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WOODWORKING INDUSTRIES

DP/CMR/87/005

THE REPUBLIC OF CAMEROON

Technical report: Assistance in sawdoctoring and tool maintenance*

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

Based on the work of Geoffrey A. Woods
Sawdoctoring and tool maintenance expert

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Vienna

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* This document has not been edited.

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1. INTRODUCTION AND BACKGROUND

1.1 Geoffrey A. Woods. Sawdoctoring and Tool Maintenance Expert undertook a one month mission to Cameroon in January 1989 to survey the needs in sawdoctoring and tool maintenance for the secondary wood processing industries. The mission came under the auspices of UNDP/UNIDO project "Industries du Bois" (DP/CMR/87/005) and a full report on his findings and recommendations, which should be read in conjunction with this report, has as reference number DP/ID/SER.A/1210. It is dated 5 June 1989.

1.2 The counterpart government department in 1989 was the National Center for the Development of Forests (CENADEFOR) but has since been changed to the Office National de Développement des Forêts (ONADEF). The bulk of the work of the expert has been carried out at the woodworking complex of ONADEF at Nkolbisson a few kilometers outside of Yaounde.

1.3 The two month follow-up mission by the expert could not be undertaken until January 1991 when he travelled to Cameroon arriving on the morning of 24 January and leaving Yaounde on the evening of 18 March for Douala and leaving the next day (19 March) for debriefing in Vienna.

2. WORKPLAN AND ACHIEVEMENTS

2.1 The workplan for the second phase was substantially as recommended by the expert in the first report with a few additional items related to the new workshop being built and the envisaged increase in the servicing work carried out for outside customers. There was also a good proportion of the work which should have been completed by the counterpart department still to be done. A list of all the work completed is as follows:

2.2 Proposed work to be carried out before the second phase but not completed:

i. Change all tooth shapes on the circular plate blades which are in use at the ONADEF workshop.

ii. Fit steel tubing and make additional rollers for the Stenner tensioning bench.

iii. Locate staff of the CAPME workshop which had been closed down and arrange for the purchase of the welding clamp, which was not quite finished when the expert left in 1989.

iv. Try to obtain larger wide bandsaw blades than the 80 mm blades used in the ONADEF workshop for levelling and tensioning training as well as pieces of blade to be used for welding practice.

2.3 Install and test the new machinery and equipment.

2.4 Training:

Train ONADEF's staff in the use of the two new and one repaired machine and the correct use of previously existing machinery and equipment. In

particular teaching of the following urgently required skills were treated as the most important aspect of the expert's assignment.

(a) Weld joining of wide bandsaw blades;
(b) Repair of cracks in wide bandsaw blades by welding;
(c) Butt weld joining of narrow bandsaw blades;
(d) Levelling and tensioning of wide bandsaw blades;
(e) Swaging and side dressing of wide bandsaw blades;
(f) Sharpening of wide bandsaw and circular plate blades;
(g) Sharpening of tungsten carbide tipped (TCT) circular sawblades including side grinding of new replacement tips after repair;
(h) Removal and replacement of damaged TC tips;
(i) Levelling and tensioning of circular plate and TCT blades;
(j) Correct use of the Tool and Cutter Grinding machine using the angular setting method. Previously all angles were guessed.

2.5 Additional work:

i. At the request of Mr. Consonni, the UNIDO Project Coordinator, the expert prepared a list of further additional machinery and equipment for use in the Sawdoctoring and Tool Maintenance Servicing Center should a third phase of the project be implemented. See Appendix I.

ii. Draw up a plan for the layout of machinery and equipment for the new Servicing Center workshop now under construction. See Appendix II.

iii. Discuss and advise the management and relevant staff at Nkolbisson on the management of the servicing center in particular on how to compile a scale of charges for the whole range of sharpening and repair services undertaken for outside companies.

2.6 For various reasons, the one day training workshops proposed in the first phase were not implemented, the reasons being as follows:

i. It was felt that training personnel from outside industry would be counter-productive since it is the intention of ONADEF to try and make a commercial success of the Servicing Center servicing tools from outside industry.

ii. In the secondary woodworking industry in and around Yaounde the machinery and equipment necessary for saw and tool maintenance was almost non-existent outside Nkolbisson therefore making the training of outside personnel an unnecessary luxury when there was so little time available to train the Nkolbisson staff.

3. MACHINERY AND EQUIPMENT SUPPLIED

3.1 The new machinery and equipment recommended in 1989 by the expert was all supplied by UNIDO and their procurement section is to be congratulated on a job well done. One small item was not supplied, i.e. the plastic backing pads for the two angle grinders and one other item was the wrong size namely the flexible coupling for the Stenner Stretcher rolling machine reference E.9.

The expert supplied a full size drawing of this item so it is difficult to see what went wrong.

3.2 However, the plastic backing pads have temporarily been made out of leather and the stretcher rolls coupler which the expert repaired in 1989 is still working so there has been no hold-ups because of these two very minor errors. The expert took the coupler supplied, which is too large, back to Vienna which hopefully can be exchanged and returned by post.

3.3 Not connected with the equipment supplied by this project was a problem which has been outstanding since the original machinery was supplied many years ago. It appears that the wrong size bore cutterblock was supplied for use with the RYE linear shaping machine and in consequence the machine has stood idle all these years. The expert was asked if he could help solve the problem and after a few telephone calls to RYE Machinery Ltd. of High Wycombe U.K. has a replacement cutterblock sent to his home which he brought with him on his return. Hopefully ONADEF will write and confirm receipt of the item quoting delivery note 53319 reference X 9917/37458 Order number ZZW0901 dated 8.1.1991. Full address:

RYE MACHINERY LTD.
Lincoln Road
High Wycombe
Buckinghamshire HP12 3TR
United Kingdom.

4. TRAINING

4.1 As far as the expert was concerned the training of the toolroom staff was the most important part of his return assignment for although the chief technician Mr. Daniel Nkwenja had received some training in France, all techniques used in the ONADEF toolroom workshop were based on guesswork.

4.2. Some frustration was experienced by the expert in not always having the three toolroom staff available for training because these three staff have other responsibilities such as machine maintenance for all machinery within the complex as well as the reconnecting of electrical and other supplies when new machines are installed or existing machines moved.

4.3. No doubt after the rearrangement of machinery throughout the complex which is currently taking place as part of the project is completed, the staffing of the toolroom will be more stable. Nevertheless this situation must be looked at seriously if a successful servicing center is to be established as paying customers should not have to wait for tools to be sharpened whilst staff are seeing to machinery breakdowns in the Nkolbisson complex.

4.4 Despite the conflicting activities of re-arranging most of the woodworking machinery during the two month missions eventually the full training programme was completed and the keenness shown by the two younger staff in particular paid dividends and some good results, especially in wide bandsaw blade welding, were obtained.

4.5. A full list of activities covered is shown in the work plan (see page 3, point 2.1).

4.6 As part of the training, visits were made to the small sawmill Société Comerounaise des Industries du Bois (SCIB) known to have many problems from visits made in 1989. These problems were pointed out and discussed and those which could be corrected were corrected as part of the training. We also arranged for two of their blades to be brought to the ONADEF workshop for a thorough overhaul including the welding of cracks, levelling and tensioning and sharpening. Afterwards we returned to the sawmill to see the blades cutting logs. The reason for the exercise, apart from assisting the sawmill, was to enable the staff to work on much larger blades than those used in their own workshop, and to see typical problems in a sawmill situation. It could of course also generate some extra work for the Servicing Center repairing cracks, etc. in fact, the sawmill staff returned the following week with three more blades for repair.

5.SERVICING CENTER RECOMMENDATIONS

Staffing:

5.1 At the present time the staff of the servicing center also cover the maintenance of the machinery for all the complex. If a servicing center is to function effectively these two activities should be completely separated, i.e. both staff and workshops. Records of all transactions must be kept, i.e. work must be booked in with a brief description of the items received, a date and time given when the work will be ready for collection and of course records of the charges made and monies received. If the volume of work increases, as it should if the project is advertised and run efficiently, then separate clerical staff, one person, will be needed for this work. The number of sawdoctoring staff will of course depend upon the amount of work generated but the three existing staff should be able to cope with a lot of servicing work providing they are not also involved in maintaining the machinery of the complex.

Servicing charges:

5.2 Obviously charges for servicing have to be realistic, i.e. they must cover labour, materials used and include some profit, however the total cost must always be well below the cost of a new blade or tool. No set formula can be given as some difficult work will generate very little profit whilst other items of work easily accomplished can have a good profit margin. It was agreed that the expert would sit down with the local staff and outline the basic principles for costing this type of work. This was done and examples given for all items serviced at the centre.

Identification of customers' work:

5.3 All items received for sharpening must be clearly marked with the customer's name as the consequence of giving out the wrong item to a customer can be very embarrassing and could be costly if a lost item has to be replaced with a new one by the servicing center. The most efficient way is to ENGRAVE the names on as many items as is possible in this way the names cannot be accidently removed and will last the life of the tool and will not need marking again.

Sets of high speed steel (H.S.S.) planer knives are not easily engraved so customers should be encouraged to make boxes for sets of knives. The boxes can be easily marked as well as giving protection for the sharpened edges.

Customer's addresses:

5.4 A complete list of customer's names, addresses and telephone numbers should be compiled and kept up to date. As well as the company's name, the names of two contacts should be included, one technical person such as the works foreman or manager who could answer queries should they arise about how they require a tool or blade to be sharpened and someone on the financial side should questions arise regarding accounts or payments.

Efficient methods of working:

5.5 In the short time available, the expert has tried to instill into the toolroom staff how essential it is to cut out guesswork and have an efficient system of working for all processes undertaken and whenever possible recorded data should be kept on such things as tooth profiles, cutting angles and machine settings so as to reduce setting and sharpening time to a minimum. Not only time is saved in working efficiently but additional savings on electricity and materials used such as grinding wheels can be realized.

5.6 Three charts are included as appendices III, IV and V as examples of the type of recording introduced.

5.7 Consumable items of equipment and spare parts:

The situation with spare parts and consumables is extremely poor and had it not been for UNIDO providing such things as grinding wheels, tungsten carbide tips and brazing paste recommended by the expert, the training would not have been able to proceed as it did. It is absolutely vital that management allocate some of the money generated by servicing to replace, in good time, all those items such as grinding wheels without which the servicing center cannot function.

5.8 Saw blades and cutterblocks which are brought in for servicing are cleaned in caustic soda by the Nkolbisson Service Center staff. Although the system is very effective and the center may want to continue the process for their own tools, it is questionable whether the time should be spend on outside customers' tooling since the cleaning can take as long as the sharpening process and therefore should in theory double the cost of servicing items cleaned. Obviously precleaning is often necessary otherwise gums on the tools may often clog up the grinding wheels used for sharpening, it is just whether or not it would be better to make the customer responsible for the time consuming and messy process of cleaning.

6. MAINTENANCE OF MACHINERY WITHIN THE COMPLEX

6.1 The general maintenance of machinery within the ONADEF Nkolbisson Complex is not part of the expert's brief for this assignment however it is such a serious problem which affects the entire capabilities of the workshop and is also closely linked with the staffing of the Servicing Center that some mention of it should be included.

6.2 Preventive maintenance of machinery does not exist at all in the Nkolbisson Complex. The practice is simply to wait until a machine breaks down then, and not until then, do the so-called maintenance staff appear who may or may not be able to repair the damage. Often they cannot because of a complete lack of spare parts.

6.3 No machine will run forever without lubrication and some parts such as drive belts having to be replaced. ideally stocks are kept of items which are known to wear out such as drive belts and as they are used re-ordered an replaced in stock so that they are immediately available.

6.4 This information is not new, it is not even new to the management at Nkolbisson it is just BASIC common sense but it is NOT being applied. Several machines in the complex cannot be used at all because of this complete lack of maintenance and most of the others have faults which could be eliminated by applying a spot of oil or grease, a good clean and the odd bolt renewed which has been stripped or its head rounded off.

6.5 A typical example was a complaint from one of the machinists which the expert received that the RYE round-edged tenoning machine was spoiling one of the edges of all the tenons produced therefore the machine was lying idle instead of playing an extremely useful role in the type of products being made. In the expert's report of 1989 mention was made of a repair needed then, which in two years was not done! It took the expert about one hour to make this repair and half a day to solve the other problem which was a combination of giving the working parts a good clean and ensuring that the correct air pressure was available to the machine's pneumatic system.

6.6 The solution to this very sad situation, apart from someone making money available for spare parts and implementing the necessary orders, is that management have to change their attitude to maintenance making it a priority and instigate a preventive scheme allocating one man FULL TIME the tasks of cleaning, lubricating and generally ensuring that every machine is always in working order. He should not be one of the Servicing Center staff and he may need additional help when dealing with breakdowns of machinery.

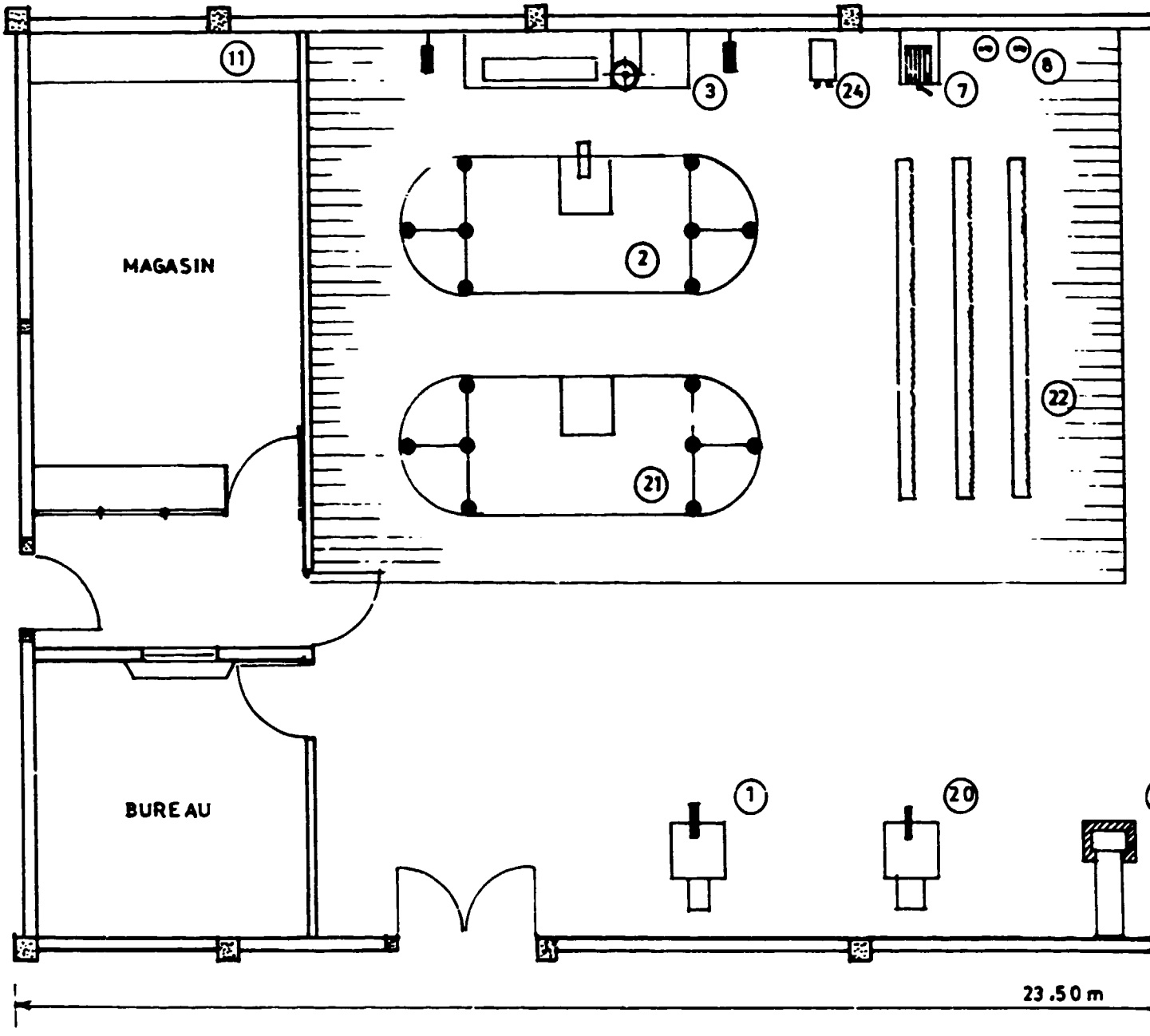
6.7 In the expert's opinion, Mr. Daniel Nkwenja should stay in charge of both the Servicing Center and Machine Maintenance for his wide experience is invaluable but should have two additional staff, the one mentioned above for daily maintenance and one more in the Servicing Center to replace Daniel himself so that he can take on a more supervisory capacity whilst still being available to help when breakdowns occur.

APPENDIX I

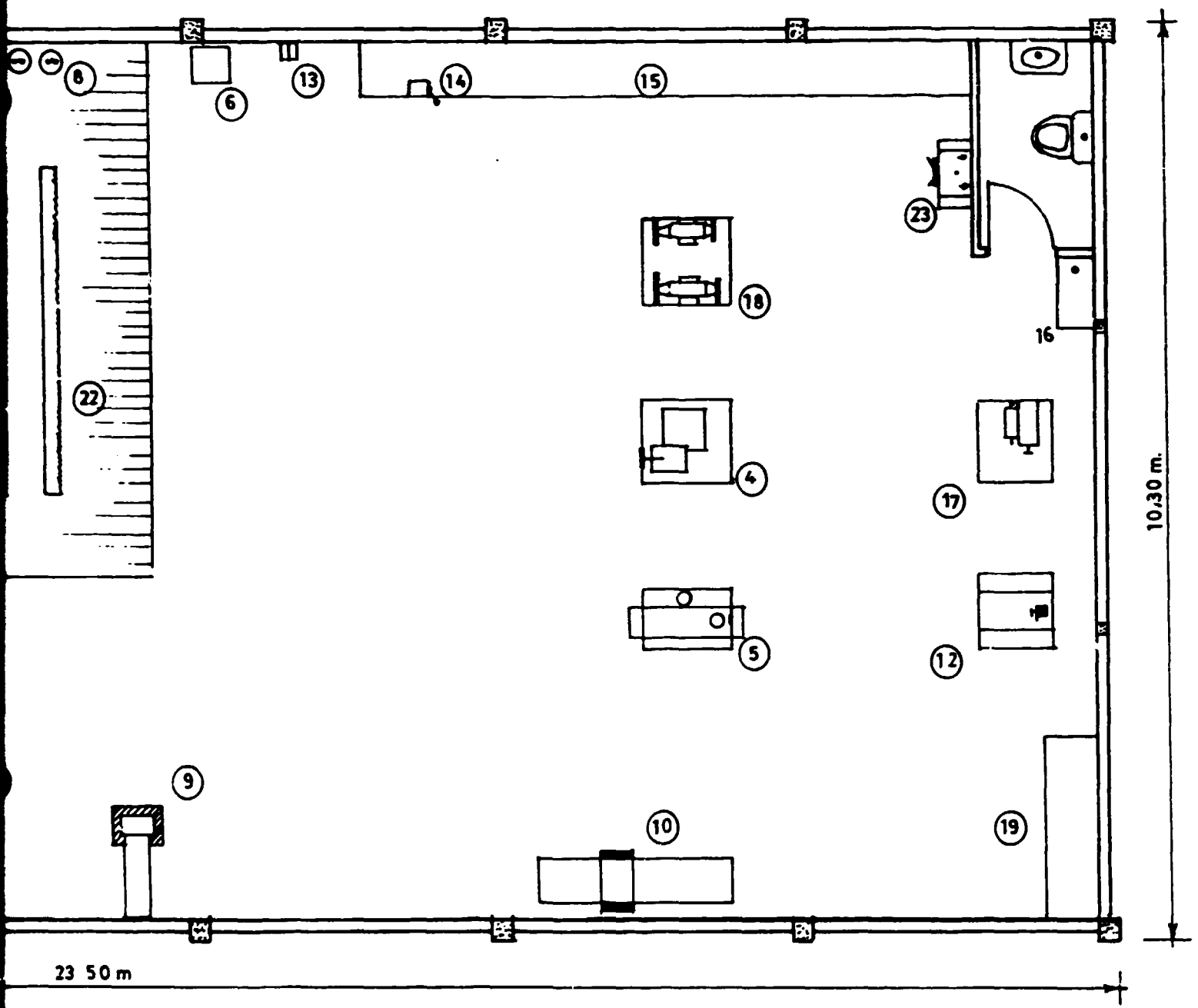
ADDITIONAL SAWDOCTORING AND TOOL MAINTENANCE EQUIPMENT

Item No. and description	Approximate Cost US$
1. Side grinding machine for "Stellite" tipped teeth for wide bandsaw blades (W.B.B.) and circular saw blades (C.S.B.) recommended type LOROCH	15.000
2. Set of W.B.B. support stands for above machine	2,000
3. TIG welding machine for joining and repair of cracked W.B.B. - Recommended type KEPI 150 or similar	1,500
4. Grinding machine for tungsten carbide tipped (T.C.T.) C.S.B. complete with stand and coolant pump for wet grinding. VOLLMER 600 or similar	6,000
5. 10 kgs 3 mm diameter grade 12 stellite rod	300
6. 10 kgs coil of plain carbon steel wire as used for MIG welding	100
7. Additional spare parts for existing swaging and side dressing tools (as supplied in phase I)	500
8. Additional spare grinding wheels 200 mm diameter; 13 mm and 3 mm thick (as supplied in phase I)	1,000
9. Spare grinding wheels for items Nos. 1 and 4	1,000
10. Grinding machine for circular plate blades	18,000
TOTAL & CARRIAGE	45,400

N.B.: Prices are estimated and freight costs are not included.

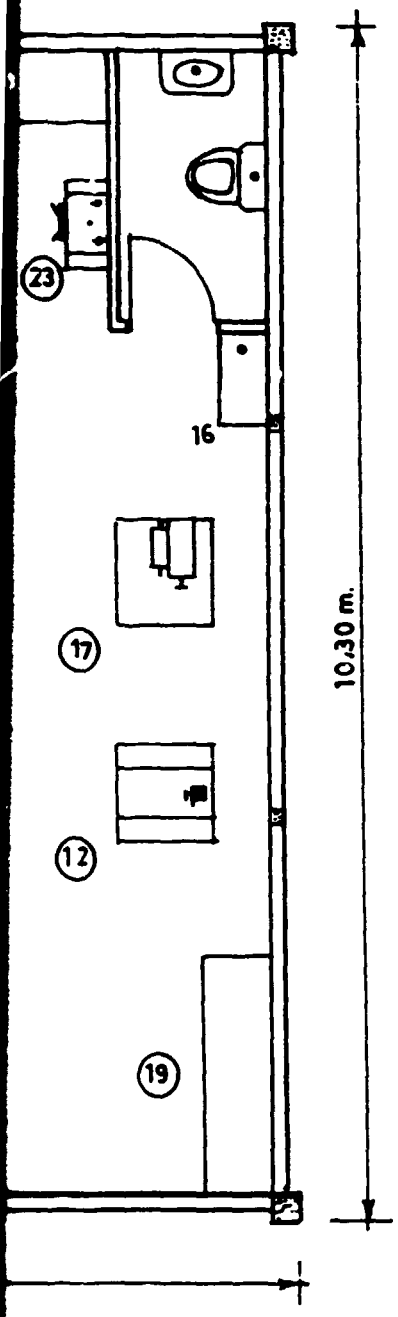


SECTION 1



SECTION 2

APPENDIX II



1. AFFUTEUSE DE SCIE CIRCULAIRE
2. AFFUTEUSE DE GRANDE SCIE A RUBAN
3. BANC TENTIONNAGE ET DE PLANAGE
4. AFFUTEUSE UNIVERSELLE D'OUTIL
5. AFFUTEUSE UNIVERSELLE D'OUTIL
6 AFFUTEUSE DE PETITE SCIE A RUBAN
7. PRESSE A SOUDER LA SCIE A RUBAN
8. BOUTEILLE DE GAZ
9. ENCLUME DE TENSION DE SCIE CIRCULAIRE
10. AFFUTEUSE LAMES DE RABOTEUSE
11. ARMOIRE D'OUTILLAGE
12. RECTIFIEUSE DES DENTS DE SCIE
13. AVOYEUSE DE DENTS DE PETITE SCIE A RUBAN
14. CISAILLE DE PETITE SCIE A RUBAN
15. BANC POUR LA PETITE SCIE A RUBAN
16. BAC A SOUDE CAUSTIQUE
17. * AFFUTEUSE DE SCIE CIRCULAIRE CARBURE
18. * ETABLI D'AFFUTEUSE
19. BANC DE NETTOYAGE D'OUTIL
20. AFFUTEUSE DE SCIE CIRCULAIRE A TETE OSCILLANTE
21. AFFUTEUSE POUR LA RECTIFIEUSE DE STELLITE
22. PLANCHER POUR GRANDE SCIE A RUBAN
23. SOUDEUSE DE SCIE A RUBAN BOUT-A-BOUT
24. SOUDEUSE ELECTRIQUE TUNGSTENE ET GAZ

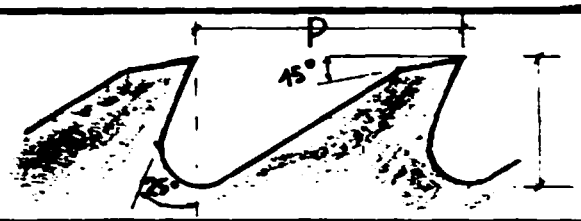
ECH. 1/50e		
C P B ONADEF N KOLBISSON	PLAN DE LA SALLE D'AFFUTAGE	
		Date 05.03.91 Par:

SECTION 3

APPENDIX III

CARTE POUR L'AJUSTEMENT D'AFFÛTEUSE DE SCIE CIRCULAIRE

DENTS A FENDRE



0.5 P

INVARIABLE :-	ARBRE POSITION 10%	Diametre de Lame	PENTE DE TÊTE 15°

PAS DE DENTS	AJUSTEMENT DU PAS	AJUSTEMENT DE HAUTEUR	N° de MEULE
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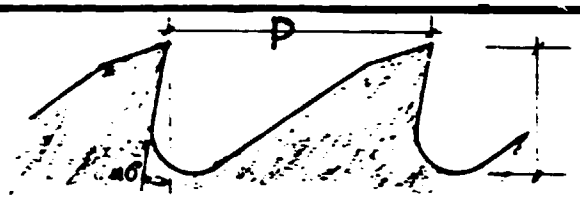
APPENDIX IV

CARTE POUR L'AJUSTEMENT D'AFFÛTEUSE DE SCIE CIRCULAIRE

DENTS A TRONÇONNER



INVARIABLE :-	ARBRE POSITION CENTRE	PENTE DE TÊTE 10 %

PAS DE DENTS	AJUSTEMENT DU PAS	AJUSTEMENT DE HAUTEUR	N° DE MEULE
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APPENDIX V

CARTE DE SOUDURE

LARGEUR DE LAMES	COURANT DE SOUDURE	MARCHE DE REFOULEMENT	PRESSION DE REFOULEMENT	ECHELLE	AUGMENTATION DU PAS