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STRENGTHENING OF THE CHINA DYEING
AND FINISHING DEVELOPMENT CENTRE

DG/CPR/87/017/11-01

PEOPLE'S REPUBLIC OF CHINA

Technical report: Third visit of the Chief Technical Adviser*

Prepared for the Government of the People's Republic of China
by the United Nations Industrial Development Organization

Based on the work of George W. Madaras
Chief Technical Adviser

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*

This document has not been edited.

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ABBREVIATIONS

CDFDC	China Dyeing and Finishing Development Centre
CICETE	China International Centre for Economic and Technical Exchanges
Co/PE	Cotton rich blend with polyester
CTA	Chief Technical Adviser
FR	Flame Retardant
H/S	Heat Setting
ID	Information Department
IIC	International Institute of Cotton, Manchester (UK)
NPD	National Project Director
PD	Project Document
PE	Polyester
PE/Co	Polyester/Cotton blend
PP	Pilot Plant
PPER	Project Performance Evaluation Report
PRC	People's Republic of China
PU	Polyurethane
PVA	Polyvinyl alcohol
R & D	Research and Development
RDD	Research and Development Department
SI	Shirley Institute, Manchester (UK)
SIDFA	Senior Industrial Development Field Adviser
SRRL	Southern Regional Research Laboratory (USA)
STIB	Shanghai Textile Industry Bureau
STRI	Shanghai Textile Research Institute
TD	Training Department
THPC	Tetra kishydroxy phosphonium chloride
TIS	Technical Information System
TPRM	Tripartite Review Meeting
UNDP	United Nations Development Programme
Vi	Viscose
WR	Water Repellent
WTA	World Textile Abstract

I. SUMMARY

The purpose of the third mission (31st October 1989 to 29th November 1989) was to monitor progress of the FOUR 'Immediate Objectives', as detailed in the Project Document "Strengthening of the China Dyeing & Finishing Development Centre", for the year ending December 1989.

Good progress can be reported in respect of the work and activities of the RDD and TD. (Outputs 1 and 3 in the PD and PPER No.2).

The progress made in constructing the PP since building started in January 1989 is most impressive and completion of building work is now confidently expected by the end of January 1990. (Output 2 in PD & PPER No.2.).

The activities of the ID also meet the immediate objectives of the PD, with the exception of the output of the computerised database and retrieval system. (Output 4 in PD & PPER No.2).

II. INTRODUCTION

The background to the formation of the CDFDC and the four 'Immediate Objectives' laid down for its efficient functioning have previously been described in the Technical Report:

First Visit of the Chief Technical Adviser (ref. DP/ID/SER.A/975)
dated 25 February 1988.

During the 2nd visit, progress made by CDFDC up to December 1988 was monitored, a PPER was agreed and prepared in collaboration with the NPD and the activities of CDFDC were encouraged by discussions, lectures and factory visits which are described in the Technical Report:

Second Visit of the Chief Technical Adviser (ref. DP/ID/SER.A/1153)
dated 13 February 1989.

The purpose of the CTA's third mission has been:-

First, to monitor and assess the progress made in the year ending December 1989 in meeting the four 'Immediate Objectives', viz. i/ strengthening the RDD; ii/ establishing a PP; iii/ establishing a TD; iv/ establishing an ID.

Secondly, to agree with the NPD the completion of the Second PPER, a necessary prerequisite for the holding of the next TPRM, fixed for 3rd and 4th April 1990.

Thirdly, to help and advise on the activities of the CDFDC.

III. RECOMMENDATIONS

It is encouraging to report that all four recommendations made by the CTA in his 2nd Mission Report have been acted upon, thus:

- i/ the erection of the PP is proceeding with all haste;
- ii/ Chinese and Foreign machinery have been ordered for phased delivery to the newly erected PP in the first six months of 1990;
- iii/ the Fellowship programme has been resumed: two candidates have been trained in 1989;
- iv/ the Second Study Tour has taken place.

It is now recommended that:

1. Funds earmarked and no longer required for 'Commercial Training' (Project No. 33.00) are put towards funds required to purchase a Foreign pad mangle.
2. Excess funds earmarked for 'Fellowship Training' (Project No. 31.00) are used for training two additional fellows (Nos. 9 & 10) as agreed at the TPRM in March 1989 (See V. & VII.B.).
3. Two international experts, viz. Dyeing (Ref. 11-07) and Product Development (Ref. 11-05) are rescheduled to March 1991 (See VII.A.).
4. Computer database and retrieval system activities are suspended during the remaining period of the project owing to lack of funds, thereby delaying the recruitment of an experienced data processing operator and the replacement of a broken-down and outdated microprocessor.
5. If a computerised database and retrieval system are considered of sufficient importance, they should be incorporated into a Phase II of this Project, the possibility of which was discussed at the TPRM in March 1989.

IV. PROJECT PERFORMANCE EVALUATION REPORT (PPER No.2)

The contents of the 2nd PPER were agreed between the NPD and the CTA and the completed report has been distributed by CDFDC to all interested parties, including the Ministry of Textiles (Dr Zhu Xing), CICETE (Mr Li Ming), UNDP (Dr Shunichi Murata) and UNIDO.

The newly completed PPER will form the basis for the Second TPRM, provisionally fixed for 3rd, 4th April 1990.

V. SUMMARY OF FIRST TPRM

A TPRM was held in Shanghai on 14/15 March 1989, attended by representatives from CICETE, Ministry of Textiles, CDFDC, UNDP and UNIDO.

Dr K.S. Stephens, SIDFA, issued Minutes on 6 April, 1989, listing the following outputs, decisions and management actions:

'Outputs to be produced before the next Tripartite Review (TPR)'

1. Next TPR meeting to be held in March/April 1990.
2. In-depth evaluation in September 1990.
- 3/i PP construction to be completed and equipment installed with trial experimental runs underway,
/ii Experts on information and printing are to be fielded.
4. Four fellowships to be placed in 1989, each for 6m/m.
5. Completion of further R & D investigations (as outlined in CTA's Report of 13 February 1989).

'Decisions and management actions to be taken, when and by whom'

The following 12 action points are listed in an abbreviated form:

1. Construction of PP to be followed closely by NPD and project staff for completion by end of 1989.
2. Equipment installation to be coordinated and expedited upon completion of the PP by NPD and project staff.
3. CTA and NPD to prepare revised 'WORK PLAN' for inclusion in SIDFA's Minutes by mid-April 1989.
(N.B. Work Plan, Bar Chart, Revised Equipment and other Notes were mailed to SIDFA by Express Air Mail on 30 March 1989 but do not appear to have been included in these Minutes.)
4. Specifications, competitive bidding and bid evaluation, and procurement of equipment to be carried out by NPD and staff with timing of delivery coordinated with building construction completion.
5. Official request for UNDP contribution from IPF to be submitted by CICETE to UNDP (Beijing) in one month.
6. CTA to prepare and submit Mission Report by mid-April 1989 (N.B. It was agreed that such a report would duplicate the Minutes and was therefore superfluous.)

7. NPD and CTA to prepare a report of the 3 items of equipment already procured, showing their relevance to the project and requesting a waiver of competitive bidding (completed).
8. NPD and staff to undertake additional R & D work and enterprise consultancies throughout 1989.
9. NPD and CTA to prepare a comprehensive and thorough PPER by January 1990 in preparation for the next TPR meeting.
10. UNIDO to recruit and field experts in information and printing in 1989.
11. UNIDO, with assistance from CTA, to arrange placement of fellowships.
12. CICETE to prepare revised budget in accordance with the work plan etc.

VI. REVIEW OF ACTIVITIES AND OUTPUT

VI.A. Research and Development (RDD)

The results of three R & D investigations, completed in 1988/89 and reported in the CTA's 2nd Technical report (13/2/89), have been transferred to full-scale processing in several factories.

i/ Combined (one bath) scouring and bleaching of 100% Co fabrics
(c.f. V.A.i/p.6, 2nd Tech. Rep.)

The technology transfer of this investigation from laboratory-to pilot plant-to full-scale processing represents a notable achievement for technologists working under the direction of Mr Cheng Chengkang (senior engineer). To date, more than $\frac{1}{2}$ million m. Co. fabrics have been processed, the largest run consisting of 100,000 m.. The fabrics meet the usual criteria for whiteness and loss of strength (increase in fluidity). Advantages claimed for this modified combined scouring/ bleaching process include: a/ energy saving; b/ lower capital investment; c/ reduced labour cost; d/ higher production.

The help and advice of the Preparation Expert, Mr Kenneth Dickinson (Ref. 11-02) contributed to the success of this investigation. The following factories have carried out bulk trials and are using the process:

- a/ YEN TSUN Dyeing and Finishing Mill, Jiangsu Province
- b/ NANTONG ----- do -----
- d/ KUN SHAN ----- do -----
- e/ SHANGHAI No.2 Dyeing and Printing Mill, Shanghai

ii/ Rapid dyeing of 100% Co fabrics with reactive dyes
(c.f. V.A.iv/p.6, 2nd Tech. Rep.)

This process involves the fixation of reactive dyes by rapid steaming. The sequence pad-steam involves no intermediate drying. Steaming conditions are: 150°C for 90 seconds using superheated steam. Both monochloro triazine and vinyl sulphone type reactive dyes were used. The work under the direction of Mr Cheng Chengkang (senior engineer) started in the laboratory, and after pilot-scale trials has been transferred to bulk processing. To date, 100,000 m. Co fabrics have been satisfactorily processed at Shanghai No.2 Dyeing

and Printing Mill. Advantages claimed for this process include: a/ energy saving; b/ enhanced dye uptake (15%); c/ higher production, hence reduction in unit cost.

iii/ Flame-retardant (FR) finishes

(c.f. V.A.ii/p.6, 2nd Tech. Rep.)

A four-year project involving 19 organizations, coordinated by CDFDC under the supervision of Messrs Shen Songxiang and Yang Dongliang (senior engineers) has been completed. Commercially feasible FR processes were developed for Co, PE, Co/PE, Vi and PVA fabrics. CDFDC selected the institutions, organised and coordinated the project, helped in formulating the research programme and supervised the research work. Liaison between the institutions was CDFDC's responsibility and at the end of the project a symposium was held to discuss results, followed by a conference for the benefit of users. The FR project, with the development of products and processes for the benefit of the finishing industry of the PRC, represents another success story for CDFDC.

iii/a 100% Co

In collaboration with STRI and Shanghai No.2 Works, a modified FR product and process was developed, based on Pyrovatex CP (Ciba-Geigy). The resultant finish has a better handle than Proban (an alternative FR finish), but strength losses are greater. To date, some 2 million m. Co fabrics have been successfully processed at Shanghai No. 2. Outlets: apparel, decorative, workwear, safety and contract (hotels, etc.) fabrics.

iii/b 100% Co

An alternative FR finish based on Proban's modified THPC product has been developed by Beijing Textile Research Institute and Konghua Dyeing and Finishing Mill. The strength loss is less than in iii/a, but a harsher handle results. Outlets: decorative and furnishing fabrics.

iii/c 100% PE

Three organizations collaborated in the development of a FR finish based on 'Anti-Blaze 19T' ex Mobil (U.S.A.). The R & D work was carried out at Changshu Chemical Research Institute, and Changshu

Knitting Mill and Tong Fong Dyeing Mill, all at Changshu, Jiangsu Province, have since knitted and finished 5 million m. PE curtain fabrics with satisfactory FR properties.

iii/d 100% Vi and 100% PVA

CDFDC and China Textile University (Shanghai) collaborated in producing two FR finishes for Vi decorative fabrics and a combined FR/WR finish for PVA tentage and tarpaulin fabrics.

iii/e Co/PE and PE/Co blends

The work was carried out at Shoanxi Province Research Institute in collaboration with North West No.1 Dyeing Mill, both in Xi'an. The FR finish is based on a combination of a phosphorus base and organic compounds and Anti-Blaze 19T (c.f. iii/c). The finish meets FR regulations and is fast to washing (50 washes), but the handle is firm. 100,000 m. PE/Co blends have been successfully processed.

iv/ Advances in coating technology

(c.f. V.A.vi/p.6, 2nd Tech. Rep.)

This two-year project has been commissioned by the Ministry of Textiles and is also receiving financial support from the Shanghai Textile Industry Bureau (STIB). CDFDC is coordinating the work, involving the following organizations: a/ STRI; b/ Beijing Textile Research Institute; c/ Tianjin Research Institute; d/ Shanghai No.5 Printing and Dyeing Mill; e/ Shanghai Yung Sing Raincoat Mill; f/ Chengdu Dyeing and Printing Mill (Sichuan Province); g/ China Textile University; h/ Shanghai Dyeing and Finishing Research Institute. Aqueous based acrylic compositions are being developed by CDFDC and STRI; Beijing Textile Research Institute is developing solvent-based PU compositions. All forms of coating processes are being examined, including Direct, Foam, and Transfer coating (Mr Cai Zhongfang).

v/a Technical consultancies

Improved whiteness of PE fabrics. 1-year project for Shanghai Knitting Mill on a repayment basis.

v/b Stiffening of acrylic interlinings. 1-year project for Shanghai Tie Mill on a repayment basis.

VII.B. Pilot Plant1. Buildings

Since December 1989 when the CTA first visited and reported on the site of the PP (c.f. 2nd Technical Report), considerable progress has been made in erecting the PP. As anticipated in the 1st PPER, the building operations have progressed well. In January 1989 foundations were prepared; in March 1989, when the SIDFA and the CTA visited the site, pile driving was in progress; by August 1989, when the Technical Information Systems Expert visited the site, concrete foundations and framework of several buildings could be seen; on the CTA's 3rd visit on 14th November 1989, the buildings listed below (underlined) were nearly complete or in process of completion (c.f. Annex IX.C. PP Blueprint, CTA's 2nd Technical Report).

A large number of projected buildings have not yet been started and it is hoped that Central Government and Local Government funding will become available in a Phase II of the Project. It is expected that the main workshop will be completed by January 1990, so as to enable a phased installation and commissioning of machinery during the six months ending June 1990. (See Revised Work Plan Annex, X.A.)

1. Processing Plant Main Workshops for Preparation and Dyeing.
3 sections roofed, 1 section to be roofed.
2. Two Boiler Houses One completed with 2 Chinese NB coal-fired boilers and consoles installed; the 2nd boiler house requires concrete floor, but boiler already on site.
3. Warehouse for Grey Goods. (Phase II)
4. Maintenance Workshop. (Phase II)
5. Garage/Showers Completed.
6. Storage Shed for Dangerous/Inflammable Chemicals Completed.
7. Dormitory for Single Men. (Phase II)
8. Canteen Completed.
9. Office Building. (Phase II)
10. Reception/Gatehouse. Completed.
11. Finishing Workshop. Only one section completed (to be used for coating). 2 sections not yet started (Phase II)
12. Cancelled.
13. Cancelled.
14. Container for Dilute Alkali (Phase II)

15. Storage Container for Concentrated Alkali. Not yet started.
16. Underground storage for Dilute Alkali. " .
17. Container for Concentrated Alkali (NaOH). " .
18. Waste Water Reservoir. (Phase II) " .
19. Cancelled.
20. Cancelled.
21. Cancelled.
22. Cancelled
23. Chemical Laboratory. In progress.
24. Storage Buildings. (Phase II)
25. Chimney. Completed.
26. Pump Room. (Phase II)

2. Machinery and Equipment

There have been further changes to the List of Foreign and Chinese Machinery and Equipment detailed in the CTA's 2nd Technical Report (Annex IX.E, p.30) for both technical and economic reasons. In brief, under C. "Laboratory Equipment Required by CDFDC", item 13, a Peroxide and Alkali concentration testing instrument, KURABO, has been cancelled because of its high cost. Under D "Full Width Production Scale Machines Required by CDFDC - Chinese Government Input", item 15, a "Continuous preparation range" has been cancelled for a variety of reasons: First, CDFDC will initially handle small lots and therefore a fully continuous preparation range is at this stage inappropriate. Secondly, the successful outcome of the RDD investigation, "Combined (one bath) scouring and bleaching of 100% Co fabrics" (c.f. VI.A.i/) requires CDFDC to have facilities to demonstrate the new process. Thirdly, there is provision in the processing plant (c.f. Annex X.C) for a continuous preparation range in a Phase II of this Project (as yet to be agreed). Hence item 15 is being replaced by a Chinese machine for scouring and bleaching by the cold pad-batch process. Item 17 has been cancelled as superfluous in view of the purchase of B.4, a Vald Henriksen high pressure jigger. Item 20, a Monfort Montex type stenter has been cancelled for a variety of reasons. First, the Finishing Workshop will only comprise a PU Transfer Coating Plant, for which a stenter is not required; secondly, for heat-setting, drying and resin-finishing operations, which will be carried out in the Processing Plant, a multi-purpose machine known as a SST, (Short loop-short dry-tenter), capable of relaxed (loop) drying and also drying to width (tenter), as well as heat-setting, apparently meets the requirement of CDFDC and has been ordered. The CTA was shown such a

machine operating satisfactorily at Shanghai Ding Xin Printing and Dyeing Mill (c.f.VII.D.).

An up-to-date list of Foreign and Chinese machinery can be found in Annex X.E. It should be added that the cost of Chinese machinery (RMB Y) must be increased by 30% due to inflation.

All full-scale equipment, Chinese and Foreign, not already purchased has been or will be ordered by the end of December 1989 for delivery and commissioning by June 1990. For Chinese machinery the method of payment is: 30% on ordering, 40% on delivery and 30% after satisfactory commissioning.

A new development represents CDFDC's decision to cater for the wet processing of circular knitted fabrics. Apparently CDFDC owns quite a variety of machinery which is at present on loan to a Knitting Mill in ZHEJIANG Province. CDFDC have terminated the agreement and requested the return of the machinery which will be installed in the new PP.

VI.C. Training Department (TD)

Training courses, workshops, seminars and conferences were held on the premises of STRI, Shanghai Textile Engineering Association and elsewhere.

The following seminars and conferences were held at different venues in Shanghai with attendances in brackets:

- a/ "New winding and batching technology on A-frames", presented by BASTIAN, FRG. (63)
- b/ "Collection and Dissemination of Information", by Brian Rostron, Expert in Technical Information Systems, Ref. 11-04. (70)
- c/ Pigment dyeing of PE/Co blends. (50)
- d/ Combined (one bath) bleaching and scouring. (55)
- e/ FR finishes and finishing. (45)
- f/ Sanitized finishes. (45)

Some 320 people attended these seminars and conferences; another 180 participants attended various training courses and workshops. The information provided will help scientific and technical staff in institutes and mill personnel at all levels:

- (i) to keep abreast of technical innovations and new processing procedures,
- (ii) to understand more fully the nature of their tasks and responsibilities,
- (iii) to function more effectively, thereby increasing output and reducing unit costs of production.

VI.D. Information Department (ID)

Two monthly publications are widely circulated to the textile wet processing industry, i.e. dyers, printers and finishers, viz. a/ "Dyeing and Finishing", (in collaboration with STRI) reports the results of dyeing and finishing investigations carried out by STRI & CDFDC; b/ "Dyeing and Finishing Information" provides news and views about the industry.

Three information exchange meetings were held for personnel in the dyeing, printing and finishing industry. These were:

- i/ New advances in the Technology of Printing at FUZHOU, FUJIAN province.
- ii/ New Advances in the Technology of Finishing at Beijing.
- iii/ New Advances in the Modernization of Factories at Chengdu, Sichuan province.

Some 160 people attended these events, which were financially supported by the mills of the towns and provinces where the meetings were held.

Due to a major fault in the DUAL-68000 microcomputer of the Unix system, the computerised database and retrieval system has not functioned properly for 12 months. The PD and CDFDC management identify and require several different outputs from the computerised database, yet the TIS expert, Mr Brian Rostron, states in his Technical Report: "Visit of the TIS expert dated 29 August 1989" that:

- i/ no formal work plan exists with targets, aims and time-table,
- ii/ no one person is in charge of overseeing and coordinating projects,
- iii/ an experienced data processing operator be appointed with responsibility for ensuring compatibility of hardware, software operating system and languages between CDFDC and STRI computers.

The computer failure has resulted in a cessation of: a/ collecting abstracts for the Chinese and English language database; b/ compiling a list of machinery for the Textile Academy in Beijing on behalf of the Ministry of Textiles. CDFDC management had to decide whether or not to have the existing microcomputer, which is 5 years old, repaired. In the opinion of a computer expert, the existing microcomputer cannot be modified i/so as to increase its data storage capacity and ii/ make it compatible with other

STRI equipment on site. As there are no funds available to purchase an up-to-date main frame computer with adequate data storage capacity, CDFDC management has reluctantly come to the conclusion to shelve the computerised data storage and retrieval system for the remainder of the present project (ca. 15 months) and re-activate this output in a subsequent Phase II of this Project. The CTA is in agreement with this decision.

VII. REVIEW OF OTHER ACTIVITIES

VII.A. Revised Schedule for International Experts

Project No. DP/CPR/87/017

<u>Post/Title</u>	<u>Ref.</u>	<u>Duration</u>	<u>Date Required</u>
Chief Technical Adviser	11-01	i/0.7m/m	17 Jan 1988-6 Feb 88 (Mission Completed)
		ii/1m/m	22 Nov 1988-22 Dec 88 (Mission Completed)
		iii/1m/m	31 Oct 1989-29 Nov 89 (Mission Completed)
		iv/1m/m	November 1990
Experts in:			
Prep. of cotton & cotton blends	11-02	1m/m	June 1988 (Mission Completed)
Tech. Information Systems	11-04	1m/m	August 1989 (Mission Completed)
Textile Printing	11-03	1m/m	Apr - May 1990
Tex. Finishing & Fabric Coating	11-06	1m/m	July - Aug 1990
Textile Dyeing	11-07	1m/m	March 1991
Product Development of Textiles	11-05	1m/m	March 1991

Comments

11-04 Technical Information Systems Expert. Mr. Brian Rostron's mission was beneficial to CDFDC insofar as he analysed in a positive and constructive way the activities and output of the ID. He highlighted some of the problems and difficulties CDFDC is faced within their activities with the computerised database and retrieval system. Mr. Rostron established a useful relationship with the Institute for Science and Technology Information of Shanghai which is able to satisfy CDFDC's needs for access to international on-line host databases - particularly access to WTA, Textile Technology Digest and TITUS. The Expert emphasized the need i/ for training more CDFDC personnel in all aspects of the use of databases; ii/ to establish a programme of familiarization and training for mill technologists, thereby introducing this new technology to the Chinese textile dyeing, printing and finishing industry. A full-day seminar was held on the subject of 'The Collection and Dissemination of Information', which was attended by about 70 people c.f. VI.C. A stimulating and constructive Technical Report: 'Visit of Expert in Technical Information Systems', dated 29th August 1989, is available.

11-03 Textile Printing Expert. Considerable effort was required to locate a suitable Printing Expert after the previously chosen experts were either unwilling to undertake the mission to the PRC or had been rejected by UNIDO. However, a suitable candidate has emerged in Mr G.S.A. (Tony) Corbishley, whose candidature the NPD has accepted, but has yet to be approved by UNIDO. Mr. Corbishley's qualifications and experience make him an ideal choice for the post. In addition to the activities listed in the Job Description, the NPD has requested that Mr Corbishley should give the following lectures:

1. The present situation and future trends in pigment printing.
2. Review of properties including methods of application of binders and thickening agents.
3. Discharge and Resist Printing of PE/Co and Co/PE blends.
4. Technical and commercial advantages and disadvantages and trends of copper roller printing versus flat and rotary screen printing.
5. Laser engraving.

The NPD suggested that the first 2 lectures should be formal, as they will be given to a large audience and would require more preparation and visual

aids than the remaining 3 lectures. Again it has been requested that MSS be made available for translation a fortnight before the arrival of the Expert in Shanghai.

11-06 Textile Finishing and Fabric Coating Expert. Ir Jongbloet's mission is now scheduled from mid-July until mid-August 1990. The titles of five lectures which Ir Jongbloet is due to deliver at CDFDC (as listed in the Technical Report: Second Visit of CTA') remain unchanged.

11-07 Textile Dyeing Expert. At the request of the NPD, Dr Beckmann's mission has been postponed for operational reasons until March 1991. The titles of five lectures which Dr Beckmann has been asked to deliver at CDFDC (as listed in the 'Technical Report: Second Visit of CTA') remain unchanged.

(N.B. Since this Report has been written, Dr Beckmann has informed the CTA that the new mission date is not acceptable. However, Dr Beckmann is available to visit CDFDC on or after 22nd October 1990 with the mission terminating before Christmas 1990. UNIDO and the NPD are being advised of Dr Beckmann's request.)

11-05 Product Development of Textiles Expert. At the request of the NPD, the selected candidates's mission has been postponed for operational reasons until March 1991.

VII.B. Fellowships

During 1989 two further Fellowships were taken up each of six months duration.

Mr SHI Hui Ming was accepted by Courtaulds Research Division and has been placed with the R & D Group based in Spondon, Derby, U.K.

Miss HAO Ping was accepted by Southern Regional Research Laboratories (SRRL) and has been working in their Laboratories in New Orleans, Louisiana, U.S.A.

At the TPRM held in March 1989 it was agreed to increase the number of Fellowships from eight to ten; however, in the CTA's opinion inadequate provision was made in the Project for the implementation of the Fellowship programme. In particular, no funds were earmarked to pay for the cost of training. As a result, free training places have to be secured by CDFDC and the CTA, the latter making use of his former contacts and connections. Moreover, the CTA wishes to put on record that his efforts in securing places for Fellows (and other activities) are carried out in his own time and at his own expense.

Brief details of the Fellowship Programme (completed, in progress, and planned) are given in tabular form below. The duration of all Fellowships has been reduced to six months from the ten months stated in the PD.

<u>NAME</u>	<u>INSTITUTION</u>	<u>PLACE AND LOCATION</u>	<u>DATE</u>	
			from	to
1. CAI Zhong Fang	Shirley Institute	Manchester, U.K.	Mar 88	Sep 88
2. QI Rong	Hamburg University	Hamburg, F.R.G.	Apr 88	Oct 88
3. Miss HAO Ping	SRRL	New Orleans, U.S.A.	May 89	Nov 89
4. Mrs ZHOU De Xin	Ciba-Geigy	Basle, Switzerland	Jan 90	Jul 90
5. SHI Wei Ming	Courtaulds	Derby, U.K.	Aug 89	Feb 90
6. DONG Wei Ching	Bayer	Leverkusen, F.R.G.	to be arranged.	
7. ZHANG Yu Fan	Oasak Res. Inst.	Osaka, Japan	Sep 90	Mar 91
8. WU Pei Qiang	Hoechst	Frankfurt, F.R.G.	Sep 90	Mar 91
9. ?	BASF or ICI	Ludwigshafen, F.R.G. Manchester, U.K.	Sep 90	Mar 91
10. ?	Du Pont or Müegyetem	Wilmington, U.S.A. Budapest, Hungary	Sep 90	Mar 91

VII.C. Study Tours

The postponed Second Study Tour to U.S. and Canadian machinery manufacturers and textile wet processing mills was finally realised during the period under review.

The second technical study tour to the U.S.A., Canada and Singapore covered five weeks and took place from 8th September to 10th October 1989. Six senior members of the Ministry of Textile Industry and CDFDC took part. 'The Second Technical Study Tour Delegation' issued a Report in English dated October 1989 which has been distributed to interested parties.

According to the Revised Work Plan (see Annex X.A.), the Third Technical Study Tour again involving six senior persons from the Ministry and CDFDC is now expected to take place in September/October 1990. It is intended to visit machinery manufacturers and textile wet processors in the following European countries: F.R.G., Spain and Belgium.

VII.D. Factory Visit**Shanghai Din Xin Printing and Dyeing Mill**

Present: Mr Xu Bao Xing - Director

Mrs Tong Man Qing - Assistant Mill Manager; Chief Engineer

The purpose of this visit was two-fold. First, to inspect a SST machine operating under mill conditions. Secondly, to ask management for its view and experience in using the SST machine for a variety of finishing processes.

Din Xin is a relatively old mill, but was reconstructed in 1984 and re-equipped. In 1986, it started producing a wide range of dyed and printed fabrics. Its annual output is 24 million m. and it employs 1050 staff and workers. The mill handles a great variety of fabrics made from PE/Co, Co, Co/Vi in medium staple lengths and in widths from 70 to 160 cm. The machines are large Chinese made; however, Japanese preparation ranges, Stork (Dutch) rotary screen printing machines, an Arioli (Italian) steamer and a Monforts (FRG) heat-setting stenter were pointed out.

Several continuous preparation lines, made by Sando Iron Works, Japan, produce scoured and bleached 65/35% PE/Co fabrics. A mercerisation range is available for 100% Co fabrics. Facilities exist for Thermosol dyeing comprising: a Küsters pad, I.R. and hot-flue pre-dryers; heat-setting and dye fixation is carried out on Monforts stenter.

Din Xin management is fully aware of the competition facing them in the world's export markets. In order to maintain and even increase their exports, they plan to improve the quality of their production, also accept smaller dye lots in keeping with high quality up-market trends.

The SST machine installed, a Japanese development of the 70s, was made by Kunshan machinery company and is three years old. It is a versatile machine and can be used for a variety of operations such as: i/ conventional stentering (e.g. 100% Co fabrics); ii/ heat setting (e.g. 100% PE and PE/Co blend fabrics); iii/ padding, drying and curing of resin finishes and softeners (e.g. 100% Co and Vi and PE/Co and PE/Vi blends). The machine consists of a padder leading to an elevated short loop pre-dryer, followed

by a brattice dryer, where the cloth is conveyed in plaited form. The stenter (tenter) is on ground level. The abbreviation SST stands for short loop, short conveyor dryer, tenter.

Mrs Tong explained that heat setting conditions were: 180°C, 60 m/min with a dwell time of 30 seconds at top temperature. The machine was also frequently used as a dryer and polymeriser for resin finishing. Its multi-purpose capability was praised, which is the reasoning behind CDFDC management's decision to purchase one instead of a conventional stenter. The only difficulty encountered in three years' usage related to problems of synchronising the different operating units. The SST machine at Ding Xin is gas heated; the PP machine, in the absence of gas, will have to be oil heated.

Several photographs were taken which are included in the Annex X.E.

VIII. CONCLUSIONS

The project is now on target as far as the activities and output of all four 'Immediate Objectives' are concerned, viz. a/ RDD; b/ PP' c/ TD and d/ ID. In particular, the outputs of both the RDD and TD continue to be above average. Further, it is a pleasure to report that much progress has been made in meeting the 'Immediate Objective' of 'Setting up a PP' as already described. The erection of the PP is more or less on schedule as agreed at the last TPRM in March 1989, with completion of all building operations by the end of January 1990. Orders have been placed for most of the Chinese and foreign machinery and equipment, and the remaining orders will be placed by the end of December 1989. Erection and commissioning of machinery is expected to be on schedule too, i.e. June 1990.

The activities and output of the ID are also satisfactory, with the exception of the computerised database and retrieval system. After giving due considerations to the various options available to management and being mindful of the recommendations made by the TIS Expert who visited the Centre in August 1989, a decision has been taken to shelve this particular output for the remainder of this Project but reactivate it in a possible Phase II.

IX. ACKNOWLEDGEMENTS

The CTA wishes to thank Dr Zhu Xing and his staff of the Department of International Cooperation, Ministry of Textiles, Beijing for the courtesies extended to him and his wife during their stay in Beijing. The CTA was pleased to have had detailed discussions with Dr Zhu and Mr Chen concerning the progress and achievements of the Project "Strengthening of the China Dyeing and Development Centre".

It is a pleasure to recall the luncheon given by Dr Zhu for the CTA and his wife at which Dr Shun-ichi Murata and his wife represented UNDP and Mr Li Ming and Miss Wang Wei Li represented The China International Centre for Economic and Technical Exchanges.

The very close and good working relationship established between the NPD, his staff and the CTA continues unchanged. All meetings and discussions always take place in a spirit of cooperation and complete frankness which is of benefit to the progress of the project.

The efforts of a large number of CDFDC staff members to be assistance should be recorded. In particular, Mr Cai Zhong Fang and Mr Cai Pei Wei continually strive to remove all problems and make our stay as pleasant as possible. The CTA would like to thank the NPD for making the visit to Suzhou and Wuxi possible.

X. ANNEX

X.A. Revised Work Plan

<u>No.</u>	<u>ACTIVITY</u>	<u>DETAILS</u>	<u>DURATION</u>
1.	<u>Construction of PP</u>	Building started Dec. 88	Dec 88 - Jan 90
2.	<u>Fellowship No.3</u>	Miss Hao Ping seconded to SRRL	May 89 - Oct 89
3.	<u>Imported Lab.Equipmt</u>	2 Roll Horiz. Pad ex Benz order/del	Dec 89 - Apr 90
4.	do.	Drying and curing (H/S) Unit ex Benz	do.
5.	do.	Flammability 45° Test Inst. ex Suga	do.
6.	do.	" Vertical " "	do.
7.	do.	" Mushroom ex US Test Co	do.
8.	<u>Technical Study Tour</u>	Tour No.2; USA, Canada, Singapore	Sep 89 - Oct 90
9.	<u>Fellowship No.4</u>	Mrs ZHOU De Xin seconded to Ciba-Geigy, Basle, Switzerland.	Jan 90 - Jul 90
10.	" <u>No.5</u>	Mr SHI Wei Ming seconded to Courtaulds Research Div., Derby, U.K.	Aug 89 - Feb 90
11.	<u>Imported Machinery</u>	H.P. Jigger ex Vald Henriksen ord/del	Sep 90 - Mar 90
12.	"	H.T. Jet/Overflow Machine ex Béné "	do.
13.	<u>International Expert</u>	Tech.Info.Systems (Mr Brian Rostron)	August 89
14.	<u>Imported Lab Equipmt</u>	Dyeing Machine ex AHIBA order/deliv.	Dec 89 - Apr 90
15.	do.	HT Jet/Overflow ex. W. Mathis "	do.
16.	<u>Imported Machinery</u>	Calender ex Ramisch-Kleinewef. "	Dec 89 - Jun 90
17.	<u>Fellowship No.6</u>	Mr DONG Wei Ching seconded to Bayer Leverkusen, F.R.G.	to be confirmed
18.	<u>International Expert</u>	Textile Printing (Mr Tony Corbishley)	Apr 90 - May 90
19.	<u>CTA's Third Mission</u>	Preparation of PPER for Mid TPRM	November 89
20.	<u>PP Commissioning</u>	PP to be fully operational with imported and Chinese Machinery by Jun 90	Jan 90 - Jun 90
21.	<u>Mid TPRM</u>	Shanghai, 3rd & 4th April 1990	April 90
22.	<u>Technical Study Tour</u>	Tour No.3; FRG, Spain Belgium	Sep 90 - Oct 90
23.	<u>International Expert</u>	Textile Dyeing (Dr W. Beckmann)	March 1991*
24.	<u>Fellowship No.7</u>	Mr. ZHANG Yu Fan seconded to Osaka Research Institute, Japan	Sep 90 - Mar 91
25.	" <u>No.8</u>	Mr WU Pei Qiang seconded to Höchst, Frankfurt a.M., FRG	do.
26.	<u>International Expert</u>	Textile Finishing/Fabric Coating (Ir Jan Jongbloet)	Jul 90 - Aug 90
27.	<u>In-Depth Evaluation</u>	To take place 6 months before end of project	September 90
28.	<u>CTA's Final Mission</u>	Preparation of PPER for terminal TPRM	November 90
29.	<u>Fellowship No.9</u>	Fellow to be seconded to BASF, Ludwigshafen, FRG (to be agreed)	Oct 90 - Mar 91
30.	<u>Fellowship No.10</u>	Fellow to be seconded to ICI (U.K.)/Du Pont (U.S.A.) (to be agreed)	do.
31.	<u>International Expert</u>	Product Development (Mr John Gordon)	March 91
32.	<u>Terminal TPRM</u>	To be held March 1991 prior to termination of Project	do.
33.	<u>End of Project</u>	Extended to March 1991	31st March 91

* Above date unacceptable to Dr Beckmann. A date this year, but after 22/10/90 will have to be agreed by all parties.

X.C. PROJECT BUDGET/REVISION

UNITED NATIONS DEVELOPMENT PROGRAM

MANDATORY REVISION

COUNTRY: People's Republic of China
 PROJECT TITLE: Strengthening of the China Dyeing
 and Finishing Development Centre
 PROJECT NO: CPR/87/017/C/01/99

The attached budget of the above-mentioned project is mandatorily amended. It has been made to reflect the actual expenditure of 1988 and to rephase the savings to subsequent years.

Furthermore, it has been revised to increase US\$250,000 of IPF allocation to replace the half of the Government cost sharing (please see our letter dated April 3, 1989 for details).

The change in the UNDP contribution is as follows:

Previous UNDP input-project budget code "B"	US\$1,476,522
Revised UNDP input-project budget code "C"	US\$1,476,522
UNDP input - increase	US\$250,000
Government cost-sharing decrease	US\$250,000

 Approved on behalf of the Government

1989.5.11
 Date

 Approved on behalf of the UNDP

 Date

PROJECT BUDGET SHOWING UNDP CONTRIBUTION
(IN US \$)

COUNTRY: THE PEOPLE REPUBLIC OF CHINA
PROJECT NUMBER: CPR/87/017/C/01/99
TITLE: STRENGTHENING OF THE CHINA DYEING AND FINISHING
DEVELOPMENT CENTRE (PHASE II)

		TOTAL		1987		1988		1989		1990	
		m/m	\$	m/m	\$	m/m	\$	m/m	\$	m/m	\$
10	PROJECT PERSONNEL										
11.01	CTA	4.5	52,225			2.0	25,942	1.5	12,280	1.0	14,003
11.02	BLEACHING EXPERT	1.0	12,400			1.0	12,400				
11.03	PRINTING EXPERT	1.0	8,500					1.0	8,500		
11.04	INFORMATION SYSTEM EXPERT	1.0	8,500					1.0	8,500		
11.05	PRODUCT DEVELOPMENT	1.0	9,000							1.0	9,000
11.06	COATED FABRICS	1.0	9,000							1.0	9,000
11.07	DYEING TECHNOLOGY	1.0	9,000							1.0	9,000
11.51	SHORT-TERM CONSULTANTS	1.0	9,000					.5	4,500	.5	4,500
11.99	Sub-total	11.5	117,625			3.0	38,342	4.0	33,780	4.5	45,503
16	MISSION COST		22,000				857		14,000		7,143
16.99	Sub-total		22,000				857		14,000		7,143
17	Component Total	11.5	139,625			3.0	39,199	4.0	47,780	4.5	52,646
30	TRAINING										
31	FELLOWSHIP	60.0	142,400			12.0	22,274	24.0	60,063	24.0	60,063
31.99	Sub-total	60.0	142,400			12.0	22,274	24.0	60,063	24.0	60,063
32	STUDY TOUR	18.0	117,836	6.0	37,275			6.0	38,900	6.0	41,661

30

PROJECT BUDGET SHOWING UNDP CONTRIBUTION
(IN US \$)

COUNTRY: THE PEOPLE REPUBLIC OF CHINA
PROJECT NUMBER: CPR/87/017/C/01/99
TITLE: STRENGTHENING OF THE CHINA DYEING AND FINISHING
DEVELOPMENT CENTRE (PHASE II)

		TOTAL		1987		1988		1989		1990	
		m/m	\$	m/m	\$	m/m	\$	m/m	\$	m/m	\$
32.99	Sub-total	18.0	117,836	6.0	37,275			6.0	38,900	6.0	41,661
33	COMMERCIAL FELLOWSHIP	9.0	22,500					9.0	22,500		
33.99	Sub-total	9.0	22,500					9.0	22,500		
39.	Component Total	87.0	282,736	6.0	37,275	12.0	22,274	39.0	121,463	30.0	101,724
40	EQUIPMENT										
41	EXPENDABLE EQUIPMENTS		26,000						16,000		10,000
41.99	Sub-total		26,000						16,000		10,000
42	NON-EXPENDABLE EQUIPMENT		1,020,000				105,121		94,879		820,000
42.99	Sub-total		1,020,000				105,121		94,879		820,000
49.	Component Total		1,046,000				105,121		110,879		830,000
50	MISCELLANEOUS										
51	SUNDRY		8,161				175		3,536		4,450
51.99	Sub-total		8,161				175		3,536		4,450
59.	Component Total		8,161				175		3,536		4,450

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PAGE 3

PROJECT BUDGET SHOWING UNDP CONTRIBUTION
(IN US \$)

COUNTRY: THE PEOPLE REPUBLIC OF CHINA
PROJECT NUMBER: CPR/87/017/C/01/99
TITLE: STRENGTHENING OF THE CHINA DYEING AND FINISHING
DEVELOPMENT CENTRE (PHASE II)

		TOTAL	1987	1988	1989	1990
	m/m	: \$	m/m	\$	m/m	\$
99	GRAND TOTAL	98.5	1,476,522	37,275	166,769	283,658
			37,275	166,769	283,658	988,820
100	GOVERNMENT COST-SHARING		250,000		150,000	100,000
109	Component Total		250,000		150,000	100,000
999	UNDP INPUT		1,226,522	37,275	166,769	283,658
			1,226,522	37,275	166,769	888,820

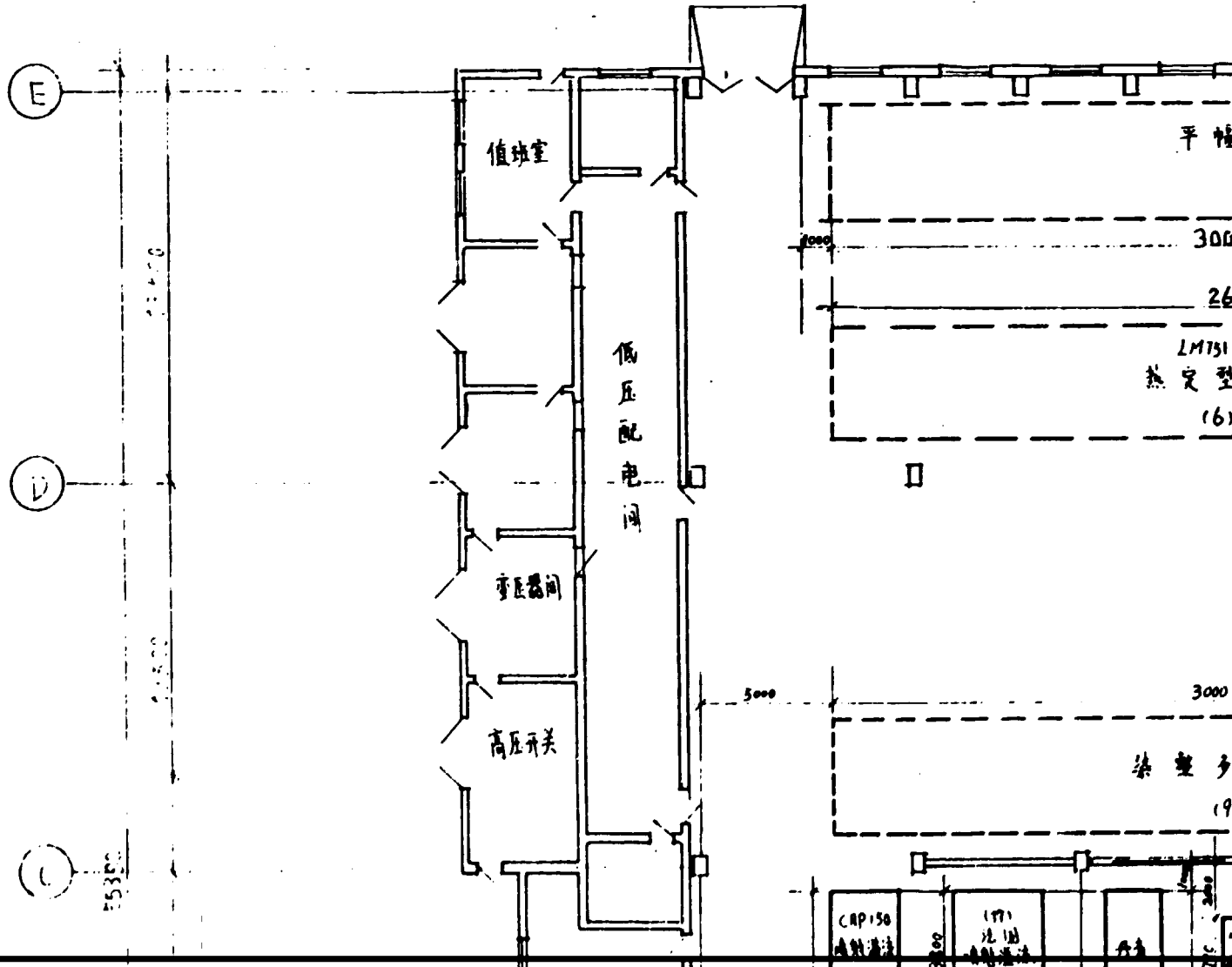
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X.D. List of Foreign and Chinese Machinery and Equipment

A. <u>Full-width Production Scale Machinery Acquired by CDFDC</u>	Actual Cost
1. Jeans stone washing and treatment machine, Tupesa, Spain	\$ 27,500
2. Rotary coating machine (head), Mitex Co., Spain	\$ 44,000
3. Thermobrush design machine, Mortamet Co., France	FF 480,000
B. <u>Full-width Production Scale Foreign Machines Order by CDFDC</u>	
4. High pressure jigger (Vald Henriksen)	\$ 250,000
5. High pressure jet/overflow rope dyeing machine (Béné)	\$ 200,000
6. Calender (Ramisch-Kleinewefers)	\$ 300,000
C. <u>Foreign Laboratory Equipment Ordered by CDFDC</u>	
7. Lab. drying and curing (H/S) unit Type MT (Benz)	\$ 17,842
8. Lab. 2 roll horz. padder type KLFH-F (Benz)	\$ 10,715
9. Flammability 45° Test Instr. (SUGA)	\$ 13,800
10. - do. - Vertical Test Instr. (SUGA)	\$ 12,700
11. - do. - Mushroom Test Instr. (US Testing Co. Inc)	\$ 13,500
12. Lab. dyeing machine; six dyeing positions (AHIBA)	\$ 15,000
13. Lab. jet/overflow pressure dyeing machine (Werner MATHIS)	\$ 20,000
D. <u>Full-width Production Scale Machines Ordered by CDFDC</u>	
<u>Amended List. Chinese Government Input</u>	Approximate Price RMY B
14. One double face gas singeing machine (LMH - 003 AJ - 180)	150,000
15. One cold pad-batch machine for scouring/bleaching cotton	400,000
16. Two jiggers (SM-315C - 180); already acquired	50,000
17. One rope opener; already acquired	50,000
18. One cylinder dryer	100,000
19. One curing machine (MH 681 - 180); already acquired	150,000
20. One progressive shrinkage machine (LMH 751 - 180)	150,000
21. One heating cylinder for silk	50,000
22. One Type SST short loop - short dry - tenter	500,000
22. Other miscellaneous machines and equipment	110,000
All the above equipment, not already acquired, has been ordered for phased delivery between now and end of June 1990.	

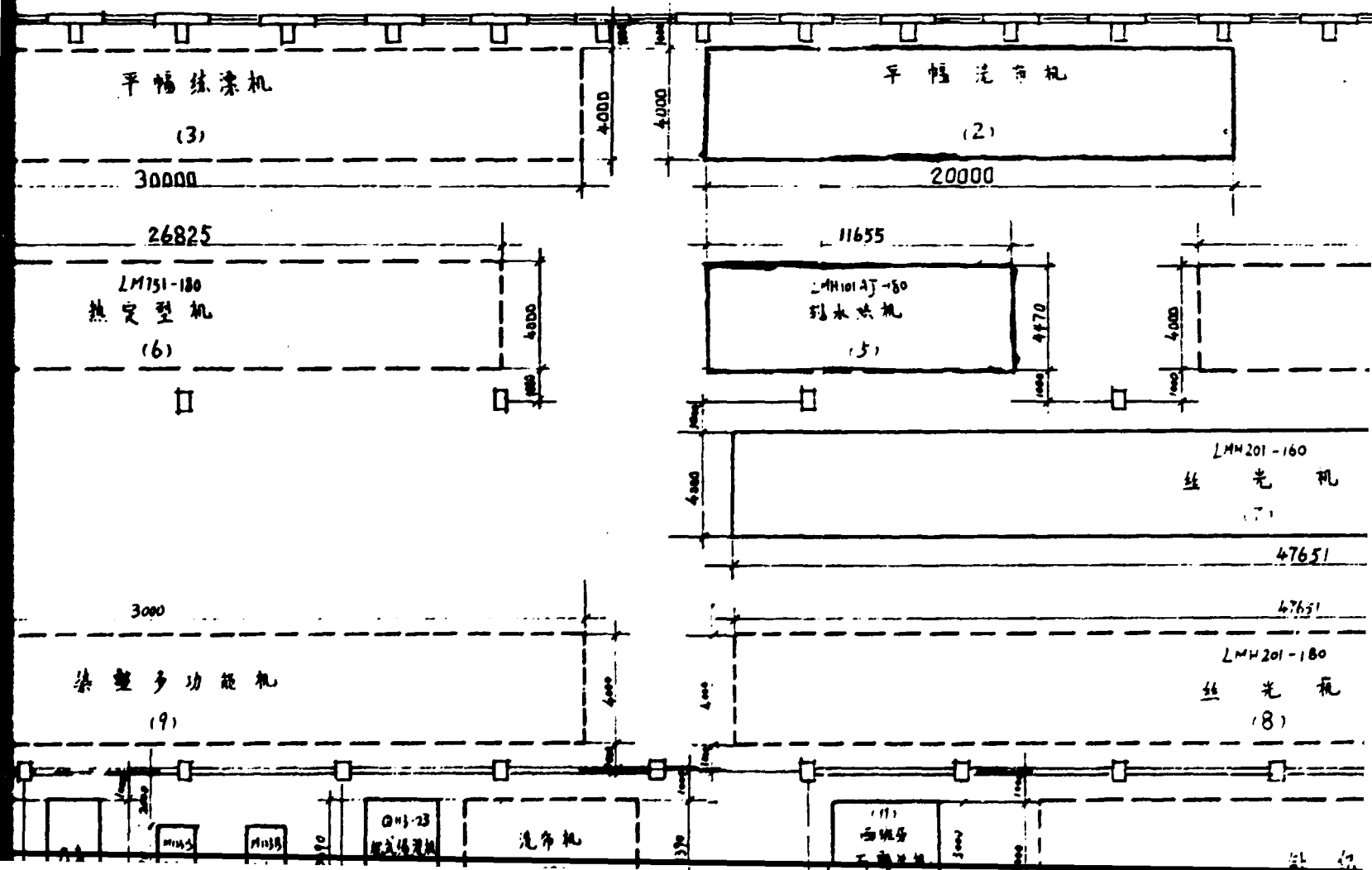
The above prices must be increased by 30% to allow for inflation.

SECTION 1



X.C. LAYOUT OF PILOT PLANT

SECTION 2

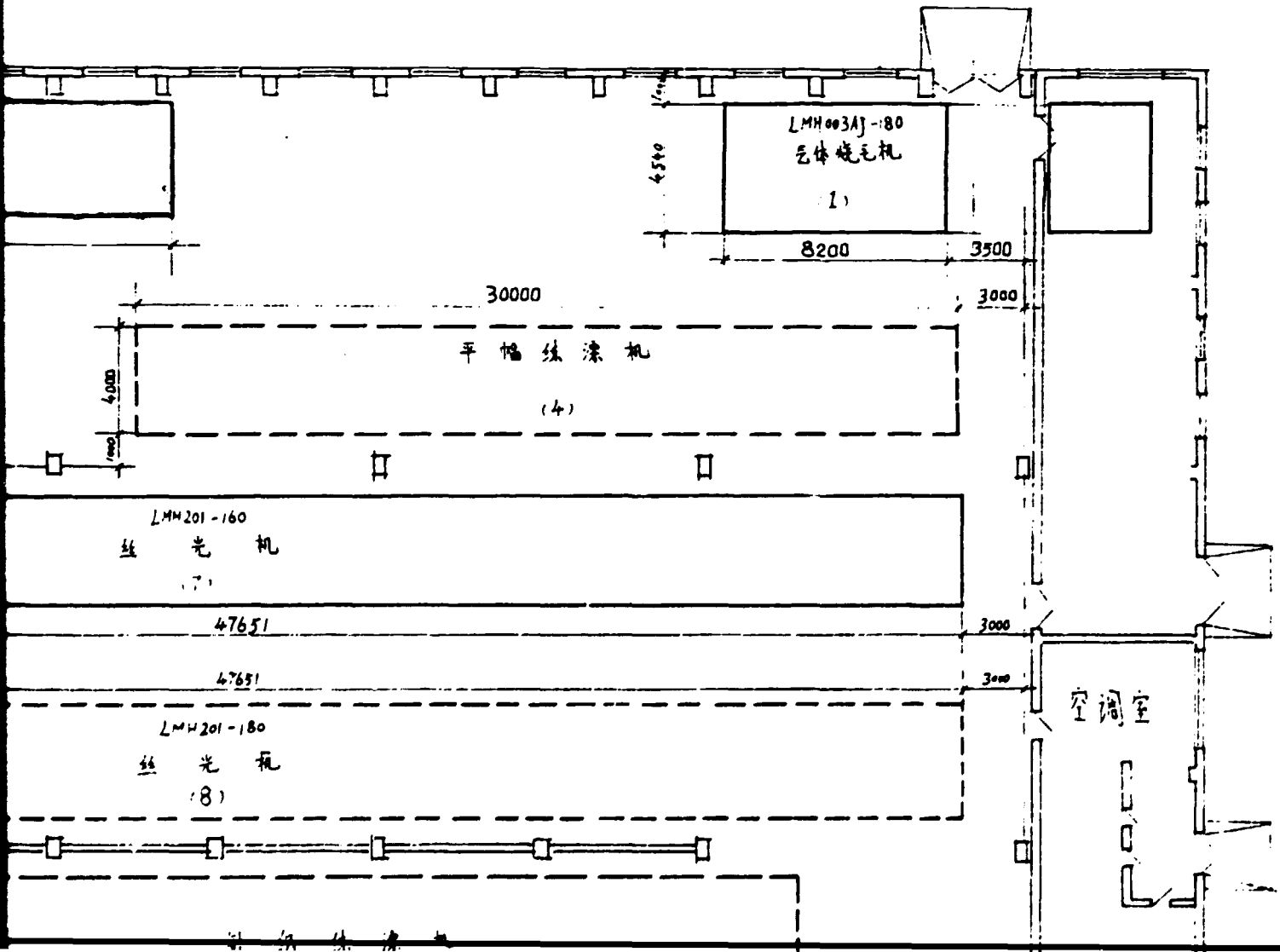


———— Machines to be installed during January - June 1990

ANT

- - - - Space for machines to be installed in Phase II of Project

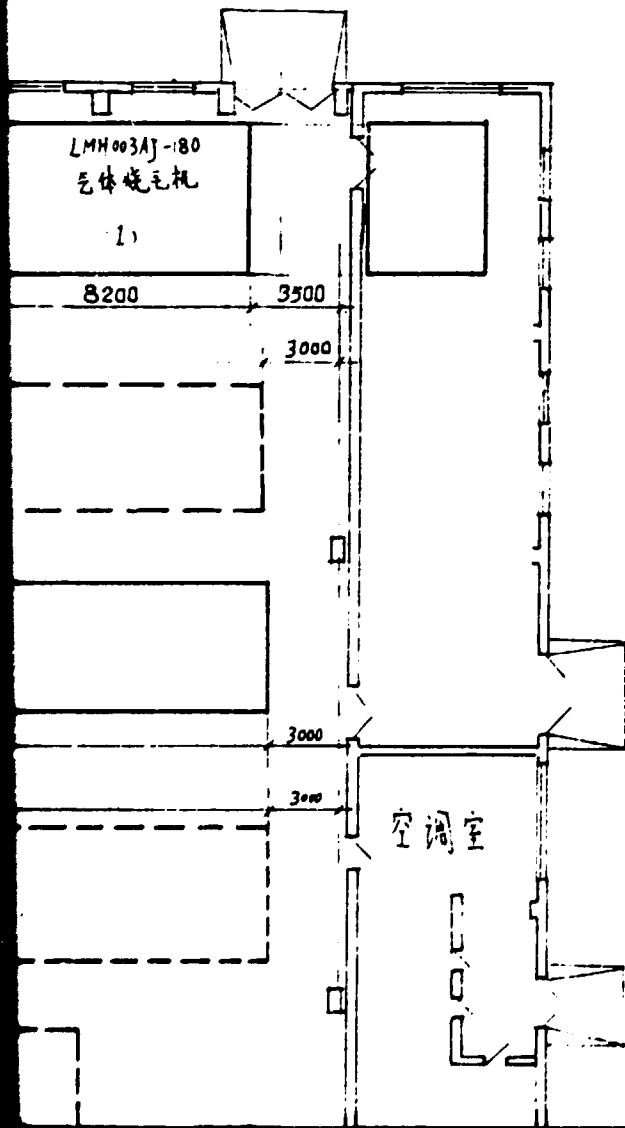
SECTION 3



installed during January - June 1990

ines to be installed in Phase II of Project

SECTION 4



NOTE

1.	Gas singeing machine	✓
2.	Open width washing machine	✓
3.	Open width scouring and bleaching range	✓
4.	Open width scouring and bleaching range	✓
5.	Mangle and drying machine	✓
6.	Heat setting machine	✗
7.	Mercerizing machine	✓
8.	Mercerizing machine	✗
9.	Multi-use dyeing machine	✗
10.	Scouring and bleaching range for knitted goods	✓
11.	Stone-wash machine (Spain)	✓
12.	Washing range for knitted goods	•
13.	Tensionless washing machine in rope form	✓
14.	Jigger	✓
15.	Jigger	✓
16.	VH-SUPER-1200 HT jigger (Denmark)	✓
17.	HT jet-overflow rope dyeing machine (France)	✓
18.	Jet-overflow rope dyeing machine	✓
19.	Three roller steaming calender for knitted goods	✓
20.	Horizontal cloth turning machine for knitted goods	✓
21.	Mosh drum cylinder dryer for knitted goods	✓
22.	Mangle and drying machine	✓

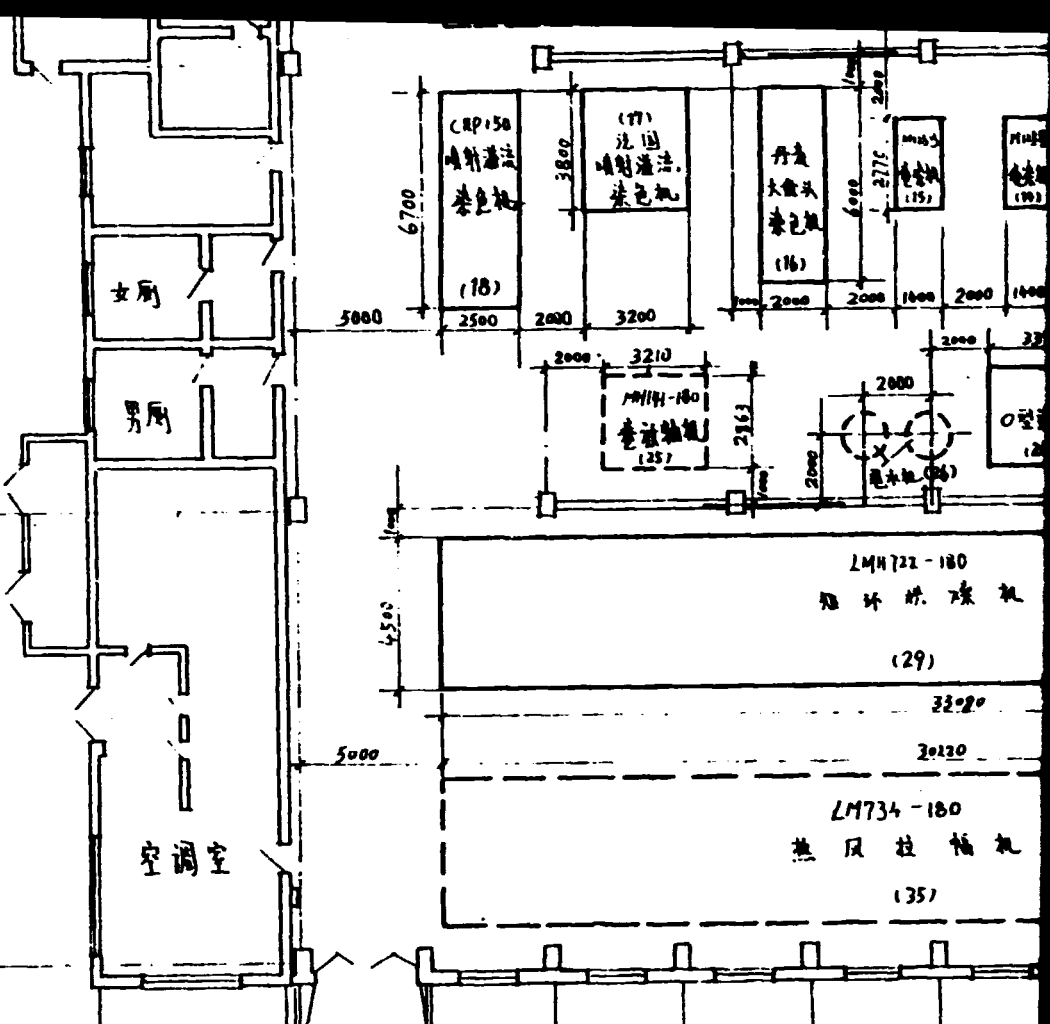
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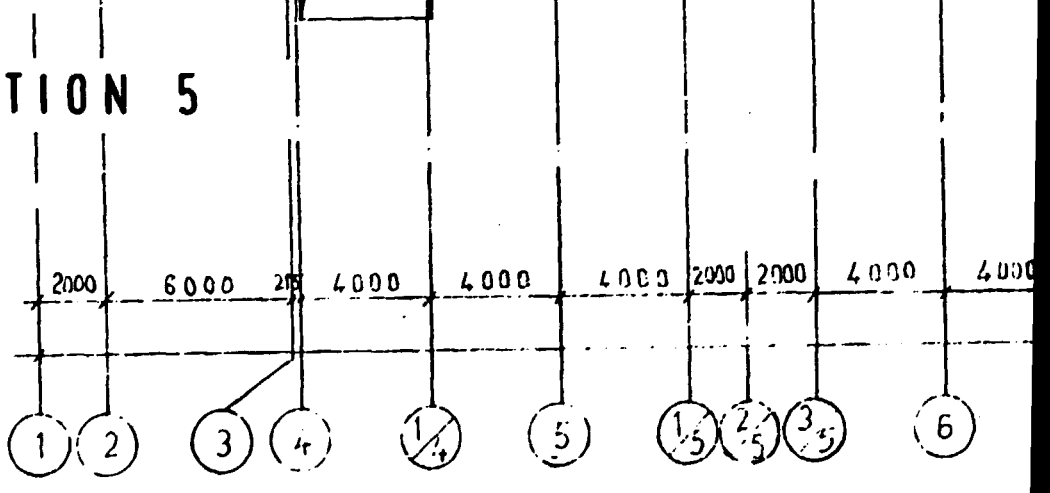
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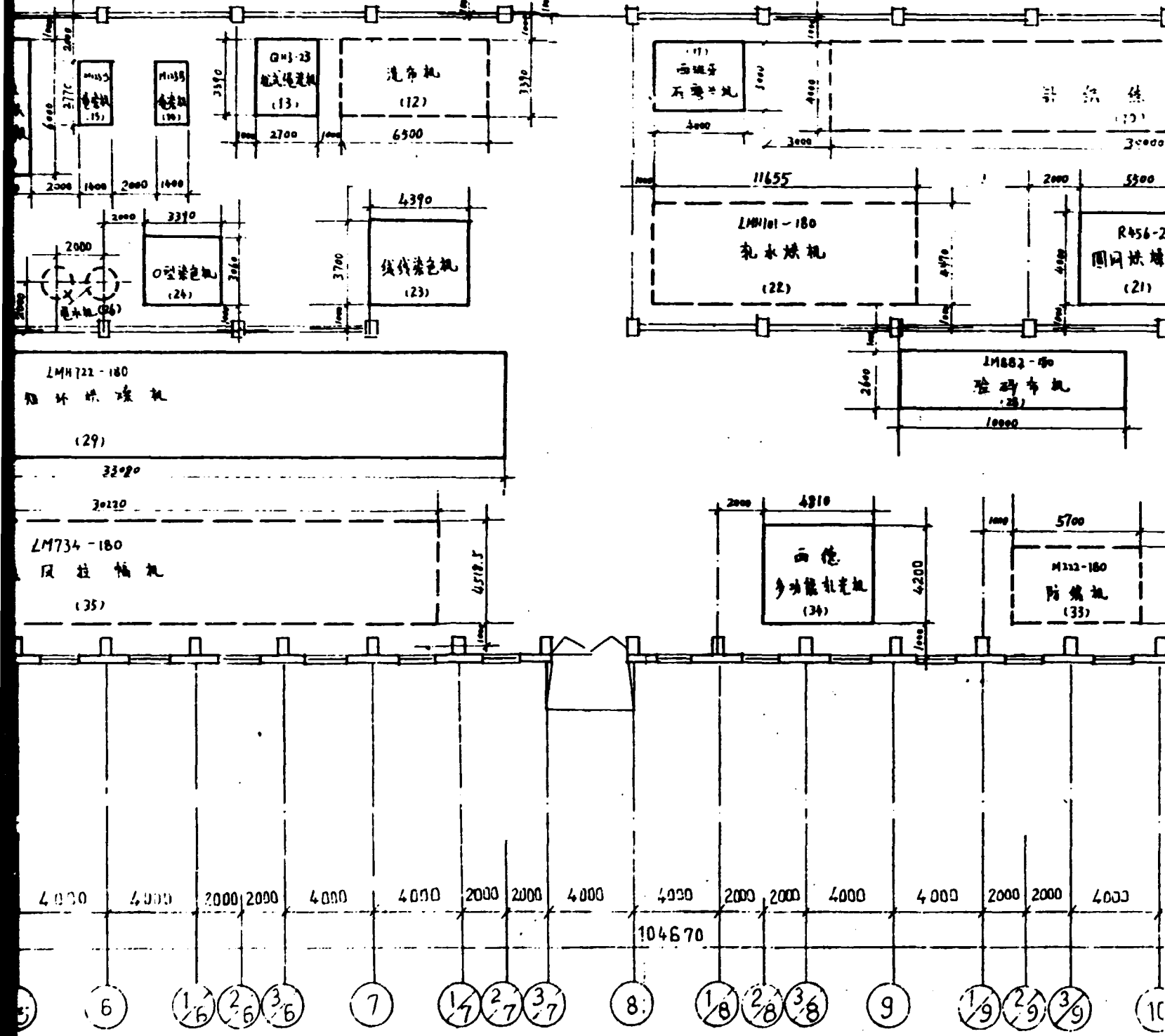
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SECTION 5



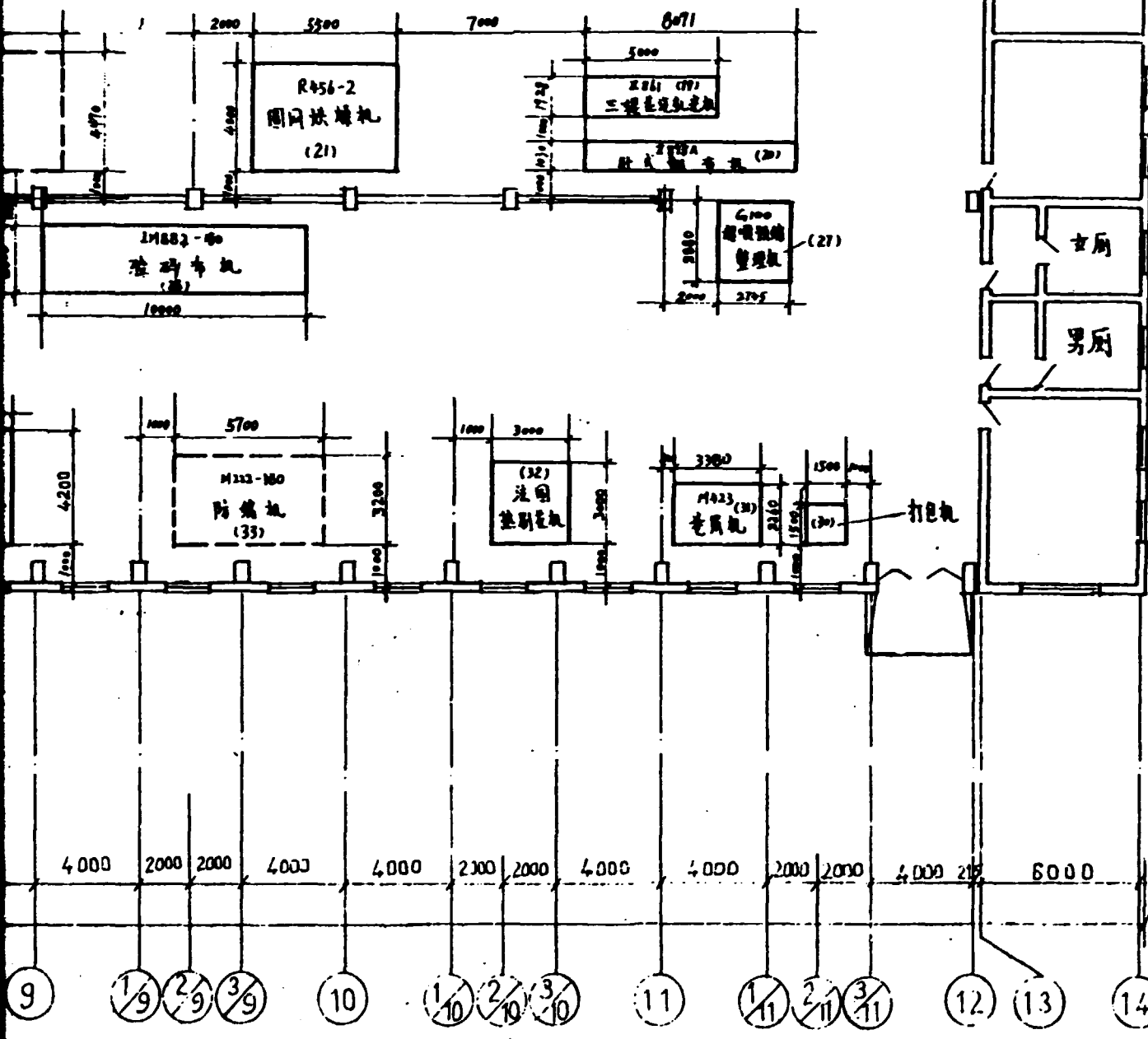


SECTION 6

纤维丝漆机

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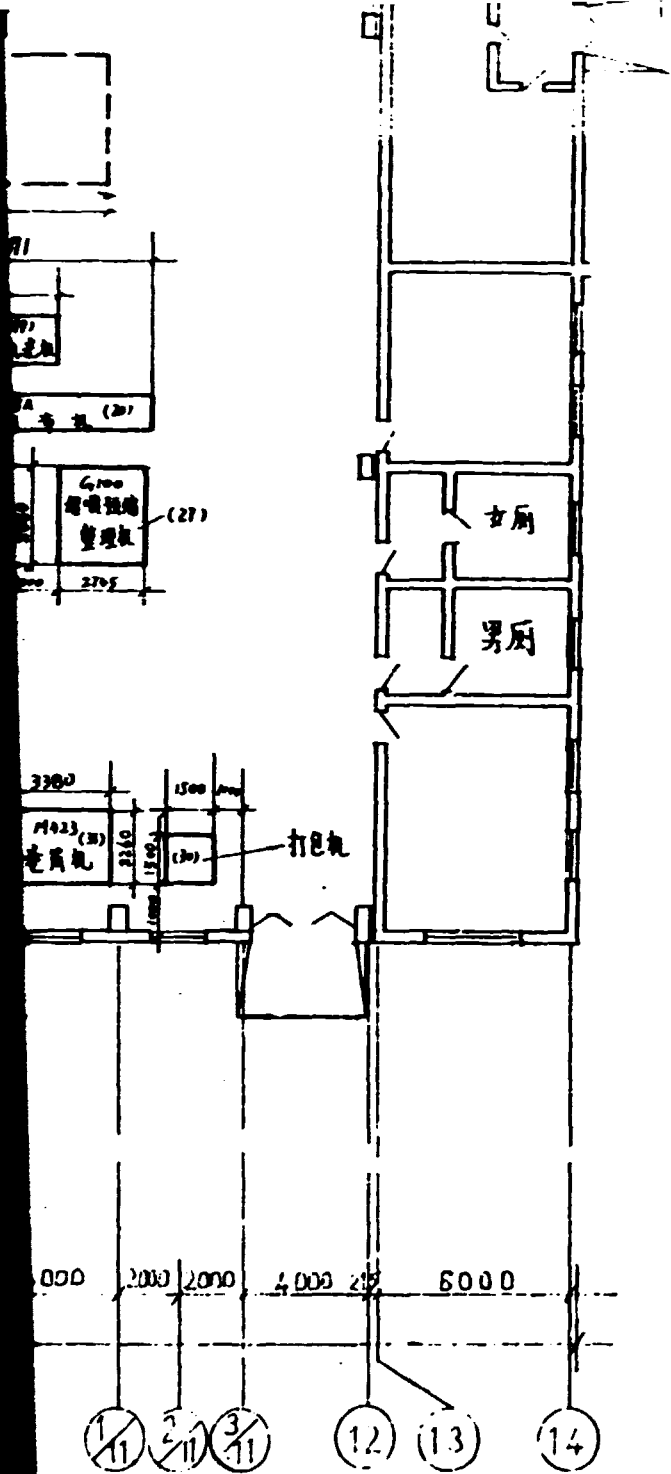


女厕

男厕

SECTION 7

设计	李洪斌
制图	李洪斌
插图	
校对	李洪斌
工艺检查	
材料检查	
标记	更改内容及依据
	更改人
	日期
	审核



- | | | |
|----|---|---|
| 19 | Three roller steaming calender for knitted goods | ✓ |
| 20 | Horizontal cloth turning machine for knitted goods | ✓ |
| 21 | Mark down cylinder duster for knitted goods | ✓ |
| 22 | Mangle and drying machine | × |
| 23 | Heat drying machine | ✓ |
| 24 | O type HT rope drying machine | ✓ |
| 25 | Batching device | ✓ |
| 26 | Centrifuge | ✓ |
| 27 | Over feed progressive shrinkage machine for knitted goods | ✓ |
| 28 | Inspecting and measuring machine | ✓ |
| 29 | SST. (short loop and short dry tester) | ✓ |
| 30 | Packing machine | ✓ |
| 31 | rolling machine | ✓ |
| 32 | Thermobrush design machine (France) | ✓ |
| 33 | Progressive shrinkage machine | ✓ |
| 34 | Three roll Calender (West Germany) | ✓ |
| 35 | Hot floc stenter | × |

SECTION 8

			设计	设计	图样标记				上海市 纺织科学研究院
			制图	制图	重量	比例			
			插图	插图		1:500			主车间设备排列图
			校对	校对	共	张	张		
			工艺检查	工艺检查	材		材		
			标准检查	标准检查					
标记	更改内容及依据	更改人	日期	审核					69.11.18