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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
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Project No. SI SOM/87/801

FINAL REPORT

ASSISTANCE TO THE LEATHER INDUSTRY IN SOMALI DEMOCRATIC REPUBLIC

Prepared by INVEST-IMPORT Co., Beograd, Yugoslavia,
for United Nations Industrial Development Organization
(UNIDO)

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English

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F I N A L R E P O R T

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ABBREVIATIONS:

UNIDO: United Nations Industrial Development Organization

UNDP : United Nations Development Programme

SLA : Somali Leather Agency

Tannery: Tannery and Shoe Factory at Km 7. Mogadishu

I-I : Invest-Import Co., Belgrade, Yugoslavia

Recommendations:

1. New machines mentioned in Item A.7 should be provided, particularly scale for pelt.
2. Salaries should be increased in order to extend the scope of production.
3. Training courses abroad for young engineers should be arranged.
4. Permanent preventive maintenance and lubrication of machines should be carried out in compliance with the given instructions.
5. It is necessary to comply strictly with the introduced technological process and determined operations. Any possible modifications should be introduced only after certain technological analyses and practical experiments have been carried out.

C O N T E N T S :

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LIST OF ANNEXES:

I N T R O D U C T I O N

Based on the Contract No. 87/139, signed between UNIDO and INVEST-IMPORT, Belgrade, Yugoslavia, INVEST-IMPORT`s team arrived in Somalia at the beginning of March 1988, and immediately started with implementation of the Project.

Team members and duration of their assignment:

1. Mr.Ljubomir Andjelković, Team Leader, Leather Technologist, - 3 months
2. Mr.Andrija Brglez, Service Engineer, - 6 months
3. Mr.Emilian Skerbiš, Service Engineer, - 6 months.

It had been anticipated that the Team Leader would spend 45 days on the Project Area at the beginning of Project implementation, and the same number of days at the end of its implementation. The Team Leader fulfilled the first part of his mission in the period from 29th March 1988 to 15th May 1988. Due to the requirements of medical treatment, the Team Leader fulfilled the second part of his mission in the period from 27th September 1988 to 20th November 1988. After expiry of six months, the other two members of the team stayed in the Tannery, on the basis of a bilateral agreement, since it was necessary to proceed with the training of local personnel which had already been started.

Taking into consideration the greater potential of the Tannery in Mogadishu compared to the Tannery in Kismayo, the Somali party judged it would have been more useful if the experts had spent the whole time in the Tannery at 7 km Mogadishu. The experts agreed with this opinion.

Information on Tannery at km 7 - Mogadishu

The original tannery had been constructed in 1966, to be used more as a training center, having the capacity of approximately 100 pieces of hides per day.

Reconstruction of the Tannery started in 1979, and the present capacity is:

300 pieces of hides,
2.500 pieces of skins,

out of which:

- 40% up to finished leather
- 60% up to crust.

Reconstruction was carried out by INVEST-IMPORT Company, Yugoslavia.

In the period from 1983 to 1985, the Tannery processed 200 - 300 pieces of hides up to finished leather, whereas skins were processed only periodically.

In this period the Tannery started to export the smaller quantities of wet-blue hides.

The Tannery possesses the complete equipment required for production of hides, upper leather and sole leather.

A. Maintenance of Equipment

1. Existing Condition

1.1 Equipment

In general, the existing process machines were in a very poor condition. It was obvious that current and regular maintenance had not been carried out with proper attention. Other equipment: steam boiler, transformer station, compressors, water pumps, generating sets, were in operating condition and made possible the smooth running of the Tannery. The survey of conditions of individual machines and other equipment is presented herebelow:

1.1.1 Tumbling drums, (2 pcs.) - taking into account that raw hides are obtained directly from the slaughterhouse in green stage, these drums are not necessary, so the electric motors have been taken down to be used for other drums.

1.1.2 Liming drums, dia. 3 x 3 m,(4 pcs.) are in operating condition.

1.1.3 Tanning drums, dia. 2,5 x 2 m, (5 pcs.) are in operating condition, however, the dosing pipes should be replaced.

1.1.4 Retanning drums, dia. 2,5 x 2 m, (4 pcs.) are in operating condition.
There is one retanning drum more, which has not been used for more than ten years, as the above mentioned four retanning drums are sufficient for reaching the required capacity.

1.1.5 Milling drums, dia. 2,5 x 1,25 m, (2 pcs.) are in operating condition.

1.1.6 Drums for vegetable tannage, dia 2,6 x 3 m, (3 pcs.) - one drum is in operating condition, whereas the other two drums are out of order and should be replaced by the new ones. For this reason, the vegetable tannage section capacity has been reduced from 50 pcs. of hides to only 16 pcs. of hides per day.

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1.1.7 Hydrauiic fleshing machine, working width 2100 mm, (1 pc.) - its operation is not satisfactory. It is necessary to eliminate failures on the device which brings skins to the knife, and to carry out general over-haul.

1.1.8 Hydraulic fleshing machine, working width 1800 mm, (1 pc.) - the machine is out of order. It is necessary to carry out general over-haul.

1.1.9 Scudding machines, working width 1800 mm, (2 pcs.), are no longer in operating condition. Parts which could be used for other machines have been taken down. Since skins are not actually processed in this Tannery, it is not necessary to carry out the general over-haul.

1.1.10 Through-feed sammying machine, working width 2500 mm, (1 pc.). The new machine which was put into operation at the beginning of 1988 operates satisfactorily.

1.1.11 Splitting machine for wet-blue, working width 2400 mm, (1 pc.) - same as under Item 1.1.10.

1.1.12 Hydraulic shaving machine, working width 1500 mm, (1 p.) - satisfactory operation.

1.1.13 Shaving machine, working width 450 mm, (1 pc.) is out of order.

1.1.14 Shaving machine, working width 600 mm, (1 pc.) is out of order.

1.1.15 Hydraulic setting-out machine, working width 2100 mm, (1 pc.) is out of order.

1.1.16 Setting-out machine, working width 2100 mm, (1 pc.) is out of order.

1.1.17 Hydraulic sammying and setting-out machine, working width 1600 mm, (2 pcs.) - out of order. It is necessary to carry out general over-haul on both machines and to provide new spare parts.

1.1.18 Vaccuum driers, plate dimensions 4000 x 2000 mm (2 pcs.), one drier is in operating condition, whereas the other is out of order.

1.1.19 Joy staking machines, (2 pcs.) - one machine is in operating condition and satisfies requirements of factory operation at full capacity.

1.1.20 Staking machine, Type Shödal, working width 1200 mm, the essential part has been broken and the machine is out of order.

1.1.21 Wheel staking machines, (5 pcs.) are in operating condition, however, they are not in use, because skins are not processed in this Tannery.

1.1.22 Buffing machine, working width 1800 mm, (1 pc.) - out of order.

1.1.23 Buffing machines, working width 250 mm, (2 pcs.) are in operating condition.

1.1.24 Brushing machine, working width 2000 mm, (1 pc.) is in operating condition.

1.1.25 Toggling units, 2750 x 1500 mm, (3 pcs.), are in operating condition.

1.1.26 Hydraulic press, Type "Mostardini", (1 pc.) is in operating condition, however, the satisfactory quality of plate imprint is not achieved during embossing operation. Certain parts should be replaced.

1.1.27 Hand-spraying units, (2 pcs.) are in operating condition.

1.1.28 Hydraulic press, Type "KOSTROJ", (1 pc.) is in operating condition.

1.1.29 Glazing machine is in operating condition.

1.1.30 Measuring machine, working width 1625 mm, Type "TURNER" is out of order.

1.1.31 Measuring machine, working width 2440 mm, Type "KOSTROJ" is in operating condition.

1.1.32 Setting-out machine for bellies, (1 pc.), is in operating condition.

1.1.33 Setting-out machine for shoulders, (1 pc.), is in operating condition.

1.1.34 Hot air stuffing drum for impregnation, dia. 2,5x1,25 m, (1 pc.), is out of order.

1.1.35 Rolling machine for sole leather, (1 pc.), is in operating condition.

1.1.36 Boiler house (1 steam boiler, capacity 2000 kg of steam per hour). Both pumps for transferring the condensate form the condensate tank to the supply tank are out of order. For that reason the considerable quantity of heat is lost. The boiler itself and other pertaining equipment are in operating condition and it is necessary to carry out only the regular maintenance.

1.1.37 Compressors, (2 pcs.), have the satisfactory operation.

1.1.38 Pumps for water supply, (3 pcs.) - two pumps are in operating condition and satisfy the requirements of the Tannery. Spare parts for the third pump should be ordered.

1.1.39 Deep pump for water supply, (1 pc.) - satisfactory operation.

1.1.40 Transformer station, 2 x 630 KVA - satisfactory operation.

1.1.41 Generating sets, (2 pcs.) had been installed several months before arrival of INVEST-IMPORT`s team. Their operation is satisfactory.

1.1.42 Machines in workshops were in poor condition, which proved that they had not been maintained properly.

2. Undertaken Actions

2.1 Maintenance of Machines and Equipment

First of all, the experts took necessary steps to raise the situation in the workshops to a satisfactory level, in order to create required working conditions for maintenance of machines. The workshops were cleaned, unnecessary things were removed, machines were dusted and lubricated. Tools were collected at a certain point and measures were taken to ensure their maintenance.

Then the experts started repairing the machines which had been out of order. In some cases only servicing and inspection of electric parts were necessary, however, a large number of machines needed general overhauling.

A survey of operations performed regarding maintenance of individual machines is presented herebelow:

2.2.1 Liming drums, dia. 3 x 3 m: doors have been adjusted to prevent float leakage from the drums. Oil has been changed in reduction gears and hydro-dynamic couplings. V-belts have been replaced and all surfaces affected by friction, e.g. axles and gears, have been oiled.

2.2.2 Tanning drums, dia. 2,5 x 2 m: leaning of door on the drum rim has been adjusted, oil has been changed in reduction gears and hydro-dynamic couplings. V-belts have been replaced, wooden barrels for water and chemicals dosing have been adjusted, pipes with valves connecting barrels and drum axles have been replaced. All elements in control electric cabinets have been serviced.

2.1.3 Retanning drum, dia. 2,5 x 2: the same operations as under 2.2.2 have been performed.

2.1.4 Milling drum, dia. 2,5 x 1,25 m: Regular servicing has been carried out.

2.1.5 Vegetable tanning drums, 2,6 x 3 m: All parts of the only drum which was in operating condition have been serviced. As it was already stated under Item 1.1.16, the other two drums are to be discarded.

2.1.6 Hydraulic fleshing machine, working width 2100 mm: general over-haul of hydraulic elements, mechanical and electric parts has been carried out.

2.1.7 Hydraulic fleshing machine, working width 1800 mm: general over-haul of the complete machine has been carried out. Protective paint has been re-applied on the machine, so that it looked as if it was new.

2.1.8 Through-feed sammying machine, working width 2500 mm: only regular maintenance has been carried out.

2.1.9 Splitting machine, working width 2400 mm: regular maintenance has been carried out. Band knife has been replaced when necessary, and band knife guides have been repaired.

2.1.10 Hydraulic shaving machine, working width 1500 mm. Regular maintenance of the machine has been carried out, and spiral knives have been replaced when necessary.

2.2.11 Shaving machine, working width 600 mm: the machine has been made ready for operation.

2.1.12 Hydraulic setting-out machine, working width 2100 mm. Certain spare parts have been procured and the machine has been made ready for operation.

2.1.13 Hydraulic sammying and setting-out machines, working width 1600 mm: due to shortage of spare parts, both machines are out of order.

2.1.14 Vacuum driers, 4000 x 2000 mm.In spite of the shortage of spare parts, both driers have been maintained in operating condition, however, with great efforts made by the experts. Vacuum pump should be urgently replaced on one drier.

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It would have been necessary to replace all pipelines on the driers, because they are in worn-out condition, however, this has not been effected, since the Tannery could not provide funds for that purpose.

2.1.15 Joy staking machine: regular servicing has been carried out

2.1.16 Buffing machine, working width 1800 mm: the machine has been inspected, all electric contacts have been cleaned. Rubber roller has been replaced.

2.1.17 Buffing machine, working width 250 mm. Regular servicing has been carried out.

2.1.18 Brushing machine, working width 2000 mm. Regular maintenance has been carried out.

2.1.19 Toggling units, frame sizes 2750 x 1500 mm: regular maintenance has been carried out.

2.1.20 Hydraulic press, Type "MOSTARDINI": regular maintenance has been carried out, however, due to shortage of spare parts, it has not been possible to fulfil the main requirements: to make and maintain pressure during embossing.

2.1.21 Hand spraying units: regular servicing has been carried out.

2.1.22 Hydraulic press, Type "KOSTROJ": gaskets on main cylinders have been replaced and regular maintenance has been carried out.

2.1.23 Measuring machine, working width 2440 mm: regular maintenance has been carried out.

2.1.24 Setting-out machine for bellies: regular maintenance has been carried out.

2.1.25 Setting-out machine for shoulders: regular maintenance has been carried out.

2.1.26 Hot air stuffing machine for impregnation, dia.2,5 x 1,25 m. The machine has been over-hauled which made possible manufacture of sole leather of better quality.

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2.1.27 Rolling machine for sole leather: regular maintenance has been carried out.

2.1.28 Boiler house: regular maintenance has been carried out, and in addition to that, supply pumps, burner, condensate pumps etc. have been serviced. Unfortunately, condensate pumps could not be repaired, because the electric motors had been burnt out, and the Tannery could not provide funds for re-winding of motors.

2.1.29 Pumps for water recirculation for the needs of vacuum driers: regular maintenance has been carried out.

2.1.30 Compressors: regular maintenance has been carried out.

2.1.31 Pumps for water supply: regular over-hauling of pumps has been carried out, so there were no problems in supplying the Tannery with water as regards these pumps. Difficulties arose on 24th September 1988, when the deep pump for water supply broke down. It was concluded that the pump could not be repaired, but it was necessary to procure the new one. As its price was considerable, the pump was not replaced until within a month.

2.1.32 Workshop machines have been cleaned, lubricated and adjusted for normal operation.

2.2 List of Spare Parts Required for Maintenance of Machines

Simultaneously with inspection of machines and equipment, the experts started making lists of spare parts required for maintenance of machines. Taking into account that financial possibilities of the Tannery were limited, the list included only the most necessary parts for the machines which were of vital importance for processing of hides, i.e. fleshing and shaving machines, hydraulic press and vacuum drier.

Annex No. II contained the list of spare parts which was submitted to the Tannery management for the purpose of placing an order with the manufacturer.
The order was executed, but the parts have not reached the factory during the Project duration. INVEST-IMPORT submitted free of charge some parts which were neecssary for normal operation of the Tannery. These parts consisted of: one set of spiral knives for shaving machine having working width of 1500 mm, grinding stones for fleshing machine having working width of 1800 mm and packings for hydraulic press.

2.3 Inspection of Existing Spare Parts

Storehouse of spare parts has been cleaned, the existing spare parts have been inspected, and rusty, worn-out or damaged parts have been eliminated. Useable parts have been numerated as per code numbers in the catalogue and classified according to machines. Parts which could not be used for several machines, such as, for example, V-belts, bearings, contactors, time relays, etc., have been classified separately.

Tabular surveys showing which types of V-belts and bearings are used on each machine, are placed at Tannery`s disposal. Owing to these tabular surveys, it is much easier to keep records of these parts in the storehouse and possibility of applying available V-belts and bearings on various machines can be checked.

2.4 Forming of Catalogue Files

A file cabinet in the workshop has been set aside for filing catalogues of all machines and other equipment. The catalogues include instructions for maintenance, handling and lubrication of machines, as well as lists of all machine parts. Catalogues of machines are arranged in the file cabinet according to the sequence of technological operations, so that they could be found easily, and the list of all catalogues is attached to the cabinet. In this way, work of maintenance service has been made easier, as well as preparation of lists of required spare parts so that they could be ordered in due time.

2.5 Training Course of Current Maintenance of Machines

In order to improve expert knowledge of workers engaged in maintenance of equipment, the experts have organized their training course. The course consisted of a theoretical and a practical part.

Programme of course:

2.5.1 Theoretical Part for Mechanics:

- interpretation of drafts (diagrams),
- familiarizing with mechanical elements and their functions,
- use of measuring tools.

2.5.2 Practical Part for Mechanics:

- practice in using various tools,
- functions of machines,
- familiarizing with functions of individual elements,
- trouble-shooting (causes and manifestation of damages,
- training in elimination of damages,
- adjustment of machines for correct operation,
- machine lubrication (lubrication of bearings, rotating elements, sliding elements, chains)
- manufacture of simple fits of machine parts (hand machining),
- welding: electric and autogenous; cases in which the former and the latter are carried out,
- current maintenance,
- tamping of spiral knives on rollers,
- safety measures.

2.5.3 Theoretical Training for Electricians:

- interpretation of drafts (diagrams),
- functions and applications of elements,
- measuring instruments.

2.5.4 Practical Training for Electricians:

- use of measuring instruments,
- familiarizing with machine functions,
- trouble-shooting and elimination,
- elimination of causes of damages,
- adjustment of machines for correct operation,
- current maintenance,
- control and maintenance of the low-voltage part of transformer station,
- safety measures.

Training courses were organized 4 times a week on average, lasting 60 minutes each. A large number of details and parts of training have been repeated several times in order to be mastered more efficiently.
Large fluctuation of workers engaged in maintenance operations affected the improvement of maintenance quality.

2.6 Instructions for Machine Lubrication

For the purpose of improvement of machine maintenance quality, the experts have made panels with photos of machines or machine parts indicating lubrication points with inscriptions in English language informing how often lubrication should be carried out. Namely, from inscriptions "daily", "weekly" or "monthly", small arrows led to corresponding lubrication points.
The total of 11 panels have been made. They have been wall-mounted next to a corresponding machine or group of machines having the same lubrication chart.

2.7 List of Spare Parts Required for Future Maintenance of Machines (Annex III)

Before Project completion, the experts have made a new list of necessary spare parts (Anenx III), in order to provide spare parts required for the future running of the Tannery.

2.8 Suggested List of Spare Parts Which Should Always Be Available In The Tannery

Annex No. IV contains the list of spare parts which should always be available in the spare parts store. These parts could neither be purchased nor manufactured in Mogadishu, and machines could not operate without them. The management of the Tannery should always take care that spare parts indicated on this list are always available in the Tannery.

B. Technology and Organization of Production

1. Existing Condition

From the moment of entering the production hall, it was obvious that the experts would have a lot of work to do.
The Team Leader had been engaged in running-in of production in this Tannery, as the expert of INVEST-IMPORT, in the period from 1983 - 1984. The level of the technological process, namely, the quality of processed leather were rather high.
There are several reasons why the Tannery has not maintained the achieved level of production. Some of them are as follows:

- rather low salaries of the entire employed personnel,
- insufficient incentive payment for the managing staff.

Due to failures on the old splitting machine, malfunction of pipes for dosing of chemicals during the process of tanning, shortage of spiral knives and power cut-offs, a stock of approximately 46.000 of partially damaged cow hides has been accumulated during the past 2 - 3 years. At the time of arrival of the experts this stock was still increasing. Namely, daily soaking amounted to 150 - 170 pieces of cow hides, out of which number 70% (approx. 110 pcs. daily) were packed to be exported in wet-blue condition, whereas the remaining 30% were partially finished (approx. 30 pcs. daily), and partially went to the stock of unfinished hides. During that period, rather small quantities of skins have been soaked in wet-blue condition in this Tannery.
In addition, the experts have found out the following shortcomings:

- fresh hides were not trimmed before being put into the soaking drum;
- no anti-bactericide agent was being added during the operation of soaking (e.g. CORTIMOL G);

- pelt weights were not being determined after the operations of liming and fleshing, and weights were specified according to the average weight per piece based on experience;
- correction of pH value by means of soda ash (Na_2CO_3) was not being done by the end of the operation of tanning;
- the operation of trimming was not being performed after the operation of shaving;
- the shaved weight was being determined according to the number of pieces (i.e. 130 sides = 400 kg);
- the operation of conditioning after air-drying was frequently being left out, so the operation of staking was being performed with dried or partially dried hides, which resulted in the production of leather inadequate to touch.
- during processing of hides for smooth upper leather, sometimes the operations of buffing and impregnation were not performed;
- the operation of padding was not being performed properly;
- insufficient inspection during the operation of hand-spraying.

The experts have found out that some mechanical operations were being left out due to subjective reasons only, such as the insufficient number of workers, namely the unwillingness of workers to work seven hours a day.

A great number of failures have been found in the organization of the production process. The Tannery had completely failed to comply with the fundamental principle of organization: that the number of hides which daily arrive to the Tannery, should be processed every day as well. As this principle was being neglected, a stock of approximately 46.000 sides in wet-blue stage was found in the Tannery when the experts arrived.

Normally, the unfinished production should include the following quantities of hides:

- daily soaking: approximately 160 hides or 320 sides
- duration of technological process: 16 working days.

320 x 16 = 5120 sides.

This means that any number exceeding the number of 5120 sides would not be profitable.

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2. Inventory of Chemicals Available in Tannery

During 1983, 1984 and 1985, in cooperation with technical service department of the Tannery, the experts of INVEST-IMPORT had introduced rather advanced technological procedure of leather processing, by using the chemicals manufactured by some well-known companies in the world (BASF, BAYER and CIBA-GEIGY).

The similar situation was found out this time, too. There were sufficient quantities of high-quality chemicals available in the Tannery, to be used in regular production process, which was estimated as a favourable fact. Annex No.V shows the inventory of chemicals on 31st August, 1988.

In addition to the chemicals available in the Tannery, there is a central storehouse of chemicals at SLA, wherefrom chemicals are provided for the needs of all tanneries belonging to SLA. The experts did not have the opportunity to gain an insight into the inventory of chemicals in this storehouse.

The experts have concluded that cooperation between the SLA service which deals with orders of chemicals and the technical service of the Tannery was not sufficiently developed. Therefore it usually happened that the ratio of certain chemicals available on stock did nor correspond to the ratio of these chemicals in the technological process. Due to this reason, sometimes there is a shortage of certain chemicals, namely, inadequate chemicals are used in the technological process, either according to their properties, or to their cost prices.

3. Inspection of Technological Process

As it has already been mentioned, in the period from 1983 to 1985, processing treatments of all articles of hides and skins were introduced, both for the requirements of the local market, and for export (wet-blue, crust), and this was confirmed by preparation of corresponding documents. This documentation is still used by the technical service department of the Tannery as a basis for running and inspection of the technological process.

3.1. Daily Inspection

Due to various subjective reasons, the adopted processing treatments and corresponding documents have not been fully respected, so the experts had to introduce the practice of strict carrying out of the following daily inspections again:

Raw Materials:

Organoleptic inspection of raw hides before soaking in order to determine the method of preservation and grade of satisfactory condition of hides during their storing and transport.

Soaking:

Since dry-salted hides are occasionally processed in the Tannery, a method of inspection of soaking process has been introduced. This method includes inspection of pH value of the soaking solution, which should amount to approximately 9,5, as well as visual inspection of cross-section of hides in order to determine the soaking degree - cross-section of hides should be white.

Liming:

Inspection of liming operation is also organoleptic and aims at determining to which extent hair has been destroyed, as well as finding out the degree of plumping.

Deliming:

Inspection of the extent to which hides have been delimed is carried out by pouring the solution of phenophthalein over the cross-section of the thickest part of a hide, whereby this process is developed to partial or complete deliming (colourless cross-section) and pH value between 7,8 and 8,2, depending on the purpose of finished leather product.

Bating:

When pH value of hides and float as well as ambient temperature have been adjusted, the enzymatic bating of hides is carried out after the process of deliming.
In addition to determination of the quantity of bating agents and process duration, it is necessary to find out the grade of softness, pliability and flexibility in the finished product. Inspection is organoleptic.

Pickling:

As regards the process of pickling it is necessary to inspect density of pickle (over 5 Bé) and pH value of hides and float. For inspection of a degree to which a hide has been pickled, it is necessary to use the indication paper and bromine-cresol green indicator. Exact inspection of pH value of pickle solution by using an electrometer (pH-meter) has been introduced; depending on the tanning agent which is available, the technologist determines pH value of pickle, ranging from 2,8 to 3,4 for chrome tannage, and from 3,6 to 5,5 for vegetable and synthetic tannage.

Tanning:

Inspection of the process of tanning is carried out by measuring the pH value of tanning float at the end of tanning operation, and by performing a boiling test of a piece of hide at 100°C, lasting one minute. When vegetable or synthetic tannage is in question, the inspection is carried out by determining the tanning agent penetration degree and the temperature of contraction.

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Neutralization, Retanning, Dyeing and Fat-Liquoring:

The process of neutralization of hides is inspected by using bromine-cresol green as an indicator. The cross- section of a thoroughly sammied piece of hide taken out of the drum is poured with the indication solution. If the cross-section gets a blue colour, it means that the process of neutralization is finished.
Inspection of other operations is carried out organoleptically.

In order to obtain some more detailed information on the raw material which is being processed and the applied technological procedure, the chemical laboratory is equipped with devices and apparatuses for complete monitoring and inspection of raw materials, auxiliary chemicals, semi-processed and finished leather.
Chemical laboratory has been reinstated for carrying out of the following inspections:

1. Inspection of water for soaking - soluble albumins;
2. Inspection of liming solution - total alkalinity;
3. Inspection of fat-liquoring solution - contents of fats;
4. Inspection of tanning solution - contents of Cr_2O_3 and alkalinity;
5. Inspection of hides/skins:
   a) contents of chrome,
   b) skin substance,
   c) ash,
   d) moisture.

3.2. Modifications Introduced in Running of Technclogical Process or Re-introduced Operations

- trimming of fresh hides,
- compulsory adding of anti-bactericide agents (CORTIMOL G) during the operation of soaking,
- correction of pH value after tanning by adding the adequate quantity of soda ash,
- trimming of sides after shaving,
- weighing after trimming in order to determine the shaved weight,
- introduction of the operation of conditioning after air-drying,
- manufacture of corrected grain smooth upper leather, respecting the following sequence of operations:
  - buffing (paper 220 or 180)
  - brushing
  - impregnation, overnight
  - vacuum drying
  - buffing (paper 400)
  - brushing, etc.

It is interesting to mention that the consumption of chemicals for neutralization, dyeing, retanning and fat-liquoring has been reduced by approximately 40%, owing to re-introduction of determining of shaved weight. Namely, it used to be presumed that 400 kg of shaved wet-blue hides for upper leather contained 130 sides, without weighing. By introducing weighing of hides, it has been found out that 400 kg of wet-blue hides for upper leather contained approximately 180 - 200 sides.

- Unfortunately, determining of pelt weights could not be introduced, because no scale for pelt weight weighing was available.

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4. Undertaken Measures

4.1. Organization

In order to bring the organization of production to the optimum level, and considering the available technical personnel, the Team Leader suggested to have the technological process divided into sections, as shown in Annex VI, which was accepted by the Tannery management.

In this way, two young engineers who had been employed in the Tannery for some time, were given concrete tasks in the technological line of leather processing. In addition, the process of preparation of wet-blue hides for export was located in a separate section, thus enabling the respective chief of section to carry out direct inspection of the process, and making possible the fulfilment of daily production. The Team Leader supported the idea that the young engineers should spend some time as chiefs of each section, in order to be properly trained for managing the technological process and the workers.

4.2. Wet-blue hides for export:

When the experts arrived in the Tannery, sorting out of wet-blue hides for export was being carried out within the finishing section, where conditions were rather inadequate. Namely, this section is located far from the section where the sammying machine is placed, and it is not properly lighted for sorting out of hides according to classes. On the other hand, displacement of the operation of sorting-out into the finishing section resulted in creating inadequate conditions for the operation of finishing, i.e. the finishing section area should be clean and dry.

The Tannery management agreed to displace the operation of sorting out into a separate section, being right next to the chrome-tanning section, where a new sammying and a new splitting machine had already been installed. In this way following advantages have been achieved:

- transport of hides to the sammying machine has been reduced;
- experts in sorting out sorted hides on sorting tables placed next to the outlet side of the continuous sammying machine;
- low quality hides, which did not comply with export standards, were just being returned to be re-sammied for the operation of splitting, and this was done without any special transport, as these machines were placed close to each other;
- since the room for sorting-out is large enough, it was possible to carry out packing and stacking of sacks in it, too.

During the first two weeks of work in the Tannery, the experts succeeded in making the Tannery personnel realize that processing of wet-blue hides for export had to run continuously, starting from the operation of soaking of fresh hides till the operations of sorting out and packing. At the same time, the wet-blue hides intended for domestic market had to be further processed every day, starting from the operation of splitting, shaving, etc.
In that way further increase of wet-blue hides stock has been prevented.

4.3. Elimination of Stock of Low-Quality Wet-Blue Hides

The next great objective was to eliminate the accumulated stock of low-quality wet-blue hides intended for the domestic market.

The Team Leader and the Managing director of the Tannery have considered the possibility of increasing production in the stage of finishing by 300 sides per day. If splits are added to this number, this means the total amount of 600 pieces of various kinds of hides (hunting splits, smooth and embossed upper leather, hunting, etc.) Based on this quantity, 15 - 20 new workers should have been employed. Besides, it has been assumed that the existing workers would be more stimulated by introducing the incentive payment system.
In May, when the largest scope of monthly production of finished leather in the whole observed period was achieved, daily output sometimes reached the number of 400 sides. These results could not be further improved due to the following reasons:

- new workers have not been employed,
- the existing workers were not stimulated to a greater extent, considering the existing level of salaries,
- by the end of September 1988, deep pump for water supply got out of order, and for more than one month the Tannery was supplied with water from cisterns, however, for retanning purposes only.

Owing to a good business step undertaken by the management of the Tannery, which consisted of conclusion of a contract for export of low-quality wet-blue hides, the stock was finally completely eliminated at the beginning of November.

4.4. Elimination of Stock of Low-Quality Crust Hides

In various corners of the finishing section there were approximately 2000 sides in crust stage, which had been rejected due to poor quality of grain and various other defects. Based on numerous contacts with buyers, the Tannery found out what kind of embossing plate should be selected, and the use of this plate helped to "cover" majority of defects, which resulted in elimination of the whole stock.

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4.5. Vegetable Section

4.5.1. Existing Conditions

The designed technological procedure anticipates so-called quick tanning of sole leather in the drum according to the system of Messrs Bayer or BASF.

Theoretically, the procedure lasts for 48 hours. However, taking the availability of chemical and the conditions in the Tannery, the duration of tanning procedure was anticipated to last 72 hours.

After two out of three drums ceased to operate, the production of sole leather was reduced in such way that every third day 5o pcs. of hides were taken to be processed.

After having arrived, the experts stated that vegetable tanning procedure lasted for more than three days. The experts modified the procedure paying due respect several times to the verified procedure of Messrs BASF, whereby tanning procedure gained in speed and sole leather of satisfactory quality was achieved.

The modification consisted of treating the hides with 5% of Basynton RM before tanning after which tanning was carried out by means of vegetable tannins. Despite the shortage of Basyntan M, the second essential agent for vegetable dispegation, tanning procedure was conducted succesfully by using some other substitutes.

4.5.2. Proposed Measures

In order to restore this section into condition it used to be at the beginning of the tannery operation, i.e.:

5o pcs of hides or 1oo sides of daily processing or 1ooo kg. of pelt

the following is to be done:

1. Purchase of : 2 pcs. of tanning drums. 2,8 m x 3 m
   1 pce. sammying m/c for vegetable leather, 1600 mm
2. Transfer of setting-out m/c, working width 2100 mm into vegetable section (Enclosure : equipment displacement sketch)

5. Production

The Annex VII provides a survey of soaking during the period April-October,1988.

The Annexes VIII and IX provide the surveys of out-put in the period January-March, namely April-October.1988.

5.1. Skins Processing

Even though the Tannery was designed so that it can process 2.500 skins daily, in the period April-October the quantity of processed goat and sheep skins is not worth mentioning.

5.2. Hides Processing and Achieved Out-put

The Annexes VIII and IX show that before the arrival of the experts the average daily production amounted to 30 pcs. of upper leather and vegetable leather, whereas the production of splits started only at the end of March.

The production of wet-blue hides has not been taken into consideration.

The average out-put was 8.55 sq.ft./side.

In the period covering the stay of the experts an average daily production of 57 pcs. of upper leather and vegetable leather was achieved. An average out-put of 9.62 sq.ft/side was achieved which represents and increase of more than one sq.ft/ per side.

It should be noted here that in the period April-October wet-blue cow hides of low quality was processed. Due to being stocked for long time and to numerous damages it had to be trimmed to a bigger extent. If it were not for that even more favourable out-put could have been expected.

Owing to the the imporved quality, hunting splits has found its appliaction at the local market, therefore its production was increased from 269 pcs. in March to almost 6ooo pcs in October.

5.3. Water Supply Pump Failure

As it was already stated at the end of September, 1988. there came to a failure on the only deep pump which supplied the Tannery with water. After having inspected the pump it was ascertained that a new pump was to be purchased, the price of which proved to be higher than the Tannery was able to pay. With a help of the Ministry of Industry a new pump was installed only at the end of October.

The above mentioned problem reflected in the production in September and October, which would otherwise surely be at least on the level of the previous months .

6. Utilization of Capacity

6.1. Skins

It has already been mentioned that sheep and goat skins were hardly even processed, even though there is installed daily capacity of 2.5oo pcs.

6.2. Hides and Camels

The installed capacity is 3oo pcs. of hides.
From the Annex VII it can be seen that in the period April-

September the average monthly soaking amounted to 4.32o pcs. of hides, i.e. an average daily of 173 pcs. That means that at the average the capacity is utilized with 57,6%. Taking into consideration that skins are not processed, Team Leader suggested that daily hides or camels soaking is increased to total of 55o pcs. In that way hides would be processed into wet-blue for export and camels into finished leather for domestic market.

The capacity could even be increased to 6oo pcs. providing the vegetable section processed 5o pcs. of hides daily, for which purpose 2 pcs. of drums for vegetable tanning should be replaced by new ones.

7. Requirements in New Equipment

It has already been stated that two vegetable tanning drums are out of operation, therefore they should be replaced by new ones. In that way the capacity of the vegetable section would again be 5o pcs. daily.

This is necessary for the Tannery to effect it as sole and insole leather are not meeting the requirements of shoe factory.

Hydraulic fleshing machine is required for hides processing.

For the requirements of sole and insole leather processing it is necessary to provide sammying machine.

At present wet-blue is exported and is charged per piece.

Measuring the hides would provide and exact surface measuring and greater income.

This is the list of the required machines:

- 2 pcs. Vegetable tanning drums, Ø 2,5 x 3 m,
- 1 pc. Hydraulic fleshing machine, w.w. 27oo mm
- 1 pc. Sammying machine for vegetable leather, 16oo mm
- 1 pc. Electronic surface measuring machine for wet-blue, 18oo mm,
- 1 pc. Scale, capacity 2000 t.

8. Standards for Sorting of Wet-Blue Skins and Hides

Based on stat. .cal data Somalia has 3,7 million heads of cattle and 1o million heads of sheep, 16 million heads of goats and 5,7 million heads of camels.

Breeding of cattle in Somalia is carried ou in nomadic way and for the owner it mainly serves as property and not as goods for the market.

Total take-off is 37o cattle heads, 3,3 million sheep , 4.2 million goats and 28o thousand camels.

Slaughtering of animals is mostly individual - particularly slaughtering of goats and sheep and in smaller quantities it is performed in industrial slaughter-houses.

As regards cattle in Somalia there prevails African humped cattle ZEBU in a number of approximately 9o% whereas the remaining approximate of 1o% is cattle with flat or almost flat backs.

When camels are concerned it should be noted that mainly dromedary is bred.

As regards sheep and goats, besides goats a well-known black-headed sheep is bred which provides excellent skin. Somalia is a spacious country covering approx. 1.ooo km² and there are significant climatic differences between the Northern mountain and Southern plane region which causes also different conditions for breeding of cattle and this again brings about the differences in the quality of skins and hides.

Damages and defects of raw skins and hides from Somalia can be listed into three groups, which is a usual practice, being:

a. defects and damages in the course of animal`s life,
b. defects and damages made at slaughtering and flaying, and
c. defects and damages caused by inadequate preservation and storage of skins and hides.

a. Damage of skins and hides while animals are still alive - in this part of Africa there is no grubs (Warble) but there are numerous damages caused by Ixodidae, flies, thorns, strucks by horns, various types of mange, poxes and particularly brand marks. Skins and hides are also damaged because of driving the cattle with sharp objects, particularly in the area of rear legs.

b. Damages caused at slaughtering and flaying

Cattle slaughtering is performed mainly individually all over Somalia. As the purchase prices of raw skins and hides are rather low, there is no interest on the part of individuals to treat skins and hides with due care and therefore very often improperly removed from animal`s body by making blind cuts or cuts in the shape of holes on the skin. This is particularly noticed at flaying camel hides.

c. Damages caused by improper preservation and stocking

The usual way of preservation of skins and hides in Somalia is drying.

When hides are concerned salting prevails after which hides are dried, whereas skins are regularly dried.

Skins and hides are ususally dried in the shade on frames whereby drying is not effected till the end since skins are packed so as to be folded along the spinal line with hairy side inside and hides are packed like a book.

In case skins and hides are completely dried there would come to breaking of skin fibres at bending. Even despite the checking it may happen thea prior to packing skins and hides are overdried and then it comes to breaking of skin fibres along the line of folding. As regards skins and hides which are packed and contain excessive moisture at the places of folding there comes to growth of micro-organisms which also damages skins and hides.

It is not rare that during transport or while stocked skins and hides are exposed to rain whereby moisture is mostly retained exactly at these bends which also causes growth of microorganisms and they in turn damage the skins and hides.

As regards skins and hides, piled in storages, which were exposed to rain, there comes to very slow drying thus making possible microorganisms to grow which affect skin and hide face and damage it to a great extent. Many African countries have introduced their own criteria for standards for sorting of raw and semi-processed skins and hides which the Buyer adjust to.

The expert considers that Somalia should also have its own standards for sorting of wet-blue skins and hides for export, thus making it possible for Somali leather to be recognizable at the world market.

Standards for sorting of skins and hides are provided in the Annex X.

9. Programme of Training of Young Engineers and Technicians

In order to enable young educated personnel, coming from faculties to the tanneris, to be properly trained and prepared for responsible jobs in running of the production pro-

cess in tanneries, the Team Leader suggested the programme of training which is provided in Annex XI. The entire training programme would be carried out in the Tannery itself. Only after undergoing such training and practical work in tanneries, the young experts should be directed for specialization abroad.

10. Costs

On the basis of the data at disposal of the Tannery - the price of wet-blue skins and hides is formed in this way:

Ser. No.	MATERIAL	Price per 1 pc.ofhide So Sh
1.	Hides	2oo
2.	Labour	5.6o
3.	Chemicals	4o9.oo
4.	Factory overheads	161.5o
5.	Packing bags	1o.6o
	Total	786.7o

That means that the cost of raw material - hides, accounts for some 25% of the total unit cost of wet-blue. which is a very low percentage in relation to the customary one in the world.

At the time of preparation of this study the exchange rate amounted to:

1 US$ = 245 SoSh

11. Making Use of the Special Fund Granted by UNIDO

The Team Leader is acquainted with the fact that out of that Fund the Tannery purchased hydraulic oil for machines. However, it is not known to the Leader whether the entire Fund has been exhausted.

12. Modifications in Lay-Out

For the purpose of reducing the internal transport, the Team Leader suggests the following modifications:

12.1. Sammying machine (Position 10) and splitting machine (Position 11) should be transferred to the place in front of the shaving machine, (Positions 10a and 11a), which is displayed by dashes on the lay-out. In this way transport of hides/skins would be reduced to the minimum.

12.2. Setting-out machine (Position 16) should be transferred to the vegetable tannage section opposite to the vegetable tanning drums, (Position 16a).

The Annex XII provides Tannery lay-out with the suggested modifications.

ANNEX NO. I

PRELIMINARY WORK PLAN

Project No.: SI/SOM/87/80/
Contract No.: 87/139

1. In the Project Area

a) First Part: 1,5 months

- Mogadishu Tannery at Km. 7:

Inspect the condition of machines and equipment.

Make a list of necessary spare parts.

Bring the equipment into best possible operating condition using the available spare parts.

Make a suggestion of how to observe the condition of spare parts in the store.

Work out the instructions for preventive maintenance of the equipment.

Make a survey of technological process and control places. If necessary, give recommendations for improvements.

- Kismayo Tannery

Inspect the condition of machines and equipment.

Make a list of necessary spare parts.

Bring the equipment into best possible operating condition using the available spare parts.

Make a survey of the technological process. If necessary, make a suggestion of ways of control and improvements.

b) Second Part: 3 months

- Mogadishu and Kismayo Tannery

Current maintenance of equipment. Training of counterparts in preventive maintenance of equipment. Working out of instructions for maintenance of equipment.

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Putting file in order, as well as catalogues and instructions for maintenance of the machines.

c) Third Part: 1,5 months

Current maintenance of equipment and supervision over the independent work of counterparts. Make an additional list of the necessary spare parts.

Carry out the supervision over the chosen technological process. Compare the achieved results to the existing state, as regards quality, yield, etc.

2. Home Office Service:

- Preparation of the team of experts for departure to Somalia. Survey of their work and rendering of necessary services and assistance.

A N N E X I I

LIST OF SPARE PARTS NECESSARY FOR MAINTENANCE OF MACHINES
(made at the beginning of Project implementation)

A) SPARE PARTS FOR FLESHING MACHINE

Type 11600 AND Type 11700

1.	4	Pcs.	Beam
2.	4	pcs.	Bolt
3.	4	pcs.	Bushing
4.	4	pcs.	Cover
5.	4	pcs.	Lever
6.	4	pcs.	Connecting bushing
7.	4	pcs.	Worm
8.	2	pcs.	Worm
9.	4	pcs.	Worm wheel
10.	4	pcs.	Spindle
11.	4	pcs.	Nut
12.	1	pcs.	Frame
13.	4	pcs.	Cleaner
14.	2	sets	spiral knives
15.	2	sets	spiral knives
16.	2	pcs.	Safety valve
17.	16	pcs.	Two-pole switch
18.	8	pcs.	Contactless switch
19.	4	pcs.	Electric magnet
20.	8	pcs.	Ball-bearing
21.	4	Pac.	Bushing
22.	2	pcs.	Bushing
23.	4	pcs.	Ball-bearing
24.	2	pcs.	Hydro-moto supporting hoop

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25. 4 pcs. Roller bearing
26. 2 pcs. Roller bearing
27. 4 pcs. Bearing
28. 2 pcs. Chain wheel
29. 2 pcs. Chain wheel
3o. 2 pcs. Chain wheel
31. 2 pcs. Chain wheel
32. 14 pcs. Chain
33. 8 pcs. Connecting link 1/2 "for chain 1/2
34. 4 pcs. Curved external - internal.
connect.link 1/2 "for chain 1/2"

B) SPARE PARTS FOR SHAVING MACHINE TYPE
B24

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1. 15o pcs. Copper weage 3,5x8x1oo
2. 6o pcs. kinfe left-hand
3. 6o pcs. kinfe right-hand
4. 4 pcs. End switch
5. 5 pcs. Relay
6. 5 pcs. Relay
7. 1o pcs. Grinding wheel
8. 4 pcs. Bearing
9. 1 pcs. Bearing
1o. 1 pcs. Bearing
11. 1 set Templates for measuring
screw thread up-grade

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C) SPARE PARTS FOR HYDRAULIC

PRESS TYPE FO5

1.	4	pcs.	felt for working desk
2.	3	pcs.	pipe
3.	3	pac.	pipe
4.	4o	pcs.	Connection
5.	3o	pcs.	Connection
6.	4o	pcs.	Connection
7.	3o	pcs.	Connection
8.	3o	pcs.	Connection
9.	5	pcs.	Connection
1o.	1o	pcs.	Connection
11.	5	pcs.	Pressure gauge
12.	3o	pcs.	V-belt
13.	15	pcs.	V-belt
14.	5	pcs.	Filter
15.	2	pcs.	Return Filter
16.	3	pcs.	Return Filter
17.	2	pcs.	Hydro-motor

D) T O O L

1.	1	Pcs.	Fork spanner 8/9 mm
2.	1	pcs.	fork spanner 1o/11 mm
3.	1	pcs.	fork spanner 14/15 mm
4.	1	pcs.	fork spanner 16/17 mm
5.	1	pcs.	fork spanner 27/3o mm
6.	1	pcs.	Box spanner 24/26 mm 122o
7.	1	pcs.	Hammer o,5KG

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8.	1	pcs.	Combined shears
9.	1	pcs.	Universal instrument
1o.	1	pcs.	Pipe curving device Ø 1o mm ART. 342

"E" OTHER PARTS

1.	15	pcs.	Matica RE 16
2.	15	pcs.	Matica RE 13,5
3.	2	pcs.	Doza sm 7o1
4.	15	pcs.	Uvodinica pg 16
5.	15	pcs.	Uvodnica pg 13,5
6.	1oo	pcs.	Mazalica M1ox1mm
7.	1	set	Ureznica M1ox1

F) ELECTRICAL PARTS

		QTY
1.	Fuse D III 63A	4 cartons
2.	Fuse D II 25A	2 "
3.	Fuse D III 35A	3 "
4.	Fuse D III 5oA	3 "
5.	Switch 46 631o VR 232	6 pcs.
6.	Bimetal Relay TRB 34 24-45A	6 "
7.	Bimetal Relay TRB 34 2o-35A	6 "
8.	Bimetal Relay TRB 36 6o-1ooA	6 "
9.	CONTRACTOR K63 42,22o VAC	25 "
1o.	Contractor K16 11,22o VAC	5 "

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		QTY
11.	Contractor K25 42,22o VAC	5 pcs.
12.	Contractor K4o 42,22o VAC	15 "
13.	Contractor KN8o 22o VAC	3 "
14.	Contractor Kloo, 42, 22o VAC	5 "
15.	Time Relay tre 15ol, 3o5, 22o VAC	15 "
16.	Time Relay CRT 5o, 1io VAC	6 "
17.	Switch o-3o ISKRA	4 "
18.	Switch 46 25 1o VR o32	5 "

G) SPARE PARTS FOR CORTIGLIANO VACUUM DRYERS SERIES III

1.	1	pcs. part.17o pressure egulator dia. 1/2
2.	loo	pcs. part.lol s/s stud bolts
3.	1	pcs. part.lo2 s/s mesh net intermediate
4.	1	pcs. part.lo2 s/s net 7o/45
5.	loo	pcs. part.99 s/s hexagon nuts
6.	loo	pcs.part. 161 tps bolts
7.	1	pcs.part. loo surrounding cord
8.	1	pcs.part.167 s/s double hook
9.	1	sets part.162 rubber packing dia.5
lo.	1	sets part.163 milled dstructural sh.
11.	1	sets part.168 trimming for fiting rub.
12.	1	sets part.215 s/s sheet protect mat
13.	1	sets part.98P+253 New linenized mat
14.	2	pcs.part. 159 Vacuum valve
15.	1	pcs. part.155 small politen tube 4x6
16.	2	pcs.part.4 pneumatic system lubrific

ANNEX III

LIST OF SPARE PARTS REQUIRED FOR FUTURE MAINTENANCE OF MACHINES

LIMING DRUM Type 9-17

1.	Vee belt 20 x 1800 JUS G.E2.053	12	pcs
2.	Hydrodinamic coupler with pulley EKH 370	2	pcs
3.	Electric motor - tropiealized 4AZD 180 L-8-4	1	pcs
4.	Grease cup 7R 3/8"	5	pcs
5.	Locking grip S14.012500-0	12	pcs

TUMBLER DRUM

1.	Vee belt 20 x 1650 JUS G.E2.053	40	pcs
2.	Electric motor-tropicalized 4AZ 160 M4 R.K.	1	pcs
3.	Screw M 24 x 270 S 72.010500-0	20	pcs
4.	M 20 x 175 S 72.010600-0	20	pcs
5.	M 20 x 245 S 72.010700-0	20	pcs
6.	Locking grip R 023.300	20	pcs
7.	Grease cup R 3/4"	10	pcs

FLESHING MACHINE TYPE 11600

1.	Hydraulic motor 119001-1	2	pcs
2.	Distributor "ORSTA"	1	pcs
3.	Oil filter 11009-256	4	pcs
4.	Pump 11902-sest.3	2	pcs
5.	Ball bearing SKF 6207	4	pcs
6.	" " SKF 6208	4	pcs
7.	" " SKF 2310	10	pcs
8.	Double chain wheel 11004-115	4	pcs
9.	" " 11004-117	4	pcs
10.	Rubber roller 11705-6	1	pcs
11.	Ball bearing SKF 6311	4	pcs
12.	Roller bearing SKF NU.311	2	pcs
13.	Lever 13.07.0006	4	pcs
14.	Roller bearing SKF NU.213	4	pcs
15.	Ball bearing SKF 6204	2	pcs
16.	Chain wheel A20.030003-0	2	pcs
17.	" " A20.030005-0	1	pcs
18.	" " A20.030006-0	2	pcs
19.	" " A20.030004-0	1	pcs
20.	Roller chain 5/8" JUS M.CI.821	30	m
21.	" " 1/2" JUS M.CI.820	20	m
22.	Grinder D 2 B 70 NGVx2	10	pcs
23.	Vee belt 17 x 11 x 1900	10	pcs

CHEVING MACHINE Type B-24

1.	Crom roller	B24.04.0001-0	1	pcs
2.	Bearing	FAG 22211 HL	2	pcs
3.	Bearing	FAG 32211 A	2	pcs
4.	Roller	B24.020001-0	1	pcs
5.	Lever cup	B24.020100-0	2	pcs
6.	Cutter	d=190,5 D=260 P=330 L780	96	pcs
7.	Bearing	32212 Ø 110x60x28	2	pcs
8.	"	32213 Ø 120x65x31	2	pcs
9.	Tipalo	Kompletno catolog B-24 page 35	1	pcs
10.	Vodilna leter	B24 180002-1 (cat.page 47)	4	pcs
11.	Chain wheel	Jus H.CI.821	10	pcs
12.	Bearing	B24.174000-3	4	pcs
13.	Grinder	A80 P3 V (Ø 250x100x40)	10	pcs
14.	Bearing	Page 53 Complete part 1-23		
15.	Bearing	Page 55 Complete part 1-18		
16.	Hydromotor	3125.451.99	1	pcs
17.	Cardan	ST-01.118x500	1	pcs
18.	Vee belt 710	JUS C.E2.053	4	pcs
19.	Bearing compl.	TVX 306A SKF	2	pcs
20.	Regulation	1674639 remark 1542-4.45	1	pcs
21.	Hydraulic pump	1816990	1	pcs
22.	" "	1817022	1	pcs

SPLITTING MACHINE "MOSCONI" Typ SIRID 2300/E

					Page No.
1.	Seat ring	Code No. 13.029	4	pcs	4
2.	" "	" 13.030	4	pcs	4
3.	Bearing	" 12.038	4	pcs	4
4.	Set of small rollers	400.04.00.057	1	pcs	37,1
5.	Filter	Code No. 24.221	3	pcs	41
6.	"	" 24.136	2	pcs	41,1
7.	Counter roller	Code No. 400.03.00.329	2	pcs	34,1
8.	" "	" 400.03.00.330	2	pcs	34,1
9.	Emery wheel	" 21.047	2	pcs	27

WATER PUMP

5,5 KW; 2885 RPM; 160-300 L/MIN

HID.SAMMING AND SETTING - OUT MACHINE B-07

1.	Regulation gear Complette L+R			page No. 20-21
2.	Hydraulic tubes and suplyes-complete			page No. 26+27
3.	Rabber coated roller Ø 160 B07.050200-0	1	pcs	page No. 16
4.	Felt jacket B07.040101-0	2	pcs	
5.	Electric motor 3KW,380V, 6,9A	1	pcs	(for hydraulic pump

DUALPRESS "3" Type 2400 T (Samming machine)

1.	Bearing	23226	2	pcs	Ø 130x230x80 mm
2.	Bearing	23226	2	pcs	"
3.	Bearing	1211	4	pcs	55x110x21
4.	Bearing	2208	4	pcs	40x80x23
5.	Bearing	6207	4	pcs	35x72x17
6.	Felt jacket	Complet	1	pcs	

HIDRAULIC PRESSE Type F-05 "Kostroj"

1.	Hydraulic pressure pump x 36, OK	1	pcs	
2.	Solenoid "Kladivar" MR,7A KUN 24 V/!L WDC	2	pcs	
3.	Solenoid valve Complet	1	pcs	(page 10+9)

VACUUM DRYER SERIES III "CARTIGLIANO"

1.	Steam valve part 68	2	pcs
2.	Suction valve part 159	4	pcs
3.	Heating pump V 102 F.B.M.	1	pcs
4.	Electric motor 1,5HP 2800RPM	1	pcs
5.	Suction vacuum pump P.512 F.B.M.	1	pcs

DRUM

1.	Electric motor	type 4AZD 180 L-8-4	1	pcs
2.	Vee belt	20x1800 mm	12	pcs
3.	Electric motor	type 4AZ 160	1	pcs
4.	Vee belt	20x1650 mm	20	pcs
5.	Screw	M24x270 mm	20	pcs
6.	"	M20x175 mm	20	pcs
7.	"	M20x245 mm	20	pcs

FLESHING MACHINE

1.	Hydraulic motor	11900-1-1	2	pcs
2.	Filter	11009-256	4	pcs
3.	Hydraulic pump	11202-sest.3	2	pcs
4.	Ball bearing	SKF 6207 Ø 35x72x17	6	pcs
5.	"	SKF 6208 Ø 40x80x18	6	pcs
6.	"	SKF 6311 Ø 55x120x29	4	pcs
7.	"	SKF 2310 Ø 50x110x40	4	pcs
8.	"	SKF NU 213 Ø 65x120x23	4	pcs
9.	"	SKF 6204 Ø 20x47x14	2	pcs
10.	Chain wheel	A.20.030003-0	2	pcs
11.	"	A.20.030005-0	2	pcs
12.	"	A.20.030006-0	2	pcs
13.	"	A.20.030004-0	2	pcs
14.	Roller chain	JUS M.CI 821-5/8"	30	pcs
15.	"	JUS M.CI 820-1/2"	20	pcs
16.	Vee belt	17x11x1900	10	pcs

SHAVING MACHINE B-24 "KOSTROJ"

1.	Bearing	B24.FAG 22211HL	2	pcs
2.	"	B24.FAG 32211 A	2	pcs
3.	"	32212 (Ø 120x65x31)	2	pcs
4.	Knifes	d=190,5; D=260 P=330; L=780	3	compl.
5.	Grinder	Ø 250 x 100 x 40	10	pcs

SPLITTING MACHINE "MOSCENI" Typ SIRIO 2300/E

1.	Seat ring	13.029 (page 4)	5	pcs
2.	"	13.030 (page 4)	5	pcs
3.	Bearing	12.038 (page 4)	4	pcs
4.	Filter	24.221 (page 41)	4	pcs
5.	"	24.136 (page 41.1)	4	pcs

VEE - BELTS

1.	Vee-belt	20x1500	20	pcs
2.	"	17x2200	20	pcs
3.	"	17x1900	20	pcs
4.	"	17x1700	20	pcs
5.	"	13x2100	10	pcs
6.	"	13x2300	10	pcs
7.	2	13x1650	5	pcs

SAMMYNG MACHINE "3P" Type 2400 T

1.	Bearing	23226 Ø 130x230x80	2	pcs
2.	"	1211 Ø 55x110x21	4	pcs
3.	"	2208 Ø 40x80x23	4	pcs
4.	"	6207 Ø 35x72x17	4	pcs

SAMMYNG MACHINE "KOSTROJ" Type B-07

1.	Regulating-gear Complet (page 20+21)		1	compl.
2.	Hydraulic tubes and uplyes Complet (page 26+27)		1	compl.
3.	Rubber roller B07.050200-0		1	pcs
4.	Felt jacket B07.040101-0		2	pcs
5.	Electric motor 3 KW, 380V, 6,9A		1	pcs

BIMETAL RELAY

1.	"ISKRA" 2B4	16-32 A	5	pcs
2.	"ISKRA" RB4	8-16 A	5	pcs
		6-12 A	5	pcs
		12-24 A	5	pcs

BIMETAL RELAY

4.	"ISKRA" RB2	1- 2 A	5	pcs
		12-24 A	5	pcs
		10-16 A	5	pcs

	RB2	4-6 A	5	pcs
		2-4 A	5	pcs
		0.5-1 A	2	pcs
4.	CONTACTOR 220 VAC	K-63-	10	pcs
		K-40-	5	pcs
		K-25-	30	pcs
		K-16-	30	pcs
		KO 53-	5	pcs
		KO 62-	5	pcs
		KO 44-	5	pcs
5.	CONTACTOR "RADE KONČAR" 220 VAC CN-40		10	pcs
6.	RELAY "ISKRA" PR 59 24VDC		5	pcs
7.	" " PR 59 230 VAC		5	pcs
8.	TIME RELAY "ISKRA" CRT 01 220 VAC	0.6-60 sec.	1	pcs
		0.3-30 sec.	1	pcs
		0.2-20 sec.	5	pcs
		0.1-15 sec.	2	pcs
		0-6 sec.	1	pcs
9.	RECTIFIERS GRAETZ 30 V / SA Sc.		1	pcs
		B50 C 5000 (3300)	10	pcs
		B50 C 3000 (2200)	5	pcs
10.	ELECTROLYTIC CONDENSER "ISKRA" 5 0MF/50V		2	pcs
11.	CAM SWITCH	20200-10-U-2132	1	pcs
		40100-10-U-R132	1	pcs
		20100-10-U-R132	3	pcs
		2063-10-U-R132	5	pcs
		2040-10-U-R132	2	pcs
		2025-10-U-R132	5	pcs
		2016-10-U-R132	3	pcs
12.	FUSE DIII	63/35-20 pcs	1	box
		25/20-50 pcs	2	boxes
		25/16-50 pcs	2	"
		25/10-50 pcs	2	"
		25/6-50 pcs	2	"
13.	FUSE OUS	2A	2	boxes
		500 MA	3	"
		200 MA	1	box
		125 MA	1	"
14.	END SWITCH "ISKRA" MSOK 6		10	pcs.

15.	CABLE SHOE	Ø 8 x 25 mm2 Ø 8 x 16 mm2	20 pcs.
16.	MAIN TRANSFORMER	380V/220V/12V/24V/200VA	3 pcs.
17.	" "	220V/12V/30V/300VA	4 pcs.
18.	" "	220V/12V/100VA	2 pcs.
19.	FUSE SOCKET 63A Complet Set		50 pcs.
20.	FUSE SOCKET 25A Complet Set		75 pcs.
21.	FUSE SOCKET NV-100		20 pcs.
22.	FUSE SOCKET NV-250		20 pcs.
23.	FUSE 6A		50 pcs.
24.	" 10A		50 pcs.
25.	" 16A		100 pcs.
26.	" 20A		100 pcs.
27.	" 25A		100 pcs.
28.	" 35A		80 pcs.
29.	" 50A		80 pcs.
30.	" 63A		60 pcs.
31.	" NV 100/80A		20 pcs.
32.	" NV 100/100A		20 pcs.
33.	" NV 100/125A		20 pcs.
34.	" NV 250/100A		20 pcs.
35.	" NV 250/125A		20 pcs.
36.	" NV 250/150 A		20 pcs.
37.	" NV 250/250A		20 pcs.
38.	" NV 250/400A		20 pcs.

39.	INLET WITH NUT Ø 13,5 mm	100 pcs.
40.	" " Ø 16 mm	100 pcs.
41.	" " Ø 21 mm	100 pcs.
42.	SUPPORT FOR COUPLINGS "NVS 2" ELKOM-STROJKOPLAST	5 pcs.
43.	SUPPORT FOR CONTACTORS	3 pcs.

ANNEX IV

SUGGESTED LIST OF SPARE PARTS WHICH SHOLUD ALWAYS BE AVAILABLE IN THE TANNERY

VACUUM DRYER SERIES III "CARTIGLIANO"

1.	Steam valve part 68	2	pcs
2.	Suction valve part 159	4	pcs
3.	Heating pump V 102 F.B.M.	1	pcs
4.	Electric motor 1,5HP 2800RPM	1	pcs
5.	Suction vacuum pump P.513 F.B.M.	1	pcs

DRUM

1.	Electric motor	type 4AZD 160 L-8-4	1	pcs
2.	Vee belt	20x1800 mm	12	pcs
3.	Electric mo*	type 4AZ 160	1	pcs
4.	Vee belt	20x1650 mm	20	pcs
5.	Screw	M24x270 mm	20	pcs
6.	"	M20x175 mm	20	pcs
7.	"	M20x345 mm	20	pcs

FLESHING MACHINE

1.	Hydraulic motor	11900-1-3	2	pcs
2.	Filter	11009-256	4	pcs
3.	Hydraulic pump	11202-test.3	2	pcs
4.	Ball bearing	SKF 6207 Ø 35x72x17	6	pcs
5.	"	SKF 6206 Ø 40x80x18	6	pcs
6.	"	SKF 6311 Ø 55x120x29	4	pcs
7.	"	SKF 2310 Ø 50x110x40	4	pcs
8.	"	SKF NU 213 Ø 65x120x23	4	pcs
9.	"	SKF 6204 Ø 20x47x14	2	pcs
10.	Chain wheel	A.20.030003-0	2	pcs
11.	"	A.20.030005-0	2	pcs
12.	"	A.20.030006-0	2	pcs
13.	"	A.20.030004-0	2	pcs
14.	Roller chain	JUS M.CI 821-5/8"	30	pcs
15.	"	JUS M.CI 820-1/2"	20	pcs
16.	Vee belt	17x11x1900	10	pcs

SHAVING MACHINE B-24 "KOSTROJ"

1.	Bearing	B24.FAG 22211HL	2	pcs
2.	"	B24.FAG 32211 A	2	pcs
3.	"	32212 (Ø 120x65x31)	2	pcs
4.	Knifes	d=190,5; D=260, P=330; L=780	3	compl.
5.	Grinder	Ø 250 x 100 x 40	10	pcs

SPLITTING MACHINE "MOSCENJ" Typ SIRIO 2300 E

1.	Seat ring	13.029 (page 4)	5	pcs
2.	"	14.030 (page 4)	5	pcs
3.	Bearing	13.038 (page 4)	4	pcs
4.	Felt ring	24.131 (page 41)	1	pcs
5.	"	24.136 (page 41.1)	4	pcs

V-BELTS

1.	Vee-belt	20x1500	30	pcs
2.	"	17x2200	20	pcs
3.		17x1900	20	pcs
4.		17x1700	20	pcs
5.	"	13x2100	10	pcs
6.	"	13x2300	10	pcs
7.	"	13x1650	5	pcs

SAMMYING MACHINE "SP" Type 2400 T

1.	Bearing	23226 Ø 130x230x80	2	pcs
2.	"	1211 Ø 55x110x21	4	pcs
3.	"	2209 Ø 40x80x23	4	pcs
4.	"	6207 Ø 35x72x17	4	pcs

SAMMYING MACHINE "KOSTROJ" Type B-07

1.	Regulating-gear Complet (page 20+21)	1	compl.
2.	Hydraulic tubes and Suplyes Complet (page 26+27)	1	compl.
3.	Rubber roller B07.050200-0	1	pcs
4.	Felt jacket B07.040101-0	2	pcs
5.	Electric motor 3 KW, 380V, 6,9A	1	pcs

BIMETAL RELAY

1.	"ISKRA" 2B4	16-32 A	5	pcs
2.	"ISKRA" RB4	8-16 A	5	pcs
		6-12 A	5	pcs
		12-24 A	5	pcs

BIMETAL RELAY

4.	"ISKRA" RB2	1- 2 A	5	pcs
		12-24 A	5	pcs
		10-16 A	5	pcs

	P32 4-6 A	5	pcs
	2-4 A	5	pcs
	0.5- 2 A	2	pcs
4.	CONTACTOR [illegible] K-65-	10	pcs
	K-40-	5	pcs
	K-25-	30	pcs
	K-16-	30	pcs
	KO 55-	5	pcs
	KO 82-	5	pcs
	KO 44-	5	pcs
5.	CONTACTOR "RADE KONČAR" 220 VAC CN-40	10	pcs
6.	RELAY "ISKRA" PR 59 24VDC	3	pcs
7.	" " PR 59 220 VAC	5	pcs
8.	TIME RELAY "ISKRA" CPT 01 220 VAC 0.6-60 sec.	1	pcs
	0.3-30 sec.	1	pcs
	0.2-20 sec.	5	pcs
	0.1-15 sec.	2	pcs
	0-6 sec.	1	pcs
9.	RECTIFIERS GRAETZ 30 V / 5A Sc.	1	pcs
	B50 C 5000 (3300)	10	pcs
	B50 C 3000 (2200)	5	pcs
10.	ELECTROLYTIC CONDENSER "ISKRA" 5 0MF/50V	2	pcs
11.	CAM SWITCH 20200-10-U-2132	1	pcs
	40100-10-U-R132	1	pcs
	20100-10-U-2132	3	pcs
	2063-10-U-R132	5	pcs
	2040-10-U-R132	2	pcs
	2025-10-U-R132	3	pcs
	2016-10-U-R132	3	pcs
12.	FUSE DIII 63/35-20 pcs	1	box
	25/20-50 pcs	2	boxes
	25/16-50 pcs	2	"
	25/10-50 pcs	2	"
	25/6-50 pcs	2	"
13.	FUSE OUS 2A	2	boxes
	500 MA	3	"
	200 MA	1	box
	125 MA	1	"
14.	END SWITCH "ISKRA" MSOK 6	10	pcs.

15.	CABLE SHOE [illegible]	[illegible]	pcs.
16.	[illegible]	[illegible]	pcs.
17.	" "	[illegible]	pcs.
18.	" "	220V/12V/100VA	pcs.
19.	FUSE SOCKET 63A Complet Set	50	pcs.
20.	FUSE SOCKET 25A Complet Set	75	pcs.
21.	FUSE BASE NV-100	20	pcs.
22.	FUSE BASE NV-250	20	pcs.
23.	FUSE 4A	50	pcs.
24.	" 10A	50	pcs.
25.	" 16A	100	pcs.
26.	" 20A	100	pcs.
27.	" 25A	100	pcs.
28.	" 35A	80	pcs.
29.	" 50A	80	pcs.
30.	" 63A	60	pcs.
31.	" NV 100/80A	20	pcs.
32.	" NV 100/100A	20	pcs.
33.	" NV 100/125A	20	pcs.
34.	" NV 250/100A	20	pcs.
35.	" NV 250/125A	20	pcs.
36.	" NV 250/150 A	20	pcs.
37.	" NV 250/250A	20	pcs.
38.	" NV 250/400A	20	pcs.

3[illegible]. INSERT WITH NUT Ø 13,[illegible] mm   100 pcs.

40. " " Ø 16 [illegible]   100 pcs.

[illegible] " " Ø [illegible] [illegible]   [illegible]

[illegible] SUPPORT F[illegible] COUPL[illegible] [illegible]   [illegible]

43. SUPPORT FOR CONTACTORS   5 pcs.

ANNEX V

INVENTORY OF CHEMICALS IN TANNERY ON 31ST AUGUST 1989

No.	Description	Kgs.
	ACID, SALTS AND OTHERS:	
1.	Dieaferman 4023	900
2.	Sod.sulphide flakes	6.250
3.	Sod. bisulphite	6.200
4.	Formic acid	4.010
5.	Sulphuricacid	350
6.	Sod. carbonate	26.850
7.	Sod. bicarbonate	1.700
8.	Sodium Sulphate	8.000
9.	Aluminium Sulphate	4.750
10.	Lutensol AP6	630
11.	Magnezium sulphate	300
12.	Oxalic acid	1.250
13.	Tinovetin BL	300
14.	Ca.fornciat	7.300
15.	Amonium	190
	TANNING AGENTS:	
1.	Chromitan MS	5.000
2.	Lutan B	1.600
3.	Chestnut sweet	6.000
4.	Mimosa	23.375
5.	Basyntan DLE	500
6.	Basyntan N	800
7.	Basyntan RM	1.975
8.	Irgatan LV gran (BLE)	1.100
9.	Irgatan HO gran (D)	275
10.	Irgatan BS	600
11.	Tanolin (USA) 33%	3.000
12.	Lutan F	150
13.	Blancorol CF	1.750
14.	Tanigan CK	550

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No.	D e s c r i p t i o n	kgs.
	O I L S:	
1.	Lipoderm Licker 1	480
2.	Lipoderm Oil SK	600
3.	Batigan AR	970
4.	Cod Oil	2.040
	D Y E S:	
1.	Luganil Yellow NGG	25
2.	Luganil Brown NG	25
3.	Luganil Brown NGB	50
4.	Luganil Brown N3G	125
5.	Luganil Brown NR	200
6.	Luganil Red NB	25
7.	Luganil Violet NG	25
8.	Luganil Blue NL	25
9.	Luganil Grey GC	25
10.	Sella fast Brown HH	125
11.	Sella fast Red C	50
12.	Sella fast Green BW	25
13.	Sella fast Black FC	90
	PIGMENTS, RESINS... :	
1.	Lepton White	560
2.	Lepton Black	110
3.	Lepton Caramel	240
4.	Lepton Brown	320
5.	Lepton Yellow	200
6.	Lepton Red	1.140
7.	Lepton Binder M	240
8.	Lepton Wax A	220
9.	Eukesolar Yellow GL Liquid	75
10.	Eukesolar Brown 5 RL Liquid	100
11.	Eukesolar Brown RL Liquid	50
12.	Eukesolar Red GL Liquid	50
13.	Corial EM base S	150
14.	Corial Matting G	75
15.	Corial Diluent A	340

No.	Description	kgs.
16.	Corial EM Black LS	1.550
17.	Corial Glant XN	550
18.	Derma White C	725
19.	Derma Black B	100
20.	Derma Wax WP	150
21.	Derma Bottom USA	120
22.	Derma Driver DE	180
23.	Isoderma base HF	780
24.	Levaderm Black Liquide	90
25.	Levaderm Red Liquide	30
26.	Eukanol Brown D	1.070
27.	Eukanol Caramel D	795
28.	Eukanol Yellow DN	210
29.	Eukanol Red	150
30.	Eukanol Blue	125
31.	Eukanol Filler 1060	120
32.	Baysin Luster K	200
33.	Baysin LN	350
34.	Cromleather brilliant Black 2R	1.600

A N N E X V I

TANNERY AT KM.7 - MOGADISHU / SOMALIA

Description of Operations and Duties of Individual Chiefs of Sections

1. Chief of Chrome Section

Description of operations inspected and organized by the Chief of Chrome Section:

- reception of fresh hides and skins
- trimming
- liming
- fleshing
- selection for vegetable and chrome tannage if necessary
- measuring (pelt weight)
- deliming
- pickling
- chrome-tannage
- vegetable tannage
- impregnation
- setting-out
- drying
- setting-out (flat)
- re-drying
- rolling
- measuring

To make a daily evidence of received and processed hides and skins.

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2. Chief of Section for Wet-Blue Exporting

Description of operations inspected and organized by the Chief of Section for wet-blue exporting:

2.1 Fresh Wet-Blue Tanned Hides

- transport of chrome tanned hides to exporting section
- sammying
- trimming
- selection - grading (I - V)
- packing
- loading on the lorry

2.2 Tanned Hides for Local Market (Rejected from export or/and from the stock)

- re-wetting in the drum
- sammying
- splitting (2,5 mm)
- shaving for upper leather
- shaving of splits for hunting

To make a daily evidence of processed hides for export and for local market.

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3. Chief of Retanning Section

Description of operations inspected and organized by the Chief of Retanning Section:

- trimming after shaving
- selection of hides and skins according to the quality
  skins - upper
  - suede
  - lining
  hides - smooth
  - embossed
  - hunting
- measuring
- neutralization, retanning, fatliquoring, dyeing
- vacuum drying, re-drying and drying after impregnation
- hanging

To make a daily evidence of processed hides and skins.

4. Chief of Finishing Section

Description of operations inspected and organized by the Chief of Finishing Section:

4.1 hunting out of splits:

- taking splits from the drying space
- milling in the drum
- trimming
- buffing if necessary
- brushing if necessary
- measuring

4.2 smooth upper leather

- taking the sides from the drying room
- conditioning
- staking
- trimming
- vacuum re-drying
- buffing, 220, 180
- brushing
- impregnation
- vacuum drying
- re-buffing, 400
- brushing
- I padding and drying
- embossing hair cell, 200 atm / 90°C
- II padding and drying
- 2 x spraying pigment
- top coat spraying
- I plating 70 atm/ 60°C
- top coat spraying
- II plating 70 atm/ 60°C
- measuring

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4.3 embossed (military) upper leather

- taking sides from the drying room
- conditioning
- staking
- trimming
- vacuum re-drying
- I padding
- spraying
- embossing 90°C / 200 bar / 6-8 sec.
- spraying
- top coat spraying
- measuring

To make a daily evidence of processed leather.

A N N E X VII

IN PUT

FOR THE PERIOD APRIL - OCTOBER 1988.

Month	RAW HIDES		Average Kg/pcs.
	Pcs.	Kgs.	
April	3.473	54.287	15,63
May	3.775	61.016	16,16
June	5.267	84.178	15,98
July	4.344	69.937	16,01
August	4.428	67.599	15,27
September	4.636	73.098	15,77
Octoter	-	-	-
T O T A L	25.923	410.115	15,82

A N N E X   VIII

Cow hides   Out - put for the period january - march 1988.

Month	Upper leather									Sole and insole leather		Hunting splits		Wet blue for export
	Military		Smouth		Hunting		Total		Average					
	Sides	Sq.f.	Sides	Sq.f.	Sides	Sq.f.	Sides	Sq.f.	Sq.f/Sides	Sides	kgs.	Sides	Sq.f.	Sides
Jan.	-	-	825	7.419	-	-	825	7.419	8,99	442	1.462	-	-	12.000
Feb.	-	-	903	7.[illegible]58	57	500	960	7.968	[illegible]	[illegible]	784	-	-	[illegible]
Mar.	312	2.507	1.314	11.291	-	-	1.626	13.7[illegible]8	[illegible]	329	[illegible]	269	[illegible]	..
TOTAL:	312	2.507	3.042	26.168	57	500	3.411	29.175	8,55	1.017	3.369	269	1.363	26.400

Total upper leather plus Sole and insole leather = 3.411 + 1.017 = 4.428 Sides

4.428 Sides : 3 months = 1.476 Side/month = 738 pcs/month

738 : 25 days = 30 pcs/day

A N N E X IX

Cow hides — Out - put for the period april - october 1988.

Month	Upper leather									Sole and Insole leather		Hunting splits		Wet blue for export
	Military		Smouth		Hunting		Total		Average					
	Sides	Sq.F.	Sides	Sq.F.	Sides	Sq.F.	Sides	Sq.F.	Sq.F/Sides	Sides	kgs.	Sides	Sq.F.	Sides
Apr.	558	5.128	1.240	12.053	-	-	1.798	17.181	9,55	161	580	1.214	5.347	12.000
May	2.136	19.479	913	8.231	306	2.446	3.355	30.156	9,00	-	-	3.290	17.483	7.200
Jun.	1.862	18.746	877	9.774	-	-	2.739	28.520	10,41	272	942	[illegible]	1.749	-
Jul.	1.398	13.514	1.325	14.176	-	-	2.723	27.690	10,17	468	1.784	-	-	12.000
Aug.	1.605	14.650	1.294	13.046	-	-	2.899	27.696	9,55	792	3.038	386	2.187	-
Sep.	1.455	12.890	637	6.181	-	-	2.092	19.071	9,12	391	1.309	30	152	7.200
Oct.	1.770	16.537	439	4.470	50	520	2.259	21.527	9,53	60	270	5.967	31.730	-
TOTAL:	10.784	100.944	6.725	67.931	356	2.966	17.865	171.841	9,62	2.144	7.973	11.187	58.648	38.400

Total upper leather plus Sole and insole leather = 17.865 + 2.144 = 20.009 Sides

20.009 Sides : 7 months = 2.858 Sides/month = 1.429 pcs/month

1.429 : 25 days = 57 pcs/day

GRAND TOTAL (INCLUDING WET BLUE) = 58.409 Sides or 29.204 pcs.

ANNEX X

STANDARD FOR WET-BLUE SKINS AND HIDES FROM SOMALIA

1. Wet-blue goat and sheep skins

Grade I - clean, with four legs
- without flaying cuts
- without damages or grain side
- good structure
- max. 2 holes up to 5cm from the edge

Grade II - correct form with four legs
- good structure
- without open holes on the butt
- holes, flayings, cuts or damages caused by diseases up to 7% of the surface
- accepted some not deep scrubs on the butt

Grade III - form could be defected
- structure a little weaker
- some shrunken places or structure weakness could be accepted
- damages: up to 15% of the surface

Grade IV - defected form
- structure not standard
- damages: up to 25% of the surface
- deep damages, scrubs or diseases, shrunken places, up to 25% of the surface

Grade V - defected form
- deep damages up to 50% of the surface

2. Wet-blue cow hides

Grade I - undamaged, solid hides with up to 4 damages (warble holes, minor healed wounds, scratches of thorns or damages made by insect bites), and with damages on the butt having surface of up to 100 cm^2, and on shoulder or bellies, up to 200 cm^2.

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Grade II - undamaged and solid hides, with damages on the butt due to improper preservation, having surface up to 200 cm^2, and on the shoulder and bellies, having surface of up to 400 cm^2, two deep cuts on the butt, up to 100 cm^2, and five deep cuts on the shoulder and bellies, up to 200 cm^2.
In leather processing industry, degree of utilization of these hides should be more than 80%.

Grade III - the same properties as Grade I as regards the form, but the number of damages could be greater and sides do not have to be identical.
a) surface of deep damages on the butt can amount to maximum 150 cm^2, and on the shoulder and bellies it can be up to 300 cm^2.
b) Surface damages: on the butt - up to 300 cm^2
on the shoulder and bellies - up to 600 cm^2.
Utilization should not be less than 65%.

Grade IV - This grade includes all hides which are damaged to a greater extent than those belonging to Grade III, and which have minimum half of the surface undamaged, i.e. utilization for leather processing is minimum 50% of the utilization of hides belonging to Grade I.

Grade V - this grade includes hides of lower quality than those belonging to Grade IV, whose degree of utilization for leather processing is minimum 40%.

Reject - Hides which cannot be sorted into Grade V are not suitable for export and they are processed for the needs of domestic market.

All the above stated sizes of damages should be divided by two if sides are in question.

ANNEX XI

TRAINING COURSE PROGRAMME

1. Training of engineers and technicians in the field of leather processing in Somalia

1.1. Work in slaughterhouse — 1 month

The purpose of training in the slaughterhouse is to familiarize with the way of stunning and slaughtering of animals, the method of drawing blood out, the importance of proper bleeding for the quality of meat and leather, the way and importance of proper flaying, processing of hides and skins after flaying, selection of hides/skins, preparation of hides/skins for shipment and preservation.

Trainees are supposed to give brief descriptions of their observations as per the above mentioned points:

3 - 4 typed pages

1.2. Preservation of hides/skins — 15 days

The purpose of training is familiarizing with possible ways and methods of preservation of hides/skins, and their unfavourable and favourable properties; determination of consequences caused by improper or untimely preservation; familiarizing with protective agents used for storing and preservation of hides/skins.

Trainees have to prepare brief descriptions as per the above mentioned points — 3 - 4 typed pages

1.3. Work in the storehouse for raw hides/skins in the leather processing factory — 15 days

The purpose of training is familiarizing with the way of supplying, keeping records and particularly, sorting out of raw hides/skins; familiarizing with storing methods, preparation of lots for daily soaking and handling of raw hides/skins in general.

Trainees have to prepare brief descriptions as per the above mentioned points

2 typed pages.

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1.4. Work in the liming section 2 months

Familiarizing with the processes of soaking, liming, rinsing, fleshing, trimming and splitting of hides/skins. It is necessary to determine and describe the importance of proper preparation of lots for daily soaking as regards uniformity of raw materials as per kinds, origin, weight, preservation method and purpose. It is also necessary to determine and describe the importance of use of agents for speeding up the process of soaking and prevention of growth of micro-organisms and mildew. Detailed familiarizing with mechanical treatment and machines used for this treatment.

Text 6 - 8 pages

1.5. Tanning section 1 month

Trainees should get familiar with the possible methods and ways of preparation of hides/skins for tanning, as well as with the method of mineral tanning. Importance of pH value of float and hide/skin in the processes of deliming, bating, pickling and tanning should be particularly explained. The generally accepted theory of mineral (chrome) tanning should be presented in brief.

The written part of training consists of giving descriptions of the processes of deliming, bating, pickling and tanning of hides/skins. It is necessary to make comments on the process and causes of case-hardening.

6 - 8 pages

1.6. Retanning section 2 months

Familiarizing with mechanical and chemical processing of hides/skins during the operations of sammying, shaving, rinsing, neutralization, retanning, dyeing and fat-liquoring of hides/skins. Determination and description of the possibilities of defining properties of leather in the finished product depending on the way in which retanning, dyeing and fat-liquoring operations have been carried out.

Study of the possibilities of determining the finished leather properties as regards the chemicals used for re-tanning, dyeing and fat-liquoring.
Making comments on the basic chemical processes during neutralization, re-tanning, dyeing and fat-liquoring.
Explanation of the amphoteric character of collagen fibre.

Text 8 - 10 pages

1.7. Leather finishing
Familiarizing with the possible ways of leather finishing. It is necessary to define division of finishing methods based on the following:
a. mechanical procedures
b. chemicals used in the finishing process.
Familiarizing with the chemicals which may be used for leather finishing, as regards their kinds and chemical origin. Sorting out of finished goods.

Text 6 - 8 pages

1.8. Vegetable tannage section 2 months
Sorting out of pelt for soles. Sorting criterion.
Technological process of the so-called fast tanning in drums.
Influence of pH value in preparation of hides/skins for tanning at in the process of tanning.
Influence of temperature upon the process of vegetable tannage.
Rinsing, retanning and bleaching of soles. Impregnation and fat-liquoring. Mechanical treatment of sole leather.
Process of sole drying.

Text 8 - 10 pages.

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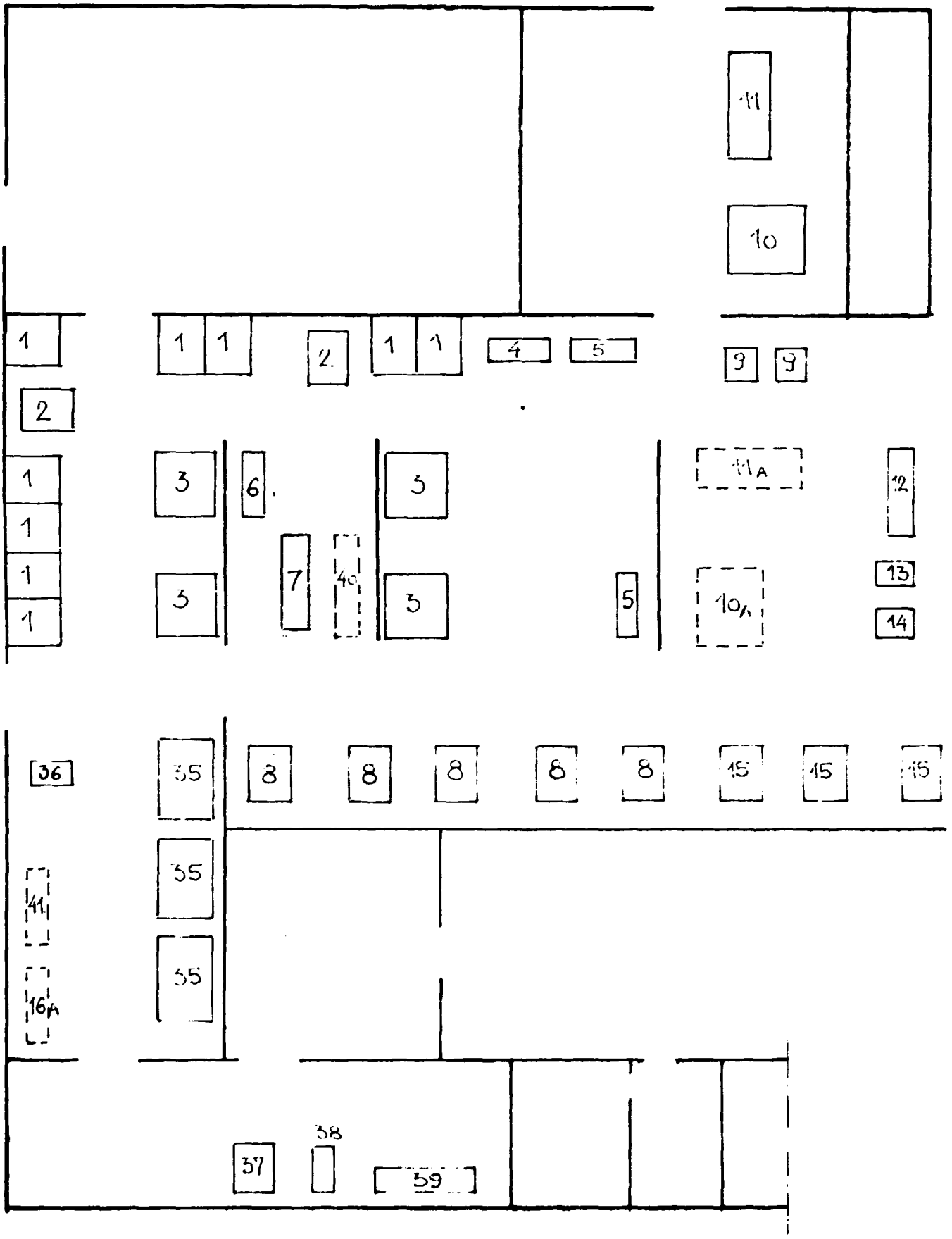
1.9. Chemical laboratory 1 month

In the chemical laboratory, trainees get theoretical and practical knowledge on the following:

1. Preparation of indicating solutions:
   a. phenophthalein
   b. bromine cresol-green,
2. Determination of pH value for all solutions by pH-meter,
3. Making of standard solutions of chemicals for the needs of the laboratory,
4. Finding out normality factors of the solutions made in the laboratory,
5. Inspection of float during deliming, bating, pickling, tanning and fat-liquoring.
6. Determination of the following:
   a. soluble albumins in water for soaking,
   b. total alkalinity in the liming solution,
   c. density and pH value of pickle,
   d. concentration of Cr_2O_3 and alkalinity of chromic float remaining after tannage,
   e. skin substance,
   f. contents of chrome in sin,
   g. contents of ash in skin.

2. Specialist training of experts abroad

It has been proposed to send engineers and technicians (having 2-3 years of work experience in leather processing industry) to be trained in leather processing factories or factories manufacturing chemicals for leather processing. The training course should last from three months to 2 years.
Following countries are suggested for training abroad: Yugoslavia, Italy, France, West Germany, Switzerland , Spain, United Kingdom, Egypt, India, Pakistan.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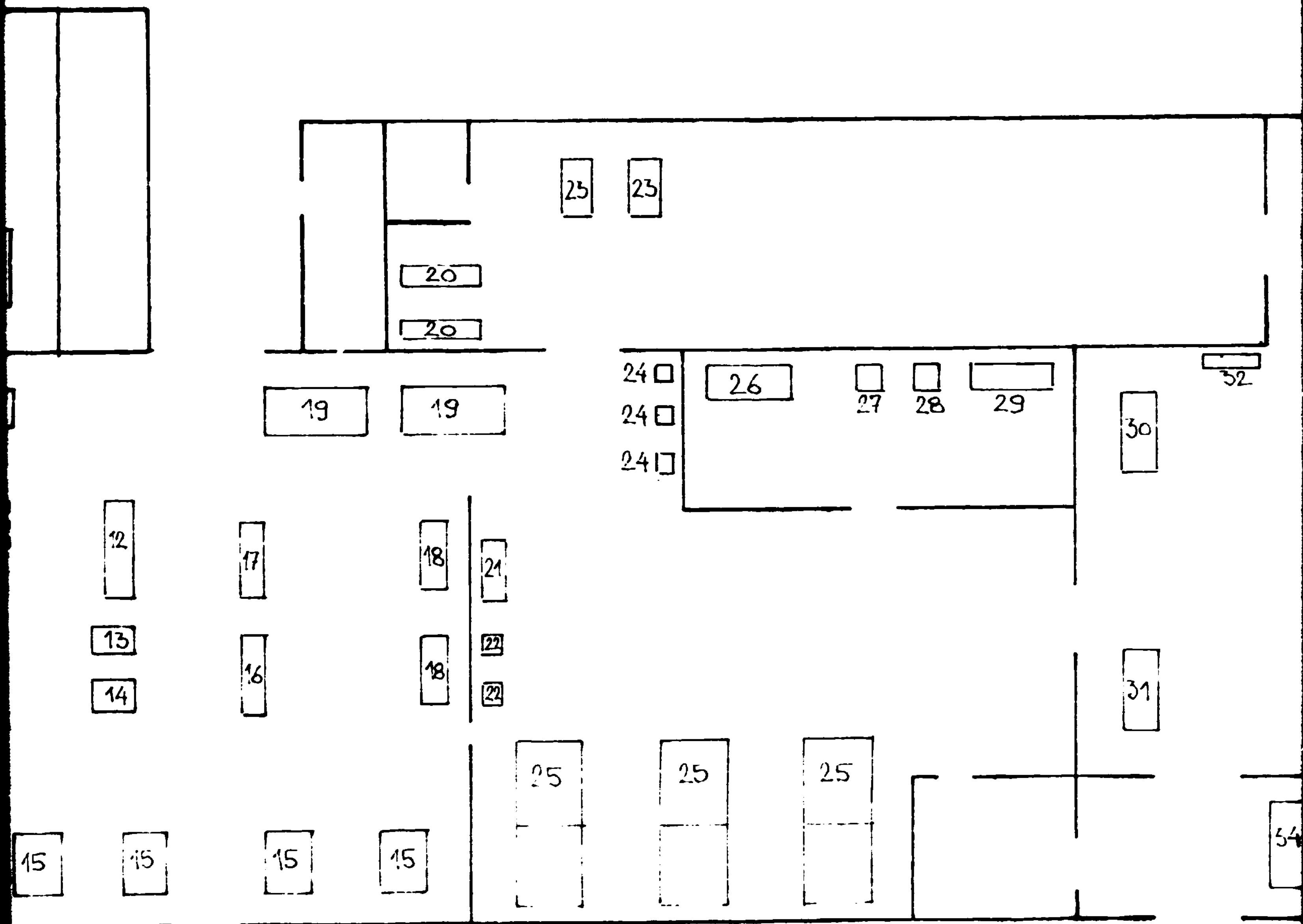
SECTION 1



SECTION .2

TANNERY KM. 7 - MOGADISHU, LAY-OUT

SCALE (1:250)

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1. SOAKING PITS
2. TUMBLING DRUM Ø 25[illegible]
3. LIMING DRUM Ø 3000[illegible] mm
4. FLESHING MACHINE 18[illegible] mm
5. SCUDDING MACHINE 18[illegible] mm
6. FLESHING MACHINE 21[illegible] mm
7. SPLITTING MACHINE 218[illegible] mm
8. [illegible] DRUMS Ø 2500x2000 mm
9. [illegible] PRESS 1200x1200 mm
10. [illegible] MACHINE 2400 mm
11. [illegible] MACHINE 2400 mm
12. [illegible]

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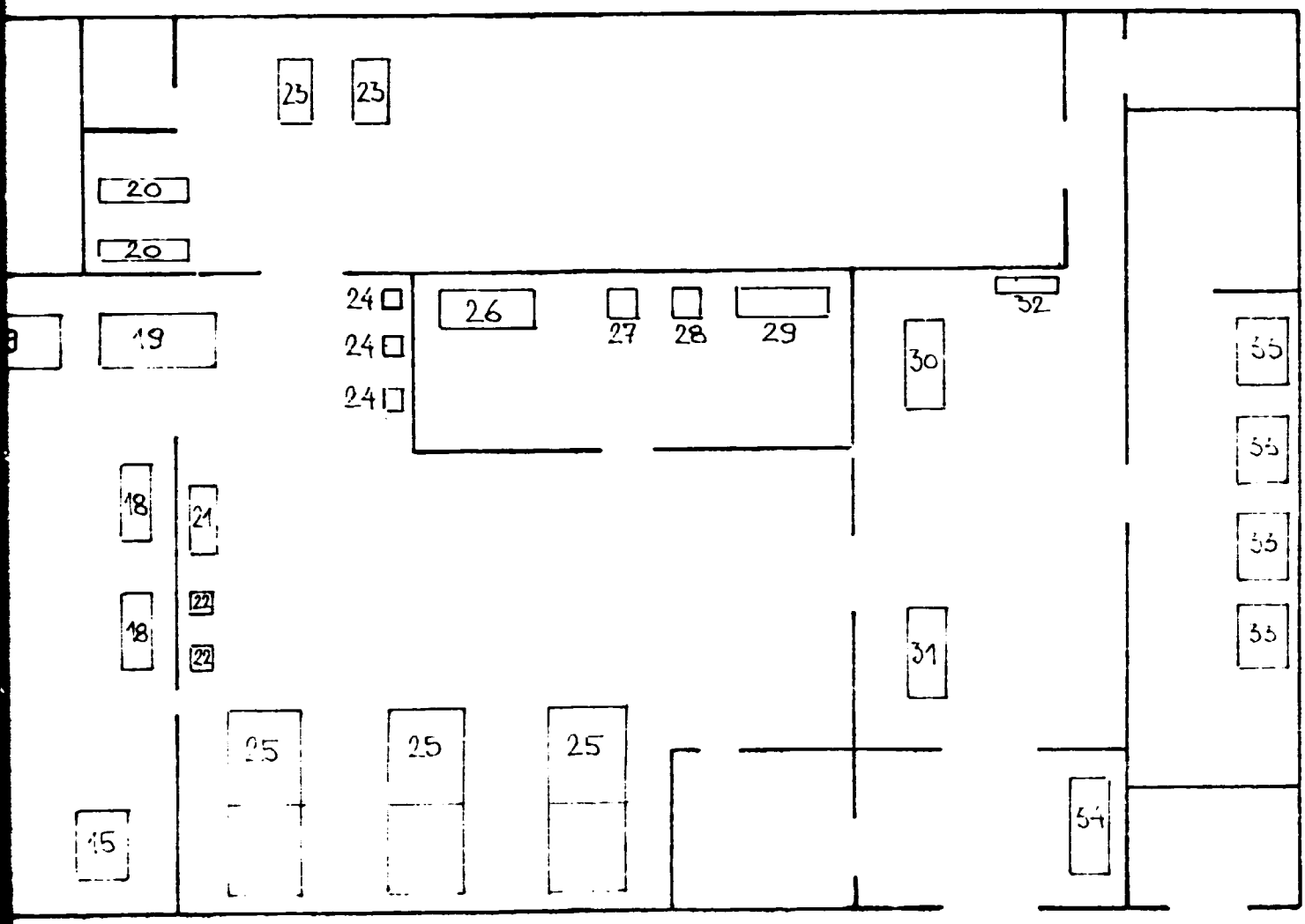
[illegible] 1[illegible]
[illegible] " " 1[illegible]
[illegible]
[illegible]
34. SURFACE [illegible] MACHINE
35. VEGETABLE TANNING DRUMS
36. HOT AIR S[illegible]UFFING DRUM
37. SETTING OUT MACHINE FOR
38. " " " "
39. ROLLING MACHINE



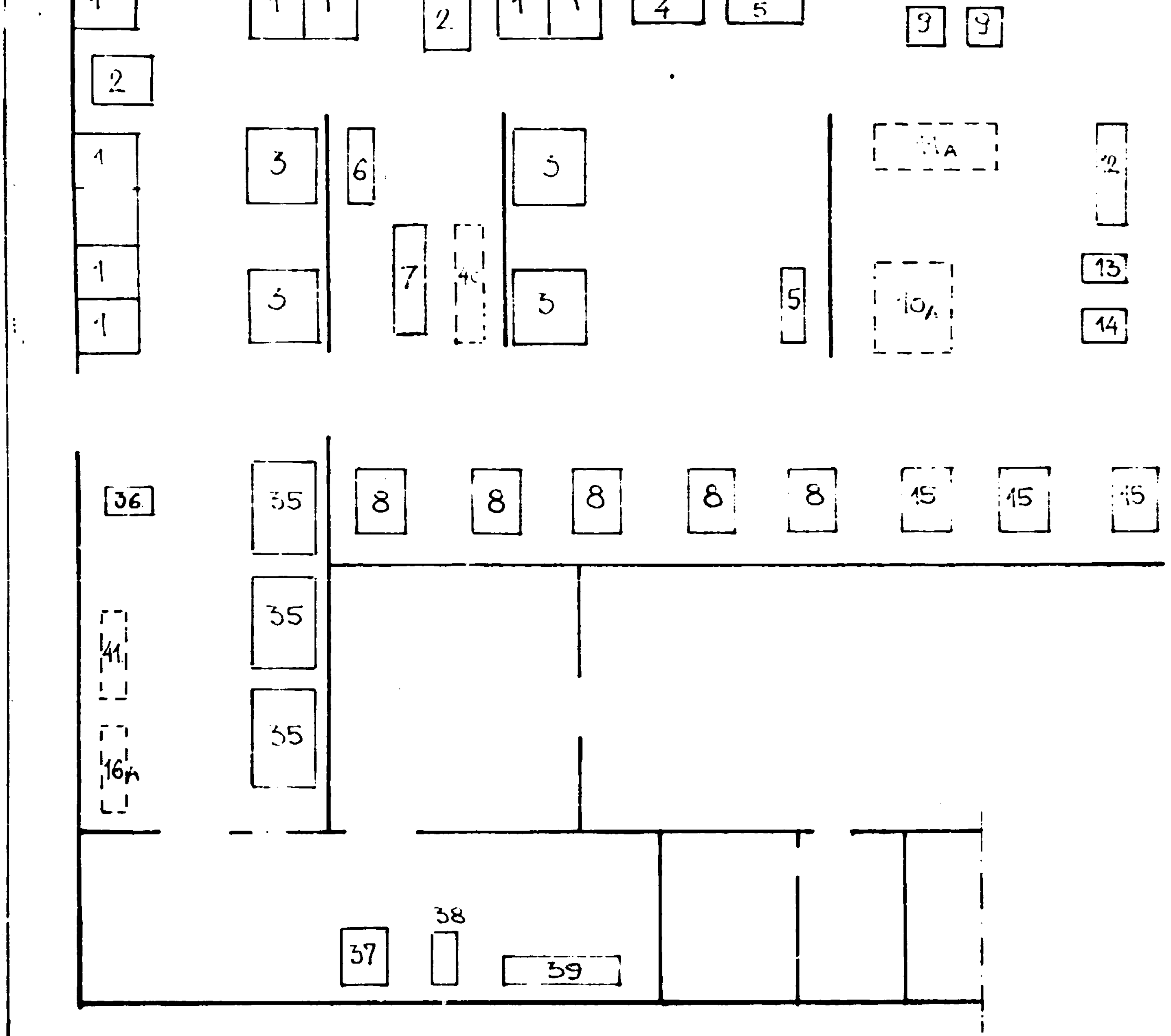
SECTION 3

. 7 - MOGADISHU, LAY-OUT

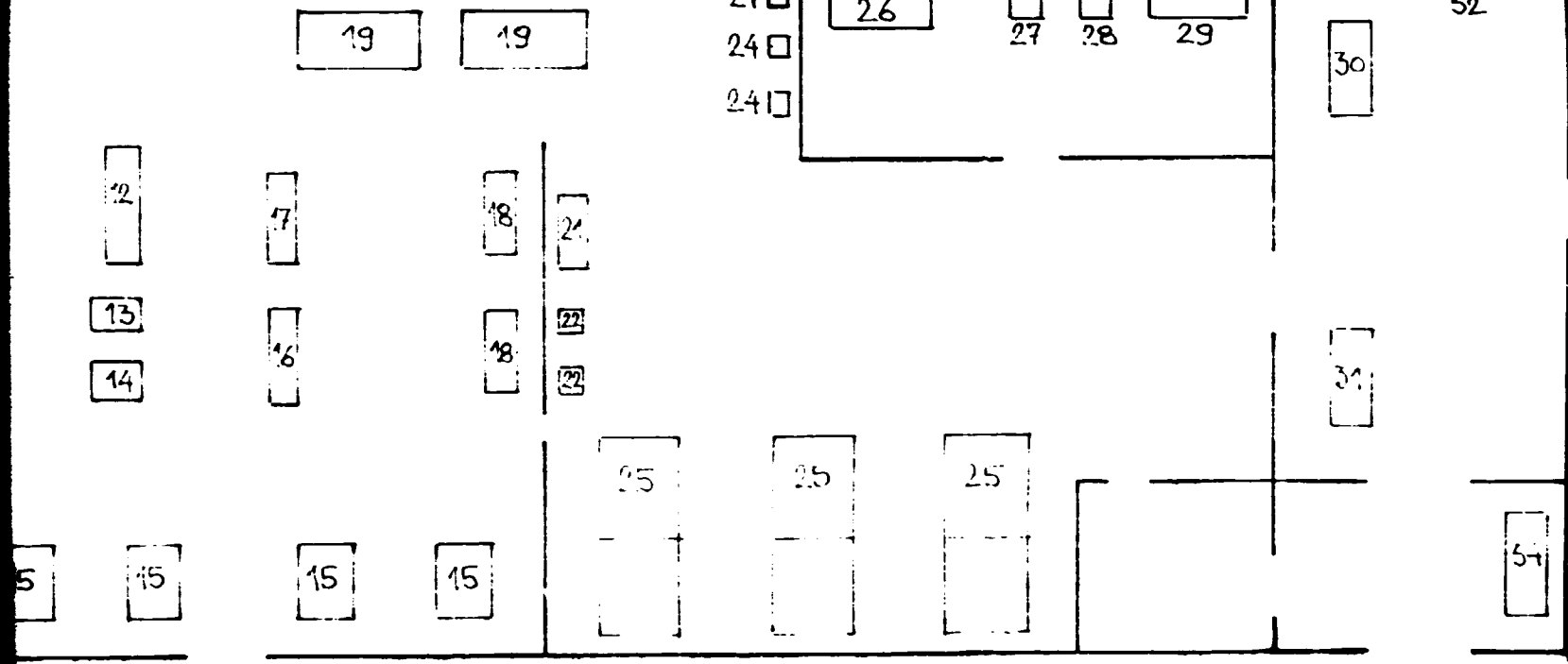
50)

G [illegible]
NG DRUM ø 25[illegible]
G DRUM ø 3000[illegible] mm
NG MACHINE 18[illegible] mm
NG MACHINE 18[illegible] mm
G MACHINE 21[illegible] mm
NG MACHINE 2180 mm
DRUMS ø 2500x2000 mm
LIC PRESS 1200x1200 mm
G MACHINE 2400 mm
NG MACHINE 2400 mm
MACHINE 2500 mm

[illegible]
[illegible]
[illegible]
[illegible]
34. SURFACE MEASURING MACHINE
35. VEGETABLE TANNING DRUMS
36. HOT AIR BUFFING DRUM
37. SETTING OUT MACHINE FOR BELLIES
38. " " " " SHOULDERS
39. ROLLING MACHINE



SECTION 4



SECTION 5

TANNERY KM. 7 - MOGADISHU, LAY-OUT

SCALE (1:250)

1. SOAKING PITS
2. TUMBLING DRUM Ø 25[illegible] mm
3. LIMING DRUM Ø 3000[illegible] mm
4. FLESHING MACHINE 18[illegible] mm
5. SCUDDING MACHINE 18[illegible] mm
6. FLESHING MACHINE 21[illegible] mm
7. SPLITTING MACHINE 2180 mm
8. [illegible] DRUMS Ø 2500x2000 mm
9. HYDRAULIC PRESS 1200x1200 mm
10. SAMMYING MACHINE 2400 mm
11. SHAVING MACHINE 2400 mm
12. SHAVING MACHINE 1500 mm
13. " " 600 mm
14. " " 450 mm
15. REHANDLING DRUM Ø 2500x2000 mm
16. SETTING OUT MACHINE 2100 mm
17. " " 2100 mm
18. SAMMYING AND SETTING OUT MACHINE 1600 mm
19. VACUUM DRYER 4000x2000 mm
20. STAKING MACHINE
21. HYDRAULIC STAKING MACHINE
22. STAKING WHEELS
23. MILLING DRUMS Ø 2500x1250 mm
24. STAKING WHEELS
25. TOGGLING UNIT 2750x15[illegible] mm
26. BUFFING MACHINE 1300 mm
27. " " 250 mm
28. " " 250 mm

[illegible]
[illegible]
1. " " 13[illegible] mm
[illegible]
[illegible] HAND [illegible] UNITS
34. SURFACE MEASURING MACHINE
35. VEGETABLE TANNING DRUMS
36. HOT AIR STUFFING DRUM
37. SETTING OUT MACHINE FOR BE
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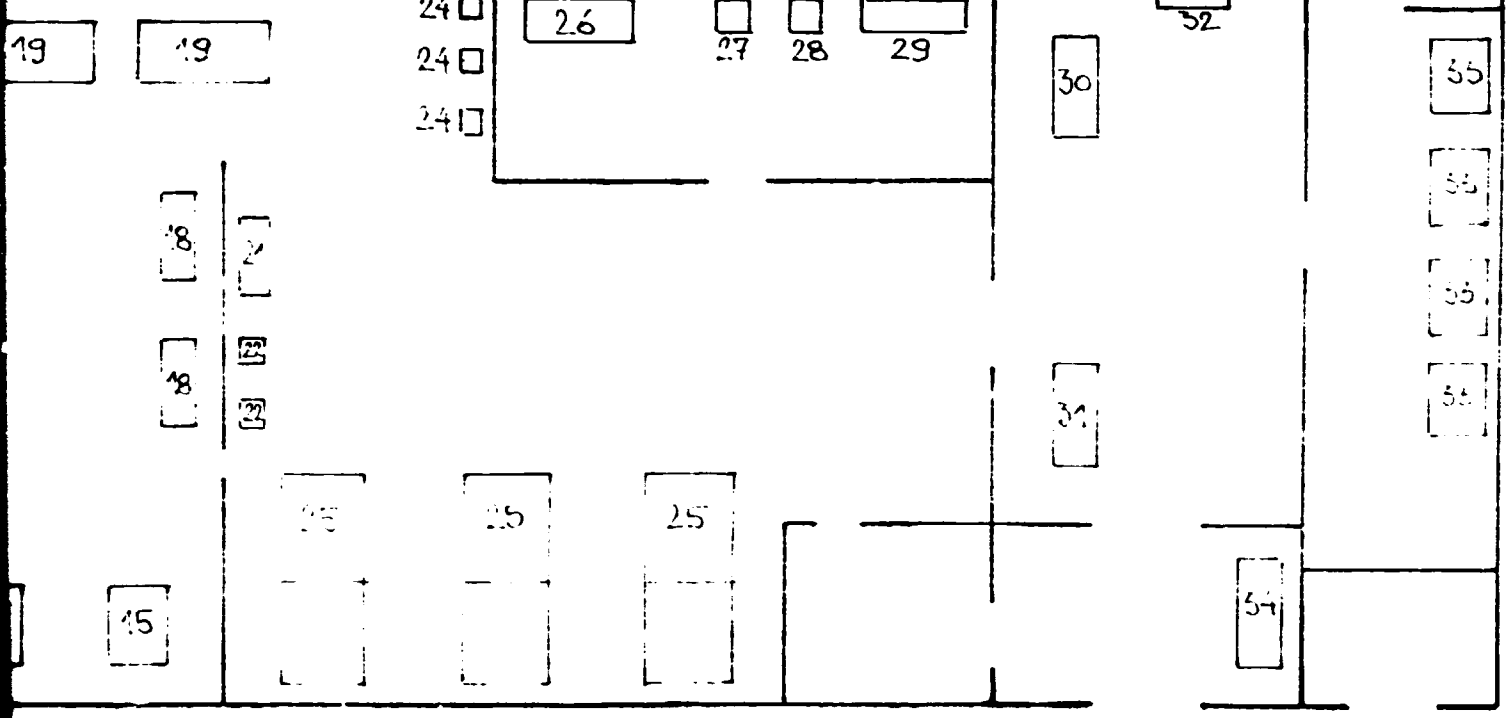
39. ROLLING MACHINE
40. FLESHING MASHINE 2700 mm
41. SAMMYING MACHINE 1600 mm



KM. 7 - MOGADISHU, LAY-OUT

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SECTION 6

ING [illegible]
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DING MACHINE 18[illegible]
ING MACHINE 21[illegible] mm
ING MACHINE 2180 mm
DRUMS ø 2500x2000 mm
LIC PRESS 1200x1200 mm
NG MACHINE 2400 mm
ING MACHINE 2400 mm
NG MACHINE 1500 mm
" 600 mm
" 450 mm
ING DRUM ø 2500x2000 mm
G OUT MACHINE 2100 mm
" 2100 mm
ING AND SETTING OUT MACHINE 1000 mm
M DRIER 4000x2000 mm
G MACHINE
LIC STAKING MACHINE
G WHEELS
DRUMS ø 2500x1250 mm
G WHEELS
ING UNIT 2750x1500 mm
G MACHINE 1800 mm
" 250 mm
" 250 mm

[illegible]
[illegible]
1. " "
[illegible]
[illegible]
34. SURFACE MEASURING MACHINE
35. VEGETABLE TANNING DRUMS
36. HOT AIR STUFFING DRUM
37. SETTING OUT MACHINE FOR BELLIES
38. " " " " SHOULDERS
39. ROLLING MACHINE
40. FLESHING MASHINE 2700 mm
41. SAMMYING MACHINE 1600 mm

List of persons met during the mission:

UNDP Office:

Mr. S. Ristić, resident representative
Mr. Bryan Cocke, deputy resident representative
Mr. Kalifa, vice resident representative
Mr. Henrik Plaschke, JPO-UNIDO representative

Somali Leather Agency:

Mr. Issa Ugas Abdulle, general manager
Mr. Mohamed A. Kabin, commercial director

Tannery and Shoe-Factory at Km.7 - Mogadishu:

Mr. Abdullahi Jama Hussein, managing director
Mr.Eng. Abdi Alas Gaal, technical manager
Mr. Abdi Mohamed Omar, chief of production
Mr.Eng. Mohamed Abdi Farow, general maintenance
Mr.Eng. Said Ahmed Abdalla, chief of beamhouse and tanning section
Mr.Eng. Abu Karim Farah Ali, chief of finishing section
Mr. Hussein Ossoble Adam, chief of wet-blue section
Mr. Mohamed Kasim Mohamed, chief of production control
Mr.Eng. Abdi Salam Hasan Ali, quality control