FACTORS AFFECTING PROJECT COMPLETION TARGET DATES:
A CASE FOR NIGGER STATE

BY

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OCTOBER, 1983.

DIGITIZED

DECLARATION

I hereby declare that this thesis has been written by me and that it is a complete record of my own research work. It has not been presented in any previous application for a higher degree.

All sources of information are specifically acknowledged by means of references.

Signed ----------
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We certify that we have read this thesis and in our opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality, as a thesis for the degree of Master of Science in Construction Management.

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Date of Approval/Examination ---------- 1983.

DEDICATION

To Mama and Papa

who begot me and made me what I am today.

ACKNOWLEDGEMENTS

May God be praised, for despite my shortcomings, He has always stood by me in difficult times, such as, pursueing this course to its altimate end successfully, inspite of all kinds of hardships encountered all through the session - 1982/83.

My special thanks goes to Dr. Tim O. Mosaku, my sole supervisor, for his relentless efforts in guiding me all through the preparation of this dissertation. The patience and time he took in reading through the manuscripts are invaluable. His contribution in the overall arrangement of this thesis will definitely beggar any description. Once more, Dr. Tim O. Mosaku I wish you Gods' blessings and Guidance.

To Mr. Eric Modu, I say, I am not ungrateful for the financial and moral support he gave me all through my stay at A.B.U., Zaria.

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ABSTRACT

This thesis deals with the investigation of the factors affecting optimum project completion dates in Nigeria. Optimum project completion date is the most economical date in which the project must be completed assuming that there are no unforseen set-backs. Results from this investigation revealed that any deviation from this date has varying effects on the parties to the contract.

It is an acceptable fact that the need for housing and other infrastructural facilities in Nigeria demand that all construction projects be executed within the stipulated project completion target dates and in accordance with the stated specifications. However lapses has been, hitherto, reported which has resulted in delays in project execution and/or abandonment. In view of this fact, this investigation was extended to cover the major causes of delays in project execution and/or project abandonment in Nigeria with special reference to Niger State..

It has been discovered during this extended investigation that lapses recorded in the execution of construction projects were as a result of certain

negating actions taken by both contractors, clients and consultants together with the deficiences in the contract awarding system prevailing in the country. In addition, it was found that Government monetary policy determine, to a great extent the pace at which some construction projects are executed.

The analysis of the factors established to be the major causes of delays in project execution and/or abandonment, formed the basis, from which conclusions were drawn and suggestions made which is believed will enable improvements to be made in the execution of construction projects.

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CHAPTER ONE

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

1.0.0 Need for this Dissertation:

The provision of various types of infrastructural facilities in the country has been the primary concern of successive States and Federal Governments in Nigeria. Without doubt, the execution of these projects is the handiwork of construction firms.

It is an acceptable fact that a country's economic and social growth are to some extent measured by the degree of infrastructural facilities already in existence including those in the making.

A developing nation, like Nigeria invests an appreciable percentage of its financial resources in the provision of infrastructural facilities like roads and buildings. The increased need for these facilities demand that they are executed according to specifications and within the stipulated project completion target date by the construction firms.

However, hitherto, lapses have been reported which have resulted to projects being delayed and/or completely abandoned. This unfortunate trend does not only affect the economy of the nation, but also poses a threat to the very existence of most construction firms, particularly the indigenous firms.

However these lapses are caused by both the Government, construction firms and the general

stage of our development.

1.0.1 Stage of National Development:

The present stage of development in the country is such that there is an acute shortage of skilled manpower both in the managerial and technical fields in the nation's construction industry. In addition, most industries, particularly the construction firms depend more on imported materials for use in project execution. It is not surprising then, that with the introduction of the tight import restriction policy by the Federal Government, the scarcity of essential materials for construction purposes has to a great extent affected the performance of most construction firms. Even the production output of local industries that manufacture building materials is greatly affected too, since, most of these local industries depend on the importation of raw materials for their production. Nevertheless, scarcity of building materials is only but a recent factor responsible for the lapses reported in the execution of projects.

1.0.2 Government Contribution to these Lapses Reported in Project Execution:

Government contribution to these lapses in project execution can be attributed to a number of factors. These include the following:

1. The general practice of registering contractors into various categories or class based only on the information furnished by the contractor, without an efficient machinery for cross-checking the authenticity of such information,

result in cases of ill-equipped persons or companies being registered as contractors under categories which otherwise should have not been the case.

2. The increase in the general disregard of the factors often considered in the making of contract awards by some Government Agencies especially where construction firms owned by influential party members are involved.

3. Government neglect in checking and monitoring the activities of registered contractors to ensure that they abide by the laid down regulations for operation in the country and the failure, by the appropriate bodies, in most cases, to take prompt and disciplinary actions against any of the defaulting contractors.

1.0.3 Construction Firm's Contribution to these Lapses in Project Execution:

Construction firms too, contribute to these unfortunate trends od delays in project execution and/or abandonment. Some of these firms, particularly indigenous firms have failed, in most cases, to execute their projects according to specification and within the stipulated project completion target date, either due to poor project planning, shortage of skilled technical personnels, inefficient material management or sometimes unpatriotic attitude.

1.1 Objectives of this Dissertation:

The objectives of this dissertation are:-

1. To examine the contract awarding system in Nigeria with a view to highlighting the advantages and

disadvantages of each procedure and the type of project each procedure is best applicable to.

2. To establish, not only, the basic criteria that govern time consideration in project execution, but also, the setting of completion dates for various projects with a view of determining the effects any deviation from these dates will have on the parties to a contract.
3. To analyse the factors that affect project completion target dates.
4. To investigate the causes of delays and/or project abandonment in Nigeria with special reference to building and Civil Engineering projects in Niger State and
5. Finally to draw conclusions from the findings and analysis made and suggest recommendations for improvement.

1.2 Methodology:

This dissertation was accomplished through interviews, questionnaires, references to standard texts, newspaper reports, reading through project files for proper assessment of progress reports, and the study of the following:

1. Regustration procedure and contract awarding system of the Niger State Tenders Board with a view to highlighting the deficiencies in the system and the likely abuses that may occur as a result of these deficiencies

2. A building and a civil engineering project currently being executed in Niger State, inorder to establish the major causes of delays in the process or executing the projects.
3. A building and civil engineering project in Niger State that were completely abandoned by the contractors with a view of determining the trends that led to the abandonment and
4. A building project that was successfully completed two months ahead of the stipulated project completion target date, inorder to find out the factors that contributed to such commendable performance by the contractor.

CHAPTER TWO

CONTRACT AWARDING SYSTEMS IN NIGERIA

2.0.0 Introduction:

The issues of delays and/or prompt delivery of a building to the owner cannot be divorced from the registration process and contracts procedure.

For a construction firm to operate in Nigeria, it is mandatory that it must first be registered with the Federal Works Registration Board and then re-registered with the State Tenders Board in which it intends to carry out its works. It has even become the order of the day for every prospective client to stipulate that tenders be submitted by contractors registered (within a particular category) with him.

This chapter is devoted to discussing the registration process and contract procedures applicable in Nigeria with particular reference to Niger State.

2.1. Category of Registration:

Classification of contractors into different categories differ from state to state. Nevertheless eqivalents can always be drawn from the tables of registration categories of different states and that of the Federal Works Registrations Board.

The methods employed in registration vary from employer to employer. While the Federal and State Governments have standard application forms, other clients may demand for a written application of completion of their respective locally designed application forms.

These forms are only processed upon payment of a stipulated registration fee (depending upon the category) by the contractor.

For the purpose of clarity and comparisons, the categories of registration of contractors of the Federal Works Registration Board and that of the Niger State Tenders Board have been reproduced below.

Table 2.1: Registration of Contractors Federal Works Registration Board Building and Civil Engineering Contract.

Category	Contract Value
A	Up to ₦50,000
B	₦50,001 - ₦250,000
C	₦250,001 - ₦2,000,000
D	₦2,000,000 and above

Source: Federal Ministry of Works Minna.

Table 2.2: Registration of Contractors, Niger State Tenders Board Niger State Government

Class and Category	Types of Contract	Contract Value
Class 1	Minor Jobs	
Category	A	Up to ₦5,000.00
Category	B	₦5,001-₦15,000.00
Class II	Supply of Goods Materials	
Category	A	₦15,001-₦50,000.00
Category	B	₦50,001 and above
Class III	Building and Civil Engineering Works	
Category	A	₦50,000-₦250,000
Category	B	₦250,001-₦2,000,000
Category	C	₦2,000,000 and above
Class IV	Electrical and Mech. Installations	
Category	A	Up to ₦30,000
Category	B	₦30,001-₦100,000
Category	C	₦100,001 and above

The category into which a contractor is registered is determined by the Registering Body or the client. It is now common practice for a non-refundable application fee to be paid by the contractor applying for registration. The value of this fee depends on the

category into which registration is sought. Once registered, subsequent re-newal fees are paid annually. The value of this too, is dependent on the category the contractor is registered.

Some clients have provisions for upgrading contractors to a higher grade. This they do by assessing the worth of the job executed by the contractor and his overall performance in terms of satisfactory completion of work within the stipulated project completion target date etc. It is, however, interesting to note that upgrading of a contractor is only entertained, upon application by the contractor seeking upgrading, after the lapse of twelve months from the date of previous classification.

Table 2.3: Registration and Renewal Fees Payable in Niger State (Niger State Tenders Board)

Class	Category	Initial Registration Fee	Annual Renewal Fee
Class I	A	₦25.00	₦15.00
	B	₦50.00	₦25.00
Class II	A	₦100.00	₦50.00
	B	₦200.00	₦80.00
Class III	A	₦100.00	₦50.00
	B	₦150.00	₦100.00
	C	₦500.00	₦200.00
Class IV	A	₦75.00	₦40.00
	B	₦150.00	₦60.00
	C	₦200.00	₦80.00

2.2 Registration Requirements:

Company registration is required of all types of industries operating in Nigeria. However, the registration of a construction firm demands that certain requisite information be provided. These informations include the following:

1. Evidence of registration of business name and manner of registration, whether it is
   (i) A Limited Liability Company
   (ii) A Partnership
   (iii) Private Individual
2. If it is a limited liability company or partnership:-
   (i) The name and address of bankers and a photocopy of last balance sheet.
   (ii) Issued Capital
   (iii) Paid up capital
   (iv) Date of incorporation of company
   (v) Certificate of registration and number
   (vi) Name of Directors
   (vii) A copy of the memorandum and article of association.
3. Record number of years the organisation has been in existence.
4. Details of technical qualification of the organisation's staff.
5. Details of plant and equipments
6. Details of work the firm is currently executing
7. Details of work completed during the past three years.

The information provided in the completed forms will form the basis for registration into the client's designed appropriate category. It is well to point out that education is not an important factor for consideration in registration. The factors of paramount importance for registration are:

1. Personnel
2. Experience on jobs
3. Plant and equipment available
4. Financial standing of the person or company

The propensity, however, is for some people to give incorrect information inorder to secure registration. Hence it is not surprising to find petty traders and small time businessmen armed with registration certificates under category 'D' parading themselves as major contractors. It is rather unfortunate that most of these informations are difficult to check and, in consequence, many contractors are registered without possessing the necessary requirements.

In correct information can be found in forms completed for registration with public establishment like Federal and State Governments where it is not likely that information are cross-checked. On the other hand, private and autonomous organisations are strict and claim to follow up such information on the financial stand of the prospective contractor by corss-checking from his/her bankers. Regretably, there is no sure way of ascertaining the correctness of most of the

essential information required - personnel, plant equipments, etc.

Nevertheless, should incorrect information be detected during processing of the forms for registration, the contractor's application is rejected outright. Similarly, certificate of registration can be withdrawn if information is found to be incorrect after registration.

It is however interesting to note that registration of a contractor does not automatically qualify him or her to be awarded a contract by the client, since contract jobs require some specialisation and abundant technical know-how. It therefore behoves whoever goes into this line of business, to be adequately equipped and capable of executing projects within the stipulated project completion target date and according to specifications. Unfortunately, we have had too many contractors in the country who are simply charlatans possessing no other qualifications except their official connexions with which they win contracts.

2.3 Contract Procedures:

2.3.1. Introduction:

In building and Civil Engineering contracts, many persons are involved. However, the principal parties to the contract are the client and the contractor. In this section, the major types of contracts and various

forms of tendering will be examined. In addition, the duties, responsibilities and relationships between the various parties involved in a contract will be briefly discussed.

2.3.2 Types of Contract:

There are primarily two major types of contracts:

1. The prime cost contract, where the cost of delay is shouldered by the client.
2. The firm priced contract, where the cost of delay is rather difficult to evaluate.

Most building and Civil Engineering contracts fall into the second category. In consequence, legal documents are drawn up stating the contract conditions which provide for anticipated work changes and delays and placing legal liability on any one of the parties who may be at fault in the process of the contract execution.

Many factors combine to make up a valid contract. These include the followings:

(i) There must be an offer.
(ii) An unqualified acceptance of the offer.
(iii) An intention to create a legal relation.
(iv) A firm genuiness of consent.
(v) A clear-cut definition of the capacities of the parties to the contract.
(vi) A possibility of performance.

(vii) A clear understanding of the terms of the contract.

(viii) Legality of objects.

(ix) Valuable consideration.

A good contract demands that the terms or conditions of contract be brought to the notice of each party in good time and understood by both parties.

2.3.3 Tendering Procedure:

Under normal circumstances, contracts are awarded based on the tenders recieved. The tendering procedure used are greatly influenced by the prevailing circumstances. This implies that a particular situation will require the use of a particular tendering procedure for convenience and best results. However the success of any tendering procedure depends to a great extent on those concerned.

Forms of Tendering:

1. Open Tendering.
2. Selective Tendering.
3. Negotiated Contracts.
4. Package Deal.
5. Cost-Plus Contract.
6. Cost-Plus Fixed Fee.
7. Target Cost with Variable Fee.

Of the seven forms of tendering mentioned above, only the first four are commonly used in Nigeria, and these will be briefly examined.

Open Tendering:

This method of tendering is commonly used by government agencies. It provides an opportunity for contractors in the category specified to put forward their respective tenders for the job. This form of competitive tendering does not in any way bind the client to accept the lowest tender or any of the tenders.

Selective Tendering:

Here the client invites competititive tenders from a list of contractors of established reputation. This form of tender has the advantage of removing the possibility of awarding the contract to an incompitent contractor.

Negotiated Contracts:

This method of tendering is usually employed where the magnitude of the work may be unknown at first or where early completion is of utmost importance. Under a contract of this nature, there is always the danger that a price obtained in this way might be higher than against a competitive tender. However, its intelligent use may even result in a lower price.

Most negotiated contracts are arranged on a prime cost basis with a single selected contractor whose credibility has been tested or ascertained.

Package Deal:

Under a package deal, a client provides brief details as to his requirements and either selects a contractor or offers it open on selected methods, leaving

the onus of design and costs to the contractor. Generally, this form of tender is used for projects requiring special techniques like Industrial Buildings, Television or Radio Stations, etc.

Factors Often Considered in Making Contract Awards:

Tenders submitted for most Building and Civil Engineering contracts are cross-checked for errors and appraised by the consultant. Recommendations on each tender is passed to the client. However, the client is not bind to act on such recommendations. He is at liberty to use his discretion in making the award.

Nevertheless, factors said to be considered in making awards are:

1. Sufficiency of the tenderer in resources. These include financial, personnel and material resources.
2. The number and magnitude of projects a contract is currently handling. This is to enable the client determine the extent an additional award of contract will stretch the contractor's resources, thereby hampering his expected performance.
3. The credibility of the contractor based on his past performance on similar projects with the client or elsewhere.
4. The category the contractor is registered. This, however, does not often apply when the project is complex in nature and require special skills.
5. The quoted tender figure and project completion time.

It is only the successful contractor that is communicated on the award and he is asked to come and sign the contract agreement. Others who tendered for the job, but are unsuccessful, are not informed that the award has been made.

2.4 Duties and Relationship Among Parties to a Contract:

Parties to a contract in most Building or Civil Engineering projects are the client, consultant and the contractor.

The client is the owner and sole financier of the project. He engages both the consultant and the contractor. While the consultant carrys out the design and/or supervision of the project the contractor is solely concerned with the actual construction.

The consultant, whose services has been retained at an agreed fee ensures that the works are executed according to specifications. He also ensures that the interest of both parties to the contract are protected. In short, he can rightly be described as the middle-man in the process of execution of the project.

Payments on interim certificates of claims are made to the contractor by the client only after the works have been duly certified and approved by the consultant.

Extension periods and other concessions are granted the contractor by the consultant, only when there are genuine reasons for them. This action is to protect

the contractor from paying liquidated damages as a result of late completion, should that happen.

2.5 Performance Evaluation of Construction Firms in Nigeria.

Although there is no standard yard-stick for evaluating the performance of a construction firm, yet the slow pace at which major projects are executed and the rate they are recklessly abandoned by some contractors especially indigenous contractors is now a source of concern to both the Federal and State Governments and the public in general.

This unfortunate trend has greatly affected the confidence reposed on our contractors by the public and Government Agencies. In view of this fact, most major contracts are been awarded to alien-owned construction firms.

Owing to public outcry over the awards of major contracts to alien-owned construction firms, and also, as an encouragement to indigenous contractors, the Federal and State Governments have now devised means of getting indigenous contractors involved in the execution of major contracts. This is done by breaking down major contracts into smaller units and awarding them to various indigenous contractors.

But unfortunately, there still exist cases of project abandonment where these small units are concerned by our contractors.

CHAPTER 3

PROJECT ADMINISTRATION

3.0.0 INTRODUCTION

On being awarded a contract, a contractor's operations from start to the finish of the project can be broadly divided into four major groups:

1. Procurement of the necessary labour material and equipment for executing the project.
2. Transporting these resources to the site.
3. Making effective utilisation of these resources to complete the project.
4. Removing the men, equipment, surplus material and clearing the rubbish from the site when the job is completed.

Once these four phases of operation are completed within the stipulated project completion target date, then the contract has been executed as agreed upon.

However, the successful completion of any contract depend largely upon the ability of its management to carry out its responsibility both effectively and efficiently. Generally, management can be described as the judicious allocation and efficient usage of resources to achieve a pre-determined goal.

The objective(s) of the construction firm is often set before the administration of a project takes off. The setting of this pre-determined goal is, however, the function of the firm's top mangement

- Board of Directors or the Managing Director. This leaves project administration with the task of determining the means by which a profitable and satisfactory accomplishment of the objective can be achieved using the available resources.

Project administration embraces the following functions:

1. Decision making at all phases in the process of execution of the project.
2. Planning and control.
3. Delegation of authority and responsibility on the site.
4. Project Co-ordination; and
5. Resource management.

3.1 DECISION MAKING:

Decision, by definition, is a course of action chosen to achieve a desired result. It is the result of a choice between at least two courses of action. In attaining effective decisions in project administration, the project management team headed by the project manager must examine and investigate all alternative courses of action.

However, for prompt completion of the project a number of important decicions are needed to be taken initially by the top management. These include the following:

1. Selection of a competent management team to plan the project. This management team, headed by the Project Manager, includes the Estimator (Construction Cost Accountant), Plant and Transport Manager, Purchasing Manager, Site Accountant and Site Agents (depending on the number of sites).
2. Requesting sub-contractors whose performance have been tested to tender for areas of the works to be subletted. A mistake in choosing an inefficient sub-contractor can be expensive and may result in heavy losses been incurred by the prime contractor owning to delays and shoddy workmanship.
3. The likely sources of funds for financing the project. This is of utmost importance to the contractor since funds are required for the procurement of both administrative staff on the site, labourforce, plants, materials and equipments with which to execute the contract. Financial resources is generally the life blood of any construction project.

For project construction and management, there are four sources from which funds can be raised. These are:-

1. Residual working capital
2. Loans from Financial Institutions
3. Mobilisation fee
4. Progress payments based on jobs successfully.

executed.

After this intial decisions aremade by the top management, the responsibility of planning, controlling, co-ordinating the execution of the project now rests on the selected management team.

3.2 PROJECT PLANNING:

1. PRELIMINARY PLANNING

The aim of preliminary planning is to get a thorough appreciation of the scope of work to be done and sort it out into its main constituents, to decide how and in what order to do it and to determine the time phasing of the main items of the work.

Preliminary planning involves the following:

1. Reassessment of the works in the project since the first assessment during the tender stage must have been carried out within a limited time period and in consequence some vital aspects might have been overlooked.
2. Assessment of resource requirements - finance, personnel, equipment, plants and materialas.
3. Resource planning (contract planning and short term planning).
4. Estimating the cost of the project and the likely margin of profit.
5. Determination of the areas and nature of work sub-contractors may be involved, etc.

2. CONTRACT PLANNING

A contract plan involves the breaking down of the project into operational and manageable units called activities. After a project has been broken down into activities a seperate analysis is made of how these various activities may be accomplished and what construction method will be employed.

Different techniques are applicable in the breaking down of a project into various activities. These include the conventional bar chart, PERT and the C.P.M. However the C.P.M., which is the most modern has the added advantage owing to its flexibility.

With the C.P.M. technique, all activities in the project are considered collectively and their interelationship established. Critical activities which determine the overall project completion time are identified and consequently given special attention in the construction process. Failure to complete the critical activities within the estimated time will affect the overall project duration and result in delays.

Nevertheless, no matter what technique is applied in the planning of a project, a detailed contract plan will facilitate a construction project by establishing the following:

1. The time for material delivery.
2. The types, quantities and duration of equipment

needs.

3. classification and numbers of workers needed and the periods during which they will be needed.
4. The time required to complete each activity and hence the overall project duration.
5. Contract planning also helps in advising sub-contractors on their start and finish dates.

In the contract planning process it is essential that all personnels in the project management team are involved, since to effectively and profitably accomplish a project, sound management contributions from every one in the management team are very necessary.

If the project includes a fair amount of work to be performed by sub-contractors, these persons should be consulted during the contract planning stage to establish how their work must and can fit into the overall picture. This is of utmost important since poor performance by sub-contractors can upset the entire plan, create delays and sometimes turn a carefully bid project from profit to loss.

Careful contract planning minimises variations and problems during construction, but it never completely eliminates them due to many unforseen variables and occurrences typical with construction projects. These unforseen occurrances include:

1. Specified materials not being readily available requiring substitutes.
2. Machine break-downs
3. Inclement weather
4. Financial handicap owing to the clients inability to meet with the agreed contractual financial obligations.

These occurrences constitute delays in project execution. However, they can be substantially reduced by following planned system and control in all phases of construction and introducing remedial actions as circumstances dictate.

3.3 CONTROL SHORT TERM PLANNING:

When a planned system is in operation, control also goes with it. Control involves reviewing of activities during construction to ascertain that all operations of the various departments are in accordance with the plan or if there is any deviation, the extent of deviation. For effective control on any construction project, short term planning is very necessary.

SUGGESTED PROGRESS FEED-BACK REPORTING FORM FOR EFFECTIVE CONTROL.

PROJECT STATUS REPORT (FOR FEED-BACK)

PROJECT _____ CONTRACT No. _____ REPORT DATE _____

IDENTIFICATION			TIME STATUS					COST S		
Activity No.	Start Event No.	End Event No.	Schedule Elapse Time (Wks)	Date Completed	Earliest Completion Date	Latest Completion Date	Activity Slack (Wks)	Actual Cost to Date	Estimated Cost ₹:k	Latest Revised

Fig. (1)

Short-term planning transform project planning into a continuous process rather than a once-and-for-all operation. The purposes of this systematic and analytic pattern of planning include the following objectives.

1. To encourage the site management to look ahead, to forsee immediate requirements and hence avoid delays.
2. To review the actual progress achieved (control), to check performance, and either to take remedial actions for short comings or to take advantage of any gains.
3. To incorporate any design modifications and to facilitate improved production techniques in the light of further information.

Without doubt, by forecasting for a shorter period of time, it ispossible to plan in greater detail with more accuracy thereby minimising delays in project execution.

3.4 DELEGATION OF AUTHORITY AND RESPONSIBILITIES.

When the activities involved in the execution of the project have been clearly identified and grouped, it then becomes necessary to define the duties attached to each management position by a job title. The title of the post is usually descriptive of the work involved, such as "Concrete Foreman" or "Head Capenter", etc.

The precise requirements of a post vary with the type of undertaking, the size of the company, type and nature

of project and the objectives to be pursued. In all construction projects, no matter the size and nature, it is often necessary to prepare a written schedule indicating the nature and scope of the various duties.

Since it would take a large amount of space to list all the ramifications of the work to be performed by the holder of a post, it is necessary that a schedule concentrates upon the important futures of the duties - the responsibilities vested in the position. In addition, a schedule must indicate the job title of the post as a heading, followed by the position to which the holder of the post will be held responsible.

In discharging this responsibility, the person occupying this position must possess the right to command and as such is allowed a measure of authority, the details of which are incoporated in the schedule.

It is of utmost importance that the span of the executives authority is limited to the number of subordinates whose activities he can effectively direct, co-ordinate and control. Harmonising the seperate activities of each position and departments given in the schedules enables work on the site by the contractor's work-force to be executed efficiently and without delay.

3.5 PROJECT CO-ORDINATION

The construction Industry is a unique organisation in itself, since activities are not only varying and complex in nature but also totally dependent upon the performance of the different specialists. It is the duty of the project manager to co-ordinate the efforts of the various specialists to achieve a successful completion of the contract.

Co-ordination is the concious process of assemblying and synchronising differented activities so that they function harmoniously, in the attainment of organisations objectives.

The problems of co-ordination in any construction project can be broadly divided into three groups:

1. Co-ordination of activities within the contractors work-force on the site.
2. Co-ordination of variation orders.
3. Co-ordination of sub-contractors work.

3.5.1. Co-ordination of activities within the contractors work-force on the site.

The problem of effective co-ordination within the contractor's staff on the site often arise owing to the high degree of dependence on verbal instructions. It is not uncommon for verbal directives to be subject to distortion somewhere along the line before the message gets to the intended recipient. This does not mean

that verbal instructions should be completely ruled out. However, it is suggested that directives should be backed by documented facts if intended objectives are to be achieved. Definitely, a clear understanding of a given directive, reduces unproductive times and facilitiate the execution of the project with minimum delays.

In addition effective co-ordination within the contractor's staff can be greatly enhanced if

1. Each department is channelled to work in harmony with each other under the same management.
2. Each department, divisions and sections is made to realise the share of its responsibility in the common task.
3. Each department is moulded so that it can adjust its working schedule to suit any prevailing circumstances.

3.5.2 Co-ordination of Variation Orders

Most construction projects make provisions for work changes in design, specifications and volume of work, completion time and the total amount to be paid.

Change orders create both problems and opportunities for the project and the contractor. When there are too many of them, they slow down the project and increase the unit cost. If, however, these change orders cause

delays in completing the job, it is necessary to obtain time extentions inorder to prevent resulting difficulties. On the other hand they offer opportunities to negotiate changes in contract price which can prove quite profitable. Oral change orders are an open invitation to disputes and often lead to litigations. In consequence they should be avoided as much as possible.

Co-ordination of variation order to the various groups working on a project is the sole responsibility of the contractor. When the clients' representative notifies the contractor that a change is to be made, the contractor should stop as much as possible the work that should be changed. Sub-contractors should also be notified to take similar steps.

Communication of these variation orders to sub-contractors and other departments can be made easier by making use of various forms intended for that purpose. These forms include:

1. "Notice of pending change order" form. This form is used for notifying the different groups concerned about the change order.
2. "The work order Form". Extra work requested by the contractor from the sub-contractor is covered by using this form.

3. "Disposition of pending change order". This form is used to notify the sub-contractors when a proposed change order has been abandoned or definitely ordered. A similar form adopted to fit purchase orders are also used to make changes in purchase orders.

Generally, payment for work done under change order is signed and returned by the contractor to the client's representative. Unreasonable delay in issuing change orders coupled with withholding payments can and often result to delays and disruption of the planned schedule of work of both the prime contractor and subcontractors.

Notice of Pending Variation Order	
Project ----------	
Project No. ---------- Date -----	
Job Description ----------	
Notification has been given by the consultant that for the above-described job the following chang(s) are to be ordered	
Location of Change(s)	Nature of Change(s)
You are hereby requested to avoid executing any work(s) that may be affected by such change(s)	
Signed .... (Project Manager)	

Fig.(3) Notice of Pending Change Order.

WORK ORDER

Work Order Date ---------- Work Order No.----

Project No. ---------- Description ---------

Location ----------

Description of Work in Detail

Work Ordered by ---------- Title --------

Work to be executed for ----------

Accepted by ---------- For ----------

Fig.(3) Work Order.

DISPOSITION OF PENDING VARIATION ORDER

Project No. ---------- Date ----------

Job Description ----------

Please refer to one "Notice on Pending Change Order"

No. ---------- dated ---------- issued in connection with the above-described job.

The proposed change has been

☐ Abandoned

☐ Ordered in the form originally described.

☐ Ordered in an amended form see attached.

Will you please proceed as follows

☐ Continue under present plans and specifications.

☐ Proceed at once with change. Formal change order is being prepared

☐ Do not proceed with change pending issuance of formal change order

Signed ----------

Fig. (4) Disposition of Pending Change Order.

3.5.3 Co-ordination of Sub-contractors work.

The performance of both selected and nominated sub-contractors affect to a great extent the progress in the execution of any construction project. It is the responsibility of the contractor to ensure that these sub-contractors follow the planned schedule so as to avoid disruption of the entire contract plan.

Faulty co-ordination often creates financial problems; construction costs rise and project delayed. Well chosen sub-contractors offter least problems.

However, the contractor needs a lot of tact in dealing with both nominated and domestic sub-contractors. The usual practice is coercing or even threats to get them to work as planned.

It is also necessary to arrange weekly or bi-monthly meetings with the sub-contractors to discuss common problems, offer professional advices and analyse plans for the next stage of work.

3.6 RESOURCE MANAGEMENT:

Manpower, equipments, plants and materials are important project resources that determine to a great extent the successful implementation of a project plan for a construction contract. The supply and availability of these resources are seldomly certain because of the usual shortages, labour disputes, equipment and plant

break downs, competitive demands and delayed deliveries. In view of this fact, these resources require close management.

The basic objective of resource management is the efficient allocation of resources so as to maintain the project schedule and keep costs within the estimate. Resource management can be broadly divided into the following groups:

1. Manpower Management
2. Material Management
3. Plant Management

3.6.1 Manpower Management

The quality of personnels in a construction firm tells much on the overall performance of the firm more than any other resources at the firm's disposal. This is because the effective utilisation of other resources - finance, material plants and equipment can only be achieved by the firm if the right calibre of personnels are employed. With ill-equiped persons, the tendency is for the company to record unexpected losses owing to either waste or mismanagement of its limited resources. Hence the most vital aspect of manpower management is manpower utilisation and care.

MANPOWER UTILISATION

The first step in man-power management is to make a compilation of daily labour requirements, by craft or crew, needed to maintain the normal or expedited project schedule. If it appears that their will be adequate numbers of workmen available to satisfy these requirements, then the project can be manned to maintain the established schedule without adjustment.

However daily labour needs rises or decreases, and in such a case 'levelling' of the labour needs may be in order. On the other hand, if the labour demand exceed supply, then the use of overtime on critical activities may make it possible to maintain the originally established schedule. It is the responsibility of the Site Engineer and his supervisors to get the most out of their men and equipment on a day to day basis.

The importance of manpower management ensures

1. That the number of staff employed is as low as possible without sacrificing efficiency and output of work.
2. It ensures that the cost of supervision does not exceed the percentage of the cost of the work which was allowed for in the contract plan.
3. Ensures that labour force is effectively utilised thereby minimising delays and waste from unproductive times.

MANPOWER CARE (WELFARE)

The well-being of the generality of workers has a lot to do with their output in any organisation. Wage increase, improved fringe benefits and other allowances as motivators are not all that determine or influence increased productivity. Other aspects of workers' needs, especially Housing, Transport, adequate sanitary facilities on the site, canteen, etc. play great roles in enhancing productivity.

It is not an uncommon sight to see these facilities, that is wherever they are provided, being generally crude, inadequate and unhygenic. The usual excuse given by the management for such lapses is that the facilities are only temporary, and as such, more elaborate and expensive facilities are not justified.

It is rather unfortunate that most construction firms in Nigeria do not realise that the health and welfare of workers are closely related to their safety. Persons who are healthy and are comfortable at their place of work are much less prone to accidents. Fatigue is the primary cause of carelessness that eventually lead to accidents.

The construction industry is known to have a high rate of total injurious accidents than any other industry. This is justifiable considering the fact

that the construction industry has no set pattern for likely dangers, unlike in a production industry, where the dangers are foreseen and adequate measures taken in advance to prevent them.

The harsh and inclement weather in which a construction worker is compelled to work make him very prone to falling sick. Consequently, it is suggested that provision of decent food and a comfortable place to rest during break periods on the site is of utmost importance to his welfare. If these facilities are either inadequate or not existing, the operative works less efficiently, and his manual dexterity deteriorates. He tends to become disgruntled, quarelsome and less considerate and co-operative to his workmates and supervisors.

Consequently a wise employer will realise in the long run, that money spent on workers welfare is not a waste. Sarisfied employees work spritedly and efficiently on their jobs, and ofcourse, the execution of the project within the stated completion target date is unconciously taken care of.

HUMAN RELATIONS

The duties of an executive does not only lie in planning and co-ordinating of activities, but also in getting things done through people in the proper manner.

But in getting people to perform specific task, the executive must know how to handle them and how to motivate them.

On a construction site no matter the size, a thorough understanding of the workers by the site engineer and his supervisors help, in no small measure in enhancing productivity. Some delays in project execution are known to be caused by strained relationships existing between the management and workforce. Consequently, the site engineer and his supervisors should as much as possible maintain a harmonious coexistence among all categories of workers on the site to ensure that difficulties arising from strained relationship do not near its ugly head as this may disrupt the entire planned schedule of the project.

3.6.2 Material Management

The importance of efficient material management increases with the proportion of "Material Cost" of the project to the "Whole Cost" and with the complexity of the project. Effectiveness of material management is measured in the context of original cost, delivery and quality.

Material abailability on the site at the right time which affects the economic health of the firm depends to a large extent on the performance of the

purchasing department. It is suggested that purchasing should buy the right material in the right quantity, in the right quality at the right price and get delivery made at the right time.

However, if materials are to be available for use when required, other departments must provide relevant information to the purchasing department. While the planning department provides the scheduling showing when the material is required, the accounts department and inventory control provide information on financial availability and what portion of required material is available in stock.

The size of the purchasing department depends, to a large extent, on the number of materials required and on the number of operations that make up the entire construction project. In a small project, the department may consist of only one or two purchasing officers and a couple of clerks. Larger construction projects, however, may have seperate purchasing departments for each operation or a centralised purchasing organisation.

Nevertheless, whatever the size of the project, a complete set of information, records and controls must be established. The following list indicates the extent of this needed information:

INVENTORY RECORD

NAME _____ DESCRIPTION _____ ITEM NO. _____

SUPPLIER _____ STANDARD COST _____ LOCATION _____

ORDER QUANTITY ____

STANDARD UNIT _____

ON ORDER			RECIEPTS			RESERVED			ISSUED				BALANCE		
Date	Required No.	Quantity	Date	Rec. No.	Quantity	Date	For Order	Quantity	Date	Required No.	Job. No.	Quantity	Date	Quantity	Unit Cost

Fig.(5) Inventory Record Card.

1. Requisitions, material lists and completed documents.
2. Quotations from suppliers and prospective suppliers.
3. Purchase orders (open and closed) recieving records and and correspondence with suppliers.

3.6.3 Plant and Equipment Management

Plants play an increasingly important role in the construction of building projects and both time and money can be saved by the efficient and judicious use of mechanical aids. Yet, full advantage can only be obtained if the plant is well managed both on and off the site.

The management of equipment is same as that of manpower. However the following considerations are important to the selection, use and maintenance of equipment on the job.

1. The equipment sent to the job should be of the type that will best perform the work under actual working conditions. The Plant and Equipment Manager should be consulted before final selection is made.
2. Plant and Equipment sizes should be matched to the production schedules, and their spreads should be balanced so that each unit delivers maximum production.
3. Work should be scheduled to achieve the fullest utilisation of every plant and equipment item. Idele plant or equipment cost money. Replacement should be arranged before any plant or equipment go for their scheduled repairs.

4. Since the production rate of an equipment depends largely upon the operator and his supervisor, close supervision of operators and their equipment/plant should be considered as important as it is for a labour crew.

5. Overloading of equipment in an attempt to get more production should be discouraged. Generally, an equipment is designed to do its best in the long run when loaded only to its rated capacity. It is of interest to note that production gained by overloading will normally be more than offset by the additional costs of repairs and the shorter life of the machine.

It is an acceptable fact that the active life span and trouble free service period of a plant depend on proper maintenance. Therefore, it is suggested that, whatever the size of the construction firm, the efficient organisation of plant maintenance department should be of vital importance.

Systematic maintenance of plants and equpments should follow a planned schedule which should be in continuous operation. Plant records should also be kept to ensure that the history of each plant is registered for future rise.

Since plants and equipments are vital to the successful completion of any construction project, it is therefore imperative that the responsibility of effective plant management should be a collective effort, involving the plant department, site management and the personnel in authority to ensure sound co-ordination.

3.6.4 Resource Scheduling

When the element of time is imposed on a project plan, the activities then become a programe or a shedule. Resource scheduling is of great importance both to the major contractor and the sub-contractors.

Resource scheduling is the detailed planning of materials, labour, equipment and plant - time so that the necessary materials, plants and labour force will be at the right place and at the right time, so that an activity can be completed within the time stipulated for it and in accordance with the stipulated requirements.

Resource schedule enables checks to be made to ascertain if all is going well according to plan, and, if not, to report deviations and take corrective actions. Resource schedule vary greatly from firm to firm.

Nevertheless, there are certain factors that must be considered in any resource scheduling exercise. These include:

1. Classification of activities, whether they are continuous or intermitent.
2. Determination and duration of activity times.
3. Availability of resources.
4. Satisfactory manpower requirements.
5. Management decisions.
6. The general pattern and nature of the project.

Different techniques are used in carrying out resource scheduling exercises. These include the Bar Chart, PERT and the C.P.M. However, the most reliable and flexible method is the Critical Path Method (CPM) since it provides a much more accurate picture than the other methods which are products of judgement and intuition.

It is interesting to note that no matter what technique is applied, all resource schedules provide the following information.

1. The number of personnel available.
2. The estimated requirements in man-hours for the whole duration of the project.
3. Plant-hours estimated for each activity and projected to cover the entire project.
4. Direct material requirements broken down into weekly or monthly usage.
5. The timing of each activity to ensure that resources are evenly spread - resource levelling.

Resource levelling enable labour materials and equipments to be distributed among various activities, at the final stage of the planning, in accordance with thier respective needs, so as to present the site engineer with a feasible plan and schedule with which to start the job. As work progresses on the site, revision of plans are made and resources redistributed as circumstances dictate.

CHAPTER 4

TIME CONSIDERATION IN PROJECT EXECUTION

4.0 INTRODUCTION

Development projects vary both in nature and in magnitude. The nature of a project and the services it is expected to provide effect the setting of a completion target date or completion period. Any deviation from this stipulated project completion target date have varying effect on the parties to the contract.

4.1 OPTIMUM PROJECT COMPLETION DATE:

Optimum completion date for a project is defined as the most economical date in which the project must be completed assuming that there are no unforseen setbacks.

An analysis of a time/cost curve of a planned project will readily reveal that any completion date different from the optimum completion date will affect the overall cost of the project. The implication of the analysis is that an early completion before the optimum date or late completion after the optimum date will result in an increase in the cost of executing the project.

4.2 PROJECT ORIENTATION

Development projects can be readily grouped into two distinct categories:

1. Profit Oriented Projects
2. Social Oriented Projects.

4.2.1 Profit Oriented Projects

As the name indicates, projects of this nature are purely for economic gains. An early turnover on the capital invested are the primary concern of the clients. Consquently, the clients insist on setting a target date for the completion of the project.

Profit oriented projects include:

1. Housing Estates by either private developers, organisations or government agencies.
2. Hotels and Surper-markets.
3. Banks and Financial Houses, etc.

4.2.2 Social Oriented Projects

The purpose of social oriented projects is the provision of social services to the public. The completion target date, like every other project, depends to a large extent on the availability of funds.

Government Agencies target their completion dates on funds budgeted for in advance for the project, while charitable organisation base their completion target dates on how much fund can be raised for the project from time to time. This in effect means that the completion period cannot be readily established.

Social oriented projects include:

1. Churches, Mosques and other projects associated with religious works.

2. Civic centres, recreation centres and public libraries.
3. Schools, Colleges and Universities.
4. Road Projects, etc.

4.3 COMPLETION TARGET DATES - DECIDING FACTORS.

The setting of a completion date for any project depends, not only on the size and anture of the project, but also on the type of client, the ability of the contractor and the location of the project.

Completion target dates stipulated for different types of projects are:-

4.3.1 Negotiated Completion Target Date:

This is often an agreed date reached between the client and a selected single contractor whose credibility and competence has been ascertained. Usually this form of contract is employed where an early completion of the project is of paramount importance or where specialised techniwues are to be employed in the execution of the project. Renovation of existing building for urgent occupation fall into this category.

4.3.2 Completion Target Date Decided by the Client:

Setting of such completion date is typical with projects that are profit oriented or where the project must be ready for commissioning before a certain date. Examples of these are Housing Estates, Super-markets, Public Utility Projects like Power Stations, Water Works, etc.

4.3.3 Completion Target Date Decided by the Contractor:

This is often the case when the project is complex in nature, requiring special skills and sophisticated equipments like in the construction of a refinery.--

4.3.4 Non-Critical Competion Target Date:

Where the client is a charitable organisation, whose source of funding the project depends entirely on fund raising activities and donations, the completion date cannot readily be predicted and in consequence becomes non-critical.

4.3.5 Critical Completion Target Date:

This is stipulated for projects well planned in advance to follow an agreed schedule. The schedule enable both parties to the contract to be able to fulfil their contractual obligations. An early or late completion by the contractor may be unwelcome to the client as this may affect his already planned and projected cash flow.

4.3.6 Phased Completion Target Date:

This is applicable on projects where the start of one operation depends on the preceeding one being completed. Radio and Television Stations fall into this category. Since the installation of the necessary equipments depend entirely on the completion of the requisite infrastructures.

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4.3.7 Substantial Completion Target Date:

This is usually allowed in roadworks. Completed stretch of the total roadworks may be formally handed over to the client as substantially completed while work is still in progress in the remaining portion. Fifty percent of the retention money on the completed stretch can be realised to the contractor and the agreed maintenance period computed from that date.

4.3.8 Completion Target Date Influenced by Location:

Setting of project completion target dates for projects located in restricted areas like in city centres are made as short as possible to minimise the inconveniences, the execution of such projects are likely to cause to the public using the motor ways and adjacent properties and also damages to public utilities.

4.3.9 Completion Target Date Decided from the time the Contractor actually takes over the site:

This is often necessary where there is delay in acquiring the site owing to either late payment of compensation to the owners of the land or where the occupants have to be moved out or resettled elsewhere like in Abuja and Shirore.

4.4.4 Effects of Deviation from stipulated Project Completion Target Date on Parties to a Contract - Client, Consultant and Contractor:

The completion of a project before or after the stipulated project completion target date has varying effects on the parties to the contract. In this section,

these effects as it affects each party to the contract will be discussed.

4.4.1 Effects on the Client:

(A) EARLY COMPLETION

ADVANTAGES

1. If the project is profit oriented, the client is likely to realise an early turnover on the capital he invested on the project.
2. For a project slated to be commissioned on a later date, an early completion provides the client ample time to make adequate preparations for the ceremony.

DISADVANTAGES

1. An early completion may disrupt the planned projected cash flow of the client.
2. Taking over the project before it is ready for occupation might entail additional expense in safeguarding the property against misuse by squatters.

(B) LATE COMPLETION

ADVANTAGES

1. There is ample opportunity for modications to be made in the design by the consultant to suit the needs and tastes of the client.
2. It provides an excuss for the client to disregard the conditions of contract especially where payments are concerned.

DISADVANTAGES

1. In the case of a profit oriented project, the client stands to lose much money due to late completion.
2. Late completion may likely disrupt the planned programme of the client. This include his cash flow and envisaged early turnover on the capital invested.
3. May likely cause untold embarassment to the client, especially where the public has been made to know that the project is to be commissioned on a particular date.
4. There is definitely an increase in the project cost with any extension period granted to the contractor by the consultant.
5. If the project is located in a restricted area like in a city center, social costs, where they are charged by the authrotics concerned, will eventually increase the project cost.
6. In the course of the consulting or construction firm going on voluntary liquidation, the problem of litigation may arise in the quest of getting any of the party affected to fulfil its contractual obligations.

4.4.2 Effects on the Consultant:

EARLY COMPLETION

ADVANTAGES

1. Relieves the consultant from his contractual dution before the stated target date, thereby enabling him redeploy hs staff to other existing and new projects under his supervision.
2. Since a consultant's professional fee is fixed, an early completion of the profit increase his margin of profit.

DISADVANTAGES

1. Does not give the consultant enough time to make changes and modifications in the design if desired by the client.
2. Makes the task of supervising the project very taxing for the consultant and his staff without an increase in his professional fee.
3. The overall cost recorded in the early completion of the project cannot be accurately applied to access the costs of future similar projects.

LATE COMPLETION

ADVANTAGES

1. Enables the consultant to make modifications in design to suit the tastes of the client.
2. Permits the consultant the added advantage of carrying out thorough supervision of the project with minimum workforce.

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DIS/DV/NT/GES

1. More time is spent on supervising the project without an increase in professional fee.
2. Where the client has an unstable taste, the consultant is faced with the problem of constant modifications of design to suit the tastes and needs of the client, thereby, inadvently reducing the percentage of professional fee chargeable.
3. Records kept for such projects cannot be judiciously applied to similar projects in the future as this may be misleading.
4. The consultant is faced with the difficult problem of extending the contract period inorder to protect the contractor from paying liquidated damages and at the same time doing all in his power to protect the interest of the client.

4.4.3 Effects on the Contractor:

E/RLY COMPIETION

ADV/NT/GES

1. Creates a good reputation for the contractor thereby increasing his chances of winning more contracts in the future.
2. Enables the contractor to deploy his resources to other sites.

3. Where the project is labour intensive, an early completion reduces the overhead cost on labour.
4. Fosters good relationship among the parties to the contract i.e the client, consultant and contractor.

DISADVANTAGES

1. By expediting the execution of the project, the contractor is likely to pay more for labour thereby increasing the overhead cost and reducing his margin of profit.
2. The client may be reluctant to take over the project before the stated completion target date, and under such situation, the responsibility of safeguarding the property before the official handing over exercise becomes that of the contractor.
3. Except where a bonus is stipulated in the conditions of contract for early completion, the contractor stands to gain nothing financially.

LATE COMPLETION

ADVANTAGES

1. The contractor can be exnorated from any blame and may not be liable to pay liquidated damages if the client has in one way or the other violated the terms of the contract - e.g late payments on certificates already checked and approved by the consultant.

2. Permits the contractor to reschedule his resources to ensure that only those requisite resources are put into use at any one time for effective utilisation and reduction of unproductive times.
3. If the project is plant intensive like in an industrialised building system, late completion of the project reduces the direct cost of the project.
4. Allows the contractor to put up claims for variations in the costs of material and labour as extension periods are granted him by the consultant from time to time.

DISADVANTAGES

1. Late completion of a project often tarnishes the image of the contractor and invariably reduces his chances of winning further contracts.
2. The contractor may be liable to pay liquidated damages for late completion.
3. Strains the relationship among the parties to the contract and may likely lead to litigation.
4. Purely against the policy of any construction firm.
5. The project is likely to be caught in the web of galloping inflation if delayed unnecessarily. This will definitely increase the cost of construction to such an extent that the contractor

may be forced to abandon the project if the entire contract is not revalued.

6. There is naturally an increase in overhead cost as more time is spent on the execution of the project.

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CHAPTER FIVE

CASE STUDY - ANALYSIS AND REPORTS

5.0.0 Introduction

In view of the lapses, hitherto reported, as being responsible for delays and/or abandonment of construction projects, it was found necessary to investigate some major construction projects in Niger State with a view to highlighting the causes of these lapses. In addition, other factors which may have indirectly contributed to delays in the execution of construction projects will be examined in this chapter.

5.1 Analysis of Projects Investigated

Construction projects investigated include both Building and Civil Engineering projects. From field investigations, it was found that while some of these projects were victims of delays, others were completely abandoned, all for various reasons.

Relevant informations and analysis of these project are presented, here, both in tabular and graphical forms as follows:

Table (5.1) Particulars of Project.

Table (5.2) Estimated and Actual Construction Periods of the Projects.

Fig. (5.1) Graphical Representation of Project durations.

Table (5.3) Estimated and Actual Construction Costs of the project.

Fig (5.2) Graphical Representation of Costruction Costs.

Fig (5.3) Graphical Representation of Extension time and Variation Costs percentages.

Table 5.1: Particulars of Projects Investigated.

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	Project Title	Client	Contractors	Consultants	Initial Contract Sum	Initial Contract Duration	Date of Site Possession	Remarks
1	Federal Prisons Project Minna.	Federal Ministry of Internal Affairs.	Edjeba Land Services Limited, Sapele (Indigenous Firm)	Prindle Patrick & Partners Kaduna.	₦2.6m	40 Weeks	February 1982	Work still in progress
2	Presidential Guest House Minna.	Niger State Government.	Rotherthorne Nig (Ltd) Lagos (Foreign Firm)	Niger State Housing Corporation	₦357,000	18 Weeks	June 1980	Completed
3	260 No Low Cost Housing Units Minna.	Niger State Housing Corperation	Krama Italo (Foreign Firm)	Niger State Housing Corperation	₦5,876,000	36 Weeks	October 1980	Completed
4	Niger State Parliament Building Minna.	Niger State Government	D.C.C.C. Ltd. Bida (Indigenous Firm)	Ministry of Works and Transport Niger State.	₦4,747,841	38 Weeks	April 1979	Abandoned
5	Paiko-Lapai (47.5km) Road Project	Niger State Government	Korda (Nig) Ltd. Kano (Indigenous Firm)	Ministry of Works and Transport Niger State.	₦10,906,209	80 Weeks	January 1978	Abandoned
6	Tunga Kawo Irrigation Project.	Niger River Basin Dev. Authority Ilorin.	Miko Engr. Ltd. Ibadan (Indigenous Firm)	Associated Engineers and Consultant (Nig) Ltd. Ibadan	₦5,047,857	48 Weeks	Febraury 1982	Work almost Completed.

Table 5.2: Estimated and Actual Construction Periods.

	Project Title	Stage of Completion Reached.	Estimated Luration for Stage Reached.	Actual Construction Period for Stage Reached.	Total Time Lost/Gained	Total Lost/Gained as a percentage of Estimated Time.
1.	Federal Prisons Minna.	55%	26 Weeks	38 Weeks	12 Weeks (Lost)	-66.15%
2.	Presidential Guest House Minna.	100%	18 Weeks	30 Weeks	12 Weeks (Lost)	-66.66%
3.	260 No. Low Cost Housing Units Minna	100%	36 Weeks	20 Weeks	16 Weeks (Gained)	+44.44% (Early Completion)
4.	Niger State Parliament Building Minna.	50%	19 Weeks	44 Weeks	25 Weeks (Lost)	-131.57%
5.	Paiko-Lapai (47.5 km) Road Project.	93%	74.4%	180 Weeks	105.6 Weeks (Lost)	-141.9%
6.	Tunga Kawo Irrigation Project	63.5%	40 Weeks	84 Weeks	44 Weeks (Lost)	-110%

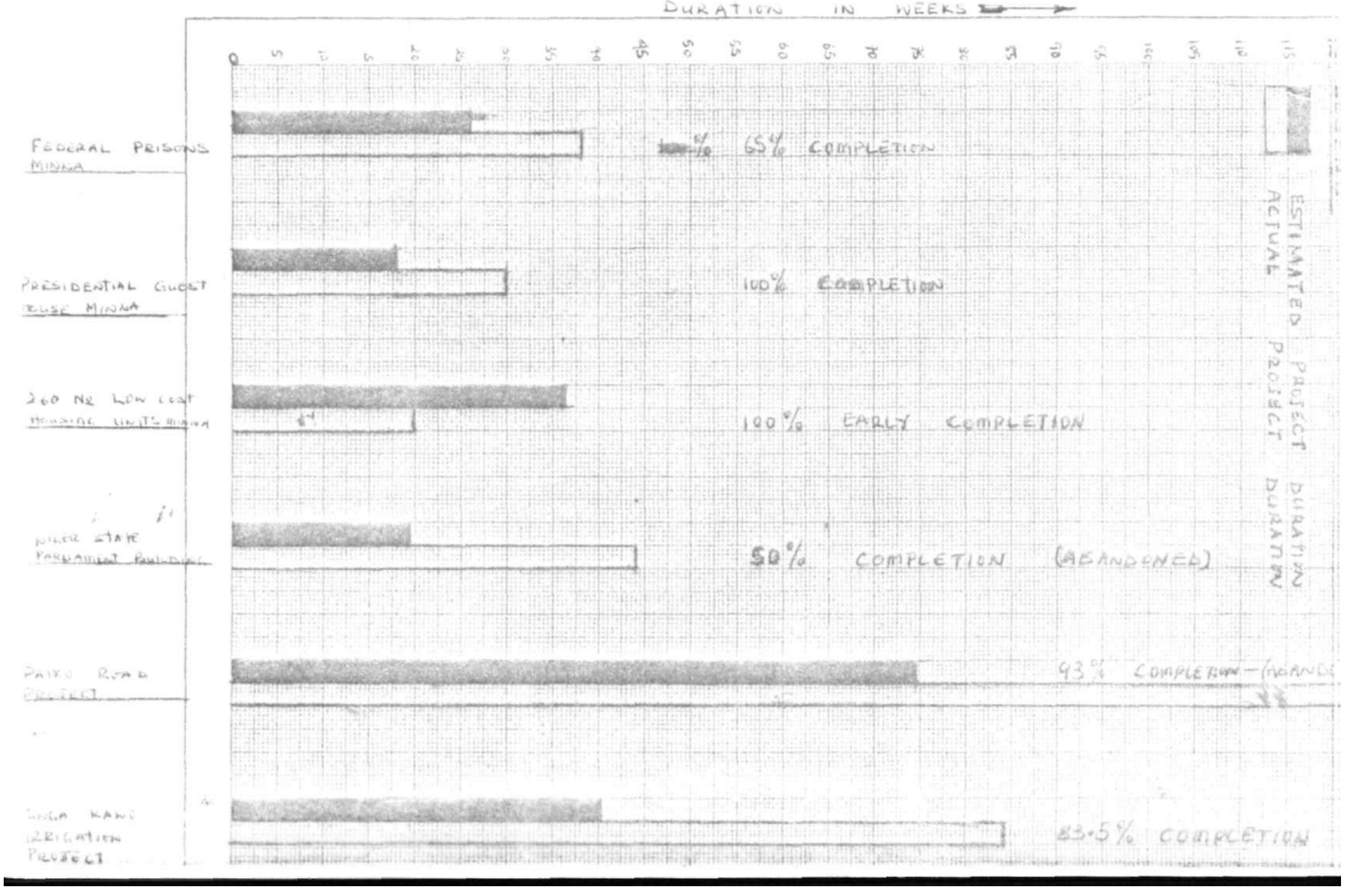
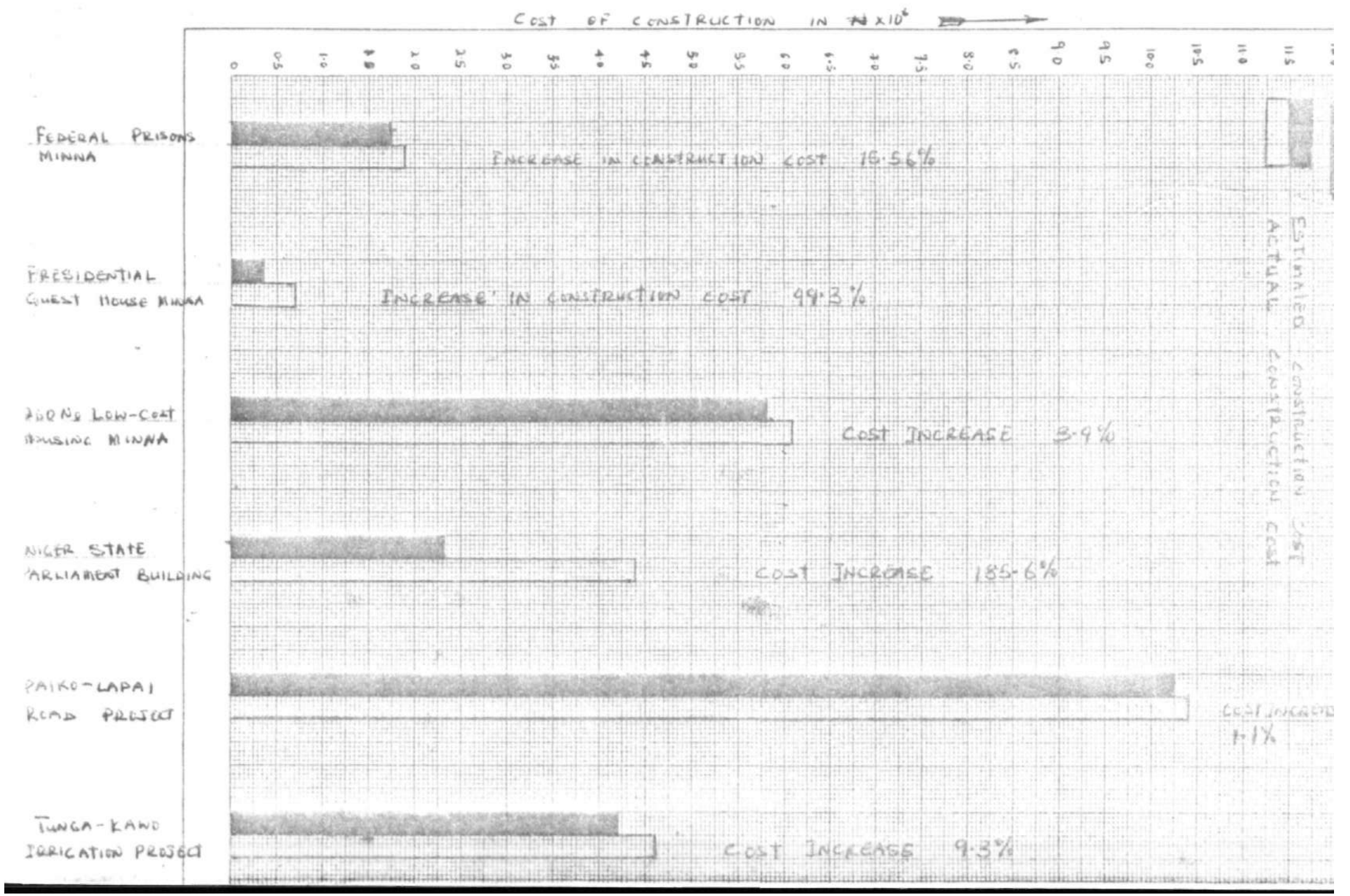
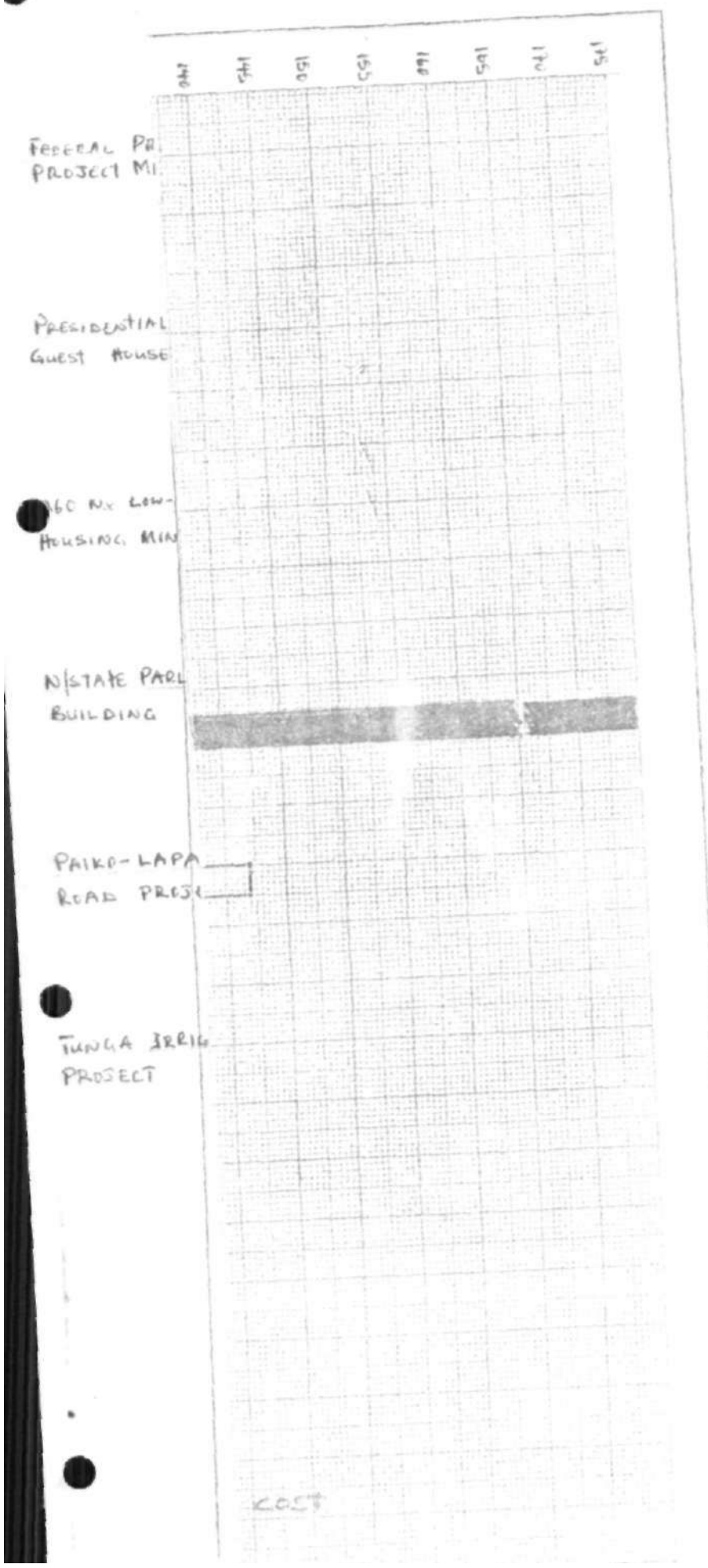

DURATION IN WEEKS
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
ESTIMATED PROJECT DURATION
ACTUAL PROJECT DURATION
FEDERAL PRISONS MINNA
65% COMPLETION
PRESIDENTIAL LODGE MINNA
100% COMPLETION
200 NR LOW COST HOUSING UNITS MINNA
100% EARLY COMPLETION
NIGER STATE PARLIAMENT BUILDING
50% COMPLETION (ABANDENED)
PAVED ROAD PROJECT
93% COMPLETION—(ABANDO
SOKOTO RIMA IRRIGATION PROJECT
83.5% COMPLETION

Table 5.3: Estimated Cost and Actual Construction Costs.

	Project Title	Stage of Completion Reached	Estimated Cost for Stage Reached	Actual Construction Cost for Stage Reached.	Outstanding Payments.	Cost of Delay and/or Variations.	Cost of and/or Variations as a percentage of estimated cost
1.	Federal Prisons Project Minna.	65%	₦1,722,570.00	₦1,990,704	₦143,705.5	₦268,126.50	15.56%
2.	Presidential Guest House Minna.	100%	₦357,000.00	₦711,600.00	Nil	₦354,600.00	99.3%
3.	260 No. Low Cost Housing Units Minna.	100%	₦5,876,000.00	₦6,107,961.20	Nil	₦231,961.17	3.9%
4.	Niger State Parliament Building Minna.	50%	₦2,373,920.50	₦4,406,735.00	Nil	₦2,032,814.8	185.6%
5.	Paiko-Lapai (47.5km) Road Project.	93%	₦10,259,529	₦10,376,285.00	₦3,733,639	₦116,755.45	1.1%
6.	Tunga Kawo Irrigation Project.	83.5%	₦4,215,800.00	₦4,608,962.00	Nil	₦393,162.00	9.3%


COST OF CONSTRUCTION IN ₦ x10⁶
0
0·5
1·0
1·5
2·0
2·5
3·0
3·5
4·0
4·5
5·0
5·5
6·0
6·5
7·0
7·5
8·0
8·5
9·0
9·5
10·0
10·5
11·0
11·5
ESTIMATED CONSTRUCTION COST
ACTUAL CONSTRUCTION COST
FEDERAL PRISONS MINNA
INCREASE IN CONSTRUCTION COST 16·56%
PRESIDENTIAL GUEST HOUSE MINNA
INCREASE IN CONSTRUCTION COST 99·3%
KADUNA LOW-COST HOUSING MINNA
COST INCREASE 3·9%
NIGER STATE PARLIAMENT BUILDING
COST INCREASE 185·6%
PAIKO-LAPAI ROAD PROJECT
COST INCREASE 1·1%
TUNGA-KANO IRRIGATION PROJECT
COST INCREASE 9·3%


FEDERAL PR
PROJECT MI
PRESIDENTIAL
GUEST HOUSE
N/STATE PARL
BUILDING
PAIKO-LAPA
ROAD PROJ
TUNGA IRRIG
PROJECT
COST

5.2 CASE REPORT ON PROJECTS EXECUTED BY [illegible]

5.2.1 Federal Prisons Project Jimeta.

The prime contractor executing this project is an indigenous construction firm, registered under category 'D' with the Federal Works Registration Board.

As at the time of this study, the project was virtually being executed at a slow pace with only a skeletal labour force, as evidenced in the company's daily labour returns of the 13th June 1983 (Appendix I). The percentage of the total works executed was only 65% inspite of the fact that over twelve weeks has already being lost in the process of execution of the works. The Site Engineer attributed the lost in construction time to the clients inability to make payments for works successfully executed as stated in the conditions of contract (see outstanding payments in table 5.3).

However on further investigations, it was discovered that there were other factors which gave rise to the delays in the execution of the project. It was rather difficult to establish the degree of delay contributed by the individual factors. Nevertheless, a summation of all the delays indicated that it amounted to over 46% of estimated time for the stage of completion recorded. These factors include:

1. Management Factors:

There was neither an organisational chart nor a schedule of duties and responsibilities in existence that would have clearly defined the status of the employees, their scope of authority and responsibilities and to whom they are responsible to. In view of this, personality conflict and conflicting orders were rampart, resulting in poor harmonisation of the different-ieted activities of the various sections on the site. In addition, there was only a-not-too-detailed conventional project Bar Chart on display in the Site Engineers office. It was gathered that this was the only project plan prepared for the project - there was no projected resource schedule plan.

The inadequacy of the only project plan available made it, not only difficult to identify critical activities, but also, made the resource requirements for each operation on the site a matter of judgement and intuition. There was no relationship between material delivery dates and the timing of operations. As a result, co-ordination of the various activities was inefficient and this contributed to a certain degree of the delays recorded.

2. Unfavourable Working Conditions:

The facilities provided for worker's comfort during break periods on this site were inadequate.

Sanitary facilities were non-existent. This definitely, must have contributed, to some extent, to the low level of performance by the workers, thereby, inadvertly causing delays in the execution of the project. Furthermore, it was reliably learnt that the majority of the workers were said to be engaged on a "Hire and Fire" basis. This practice breeds fear of insecurity in the minds of the workers concerned. Such workers, generally, tend to spend more time than is necessary on their jobs inorder to prolong their stay in the company's payroll. Unfortunately, since there was no adequate and detailed plan for the project, there was no accurate means by which the Site Engineer could compare the output of the workers to that estimated.

5.2.2 Presidential Guest House Jinna:-

The major contractor, Rutherthorne (Nig) Ltd., is a foreign firm also registered in category "D" with the Federal Works Registration Board.

Although the project was successfully completed, the overall estimated project duration and cost were exceeded by 66.66% and 99.3% respectively. (see tables 5.2 and 5.3). The prime cause of these excess is mainly on the design aspect of the project.

The initial estimate by the client and quotation by the contractor were done based on only the architectural drawings available. As a result both parties grossly under-estimated the cost of the project.

Even then, the architectural drawings were subjected to too many changes as the construction was in progress. Additional works were ordered for. In view of this fact, both the initial project cost and duration became quite unrealistic. A breakdown of the progress payments made to the contractor for the various stages together with payments for work changes and extra work are shown in Table 5.4.

5.2.3 Construction of 260 No. 3 Bedrook Low Cost Housing in Minna.

The contracting firm, Brann Italo was first established in Nigeria in 1959. Registered under category "D" with the Federal Works Registration Board, the company, although alien-owned, has a share structure of 67.5 percent Nigerians and 37.5 percent Swiss.

The contract for the construction of the housing units was awarded to a single selected contractor - Negotiated Contract. As was stated in chapter 2 (section 2.3.4), this form of tendering is employed when an early completion of the project is either of utmost importance or where specilised technique in construction is required. In the case of this project, both conditions were relevant. First, as a profit oriented project, an early completion was considered of paramount importance and secondly, the method of construction employed is a specialised technique - SYSTEM CONSTRUCTION.

The estimated contract duration was 9 months. However, the project was completed four months ahead of the stated completion period. This represents a gain of about 44.44% of the total contract period. Despite the early completion, the additional cost in the execution of the project was only 3.9% of the estimated cost. This cost was incurred as a result of the additional 15% charged on the cost of labour for each month and 10% on fortnightly valuation of materials, as stated in RIBA clause (31E) and agreed to by both parties to the contract.

The commendable performance by the contractor can be attributed to certain factors:

1. Excellent planning, monitoring and co-ordinating of activities of the various sections on the site - sound management.
2. The specialised modern technique of construction employed - SYSTEM CONSTRUCTION.
3. The fact that both parties to the contract felt fully committed to achieving the desired goal - A successful, and if possible, early completion of the project.
4. The availability of funds for the execution of the project through offshore loan granted to the contractor by their overseas financiers.

5.2.4 Niger State Parliament Building:

This project is of special interest. In view of this, every attempt was made to secure vital and relevant documents that will throw more light on the history of the project. The facts gathered from studying these relevant documents are the sources of the information contained in the following report.

The contract for the construction of this project was awared to an indigenous construction firm at the contract sum of ₦4,747,841.00 in December 1978. However, the date of site possession was in April 1979.

The contract figure stated above was below the estimated cost submitted by the Consultant Quantity Surveyor which was ₦5,810,381.00. Nevertheless, the contract was awared, without due consideration of the differences in the contract figures, by the client. On taking possession of the site, work began in earnest. Payments on Interim Certificates of Valuation raised by the contractor were made promptly.

However, after expending about 44 weeks on the project, the contractor unilaterally stopped work on the project. An investigation by a team of Government estimators revealed that, in respect of this project, while a physical achievement of about 50% has been recorded, the contractor has actually recieved payments of about 99.6% of the original project cost. When

querried, the contractor explained that after re-assessing the whole project, he has finally arrived that the cost of the project including variation and provisional sums amounted to ₦8,303,000.00. He further demanded that an urgent payment of ₦2.5 million be made to him if he was to resume work on the project.

This matter was referred to the Consultant Quantity Surveyor who was asked to re-prepare a detailed bill of quantities for the whole project as contained in the drawings including all revisions that were made. In compliance with the request, the Quantity Surveyor carried out a revision of the total project cost and arrived at a sum of ₦6,099,049.65k as against ₦8,308,000.00 demanded by the contractor.

This revised contract figure, reached by the Quantity Surveyor, was communicated to the contractor. This figure, however, was rejected by the contractor, who, instead presented another fresh quotation for ₦17.0 million to replace the previous one for ₦8.3 million. This new development brought all negotiations to a dead-lock.

Nevertheless, owing to the great importance attached to this project, coupled with the huge sum of money already invested in it, the client decided to engage the services of an independent Quantity Surveyor to prepare and price new Bills of Quantities for the

revised work, for a negotiated fee of ₦110,130.00.

The revised project cost reached by the Independent Quantity Surveyor was ₦11,463,500.00. This latest revised contract figure was finally accepted by the contractor and a fresh agreement signed on the 17th of December 1982.

However, it is unfortunate that work is yet to be resumed on the project despite repeated demands and appeals by the client. Naturally, one would have expected the client to take legal actions against the contractor for failing to carry out his contractual obligations, but surprisingly, nothing of the such has been done.

Nevertheless, it is worthy to state that records of progress payments made to the contractor indicated that a great percentage of the amount paid to the contractor was as a result of too many variations both in the design and volume of works ordered for, by the Consultant Engineers - Ministry of Works and Transport, Civil Engineering Department. This fact might have resulted in the client's reluctance to take any legal action against the contractor.

However, no matter the extent of variations ordered by the client's technical representatives, the difference between the finally revised and intial project costs, clearly indicates that other factors contributed to the project being finally abandoned. These include:

1. The possibility that the information given in the original working drawings were not detailed enough, thereby giving rise to a misleading initial contract sum been acceptable to both parties.
2. The disregard of the factors often considered in making contract awards by the client which resulted in the contract being awarded at a sum far below that estimated by the Consultant Quantity Surveyor.

5.2.5 Paiko-Lapai 47.5 kilometre Road Project:

This project is a typical example of where the stated completion target date can be subdivided into substantial completion target dates.

A 42 kilometer stretch of the road works representing a total of 88.4% of the whole project was formally handed over to the client as at September 1981 while work on the remaining portion was still in progress.

However, the project was finally abandoned after 93% of the total works has been satisfactorily completed, (see Appendix III). The actual construction time expended in achieving the 93% completion was about 180 weeks. This implies that over 105 weeks were lost for various reasons other than inclement weather, which is generally known to retard progress in road works.

Further investigation revealed that certain major factors were responsible for the delays and the final abandonment of the project. These factors include:-

1. Protracted Inspections and Approvals by the Consultants:

The consultants are staff of the client. It was gathered that they regarded the job of inspecting and approving the works executed by the contractor as doing him (the contractor) a favour. As a result, certificates, even when approved were not processed with dispatch thereby delaying payments due to the contractor. These actions affected the contractor's overall performance in the execution of the contract.

2. Disregard of the Conditions of Contract:

Although the J.C.T. (Joint Contract Tribunal) Clause 30(1) stipulated the period of payment by the client on any Interim Certificate raised by the contractor and approved by the consultant, yet in the execution of this contract, this section of the general conditions of contract was grossly violated by the client. From records available, the outstanding payments due to the contractor is ₦3,733,639.00. The inability of the client to fulfill his contractual obligations forced the contractor to finally abandon the project.

5.2.6 Tunga-Kawo Irrigation Project:

This project is being executed by an indigenous firm based in Ibadan. The initial contract duration stated in the contract agreement was eight months. However, this duration was revised to eleven months

duration when the contractor presented his programme of work (Fig. 5.4).

As construction of the project was in progress, extension periods were granted the contractor on application, by the consultant. The extension periods were from February - June 1983 nd July to October 1983. Despite the extension periods, only 83.5% of the total works have been successfully completed. The revised programme of work showing the estimated nd actual construction periods expended on each operation is given in Fig. 5.5. Certain factors were responsible for the delay in the execution of this project. These include:-

1. The unrealistic nature of the initial project plan submitted by the contractor. This plan was prepared without a proper analysis of the likely constraints that may arise in the execution of the project - for example the topography and soil texture of the site.
2. The inability of the contractor to fully utilise the heavy earth moving plants during the rainy season and some periods after the rainy seasons.
3. It was alledged that some subcontractors failed to execute their own part of the works within the period stipulated for such jobs. This unfortunate action by the subcontractors definitely contributed to the delays. However, the magnitude of the delay caused by subcontractors cannot be confidently quantified.

TUNGA-KAWO IRRIGATION PROJECT.

ORIGINAL OR INITIAL CONSTRUCTION PROGRAMME 2nd FEB 1972

	ACTIVITIES		INTER-RELATIONSHIP WITH OTHER ACTIVITIES	DURATION IN MONTHS	1972 FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1	SETTING OUT		2, 3, 4, 5, 6, 7, 8 9, 10	4·25												
2	BUSH CLEARING	9.27 HA	1	3·5												
3	DRAINAGE CHLS	250,000 m^3	1, 2	10												
4	DRAINAGE GLUCS	1 No	1, 2	2·0												
5	ESCAPE STRUCTURE	1 No	1, 2	1·5												
6	BIFURCATION STRUCTURE	1 No	1, 2	2·0												
7	OTHER STRUCTURES	93 No	1, 2	5·0												
8	EARTH WORK IN CANAL	85,000 m^3	1, 2	5·75												
9	MAIN CANAL LINING	11,500 m^3	1, 2, 8	2·0												
10	FLOOD EMBANKMENT	11,250 m^3 10,500 m^3	1, 2	5·0												
11	LAND LEVELLING	774 HA	1, 2	5·0												
12	SERVICE ROADS	60,000 m^2	1, 2	4·0												
13	SUPPLY & INSTALLATION OF GATES	7 No	1, 2	3·5												

LEGEND ▨ PROGRAMME OF WORK

TUNGA - KAWO IRRIGATION PROJECT

REVISED CONSTRUCTION PROGRAMME AND PROGRESS OF WORK (REVISED 20th JAN 1983)

	ACTIVITIES		INTER-RELATIONSHIP WITH OTHER ACTIVITIES
1	SETTING OUT		2, 3, 4, 5 & 6 ...
2	BUSH CLEARING	937 HA	1
3	DRAINAGE CHLS	290,000 M	1 . 2
4	DRAINAGE SLUICE	1 No	1 . 2
5	ESCAPE STRUCTURE	1 No	1 . 2
6	BIFURCATION STRUCTURE	1 No	1 . 2
7	OTHER STRUCTURES	93 Nos	1 . 2
8	EARTH WORK IN CANALS	85,000 m^3	1 . 2
9	MAIN CANAL LINING	1150 m^3	1 . 2
10	FLOOD EMBANKMENT	10500 m^3 42,000 m^3	1 . 2
11	LAND LEVELLING	777 HA	1 . 2
12	SERVICE ROADS	60,000 m^2	1 . 2
13	SUPPLY & INSTALLATION OF GATES	7 Nos	1 . 2 . 5 . 6 . 7

FEB 1982 | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN 1983 | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT

DRY SEASON | WET SEASON

MONTHLY FINANCIAL EVALUATION: Programme / Progress

1,60,000 / 1,85,000 | 3,36,000 / 1,49,125 | 4,71,000 / 5,58,000 | 6,31,000 / 5,72,000 | 7,51,000 / 5,59,000 | 7,82,000 / 7,35,000 | 8,27,000 / 7,84,000 | 8,72,000 / 8,11,000 | 9,17,000 / 8,29,000 | 9,72,000 / 8,69,000 | 10,27,000 / 8,84,000 | 10,82,000 / 9,38,000 | 11,37,000 / 9,84,000 | 11,92,000 / 10,30,000 | 12,47,000 / 10,75,000 | 13,02,000 / 11,20,000 | 13,57,000 / 11,65,000 | 14,12,000 / 12,10,000 | 14,67,000 / 12,55,000 | 15,22,000 / 12,90,000 | 15,77,000 / 13,55,000 | 16,32,000 / 13,85,000 | 16,87,000 / 14,35,000 | 17,42,000 / 14,60,000

LEGEND: PROGRAMME / PROGRESS

5.3 Other Factors that affect Project Completion Target Dates:

Other factors that affect project completion target dates will be discussed in this section. Although these factors were not directly responsible for the delays in project execution and/or project abandonment in the projects investigated, yet they are known to be contributory factors. These include:

1. Shortage of skilled manpower.
2. Government monetary policy.
3. Contractors cash flow analysis.
4. Government Regulation on Registration of Contractors.
5. Politicising of contract awards.
6. Unforeseen factors.

5.3.1 Shortage of Skilled Manpower:

No doubt, the Federal and State Governments have taken bold steps to improve on the shortage of skilled professionals in our construction industry by establishing various Technological and Research Institutions. Nevertheless, certain actions by the Federal and State Governments tend to undermine the objectives of these bold steps. These include:

1. Cutting down drastically the financial grants usually allocated to these institutions owing to the current economic recession.

2. The continous practice of awarding most major contracts to foreign construction firms, thereby denying our Engineers the opportunity of improving their knowledge.

5.3.2 Government Monetary Policy:

The ability of financial houses to grant loans for development purposes depend to a large extent on the Federal Government Monetary Policy.

Since the advent of the present austerity measures, the Federal Government has cut-down the financial grants to these Financial Houses. Even Commercial Banks are not left out, since the tight policy of the Central Bank demands that commercial banks increase their "Reserve Ratio". This action by the Central Bank drastically affected the liquidity of commercial banks.

In consequence, interest rates charged by commercial banks are now so high that construction firm, particularly indigenous firms, prefer to execute their projects on the basis of whatever funds could be realised from residual working capital, mobilisation fee, and progress payments. In view of this fact, the stated project completion target date are not often met by indigenous contractors who are not as financially strong as their foreign counterparts.

5.3.3 Contractors' Cash Flow Analysis:

Construction projects make substantial demand on a contractor's cahs at hand. Unfortunately, most construction firms, particularly the indigenous firms

give little thought over cash flow analytic projection when embarking on the execution of a project.

As a result financial requirements at any point in time are difficult to estimate. This gives rise to varying degrees of financial crisis which altimately lead to late completion or project abandonment.

5.3.4 Government Regulation on Registration of Contractors.

Registration requirements for contractors as discussed in chapter 2 (section 2.2) seem quite laudable. However, it has been observed that these regulations are flouted with the connivance of unscrupulous registration officials.

In view of this fact, it is not uncommon to find petty traders and small time business-men being registered under category "D" with the Federal Works Registration Board. Armed with this certificate and with the right connections in the right places, these "Emergency Contractors" win contracts running into several million naira, only to abandon the project and abscond with the bulk of the mobilisation fee.

Such unpatriotic actions by these greedy individuals are not only detrimental to the interest of a developing nation like Nigeria, but also lend credence to the general believe that indigenous contractors are, not only grossly inefficient in the execution of projects but also fraudulent in nature.

5.3.5 Politicising of Contract Awards:

With the advent of the civilian administration in Nigeria, contract awards have been highly politicised and are strictly on party lines.

Party "Heavy Weights" who are either owners of construction firms or have vested interest in any construction firm ensure through lobbying or otherwise, that major contracts are awarded to the firm(s). In most cases, the credibility and competence of these firms are never ascertained before the awards are made. In viewwof this fact, projects are known to be recklessly abandoned by some of these firms after expending only an insignificant fraction of the mobilisation fee on the project.

It is rather unfortunate that the actions of these contractors are never questioned, neither are legal actions instituted by the Government Agencies concerned inorder to recover the mobilisation fee.

5.3.6 Unforseen Factors:

These are factors that can neither be controlled by the client or the contractor. Cost of delays arising from such factors are among the contractual risk the contractor undertakes. They include:-

1. Natural disasters like floods, etc.
2. Inclement Weather.
3. Industrial Actions.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

From field investigations and analysis carried out the following conclusions can be drawn:-

1. That the detail planning of a project before the actual execution, and carrying out of short-term planning exercises as construction is in progress, not only make control and co-ordination of the various operations and activities very effective, but also, ensures that project execution follow the planned schedule.
2. Availability and efficient management of resources - manpower, material, plants and equipments by the contractor together with the client's ability to fulfil his contractual obligations enable a project to be completed within the stipulated project completion target date (see 5.2.3).
3. That too many variations on the design and volume of work on any project by the consultant Engineer or Architect slow down the pace of work and hence make the stated project completion date quite unrealistic. These variation orders also create opportunities for the contractor to negotiate changes in the contract price or total revaluation of the contract as was the case in the construction of the Niger State Parliament Building (see 5.2.4).

4. The general disregard of certain aspects of the contract conditions, especially where payments are concerned, by clients cause disruption in the planned projected cash-flow of contractors and as a result projects are either delayed and/or abandoned (see 5.2.5).
5. Awarding a contract at a price far below that estimated by a Consultant Quantity Surveyor is never to the advantage of the client as problems are bound to arise that may or may not lead to litigation, but will certainly result in delays and/or project abandonment as was in case (5.2.4.
6. The politicising of contract awards has resulted in projects being recklessly abandoned without the government agencies taking any legal actions against the defaulting contractors (Daily Times Opinion April 24, 1982).
7. The deficiency in the Government Regulations guiding the Registration of contractors has made it possible for ill-equipped persons or organisations to be registered in the highest category with the Federal Works Registration Board. Such contractors hardly perform satisfactorily. Execution of contracts awarded to them often suffer series of delays owing to lack of adequate personnels and equipment (see 5.2.1).

8. Money is the life blood of any construction firm. With enough fund, a contractor is in the position to plan and project his cash flow to cover the entire project duration with some degree of certainty. Inv view of this fact, there is the tendency that the project will be completed within the stipulated completion date. This was evidenced in the case of the construction of the 260 No. Low Cost Housing Units (case 5.2.3) where the project was financed through offshore loan secured by the company from their overseas financiers.

9. The present Government tight monetary policy has made it difficult for contractors to obtain the necessary materials for the execution of their projects. As a result many projects are being executed at a slow pace.

10. Indigenous contractors often find it difficult to secure loans from commercial banks, inspite of their collateral securities, for the execution of their projects. Consequently, indigenous contractors are seen not to perform satisfactorily as their foreign counterparts who, generally are financially stronger.

11. A project plan which is based purely on time consideration often turn out to be unrealistic if other constraints are not taking into account when formulating the project plan (see case 5.2.6).

In view of the conclusions drawn from field investigations and analysis, it is suggested that:

1. Employers should employ the services of independent consultants to handle their projects, since it has been observed that projects handled by the employer's staff are not properly managed in most cases as those handled by proefssional consultants.
2. When employer's staff are to be used, it is necessary that Arbitrators be appointed, so that, in the case of any breach of contract by any of the parties, contractual redress could be sought in the courts of law. This will provide an avenue for peaceful settlment instead of the contractor abandoning the job or the client blacklisting the contractor, where the contractor is the defaulting party.
3. Government bodies charged with the responsibility of registering contractors should set up a machinery which will enable them cross-check the authenticity of the information furnished by the contractors before registering them. In addition activities of contractors should be monitored to ensure that they conform with the laid down government regulations.

4. A contractor should always endeavour to notify the consultant and the client about his anticipated cash inflow for the following months in advance. This valuable piece of information, will enable the client review his projected cash flow to ensure that prompt payments are made to the contractor.

5. Government should direct commercial banks to relax their lending policy to enable indigenous contractors, with collateral securities, secure loans to finance the execution of their projects. Nevertheless, where a loan is granted to an indigenous contractor, the lending house should monitor the progress of work on the project and release funds accordingly. This measure is to ensure that the loan is effectively utilised.

6. Both the Federal and State Governments should curtail the award of major contracts to foreign firms. This will not only help in preserving our foreign exchange earnings, but will also provide our Engineers the opportunity to improve on their knowledge. It is a well-known fact that major contracts, awarded to foreign firms, provide these firms the avenues of improving the quality of their expatriate technicians at the expense of Nigerian Engineers.

7. Although, the lowest tender may be tempting to the client, award of contract to the lowest bidder might lead to a series of problems. Consequently, all factors often considered in the making of awards should be carefully examined before an award is made.

8. All planning techniques, whether it is the conventional Bar-Chart, PERT or C.P.M. when used in planning a project should take into consideration likely constraints (inclement weather). This will enable a workable and realistic project plan to be formulated; thereby, minimising substantially unforeseen delays.

9. Finally, a contractor must be enough of a diplomat to maintain good working relations within his own organisation, with his sub-contractors and suppliers and with the client's representatives so that he can execute his project as planned.

It is hoped that these suggestions, if considered and implemented, will go a long way in facilitating the execution and completion of projects within the stipulated project completion target dates.

APPENDIX II.

CONTRACT FOR THE CONSTRUCTION OF 260 UNITS OF HOUSES AT MINNA.

Gentlemen of the Press.

The Niger State Housing Corporation, intends to construct about 300 housing units of various categories during this fiscal year. After a series if dialogue with some construction firms, the Corporation recommended Italo Builders Co. Ltd for the award of the contract to build 260 housing units by means of contech Forming System of contruction. The latter approach has been found useful in solving the short term housing problems, Given the time of completion of building through this approach, it could be argued that there are more chances of achieving results at a cheaper easier and quicker manner.

2. The Niger State Government has approved the award of the contract as well as the systems approach as recommended. The construction period is 9 months and will cost ₦5,876,000.00k. Each of the three bedrooms will be constructed in terraces of 6,8, and 10 units per block. When completed, the houses will reflect our local ways of living.

3. For economic factors often associated with the system approach in construction, it has been necessary to locate all the units at a site within NTP 14, Tundun Wada Minna.

4. Meanwhile the remaining housing units out of the 300 mentioned above, will go to open tender very soon. They will be built through the conventional building method and our local contractors will be involved in the scheme.

Thank you.

7/7/80

APPENDIX I.

DAILY LABOUR RETURN

№ 13125

SITE Federal Prisons Mine

DATE 13/6/83

WEATHER CONDITION Bright

PLANT AND MACHINERY ON SITE
2 No. Concrete Mixer
2 No. Vibrator and 1 No. Dumper.

DESCRIPTION OF WORK	LABOUR FORCE											TOTAL O/Time Hrs
	Carpenters	Masons	Electricians	Plumbers	Painters	Iron Benders	Operators	Labourers				
Erecting of Scaffold for use in Units 9, 10, and 11	6							4				10
Block work from lintel level to roof level in Unit B		3						3				6
Cutting, bending and preparing steel reinforcement						4		2				6
							3					3
TOTAL	6	3				4	3	9				25

REMARKS We are short of materials especially cement, gravel chippings and 1/2" rods. One concrete mixer is bad.

Signed ..... O/C of Site

Designation Site Supervisor

Date 13/6/83

APPENDIX III.

"P R O G R E S S R E P O R T"

No: 17..... Date: 25/6/81

Project Title: PAIKO,- LAPAI ROAD PROJECT

Contract No. NG:TB: 10/76 - 77 Head 4228 S/Head 017

Contractor: MESSRS NORDA (NIG) LTD

Date of Site possession: 5th JANUARY, 1978

Contract Period: 20 MONTHS

Date of Completion (Actual). 5th SEPTEMBER, 1979

Percentage Progress: 93%

Standard of Construction: SATISFACTORY

Report of Supervising Officer: SITE CLEARING - 100%, EARTH WORKS COMPLETED WITH EXCEPTION OF THE STRETCH ALONG CECE VILLAGE, SUB BASE AND BASE COURSE WORKS HAVE COMPLETED UP TO 94%. 45km OF THE ROAD HAS BEEN PRIMED AND 32km COATED WITH S-125. ALL CULVERTS ON THE ROAD HAVE BEEN COMPLETED -100%, BRIDGE WORKS 96%, ACESS CULVERTS AND STONE-PITCHING -97%.

M.Y.B. MOHAMMED
Signature of Supervising Officer

DATE

Remarks of the Division/Resident Engineer: THE MAJOR PROBLEM THAT DELAYED THE PROGRESS WAS THE NON-AVAILABILITY OF THE CHIPPINGS AND SURFACING EQUIPMENT, HOWEVER THE PROGRESS HAS BEEN QUITE SATISFACTORY SINCE THESE WERE ACQUIRED ABOUT A MONTH AGO.

M.Y.B. MOHAMMED
Signature of Divisional/Resi/Engr.

Comments of the Head:

Signature of Head of Tran. Services.

TO BE PREPARED IN TRIPLICATE.

APPENDIX IV.

5% INTEREST ON CERTIFICATES
AS PER CONTRACT CONDITIONS

CERTIFICATE NO.	AMOUNT	INT. ACCRUED
No. 17 of July, 1981	151627.27	2/12 x 5/100 x 15162727 ₦ 1263.56
No. 17 of July, 1981	91627.27	7/12 5/100 x 91,627.27 ₦ 2672.46
No. 18 of Sept. 1981	248460.69	7/12 x 5/100 248460.69 ₦ 7246.77
No. 19 Retention Money for 42 Km. of Sept. 1981	448756.01	7/12 x 5/100 448,756.01 ₦13068.72
		TOTAL INT. ACCRUED ₦24271.51

APPENDIX V.

BUILDING AND CIVIL ENGINEERING CONTRA

Our Reference MN/JEP/gp
Your Reference
Date 16 October 1980

The General Manager
Niger State Housing Corporation
PMB 105
Minna

Dear Sirs,

Tudun Wada Housing Development

To assist you in your cash flow planning for this project we list below our revised estimates of our applications for the coming months.

October 1980 ₦ 1,500,000
November 1980 ₦ 1,200,000
December 1980 ₦ 1,000,000

We trust this information is of use to you to avoid delays in payment with each certificate.

Yours faithfully
for KRAMER-ITALO LTD

J E PENNY
Regional Manager

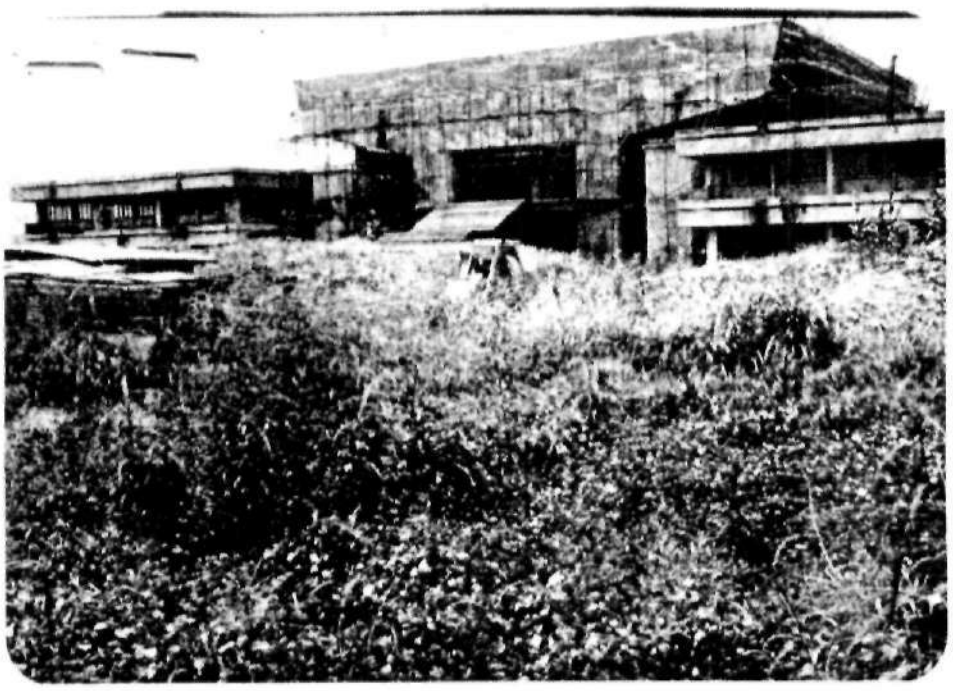


PLATE (i) FRONT VIEW OF THE ABANDONED NIGER STATE PARLIAMENT BUILDING.

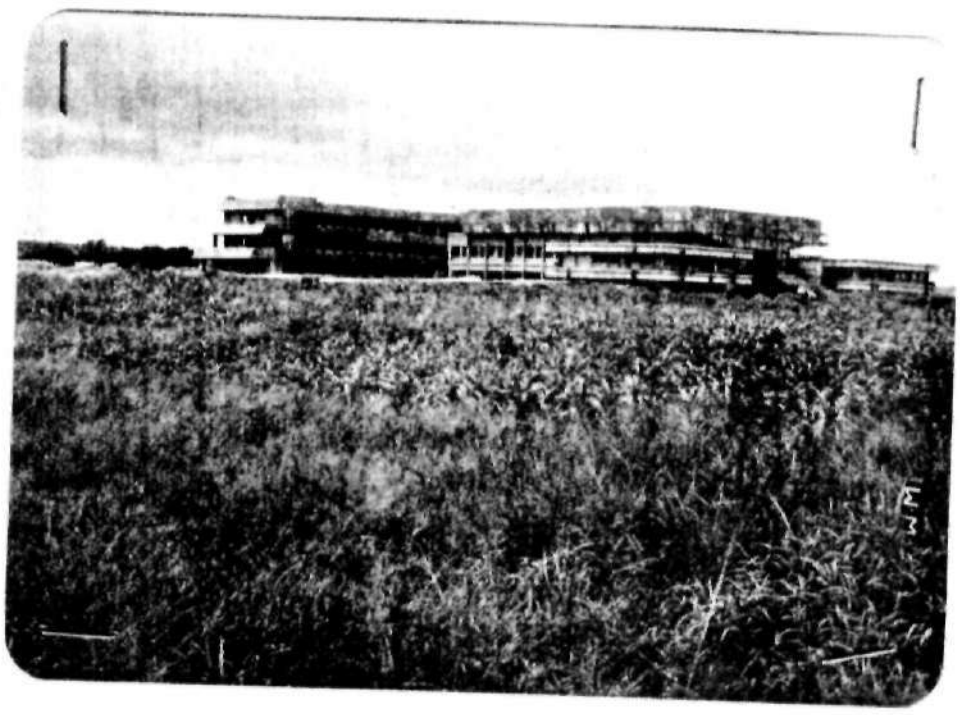


PLATE (ii) A DISTANT VIEW OF THE ENTIRE ABANDONED NIGER STATE PARLIAMENT BUILDING.

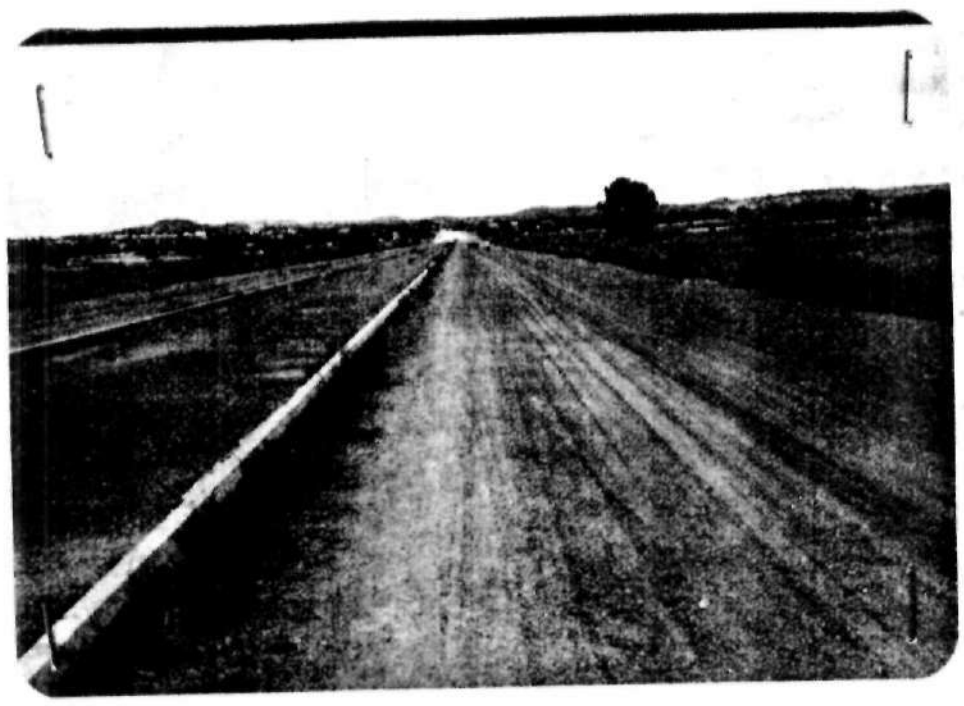


PLATE (iii) A SECTION OF THE ABNDONED ROAD PROJECT.



PLATE (iv) THE COMPLETED LOW-COST HOUSING IN MINNA.



PLATE (v) CLEARING OF THE ENVIRONMENT WITHIN THE LOW COST,