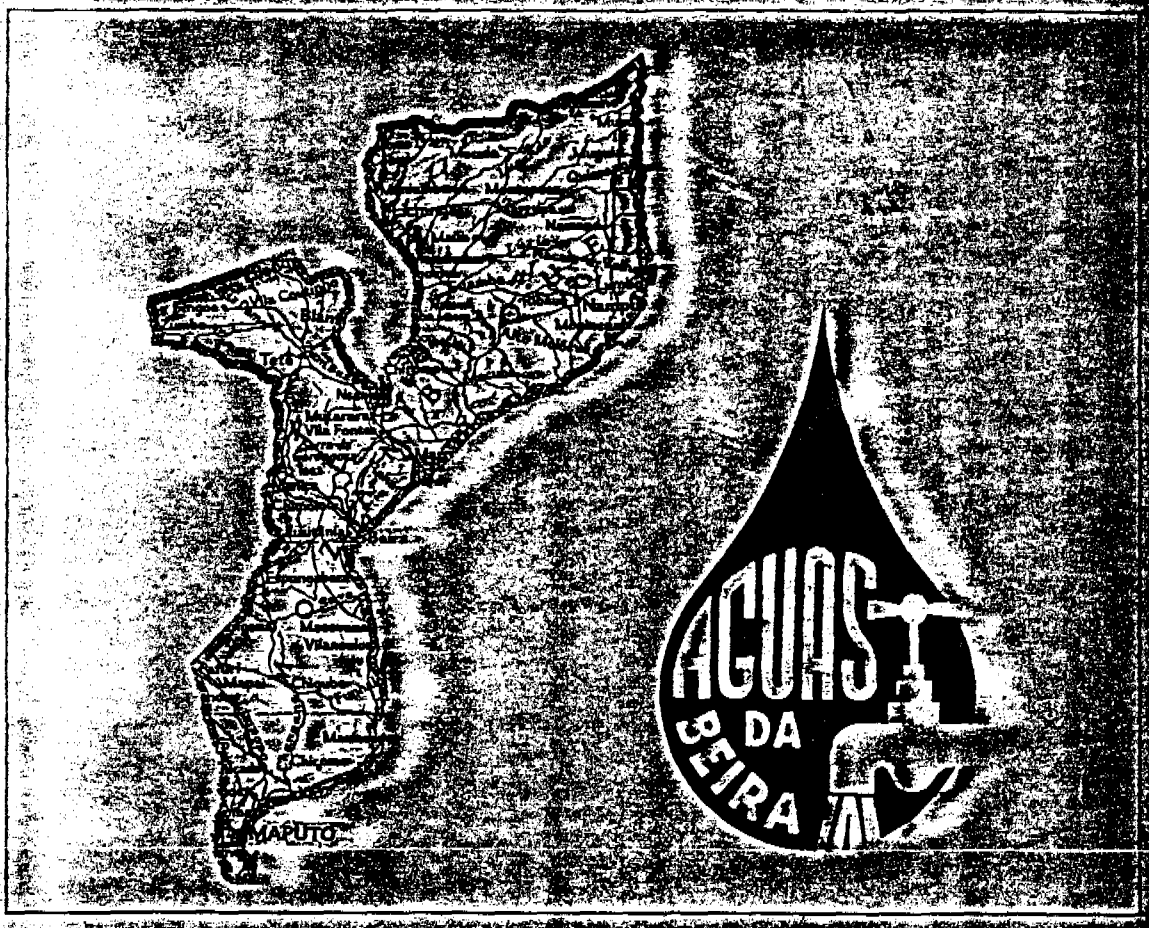
MINISTRY OF CONSTRUCTION AND WATERS, MOZAMBIQUE

FINNISH INTERNATIONAL DEVELOPMENT AGENCY, FINLAND



COMPREHENSIVE TRAINING PLAN

AGUAS DA BEIRA

FINNISH NATIONAL ROAD ADMINISTRATION (FinnRA)

PEANCENTER LTD

APRIL 1995

1. BACKGROUND INFORMATION

The existing population of Beira is estimated to be close to 400,000 inhabitants, and with the surrounding suburbs 500,000 people.

The present water supply system was built in the 1950's and 1960's and it now serves the population of Mutua, Mafambisse, Mezimbite, Dondo, Inhawizua, Manga and Central Beira. About 30 per cent of the population benefit from the Beira Water System.

Central Beira has a water-borne sewerage system built in the early 1960's as well as a drainage system. It serves only about 15 per cent of the population. The rest of the inhabitants use septic tanks or pit latrines.

The water distribution network in Central Beira especially is in poor condition and loss of water through leakages is considerable. The frequent falls of the water pressure increase the chances of contamination, as at the same time the sewerage system is not functioning. More detailed description of the system has been given in the Water Master Plan, prepared by the Project.

Figure 1 shows the Beira Water Supply and Sewerage System in a map.

The management, operation and maintenance of Beira's water supply and sanitation system is the responsibility of the state enterprise "Aguas da Beira" (AdB). The company is under the authority of the Ministry of Construction and Waters.

Aguas da Beira has a total staff of 381 people (1989). In practice the number varies between 360-400. On request of the Project, AdB has recruited about 50 casual workers so that the total number of employees can rise until 450. The programme of the Supervision Unit established by the DNA, includes 10 posts of five different profissions. There are skilled manpower e.g. masons, fitters, electricians, etc. Their skills will not, however, meet existing and future needs. At the management level the main problem is a lack of educated personnel, and those that there are, have very limited experience.

Table 1.1 shows the educational level of the personnel (1989) supplied by AdB. It indicates, among other things, that one-third of the personnel can neither read nor write.

The Finnish assistance programme includes the preparation of the institutional development plan for Aguas da Beira. In addition to organizational aspects it consists of the preparation of the comprehensive training plan for the personnel of Aguas da Beira.

BEIRA WATER SUPPLY PROJECT

COMPREHENSIVE TRAINING PLAN

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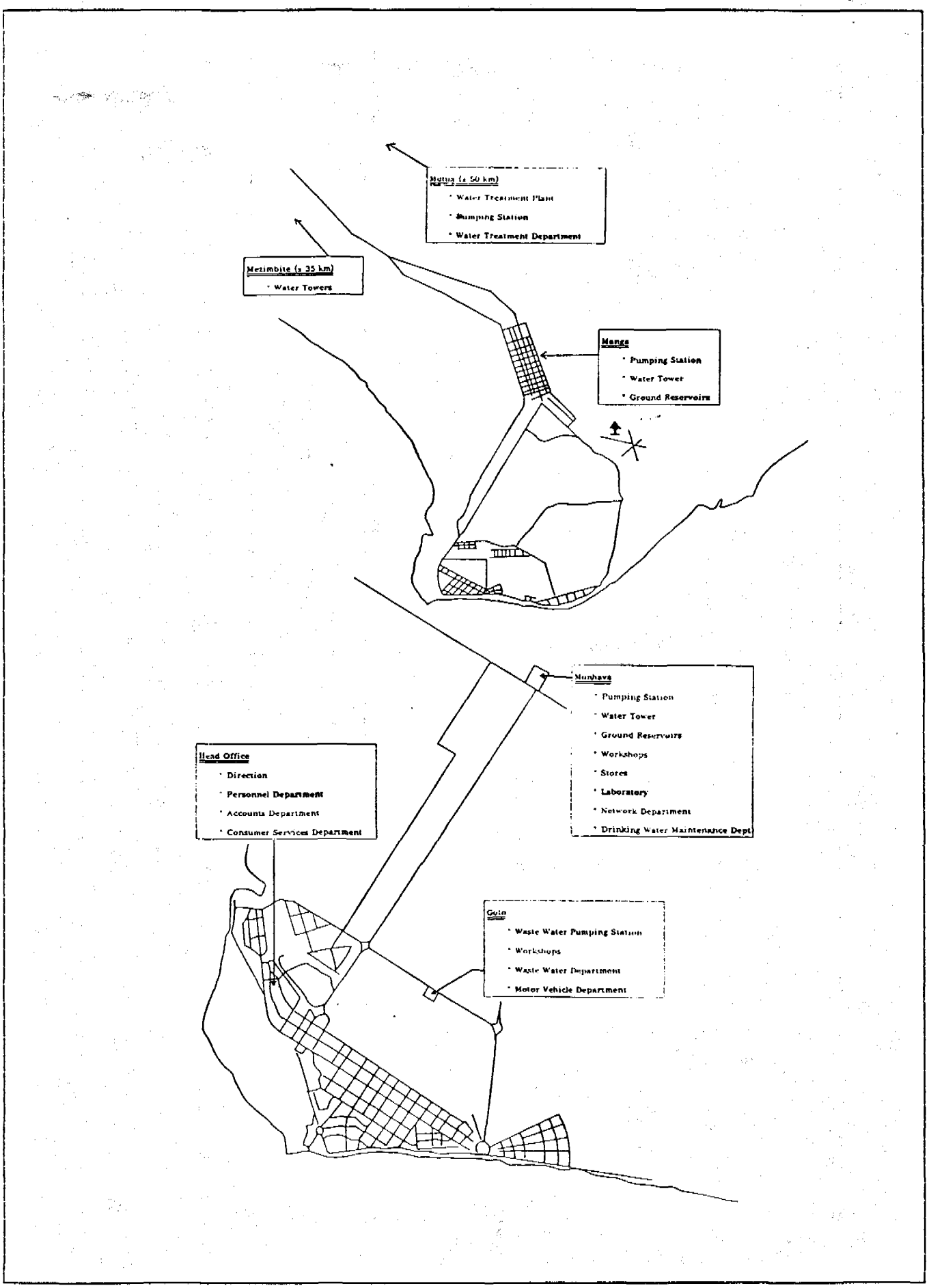

Mutua (± 50 km)
* Water Treatment Plant
* Pumping Station
* Water Treatment Department
Mezimbite (± 35 km)
* Water Towers
Manga
* Pumping Station
* Water Tower
* Ground Reservoirs
Munhava
* Pumping Station
* Water Tower
* Ground Reservoirs
* Workshops
* Stores
* Laboratory
* Network Department
* Drinking Water Maintenance Dept
Head Office
* Direction
* Personnel Department
* Accounts Department
* Consumer Services Department
Goia
* Waste Water Pumping Station
* Workshops
* Waste Water Department
* Motor Vehicle Department

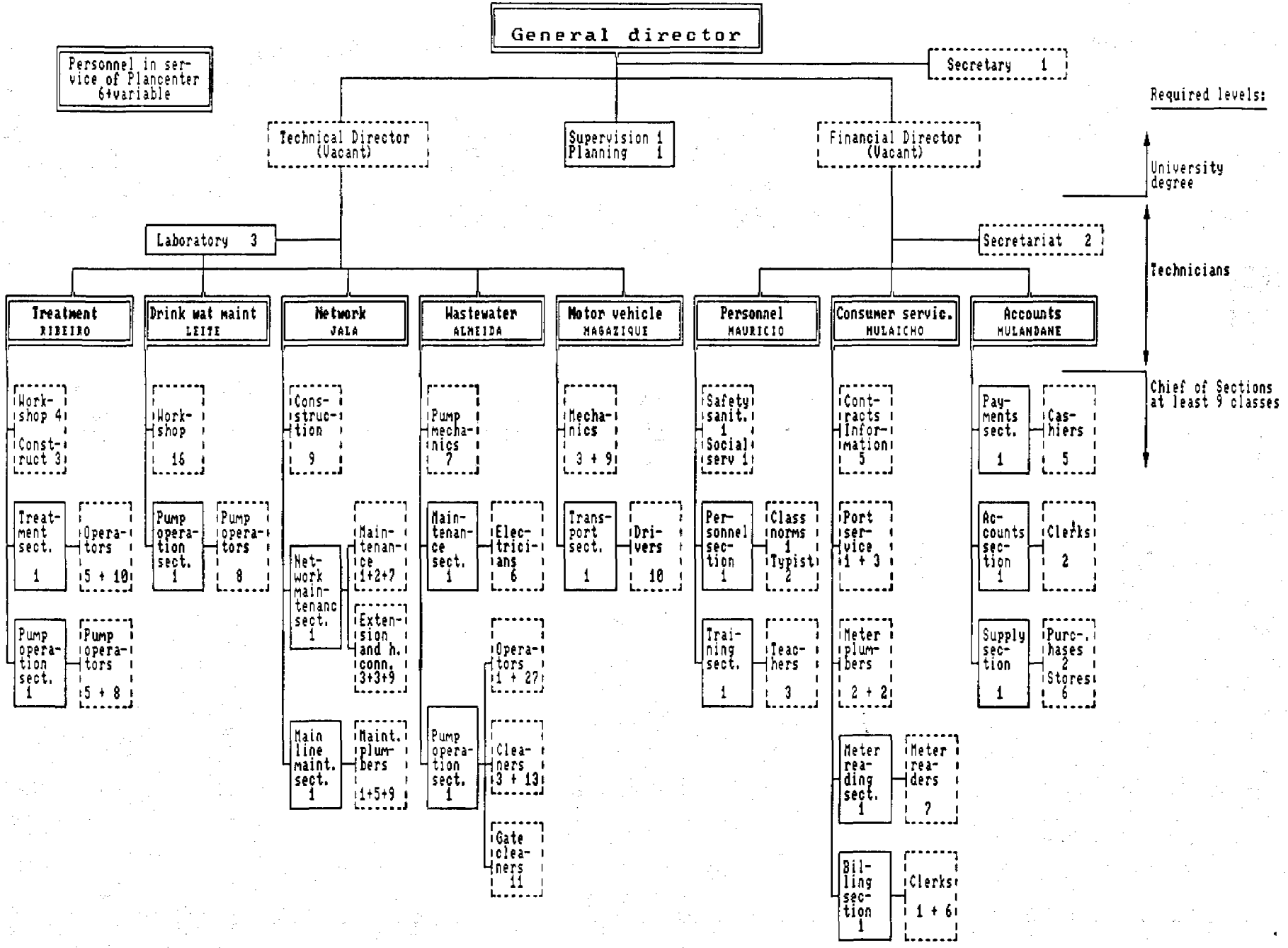

General director
Personnel in service of Plancenter 6+variable
Secretary 1
Technical Director (Vacant)
Supervision 1
Planning 1
Financial Director (Vacant)
Required levels:
University degree
Technicians
Chief of Sections at least 9 classes
Laboratory 3
Secretariat 2
Treatment
RIBEIRO
Drink wat maint
LEITE
Network
JALA
Wastewater
ALMEIDA
Motor vehicle
MAGAZIQUE
Personnel
MAURICIO
Consumer servic.
MULAICHO
Accounts
MULANDANE
Work-shop 4
Construct 3
Treatment sect. 1
Operators 5 + 10
Pump operation sect. 1
Pump operators 5 + 8
Work-shop 16
Pump operation sect. 1
Pump operators 8
Construction 9
Network maintenanc sect. 1
Maintenance 1+2+7
Extension and h. conn. 3+3+9
Main line maint. sect. 1
Maint. plumbers 1+5+9
Pump mechanics 7
Maintenance sect. 1
Electricians 6
Pump operation sect. 1
Operators 1 + 27
Cleaners 3 + 13
Gate cleaners 11
Mechanics 3 + 9
Transport sect. 1
Drivers 10
Safety sanit. 1
Social serv 1
Personnel section 1
Class norms 1
Typist 2
Training sect. 1
Teachers 3
Contracts Information 5
Port service 1 + 3
Meter plumbers 2 + 2
Meter reading sect. 1
Meter readers 7
Billing section 1
Clerks 1 + 6
Payments sect. 1
Cashiers 5
Accounts section 1
Clerks 2
Supply section 1
Purc-. hases 2
Stores 6

Figure 2 shows the existing organizational structure of Aguas da Beira personnel. The Training Plan has been prepared on basis of the present organization but it is easy to take into account the structure and requirements of the future organization which will be proposed later. In appendix 1 there are however listed AdB's actual personnel by names, as detailed as possible to identify the persons in question, if needed.

The appreviations of departments, sections and training courses applied in the text, tables and appendices are presented in appendix 2. -

Table 1.1. Human resources of Aguas da Beira, June 1989. (Collected by Aguas da Beira)

CATEGORY	EDUCATIONAL LEVEL							
	Univ. (Basic)	Medium	9th	6-8	4-5	1-3	Illit	Total
Director	1							1
Department chief			3	5				8
Section chief		1		7	2			10
Engineers		2						2
Mechanics				3	4			7
Electrician			1	1	3			5
Laboratory assistant			1	1				2
Basic pump mechanic				2	1	1		4
Basic tec. water supply				1				1
Basic tec. adm. + fin.				2				2
Clerk, administration			1	6	11			18
Clerk, accounts				2				2
Meter readers				5	3			8
Cashier				3	1			4
Pump operator					8	5		13
Treatment operator				1	3	1		5
Driver				2	10	1		13
No specialized staff				3	24		82	109
Eventual etc.				5	22	9		36
Other adm. + fin. staff, and teachers				4	6	15	51	76
Other teaching staff				6	12	31		49
Classificator				1				1
Panel beater				1				1
Fitter			1	1	2			4
TOTAL	1	3	7	62	112	63	133	381

2. O B J E C T I V E S

In order to ensure a sufficient supply of good-quality water for consumers and the cost effective functioning of Aguas da Beira the distribution system has to be renovated and new components for the system have to be constructed, but above all the skill content of the personnel at all levels has to be raised.

In order to improve the skill standards a comprehensive training plan has to be prepared and implemented.

The comprehensive training plan will be composed of:

- Identification of Training Needs;

  The training needs can be found out by working out the skill and task analyses where the employees skills are evaluated against their daily tasks. The possible changes of tasks, according to organizational development, have been taken in the consideration on the identification of training needs.

- Survey of Training Facilities;

  In order to implement training programmes successfully the appropriate training facilities (workshops, classrooms, tools and equipment) as well as competent teaching staff should be available.

- Preparation of Training Programmes;

  The training programmes are worked out in conformity with the skill and task analyses. The effectiveness and up-to-date competence have been emphasized in cost estimates.

- Follow-up;

  It is vital to evaluate how well the given training meets aspirations of the trainees and requirements of the employer, and what kind of programmes and measures should be implemented in the future.

3. IDENTIFICATION OF TRAINING NEEDS

TASK AND SKILL ANALYSES

Task and skill analyses have been prepared on the basis of the existing organization and practice.

If the organization is renewed the operational units may to a certain extent be rearranged and departments combined.

It will not, however, have any significant influence on the training planning, because basic operational functions, in general, will not change. Possible changes can easily be taken into account when the possible new organization will be approved and implemented.

The first step was to collect adequate information on the personnel of Aguas da Beira, such as age, educational background, date of recruitment, position in the organization and professional qualifications. That was mainly made on basis of AdB's personnel files and statistics.

Secondly, department chiefs, section heads and other key employees were interviewed. The questionnaire consisted of items such as language skills, training background, work experience, scope of activities and training aspirations. A separate detailed report of procedure, results analyses and conclusions of the interviews has been prepared by the Project (See document 'Skills and tasks analyses - report of the personnel interviews')

Thereafter, the task and skill analysis forms were prepared. The required data was sorted out, evaluated and put into the forms.

Finally a second round of interviews was carried out so as to ensure that skills and tasks that were filled in were in conformity with the employees' job descriptions and wishes.

Psychological tests for the key employees were held and reported separately. Also during the short courses organized by the project, abilities and skills of the trainees were recorded.

The task and skill analyses comprise more than 40 various occupations and 279 employees at various skill levels of AdB. It constitutes 73 per cent of the total labour force covering all operationally significant levels and occupations in the organization.

Detailed analyses is presented in appendix 3. Scope of activities and skills required are analyzed per each employee. The Operators of the Water Treatment Department participated on the training programme planned and provided by the emergency project of Simonazzi Company financed by

the Italian Government. The training plan was evaluated and verified to be well prepared.

The skills of corporate planning and management and on-the-job training are not mentioned in the lists presented in appendix 3. These are however required skills of all management and middle management staff.

10 key employees recruited on request of the Project are included on the analyses as well as the SUPRA (Supervision Unit) personnel. They will continue in AdB after termination of the Project if necessary.-

Table 3.1. Summary of employees included the process

Placement	Number
- Top Management	1
- Supervision	1
- Secretariat	2
- Secretary of General Director	1
- Laboratory	3
- Waste Water Department	71
- Network Department	52
- Water Treatment Department	38
- Motor Vehicle Department	24
- Drinking Water Maintenance Department	26
- Personnel Department	11
- Accounts Department	19
- Consumer Services Department	30
- Pers. in service of Plancenter Project	10
- Personnel in service of SUPRA	10
GRAND TOTAL	299

4. SURVEY OF TRAINING FACILITIES

One of the most important aspects in the preparation of the training plan is to find out reasonable facilities for implementation of training:

- rooms and shops for theoretical and practical lessons must be available
- tools, equipment and materials matching the syllabus are equally important
- facilities for full board and lodging may also be required
- the availability of competent teachers and instructors is of paramount importance

The survey of the training facilities was carried out on the basis of the above factors.

The facilities existing in Beira, Maputo and Lisbon were listed down according to the information available. Final evaluations were made on the basis of visits to the establishments and facts found during discussions.

The results of the survey are divided into five groups - Beira, Maputo, Lisbon and Tampere. Beside these, preliminary contacts with the Tete Training Center has been taken.

Summary of the survey of training facilities is collected in appendix 4.

4.1 BEIRA

COMMERCIAL SCHOOL AMILCAR CABRAL

Training places	529
Teachers	33

Departments:
- typing
- secretarial services
- accounts

The school has well-furnished facilities and competent teachers. The teachers are mainly medium commercial technicians with long teaching experience. The school owns a large profissional library, from where the students are allowed to borrow books referring to their

studying subjects. Arranging for courses in industrial accounts, office and accounts management, typing; statistics etc.

The school is situated in Ponta-Gea, about 1 km far from the AdB head office.

Contact person: Director Fernando Chironda, office telefon 325039

COMPUTER TRAINING AND DATA PROCESSING CENTRE

Training places	12
Teachers and instructors	4

Well-furnished facilities just in the city center close to AdB head office. Very competent, experienced and motivated staff. It is possible to borrow magazines and news corcerning information technology.

Arranging for various kind of courses in micro- and minicomputing, f.ex. courses for most common PC-programmes like Wordperfect, Lotus-123, Symphony, dBase, MS-DOS, Wordstar, Multimate, BASIC and COBOL. DOS-driven Amstrad computers with 2 floppy disk drivers are used for teaching.

The company has abilities and skills to maintain and repair computers. For serious problems they have contacts to Maputo, from where repair technician may come, when request.

Contact person: Director Américo Murtar, office telefon 324820.

EMODRAG E.E.

State dredging company Emodrag is organizing courses on English language and computer applications.

There are 20 training places for English teaching and only three for computers. The company has supplied the training by electroprojector, video equipment and sufficient reading and exercise materials.

The English teacher is very competent and hired from the Industrial Institute.

Contact person: Rui Marudeira, Chief of Personnel Department.

HIDROMOC E.E.

- workshops for reparation of pumps, valves and motors; makes also plumbing and pipefitting

- technician level instructors. Possible to arrange more skilled instructors from the head office of Hidromoc-Maputo or from the DNA Training Center.

- well-equipped facilities. Possible to use on teaching special equipment of AdB.

Arranging for practical courses in pump mechanics and operations, electrical repairs and installations, plumbing and pipe-fitting.

Under Ministry of Construction and Waters.

Contact persons: Director Tembe or engineer Hilário, office telefon 326082.
Contacts in Maputo head quarters: Steven Hugman (British expert), office telefon 01-400696 or 01-400181/4, telex 6-234, FAX 01-732006.

INDUSTRIAL AND COMMERCIAL INSTITUTE

Training places	450
Teachers	40

There are five departments

- Mechanical
- Electrical
- Roads and Traffic
- Accounts
- Civil Engineering

Facilities are satisfactory, except in the case of special tools and equipment.

Teaching is mostly theoretical oriented and not proper for the requests of AdB staff.

Contact person: Director Avelino Junior, office telefon 363061.

INDUSTRIAL SCHOOL

Training places	926
Teachers and instructors	76

Departments:

- Mechanics, incl. fitters, plumbers, automechanics and draftsman.
- Electrical, incl. general electricity, installations
- Civil Construction, incl. foreman and surveying.

Autoworkshops are well equipped. Other facilities are satisfactory. Lack of special tools. Technical and material support of Danida and Soviet Union.

The school has experience on arranging courses by request especially on motor vehicle repairs and maintenance.

Industrial Institute and School are located in Matacuane some kilometers far from the head office of AdB.

Contact person: Director Silva, office telefon 363162.

NATIONAL PROFESSIONAL TRAINING CENTRE UNDER MINISTRY OF CONSTRUCTION AND WATERS

Training places	50
Instructors	3

Existing facilities locating in Palmeiras are below standard. New facilities are, however, under planning.

Regular courses on construction foreman (lower management) with duration of 6 months.

Contact person Director Joaquim Magumisse, office telefon 312035/7.

SHIPYARD OF BEIRA

- Own training school
- Experienced and competent instructors, also international experts in teaching staff
- well-equipped facilities

Organizing courses in fitter-mechanics, welding and machine-shop operations.

Due to internal and managerial problems the shipyard of Beira is not able to provide teaching of any kind at least during some years.

Contact persons General Director João Portela Macuba, office telefon 325309 or Production Director Paulo Fernandez Dimitri, office telefon 324029/324033.

TEACHER TRAINING COLLEGE FOR ADULT EDUCATION
(Centro Formaçáo dos Educadores dos Adultos, 1° de Maio, Manga)

Training places	120
Teachers and lecturers	20

Seminar-type lectures given by very competent teaching staff.
Practical exercises are held at companies and firms.

Overall facilities in Manga are good including accommodation.

Contact persons: Pedagogical Director Coelho or ARO-cooperant Paula Oksanen, office telefon 302129.

4.2 MAPUTO

INDUSTRIAL INSTITUTE

Training places 800
Teachers 75

- incl. international experts

Departments
- General Mechanics
- Electrotechnics
- Chemistry
- Civil Construction

Technical staff is experienced and competent. Training facilities are good. Modern, well equipped hydraulic and water chemistry laboratories. Computer facilities.

No accommodation.

Providing short courses by requests or refresher courses on management, maintenance and all of the teaching areas including to department's topics.

Contact persons: Director Casimiro Cala, or pedagogical Director Gabriel Machado, office telefon 01-415244.

INDUSTRIAL TRAINING CENTRE

Training places 240
Teachers 16
- in addition, national and international lecturers financed by SIDA and UN.

About 80 teachers by hour from various companies.

Training courses are management oriented. Facilities are satisfactory and instructors very competent.

No accommodation possibilities.

Contact persons: Director Carlos Ferreira or Vice Director Arlindo Dhancale, office telefon 01-24600, telex 6-235 RHMIE MO

MINISTRY OF PUBLIC ADMINISTRATION, TRAINING DEPARTMENT

Several training centres, two of which are situated in Maputo. No well organized training.

Training is provided in administrative subjects.

Contact persons: National Director of Public Functions Leonardo Simbine or Administration Technician João Pitroce Simente, office telefon 01-427574.

PROFESSIONAL TRAINING CENTRE UNDER NATIONAL DIRECTORATE OF WATERS (DNA Training Centre)

Training places	150
Teachers	24
- incl. 12 international experts	

After renovations the number of training places will amount to 250.

The training facilities will then comprise classrooms, workshops, laboratories, library services etc. All fully furnished with modern equipment and tools, mainly financed by foreign governments.

Training and accommodation facilities are excellent. Training courses are practically oriented and centered in water supply and waste water engineering.

The Establishment is organizing courses at various skill levels especially on the area of water supply, for example:

Pump Operations and Maintenance	8 weeks
Water Treatment Operations	8 "
Pump Mechanics	8 "
Electricians	12 "
Laboratory Assistants	12 "
Plumbers	6 "
General Management	4 "
Store Management	6 "
Planning of Human Resources	8 "

Contact persons: Director Lourenço F. Rodrigues or vice Director Xavier Tembe, telefones: 01-732122 (*), 01-733862 (Director), 732122 or 733862. Telex: 6-521, FAX 01-421403.

UNIVERSITY OF MAPUTO (Universidade de Eduardo Mondlane)

Water engineering programme at the Civil Engineering Department for a degree of B.Sc.eng. has a duration of 5 years. The annual number of graduated students at the Department has been between 7-8, but will increase to more than 10. Most of the graduated water engineers are being allocated by DNA. One part has oppurtunity to continue post-graduate studies abroad.

At the water section there are at the moment 4 mozambican employees and 2 Dutch experts.

About 80% of books in the library are in English, the rest in French and Portuguese only a few.

Contact person: Dr. Alvaro Carmo Vaz, office telefon 01-733210. (Faculty of Engineering)

4.3. TETE

Tete Water Training Center is supported by the DNA and Danida. They are organizing 2 years professional courses on plumbing and pump mechanic. According to the information received from the DNA, the courses are very practical oriented and suitable for training of AdB's staff.

More information has been requested, but due to very poor communication facilities, not yet received.

Contact persons:
Centro de Formaçâo Professional de D.P.C.A.
Director Evaristo Mateus João, (or Ole Aundal, Danida)
C.P. 600 Tete
Telefon 152 - 2346

4.4 LISBON, Portugal

HIDROPROJECTO

Hidroprojecto is a consulting company specializing in water supply, water treatment, treatment of waste water and refuse collection. The company is arranging courses within the planning and construction fields.

Teaching is practically oriented, instructors well educated, experienced and competent and overall facilities are good.

Contact person: Marketing Manager Lopes dos Santos, telefon 7580141 or 7580545, telex 14368 HIDRO P, Telefax 01/7589575,
Address: Av. Marechal Craveiro Lopes 6
1700 Lisbon, Portugal

EMPRESA PUBLICA DAS AGUAS LIVRES-EPAL

EPAL is the Waterworks of Lisbon supplying water for the city and surrounding provinces, 3/4 of Portugal's water consumption altogether.

EPAL is arranging training in the managerial, behavioral and technical skills as required in dealing with everyday problems and activities within the operation and maintenance fields of water supply engineering.

Training facilities are good, and teaching is practically oriented. The staff is well educated, motivated and skilled.

Contact person: Director Carlos Saraiva
Address: Conselho de Gerência
EPAL - Empresa Pùblica de Aguas Livres
Av. Liberdade 24
1200 Lisbon, Portugal

4.5. TAMPERE, Finland

Institute of Water and Environmental Engineering of the Tampere University of Technology is organizing postgraduate courses in water supply and sanitation for B.Sc. level engineers of developing countries. The programme is financed by Finnida.

The goal of the course is that between 15 and 20 annual participants will be awarded the degree of M.Sc in Civil Engineering during 18 months programme. First 12 months is arranged in Tampere and the last 6 months is planned to take place in the participant's home countries by preparation of Master's thesis.

The course programme covers widely the whole area includng basic scientific background, water and wastewater technology and water systems management. Seminars and workshops have a heavy role of the course. One week study tour has normally been arranged during the theory period.

Facilities are excellent and teaching staff represents the professional top of Finnish water engineers and other experts.

Contact address:
Tampere University of Technology
Institute of Water and Environmental Technology
Postgraduate Course in Water Supply and Sanitation
P.O. BOX 527 Tel: 359-31-162111
SF 31001 Tampere Telex: 22313 ttktr sf
FINLAND Fax: 359-31-162907

5. T R A I N I N G P L A N

5.1 GENERAL VIEWPOINTS

Training functions can be divided into two main types:

Off-the-Job Training
- short term
- long term

On-the-Job Training

Off-the-Job Training is applied generally in the form of courses, seminars and workshops outside normal work places complying with the approved syllabuses and programmes. In addition, there are study tours and supervised work experience. The training is provided at local, national or international levels in accordance with the resources available.

The On-the-Job Training is conducted in work places as daily instructions and guidance. Instructional visits to factories and manufacturers' agencies constitute part of On-the-Job Training activities.

When considering what type of training would be the most appropriate, one must take into account several factors, such as:

- Educational backgrounds of the trainees
- Are the skills to be trained major or minor ones
- The availability of tools and equipment as well as competent instructors
- Scope of activities of the trainees

Both types of training are utilized in the following training plan.

In addition to the conventional technical and management skills, computerized skills were in several interviews regarded as useful, particularly in administrative offices. It is supported by the fact that for example in the Electricity Supply Company of Mozambique (Maputo) a computer system has been established, and in Beira branch offices an IBM computer with three terminals has now been installed.

In the light of the above an introductory course into information technology and a course for computer aided text processing have been included. Only those employees, which will work directly using computers, will take part in these courses.

In addition, training for computer operators should be organized, but only when decision about computerized

financial administrative system has been taken. The training should be included on the purchase of the equipment.

In order to keep abreast of international developments it is important to collect up-to-date information on overseas organizations and technologies.

Particularly for the keyemployees who are in charge of planning and overall development overseas experiences and contacts are most useful. The ability to speak English is a key-factor in international communication.

Special equipment and machinery of overseas origin often have instructions for installation and maintenance only in English. For successful installations, operations and care technical staff should be able to understand English. During the first phase of the Project, altogether 6 employees of AdB participated on basic English teaching organized together with the Port Container Project/ Plantrans.

There is a large number of illiterate employees in the organization. In order to make it possible for them to improve their professional skills, reading, writing and other basic skills should be taught. Motivation of the illitarate workers to study further should be risen by better salaries, incentives and other rewards. Also the teaching skills of adult teachers should be brought up-to-date. Illiterate employees more than 40 years old have no capacity and willingness to continue their basic studies. The teachning should thus be concentrated to improve abilities of younger employees.

5.2. OFF-THE-JOB TRAINING PLAN

5.2.1. Training Courses

Training courses have been determined on the basis of tasks and skills analyses and the existing training facilities. Totally 28 separate courses were named and the participants for each course choosen.

According to excellent facilities of the DNA Training center, 13 courses are proposed to organize there, with 81 participations. Beside the proposed course in Lisbon, all the rest courses are supposed to have in Beira, in several organizing institutions. The total number of participations is planned to be 245.

The courses cover all of the main activities of AdB. Some courses are divided to basic level and advanced level training. The maximum number of participants on course at the same time is 13. Therefore some courses should be arranged two or three times. On this stage the durations of the courses can not be long, because the main aim is the provide basic training for all operational staff

during the first implementation phase of the Project without hambering the normal operation of the company. Summary of training courses including names of each course, organizing establishments, participants and durations of the courses is presented in appendix 5. Each course has been indicated with a letter A..Ö for supporting identification of the courses and reading of the plan.

5.2.2. Course Outlines

The course outlines for each course (except course Ö - computer operating, which will be planned by the possible computer system supplier) are collected in appendix 6. They are made in close cooperation with organizing establishments according more or less the following procedure flow:

(1) First contacts to the institutes after completetion the study of training facilities and requests on their real willigness for cooperation. Combination of the course topics in general.

(2) Draft proposal of the course outlines in Portuguese, prepared by the Project.

(3) Presentation of the course outlines to AdB and organizing establishment for their comments. Preliminary quotations and price negotiations.

(4) Collection of the comments and preparation of the final course outlines.

(5) Presentation of the course outlines to the institutes and AdB, final price negotiations. Final comments. Discussions about detailed curricula and other implementation matters.

(6) Translation from Portuguese to English.

(7) Reporting in the Training Plan.

The detailed curricula of the planned courses will be made mainly by instructors, but under the supervision of the Project. The detailed planning will start as soon as the decisions of the implementation of the Plan has been made.

The course outlines have been made especially for the purpose of the AdB's training programme. The courses are very practical oriented and no any minimum educational level is threfore required. Knowledge of reading and writing is thus an advantage, of course.

5.2.3. Guidelines for Implementation

In order to implement the training plan successfully the following points should be taken into account.

The training officer who is in charge of the implementation has to make an inspection visit to each training establishment before the starting date of a course or seminar. The purpose of the visit is to ensure that

- required training facilities (workshops, classrooms, equipment, tools, visual aids etc.) are available
- teachers and instructors comply with the approved syllabuses in preparation of lessons or exercises
- food and accommodation services are in order.

It is important that participants are fully aware of training objectives and contents before the start of courses or seminars. The easiest way to do it, is to provide the participants with a copy of the course outline or seminar programme and other vital information.

Inspection visits during the training are also necessary. In so doing the inspecting officer can ensure that the approved training programme is being complied with, and problems slowing down the planned progress are resolved.

It is desirable, that some participants from other ongoing projects or companies can be sent to the courses. Then it will be possible to change impressions and experiences.

At the close of courses and seminars the participants should be provided with certificates, the format of which has been designed in cooperation with the training establishments. In addition, the participants should be informed about the functions relating to the follow-up procedure.

For supporting the implementation of the Training Plan, several summary tables were prepared:

- The training matrix is presented in appendix 7. There can be seen easily, in which courses each employee is supposed to take part.
- The costs of each course are listed in appendix 8. The total cost is more than 155 000 US$.
- A proposal of course calendar has been collected in appendix 9. It consists of 6 pages. First two pages indicates the general time schedule of the courses during the implementing time, four years. The four other pages represents the time schedule by each employee included the Training Plan. It can easily be seen, at which course and at what time period each employee will join to the training programme.
- Substitution system of AdB has been shown in appendix 10. The time schedule of the programme has been planned in concordance with substitutions so, that operation of the company will suffer as little as possible.

It was agreed with the organizing establishments, that one part of the costs should be paid by material aid because of difficulties to purchase teaching materials to Mozambique. The following agreeds can be listed per mentioned course:

- (B) Adult Training Methodology/ Teacher Training College for Adult Education, material value 300 US$:
  - Several sets of ballpoint pens
  - Pencils with separate leads
  - Files
  - Bags
  - Shoes, t-shirts
  - Typewriter

- (G) Typing/ Commercial School of Amilcar Cabral, material value 700 US$:
  - 60 ink tapes with 2 colours (black-red)
  - 20 rices of typing/copying paper A4
  - 20 bottles of correction paint
  - 10 bottles of fine lubrification oil
  - 4 boxes of A4 carbon paper
  - 4 boxes of wax paper for copying machine
  - Typing manuals and books

- (H) Office Management/ Commercial School, material value 400 US$, the following manuals:
  - Voltaire Jorge Baptista da Piedade: Manual de escritório comercial
  - H. Bernaténé: Prática de secretariado
  - Editoral Pórtico: Manual de secretaria moderna
  - Georges Bousquié: Como redigir um relatório
  - Luís M. Ensenyat Daura & J. L. Artigas Rimbau: O livro do secretária
  - M. H. Fabre: A secretária e o seu chefe.

- (L) Computer Aided Text Processing and (M) Introduction to Information Technology/ Computer and Data Processing Centre, material value 425 US$ + 4760 US$ = 5185 US$:
  - Manuals, magazines etc. concerning hardware and software
  - 3 boxes of 5½" diskettes
  - 2 boxes of 3½" diskettes
  - Voltage regulator UPS, 500 W
  - Ribbon (80 and 132 columns) for Amstrad DM 300 printers
  - Templates for writing text and symbols

Contracts with the organizing establishments will be done after the decisions about the financing have been taken. Before that regular contacts should be kept up and inform the development the situation.

5.2.4. Follow-up

The purpose of follow-up activities is to examine and evaluate the practical usefulness of training, to help in the application of what has been learned, and to provide for a continuity of training and education.

A few months after the completion of a course or seminar is the time to start follow-up activities.

Evaluation of Training

The suitability and usefulness of the skills and knowledge acquired have to be assessed. It can be done by observations and interviews. If case there are several employees who have completed the same training, the correlation method will produce reliable results. If the correlation between job success and training results or between job performance prior to the course and after is high the training course has been well designed and implemented.

The training officer together with the superior of the employees should carry out the evaluation procedure.

Help in Practical Applications

During the application of skills learned an employee may need concrete, detailed advice or certain services to be carried out. If this advice or service are not available the employee may be unable to apply what he has learned. For example, if a welder does not have the special electrode he has been taught to use, he is unable to apply new skills. In some cases interpretation of new instructions may prove too difficult to understand, and the application will not succeed.

In these cases help is to be provided, otherwise the particular training has failed to meet the course objectives.

Further Personal Development

Due to the rapid development of techniques and management requirements the continuous learning shall be of every day practice.

Findings in the course evaluations will give good indications of the subject areas to be covered by further training.

In addition to on-the-job training the further training may be organized according to the following guidelines:

- more specialized courses or seminars, dealing with selected subject areas or methods
- more advanced courses, preparing employees for higher grades or promotions
- updating courses, bringing employees up to date

Liaison of Training Establishments with Former Course Participants

Regular contacts and visits between the training establishments and former course participants are very useful for both parties, as regards the following:

- getting feedback on the usefulness and effectiveness of training
- identifying cases where the Establishment might assist in practical applications of the skills
- supplying the company with the recent developments within the subject area
- offering special training for the needs of the company.

5.3. ON-THE-JOB TRAINING PLAN

5.3.1. Guidelines

On-the-job training is even more important part of the training plan, than off-the-job courses, because the nature of on-the-job training is more effective and long lasting, when it is well planned and organized. That was the reason, why the project requested home office support to produce a document as guidelines for on-the-job training. It gives basic frames, directives and support to practical implementation of on-the-job training activities and also for training of trainers. The document is presented in appendix 11.

Beside this, the Project developed during the first phase some practices concerning on-the-job training planning, reporting and evaluation. Examples of these activities are presented in appendix 12 serving as a model for practical implementation.

5.3.2. Suggestions for on-the-job training

A number of on-the-job training topics including general outlines and target groups is being presented in this chapter. They have been produced on the basis of AdB's problem analyses presented by the Appraisal Mission. These examples have been chosen seeking the most serious problem areas.

The first mentioned courses include mainly managerial skills for administrative and technical sectors and the last ones mainly basic technical and other supporting skills.

General Management

For General Director, chiefs of Departments and qualified technicians

Content: Organizations, information flow, delegation of orders, supervision, progress evaluation, reporting, communication, public relations, liaisons.

Personnel Administration

For Chiefs of Personnel Department and Section

Content: Recruitment, personnel practices (filing, salary payment etc.), tasks and skill analyses, carrier development, motivation, planning of job descriptions, training plans.

Workshop Management

For Chiefs of workshops in Goto, Munhava and Mutua

Content: Safety rules and equipment, job distribution, job follow-up and supervision, result control, work measurement, filing and registering, workshop organization.

Maintenance Management

For Chief of technical Departments

Content: Creation of regular maintenance system, preventive maintenance, organization of maintenance, files and regords, supervision techniques.

Transport Management

For Chief of Motor Vehicle Department and Chief of Transport Section

Content: Vehicle costs, transport costs, control, log-books and files, fleet maintenance, information flow.

Water Quality Management

For Laboratory Technician, Technical Director (General Director)

Content: Laboratory management and operation, water quality control, alarm systems/liaisons, chemical use control, quality limits and standards, analyses of results.

Material Management

For Chief of Accounts Department, Chief of Supply Section, Officer in purchase and stores

Content: Stores management, purchase procedures, cost follow-up, tender evaluation.

Office Management

For Chiefs of Departments and Chiefs of Sections acting in administrative areas

Content: General management, filing, secretary organization, equipments and other facilities, work measurement and control.

General course of AdB

For General Director, Chiefs of Departments, Chiefs of Sections, qualified Technicians

Content: Functions, duties, organization, personnel and problems of AdB.

Management Information Systems
For General Director, Chiefs of Departments, Chiefs of Sections, qualified Technicians
Content: Need of information flow, alternative systems, planning of information systems, informations systems in practice.

Financial and Investment Planning and Management
For Chiefs of Accounts Department and Section, Chief of Personnel Department, Chief of Consumer Service Department
Content: Accounts systems, financial planning, budgeting, need of investments, benefits of investments, management, control and monitoring

Cost control, budget control
For Chief of Accounts Department
Content: Importancy of cost control, cost control methods, budget control

Tools, Equipment and Spares Management
For Chief of Supply Section, Officer in Stores, Chiefs of technical Sections
Content: Planning, filing, stores, control, maintenance.

Data Reporting
For General Director, Chiefs of Departments, Technicians
Content: Planning and layout of content, data organization, graphical presentation, statistics, evaluation of results, analyses and reporting.

Manual Development
For Chiefs of Departments, Chiefs of Sections, Technicians
Content: Survey of needs, layout and content, general viewpoints of preparation, presentation principles.

Meeting organization
For General Director, Chiefs of Departments
Content: Invitation, agenda, general roles, oral communication, election, notes and speed writing, minutes preparation, chairman functions.

Material Quality Control
For Chiefs of technical Departments and Sections, especially Network
Content: Standards, requests, production procedures, material knowledge, quality measurement techniques, control matters

Construction and Maintenance Supervision
For Chiefs of Network Department and Section, Supervision Technicians
Content: Requests of supervision, regulations and standards, supervision activities in practice, follow-up procedures

Physical Planning
For Planning Technician, (Technical Director)
Content: Data and information collection, target determination, planning procedures and criterias, cost and benefit analyses, impacts to the community, socio-economic studies, environmental impacts

Technical Water Supply and Sanitation Planning

For Chiefs of Network, Oparation, Treatment, Waste Water Departments, Network Technicians, Planning and Supervision Technicians

Content: Basic science (mathematics, hydrology, hydraulics, chemistry), water sources, treatment methods, pumping stations, distribution centers, consumption estimation, detailed network and water distribution calculations and planning, waste water supply and treatment, special condition in Beira, plan reporting and presentation

Office Equipment

For Secretaries and typists

Content: Use of telex, telephone, telefax; typing, meganograph machine, maintenance, furniture maintenance, cleaning and office organization.

Consumer Service

For Clerks of Contracts, Information and Payment

Content: Recieving clients, communication, proper service, personal character development

Control of Water Payments

For Chiefs of Consumer Service and Accounts Departments, Chiefs of Water Meter Reading and Billing and Payment Sections

Content: Filing systems, meter reading, claims, control methods

Water Sampling and Analyses

For Laboratory staff

Content: Sampling programme, sample taking, water quality analyses (standards and methods), store control and purchase procedures, reporting and filing

Environmental Impacts

For Chief of Treatment, Operation, Waste Water and Consumer Service Departments, Laboratory Technicians, Nurse

Content: Raw water pollution sources, see water impacts to raw water, waste supply, waste water treatment, drainage, epidemies and preventive acts, public education, occupation safety

Water Treatment

For Water Treatment staff, Laboratory technician

Content: System layout, chemical basis, treatment phases, dosage regulation, quality control, information flow

Pump Operation

For Pump Operators of Drinking Water Maintenance (Operation) and Waste Water Departments

Content: System description, principles of operation, accessories, maintenance, filing

Occupational Health

For First Aid Men, Foremen, Chiefs of technical Sections, Workshop staff

Content: Risks in work environmental, prevention of accidents and deseases, safety materials, first aid, break gymnastic

Draftsman skills

For Planning Technician, Chiefs of Network Department and Section, Draftsmen

Content: Use and maintenance of equipment, drawing techniques, symbols, archive, materials.

Water Meters

For Water Meter Mechanics, Meter Plumbers, Plumbing Technician in charge of Water Meters

Content: Types of water meters, reading, testing, repairing, installation, storing

Preventive Network Maintenance

For Network staff, especially Chiefs of Department and Section

Content: General aims of preventive maintenance, methods description, flushing, practical implementation, follow-up.

Network Construction and Installation

For Network staff

Content: Materials, tools, use and maintenance of equipment, material handling, diging, installations, fittings, finalizing works, pollutions

Network Repairs

For Chief of Network Section, key Plumbers

Content: Leakage detection methods, diging, cables, other tubes, traffic arranging, material handling, repair equipment, repair methods, pollution, finalizing works

Cleaning

For Cleaners and other Helpers

Content: Cleaning equipment, cleaning subtances, material characteristics, working methods in different cases.

5.3.3. Seminars and Workshops

Seminars and workshops are more specialized than courses. The duration varies generally from one day to one week. The teaching content is centered normally on one subject area, such as "Modern techniques in maintenance management", "Pollution and environmental problems and their solutions", "Filing and documentation Techniques", etc.

Participants are generally selected from management levels. Particular attention has to be paid on appropriate teaching methodology, due to the short duration of the seminar or workshop. Typical participative methods are the following.

- **Project methods**

  Where participants are asked to undertake a particular task leading to a required result.

- Case study method

  Where participants have to diagnose the causes of a particular problem, or participants have to set out to solve a particular problem.

- Simulation methods

  Management games

  Decision-making exercises where participants in small groups organize themselves to make decisions on the basis of a sequence of problems.

  Role playing

  In which participants assume an identity other than their own. For example, two trainees might act out an interview, one taking the role of chief of department, the other of a subordinate, in which the chief is evaluating the job performance of the subordinate.

  In-Basket (in Tray)

  Trainees are given a series of files, papers and letters similar to those they will be required to deal with at the place of work. Trainees take action on each piece of work. The results are evaluated.

  Business games

  Trainees are given different management roles to perform. One group may be concerned with network maintenance, another with consumer services and so on. These groups "run" the company. Results of actions and decisions are then evaluated.

5.4. LONG TERM TRAINING

As high educated staff as needed is one of the most important advantages of the company. AdB's actual personnel is very low level in this matter. Beside the descriped off-the-job and on-the-job activities, it is necessary to have a look for the longer future development of educational levels.

Generally that means, that each employee should rise his schooling level both by studying in the school organized by the company as well as studying at the industrial, commercial and general schools and institutes, even at the universities. In practice the studies should be carried out partly studying evenings or having founds and support of the company for full day studies.

The Training Center of the National Directorate of Waters (DNA) is organizing long lasting (= until one year) professional courses on the following topics:

- Water Supply and Sanitation "A" and "B"- levels
- Administration and Finance "A" and "B"
- Pump Mechanics "A" and "B"

Admission educational level for the "B"-courses is 6 classes and for the "A"-courses is basic technician (= 9 classes of industrial or commercial school).

The Training Center is organizing also shorter, 6 months courses, which give professional diplomas to the participants. The participants should have at least 9 classes of education. The training topics are listed below:

- Water Supply and Sanitation "A"
- Administration and Finance "A"
- Analyses of Waters "A"
- Pump Mechanics "A"

The training programme for the year 1991 of the DNA Training Center is presented in appendix 13. All of the courses with durations and requested admission levels of the participants are listed there.

The detailed long term training plan for the key personnel of Aguas da Beira is presented in appendix 14. The table shows, that almost everyone should rise his/her educational level by several steps, which can take between 2 - 5 years studies.

The table has been prepared on the basis of the actual staff, but it can be interpretated more generally. Thus the colum "required long term training" means also the required educational levels for each posts. So it gives criterias to the recruitment. If some post is or will be vacant, it should be filled with employee, whose educational level corresponds with the listed required levels.

The aim on planning the long term training was to rise both general qualifications as well as professional knowledge of the key personnel to that level, which is sufficient to the proper and correct operation of the whole company. Following this principle, the level development by different steps is the following:

- 9 classes or basic technician
- 12 classes or medium technician
- B.Sc. (in Mozambique only at the University of Eduardo Mondlane, Maputo)
- M.Sc. and higher (abroad)

Normally it has been planned, that each employee should rise from the lower step to the upper level. In some cases it will not be possible because the employee is too old or his capacity is not sufficient or that level is even not needed.

In figure 2 the schooling system of Mozambique is shown. It was changed after the year 1989 and the both systems can be seen in the figure. In the actual system the landmarks are after 6, 9 and 12 years (or 11 years in general line) active studies.

On the technical fields the normal way after primary school is to go through industrial school and institute to the university.

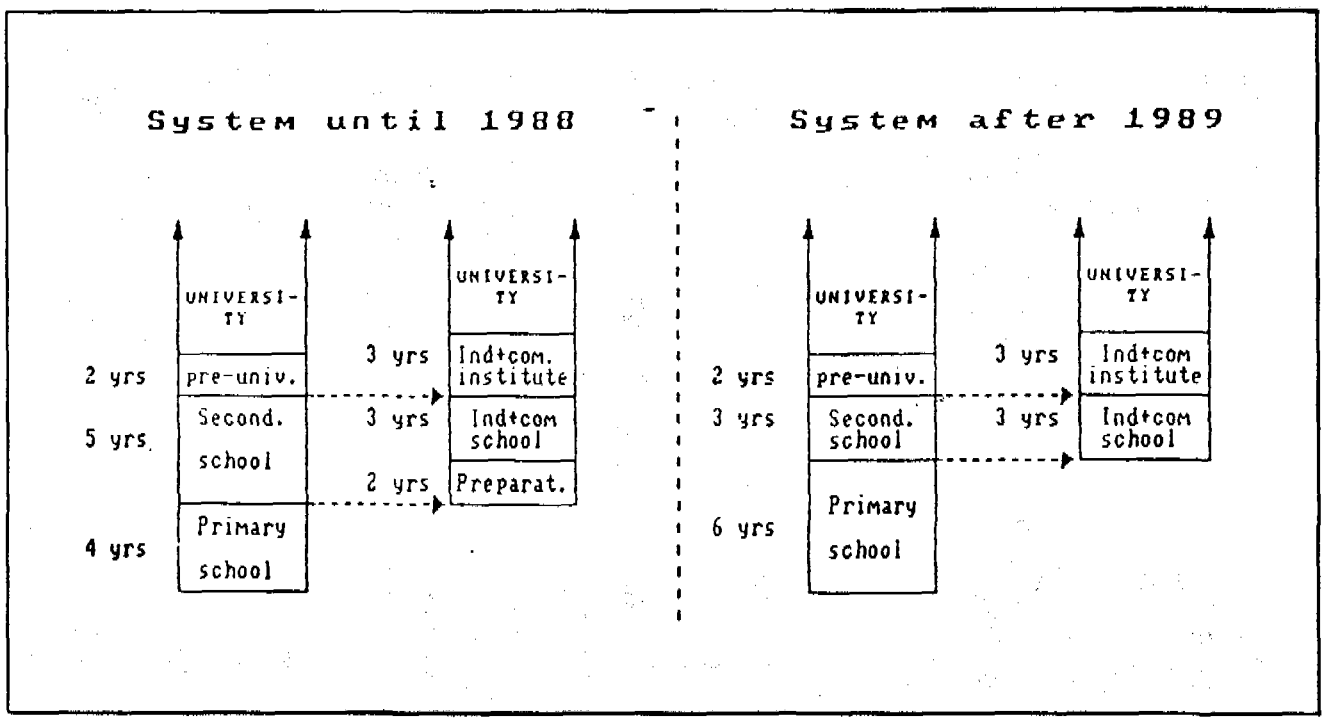


Figure 2. Schooling system in Mozambique before and after 1989.

LIST OF APPENDICES

PERSONNEL OF AGUAS DA BEIRA

Position	Sect.	Dept.	Nr.	Names:
General Director			1	Gilberto Waya
Chief of Department		WW	1	António Almeida
Chief of Department		NW	1	Inácio Jala
Chief of Department		WT	1	Américo Ribeiro
Chief of Department		DW	1	Carlos Gomes
Chief of Department		MV	1	Fransisco Magazique
Chief of Department		PE	1	Frederico Maurício
Chief of Department		AC	1	José Mulandane
Chief of Department		CS	1	Luis Mulaicho
Technician			1	Filipe Chavane
Chief of Section	OP	WW	1	vacant
Chief of Section	MA	WW	1	vacant
Chief of Section	MM	NW	1	Janeiro Alves
Chief of Section	NW	NW	1	Samuel Miguitaio
Chief of Section	TR	MV	1	Mussagy Gulamo
Chief of Section	OP	DW	1	Mando Fernando
Chief of Section	PE	PE	1	José Manuel
Chief of Section	TG	PE	1	Bartolomeu Tato
Chief of Section	PA	AC	1	José Luis Solo
Chief of Section	AC	AC	1	Marques Luis
Chief of Section	SP	AC	1	vacant (Beatrice Fabião)
Chief of Section	MR	CS	1	João Tenez Botão
Chief of Section	BL	CS	1	Pedro Cônsule
Chief of Section	WT	WT	1	Victor Manuel
Chief of Section	PU	WT	1	José Manuel Carvalho
Clerk, Secretaries			3	vacant, Domingas, Madalena
Laboratory technician	Lab.		2	Zaqueu, José capece
Laboratory assistant	Lab.		1	Pinho Sande
Pump Mechanic		WW	7	several
Pump. Oper. Foreman	OP	WW	1	António Soares
Pump Operator	OP	WW	27	several
Cleaners	OP	WW	27	several
Electrician	MA	WW	4	Eduardo, Ferreira, Silva Bero, vacant
Ass. Electrician	MA	WW	2	Tomás Campira, Zeca Mazemba
Carp., Mason, Paint.		NW	3,4,2	several
Plumber Foreman	NW	NW	1	João Mandava
Plumber	NW	NW	9	several
Ass. Plumber	NW	NW	25	several
Plumber Foreman	MM	NW	1	Pedro Matope
Plumber	MM	NW	5	several
Mason, Painter		WT	2, 1	Matore, Mazuire, Mucharuenhe
Fitter, Ass. Fitter		WT	1, 1	José bande, João Lole
Ass. Electrician (teacher)		WT	1	Assumane Adão
Lubricator		WT	1	vacant
Treat. Oper. and Ass.	WT	WT	5, 10	several
Pump oper. and ass.	PU	WT	5, 8	several
Motor Vehicle Mech.		MV	3	V.M.Guiambiça, Inácio João, António esmail
Ass. Mot. Veh. Mech.		MV	9	several
Drivers	TR	MV	10	several
Fitter, Ass. Fitter		DW	3, 2	several
Turner		DW	1	Eduardo Matesso
Electrician		DW	2	Ilidio, Damo
Ass. Electrician		DW	1	Bernarda Gina
Pump Mechanics		DW	2	António Junior, vacant
Ass. Pump Mechanics		DW	2	Noel Herve, Raul Bazo
Water Meter Mech.		DW	2	Domingas, Lazar António
Ass. Wat. Met. Mech.		DW	1	Feliz Quente
Pump Operator	OP	DW	8	several
Occupational Safe		PE	4	Henriques César, Pinho Sande, Bicho Anhiça, Pinto Gema
Officer in Charge		PE	2	Pedro Salvador, Osório Fernandez
Typist	PE	PE	2	Blaunde Jó, Helena Froi
Teacher	TG	PE	3	Agostinho Sates, Inês Simbe, Angela Maria
Cashier, Ass. Cash.	PA	AC	4, 1	several
Clerk	AC	AC	2	Adélia, Maria
Officer in Charge	SP	AC	2	Olavo Armando, Américo
Storekeeper	SP	AC	1	Zana
Ass. Storekeeper	SP	AC	5	several
Clerk		CS	3	Gundana, Boneze, Lucas
Clerk		CS	2	Cézar, Tito
Plumber	PO	CS	1	Maraije Alberto
Ass. Plumber		CS	5	several
Plumber	MP	CS	2	Mussapara, Dongue Marera
Water Meter Reader	MR	CS	7	several
Senior Clerk	BL	CS	1	Zinga
Clerk	BL	CS	6	several
Draftsman		PC	1	Gremildo
Secretary		PC	1	Virginia
Surveyor, Ass. Surv.		PC	2, 2	Massambo, Ernesto, Charles, Sumiane
Plumber technician		PC	1	Baptista Giva
Electrician-forman		PC	1	Carlos Rosa
Planning Technician		PC	1	Donato Estevão
Excavator operator		PC	1	Reis Binasse
Civil engineer		SU	2	Telles, Magalhães
Eng. technician		SU	3	vacant
Administration techn.		SU	1	Macuacua
Surveyor		SU	2	Eduardo Baptista, vacant
Clerk		SU	1	vacant
Draftsman		SU	1	Domingos Geraldo

ABBREVIATIONS APPLIED IN THE TEXT

COURSES:

A=	Basic English
B=	Adult Training Methodology
C=	Basic Plumbing and Pipe Fitting
D=	Oper. and Maint. of Pumps and Valves
E=	Fitter Mechanics
F=	Basic Statistics
G=	Typing
H=	Office Management
I=	Accounts Management
J=	Automotive Repairs
K=	Surveying and Mapping
L=	Computer Aided Text Processing
M=	Introd. to Information Technology
N=	Transport Management
O=	Occupational Safety and Health
P=	Types and Rep. of Watermeters
Q=	Elect. Repairs and Installations
R=	Plumbing and Pipe Fitting
S=	Repairs and Maint. of Pumps and Valves
T=	Water Supply and Wastewater Eng.
U=	Pers. Man. and Labour Relations
V=	Project Planning and Management
W=	Manpower Training and Developm.
X=	Stores Management
Y=	Engineering Economics
Z=	Ocerseas Training, Lisbon
Ã=	General Course in Management Technics
Õ=	Computer Operations

DEPARTMENTS:

WW=	Wastewater
NW=	Network
WT=	Water Treatment
DW=	Drinking Water Maintenance
MV=	Motor Vehicle
PE=	Personnel
AC=	Accounts
CS=	Consumer Service
PC=	Plancenter Project
SU=	Supervision Unit, SUPRA

SECTIONS:

OP=	Operation
MA=	Maintenance
NW=	Network
MM=	Mainline Maintenance
TR=	Transport
PE=	Personnel
TG=	Training
PA:	Payment
AC=	Accounts
SP=	Supply
MR=	Meter Reading
BL=	Billing
WT=	Water Treatment
PU=	Pumping
Lab.=	Laboratory
PO=	Port Service
MP=	Water Meter Plumbers

Identification of training needs

Tasks and skills analyses

TOP MANAGEMENT

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
General Director	1	- Overall responsibility for AdB functions - Counterpart to the Project Manager/Plan-center	- Water supply and wastewater engineering - General Management including basics in Information Techn.
TOTAL	1		

TECHNICIAN

Technician	1	- Supervising activities of development projects - Counterpart to the Water Supply Engineer	- Project planning and management - Construction, operation and maintenance management - Basics in Inform. Technology
TOTAL	1		

SECRETARIAT

Clerk	2	- Correspondence - Typing, filing - Purchase of office materials	-Computer applications
TOTAL	2		

SECRETARY OF GENERAL DIRECTOR

Clerk	1	- Typing - Keeping records - Other secretarial duties	-Computer applications
TOTAL	1		

LABORATORY

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Laboratory Technician Laboratory Assistant	1 2	- Water quality control - Tests and analysis - Recording and filing	-Water quality control methodology
TOTAL	3		

WASTEWATER DEPARTMENT

Chief of department	1	- In overall charge of wastewater department	- Managerial skills - Pump technology - Wastewater techn.
Pump mechanic	7	- Pump reparations and installations	- Repair methods
Chief of operation section	1	- Management and supervision - Work planning	- Managerial skills - Pumps and valves
Pump operator, foreman	1	- In charge of the operator team	- Pumps and valves
Pump operator	27	- Operation of pumps and valves	- Pumps and valves
Cleaner, foreman	3	- In charge of cleaning groups	
Cleaner	13	- Cleaning	
Cleaner (gates)	11	- Cleaning gates	
Chief of maintenance section	1	- Management - Work planning	- Pump technology - Management
Electrician	4	- Repairing of electrical installations and motors	- Electrical theory and repairs
Assistant electrician	2	- Assisting the electricians	
TOTAL	71		

WATER TREATMENT DEPARTMENT

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Chief of department	1	- In overall charge of department	- Electric. applied to water treatment procedure
Mason	2	- Masonry	- Masonry
Painter	1	- Painting work	- Types and preparation of paints
Fitter	1	- Welding, turning and repairs	- Mechanical skills
Assistant fitter	1	- Assisting the fitter	- Mechanical skills
Assistant electrician	1	- Assisting the chief of pumping section in electrical jobs	- Electrical repairs
Lubricator	1	- Lubrications	- on-the-job
Chief of treatment section	1	- In charge of water treatment, stock and purchases	- Water treatment technology
Water treatment operator	5	- Water quality control - Use of chemicals - Record keeping - Providing information	- (Simonazzi training programme) - Water quality control methods
Assistant operator	10	- Assisting operators	- " -
Chief of pumping sect.	1	- In charge of pump operations and workshop	- (Simonazzi training programme)
Pump operator	5	- Pump operations - Water level control - Pumping regulations - Simple electrical jobs - Record keeping	- " -
Assist. pump operator	8	- Assisting operators	- " -
TOTAL	38		

MOTOR VEHICLE DEPARTMENT

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Chief of department	1	- In overall charge of workshop and transport - Counterpart to the foreman/trainer/Plan-center	- Transport management - Repair techniques, including electr. and hydraulics
.Motor vehicle mechanic	3	- Maintenance and repairs of motor vehicle	- Repair techniques, including electr. and hydraulics
Assist. motor vehicle mechanic	9	- Assisting mechanics	- " -
Chief of transport section	1	- **Organizing transport** - Supervising repairs and maintenance - Counterpart to the foreman/trainer/Plan-center	- **Transport management** - Repair techniques, including electr. and hydraulics
Drivers	10	- Driving trucks, pick-ups and other vehicles - Daily maintenance	- Driving techniques - Logbook keeping
TOTAL	24		

NETWORK DEPARTMENT

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Chief of department	1	- Supervision, planning - Construction, maintenance - Counterpart to the Construction Supervisor/Plancenter	- Managerial skills - Technical skills
Carpenter	3	- Construction work - Furniture making	- Carpentry
Mason	4	- Masonry	
Painter	2	- Painting works	- Types and preparation of paints
Chief of network maintenance section	1	- In charge of repairs and installations - Counterpart to the Construction Supervisor/Plancenter	- Managerial skills - Installat.,repairs - Detection methods
Plumber, foreman	1	- In charge of the plumbing team	- Network materials - Valves
Plumber	8	- Repairs and installations	- Repair methods
Assistant plumber	16	- Assisting plumbers	
Chief of main line maintenance section	1	- In charge of repairs and maintenance - Leakage detection	- Managerial skills - Repair methods, including welding
Plumber	1	- Repairs and maintenance	- Repair methods, including welding
Assistant plumber	14	- Assisting the plumber	
TOTAL	52		

DRINKING WATER MAINTENANCE DEPARTMENT

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Chief of department	1	- In overall charge of department - Counterpart to the foreman/trainer/Plan-center	- Applied electricity - Management
Fitter	3	- Filing, welding, fitting	- Mechanical skills, including threads
Assistant fitter	2	- Assisting fitters	- " -
Turner	1	- Turning, welding, fitting	- Turning, welding, fitting
Electrician	2	- Repairs of electrical motors and installations	- Electrical work planning - Reading drawings and circuits - Repair methods
Assistant electrician	1	- Assisting electricians	- " -
Pump mechanic	2	- Repairing and servicing pumps and valves	- Pump technology - Pump/motor connect. - Valves and functions - Repair methods
Assist. pump mechanic	2	- Assisting mechanics	- " -
Water meter mechanic	2	- Testing and repairing water meters	- Types of wat. meters - Functions and repair methods
Assistant water meter mechanic	1		- " -
Chief of operation section	1	- In charge of pump operations	- Managerial skills - Fault-finding methods
Pump operator	8	- Pump operations - Water level control and pump regulation - Recording	- Fault-finding methods
TOTAL	26		

PERSONNEL DEPARTMENT

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Chief of department	1	- Supervising and organizing - Labour laws - Planning - Evaluation of employees - Counterpart to the training officer/PC	- Personnel management and labour relations - Engineer. economics - Basics in inform. technology
Officer in charge of occupational safety and sanitary functions	1	- Planning and implementing job safety and first aid activities - Providing information on safe work methods and sanitary func.	- Job security
Officer in charge of social services and protocol	1	- Taking care of visitors and their needs - Arranging for meetings - Other services	
Chief of personnel section	1	- Office management - Keeping records and files - Making payment lists, contracts and schedules	- Personnel management and labour relations - Basics in inform. technology
Officer in charge of classifications and norms	1	- Wages scales and ratings - Working conditions and their evaluations, norms and statistics	
Typist	2	- Typing	
Chief of training section	1	- Office management - Development of technical and cultural skills and interests of employees - Manpower planning and training - Counterpart to the Training Officer/PC	- Manpower training and development
Teachers	3	- Lecturing on general subjects, including reading, writing and other general subj.	- Adult training pedagogy
TOTAL	11		

ACCOUNTS DEPARTMENT

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Chief of department	1	- Supervising and organizing department activities - Economic planning - Inspection of accounts - Assisting general director in administrative functions	- Eng. economics - Basics in inform. technology
Chief of Payments Section	1	- Supervision and control	- Accounts management
Cashier	4	- Receiving payments - Keeping files	
Assistant cashier	1	- Assisting in office routines	
Chief of Accounts Section	1	- Supervision and control - Classification of documents - Preparation of accounts - Economic planning	- Accounts management - Basics in inform. technology
Clerk	2	- Typing - Office routines	- Typing
Chief of Supply Sect.	1	- Office management - Planning - Supervision of stores	- Stores management - Basics in inform. technology
Clerk	1	- Assisting the chief	- " -
Officer in charge of purchases, custom declarations and fuels	1	- Ordering spares, materials and tools - Taking care of customs declarations	- " -
Storekeeper	1	- Receiving and distributing supplies, storekeeping and inventories, store management - Counterpart to the foreman/trainer/Plan-center	- " -
Assistant storekeeper	5	- Assisting in store activities - Distribution of fuels	
TOTAL	19		

CONSUMER SERVICES DEPARTMENT

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Chief of department	1	- Supervising and organizing department activities - Planning, statistics	- Management - Basics in inform. technology
Clerk	3	- Consumers' contracts - Charts and forms - Providing information for consumers	- Typing and filing - Consumer service
Clerk	2	- Making bills and receiving payments - Receiving consumers' requests and sending them to Wastewater Department	- General knowledge on functions & lay-out of wastewater system
Plumber	1	- Providing vessels with water - Recording	- Simple leakage repairs
Assistant plumber	3	- Assisting the plumber	- " -
Plumber	2	- Changing water meters - Simple repairs - Recording	- Installation, structure & functions of water meters, fault finding and repairs
Assistant plumber	2	- Assisting the plumbers	- " -
Chief of Meter Reading Section	1	- Supervision and planning - Inspection of records - Water meter reading	- Management - Basics in inform. technology
Water meter reader	7	- Reading and recording meters - Observing and reporting faulty meters	- Reading different kinds of wat. meters - Typical faults in water meters
Chief of Billing Section	1	- Office management	- Material skills - Making statistics - Basics in inform. technology
Senior clerk	1	- Inspection of bills - Statistics, office routines	- Making statistics - Basics in inform. technology
Clerk	6	- Preparation of bills - Typing, keeping files	- Office work
TOTAL	30		

PERSONNEL IN SERVICE OF PLANCENTER PROJECT

On the recommendation of the project the following most important recruitment ıve been made:

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Draftsman	1	- Making drawings and maps	- Water engineering drawing; maintenance and documentation
Secretary	1	- Recording; filing; translating	- Computer applications
Surveyor	2	- In charge of surveyor team	- Leakage detection methods - Mapping
Ass. Surveyor	2	- Leakage detection - Mapping	- " -
Planning Technician	1	- Technical and physical planning	- Water supply and wastewater engineering - Project planning and Management - Basics in Inform. Technology
Plumber Technician	1	- Water meter investigations, public tap investigations - Assistance in planning and field studies	- Plumbing - Water meters - Management and reporting
Electrician-foreman	1	- In charge of surveyor and investigation groups	- Electrical matters - Management and reporting
Excavator Operator	1	- Operating excavator	- Maintenance - Operation
TOTAL	10		

PERSONNEL IN SERVICE OF THE SUPERVISION UNIT

POSITION	NR	SCOPE OF ACTIVITIES	SKILLS REQUIRED
Civil Engineer	2	- Supervision of projects	- Water and wastewater engineering - Project planning and supervision
Eng. Technician	3	- Technical planning - Ass. in supervision	- Project planning and supervision
Surveyor	2	- In charge of surveys	- Surveing and mapping - Drawing and filing
Adm. Technician	1	- Office works - Correspondence - Accounting	- Office management - Accounts management
Draftsman	1	- Drawings and maps	- Filing, equipment handling
Clerk	1	- Office routines - Typing	- Computer applications - Secretary skills
TOTAL	10		

GRAND TOTAL **299**

SUMMARY OF TRAINING FACILITIES IN BEIRA AND MAPUTO

NAME OF TRAINING PLACE	NR. OF TR. PLACES	NR. OF TEACHERS	TEACHING SUBJECTS
BEIRA			
Commercial School Amilcar Cabral	529	33	typing, secretarial services, accounts
Computer Training and Data Processing Center	12	4	computer software
Emodrag E.E.	23	3	English, computer software
Hidromoc E.E.	variable	variable	pump mechanics and oper., electrical repairs and installations, plumbing and pipe fitting
Industrial and Commercial Institute	450	40	mechanics, electronics, roads and traffic, accounts, civil engineering
Industrial School	926	76	mechanics, electronics, civil construction
National Professional Training Center under Ministry of Construction and Waters	50	3	Construction foreman-course
Shipyard of Beira	variable	variable	fitter-mechanics, welding, machine operations
Teacher Training College for Adult Education	120	20	adult educations methodologies
MAPUTO			
Industrial Institute	800	75	mechanics, electrotechnics, chemistry, civil construction
Industrial Training Center	240	16	management techniques
Training Department of Ministry of Public Admin.	variable	variable	Administration
DNA Training Center	150	24	water supply, civil contstruction, etc.

TRAINING COURSES

Position	(Sect./) Dept.	No.	Name and code of the course	Duration hours	Duration weeks	No. of trainees	Organizing Establishment
General Director		1	Water Supply and	480	2*12	10	Training Center
Chief of Department	WW	1	Wastewater Engineering				DNA, Maputo
Chief of Department	NW	1	T				
Chief of Department	DW	1					
Chief of Department	WT	1					
Planning Technician	PC	1					
Plumber technician	PC	1					
Eng. technician	SU	3					
Chief of Department	PE	1	Engineering Economics	240	12	2	Training Center
Chief of Department	AC	1	Y				DNA, Maputo
Chief of Section	SP/AC	1	Stores Management	120	6	4	Training Center
Off. in Charge	SP/AC	2	X				DNA, Maputo
Storekeeper	SP/AC	1					
Chief of Section	TG/PE	1	Manpower Training and Development	160	8	1	Training Center DNA, Maputo
			W				
Supervison Techn.		1	Project Planning	160	8	4	Training Center
Planning Techn.	PC	1	and Management				DNA, Maputo
Civil engineer	SU	2	V				
Chief of Department	PE	1	Personnel Management	80	4	2	Training Center
Chief of Section	PE/PE	1	and Labour Relations				DNA, Maputo
			U				
Off. in Charge		4	Occupational Safety and Health	80	4	4	Training Center DNA, Maputo
			O				
Chief of Section	TR/MV	1	Transport Management	120	6	1	Training Center
			N				DNA, Maputo
Chief of Section	OP/WW	1	Repairs and Maintenance	480	2*12	9	Training Center
Chief of Section	MA/WW	1	of Pumps and Valves				DNA, Maputo
Chief of Section	OP/DW	1	S				
Pump Mechanic	WW	3					
P.O. Foreman	OP/WW	1					
Pump Mechanic	DW	2					
Chief of Section	NW/NW	1	Plumbing and Pipe Fitting	240	2 * 6	15	Training Center
Chief of Section	MM/NW	1	R				DNA, Maputo
Plumber Foreman	NW/NW	2					
Plumber	NW	9					
Plumber	PO/CS	1					
Plumb. technician	PC	1					
Electrician	MA/WW	4	Electrical repairs	480	24	11	Training Center
Ass. Elect.	MA/WW	2	and Installations				DNA, Maputo
Ass. Elect.	WT	1	O				
Electrician	DW	2					
Ass. Elect.	DW	1					
Electr.-foreman	PC	1					
Water Meter Mech.	DW	3	Types and Repairs	120	6	4	Training Center
Plumb. technician	PC	1	of Watermeters				DNA, Maputo
			P				
Chief of Department	NW	1	General Course in	120	3 * 2	25	Training Center
Chief of Department	WW	1	Management Technics				DNA, Maputo
Chief of Department	MV	1	A				
Chief of Section	WT/WT	1					
Chief of Section	MA/WW	1					
Chief of Section	NW/NW	1					
Chief of Section	TR/MV	1					
Chief of Section	BL/CS	1					
Chief of Section	MR/CS	1					
Chief of Section	PA/AC	1					
Chief of Section	PE/PE	1					
Chief of Section	TG/PE	1					
Surveyor	PC	1					
Laboratory tech.	Lab.	1					
Network Foreman	NW	3					
Water Meter Mech.	DW	1					
Foreman	OP/WW	1					
Storekeeper	SP/AC	1					
Safety Officer	PE	1					
Network Manager		1					
Operating Manager		1					
Plumb. technician	PC	1					
Electr. foreman	PC	1					
General Director		1	Introduction to Information	2 * 60	2 * 6	20	Computer Training
Chief of Department	WW	1	Technology				and Data Processing
Chief of Department	NW	1	M				Center, Beira
Chief of Department	WT	1					
Chief of Department	DW	1					
Chief of Department	MV	1					
Chief of Department	PE	1					
Chief of Department	AC	1					
Chief of Department	CS	1					
Supervison Techn		1					
Planning Techn.		1					
Chief of Section	PE/PE	1					
Chief of Section	TG/PE	1					
Chief of Section	PA/AC	1					
Chief of Section	AC/AC	1					
Chief of Section	SP/AC	1					
Chief of Section	MR/CS	1					
Chief of Section	BL/CS	1					
Off. in Charge	SP/AC	1					
Off. in Charge	BL/CS	1					

continue...

continue...

Position	(Sect./) Dept.	No.	Name and code of the course	Duration hours	Duration weeks	No. of trainees	Organizing Establishment
Clerk		1	Computer Aided	33	2	6	Computer Training
Secretary		1	Text Processing				and Data Processing
Typist	PE/PE	2	L				Center, Beira
Secretary	PC	1					
Clerk	SU	1					
Chief of Section	PE/PE	1	Basic Statistics	144	12	3	Commercial School
Off. in Charge	SP/AC	1	F				of Amilcar Gabral,
Senior Clerk	BL/CS	1					Beira
Clerk, secretary		2	Typing	144	12	10	Commercial School
Typist	PE/PE	2	G				of Amilcar Gabral,
Clerk	AC/AC	1					Beira
Clerk	BL/CS	3					
Secretary	PC	1					
Clerk	SU	1					
Chief of Section	PA/AC	1	Accounts Management	190	16	4	Commercial School
Chief of Section	AC/AC	1	I				of Amilcar Gabral,
Off. in Charge	SP/AC	1					Beira
Adm. Technician	SU	1					
Chief of Section	PE/PE	1	Office Management	144	12	6	Commercial School
Chief of Section	PA/AC	1	H				of Amilcar Gabral,
Chief of Section	MR/CS	1					Beira
Chief of Section	BL/CS	1					
Secretary		1					
Adm. Technician	SU	1					
Chief of Section	PU/WT	1	Operation and Mainten.	2 * 140	2 * 4	* * 27	Hidromac, Beira
Pump Operator	OP/WW	18	of Pumps and Valves				in cooperation
Ass. Pump Mech.	DW	2	D				with DNA
Pump Operator	OP/DW	6					
Ass. Plumber	NW/NW	17	Basic Plumbing and	2 * 140	2 * 4	25	Hidromac, Beira
Ass. Plumber	CS	3	Pipe Fitting				in cooperation
Ass. Plumber	CS	3	C				with DNA
Ass. Plumber	CS	2					
Fitter	WT	1	Fitter Mechanics, incl.	90	15	8	Industrial School,
Ass. Fitter	WT	1	Turning and Welding				Beira
Fitter	DW	3	E				
Ass. Fitter	DW	2					
Turner	DW	1					
Chief of Department	MV	1	Automotive Repairs	90	15	5	Industrial School,
Chief of section	TR/MV	1	J				Beira
Mechanic	MV	3					
Surveyor	PC	2	Surveying and Mapping	90	15	6	Industrial School,
Ass. Surveyor	PC	2	K				Beira
Surveyor	SU	2					
Teacher	WT	1	Adult Training	90	3	4	Teacher Training
Teacher	TG/PE	3	Methodology				College for
			B				Adult Educ.
Clerk		3	Computer Operations			3	Computer Supplier
			Ö				(not yet specified)
Chief of Department	WW	1	Basic English		4*16	20	Plancenter
Chief of Department	NW	1	A				Project in
Chief of Department	DW	1					cooperation
Chief of Department	PE	1					with AdB
Chief of Department	CS	1					
Planning Techn.		1					
Chief of Section	TR/MV	1					
Chief of Section	TG/PE	1					
Chief of Section	PA/AC	1					
Chief of Section	SP/AC	1					
Chief of Section	MR/CS	1					
Chief of Section	BL/CS	1					
Chief of Section	WT/WT	1					
Clerk		1					
Labor. Worker	Lab.	1					
Cashier	PA/AC	2					
Off. in Charge	SP/AC	1					
Plumb. technician	PC	1					
Adm. technician	SU	1					
General Director		1	Overseas Training,		5	6	EPAL and
Chief of Department	WW	1	Lisbon Portugal				Hidroprojecto
Chief of Department	NW	1	Z				
Chief of Department	PE or	1					
Chief of Department	AC						
Supervision Techn.		1					
Planning techn.		1					

TOTAL **245 participations**

Course outlines

ALTERNATIVE 1
COURSE NAME: English
Emodrag E.E. State Company
20 participants

A

COURSE OUTLINES: see the five following pages

TOTAL COSTS: 4000 US$

ALTERNATIVE 2
COURSE NAME: Basic English
Beira Water Supply Project with Aguas da Beira
Duration 21 weeks (150 hours), 20 participants in two groups

A

OBJECTIVES:
- To be able to speak, read, write and understand English on a basic level.
- To know the basic grammar of the English language

COURSE OUTLINES

TOPIC	**CONTENT**
- Diagnostic test	
1. Introduction	- Aims and objectives of English language - Use of English worldwide
2. Grammar	- The alphabet - The indefinite and definite Articles - Plural of nouns - The of-construction - Comparison of adjectives - Numerals - Personal pronouns - Possessive pronouns - Demonstrative pronouns - Interrogative pronouns - Indefinite pronouns - Irregular verbs - All tenses - Conjunctions - Prepositions
3. Final test	

TEACHING METHODS:
- Lectures, home works, exercises, audio-visual methods

COSTS:
TOTAL 6000 US$

Empresa Moçambicana de Dragagens
EMODRAGA E.E.

DEPARTAMENTO DE RECURSOS HUMANOS

SECTOR DE FORMAÇAO

B E I R A

PROGRAMA DE INGLÊS

1. Ao elaborar o presente programa tenho em conta o ambiente em que vou dirigir o ensino desta língua, a natureza dos alunos, e as necessidades futuras da empresa: Comunicação e trabalho.

2. O programa está dividido em duas partes:

I - Inglês geral: 4 níveis
II Inglês no trabalho: Prática comercial e correspondência nível único.

3. A primeira parte (Inglês geral) está dividida em 4 níveis. Sendo o primeiro mais longo do que os restantes. Com a seguinte distribuição:

1. Nível : 6 meses - 60 lições - 34 teóricas + 20 práticas + 6 avaliações
2. Nível : 3 meses - 36 lições - 18 teóricas + 10 práticas + 8 avaliações.
3. Nível : 3 meses - 36 lições - 18 teóricas + 10 práticas + 8 avaliações.
4. Nível : 3 meses - 36 lições - 18 teóricas + 10 práticas + 8 avaliações
5. Nível : 4 meses - 48 lições - 18 teóricas + 22 práticas + 8 avaliações

Na 1. fase :

1. Nível : De 12/09/90 a 20/02/90
2. Nível : De 05/09/90 a 05/12/90
3. Nível : De 05/09/90 a 05/12/90
4. Nível : a 19/10/90
5. Nível : Sem alunos ainda.

Nas fases seguintes a contagem será semelhante conforme a distribuição de tempo.

4. Para o presente programa sustento-me nos seguintes princípios:

1. Vamos ensinar os alunos a falarem inglês mas não a falarem do inglês. Para isto terá que haver uma sessão de prática para cada lição. É por isso que tenho que contar com aulas de prática na distribuição do tempo e que o 1. nível seja mais longo por causa de adaptação.

.../// ...

2. Muitas vezes os alunos não falam: primeiro porque não têm nada que falar, segundo porque são acanhados.
Para isto temos que proporcionar aos alunos temas escolhidos para a oralidade orientada os quais eles expõem oralmente diante da turma constituindo assim pequenos discursos que são índices do grau da prática oral do aluno.

1. Nível deverá conseguir exposições de 5 minutos
2. Nível " " " " 10 "
3. Nível " " " " 15 "
4. Nível " " " " 20 - 30 minutos
5. Nível " " " " 30 - 45 "

5. Os níveis a que me refiro distinguem-se com os seus objectivos específicos:

I - Nível - Considera-se que neste nível o aluno não tem nenhuma base de conhecimento da língua.
Aqui, pela primeira vez, deve aprender vocabulário (eixo paradigmático), construção de frases (eixo sintagmático), entoação sensibilidade...

A) - Deve saber a seguinte matéria da estrutura gramatical:

- Artigos definidos e indefinidos (the, a, an)
- Pronomes pessoais sujeitos (I, you, he, she,it, we, you, they)
- Adjectivos possessivos (my, your, his. her, its, our, their)
- Pronomes pessoais complementos (me, you, him, her, it, us, them)
- Pronomes possessivos/caso possessivo (the teacher`s book)
- Verbos auxiliares: to be, have, can, may, must.
present tense (todas flexões)
- Verbos de acção: to go, come, do ...
- Flexão dos verbos de acção com o auxiliar to do
presente tense (negative ....)
- Passado e futuro
- Forma progressiva (auxiliar to be + gerúndio)
- Graus dos adjectivos

B)- Area vocabular
- Posições: on, under, in, here, there, in front, behind, far, near
(how far ?)

.../// ...

- Numerais cardinais até 100 (how many)
- Numerais ordinais até 100 (dates)
- Meios de transporte (how do you go home after work?)
  (how often...?...
- Processo de comunicação: what, how, when, who, with what, how many, which, how far, how often?

- Cores - What colour is ...?

Formas e tamanhos (big, small, short, round, triangular)

how high is this room?
how wide

- Textos de apoio: "Follow me to Britain"

2. NÍVEL: É um nível de consolidação do 1. nível
   - Deverá alargar o vocabulário
   - Deverá rever a gramática (presente, past, future)
   - Deverá conhecer o condicional

Área Gramatical:

Revisão
Condicional
Leading forms
Pronomes reflexos - Conjugação reflexa.

Área Vocabular:

Unidade 1 - texto "Saturday morning"
Unidade 2 - texto "Frank´s last day in prison
Unidade 3 - Laura`s old Job?"
Video Cassetes "Follow me to Britain"

3. NÍVEL: Este é o nível caracterizado pela procura de maior conversação.
   - Muitas revisões com muita oralidade.

Área Gramatical:

- Revisões
- Present perfect
- Past perfect

Área Vocabular:

Unidade 1 - "A Job for Frank"
Unidade 2 - "The Kidnapping"

.../////...

Unidade 3 - "The telephone Call"
Unidade 4 - "A million Dollars"
Video - "Follow me to Britain"

4. NÍVEL: Neste nível completa-se o inglês geral, portanto, a primeira parte destinada a "Comunicação".
   - O aluno deve estar mais à vontade ao expressar-se em inglês.
   - Deve dominar " A voz passiva e activa";
   - Deve dominar " O discurso directo e indirecto"
   - Inglês e as preposições: Expressões ideomáticas

Área Gramatical:

- Passive and active voice
- Direct and reported (indirect) speech.
- English and prepositions.
- Revisions

Area Vocabular:

Unidade 1 - "Hob Gives his first Im pressions of England"
Unidade 2 - "Olaf and Pedro Discuss their Plans"
Unidade 3 - "Olaf reads another of his Plays"
Unidade 4 - "Mrs Priestley tells a story and Mr. Priestley puts up a hen - house"
Termina a primeira parte do curso.

5. NÍVEL: Este nível corresponde A II parte do curso. É inglês especial, cujo objectivo é aplicação no trabalho:
"Actividade comercial e correspondência".
Há uma necessidade de dar ao aluno um conhecimento simples e claro de prática na escrita de carta comerciais.

Área Gramatical:

- Revisões

Área Vocabular: Departments of "Weavewell Woolen Co. Ltd".

1. The manager´s room
2. The general office
3. filing
4. The office equipment
5. The telephone switchboard

6. The work of the general office
7. Comercial correspondence
8. Applications for a job
9. Confirming an apposintment
10. The sales department
11. Correspondence of sales department (1)
12. Correspondence of sales department (2)
13. Some explanations. Sales promotion
14. A circular and the inquiries from it.
15. Orders and their execution (correspondence)

Beira, 21 de Setembro de 1990

COURSE NAME: Basic Plumbing and Pipe Fitting
Hidromoc E.E., Beira in cooperation with DNA Training Center C
Duration 4 weeks (140 hours), 25 participants in two groups

OBJECTIVES:
- To be similar with tools and materials used in plumbing. To know the importance of maintenance.
- To be able to execute plumber's work

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Objective and content of the course - Safety rules, use of safety material and first aid
2. Working tools	- Identification, use and maintenance of tools and equipment
3. Plumbing materials	- Knowledge and identification of different material used in plumbing works
4. Knowledge of tubes fittings	- Types of tubes and fittings - Cutting, threading - Fitting, joining, bending
5. Special plumbing	- Knowledge of different types of fittings Air valves, wash outs Stop clocks, bib clocks, gate valves Float valves Other valves and water meters
6. Maintenance and repair of tubes and other parts	- Connections, tubes - Valves and taps - Flushing system
7. House connections	- Execution of house connections - Installation of taps on different pipes
8. Maps and drawings	- Interpreting maps and technical drawings
9. Installation of small waterpumps	- Fitting and installation of small water pumps
10. Final test	

TEACHING METHODS:
- Lectures, Practical, individual exercises
- Demonstrations

COSTS:
Teaching 6000 USD TOTAL 6000 USD

COURSE NAME: Adult Training Methodology
Teacher Training College for Adult Education, Beira-Manga B
Duration 3 weeks (90 hours), 4 participants

OBJECTIVES:
- To enable the adult educators to use the current psychopedagogy and methods of adult education.
- To enable them to plan and carry out lessons
- To give them basic knowledge of the process of planning and organizing small courses for internal education, to enable them to participate as members of an education team.
- To introduce the processes of diagnostification and evaluation, as well as development of teaching processes.

COURSE OUTLINES

TOPIC	CONTENT
1. Introduction	- The general aims and objectives of education, specially of alphabetization - Notions of andragogy; Role of a teacher - The National Education System/The National Programme of Adult Literacy and it's aims and structure
2. Process of Learning	- Motivation; Perception; Knowledge of processing; Types of memory and the process of forgetting
3. Techniques and methods of learning	- Methods: Lecture; Demonstration; Investigation Group work and discussions; Individual study; Brainstorming Dramatizations; Activating methods; Necessity and utility of teaching aid - Basic elements of a lesson: Preparation, stimulation, introduction of new contents, fixation - Variety of lessons: Introductory; Further development/news; Checking, controlling and evaluating; Affirmation; Repetitions; Exercitions
4. Teaching practice	- Planning of lessons; Practical teaching and simulations; Analysis of lessons
5. Evaluation	- Different types of evaluation; Forming questions - Multiple choice tests and their construction; Marking Technique; Central Tencendy-Mean Mark; Spread of Marks-Standard Deviation; Item Analysis - Item Difficulty and Discrimination - Correction; Reliability and validity of tests and exams
6. Planning of courses	- Identifying aims and objectives - Choice of methods; Running of a course; Evaluation
7. Organization	- Participants; Place; Personnel; Practicalities; Materials
8. Final day	- Analyses of the work done during the course; Evaluation of the course

TEACHING METHODS:
- Lectures; shop talk; Brainstorming; Discussions, Demonstrations; Exercises, Teaching practice

COSTS: Teaching 500 USD Materials 300 USD TOTAL 800 USD

COURSE NAME: Operation and Maintenance of Pumps and Valves D
Hidromoc E.E., Beira in cooperation with DNA Training Center
Duration 4 weeks (140 hours), 27 participants in two groups

OBJECTIVES:
- To know the principles of pumps, motors and valves in Water Supply and Wastewater Systems.
- To know the need of maintenance and to make it and to operate the pumping stations.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Objective and programme of the course - Properties of water - Importance of preventive maintenance
2. Workshop knowledge	- Safety rules - Use and care of tools
3. Pump units	- Working principles of the pumps, diesel and electric driven - Operation in water and wastewater systems
4. Prime movers	- Working principles of diesel engines and electric motors - Interpretation of the characteristic curves
5. Faults and repairs	- Fault finding and identification - Repair methods
6. Maintenance	- Preventive maintenance; Lubrification - Selection and use of proper tools - Changing of fuses fan belts air filters - Dismantling and cleaning
7. Valve	- Knowledge of valves and their components - Operation and maintenance of valves
8. Record keeping	- Meter reading - Record keeping - Recording abnormalities and emergencies
9. Operation system in Beira	- Explication of the water supply and wastewater system in Beira
10. Final test	

TEACHING METHODS:
- Lectures and demonstrations
- Exercises and practical work in workshop and pumping stations

COSTS:
Teaching 9000 USD TOTAL 9000 USD

COURSE NAME: Fitter Mechanics, Including Turning and Welding E
Industrial School of Beira
Duration 15 weeks (90 hours), 8 participants

OBJECTIVES:
- To know and identificate tools and metals. To be able correctly and safety execute mechanical workshop works.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Programme and objective of course - Safety rules; first aid
2. Tools	- Identification, use and maintenance
3. Metals	- General identification and knowledge of different metals and other materials
4. Basic works	- Measurement - Marking off - Filing - Hacksawing - Drilling - Tapping and screwing with stocks and dies
5. Milling	- Milling machine - Cutting tools with a milling machine - Rectangular block milling - Milling a V - block
6. Turning	- Lathe; operation and maintenance - Plain turning - Step turning
7. Welding	- Arc welding Principles Polarity; Electrodes and filler rods Metal building up by arc welding Types of joints Weld defects - Gas welding Principles Flames used in gas welding Laying leads without and with filler rods Joints; Weld defects - Metal cutting and bending Cutting and bending with gas Mechanical cutting and bending Drilling
8. Drawings	- Reading and understanding technical drawings
9. Final test	- Written and Practical Tests

TEACHING METHODS:
- Lectures and demonstrations; practical exercises

COSTS:
Teaching 900 USD TOTAL 900 USD

COURSE NAME: Basic Statistics
Commercial School of Amilcar Cabral, Beira
Duration 12 weeks (144 hours), 3 participants

F

OBJECTIVES:
- To be able to make statistical, both numerical and graphical, analyses.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Historical review. Definition, application and use of statistics. Limits and risks of statistics - Descriptive statistics and statistical inference. Inductive and deductive analyses - Population and samples; definition
2. Notions of samples and data processing	- Process phases of statistical analyses - Information sampling Sources and types of data Classification of statistical units Reception and filing of data and documents Methods and proceedings of samples - Data processing Statistical critic Mechanization and automatization Statistical series
3. Distribution of frequencies	- Introduction and conception - Class intervals, limits, class marks - General rules on formation - Histogram, polygon of frequency and curve of frequency Conception, elements and construction of histograms Construction of polygon of frequencies
5. Mean values and percentages	- Arithmetic mean: conception, calculation - Median: Conception, localization and calculation - Mode: conception, localization and use
6. Correlation	- Principle, use, calculation and limits
7. Regression	- Principle, types, use, calculation, limits
8. Final test	

TEACHING METHODS:
- Lectures, discussions, exercises

COSTS:
Teaching 800 USD TOTAL 800 USD

COURSE NAME: Typing
Commercial School of Amilcar Cabral, Beira [G]
Duration 12 weeks (144 hours), 10 participants

OBJECTIVES:
- To give advanced notes and tips for typists. To repeat the general typing functions. To take care of the machines.

COURSE OUTLINES

TOPIC	CONTENT
1. Introduction	- Course object and programme
2. Theory	- Brief history of typewriter - Utility of typewriter - Principle organs of typewriter - Division of keyboard in action fields - Nomenclature - Types of typewriters - Structure and function - Classification by keyboard - Conservation of the typewriter - Damages, manner on impede an remedy - Collocate and substitute the ribbon - Inserting and margination of paper - Position of typist and the machine - Pulsation and it's requisites - Digitation - Regulation of interlineation - Utilization of correction tape - Types of tapes of the typewriter - Typing errors, overwritten characters, use of rubber - Centralizing - Use of tabulator - Commercial phraseology (commencement and finish the letters) - Commercial letters - Requirements - Reports - Stencil - Correction marks - Electrical typewriter
2. Practical lessons	- Digitational training - Pulsation exercises
3. Final test	

TEACHING METHODS:
- Theoretical and practical lectures
- Individual practical exercises

COSTS:
Teaching 900 USD Material 700 USD
TOTAL 1600 USD

COURSE NAME: Office Management
Commercial School of Amilcar Cabral, Beira
Duration 12 weeks (144 hours), 6 participants

H

OBJECTIVES:
- To lead office on every activities including communication and archive.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Justification of function - Principal functions of office
2. Management	- Functions - Principles of management - Quality of the management elements
3. Communication	- Language/tongue/speak - Importance of language Basic principles Simplificate; Clarity; Correction Fault avoiding Repetition; Gerund abuse Syllable division (lisibility rules) - Functions of languages Relations with the communication factors
4. Office	- Function, utility and organization - Installations - Ambience factors (temperature, illumination, etc.) - Furniture distribution - Working table
5. General works	- Expedient work - Visits; Travels of direction - Meetings - Telephone, telex, telefax - Other machines
6. Archive	- Alphabetical classification - Classification by topic - Numerical classification - Alphanumeric classification - Geographical classification - Chronological classification - Chromatic classification - Practical utilization of archive classification
7. Work measurement and control	
8. Final test	

TEACHING METHODS:
- Lectures, discussions, exercises, visits

COSTS:
Training 900 USD Material 400 USD
TOTAL 1300 USD

COURSE NAME: Accounts Management
Commercial School of Amilcar Cabral, Beira [I]
Duration 16 weeks (190 hours), 4 participants

OBJECTIVES:
- To know advanced methods on accounts systems and economical documentation

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Object and programme of the course
2. Patrimony commerce	- Conception of patrimony; base of
3. Inventory and balance	- Inventory - Genesus of balance - Practical disposition of balance - Synthetic and analytic balance - Preliminary and final balance - Classical disposition of balance - Legal dispositions of inventory and balance - Evaluation of patrimony elements
4. Accounts	- Accounts and it's variation - Variations of balance - Casting's forms - Diary and judgment - Application of account principles - Account classification
5. More vulgar accounts	- Capital, chest, deposit in banks - Merchandises, active and passive depts - Result immobilization
6. Documents and registers	- Book-keeping, documents - Books, their classification - Who is dispense for making book-keeping - Internal and external requisites for commerce books - Sanctions for lack of regularity of book-keeping - Complementary notions on the diary and judgment - Ordering accounts in files and registers
7. The phase of account work	- Assembly of writing - Account system and book system - Opening of writing - Accounting of usual operations - Cancellation, balance sheets - Inventory of patrimony - Regularization of accounts - Refining of results - Closing the accounts - Application of results
8. Final test	

TEACHING METHODS:
- Lectures, discussions, exercises, brainstorming

COSTS:
Teaching 1300 USD TOTAL 1300 USD

COURSE NAME: Automotive Repairs
Industrial School of Beira
Duration 15 weeks (90 hours), 5 participants

J

OBJECTIVES:
- To maintain end repair all part of vehicles. To get advanced knowledge on hydraulical and electrical systems.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Objective and programme of the course - Importance of maintenance
2. Safety rules	- First aid - Jack; lifts
3. Materials	- Iron, steel, alloys, plastics, glass - Strength, welding, bonding
4. Working tools	- Hand tools, special tools, electrical and pneumatic tools - Measuring and test instruments
5. Engine	- Engine; Gearbox - Transmission; Suspension - Fuel system Injection pumps; Injectors; Filters, Pipes, Tanks, Feedpumps - Damages and repairs
6. Chassis	- Suspension; Steering - Shock absorbers; Brakes; Wheels and tyres - Damages and repairs
7. Body	- Cabin; Doors; Class - Platform; Hoods; Shuttern - Damages and repairs
8. Hydraulics	- Pumps; Actuadores; - Pressure; Valves - Damages and repairs
9. Electricity	- Battery; Generator - Starter; Wiper; Light - Voltage drops; Test instruments - Electrical motors - Armors - Electrical symbols - Pneumatic/Electric commutation - Working security rules - Damages and repairs
10. Final test	

TEACHING METHODS:
- Lectures and demonstrations; practical workshop exercises.

COSTS:
Teaching 800 USD TOTAL 800 USD

COURSE NAME: Surveying and Mapping
Industrial School of Beira
Duration 15 weeks (90 hours), 6 participants

K

OBJECTIVES:
- To know theoretical principles of basic surveying methods. To be able to plan and execute practical survey and mapping works.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Course programme - Geometry Elements of geometry Units for distance indication Angles, areas, polygons Scales, circle
2. Topography	- General notions - Angles; Quotas; Perfil; Inclination
3. Equipment	- Banderoles; Plumbs - Measuring bands; Squadrons - Magnetic needles; Level and marks - Theodolite
4. Planimetric survey	- General matters - Method of perpendicular measurement - Method of distance - Irradiation; Intersection
5. Altimetric	- General matters - Simple leveling; Composition leveling - Surface leveling
6. Level curves (contours)	- General matters - Interpolation - Tracing of contours
7. Coordinates	- Ortogonal coordinates - Polar coordinates; Topographic coordinates
8. Mapping	- Maps for various purposes - Scales; Symbols - Interpretation of maps - Interpretation of aerial and satellite photographs - Preparation of maps
9. Final test	

TEACHING METHODS:
- Theoretical lectures, calculation exercises
- Field exercised.

COSTS:
Teaching 900 USD TOTAL 900 USD

COURSE NAME: Computer Aided Text Processing (WORDPERFECT)
Computer and Data Processing Centre, Beira
Duration 2 weeks, 6 participants

L

OBJECTIVES:
- To be able to operate with MS-DOS-driven text processor using both diskettes and hard disc.

COURSE OUTLINES

TOPIC	CONTENT
1. Introduction	- Introduction to information - Introduction to computers - Introduction to operation systems Hardware, Software, Firmware
2. MS-DOS	- General characteristics on the operation systems - Main commands - Internal Commands - External commands - Directories, file system - PATH command - Security rules - Diskette management - BACKUP command
3. Text processing (WORDPERFERCT)	- What is "text processing" - Advantages to the classical typing - Main menus - Block management commands - Cursor movement commands - Commands used by screen - Basic choices - Creation documents - Editing documents - Printing documents - Saving documents - Special functions - Search - Block movements
4. Final Test	

TEACHING METHODS:
- Practical lessons
- Practical exercises with microcomputers

COSTS:
Teaching 250 USD Materials 425 USD
TOTAL 675 USD

COURSE NAME: Introduction to Information Technology
Computer and Data Processing Centre, Beira
Duration 6 weeks (60 hours), 20 participants in two groups

M

OBJECTIVES:
- To give general knowledge on the information systems, applications and capacities of microcomputers
- To present the most known software programmes.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Objective and programme of the course
2. System of information technology	- Information and data - Hardware; Software; Firmware
3. Microcomputers	- Parts and function - Comparison between different marks - Maintenance
4. Data	- Input by keyboard - Graphic table - Voice input - Input/Output control
5. Information storage and Retrieval	- File Creation - File Update - Retrieving Files
6. Use of existing programmes:	
MS-DOS	- Principle commands - Directories - Executive files
BASIC	- Introduction to programming - Use of programmes
WORDPERFECT	- Main menus - Cursor commands - Creation of documents - Printing - File saving
LOTUS 1-2-3	- Creation a worksheet - Graphic creation
7. Final test	

TEACHING METHODS:
- Lectures and demonstrations
- Individual practical exercises

COSTS:
Teaching 1500 USD Materials 4760 USD
TOTAL 6260 USD

COURSE NAME: Transport Management
National Directorate of Waters, Training Center
Duration 6 weeks, 1 participant

N

OBJECTIVES:
- To organize and control the transport sector on the following branches:
  Maintenance; Staff organization; Distribution; Costs; Tools; Store.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Importance of well functioning transport administration - Importance of regular preventive maintenance
2. Vehicle costs	- Theory and background - Calculations
3. Transport costs	- Theory and background - Calculations
4. Transport Administration	- Organization - Economics - Routines - Log-books and files - Discipline - Marketing - Legal affairs
5. Fleet Maintenance	- Daily checks - Regular services - Repairs - Spare part supply - Mobile workshop
6. Final test	

TEACHING METHODS:
- Exercises and seminars
- Case studies
- Study visits and use of audio-visual methods.

COSTS:

Alimentation 130 USD	Accommodation 53 USD
Flight Beira-Maputo-Beira 140 USD	Teaching 1125 USD
Daily allowance 42 USD	TOTAL 1490 USD

COURSE NAME: Occupational Safety and Health
National Directorate of Waters, Training Center
Duration 4 weeks, 4 participants

OBJECTIVES:
- To get general view on industrial safety in Mozambique
- To define correctly, what is the working accident and it's influence to productivity.
- To know and handle the occupational protection materials and to know it's importance on healthy protection of workers.
- To know to prevent and to combat fire and the use of extinction equipment
- Application of first aid
- To know the types of working accidents and to apply technical prevention.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Objective of the course and it's contents
2. Concept-Hygiene	- Principle of hygiene - Prevention of illnesses - Waste
3. Accidents	- Primary and secondary prevention - Technics of prevention
4. Individual and general protection	- Individual equipment - Working knowledge - Collective protection material - Working conditions
5. Poisons	- The way through that poisonous substances get into our organism
6. Professional Illnesses	- Causes and identification - Prevention - Treatment
7. Work accidents	- Prevention - Identification and treatment
8. Final test	

TEACHING METHODS:
- Manuals, shop talks, lectures
- Audio-visual methods; study visits.

COSTS:

Alimentation 360 USD	Accommodation 140 USD
Flight Beira-Maputo-Beira 560 USD	Teaching 500 USD
Daily allowance 112 USD	TOTAL 1672 USD

COURSE NAME: Types and Repairs of Watermeters
National Directorate of Waters, Training Center [P]
Duration 6 weeks, 4 participants

OBJECTIVES:
- To be able to fix and dismantle various type of watermeters used in Mozambique. To carry out reparation, calibration and reading.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Course programme - Importance of good care of watermeters
2. Threads	- Opening of threads on calvanized tube - Construction of simple house connection
3. Network	- Different types of networks - Construction principles
4. Tubes and Accessories	- Identification and use
5. Ditches	- Principles
6. Pipe fitting	- General principles
7. Water meters	- Showing of different types of meters - Inside Structure - Installation of watermeters - Operation and function
8. Meter reading	- Reading of multiple and submultiple numbers
9. File keeping	- Calculations and filing
10. Repairing	- Repairing of high calibre and other meters
11. Calibration	- Theory and practice
12. Meter storage	- Painting and stamping
13. Phalanx	- Construction of phalanx for fixing of high calibre meter
14. Final test	

TEACHING METHODS:
- Use of workshop of C.F.P./D.N.A and several teaching apparatus
- Study visits to the Watermeter Department of Aguas de Maputo.

COSTS:

Alimentation 540 USD	Accommodation 210 USD
Flight Beira-Maputo-Beira 560 USD	Teaching 750 USD
Daily allowance 168 USD	TOTAL 2228 USD

COURSE NAME: Electrical Repairs and Installation
National Directorate of Waters, Training Center
Duration 12 weeks, 11 participants in two groups

OBJECTIVES:
- To mount, repair and maintain electrical installations and illuminations and power fund.
- To mount, repair and maintain electrical pumps and other electrical machines.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Summary of the programme - Basic electrical theory
2. Lighting	- Main components of installations - Assembly - Maintenance - Repairing
3. Delivery table and circuit	- Installation - Testing - Fault finding
4. Protecting	- Protection of installations - Earthling
5. Starter systems	- Different types - Operation
6. Electric Motors and Transformers	- Installation, function, operation - Maintenance - Fault finding and repair
7. Electric Machines generally	- Installation, function, operation - Maintenance - Fault finding and repair
8. Measurement Apparatus	- Operation - Maintenance
9. Final test	

TEACHING METHODS:
- Use of electrical, pump and motor workshop of C.F.P./D.N.A.
- Manuals and audio-visual methods
- Study visits: Hidromoc, Electricidade de Moçambique, Agua de Maputo.

COSTS:

Alimentation 2970 USD	Accommodation 1155 USD
Flight Beira-Maputo-Beira 1540 USD	Teaching 3030 USD
Daily allowance 1848 USD	TOTAL 10543 USD

COURSE NAME: Plumbing and Pipe Fitting
National Directorate of Waters, Training Center
Duration 6 weeks, 15 participants in two groups

R

OBJECTIVES:
- To be able to construct and maintain water distribution and wastewater network including accessories and fittings.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Objectives and programme of the course.
2. Tools	- Identification and general knowledge.
3. Materials	- Identification; Properties - Material handling and storing
4. Measurement	- Different methods - Reading of drawings
5. Threads	- Knowledge about screws and screw-nuts - Cutting of threads - Threads of accessories, valves and other fittings
6. Drilling	- Drill and male for drill - Drilling with graver - Drilling under pressure - Drilling or various materials
7. Tube Bending	- Different types - Practical execution
8. Construction of Network	- Main conduit - Distribution net - Opening of ditches and installation of tubes - Fittings and accessories - Maintenance
9. House connections	- Installation of tubes and accessories - Use of different materials (PVC, HDPE, LDPE, calvanized, etc.) - Water meter units
10. Valves	- Installation and Repairing - Preventive and other phases of maintenance - Operation - Leak detection - Repair methods - Preventive maintenance
12. Final test	

TEACHING METHODS:
- Use of plumber's workshop of C.F.P./D.N.A.
- Use of practical teaching zones
- Study visits and audio-visual methods

COSTS:

Alimentation 2025 USD	Accommodation 789 USD
Flight Beira-Maputo-Beira 2100 USD	Teaching 1500 USD
Daily allowance 1260 USD	TOTAL 7674 USD

COURSE NAME: Repairs and Maintenance of Pumps and Valves
National Directorate of Waters, Training Center
Duration 12 weeks, 9 participants in two groups

S

OBJECTIVES:
- To be able to repair and execute maintenance of pump units and valves in water supply and waste water systems
- To know general operation principles

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Course programme - Importance of maintenance
2. Pump types and their components	- Identification of pumps - Components of pumps
3. Maintenance and lubrification of bearings	- Lubrification - General maintenance of bearings
4. Fitting up gasket	- Practical fitting
5. Alignment	- Fitting and testing of electrical and motordriven pumps - Demonstration of various types of couplings
6. Interpretation of characteristic curves	- Principle - Interpretation
7. General principles of operation	- Starting, stopping - Filling the pump with water
8. Function and use of accessories	- Manometer, valves, etc.
9. Valves	- Installation - Reparation
10. Maintenance training	- Preventive and other maintenance - Diesel motor routines
11. Final test	

TEACHING METHODS:
- Use of pump and motor workshop of C.F:P./D.N.A.
- Different types of centrifuge pumps and motors.
- Study visits, catalogues and audio-visual methods.

COSTS:

Alimentation 2430 USD	Accommodation 945 USD
Flight Beira-Maputo-Beira 1260 USD	Teaching 3030 USD
Daily allowance 1512 USD	TOTAL 9177 USD

COURSE NAME. Water Supply and Wastewater Engineering [T]
National Directorate of Waters, Training Center
Duration 12 weeks, 9 participants in two groups

OBJECTIVES:
- To know how the basic principles and most utilized technologies in water supply engineering.
- To be able to superintend the construction and maintenance of water distribution and wastewater system, as well as simple treatment plants.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Basic concepts and practices
2. Systems of Water Supply	- Water Intakes - Transmission and distribution - Pipelines and pipe materials - Pumping stations and design - Pump types and selection - Water Treatment
3. Waste Water Systems	- Sewage network - Stormwater drainage - Pipelines and pipe materials - Overflow structures - Pumping stations - Construction of sewer structures
4. Wastewater Treatment	- Various treatment processes - Re-use of wastewater - Pollution control and prevention
5. Operation and maintenance	- Centralized and decentralized maintenance - Preventive maintenance - Organization and management - Storekeeping and billing
6. Final test	

TEACHING METHODS:
- Exercises, seminars, study visits
- Use of hydraulic and chemical laboratories of C.F.P./D.A.
- Use of films, slides and other audio-visual methods.

COSTS:

Alimentation 2430 USD	Accommodation 945 USD
Flight Beira-Maputo-Beira 1260 USD	Teaching 3710 USD
Daily allowance 1512 USD	TOTAL 9857 USD

COURSE NAME: Personnel Management and Labour Relations U
National Directorate of Waters, Training Center
Duration 4 weeks, 2 participants

OBJECTIVES:
- To promote more capacity in personnel management and labor relations
- To incorporate the scientific methods in staffing organization

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Programme and objective of the course
2. Personnel Policies	- Choose of proper policy - Renumeration - Discipline
3. Staffing Organization	- Function of organization - Principal and secondary function
4. Manpower Training	- Planning - Organizing - Evaluation
5. Performance Evaluation	- Different methods of evaluation
6. Manpower Planning	- Manpower movement - Promotion - Recruitment
7. Labour Relations	- Nature of Human Resources - Motivation - Communication - Staff participation of the company life - Prevention of conflicts
8. Final test	

TEACHING METHODS:
- Human resources Manual compiled in C.F.P./D.N.A.
- Lectures, audio-visual methods

COSTS:

Alimentation 180 USD	Accommodation 70 USD
Flight Beira-Maputo-Beira 280 USD	Teaching 750 USD
Daily allowance 56 USD	TOTAL 1336 USD

COURSE NAME: Project Planning and Management (alternative to the overseas course in Lisbon)
National Directorate of Waters, Training Center [V]
Duration 8 weeks, 4 participants

OBJECTIVES:
- To know phases and methods of project planning, preparation and management.

COURSE OUTLINES

TOPIC	**CONTENT**
- Diagnostic test	
1. Introduction	- Course programme
2. Project preparation and formulation	- Target determination - Strategy comparison and choice - Preparation activities
3. Technics of measuring project results	- Costs and benefits - Essential measurements - Result reliability
4. Project financing	- Different sources - Different types - Risks of financing
5. Project Organization Structures	- Management - Implementation - Planification
6. Project Monitoring and evaluation	- Monitoring system - Evaluation
- Final test	

TEACHING METHODS:
- Exercises, seminars, case studies
- Utilization of audio-visual methods and material produced by the World Bank and translated by DNA Training Center.

COSTS:

Alimentation 720 USD	**Accommodation 280 USD**
Flight Beira-Maputo-Beira 560 USD	Teaching 1500 USD
Daily allowance 224 USD	TOTAL 3284 USD

COURSE NAME: Manpower Training and Development
National Directorate of Waters, Training Center
Duration 8 weeks, 1 participant

W

OBJECTIVES:
- to be able to analyze and develop manpower skills according to the expectations of manpower planning

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Objectives of the course and the course programme
2. Skills of personnel	- Planning - Measurement and analyses - Development
3. Manpower Training	- Adult education - Planning of training activities - Course programming - Teaching methods - Evaluation
4. Systems and techniques of personnel management	- Organization - Communication - Management
5. Manpower Planning	- Basic principles - Planning methods
6. Administrative methods and procedures of manpower	- Most important methods and procedures
- Final test	

TEACHING METHODS:
- Manpower manual compiled in DNA Training Center
- Shop talk, audio-visual methods

COSTS:

Alimentation 180 USD	Accommodation 70 USD
Flight Beira-Maputo-Beira 140 USD	Teaching 1000 USD
Daily allowance 56 USD	TOTAL 1446 USD

COURSE NAME: Stores Management
National Directorate of Waters, Training Center
Duration 6 weeks, 4 participants

X

OBJECTIVES:
- To provide for staff working in acquisition sector different forms of purchase and administrative organization.
- Purchases and material control. Files, medium costs and control of stocks.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Course programme - Importance of well organized store
2. Purchase	- Function of purchase - What is purchasing? - Administrative organization of purchase - Different forms of purchase - Commercial documents - Packaging - Control of bills - Reception and control of merchandise
3. Store Administration	- Store ordering and accounting - Determination of administration level - Existence files - Control of monthly consume - Existence valuation and control - Inventory
4. Stores	- Function of store - Store - Localization of store - Decentralization of stores - Principles and methods of storing - Arrangement planning - Methods of references - Equipment of arrangement
- Final test	

TEACHING METHODS:
- Manuals, working files
- Study visits: Hidromoc, Steia, Entreposto

COSTS:

Alimentation 540 USD	Accommodation 140 USD
Flight Beira-Maputo-Beira 560 USD	Teaching 750 USD
Daily allowance 168 USD	TOTAL 2158 USD

COURSE NAME. Engineering Economics [Y]
National Directorate of Waters, Training Center
Duration 12 weeks, 2 participants

OBJECTIVES:
- To know the fundamental principles and methods of cost analysis of water and wastewater systems.
- To be able to effectuate cost-benefit analyses of water supply projects.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Course programme and objectives of the course.
2. Basic conceptions	- Terminology and basic principles
3. Costs of investment	- Costs of implementation - Costs of construction - Materials and hand work
4. Depreciation	- Principle and objects - Determination of depreciation time - Depreciation systems
5. Operating costs	- Different factors - Direct and indirect costs - Monitoring
6. Cost-benefit analyses	- Different methods and basic principles - Profit of project - Profit of operation
7. Financial analyses	- Source of funds - Budget of various sectors of Company - Budget control and monitoring
- Final test	

TEACHING METHODS:
- Exercises, seminars.
- Case studies
- Utilization of audio-visual methods and material produced by the World Bank (translated by DNA Training Center).

COSTS:

Alimentation 540 USD	Accommodation 140 USD
Flight Beira-Maputo-Beira 280 USD	Teaching 2 250 USD
Daily allowance 168 USD	TOTAL 3378 USD

OVERSEAS TRAINING

LISBON COURSE
6 participants, Duration 5 weeks

Z

BLOCK (1) - GENERAL PART (GENERAL COURSE OF 2 WEEKS)
6 Technicians of Aguas da Beira"

1 - General Management - 3 Days
2 - The Water Production and Distribution - 2 Days
3 - Drainage and Sewage Treatment Systems - 2 Days
4 - Applications in Microcomputing - 3 Days

BLOCK (2) - PRACTICAL PROFESSIONAL TRAINING PERIOD
(3 COURSES WITH A DURATION OF 2 WEEKS)
3 Subgroups with 2 technicians, each

A - Planning and Management of Works
B - Impounding, supply, treatment and exploitation
C - Human Resources and Finances

BLOCK (3) - STUDY VISITS (1 WEEK)
6 Technicians - 1 week

The training courses will be held in HIDROPROJECTO's and EPAL's premises.

PRELIMINARY TRAINING COURSES PROGRAM

BLOCK (1) - GENERAL PART

1. Organization and Management Systems (3 Days Period)
- **1.1** - The Enterprise, the Management and its Environment;
- **1.2** - Planning - Enterprise aims, strategies definition and the planning process;
- **1.3** - Enterprises Organization and Management;
- **1.4** - Management Control Process and the Information Systems;
- **1.5** - Charging, invoicing and collection of the water bills.

2. The Water Production and Distribution (2 Days Period)
- **2.1** - The historical evolution of the water supply process and the water cycle;
- **2.2** - From the impounding to the supply - urban and rural environment;
- **2.3** - Composition and quality of the water.

3. The Drainage and Sewage Treatment Systems (2 Days Period)
- **3.1** - Drainage
- **3.2** - Treatment of domestic and industrial wastes

4. Microcomputing (3 Days Period)
- **4.1** - Introduction to the data processing and to the microcomputing;
- **4.2** - Information, computer and information processing notions;
- **4.3** - Microcomputers;
- **4.4** - Operational systems;
- **4.5** - Software for microcomputers (Word processing, computing leaf, data bases, CAD, etc.)

BLOCK (2) - PRACTICAL PROFESSIONAL TRAINING PERIOD
(3 COURSES WITH A DURATION OF 2 WEEKS)

A - PLANNING AND MANAGEMENT OF WORKS (2 technicians)

1 - Activity of equipment maintenance (mechanics, electricity, instrumentation and telecommunications);
2 - General workshop - specialized works and recovery of the network materials;
3 - Management, checking and repair of counters;
4 - Car fleet - Management and maintenance;
5 - Distribution systems and its record;
6 - General network and performance of enlargement works and network replacement;
7 - Ruptures repair and maintenance of the maneuver parts of the network;
8 - Studies, designs and planning of works.

B - EXPLOITATION AND SUPPLY (2 Technicians)

1 - Superficial and ground impounding;
2 - Pumping systems and pumping central;
3 - Pumping stations, chlorination posts;
4 - Treatment plant;
5 - Quality control (Equipments and Methods);
6 - Exploitation and supply system;
7 - Exploitation control (Equipments and Control Processes);

C - HUMAN RESOURCES AND FINANCES (2 Technicians)

1 - Organization and Management of Human Resources and Social Support;
2 - Aspects of sanitation, medicine, prevention and safety in work;
3 - Management and renumeration;
4 - Technical management of human resources and professional training;
5 - General and analytic accountancy (budgetary and of exploitation);
6 - Treasury - organization and functioning aspects;
7 - Management control - Analysis; information and control;
8 - Planning and financial management;
9 - Provision of the working and investment costs/Charging systems.

BLOCK (3) STUDY VISITS (1 week)

1 - Visit to the subsystem of Castelo de Bode;
2 - Visit to the treatment plant of Vale da Pedra;
3 - Visit to the enterprise premises related with the supply system exploitation (Past and Present);
4 - Visit to the new interception and sewage treatment system of the city of Lisbon;
5 - Visit to Municipality systems of water and sanitation;
6 - Visit to a Projects Enterprise.

COSTS:

Teaching	26 000 US$	Alimentation and accommodation	3 000 US$
Flights	14 200 US$	Daily allowance	4 800 US$
TOTAL	48 000 US$		

COURSE NAME. Ceneral Course in Management Techniques (Foreman Course)
National Directorate of Waters, Training Center
Duration 2 weeks, 25 participants in 3 groups

Ä

OBJECTIVES:
- To know general principles of management and apply them into practice.
- To be able to lead the staff by legal, rightfull and skilled way.

COURSE OUTLINES

TOPIC	CONTENT
- Diagnostic test	
1. Introduction	- Course programme and objectives of the course.
2. Basic conceptions	- Terminology and basic principles - Management levels
3. Recruitment principles	- Need of personnel - Job descriptions
4. Job instruction	- Company level instruction - Job level instruction - Total need of instruction
5. Staff handling	- Motivation - Delegation - Order giving - Policy aspects
6. Result control	- Control the given orders - Job measurement - Job evaluation
7. Training	- Identification of training needs - Training techniques - Evaluation of the success of training
- Final test	

TEACHING METHODS:
- Pracical exercises, seminars.
- Role plays
- Lessons
- Utilization of audio-visual methods.

COSTS:

Alimentation 1125 USD	Accommodation 438 USD
Flight Beira-Maputo-Beira 3500 USD	Teaching 1 125 USD
Daily allowance 350 USD	TOTAL 6538 USD

TRAINING MATRIX

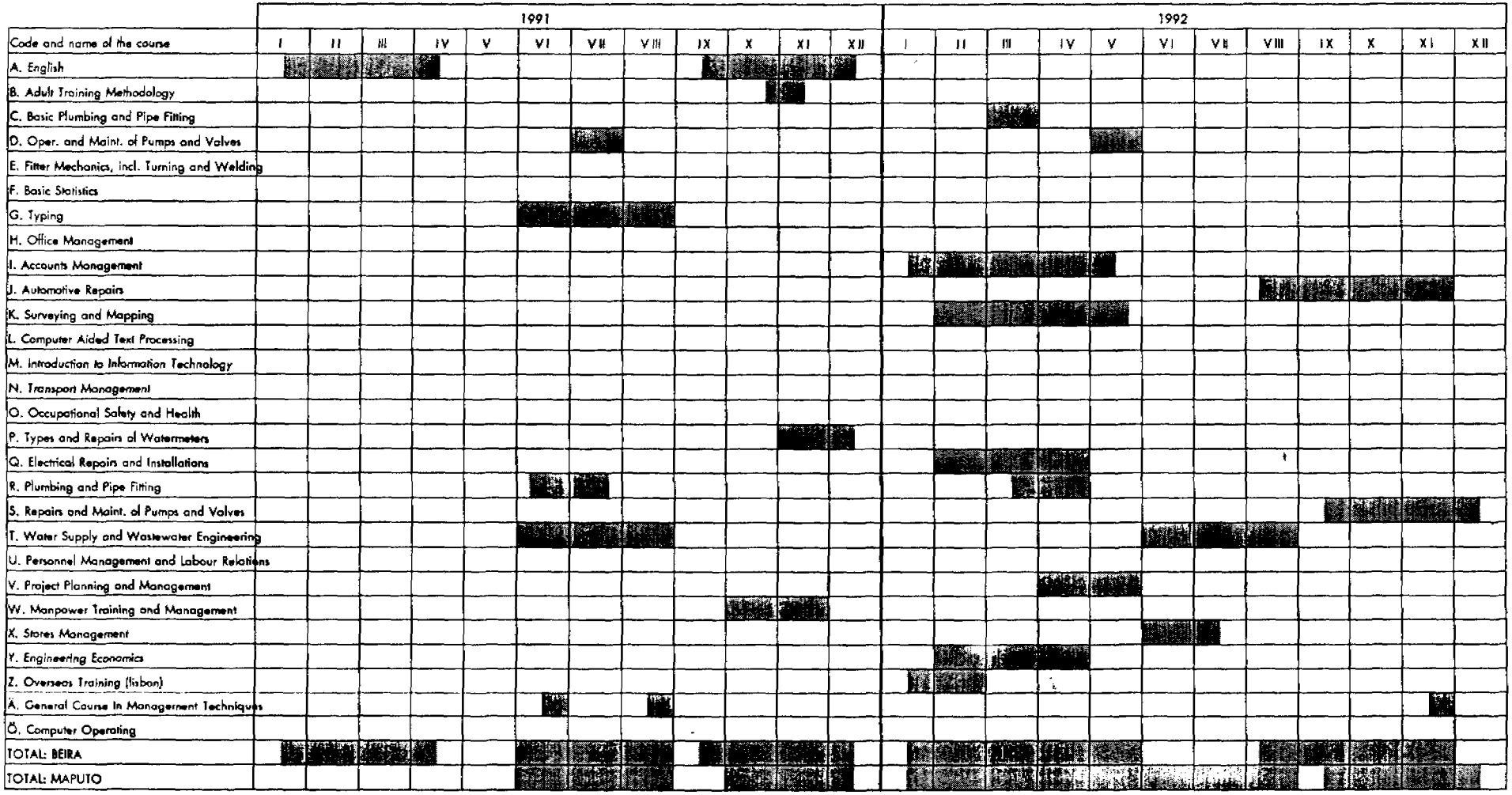
Position	Sect.	Dept.	Nr.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Ä	Ö
General Director			1													1							1						1		
Chief of Dept.		WW	1	1												1							1						1	1	
Chief of Dept.		NW	1	1												1							1						1	1	
Chief of Dept.		WT	1													1							1								
Chief of Dept.		DW	1	1												1							1								
Chief of Dept.		MV	1										1			1														1	
Chief of Dept.		PE	1	1												1								1				1	(1)		
Chief of Dept.		AC	1													1												1	(1)		
Chief of Dept.		CS	1	1												1															
Superv./Oper.			1													1									1				1		
Chief of Section	OP	WW	1																			1									
Chief of Section	MA	WW	1																			1								1	
Chief of Section	NW	NW	1																		1									1	
Chief of Section	MM	NW	1																		1										
Chief of Section	TR	MV	1	1									1				1													1	
Chief of Section	OP	DW	1																			1									
Chief of Section	PE	PE	1						1		1					1								1						1	
Chief of Section	TG	PE	1	1												1										1				1	
Chief of Section	PA	AC	1	1							1	1				1														1	
Chief of Section	AC	AC	1									1				1															
Chief of Section	SP	AC	1	1												1											1				
Chief of Section	MR	CS	1	1							1					1														1	
Chief of Section	BL	CS	1	1							1					1														1	
Chief of Section	WT	WT	1	1																										1	
Chief of Section	PU	WT	1				1																								
Clerk, Secretaries			3	1						2	1				2																1
Laboratory tech.	Lab.		2	2																										1	
Laboratory ass.	Lab.		1																												
Pump Mechanic		WW	7																			3									
Pump. Oper. Foreman	OP	WW	1																			1								1	
Pump Operator	OP	WW	27				18																								
Cleaners	OP	WW	27																												
Electrician	MA	WW	4																	4											
Ass. Electrician	MA	WW	2																	2											
Carp., Mason, Paint.		NW	3,4,2																												
Plumber Foreman	NW	NW	1																		1									1	
Plumber	NW	NW	9																		9									1	
Ass. Plumber		NW	25			17																									
Plumber Foreman	MM	NW	1																		1									1	
Plumber	MM	NW	5			3																									
Mason, Painter		WT	2, 1																												
Fitter, Ass. Fitter		WT	1, 1					2																							
Ass. Electrician(teacher)		WT	1		1															1											
Lubricator		WT	1																												
Treat. Oper. and Ass.	WT	WT	5, 10																												
Pump oper. and ass.	PU	WT	5, 8																												
Motor Vehicle Mech.		MV	3										3																		
Ass. Mot. Veh. Mech.		MV	9																												
Drivers	TR	MV	10																												
Fitter, Ass. Fitter		DW	3, 2					5																							
Turner		DW	1					1																							
Electrician		DW	2																	2											
Ass. Electrician		DW	1																	1											
Pump Mechanics		DW	2																			2									
Ass. Pump Mechanics		DW	2				2																								
Water Meter Mech.		DW	2																2											1	
Ass. Wat. Met. Mech.		DW	1																1												
Pump Operator	OP	DW	8				6																								
Occupational Safe		PE	4															4												1	
Officer in Charge		PE	2																												
Typist	PE	PE	2							2					2																
Teacher	TG	PE	3		3																										
Cashier, Ass. Cash.	PA	AC	4, 1	1																											
Clerk	AC	AC	2							1																					1
Officer in Charge	SP	AC	2	1					1			1				1											2				
Storekeeper	SP	AC	1																								1			1	
Ass. Storekeeper	SP	AC	5																												
Clerk		CS	3																												
Clerk		CS	2																												
Plumber	PO	CS	1																		1										
Ass. Plumber		CS	5			3																									
Plumber	MP	CS	2			2																									
Water Meter Reader	MR	CS	7																												
Senior Clerk	BL	CS	1						1							1															1
Clerk	BL	CS	6							3																					
Draftsman		PC	1																												
Secretary		PC	1							1					1																
Surveyor, Ass. Surv.		PC	2, 2											4																1	
Plumping techn.		PC	1	1															1		1		1							1	
Electr.-foreman		PC	1																	1										1	
Planning Technician		PC	1	1												1							1		1				1		
Excavator Operator		PC	1																												
Civil engineer		SU	2																						2						
Eng. technician		SU	3																				3								
Adm. technician		SU	1	1							1	1																			
Surveyor		SU	2											2																	
Clerk		SU	1							1					1																
Draftsman		SU	1																												
	TOTAL		299	20	4	25	27	8	3	10	6	4	5	6	6	20	1	4	4	11	15	9	10	2	4	1	4	2	6	25	3
				A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Ä	Ö

COSTS OF THE COURSES

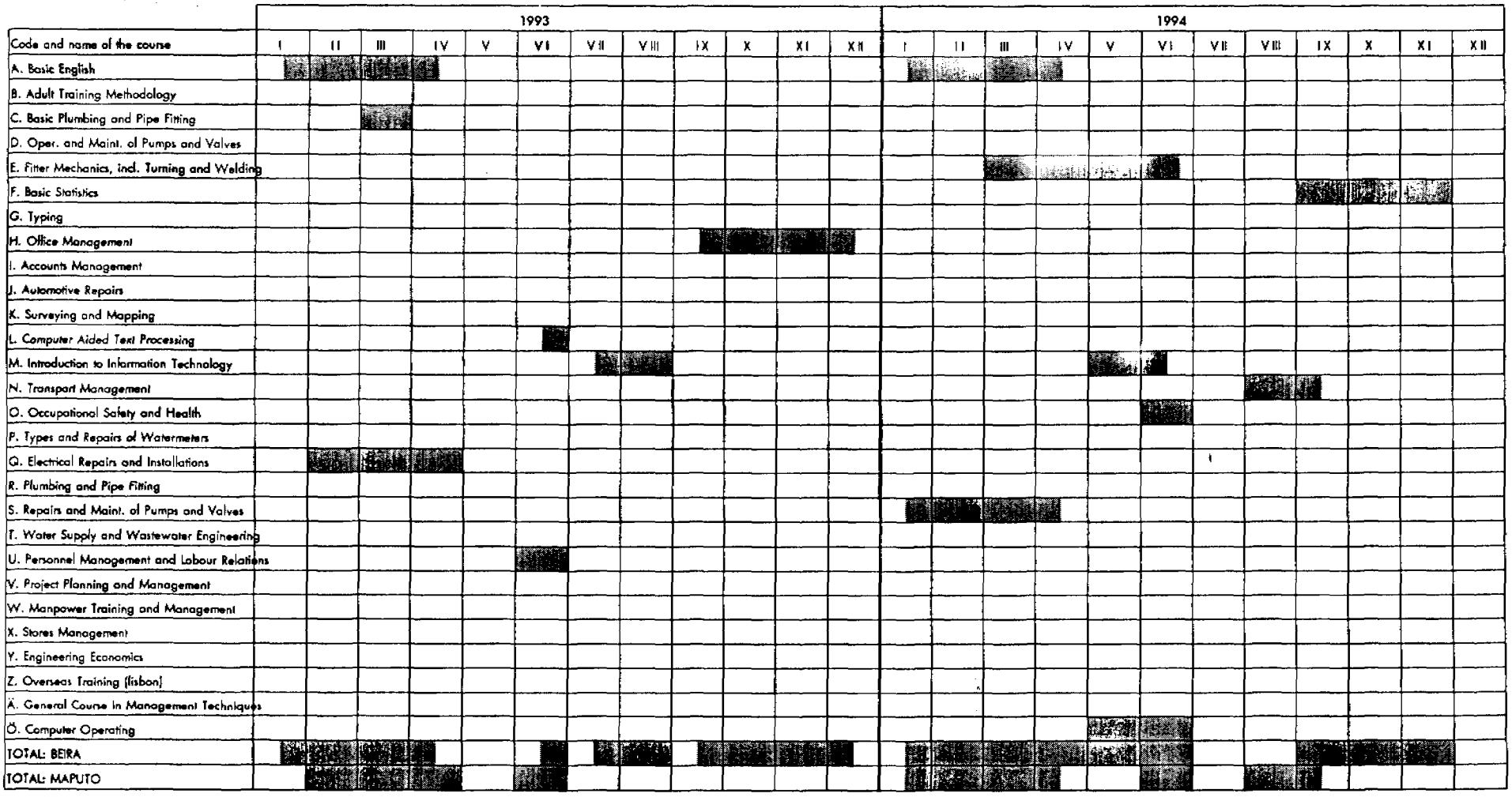
CODE AND TITLE OF COURSE	Duration hours	Duration weeks	No. of partic.	ESTIMATED COSTS, USD
Training Center/DNA, Maputo				
N. Transport Management	120	6	1	1,490
O. Occupational Safety and Health	80	4	4	1,672
P. Types and Repairs of Watermeters	120	6	4	2,228
Q. Electrical repairs and installations	480	24	11	10,543
R. Plumbing and Pipe Fitting	240	2 * 6	15	7,674
S. Repairs and Maintenance of Pumps and Valves	480	2 * 12	9	9,177
T. Water Supply and Wastewater Engineering	480	2 * 12	9	9,857
U. Personnel Management and Labour Relations	80	4	2	1,336
V. Project Planning and Management	160	8	4	3,284
X. Stores Management	120	6	4	2,158
Y. Engineering Economics	240	12	2	3,378
W. Manpower Training and Development	160	8	1	1,446
Ä. General Course in Management Technics	120	3 * 2	25	6,538
Z. Overseas Training, Lisbon		5	6	48,000
Comercial School of Amilcar Cabral				
F. Basic Statistics	144	12	3	800
G. Typing	144	12	10	1,600
I. Accounts Management	190	16	4	1,300
H. Office Management	144	12	6	1,250
Computer Training Center				
L. Computer Aided Text Processing	33	2	6	675
M. Introduction to Information Technology	2 * 60	2 * 6	20	6,260
Hidromoc E.E. and DNA Tr. Center				
D. Operation and Maintenance of Pumps and Valves	2 * 140	2 * 4	27	9,000
C. Basic Plumbing and Pipe Fitting	2 * 140	2 * 4	25	6,000
Industrial School				
E. Fitter Mechanics, incl. Turning and Welding	90	15	8	900
J. Automotive Repairs	90	15	5	800
K. Surveying and Mapping	90	15	6	900
Teacher Training College for Adult Education				
B. Adult Training Methodology	90	3	4	800
Emodrag E.E.				
A. English		4 * 16	20	4,000
		TOTAL		143,066
		PRICE ESCALATION		14,307
		GRAND TOTAL		157,373

Course calendar

TRAINING PLAN, TIME SCHEDULE OF THE COURSES, 1991-1992



TRAINING PLAN, TIME SCHEDULE OF THE COURSES, 1993-1994



COURSE PARTICIPATIONS, TIME SCHEDULE 1991-1992

Position	Sect.	Dept.	Nr.	1991 I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	1992 I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
General Director			1					T								Z											
Chief of Department		WW	1	A				T				A				Z										Ä	
Chief of Department		NW	1	A							Ä	A				Z				T							
Chief of Department		WT	1																	T							
Chief of Department		DW	1	A								A								T							
Chief of Department		MV	1						Ä														J				
Chief of Department		PE	1	A								A				Z			Y								
Chief of Department		AC	1													Z			Y								
Chief of Department		CS	1	A								A															
Technician			1	A												Z			V								
Chief of Section	OP	WW	1																					S			
Chief of Section	MA	WW	1						Ä																		
Chief of Section	NW	NW	1						R		Ä																
Chief of Section	MM	NW	1																	R							
Chief of Section	TR	MV	1	A					Ä			A											J				
Chief of Section	OP	DW	1																					S			
Chief of Section	PE	PE	1						Ä																		
Chief of Section	TG	PE	1	A								W														Ä	
Chief of Section	PA	AC	1	A							Ä	A															
Chief of Section	AC	AC	1													I											
Chief of Section	SP	AC	1	A								A				I					X						
Chief of Section	MR	CS	1	A								A														Ä	
Chief of Section	BL	CS	1	A								A														Ä	
Chief of Section	WT	WT	1	A							Ä	A															
Chief of Section	PU	WT	1						D																		
Clerk, Secretaries			3	A			1	G			2	A			1												
Laboratory technician	Lab.		2	A								A														Ä	
Laboratory assistant	Lab.		1																								
Pump Mechanic		WW	7																					S			2
Pump. Oper. Foreman	OP	WW	1						Ä																		
Pump Operator	OP	WW	27						D		9									D		9					
Cleaners	OP	WW	27																								
Electrician	MA	WW	4													G					2						
Ass. Electrician	MA	WW	2													G					1						
Carp., Mason, Paint.		NW	3,4,2																								
Plumber Foreman	NW	NW	1						Ä									R									
Plumber	NW	NW	9						R		4							R			5					Ä	1
Ass. Plumber	NW	NW	25															C		9							
Plumber Foreman	MM	NW	1						R		Ä																
Plumber	MM	NW	5															C									
Mason, Painter		WT	2, 1																								

APPENDIX 9 (4/7)

continue...

Position	Secr.	Dept.	Nr.	1991 I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	1992 I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Fitter, Ass. Fitter		WT	1, 1																								
Ass. Electr. (teacher)		WT	1													B											
Lubricator		WT	1																								
Treat. Oper. and Ass.	WT	WT	5, 10																								
Pump oper. and ass.	PU	WT	5, 8																								
Motor Vehicle Mech.		MV	3																				J				
Ass. Mot. Veh. Mech.		MV	9																								
Driver	TR	MV	10																								
Fitter, Ass. Fitter		DW	3, 2																								
Turner		DW	1																								
Electrician		DW	2													Q				1							
Ass. Electrician		DW	1													Q				1							
Pump Mechanics		DW	2																					S			1
Ass. Pump Mech.		DW	2						D	1										D	1						
Water Meter Mech.		DW	2										P													Ä	1
Ass. Wat. Met. Mech.		DW	1										P														
Pump Operator	OP	DW	8						D	3										D	3						
Occupational Safe		PE	4						Ä	1																	
Officer in Charge		PE	2																								
Typist	PE	PE	2					G			2																
Teacher	TG	PE	3													B											
Cashier, Ass. Cash.	PA	AC	4, 1	A			1					A			1												
Clerk	AC	AC	2					G			1																
Officer in Charge	SP	AC	2	A			1					A			1	I				1	X						
Storekeeper	SP	AC	1							Ä										X							
Ass. Storekeeper	SP	AC	5																								
Clerk		CS	3																								
Clerk		CS	2																								
Plumber	PO	CS	1					R																			
Ass. Plumber		CS	5														C		2								
Plumber	MP	CS	2														C		1								
Water Meter Reader	MR	CS	7																								
Senior Clerk	BL	CS	1																								
Clerk	BL	CS	6					G			0																
Draftsman		PC	1																								
Secretary		PC	1					G																			
Surveyor, Ass. Surv.		PC	2, 2							Ä						K											
Plumber technician		PC	1	A									P					R			T					Ä	
Electrician-forman		PC	1						Ä																		
Planning Technician		PC	1	A				T				A				Z			V								
Excavator Operator		PC	1																								
Civil Engineer		SU	2																V								
Eng. Technician		SU	3					T			2										T			1			
Adm. Technician		SU	1	A								A				I											
Surveyor		SU	2													K											
Clerk		SU	1					G																			

COURSE PARTICIPATIONS, TIME SCHEDULE 1993-1994

Position	Sect.	Dept.	Nr.	1993 I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	1994 I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
General Director			1							M																	
Chief of Department		WW	1	A						M						A											
Chief of Department		NW	1	A												A				M							
Chief of Department		WT	1																	M							
Chief of Department		DW	1							M																	
Chief of Department		MV	1																	M							
Chief of Department		PE	1	A				U								A				M							
Chief of Department		AC	1							M																	
Chief of Department		CS	1	A												A				M							
Technician			1	A						M																	
Chief of Section	OP	WW	1																								
Chief of Section	MA	WW	1													S											
Chief of Section	NW	NW	1																								
Chief of Section	MM	NW	1																								
Chief of Section	TR	MV	1	A												A							N				
Chief of Section	OP	DW	1																								
Chief of Section	PE	PE	1					U				H								M				F			
Chief of Section	TG	PE	1	A						M						A											
Chief of Section	PA	AC	1	A								H				A				M							
Chief of Section	AC	AC	1							M																	
Chief of Section	SP	AC	1	A						M						A							t				
Chief of Section	MR	CS	1	A								H				A				M							
Chief of Section	BL	CS	1	A								H				A				M							
Chief of Section	WT	WT	1	A												A											
Chief of Section	PU	WT	1																								
Clerk, Secretaries			3	A			1		L	2		H			1	A			1	O		1					
Laboratory technician	Lab.		2	A																							
Laboratory assistant	Lab.		1																								
Pump Mechanic		WW	7													S			1								
Pump. Oper. Foreman	OP	WW	1													S											
Pump Operator	OP	WW	27																								
Cleaners	OP	WW	27																								
Electrician	MA	WW	4	O				2																			
Ass. Electrician	MA	WW	2	O				1																			
Carp., Mason, Paint.		NW	3, 4, 2																								
Plumber Foreman	NW	NW	1																								
Plumber	NW	NW	9																								
Ass. Plumber	NW	NW	25			C	8																				
Plumber Foreman	MM	NW	1																								
Plumber	MM	NW	5			C	2																				
Mason, Painter		WT	2, 1																								

APPENDIX 9 (6/7)

continue...

Position	Sect.	Dept.	Nr.	1993 I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	1994 I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Fitter, Ass. Fitter		WT	1, 1														E										
Ass. Electrician (teacher)		WT	1		O																						
Lubricator		WT	1																								
Treat. Oper. and Ass.	WT	WT	5, 10																								
Pump oper. and ass.	PU	WT	5, 8																								
Motor Vehicle Mech.		MV	3																								
Ass. Mot. Veh. Mech.		MV	9																								
Drivers	TR	MV	10																								
Fitter, Ass. Fitter		DW	3, 2														E										
Turner		DW	1														E										
Electrician		DW	2		O																						
Ass. Electrician		DW	1																								
Pump Mechanics		DW	2													S			1								
Ass. Pump Mechanics		DW	2																								
Water Meter Mech.		DW	2																								
Ass. Wat. Met. Mech.		DW	1																								
Pump Operator	OP	DW	8																								
Occupational Sole		PE	4																	O							
Officer in Charge		PE	2																								
Typist	PE	PE	2						L																		
Teacher	TG	PE	3																								
Cashier, Ass. Cash.	PA	AC	4, 1	A			1									A			1								
Clerk	AC	AC	2																	Ö		1					
Officer in Charge	SP	AC	2	A			1									A			1	M		1					
Storekeeper	SP	AC	1																				F				1
Ass. Storekeeper	SP	AC	5																								
Clerk		CS	3																								
Clerk		CS	2																								
Plumber	PO	CS	1																								
Ass. Plumber		CS	5			C	1																				
Plumber	MP	CS	2			C	1																				
Water Meter Reader	MR	CS	7																								
Senior Clerk	BL	CS	1							M										Ö			F				
Clerk	BL	CS	6																								
Draftsman		PC	1																								
Secretary		PC	1	A					L							A											
Surveyor, Ass. Surv.		PC	2, 2																								
Plumber technician		PC	1	A												A											
Electrician-formon		PC	1		O																						
Planning Technician		PC	1	A						M																	
Excavator Oper.		PC	1																								
Civil Engineer		SU	2																								
Eng. Technician		SU	3																								
Adm. Technician		SU	1	A								H				A											
Surveyor		SU	2																								
Clerk		SU	1						L																		

ACTUAL SUBSTITUTE SYSTEM OF AdB

Position	No.	Substitute
General Director	1	Chief of Acc. Dept.
Technician (Chavane)	1	Director, Chiefs of Depts.
Clerks of secretariat	2	Each others
Secretary of the Gen. Dir. (vacant)	1	Teacher (Inés Mariazinha)
Laboratory workers	3	Each others

WASTEWATER DEPARTMENT

Chief of Department	1	Chief of Maintenance Section (Bené)
Pump mechanic	7	Each others
Chief of Operation Section (vacant)	1	Chief of Department
Clerk (António Guente)	1	Chief of Department
Pump operator	27	Each others
Cleaner Foreman	4	Each others
Cleaner	24	Each others
Chief of Maintenance Section	1	Chief of Department Electrician (Eduardo F. Manuel)
Electrician, ass. el.	6	Each others

WATER TREATMENT DEPARTMENT

Chief of Department	1	Chief of Treatment Section
Mason, Painter, Fitter, ass.Fitter, ass. electrician, Lubricator	7	Chiefs of Sections Each others
Chief of Treatment Section	1	Chief of Department
Treatment Operator and ass.	15	Each others
Chief of Pumping Section	1	Chief of Department Pump Operator (Victor Airone)
Pump Operators ans ass.	13	Each others

NETWORK DEPARTMENT

Chief of Department	1	Chief of Network Maintenance Section
Carpenter, Mason, Painter	9	Each others
Chief of Network Maint. Section	1	Chief of Department Chief of Mainline Maintenance Section
Plumber Foreman (J. Mandava)	1	Plumber (Paulo Ndevo)
Plumber, ass. plumber	24	Each others
Chief of Mainline Maint. Section	1	Plumber (Raul J. Domoze, Pedro M. Tima)
Plumber (Raul J. Domoze)	1	Plumber (Pedro M. Tima)
Ass. Plumber	14	Each others

MOTOR VEHICLE DEPARTMENT

Chief of Department	1	Chief of Transport Section
Motor Vehicle Mechanic and ass.	12	Each others
Chief of Transport Section	1	Chief of Department
Driver	10	Each others

DRINKING WATER MAINTENANCE DEPARTMENT

Chief of Department	1	Fitter (Jorge Mequecene) Electrician (Ilídio)
Workshop employees	16	Each others
Chief of Operation Section	1	Chief of Department Operator (Augusto Pongo)
Pump Operator	8	Each others

PERSONNEL DEPARTMENT

Chief of Department	1	Chief of Personnel Section
Officer in Charge of Occupational	1	Coto: Pinho P. Gema
Safety and Sanitary Fuctions		Munhava: Pinho M. Sande Mutua: Picho Anisa
Off. in Charge of Soc. Serv. and Protocol	1	-
Chief of Personnel Section	1	Officer in Charge of Classification and Norms
Officer in Charge of Classification and Norms	1	-
Typist	2	Each others
Chief of Training Section	1	Teacher (Agostinho Sates)
Teacher	3	Each others

ACCOUNTS DEPARTMENT

Chief of Department	1	General Director (desicions) Chief of Personnel Department
Chief of Payments Section	1	Chief of Department Cashier (Fabião Gemo)
Cashier and assistants	5	Each others
Chief of Accounts Section	1	Chief of Department
Clerk	2	Each others
Chief of Supply Section	1	Officer in Charge of Purchases, Custom Declarations and Fuels
Purchase Clerk (Américo)	1	Officer in Charge of Purchases, Custom Declarations and Fuels
Officer in Charge of Purchases, Custom Declarations and Fuels	1	Chief of Supply Section Storekeeper (Zana)
Storekeeper	1	Purchase Clerk
Ass. Storekeeper	5	Each others

CONSUMER SERVICE DEPARTMENT

Chief of Department	1	Chief of Meter Reading Section
Contracts and Information Clerk	5	Each others
Plumbers and assistants	8	Each others
Chief of Meter Reading Section	1	Chief of Department Reader (António C. Candicho)
Water Meter Readers	7	Each others Chief of Water Reading Section
Chief of Billing Section	1	Senior Clerk (Zinga)
Senior Clerk	1	Chief of Billing Section
Clerk	6	Each others

Guidelines for on-the-job training

Training of trainers

ON-THE-JOB TRAINING

1. AIMS AND OBJECTIVES OF ON-THE-JOB TRAINING

On-the-job training is provided at the work place, in actual working situations. As for planning and implementation procedures, there are differences as compared with off-the-job training, even though the aims are the same, thus

(a) to increase productivity by ensuring that employees achieve standards of quality and quantity in the shortest possible time;

(b) to ensure that plant and equipment is properly, safely and economically used;

(c) to make best use of raw materials and thereby avoid waste;

(d) to enable workers to achieve optimum earnings as quickly as possible;

(e) to help reduce labour turn-over by encouraging workers to develop their skills quickly.

2. STRUCTURE OF THE ON-THE-JOB TRAINING PROGRAMME

A training programme can be divided into the following parts: Induction and development of skill and acquisition of job knowledge.

(a) Induction training

Induction training represents the first phase of one-the-job training.

When new employees start work in an organization they cannot give of their best until they have become accustomed to their new environment and the general working conditions.

Some of the more important topics which might be included in an induction training syllabus are set out below.

(i) Safety and accident prevention

- Workshop safety
- Industrial hygiene and preventative health measures
- First aid facilities

(ii) Fire precautions and alarm procedures

(iii) Organization, rules procedures and terms and conditions of employment
- Time keeping
- Hours of work
- Pay arrangements
- Sickness and absence
- Holiday arrangements
- Other relevant information

(b) Identification of the skills and knowledge to be trained

The main part of the on-the-job training is intended to develop the required skills and pass on the knowledge required for the employees to do the job efficiently and safely.

The best way of developing a combination of skills and elements of know-how is to learn and practice each component skills separately until a satisfactory standard is reached. In order to identify required skills, the task and skill analyses are to be made.

The tasks and skills analyses can be carried out by interviewing employees and observing their activities at work places as done in connection with off-the-job training courses.

Another method of preparing the analyses is to make grids, as explained in the chapter "Training of trainers".

A detailed breakdown of the job is required to be sure that nothing is overlooked in the instruction. The analysis/breakdown may include also key points of each step.

Fault analysis

Fault analysis is a means of identifying the faults which can occur in an operation, their cause, remedy and prevention. It is an extension of task analysis and helps to reduce the amount of scrap, loss of production time and risk of damage to plant and material.

Extract from fault analysis:
Manufacture plate for support bracket

Name	Cause	Effect	Action	Preventation
Undersize hole	- Incorrect drill selected - Worn drill	Component cannot be assembled	Change drill, Re-drill to correct size	Check size of drill before fitting
Oversize hole	- Incorrect drill selected - Blunt drill	Component scrapped	Complete scrap record Change drill	

The above analyses will then constitute the basis for the curriculum and instructor's outline.

3. THE INSTRUCTION METHODOLOGY FOR ON-THE-JOB TRAINING

The general pattern of instruction of a skill is a four-step process:

(a) **Prepare the employee**

Find out what he already knows about the job and stimulate his interests in it.

(b) **Present the operation**

Go through the operation carefully using drawings, diagrams, job sheets, instruction sheets, etc. for reference.

Particularly with longer or more complex jobs it is better to prepare and use the so called instruction sheets, setting out in the correct order of stages of instruction with the necessary details of how the task should be done. A sample instruction sheet is shown in App. A.

Tell the trainee exactly what each stage is and how to do it by way of demonstration. Note the key points and precautions which must be taken to protect the work, equipment or the operator himself.

(c) **Try out employee's performance**

Let him perform the operation. Have him explain the steps and key points to you.

Ask him questions about the steps to be absolutely sure that the understands them thoroughly.

(d) **Follow-up**

Put the trainee on his own. Let him do the job by himself. Observe his performance regularly to be sure he is following the correct methods.

The trainer must keep a close watch on the progress of the trainee as training continues. Any difficulty the trainee is having should be instantly brought to the attention of the trainer.

4. SELECTION OF THE TRAINING PLACE

In general the on-the-job training takes place at the trainee's workplace.

He will learn to use tools and equipment which he has to use in actual operations as for training. He is able to develop positive contacts with his fellow employees and supervisory staff already during the training time, both of which greatly contribute to the job success and motivation of the employee.

There are, however, some points to be taken into account.

First, the tools and equipment as stated in the training programme must be available.

Second, the skills of the instructors must be up-to-date.

In the negative case the training should be implemented in other facilities where the above-mentioned requirements are met. The training or a part of it may take place even in an overseas organization.

5. MEASUREMENT OF TRAINEE'S PROGRESS

Measurement of trainee's progress is the responsibility of the trainer. Well-planned tests will give him this essential information. Tests vary from a casual question asked of a trainee to a request for a detailed explanation of a complicated operation or a comprehensive written examination, or job performance.

(a) Performance tests measure the ability to perform the specific tasks at a skill level commensurate with the stage of training. This type of practical tests are meaningful to the learner and give the trainer concrete evidence of skill development. A sample practical test is shown in App. B.

(b) Verbal tests can vary in difficulty. They provide a quick check on the spot on basic understanding of the trainee.

(c) Written tests measure the job knowledge related to the operation of the skill. There is a wide choice of written tests, of which objective tests are commonly used.

6. KEEPING RECORDS

The supervisor or the trainer needs progress records, or job logs, so that he can check the development of the trainee and be able to remember the state of development that each has reached.

The following forms will usually take care of the essentials of record keeping:

(a) The weekly job log

The weekly job log will be kept by the trainee. A sample form is shown in App. C. It is laid out to allow one line for each work assignment or subject area during the day, including off-the-job training. The hours for each day can be totalled and the form can then be used as a timekeeping card.

Each category or work is assigned a symbol to make the recording easy. Absences are also symbolized.

As stated, the trainee keeps a daily record of him activities, showing symbols and the average amount of time spent in each activity during the day. At the end of the week, he turns the record over to the instructor to be entered in the monthly job log.

(b) The monthly job log

The monthly job log will be kept by the trainer. A sample form in App. D. Each subject area is listed in the left-hand column by name and by symbol. The next column is for the instructor's estimate of the total number of hours required for each area. The columns have an upper and lower section for each subject area. The number of hours spent in each activity should be noted in the upper section and the accumulated total in the lower section.

(c) The target times record

It has often been found advantageous to give the target times to trainees and to allow them to record their own progress. This gives immediate knowledge of results to the trainees and encourages them to improve performance. The work sheet is used to record trainees' target times.

(d) The personal record

The trainee personal record contains at least the following information:

- name
- age
- commenced training
- training programme to be followed
- name of trainer
- completed training
- trainer's assessment
- supervisor's assessment on trainee's performance at work.

7. THE SUPERVISION AND CONTROL OF ON-THE-JOB TRAINING

The training of employees at the workplaces must be adequately supervised. A responsible chief should be nominated to exercise control for training so as to ensure that sound policies and practices are developed and applied. In this way the aims of the on-the-job training are most likely to be achieved.

TRAINING OF TRAINERS

1 Basic Qualifications of a Successful Trainer

2 The Instructional Skills Required

3 Learning the Instructional Skills

1. BASIC QUALIFICATIONS OF A SUCCESSFUL TRAINER

The acquisition of knowledge and development of skills by employees under training will depend largely on the quality of the instruction given. Whether an instructor is a supervisor, a foreman or a fellow employee, he must be highly skilled in the processes he is to teach.

It is not, however, enough. He may know how to do a job well, but he may not be able to instruct others how to do that job in which he is so highly skilled. Doing is one thing. Passing know-how along to another person is something else. The correct techniques of instruction are required. It is, however, possible for the skilled man to learn the techniques of successful instruction.

In addition to the technical skills, some basic qualities are required to do a successful trainer:

(a) He must know exactly what he is trying to do and must be able to persevere in doing it.

(b) He must be enthusiastic. It is infectious.

(c) He has to have the positive attitude towards the organization and the trainee.

(d) He must be willing to learn the proper techniques of instruction.

2. THE INSTRUCTIONAL SKILLS REQUIRED

(a) Elaboration of curriculum

A curriculum is a list of topics forming the foundation upon which a programme of instruction is built.

The sequence leading to specification of the curriculum consists of identification of a need to train personnel to perform a specific function. The production of a job description, if not up to date, will be necessary to define the end point of training, and the input level of the programme will have to be specified .

(b) The preparation of task and skill analyses

The task and skill analysis will identify the operational or performance components of the job and relate these items to the knowledge and skills required to perform the job.

Once the task analysis grid has been developed, it is possible to identify those items of a potential curriculum and place them into categories. In this connection it is to be kept in mind that it is far better to teach a little thoroughly than attempt a lot superficially.

The skill analysis will show the employees who are in need of skills appearing in the task analysis.

The development of the task and skill analyses is best performed in consultation with the responsible chief of the personnel. In this way the credibility of the curriculum is established and the trainer bears the realistic responsibility of providing the best possible instruction.

A format for task analysis as developed in the case of "Small engine repairman" might begin as follows:

To Do / To Know	Clean cylinder head cooling fins	Adjust points	Decarbonize cylinder head	Change oil	Clean spark plugs
Use hand tools	X	X	X	X	X
Types of lubricants				X	
Voltage measurement		X			
Fastening systems			X		X
Identification of Engine Parts	X	X	X		X
Safe work habits	X	X	X	X	X

A sample skill analysis is shown in App. E.

A curriculum for "Small engine repairman" would include the topics:

- use of handtools
- types of lubricants
- voltage measurement
- fastening systems
- identification of engine parts
- safe work habits etc.

(It is not necessary to follow this order.)

(c) Preparation of a course outline/syllabus

The course outline is the essential document in the design of effective instruction.

The contents of the topics have been detailed, teaching strategies/practical operations have been specified and time estimates made. A sample course outline is shown in App. F.

(d) Various methods of instruction

The selection of a method depends on the type of training used. Training may take place "on-the-job" in the production area or "off-the-job" in a separate area away from the production environment, or in institute.

- shop talk
- demonstration
- project method - learning by doing
- instructional visits
- applied exercises
- instruction pattern for workplace training

are typical methods for on-the-job training, whereas

- lesson
- lecture
- participative learning
- assignment and discussion
- case study - group discussions
- teaching pattern for classroom training

are more appropriate for off-the-job training.

(e) Use of training aids and materials

The selection of training materials and aids depends also on the type of training used.

- chalkboard
- manufacturer's manuals
- samples and displays
- mock-ups and models
- drawings, diagrams, job sheets, instruction sheets and records

are most used in on-the-job training.

In addition to the above

- overhead projector
- slide projector
- flip charts

are applied mostly to off-the-job training situations.

(f) Measuring trainees progress

The trainer must always know his trainees' stage of development. He must be able to determine whether they are on the right track and how far they have travelled on it. A well-planned series of tests to accompany his instruction will give him this information.

Tests fall into three categories:

- performance tests
- verbal tests
- written tests

of which performance tests are most important, particularly on employees' level.

Tests are an important part of the teaching process. Every test should be graded and returned. Each test does two jobs. It tests both the knowledge and skills of the trainee and the effectiveness of the trainer.

3. LEARNING THE INSTRUCTIONAL SKILLS

Trainer candidates should be selected, as mentioned earlier, form among supervisors, foremen or experienced employees who are technically highly skilled and have basic qualities required to do a successful trainer.

They have not, however, any training in instructional skills. Therefore instructional methods course should be launched soonest. Particularly on-the-job training, that will be a continuous process in the future, will need trained instructors most of which will teach on part-time basis.

The course would be composed of the following parts:

- The first part - 2 weeks of duration

  The curriculum of the first part would consist of the methodology and exercises as meant for on-the-job training.

- The second part - also 2 weeks of duration

  The curriculum would mainly concentrate on off-the-training methodology and related exercises.

- The last part of the course will be as supervised teaching practice of which 2 weeks would be implemented in normal working conditions (a part-time on-the-job trainer) in AdB organization. Another 2 weeks would take place in DNA Training Centre in Maputo as an off-the-job trainer.

The total duration of the course will then amount to 8 weeks.

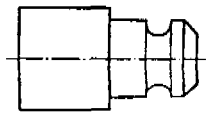
Between the first and second part should be an about 3 months' break during which the participants will prepare training materials in the course of their normal duties.

The durations above are estimated and are subject to changes depending on the abilities and backgrounds of the trainer candidates.

	TURNING OF A PROFILE	Instruction Sheet TURNING [redacted]

Order of instructions

1 Chucking the workpiece
2 Clamping the lathe tool
3 Turning with profile tool
4 Parting off



The instructor indicates dimensions and tolerance
Tool material: high speed steel

1 Chucking the workpiece

When turning with a profile tool it is important that the workpiece is chucked as rigidly as possible

2 Clamping the lathe tool

a Checking
- — see that the lathe tool has the profile indicated in the drawing
- — check that the tool is sharp

b Setting the lathe tool
- — set the tool to centre height
- — tighten securely but do not damage the threads
- — adjust the tool laterally so that the correct profile is obtained on the workpiece
- — tighten the tool holder firmly

3 Turning with profile tool

a Setting the spindle speed
- — use a cutting speed of about 8 m/min

b Turning
- — feed by hand with the cross slide
- — let the tool cut out between each feeding in
- — lubricate adequately

c Checking the profile
- — wipe the workpiece clean
- — use a template
- — hold a white paper under
- — keep the template horizontally

4 Parting off

- — catch the workpiece so that damage to the workpiece and the machine are avoided

Turning of a Profile

APPENDIX B.

Item	Operations	Basic Mark (0.1.2)	Factor (1.2.3)	Marks Obtained	Marks Possible
1	Disconnect the leads and remove the plugs;		1		2
2	Compare plugs to the chart for correct fitment		2		4
3	Sand-blast the plugs and thoroughly clean the threads, body and electrodes;		3		6
4	Adjust the air gaps;		2		4
5	Test the sparks;		2		4
6	Install the plugs and refit leads;		2		4
TIME TAKEN		Quality Mark			24
		Percentage			%
If the engine does not start on the completion of the test, the candidate is regarded as a failure in this Assignment5.		Time factor			%
		R E S U L T			

APPENDIX C

WEEKLY JOB LOG									
NAME									
WEEK OF		YEAR 19...							
		S	M	T	W	T	F	S	TOTAL
BL	1. Bench Layout								
IN	2. Installation								
FO	3. Forming								
DR	4. Drafting								
DRP	5. Drafting, practical								
M	6. Math								
CH of M	7. Characteristics of Metals								
DI	8. Drafting Instruction								
DES	9. Design								

APPENDIX D

MONHTLY JOB LOG									
NAME									
MONTH OF			YEAR 19...						
WEEK OF		required completed							TOTAL
BL	1. Bench Layout	100							
IN	2. Installation	80							
FO	3. Forming	80							
DR	4. Drafting	80							
DRP	5. Drafting, practical	35							
M	6. Math	50							
CH of M	7. Characteristics of Metals	16							
DI	8. Drafting Instruction	16							
DES	9. Design	16							

APPENDIX E.

SKILL ANALYSIS FOR WATER TECHNICIANS (PUMP MECHANICS, GRADE I)

NAME/GRADE	Proficiency in basic English language	Application of language in the field	Proficiency in basic Mathematics	Application of Maths in the field	Understanding of general Science	Science in the field of pumps	Sketching, scale drawing layout and diagrams	Reading /Understanding of layouts and diagrams	Understanding of shop and safety rules	Care and use of tools	Working principles of plants and their components	Interpretation of workshop manuals and parts cataloques	Interpretation of technical service, instruction data	Supervisory techniques	Ability to instruct
1. MWALIM AHAMAD Technician IV Grade	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-
2.USHANGA HASSAN Asst.Technician Grade	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-
3. M. KWINSU Asst.Technician Grade	X	X	X	X	X	X	-	-	-	-	-	-	X	X	X
4.SAIDI HASSAN Technical Aux.Grade	X	X	X	X	X	X	-	-	-	-	-	-	X	X	X

Symbols: X = Training required; (-) = Training is badly required

APPENDIX F.

COURSE: AREAL TECHNICIAN, GRADE III

Objective: **It is intended to meet the needs of Areal Technicians enganged on the preventive maintenance and trouble shooting as well as community work in villages. The participants are preparing for the award of the National Grade III Trade Certificate.**

Duration: **45 hours**

Amount of Participants: 22

Number of Courses: 2

Syllabus: **In line with the task- and skill analysis**
Implementing Establishment: **Water Resources Institute and organizations**
Cost estimate:

SYLLABUS; AREAL TECHNICIAN, GRADE III

NO	Topic	Content	Teaching Strategy	Time/ hrs
1.	Introduction	- Shallow wells as low cost technology	Lecture, discussions	2
2.	Identification and Operation of hand pump	- Material and names of pump components - Working principles	- Demonstrations - Dismantling and assembling of pumps	12
3.	Follow-up	- Follow-up activities - Follow-up forms - Filling in procedure	- Lecture/ demonstrations - Filling in exercises	3
4.	Community work	- Formation and duties of Village water community	- Lecture/ demonstrations - Discussions	2
5.	Pump Replacement	- Requirement of pump replacement - Types of pumps	- Lecture/ demonstrations	7
6.	Hand pump maintenance	- Preventive maintenance - Trouble shooting and remedy actions	- Lecture/ demonstrations - Practical excercises - Group discussions	13
7.	Reporting	- Monthly reporting a) maintenance b) water committee	- Demonstrations - Group work	3
8.	Final test and certification		- Summative test	3
			TOTAL OF HOURS	45

On-the-job training planning, reporting and evaluation

Beira Water Supply Project
Plancenter LTD - Aguas da Beira

INSTRUCTIONS TO PLAN AND REPORT COUNTERPART ACTIVITIES

Kalle Rajantie
Training Officer

1. Introduction

Counterpart training and other counterpart activities are one of the most important tasks in development cooperation. The expatriate should be able to teach his counterpart to do all operative tasks independently, also after the contract of the expert has been terminated.

Not only the expert teach his counterpart, but also the counterpart should teach the expert especially on local circumstances, norms, standards etc. Expert and counterpart should work always together solving problems together. Only by this way the work of expert will create lasting development, which is one of the main targets of development aid.

Two different form types, first for planning and other for reporting, are being presented in this paper. The aim is, that counterpart activities will be planned and reported monthly by each expert.

2. Planning of counterpart activities

The form for planning of counterpart activities consists of five parts. Names and planning period should be filled up on the first part, on top of the form.

The other four parts are similar with each other. Every part of them is for one main topic (matter) of training. On the left side date(s) and time(s) of training on each topic should be written. There is also space for detailed sub-topics, which indicate the content of the training.

In Annex 1 is presented an empty planning form. The counterparts should fill up their own forms together with consultants, this activity being then also one part of training. Practice in Portuguese and English languages should and could be one part of the every day counterpart training.

Too detailed descriptions of the trained skills are not needed. If it is not possible to indicate exact date and time, it is enough to mention more or less the planned duration of each teaching topic.

The counterpart plan for next month should be presented to the Project Manager and Training Officer on 1st day of every month. The Manager will collect the plans and present to the SUPRA.

3. Counterpart activity report

Main target, but also main problem of reporting is to evaluate the success of the training. Now can be only suggested, that the expert should estimate per every topic a numerical value **between 0-5** depending on the learned level or level of understanding or level of communication success of his counterpart.

For this purpose, a special form was developed. An empty version in English is presented in Annex 2. The form looks almost like the planning form. The only major difference is the column "success". There should be marked the success levels of the activities which are listed in the column "realized activities". The listed activities should be the same as mentioned on the planning form.

It is recommended, that the consultant together with counterpart analyses the success of the training giving paralelly feedback. They should discuss if it is necessary to continue the training of some topics or if the counterpart knows already enough.

If date(s) and time(s) couldn't be indicated exactly, it is enough, that at least duration of the training will be reported per each main topic.

The plans should be flexible. If the counterpart didn't learned some topics as planned, the programme should be changed and more time reserved for that topic. This will then be seen in the monthly report.

It is desirable, that the experts discuss with the Training Officer or with the Manager about each monthly report and gives detailed information about the trained skills, if requested for the evaluation purposes. The training will then be evaluated on the basis of report and discussions and if needed, also by supplementary checkings.

The counterpart report should be presented to the Project Manager and Training Officer before 5th day of every month.

4. Training pre-information and evaluation

If the consultant has aim to organize a special instruction course to his staff, he should fill up a form presented in Annex 3 and give the form to the Training Officer as an information of the course. He then, if needed, will participate on the preparation and teaching in the course. The form is also important for filing registering purposes.

The evaluation form presented in Annex 4 is mostly prepared for use of the Training Officer, but is also useful for other consultants giving on-the-job training. The form is especially for practical evaluation of the training. The skills should be distributed to small parts and each part should have some weight so that the whole act will have total weight of 1.0. Then each sub-skill should be evaluated with rate 0-5 and the total success calculated.

Beira, on 23.11.1990

Beira Water Project

Plancenter - AdB

PLAN FOR COUNTERPART ACTIVITIES

Month:	Year:
Consultant:	Counterpart

Planned activities

DATE:	Main topics:
	Other topics:
TIME:	

Planned activities

DATE:	Main topics:
	Other topics:
TIME:	

Planned activities

DATE:	Main topics:
	Other topics:
TIME:	

Planned activities

DATE:	Main topics:
	Other topics:
TIME:	

Beira Water Project

Plancenter - AdB

REPORT ON COUNTERPART ACTIVITIES

Month:	Year:

Consultant:	Counterpart:

	Realized activities:	**Success (0-5):**
DATE:		
TIME:		

	Realized activities:	**Success (0-5):**
DATE:		
TIME:		

	Realized activities:	**Success (0-5):**
DATE:		
TIME:		

	Realized activities:	**Success (0-5):**
DATE:		
TIME:		

BEIRA WATER SUPPLY PROJECT - PLANCENTER LTD

PREANNOUNCEMENT OF ON-THE-JOB TRAINING

Ref. no:

Topic of Training:

Date(s) of Training:					
Time(s) of Training:	-	-	-	-	-

Participants:

Name	Position	Department

Description of Training:

Responsible:

Date:

BEIRA WATER SUPPLY PROJECT - PLANCENTER LTD
EVALUATION OF ON-THE-JOB TRAINING

Topic of Training: _____

Name of Trainee: _____

Section and Department: _____

Trained skills:	A Weight of the performance %	B Level of success (0 - 5)	A * B
		TOTAL SUCCESS:	

Observations:

Observer: _____ Date:

MINISTÉRIO DA CONSTRUÇÃO E ÁGUAS — DIRECÇÃO NACIONAL DE ÁGUAS

CENTRO DE FORMAÇÃO PROFISSIONAL

F - 1

ANO LECTIVO - 1991

A) CURSOS DE FORMAÇÃO	DURAÇÃO	NÍVEL DE INGRESSO
1. Abastecimento de Água e Saneamento "B"	1 ano	6ª Classe
2. Administração e Finanças "B"	1 ano	6ª Classe
3. Hidromecânica "B"	1 ano	6ª Classe
4. Abastecimento de Água e Saneamento "A"	1 ano	Técnico Básico "B"
5. Administração e Finanças "A"	1 ano	Técnico Básico "B"
6. Hidromecânica "A"	1 ano	Técnico Básico "B"
7. Dipl. Prof. Abast. Água e Sanmtº. "A"	6 meses	9ª Classe
8. Dipl. Prof. Administ. Finanças "A"	6 meses	9ª Classe
9. Dipl. Prof. Analistas de Águas "A"	6 meses	9ª Classe
10. Dipl. Prof. Hidromecânica "A"	6 meses	9ª Classe

B) CURSOS DE APERFEIÇOAMENTO TECNICO	DURAÇÃO	NÍVEL DE INGRESSO
1. Analistas de Águas e Esgotos	12 semanas	7ª Classe
2. Electricidade Industrial	12 semanas	6ª Classe
3. Operadores de Estações Elevatórias	8 semanas	6ª Classe
4. Operadores de Estações de Tratamento	8 semanas	6ª Classe
5. Hidromecânica	8 semanas	6ª Classe
6. Sistemas de Manutenção Drenagens	6 semanas	Técnicos Médios
7. Tipos e Reparação de Contadores	6 semanas	6ª Classe
8. Sistemas de Canalização	6 semanas	4ª Classe
9. Operação e Manutenção Motobombas	6 semanas	4ª Classe
10. Montagem de Bombas Manuais	6 semanas	4ª Classe
11. Operadores de Sondagem	6 semanas	4ª Classe

C) CURSOS DE APERFEICOAMENTO ADMINISTRATIVO	DURACÃO	NÍVEL DE INGRESSO
1. Contabilidade e Finanças	12 semanas	6ª Classe
2. Aprovisionamento, Armazéns e Stocks	6 semanas	6ª Classe
3. Higiene e Segurança no Trabalho	4 semanas	6ª Classe

D) CURSOS DE APERFEIÇOAMENTO DE GESTÃO	DURAÇÃO	NIVEL DE INGRESSO
1. Gestão de um Estaleiro Água Rural	6 semanas	6ª Classe
2. Gestão de um Parque de Viaturas	6 semanas	6ª Classe
3. Gestão de Pessoal e Relações Públicas	4 semanas	6ª Classe

E) CURSOS DE APERFEICOAMENTO ESPECÍFICO	DURAÇÃO	DIRIGIDO A:
1. Engenharia de Água e Saneamento	12 semanas	Chefes de Departamento
2. Avaliação Económica de Projectos	12 semanas	Chefes de Departamento
3. Planificação e Gestão de Projectos	8 semanas	Chefes de Departamento
4. Planificação de Recursos Humanos	8 semanas	Chefes Serviços R.H.
5. Conhec. Práticos Sistemas Abast. Água	4 semanas	Chefes de Departamento
6. Princípios Básicos de Legislação	4 semanas	Chefes Serv. Administ.
7. Direcção e Gestão de Empresa	4 semanas	Quadros de Direcção

LONG TERM TRAINING NEEDS OF THE KEY PERSONNEL OF AdB

Post	Dpt.	Bth yr	Received education and training	Required long term training
Gen. Director		-39	University degree in economics	
Supervision Technician		-65	Medium technician in water supply	B.Sc. civ.eng./ University of Maputo
Laboratory tech.		-58	Basic technician	Prof. Dipl. Water Anal./ DNA Tr. Cnt. course A9.; Med. Techn./ Ind. Inst.
Chief of Department	PE	-51	Basic commercial technician, human resources course (14d), evaluation course (11d)	Medium Adm. Technician/Comm. Institute
Chief of Department	AC	-50	Basic comm. techn. 1 year in the Comm. Inst.	Medium Financial Technician/Comm. Institute
Chief of Department	CS	-54	7 classes (commercial school), typing course, teaching course	Bas. Adm. Tech./ Comm. Sch.; Adm.&Fin "A"/DNA Tr. Ctr course A8
Chief of Department	NW	-46	8 classes, draftsman course by corresp. (1 year)	Bas. Techn./ Ind. School; Wat. Supply & Sanit. "A"/ DNA Tra. Cnt. A4
Chief of Department	DW	-53	Basic electrical technician, electricical pump course (2 months)	Pump mech. "A"/ DNA Tr. Cnt. course A6; Med. Techn./ Ind. Inst.
Chief of Department	MV	-56	6 classes	Basic Technician/ Ind. School
Chief of Department	WW	-57	6 classes	Basic Technician/ Ind. School
Chief of Department	WT	-33	4 classes	
Chief Pers. Section	PE	-58	8 cl., typing course, manag. course (2 mths)	Bas. tech./ Comm. Sch.; Prof: Dipl. of Adm&Fin "A"/ DNA Tr. Cnt. A8
Chief Training Sect.	PE	-50	6 classes, DNA adm. and fin. courses (2 years)	Basic Technician/ Comm. School
Chief Payment Sect.	AC	-48	8 classes, APIE cashier course (40 d)	Basic technician/ Comm. School
Chief Acc. Section	AC	-56	7 classes, DNA account courses (2 years)	Bas. tech./ Comm. Sch.; Prof. Dipl. of Adm&Fin "A"/ DNA Tr. Cnt. A8
Chief Supply Section	AC	-52	8 classes, teaching course (4 years), typing	Bas. tech./ Comm. Sch.; Prof. Dipl. of Adm&Fin "A"/ DNA Tr. Cnt. A8
Chf. Met. Read. Sect.	CS	-45	6 classes	9 classes
Chief Billing Sect.	CS	-48	5 classes, political course (3 months)	9 classes
Chief Netw. Maint. S.	NW	-59	6 classes, DNA water supply courses (2 years)	Bas. techn./Ind. School; Water Supply & Sanit. "A"/ DNA Tr. Cnt. A4
Chief ml. maint. Sect.	NW	-45	5 classes	6 classes; Water Supply & Sanitation "B"/ DNA Tr. Cnt. course A1
Chief Oper. Section	DW	-45	5 classes	Basic Techn./ Ind. Inst.
Chief Transp. Sect.	MV	-56	6 classes, DNA pump mech. course (4 months)	Basic Techn./ Ind. School; Medium Techn./ Ind. Institute
Chief Maint. Sect.	WW		vacant	
Chief Oper. Section	WW		vacant	
Chief Treatm. Sect.	WT	-43	6 classes, DNA management course (4 months)	Bas. Techn./ Ind. Sch.; Prof. Dipl. in Water Anal. "A"/ DNA Tr. Cnt. A9
Chief Pumping Sect.	WT	-52	4 classes	6 classes; Operation of pumping stations/ DNA Tr. Cnt. course B3
Offr. in charge of norms and stand.	PE	-56	6 classes, norming course (1 year), salary organization course (1 year)	Basic Techician/ Comm. School
Offr in charge in occup. saf. and hyg.	PE	-65	6 classes, first aid moritory courses (3 months, 1,5 years and 7 months)	9 classes
Sen. paym. clerk	AC	-53	7 classes (commercial), political courses	Basic techn. /comm school; Adm&Fin "A"/ DNA Tr. Cnt. course A5
Offr in charge of purch. and fuels	AC		Basic agriculture technician	Adm&Fin "A"/ DNA Tr. Cnt. course A5
Fitter mechanic	DW	-64	Basic mechanical technician, 10 classes	Medium Technician/ Ind. Institute
Electrician	WW	-68	Basic electrical technician	Medium el. Techn./ Ind. Institute
Draftsman	PC	-64	8 classes	Basic technician/ Ind. School
Secretary	PC	-60	7 classes, 1 month computer course	9 classes (basic comm. technician)
Plumber Technician	PC	-68	Basic Technician	Water Supp. & Sanit. "A"/ DNA Tr. Cnt. A4; Med. Techn./ind. Inst.
Electrician Foreman	PC	-60	Basic Technician	Medium Technician/ Ind. Institute
Surveyor	PC	-57	Basic Technician	Medium Technician/ Ind. Institute
Surveyor	PC	-59	Basic Technician	Medium Technician/ Ind. Institute
Planning Technician	PC	-61	Medium Technician	B.Sc.eng./ University of Maputo
Civil Engineer (2)	SU		B. Sc. Eng.	M.Sc. eng./ Post graduate course in Tampere Techn. Univ. Finland
Eng. Technician (3)	SU		Medium Technician	B.Sc.eng./ University of Maputo
Adm. Technician	SU	-59	Basic technician	Adm&Fin "A"/ DNA Tr. Cnt. A5; Medium Techn./ Comm. Institute
Surveyor (2)	SU		Basic technician	Medium Technician/ Ind. Institute
Draftsman	SU	-66	8 classes, draftsman course in correspondence	Medium Technician/ Ind. Institute

N.B: See codes of the DNA Training center courses in Appendix 12