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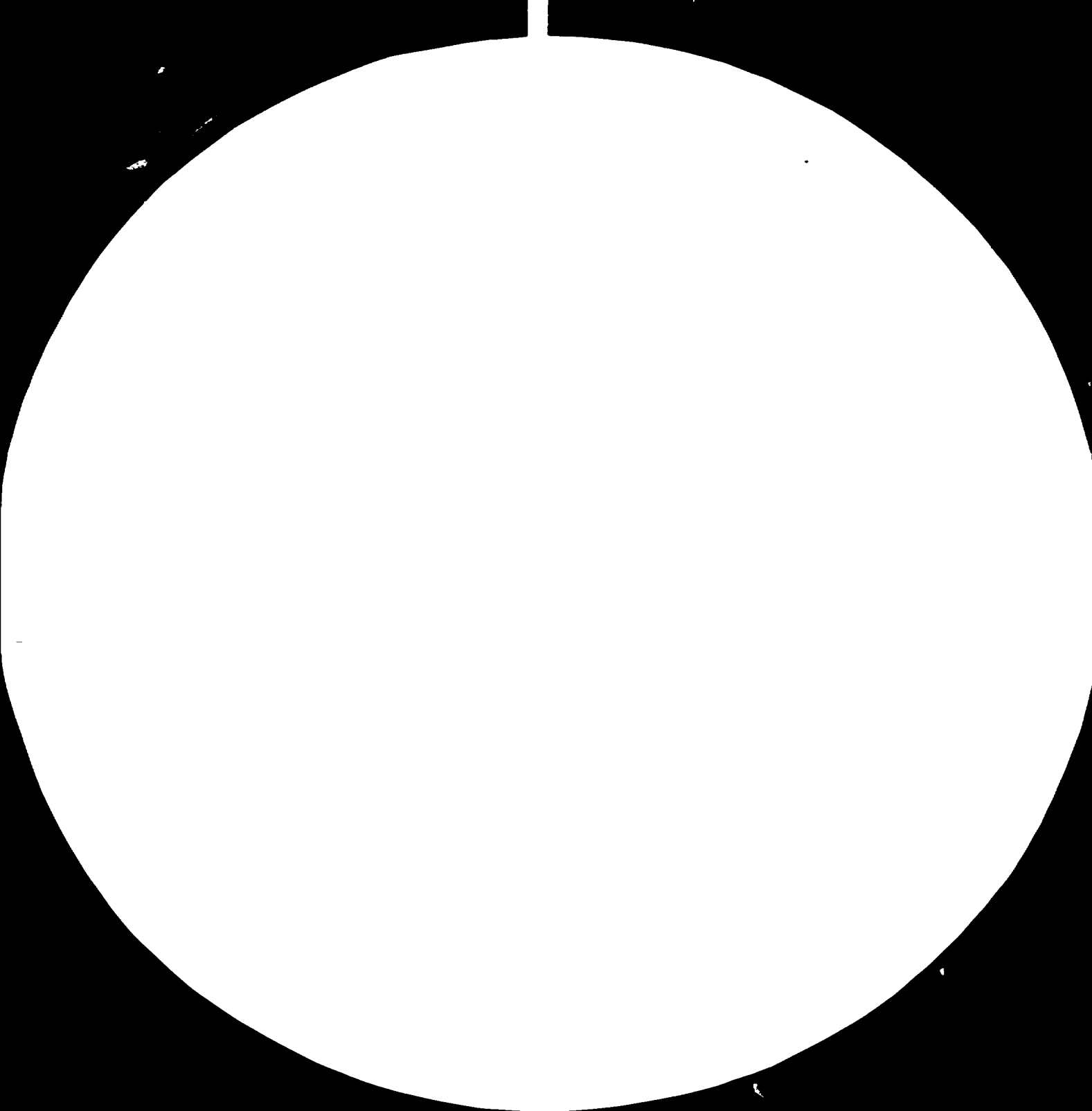
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**THE PEOPLE'S DEMOCRATIC
REPUBLIC OF YEMEN**

MINISTRY OF INDUSTRY

INDUSTRIAL TRAINING CONSULTANCY SERVICES

UF / PDY / 78 / 104 CONTRACT No. 78 / 73

THE UNITED NATIONS

INDUSTRIAL DEVELOPMENT ORGANISATION

FINAL REPORT

000.76



PA International Management Consultants Ltd.

International Development Division

December 1979

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THE PEOPLES DEMOCRATIC
REPUBLIC OF YEMEN

MINISTRY OF INDUSTRY

(R) INDUSTRIAL TRAINING CONSULTANCY SERVICES,
UF/PDY/78/104 CONTRACT NO. 78/73

THE UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANISATION

FINAL REPORT

PA International Management Consultants Ltd
International Development Division
339 High Street Slough Berkshire England
December 1979

1. INTRODUCTION

During the course of the project number UF/PDY/78/104 the contract has been modified as follows

Amendment No 1 Increasing the number of visits within the contract from three to four

Amendment No 2 Adding a two week visit to the PDRY in order to prepare a report on the management in the cement project.

In this fifth, and final, visit to the PDRY under this contract, the consultant arrived early on the morning of 2nd September and left on 26th September. Debriefing in Vienna is scheduled for 12th November.

The total time now worked in the project area is

	Working days
1st visit October to November 1978	40
2nd visit March to April 1979	24
3rd visit May 1979	12
4th visit June to July 1979	20
5th visit September 1979	21
	<u>117</u>

There is a total in the contract as revised of 115 days. In addition, the consultant has been briefed and debriefed in Vienna on 18th December 1978

11th August 1979

18th November 1979

The final report, which should be read in conjunction with the various interim reports, summarises the work that has been done on the project, reviews the results achieved, lists problems encountered or envisaged and recommends a further series of supervisory visits.

2. WORK DONE

The work done in this final visit has been

- the preparation of a training manual for project manager and others in the Investment Department. The manual has been based upon the training given during the course of the project
- assisting the Ministry to prepare terms of reference for a firm of consultants to conduct the study stage of the Cement Works Project
- updating the programmes produced to date
- training the staff of the Programming and Control Unit
- abstracting the project accounting documents from the accounting systems produced by S K Desai, agreeing these with users and incorporating the systems in the training manual.

A further description of this work follows

2.1 Training Manual

The training manual has been completed and one copy is enclosed with this report. The manual provides the following sections

- a statement of the Government's intentions for development of the industrial sector of the economy as recorded in the second five year plan
- the organisation of the Investment Department and job descriptions for posts on the chart
- instructions in the method of planning and scheduling of projects using the system developed for the Ministry. The method is based upon precedence networks for planning and Gantt charts for scheduling and progress reviews. This section contains exercises that become progressively harder and culminates in a substantial problem, based upon the study stage of the cement project, where the trainee has to produce a complete programme for a large project

- progress review and reporting. The method of reviewing progress is described and the reports used at present are listed
- project accounting systems as defined by Mr S K Desai under the work of the Advisory Unit
- standard instructions defining policy or giving detailed instructions on how to carry out certain tasks.

Forty copies of this manual have been sent to the Ministry for use by members of the Investment Department.

2.2 Terms of Reference

The Third Interim Report defined the manner in which the Ministry of Industry should approach the new Cement Project.

This Report was reviewed and accepted by the Ministry and they asked for assistance in the preparation of terms of reference for Consultants for the study stage.

These terms of reference were prepared and were handed to the Ministry during the course of the visit and record

- Ministry organisation for the project
- the method of approach to be adopted. To recapitulate, this was based upon a series of consultative reports each dependent on the other. Time has been allowed in the programme for agreement of each report before proceeding to the next stage and for all of the consultative reports to be agreed before the feasibility report is started. Reports are listed in the terms of reference and the scope of each report is defined
- an outline of the changes that will need to be made to standard forms of contract to cover the client's special requirements

- the overall programme of work
- counterpart staff that will be provided by the Ministry and the training that such counterpart staff will receive from the consultant
- financial and other assistance that the Government will provide to the consultant

2.3 Programmes

During the course of the visit, the Programming and Control Unit, aided by the consultant, updated the following programmes

- Soft Drinks Bottling Plant. The work is generally on programme and completion is being predicted on time
- Al Gundi Plastics. Programme being maintained and the plant will be ready for operation on schedule
- Expansion of the Cigarette and Match Factory. There has been delay in finding a suitable site for a new tobacco warehouse and there has been effectively no progress on this project
- Brewery. The project is still delayed owing to the collapse of the main contractor. Work on site using a local contractor is complete and no further work can be done until a new main contractor has been appointed and work started.

The Head of the Programming and Control Unit prepared his first quarterly report as at the end of September under the supervision of the consultant.

2.4 Training of Programming and Control Unit Staff

There are now two full-time members of the unit, these are:

Fuad Mana

Mahyoob Quosais

On-the-job training was carried out continuously throughout the visit and the staff were encouraged to complete their tasks with the minimum of assistance from the consultant.

Specifically they have

- carried out updating of the various programmes mentioned in 2.3
- prepared the Unit's quarterly report
- prepared new networks for the Cigarette and Match factory and the Brewery
- in the presence of the consultant, instructed project managers in the project management systems and procedures that have been defined
- written some of the standard instructions included in the training manual.

2.4 Project Accounting Documents

With the assistance of Mr S K Desai, project accounting documents and instructions on their use have been abstracted from the Ministry's accounting system. Documents have been reviewed by the consultant and discussed fully with S K Desai, Salem Basabrain, Taha Shaker and Fuad Mana and minor changes have been made to their content. These changes have been agreed as the discussion have continued.

The Project Accounting system will now stand on its own and will be incorporated in the training manual which will be available to all project managers.

3. RESULTS ACHIEVED

The following results have been achieved during the course of the project:

- the organisation of the Investment Department of the Ministry has been modified with the addition of the Programming and Control Unit. The main function of this unit is to ensure that all projects are properly planned, that progress reviews are made and that any delays are brought to the attention of senior management before they can severely affect the progress of the project
- all projects on the 5 year plan which are either underway or are due to be started in the near future have been planned and programmed
- the Ministry has been made aware of the full scope of the work that is involved in setting up the new Cement Works and has already set up the control organisation that has been recommended and is generally getting off to a good start on this very important project
- there is growing awareness in the Ministry of what can be achieved, in particular, through planning, but also maintaining a continuous watch in the progress of projects
- in spite of unavoidable delays early in the project it has been possible to implement the project accounting system in two projects, namely soft drinks bottling plant and the Brewery. Implementation of the project accounting system is underway in other projects
- implemented a project review system at all levels in the Ministry starting with: project managers reviewing the individual contracts with contractors, through project managers reviewing the progress of their project with the head of Implementation Section, to the Director of the Investment Department preparing a quarterly report summarising the progress and key financial figures for use by higher levels of management.

There is general enthusiasm for the work of the consultant and the results achieved by Ministry staff at all levels within the Ministry. There is also a feeling of mutual respect and trust between the consultant and senior staff in the Ministry.

4. PROBLEMS ENCOUNTERED

The main problems which were encountered have already been recorded in the Second Interim Report. These had primarily been the lack of office equipment and it is hoped that in any future extension of the project UNIDO can provide funds for purchase of the relatively minor items which are required.

Industrial development projects necessarily have a long lead time and it has not yet been possible to manage and control a project from the start of work through to commissioning. The Programming and Control Unit staff have therefore not had experience under the supervision of the consultant of all stages of a project and it can be expected that implementation will not go so well at these later stages unless training is continued.

5. FURTHER VISITS

In view of the long lead time mentioned in the previous section and the need to ensure that the systems which have been implemented are maintained, we recommend there should be a further series of supervisory visits for at least the next two years. It is our view that these should consist of three visits a year of three weeks each, timed approximately in January, June and November. The scope of the work of the consultant should be:

- generally to assist the Programming and Control Unit
- continue training new project managers
- ensure that the systems and procedures are applied to all new projects and are kept up-to-date
- identifying other areas where the Ministry may need further assistance.

This programme should ideally start in January 1980 and continue through 1981.

6. ACKNOWLEDGEMENTS

The consultant wishes to thank all of the staff of the Ministry for the support and assistance that has been given to him, all of which has increased his effectiveness and contributed in no small measure to the success of the project. In particular he would like to thank

Mr Salem Basabrain for his continuing support and for his questioning approach to the work of the consultant, which has in no small way ensured that the results are relevant to the work of the Ministry.

Mr Taha Shaker for advice given and for ensuring that the project managers, who, after all, are the main people concerned with the work of the consultant, were encouraged to work closely with him and the Planning and Control Unit.

Mr Fuad Mana for support and assistance in his role of counterpart and for agreeing to become the Head of the Programming and Control Unit. Mr Mana has been active in promoting the work of the Unit and is capable of instructing project managers in the project management procedures.

Mr Mahyoub Quosais for his willingness to spend considerable time in resolving problems surrounding the Brewery project and for carrying the staff of the Soft Drinks Bottling Plant so effectively towards a successful project.

Mr S K Desai for his assistance and advice on a wide range of matters in particular in the design of the adjustments to the project accounting accounting system.

Members of the UNDP who have also assisted in the progress of this work and with easing the consultant's domestic arrangements in Aden.

The typists in the Ministry who have had to decipher the consultant's handwriting and still produce quality, typed documents on antiquated and poorly adjusted machines.

MINISTRY OF INDUSTRY

INVESTMENT PROGRAMME

Cement Project - Study Stage

TERMS OF REFERENCE FOR CONSULTANTS

1. PREFACE

The Ministry of Industry is proceeding with the project to construct a Cement Plant in the 3rd Governorate. The study stage will be carried out by independent technical, marketing and economic consultants.

The following terms of reference for these consultants reflect the manner in which the Ministry wishes to conduct this stage of the project.

2. SCOPE AND OBJECTIVES

The scope of the study stage of the Cement Project is defined as:-

- Review of work done to date
- Preparation of Consultative reports required by the client
- Preparation, presentation and agreement of the feasibility report
- Preparation of contract documents for the form of contract selected
- Assisting the client to select a contractor and in letting the contract.

The Project will involve more expenditure than is planned for the remainder of the industrial sector in the current five year plan and is accordingly vitally important to the economy of the country. The Government is concerned that the implementation of the project should proceed as rapidly and smoothly as possible while they, at the same time, assure themselves that the processes and methods adopted are the most suitable for conditions in the P.D.R.Y.

The Ministry of Industry has established a Board that will control the project and which will subsequently be responsible for its efficient operation. The Board wishes to be consulted on major items before they take decisions and these terms of reference define the detailed method of approach.

3. METHOD OF MANAGEMENT

3.1 Ministry of Industry

The Ministry of Industry has appointed a Board responsible for controlling the study stage of the project. The members of the Board have been drawn from the Ministry of Industry, others by Government Departments and from Industry and Commerce. Board members will be given sufficient time free from their normal duties to enable them to react quickly to the consultants' study reports.

The Board will meet periodically to consider reports prepared by the consultants.

The programme of meetings will be agreed early in the project.

Board members will require time to consider reports prior to the actual meetings and they will require them two weeks in advance of meeting.

The Project Manager will be the consultant's main link with the Board and all reports will be submitted and instructions received through him.

3.2 Consultants

Within two weeks of starting work on the project, the consultants will submit their management report which will include:-

- The name and curricula vitae of their team leader in order that the appointment may be approved by the Board
- A detailed programme for the study stage showing the preparation of each report and listing the individuals that it is proposed to assign to their preparation. This programme shall be contained within the schedule in section 7 of these terms of reference
- An indication of which parts of the work will be carried out in P.D.R.Y. and which parts abroad
- A statement of the counterpart assistance that will be needed and the training that will be provided
- The method of reporting progress against this programme which will be based upon monthly reviews of progress held jointly with the Project Manager and a confirming report on the reviews
- The organisation of the project team.

The Board expects the Team Leader to be present full time in the P.D.R.Y. When the Team Leader is out of the country, a suitably senior deputy shall be nominated to the Board for their approval.

4. PATTERN OF REPORTS AND REVIEW PROCEDURES

The client's desire to adopt a fully consultative method of working has led him to the decision to request a series of consultative reports on specific subjects. These reports will be individually reviewed and the client's decisions and views will be made known to the consultant before he starts on the next stage of the work. The logic diagram for the study stage, which shows how these studies build up logically and supporting the main feasibility report is appended to these terms of reference.

Generally a report will be reviewed and the client's decisions made known within a month of submission, but the consultant should be prepared to answer subsidiary questions or to rewrite all or part of any report.

5. TERMS OF REFERENCE FOR REPORTS

5.1 General

The consultative reports will generally take the following form:-

- Summary of findings. The problem will be defined in outline and the solution recommended outlined
- Present position: Stating the present position and the results of any relevant decisions that have already been taken that may affect the report, and defining the problems to be overcome
- Solutions: All solutions to the problem will be listed and a preliminary evaluation carried out to eliminate the least practical. Following the preliminary evaluation there should be not more than six solutions remaining for full evaluation
- Evaluation of solutions. The solutions should be evaluated using both financial and non-financial factors
- Recommendation: The consultant should recommend the best solution for P.D.R.Y. in the light of the factors that have been considered.

Special care should be taken in ensuring that all factors and solutions are considered and that evaluations and opinions are supported by figures.

The consultative reports required are outlined below.

5.2 Automation

It is possible to design two cement plants of the same capacity, one relying entirely upon human intervention for operation and control of the process and the other being fully automated with relatively few operating staff.

The Board wishes to be assured that the works are designed with the right level of automation for the P.D.R.Y. taking into account at least the following factors:-

- Capital cost
- Operating cost
- Material utilisation
- Fuel utilisation
- Labour and skills available
- Training programmes proposed
- The ability to maintain and repair the plant
- The availability of spares

- The cost of a shutdown caused by a mechanical or electronic failure until a component can be obtained and replaced
- Quality and consistency of quality of the finished products
- Construction programme
- Raw material conditions.

The automation consultative report should:-

- Define the possible levels of automation at each stage of the process
- Evaluate each of the possibilities
- Contain a recommendation on the right degree of automation for the P.D.R.Y.

5.3 Markets and Capacity

An appraisal of the market and likely market trends for at least 15 years ahead is required. It shall include assessments of:-

- The home market for the different types and grades of cement
- The possibility of substituting cement for traditional construction materials, for example, clay, mud and timber
- The potential for producing concrete products, for example, pipes for water supply and drainage
- The potential for concrete as a road paving material
- Foreign markets in the area
- Foreign sources in the immediate area and an assessment of existing and planned capacities in nearby foreign countries
- The price that could be obtained in foreign markets compared with a preliminary assessment of the cost of locally produced cement.

And a judgement made of the penetration of these markets that is likely to be attained.

It will never be possible to exactly match capacity to home sales and a decision is required on the best way of providing capacity taking into account the ability of the industry to service and repay the necessary loans as well as the effect of the programme on the balance of overseas trade.

5.4 Production Process

The client wishes to be certain that the correct production process is chosen as it is understood that there are considerable economic differences between the two main options. The wet process uses more:-

- Water, which is scarce in P.D.R.Y.
- Fuel, which is becoming rapidly more expensive and which has to be paid for in foreign exchange,

and works in many countries are being converted to the dry process in order that they may become economical once more.

A production process report should be prepared which will evaluate fully the two main processes as well as the semi-dry process and taking into account the following factors:-

- The availability of suitable water on site
- The capital cost
- Operating costs
- Foreign exchange requirements both for the initial investment and for operating costs
- The suitability of the raw materials
- Dust control
- Water pollution
- Wear on mechanical components and likely costs
- The cost of obtaining and transporting any additional water that will be required, both capital and operating costs are required
- Ease of operation and any other relevant factors.

5.5 Plant Size and Location

The size of the plant will need to be confirmed as well as its location. These will depend upon:-

- Market forecasts and agreed capacity provision
- Resources available at the suggested site, with particular regard to water
- The foundation conditions
- The maximum production capacity that can be sustained on the site over the assumed economic life
- The possibilities of expanding the existing project in the future
- The economics of having several smaller plants at different locations in the country, each capable of being sustained on local resources.

5.6 Quarrying Methods

A report is required upon the quarrying methods to be adopted. This will include:-

A Limestone

- A quarry development plan
- Drilling & Blasting methods and costs
- Handling and transport in the quarry
- Any screening crushing, grinding, washing or other treatment to be adopted in the quarry
- Whether the quarry should be opened at an early stage to provide aggregates for concrete and other material for roads and other construction
- Ground water.

B Clay

- A clay pit development plan
- Excavating techniques and costs
- Handling, transport and storage in the pit
- Any pretreatment required
- Water pollution downstream
- Flood protection
- Dewatering methods.

5.7 Environmental Matters

The new cement works will be close to and upstream of a small village (Batis), which is itself upstream of a large agricultural area centred on Ja'ar.

During the construction of the work there will be a large number of additional people in the area, all producing human waste products. There will, in addition, be liquid waste products from construction.

Once the work is operating the number of staff required will probably fall, but the total number of people may not as they will tend to make their homes in the vicinity of the site as opposed to construction workers who usually make their home elsewhere.

In addition, the process uses considerable quantities of water which may be:-

- Polluted with oil products
- Heavily laden with silt or clay in suspension
- Hot where the water is used for cooling purposes.

And the effect of the discharge of such water on downstream users shall be evaluated and suitable procedures for avoiding any undue damage to health or crops shall be outlined.

Cement works also pollute the atmosphere, mostly with dust from the final grinding and packing processes. The pattern of winds in the vicinity shall be studied and suitable methods shall be outlined for the reduction of the nuisance to acceptable levels, which will themselves be defined. The effect of site and access roads and their associated traffic on natural drainage and pollution should also be evaluated.

5.8 Housing

Owing to the remote location it will be necessary to house both the permanent staff and the construction workers. An outline plan involving the use of both temporary and permanent housing is required. The consultant is asked to provide the plan including:-

- The number of staff in different grades at various stages of the work
- The type of accommodation that will be allocated to each grade
- The number of permanent houses to be provided
- The number of temporary units to be provided
- The use that can be made of the temporary units after the construction period
- The site (or sites) for the housing
- Services required
- An estimate of their cost
- A programme for the design, construction and occupation of the houses
- An estimate of the cost of operating the housing schemes, including building maintenance
- A suggested control and letting policy
- A recommended designer for permanent housing and suggested suppliers for temporary or prefabricated houses.

5.9 Distribution

A distribution policy is to be established. At the present time there is little, if any, cement entering the country in bulk and the local point of supply is the Port of Aden

An indigenous cement works will make bulk supply more economical to the larger users and perhaps even to distribution centres in the larger towns. The consultant is required to recommend a distribution policy including:-

- The setting up of local distribution centres
- Transport arrangements
- Bulk and bag supplies
- Price differentials for bag and bulk supplies
- Average stocks held at different locations
- The capital and operating costs of distribution
- Special arrangements, if any, for foreign markets
- Any predicted shifts in the pattern of use of cement in the country, with the opening of the new plant which will reduce the price
- An outline programme for implementing a new distribution network.

5.10 Infrastructure

The existing infrastructure which is based upon a small agricultural population will be insufficient to support the much larger industrialised population that will build and operate the new works. The consultants will study the existing report and advise on the need for, and the cost of, new support services for the additional people. This will include:-

- Domestic water supply
- Waste water treatment and disposal
- Electric power
- Telephone and telex
- Main services
- Health services
- Public transport
- Roads
- Schools
- Sporting facilities
- Shops
- Banks and post offices
- Refuse collection and other municipal services.

An outline programme will be required for the implementation of any recommended improvements and arrangements shall be specified for managing additional municipal services.

5.11 Materials Handling

Both the construction process and the subsequent operation of the completed plant will require the handling of considerable volumes of materials both on site and at other locations, notably Aden Port.

The consultant will prepare a report on:-

- Handling in Aden Port
- Transport from the Port to site
- Handling of construction materials on site
- Erection equipment
- Handling of production raw materials in quarries and its pits
- Transport of materials from quarries and pits
- Handling of finished goods within the works (outside handling of finished goods is dealt with in the report on distribution)
- Handling of materials for maintenance and particularly of refractory materials for relining the kiln.

5.12 Construction Method

The consultant will be asked to advise the best method of contracting for the construction work and to define the organisation of the client for the period. The report shall cover:-

- The type of contract that will be used. There are two main types; "conventional" and "package deal"
- The form of contract
- The arrangements for briefing the designers
- The arrangements for quality control of both design and construction
- contract details: fixed price or reimbursable, fluctuation clauses, etc.
- quality control
- progress control
- whether to use local or foreign contracts for civil works
- special contract clauses on: training of staff, commissioning and technology transfer
- any special constraints imposed upon the design by conditions in the P.D.R.Y.
- the outline programme for the remainder of the implementation of the project.

5.13 Feasibility

The final techno-economic feasibility report will be based upon the agreements reached and result of the previously defined consultative reports. These will be summarised in the feasibility report which will contain:-

- Summary of the predicted sales of the enterprise
- The capital cost showing local and foreign content
- The cost of all the ancillary works such as housing and infrastructure
- The detailed predicted operating accounts for the enterprise
- Staff numbers, grades, rates and total payroll cost
- The economic justification for the project showing the effect upon the foreign exchange balance of the country
- The amount and terms of loans required, both foreign exchange and local and the ability of the enterprise to service and repay these loans.

6. TERMS OF REFERENCE FOR CONTRACTING

Following the completion and acceptance of the feasibility report. The study stage will be completed by the letting of the contract or contracts for the construction of the works and perhaps of smaller contracts for preliminary works for housing, roads and so on. The work to be done under this stage is defined in this section of the report.

This section is written on the assumption that a design and build contract will be let to a single foreign contractor for the cement works, quarries and connecting roads, excluding housing, infrastructure improvements and other work not connected directly with the production process. If a different pattern of contract is decided upon following consideration of Consultative Report 5-12 construction method, these terms of reference will need to be modified.

6.1 Contract Documents

Contract documents will need to be prepared. These will presumably be based upon a standard form modified to suit the conditions in P.D.R.Y. The anticipated changes will cover changes or additional clauses as follows:-

- The full extent of the work should be described in detail, probably by reference to the design brief which should form part of the contract
- The contractor should be made fully responsible for determining local conditions and designing and building accordingly
- The contractor should be fully responsible for the quality and quantity of the cement produced during the guarantee period
- The contractor shall be required to provide operating and maintenance manuals for the entire plant at least three months prior to start-up
- The contractor shall be required to train the operating and maintenance staff comprehensively both in P.D.R.Y. and abroad
- The contractor shall take out, at the expense of the Ministry a performance bond against him, or the plant, failing to produce to standard or to programme
- The price is to be developed in two stages, the fee for design being based upon the initial estimate and being fixed at that figure. The final contract price is arrived at by a process of negotiation with the Ministry retaining the right to require the contractor to sublet all or any part of the work to an international contractor at prices set by them, the percentage mark-up on subcontracted work being set before the contract is let. A reasonable figure would be in the range

of 5 to 15 percent. This feature is to enable the Ministry to protect itself against possible irresponsible pricing of the work and to give them a bargaining advantage during the negotiating stage

- The procedure for initiating and approving variation orders should be laid down. This will include a statement of the basis for pricing variations, a requirement on the contractor to give a firm price and effect on programme on all variations before the Ministry gives its approval to start with the work. In particular a variation price must be comprehensive and it must be agreed that the price will include any claims for extra costs arising out of extension of time, out of sequence working, or any other reason under the contract
- The Ministry will almost certainly benefit from introducing a fluctuations clause into the contract rather than to attempt to negotiate a fixed price contract. If asked to provide a fixed price, the contractor would be forced to make a pessimistic forecast of likely price increases in order to ensure that his profit margins are maintained

There are two main methods of making price adjustments. The recommended method is to index invoices against established price indices. These are available for a wide range and combination of building and manufacturing trades, and a satisfactory method and baseline for calculating price fluctuations can be established while the main contract is being negotiated. The alternative is to establish base prices for all items of expense and for actual increases to be paid to the contractor against invoices and time sheets. This method is being used less as it is time consuming and expensive to operate

Disputes will arise during the course of the contract and a rapid, inexpensive and independent method of resolving such disputes must be written into the contract

- It is usual for professional designers (Engineers, Architects, etc.) to carry an insurance policy to cover themselves against claims arising from errors and omissions in their work. The contract should require the design and build contractor to carry a similar professional indemnity insurance
- The contract should recognise the Government as the agent who makes the payments. It may be tempting to "simplify" the procedure for payment by making it possible to the foreign lending agency to pay the contractor direct against his own claim. This, however, removes from the Government the essential control of being seen to be the payee
- It is presumed that both the loan and the payment to the contractor will be in roubles. In this event the only mention that needs to be made of exchange rate fluctuations is to ensure that the Ministry is not liable for increased payments in a third currency
- The contract should define the rights, privileges and restrictions placed upon the contractor's staff as well as the charges, taxes and duties (if any) that will be levied upon them

- The contract should define the working week and statutory holidays when the site will be working
- The contract should define the methods of planning, reporting progress on the site, scheduling interfaces between the contractor and any works to be carried out by the Ministry, and also of reporting expenditure both to date and anticipated final expenditure
- In a traditional form of construction the designer takes samples and makes tests on them and on the work in order to ensure that construction is being carried out to specification. In a design and build contract the contractor is also the inspector. Suitable arrangements are required to ensure that the inspection work is carried out thoroughly and professionally.

6.2 Selection of Bidders

It is assumed that there will be a form of competitive Tendering between at least three contractors. It will be necessary to:-

- Obtain a list of suitable contractors
- Get them to confirm that they are interested in tendering for the work
- Request and receive prequalification documents from the interested contractors and recommend which contractors should be invited to tender
- Receive the clients instructions and notify contractors of their success or otherwise

6.3 Design Brief

The contractor will need instructions upon which to base his designs. These will be contained at least in part in the feasibility study and in the consultative reports, but they will be confidential to the client and consultant and a separate design brief is required. The design should include:-

- A statement of products and capacities required
- Copies of the reports on raw materials and water
- A definition of the scope of the work
- Design codes to be adopted
- Ruling conditions
- Investigatory work required
- Instructions on procedures to be adopted
- Quality standards for finished product
- Disposal of waste products and limits of pollution to be allowed
- Any special process conditions

- Fuels to be used
- Efficiency of the completed plant
- Automation required
- Maintenance procedure requirements
- Details of the site
- A description of the facilities at Aden Port
- Transport capacities and restrictions
- Services to be provided by the client
- A statement of the overall programme for design and construction.

6.4 Services during the Tender Period

During the tender period consultant will be required to answer any subsidiary questions raised by the contractors. Answers given to any one tenderer will be communicated to all.

When tenders are received, the consultant will evaluate them and recommend acceptance of one of them to the client.

The client may wish to negotiate some of the contract conditions and the consultant will advise and assist him in preparing and presenting his case.

6.5 Supporting Services

Some supporting services will either need to be available immediately the contractor arrives on site or shortly afterwards. These will include:-

- Housing
- Water Supply
- Electricity Supply
- Drainage
- Roads
- Waste Water Disposal
- Telephone and telex

The consultant will prepare design briefs for all of these services and will, in the case of housing, carry out the design and assist in tendering.

The other services will be arranged by the client through the appropriate agencies.

7. PROGRAMME OF WORK

The client wishes to have the feasibility report presented on 31st July 1980 and to be ready to let the main design and build contract on 31st December 1980.

8. COUNTERPART STAFF AND TRAINING

The client will provide one counterpart staff for each member of the consultant's staff while he is in the country. There will be no charge for the assistance.

The consultant will consider as part of the task the training of counterpart staff in the work that is being carried out. This training will be mostly on-the-job training but formal or classroom training may be shown to be necessary.

9. LOCAL CONDITIONS FOR CONSULTANT STAFF

The Government will provide free of charge for the consultant's staff:-

- Housing
- Import of personal effects including up to one car for each consultant which is to become the property of the Ministry at the end of the study
- Medical and dental treatment in P.D.R.Y.

19th September, 1979

