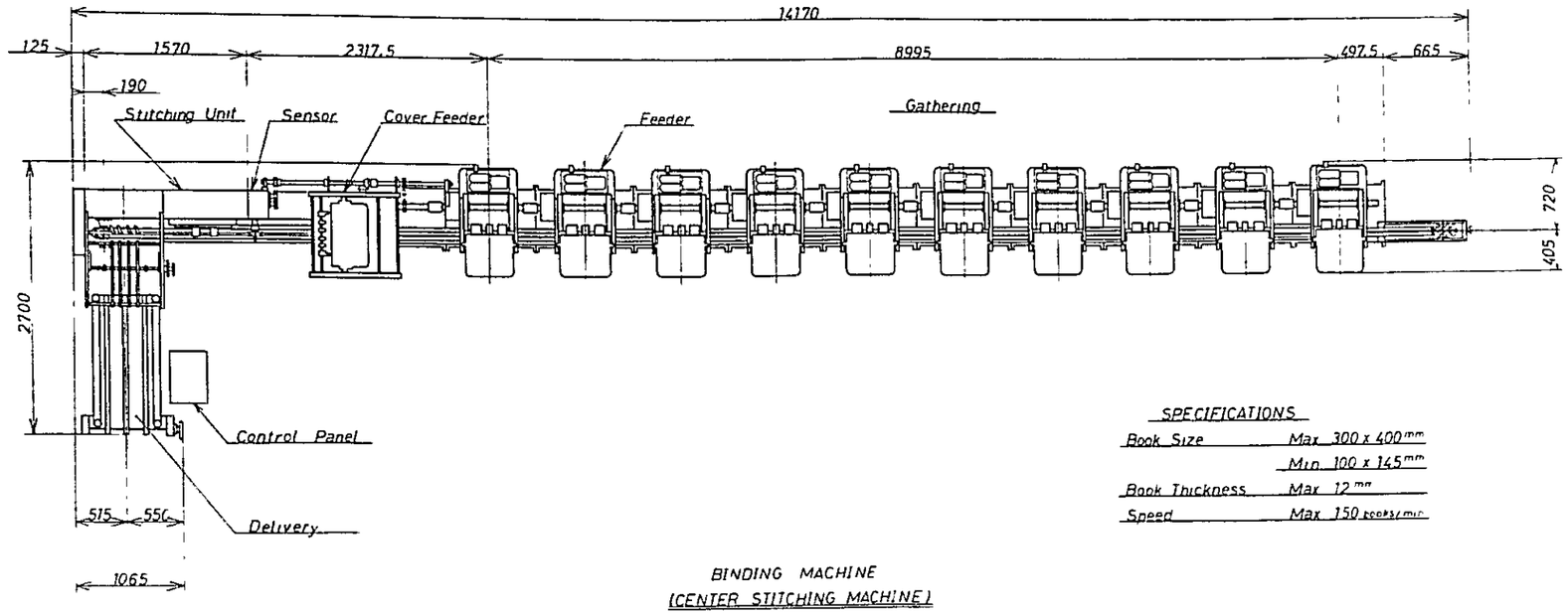


SPECIFICATIONS

Cut Capacity Width	Max 1016mm
Cut Capacity Thickness	Max 145mm



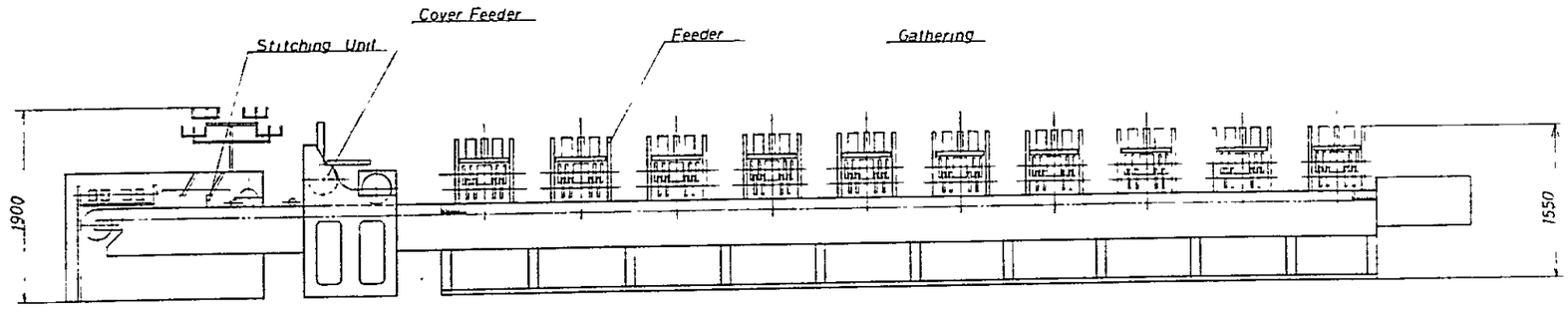
GUILLOTINE CUTTER



SPECIFICATIONS

Book Size	Max 300 x 400 mm
	Min. 100 x 145 mm
Book Thickness	Max 12 mm
Speed	Max 150 books/min

BINDING MACHINE
(CENTER STITCHING MACHINE)



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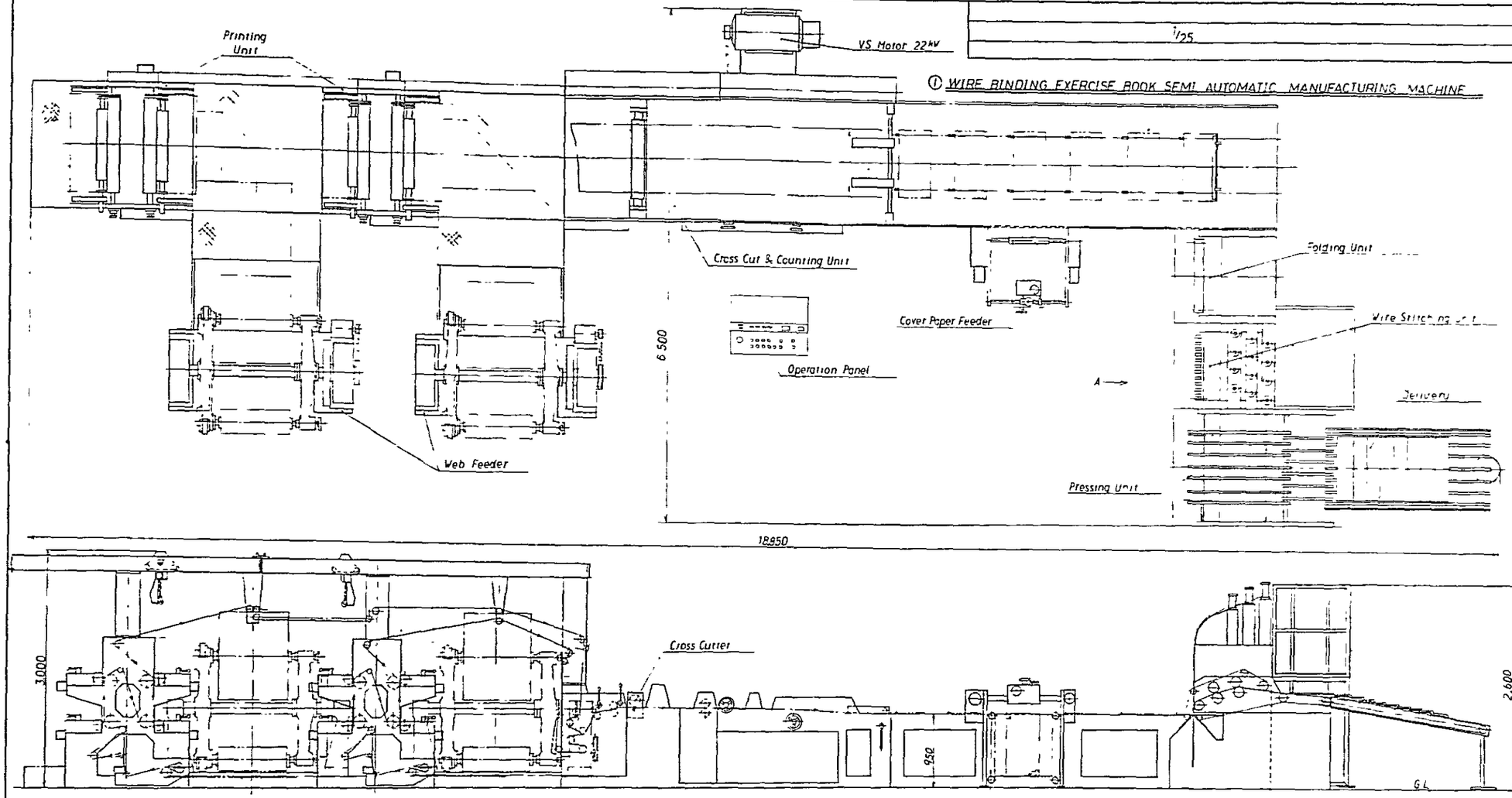
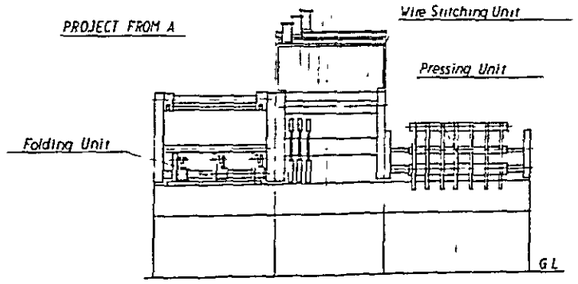
① WIRE BINDING EXERCISE BOOK SEMI AUTOMATIC MANUFACTURING MACHINE

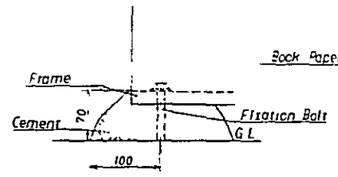


SPECIFICATIONS	
Web Paper Width	600 ~ 860mm
Rolled Paper Diameter	Max 1,100 ϕ
Feeder	2 Web Turret Type
	With Aircooled Powder Brake
Printing Unit	Flexographic Printing
Cross Cut Length	305 ~ 430mm (330mm)
Printing Speed	Max 200 m/min
Binding Speed	Max 50 blocks/min
Electric Source	440 V, 50 Hz
Main Motor	VS 22kw

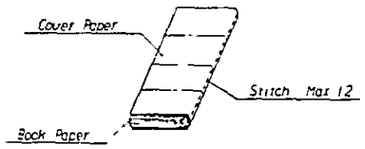
PROJECT FROM A



SCHEME OF BASEFIXING



SHAPE OF PRODUCT ON DELIVERY



3. Matters to Be Taken by the Government of the Socialist Republic of the Union of Burma

① To provide sufficient space (approx. 1,200m^2) in the factory for the installation of the school textbook manufacturing machinery and exercise book manufacturing machinery.

② To provide sufficient electricity (approx. 470KVA) and water necessary for the smooth operation of the machinery provided by Japan.

③ To make arrangements for marine transportation of the provided equipment from a Japanese port to the Socialist Republic of the Union of Burma and for marine insurance, and to bear related expenses (approx. ¥23,000,000). .

④ To ensure prompt unloading, tax payment, customs clearance at a port of disembarkation in Burma, and prompt internal transportation of the equipment provided.

⑤ To permit the Japanese nationals whose services may be required in connection with this Project to enter, stay in and use relevant facilities in the Socialist Republic of the Union of Burma.

⑥ To maintain and use properly and effectively the equipment purchased under grant aid.

⑦ To bear all expenses, other than those to be borne by the grant aid which will accrue in implementing the Project.

4. Implementation Plan

4-1 Implementing Organs

As stated earlier, the Ministry of Information will be the competent ministry for the implementation of this Project. The Project will be directly administered by PPC, an agency belonging to the Ministry of Information.

PPC is the sole public corporation engaged in the manufacture of textbooks, exercise books and governmental publications. At present, PPC has its headquarters in the political district in Rangoon city. It has four factories in the city and its suburbs, where a total of about 5,000 employees work.

Recently, the Government of the Socialist Republic of the Union of Burma expressed to the Japanese Study Team its strong desire to take direct charge of the work this Project, from preparation of tender documents, purchasing of equipment to completion of equipment installation, stressing that the government has had experience in this regard.

4-2 Scope of Implementation

This Project involves the provision of equipment only. At the request of the Government of the Socialist Republic of the Union of Burma, ocean transportation of the equipment shall be taken by ships chartered by the Burma Five Star Line Corporation, and inland transportation and installation of the equipment shall also be handled by the Government of the Socialist Republic of the Union of Burma, as stated earlier. However, it is recommended that a supervisor for installation on site will be dispatched from a Japanese machine manufacturer.

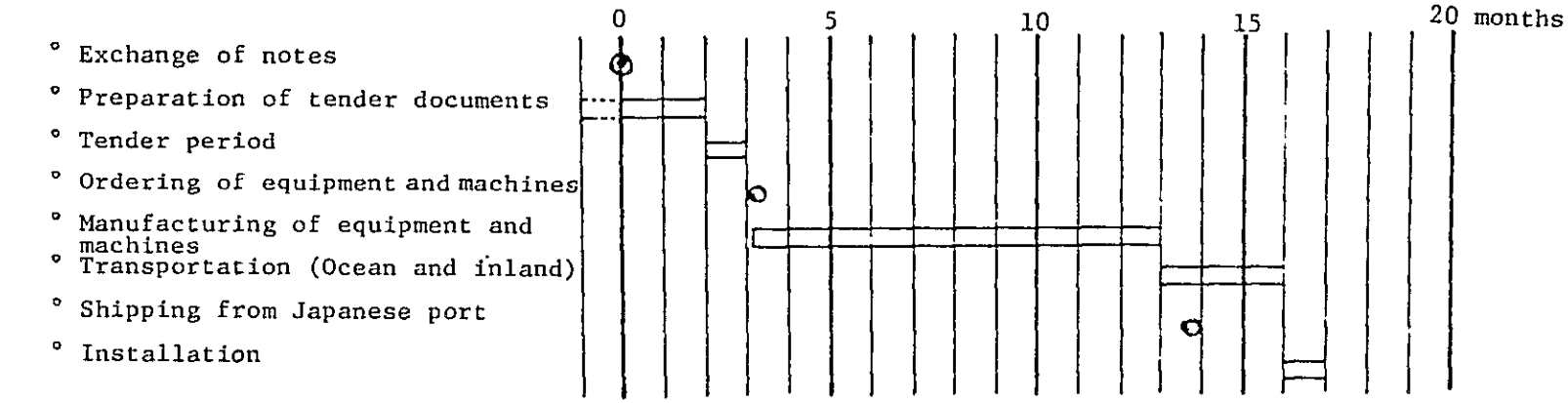
To sum up, the machine manufacturing costs incurred in Japan (by the machine manufacturer), export packing expenses, and the expenses required for sending a supervisor for installation of the machine on site will be covered by this Project.

4-3 Implementation Schedule

For manufacture of the machine, about 10 ~ 12 months will be required, after receiving the order, until the product is shipped from a Japanese port. For installation on site, about 1 month will be required. The period from exchange of notes till completion of machine installation is estimated at about 17 months, including about 2 months for preparation of tender documents, about 1 month for tender period, and about 3 months for ocean and inland transportation.

Table IV-1

Schedule



V. ADMINISTRATIVE AND MANAGERIAL PLAN

1. Personnel Plan

The numbers of personnel required for manufacturing textbooks and exercise books using the equipment provided under this Project are shown below. The number may be changed, owing to technical level and skills.

1-1 Textbook Manufacturing Line

	Number of machines	Number of workers
a. Offset printing machine	1	5
b. Side binding line	1 set	12
c. Center binding line	1 set	8
d. Folding work (Manual)		10
e. Guillotine cutter	2	5
	Subtotal	40

1-2 Exercise Book Manufacturing Line

a. Wire binding exercise book semi-automatic manufacturing machine	2	10
b. Guillotine cutter	4	10
	Subtotal	20

1-3 Other Work

a. Packing		30
b. Maintenance		5
	Subtotal	35
	Total	95

2. Production Cost

		Material	Personnel	Electricity	Machine depreciation	Total
a. Textbook (large-size)	64P	0.511	0.004	0.005	0.022	0.542
b. Exercise book	80P	0.443	0.001	0.002	0.021	0.467

(kyats/book)

The above-mentioned costs have been calculated for materials, personnel, electricity and machine depreciation costs only, on the assumption that printing paper price is 3.45 ~ 4.3 kyats/kg, personnel cost 170 kyats/person/month, electricity charge 0.28 kyats/KWH, and machines are depreciated for a 20-year period (legal straight-line depreciation in the Socialist Republic of the Union of Burma).

2-1 Example Calculation (when manufacturing 80-page exercise books)

① Material costs

- Inside paper (60g/m^2, 4.11 kyats/kg, 8% loss)

  0.85m × 0.33m × 20s × 1/4 × 0.06kg/m^2 × 1.08 × 4.11

  = 0.373 kyats/book

- Cover paper (150g/m^2, 4.3 kyats/kg, 8% loss)

  0.85m × 0.33m × 1/4 × 0.15kg/m^2 × 1.08 × 4.3 = 0.049 kyats/book

- Auxiliary materials (5% of paper cost)

  (0.373 + 0.049) × 0.05 = 0.021 kyats/book

  Subtotal 0.443 kyats/book

② Personnel cost (170 kyats/person/month, 20 days/month)

170 × 20 ÷ (134,000 books/day × 20 days) = 0.001 kyats/book

③ Electricity charge (0.28 kyats/KWH)

140KW × 8H × 0.28 ÷ 134,000 books/day = 0.002 kyats/book

④ Machine depreciation cost (20-year straight-line depreciation)

$$\frac{405 \text{ million yen} \times 0.05}{12 \text{ months} \times 20 \text{ days} \times 134{,}000 \text{ books} \times 30.6 \text{ kyats/book}}$$

= 0.021 kyats/book

Total 0.467 kyats/book

2-2 Comparison between Present Production Cost and Production Cost under the Project

(Unit: kyats/book)

	Present (Estimate)	Under Project
a. Textbook (Large-size, 64 pages)	0.653	0.542
b. Exercise book (80 pages)	0.482	0.467

Note: The present production cost has been calculated in accordance with the preceding Example. Note also that machine depreciation cost is not included since the machines are obsolete.

3. Maintenance and Control Expenses

In view of the fact that the existing machines owned by PPC have been used for about 20 years and yet are still being used for production, one can conclude that PPC's maintenance and control technology is fairly high.

In view of this state of the art for maintaining and controlling equipment and machinery, plus the spare parts which will be provided under this Project, PPC is deemed capable of maintaining and controlling the equipment to be provided under this Project.

The equipment to be provided under this Project includes a set of primary components and a 2-year supply of consumable parts. Therefore, for the time being, maintenance expenses will comprise about 15,000 kyats/year as personnel expenses for an additional 5 maintenance workers. After 2 years, additional consumable parts will have to be purchased at a cost of about 200,000 kyats/year (about 1% of machine price), bringing the total cost to about 215,000 kyats/year. Funds for these expenses will be appropriated from the approximately 2,250,000 kyats/year in profits arising from the sale of textbooks and exercise books.

According to the existing plan, maintenance worker training will be provided during engineering section to be held at PPC.

VI. EVALUATION OF THE PROJECT

The Project is fundamentally designed toward the development of educational activities in the Socialist Republic of the Union of Burma. The development and prosperity of developing nations should be initiated by the development of human resources, with improvement in scholastic attainments as its base. If the implementation of this Project results in reinforced capacity to produce textbooks and exercise books, the increased supply of such materials — fundamental tools of education — would supplement the Burmese policy to upgrade its education system.

If the grant aid covered by this Project is realized in the Socialist Republic of the Union of Burma, where, the people are far more concerned with education, with the literary rate at 70%, it will definitely have significant effects, despite fairly low economic standards.

The installation and operation of the equipment to be provided by the Japanese Government at the PPC has the following merits:

(1) Expansion of employment

When production reaches the planned scale, about 95 workers will be required when the equipment is operated for 1 shift. Including the addition of workers required for management and for 2-shift operation, a total of 200 people will be given employment opportunities.

(2) Merit of scale

When the planned production quantity is reached, total production volume will have doubled; consequently, requirements for printing paper and other materials will also double. At present, the PPC imports most of these necessary materials from foreign countries by tender. As the quantity of materials increases, tenders will be controlled more favorably for the Burmese, resulting in purchase at lower price.

(3) Reduction of cost

With regard to production cost, the cost of producing one textbook will be reduced by about 0.111 kyats and for one exercise book will be reduced by about 0.015 kyats, through increased efficiency of high-speed machine operation

and improvement of the production scheme, as well as through savings of printing paper by means of reduced finishing allowance. When converted into annual figures, about 1,500,000 kyats for textbooks and about 750,000 kyats for exercise books will be saved (a total of about 2,250,000 kyats saving). Assuming that about 215,000 kyats will be spent for maintenance and control of the equipment, a profit of about 2,035,000 kyats will accrue annually. Moreover, the ratio of nonconformity can be reduced through the adoption of a uniform production process.

(4) Improvement of technological level

The existing machines at the PPC are 15 ~ 20 years old. If the machines proposed under the Project are installed, the PPC engineers will be able to have easy access to new Japanese technology. Through continuous production activities, the PPC's printing and bookbinding technologies will be improved dramatically.

Particularly, since this Project involves production facilities, the advanced technology of Japan, which is incidental to the provision of physical property, will have a favorable influence on related industries, e.g. printing- and bookbinding-related industries and the machine industry in the Socialist Republic of the Union of Burma, thereby contributing greatly to the development of the country. This kind of project will have innumerable repercussions in a nation whose economy is mostly dependent upon exports of agricultural products and where promotion of other industries is the priority.

VII. CONCLUSION AND PROPOSAL

Recently, the Government of the Socialist Republic of the Union of Burma drew up a plan to have the new educational system, incorporating a one-year extension of high school education and the upgrading of the contents of education, with the objective of raising the country's educational standards. This new educational system is to be put into effect in 1984/1985. It is expected, therefore, that the demand for textbooks and exercise books will increase drastically following this new educational system, exceeding the capacity of the existing production equipment.

In the developing Socialist Republic of the Union of Burma, textbooks and exercise books will definitely play a vital role as tools of education in implementing the new educational system, in terms of both quantity and quality. Therefore, security of supply and stabilization of prices of these teaching materials are essential.

The present Project is intended to reinforce the country's production capacity so as to meet the demands five years from now for 26,500,000 textbooks/year and 100,000,000 exercise books/year, taking into consideration the increase in demand due to the above-mentioned new educational system, growth in the number of pupils/students enrolled, and the resultant need to increase the number of textbooks and exercise books provided per pupil/student.

Through the implementation of this Project, reduction of production cost will be realized by improvement of printing and bookbinding technology, higher productivity of equipment and machinery, and reduction of materials loss. Moreover, production efficiency as a whole will increase, thanks to the influence of this Project on the existing production system. This will eventually lead to an ample supply of low-cost, high-quality textbooks and exercise books.

In view of the fact that the Socialist Republic of the Union of Burma's economic status is not so high enough, it is desired that the Project be realized promptly, under the "Grant Aid Programme" which is one at Japan's economic cooperation schemes to provide developing countries with non reimbursible funds.

In implementing this Project, the Socialist Republic of the Union of Burma is required to recruit about 200 workers, including management staff, provide about 1,200m^2 space for installation of the equipment and machinery, bear the expenses incurred in connection with increased import of materials, and establish a system to maintain and control the equipment.

Finally, in order to smoothly and efficiently operate the equipment to be provided under this Project, the Government of the Socialist Republic of the Union of Burma should, as follow-through on this Project, send its engineers to advanced industrial countries to receive software-related technical training in printing, bookbinding and production control technologies.

APPENDIX

(1) Minutes of Discussion

The Agreed Minutes of Discussion

on

School Text Book Printing and Exercise Book

Production Development Project

In response to a request made by the Government of the Socialist Republic of the Union of Burma for Grant Aid Assistance for the School Text Book Printing and Exercise Book Production Development Project (hereafter referred to as " The Project"), the Government of Japan has sent, through the Japan International Cooperation Agency (JICA), a team headed by Mr. Takaharu Kazama, Executive Director, JICA, to conduct a basic design study from April 4th to 13th, 1983.

The Team has carried out a field survey and held a series of discussions and exchanged views with the officials concerned of the Government of the Socialist Republic of the Union of Burma as to the Projeet.

As a result of the survey and discussions, both parties agreed to recommend to their respective Governments to examine the results of the survey and discussions attached herewith towards the realization of the Project.

(Takaharu Kazama)
Leader of the Japanese
Basic Design Study Team
JICA

11/4/83.

(U Maung Maung Khin)
Managing Director, -
Printing and Publishing Corporation,
Leader of the Burmese Team
Ministry of Information.

Dated April 11 ,1983

ATTACHMENT

1. Background for the Project.

In Burma the Printing and Publishing Corporation is the only government organization engaged in printing all government publications.

The Corporation is responsible for printing text books and producing exercise books for all schools, universities and colleges, and those books are distributed to students through the Paper Stationery Printed Matter and Photographic Stores Trade Corporation.

The Ministry of Education plans to increase the number of school grades from ten to eleven.

An increased capacity will be, therefore, necessary for production of text books and exercise books to meet the additional demand anticipated in 1984/85 and an annually increasing national requirement thereafter.

Existing production equipment has an annual production capacity of 13 million text books and 50 million exercise books, but under the new education system necessary production capacity is estimated at 26.5 million text books and 100 million exercise books a year.

2. The objective of the Project is to provide school text book printing machinery, exercise book producing machinery and auxiliary equipment to increase the existing production capacity.

3. The Ministry of Information is responsible for the administration of the Project, and the Printing and Publishing Corporation is the executing agency of the Project.

4. The text book printing machinery and exercise book producing machinery will be installed at Photolitho Press, Ngadatkyi

Pagoda Road, Rangoon, belonging to the Printing and Publishing Corporation.

5. The text books and exercise books printed or produced in this factory will be distributed through the system described in ANNEX 1.

6. The Japanese Survey Team will convey to the Government of Japan the desire of the Government of the Socialist Republic of the Union of Burma that the former takes necessary measures to cooperate in implementing the Project and provide the Government of the Socialist Republic of the Union of Burma with the items listed in ANNEX II with priority order within the scope of Japanese Economic Cooperation Programme in Grant Aid form.

7. The Government of the Socialist Republic of the Union of Burma will take necessary measures listed in ANNEX III on condition that the Grant Aid Assistance would be extended to the Project.

8. The Japanese Survey Team will also convey to the Government of Japan the desire of Government of the Socialist Republic of the Union of Burma described as follows:-

   a. The ocean transportation will be made by the Burma Five Star Line Corporation or its nominee, from the port of embarkation in Japan to Burma.

   b. The preparation of the Tender Documents based on the Basic Design Study Report will be made by the Printing and Publishing Corporation,

   c. The despatch of machine installation engineers by suppliers of machinery, according to the terms of contract.

ANNEx I

1. Ministry of Education

   * to write text books,
   * to decide how many text books and exercise books are necessary,
   * to ask the Paper Stationery Printed Matter and Photographic Stores Trade Corporation to order the Printing and Publishing Corporation to print text books and produce exercise books.

2. The Paper Stationery Printed Matter and Photographic Stores Trade Corporation

   * to order the Printing and Publishing Corporation to print text books & produce exercise books.

3. The Printing and Publishing Corporation

   * to print text books and produce exercise books as ordered by the Paper Stationery Printed Matter and Photographic Stores Trade Corporation,
   * to deliver printed text books and exercise books to the Paper Stationery Printed Matter and Photographic Stores Trade Corporation.

4. The Paper Stationery Printed Matter and Photographic Stores Trade Corporation

   * to sell text books and exercise books to students.

5. Ministry of Information

   * to coordinate the works of the Ministry of Education, the Ministry of Trade & the Printing and Publishing Corporation.

ANNEX II

Serial No.	Priority Items	Equipment Description Specification	Quantity
1.	EXERCISE BOOK MAKING MACHINE & SHARE PARTS	Ruled, Collated, Covered Stitched Max Reel Width $36\frac{3}{8}$" Max Reel Diameter 55" 4 up, 12000 books/hr up to 120 pages	3 Nos.
2.	FOUR UNIT WEB OFFSET PRINTING MACHINE AND SPARE PARTS.	Max; Reel Width 35" Max; Reel Diameter 42" Cylinder cut off size $22\frac{3}{4}$" (Standard)	1 No.
3.	TWO UNIT WEB OFFSET PRINTING MACHINE AND SPARE PARTS.	Max; Reel Width 35" Max; Reel Diameter 42" Cylinder cut off size $22\frac{3}{4}$"(Standard)	2 Nos.
4.	SHEET FED OFFSET PRINTING MACHINE AND SPARE PARTS.	Two Colour Sheetfed Offset Machine Max; Sheet Size 28"x 40" Max; Sheet/hr 10000	2 Nos.
5.	GANG STITCHER AND SPARES.	Collating, stitching Trimming, Hand feeding	2 Nos
6.	WIRE STITCHING MACHINE AND SPARES.	Stitching Thickness 4" Wire Thickness - 20 guage to 25 guage	10 Nos.

Serial No.	Priority Items	Equipment Description Specification	Quantity
7.	PROCESS CAMERA AND EQUIPMENT PARTS	Film size 21"x25" Contact Screen Capacity 21"x25", 10¾" lens(270 mm) Colour Corrected Reduction Range down to 50% Enlargement up to 200%. Temperature controlled bath sink,safe light tray etc.	1 Lot.
8.	PAPER CUTTING MACHINE AND SPARE PARTS.	Standard Hydraulic Clamping High Speed size 42" Max.	6 Nos.
9.	FORK LIFT.	Diesel Engine 5 tons - 2 tons.	5 Nos.
10.	KNIFE GRINDING MACHINE.	Max Length 46"	1 No.

ANNEX III

Following arrangements are required to be taken by the Government of the Socialist Republic of the Union of Burma

1. To provide enough space in the factory for the installation of the school text book printing machinery and the exercise book producing machinery.
2. To provide enough electricity and water necessary for the smooth operation of the factory.
3. To ensure prompt unloading, tax payment, Customs clearance at ports of disembarkation in Burma, and prompt internal transportation of the products purchased under the Grant.
4. To accord Japanese Nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as provided to the Japanese Nationals in similar project implemented with Japanese Grant in Burma as may be necessary for their entry into Burma and Stay therein for the performance of their work.
5. To maintain and use properly and effectively the equipment purchased under the Grant.
6. To bear all expenses other than those to be borne by the Grant, necessary for the execution of the Project.

(2) Members of the Basic Design Study Team

Mr. Takaharu KAZAMA	Team Leader Executive Director Japan International Cooperation Agency
Mr. Hideki TOMOBE	Planning & Management Grant Aid Department Japan International Cooperation Agency
Mr. Fumio NAKAMURA	Production Planning Director of Engineering Department KOKUYO Co., Ltd.
Mr. Yasumasa IWASE	Printing Machinery Engineer KOKUYO Co., Ltd.
Mr. Kanjiro TANAKA	Bookbinding Machinery Engineer KOKUYO Co., Ltd.
Mr. Hiroyasu WATANABE	Facility KOKUYO Co., Ltd.

(3) Study Schedule

Saturday, April 2, 1983

Leave New Tokyo International Airport (JL-475)

Arrive in Bangkok

Sunday, April 3

Arrive at Rangoon (UB-222)

Monday, April 4

Visit Japanese Embassy and JICA office

- o Courtesy visit to Ambassador Tachibana
- o Explanation of policy and details of study (by Mr. Takeda, Director of JICA)

Courtesy visit to FERD (U Thein Myint, General Director)

Tuesday, April 5

(AM) Courtesy visit to PPC

- o U Aung Htay (Deputy Minister MoI)
- o V Maung Maung Khin (Managing Director of PPC)

(PM) First meeting with PPC

- o Explanation of policy and details of study
- o Adjustment of study schedule
- o Presentation of questionnaire and detailed explanation thereof

Wednesday, April 6

(AM) Visit PPC factory

- o Sarpay Beikman Press (in Rangoon)
- o Meeting with management of the factory (U Tin Aye, Printing Manager and others)

(PM) Visit PPC factory

- o Photolitho Press (in Rangoon)
- o Meeting with management of the factory (U Han Sein, Factory Manager and others)

Thursday, April 7

(AM) Visit PPC factory

- o Form Press (located about 20km NNE of Rangoon)
- o Meeting with management of factory (U Aung Myint, Factory Manager and others)

(PM) Second meeting at PPC head office

o Questions and answers based on the responses to the questionnaire

Friday, April 8 (All day)

Third meeting at PPC head office

o Questions and answers based on the responses to the questionnaire — continued from the previous day

Saturday, April 9

(AM) Study at PPC factory

o Photolitho Press

o Determination of place for installing equipment, as well as measurement

(PM) Study in Rangoon city

o Sales of textbooks and exercise books in certain markets

Sunday, April 10

Meeting of Study Team

Monday, April 11

(AM) Visit NPC factory (near PPC head office)

o Examination of newspaper press manufactured by Rockwell, U.S.A.

(PM) Fourth meeting at PPC head office

o Signing and exchanging of minutes

Tuesday, April 12

(AM) Visit Japanese Embassy and JICA office

o Report on results of study

(PM) Mr. Kazama, Leader, and Mr. Tomobe leave Burma for Japan (UB-221)

Wednesday, April 13

(AM) Fifth meeting at PPC head office

o Confirmation of technical matters, etc.

(PM) Leave Rangoon (UB-221)

Stay in Bangkok

Thursday, April 14

Arrive at New Tokyo International Airport (JL-462)

(4) The Offices and Officials Visited by Study Team

MINISTRY OF INFORMATION

- o Deputy Minister ..... Colonel Aung Htay
- o Planning Officer ..... U Htin Aung

MINISTRY OF FOREIGN AFFAIRS

- o Director Economic Division ..... U Ba Thwin

FOREIGN ECONOMIC RELATION DEPARTMENT

- o General Director ..... U Thein Myint
- o Assistant Director ..... U Myint Htoo

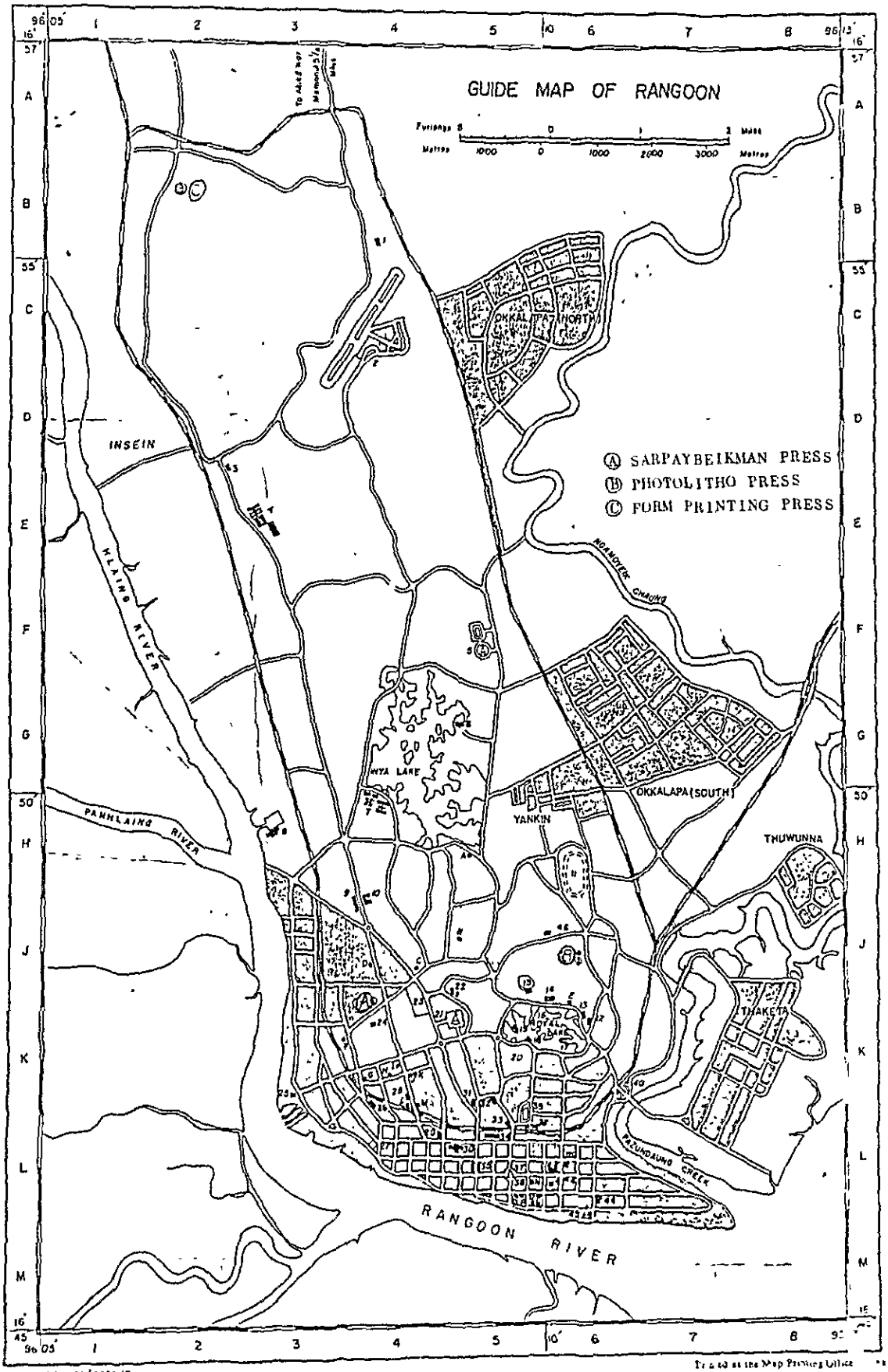
PRINTING AND PUBLISHING CORPORATION

- o Managing Director ..... U Maung Maung Khin
- o Director ..... Lt. Colonel Maung Maung Lay
- o Additional Director (ADMIN) ..... LT. Colonel Pe Thein
- o Additional Director ..... U Money
- o Additional Director ..... U Aung Myint
- o Additional Director ..... Daw Ohn Kyi
- o Assistant Director (Engineering Department) .. U Kyaw Thu

NEWSPAPER AND PERIODICAL CORPORATION

- o Director ..... U Than Saw

(5) Drawing of Factory (PPC)



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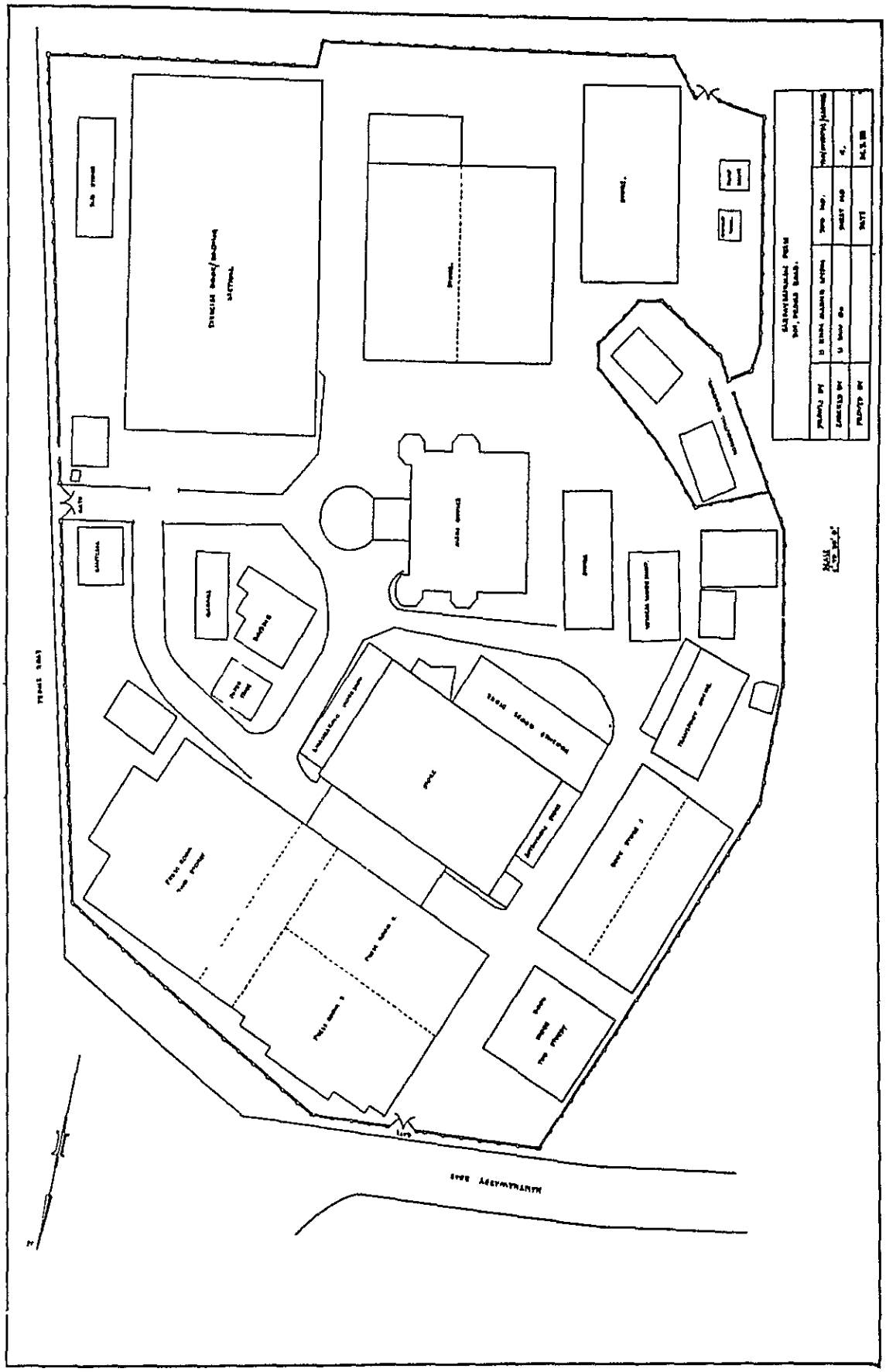

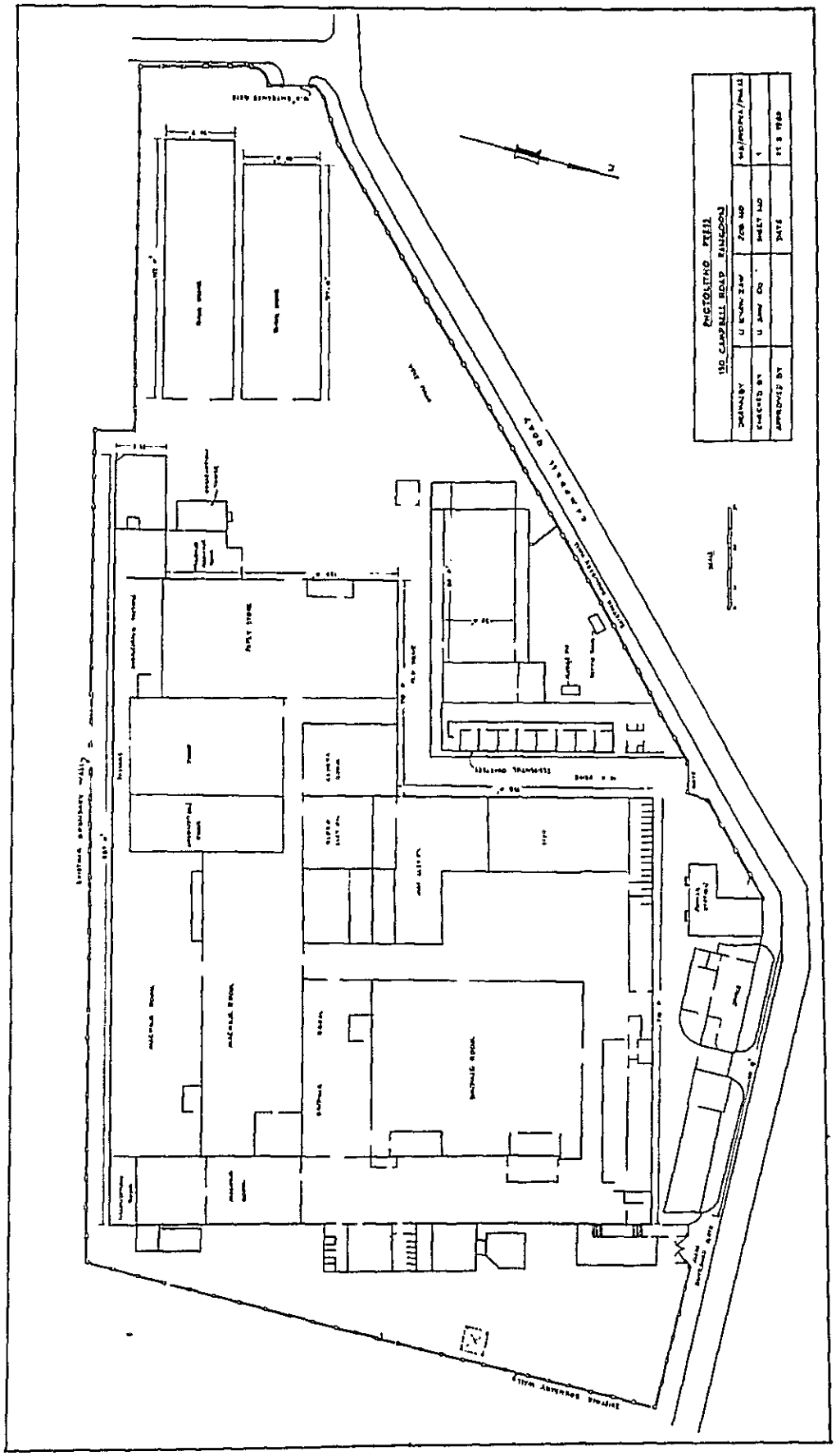

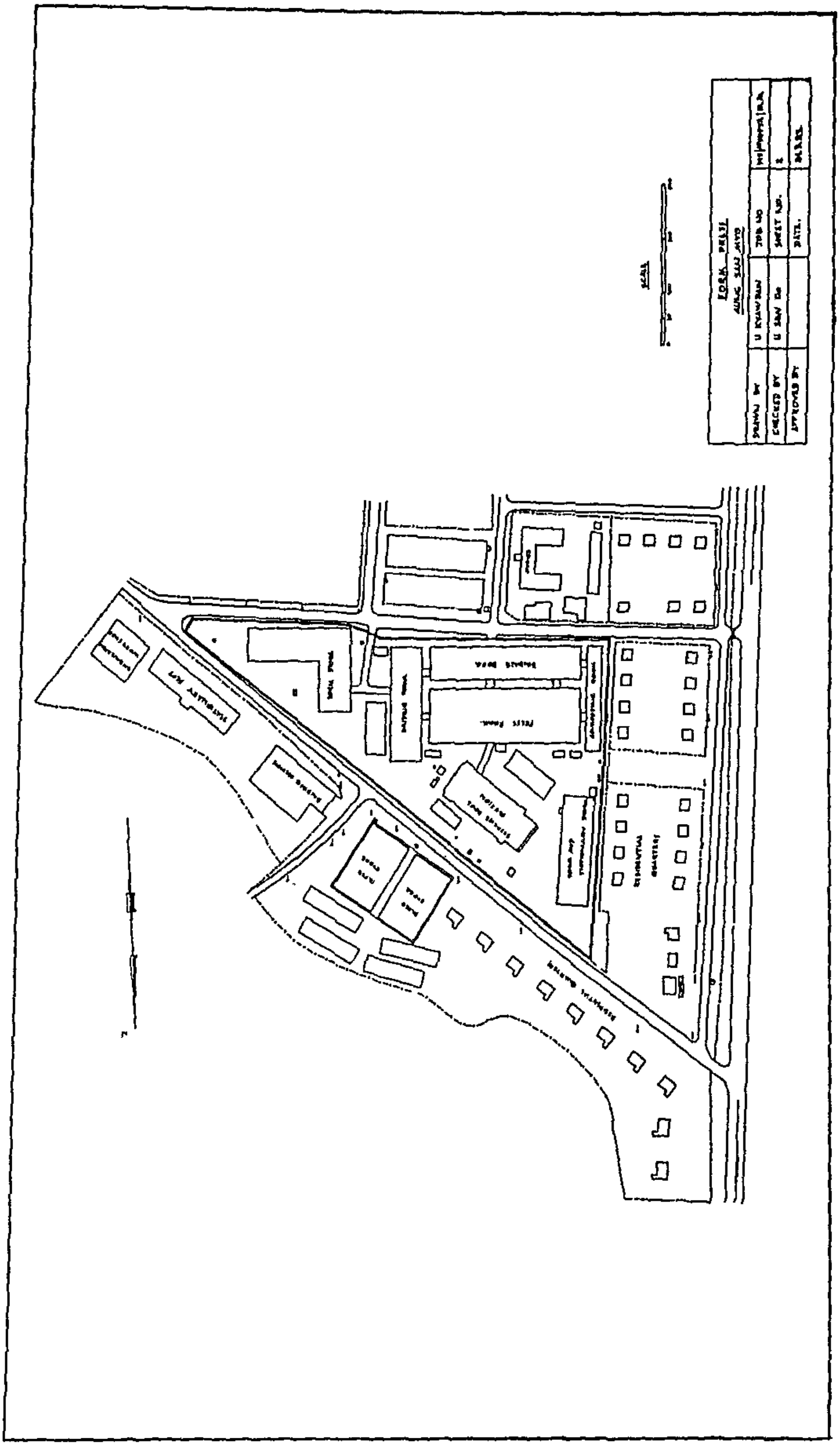
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