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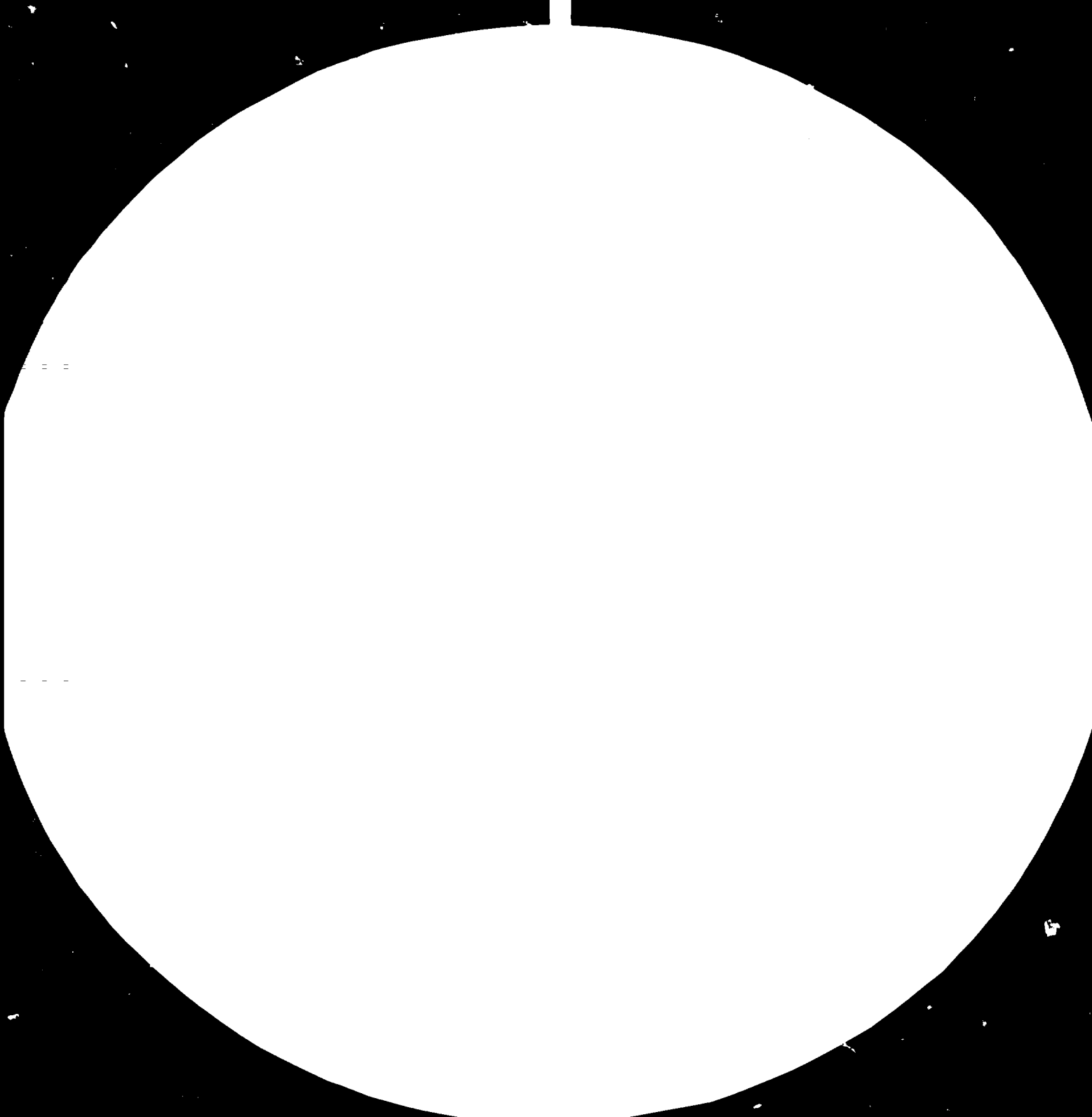
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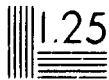


Figure 1. Resolution test targets used to determine the resolution of the system.

REPORT No.30

(RESTRICTED)

12604



Iraq.

**ASSISTANCE  
TO INDUSTRIAL ESTATES**

TF/IRQ/79/001/UNIDO

Post:1163/31.3.E

**PROJECT FINDINGS AND RECOMMENDATIONS**

**MISSION TERMINAL REPORT**

Prepared for

THE GOVERNMENT OF IRAQ,  
STATE ORGANIZATION FOR INDUSTRIAL DEVELOPMENT  
DIRECTORATE GENERAL FOR COOPERATIVES AND INDUSTRIAL ESTATES

By

**P. P. DHARWADKER**

Expert of

the United Nations Industrial Development Organization

Baghdad, Oct, 1982

Note: This report has not yet been cleared with the United Nations Industrial Development Organization, which does not therefore necessarily share the views expressed.

REPORT No. 30

RESTRICTED



# ASSISTANCE TO INDUSTRIAL ESTATES

TRIPR/79/001/ELIDC

Inst: 1163/31.3.E

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Abbreviations and Conversions

S.O.I.D. State Organization for Industrial Development  
D.G.C.I.E. Directorate General for Co-operatives and Industrial Estates.  
U.N.D.P. United Nations Development Programme  
U.N.I.D.O. United Nations Industrial Development Organization  
S.I.D.F.A. Senior Industrial Development Field Adviser  
HQs. Headquarters  
N.I.E. Nahrawan Industrial Estate.

I.D. = Iraqi Dinar = US \$ 3.337  
m = meter  
sq.m = square meter  
km. = kilometer  
sq.km= square kilometer  
ha = hectar = 10,000 sq.m = 4 donums  
M = Million

A B S T R A C T

This is the Terminal Report on the mission assigned to the author by UNIDO for Assistance to Industrial Estates-Project TF/IRQ/79/001 as pertaining to post 11-03/31.3E, UNIDO advisor to the Government of Iraq on the specific project of development of Industrial Estate at Nahrawan in Iraq.

In this Report, the work done by the author in Iraq during his two years assignment (25th Nov. 1980 to 24th Nov. 1982) vis-a-vis the principal tasks assigned to him has been summed up and recommendations have been made for the future of the Project.

With the main objectives of the Project in view, the various inputs were assessed in the first place and activities required for the Project implementation were laid down in a Work Programme for the duration of the mission. The basic document of Feasibility Study Report on Nahrawan Industrial Estate/Industrial Area was then prepared in collaboration with other experts and counterparts. The author concentrated on contribution in specific areas of investigation, planning, designing and execution of various activities of the Project.

Starting with concept planning, the author outlined the scope of work in each area and assisted the DGCIE in the general planning of the Estate and on preparation of scope plans, detailed planning and design of infrastructure including common service facilities and services, sample designs for clay brick factories, and housing scheme essentially required for the operation of the Estate.

Advise on the execution of works included preparation of tenders for consultancy and construction works as also operation of contracts with a view to train the counterparts to proceed with the balance of construction stage without any major external help in the specific area of civil engineering and construction. With the experience gained, the author considers it possible for the DGCIE to proceed with the balance work with the essential addition to the existing staff. Continued assistance of UNIDO would however, help DGCIE in achieving better end results.

## I. INTRODUCTION

### 1.1 Project Background

The author's assignment with the project as Civil Engineer is included in the Funds-in-Trust Agreement and Project Document signed by the Government of Iraq and UNIDO on 21 October, 1979.

### 1.2 General information concerning the project:

<u>Project Title</u>	Assistance to Industrial Estates
<u>Project Number</u>	TF/IRQ/79/001
<u>Duration</u>	24 months
<u>Primary Function</u>	Institution Development
<u>Secondary Function</u>	Advisory Services
<u>Sector</u>	Industry
<u>Sub-sector</u>	Industrial Estates
<u>Government Implementing Agency</u>	State Organization for Industrial Development, Directorate General for Co-operatives and Industrial Estates.
<u>Executing Agency</u>	United Nations Industrial Development Organization (UNIDO)
<u>Government Funds-in-Trust Contribution</u>	US \$ 508,939
<u>Estimating Starting ate</u>	1 January, 1980
<u>Actual Starting Date</u>	5 Dec. 1980, on arrival of the team of experts in Baghdad.
<u>Project Site</u>	Nahrawan Area located about 65 km. East from Baghdad.



1.3 Development Objectives of the Project

The development objective of the project is to accelerate development of small and medium-scale industry in Iraq through decentralization of industry, including industrialization in rural or less developed areas and assistance in the relocation of existing small brick factories from the present location near Baghdad to the Nahrawan area.

1.4 Immediate Objectives

The SOID intends to develop the first industrial estate in the country to give a comprehensive support to small and medium scale industry sector. It is planning to relocate about 100 small and medium size clay-brick factories from their present location in Baghdad to Nahrawan. The Government has allocated for this purpose an area of about 40,000 Donum = 100 square kilometers. Several soil tests have been carried out in the area. These have revealed that available clays are of a suitable quality and deposits are large enough.

The immediate objectives of the project are:

- to advise and assist SOID - DGCIE in its work in the industrial sector.
- to advise and assist in the planning and implementation of the first industrial estate for small and medium scale industries at Nahrawan for brick manufacturing, as also for industries in other industrial sectors;
- to advise and assist in the necessary economic and engineering studies and research work to establish the flexibility of this proposed industrial estate;
- to advise and assist in the creation of an efficient and yet simple application and allotment procedure for the small and medium-scale industrialists wishing to establish their factories within the estate.

1.5 Previous studies

DGCIE has prepared a preliminary study report on the Nahrawan Industrial Area, in 1980. Results of testing 478 samples of raw-material collected from 239 test pits made in Nahrawan were appraised in the study and suggestion on relocation of clay-brick factories to Nahrawan fully supported.

1.6 Job Contents

Job Description for the author's assignment in Iraq forms Appendix No.1 to this report. A more detailed work plan was prepared and approved by DGCIE in January, 1981 (please see Appendix No.2).

II- PROJECT ACTIVITIES - AUTHOR'S CONTRIBUTION

2.1 Within the main objective to assist the SOID in its efforts to accelerate the development of new and relocation of existing small and medium scale industries in the country, (placing emphases on de-centralization of industry and industrialization of rural and lesser developed area) the principal tasks of the author were basically of techno-economic nature and related to the following:

2.1.1 Advise on the location of the Estate within the area allocated.

2.1.2 Recommend the lay-out and size of industrial estate with details pertaining to the requirements of zoning, sizes of plots and factory buildings including the necessary common service facilities and services.

2.1.3 Preparation of sample designs of workshops and suggestion on functional buildings for common facilities.

2.1.4 Assistance and advise on planning and implementation of industrial estates including cost estimates, tender documents and supervision of works.

2.1.5 Advise individual industrialists in their civil engineering problems.

2.1.6 Training counterparts in his field of work.

(Please refer to Appendix No.1 for Job Description)

2.2 The author started his work in Iraq with collection of basic data and preparation of work programme for the various activities involved and carefully followed it up throughout the mission. The terms of reference as per Job Description/Work Plan, the related proposed activities and the action taken from time to time has been summed up in a statement which is evolved at Appendix 2.

2.3 In respect of specific area allocated at Nahrawan to set up an industrial estate, the author contributed to the preparation of feasibility study N.I.E. and in collaboration with his counterparts and other expert, a comprehensive techno-economic proposal was evolved on the establishment of clay-briks, clay products and general industrial estate at Nahrawan, in good time. The proposal included actual location of the estate within the area allocated with all the relevent details pertaining to the zoning of the area, various sizes of plots and location of common service facilities as well as necessary services buildings such as administration buildings (including post office, bank, health centre, etc.), workshop (including fire fighting station), recreation centre, commercial centre and tentative location for the township, essentially required to house the estate personnel.

2.4 The feasibility study report was approved by the competent authority and a part of the funds required for the project implementation was allocated to enable some of the important and time consuming activities to be started.

2.5 In respect of external infrastructure, whereas the main approach road and HT power line was decided to be entrusted to the State Organization for Roads and Bridges and State Organization for Electricity respectively and the advise required on these external services was limited, in respect of water supply a comprehensive proposal was required to be prepared and advise had to be rendered right from the stage of initial survey and investigation work required for this essential service. Tender papers were prepared for the consultancy services to undertake detailed planning, designing, tender documents for construction etc. based on the conceptual plans in the feasibility study report. The tenders received were scrutinized and advise was rendered on allotment of work. Observations were raised on preliminary designs and drawings and the final proposal evolved by the consultants with the constructional aspects required to be kept in view. The alternatives proposed by UNIDO may mean a saving of up to ID 1 M. to DGCIE.

2.6 A separate report was prepared on Sample Designs for Clay-brick Factories in which proposals were evolved for three different sizes/capacities of clay-brick factories laid out in three different sizes of plots of land with provision for planned expansions. Individual layouts were prepared for each size of plot indicating the scope plans for factory buildings (production block and ancillary buildings) and internal services. General specifications of work were discussed, cost estimates were prepared and construction time schedule laid down. The report was meant to be for general guidance of the prospective entrepreneurs.

2.7 The above proposal was only tentative, in as much as it was evolved pending finalization of plant and equipment for the various sizes/capacities of factories. In course of time on receipt of certain quotations for the clay brick factories, the above report was supplemented with another report in which alternative designs and specifications were further discussed and certain recommendations made for possible economy in civil engineering works with due considerations for the ease of construction and maintenance problems, for the benefit of the prospective entrepreneurs.

2.8 On the requirements of Common Service Facilities and Services for the Estate, a separate report was prepared in which a general layout for the facilities and services was further detailed. Actual requirements of various facilities/services were laid down for effective operation/maintenance of the estate and scope plans were prepared for individual buildings and services. Specifications of work, materials take off, cost estimates and construction schedule were also discussed in this report which formed the basis for proceeding further with the tender for detailed consultancy services.

2.9 Tender papers were prepared for the consultancy services for the above works in course of time. The tenders received were scrutinized and recommendations made for allotment of work.

At this stage, it was however decided by the DGCIE to entrust this consultancy work to the State Organization of Industrial Designs and Construction.

2.10 Further to the preliminary proposal on Housing for the Estate, a more detailed report was prepared for Housing Scheme at Nahrawan for the assessed requirements of residential units and essential public buildings. The line plans were selected for the residential quarters and the scope of public buildings was laid down. This became the basis for the preparation of the tenders for consultancy services for the Housing Scheme.

2.11 On the same lines as 2.9 overleaf, a draft tender document was prepared for the total consultancy of the Housing Scheme in April 1982. The DGCIE has however yet to take decision in the matter of housing for the Estate.

2.12 In line with the work programme for 1982, based on the available information, another report was prepared on Type Designs for General Industries. This included the scope plans for a few typical sizes of plots of land in the proposed alternative layouts for the General Industries Area, the specifications of work, approximate cost estimates and a construction schedule.

2.13 Besides the above, the author contributed to several other documentary inputs such as soil investigation work, environmental aspects, co-ordination of internal infrastructure etc. The entire work has been documented in the forms of reports/papers. Important contributions have been summed up in Appendix 3. For ready reference a consolidated list of all project reports/papers is also enclosed at Appendix 4.

2.14 The discharge of duties and responsibilities of the author involved several visits to sites, offices, laboratories etc. This included connected Government offices, Government and private clay-brick factories (in connection with relocation), Khan Bani Saad (one of the existing Industrial Area in the vicinity of Baghdad), Garma and Abu Ghraib (about 50 km. from Baghdad, in connection with reconnaissance of new sites for industrial estates) etc.

2.15 During the whole period of the assignment the counterparts nominated by the DGCIE closely collaborated with the author and to a large extent, the experience of the author in the specific areas has been imparted to the DGCIE counterparts. However, for the successful implementation of the project till the completion stage of Nahrawan Industrial Estate, continued UNIDO assistance may prove beneficial to the DGCIE, particularly as the training in the specific area of the author was limited to "on job" training, which was considered adequate by the DGCIE.

2.16 Whereas most of the tasks envisaged for the author as per Job Description could be considered to have been completed, the work pertaining to one important activity viz. supervision of on-going works cannot be said to have been completed. In fact, it is yet to be started in right earnest and is going to be a continuous process. With the up to date work done and the information available, no doubt, the task of supervision has been substantially simplified. It will however mean supplementing the existing staff and overall UNIDO guidance during the construction phase of Nahrawan Industrial Estate. The organizational set up proposed for the balance of construction phase is enclosed at Appendix 5.

2.17 In the absence of the Team Leader generally, and during the last 6 months in particular, the author also co-ordinated the project work and had the opportunity to deal with the administrative matters concerning the project with the representatives of the Government, UNDP and UNIDO.

1.18 The author, as Expert-in-Charge has followed the Internal Evaluation System, newly introduced by UNIDO and has completed the first Progress Evaluation Report for the project.

CONCLUSIONS & RECOMMENDATIONS

1. It can be concluded that the author has, by and large, completed the tasks assigned to him on this project for the period of his mission, inspite of some constraints in its implementation.
2. After the necessary field surveys and studies required for establishing the feasibility of the proposal, the author contributed substantially to the preparation of the Feasibility Study Report on N.I.E. which was done in association with other experts and counterparts. This report formed the basis of all the future work of the author.
3. Plans were evolved on the location of the Estate within the area allocated by the Government and the best suited size and layout of the Estate was recommended, with necessary zoning of the areas, to take into account also the future expansion.
4. Proposals were evolved for alternative sizes of plots and factory buildings as also the necessary common service facilities and services required for effective operation and maintenance of the Estate.
5. Specific advise was rendered, on request, to DGCIE on the external infrastructure including the approach road and HT transmission line/sub-station, execution of which was entrusted to other Government organizations.
6. In respect of water supply to the Estate, advise was rendered right from the investigation stage to the construction phase of the project which inter-alia included evolving the proposal and advise on planning and detailed designs etc.
7. Advise was rendered to the DGCIE on the aspects of planning, designs, drawing specifications of work, estimation of costs, working out bills of quantities and preparation of tender documents for several components of the project which included sample designs of workshops and functional buildings for common service facilities.



8. Necessary advise was rendered on the selection of consultants and contractors for various contracts entered with by the DGCIE.
9. Suggestions were made on several other aspects connected with implementation of the project and advise sought by DGCIE in the specific areas.
10. Proposals were made to advise individual industrialists in civil engineering and constructional problems. Sample designs and specifications of work were prepared for alternative typical factories.
11. Though no specific training programme, study tours or fellowships were considered necessary, "on-job" training of the counterparts in the field formed a continuous process during the period of assignment.
12. With up to date preparatory work done and advise rendered, it should be possible for the DGCIE to proceed with the balance of the execution stage of the project, with overall UNIDO assistance and with proper stream lining of construction organization and essential supplementing of the existing staff, as recommended.
13. The first priority should be given for the construction programme of internal and external infrastructure for the Estate.
14. Ways and means should be found to induct potential entrepreneurs for the relocation of existing nuisance factories and construction of new clay-brick and general industries factories in the Estate, simalteniously.
15. Common clay winning unit and maintenance & repair facilities should be organized for the Estate in good time.
16. The proposed housing scheme should be expedited.

ACKNOWLEDGEMENT

On the completion of his mission the author would like to express his sincere thanks to Dr. Abdulwahab H. Al-Najjar, Director General, Mr. Yassin Al-Rubaei, Chief Engineer, Mr. Ali Fukaiki, Economist and their associates for cooperation and help which facilitated the author's work in Iraq.

Likewise, his sincere thanks are due to the Resident Representative of UNDP Mr. A.K. Soghaier, the UNIDO Headquarters and associated staff members for their help and cooperation in solving various problems arising during the organization and implementation of the project.

The author has also to place on record the guidance, cooperation and support in the project work which he got from his team leader Mr. J.M. Gajewski, during the time he held the charge of the project.

Expert-in-Charge

JOB DESCRIPTION

TF/IRQ/79/001/11-03/31.3.E

Post title	Civil Engineer/Architect
Duration	One year, with possibility of extension
Date required	As soon as possible
Duty station	Baghdad, with frequent travel to Nahrawan
Purpose of project	To assist the State Organization for Industrial Development (SOID) in its efforts to accelerate the development of new and the relocation of existing small and medium-scale industries in the country, placing emphasis on decentralization of industry and industrialization of rural and lesser developed areas.

**DUTIES**

The tasks of the project are of techno-economic nature and in this respect the expert will specifically be expected to:

1. Advise SOID on the location of the estate within the area allocated.
2. Based on the estimated demand for industrial plots, recommend the lay-out and size of the industrial estate, including the zoning for different industrial sectors, size of plots and factory buildings, location and size of common service facilities as well as the necessary services, such as administrative buildings (post office, banks, health services, fire fighting stations, etc.).
3. Prepare sample designs for workshops of different sizes and different industries (especially brick making) and suggest suitable functional buildings for common facilities.

4. Assist and advise on planning and implementing industrial estates, specifically cost estimates of construction work, preparation of tender documents, etc., as well as supervise on-going construction work.
5. Advise individual industrialists regarding their civil engineering problems for their new factories.
6. Train counterpart personnel in his field of work.

The expert will also be expected to prepare a final report, setting out the findings of his mission and his recommendations to the Government on further action which might be taken.

**QUALIFICATIONS**

Civil Engineer/Architect with extensive experience in planning and construction of industrial estates, industrial areas or similar works, preferably in developing countries.

**LANGUAGE**

English; Arabic an asset.

Terms of Reference as per Job Description/Work Plan and related project activities.

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S. No.	Terms of reference	Relevant reports/papers on related activities prepared by the author in cooperation with other members of team and counterparts.
1	Site survey, visits to offices and factories for data collection.	Visited the proposed project site at N.I.E. on a number of occasions for collection of site data. Also visited several existing clay-brick factories and concerned State Organizations such as State Organization for Roads and Bridges, State Organization for Land Reclamation, State Organization for Electricity etc. for collection of basic data and information(Report No.1)
2	Evaluation of data and proposal on location of N.I.E.	
a)	Review of available data, tepeesheets, climatic conditions, etc.	The data collected as a result of the visits as also from the available reports was evaluated for the purposes of feasibility study of the proposal.
b)	Preparation of general lay-out and type designs	The general lay-out of N.I.E. was prepared and included in the feasibility study report. Tentative type designs were also evolved (Report No.2).
c)	Drawing general specifications of work and approximate cost estimates	The general specifications for the works were drawn for the preparation of approximate cost estimates(Report No.2)

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- d) Framing of project implementation schedule. The project implementation schedule was drawn for the Industrial Estate and was made a part of the Feasibility Study Report (Report No.2)
- 3 Consultation during the approval of report by DGCIE The queries made on the report were duly replied, to the satisfaction of DGCIE.
- 4 Advise on external infrastructure
- a) Approach road Advise was rendered to DGCIE on the specific aspects referred.
- b) Power line, sub-station & telecommunication -do-
- c) Water supply
- i) Investigation Advise was rendered to DGCIE on the extent of investigation required for determining the source of water, rising main, treatment plant, distribution system etc.
- ii) Planning, design, estimating and tendering This included, besides the concept planning and tender documents for consultancy work, (Paper No.5) scrutiny of consultants' offers and reports on initial and final proposals on planning, designing, estimating and tendering as also scrutiny of tenders for execution of works.
- iii) Execution of work Up to date advise was rendered on constructional aspects of the water supply scheme.
- 5 Advise and assist on internal infrastructure including internal roads, water supply Initially a report was prepared on details of Common Service Facilities & Services required for operation and maintenance of the Estate (Report

lines, sewerage and drainage, power & telecommunication system and service buildings.

- 6 Advise and assist in the preparation of sample designs for clay-brick factories

- 7 Advise and assist in preparation of township layout, type designs of residential and public buildings, services etc.

No.11). This formed the basis for proceeding with detailed design & drawings and execution of works. Tender papers were also drafted for consultancy services (Paper No.12) and advise was rendered on consultants' offers, their preliminary and final proposals, tenders for execution of works and supervision of works, to the extent it was required.

Initially a report was prepared on sample designs for three different sizes of clay-brick factories (Report No.4) to form guidelines for the prospective entrepreneurs. On receipt of certain offers for the supply of plant and equipment a further report has been prepared on alternative type designs and specifications of work for clay-brick factories in which the quotations received by DGCIE are analysed and possible alternatives available to the prospective entrepreneurs on type designs and specifications of work have been discussed(Report No. 20).

After the initial proposal made for housing in the Feasibility Study Report, a further report was prepared for housing scheme for the Estate in which the housing requirements have been discussed, line plans for various types of houses have been illustrated and phased requirements of public buildings and

services has been laid down. This report formed the basis for financial allocation and preceeding further with consultancy (Paper No.22) and works contracts for construction of the town-ship.

- 8 Advise and assist in the preparation of typical designs and specifications of work for general type of industries

Based on the report prepared by Mr. Gajewski, Expert, on the proposal for general type of industries, some preparatory work has been done on typical designs and specifications for civil engineering works in the various plot sizes and the type of industries proposed. (Report No. 26)
- 9 Advise individual industrialists on their civil engineering problems

This was done as and when asked for. However, in the absence of adequate responce from the entrepreneurs, such advice was limited.
- 10 Any other advise, if required by the DGCIE

Specific issues concerning other civil engineering and construction management were dealt with, such as advise on soil investigation work (Paper No.16), environmental aspects (Paper No.17) etc.
- 11 Training counter-parts personnel

Mainly "on job" training was involved and this was a regular process throughout the tenure of the mission.
- 12 Preparation of progress and terminal reports.

These have been prepared as per UNIDO guidelines and submitted to the concerned authorities(Reports No.8,18,25 &30) The first Project Evaluattion Report has also been prepared on the lines laid down for the Internal Evaluation System, recently. (Report No. 27)



Gist of Reports/Papers

3.1 Report No.1

Preliminary Report on Nahrawan Industrial Estate/Industrial Area

Prepared in January 1981

No. of pages 10

The Report was jointly prepared by the team of three experts (Mr. J.M. Gajewski, Dr. M.F. Selim and the author) assigned to the project. It was based on the information collected during the meetings held with the DGCIE and the briefing available on policies of the Government as regards the project proposal including land acquisition and external infrastructure for the project.

All the three experts had to get themselves acquainted with the previous studies and surveys done by the DGCIE in the area of clay-brick industry in Iraq. Several visits were carried out and a few meetings were held with the owners of the existing clay-brick factories during which the author had the opportunity to collect relevant data and information required for the preparation of his part of feasibility study for the N.I.E./Ind. area which was to be carried out subsequently.

The report includes an outline of individual work programme for the duration of the project of two years as specified in the Project Document/Trust Fund Agreement.

The report was approved by the DGCIE/SOID and has since been the basis of subsequent work done by the author during his assignment in Iraq.

3.2 Report No.2

Feasibility Study on Nahrawan Industrial Estate

Prepared in March 1981

No. of pages 99

The report has been jointly prepared by Mr. J.M. Gajewski and the author. It is a basic document dealing with techno-economic aspects for the proposal on N.I.E./Ind.area and was meant to help the Government of Iraq in taking decision on its implementation and providing the required funds.

The report is generally based on technological study carried out by Dr. M.F.Selim and the proposal formulated by him on the subject (please refer to report No.3).

In this report the authors have evolved a comprehensive proposal for the establishment of the first industrial estate in Iraq consisting of clay-bricks and clay products factories and other general type of industries. The proposal for the factories for manufacturing clay-bricks and products has been based on the established potentials of clay deposits and capacities arrived at by Dr. Selim. The Estate is to consist of new factories and relocation of old clay brick factories in Baghdad which have created pollution hazards.

The area covered by the Estate is of the order of 330 hectares in a total area of 100 square km.earmarked by the Government. The remaining land is proposed to be used for the clay pits, construction of township etc. Provision has also been made for the expansion of the Estate in course of time.

The total estimated cost of the project is ID.47 Million (approx.) which includes the cost of external infrastructure, consisting of approach road, power line, water supply, telecommunication etc. housing scheme, estate facilities and internal infrastructure and services.

The author's particular contribution in the report is in respect of overall planning, design and cost estimates for the project.

Whereas the entire capital investment for the Estate will be met by the Government as a development work, the operational cost of the Estate is proposed to be met from rentals collected from the lease holders of the plots.

The investment for the factories including the services inside the plot will be financed by the prospective entrepreneurs/cooperatives with such support from the Government as is admissible.

The feasibility study report has been approved by the Government and the various activities of the project are in progress.

### 3.3 Report No.4

#### Sample Designs of Clay-brick Factories Nahrawan Industrial Estate

Prepared in May 1981

No. of pages 38

The report has been prepared by the author as a follow up of the feasibility study report based on technological study carried out by Dr. M.F. Selim (Report No.3).

In this report sample designs for 3 different sizes of clay-brick factories have been discussed, the principles of design of civil engineering works have been generally laid down and typical designs and scope drawings for each type illustrated. General specifications of work to be adopted have been recommended and approximate cost estimates and quantities of construction materials required have been worked out. Construction time schedule has also been laid down for the various capacities of factories.

The report is meant to form general guidelines in respect of lay-out <sup>of</sup> factories and civil and structural engineering works to the prospective entrepreneurs who have to formulate their own proposal for their factories, suited to the process and the equipment to be actually used, within the overall guide lines laid down by the DGCIE.

3.4 Paper No.5

Draft Tender Document for Consultancy Services for Water Supply Scheme Nahrawan Industrial Estate

Prepared in May 1981

No. of pages 32

The draft tender document was formulated to help DGCIE to call the tenders for the consultancy services for the water supply system as conceived in the Feasibility Study Report. It included instructions to tenderers, scope of work and general terms and conditions for the consultancy services as also technical conditions, terms and conditions for remuneration etc.

The form of agreement and the general conditions of the contract as are being used by the Government of Iraq were adopted for the purpose.

The tenders based on the above documents were duly received by the DGCIE, scrutinized and work allotted to the selected Consultant. Based on the tenders prepared by the Consultant for the execution of works, the contractors for the construction of the water supply scheme have to be decided.

3.5 Report No. 8

Project Progress Report No.1

Prepared in May 1981

No. of pages 13

This report has been prepared as required under the UNIDO guidelines and in accordance with the project agreement by Mr. J.M. Gajewski the Team Leader, with the help of the author.

The report is meant to indicate the progress on the project for the first six months since its inception. The up to date achievements on the project implementation have been brought out in this report. Attention was also drawn to the constraints being faced/likely to be faced in the implementation of certain activities of the project.

3.6 Report No.11

Common Service Facilities and Services for Nahrawan Industrial Estate

In this report details of Common Service Facilities and Services required for operation and maintenance of N.I.E. have been discussed. The actual requirement of service facilities and services have been laid down and a lay-out has been evolved for these facilities. Scope drawings for the various buildings in the services area have been illustrated. The lay-out of external services for this area has also been worked out and the proposed specifications of work, materials of construction and construction schedule for the works have been indicated.

The report forms a basis for proceeding further with a tender action either on turnkey basis (detailed design & construction) or separately for a consultancy agency for undertaking the detailed designs and construction drawings to be followed by tenders for civil engineering works based on the detailed designs and drawings, bills of quantities etc., prepared by the consultants.

3.7

Paper No.12

Tender for Consultancy Service - Common Service Facilities and Services Nahrawan Industrial Estate

Prepared in September 1981

No. of pages 47

Based on the decision of the DGCIE to go in for a separate tender for the Consultancy Services on which the required spade work <sup>was</sup> done on the report referred to above (Report No.11) draft tender papers were prepared for the consultancy services to include instructions to tenderers, the scope of work and terms and conditions, technical conditions for the consultancy services, conditions for remuneration etc.

The form of agreement and general conditions of contract as are being followed in Iraq were adopted for the tender.

The tenders for the consultancy services have since been received and decision taken on allotment of the work.

3.8

Report No.13

Housing Scheme for Nahrawan Industrial Estate

Prepared in September 1981

No. of pages 30

The report has been jointly prepared by the two experts of the team (Mr. J.M. Gajewski and the author) mainly with a view to provide a document to support official request to the Government for allocation of funds for the housing scheme which was considered to be essentially required for the success of the Industrial Estate project.

In this report general proposal for the housing scheme for the Estate has been discussed. Need for construction of a total number of 1750 units has been stressed and time schedule for its implementation has been recommended in a phased manner.

The township has been proposed in a 118 hectar of land earmarked for the housing scheme in the feasibility study report of N.I.E. to include the requirement of Government factories as also some expansion area.

Line plans for various types of houses proposed have been illustrated in the report. Phased requirement of public buildings and services has also been laid down for the township.

The report will form the basis for town planning and architectural consultants to undertake detailed town planning and architectural, structural and services designs and drawings for residential and public buildings for proceeding further with the tender action and execution of works.

3.9 Paper No.16

Terms and Conditions and Specifications for Soil Investigation work Nahrawan Industrial Estate

Prepared in October 1981

No. of pages 14

This Paper consists of a draft tender document for soil investigation work which was considered essential for determining sub-soil conditions of the site and for determining the bearing capacity at the specific construction sites at Nahrawan.

The exact locations of trial borings was indicated and extent of investigation including sampling, insitu testing and laboratory testing etc. was specified.

Based on the scope of work laid down, the National Center for Construction Laboratories have since completed the soil investigation work and submitted the report to DGCIE, which will form the basis of design of the structures for N.I.E.

3.10 Paper No.17

A note on Environmental Aspect - Nahrawan Industrial Estate

Prepared in December 1981

No. of pages 5

The note was prepared at the instance of DGCIE, to indicate precautions taken in the planning of N.I.E. to prevent pollution.

It was pointed out that in an industrial estate of the type it is difficult to entirely eliminate all the harmful effects on the environment but the pollution, if any, could be restricted to barest minimum by taking possible precautionary steps at planning, design and construction stages and subsequently providing effective maintenance to create a livable environment in otherwise a desert area at Nahrawan.

3.11 Report No.18

Project Progress Report No.2

Prepared in December 1981

No. of pages 13

In this report which was prepared by Mr. J.M. Gajewski, the Team Leader, with the help of the author, the up to date position of implementation of the project was brought out, the financial allocation made by the Government for the execution of the project was indicated and efforts being made by the DGCIE to proceed with the construction stage were pointed out. Certain continuing handicaps in the project implementation were also indicated.



3.12 Report No.20

Alternative type designs and specifications of work  
clay-brick factories Nahrawan Industrial Estate

Prepared in March 1982

No. of pages 24

This report is further to report No.4 in which sample designs for the various capacities/sizes of clay brick factories were discussed from civil engineering/construction angle, and certain guide lines laid for the prospective entrepreneurs.

Based on several quotations received by the DGCIE for the supply of plant and equipment for factories, the possible alternatives available to the prospective entrepreneurs have been pointed out and an optimum solution recommended for a typical medium size capacity of the factory for producing 15 M.bricks/year.

It has been pointed out in this report that the final solution will depend on the actual plant and equipment obted by the prospective entrepreneur and DGCIE should be in position to advise them on the specific problems which are likely to be faced on planning, design and construction of clay-brick factories, based on the general guide lines available.

3.13 Paper No.22

Tender Document for Consultancy Services - Housing  
Scheme Nahrawan Industrial Estate

Prepared in March 1982

No. of pages 49

Based on the decision of the DGCIE to go in for Consultancy for town planning and architectural/structural services, tender papers have been prepared for the services required to include instructions to tenderers, scope of work, terms and conditions, technical conditions for the consultancy services, conditions for remuneration etc.

3.14 Report No. 25

Project Progress Report No. 3

Prepared in May 1982

No. of pages 13

On departure of Mr. Gajewski, the team leader, this report was independently prepared by the author. It was prepared in the laid down format and brought out the up to date position on the project implemetation and the efforts being put up by the DDCIE to speed up the construction programme which has lagged behind the schedule drawn for the works.

3.15 Report No. 26

Type Designs and Specifications of Work  
for General Type Industries.

Prepared in July 1982

No. of pages 25

In this report, in line with the work programme for 1982, and based on the available information, a few scope plans have been evolved for typical plots of land in the two alternative layout plans prepared for the General Industries Area. Specific industries amongst the selected group have been kept in view, with a stress on materials of construction such as pre-cast components, structural fabrication, timber workshop, fixtures and fittings etc. General specifications of work have been suggested and cost indications given. A typical construction schedule has also been illustrated.

3.16 Report No. 27

Project Evaluation Report

Prepared in Aug. 1982

No. of pages 10

This is the first report prepared by the author to conform to the Internal Evaluation System newly introduced by URIDO in which the up to date performance of the project has been assessed in the format laid down for the purpose. The achievements have been highlighted and deficiencies have been pinpointed in the project implementation programme.

3.17 Paper No. 28

Co-ordination of Internal Infrastructure

Prepared in Sept. 1982

No. of pages 14

In this paper, the importance of proper co-ordination amongst the several items of Estate infrastructure, including the various services for the area, right from planning & design stage to construction & maintenance stage, has been brought out.

To fit in with the layout of the Estate, the locations of the various services such as raw and drinking water mains, sewer lines, power cables, storm water channels, telecommunication and gas lines etc. have been indicated both in plan and cross-sections, to have the least interference amongst them and provide ease of construction and maintenance. Some sequence of construction has also been suggested.

3.18 Paper No. 29

A further paper on alternative type designs and specifications of work for clay-brick factories

Prepared in Oct. 1982

No. of pages 9

This paper has been prepared as desired by DGCIE, further to two earlier reports on the subject (Nos. 4 & 20) with a view to arrive at the most economic solution on the civil engineering works for the clay-brick factories, based on the up to date information on costs available from the DGCIE.

3.19 Report No. 30

Assistance to Industrial Estates  
Mission Terminal Report

Prepared in Oct. 1982

No. of pages 36

This is the final report under submission, prepared generally on the guide lines laid down for the purpose. The several activities of the project completed during the mission period have been brought out and the contribution made by the author in particular, have been pointed out in the overall implementation programme. The report also includes project findings and recommendations of the author for the execution stage of the project.

3.20 The author also helped the other expert and the team leader Mr. Gajewski in several other reports and papers generally and from civil engineering/construction angle in particular. Some of the contribution was in the following reports/papers.

Paper No. 6

Draft lease agreement on Industrial Development Land,  
Nahrawan Industrial Estate.

Report No. 14

A proposal on Development of Industrial Estates in Iraq.

Report No. 19

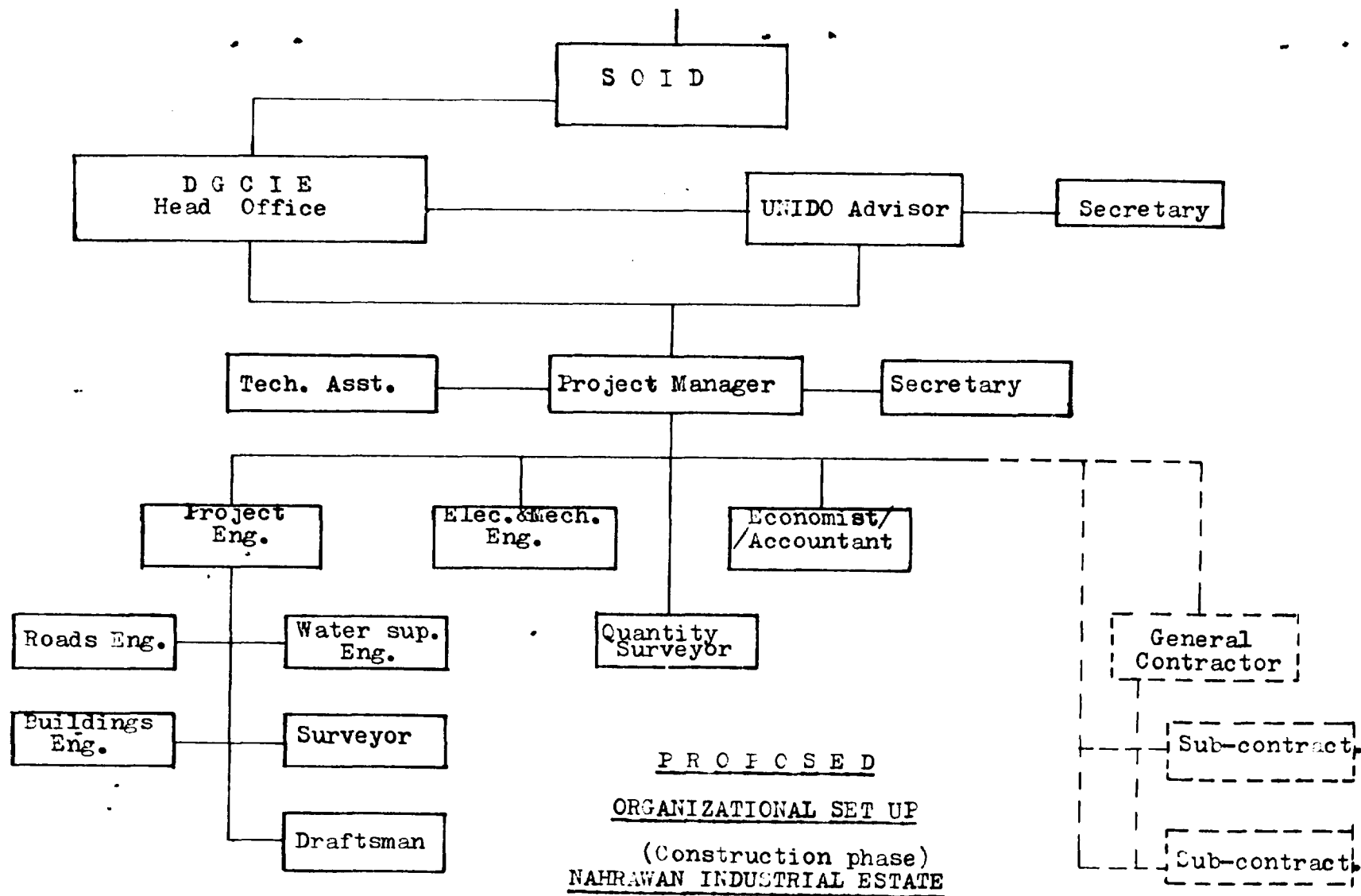
Cost and Viability Analyses for clay-brick factories at  
Nahrawan Industrial Estate.

A consolidated list of important  
Reports / papers on the project

<u>No.</u>	<u>Description</u>	<u>Authors/</u>	<u>Date of issue</u>
1	Preliminary Report on NIE/Area	Team	Jan/ 1981
2	Feasibility Report on NIE	GG & PPD/	Mar. 1981
3	Technolglcal Report on NIE	Dr. Salim/	Mar. 1981
4	Sample Designs of Clay-brick Fact's	PPD /	May. 1981
5	Draft Tender Water Supply Consul- tancy	PPD /	May. 1981
6	Draft Lease Agreement	GG /	May. 1981
7	Industrial Estates Questionair	GG /	May. 1981
8	Project Progress Report No. 1	GG & PPD/	May. 1981
9	Selected Types of Industries for NIE	GG /	June 1981
10	Cost & Viability Analyses CBF I	GG /	July 1981
11	Common Service Facilities & Services	PPD /	July 1981
12	Draft Tender C. S. F. & S., NIE	PPD /	Sept 1981
13	Housing scheme, NIE	PPD & GG/	Sept 1981
14	Industrial Estates Development in Iraq	AF & GG/	Dec. 1981
15	Mission Terminal Report	GG /	No. 1981
16	Soil Investigation Work, NIE	PPD /	Oct 1981
17	Environmental Aspects, NIE	PPD /	Dec. 1981
18	Projcet Progress Report No. 2	PPD & GG/	Dec. 1981
19	Cost & Viability Analyses CBF II	GG /	Feb. 1982
20	Alternative Type Designs CBF	PPD /	Mar. 1982
21	General Industries at NIE	GG /	Mar. 1982
22	Draft Tender Housing Scheme C.S.	PPD /	Apr. 1982
23	Clay-winning Unit, NIE	GG /	Apr. 1982
24	Mission Terminal Report ( Suppl.)	GG /	May. 1982

( page 2 contd. )

25	Project Progress Report No 3	PPD	/May 1982
26	Type Designs- General Industries	PPD	/July 1982
27	Project Evaluation Report	PPD	/Aug. 1982
28	Co-ordination of Internal Infrastruc.	PPD	/Sept 1982
29	Analyses of Cost- Civil Work CBF	PPD	/Oct. 1982
30	Mission Terminal Report	PPD	/Oct. 1981





ADMINISTRATIVE NOTE

ON

MISSION TERMINAL REPORT

Oct. 15.12.1972

ASSISTANCE TO INDUSTRIAL STATE

(Post 11-03/31.3.73)

1. The Mission Terminal Report including the project findings and recommendations for the project was prepared as originally scheduled for two years assignment ending on 24th. Nov. '72 in the month of Oct. '72 and the draft was submitted to UNCTAD, UNICEF Vienna and Mes. Rep. USSR Baghdad, in the last week of Oct. '72. No substantial comments have been received from any quarters.

2. In the meantime when the assignment was about to come to a close, the duration of the post was extended up to the end of Feb. '73. At the instance of the Government of Iraq, the departure of the undersigned from Baghdad which was originally scheduled for 17th. Oct. '72 and therefore to be postponed. The departure is now scheduled for 4th. Jan. '73. (with the balance terminal leave to credit) the departure from Vienna is scheduled for 5th. Jan. '73.

3. During the extended period of assignment besides attending to the normal residual project activities, the following items of work were attended to in particular, as recorded by UNCTAD.

3.1 A proposal was prepared on the co-ordination of external services for the Government clay brick factory located to the North of Bahrawan Industrial Estate.

3.2 Advice was rendered on the budget revision for 1973 for the phased construction of the estate.

3.3 Suggestions were made on the actual locations of tel.com. lines in the estate area with respect to internal estate road network.

3.4 Specific queries raised on the tenders received by the contractor for the construction of Bahrawan water supply scheme were answered.

3.5 Practical suggestions were made for the possible reduction of cost of internal road network for the state with the least detriment to the efficiency of transportation system.

3.6 Reputation proposal of Mr. David Nathalia, civil engineer, 1931, was closely followed for a fellowship programme on management and planning aspects of industrial estates development with IIT, Kharagpur.

3.7 Comments were made on the set of drawings prepared by the state for initiation of Industrial Design and Construction of Common Service Facilities and Services for the state, indicating possible economy and discrepancies.

3.8 Mr. Lim, brick making specialist, on short term IITK assignment was briefed on the up to date position of the project and several reports prepared by the various experts were discussed with him.

4. With the arrival of the brick making specialist in early Dec. '62, it is expected that the existing gaps in the technical aspects of brick making will be filled in. He has been briefed on the certain work done by Mr. Lim, the previous expert and the follow up action taken after his departure. In particular, the new expert, Mr. Lim would be advised to look on the techno-economic aspects of commercial pit, quality control, testing methods, chimney & equipment required for each relocated clay brick factories, problems of installation, trial runs, operation & maintenance and the need of training, if any. He would be expected to assist on other specific aspects referred to him.

5. It is interesting to note that since the last progress report there is substantial physical progress on the project. The access road to the project site has been completed. The work on the main approach road to the state is in progress and a good deal of agreement for the project end has been completed. With the receipt of tenders for the water supply scheme and various other facilities on the allotment of work shortly, the construction of the estate is expected to be further advanced. In spite of the various constraints, the revised construction schedule for completion of

the project by the middle of 1964 seemed attainable if there were no further set-backs to the implementation programme. However, with the latest decision to defer the allotment of this work, the completion schedule is likely to be affected.

6. On completion of the fellowship programme of Mr. Farid Fathallah, civil engineer, in the management and planning aspects of industrial estates development with the Centre for Management and Industrial Development of I.I.T. during the current month and thereafter, it is expected to formulate a nucleus of management cell for the first industrial estate both for completion of construction and operation of the first industrial estate in the country, based on the available guide lines which could be a model for development of other industrial estates contemplated in Iraq.

7. No changes are proposed in the conditions arrived at and the recommendations made in the original report submitted, except that it is recommended that further concerted efforts be made for from the local side to follow the recommendations made and achieve the earliest possible completion of the project with a view to make it a success. Continued co-operation of I.I.T. till the completion stage of the project will go a long way in achieving this objective.

8. On completion of the extended assignment, the undersigned would like to express his sincere thanks to Mr. Farid Fathallah, Director General and Mr. Masim Al-Wakeel, Chief Engineer of I.I.T. and other associates for co-operation and help which facilitated the author's work in Iraq.

Yours faithfully,  
Farid Fathallah

