OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

RESTRICTED

15910

DP/ID/SER.A/769
8 September 1986
ENGLISH

STRENGTHENING OF THE COLLEGE OF LEATHER TECHNOLOGY, CALCUTTA

DP/IND/82/025/A/01

(R) INDIA :

Technical report: Modernization of footwear department and installation of tanning equipment at the College of Leather Technology, Calcutta.

Prepared for the Government of India
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Mr E. Birkhaug,
footwear technologist

Backstopping officer: J. Berg, Agro-Industries Branch

United Nations Industrial Development Organization
Vienna

23

V.86-59753
3263T

Explanatory notes

The monetary unit in India is the rupee (Rs).

Mention of the names of firms and commercial products does not imply endorsement by the United Nations Industrial Development Organization (UNIDO)

ABSTRACT

As part of the on-going project "Strengthening of the College of Leather Technology, Calcutta" (DP/IND/82/025), for which the United Nations Industrial Development Organization (UNIDO) is the executing agency, a footwear technologist was fielded on 12 February 1986 for a mission of three months.

Within the overall objective of the project to strengthen the College and to turn it into a leading institute, the expert was expected to assist in the preparation of the modernization plans for the footwear pilot plant, to supervise the installation of the new tanning machinery and equipment, and, in co-operation with the tanning expert, to start experimental tanning operations.

The expert found that practically all machinery and equipment of the Boot, Shoe and Leather-Goods Department was not serviceable. He therefore had to take apart, repair and re-assemble most of the equipment, which is now in a working condition. Following the decision of an expert committee, convened by the State government, to re-introduce a two-year advanced certificate course at the Department with immediate effect, the expert proposed additional items to be included in the syllabus. He also prepared a layout for the equipment in the existing premises as well as one for the new building at Salt Lake City.

In the Tanning and Finishing Department, old and obsolete machines had to be removed before foundations for the new equipment could be made and existing partitions and walls taken down and new ones put up. Since that work was coming along very slowly, the installation of all machines, according to the expert's modified layout, could not be completed during his mission.

In order to restore the once good reputation of the College, he recommends to appoint, as soon as possible, a new, dynamic principal, to reduce the number of staff and to retrain the remaining personnel; to assign an international expert who would co-ordinate the project inputs and provide guidance and technical support to the new principal; and to hire a number of national experts (mechanics, electrician, carpenter). Furthermore, his recommendations include a list of indispensable equipment which should be provided under the project.

CONTENTS

INTRODUCTION

A. Background

India has 13 institutes which offer training courses in leather technology. Out of these, only two institutes, the College of Leather Technology at Calcutta in the eastern region, and the A. C. College of Engineering and Technology at Madras in the southern region, are imparting higher and advanced training in leather technology. The total out-turn of graduate technologists from these colleges is approximately 50 per year, which is grossly inadequate to meet the demand of the fast developing and expanding leather industry of the country. Moreover, the curriculum of the graduate courses is based on the requirements of the industry in its first phase of conversion from semi-processed to finished leather. Since the emphasis has now shifted from finished leather to leather goods, the curriculum for graduate courses has to be updated accordingly.

The only college in India which is offering courses at the post-graduate level and organizes research in leather technology is the A. C. College of Engineering and Technology at Madras, in collaboration with the Central Leather Research Institute, a national laboratory under the Council of Scientific and Industrial Research. However, that College is not in a position to fulfill the demand for well-trained specialists which is increasing rapidly, as industry is diversifying its products. It is considered necessary therefore, to initiate training courses at the post-graduate level in the eastern region which has a large leather industry, comprising of more than 300 tanneries and leather-products manufacturing units, which account for 35 per cent of the total production in the country.

The leather industry also needs continuous guidance and advice on how to adapt manufacturing processes to various environment factors in order to control and improve the quality of leather. Therefore, a capability for providing technical consultancy and testing services has to be created at the College of Leather Technology, together with related research and development work, with a view to support the development of the leather industry in the eastern region. The College of Leather Technology, Calcutta, which is the only institute of its kind in the eastern region, has to play a vital and effective role in both training and research in leather technology.

As a pioneer centre for training and research in leather technology, the college was created by the State Government in 1919 under the name "Calcutta Research Tannery", with the aim of exploiting indigenous resources of hides, skins and tanning materials. Later, technical training programme were added to the activities of the college to meet the demands of a growing leather industry. The name of the college was changed to "Bengal Tanning Institute" in 1926. In 1943, the institute was affiliated to the University of Calcutta and was renamed "College of Leather Technology" in 1958.

During the last sixty years of its existence, the College has played an important role in the training of technical personnel and also in organizing limited applied research in the field of leather technology. Over that period the College has turned out about 1,070 technicians of the following categories:

(a)	Graduate technologists	250
(b)	Technicians (diploma and certificate holders)	585
(c)	Artisans	235

A large number of students of the College are holding high positions in industrial organizations, in and outside the country, in government and semi-governmental establishments. Quite a few of them are running their own business with international reputation and recognition.

The State Government of West Bengal, in its effort of strengthening the College and turning it into a leading institute, has recently sanctioned funds for the construction of new buildings, a modernization of the laboratories and workshop facilities, and for an increase of the teaching staff. Funds have also been allocated for setting up new laboratories for footwear technology, leather finishing and product design. These facilities were to be completed in the first phase of the project. The advanced-level training courses (M.Tech.) and a consultancy and testing services unit were to be established in a separate building during the second phase of the project. The land for the latter building has already been acquired in the new Salt Lake City, situated close to the existing college campus. The qualified technologists (M.Tech.) would not only meet the requirements of the industry, but would also alleviate the acute shortage of teaching staff in the leather technology institutes in the country.

In order to develop the College of Leather Technology into an advanced centre of training and research as envisaged in the project, additional support was required, especially in terms of international consultants, to develop the planned training courses in conformity with the needs of the developing leather industry in India, to guide the college faculty to run these courses effectively and to train the faculty members in their respective disciplines, as well as modern equipment and machinery which was not available locally.

The Government therefore requested the United Nations Development Programme (UNDP) for assistance, and the project "Strengthening of the College of Leather Technology, Calcutta" (DP/IND/82/025) was approved on 28 December 1983 and the United Nations Industrial Development Organization (UNIDO) designated as executing agency.

The purpose of the project is to provide the leather, footwear and leather-products industry with trained manpower, both at operator and technician levels, as well as at higher technical levels.

B. Purpose of the expert's mission

The expert in footwear technology was fielded on 12 February 1986 for a total of three months. He was attached to the Ministry of Industry, through the Department of Technical Education, Government of West Bengal, and worked at the College of Leather Technology at Calcutta. In co-operation with the national project director (the principal of the College), he attended specifically to the following:

(a) Advise on and assist in the preparation of the modernization plans for the footwear pilot plant;

(b) Supervise the installation of the tanning machinery and equipment;

(c) In co-operation with the tanning expert of the Food and Agriculture Organization (post 11-02) assist in starting the experimental tannery operations.

RECOMMENDATIONS

1. The once good reputation of the College should be restored by the following measures: (a) appointing a new, dynamic principal who will be able to re-organize the place and enforce the adherance to normal working hours by the staff; (b) reducing substantially the number of staff and starting immediately to retrain the remaining personnel.

2. An international expert in all aspects of footwear manufacturing, possibly including leather goods, and having teaching experience should be engaged for the Boot, Shoe and Leather-Goods Department, not later than August 1986.

3. Two first class mechanics (one for tanning and one for shoe-making machinery) should be hired as soon as possible, but not later than August 1986. Furthermore, one furniture carpenter and one electrician, on full-time or part-time basis, would also be needed.

4. The following machines and equipment should be purchased:

(a) 1 simple pneumatic eyeletting apparatus;

(b) 1 upper leather folding machine;

(c) 1 strap cutting machine for straps of 3 to 18 mm;

(d) 1 heavy-duty strap cutting machine for straps of 8 to 50 mm, with motor;

(e) 1 special suitcase stitching machine with movable arm;

(f) 1 framing machine for purses;

(g) 1 OMAG thermo cementing machine;

(h) 3 wooden cutting blocks.

FINDINGS AND ACTIVITIES

A. Boot, Shoe and Leather-Goods Department

Status of the Department

When the Boot, Shoe and Leather-Goods Department was set up in 1929, it had 20 to 26 students and a teaching staff of 12. The following departments were operational at that time: Civilian Footwear, Military Footwear, Design of Leather Goods and Fancy Sandals.

Since 1972 no courses had been offered, with the exception of a one-year artisan course which took place in 1979. At that time, only two sewing machines (Singer 31K48) and one finishing machine were operational. For the last 14 years - with the exception of 1979 - the staff of now 14 have all remained idle, although the Government had been requested to re-introduce the two-year courses.

Decisions by an expert committee

In view of that problem, the State government, on 26 March 1985, set up an expert committee under the chairmanship of Shri S. P. Poral, ex-chairman and managing director of West Bengal Leather Industry Development Corporation Ltd., to examine the issue of re-introducing the two-year advanced certificate course for boot, shoe and leather-goods making in the College. The members of the expert committee were:

Shri B. S. Pal, Bata Shoe Company
Shri G. Ghosh, Bata Shoe Company
Shri A. K. Ghosh, State Trading Corporation
A representative from Footwear and Allied Crafts Technical Association
A representative from Khadi and Village Industry Commission
A representative from the Cottage and Small-Scale Industries Department
S. K. Sarkar, professor, College of Leather Technology
P. H. Rao, principal, College of Leather Technology
Shri D. C. Das, Deputy Director for Technical Education, West Bengal

The terms of reference of the committee were as follows:

(a) To examine the manpower requirement of the footwear industries at the craftsman level, for which this certificate course would be given, and to suggest whether the course should be re-introduced;

(b) To suggest the duration of the course;

(c) To suggest whether the course should be organized as a sandwich programme in collaboration with the footwear industries or otherwise;

(d) To determine the entry qualifications and the intake for the course;

(e) To propose the curriculum and detailed syllabi for the course;

(f) To suggest additional facilities required, along with financial implications;

(g) To examine other relevant matters and make recommendations thereon.

The committee met several times, and after extensive deliberations recommended the following:

(a) The advanced certificate course should be re-introduced immediately. The committee felt that the course would help young people of the State to obtain gainful employment in the footwear industry and also offer scope for self-employment;

(b) The duration of the course should be two years. The committee felt that one year was too short a period for that type of course;

(c) The course should be a full-time institutional course (not a sandwich type), with adequate facilities for practical work at the College;

(d) The entry qualification should be a pass of the Madhyamik Examination of the West Bengal Board of Secondary Education or its equivalent;

(e) The intake should be ten students, and the question of increasing the intake be re-examined after a few years, depending upon the demand and quality of training imparted by the College.

A sub-committee was formed to draft the structure and details of the curriculum and syllabi for the course, which after some modifications was accepted by the committee.

A complete report on the two-year advanced certificate course in boot, shoe and leather-goods manufacture is with the Directorate of Technical Education, Government of West Bengal.

Work accomplished by the expert

As mentioned earlier in this report, the only machinery operational in 1979 during the artisan course were two flat-bed sewing machines and one finishing machine. However, a number of old machines, out of order and badly affected by time, were stored in the Department. With 14 staff unoccupied for 13 years, the number one objective was to activate that Department again. Nobody was used to attending full working hours in the College. During discussions with the staff, it was found that there was a genuine desire to come again into action, but also that a thorough retraining was indispensable. One of the most neglected areas was maintenance, not only in this Department, but throughout the College. The existing workshop has a number of lathes and other equipment, but none was in working condition, despite the fact that a mechanic was available.

The importance of maintenance work was fully recognized by the staff, and it was decided at the beginning of the expert's mission to overhaul all available machines and equipment. The work started off slowly, but with time the output increased and the working hours improved.

The expert stripped down the machines to the last part and explained every segment and its functions. All parts were cleaned and polished by the staff and the assembly work started. All machines were short of certain parts which, however, could be made locally, which required frequent visits to workshops for spare parts. In the latter part of the mission, the staff continued to assemble the machines on their own.

Finally, all machines were repainted after having been cleaned and primed, and all sewing machine tables got new tops with Formica.

This is a list of the machines that were reconditioned:

Sandt bottom-leather cutting press
Singer sewing machines of types 17-1 (two pieces), 31K48 (three pieces), 52W22, 45K1, 45K25, 107W 1 and 16W 220
Upper-leather splitting machine
Upper-leather skiving machine
Bottom-leather skiving machine
Hand-operated hydraulic press
Heel-slugging machine
Sole-stitching machine (McKay)
Outer-sole stitching machine

These machines can be used to supplement the modern equipment shortly expected from UNIDO. So far the only piece received for this Department is the heat setter.

The staff of the Boot and Shoe Department should be able to keep the machines in good running condition. It is worth mentioning that the total cost for spare parts and materials, including the new table tops, was about Rs 3,500 to 4,000 ($US 300 to 325).

Future training courses

In accordance with the decision of the expert committee, the Department should start soon with the two-years advanced certificate course. However, this course is more basic, and only after moving to Salt Lake City, the three-years diploma course can be initiated, as foreseen in the project document, part II. The development objectives of that course are to train manpower both at operators' and technicians' levels, as well as at higher technical levels.

In addition to the above-mentioned courses, short-term training should be included whenever needed. In his report, the training specialist listed the following possible short-term courses:

(a) Training of trainers;

(b) Training for foremen and supervisors;

(c) Pattern cutting;

(d) Village leather footwear and leather-goods production;

(e) Sewing-machine operator courses;

(f) Footwear and leather-goods design;

(g) Material testing for footwear and leather-goods personnel.

Some of these courses should be prepared before starting up in Salt Lake City.

Proposals for syllabi

The points given below are intended to complement the syllabus for the two-year course, elaborated by the expert committee:

(a) Historical background of footwear and its development;

(b) Foot anatomy (to be lectured by medical specialist);

(c) Lasts, the various systems in use today. Last constructions and how these can be adapted to type of footwear and footwear constructions (to be lectured by a last manufacturer);

(d) Product development: lasts, design, leather uppers and leather lining materials. Synthetic uppers and lining materials, textiles, colours. Insole materials, stiffeners and toepuff materials. Materials for heels and soles, adhesives etc.;

(e) Design and pattern-cutting, practical and theory;

(f) Pattern grading, practical. Various grading methods in use today, from hand-grading to computer-aided design and manufacturing. Machine settings and maintenance. Material utilization;

(g) Upper-leather cutting. Machine and hand cutting. Types of cutting blocks and types of cutting knives. Material utilization. Knowledge of all types of materials to be cut.

(h) Preparation before closing: splitting, skiving, edge treatments, marking, stamping, embossing;

(i) Closing by SATRA system. Sewing machines and equipment available. Folding machines, perforating machines, eyeletting machines etc. Machine maintenance. Quality control;

(j) Preparation for lasting: backpart moulding, materials for toepuffs, stiffeners and shanks;

(k) Lasting and making: different bottom constructions, machines and equipment used for different constructions. Various processes. Indications of productivity in the various constructions. Maintenance. Quality control.

For the diploma course a number of topics should be added, such as:

(a) Production planning and control;

(b) Quality control;

(c) Stock control, various systems from cardex to computer;

(d) Factory planning;

(e) Material utilization and costing;

(f) Factory management;

(g) Time and motion studies or other systems of job evaluation;

(h) Preparation of diagrams and charts, work instructions and job descriptions.

The College should invite chemical firms to lecture on different types of finishes and adhesives. The same goes for other materials that need specialized knowledge.

In April, newspapers like The Statesman, published articles about plans to increase the export of shoes and leather-goods four times during the next Seven Year Plan. However, even doubling the export of those articles means the establishment of a number of new plants, in addition to expansion of existing ones, which can only be achieved with a sufficient number of qualified personnel.

Other work performed by the expert

In connection with the production of toe-bands and wipers for the Schoen pulling-over and lasting machine, the expert assisted the last manufacturer of Footform, Calcutta, to send lasts and uppers, through UNDP Calcutta, to Schoen, Federal Republic of Germany. When Schoen will have completed their work, the last should be sent on to the manufacturer of the back-part moulding machine for adjustment of the back-part moulds.

B. Tannery and Finishing Department

At the beginning of the expert's mission it was decided in meetings with Mr. Sen, Director of Technical Education and his deputy, Mr. Das as well as Prof. Dutta and Mr. Mukherjee from the College of Leather Technology, that the cleaning out of the tannery and Finishing Department as well as the removal of partitions and foundation work be carried out by day labourers under the supervision of Mr. Mukherjee, as well as by a contractor and his team. It was further decided that all old and out-dated machinery be removed from the respective sections to other places within the College for auctioning at a date to be set.

The work took off very slowly. Machines and equipment were removed, but the main job in the tannery took extremely long because work went on for a few days only, after which it came to a halt, the reason being a shortage of funds to pay off labourers. During the first six weeks, the foundation for the fleshing machine was made and the machine installed, however not according to the plan of the training specialist, but in agreement with all concerned. Further foundations for paddles were prepared and one installed. The stainless-steel drum was moved to the same area, waiting to be installed until the pits were filled, and a new floor made, which came about at the end of April. The drum, however, was moved to the tanning area. The expert had frequent contacts with Mr. Sen and his deputies to discuss actions to be taken.

In the last week of March, the expert, after weeks of struggle, came to the conclusion that if work at the College did not pick up very quickly, it would be impossible to finish it in time. Further participation of UNIDO in the project looked futile and this view was communicated to UNDP, New Delhi, to the UNIDO senior industrial field adviser and to the back-stopping officer at UNIDO.

In a meeting held on 27 March, a chart indicating the work to be done in April with a time-limit for each separate job was submitted. A similar chart had been prepared for the month of March. In the same meeting, it was decided that Mr. Sen and the expert should see the Permanent Secretary, Ministry of Education on 1 April, seeking his assistance in solving the problems with the construction work.

The meeting with the Permanent Secretary proved very fruitful. He suggested that Public Works Department (PWD) take over the big task of

finishing the work within the time of the expert's assignment, ending on 7 May 1986. The same day meetings took place with the chief engineers of PWD, and as of 4 April work progressed steadily thanks to the co-operation of the engineers who inspect the work on a day-to-day basis.

Some of the important work completed by PWD was:

(a) Foundations for new machines from UNIDO (foundation plans prepared by the expert);

(b) Removal of old central shafts, both in tannery and finishing section;

(c) Removal of partitions, walls and old foundations;

(d) Filling of eight pits and renovation of six pits with sub-divisions;

(e) Renovation of walls, laying of new floors and renovation of partitions;

(f) Moving of all machines from outside store to site;

(g) Special foundation for toggling unit, including raising of guide supporters for frames (frames were 8 to 10 cm short in height);

(h) Boiler room under construction at the end of mission;

(i) Electric connections (after drawing wires for AC current from the Boot and Shoe Section) and water connections started in the last days of mission;

(j) Removal of motor for central shaft and repositioning to be used for the three drums until individual motors will be available;

(k) Clearing of all old out-dated equipment, materials, tables, drawers etc. This last point was a big job since a lot had accumulated over the years.

The tanning expert arrived at Calcutta on 14 April 1986 and took up his work on 16 April. From that time on the two experts have worked as a team.

Problems were experienced with the installation work due to a lack of catalogues, plans, foundation drawings and wiring diagrams. After contacting the UNIDO backstopping officer and some machine manufacturers, the plans and wiring diagrams arrived in the first half of April. The plans for the assembly of the toggling unit did not correspond at all to the equipment received. Some problems were also experienced with oil leakage from the hydraulic unit for the vacuum dryer, filling up the electrical panels which had been badly bent and dented during handling.

The lay-out proposed by the training specialist has undergone some changes, and a revised lay-out is given in annex I.

The stainless steel drum has not been positioned, but it will be placed in the area at present occupied by the two big drums. It has been recommended that the two big drums as well as the two smaller ones, be sold by auction or advertised together with the old plating press.

None of the machines and equipment to be purchased by the State Government have been ordered, in spite of continuous reminders from the expert.

Although the expert had stressed the importance of buying one compressor and two air filters for the vacuum dryer and toggling unit and one for the spraying unit, this did not materialize during his mission.

In the revised lay-out some space has been set aside for a staff room. Next to it the chemical store could be accommodated. Those rooms should be built with light partitions which can be easily removed should at a later date more space be needed for machines.

There had been general agreement to depart from central drives and to install individual motors for each machine. In spite of various reminders that the motors were needed urgently, they were not purchased during the mission.

At the end of the mission it became clear that there would be no time to test-run the machines because electric and water connections were under construction. This meant that the tanning expert would have to see that work through before production could start.

C. Production layouts

The plot of land for the new buildings at Salt Lake City was legally at the disposal of the College of Leather Technology in April 1986. If the work at the site starts in June/July 1986, the buildings and installation work will probably not be ready before the end of 1987 or the beginning of 1988.

The expert, therefore, prepared two layouts for the Boot, Shoe and Leather-Goods Department, i.e. in the existing premises (see annex II) and in the new building at Salt Lake City (see annex III). Annex IV shows the general plant layout at Salt Lake City.

The one room available at present gives just enough space to start courses. However, the expert has requested PWD engineers to remove the wall to the adjacent room which was confirmed to be possible. With that alteration, the facilities for the Department should be large enough. For designing and pattern cutting a separate room should be used. The courses could start in August 1986.

D. Stores

The so-called store is a place filled up with 80 to 90 per cent of unusable items. A committee should be set up urgently to decide on what can be disposed of right away.

If the present store room is to be used in the future, it will have to be completely renovated. It needs to be painted, and handy angle shelves and cabinets will have to be purchased to accommodate spare machine parts. Solvents and inflammables should be stored separately in a special room.

It follows that this would be a good opportunity to introduce a proper storage system, be it by cardex or by computer. A storekeeper with a flair for following a system and prepared to observe working hours should be hired. Since the Boot, Shoe and Leather-Goods Department will eventually move to Salt Lake City, the store room, when renovated, will perfectly well serve its purpose for the time being.

E. Extension services

Once Salt Lake City will be operational, extension service work will be part of the programme.

Extension service means to pinpoint short-comings (administrative, planning, in processes or in production) in the industries, and to present solutions. Most of it will be rendered directly in the respective industries, and only a small part will constitute testing and laboratory work. To be successful, such type of service requires real experts.

So far there is nobody in the Boot, Shoe and Leather-Goods Department who could offer extension services to the industry. Therefore, once an international expert will be in the field, he should devote one day per week to extension services in shoe factories or small-scale industries. It will be in the interest of the College to charge for these services, since factories incline to follow advice more readily if they have to pay for it. The staff taking part in the extension service work should share a certain percentage of this income as an incentive.

For the production of factory plans and layouts, a small drawing office will be needed, which should have a special drawing table and such other equipment which is common for an office of that type.

F. Overall conditions in the College of Leather Technology

At the beginning of the expert's mission the conditions in the Tanning and Finishing Departments as well as in the Boot, Shoe and Leather-Goods Department were very poor indeed. The situation has now improved, but without competent mechanics who will keep all machines and equipment properly maintained, the conditions will again deteriorate. A first-class mechanic should therefore be hired as soon as possible, with at least one assistant. In addition, a carpenter is also urgently needed.

Since H. Rao left the College on 21 March 1986, it has been without a principal. S. K. Sen, Deputy Director of Technical Education, has acted as administrator on a part-time basis, and shortly after H. Rao's departure, S. S. Dutta took over as co-ordinator, and as such has done an excellent job. Nevertheless, the most urgent and important duty of the College is to find a new principal. The ideal age of a principal would be 35 to 40 years, and he should be dynamic and firm to restore the image of the College.

The staffing of the College is another serious matter. As mentioned earlier in the report, more than 80 people are engaged for a number of students which today is no more than 42. It would be in the State Government's interest to reduce the number of staff substantially by transfers and to add a few new dynamic lecturers. If transfers are not feasible due to overstaffing in most technical colleges, other kinds of activities should be sought for them.

Because of the negative effect of idle personnel on the image of the College as well as on the rest of the staff, it would be preferable to send home all the idle and unsuitable staff and to pay their salaries.

At present nobody keeps full working hours at the College. When B. Sen visited the College on 7 March 1986, he had discussions with the staff, with the intention of solving the problem of poor attendance. However, little improvement could be noticed so far. Probably a lawyer's advice should be sought in this matter.

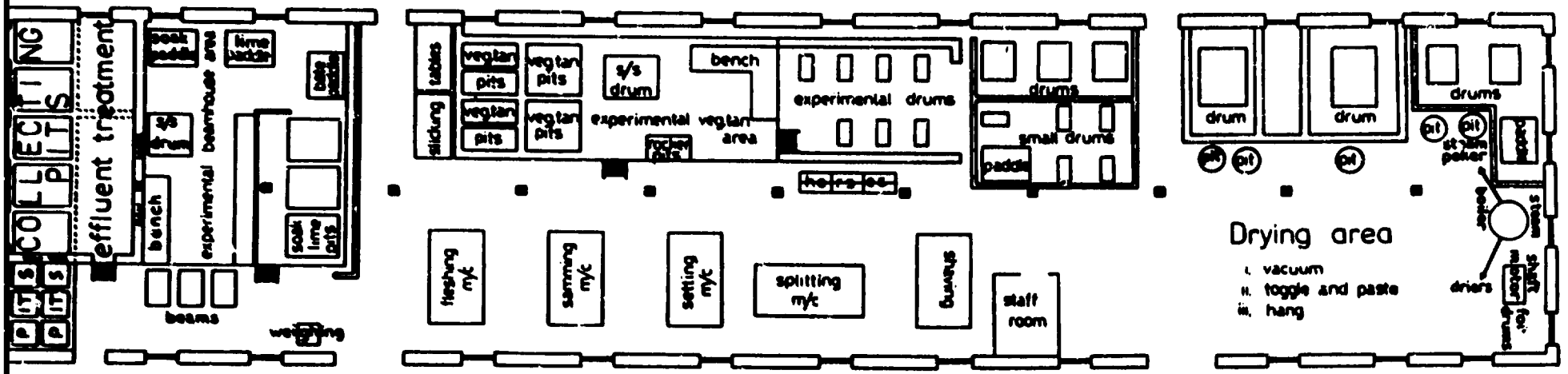
Besides the fellowships which are already in process, lecturers should be retrained continuously. Better than fellowships would be the presence of international experts who would lecture and retrain the staff on a continuous basis.

The Boot and Shoe Section would need expert assistance as of August 1986. The Boot, Shoe and Leather-Goods Department has to start offering courses in August 1986. Since it is possible to hold them in the existing premises, there is no need to wait until the Salt Lake City project will be completed.

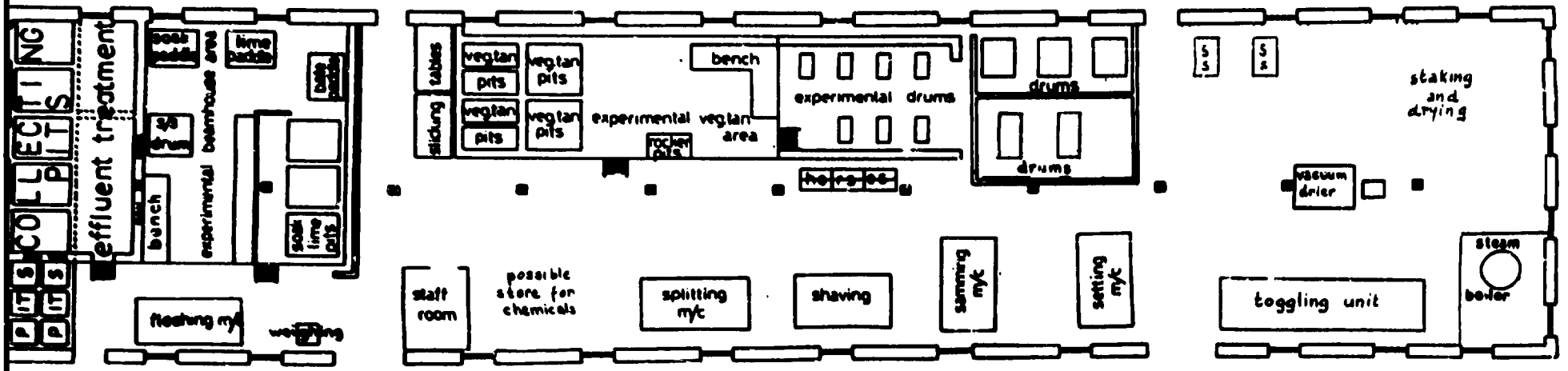
ANNEX I

LAYOUT FOR THE TANNERY

a. Layout proposed by the training specialist

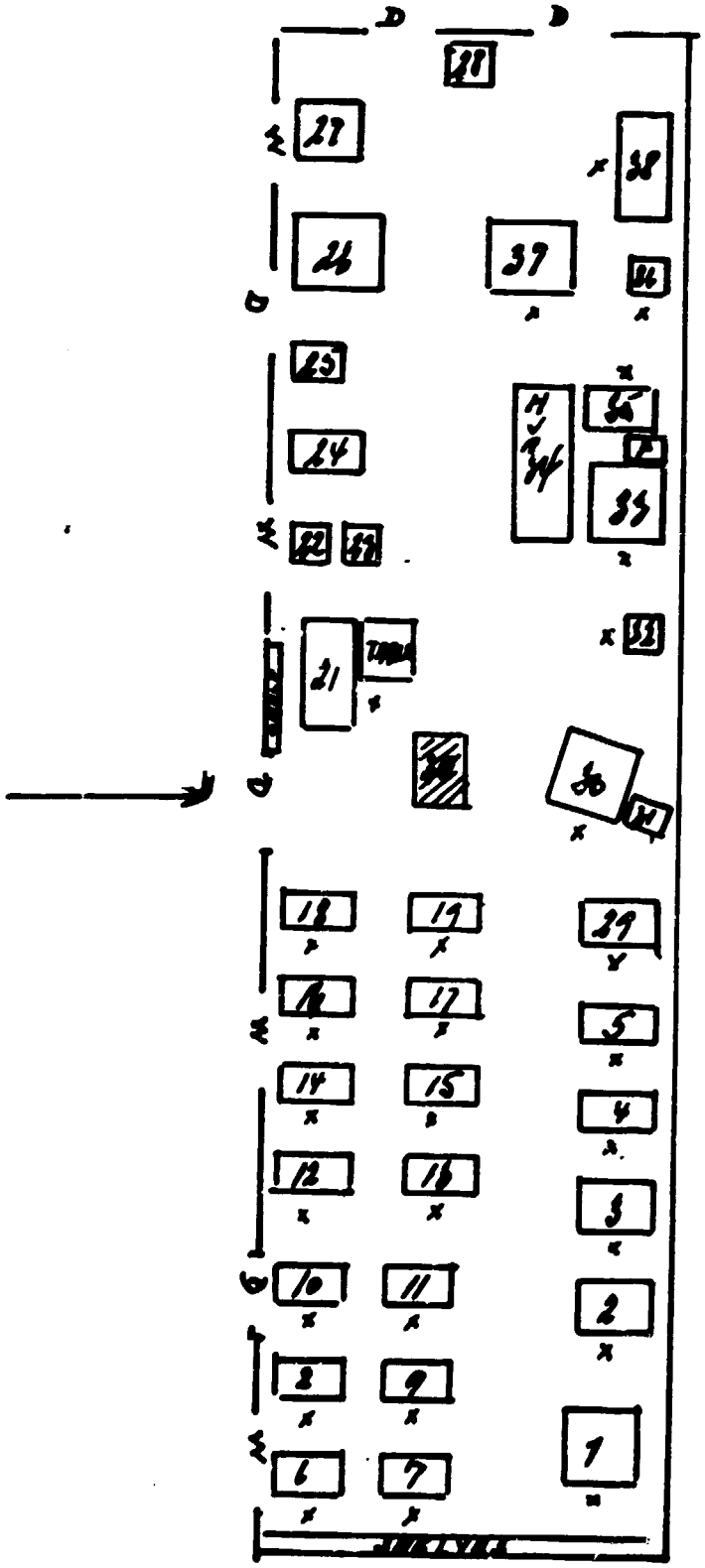


b. Layout revised by the footwear technologist



ANNEX II

LAYOUT FOR THE BOOT, SHOE AND LEATHER-GOODS DEPARTMENT
AT THE COLLEGE OF LEATHER TECHNOLOGY



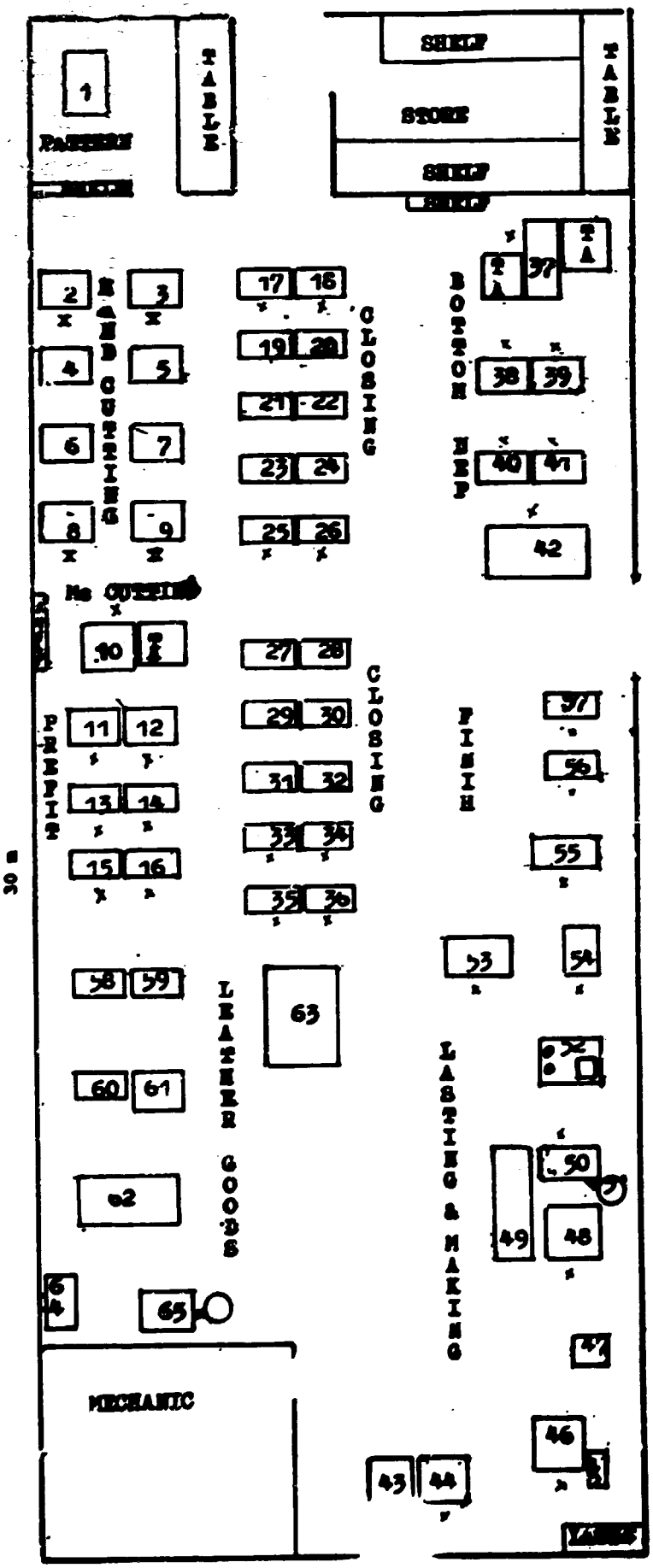
Key:

Machine number	Upper Leather Cutting Section	Status
1	Upper leather cutting press (hydraulic)	New
2	Upper leather splitting machine	New
3	Upper leather splitting machine	Overhauled
4	Upper leather skiving machine	New
5	Upper leather skiving machine	Overhauled
	Design and Pattern-Cutting Section	
6 to 11	Design tables (to be made)	
	Closing Section	
12 to 17	New sewing machines (12=28, 13=34, 14=335, 15=474, 17=491), eyeletting machine (16)	
18 and 19	Existing sewing machines	Overhauled
20	Tables for supervisor	
	Bottom Cutting Section	
21	Bottom cutting press (Sandt)	Overhauled
22	Bottom skiving machine	Overhauled
23	Bottom skiving machine	New
24	Bottom splitting machine	New
25	Stamping machine	New
26	Insole moulding machine	New
27	Slugging machine	Overhauled
28	Sole stitching machine	Overhauled
29	Backpart moulding machine	
	Lasting and Making Section	
30	Pulling and lasting machine	New
31	Damping unit	New
32	Side lasting	New
33	Heel seat lasting machine	New
34	Heat setter	New
35	Upper roughing machine with filter	New
36	Cementing table	
37	Sole laying machine	New
38	Combined finishing machine	New

There will be a need for approximately 30 hp; plus 20 kW for the heat setter in case all machines are operated at the same time.

ANNEX III

LAYOUT FOR THE BOOT, SHOE AND LEATHER-GOODS DEPARTMENT AT SALT LAKE CITY



Key:

Machine number	
1	**Grading machine**
	One table 3.5 x 1 m for the following:
	(a) Pattern binding and moulding apparatus
	(b) Pattern vice
	(c) Pattern binding
	(d) Numbering
	(e) Pattern shears
	One shelf for patterns 2 x 0.50 m
	In the store:
	(a) One table 3.5 x 1 m (for checking of materials)
	(b) One shelf 5 x 1 m
	(c) One shelf 4 x 1 m
	Cutting
2 to 9	Hand cutting tables with wooden cutting blocks
10	Upper leather cutting machine with joining table 0.8 x 0.8 m
11	Upper leather splitting machine
12	Upper leather splitting machine, reconditioned
13	Upper leather skiving machine
14	Upper leather skiving machine, reconditioned
15	Marking table
16	Stitch marking table
	Closing
17	Singer 107W1, reconditioned
18	Singer 31K48, reconditioned
19	Singer 31K48, reconditioned
20	Upper leather folding machine (to be purchased)
21	Singer 16W220, reconditioned
22	Singer 45K1, reconditioned
23	Singer 45K25, reconditioned
24	Pfaff 34-705/03 BL
25	Singer 52W22, reconditioned
26	Pfaff 28-55/01 BL
27	Singer 31K48, reconditioned
28	Singer 31K48, reconditioned
29	Work table
30	Work table
31	Pfaff 335-H3-17/01 BL
32	Pfaff 491-755/03-725/04-900/51 BL
33	Singer 17-1, reconditioned
34	Pfaff 474-755/01-900/51 BL H 3,6
35	Working table
36	Eyeletting apparatus

continued

Machine number	
	Bottom
37	Sandt bottom cutting machine, reconditioned with two tables, one 1 x 1 m, the other 0.8 x 0.8 m
38	Sole splitting machine, on table
39	Bottom skiving machine, reconditioned
40	Bottom skiving machine
41	Heel slugging machine
42	Table for preparation of cut stock and sole stamping
	Lasting and making
	Last bins 1.5 x 0.50 m
43	Table for inserting stiffeners and fixing toepuffs
44	Backpart moulding machine
45	Damping unit
46	Pulling over and forepart lasting
47	Side lasting machine
48	Heel seat lasting machine
49	Heat setter
50	Bottom roughing machine (with water filter)
51	Dust extractor with water curtain
52	Table with last stands and hand-operated outsole stitcher and cementing
53	Sole laying
54	Sole stitching
55	Finishing board
56	Finishing table
57	Finishing table
	Leather goods
58	Strap cutting machine, fine, to be used on a sewing machine table (to be purchased)
59	Heavy-duty strap cutting machine with drive (to be purchased)
60	Framing machine (to be purchased)
61	Special suitcase stitching machine with moveable arm (to be purchased)
62	Thermo cementing machine (OMAC) (to be purchased) on table 2 x 1 m
63	Table 1.5 x 2 m
64	Spraying boot (to be purchased)
65	Hand-operated hydraulic press for embossing etc.

Annex IV

GENERAL PLANT LAYOUT AT SALT LAKE CITY