# EVALUATION OF THE RELATIONSHIP BETWEEN DELAYED PAYMENTS AND COST AND TIME OVERRUNS

**BY**

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## DECLARATION

I hereby declare that this thesis titled "**Evaluation of the Relationship Between Delayed Payments and Cost and Time Overruns**" has been performed by me in the Department of Building under the supervision of Dr. Bala Kabir and Dr. I.K. Zubairu. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any University.

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## CERTIFICATION

This thesis titled "**Evaluation of the Relationship Between Delayed Payments and Cost and Time Overruns"** by **Musa Osiregbhemhe Abdul Mtallib** meets the regulations governing the award of the Degree of Master of Science in Construction Management of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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This thesis is dedicated to my parents: late Alhaji Musa Osinere Ozekhomhe; and Hajia Rekhia Musa Ozekhomhe

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## ABSTRACT

This study was undertaken to establish the relationship that exist between delayed payments and time and cost overruns. Data were collected from seven hundred and fifty (750) construction projects in Nigeria completed between 1989 and 2005. After a careful study of the data on the seven hundred and fifty (750) projects, data on one hundred and fifty one (151) completed building projects were accepted and analysed. The total delay in payments, the time overrun, and the cost overrun were determined for each of the projects. The coefficients of correlation of delayed payments and cost overruns, and delayed payments and time overruns were calculated for combined public and private building projects, public building projects, and private building projects.

For the combined public and private building projects, the value of the coefficients of correlation of delayed payments and cost overruns and delayed payments and time overruns are 0.41, and 0.5,3 respectively. For public building projects, the coefficients of correlation of delayed payments and cost overruns and delayed payments and time overruns are 0.41, and 0.57, respectively. In the case of private building projects, the coefficients of correlation of delayed payments and cost overruns and delayed payments and time overruns are 0.66, and 0.30, respectively.

Two hypotheses, Hypothesis 1 and Hypothesis 2, were formulated to assess the significance of the correlation coefficients of delayed payments and cost overruns, and delayed payments and time overruns, respectively. Based on *bivariate normal* distribution of the data, the hypotheses were tested at 5% level

of significance using the Fisher r-to-z transformation. The P-value for each of the correlation coefficients was found to be greater than the tabulated value.

From the results, it is concluded that cost overrun has positive but weak relationship with delayed payments in the combined public and private building projects, and the public projects. Cost overrun has positive and fairly strong relationship with delayed payments in private building projects. Time overrun has positive but moderate relationship with delayed payments in combined public and private building projects. Time overrun has positive but weak relationship with delayed payments in private building projects. The coefficients of correlation of cost overruns and delayed payments, and time overruns and delayed payments for all categories of building projects studied are significant at 5% level of significance. From the values of correlation coefficients and the established significance of the correlation coefficients, delayed payments do cause time and cost overruns in building projects. From the findings of this study, it is recommended that delayed payments should be avoided to forestall the possibility of running into time and cost overruns and their associated consequences in building projects.

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# CHAPTER ONE

# INTRODUCTION

## 1.1 BACKGROUND

The Construction industry can be described as a collection of loosely integrated firms involved in the provision of the materials for the construction of structures, designing facilities to be constructed, constructing the facilities, installation of specialized services in the constructed structures, and supervision of the constructions in the areas of building and civil engineering works.

Construction projects refer to the projects undertaken by the construction industry to provide the much needed infrastructures for national development. Such infrastructures include roads, bridges, railways, airports, seaports, dams, canals, buildings, etc. The clients promote the construction of these projects through the inception of the idea to construct, and actually financing the preparation of the project for construction and the actual construction of the project. Preparation of the project for construction and supervision of the construction are usually left in the hands of the consultants, while the construction is normally contracted out to a professional builder or constructor, hereafter referred to as the contractor. Both the consultants and the contractor are paid by the client on an agreed payment pattern defined in the contract's "term of payments".

Payment pattern as used in this study refers to the time periods the contractor was paid, by the client, the monies due to him in the course of executing the project. Traditionally, payment procedures are set by the

"Conditions of Contract". The payment procedures vary with the nature, type and scope of the project. It is not uncommon, however, to observe flagrant disregard to the agreed contract's terms of payments by the clients, which most often leads to delayed payments to the contractor. Delayed payment has been identified as one of the factors that are responsible for cost-and time-overruns in construction projects, (Muazu, 1982; Okpala and Aneikwu, 1988; Dlakwa and Culpin, 1989; Chan and Kumaraswamy, 1997; Odusami and Olusanya, 2000; Udoh, 2002).

Cost overrun is a term used to express situations when actual cost of a project exceeds the budgeted cost. Time overrun is a situation when the actual completion date outpaced the scheduled completion date. The budgeted cost and scheduled completion date most often are not positively achieved by the contractor. More time and money are usually required to complete the construction of a project.

Cost-and time-overruns in construction projects negatively impacts on the important role the construction industry plays in any given economy, especially developing economies such as Nigeria's. The role of the construction industry in the economic advancement of any nation have been discussed by many researchers. Stanley *et al* (1977) have pointed out that the performance of the construction industry serves as an indicator for the performance of any given economy, since, in their opinion, the construction industry grows at a rate approximately equal to the rate of growth of Gross National Product (GNP). Russel (1976) attached great importance of construction industry to any given

society and described construction projects as vehicles for growth and development. Kolawole and Owor (1992) and Owoeye (1992) emphasized that the Nigerian construction industry is very vital to the national economy.

For the construction industry to effectively play its vital role in any given economy it must be able to actualize quality projects on schedule and within budget. Far from these expectations, construction projects in Nigeria have been found to be characterised by poor quality projects, and cost-and time-overruns (Muazu, 1982; Kolawole and Owor, 1992; Owoeye, 1992; Bayo, 1993; Omoniyi, 1996; Chan and Kumaraswamy, 1997; Dlakwa and Culpin , 1997; Odusami and Olusanya 2000; Udoh 2002).

It should be noted that the major concern of the construction industry to actualize quality facilities on schedules and within budgets is largely left in the hands of the contractor. The contractor is responsible for completing the contract within the specified time period, within the budgeted cost, and of the required quality. Many factors exist that may frustrate the effective discharge of these all important responsibilities of the contractor. Several studies have identified these factors, (Hillebrandt, 1984; NEDC, 1991; Kolawole and Owor, 1992; Russel, 1976; Sirajo, 1995; Wabara and Raheem, 2001; Udeh, 2002; Udoh, 2002). Prominent among the factors often identified as causing cost-and time-overruns is the delay in paying the contractor by the client. Sadi *et al* (1996), for instance, presented among other comments from the respondents of their study that "owner delay in paying the contractor on time affect contractor's performance significantly".

Though cost and time overruns occasioned by delayed payments to the contractor can be checked through a well articulated project funding plan, but the effective implementation of a project funding plan is dependent on financial buoyancy and availability of the source of funds (the client) for the project.

## 1.2 JUSTIFICATION

Studies, (Muazu, 1982; Okpala and Aneikwu, 1988; Dlakwa and Culpin, 1989; Sadi *et al*, 1996; Chan and Kumaraswamy, 1997; Odusami and Olusanya, 2000; Udoh, 2002), that reported that delays in paying the contractors by the clients would result in cost-and time-overruns have been carried out on the basis of purposive sampling techniques of research. Questionnaires were administered to participants in the construction industry to either assess the effects of delayed payments on cost-and time-overruns using the Likert's scale, or rank, among other factors, the effects of delayed payments on cost-and time-overruns. These techniques seek to elicit information from respondents on the basis of their own personal perceptions and opinions on the subject matter. Even, in many cases, the way and manner the questions are framed could sway the opinions of the respondents. Hence the results obtained through such research methods could be, to a large extent, subjective. That the reports are founded on subjective responses reduces their credibility of representing the real situation as it stands. Therefore, in order to compliment the efforts of previous researchers and to establish a more dependable relationship between delayed payments and cost-and time-overruns, and to establish how significant is delayed payments to the incidents of cost-and

time-overruns, a more scientific approach of analysis using real and existing data collected from completed construction projects is imperative. This, in essence, is exactly what this study is set to achieve.

## 1.3 AIM AND OBJECTIVES

### 1.3.1 Aim

The aim of the study is to establish a statistical relationship between delayed payments and cost- and time-overruns in construction projects so as to assist in the improvement of the performance of the construction industry in the successful delivery of construction projects.

### 1.3.2 Objectives

The objectives of the study are:

i. To compare the scheduled completion time with the final completion time of some selected projects so as to establish whether or not there was time overrun.

ii. To compare the budgeted cost with the final costs of some selected projects so as to establish whether or not there was cost overrun.

iii. To compare dates payments were due with dates payment were actually made in each of the projects selected so as to establish the extent of delay in payments.

iv. To compare dates valuations were due to the actual dates valuations were made so as to establish the extent of delay in valuations.

v. To assess the total delay in payments, the cost-overrun, and the time overrun for each of the projects selected.

vi. To perform statistical tests using the values from objective (v) to establish the relationship between delayed payments and cost-and time-overruns.

vii. To determine the significance of the relationship between delayed payments and cost-and time-overruns at 5% level of significance using the results from objective (vi).

viii. To proffer suitable recommendation based on the results of the analysis in (i-vii)

## 1.4 SCOPE AND LIMITATIONS

### 1.4.1 Scope

The study is focused only on how delayed payments impacts on the cost and time-overruns. Building projects completed between 1989 and 2005 will be sought for data collection. The period of 1989 – 2005 was chosen to reflect different regimes of governance and economic policies in Nigeria, and to ensure that the time during which the study is undertaken is captured in the collection of data. The study will cover only such projects with contract payments terms based on periodic valuation, or completed stages of work followed by valuation. Only the time periods at which the contractor was actually paid the monies due to him will be of interest; that is, the study does not take interest in the actual amounts of monies paid to the contractor at any given time. The sources of data will be only

Architectural, and Quantity Survey consulting firms, Building Contractors, and Clients' organisations.

### 1.4.2 Limitations

The following limitations on the study can be identified:

i. Only building projects are studied

ii. The study covers only some selected numbers of completed building projects

iii. The study covers only a 17-year period of 1989 to 2005.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 GENERAL

The construction industry can be described as a collection of loosely integrated firms that are engaged in the manufacture and supply of construction materials, designing structural facilities, the construction of the designed facilities, installation of specialized services in the constructed facilities, supervision of the constructions, and the maintenance of the constructed structural infrastructures in the fields of building and civil engineering. Andawei and King (2001), have portrayed the construction industry as an assembly industry that assembles on site the products of other industries.

The construction industry is unique. The uniqueness of the construction industry is generally derived from the types and nature of its products, the demand pattern, the type of clients, type of employees and nature of employment, nature of financing, mobility, varying site conditions, uniqueness of projects, etc., (Fellows *et al*, 1998)

The types and nature of the construction projects are important attributes of the uniqueness of the construction industry. A project can been defined as a sequence of unique, complex and inter-connected activities having one goal or purpose and that must be completed in a specific time, within budget and according to specifications, (Kliem *et al*, 1997). Kliem *et al*, (1997), emphasized that a project must have definite start time and end time; and stressed that the

"so-called projects that have no definite start time and end time are mere continuum of routine operations".

Construction projects refer to the projects undertaken by the construction industry to provide the much needed infrastructural facilities for national development. Such infrastructures include roads, bridges, railways, airports, seaports, dams, canals, buildings, etc. Construction projects, like the construction industry, are unique. No two projects, with every conceivable considerations taken into account, are ever the same. Each project is tailored to suit its environment, designed to perform its own specific function, and constructed to reflect personal and/or community taste and preference. In addition, the vagaries of construction sites and the variations in the utilization of even the standardized projects types combine to make each construction project a new and different experience, and of unique importance.

The basic importance of the construction industry vis-à-vis the construction projects to any given economy have been established. Stanley *et al*, (1977), pointed out that the construction industry is very vital to the development of any nation, and the performance of the construction industry serves as an indicator for the performance of any given economy, since, in their opinion, the construction industry grows at a rate approximately equal to the rate of growth of Gross National Product (GNP). Russel (1992), stressing the high importance of the construction industry to any given society, observed that construction projects are vehicles for growth and development. Kolawole and Owor (1992), and

Owoeye (1992), emphasized that the Nigerian construction industry is very vital to the national economy.

For the construction industry to effectively and efficiently play its vital role in the development of any economy, it must be able to deliver construction projects successfully. Successful delivery of construction projects is characterised by three basic elements comprised of completion on schedule, completion within the budgeted costs, and completion with the specified quality achieved. Several observations support these three components as determinants of successful delivery of construction projects. Kliem *et al* (1997), Fellows *et al* (1998), and Hendrickson and Au (2004), presented that cost and time factors are the most vital in project execution; in addition the quality of the project is equally important. Lawal (2003), posits that the concepts of project time and cost overruns in the execution of projects are relative, and their performance evaluation criteria serve as an indicator for the successful execution of construction projects. Therefore, successful completion of project should be considered by the following indicators on completion of the project.

i. Adherence to the time schedule

ii. Adherence to cost estimates.

iii. Adherence to quality standard.

Therefore, it can be seen from the foregoing that the three key areas of concern in meeting the contractor's obligations are:

i. Quality of work during construction

ii. Cost of construction

iii. Duration of construction

These three important factors that measure the successful delivery of construction projects have been reported to be largely unachieved by the construction industry. In other words, construction projects have been found to be characterized by poor quality, and time and cost overruns. Bromilow (1974), concluded that there exist widespread increase in the total construction time for construction projects; and that the increase in the total construction time results in an increase in the total construction cost. Ekechukwu (2003), observed that despite the tremendous contribution of the construction industry to national development, it is sad to note that time and cost overruns are widely prevalent in construction projects. Uddesh (2004), asserts that in public sector projects, it is a well known fact that time and cost overruns are widely prevalent. Dlakwa and Culpin (1989), pointed out that delays in project implementation and the attendant cost overruns have become a regular feature of public sector projects. In Nigeria a serious problem facing the Nigerian construction industry is that almost all projects are being completed at sums much higher than their initial contract sums, and they are also completed at durations longer than the initial planned durations (Giwa, 1987; Lawal, 2001). In the opinions of Ogulana and Olomalaiye (1988), and Mbachu (1997), the Nigerian construction industry is bedeviled by the problem of completing construction projects at higher costs and with durations much longer than the planned. Elinwa and Joshua (2001), observed that completing construction projects on time and within budget continues to be a chronic problem in Nigeria.

Failing to successfully deliver construction projects adversely affect the construction industry's efficiency and effectiveness, thereby reducing the construction industry's potency to successfully play its vital role in national development. Untimely completion and extra-budgeted costs of construction projects have been found to be major obstacle to the successful delivery of construction projects by the construction industry (Mbachu and Olaoye, 1999; Elinwa and Joshua 2001). Morris (1990), and Uddesh (2004), described time and cost overruns as threats to construction projects. According to Chan and Kumaraswamy (1997), not completing a project on time is an indication of inefficient construction industry. Dlakwa and Culpin (1989), corroborated this view, stressing that delays and cost overrun have a "knock-on" effect on the construction industry, and indeed on the economy as a whole.

The direct linkage of time and cost overruns to the performance of the construction industry in particular, and the national economies in general is premised on the fact that time and cost overruns are determined with reference to the initial plans. The values of time overruns are arrived at by comparing the actual completion time to the initial scheduled completion time. Most cost overruns are calculated by comparing budgeted costs and final costs of projects. It should, however, be stressed here that if the budgeted cost are not based on a well-defined scope, they are probably unnecessarily low, and not valid basis for comparison. In addition, subjective budgeted costs, whether low or high, are also not good basis for comparisons. Thus, given a realistically established initial scheduled completion time and objective budgeted costs, the final completion

time and the final account are indicators of how well the project has been managed. So, time and cost elements are the most vital factors in projects' execution. In good practice, the final completion time should be within a reasonable plus or minus percentage value of the original scheduled time for completion. Similarly, the final account figure should be about plus or minus reasonable percentage value of the original contract sum. It is worrisome, however, to note that the reported final accounts of most projects executed in Nigeria have always been on the excessive-plus-side of the original contracts' sums. Giwa (1987), established cost overruns of above 50% of the initial cost for as much as 10% of building projects studied; and as high as 150% of the initial cost of 10% of civil engineering projects. Danbatta (2005), studied the magnitude of cost-overruns on 150 building projects. The study revealed that 129 projects had cost overruns; 91 projects had cost overruns of between 0 and 10%; 27 projects had cost overruns of between 10% and 20%; 6 projects had cost overrun of between 20% and 30%; 2 projects had cost overrun of between 30% and 40%; and 3 projects had cost overrun of above 40%. The highest value of cost overrun from this study is 88% and it was recorded for 1 project. The menace constituted by the prevalent time and cost overruns to the indispensable role of the construction industry to national development vis-à-vis the growth of the economy could be adequately checked by an effective control of time and cost overruns.

For an adequate control of time and cost overruns, expansion and improvement on the knowledge of time and cost overruns are essential.

Bromilow (1974), asserts that few businesses can survive without an adequate knowledge of costs, and without an intelligent control of costs. Expanded and improved knowledge of the issues involved in time and cost overruns will aid in preparing time and cost estimates upon which an intelligent control of time and cost overrun will be based. In addition, the knowledge will assist in the need to see the potentials of occurrence of time and cost overruns, assessment of the associated risks, and the likelihood of failure before it actually occurs; otherwise there will be run out of time and budget which adversely affect the construction industry, and hampers the growth of the economy.

## 2.2 EXPLANATIONS AND DEFINITIONS OF TIME AND COST OVERRUNS

Construction projects usually have attached time-tags. Before construction is commenced a schedule is drawn up to indicate the start and finish times for the project. While it is most desirable to complete the construction of the project on the scheduled completion date, most construction projects are completed far behind schedule. Ogulana and Olomalaiye (1988), and Mbachu (1997), observed that cases of extended duration of construction projects have become so rampant that planned durations can hardly be relied upon. This phenomenon gives rise to what is referred to in the construction circle as time overrun. Time overrun as used in the construction industry, refers to a situation in the course of project implementation where the actual time of project completion exceeds the initial scheduled time for completion of the project. The quantity-

value of time overrun is represented by the value of the difference between the final completion time and the originally scheduled time as a result of the delay in completing the project.

Delays leading to time overrun, and consequently cost overrun can be grouped into three (Elinwa and Silas, 1993).

i. Non-excusable delays which entitle the client to claim for damages.

ii. Excusable compensable delays which entitle the contractor to extension of time and/or claims for damages. They include client-caused delays, differing site conditions, etc.

iii. Excusable non-compensable delays which entitle the contractor to extension of time without monetary compensation. This include delays caused by strikes, weather conditions, natural disaster, etc.

The Aqua Group (1990), summarizing the provisions of clause 25 of the JCT (1980), indicated that events beyond the control of the contractor should be recognized by law, thus enabling the contractor to obtain extension of time.

Time overruns have also been classified as either avoidable or unavoidable, (Elinwa and Joshua, 2001). Avoidable time overruns are those that result from causes that could have been anticipated, reasonably foreseen, and provided for. Unavoidable time overruns are those that are necessitated by events beyond the control of the project participants.

The term cost is being applied in various fields to connote the price paid or to be paid for particular item or act. The Economist would define cost as the monetary value of economic resources. Lucy (1998), defined cost as an amount

of expenditure and is always related to some object or unit. Cost could also be defined as the value of goods and services in terms of money. Considering the various definitions of cost, it can be seen that the term cost is generally applied to signify that, that involves the use or exchange of money. The "cost" of interest here is the amount of money the client has paid or has to pay for having a building in place.

The cost of buildings can be assessed from three hierarchical perspectives (Ekechukwu, 2003).

i. Cost of land, cost of finance, consultant fee, and other statutory charges.

ii. The cost of actual construction of the building.

iii. The totality of the maintenance or running costs or cost in use.

The focus here is on the cost of the actual construction of buildings.

The cost of constructing a building consists of both direct and indirect cost elements. The direct cost elements are those that can be attached to specific items of work such as labour, materials, plant and equipment. The indirect cost elements are those that cannot be attached to specific items of work such as transportation, insurance, taxes, overhead, and the contractor's profit. These costs are usually budgeted for before the take-off of construction, and it is most desirable to keep the construction costs within the provisions of the budget. More often than not, however, the clients found themselves paying more monies over and above the budgeted costs. This situation in the process of project implementation whereby the actual cost exceeds the budgeted cost is referred to as "cost overrun".

Cost overrun in building projects could either be apparent or real, and could either be avoidable or unavoidable. Apparent cost overruns are those that result from circumstances that could have been anticipated or foreseen and checked. Such circumstances include poor scope definition, poor design, sharp practices by the contractor and others involved in the project. These types of cost overruns are therefore avoidable. Real cost overruns on the other hand are not avoidable. They result from unanticipated or uncontrollable increase in costs caused by factors beyond the control of the project decision makers. Such factors include the extra costs imposed by unexpected environmental changes, higher costs, strikes, political insurrection, fire disaster, and force majeure.

## 2.3 INCIDENTS OF TIME AND COST OVERRUNS

The history of time and cost overruns, according to Rangaranja, (1982), is legend. Flyvbjerg *et al* (2003), observed that large construction cost escalations are common in infrastructure projects and exist across different historical periods. No area of projects is exempt. Building and civil engineering, shipping, new products development, manufacturing, etc., are all affected. However, the extent to which time and cost overruns are associated with these projects differs. In the case of building projects, which is the main focus here, the extent and frequency of time and cost overruns also differ between public sector projects and private sector projects. Time and cost overruns have been found to be more rampant in public sector projects (Giwa, 1997; Achuenu, 1997; Lawal, 2001; Uddesh, 2004; Flyvbjerg *et al*, 2004). Merewitz (1973), Ellis

(1985), and Snow and Dinesen (1994), in different studies arrived at similar conclusions that the track record of cost-overrun is poorer for large projects than for small projects, and that cost overrun for large projects are particularly common and large.

Time and cost overruns are experienced internationally. Cases of time and cost overruns abound in Nigeria as well as other countries. The track record of time and cost overruns, according to Aharoni (1986), and O'Connor and Vickroy (1985), is not good worldwide. Aqua Group (1990), states that delay is on of the most common of the difficulties encountered during the administration of construction contracts.

In Nigeria almost every construction project eventually run into time and cost overruns to the extent that presenting incidents of time and cost overruns in Nigeria will involve practically an "endless" list of projects that may not be warranted here. Therefore, few cases, among the many cases available, have been presented to represent the awesome situation.

Elinwa and Silas (1993), reported cost overruns of the range of 8% to 142% for 10 selected building projects in Nigeria. According to Mbachu (1997), the extent of delay in building projects in Nigeria is usually between 155.8% and 516.22%. Contrary to Mbachu (1997), Nwafor (1989), reported that building projects in Nigeria overrun their initial duration by between 115% and 300%. According to Achuenu (1997), the most visible incidence of time and cost overruns in Nigeria are in government projects. The government is the largest initiator and financier of building construction works. The Federal Ministry of

Works and Transport cited in Lawal (2004), revealed that cost overruns totaled fourteen billion, five hundred million Naira (₦14.5b) in 1999-2003. Giwa (1987), studied ninety completed public building projects and found an overall cost overrun of 26.06%. Yusuf (2004), citing National Concord of 29th May, 1983 claimed that the presidential lodge at Abuja originally awarded at the cost of twenty million Naira (₦20m), had a final cost of thirty five million Naira with a 75% cost overrun.

Gumel Local Government Secretariat complex construction contract awarded in 1992 to be completed in 1994 at a cost of five million Naira (₦5m), was completed in 1999 at the cost of eighty million Naira (₦80m), with a whooping seven (7) years and seventy five million Naira (₦75m) time and cost overruns respectively, (Yusuf, 2004). The construction of the warehouse for the Maigateri Border Free Zone contract awarded in June 2001, was to be completed in December, 2001 at a cost of seven million Naira (₦7m). The warehouse construction was finally completed in October, 2002 at the cost of fourteen million Naira (₦14m). This showed 10 months (166.7%) time overrun, and seven million Naira (₦7m) (50%) cost overrun, (Yusuf, 2004). The Daily Times of 5th May, 1983, cited in Yusuf (2004), reported that the Ammenity Hospital in Kaduna originally awarded at the cost of four million, three hundred thousand Naira (₦4.3m) had a final account of seven million Naira (₦7m). This represent two million, seven hundred thousand Naira (₦2.7m) cost overrun.

Adamu (2004), reported one year time overrun, and thirty-four million, nine hundred and fifty-five thousand, eight hundred and thirty-eight Naira only

(₦34,955,838) cost overrun in the construction of block V, Audu Bako Secretariat, Kano. The extention of Nasarawa Hospital, Kano, originally awarded at the cost of two million, nine hundred and eleven thousand, nine hundred Naira (₦2,911,900.00), was completed at the cost of nineteen million, two hundred and twenty five thousand, six hundred and eighty-three Naira (₦19,225,683.00) only. This indicate a cost overrun of sixteen million, three hundred and thirteen thousand, five hundred and eighty-three Naira (₦16,313,583.00) only (i.e. over 800% cost overrun).

The contract for the construction of fifty numbers bungalows for the NNPC Housing Complex in Port Harcourt, which was awarded at the cost of one hundred million Naira (₦100m) only, and scheduled to be completed within twenty four (24) months, was finally completed at the cost of one hundred and fifty million Naira (₦150m) only, and with a duration of thirty six (36) months. This presents a cost overrun of fifty million Naira (₦50m) only (i.e. 50%), and a time overrun of twelve (12) months (i.e. 50%), (Rabiu, 2004).

Okpapi (2004), reported that the contract for the construction of twenty (20) bungalows for the Shell Housing Complex in Warri with an initial cost of two hundred and fifty-two million, sixty-six thousand, four hundred and eighty-three Naira, sixty four kobo (₦252,066,483.64) only, was finally completed at the cost of two hundred and sixty eight million, five hundred and eighty thousand, five hundred and twelve Naira (₦268,580,512.00) only. This indicates a cost overrun of sixteen million, five hundred and fourteen thousand, and twenty eight Naira, thirty-six Kobo (₦16,514,028.36) only. The project which was

scheduled to be completed in six (6) months, was actually completed in eighteen months with a twelve (12) months (200%) time overrun.

Elsewhere, outside Nigeria, Al-Abedien (1993), reported an average of 70% time overruns for public projects in Saudi Arabia. Some years later in a similar study, Al-Ghafly (1995), established an average time overrun of 39% for construction projects in Saudi Arabia. DPI (1997) submitted that as at February, 1997, 118 of 187 of the 5-year plan of the "Central Sector" projects were running behind schedule by from 1% to 200%, and cost overruns for the projects ranged between 40% and 75%. Patrick (2000), reported an average of 30% cost overrun on World Bank funded construction projects between 1960 and 1990.

## 2.4 CAUSES OF TIME AND COST OVERRUNS

The causes of time and cost overruns are varied and diverse. The causes of time and cost overruns are also interwoven, and could be individually or severally responsible for the occurrence of time and cost overruns. The causative factors of time and cost overruns are generally traceable to the client and/or the agent of the client, the consultant, the contractor, and circumstances outside the control of the project's participants. The general causes of time and cost overruns linkable to the parties mentioned above include slow decision making, change order, delay in payment of interim certificates, inadequate project planning, delay in the supply of construction resources, change in government policy, late hand over of site, design changes, poor labour productivity, cash flow problems, fluctuations due to inflation, poor project design and/or implementation, bureaucracy, high exchange rate, under-estimation, inadequate

funding, lack of coordination among project participants, poor or inadequate scope definition, politically oriented decisions, political expediency, loss of scope control, disproportionate growth in scope, lack of technical expertise, inexperience of one or more of the project's participants, choice of technology, procurement inefficiencies, construction inefficiencies, incompetence of one or more of the project's participants, corrupt practices, inadequate project analysis, lack of proper implementation plan, lack of project management skills, poor or lack of organisational structure, political instability, poorly formulated contractual agreement clauses, lack of cost control, poor contract management, fraudulent practices, etc. Causes of time and cost overruns by circumstances outside the control of the project's participants include events such as exceptionally inclement weather conditions, war, civil commotion, strikes, loss or damage due to fire, or flood, or wind storm, and other environmental factors.

Kaming *et al* (1997), identified the major causes of construction projects delays to be changes in design, poor labour productivity, and inadequate planning. Al-Khalil and Al-Ghafly (1999), identified sixty (60) causes of time overruns, and summarized them into six (6) major categories to include

i constructor's performance,

ii client's administration,

iii planning and design,

iv government relations,

v site and environmental conditions, and

vi site supervision.

Flyvbjerg *et al* (2004), traced the causes of cost overruns to three major variables which are the duration of the project, the size of the project, and the type of client. On the basis of Uddesh (2004), the main causes of time and cost overruns can be categorized into three:

i. Inadequate formulation

ii. Lack of proper implementation planning

iii. Poor management of implementation

Similar to the categorization of the causes of the time and cost overruns by the previous researchers cited above, it is considered reasonable in this study to categorize the main causes of time and cost overruns into five:

i. Time and cost overruns caused by the client

ii. Time and cost overruns caused by the consultant.

iii. Time and cost overruns caused by the contractor.

iv. Time and cost overrun jointly caused by two or more of the project's participants.

v. Time and cost overrun caused by events outside the control of the project's participants.

### 2.4.1 Client-Caused Time and Cost Overruns

The client has been identified by many researchers as the major cause of time and cost overruns. One of the fundamental factors of time and cost overruns emanating from the clients is poor conceptualization of the project. Poor conceptualization of the project will generate many other time and cost overruns

causative factors such as inadequate scope definition, inadequate cost budgeting, unrealistic design and construction plans, and ineffective control plans.

Corrupt practices in the client's organisation could also lead to time and cost overruns. Inyang-Udoh (1982), observed that corrupt practices that results in issuing instruction directly to the contractor by the client, and allow the contractor to bypass the consultants on issues relating to the contract will result in time and cost overruns.

Delay in payments to the contractor has also been established as one of the major reasons for time and cost overruns. Inyang-Udoh (1982), pointed out that the clients contribute to the escalation of construction time and cost by their non-challant attitude to regular payments to the contractor. Dlakwa and Culpin (1989), observed, among other reasons, that the delay in paying contractors' interim payments is responsible for time, and cost overruns. Okpala and Aneikwu (1988), identified delay in payment to the contractor as one of the important causes of cost and time overruns. Assaf *et al* (1995), concluded that delay in payment by the owner is one of the major causes of time overrun in construction projects. Izam and Bustani (2001), identified that the major cause of time overrun is delayed payments. Their findings show that delayed payments accounts for 48% of the time overrun, architect's variational instruction, 32%, materials shortages due to late delivery, 6%, repeat work, 4%, inclement weather, 1%, and other causes, 9%. Studies that have also identified delayed payments by the clients as a major cause of time overruns, and cost overruns, include Baldwin and Manthei (1971), Merewitz (1973), Bennie (1982), Ardity *et al* (1985),

Kraieni and Diekman (1987), Okpala and Aneikwu (1988), Nwafor (1989), Al-Ghafly (1995), Nkado (1995); Chan and Kumaraswamy (1997), Kaming *et al* (1997), Mbachu and Olaoye (1999), Al-Momani (2000), Elinwa and Joshua (2001), Bustani (2002), Flyvbjerg *et al*, (2004).

Bureaucratic bottlenecks of the client's organisation, especially in the case of public sector projects, has also been identified to be responsible for time and cost overruns. According to Morris (1990), bureaucracies on the part of government and public sector are major factors that affect planning, designing, and implementation of project execution to such an extent that the project will experience time and cost overruns.

Political consideration is yet another factor that has been observed to cause time and cost overrun. Morris (1987), explained that the short term politically expedient tendency to take up large numbers of projects and short-fund them all, except those with the very highest priority, is perhaps the most important factor in construction delays and the subsequent construction cost escalations. The spread of lean financial resources over large number of projects stretches the period of completion of the project. Morris (1987) asserts that politically motivated projects which are usually subjectively appraised by the government are very often devoid of meaning when emphasis is placed only on the form of the project proposed rather than on its contents. Contracts for such projects which are often subjectively awarded to ruling political party's faithfuls and people close to those in government usually end up in time and cost overruns.

Change order is another factor which as been noted to give rise to time and cost overruns. Morris (1987), concluded that changes requested by the client led to delay in construction and added costs. Other researchers that have also established change orders of the client as a major cause of time and cost overruns include Ayeni and Oforeh (1991), Kunle and Yusuf (1993).

Inadequate funding is another client factor that has been pointed out to be among the factors that could lead to time and cost overruns, (Morris, 1987, Okpala and Aneikwu, 1988, Morris, 1990, Kumaraswamy and Chan, 1995). Funding as applied here do not only cover the money required to pay the contractor, but also embraces monies required to defray other costs associated with the project. Inadequate funding will lead to cash flow problems which could result in delays in implementing the construction plan. Rangaranjan (1982), Aharoni (1986), and Morris (1987), observed that one of the most important causes of time and cost overruns is the inadequate funding of the projects. The observations of Rangaranjan (1982), Aharoni (1986), and Morris (1987), are corroborated by the findings of John (1997), that concluded that short funding of projects as a result of thin financial resources would lead to delay in project implementation.

Other client related factors identified to be causing time and cost overruns include slow decision making, inadequate project planning, delay in the supply of construction resources promised by the client, change in government policies, political instability, late handover of site, etc. (Bromilow, 1974; Ireland, 1986; Morris, 1987; Ogunlana and Olamalaiye, 1988).

### 2.4.2 Consultants Related Factors Causing Time and Cost Overruns

The consultants have also been largely blamed for generating factors that could initiate and propagate time and cost overruns. Some of the consultant related factors causing time and cost overruns include errors and omissions in designs and plans (CICE, 1982; Morris, 1987; Morris 1990; Kumaraswamy and Chan, 1995); delays in issuance of revised drawings, and instructions, (Kunle and Yusuf, 1993); discrepancies in the drawings and specifications, (Ayeni and Oforeh (1991); changes in specifications, (CICE, 1982; Morris, 1987; Chan and Kumaraswamy, 1997); inaccuracies of quantities take-off, (Rangaranjan, 1982); under estimation resulting from the use of insufficient rates or wrong calculations, (Bennie, 1982; Kraieni and Diekman, 1987; Assaf and Al-Hazmi, 1995); delay in approval of proposed construction methods, (Kunle and Yusuf 1993). Inyang-Udoh (2002), asserts that time and cost overrun result in construction projects because "the professional Architect, Engineer, Quantity Surveyor inclusive are not very much cost conscious and conversant with the management of construction contracts". Other factors of time and cost overruns traceable to the consultants include non-compliance with the design brief, inadequate review of drawings, unattainable or unachievable specifications, etc., (Baldwin and Manthei, 1971; Bennie, 1982; Kraieni and Diekman, 1987; Assaf *et al*, 1995; Kaming *et al*, 1997; Izam and Kolawole, 1998).

### 2.4.3 Contractors Related Factor Causing Time and cost Overruns

Time and cost overruns causative factors generating agent has been found in the contractor, (Ayeni and Oforeh,1991; Kunle and Yusuf, 1993; Chan and

Kumaraswamy, 1997; Izam and Kolawole, 1998; Izam and Bustani, 2001). Time and cost overruns causative factors traceable to the contractor include inexperience, ineffective or total lack of construction plan and schedule, ineffective and insufficient construction resources, poor or total lack of cost control, delay in the provision of facilities to nominated sub-contractors. Clever and sharp practices by the contractor culminating to dubious, corrupt, and mischievous activities are also highly responsible for time and cost overruns in construction projects. It can be argued, however, that the contractors related factors causing time and cost overruns in construction projects are, through an objective critical analysis, directly linked to errors of omissions or commissions of the client's organisation.

### 2.4.4 Project's Participants Related Factors Causing Time and Cost Overruns

Factors causing time and cost overruns which emanate from the joint responsibilities of two or more project's participants also exist. Prominent among these factors is poor scope definition and scope control. Poor scope definition and scope control have ripple effect on the projects. CICE (1982), reported that most construction officials consider lack of scope definition to be the most serious problem in construction projects; it concluded that "poor scope definition at the estimate (budget) stage and loss of control of project scope rank as the most frequent factors to cost overruns". Giwa (1987), concluded that cost overruns are due to adhoc changes in the concept and scope of the project. While inadequate scope definition and control are largely attributable to poor planning

and management of projects, it has been adviced that cognizance must be taken of the fact that circumstances exist that either precludes full scoping of projects or force managers to proceed at a level of scope definition less than desirable, (CICE, 1982). It has been emphasized that regardless of the reasons, when there is poor scope definition final project cost can be expected to be higher because of the inevitable changes which disrupt project rhythm, cause rework, increase project time, and lower the productivity and morale of the workforce, (CICE, 1982).

Scope definition and scope control affect both apparent and real cost overruns since most cost overruns are calculated by comparing final costs with the budgeted costs. It follows that if the budgeted costs are not based on well-defined scope, they are probably low and not valid for comparison. Real overruns occur as a direct consequence of unjustified scope growth during construction. "The inescapable conclusion", according to CICE (1982), "is that scope definition and control is a key factor in both apparent and real overruns".

It should be pointed here that full and adequate scope definition and control for most construction projects are difficult, if not impossible, to be achieved because of the complexities of the entire process of design and construction. The possibilities for voids or ambiguities are high, and not every contingency can be covered. However, if problems, including time and cost overruns, are to be avoided later in the project, more efforts should be put into adequately defining the scope of the project and serious care should be exercised to ensure that the defined scope is properly controlled.

Changes in the scope is another factor causing time and cost overruns which is traceable to the projects' participants. Morris (1990), asserts that changes in the scope of a project mostly far greater than the original scope will automatically increase the time and cost of construction projects. The cost effect of change depends on the point in time the change is introduced. If changes are made very early in the conceptual engineering phase, there may only be the direct costs of change to account for. But if changes are made much later when the construction of the project is already in progress, there can be a ripple effect on other engineering work; and there may be construction rework with the attendant delays and extra costs.

Poor formulation and planning at the inception stage of the project is another factor related to the project's participant which has been identified to be responsible for time and cost overruns, (Bromilow, 1974; Rangarajan, 1982; Aharoni, 1986; Morris, 1987; Morris, 1990; Kumaraswamy and Chan, 1995; Lawal, 2001; Uddesh, 2004). At the project formulation and planning stage, feasibility and viability studies and environmental impact analysis play important roles in investment decision making. The project concept is crystallized after considerable effort in technical studies and consultations. In many construction projects decisions are taken and plans are formulated and drawn up without the necessary basic information for better decisions and better formulation of plans. It has been shown that such poorly formulated projects generally experience more time and cost overruns (Holf, 2002; Uddesh, 2004). Uddesh (2004), further stressed that in projects that are not subjected to rigorous appraisal, the weakness

in the formulation does not get identified until too late during the construction phase. This suggests that if the basic parameters for formulating and planning the project are wrong, the time and cost overruns are built-in from the start and they are bound to manifest later. According to Morris (1987), "if we do not know what we want, we are already in serious difficulties even before we start". These difficulties will obviously include problems in funding the construction projects as a result of poor planning which will eventually result in time and cost overruns.

Wrong cost estimation is project's participants related factor indicated as causing time and cost overruns in construction projects. Seeley (1984), defined "estimated cost" as the cost estimate of a building normally prepared for and/or on behalf of the client by professional advisers just before or during tendering. Morris (1990), observed that under-estimation, or use of insufficient information and/or wrong calculations would give rise to time and cost overruns. In too many cases, according to CICE (1982), the first decision to precede on the construction of a project is prematurely based on unreliable cost information. Sometimes the client seeks preliminary cost information (just approximately, "a ball park figure") from friends and associates who have built, from real estate agents, from design professionals, and from their own experience. This information is often requested before specific site data are available, and before knowing precisely what the project is expected to do. Morris (1987), remarked that what the clients get from even the most reliable source, is cost information based on some other projects at other locations at previous times. Meanwhile,

what the clients need is dependable cost information of the project they want at a time in the future. CICE (1982), and Rangarajan (1982), have stressed that there is no magic way to obtain accurate cost estimates without specific and accurate cost information. Seeley (1984), emphasised that estimates based on inadequate information cannot be precise. It should be noted, however, that no matter how high the degree of adequacy of cost information, "estimated costs" cannot be precise. "Precise estimates" as used by Seeley (1984), is seen in this study as an exaggerated expression for emphasis to underscore the need for adequate information for cost estimating.

Achuenu (1997), blamed poor cost estimating on the inadequacies of most of the cost estimating methods and cost predictive models, and concluded that most clients are compelled either to pay for unbudgeted costs increases in the projects or abandon the project outright. Bromilow (1974), has pointed out that when the cost of projects are grossly underestimated the result is that such projects will experience severe cost overruns.

Closely related to poor cost estimation is lack of cost planning which has been indicated as one of the project's participants related factor that could give rise to time and cost overruns. Uddesh (2004), concluded that even where the project time is properly planned, the cost planning, particularly by detailed activities is hardly undertaken with the result that inspite of meeting the time schedule, there is bound to be cost overrun.

Another factor for time and cost overruns linkable to the project's participant is improper procurement methods. It is important to note that the

project acquisition processes are inadequate and poor procurement practices abound. In a study covering over 15 years of construction projects, Smith *et al* (1983), noted that due to inadequate procurement process construction projects experienced substantial time and cost overruns. Smith *et al* (1983), went further to illustrate that in some of the projects, the estimated costs tripled, and delays ran up to 8 years or more. In a study of one hundred and fifty (150) building projects to assess the effects of procurement methods on successful projects delivery, Jogana (2005), concluded that all the projects that were inappropriately procured had time and cost overruns. Kadiri and Odusami (2003), reported higher time and cost overruns for direct labour contract procurement system than for labour only contract procurement system.

Poor management of construction projects is yet another time and cost overruns causing factor that can be associated with the project participants. Chezea (1981), concluded that cost overrun of projects is due to insufficient knowledge of construction management techniques as well as inadequate organisation competence and discipline.

Wrong formulation of the terms of contract vis-à-vis the application of vague contract clauses is again another time and cost overruns generating factor that can be linked to the project participants. Standard documents such as ICE Conditions of Contract (1979), and Joint Contract Tribunal (JCT, 1980), are explicit in stating that no change to contract sum can be made except as provided for in the various clauses of the conditions of contract. Hence, according to Aqua Group (1990), and Kolawole (1995), for an increase in the contract sum to

be legal, it must trace its roots to one or more of the contractual clauses. It is noteworthy that in quite a good number of construction contracts clauses that are required to check the excesses of the project participants that could result in construction costs escalations are either ignored altogether, or misadopted, or vaguely stated and applied. Worst still, cases exist from experience where construction contracts have been awarded without a formal conditions of contract to guide the execution of the contract. In contracts where one or more of the aforementioned deficiencies exist, the situation will be akin to issuing a blank cheque to the contractor, or any selfish and dishonest project participant for that matter, to manipulate the cost of construction to an own advantage. The result is, unequivocally, cost overruns. This view is supported by Giwa (1985), who reported that cost overruns in public sector projects are due to the application of vague clauses in the contract documents.

Other time and cost overruns causative factors related to project participants are slow decision making, unavailability and/or inadequate construction resources, inadequate coordination of drawings and specifications among the professionals, non-compliance with design brief, inadequate review of the contract documents before construction etc., (Baldwin and Manthei, 1971; Bennie, 1982; Kraieni and Diekman, 1987; Assaf *et al*, 1995; Kaming *et al*, 1997).

### 2.4.5 Other causes of Time and Cost Overruns

Many other time and cost overruns causing-factors are originated from agents outside the control of the project participants. These factors include

exceptionally inclement weather, (Bennie, 1982; Kraieni and Diekman, 1987; Morris, 1990 Chan and Kumaraswamy, 1997); civil commotion, labour unrest, etc., (Baldwin and Manthei, 1971; Assaf *et al*, 1995); litigation, (Rangarania, 1982; Morris, 1987); inflation, (CICE, 1982; Rangaranja, 1982; Ireland, 1986; Morris, 1987; Morris, 1990; Kolawole, 1995; Kumaraswamy and Chan, 1995); unfavourable exchange rate, (Charles and Andrew, 1990; Morris, 1990); Force majeure such as war (Baldwin and Manthei, 1971; Al-Khalil and Al-Ghafy, 1999; and Assaf *et al*, 1995); etc.

## 2.5 CONSEQUENCES OF TIME AND COST OVERRUNS

Time and cost overruns would result in dire consequences for the individuals, the society, and the economy. Time and cost overruns could lead to increase in the cost of capital, late return on investment, additional insurance charges, capital waste in projects, projects becoming uneconomical, generation of conflicts between the client and the contractor, generation of conflicts between the client and the consultants, generation of conflicts among the project participants, and abandonment of projects.

Time and cost overruns can lead to the frustration of the client, or the contractor or both, (Ogunlana and Olomalaiye, 1988). Time and cost overruns are costly to both the contractor and the client; and could lead to acrimonious relationship between the parties involved in a project. Elinwa and Joshua (2001), observed that, in Nigeria, overruns are often given as the most important factor for projects abandonment or contractor's failure. Flyvbjerg *et al* (2004), posited

that cost escalation in construction projects would cause more havoc in terms of budgetary, fiscal, administrative, and political structures. Charles and Andrew (1990), reported that time overruns will lead to higher costs of construction projects. Mark and Rick (2004), submitted that the end result of cost overrun is reduction in profits and upset in cash flow. Kaka and Price (1991), and Flyvbjerg *et al* (2004), observed that cost overruns pose serious threats to projects' viability. According to Andrew *et al* (1999), cost overruns could result to loss of confidence by the banks which, in turn, would lead to withholding of funding by the banks.

The effects of time and cost overruns on the contractor can be catastrophic, (Ireland, 1986). At the very least, the contractor could face a situation of loss-making contract, and at worst go bankrupt. Ireland (1986), observed that time and cost overruns will raise the contractor's interest on loans and overdraft, and equipment and materials become vulnerable to pilferage and deterioration.

To the client, time and cost overruns are themselves already problems because the client has to wait longer than expected for the project to be realised, and expend more money than budgeted. Time and cost overruns will delay and reduce returns on investment to the client, or reduce the economic value of the project to the client; may cause public and/or political embarrassment to the public sector client; the client may have the project abandoned altogether, thereby making everything invested in the project a colossal waste. Ireland (1986), asserts that abandoned projects causes the client considerable trouble and

expenses. In Nigeria, there are billions of Naira worth of abandoned projects nationwide caused by delayed project implementation and attendant cost overruns. In the opinion of Ogunlana and Olomalaiye (1988), and Mbachu (1997), abandonment of projects make the project uneconomical and may useless the project's purpose.

Time and cost overruns have serious consequences on the society and the economy. Morris (1987), observed that time and cost overruns, especially in the public sector investments can raise the capital output ratio in the public sector and elsewhere, bringing down the efficacy of investments. This effect can spread to other sectors of the economy if the public sector raises the prices of its output since very important output of the public sector constitute input to the private sector. Morris (1987), stressed further that time and cost overruns adversely affect the rate of national development. High time and cost overruns will lead to capital waste. Since the financial resources available to the government is limited, inefficient use of the scarce financial resources will lead to the inability of the government to embark on more development projects. This view is similar to that of DPI (1997), and Andrew *et al*, (1999), that delayed investments have the effect of lowering the growth rates of planned ones.

With high cost overruns, many companies can be trapped by the 'sunk costs syndrome'. That is, some way through a project, cost overruns that make the project uneconomical become obvious and yet the most logical decision is to proceed to completion. The money already spent must be considered as sunk, or written-off, and the decision to proceed must be based on the project's rate of

return on the remaining forecast cost to completion, Ireland, (1986). Morris (1990), concluded that investors whose projects have high time and cost overruns will be faced with the inability to compete favourably with other competitors.

## 2.6. SOLUTIONS TO TIME AND COST OVERRUNS

### 2.6.1 Solutions To Time And Cost Overruns At The Pre-construction Stage

Researchers in the area of time and cost overruns have made some useful recommendations on how to reduce the incidence of time and cost overruns in construction projects. Some of the strongest recommendations for avoiding time and cost overruns are focused on the pre-contract activities. These include proper planning at the project inception stage, choice of competent consultants, clear and thorough client brief, adequate definition of the project scope, comprehensive feasibility study, good designs, realistic time and cost estimates, preparation of clear and dependable contract documents, selection of a competent contractor.

Morris (1987), observed that time and cost overruns are predominantly related to problems that occurred during planning and design processes; and recommended that clients should strategically focus attention and efforts on adequate planning for projects. Rangaranjan (1982), Morris (1987), and John (1997), recommended that to avoid time and cost overruns in construction projects there should be “proper planning and adequate preparation” for the project. Similarly, Morris (1990), recommended effective planning; while Uddesh (2004), recommended better formulation of the plan for construction

projects to reduce time and cost overruns. Taylor (1987), proffers that forecasting models should be used to determine construction durations to minimize time and cost overruns.

The chosen consultants play a major role in determining the occurrence and the extent of time and cost overruns in construction projects. In this regard, the professional competence, the moral standing, and the general attitude of the consultants are equally important in the efficient and effective discharge of the consultants' responsibilities. Therefore, the choice of professionally competent and highly responsible consultants has been advocated to counter the incidents of time and cost overruns, (Okpala and Aneikwu, 1988; Stephen *et al*, 1996; Andrew *et al*, 1999). Andrew *et al* (1999), further adviced that in order to curtail time and cost overruns, only qualified and experienced consultants should be engaged.

A clear and thorough client's brief has also been seen as an issue to be properly addressed to save the spending of excessive time and money on a construction project. Lawal (2001), recommended that a clear and thorough client brief should be taken at the inception of the project so as to minimize excessive change orders. It should also be noted that a clear and comprehensive plan from the client will greatly assist in ensuring adequate assessment and definition of the project scope.

To steer away from the problems of time and cost overruns, adequate definition of scope has been strongly recommended, (O'Connor and Vickroy 1985; Morris 1987). Morris (1987), pointed out that in the haste by the clients to

reap their intended benefits from the projects, most clients compromise good planning and scope definition. O'Connor and Vickroy (1985), and Morris (1987), recommended that clients should insist on adequate scope definition before proceeding with the project, and added that if time does not permit full scope definition, the risk of cost and time overruns should be considered a priority element in the project viability analysis.

Comprehensive feasibility study for projects has also been suggested to be carried out as a means of averting time and cost overruns. Morris (1987), recommended thorough site investigation to sufficiently ascertain site conditions before plans and designs. Uddesh (2004), suggested that before the commencement of any project work, it is necessary to carry out detailed survey of all the parameters relating to the intended projects. David *et al* (2004), suggested constructability review as a way of reducing project duration.

Good design is also recommended as a viable measure to check time and cost overruns. Lawal (2001), recommended that a thorough job should be done by consultants at the design stage. Morris (1987), and Kaming *et al* (1997), advocates for a critical appraisal of the project design and other provisions before implementation. Okpala and Aneikwu (1988), and Stephen *et al* (1996), proffer that the consultants should ensure proper project design and preparation of vital documents to forestall problems that will attract extension of time and extra costs during construction. Okpala and Aneikwu (1988), opined that the problems of time and cost overruns could be averted if consultants are more prudent in their design and have more knowledge about the availability and usage of materials.

To avoid time and cost overruns, the preparation of realistic time and cost schedules have been seen to be important. Lawal (2001,) advised for adequate market survey to ensure that the specified components and materials are available to guard against the application of unrealistic prices, and to avoid changes that would adversely affect the estimated costs. Kumaraswamy and Chan (1995), observed that the cost estimated for a project at an earlier planning stage may differ from the cost estimated and the budgeted cost at the time the project is finalized and construction is begun when much more detailed engineering studies on the project would have been completed. Kumaraswamy and Chan (1995), therefore suggested that if cost estimates are to be realistic they should be made close to the time of take off of the project. John and Cengiz (2004), advised that there is every need to minimize the total cost of a project subject to a project completion deadline, or to minimize the project completion deadline subject to budget constraints.

The contractor has a major role to play in checking time and cost overruns in construction projects. The selection of professionally competent and morally upright contractor is strongly recommended to keep time and cost overruns at bay. Morris (1990), recommended that the right contractor should be selected on the basis of proper assessment. Uddesh (2004), adviced proper scrutiny of contractors for competence. Morris (1990), cautioned that the process of awarding the contract should be devoid of sentiments and favouritism.

In order to forestall time and cost overruns in construction projects, Andrew *et al* (1999), suggested that fixed price contract should be entered into

for projects not exceeding two (2) years; and that fluctuations should be discouraged by, for instance, procuring durable supplies at the early stage of the project. Odusami and Olusanya (2000), adviced that the financial adequacy for a project must be seriously considered before its implementation. Kadiri and Odusanmi (2003), recommended labour only contract as a viable alternative to the traditional procure system in a bid to check time and cost overruns.

### 2.6.2 Solutions To Time And Cost Overruns At The Construction Stage

Recommendations to check time and cost overruns also embrace activities at the implementation stage of the project. Such activities include project implementation strategy, project implementation monitoring and control resources acquisition, interim valuations and payments, and general management of the project. Olatokun (1995), and Bamidele (1999), recommended sound implementation plans to guard against time and cost overruns. Morris (1990), Olatokun (1995), John (1997), and Bamidele (1999), recommended sound monitoring and control of projects as a way of averting time and cost overruns. In another contribution, Uddesh (2004), advised that a simple and effective monitoring system is essential to identify and anticipate the deviation from implementation plans, analyse the underlying problems areas and suggest corrective actions. Uddesh (2004), pointed out that anticipation is important from the point of view of preventing or overcoming the problems before they occur or taking alternative step to minimize their impact on the project time and cost.

Proper methods of resources acquisition and control have been adviced to be put in place during construction projects execution to forestall the problems of time and cost overruns. John (1997), recommended proper strategies for construction resources control. Mike (2002), presented that the solution to time overrun could be found in advance ordering of materials so that they arrive according to construction schedule. Uddesh (2004), advocates for forward buying of materials or advance payments for materials.

Preparation of interim valuation and honouring of interim certificates as and when due has been strongly recommended as a panacea for time and cost overruns in construction projects, (Rangrajan, 1982; Aharoni, 1986; Morris, 1987; Morris, 1990; John, 1997; Uddesh, 2004). Uddesh (2004), has adviced for timely honouring of interim certificates so as to enhance the contractor's cash position and ensure regular progress of work. Various suggestions have been given to ensure that the client pays the contractor as a when due. Uddesh (2004), suggested that the clients should ensure availability of funds before the award of the contract. Morris (1987), suggested that funds should be committed to specific projects. In what seems to be an elaboration on this suggestion, Uddesh (2004), is of the opinion that once a project is approved, funds should be committed to meet the requirements as detailed in the programme of work projected by resource-based networks. In strengthening the need to ensure that the client pays the contractor as and when due in orders to reduce time and cost overruns, Uddesh (2004), suggested that clients should be made to provide payment guarantee bonds to pay within the stipulated time. The suggestion went further

to add that when clients do not pay for works at the stipulated time, they should be made to pay the prevailing bank interest rates on outstanding certificates, and in addition, they should be charged for delayed payments.

Generally, good management of the project as a whole has been recommended to sideline time and cost overruns in construction projects. This involves, better contract management using management techniques and systems, (Olatokun, 1995; Bamidele, 1999); proper implementation of contract conditions, (Kolawole, 1995); strict adherence to budget, (Uddesh, 2004); and effective communication among the project participants, (Morris, 1987). So, there must be a strong commitment and a mission or a goal to complete the project on schedule and on budget, whatever may be the problem. Stephen *et al* (1996), adviced that joint efforts and cooperation among the project participants could go a long way in reducing the incidences of time and cost overruns. Andrew *et al* (1999), advocates that improvement in construction activities accompanied by cost control could help to mitigate against time and cost overruns.

### 2.6.3 Further Solutions To Time And Cost Overruns

Some other important advices aimed at reducing time and cost overruns in construction projects have been given. Morris (1987), adviced that clients should embark on the construction of essential projects that can be adequately funded. Clients should engage only registered and qualified consultants; and consultants should be limited in powers to issue variation orders likely to cause time and cost overruns without the approval of the client, and any consultant found to be involved in corrupt practices should be summarily dismissed by the client,

(Uddesh, 2004). Ragaranjan (1982), Morris (1987), and Uddesh (2004), suggested that clients should employ only competent and honest contractors and blacklist quack contractors. Similarly, Lawal (2001), suggested that professional institutions such as the NSE, NIQS, NIOB, NIA should fight against the intrusion of quacks into the construction profession.

Uddesh (2004), advocates for the insertion of corruption clause in the terms of agreement, which empowers the clients to summarily terminate the employment of the contractor on grounds of proven corruption. Nominated subcontractors should be avoided wherever possible. Uddesh (2004), proffers that mobilization fee should be discouraged as a way of reducing time and cost overruns. Giwa (1988), suggested proper application of cost control techniques to reduce the extent of cost overruns. The development of cost reporting as a check for cost escalations in construction projects is very essential. Achienu (1997), suggested "the use of effective cost prediction models to provide a good means of monitoring, controlling and minimizing time and cost overruns." Andawei (2001), advices that network based techniques be applied to control the cost of construction projects. Bustani and Izam (1999), and Chan (1999), suggest the application of predictive models for construction durations to check time overruns. Uddesh (2004), recommended the avoidance of labour unrest, and community disturbance as a way of avoiding excessive construction durations and costs.

# CHAPTER THREE

# METHODOLOGY

## 3.1 METHOD OF DATA COLLECTION

The data required for this study were collected from projects' files of completed building projects from the consulting firms of Architects, and Quantity Surveyors; and Contractors, and Clients' organisations. The collection of data was spread through out the country. The format (Appendix I) used in collecting the data shows the details of the information sought to be able to achieve the aim of this study.

A total of seven hundred and fifty (750) forms were distributed to the architectural, and quantity survey firms, construction companies, and clients' organisations. To ensure that at the end of the day there is sufficient number of projects with reliable data, this large number of forms were distributed amidst the feeling that:

(i) Many clients, consultants, and contractors would not have kept records of this information on the executed projects;

(ii) Where the records are kept, the information being sought would not have been properly, realistically, and/or objectively recorded;

(iii) People with the records of the information being sought may not be willing to release them.

Six hundred and seventy five (675) completed forms were returned. It may be worthwhile to mention that all the forms were not distributed to the respondents in a single operation. They were distributed in batches of two

hundred and fifty (250) forms per batch. Responses for each batch were carefully studied to decide on the acceptability of the information on each of the completed building projects. If the accepted responses were not sufficient, another batch of forms was distributed to collect information on other completed building projects. A duty of care was exercised to ensure that respondents who had forms from a preceding batch did not get forms from a succeeding batch so as to reduce the chances of subjective responses. At the end of a careful study of the collected responses from the third batch, a total of one hundred and fifty one (151) projects have been accepted, while the rest five hundred and twenty four (524) projects were rejected. The rejection criteria include the following:

(i) Projects that are not buildings.

(ii) Projects that have their budgeted costs equal to the final costs.

(iii) Projects that have the same scheduled and actual completion dates.

(iv) Projects that have their final costs lower than the budgeted costs.

(v) Projects that have their actual completion dates earlier than the scheduled completion dates.

(vi) Projects that have "too short" durations of, say, less than eight (8) weeks.

(vii) Projects that have their dates of completion earlier than the dates of award of contracts.

(viii) Projects that have disproportionately few valuations compared to the durations of the projects

(ix) Projects that have payments made even before the date of valuations were due.

(x) Projects that have been abandoned.

The raw facts, as obtained from the respondents, for the one hundred and fifty one (151) projects were collated and analysed.

## 3.2 METHOD OF DATA ANALYSIS

### 3.2.1 Procedure for the Analysis of Data

The data contained in the one hundred and fifty-one (151) accepted projects were analysed through objectives (i) - (iv) to sort out the most relevant information required to achieve the aim of this study. These most important information are detailed in appendix II.

The project's serial number is a symbol of identity, and connotes no special attributes to the project. The initial and final costs of projects are as supplied by the respondents. The differences between the final costs and the initial costs of projects, which represent the cost overruns of projects, were also given by the respondents; but these were cross-checked for correctness, and the relevant corrections, where necessary, were made. The scheduled completion dates and actual completion dates are as given by the respondents. The delays in completion of the projects, representing the time overruns, were calculated from the interval between the scheduled completion dates and the actual completion dates. In calculating the delays in completion, the following criteria were used:

(i) A year is equal to 365 days where it was necessary to apply a whole year.

(ii) Where it was necessary to use combined group of months, a month is taken to be equal to 30 days.

(iii) Where it was necessary to consider the months separately, January, March, May, July, August, October, and December are taken to be 31 days each; February is taken to be 28 days; and April, June, September, and November are taken to be 30 days each.

(iv) Where the actual dates, in addition to the months, are clearly stated for the scheduled completion periods and actual completion periods, the delay in completion is calculated in the interval between these two dates.

(v) Where the actual dates are not given, but only the months are given for the scheduled completion periods and actual completion periods, the scheduled completion periods and the actual completion periods are taken to be the ends of their respective months. So, the delay in completion is calculated from the beginning of the month succeeding the month of scheduled completion to the end of the month of the actual completion period.

For each project, as detailed in appendix II, the dates valuations were due and the dates valuations were actually made are as provided by the respondents. The time period between this dates were calculated to obtain the delay in valuation. The total delay in valuation for each project was obtained by summation of the delays in valuations for the individual valuation periods. The total delay in the valuation was meaned to arrive at an average value of the delay per valuation for the project. These, however, are not presented in tables 1-6, Appendix III, as they are not crucial parameters for the achievement of the aim of this study. Similar procedure for the delay in valuation was used to obtain the total value of the delay in payments for each of the projects and an average value of delay per payment. As presented in appendix II, the

sums of values in the Difference In Date of Valuation (DIDV) and Difference In Payment Dates (DIPD) column were obtained and their means there from were calculated.

### 3.2.2 Calculation of Coefficient of Correlation.

Coefficient of correlation is a measure of the degree and nature of the relationship between two variables. The coefficient of correlation is calculated using the formula given below. (Mosteller and Rourke, 1973; Ehrenberg, 1978; Frank and Althoen, 1994)

$$r_{xy} = \frac{N\sum xy - \sum x \sum y}{\sqrt{N\sum x^2 - \left(\sum x\right)^2}.\sqrt{N\sum y^2 - \left(\sum y\right)^2}} \quad \text{.....3.1}$$

Where:-

$r_{xy}$ is the coefficient of correlation between x and y

N is the total number of pairs of variables. In this study, it is the total number of projects studied (i.e. 151 projects)

X is the variable representing delayed payments

Y is the variable representing cost overruns ($y_c$), and time overruns ($y_t$)

### 3.2.3 Hypotheses

#### 3.2.3.1 Formulated hypotheses

**(i) Hypothesis 1**

Null hypothesis

$H_o$: There is no significant relationship between delayed payments and cost overruns (in other words, cost overrun is not strongly dependent on delayed payments).

Alternative hypothesis

$H_A$: There is significant relationship between delayed payments and cost overruns (in other words, cost overrun is strongly dependent on delayed payments).

**(ii) Hypothesis 2**

Null hypothesis

$H_o$: There is no significant relationship between delayed payments and time overruns (in other words, time overrun is not strongly dependent on delayed payments).

Alternative hypothesis

$H_A$: There is significant relationship between delayed payments and time overrun (in other words, time overrun is strongly dependent on delayed payments).

### 3.2.3.2 Decision criteria

If the calculated value (P-value) of the test statistic ($T_s$) is greater than the tabulated value, the null hypothesis ($H_o$) is rejected and the alternative hypothesis ($H_A$) is accepted.

If the calculated value (P-value) of the test statistic ($T_s$) is less than or equal to the tabulated value, the null hypothesis ($H_o$) is accepted and the alternative hypothesis ($H_A$) is rejected.

The results from the data analysis will be discussed, conclusions will be drawn, and recommendations will be made based strictly on the findings of the study.

### 3.2.4 Testing the Null Hypothesis ($H_o$) About ρ

In testing the null hypothesis ($H_o$) about ρ, it is assumed in this study that the joint distribution of X and Y is *bivariate normal*. For the purpose of clarifying the reasoning behind this assumption, the three properties of bivariate normal, according to Frank and Althoen, (1994), are presented.

(i) If Φ (X,Y) is bivariate normal, the marginal distribution of X and Y are normal; i.e. X:N($\mu_x$, $\sigma_x^2$) and Y:N($\mu_y$, $\sigma_y^2$)

(ii) If Φ (X,Y) is bivariate normal, all conditional distributions of Y on x and X on y are normal.

(iii) If Φ (X,Y) is bivariate normal, then X and Y are independent *if and only if* $\rho_{xy}$ *is zero*

Basically, the sample size of one hundred and fifty one (151) projects is sufficiently large to assume a normal distribution for very large populations for most statistical tests. So, properties (i) and (ii) are satisfied. From the null hypothesis, ($H_o$) for this study, if X and Y are not related, then X and Y are independent, and $\rho_{xy}$ is zero, therefore, property (iii) is satisfied.

It should be noted that testing for the independency of X and Y is tantamount to testing for the significance of correlation coefficient. This involves testing the significance of correlation coefficient about $\rho_{xy} = 0$, for the population. This is usually achieved using Fisher r–to-z transformation.

According to Frank and Althoen (1994), if the joint distribution of X and Y is bivariate normal and the number of pairs $x_i$ and $y_i$ is greater than 10, the most versatile test statistics is based on Sir Ronald Fisher's transformation of the correlation r to a normally distributed random variable denoted $Z_r$

$$Z_r = 0.5 \ln\left\{\frac{1+r_{xy}}{1-r_{xy}}\right\} \quad \text{.....(3.2)}$$

Frank and Althoen (1994), further presents that for moderate sample size (i.e. N>10), the distribution of Fisher's $Z_r$ is approximately normal with,

$$E(Z_r) = 0.5 \ln\left\{\frac{1+\rho_{xy}}{1-\rho_{xy}}\right\} \quad \text{..... (3.3)}$$

Fisher's r-to–z transformation allows the use of the techniques developed for testing hypothesis about $\mu$ to test any hypothesis of the form,

$$H_o: \rho = \rho_o$$

Where $-1 \leq \rho_o \leq +1$, against either a simple or composite alternative hypothesis. If the test hypothesis is correct, then the expected value of $Z_r$ equals:

$$E(Z_r) = 0.5 \ln\left\{\frac{1+\rho_o}{1-\rho_o}\right\} \quad \text{..... (3.4)}$$

This is denoted as $\zeta_o$. It is known that if a normally distributed variable X has expected value $\mu_o$ and variance $\sigma^2$ then

$$\frac{X - \mu_o}{\sigma}$$

is distributed N(0,1). Thus, if $\rho = \rho_o$, and the expected value of $Z_r$ therefore equals $\zeta_o$, then the statistic

$$\frac{Z_r - \xi_o}{\sqrt{\frac{1}{N-3}}} \quad \text{..... (3.5)}$$

is approximately distributed N(0,1)

Box 1 summarizes the deductions from the foregoing information

Box 1

If ρ is the correlation of bivariate normally distributed random variables, then for N>10, the statistic

$$\frac{Z_r - \xi_o}{\sqrt{\frac{1}{N-3}}}$$

is distributed approximately N(0,1) and may be used to test the $\rho = \rho_o$

Furthermore, it is also on record (Frank and Althoen, 1994) that in most correlational research, it is rare that either theoretical considerations or prior observations permit a researcher to specify a non-zero value for $\rho_o$. In most instances, a researcher simply suspects either ρ is positive or the ρ is negative and formulates the directional approximate alternative against the test hypothesis.

$$H_o: \rho = 0$$

So, when speaking of finding a "significant" correlation, it is therefore understood to mean "significantly different from zero". If $\rho_{xy} = 0$, the expected value of $Z_r$ is

$$\begin{aligned} \xi_o &= 0.5 \ln\left(\frac{1+0}{1-0}\right) \\ &= 0.5 \ln(1) \\ &= 0 \end{aligned}$$

Thus, equation (3.5) reduces to:

$$\frac{Z_r}{\sqrt{\frac{1}{N-3}}} \qquad \text{…….3.6}$$

which is distributed approximately, N(0,1).

Box 2 shows further deductions from the information presented above

Box 2

If ρ is the correlation of bivariate normally distributed random variables, then for N>10, the statistic

$$\frac{Z_r}{\sqrt{\frac{1}{N-3}}}$$

is distributed approximately N(0,1) and may be used to test the hypothesis that ρ = 0

From box 2, it can be deduced that the test statistic $T_s$ is given by

$$T_s = \frac{Z_r}{\sqrt{\frac{1}{N-3}}} \quad \text{……..(3.7)}$$

So, on the basis of the assumption made earlier of bivariate normal and the provision of Box 2, the stage is now set to test for the significance of the population correlation coefficient which also represent a test of the independence at $X_c$ on $Y_c$, and $X_t$ on $Y_t$ as stated in the null hypothesis, $H_o$. Testing the hypothesis was carried out at 5% level of significance. 5% level of significance was chosen because of the high popularity (Moore, 1979) in testing hypotheses.

# CHAPTER FOUR

## DATA ANALYSIS AND DISCUSSION OF RESULTS

### 4.1 DATA ANALYSIS

#### 4.1.1 Presentation of Data

The raw data supplied in the data collection format on the one hundred and fifty one (151) accepted projects were analysed to obtain the relevant parameters such as time overruns, cost overruns, delay in valuations, and delay in payments. Details of the calculations performed to obtain these parameters for each of the projects are presented in Appendix II. The summary of the most relevant variables required for this study are contained in columns A and B of tables 1-6 in Appendix III. In Appendix III, tables 1 and 2 present the information on the basis of the combined public and private building projects for cost overruns and time overruns, respectively; while tables 3 and 4, and 5 and 6 present similar information on public and private building projects, respectively.

In tables 1-6, Appendix III, column A represent the delay in payments variable $X_c$ or $X_t$, where $X_c$ is the delay in payments applied to cost overruns, and $X_t$ is the delay in payments applied to time overruns. In column B, the cost overrun variable $Y_c$, and the time overrun variable $Y_t$, are represented. Further statistical treatment was performed on the data in columns A and B to generate the values contained in columns C, D and E. On the basis of the summary of the results in tables 1-6, Appendix III, the correlation coefficients were calculated. The correlation coefficients were, in turn, applied to test the formulated hypotheses.

### 4.1.2 Determination of the Relationship Between Delayed Payments and Cost Overruns, and Delayed Payments and Time Overruns

In Appendix III tables 1-6, $X_c$ and $X_t$ have the same values. The subscript indicates when X is applied to cost overruns or time overruns.

The information in these tables enable the assessment of the relationship between delayed payments and cost overruns, and delayed payments and time overruns. These relationships were assessed through the calculations of their respective coefficients of correlation. The coefficient of correlation is calculated using equation 3.1.

$$r_{xy} = \frac{N\sum xy - \sum x \sum y}{\sqrt{N\sum x^2 - \left(\sum x\right)^2}.\sqrt{N\sum y^2 - \left(\sum y\right)^2}} \quad \text{.....3.1}$$

### 4.1.3 Calculation of Correlation Coefficient for Delayed Payments and Cost Overruns for Combined Public and Private Building Projects.

From equation (3.1)

$$r_{x_c y_c} = \frac{N\sum x_c y_c - \sum x_c \sum y_c}{\sqrt{N\sum {x_c}^2 - \left(\sum x_c\right)^2}.\sqrt{N\sum {y_c}^2 - \left(\sum y_c\right)^2}} \quad \text{.....4.1}$$

The coefficient of correlation for delayed payments and cost overrun was calculated from data contained in Appendix III table 1, using equation 4.1

$$r_{x_c y_c} = \frac{N\sum x_c y_c - \sum x_c \sum y_c}{\sqrt{N\sum {x_c}^2 - \left(\sum x_c\right)^2}.\sqrt{N\sum {y_c}^2 - \left(\sum y_c\right)^2}} \quad \text{.....4.1}$$

$N = 151$

$\sum x_c = 23{,}926.00$

$\sum y_c = 1{,}588{,}290{,}300.67$

$\sum x_c y_c = 801{,}541{,}413{,}287.40$

$\sum {x_c}^2 = 13{,}714{,}416.00$

$$\left(\sum x_c\right)^2 = 572{,}453{,}476.00$$
$$\sum y_c{}^2 = 2.02338\times10^{17}$$
$$\left(\sum y_c\right)^2 = 2.52267\times10^{18}$$
$$N\sum x_c y_c = 151\times 801{,}541{,}413{,}287.40 = 1.21033\times10^{14}$$
$$\sum x_c \sum y_c = 3.80014\times10^{13}$$
$$\sqrt{N\sum x_c{}^2 - \left(\sum x_c\right)^2} = \sqrt{151\times 13{,}714{,}416.00 - 572{,}453{,}476.00}$$
$$= \sqrt{1{,}498{,}423{,}340.00}$$
$$= 38{,}709.47352$$
$$\sqrt{N\sum y_c{}^2 - \left(\sum y_c\right)^2} = \sqrt{151\times 2.02338\times10^{17} - 2.52267\times10^{18}}$$
$$= \sqrt{2.80304\times10^{19}}$$
$$= 5{,}294{,}371{,}721.00$$

$$r_{x_c y_c} = \frac{N\sum x_c y_c - \sum x_c \sum y_c}{\sqrt{N\sum x_c{}^2 - \left(\sum x_c\right)^2}.\sqrt{N\sum y_c{}^2 - \left(\sum y_c\right)^2}}$$

$$r_{x_c y_c} = \frac{1.21033\times10^{14} - 3.80014\times10^{13}}{38{,}709.47352\times 5{,}294{,}371{,}721.00}$$
$$= \frac{8.30316\times10^{13}}{2.04942\times10^{14}}$$
$$= 0.405145358$$
$$\approx 0.41$$

### 4.1.4 Calculation of Correlation Coefficient for Delayed Payment and Time Overruns for Combined Public and Private Building Projects.

From equation (3.1)

$$r_{x_t y_t} = \frac{N\sum x_t y_t - \sum x_t \sum y_t}{\sqrt{N\sum x_t{}^2 - \left(\sum x_t\right)^2}.\sqrt{N\sum y_t{}^2 - \left(\sum y_t\right)^2}} \quad \text{.....4.2}$$

The coefficient of correlation for delayed payments and time overrun was calculated from data contained in Appendix III table 2, using equation 4.2

$$r_{x_t y_t} = \frac{N\sum x_t y_t - \sum x_t \sum y_t}{\sqrt{N\sum x_t{}^2 - \left(\sum x_t\right)^2}.\sqrt{N\sum y_t{}^2 - \left(\sum y_t\right)^2}} \quad \text{.....4.2}$$

$N = 151$

$\sum x_t = 23{,}926.00$

$\sum y_t = 33{,}607.00$

$\sum x_t y_t = 12{,}500{,}632.00$

$\sum x_t^{\,2} = 13{,}714{,}416.00$

$\left(\sum x_t\right)^2 = 572{,}453{,}476.00$

$\sum y_t^{\,2} = 26{,}251{,}583.00$

$\left(\sum y_t\right)^2 = 6.89146 \times 10^{14}$

$N\sum x_t y_t = 151 \times 12{,}500{,}632.00 = 1{,}887{,}595{,}432.00$

$\sum x_t \sum y_t = 804{,}081{,}082.00$

$$\sqrt{N\sum x_t^{\,2} - \left(\sum x_t\right)^2} = \sqrt{151 \times 13{,}714{,}416.00 - 572{,}453{,}476.00}$$

$$= \sqrt{2{,}070{,}876{,}816.00}$$

$$= 38{,}709.47352$$

$$\sqrt{N\sum y_t^{\,2} - \left(\sum y_t\right)^2} = \sqrt{151 \times 26{,}251{,}583.00 - 6.89146 \times 10^{14}}$$

$$= \sqrt{2{,}834{,}558{,}584.00}$$

$$= 53{,}240.57272$$

$$r_{x_t y_t} = \frac{N\sum x_t y_c - \sum x_t \sum y_t}{\sqrt{N\sum x_t^{\,2} - \left(\sum x_t\right)^2}.\sqrt{N\sum y_t^{\,2} - \left(\sum y_t\right)^2}}$$

$$r_{x_t y_t} = \frac{1{,}887{,}595{,}432.00 - 804{,}081{,}082.00}{38{,}709.47352 \times 53{,}240.57272}$$

$$= \frac{1{,}083{,}514{,}350.00}{2.060{,}912{,}778.00}$$

$$= 0.5225744434$$

$$\approx 0.53$$

### 4.1.5 Calculation of Correlation Coefficient for Delayed Payment and Cost Overruns for Public Building Projects.

From equation (3.1)

$$r_{x_c y_c} = \frac{N\sum x_c y_c - \sum x_c \sum y_c}{\sqrt{N\sum x_c{}^2 - \left(\sum x_c\right)^2}.\sqrt{N\sum y_c{}^2 - \left(\sum y_c\right)^2}} \quad \text{.....4.1}$$

The coefficient of correlation for delayed payments and time overrun was calculated from data contained in Appendix III table 3, using equation 4.2

$$r_{x_c y_c} = \frac{N\sum x_c y_c - \sum x_c \sum y_c}{\sqrt{N\sum x_c{}^2 - \left(\sum x_c\right)^2}.\sqrt{N\sum y_c{}^2 - \left(\sum y_c\right)^2}} \quad \text{.....4.1}$$

$\mathrm{N} = 85$

$\sum x_c = 17{,}165.00$

$\sum y_c = 1{,}224{,}390{,}038.79$

$\sum x_c y_c = 725{,}804{,}486{,}380.06$

$\sum x^2 = 11{,}253{,}471.00$

$\left(\sum x_c\right)^2 = 294{,}637{,}225.00$

$\sum y_c{}^2 = 1.93042 \times 10^{17}$

$\left(\sum y_c\right)^2 = 1.49913 \times 10^{18}$

$N\sum x_c y_c = 85 \times 725{,}804{,}486{,}380{,}.06$

$= 6.16934 \times 10^{13}$

$\sum x_c \sum y_c = 2.10167 \times 10^{13}$

$$\sqrt{\mathrm{N}\sum x_c{}^2 - \left(\sum x_c\right)^2} = \sqrt{85 \times 11{,}253{,}471.00 - 294{,}637{,}255}$$
$$= \sqrt{661{,}907{,}810}$$
$$= 25{,}727.56907$$

$$\sqrt{\mathrm{N}\sum y_c{}^2 - \left(\sum y_c\right)^2} = \sqrt{85 \times 1.93042 \times 10^{17} - 1.49913 \times 10^{18}}$$
$$= \sqrt{1.49094 \times 10^{19}}$$
$$= 3{,}861{,}274{,}401$$

$$r_{x_c y_c} = \frac{\mathrm{N}\sum x_c y_c - \sum x_c \sum y_c}{\sqrt{\mathrm{N}\sum x_c{}^2 - \left(\sum x_c\right)^2}.\sqrt{\mathrm{N}\sum y_c{}^2 - \left(\sum y_c\right)^2}}$$

$$= \frac{6.16934 \times 10^{13} - 2.10167 \times 10^{13}}{25{,}727.5907 \times 3{,}861{,}274{,}400}$$

$$= \frac{4.06767 \times 10^{13}}{9.93412 \times 10^{13}}$$

$$= 0.409464552$$

$$\approx 0.41$$

### 4.1.6 Calculation of Correlation Coefficient for Delayed Payment and Time Overruns for Public Building Projects.

From equation (3.1)

$$r_{x_t y_t} = \frac{N\sum x_t y_t - \sum x_t \sum y_t}{\sqrt{N\sum x_t^{\,2} - \left(\sum x_t\right)^2}.\sqrt{N\sum y_t^{\,2} - \left(\sum y_t\right)^2}} \quad \text{.....4.2}$$

The coefficient of correlation for delayed payments and time overrun was calculated from data contained in Appendix III table 4, using equation 4.2

$$r_{x_t y_t} = \frac{N\sum x_t y_t - \sum x_t \sum y_t}{\sqrt{N\sum x_t^{\,2} - \left(\sum x_t\right)^2}.\sqrt{N\sum y_t^{\,2} - \left(\sum y_t\right)^2}} \quad \text{.....4.2}$$

$N = 85$

$\sum x_t = 17{,}165.00$

$\sum y_t = 23{,}714.00$

$\sum x_t y_t = 10{,}642{,}776.00$

$\sum x_t^{\,2} = 11{,}253{,}471.00$

$\left(\sum x_t\right)^2 = 294{,}637{,}225.00$

$\sum y_t^{\,2} = 20{,}222{,}138.00$

$\left(\sum y_t\right)^2 = 562{,}353{,}796$

$N\sum x_t y_t = 85 \times 10{,}642{,}776.00 = 904{,}35{,}960.00$

$\sum x_t \sum y_t = 407{,}050{,}810.00$

$$\sqrt{N\sum x_t^{\,2} - \left(\sum x_t\right)^2} = \sqrt{85 \times 11{,}253{,}471.00 - 294{,}637{,}225.00}$$

$$= \sqrt{661{,}907{,}810.00}$$

$$= 25{,}727.56907$$

$$\sqrt{N\sum y_t^{\,2} - \left(\sum y_t\right)^2} = \sqrt{85 \times 20{,}222{,}138.00 - 562{,}353{,}796}$$
$$= \sqrt{1{,}156{,}527{,}934.00}$$
$$= 34{,}007.76285$$

$$r_{x_t y_t} = \frac{N\sum x_t y_c - \sum x_t \sum y_t}{\sqrt{N\sum x_t^{\,2} - \left(\sum x_t\right)^2}.\sqrt{N\sum y_t^{\,2} - \left(\sum y_t\right)^2}}$$

$$r_{x_t y_t} = \frac{904{,}635{,}960.00 - 407{,}050{,}810.00}{25{,}727.56907 \times 34{,}007.76285}$$

$$= \frac{497{,}585{,}150.00}{874{,}937{,}067.60}$$
$$= 0.568709646$$
$$\approx 0.57$$

### 4.1.7 Calculation of Correlation Coefficient for Delayed Payment and Cost Overruns for Private Building Projects.

From equation (3.1)

$$r_{x_c y_c} = \frac{N\sum x_c y_c - \sum x_c \sum y_c}{\sqrt{N\sum x_c^{\,2} - \left(\sum x_c\right)^2}.\sqrt{N\sum y_c^{\,2} - \left(\sum y_c\right)^2}} \quad \text{.....4.1}$$

The coefficient of correlation for delayed payments and time overrun was calculated from data contained in Appendix III table 5, using equation 4.2

$$r_{x_c y_c} = \frac{N\sum x_c y_c - \sum x_c \sum y_c}{\sqrt{N\sum x_c^{\,2} - \left(\sum x_c\right)^2}.\sqrt{N\sum y_c^{\,2} - \left(\sum y_c\right)^2}} \quad \text{.....4.1}$$

$N = 66.00$

$\sum x_c = 6{,}761.00$

$\sum y_c = 363{,}900{,}261.88$

$\sum x_c y_c = 75{,}736{,}926{,}907.34$

$\sum x^2 = 2{,}460{,}945.00$

$\left(\sum x_c\right)^2 = 45{,}711{,}121.00$

$\sum y_c{}^2 = 9.29572 \times 10^{15}$

$\left(\sum y_c\right)^2 = 1.32423 \times 10^{17}$

$N\sum x_c y_c = 66 \times 75{,}736{,}926{,}907.34$

$= 4.99864 \times 10^{12}$

$\sum x_c \sum y_c = 2.46033 \times 10^{12}$

$$\sqrt{N\sum x_c{}^2 - \left(\sum x_c\right)^2} = \sqrt{66 \times 2{,}460{,}945 - 45{,}711{,}121}$$
$$= \sqrt{116{,}711{,}249}$$
$$= 10{,}803.29806$$

$$\sqrt{N\sum y_c{}^2 - \left(\sum y_c\right)^2} = \sqrt{66 \times 9.29572 \times 10^{15} - 1.32423 \times 10^{17}}$$
$$= \sqrt{4.81095 \times 10^{17}}$$
$$= 693{,}609{,}775$$

$$r_{x_c y_c} = \frac{N\sum x_c y_c - \sum x_c \sum y_c}{\sqrt{N\sum x_c{}^2 - \left(\sum x_c\right)^2}.\sqrt{N\sum y_c{}^2 - \left(\sum y_c\right)^2}}$$

$$= \frac{4.99864 \times 10^{12} - 75{,}736{,}926{,}907.34 \times 10^{17}}{10{,}803.29806 \times 693{,}609{,}775}$$

$$= \frac{4.92290 \times 10^{12}}{7.49327 \times 10^{12}}$$

$$= 0.656976193$$

$$\approx 0.66$$

### 4.1.8 Calculation of Correlation Coefficient for Delayed Payment and Time Overruns for Private Building Projects.

From equation (3.1)

$$r_{x_t y_t} = \frac{N\sum x_t y_t - \sum x_t \sum y_t}{\sqrt{N\sum x_t{}^2 - \left(\sum x_t\right)^2}.\sqrt{N\sum y_t{}^2 - \left(\sum y_t\right)^2}} \quad \text{.....4.2}$$

The coefficient of correlation for delayed payments and time overrun was calculated from data contained in Appendix III table 6, using equation 4.2

$$r_{x_t y_t} = \frac{N\sum x_t y_t - \sum x_t \sum y_t}{\sqrt{N\sum x_t{}^2 - \left(\sum x_t\right)^2}.\sqrt{N\sum y_t{}^2 - \left(\sum y_t\right)^2}} \quad \text{.....4.2}$$

$\mathrm{N} = 66$

$\sum x_t = 6{,}761$

$\sum x_t = 9{,}893$

$\sum x_t y_t = 1{,}857{,}856$

$\sum x_t{}^2 = 2{,}460{,}945$

$\left(\sum x_t\right)^2 = 45{,}711{,}121$

$\sum y_t{}^2 = 6{,}029{,}445$

$\left(\sum y_t\right)^2 = 97{,}871{,}499$

$\mathrm{N}\sum x_t y_t = 66 \times 1{,}857{,}856$

$= 122{,}618{,}496$

$\sum x_t \sum y_t = 66{,}886{,}573$

$$\sqrt{\mathrm{N}\sum x_t{}^2 - \left(\sum x_t\right)^2} = \sqrt{66 \times 2{,}460{,}945 - 45{,}711{,}121}$$
$$= \sqrt{116{,}711{,}249}$$
$$= 10{,}803.29806$$

$$\sqrt{\mathrm{N}\sum y_t{}^2 - \left(\sum y_t\right)^2} = \sqrt{66 \times 6{,}029{,}445 - 97{,}871{,}449}$$
$$= \sqrt{300{,}071{,}921}$$
$$= 17{,}322.58413$$

$$r_{x_t y_t} = \frac{\mathrm{N}\sum x_t y_t - \sum x_t \sum y_t}{\sqrt{\mathrm{N}\sum x_t{}^2 - \left(\sum x_t\right)^2}.\sqrt{\mathrm{N}\sum y_t{}^2 - \left(\sum y_t\right)^2}}$$

$$= \frac{122{,}618{,}496 - 66{,}886{,}573}{10{,}803.29806 \times 17{,}322.58413}$$

$$= \frac{55{,}731{,}923}{187{,}141{,}039.5}$$

$$= 0.297807061$$

$$\approx 0.30$$

## 4.2 TESTING HYPOTHESES

### 4.2.1 Hypothesis 1

$H_o$: There is no significant relationship between delayed payments and cost overruns, (in other words, cost overrun is not strongly dependent on delayed payments).

$H_A$: There is significant relationship between delayed payments and cost overruns, (in other words, cost overrun is strongly dependent on delayed payments).

### 4.2.2 Hypothesis 2

$H_o$: There is no significant relationship between delayed payments and time overruns, (in other words, time overruns is highly not dependent on delayed payments).

$H_A$: There is significant relationship between delayed payments and time overrun, (in other words, time overrun is highly dependent on delayed payments).

### 4.2.3 Testing Hypothesis 1 on the Basis of the Combined Public and Private Building Projects for Delayed Payments and Cost Overruns

From equation 3.2, $Z_r = 0.5 \ln\left\{\frac{1+r_{xy}}{1-r_{xy}}\right\}$

$$Z_{r_{x_c y_c}} = 0.5 \ln\left\{\frac{1+r_{x_c y_c}}{1-r_{x_c y_c}}\right\} \text{.....4.3}$$

From Appendix III table 1, $r_{x_c y_c} = 0.41$

$$Z_{r_{x_c y_c}} = 0.5\ln\left\{\frac{1+0.41}{1-0.41}\right\}$$
$$= 0.5\ln\left\{\frac{1.41}{0.59}\right\}$$
$$= 0.5\ln(2.389830508)$$
$$= 0.5 \times 0.871222446$$
$$= 0.435611223$$
$$Z_{x_c y_c} \approx 0.44$$

From equation 3.7, $Ts_{x_c y_c} = \dfrac{Z_{r_{x_c y_c}}}{\sqrt{\dfrac{1}{N-3}}}$ ……..4.4

$$\sqrt{\frac{1}{N-3}} = \sqrt{\frac{1}{151-3}} = \sqrt{\frac{1}{148}} = 0.082199494$$

$$Ts_{x_c y_c} = \frac{0.4356112233}{0.082199494}$$

$$Ts_{x_c y_c} = 5.299439228$$

$$Ts_{x_c y_c} \approx 5.30$$

From the calculations, $T_{s_{x_c y_c}} = 5.30$, while the tabulated value at 5% level of significance is 1.64. Therefore $T_s$ calculated $>T_s$ tabulated, reject $H_o$ and accept $H_A$.

### 4.2.4 Testing Hypothesis 2 for the Combined Public and Private Building Projects for Delayed Payments and Time Overruns.

From equation 3.2, $Z_r = 0.5\ln\left\{\dfrac{1+r_{xy}}{1-r_{xy}}\right\}$

$$Z_{r_{x_t y_t}} = 0.5\ln\left\{\frac{1+r_{x_t y_t}}{1-r_{x_t y_t}}\right\} \quad \text{……4.5}$$

From Appendix III table 2 $r_{x_t y_t} = 0.53$

$$Z_{r_{x_t y_t}} = 0.5\ln\left\{\frac{1+0.53}{1-0.53}\right\}$$
$$= 0.5\ln\left\{\frac{1.53}{0.47}\right\}$$

$$= 0.5\ln(3.255319149)$$
$$= 0.5 \times 1.18029032$$
$$= 0.590145159$$
$$Z_{r_{x_t y_t}} \approx 0.59$$

From equation 3.7, $T_{s_{x_t y_t}} = \dfrac{Z_{r_{x_t y_t}}}{\sqrt{\dfrac{1}{N-3}}}$ ……4.6

$$Ts_{x_t y_t} = \frac{Z_{r\,x_t y_t}}{\sqrt{\dfrac{1}{N-3}}}$$

$$\sqrt{\frac{1}{N-3}} = \sqrt{\frac{1}{151-3}} = \sqrt{\frac{1}{148}} = 0.082199494$$

$$Ts_{x_t y_t} = \frac{0.590145159}{0.082199494}$$

$$Ts_{x_t y_t} = 7.179425701$$

$$T_{s_{x_t y_t}} \approx 7.18$$

From the calculations, $T_{s_{x_t y_t}} = 7.18$, while the tabulated value at 5% level of significance is 1.64. Therefore, $T_s$ calculated > $T_s$ tabulated, reject $H_o$ and accept $H_A$,

### 4.2.5 Testing Hypothesis 1 on the Basis of Public Building Projects for Delayed Payments and Cost Overruns

From equation 3.2, $Z_r = 0.5\ln\left\{\dfrac{1+r_{xy}}{1-r_{xy}}\right\}$

$$Z_{r_{x_c y_c}} = 0.5\ln\left\{\frac{1+r_{x_c y_c}}{1-r_{x_c y_c}}\right\} \text{……..4.3}$$

From Appendix III table 3, $r_{x_c y_c} = 0.41$

$$Z_{r_{x_c y_c}} = 0.5\ln\left\{\frac{1+0.41}{1-0.41}\right\}$$

$$= 0.5\ln\left\{\frac{1.41}{0.59}\right\}$$

$$= 0.5\ln(2.389830508)$$

$$= 0.5 \times 0.871222446$$

$$= 0.435611223$$

$$Z_{r_{x_c y_c}} \approx 0.44$$

From equation 3.7,

$$Ts_{x_c y_c} = \frac{Z_{r_{x_c y_c}}}{\sqrt{\frac{1}{N-3}}} \text{.....4.4}$$

$$\sqrt{\frac{1}{N-3}} = \sqrt{\frac{1}{85-3}} = \sqrt{\frac{1}{82}} = 0.110431526$$

$$Ts_{x_c y_c} = \frac{0.435611223}{0.110431526}$$

$$= 3.944627397$$

$$Ts_{x_c y_c} \approx 3.94$$

### 4.2.6 Testing Hypothesis 2 on the Basis of Public Building Projects for Delayed Payments and Time Overruns

From equation 3.2, $Z_r = 0.5\ln\left\{\frac{1+r_{xy}}{1-r_{xy}}\right\}$

$$Z_{r_{x_t y_t}} = 0.5\ln\left\{\frac{1+r_{x_t y_t}}{1-r_{x_t y_t}}\right\} \text{.....4.5}$$

From Appendix III table 4, $r_{x_t y_t} = 0.57$

$$Z_{r_{x_t y_t}} = 0.5\ln\left\{\frac{1+0.57}{1-0.57}\right\}$$

$$= 0.5\ln\left\{\frac{1.57}{0.43}\right\}$$

$$= 0.5\ln(3.651162791)$$

$$= 0.5 \times 1.29504569$$

$$= 0.47522844$$

$$\approx 0.65$$

$Z_{r_{x_t y_t}} \approx 0.65$

From equation 3.7,

$$Ts_{x_t y_t} = \frac{Z_{r_{x_t y_t}}}{\sqrt{\frac{1}{N-3}}} \text{.....4.6}$$

$$\sqrt{\frac{1}{N-3}} = \sqrt{\frac{1}{85-3}} = \sqrt{\frac{1}{82}} = 0.110431526$$

$$Ts_{x_t y_t} = \frac{0.647522844}{0.110431526}$$

$$= 5.83568742$$

$Ts_{x_t y_t} \approx 5.86$

### 4.2.7 Testing Hypothesis 1 on the Basis of Private Building Projects for Delayed Payments and Cost Overruns

From equation 3.2, $Z_r = 0.5\ln\left\{\frac{1+r_{xy}}{1-r_{xy}}\right\}$

$$Z_{r_{x_c y_c}} = 0.5\ln\left\{\frac{1+r_{x_c y_c}}{1-r_{x_c y_c}}\right\} \text{.....4.3}$$

From Appendix III table 5, $r_{x_c y_c} = 0.66$

$$Z_{r_{x_c y_c}} = 0.5\ln\left\{\frac{1+0.66}{1-0.66}\right\}$$

$$= 0.5\ln\left\{\frac{1.66}{0.34}\right\}$$

$$= 0.5\ln(4.882352941)$$

$$= 0.5 \times 1.585627264$$

$$= 0.792813631$$

$$Z_{r_{x_c y_c}} \approx 0.79$$

From equation 3.7,

$$Ts_{x_c y_c} = \frac{Z_{r_{x_c y_c}}}{\sqrt{\frac{1}{N-3}}} \text{.....4.4}$$

$$\sqrt{\frac{1}{N-3}} = \sqrt{\frac{1}{66-3}} = \sqrt{\frac{1}{63}} = 0.125988157$$

$$Ts_{x_c y_c} = \frac{0.792813631}{0.125988157}$$

$$= 6.292763144$$

$$Ts_{x_c y_c} \approx 6.29$$

### 4.2.8 Testing Hypothesis 2 on the Basis of Private Building Projects for Delayed Payments and Time Overruns

From equation 3.2, $Z_r = 0.5\ln\left\{\frac{1+r_{xy}}{1-r_{xy}}\right\}$

$$Z_{r_{x_t y_t}} = 0.5\ln\left\{\frac{1+r_{x_t y_t}}{1-r_{x_t y_t}}\right\} \text{.....4.5}$$

From Appendix III table 6, $r_{x_t y_t} = 0.30$

$$Z_{r_{x_t y_t}} = 0.5\ln\left\{\frac{1+0.30}{1-0.30}\right\}$$

$$= 0.5\ln\left\{\frac{1.30}{0.70}\right\}$$

$$= 0.5\ln(1.857142857)$$

$$= 0.5 \times 0.619039208$$

$$= 0.309519604$$

$$\approx 0.31$$

$Z_{r_{x_t y_t}} \approx 0.31$

From equation 3.7,

$$Ts_{x_t y_t} = \frac{Z_{r_{x_t y_t}}}{\sqrt{\frac{1}{N-3}}} \text{.....4.6}$$

$$\sqrt{\frac{1}{N-3}} = \sqrt{\frac{1}{66-3}} = \sqrt{\frac{1}{63}} = 0.125988157$$

$$Ts_{x_t y_t} = \frac{0.309519604}{0.125988157}$$

$$= 2.456735676$$

$Ts_{x_t y_t} \approx 2.46$

## 4.3 DISCUSSION OF RESULTS

The correlation coefficient of 0.41 of delayed payments and cost overruns calculated from the combined projects indicate a positive but weak relationship between delayed payments and cost overruns. That the test statistic obtained on the basis of the combined projects for the assessment of the significance of the correlation coefficient of delayed payments and cost overruns at 5% level of significance has a value that is greater than the tabulated value (5.30 >1.64) rules that the null hypothesis which states that there is no significant relationship between delayed payments and cost overruns be rejected; and that the alternative hypotheses that states that there is significant relationship between delayed

payments and cost overruns be accepted. Calculations from public projects results in coefficient of correlation of 0.41 for delayed payments and cost overruns. This also indicates a positive but weak relationship between delayed payments and cost overruns. The test statistic for the determination of significance of the coefficient of correlation of delayed payments and cost overruns at 5% level of significance for public projects has a value which is greater than the tabulated value (3.94 > 1.64), and indicates the rejection of the null hypothesis and the acceptance of the alternative hypothesis. The value of 0.66 arrived at as the coefficient of correlation of delayed payments and cost overruns for private projects is an indication of fairly strong relationship between delayed payments and cost overruns. That the test statistic obtained from the private projects to check the significance of the coefficient of correlation of delayed payments and cost overruns is greater that the tabulated value (6.29> 1.64) also supports the rejection of the null hypothesis and the acceptance of the alternative hypothesis. The results of the test of significance of correlation coefficient imply that the relationship that exists between delayed payments and cost overruns is significant. The combined results of the correlation coefficient and the significance of the correlation coefficient at 5% level of significance suggest that cost overruns are strongly tied to delayed payments. Therefore, delayed payments would have appreciable effect on cost overruns of building construction projects.

It should be recalled that the background to this study featured that delayed payments is one of the highly ranked factors causing cost overruns in

building construction projects. But this ranking was established by researchers that used the questionnaire approach. It follows that this high ranking of delayed payments as a factor causing cost overruns was based on the individual opinions of the respondents which could, to a large extent, be subjective. The results from this study applying a more scientific approach using real data from completed building projects to this issue showed that delayed payments do cause cost overruns and that delayed payments do cause cost overruns to an appreciable extent. Though the results from this study support that delayed payment do cause cost overruns and delayed payments do cause cost overruns to appreciable extent, but the results do not support the high ranking position given to delayed payments among the factors responsible for cost overruns. Therefore the appropriate ranking of delayed payments among the factors causing cost overruns requires a more scientific assessment. Considering the numerous factors (Al-Khalil and Al-Ghafly, 1999 alone identified sixty (60) factors) that cause cost overrun, a more scientific approach of evaluating the true position occupied by delayed payments, among the numerous factors causing cost overruns, cannot be over emphasized.

The results for the delayed payments and time overruns for the combined building projects show that the correlation coefficient is 0.53 which indicate a positive and moderate relationship between delayed payments and time overruns. That the test statistic for the assessment of the significance of the correlation coefficient at 5% level of significance has a value which is greater than the tabulated value ($7.18 > 1.64$) demands for the rejection of the null hypothesis that

states that there is no significant relationship between delayed payments and time overruns, and the acceptance of the alternative hypothesis that states that there is a significant relationship between delayed payments and time overruns. The value of 0.57 obtained on the basis of public projects as correlation coefficient for delayed payments and time overruns show a positive but moderate relationship between delayed payments and time overruns. In the test of the significance of the correlation coefficient of delayed payments and time overruns for public projects, the value of the test statistic is greater than the tabulated value ($5.86 > 1.64$), which, therefore, requires that the null hypothesis be rejected, and the alternative hypothesis be accepted. For private building projects, delayed payments and time overruns has positive but weak correlation coefficient of 0.30. The test of the significance of the correlation coefficient of delayed payments and time overruns for private projects produced a test statistic value that is greater than the tabulated value ($2.46 > 1.64$), and therefore, informs the rejection of the null hypothesis and the acceptance of the alternative hypothesis. The results of the test of the significance of the correlation coefficient of delayed payments and time overruns imply that the relationship between delayed payments and time overruns for building projects is significant. The combination of the results of correlation coefficient and the significance of the correlation coefficient portrays that delayed payments result into time overruns.

It could be remembered that, that time overruns also have delayed payments as a highly ranked causative factor is an element of the background to this study. Here too, the high ranking of delayed payments as a factor responsible for time overruns has been founded on the basis of results from the responses to questionnaire which could be

highly subjective since most responses to questionnaires are greatly influenced by perceptions and opinions which vary among the respondents. The results from this study support the findings of the previous researchers to the extent that delayed payments do cause time overruns, and that time overruns could be aggravated by delayed payments. However, the results do not suggest the high ranking position given to delayed payments among the factors causing time overruns. Therefore, the position actually occupied by delayed payments among the factors causing time overruns could be determined via a more scientific evaluation. In view of the many factors which have been identified to be causing time overruns, it makes sense to assert that the true ranking of delayed payments among the factors causing time overruns can only be obtained through a more scientific approach using real data, rather than the use of questionnaires, to assess the factors causing time overruns.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.

## 5.1 SUMMARY OF RESULTS

From the calculations of the coefficient of correlation, the correlation coefficient on the basis of the combined public and private building projects of delayed payments and cost overruns is 0.41, while the correlation coefficient of delayed payments and time overruns is 0.53. On the basis of the public building projects, the correlation coefficient of delayed payments and cost overrun is 0.41 which is the same as that of the combined projects; while the coefficient of correlation of delayed payments and time overruns is 0.57. In the case of the private building projects, the coefficient of correlation of delayed payments and cost overruns is 0.66, while the coefficient of correlation of delayed payments and time overruns is 0.30.

In the determination of the significance of correlation coefficients at 5% level of significance to test the null hypotheses, the test statistic in the case of delayed payments versus cost overruns for the combined public and private building projects has a value of 5.30, while the tabulated value is 1.64. Similarly, the test statistic for the delayed payments versus time overruns for the combined public and private building projects has a value of 7.18, while the tabulated value is 1.64. In the case of public building projects, the test statistic of delayed payments and cost overruns is 3.94 with a tabulated value of 1.64; the test statistic of delayed payments and time overruns is 5.86 and the tabulated value is 1.64. For private building project, the test statistic of delayed payments and cost overruns is 6.29 with tabulated value of 1.64; and the test statistic of delayed payments and time overruns is 2.46 and the tabulated value is 1.64.

## 5.2 CONCLUSIONS.

Following the results obtained and the discussions, the following conclusions can be drawn.

(1) Delayed payments in combined public and private building projects, and public building projects are positively but generally weakly related to cost overruns. Delayed payments in private building projects have positive and fairly strong relationship with cost overruns.

(2) Delayed payments in combined public and private buildings projects, and public building projects are positively but generally moderately related to time overruns. Delayed payments in private building projects have positive but weak relationship with time overruns.

(3) Delayed payments do cause cost overruns and time overruns in building projects.

(4) The high ranking position given to delayed payments among the factors causing time and cost overruns might be erroneous.

## 5.3 RECOMMENDATIONS.

From the findings of this study, the following recommendations are made.

(1) The study has established that relationship exists between delayed payments and time and cost overruns, and that delay payments do cause time and cost overruns. It is therefore recommended that delayed payments in building construction projects must be avoided to curtail time and cost overruns.

(2) The appropriate ranking of delayed payments as a factor causing time and cost overruns should be determined using a more scientific approach to evaluate the relative effects of the identified numerous factors causing time and cost overruns.

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**APPENDIX I**
**DATA COLLECTION FORMAT**

From a study of building projects completed between 1989 and 2005 provide the information required in the given format (No project should have a duration of less than 12 months}.

1. Type of building project (a) Private (b) Public (tick as appropriate)

   NOTE: Private projects refer to projects that are not owned or funded by the government.

   Public projects refer to projects that are owned and/or funded by the government.

2. Nature of Project ……

   (residential building, industrial building, shopping center or complex, lecture theatre, workshop, laboratory, hospital, etc).

3. Location of project……..

   (Detail address is not required. Only the town's name is required))

4. Date of award of the contract…….

5. Agreed date for commencement of works …….

6. Actual date work commenced …….

7. Duration ……

   (e,g, weeks, months or years)

8. Scheduled completion date ……

9. Actual completion date……

10. Difference between scheduled completed and actual completion dates ……

11. Budgeted project cost (i.e. the initial cost of the project)…….

12. Actual cost of project (i.e. final cost)……

13. Difference between budgeted cost and actual cost……

14. Contract payment terns (tick as appropriate)

    a. Based on periodic valuation of works executed.

    b. Based on the completion of defined stages of the project followed by valuation.

15. Payment pattern

| S/No | VALUATION | | PAYMENTS | |
|---|---|---|---|---|
| | Date valuation was due | Date valued | Date payment was made | Date payment was actually made |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
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| 35 | | | | |
| 36 | | | | |

## APPENDIX II

## CALCULATION OF DELAY IN PAYMENTS, TIME OVERRUNS, AND COST OVERRUN FOR EACH PROJECT.

### Meaning of Abbreviations.

**SCD** = **Scheduled Date of Completion**
**ACD** = **Actual Completion Date**
**BC** = **Budgeted Costs**
**AC** = **Actual Costs**
**DVWD** = **Date Valuation Was Due**
**DAV** = **Date Actually Valued**
**DIDV** = **Difference In Date of Valuation**
**DPWD** = **Date Payment Was Due**
**DPWAM** = **Date Payment Was Actually Made**
**DIPD** = **Difference In Payment Dates = DPWAM - DPWD**

### PROJECT 1

Type: Private
Nature: Building (Ware House)
Location of Project: Port Harcourt
Duration of Project: 12 months
SCD = 30/06/2003
ACD = 28/02/2004
Difference = ACD – SCD = 8 months $\Rightarrow$ (5 x 31) + (2 x 30) + 28 = 243 days
BC = 57,821,784.21
AC = 92,721,278.00
Difference = AC – BC = 34,899,493.79

**PAYMENT PATTERN**

| S/No. | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 30/07/02 | 26/08/02 | 26 | 02/10/02 | 04/11/02 | 33 |
| 2 | 27/08/02 | 30/01/02 | 33 | 04/11/02 | 02/12/02 | 29 |
| 3 | 30/09/02 | 25/11/02 | 55 | 02/12/02 | 03/02/03 | 63 |
| 4 | 28/10/02 | 06/01/03 | 69 | 06/01/03 | 07/04/03 | 91 |
| 5 | 25/11/02 | 24/02/03 | 92 | 03/02/03 | 05/05/03 | 60 |
| 6 | 30/12/02 | 31/03/03 | 91 | 03/03/03 | 02/06/03 | 91 |
| 7 | 27/01/03 | 28/04/03 | 91 | 07/04/03 | 07/07/03 | 91 |
| 8 | 24/02/03 | 30/06/03 | 126 | 05/05/03 | 16/09/03 | 141 |
| 9 | 31/03/03 | 28/07/03 | 119 | 02/06/03 | 06/10/03 | 136 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 | 28/04/03 | 29/09/03 | 154 | 07/07/03 | 04/12/03 | 131 |
| 11 | 26/05/03 | 27/10/03 | 153 | 07/08/03 | 05/11/04 | 149 |
| 12 | 30/06/03 | 24/11/03 | 147 | 06/09/03 | 02/02/04 | 149 |
| | | | ∑ = 1156<br>Average = 96.33 | | | ∑ = 1164<br>Average = 97.00 |

## PROJECT 2

Type: Private
Nature: Building
Location of Project: Kano
Duration of Project: 10 months
SCD = 31/10/2002
ACD = 27/10/2003
Difference = ACD – SCD = 13 months ⇒ (6 x 31) + (4 x 30) + 28 + 27 = 361 days
BC = 88,601,292.10
AC = 101,736,070.70
Difference = AC – BC = 13,134,778.60

**PAYMENT PATTERN**

| S/No. | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 27/12/01 | 27/12/01 | 0 | 10/01/02 | 24/01/02 | 14 |
| 2 | 21/03/02 | 03/04/02 | 13 | 03/03/02 | 17/04/02 | 45 |
| 3 | 02/05/02 | 07/05/02 | 2 | 28/05/02 | 04/06/02 | 7 |
| 4 | 13/06/02 | 17/06/02 | 4 | 17/07/02 | 19/07/02 | 2 |
| 5 | 23/08/02 | 27/08/02 | 4 | 27/08/02 | 24/09/02 | 28 |
| 6 | 21/10/02 | 22/10/02 | 1 | 19/11/02 | 25/11/02 | 6 |
| 7 | 16/12/02 | 17/12/02 | 1 | 14/01/03 | 15/02/03 | 32 |
| 8 | 17/02/03 | 20/02/03 | 3 | 20/03/03 | 10/04/03 | 21 |
| 9 | 20/05/03 | 22/05/03 | 2 | 19/06/03 | 10/07/03 | 21 |
| 10 | 14/07/03 | 15/07/03 | 1 | 12/08/03 | 10/10/03 | 59 |
| 11 | 27/10/03 | 28/10/04 | 1 | 25/11/03 | 05/02/04 | 69 |
| 12 | 25/05/04 | 25/05/04 | 0 | 22/05/04 | 08/06/04 | 47 |
| 13 | 14/10/04 | 19/10/04 | 5 | 11/11/04 | 09/02/05 | 91 |
| | | | ∑ = 37<br>Average = 2.85 | | | ∑ = 442<br>Average = 34.00 |

## PROJECT 3

Type: Private
Nature: Building (Senior Staff House)
Location of Project: Taikai
Duration of Project: 6 months
SCD = 03/01/1996
ACD = 15/11/1996
Difference = ACD – SCD = 10 months, 12 days ⇒ 28 + (5 x 31) + (3 x 30) + 28 + 27 + = 328 days
BC = 2,368,024.00
AC = 3,593,974.00
Difference = AC – BC = 1,225,950

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 13/08/95 | 16/08/95 | 3 | 21/08/95 | 10/09/95 | 20 |
| 2 | 13/09/95 | 21/09/95 | 8 | 22/09/95 | 12/12/95 | 81 |
| 3 | 10/10/95 | 09/01/96 | 91 | 09/01/96 | 13/04/96 | 94 |
| 4 | 02/12/95 | 02/05/96 | 151 | 09/05/96 | 29/07/96 | 81 |
| 5 | 02/02/96 | 08/08/96 | 187 | 15/08/96 | 16/10/96 | 62 |
| | | | ∑ = 440<br>Average = 88 | | | ∑ = 338<br>Average = 67.60 |

## PROJECT 4

Type: Public
Nature: Building (Library/Town Hall)
Location of Project: Takai
Duration of Project: 12 months
SCD = 27/03/2001
ACD = 10/04/2002
Difference = ACD – SCD = 12 months, 2 weeks ⇒ 365 + 4 + 10 = 379 days
BC = 7,707,620.00
AC = 10,287,620.00
Difference = AC – BC = 2,580,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 29/03/00 | 05/04/00 | 7 | 10/04/00 | 18/04/00 | 8 |
| 2 | 09/04/00 | 07/05/00 | 28 | 10/05/00 | 02/06/00 | 23 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 02/06/00 | 18/06/00 | 16 | 12/07/00 | 11/12/00 | 153 |
| 4 | 06/08/00 | 09/08/00 | 3 | 13/08/00 | 29/02/01 | 200 |
| 5 | 03/10/00 | 05/10/00 | 2 | 10/10/00 | 25/05/01 | 227 |
| 6 | 02/12/00 | 06/12/00 | 4 | 12/12/00 | 20/02/02 | 415 |
| 7 | 30/03/01 | 09/04/01 | 9 | 02/04/01 | 10/04/02 | 404 |
| | | | $\sum = 69$<br>Average = 9.86 | | | $\sum = 1430$<br>Average = 204.29 |

## PROJECT 5

Type: Public
Nature: Building (Friday Mosque)
Location of Project: Sakwaya
Duration of Project:
SCD = 26/03/1991
ACD = 30/06/1991
Difference = ACD – SCD = 3 months $\Rightarrow$ 5 + 30 + 30 + 31 + 30 = 96 days
BC = 2,553,339.00
AC = 3,678,339.00
Difference = AC – BC = 1,125,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 26/10/90 | 29/10/90 | 3 | 29/10/90 | 02/11/90 | 4 |
| 2 | 26/11/90 | 28/11/90 | 2 | 26/11/90 | 01/12/90 | 5 |
| 3 | 27/12/90 | 28/01/90 | 47 | 29/01/91 | 05/02/91 | 7 |
| 4 | 25/01/91 | 29/04/91 | 91 | 05/05/91 | 29/05/91 | 24 |
| | | | $\sum = 143$<br>Average = 37.75 | | | $\sum = 40$<br>Average = 10.00 |

## PROJECT 6

Type: Public
Nature: Building (Lecture Theater)
Location of Project: FCE Kongo
Duration of Project: 10 months
SCD = 10 months (Nov. 2000)
ACD = 14 months (March 2001)
Difference = ACD – SCD = 4 months $\Rightarrow$ 31 + 31 + 28 + 31 = 121 days
BC = 52,000,000.00
AC = 61,000,000,00
Difference = AC – BC = 9,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | Mobilization | - | - | - | - | - |
| 2 | 17/02/00 | 23/02/00 | 6 | 05/03/00 | 10/03/00 | 5 |
| 3 | 10/04/00 | 14/04/00 | 4 | 24/04/00 | 26/04/00 | 2 |
| 4 | 26/06/00 | 27/06/00 | 1 | 07/07/00 | 11/07/00 | 4 |
| 5 | 09/08/00 | 13/08/00 | 4 | 23/08/00 | 31/08/00 | 8 |
| 6 | 29/10/00 | 01/11/00 | 3 | 11/11/00 | 15/11/00 | 4 |
| 7 | 06/12/00 | 08/12/00 | 2 | 18/12/00 | 14/01/01 | 27 |
| 8 | 28/01/01 | 31/01/01 | 3 | 10/02/01 | 10/02/01 | 0 |
| 9 | 20/02/01 | 22/02/00 | 2 | 04/03/01 | 28/03/01 | 24 |
| | | | $\sum = 25$<br>Average = 2.78 | | | $\sum = 74$<br>Average = 8.22 |

## PROJECT 7

Type: Public
Nature: Building (Office Accommodation)
Location of Project: BUK Road Kano
Duration of Project: 8 months
SCD = 8 months (November, 2002)
ACD = 9 months (December, 2002)
Difference = ACD – SCD = 1 month $\Rightarrow$ 30 days
BC = 4,500,000.00
AC = 5,200,000.00
Difference = AC – BC = 700,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | Mobilization | - | - | - | - | - |
| 2 | 02/04/02 | 05/04/02 | 3 | 19/04/02 | 24/04/02 | 5 |
| 3 | 14/05/02 | 16/05/02 | 2 | 30/05/02 | 05/06/02 | 6 |
| 4 | 19/06/02 | 21/06/02 | 2 | 05/07/02 | 10/07/02 | 5 |
| 5 | 07/08/02 | 09/08/02 | 2 | 23/08/02 | 29/08/02 | 6 |
| 6 | 05/09/02 | 07/09/02 | 2 | 21/09/02 | 23/09/02 | 2 |
| 7 | 30/09/02 | 02/10/02 | 2 | 16/10/02 | 20/10/02 | 4 |
| 8 | 27/10/02 | 28/10/02 | 1 | 11/11/02 | 10/11/02 | - 1 |
| 9 | 15/11/02 | 16/11/02 | 1 | 30/11/02 | 02/12/02 | 3 |
| 10 | 12/12/02 | 13/12/02 | 1 | 27/12/02 | 29/12/02 | 2 |

| | |
|---|---|
| ∑ = 16<br>Average = 1.78 | ∑ = 32<br>Average = 3.55 |

## PROJECT 8

Type: Public
Nature: Building
Location of Project: Challawa - Kano
Duration of Project: 12 months
SCD = 30/06/2000
ACD = 26/11/2002
Difference = ACD – SCD = 17 months ⇒ 365 + 62 + 30 + 26 = 483 days
BC = 23,674,325.00
AC = 32,524,499.00
Difference = AC – BC = 8,850,174.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | - | 16/06/00 | 0 | 23/06/00 | 26/06/00 | 3 |
| 2 | 10/08/00 | 14/08/00 | 14 | 21/08/00 | 04/09/00 | 14 |
| 3 | 20/11/00 | 27/03/00 | 7 | 04/12/00 | 22/12/00 | 24 |
| 4 | 10/03/01 | 14/03/01 | 4 | 21/03/01 | 17/05/01 | 61 |
| 5 | 30/05/01 | 30/05/1 | 0 | 06/06/01 | 15/06/02 | 9 |
| 6 | 20/06/02 | 23/06/02 | 3 | 30/06/02 | 11/07/02 | 16 |
| 7 | 10/08/02 | 12/08/02 | 2 | 19/08/02 | 13/12/02 | 116 |
| | | | ∑ = 30<br>Average = 4.28 | | | ∑ = 243<br>Average = 34.71 |

## PROJECT 9

Type: Private
Nature: Building (Residential)
Location of Project: Kurna - Fegge
Duration of Project: 15 months
SCD = 15 months
ACD = 20 months
Difference = ACD – SCD = 5 months ⇒ 5 x 30 = 150
BC = 12,500,000.00
AC = 15,000,000.00
Difference = AC – BC = 2,500,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 23/06/03 | 25/06/03 | 2 | 04/07/03 | 06/07/03 | 2 |
| 2 | 09/09/03 | 11/09/03 | 2 | 15/09/03 | 18/09/03 | 3 |
| 3 | 15/10/03 | 18/10/03 | 3 | 21/10/03 | 25/10/03 | 4 |
| 4 | 02/1/04 | 4/01/04 | 2 | 07/01/04 | 10/01/04 | 3 |
| 5 | 09/02/04 | 12/02/04 | 3 | 15/02/04 | 18/02/04 | 4 |
| 6 | 07/04/04 | 10/04/04 | 3 | 15/04/04 | 19/04/04 | 4 |
| 7 | 21/05/04 | 24/05/04 | 3 | 27/05/04 | 31/05/04 | 4 |
| 8 | 15/07/04 | 18/07/04 | 3 | 21/07/04 | 25/07/04 | 4 |
| 9 | 26/08/04 | 30/08/04 | 4 | 04/09/04 | 07/09/04 | 3 |
| 10 | 03/11/04 | 05/11/04 | 2 | 08/11/04 | 12/11/04 | 4 |
| 11 | 30/11/04 | 02/12/04 | 3 | 04/12/04 | 06/12/04 | 2 |
| 12 | 20/12/04 | 24/12/04 | 4 | 25/12/04 | 28/12/04 | 3 |
| | | | $\sum = 34$<br>Average = 2.83 | | | $\sum = 40$<br>Average = 3.33 |

## PROJECT 10

Type: Public
Nature: Comp. Building (Health Centre)
Location of Project: Channo, Jigawa State
Duration of Project: 8 months
SCD = 8 months
ACD = 11 months
Difference = ACD – SCD = 3 months $\Rightarrow$ 3 x 30 = 90
BC = 11,300,000.00
AC = 14,800,000.00
Difference = AC – BC = 3,500,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 30/11/98 | 02/12/98 | 3 | 14/12/98 | 24/12/98 | 10 |
| 2 | 05/02/99 | 08/02/99 | 3 | 15/02/99 | 22/02/99 | 7 |
| 3 | 29/04/99 | 03/05/99 | 4 | 12/05/99 | 25/05/99 | 13 |
| 4 | 10/06/99 | 12/06/99 | 2 | 19/06/99 | 30/06/99 | 11 |
| 5 | 01/07/99 | 03/07/99 | 2 | 17/07/99 | 27/07/99 | 10 |
| 6 | 20/08/99 | 22/08/99 | 2 | 28/08/99 | 02/09/99 | 5 |
| 7 | 16/09/99 | 19/09/99 | 3 | 26/09/99 | 30/09/99 | 4 |
| | | | $\sum = 19$<br>Average = 2.71 | | | $\sum = 60$<br>Average = 8.57 |

## PROJECT 11

Type: Public
Nature: Building (Office Accommodation)
Location of Project: HJRBDA, Hotoro Kano
Duration of Project: 12 weeks,
SCD = 12 weeks
ACD = 16 weeks
Difference = ACD – SCD = 4 weeks $\Rightarrow$ 24 days
BC = 20,000,000.00
AC = 25,000,000.00
Difference = AC – BC = 5,000,000.00

**PAYMENTS PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 28/02/03 | 03/03/03 | 3 | 10/03/03 | 14/03/03 | 4 |
| 2 | 28/03/03 | 31/03/03 | 3 | 07/04/03 | 10/04/03 | 3 |
| 3 | 24/04/03 | 28/04/03 | 4 | 05/05/03 | 09/05/03 | 4 |
| 4 | 23/05/03 | 27/05/03 | 4 | 04/06/03 | 10/06/03 | 6 |
| 5 | 26/06/03 | 27/06/03 | 1 | 30/06/03 | 23/07/03 | 23 |
| | | | $\sum$ = 15<br>Average = 3.00 | | | $\sum$ = 40<br>Average = 8.00 |

## PROJECT 12

Type: Private
Nature: Building (Residential)
Location of Project: Nasarawa GRA, Kano
Duration of Project: 9 months
SCD = 26/04/1999
ACD = 10/08/2000
Difference = ACD – SCD = 15.5 months $\Rightarrow$ 365 + 4 + 62 + 30 + 10 = 471 days
BC = 66,787,954.83
AC = 85,340,164.51
Difference = AC – BC = 18,552,209.68

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 22/09/98 | 25/09/98 | 3 | 06/10/98 | 26/10/98 | 20 |
| 2 | 28/11/98 | 30/11/98 | 2 | 07/12/98 | 11/01/99 | 35 |
| 3 | 25/03/99 | 31/03/99 | 6 | 05/04/99 | 07/04/99 | 2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | 05/06/99 | 25/06/99 | 20 | 09/07/99 | 12/07/99 | 3 |
| 5 | 15/10/99 | 19/10/99 | 4 | 25/10/99 | 02/11/99 | 8 |
| 6 | 27/01/00 | 28/01/00 | 1 | 03/02/00 | 08/02/00 | 5 |
| 7 | 22/04/00 | 29/04/00 | 7 | 08/05/00 | 12/05/00 | 4 |
| 8 | 27/07/00 | 17/08/00 | 31 | 18/08/00 | 25/09/00 | 38 |
| | | | $\sum = 74$<br>Average = 9.25 | | | $\sum = 115$<br>Average = 14.38 |

## PROJECT 13

Type: Private
Nature: Building (Residential)
Location of Project: Hotoro GRA, Kano
Duration of Project: 8 months
SCD = 24/07/1997
ACD = 30/04/1998
Difference = ACD – SCD = 9 months $\Rightarrow$ 8 + (5 x 31) + 3 x 30) + 28 = 281 days
BC = 48,766,541.14
AC = 59,788,823.95
Difference = AC – BC = 11,022,282.01

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 10/01/97 | 14/01/97 | 4 | 17/01/97 | 04/02/97 | 18 |
| 2 | 22/03/97 | 26/03/97 | 4 | 31/03/97 | 07/04/97 | 7 |
| 3 | 25/06/97 | 28/06/97 | 3 | 30/06/97 | 28/07/97 | 28 |
| 4 | 20/10/97 | 25/10/97 | 5 | 29/10/97 | 14/11/97 | 16 |
| 5 | 15/12/97 | 17/12/97 | 2 | 22/12/97 | 29/12/97 | 7 |
| 6 | 03/02/98 | 07/02/98 | 4 | 11/02/98 | 13/02/98 | 2 |
| 7 | 24/03/98 | 27/03/98 | 3 | 30/03/98 | 31/03/98 | 1 |
| 8 | 20/04/98 | 30/04/98 | 10 | 18/05/98 | 29/05/98 | 11 |
| | | | $\sum = 35$<br>Average = 4.38 | | | $\sum = 90$<br>Average = 11.25 |

## PROJECT 14

Type: Private
Nature: Building (Residential)
Location of Project: Kano
Duration of Project: one year
SCD = 09/10/1995
ACD = 24/11/1995
Difference = ACD – SCD = 46 days

BC = 5,000,000.00
AC = 5,400,000.00
Difference = AC – BC = 400,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 10/11/94 | 30/11/94 | 20 | 01/12/94 | 30/01/94 | 29 |
| 2 | 31/01/95 | 27/02/95 | 27 | 28/02/95 | 28/04/95 | 59 |
| 3 | 30/05/95 | 19/06/95 | 20 | 24/06/95 | 16/08/95 | 54 |
| 4 | 30/09/95 | 10/10/95 | 11 | 19/10/95 | 03/11/95 | 15 |
| 5 | 24/11/95 | 01/12/95 | 7 | 12/12/95 | 15/12/95 | 3 |
| | | | ∑ = 85<br>Average = 17.00 | | | ∑ = 160<br>Average = 32.00 |

## PROJECT 15

Type: Private
Nature: Building (Residential)
Location of Project: Nasarawa GRA, Kano
Duration of Project: 9 months
SCD = 08/11/2004
ACD = 15/12/2004
Difference = ACD – SCD = 1 month 7 days ⇒ 38 days
BC = 8,560,000.00
AC = 9,000,000.000
Difference = AC – BC = 440,000.00

**PAYMENTS PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 03/04/04 | 16/04/04 | 13 | 20/04/04 | 03/05/04 | 13 |
| 2 | 24/07/04 | 06/08/04 | 13 | 10/08/04 | 12/08/04 | 2 |
| 3 | 30/09/04 | 04/10/04 | 4 | 11/10/04 | 20/10/04 | 9 |
| 4 | 20/11/04 | 03/12/04 | 14 | 05/12/04 | 10/12/04 | 5 |
| 5 | 20/12/04 | 20/12/04 | 0 | 21/12/04 | 23/12/04 | 2 |
| | | | ∑ = 44<br>Average = 8.80 | | | ∑ = 31<br>Average = 6.2 |

## PROJECT 16

Type: Public
Nature: Building {Bank Complex (NACB)}
Location of Project: Zaria Rd, Kano
Duration of Project: 36 weeks
SCD = 25/03/2000
ACD = 17/09/2000
Difference = ACD – SCD = 6 months $\Rightarrow$ 6 + 93 + 60 + 17 = 176 days
BC = 7,550,000.00
AC = 8,500,000.00
Difference = AC – BC = 950,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 18/07/99 | 23/07/99 | 5 | 07/08/99 | 14/08/99 | 7 |
| 2 | 12/12/99 | 20/12/99 | 8 | 29/12/99 | 02/01/00 | 4 |
| 3 | 06/05/00 | 10/05/00 | 4 | 21/05/00 | 23/07/00 | 63 |
| 4 | 23/07/00 | 30/07/00 | 7 | 12/08/00 | 02/09/00 | 21 |
| 5 | 11/09/00 | 13/09/00 | 2 | 19/09/00 | 01/12/00 | 76 |
| | | | $\sum$ = 26<br>Average = 5.20 | | | $\sum$ = 171<br>Average = 34.20 |

## PROJECT 17

Type: Public
Nature: Building (Laboratory)
Location of Project: Gwagwalada, Abuja
Duration of Project: 12 months
SCD = 29/05/1990
ACD = 16/09/1990
Difference = ACD – SCD = 4 months $\Rightarrow$ 2 + 62 + 30 + 16 = 110 days
BC = 12,250,000.00
AC = 14,300,000.00
Difference = AC – BC = 2,050,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 26/06/89 | 02/07/89 | 6 | 14/07/89 | 30/07/89 | 16 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 11/09/89 | 20/09/89 | 9 | 30/11/89 | 22/12/89 | 23 |
| 3 | 05/11/89 | 14/11/89 | 9 | 29/11/89 | 16/01/90 | 49 |
| 4 | 02/02/90 | 13/02/90 | 11 | 22/02/90 | 15/03/90 | 21 |
| 5 | 14/05/90 | 19/05/90 | 5 | 26/05/90 | 03/06/90 | 8 |
| 6 | 10/06/90 | 10/06/90 | 0 | 17/07/90 | 18/08/90 | 32 |
| | | | $\sum = 40$<br>Average = 6.67 | | | $\sum = 149$<br>Average = 24.83 |

## PROJECT 18

Type: Public
Nature: Building (Workshop)
Location of Project: Maiduguri
Duration of Project: 4 months
SCD = 05/03/2002
ACD = 17/06/2002
Difference = ACD – SCD = 3 months, 2 weeks $\Rightarrow$ 26 + 30 + 31 + 17 = 104 days
BC = 8,500,000.00
AC = 10,605,988.60
Difference = AC – BC = 2,105,988.60

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/11/01 | 02/11/01 | 0 | 03/11/01 | 05/11/01 | 2 |
| 2 | 05/12/01 | 05/12/01 | 0 | 14/12/01 | 20/12/01 | 6 |
| 3 | 28/01/02 | 28/01/02 | 0 | 05/02/02 | 28/02/02 | 23 |
| 4 | 10/05/02 | 21/05/02 | 11 | 30/05/02 | 26/06/02 | 27 |
| 5 | 26/06/02 | 26/06/02 | 0 | 02/07/02 | 29/08/02 | 58 |
| | | | $\sum = 11$<br>Average = 2.20 | | | $\sum = 116$<br>Average = 23.20 |

## PROJECT 19

Type: Private
Nature: Building (Hospital)
Location of Project: Kaduna
Duration of Project: 2 months
SCD = 29/06/2002
ACD = 29/07/2002
Difference = ACD – SCD = 1 month $\Rightarrow$ 30 days
BC = 27,500,000.00
AC = 28,150,200.00
Difference = AC – BC = 650,200.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 30/05/02 | 30/05/02 | 0 | 29/06/02 | 05/07/02 | 6 |
| 2 | 29/06/02 | 30/06/02 | 1 | 29/07/02 | 30/07/02 | 1 |
| 3 | 27/07/02 | 27/07/02 | 0 | 26/08/02 | 13/09/02 | 17 |
| | | | ∑ = 1<br>Average = 0.33 | | | ∑ = 24<br>Average = 8.00 |

## PROJECT 20

Type: Private
Nature: Building (Hospital)
Location of Project: Abuja
Duration of Project: 6 months
SCD = 20/11/1989
ACD = 20/03/1990
Difference = ACD – SCD = 4 months ⇒ 10 + 62 + 28 + 20 = 120 days
BC = 2,400,000.00
AC = 3,520,000.00
Difference = AC – BC = 1,120,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 10/07/89 | 15/07/89 | 5 | 15/08/89 | 20/08/89 | 5 |
| 2 | 09/09/89 | 09/09/89 | 0 | 10/10/89 | 14/10/89 | 4 |
| 3 | 07/11/89 | 20/11/89 | 13 | 20/11/89 | 13/12/89 | 24 |
| 4 | 06/01/90 | 09/01/90 | 3 | 08/01/90 | 21/01/90 | 13 |
| 5 | 04/03/90 | 04/03/90 | 0 | 03/04/90 | 24/11/90 | 235 |
| | | | ∑ = 21<br>Average = 4.20 | | | ∑ = 281<br>Average = 56.20 |

## PROJECT 21

Type: Private
Nature: Building (Block of Flats)
Location of Project: Farwa, Kano
Duration of Project: 13 weeks
SCD = 07/03/1998
ACD = 01/05/1999
Difference = ACD – SCD = 59 weeks ⇒ 365 + 24 + 30 + 1 = 420 days
BC = 13,392,916.00
AC = 19,792,932.00

Difference = AC – BC = 6,400,016.00

**PAYMENTS PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 08/12/97 | 11/12/97 | 3 | 15/12/89 | 16/12/97 | 1 |
| 2 | 31/12/97 | 14/01/98 | 14 | 20/01/98 | 20/01/98 | 0 |
| 3 | 09/02/98 | 09/02/98 | 0 | 09/02/98 | 11/02/98 | 2 |
| 4 | 16/02/98 | 16/02/98 | 0 | 20/02/98 | 25/02/98 | 5 |
| 5 | 25/03/98 | 26/03/98 | 1 | 01/04/98 | 01/04/98 | 0 |
| 6 | 30/04/98 | 30/04/98 | 0 | 05/05/98 | 30/05/98 | 25 |
| 7 | 30/05/98 | 16/06/98 | 16 | 19/06/98 | 19/06/98 | 0 |
| 8 | 30/06/98 | 14/10/98 | 105 | 19/10/98 | 19/10/98 | 0 |
| 9 | 19/10/98 | 10/11/98 | 22 | 20/11/98 | 10/12/98 | 31 |
| | | | $\sum = 161$<br>Average = 17.89 | | | $\sum = 64$<br>Average = 7.11 |

## PROJECT 22

Type: Public
Nature: Building (Staff Quarters)
Location of Project: Lagos
Duration of Project: 6 months
SCD = 28/11/1997
ACD = 26/03/1998
Difference = ACD – SCD = 4 months $\Rightarrow$ 3 + 62 + 28 + 5 = 98 days
BC = 60,500,000.00
AC = 78,725,125.00
Difference = AC – BC = 18,225,125.00

**PAYMENTS PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 25/06/97 | 30/06/97 | 5 | 29/07/97 | 30/07/97 | 1 |
| 2 | 24/07/97 | 25/07/97 | 1 | 24/08/97 | 13/09/97 | 20 |
| 3 | 24/08/97 | 27/08/97 | 3 | 26/09/97 | 21/10/97 | 26 |
| 4 | 25/09/97 | 30/09/97 | 5 | 28/10/97 | 11/11/97 | 14 |
| 5 | 24/10/97 | 25/10/97 | 1 | 24/11/97 | 13/01/98 | 51 |
| 6 | 23/11/97 | 30/11/97 | 7 | 29/12/97 | 18/11/98 | 324 |
| | | | $\sum = 22$<br>Average = 6.67 | | | $\sum = 436$<br>Average = 72.67 |

## PROJECT 23

Type: Private
Nature: Building (Hotel)
Location of Project: V. I. Lagos
Duration of Project: 6 months
SCD = 20/02/1989
ACD = 20/07/1989
Difference = ACD – SCD = 5 months ⇒ 8 + 62 + 60 + 11 = 141 days
BC = 3,331,569.88
AC = 4,218,248.20
Difference = AC – BC = 886,678.32

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 15/10/89 | 23/11/89 | 8 | 23/12/89 | 28/12/89 | 5 |
| 2 | 15/11/89 | 03/12/89 | 18 | 03/11/90 | 02/02/90 | 30 |
| 3 | 15/12/89 | 07/01/90 | 23 | 07/02/90 | 09/03/90 | 30 |
| 4 | 15/01/90 | 12/03/90 | 56 | 12/04/90 | 13/05/90 | 31 |
| 5 | 15/02/90 | 04/05/90 | 78 | 04/06/90 | 16/07/90 | 42 |
| 6 | 15/03/90 | 11/06/90 | 88 | 11/07/90 | 15/08/90 | 35 |
| | | | ∑ = 271<br>Average = 45.17 | | | ∑ = 173<br>Average = 28.83 |

## PROJECT 24

Type: Public
Nature: Building (Convocation Square BUK)
Location of Project: BUK Kano
Duration of Project: 4 months
SCD = 29/05/2003
ACD = 29/03/2004
Difference = ACD – SCD = 10 months ⇒ 2 + 155 + 90 + 28 + 29 = 304 days
BC = 24,575,000.00
AC = 28,501,250.00
Difference = AC – BC = 3,926,250.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 11/04/03 | 06/05/03 | 25 | 09/05/03 | 12/05/03 | 3 |
| 2 | 23/04/03 | 06/05/03 | 13 | 11/06/03 | 22/07/03 | 41 |
| 3 | 02/06/03 | 04/06/03 | 2 | 29/07/03 | 21/08/03 | 23 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | 27/06/03 | 22/07/03 | 25 | 05/09/03 | 30/11/03 | 86 |
| 5 | 02/029/03 | 19/09/03 | 17 | 12/03/04 | 17/05/03 | 66 |
| 6 | 26/02/04 | 04/03/04 | 6 | 24/03/04 | 17/08/94 | 138 |
| | | | ∑ = 88<br>Average = 14.67 | | | ∑ = 357<br>Average = 59.50 |

## PROJECT 25

Type: Public
Nature: Building (Office Complex)
Location of Project: Kano
Duration of Project: 3 months
SCD = 30/01/1996
ACD = 31/05/1996
Difference = ACD – SCD = 4 months ⇒ 1 + 28 + 31 + 30 + 31 = 121 days
BC = 10,000,000.00
AC = 13,750,000.00
Difference = AC – BC = 3,750,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 29/11/95 | 10/12/95 | 11 | 10/01/96 | 18/01/96 | 8 |
| 2 | 30/12/95 | 09/01/96 | 10 | 08/02/96 | 25/12/96 | 17 |
| 3 | 29/01/96 | 31/01/96 | 2 | 01/03/96 | 13/03/96 | 12 |
| 4 | 30/02/96 | 30/02/96 | 0 | 03/03/96 | 04/04/96 | 32 |
| 5 | 04/04/96 | 18/04/96 | 14 | 18/05/96 | 22/10/96 | 155 |
| | | | ∑ = 37<br>Average = 7.40 | | | ∑ = 224<br>Average = 44.80 |

## PROJECT 26

Type: Public
Nature: Building (Industrial)
Location of Project: Kano
Duration of Project: 4 months
SCD = 30/07/1991
ACD = 27/09/1991
Difference = ACD – SCD = 2 months ⇒ 1 + 31 + 27 = 59 days
BC = 30,750,000.00
AC = 33,178,520.00
Difference = AC – BC = 2,428,520.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 30/04/91 | 30/04/91 | 0 | 29/058/91 | 30/05/91 | 1 |
| 2 | 29/05/91 | 31/05/91 | 2 | 30/06/91 | 12/07/91 | 12 |
| 3 | 28/06/91 | 30/06/91 | 2 | 29/07/91 | 31/07/91 | 2 |
| 4 | 27/07/91 | 30/07/91 | 3 | 29/08/91 | 03/09/91 | 5 |
| 5 | 26/08/91 | 28/08/91 | 2 | 27/09/91 | 07/06/92 | 253 |
| | | | $\sum = 9$<br>Average = 1.80 | | | $\sum = 273$<br>Average = 54.60 |

## PROJECT 27

Type: Public
Nature: Building (Lecture Theatre)
Location of Project: Lagos
Duration of Project: 5 months
SCD = 24/11/1996
ACD = 27/02/1997
Difference = ACD – SCD = 3 months $\Rightarrow$ 6 + 62 + 27 = 95 days
BC = 47,500,000.00
AC = 49,780,128.00
Difference = AC – BC = 2,280,128.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 24/07/96 | 26/07/96 | 2 | 25/08/96 | 04/09/96 | 10 |
| 2 | 28/08/96 | 28/08/96 | 0 | 27/09/96 | 30/09/96 | 3 |
| 3 | 22/09/96 | 24/09/96 | 2 | 23/10/96 | 11/11/96 | 19 |
| 4 | 20/10/96 | 30/10/96 | 10 | 29/11/96 | 14/12/96 | 15 |
| 5 | 19/11/96 | 20/11/96 | 1 | 19/12/96 | 06/01/97 | 18 |
| 6 | 19/12/96 | 29/12/96 | 10 | 28/01/97 | 02/02/97 | 5 |
| 7 | 20/01/97 | 23/01/97 | 3 | 22/02/97 | 27/11/97 | 280 |
| | | | $\sum = 28$<br>Average = 4.00 | | | $\sum = 350$<br>Average = 50.00 |

## PROJECT 28

Type: Private
Nature: Building (Residential)
Location of Project: Kano
Duration of Project: 3 months
SCD = 22/10/1994

ACD = 21/11/1994
Difference = ACD – SCD = 1 months ⇒ 10 + 20 = 30 days
BC = 17,900,000.00
AC = 19,785,350.00
Difference = AC – BC = 1,885,350.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 21/08/94 | 25/08/94 | 4 | 24/09/94 | 25/09/94 | 1 |
| 2 | 20/09/94 | 24/09/94 | 4 | 23/10/94 | 30/10/94 | 7 |
| 3 | 19/10/94 | 20/10/94 | 1 | 19/11/94 | 20/11/94 | 1 |
| 4 | 17/11/94 | 17/11/94 | 0 | 16/12/94 | 20/12/94 | 4 |
| | | | ∑ = 9<br>Average = 2.25 | | | ∑ = 13<br>Average = 3.25 |

## PROJECT 29

Type: Public
Nature: Building (Hostel)
Location of Project: Kaduna
Duration of Project: 18 months
SCD = 27/08/2004
ACD = 29/10/2004
Difference = ACD – SCD = 2 months ⇒ 4 + 30 + 29 = 63 days
BC = 66,328,172.00
AC = 67,128,076.88
Difference = AC – BC = 799,904.88

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV | DPWD | DPWAM | DIPD |
| 1 | 14/04/03 | 21/04/03 | 7 | 05/05/03 | 06/05/03 | 1 |
| 2 | 16/06/03 | 23/06/03 | 7 | 30/06/03 | 07/07/03 | 7 |
| 3 | 18/08/03 | 25/08/03 | 7 | 01/09/03 | 23/09/03 | 22 |
| 4 | 13/10/03 | 20/10/03 | 7 | 27/10/03 | 17/11/03 | 21 |
| 5 | 15/12/03 | 22/12/03 | 7 | 29/12/03 | 10/01/04 | 12 |
| 6 | 16/02/04 | 23/02/04 | 7 | 01/03/04 | 15/03/04 | 14 |
| 7 | 12/04/04 | 19/04/04 | 7 | 26/04/04 | 24/05/04 | 28 |
| 8 | 21/06/04 | 28/06/04 | 7 | 05/07/04 | 19/07/04 | 14 |
| 9 | 16/08/04 | 23/08/04 | 7 | 30/08/04 | 15/10/04 | 47 |
| | | | ∑ = 63<br>Average = 7.00 | | | ∑ = 166<br>Average = 18.44 |

## PROJECT 30

Type: Public
Nature: Building (Library)
Location of Project: Kaduna
Duration of Project: 27 months
SCD = 22/11/1998
ACD = 03/06/1999
Difference = ACD – SCD = 7 months, 19 days ⇒ 18 + 124 + 28 + 30 + 3 = 193 days
BC = 85,291,566.23
AC = 89,587,921.23
Difference = AC – BC = 4,296,355.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/01/97 | 08/01/97 | 6 | 02/02/97 | 10/03/97 | 36 |
| 2 | 04/04/97 | 10/04/97 | 6 | 23/04/97 | 19/05/97 | 26 |
| 3 | 09/06/97 | 30/06/97 | 21 | 30/07/97 | 17/08/97 | 17 |
| 4 | 12/09/97 | 13/10/97 | 31 | 18/10/97 | 02/11/97 | 16 |
| 5 | 23/12/97 | 02/01/98 | 10 | 23/02/98 | 23/03/98 | 28 |
| 6 | 28/03/98 | 17/04/98 | 20 | 23/04/98 | 02/05/98 | 9 |
| 7 | 05/06/98 | 20/06/98 | 15 | 05/07/98 | 18/07/98 | 13 |
| 8 | 03/09/98 | 19/09/98 | 16 | 23/10/98 | 02/11/98 | 10 |
| 9 | 10/12/98 | 15/12/98 | 5 | 18/12/98 | 24/12/98 | 6 |
| 10 | 07/03/99 | 15/04/99 | 39 | 22/04/99 | 23/05/99 | 29 |
| | | | ∑ = 169<br>Average = 16.90 | | | ∑ = 190<br>Average = 19.00 |

## PROJECT 31

Type: Public
Nature: Building (Lecture Theatre)
Location of Project: Tsaure
Duration of Project: 24 months
SCD = 15/04/2003
ACD = 10/11/2003
Difference = ACD – SCD = 7 months ⇒ 15+124+60+10 = 209 days
BC = 12,700,000.00
AC = 13,200,000.00
Difference = AC – BC = 500,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 15/02/03 | 15/02/03 | 0 | 28/02/03 | 25/03/03 | 25 |
| 2 | 25/02/03 | 25/06/03 | 0 | 28/06/03 | 10/09/03 | 74 |
| 3 | 02/10/03 | 02/10/03 | 0 | 11/10/03 | 28/10/03 | 17 |
| 4 | 10/11/03 | 10/11/03 | 0 | 30/11/03 | 04/01/03 | 35 |
| | | | $\sum = 0$<br>Average = 0.00 | | | $\sum = 151$<br>Average = 37.75 |

## PROJECT 32

Type: Public
Nature: Building (Central Library Complex)
Location of Project: Kaduna Polytechnic
Duration of Project: 96 weeks (months)
SCD = 03/03/1991
ACD = 31/12/1991
Difference = ACD – SCD = 9 months $\Rightarrow$ 28+90+124+31 = 273 days
BC = 8,707,613.00
AC = 12,908,603.11
Difference = AC – BC = 4,200,990.11

**PAYMENTS PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV | DPWD | DPWAM | DIPD |
| 1 | 24/03/89 | 31/03/89 | 7 | 31/03/89 | 01/04/89 | 1 |
| 2 | 19/10/89 | 20/10/89 | 1 | 21/10/89 | 28/10/89 | 7 |
| 3 | 23/10/89 | 25/10/89 | 2 | 26/10/89 | 02/11/89 | 7 |
| 4 | 05/12/89 | 19/12/89 | 7 | 10/12/89 | 24/12/89 | 14 |
| 5 | 20/12/89 | 20/12/89 | 0 | 21/12/89 | 28/12/89 | 7 |
| 6 | 19/03/90 | 20/03/90 | 1 | 21/03/90 | 28/03/90 | 7 |
| 7 | 05/04/90 | 10/04/90 | 5 | 11/04/90 | 18/04/90 | 7 |
| 8 | 14/05/90 | 16/05/90 | 2 | 17/05/90 | 24/05/90 | 7 |
| 9 | 27/06/90 | 10/07/90 | 13 | 11/07/90 | 18/07/90 | 7 |
| 10 | 02/08/90 | 03/08/90 | 1 | 04/08/90 | 21/08/90 | 17 |
| 11 | 04/09/90 | 10/09/90 | 6 | 11/09/90 | 25/09/90 | 14 |
| 12 | 18/10/90 | 18/10/90 | 0 | 19/10/90 | 26/10/90 | 7 |
| 13 | 09/11/90 | 12/11/90 | 3 | 13/11/90 | 20/11/90 | 7 |
| 14 | 11/12/90 | 12/12/90 | 1 | 13/12/90 | 27/12/90 | 14 |
| 15 | 25/02/91 | 27/02/91 | 2 | 28/02/91 | 29/02/91 | 1 |
| 16 | 18/03/91 | 19/03/91 | 1 | 20/03/91 | 27/03/91 | 7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 17 | 11/04/91 | 11/04/91 | 0 | 12/04/91 | 26/04/91 | 14 |
| 18 | 02/07/91 | 02/07/91 | 0 | 03/07/91 | 10/07/91 | 7 |
| 19 | 23/07/91 | 26/07/91 | 3 | 27/07/91 | 03/08/91 | 7 |
| 20 | 31/12/91 | 31/12/91 | 0 | 02/01/92 | 16/02/92 | 14 |
| | | | ∑ = 55<br>Average = 2.75 | | | ∑ = 173<br>Average = 8.65 |

## PROJECT 33

Type: Public
Nature: Building (Bursary Department)
Location of Project: Kaduna Polytechnic
Duration of Project: 96 weeks (4 months)
SCD = 28/11/1991
ACD = 16/12/1991
Difference = ACD – SCD = 18 days
BC = 3,750,729.07
AC = 4,871,985.87
Difference = AC – BC = 1,121,256.80

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 11/12/89 | 13/12/89 | 2 | 14/12/89 | 28/12/89 | 14 |
| 2 | 15/12/89 | 18/12/89 | 3 | 19/12/89 | 26/12/89 | 7 |
| 3 | 09/04/90 | 10/04/90 | 1 | 11/04/90 | 18/04/90 | 7 |
| 4 | 04/05/90 | 05/05/90 | 1 | 06/05/90 | 20/05/90 | 14 |
| 5 | 09/01/91 | 10/01/91 | 1 | 11/01/91 | 18/01/91 | 7 |
| 6 | 05/02/91 | 13/02/91 | 8 | 13/02/91 | 20/02/91 | 7 |
| 7 | 03/07/91 | 04/07/91 | 1 | 05/07/91 | 12/07/91 | 7 |
| 8 | 24/07/91 | 26/07/91 | 2 | 27/07/91 | 03/08/91 | 7 |
| 9 | 13/09/91 | 13/09/91 | 0 | 14/09/91 | 21/09/91 | 7 |
| 10 | 09/10/91 | 09/10/91 | 0 | 10/10/91 | 24/10/91 | 14 |
| 11 | 16/12/91 | 17/12/91 | 1 | 18/12/91 | 25/12/91 | 7 |
| | | | ∑ = 20<br>Average = 1.82 | | | ∑ = 98<br>Average = 8.91 |

## PROJECT 34

Type: Public
Nature: Building (Tafawa Balewa Guest Inn)
Location of Project: Kaduna
Duration of Project: 96 weeks (24 months)
SCD = 11/04/1994

ACD = 29/12/1994
Difference = ACD – SCD = 8 months ⇒ 19+155+90 = 264 days
BC = 3,705,666.64
AC = 5,286,625.55
Difference = AC – BC = 1,580,958.91

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 22/04/91 | 22/04/91 | 0 | 23/04/91 | 30/04/91 | 7 |
| 2 | 04/09/91 | 05/09/91 | 1 | 06/09/91 | 13/04/91 | 7 |
| 3 | 01/11/91 | 04/11/91 | 3 | 05/11/91 | 12/11/91 | 7 |
| 4 | 12/12/91 | 12/12/91 | 0 | 13/12/91 | 20/12/91 | 7 |
| 5 | 31/12/91 | 31/12/91 | 0 | 02/01/92 | 09/01/92 | 7 |
| 6 | 14/01/92 | 21/01/92 | 7 | 22/01/92 | 29/01/92 | 7 |
| 7 | 19/02/92 | 19/02/92 | 0 | 20/02/92 | 27/02/92 | 7 |
| 8 | 25/03/92 | 25/03/92 | 0 | 26/03/92 | 03/04/92 | 8 |
| 9 | 06/5/92 | 07/05/92 | 1 | 08/05/92 | 22/05/92 | 14 |
| 10 | 15/07/92 | 15/07/92 | 0 | 16/07/92 | 30/07/92 | 14 |
| 11 | 24/08/92 | 26/08/92 | 2 | 27/08/92 | 03/09/92 | 7 |
| 12 | 27/08/92 | 27/10/92 | 0 | 28/10/92 | 05/11/92 | 8 |
| 13 | 30/11/92 | 30/11/92 | 0 | 31/11/92 | 07/12/92 | 7 |
| 14 | 04/03/93 | 04/03/93 | 0 | 05/03/93 | 12/04/93 | 38 |
| 15 | 03/06/93 | 03/06/93 | 0 | 24/06/93 | 11/06/93 | 7 |
| 16 | 25/07/93 | 27/07/93 | 2 | 28/07/93 | 04/02/93 | 7 |
| 17 | 06/09/93 | 06/09/93 | 0 | 07/09/93 | 14/09/93 | 7 |
| 18 | 29/09/93 | 29/09/93 | 0 | 30/09/93 | 07/10/93 | 7 |
| 19 | 16/05/94 | 16/05/94 | 0 | 17/05/94 | 24/05/94 | 7 |
| 20 | 29/12/93 | 29/12/94 | 0 | 30/12/94 | 13/01/94 | 14 |
| | | | ∑ = 16<br>Average = 0.80 | | | ∑ = 194<br>Average = 9.70 |

## PROJECT 35

Type: Public
Nature: Building
Location of Project: No. 73 Alhaji Amoo Street Ojota Lagos
Duration of Project: 48 weeks
SCD = 19/01/1999
ACD = 24/12/2003
Difference = ACD – SCD = 60 months ⇒ 60 x 30 = 1800 days
BC = 24,430,000.00

AC = 28,500,000.00
Difference = AC – BC = 4,070,000.00

**PAYMENTS PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | **DVWD** | **DAV** | **DIDV (Days)** | **DPWD** | **DPWAM** | **DIPD (Days)** |
| 1 | 20/04/98 | 20/04/98 | 0 | 24/04/98 | 29/04/98 | 5 |
| 2 | 10/07/98 | 13/07/98 | 3 | 15/07/98 | 12/08/98 | 28 |
| 3 | 30/10/98 | 02/11/98 | 3 | 16/11/98 | 09/01/99 | 54 |
| 4 | 03/04/99 | 03/04/99 | 0 | 15/04/99 | 06/06/99 | 52 |
| 5 | 09/08/99 | 15/08/99 | 6 | 30/08/99 | 14/09/99 | 15 |
| 6 | 20/12/99 | 22/12/99 | 2 | 22/12/99 | 02/02/00 | 42 |
| 7 | 08/06/00 | 10/06/00 | 2 | 14/06/00 | 29/06/00 | 15 |
| 8 | 11/11/00 | 13/11/00 | 2 | 18/11/00 | 16/12/00 | 29 |
| 9 | 30/03/01 | 02/04/01 | 2 | 05/04/01 | 13/05/01 | 38 |
| 10 | 08/12/01 | 10/12/01 | 2 | 12/12/01 | 12/02/02 | 63 |
| 11 | 13/09/02 | 14/09/02 | 1 | 17/09/02 | 10/10/02 | 25 |
| 12 | 01/05/03 | 03/05/03 | 2 | 14/05/03 | 15/05/03 | 1 |
| 13 | 04/07/03 | 06/07/03 | 2 | 08/07/03 | 15/07/03 | 7 |
| 14 | 12/09/03 | 13/09/03 | 1 | 16/09/03 | 18/09/03 | 2 |
| 15 | 15/12/03 | 16/12/03 | 1 | 18/12/03 | 14/01/04 | 27 |
| | | | $\sum = 29$<br>Average = 1.93 | | | $\sum = 403$<br>Average = 26.87 |

## PROJECT 36

Type: Public
Nature: Auditorium Block
Location of Project: Federal Polytechnic Nasarawa
Duration of Project: 16 weeks
SCD = 20/03/2002
ACD = 30/03/2002
Difference = ACD – SCD = 10 days
BC = 9,681,264.03
AC = 11,181,264.03
Difference = AC – BC = 1,500,000..00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | **DVWD** | **DAV** | **DIDV (Days)** | **DPWD** | **DPWAM** | **DIPD (Days)** |
| 1 | 25/12/02 | 25/12/02 | 0 | 30/12/03 | 15/01/03 | 15 |
| 2 | 30/01/03 | 31/03/03 | 1 | 06/02/02 | 12/02/03 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 28/02/03 | 03/03/03 | 3 | 08/03/03 | 18/03/03 | 10 |
| 4 | 26/03/03 | 26/03/03 | 0 | 28/03/03 | 14/04/03 | 18 |
| | | | $\sum = 4$<br>Average = 1.00 | | | $\sum = 49$<br>Average = 12.25 |

## PROJECT 37

Type: Public
Nature: Building (Male Students' Hostel)
Location of Project: Federal Polytechnic Nasarawa
Duration of Project: 18 weeks
SCD = 20/12/2003
ACD = 10/02/2004
Difference = ACD – SCD = 8 weeks $\Rightarrow$ 11 + 31 + 10 = 52 days
BC = 21,110,263.81
AC = 21,666,997.69
Difference = AC – BC = 556,733.88

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/10/02 | 02/10/02 | 0 | 06/10/02 | 21/10/02 | 15 |
| 2 | 02/11/02 | 02/11/02 | 0 | 06/11/02 | 18/11/02 | 12 |
| 3 | 07/12/02 | 07/12/02 | 0 | 10/12/02 | 20/12/02 | 10 |
| 4 | 16/06/03 | 16/06/03 | 0 | 19/06/03 | 30/06/03 | 11 |
| 5 | 07/07/03 | 09/07/03 | 2 | 10/07/03 | 15/07/03 | 5 |
| 6 | 08/09/03 | 10/09/03 | 2 | 10/09/03 | 27/10/03 | 17 |
| | | | $\sum = 4$<br>Average = 0.67 | | | $\sum = 70$<br>Average = 11.67 |

## PROJECT 38

Type: Public
Nature: Academics Affairs Complex
Location of Project: Federal Polytechnic Bida.
Duration of Project: 5 months
SCD = August 2000
ACD = July 2001
Difference = ACD – SCD = 1 year $\Rightarrow$ 11 x 30 = 330 days
BC = 20,000,000.00
AC = 27,378,000.00
Difference = AC – BC = 7,378,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 17/11/00 | 25/11/00 | 8 | 17/11/01 | 29/11/01 | 12 |
| 2 | 08/01/01 | 10/01/01 | 2 | 08/01/01 | 13/01/01 | 5 |
| 3 | 16/02/01 | 20/02/01 | 4 | 16/02/01 | 18/02/01 | 2 |
| 4 | 04/04/01 | 12/04/01 | 8 | 20/04/01 | 24/04/01 | 4 |
| 5 | 24/05/01 | 26/05/01 | 2 | 30/05/01 | 04/06/01 | 5 |
| 6 | 25/06/01 | 27/06/01 | 2 | 30/06/01 | 03/07/01 | 3 |
| 7 | 20/07/01 | 22/07/01 | 2 | 25/07/01 | 28/07/01 | 3 |
| | | | $\sum = 28$<br>Average = 4.00 | | | $\sum = 34$<br>Average = 4.86 |

## PROJECT 39

Type: Public
Nature: Building (Male Hostel)
Location of Project: Federal Polytechnic Nasarawa
Duration of Project: 18 weeks
SCD = 20/12/2003
ACD = 28/04/2004
Difference = ACD – SCD = 10 weeks $\Rightarrow$ 11+62+28+28 = 129
BC = 24,110,263.81
AC = 24,890,395.90
Difference = AC – BC = 780,132.09

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 18/09/03 | 18/09/03 | 0 | 22/09/03 | 29/10/03 | 37 |
| 2 | 18/10/03 | 20/11/03 | 2 | 25/10/03 | 23/12/03 | 59 |
| 3 | 10/01/04 | 10/01/04 | 0 | 15/01/04 | 20/01/04 | 5 |
| 4 | 20/02/04 | 21/02/04 | 1 | 23/02/04 | 10/03/04 | 15 |
| | | | $\sum = 3$<br>Average = 0.75 | | | $\sum = 116$<br>Average = 29.00 |

## PROJECT 40

Type: Public
Nature: Student Hostel Block
Location of Project: Kaura Namoda, Zamfara State
Duration of Project: 34 weeks
SCD = October 2005

ACD = November 2005
Difference = ACD – SCD = 17 days
BC = 17,135,594.30
AC = 18,847,803.70
Difference = AC – BC = 1,712,209.40

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 13/04/05 | 05/05/05 | 22 | 06/05/05 | 10/05/05 | 4 |
| 2 | 12/05/05 | 14/06/05 | 33 | 15/06/05 | 16/06/05 | 1 |
| 3 | 11/06/05 | 17/08/05 | 66 | 18/08/05 | 18/08/05 | 0 |
| 4 | 12/07/05 | 12/10/05 | 99 | 13/10/05 | 17/10/05 | 4 |
| | | | ∑ = 220<br>Average = 55.00 | | | ∑ = 9<br>Average = 2.25 |

## PROJECT 41

Type: Public
Nature: Chemistry Laboratory Block
Location of Project: Kaura Namoda, Zamfara State
Duration of Project: 12 weeks
SCD = February, 2002
ACD = April, 2002
Difference = ACD – SCD = 35 days
BC = 7,441,263.49
AC = 8,569,625.24
Difference = AC – BC = 1,128,361.75

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV | DPWD | DPWAM | DIPD |
| 1 | 30/12/01 | 09/01/02 | 10 | 10/01/02 | 15/01/02 | 5 |
| 2 | 29/01/02 | 11/02/02 | 13 | 12/02/02 | 14/02/02 | 2 |
| 3 | 28/02/02 | 21/03/02 | 21 | 23/03/02 | 27/03/02 | 4 |
| 4 | 30/03/02 | 23/04/02 | 24 | 24/04/02 | 25/04/02 | 1 |
| | | | ∑ = 68<br>Average = 17.00 | | | ∑ = 12<br>Average = 3.00 |

## PROJECT 42

Type: Public
Nature: Building (New Secretariat, Phase II)
Location of Project: Gusau (J. B. Secretariat)
Duration of Project: ??

SCD = 12/11/1999
ACD = 08/05/2001
Difference = ACD – SCD $\Rightarrow$ 365+18+93+28+30+8 = 542 days
BC = 120,000,000.00
AC = 165,000,000.00
Difference = AC – BC = 45,000,000.00

**PAYMENTS PATTERN**

| S/NO | VALUATIONS DATES (Days) | | | PAYMENTS DATES (Days) | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV | DPWD | DPWAM | DIPD |
| 1 | 25/01/00 | 11/02/00 | 17 | 25/02/00 | 02/03/00 | 6 |
| 2 | 15/03/00 | 21/04/00 | 37 | 02/05/00 | 30/05/00 | 28 |
| 3 | 27/05/00 | 23/06/00 | 27 | 06/07/00 | 01/08/00 | 26 |
| 4 | 18/07/00 | 19/07/00 | 1 | 03/08/00 | 31/03/00 | 28 |
| 5 | 22/08/00 | 22/08/00 | 0 | 04/09/00 | 28/09/00 | 24 |
| 6 | 20/10/00 | 21/11/00 | 12 | 05/12/00 | 30/12/00 | 25 |
| 7 | 19/01/01 | 09/05/01 | 11 | 23/05/01 | 01/06/01 | 9 |
| | | | $\sum$ = 204<br>Average = 29.14 | | | $\sum$ = 146<br>Average = 20.85 |

## PROJECT 43

Type: Public
Nature: Building (State's Sevretariat, Phase II – Multipurpose Hall)
Location of Project: Gusau
Duration of Project: ??
SCD = 03/02/2000
ACD = 19/11/2001
Difference = ACD – SCD = 25+155+90+19 = 289 days
BC = 175,000,000.00
AC = 187,000,000.00
Difference = AC – BC = 62,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV | DPWD | DPWAM | DIPD |
| 1 | 06/02/00 | 15/06/00 | 129 | 29/6/00 | 01/07/00 | 2 |
| 2 | 10/03/00 | 20/11/00 | 285 | 04/12/00 | 28/02/01 | 86 |
| 3 | 07/04/00 | 15/12/00 | 161 | 29/12/00 | 31/03/01 | 92 |
| 4 | 08/06/00 | 08/02/01 | 215 | 22/02/01 | 28/04/01 | 65 |
| 5 | 11/08/00 | 18/05/01 | 310 | 01/06/01 | 28/06/01 | 27 |
| 6 | 12/10/00 | 18/05/01 | 218 | 01/07/01 | 29/07/01 | 28 |
| 7 | 08/11/00 | 10/12/01 | 367 | 24/12/01 | 24/02/01 | 62 |

| | |
|---|---|
| ∑ = 1685<br>Average = 240.71 | ∑ = 362<br>Average = 51.71 |

## PROJECT 44

Type: Public
Nature: Building (Construction of Presidential Lodge 2)
Location of Project Gusau, Zamfara
Duration of Project: ??
SCD = 22/11/1999
ACD = 06/06/2001
Difference = ACD – SCD = 365+8+124+28+30+6 = 561 days
BC = 85,000,000.00
AC = 127,000,000.00
Difference = AC – BC = 42,000,000.00

**PAYMENTS PATTERN**

| S/NO | VALUATIONS DATES (Days) | | | PAYMENTS DATES (Days) | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV | DPWD | DPWAM | DIPD |
| 1 | 21/11/99 | 21/02/00 | 94 | 04/03/00 | 29/04/00 | 57 |
| 2 | 20/12/99 | 10/05/00 | 133 | 24/05/00 | 30/06/00 | 37 |
| 3 | 21/01/00 | 28/09/00 | 250 | 12/10/00 | 29/10/00 | 17 |
| 4 | 21/02/00 | 04/04/01 | 434 | 18/04/01 | 31/05/01 | 43 |
| 5 | 20/03/00 | 12/06/01 | 479 | 26/06/01 | 08/07/01 | 12 |
| | | | ∑ = 1390<br>Average = 278.00 | | | ∑ = 166<br>Average = 33.20 |

## PROJECT 45

Type: Public
Nature: Building (500 KVA Generator House)
Location of Project: Karua-Namoda, Zamfara State
Duration of Project: 8 weeks
SCD = June 1996
ACD = August 1997
Difference = ACD – SCD = 14 months ⇒ 14 xx 30 = 420 days
BC = 1,008,546.40
AC = 1,253,618.15
Difference = AC – BC = 245,071.75

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 16/05/96 | 26/07/96 | 71 | 27/07/96 | 03/08/96 | 8 |
| 2 | 14/06/96 | 08/04/97 | 298 | 09/04/97 | 15/04/97 | 6 |
| 3 | 13/07/96 | 27/08/97 | 410 | 28/08/97 | 02/09/97 | 5 |

| | |
|---|---|
| ∑ = 779<br>Average = 259.67 | ∑ = 19<br>Average = 6.33 |

## PROJECT 46

Type: Public
Nature: Building (Governor's Public Lounge and Mosque)
Location of Project: Gusau, Zamfara State
Duration of Project: ??
SCD = 12/05/2000
ACD = 01/09/2001
Difference = ACD – SCD = 365+19+62+30+1 = 477 days
BC = 115,000,000.00
AC = 125,780,000.00
Difference = AC – BC = 10,780,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 27/03/00 | 20/04/00 | 24 | 04/05/00 | 28/05/00 | 24 |
| 2 | 20/04/00 | 07/06/00 | 67 | 21/06/00 | 30/06/00 | 9 |
| 3 | 08/05/00 | 02/08/00 | 87 | 16/08/00 | 01/09/00 | 16 |
| 4 | 02/06/00 | 13/11/00 | 145 | 27/11/00 | 06/12/00 | 10 |
| 5 | 16/07/00 | 18/06/01 | 237 | 03/07/01 | 30/07/01 | 27 |
| 6 | 17/08/00 | 04/08/01 | 352 | 28/08/01 | 27/09/01 | 30 |
| | | | ∑ = 912<br>Average = 152.00 | | | ∑ = 116<br>Average = 19.33 |

## PROJECT 47

Type: Private
Nature: Building (Residential)
Location of Project: Bida, Niger State
Duration of Project: 1 year
SCD = 03/09/1991
ACD = 01/10/1991
Difference = ACD – SCD = 1 month = 28 days
BC = 5,500,000.00
AC = 5,800,000.00
Difference = AC – BC = 300,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/12/90 | 09/12/90 | 7 | 11/12/90 | 15/12/90 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 03/02/91 | 12/02/91 | 9 | 15/02/91 | 27/02/91 | 12 |
| 3 | 04/04/91 | 12/04/91 | 8 | 14/04/91 | 30/04/91 | 16 |
| 4 | 02/06/91 | 05/06/91 | 3 | 15/06/91 | 29/06/91 | 14 |
| 5 | 01/074/91 | 03/07/91 | 2 | 14/07/91 | 30/07/91 | 16 |
| 6 | 05/08/91 | 07/08/91 | 2 | 16/08/91 | 30/08/91 | 14 |
| | | | $\sum = 31$<br>Average = 5.17 | | | $\sum = 76$<br>Average = 12.67 |

## PROJECT 48

Type: Private
Nature: Building (Block of Flats)
Location of Project: Bida, Niger State
Duration of Project: 1.5 years
SCD = 30/06/2001
ACD = 30/12/2001
Difference = ACD – SCD = 6 months = 124+60 = 184 days
BC = 15,000,000.00
AC = 18,200,000.00
Difference = AC – BC = 3,200,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/02/01 | 15/02/01 | 13 | 20/02/01 | 25/02/01 | 5 |
| 2 | 01/04/01 | 07/04/01 | 6 | 21/04/01 | 27/04/01 | 6 |
| 3 | 02/06/01 | 30/05/01 | -2 | 15/06/01 | 28/06/01 | 13 |
| 4 | 01/08/01 | 03/08/01 | 2 | 09/08/01 | 17/08/01 | 8 |
| 5 | 03/10/01 | 07/10/02 | 4 | 15/10/01 | 27/10/01 | 12 |
| 6 | 13/12/01 | 15/12/01 | 2 | 15/12/01 | 20/12/01 | 5 |
| 7 | 03/03/02 | 03/03/02 | 0 | 10/03/02 | 30/03/02 | 20 |
| 8 | 02/05/02 | 13/05/02 | 11 | 15/05/02 | 29/05/02 | 14 |
| 9 | 01/08/02 | 07/08/02 | 6 | 18/08/02 | 27/08/02 | 9 |
| 10 | 03/10/02 | 15/10/02 | 12 | 15/10/02 | 30/10/02 | 15 |
| 11 | 01/11/02 | 30/10/03 | -2 | 13/11/02 | 27/11/02 | 14 |
| | | | $\sum = 52$<br>Average = 4.73 | | | $\sum = 121$<br>Average = 11.00 |

## PROJECT 49

Type: Private
Nature: Building (Students' Hostel)
Location of Project: Federal Polytechnic Bida, Niger State

Duration of Project: 6 months
SCD = 28/12/2001
ACD = 11/03/2003
Difference = ACD – SCD = 14 months ⇒ 365+3+31+28+11 = 438 days
BC = 12,000,000.00
AC = 13,725,117.00
Difference = AC – BC = 1,725,117.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 10/09/01 | 10/09/01 | 0 | 15/09/01 | 15/09/01 | 0 |
| 2 | 25/10/01 | 25/10/01 | 0 | 30/10/01 | 01/11/01 | 2 |
| 3 | 14/12/01 | 14/12/01 | 0 | 20/12/01 | 22/12/01 | 2 |
| 4 | 05/02/02 | 08/02/02 | 3 | 10/02/02 | 16/02/02 | 6 |
| 5 | 25/03/02 | 27/03/02 | 2 | 30/03/02 | 31/03/02 | 1 |
| 6 | 15/07/02 | 18/07/02 | 3 | 22/07/02 | 25/07/02 | 3 |
| 7 | 08/01/03 | 10/01/03 | 2 | 12/01/03 | 14/01/03 | 2 |
| | | | ∑ = 10<br>Average =1.43 | | | ∑ = 16<br>Average = 2.29 |

## PROJECT 50

Type: Private
Nature: Building (Residential)
Location of Project: Katsina
Duration of Project: 12 months
SCD = 01/01/2003
ACD = 14/01/2003
Difference = ACD – SCD = 2 weeks ⇒ 13 days
BC = 3,000,000.00
AC = 3,400,000.00
Difference = AC – BC = 400,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 19/01/02 | 19/01/02 | 0 | 19/01/02 | 21/01/02 | 2 |
| 2 | 09/02/02 | 09/02/02 | 0 | 09/02/02 | 14/02/02 | 5 |
| 3 | 02/03/02 | 02/03/02 | 0 | 02/03/02 | 06/03/02 | 4 |
| 4 | 23/03/02 | 23/03/02 | 0 | 23/03/02 | 27/03/02 | 4 |
| 5 | 13/04/02 | 13/04/02 | 0 | 13/04/02 | 18/04/02 | 5 |
| 6 | 04/05/02 | 04/05/02 | 0 | 04/05/02 | 09/05/02 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 | 25/05/02 | 25/05/02 | 0 | 25/05/02 | 01/06/02 | 7 |
| 8 | 15/06/02 | 15/06/02 | 0 | 15/06/02 | 20/06/02 | 5 |
| 9 | 06/07/02 | 06/07/02 | 0 | 06/07/02 | 11/07/02 | 5 |
| 10 | 27/07/02 | 27/07/02 | 0 | 27/07/02 | 05/08/02 | 9 |
| 11 | 17/08/02 | 17/08/02 | 0 | 17/08/02 | 19/08/02 | 2 |
| 12 | 07/09/02 | 07/09/02 | 0 | 07/09/02 | 11/09/02 | 4 |
| 13 | 28/09/02 | 28/09/02 | 0 | 28/09/02 | 03/10/02 | 5 |
| 14 | 19/10/02 | 19/10/02 | 0 | 19/10/02 | 23/10/02 | 4 |
| 15 | 09/11/02 | 09/11/02 | 0 | 09/11/02 | 15/11/02 | 6 |
| 16 | 30/11/02 | 30/11/02 | 0 | 30/11/02 | 10/12/02 | 10 |
| 17 | 21/12/02 | 21/12/02 | 0 | 21/12/02 | 05/01/03 | 15 |
| 18 | 11/01/03 | 11/01/03 | 0 | 11/01/03 | 15/01/03 | 4 |
| | | | $\sum = 0$<br>Average = 0.00 | | | $\sum = 101$<br>Average = 5.61 |

## PROJECT 51

Type: Public
Nature: Building (Ultra Modern Shopping Complex)
Location of Project: Ila, Osun State
Duration of Project: 10 months
SCD = 30/08/2001
ACD = 14/09/2001
Difference = ACD – SCD = 2 weeks $\Rightarrow$ 15 days
BC = 21,703,800.00
AC = 23,500,000.00
Difference = AC – BC = 2,203,800.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 01/11/00 | 01/11/00 | 0 | 15/11/00 | 17/11/00 | 2 |
| 2 | 30/12/00 | 30/12/00 | 0 | 05/01/01 | 05/01/01 | 0 |
| 3 | 14/01/01 | 18/01/01 | 4 | 20/01/01 | 21/01/01 | 1 |
| 4 | 14/02/01 | 14/02/01 | 0 | 18/02/01 | 20/02/01 | 2 |
| 5 | 27/02/01 | 28/02/01 | 1 | 02/03/01 | 02/03/01 | 0 |
| 6 | 04/04/01 | 04/04/01 | 0 | 04/04/01 | 15/06/01 | 72 |
| 7 | 25/04/01 | 27/04/01 | 2 | 27/04/01 | 18/06/01 | 52 |
| 8 | 19/05/01 | 21/05/01 | 2 | 25/05/01 | 30/07/01 | 66 |
| 9 | 21/06/01 | 21/06/01 | 0 | 30/06/01 | 08/08/01 | 39 |
| 10 | 28/06/01 | 30/06/01 | 2 | 05/07/01 | 10/08/01 | 36 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 11 | 19/07/01 | 19/07/01 | 0 | 21/07/01 | 25/09/01 | 66 |
| 12 | 05/08/01 | 07/08/01 | 2 | 25/08/01 | 30/10/01 | 66 |
| 13 | 10/09/01 | 12/09/01 | 2 | 15/09/01 | 20/11/01 | 56 |
| 14 | 15/09/01 | 15/09/01 | 0 | 17/10/01 | 24/12/01 | 68 |
| | | | $\sum = 15$<br>Average = 1.07 | | | $\sum = 526$<br>Average = 37.57 |

## PROJECT 52

Type: Public
Nature: Building (Primary Health Centre)
Location of Project: Ayegunle, Osun State
Duration of Project: 6 months
SCD = 01/11/2001
ACD = 13/01/2002
Difference = ACD – SCD = 11 weeks $\Rightarrow$ 29 + 31 + 13 = 73 days
BC = 36,220,000.00
AC = 42,540,000.00
Difference = AC – BC = 6,320,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 23/05/01 | 06/06/01 | 14 | 30/05/01 | 20/06/01 | 21 |
| 2 | 20/06/01 | 18/07/01 | 28 | 27/06/01 | 26/07/01 | 29 |
| 3 | 18/07/01 | 29/08/01 | 42 | 25/07/01 | 06/09/01 | 40 |
| 4 | 15/08/01 | 03/10/01 | 49 | 22/08/01 | 20/10/01 | 59 |
| 5 | 12/09/01 | 08/11/01 | 57 | 19/09/01 | 16/11/01 | 58 |
| 6 | 10/10/01 | 11/12/01 | 32 | 17/10/01 | 22/12/01 | 66 |
| 7 | 02/11/01 | 15/01/02 | 74 | 09/11/01 | 28/01/02 | 80 |
| | | | $\sum = 296$<br>Average = 42.29 | | | $\sum = 353$<br>Average = 50.43 |

## PROJECT 53

Type: Private
Nature: Building (Residential)
Location of Project: Minna, Niger State
Duration of Project: 4 months
SCD = 25/01/2004
ACD = 30/01/2004
Difference = ACD – SCD = 5 days
BC = 1,290,850.00
AC = 1,406,360.00
Difference = AC – BC = 115,510.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 03/10/03 | 03/10/03 | 0 | 03/10/03 | 03/10/03 | 0 |
| 2 | 10/10/03 | 11/10/03 | 1 | 11/10/03 | 13/10/03 | 2 |
| 3 | 17/10/03 | 17/10/03 | 0 | 17/10/03 | 18/10/03 | 1 |
| 4 | 31/10/03 | 01/11/03 | 1 | 01/11/03 | 01/11/03 | 0 |
| 5 | 07/11/03 | 08/11/03 | 1 | 08/11/03 | 10/11/03 | 2 |
| 6 | 28/11/03 | 29/11/03 | 1 | 29/11/03 | 29/11/03 | 0 |
| 7 | 05/12/03 | 06/12/03 | 1 | 06/12/03 | 06/12/03 | 0 |
| 8 | 13/12/03 | 13/12/03 | 0 | 13/12/03 | 13/12/03 | 0 |
| 9 | 20/12/03 | 22/12/03 | 2 | 22/12/03 | 22/12/03 | 0 |
| 10 | 29/12/03 | 10/01/04 | 12 | 10/01/03 | 12/01/04 | 2 |
| 11 | 16/01/04 | 17/01/04 | 1 | 17/01/04 | 19/01/04 | 2 |
| 12 | 23/01/04 | 23/01/04 | 0 | 23/01/04 | 23/01/04 | 0 |
| 13 | 30/01/04 | 31/01/04 | 1 | 31/01/04 | 31/01/04 | 0 |
| | | | $\sum = 21$<br>Average = 1.62 | | | $\sum = 9$<br>Average = 0.69 |

## PROJECT 54

Type: Public
Nature: Building (Residential)
Location of Project: Daura, Katsina State
Duration of Project: 18 months
SCD = 08/04/1999
ACD = 10/03/2000
Difference = ACD – SCD = 1 year $\Rightarrow$ 22 + 186 + 90 + 28 + 10 = 336 days
BC = 34,231,681.00
AC = 40,500,000.00
Difference = AC – BC = 6,268,319.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 15/11/97 | 12/02/98 | 99 | 15/02/98 | 29/02/98 | 14 |
| 2 | 08/06/98 | 12/06/98 | 4 | 18/06/98 | 05/07/98 | 17 |
| 3 | 15/01/99 | 20/01/99 | 5 | 27/01/99 | 07/02/99 | 11 |
| 4 | 09/06/99 | 07/07/99 | 28 | 15/08/99 | 29/09/99 | 45 |
| | | | $\sum = 136$<br>Average = 34.00 | | | $\sum = 37$<br>Average = 21.75 |

## PROJECT 55

Type: Private
Nature: Building (Residential)
Location of Project: Kaduna State
Duration of Project: 18 months
SCD = 25/09/2001
ACD = 03/10/2001
Difference = ACD – SCD = 1 week $\Rightarrow$ 8 days
BC = 14,539,750.00
AC = 14,600,000.00
Difference = AC – BC = 60,250.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/06/00 | 05/06/00 | 3 | 06/06/00 | 13/06/00 | 7 |
| 2 | 06/11/00 | 06/11/00 | 0 | 07/11/00 | 14/11/00 | 7 |
| 3 | 05/03/01 | 06/03/01 | 1 | 06/03/01 | 13/03/01 | 7 |
| 4 | 06/08/01 | 06/08/01 | 0 | 07/08/01 | 14/08/01 | 7 |
| 5 | 04/10/01 | 05/10/01 | 1 | 09/10/01 | 16/10/01 | 7 |
| 6 | 03/04/02 | 03/04/02 | 0 | 03/04/02 | 10/04/01 | 7 |
| | | | $\sum = 5$<br>Average = 0.83 | | | $\sum = 42$<br>Average = 7.00 |

## PROJECT 56

Type: Public
Nature: Building (Housing Complex)
Location of Project: Gusau, Zamfara State
Duration of Project: 15 months
SCD = 09/06/2001
ACD = 30/09/2001
Difference = ACD – SCD = 21+31+31+30 = 113 days
BC = 381,525,000.00
AC = 466,250,000.00
Difference = AC – BC = 84,725,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 21/02/00 | 21/02/00 | 0 | 28/02/00 | 02/03/00 | 2 |
| 2 | 12/05/00 | 12/05/00 | 0 | 22/05/00 | 06/06/00 | 15 |
| 3 | 15/09/00 | 18/05/00 | 3 | 27/09/00 | 29/10/00 | 32 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | 14/12/00 | 15/12/00 | 1 | 22/12/00 | 28/12/00 | 6 |
| 5 | 10/05/01 | 10/05/01 | 0 | 25/05/01 | 28/058/01 | 4 |
| 6 | 28/09/01 | 28/09/01 | 0 | 08/10/00 | 26/10/00 | 18 |
| | | | ∑ = 4<br>Average = 0.67 | | | ∑ = 77<br>Average = 12.83 |

## PROJECT 57

Type: Private
Nature: Building (Residential)
Location of Project: Kaduna
Duration of Project: 18 months
SCD = 27/08/2001
ACD = 08/09/2001
Difference = ACD – SCD = 2 weeks ⇒ 12 days
BC = 2,560,000.00
AC = 2,850,250.00
Difference = AC – BC = 290,250.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 27/03/00 | 28/03/00 | 1 | 30/03/00 | 06/04/00 | 7 |
| 2 | 28/06/00 | 01/07/00 | 3 | 03/07/00 | 10/07/00 | 7 |
| 3 | 27/09/00 | 30/09/00 | 3 | 02/10/00 | 09/10/00 | 7 |
| 4 | 13/12/00 | 16/12/00 | 3 | 18/12/00 | 18/12/00 | 0 |
| 5 | 22/02/01 | 24/02/01 | 2 | 26/02/01 | 02/03/01 | 4 |
| 6 | 31/05/01 | 02/06/01 | 2 | 04/06/01 | 11/06/01 | 7 |
| 7 | 27/08/01 | 08/09/01 | 12 | 10/09/01 | 17/09/01 | 7 |
| | | | ∑ = 26<br>Average = 3.71 | | | ∑ = 39<br>Average = 5.57 |

## PROJECT 58

Type: Private
Nature: Building (Shopping Complex)
Location of Project: Kaduna
Duration of Project: 15 months
SCD = 01/08/2000
ACD = 30/09/2000
Difference = ACD – SCD = 2 months ⇒ 30 x 2 = 60 days
BC = 31,215,935.00
AC = 32,535,000.00
Difference = AC – BC = 1,319,065.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 29/07/99 | 29/07/99 | 0 | 30/07/99 | 04/08/99 | 5 |
| 2 | 06/12/99 | 06/12/99 | 0 | 07/12/99 | 09/12/00 | 2 |
| 3 | 08/05/00 | 08/05/00 | 0 | 10/05/00 | 12/05/00 | 2 |
| 4 | 10/07/00 | 10/07/00 | 0 | 11/07/00 | 13/07/00 | 6 |
| 5 | 30/09/00 | 30/09/00 | 0 | 02/10/00 | 05/10/00 | 3 |
| | | | $\sum = 0$<br>Average = 0.00 | | | $\sum = 18$<br>Average = 3.60 |

## PROJECT 59

Type: Private
Nature: Building (Office Complex)
Location of Project: Kaduna
Duration of Project: 18 months
SCD = 05/12/2001
ACD = 15/01/2002
Difference = ACD – SCD = 1.5 months $\Rightarrow$ 26 15 = 41 days
BC = 45,850,200.00
AC = 46,700,500.00
Difference = AC – BC = 850,300.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 01/09/00 | 05/09/00 | 4 | 06/09/00 | 12/09/00 | 6 |
| 2 | 02/02/01 | 05/02/01 | 3 | 06/02/01 | 13/02/01 | 7 |
| 3 | 01/06/01 | 04/06/01 | 3 | 05/06/01 | 12/06/01 | 7 |
| 4 | 05/10/01 | 08/10/01 | 3 | 09/10/01 | 16/10/01 | 7 |
| 5 | 16/01/02 | 20/01/02 | 4 | 22/01/02 | 14/02/02 | 23 |
| | | | $\sum = 17$<br>Average = 3.40 | | | $\sum = 50$<br>Average = 10.00 |

## PROJECT 60

Type: Private
Nature: Building (Residential)
Location of Project: Maiduguri
Duration of Project: 3 months
SCD = 20/08/2001
ACD = 15/09/2001
Difference = ACD – SCD = 1 month $\Rightarrow$ 11 + 15 = 26 days

BC = 5,600,000.00
AC = 6,200,000.00
Difference = AC – BC = 600,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 29/06/01 | 01/07/01 | 2 | 08/07/01 | 09/07/01 | 1 |
| 2 | 26/07/01 | 28/07/01 | 2 | 04/08/01 | 06/08/01 | 2 |
| 3 | 15/08/01 | 27/08/01 | 12 | 29/08/01 | 29/08/01 | 0 |
| 4 | 03/09/01 | 08/09/01 | 5 | 13/09/01 | 15/09/01 | 2 |
| 5 | 02/10/01 | 06/10/01 | 4 | 27/10/01 | 30/10/01 | 3 |
| 6 | 05/11/01 | 07/11/01 | 2 | 09/11/01 | 15/11/01 | 6 |
| | | | ∑ = 27<br>Average = 4.50 | | | ∑ = 14<br>Average = 2.33 |

## PROJECT 61

Type: Not indicated
Nature: Building (Laboratory)
Location of Project: Hadeja
Duration of Project: 4.5 months
SCD = 18/06/1997
ACD = 20/06/1997
Difference = ACD – SCD = 2 days
BC = 8,000,000.00
AC = 9,347,540.00
Difference = AC – BC = 1,347,540.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 24/04/97 | 30/04/97 | 6 | 07/05/97 | 11/05/97 | 4 |
| 2 | 09/05/97 | 11/05/97 | 2 | 15/05/97 | 30/05/97 | 15 |
| 3 | 27/06/97 | 29/06/97 | 2 | 30/06/97 | 02/07/97 | 2 |
| 4 | 21/07/97 | 23/07/97 | 2 | 27/07/97 | 28/07/97 | 1 |
| 5 | 30/08/97 | 02/09/97 | 3 | 05/09/97 | 11/09/97 | 6 |
| | | | ∑ = 15<br>Average = 3.00 | | | ∑ = 28<br>Average = 5.60 |

## PROJECT 62

Type: Private
Nature: Building (Hospital)

Location of Project: Mubi Town
Duration of Project: 18 months
SCD = 05/12/1996
ACD = 25/12/1996
Difference = ACD – SCD = 3 weeks ⇒ 20 days
BC = 30,000,000.00
AC = 32,712,500.00
Difference = AC – BC = 2,712,500.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 11/08/94 | 13/08/94 | 2 | 20/08/94 | 22/08/94 | 2 |
| 2 | 20/09/94 | 23/09/94 | 3 | 30/09/94 | 02/10/94 | 2 |
| 3 | 21/10/94 | 24/10/94 | 3 | 05/11/94 | 09/11/94 | 4 |
| 4 | 17/12/94 | 21/11/94 | 4 | 29/11/94 | 04/12/94 | 5 |
| 5 | 26/12/94 | 26/12/94 | 0 | 05/01/95 | 03/02/95 | 29 |
| 6 | 09/02/95 | 13/02/95 | 4 | 25/02/95 | 28/02/95 | 3 |
| 7 | 02/03/95 | 11/03/95 | 9 | 18/03/95 | 21/03/95 | 3 |
| 8 | 05/06/95 | 07/06/95 | 2 | 14/06/95 | 17/06/95 | 3 |
| 9 | 01/07/95 | 06/07/95 | 5 | 13/07/95 | 20/07/95 | 7 |
| 10 | 19/08/95 | 21/08/95 | 2 | 26/08/95 | 29/09/95 | 34 |
| 11 | 11/11/95 | 16/11/95 | 5 | 23/11/95 | 10/12/95 | 17 |
| 12 | 15/02/96 | 17/02/96 | 2 | 23/02/96 | 11/03/96 | 16 |
| 13 | 05/05/96 | 09/05/96 | 4 | 16/05/96 | 20/06/96 | 4 |
| 14 | 06/08/96 | 11/08/96 | 5 | 28/08/96 | 02/09/96 | 5 |
| 15 | 17/10/96 | 21/10/96 | 4 | 26/10/96 | 03/11/96 | 8 |
| 16 | 02/12/96 | 04/12/96 | 2 | 11/12/96 | 15/01/97 | 35 |
| | | | ∑ = 56<br>Average = 3.50 | | | ∑ = 177<br>Average = 11.06 |

## PROJECT 63

Type: Public
Nature: Building (Niger State Gov. Dep. Gov. Lodge)
Location of Project: Abuja
Duration of Project: 52 weeks
SCD = 01/03/1994
ACD = 30/03/1996
Difference = ACD – SCD = 2 years ⇒ 365+365+29 = 759 days
BC = 28,798,440.00
AC = 82,648,422.00
Difference = AC – BC = 53,849,982.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 01/05/93 | 01/05/93 | 0 | 28/05/93 | 29/06/93 | 32 |
| 2 | 01/07/93 | 01/07/93 | 0 | 24/07/93 | 23/08/93 | 30 |
| 3 | 20/08/93 | 20/08/93 | 0 | 25/09/93 | 27/10/93 | 32 |
| 4 | 01/11/93 | 01/11/93 | 0 | 01/12/93 | 03/01/94 | 33 |
| 5 | 03/02/94 | 03/02/94 | 0 | 04/03/94 | 05/04/94 | 32 |
| 6 | 15/04/94 | 15/04/94 | 0 | 15/05/94 | 16/06/94 | 32 |
| 7 | 01/05/94 | 01/05/94 | 0 | 05/06/94 | 04/07/94 | 29 |
| 8 | 05/06/94 | 05/06/94 | 0 | 13/07/94 | 15/08/94 | 33 |
| 9 | 02/07/94 | 02/07/94 | 0 | 20/09/94 | 24/10/94 | 34 |
| 10 | 08/08/94 | 08/08/94 | 0 | 20/11/94 | 21/12/94 | 31 |
| 11 | 01/12/94 | 01/12/94 | 0 | 15/01/95 | 14/02/95 | 30 |
| 12 | 03/01/95 | 03/01/95 | 0 | 15/04/95 | 18/05/95 | 33 |
| 13 | 05/02/95 | 05/02/95 | 0 | 05/06/95 | 03/07/95 | 28 |
| 14 | 03/06/95 | 03/06/95 | 0 | 20/07/95 | 25/08/95 | 36 |
| 15 | 05/07/95 | 05/07/95 | 0 | 05/08/95 | 07/09/95 | 33 |
| 16 | 06/08/95 | 06/08/95 | 0 | 11/11/95 | 11/12/95 | 31 |
| 17 | 10/08/95 | 10/08/95 | 0 | 12/10/95 | 10/11/95 | 29 |
| 18 | 02/12/95 | 02/01/95 | 31 | 30/01/96 | 10/02/96 | 11 |
| | | | $\sum = 31$<br>Average = 1.72 | | | $\sum = 549$<br>Average = 30.50 |

## PROJECT 64

Type: Public
Nature: Building (Basic Health Centre)
Location of Project: Kura
Duration of Project: 3 months
SCD = 15/12/1992
ACD = 09/03/1993
Difference = ACD – SCD = 3 months $\Rightarrow$ 16+31+28+9 = 84 days
BC = 2,285,808.00
AC = 2,650,000.00
Difference = AC – BC = 364,192.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 15/10/92 | 12/11/92 | 28 | 16/09/92 | 16/09/92 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 01/12/92 | 31/12/92 | 30 | 31/12/92 | 05/01/93 | 5 |
| 3 | 03/03/93 | 12/07/93 | 131 | 12/07/93 | 27/07/93 | 15 |
| | | | ∑ = 189<br>Average = 63.00 | | | ∑ = 20<br>Average = 6.67 |

## PROJECT 65

Type: Public
Nature: Building (Admin Block)
Location of Project: Bida
Duration of Project: 12 weeks
SCD = 15/03/2001
ACD = 11/08/2004
Difference = ACD – SCD = 3 years, 5 months⇒(365x3)+16+62+60+11=1,244 days
BC = 5,699,551.00
AC = 7,183,321.00
Difference = AC – BC = 1,483,770.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/01/01 | 26/02/01 | 55 | 26/02/01 | 22/03/01 | 24 |
| 2 | 15/06/01 | 10/08/01 | 115 | 10/08/01 | 06/09/01 | 27 |
| 3 | 03/03/02 | 07/07/02 | 126 | 07/07/02 | 05/08/02 | 29 |
| 4 | 28/01/03 | 02/03/03 | 33 | 02/03/03 | 31/03/03 | 29 |
| 5 | 01/04/04 | 07/05/04 | 36 | 07/05/04 | 04/06/04 | 28 |
| 6 | 05/05/04 | 15/07/04 | 71 | 15/07/04 | 12/08/04 | 30 |
| | | | ∑ = 436<br>Average = 72.67 | | | ∑ = 167<br>Average = 27.83 |

## PROJECT 66

Type: Public
Nature: Building (Residential)
Location of Project: Sokoto
Duration of Project: 3 months
SCD = 20/01/2005
ACD = 24/03/2005
Difference = ACD – SCD = 2 months ⇒ 11 + 28 + 24 = 63 days
BC = 3,500,000.00
AC = 3,800,000.00
Difference = AC – BC = 300,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 21/11/04 | 21/11/04 | 0 | 21/11/04 | 30/11/04 | 9 |
| 2 | 20/12/04 | 23/12/04 | 3 | 23/12/04 | 29/12/04 | 6 |
| 3 | 20/01/05 | 26/01/05 | 6 | 25/01/05 | 25/03/05 | 59 |
| | | | ∑ = 9<br>Average = 3.00 | | | ∑ = 74<br>Average = 24.67 |

## PROJECT 67

Type: Public
Nature: Building (Mopol Barracks)
Location of Project: Birnin Kebbi
Duration of Project: 8 months
SCD = 01/11/2004
ACD = 20/12/2004
Difference = ACD – SCD = 49 days
BC = 21,000,000.00
AC = 23,000,000.00
Difference = AC – BC = 2,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 14/06/04 | 25/06/04 | 11 | 18/06/04 | 30/06/04 | 12 |
| 2 | 14/10/04 | 16/10/04 | 2 | 28/10/04 | 01/11/04 | 3 |
| 3 | 21/11/04 | 25/11/04 | 4 | 25/11/04 | 03/12/04 | 9 |
| | | | ∑ = 17<br>Average = 5.67 | | | ∑ = 25<br>Average = 8.34 |

## PROJECT 68

Type: Private
Nature: Building (Residential)
Location of Project: Kano
Duration of Project: 1 year
SCD = 22/04/2004
ACD = 30/04/2004
Difference = ACD – SCD = 1 week ⇒ 8 days
BC = 3,500,000.00
AC = 3,750,000.00
Difference = AC – BC = 250,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 08/06/03 | 08/06/03 | 0 | 17/06/03 | 24/06/03 | 7 |
| 2 | 15/08/03 | 15/08/03 | 0 | 15/08/03 | 24/08/03 | 9 |
| 3 | 19/09/03 | 20/09/03 | 1 | 25/09/03 | 30/09/03 | 5 |
| 4 | 07/10/03 | 08/10/03 | 1 | 20/10/03 | 25/10/03 | 5 |
| 5 | 04/11/03 | 05/11/03 | 1 | 07/11/03 | 19/11/03 | 12 |
| 6 | 03/12/03 | 03/12/03 | 0 | 05/12/03 | 13/12/03 | 8 |
| 7 | 02/01/04 | 02/01/04 | 1 | 03/01/04 | 08/01/04 | 5 |
| 8 | 01/02/04 | 01/02/04 | 0 | 03/02/04 | 07/02/04 | 4 |
| 9 | 06/03/04 | 08/03/04 | 2 | 10/03/04 | 12/03/04 | 2 |
| 10 | 09/04/04 | 10/04/04 | 1 | 15/04/04 | 30/04/04 | 15 |
| | | | $\sum = 7$<br>Average = 0.70 | | | $\sum = 72$<br>Average = 7.20 |

## PROJECT 69

Type: Public
Nature: Building (Shopping Mall)
Location of Project: Dutse
Duration of Project: 6 months
SCD = 22/12/1993
ACD = 07/01/1994
Difference = ACD – SCD = 2 weeks $\Rightarrow$ 9 + 7 = 16 days
BC = 2,000,000.00
AC = 2,100,000.00
Difference = AC – BC = 100,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 22/06/93 | 22/06/93 | 0 | 29/06/93 | 30/06/93 | 1 |
| 2 | 20/07/93 | 23/07/93 | 3 | 25/07/93 | 30/07/93 | 5 |
| 3 | 12/09/93 | 17/09/93 | 5 | 20/09/93 | 23/09/93 | 3 |
| 4 | 30/10/93 | 21/11/93 | 22 | 23/11/93 | 25/11/93 | 2 |
| 5 | 05/12/93 | 07/12/93 | 2 | 10/12/93 | 15/12/93 | 5 |
| 6 | 06/01/94 | 07/01/94 | 1 | 14/01/94 | 19/01/94 | 5 |
| | | | $\sum = 33$<br>Average = 5.50 | | | $\sum = 21$<br>Average = 3.50 |

## PROJECT 70

Type: Private
Nature: Building (3 Bedroom Flat)
Location of Project: Technical Road, Iggarra, Akoko-Edo, Edo State
Duration of Project: 6 months
SCD = 28/03/2002
ACD = 16/04/2002
Difference = ACD – SCD = 3 weeks $\Rightarrow$ 4 + 15 = 19 days
BC = 1,250,000.00
AC = 1,550,000.00
Difference = AC – BC = 300,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 12/10/01 | 12/10/01 | 0 | 14/10/01 | 15/10/01 | 1 |
| 2 | 14/11/01 | 14/11/01 | 0 | 16/11/02 | 16/11/02 | 0 |
| 3 | 10/12/01 | 15/12/01 | 3 | 12/12/01 | 15/12/01 | 3 |
| 4 | 29/12/01 | 30/12/01 | 1 | 30/12/01 | 31/12/01 | 1 |
| 5 | 24/01/02 | 24/01/02 | 0 | 24/01/02 | 24/01/02 | 0 |
| 6 | 15/02/02 | 16/02/02 | 1 | 17/02/02 | 20/02/02 | 3 |
| 7 | 06/03/02 | 07/03/02 | 1 | 08/03/02 | 08/03/02 | 0 |
| 8 | 29/03/02 | 30/03/02 | 1 | 31/03/02 | 31/03/02 | 0 |
| 9 | 15/04/02 | 15/04/02 | 0 | 15/04/02 | 15/04/02 | 0 |
| | | | $\sum = 7$<br>Average = 0.78 | | | $\sum = 8$<br>Average = 0.89 |

## PROJECT 71

Type: Public
Nature: Building (Residential)
Location of Project: Gombe
Duration of Project: 10 weeks
SCD = 09/05/2000
ACD = 01/08/2000
Difference = ACD – SCD = 2 months, 3 weeks $\Rightarrow$ 22 + 30 + 31 + 1 = 84 days
BC = 23,769,850.00
AC = 27,774,622.80
Difference = AC – BC = 4,007,772.80

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 28/03/00 | 28/03/00 | 0 | 28/03/00 | 29/03/00 | 1 |
| 2 | 25/04/00 | 25/04/00 | 0 | 25/04/00 | 25/04/00 | 0 |
| 3 | 23/05/00 | 23/05/00 | 0 | 23/05/00 | 23/05/00 | 0 |
| 4 | 20/06/00 | 20/06/00 | 0 | 20/06/00 | 23/06/00 | 3 |
| 5 | 18/07/00 | 18/07/00 | 0 | 18/07/00 | 18/07/00 | 0 |
| 6 | 01/08/00 | 01/08/00 | 0 | 01/08/00 | 25/08/00 | 24 |
| | | | $\sum = 0$<br>Average = 0.00 | | | $\sum = 28$<br>Average = 4.67 |

## PROJECT 72

Type: Not indicated
Nature: Building (Hospital)
Location of Project: Kano Town
Duration of Project: 30 months
SCD = 05/12/1997
ACD = 25/01/1998
Difference = ACD – SCD = 7 weeks $\Rightarrow$ 26 + 25 = 51 days
BC = 28,000,000.00
AC = 30,000,000.00
Difference = AC – BC = 2,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 09/08/95 | 11/08/95 | 2 | 20/08/95 | 22/08/95 | 2 |
| 2 | 20/09/95 | 23/09/95 | 3 | 30/09/95 | 02/10/95 | 2 |
| 3 | 21/10/95 | 24/10/95 | 3 | 07/11/95 | 10/11/95 | 3 |
| 4 | 17/11/95 | 20/11/95 | 3 | 29/11/95 | 05/12/95 | 6 |
| 5 | 27/12/95 | 27/12/95 | 0 | 04/01/96 | 03/02/96 | 30 |
| 6 | 10/02/95 | 15/02/96 | 5 | 25/02/96 | 29/02/96 | 4 |
| 7 | 03/03/96 | 11/03/96 | 8 | 18/03/96 | 20/05/96 | 63 |
| 8 | 05/06/93 | 07/06/96 | 2 | 15/06/96 | 16/06/96 | 1 |
| 9 | 02/07/96 | 08/07/96 | 6 | 13/07/96 | 21/07/96 | 8 |
| 10 | 09/08/96 | 21/08/96 | 12 | 26/08/96 | 29/09/96 | 34 |
| 11 | 11/11/96 | 16/11/96 | 5 | 23/11/96 | 10/12/96 | 18 |
| 12 | 15/01/97 | 17/02/97 | 33 | 23/02/97 | 11/03/97 | 16 |
| 13 | 05/05/97 | 09/05/97 | 4 | 17/05/97 | 20/06/97 | 34 |
| 14 | 06/08/97 | 11/08/97 | 5 | 28/08/97 | 02/09/97 | 5 |
| 15 | 17/10/97 | 21/10/97 | 4 | 27/10/97 | 03/11/97 | 7 |
| 16 | 02/12/97 | 04/12/97 | 2 | 11/12/97 | 25/01/98 | 45 |

| | |
|---|---|
| ∑ = 97<br>Average = 6.06 | ∑ = 278<br>Average = 17.38 |

## PROJECT 73

Type: Not indicated
Nature: Building (Residential)
Location of Project: Kano
Duration of Project: 6 months
SCD = 07/01/2002
ACD = 16/02/2002
Difference = ACD – SCD = 6 weeks = 40 days
BC = 12,358,900.68
AC = 12,858,905.00
Difference = AC – BC = 500,005.32

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 21/08/01 | 22/08/01 | 1 | 21/08/01 | 27/08/01 | 6 |
| 2 | 21/09/01 | 24/09/01 | 3 | 21/09/01 | 28/09/01 | 7 |
| 3 | 21/10/01 | 24/10/01 | 3 | 21/10/01 | 01/11/01 | 11 |
| 4 | 21/12/01 | 26/12/01 | 5 | 21/12/01 | 28/12/01 | 7 |
| 5 | 21/01/02 | 22/01/02 | 1 | 21/01/02 | 15/03/02 | 53 |
| | | | ∑ = 13<br>Average = 2.60 | | | ∑ = 84<br>Average = 16.80 |

## PROJECT 74

Type: Not indicated
Nature: Building (Office/Shopping Complex)
Location of Project: Kaduna South
Duration of Project: 12 months
SCD = 01/01/2003
ACD = 30/01/2003
Difference = ACD – SCD = 4 weeks ⇒ 29 days
BC = 476,668,150.00
AC = 498,769,216.00
Difference = AC – BC = 22,101,066.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 04/02/02 | 06/03/02 | 2 | 04/03/02 | 11/03/02 | 7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 04/04/02 | 05/04/02 | 1 | 04/04/02 | 12/04/02 | 8 |
| 3 | 04/06/02 | 10/06/02 | 6 | 04/06/02 | 13/06/02 | 9 |
| 4 | 04/07/02 | 08/07/02 | 1 | 04/07/02 | 12/07/02 | 8 |
| 5 | 04/08/02 | 05/08/02 | 1 | 04/08/02 | 19/08/02 | 15 |
| 6 | 04/09/02 | 09/09/02 | 5 | 04/09/02 | 23/09/02 | 19 |
| 7 | 04/11/02 | 04/11/02 | 0 | 04/11/02 | 19/11/02 | 15 |
| 8 | 04/02/03 | 25/02/03 | 21 | 04/02/03 | 27/03/03 | 41 |
| | | | $\sum = 37$<br>Average = 4.62 | | | $\sum = 122$<br>Average = 15.25 |

## PROJECT 75

Type: Public
Nature: Building (Hostel)
Location of Project: Nassarawa
Duration of Project: 16 weeks
SCD = 13/09/2002
ACD = 15/11/2002
Difference = ACD – SCD = 8 weeks $\Rightarrow$ 17 + 31 + 15 = 63 days
BC = 17,973,127.00
AC = 23,554,750.00
Difference = AC – BC = 5,681,623.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 13/06/02 | 17/06/02 | 4 | 17/06/02 | 21/06/02 | 4 |
| 2 | 15/07/02 | 18/07/02 | 3 | 18/06/02 | 08/08/02 | 51 |
| 3 | 12/08/02 | 15/08/02 | 3 | 15/08/02 | 13/09/02 | 29 |
| 4 | 13/09/02 | 16/09/02 | 3 | 16/09/02 | 07/10/02 | 21 |
| 5 | 11/10/02 | 14/01/02 | 3 | 14/10/02 | 21/10/02 | 7 |
| 6 | 13/11/02 | 15/11/02 | 2 | 15/11/02 | 22/11/02 | 7 |
| | | | $\sum = 18$<br>Average = 3.00 | | | $\sum = 119$<br>Average = 19.83 |

## PROJECT 76

Type: Private
Nature: Building (Residential)
Location of Project: Abuja
Duration of Project: 10 weeks
SCD = 10/112/2001
ACD = 24/11/2001
Difference = ACD – SCD = 2 weeks $\Rightarrow$ 14 days

BC = 5,800,000.00
AC = 8,693,012.00
Difference = AC – BC = 2,893,012.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 01/10/01 | 04/10/01 | 3 | 04/10/01 | 05/10/01 | 1 |
| 2 | 01/11/01 | 02/11/01 | 1 | 02/11/01 | 05/11/01 | 3 |
| 3 | 03/12/01 | 06/12/01 | 3 | 06/12/01 | 07/12/01 | 1 |
| | | | ∑ = 7<br>Average = 1.75 | | | ∑ = 5<br>Average = 1.25 |

## PROJECT 77

Type: Private
Nature: Building (Residential)
Location of Project: Abuja
Duration of Project: 12 weeks
SCD = 15/01/2000
ACD = 29/01/2000
Difference = ACD – SCD = 2 weeks ⇒ 14 days
BC = 11,817,304.00
AC = 15,782,921.00
Difference = AC – BC = 3,965,617.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 18/11/99 | 19/11/99 | 1 | 19/11/99 | 22/11/99 | 3 |
| 2 | 20/12/99 | 22/12/99 | 2 | 22/12/99 | 24/12/99 | 2 |
| 3 | 17/01/00 | 19/01/00 | 2 | 19/01/00 | 24/01/00 | 5 |
| | | | ∑ = 5<br>Average = 1.67 | | | ∑ = 10<br>Average = 3.33 |

## PROJECT 78

Type: Private
Nature: Building (Laboratory)
Location of Project: Isa
Duration of Project: 14 months
SCD = 07/05/1992
ACD = 21/09/1992
Difference = ACD – SCD = 4 months, 2 weeks ⇒ 24+62+30+21 = 137 days
BC = 11,385,221.50

AC = 11,996,634.75
Difference = AC – BC = 611,413.25

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 30/04/91 | 30/04/91 | 0 | 07/05/91 | 27/05/91 | 20 |
| 2 | 16/07/91 | 24/09/91 | 70 | 03/09/91 | 13/09/91 | 10 |
| 3 | 17/12/91 | 18/12/91 | 1 | 23/12/91 | 30/12/91 | 7 |
| 4 | 09/02/92 | 13/02/92 | 4 | 17/02/92 | 24/02/92 | 7 |
| 5 | 23/05/92 | 23/05/92 | 0 | 30/05/92 | 07/06/92 | 8 |
| 6 | 15/07/92 | 16/07/92 | 1 | 26/07/92 | 03/08/92 | 8 |
| 7 | 21/09/92 | 21/09/92 | 0 | 28/09/92 | 06/10/92 | 8 |
| | | | ∑ = 76<br>Average = 10.86 | | | ∑ = 68<br>Average = 9.71 |

## PROJECT 79

Type: Public
Nature: Building (Residential)
Location of Project: Isa
Duration of Project: 18 months
SCD = 21/12/2003
ACD = 28/03/2004
Difference = ACD – SCD = 3 months, 1 weeks ⇒ 10+31+28+28 = 97 days
BC = 23,432,126.18
AC = 24,543,138.26
Difference = AC – BC = 1,102,012.08

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 12/11/02 | 13/12/02 | 32 | 20/12/02 | 27/12/02 | 7 |
| 2 | 17/06/03 | 17/06/03 | 0 | 24/06/03 | 30/06/03 | 6 |
| 3 | 21/09/03 | 26/09/03 | 5 | 03/10/03 | 07/10/03 | 4 |
| 4 | 21/12/03 | 29/03/04 | 98 | 05/04/04 | 19/04/04 | 14 |
| | | | ∑ = 135<br>Average = 33.75 | | | ∑ = 31<br>Average = 7.75 |

## PROJECT 80

Type: Public
Nature: Building (Hospital)
Location of Project: Bafarawa

Duration of Project: 35 months
SCD = 25/06/2002
ACD = 09/08/2002
Difference = ACD – SCD = 1 month, 2 weeks ⇒ 5+31+9 = 45 days
BC = 45,872,522.82
AC = 46,987,634.90
Difference = AC – BC = 1,115,112.08

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 25/01/99 | 25/01/99 | 0 | 27/01/99 | 28/01/99 | 1 |
| 2 | 11/04/99 | 21/04/99 | 2 | 21/04/99 | 28/04/99 | 7 |
| 3 | 15/09/99 | 22/09/99 | 7 | 29/09/99 | 08/10/99 | 9 |
| 4 | 17/12/99 | 17/12/99 | 0 | 24/12/99 | 26/12/99 | 2 |
| 5 | 28/02/01 | 14/03/01 | 14 | 21/03/99 | 28/03/99 | 7 |
| 6 | 18/08/01 | 19/08/01 | 1 | 26/08/01 | 27/08/01 | 1 |
| 7 | 09/11/01 | 11/11/01 | 2 | 18/11/01 | 19/11/01 | 1 |
| 8 | 12/02/02 | 13/02/02 | 1 | 27/02/02 | 28/02/02 | 1 |
| 9 | 19/04/02 | 24/04/02 | 5 | 02/05/02 | 05/05/02 | 3 |
| 10 | 25/06/02 | 16/08/02 | 69 | 05/09/02 | 12/09/02 | 7 |
| | | | ∑ = 101<br>Average = 10.10 | | | ∑ = 39<br>Average = 3.90 |

## PROJECT 81

Type: Public
Nature: Building (Lecture Theatre)
Location of Project: Gusau
Duration of Project: 12 months
SCD = 14/09/2003
ACD = 14/03/2004
Difference = ACD – SCD = 6 months ⇒ 16+93+30+28+14 = 181 days
BC = 18,602,000.00
AC = 20,000,000.00
Difference = AC – BC = 1,398,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 20/10/02 | 20/10/02 | 0 | 26/10/02 | 26/10/02 | 0 |
| 2 | 10/12/02 | 11/12/02 | 1 | 15/12/02 | 17/12/02 | 2 |
| 3 | 20/02/03 | 20/02/03 | 0 | 22/02/03 | 22/02/03 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | 18/04/03 | 20/04/03 | 2 | 10/05/03 | 11/05/03 | 1 |
| 5 | 17/07/03 | 18/07/03 | 1 | 22/07/03 | 22/07/03 | 0 |
| 6 | 14/09/03 | 14/09/03 | 0 | 16/09/03 | 17/09/03 | 1 |
| 7 | 28/12/03 | 28/12/03 | 0 | 02/01/03 | 02/01/03 | 0 |
| 8 | 10/02/04 | 10/02/04 | 0 | 16/02/04 | 26/02/04 | 10 |
| 9 | 18/03/04 | 25/03/04 | 7 | 01/04/04 | 10/04/04 | 9 |
| | | | $\sum = 11$<br>Average = 1.22 | | | $\sum = 23$<br>Average = 2.56 |

## PROJECT 82

Type: Public
Nature: Building (Residential)
Location of Project: Kaduna
Duration of Project: 1 year
SCD = 01/02/1999
ACD = 15/02/1999
Difference = ACD – SCD = 2 weeks $\Rightarrow$ 14 days
BC = 2,500,000.00
AC = 2,650,000.00
Difference = AC – BC = 150,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/03/98 | 02/03/98 | 0 | 12/03/98 | 18/03/98 | 6 |
| 2 | 20/04/98 | 20/04/98 | 0 | 23/04/98 | 26/04/98 | 3 |
| 3 | 30/05/98 | 30/05/98 | 0 | 02/05/98 | 05/05/98 | 3 |
| 4 | 06/06/98 | 06/06/98 | 0 | 10/06/98 | 15/06/98 | 5 |
| 5 | 18/07/98 | 18/07/98 | 0 | 24/07/98 | 28/07/98 | 4 |
| 6 | 30/08/98 | 30/08/98 | 0 | 05/09/98 | 09/09/98 | 4 |
| 7 | 12/10/98 | 12/10/98 | 0 | 15/10/98 | 17/10/98 | 2 |
| 8 | 18/11/98 | 18/11/98 | 0 | 22/11/98 | 26/11/98 | 4 |
| 9 | 28/12/98 | 28/12/98 | 0 | 31/12/98 | 03/01/99 | 3 |
| 10 | 05/02/99 | 05/02/99 | 0 | 10/02/99 | 15/12/99 | 5 |
| | | | $\sum = 0$<br>Average = 0.00 | | | $\sum = 39$<br>Average = 3.90 |

## PROJECT 83

Type: Public
Nature: Building (Office Complex)
Location of Project: Kano
Duration of Project: 56 weeks

SCD = 08/09/2002
ACD = 19/05/2004
Difference = ACD – SCD = 33 weeks ⇒ 365+22+124+60+28+19 = 618 days
BC = 1,650,802,837.00
AC = 2,034,821,418.00
Difference = AC – BC = 384,018,581.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | Not indicated | 06/08/99 | - | 03/09/99 | 10/02/00 | 160 |
| 2 | Not indicated | 24/02/00 | - | 22/03/00 | 31/05/00 | 70 |
| 3 | Not indicated | 27/03/00 | - | 24/04/00 | 03/07/00 | 70 |
| 4 | Not indicated | 14/07/00 | - | 12/08/00 | 13/09/00 | 32 |
| 5 | Not indicated | 26/09/00 | - | 23/10/00 | 22/11/00 | 30 |
| 6 | Not indicated | 16/10/00 | - | 14/11/00 | 01/12/00 | 18 |
| 7 | Not indicated | 11/12/00 | - | 09/01/01 | 15/02/01 | 37 |
| 8 | Not indicated | 15/03/01 | - | 12/04/01 | 06/06/01 | 55 |
| 9 | Not indicated | 30/05/01 | - | 28/06/01 | 23/07/01 | 25 |
| 10 | Not indicated | 02/07/01 | - | 30/07/01 | 23/08/01 | 24 |
| 11 | Not indicated | 06/09/01 | - | 04/10/01 | 05/11/01 | 32 |
| 12 | Not indicated | 23/11/01 | - | 21/12/01 | 07/02/02 | 48 |
| 13 | Not indicated | 10/12/01 | - | 07/01/02 | 07/02/02 | 31 |
| 14 | Not indicated | 08/04/02 | - | 05/05/02 | 19/06/02 | 45 |
| 15 | Not indicated | 29/04/02 | - | 27/05/02 | 19/06/02 | 23 |
| 16 | Not indicated | 06/06/02 | - | 04/07/02 | 31/07/02 | 27 |
| 17 | Not indicated | 05/08/02 | - | 02/09/02 | 30/09/02 | 28 |
| 18 | Not indicated | 25/10/02 | - | 22/11/02 | 08/01/02 | 47 |
| 19 | Not indicated | 11/12/02 | - | 08/01/03 | 05/02/03 | 28 |
| 20 | Not | 05/03/03 | - | 02/04/03 | 23/04/03 | 21 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | indicated | | | | | |
| 21 | Not indicated | 05/05/03 | - | 03/06/03 | 30/09/03 | 119 |
| 22 | Not indicated | 26/06/03 | - | 21/07/03 | 30/09/03 | 71 |
| 23 | Not indicated | 31/10/03 | - | 28/11/03 | 27/01/04 | 60 |
| | | | ∑ = –<br>Average = – | | | ∑ = 1,101<br>Average = 47.87 |

## PROJECT 84

Type: Private
Nature: Building (Shopping Complex)
Location of Project: Suleja
Duration of Project: 40 weeks
SCD = 08/07/2002
ACD = 04/12/2002
Difference = ACD – SCD = 19 weeks ⇒ 23+62+60+4 = 149 days
BC = 586,234,018.00
AC = 652,068,098.22
Difference = AC – BC = 65,834,080.22

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 10/11/01 | 10/11/01 | 0 | 08/12/02 | 16/12/01 | 4 |
| 2 | 10/12/01 | 10/12/01 | 0 | 07/01/02 | 12/01/02 | 5 |
| 3 | 10/01/02 | 10/01/02 | 0 | 07/02/02 | 08/02/02 | 1 |
| 4 | 10/02/02 | 10/02/02 | 0 | 10/03/02 | 26/03/02 | 16 |
| 5 | 10/03/02 | 12/03/02 | 2 | 04/04/02 | 09/04/02 | 5 |
| 6 | 10/04/02 | 15/04/02 | 5 | 12/05/02 | 14/05/02 | 2 |
| 7 | 10/05/02 | 13/05/02 | 3 | 15/05/02 | 10/06/02 | 26 |
| 8 | 10/08/02 | 12/08/02 | 2 | 09/09/02 | 10/09/02 | 1 |
| 9 | 10/09/02 | 10/09/02 | 0 | 07/10/02 | 08/10/02 | 1 |
| 10 | 10/11/02 | 12/11/02 | 2 | 26/11/02 | 10/12/02 | 14 |
| | | | ∑ = 34<br>Average = 1.40 | | | ∑ = 75<br>Average = 7.50 |

## PROJECT 85

Type: Public
Nature: Building (Residential)
Location of Project: Durumi III Abuja
Duration of Project: 12 weeks

SCD = 18/04/2003
ACD = 20/08/2003
Difference = ACD – SCD = 15 weeks ⇒ 12+62+30+20 = 124 days
BC = 15,600,000.00
AC = 16,300,000.00
Difference = AC – BC = 700,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 24/02/03 | 10/03/03 | 14 | 17/03/03 | 31/03/03 | 14 |
| 2 | 21/04/03 | 19/05/03 | 28 | 26/05/03 | 05/06/03 | 10 |
| 3 | 03/06/03 | 27/06/03 | 24 | 02/07/03 | 15/07/03 | 13 |
| 4 | 06/08/03 | 02/09/03 | 27 | 21/09/03 | 02/10/03 | 11 |
| 5 | 19/09/03 | 02/10/03 | 13 | 12/11/03 | 05/12/03 | 23 |
| | | | ∑ = 106<br>Average = 21.20 | | | ∑ = 71<br>Average = 14.20 |

## PROJECT 86

Type: Private
Nature: Building (Residential)
Location of Project: Jada
Duration of Project: 3 years
SCD = 14/01/2004
ACD = 14/01/2005
Difference = ACD – SCD = 1 year
BC = 20,000,000.00
AC = 28,000,000.00
Difference = AC – BC = 8,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 12/10/02 | 15/10/02 | 3 | 29/10/02 | 03/11/02 | 5 |
| 2 | 22/02/03 | 22/02/03 | 0 | 28/02/03 | 02/03/03 | 2 |
| 3 | 01/06/03 | 18/06/03 | 17 | 24/06/03 | 24/06/03 | 0 |
| 4 | 10/09/03 | 10/09/03 | 0 | 15/09/03 | 29/09/03 | 14 |
| 5 | 08/01/04 | 13/01/04 | 5 | 20/01/04 | 22/01/04 | 2 |
| 6 | 05/04/04 | 05/04/04 | 0 | 07/04/04 | 15/04/04 | 8 |
| 7 | 23/07/04 | 27/07/04 | 4 | 30/07/04 | 04/08/04 | 5 |
| 8 | 15/11/04 | 17/11/04 | 2 | 20/11/04 | 22/11/04 | 2 |
| 9 | 20/12/04 | 22/12/04 | 2 | 22/12/04 | 14/01/05 | 23 |

| | |
|---|---|
| ∑ = 33<br>Average = 3.67 | ∑ = 61<br>Average = 6.78 |

## PROJECT 87

Type: Private
Nature: Building (Residential)
Location of Project: Asokoro, Abuja
Duration of Project: 3 years
SCD = 07/02/2003
ACD = 30/09/2003
Difference = ACD – SCD = 6 months ⇒ 21+124+60+30 = 235 days
BC = 26,000,000.00
AC = 31,795,000.00
Difference = AC – BC = 5,795,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 18/03/01 | 20/03/01 | 2 | 29/03/01 | 03/04/01 | 5 |
| 2 | 10/06/01 | 13/06/01 | 3 | 30/06/01 | 01/07/01 | 1 |
| 3 | 14/09/01 | 16/09/01 | 2 | 20/09/01 | 29/09/01 | 0 |
| 4 | 15/11/02 | 17/11/01 | 2 | 19/11/01 | 26/11/01 | 7 |
| 5 | 03/01/02 | 12/01/02 | 9 | 10/01/02 | 18/01/02 | 8 |
| 6 | 01/03/02 | 03/03/02 | 2 | 07/03/02 | 13/03/02 | 6 |
| 7 | 15/06/02 | 17/06/02 | 2 | 18/06/02 | 24/06/02 | 6 |
| 8 | 15/10/02 | 08/10/02 | 3 | 16/10/02 | 29/10/02 | 13 |
| 9 | 16/12/02 | 18/12/02 | 2 | 20/12/02 | 23/12/02 | 3 |
| 10 | 01/03/03 | 05/03/03 | 2 | 29/03/03 | 07/04/03 | 9 |
| 11 | 14/07/03 | 18/07/03 | 4 | 04/08/03 | 16/08/03 | 12 |
| 12 | 13/09/03 | 15/09/03 | 2 | 18/09/03 | 25/09/03 | 7 |
| | | | ∑ = 35<br>Average = 2.92 | | | ∑ = 77<br>Average = 6.42 |

## PROJECT 88

Type: Private
Nature: Building (Residential)
Location of Project: Kaduna
Duration of Project: 10 months
SCD = 16/04/2004
ACD = 19/04/2004
Difference = ACD – SCD = 3 days
BC = 9,200,000.00
AC = 9,800,000.00

Difference = AC – BC = 600,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 16/08/03 | 18/08/03 | 2 | 30/08/03 | 02/09/03 | 3 |
| 2 | 16/10/03 | 20/08/03 | 4 | 30/10/03 | 31/10/03 | 1 |
| 3 | 16/12/03 | 16/12/03 | 0 | 30/12/03 | 30/12/03 | 0 |
| 4 | 16/02/04 | 16/02/04 | 0 | 01/03/04 | 03/03/04 | 2 |
| 5 | 16/04/04 | 19/04/04 | 3 | 30/04/04 | 08/05/04 | 8 |
| | | | ∑ = 9<br>Average = 1.80 | | | ∑ = 14<br>Average = 2.80 |

## PROJECT 89

Type: Public
Nature: Building (Shopping Complex)
Location of Project: Kakuri, Kaduna
Duration of Project: 6 months
SCD = 20/07/2002
ACD = 30/07/2002
Difference = ACD – SCD = 10 days
BC = 6,400,000.00
AC = 6,650,000.00
Difference = AC – BC = 250,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 04/02/02 | 04/02/02 | 0 | 18/02/02 | 18/02/02 | 0 |
| 2 | 06/03/02 | 07/06/02 | 1 | 20/03/02 | 21/03/02 | 1 |
| 3 | 06/05/02 | 06/05/02 | 0 | 20/05/02 | 20/05/02 | 0 |
| 4 | 08/07/02 | 18/07/02 | 10 | 22/07/02 | 29/07/02 | 7 |
| 5 | 20/07/02 | 30/07/02 | 10 | 03/08/02 | 13/08/02 | 10 |
| | | | ∑ = 21<br>Average = 4.20 | | | ∑ = 18<br>Average = 3.60 |

## PROJECT 90

Type: Private
Nature: Building (Residential)
Location of Project: Azare, Bauchi
Duration of Project: 12 weeks
SCD = 25/04/1992

ACD = 03/05/1992
Difference = ACD – SCD = 1 week ⇒ 8 days
BC = 2,700,000.00
AC = 3,120,000.00
Difference = AC – BC = 420,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 13/03/92 | 15/03/92 | 2 | 20/03/92 | 21/03/92 | 1 |
| 2 | 29/03/92 | 04/04/92 | 6 | 06/04/92 | 09/04/92 | 3 |
| 3 | 19/04/92 | 20/04/92 | 1 | 23/04/92 | 25/04/92 | 2 |
| 4 | 07/05/92 | 12/05/92 | 5 | 16/05/92 | 19/05/92 | 3 |
| 5 | 27/5/92 | 29/05/92 | 2 | 05/06/92 | 11/06/92 | 6 |
| | | | ∑ = 16<br>Average = 3.20 | | | ∑ = 15<br>Average = 3.00 |

## PROJECT 91

Type: Public
Nature: Building (School Workshop)
Location of Project: Zaria
Duration of Project: 8 weeks
SCD = 20/08/1998
ACD = 27/08/1998
Difference = ACD – SCD = 1 week ⇒ 7 days
BC = 1,750,000.00
AC = 1,950,000.00
Difference = AC – BC = 200,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 17/07/98 | 19/07/98 | 2 | 22/07/98 | 23/07/98 | 1 |
| 2 | 25/07/98 | 30/02/98 | 5 | 02/08/98 | 05/08/98 | 3 |
| 3 | 14/08/98 | 16/08/98 | 4 | 17/08/98 | 20/08/98 | 3 |
| 4 | 25/08/98 | 29/08/98 | 4 | 04/9/98 | 21/09/98 | 1 |
| | | | ∑ = 15<br>Average = 3.75 | | | ∑ = 8<br>Average = 2.00 |

## PROJECT 92

Type: Public
Nature: Building (Shopping Complex)
Location of Project: Katsina

Duration of Project: 16 months
SCD = 20/08/2003
ACD = 20/10/2003
Difference = ACD – SCD = 8 weeks ⇒ 11 + 30 + 20 = 61 days
BC = 15,000,000.00
AC = 17,500,000.00
Difference = AC – BC = 2,500,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 27/05/03 | 29/05/03 | 2 | 01/06/03 | 05/06/03 | 4 |
| 2 | 02/07/03 | 05/07/03 | 3 | 08/07/03 | 12/07/03 | 4 |
| 3 | 29/07/03 | 03/08/03 | 5 | 07/08/03 | 15/08/03 | 8 |
| 4 | 17/08/03 | 19/08/03 | 2 | 23/08/03 | 27/08/03 | 4 |
| 5 | 29/08/03 | 04/09/03 | 6 | 07/09/03 | 14/09/03 | 7 |
| 6 | 12/09/03 | 15/09/03 | 3 | 19/09/03 | 03/10/03 | 14 |
| 7 | 15/10/03 | 17/09/03 | 2 | 21/09/03 | 06/10/03 | 15 |
| | | | ∑ = 23<br>Average = 3.29 | | | ∑ = 56<br>Average = 8.00 |

## PROJECT 93

Type: Private
Nature: Building (Office Complex)
Location of Project: Kano
Duration of Project: 16 weeks
SCD = 26/07/2002
ACD = 07/03/2003
Difference = ACD – SCD = 28 weeks ⇒ 5+124+60+28+7 = 224 days
BC = 10,644,000.00
AC = 16,752,068.54
Difference = AC – BC = 6,107,588.54

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 16/04/02 | 20/04/02 | 4 | 21/02/02 | 06/03/02 | 13 |
| 2 | 21/04/02 | 25/04/02 | 4 | 27/04/02 | 02/05/02 | 5 |
| 3 | 02/05/02 | 05/05/02 | 3 | 03/05/02 | 10/05/02 | 7 |
| 4 | 14/05/02 | 15/05/02 | 1 | 17/05/02 | 20/05/02 | 3 |
| 5 | 24/06/02 | 26/06/02 | 2 | 28/06/02 | 02/09/02 | 66 |
| 6 | 30/08/02 | 03/09/02 | 4 | 28/09/02 | 14/01/03 | 47 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 | 14/03/03 | 24/03/03 | 10 | 30/03/03 | 07/04/03 | 8 |
| | | | ∑ = 28<br>Average = 4.00 | | | ∑ = 149<br>Average = 21.29 |

## PROJECT 94

Type: Private
Nature: Building (Offices)
Location of Project: Talata Mafara
Duration of Project: 20 weeks
SCD = 26/07/2001
ACD = 05/04/2002
Difference = ACD – SCD = 32 weeks ⇒ 5+155+60+28+5 = 253 days
BC = 15,698,683.00
AC = 19,128,328.38
Difference = AC – BC = 3,429,645.38

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 10/05/01 | 17/05/01 | 7 | 20/05/01 | 26/05/01 | 6 |
| 2 | 26/06/01 | 09/07/01 | 13 | 12/07/01 | 23/07/01 | 11 |
| 3 | 18/08/01 | 20/08/01 | 2 | 24/08/01 | 04/09/01 | 11 |
| 4 | 05/10/01 | 25/10/01 | 20 | 29/10/01 | 14/11/01 | 16 |
| 5 | 10/11/01 | 30/11/01 | 20 | 03/12/01 | 07/01/02 | 35 |
| 6 | 05/01/02 | 21/01/02 | 16 | 30/01/02 | 04/03/02 | 33 |
| 7 | 09/03/02 | 08/05/02 | 60 | 12/05/02 | 28/05/02 | 16 |
| | | | ∑ = 138<br>Average = 19.71 | | | ∑ = 128<br>Average = 18.29 |

## PROJECT 95

Type: Private
Nature: Building (Office Block)
Location of Project: Mubi
Duration of Project: 18 weeks
SCD = 16/01/2003
ACD = 20/07/2003
Difference = ACD – SCD = 20 weeks ⇒ 15+62+28+60+20 = 185 days
BC = 20,555,421.00
AC = 22,879,072.97
Difference = AC – BC = 2,323,651.97

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 28/12/02 | 29/12/02 | 1 | 03/01/03 | 11/01/03 | 8 |
| 2 | 26/01/03 | 31/01/03 | 5 | 03/02/03 | 16/02/03 | 13 |
| 3 | 18/02/03 | 31/03/03 | 45 | 05/04/03 | 28/04/03 | 23 |
| 4 | 14/04/03 | 09/06/03 | 56 | 14/06/03 | 02/07/03 | 18 |
| 5 | 03/06/03 | 17/07/03 | 44 | 20/07/03 | 02/08/03 | 13 |
| | | | ∑ = 151<br>Average = 30.20 | | | ∑ = 75<br>Average = 15.00 |

## PROJECT 96

Type: Not indicated
Nature: Building (Residential)
Location of Project: Minjibir
Duration of Project: 5 months
SCD = 28/07/1999
ACD = 30/07/1999
Difference = ACD – SCD = 2 days
BC = 3,000,000.00
AC = 3,200,000.00
Difference = AC – BC = 200,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 15/07/99 | 15/07/99 | 0 | 15/07/99 | 17/07/99 | 2 |
| 2 | 30/09/99 | 30/09/99 | 0 | 30/09/99 | 30/09/99 | 0 |
| 3 | 14/11/99 | 14/11/99 | 0 | 14/11/99 | 17/11/99 | 3 |
| | | | ∑ = 0<br>Average = 0.00 | | | ∑ = 5<br>Average = 1.67 |

## PROJECT 97

Type: Not indicated
Nature: Building (Ultra Modern Secretariat)
Location of Project: Gagarawa
Duration of Project: 16 months
SCD = 10/03/2004
ACD = 30/03/2004
Difference = ACD – SCD = 20 days
BC = 50,000,000.00
AC = 52,500,000.00

Difference = AC – BC = 2,500,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 22/03/02 | 22/03/02 | 0 | 22/03/02 | 27/03/02 | 5 |
| 2 | 18/07/02 | 18/07/02 | 0 | 18/07/02 | 20/07/02 | 2 |
| 3 | 15/11/02 | 15/11/02 | 0 | 15/11/02 | 18/11/02 | 3 |
| 4 | 22/03/03 | 22/03/03 | 0 | 22/03/03 | 22/03/03 | 0 |
| 5 | 01/03/04 | 20/03/04 | 19 | 20/03/04 | 05/04/04 | 16 |
| | | | ∑ = 19<br>Average = 3.80 | | | ∑ = 26<br>Average = 5.20 |

## PROJECT 98

Type: Not indicated
Nature: Building (Comprehensive Hospital)
Location of Project: Kuna
Duration of Project: 18 months
SCD = 20/07/2002
ACD = 27/07/2002
Difference = ACD – SCD = 7 days
BC = 58,500,000.00
AC = 61,000,000.00
Difference = AC – BC = 2,500,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 27/04/01 | 27/04/01 | 0 | 27/04/01 | 29/04/01 | 2 |
| 2 | 20/08/01 | 20/08/01 | 0 | 20/08/01 | 23/08/01 | 3 |
| 3 | 29/12/01 | 29/12/01 | 0 | 29/12/01 | 29/12/01 | 0 |
| 4 | 14/04/02 | 14/04/02 | 0 | 14/04/02 | 18/04/02 | 4 |
| 5 | 01/09/02 | 01/09/02 | 0 | 01/09/02 | 01/09/02 | 0 |
| 6 | 20/03/03 | 27/01/03 | 7 | 27/01/03 | 30/01/03 | 3 |
| | | | ∑ = 7<br>Average = 1.17 | | | ∑ = 12<br>Average = 2.00 |

## PROJECT 99

Type: Private
Nature: Building (Estate)
Location of Project: Aba
Duration of Project: 3 years

SCD = 14/05/1980
ACD = 11/01/1983
Difference = ACD – SCD = 32 months ⇒ 365x2+17+90+124+11 = 972 days
BC = 1,250,000.00
AC = 3,300,000.00
Difference = AC – BC = 2,050,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 04/06/80 | 04/06/80 | 0 | 16/06/80 | 31/07/80 | 45 |
| 2 | 05/11/80 | 22/01/81 | 80 | 17/11/80 | 26/03/81 | 128 |
| 3 | 04/03/81 | 17/03/81 | 13 | 16/03/81 | 26/03/81 | 10 |
| 4 | 01/07/81 | 28/07/81 | 27 | 13/07/81 | 17/10/81 | 96 |
| 5 | 02/11/81 | 30/11/81 | 28 | 16/11/81 | 18/02/82 | 94 |
| 6 | 03/05/82 | 05/05/82 | 2 | 17/05/82 | 26/05/82 | 9 |
| 7 | 01/11/82 | 10/11/82 | 9 | 22/11/82 | 20/01/83 | 59 |
| | | | ∑ = 159<br>Average = 22.71 | | | ∑ = 441<br>Average = 63.00 |

## PROJECT 100

Type: Private
Nature: Building (Hospital)
Location of Project: Kano
Duration of Project: 16 months
SCD = 06/05/1985
ACD = 07/09/1985
Difference = ACD – SCD = 4 months ⇒ 25+30+31+31+7 = 124 days
BC = 550,000.00
AC = 630,000.00
Difference = AC – BC = 80,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 14/09/84 | 19/09/84 | 5 | 28/09/84 | 08/10/84 | 10 |
| 2 | 11/01/85 | 29/01/85 | 18 | 25/02/85 | 26/02/85 | 1 |
| 3 | 10/05/85 | 10/05/85 | 0 | 24/05/85 | 29/05/85 | 5 |
| 4 | 13/09/85 | 17/09/85 | 4 | 27/09/85 | 30/09/85 | 3 |
| | | | ∑ = 27<br>Average = 6.75 | | | ∑ = 19<br>Average = 4.75 |

## PROJECT 101

Type: Private
Nature: Building (Residential)
Location of Project: Yola
Duration of Project: 14 months
SCD = 22/05/1992
ACD = 31/07/1992
Difference = ACD – SCD = 2 months ⇒ 9+30+31= 70 days
BC = 9,991,640.00
AC = 11,145,950.00
Difference = AC – BC = 1,154,310.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 12/08/91 | 12/08/91 | 0 | 26/08/91 | 29/08/91 | 3 |
| 2 | 14/10/91 | 16/10/91 | 2 | 28/10/91 | 31/10/91 | 3 |
| 3 | 09/12/91 | 09/12/91 | 0 | 23/12/91 | 23/12/91 | 0 |
| 4 | 10/02/92 | 11/02/92 | 1 | 24/02/92 | 24/02/92 | 0 |
| 5 | 13/04/92 | 13/04/92 | 0 | 27/04/92 | 27/04/92 | 0 |
| 6 | 08/06/92 | 08/06/92 | 0 | 22/06/92 | 29/06/92 | 7 |
| 7 | 03/08/92 | 03/08/92 | 0 | 05/08/92 | 05/08/92 | 0 |
| | | | ∑ = 3<br>Average = 0.43 | | | ∑ = 13<br>Average = 1.86 |

## PROJECT 102

Type: Public
Nature: Building (Residential)
Location of Project: Abuja
Duration of Project: 12 months
SCD = 02/06/2003
ACD = 30/08/2003
Difference = ACD – SCD = 3 months ⇒ 28+31+30 = 89 days
BC = 25,000,000.00
AC = 16,500,000.00
Difference = AC – BC = 1,500,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/12/02 | 10/12/02 | 8 | 11/12/02 | 23/12/02 | 12 |
| 2 | 03/03/03 | 03/03/03 | 0 | 17/03/03 | 28/03/03 | 11 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 02/06/03 | 06/06/03 | 4 | 16/06/03 | 16/06/03 | 0 |
| 4 | 01/09/03 | 01/09/03 | 0 | 01/09/03 | 08/09/03 | 7 |
| | | | ∑ = 12<br>Average = 3.00 | | | ∑ = 30<br>Average = 7.50 |

## PROJECT 103

Type: Private
Nature: Building (Shopping Centre)
Location of Project: Abuja
Duration of Project: 18 months
SCD = December 2003
ACD = April 2004
Difference = ACD – SCD = 4 months ⇒ 4 x 30 = 120 days
BC = 55,,600,000.00
AC = 75,800,000.00
Difference = AC – BC = 20,200,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 02/12/02 | 06/12/02 | 4 | 09/12/02 | 19/12/02 | 10 |
| 2 | 03/02/03 | 13/02/03 | 10 | 24/02/03 | 04/03/03 | 8 |
| 3 | 07/04/03 | 10/04/03 | 3 | 28/04/03 | 01/05/03 | 4 |
| 4 | 02/06/03 | 02/06/03 | 0 | 23/06/03 | 26/06/03 | 3 |
| 5 | 04/08/03 | 07/08/03 | 3 | 25/08/03 | 29/08/03 | 4 |
| 6 | 06/10/03 | 09/10/03 | 3 | 27/10/03 | 06/11/03 | 10 |
| 7 | 01/12/03 | 10/12/03 | 9 | 22/12/03 | 30/12/03 | 8 |
| 8 | 02/02/04 | 19/02/04 | 17 | 23/02/04 | 10/03/04 | 15 |
| 9 | 05/04/04 | 06/04/04 | 1 | 26/04/04 | 30/04/04 | 4 |
| | | | ∑ = 50<br>Average = 5.56 | | | ∑ = 66<br>Average = 7.33 |

## PROJECT 104

Type: Private
Nature: Building (Shopping Mall)
Location of Project: Abuja
Duration of Project: 18 months
SCD = 03/08/2001
ACD = 14/11/2001
Difference = ACD – SCD = 3 months ⇒ 28 + 30 + 31 + 14 = 103 days
BC = 33,689,481.00
AC = 34,865,329.00
Difference = AC – BC = 1,175,848.00

**PAYMENTS PATTERN**

| S/NO | VALUATIONS DATES (Days) | | | PAYMENTS DATES (Days) | | |
|---|---|---|---|---|---|---|
| | **D1VWD** | **DAV** | **DIDV** | **DPWD** | **DPWAM** | **DIPD** |
| 1 | 01/08/00 | 11/08/00 | 10 | 22/08/00 | 31/08/00 | 9 |
| 2 | 07/11/00 | 09/11/00 | 2 | 28/11/00 | 05/12/00 | 8 |
| 3 | 06/02/01 | 16/02/01 | 10 | 27/02/01 | 27/02/01 | 0 |
| 4 | 02/05/01 | 16/05/01 | 14 | 23/05/01 | 20/06/01 | 28 |
| 5 | 07/08/01 | 13/08/01 | 6 | 27/08/01 | 31/08/01 | 4 |
| 6 | 05/11/01 | 15/11/01 | 10 | 23/11/01 | 29/11/01 | 6 |
| | | | $\sum = 52$<br>Average = 8.67 | | | $\sum = 55$<br>Average = 9.17 |

## PROJECT 105

Type: Public
Nature: Building (Shopping Complex)
Location of Project: Gadaka Furr, Yobe State
Duration of Project: 6 weeks
SCD = 20/02/1993
ACD = 22/04/1993
Difference = ACD – SCD = 2 months $\Rightarrow$ 28 + 31 + 22 = 81 days
BC = 875,000.00
AC = 935,000.00
Difference = AC – BC = 60,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | **D1VWD** | **DAV** | **DIDV (Days)** | **DPWD** | **DPWAM** | **DIPD (Days)** |
| 1 | 10/03/93 | 13/03/93 | 3 | 15/03/93 | 21/03/93 | 6 |
| 2 | 22/04/93 | 23/04/93 | 1 | 25/04/93 | 27/04/93 | 2 |
| | | | $\sum = 4$<br>Average = 2.00 | | | $\sum = 8$<br>Average = 4.00 |

## PROJECT 106

Type: Public
Nature: Building (Health Clinic)
Location of Project: Dunbulwa
Duration of Project: 3 months
SCD = 29/03/2000
ACD = 04/10/2000
Difference = ACD – SCD = 6 months $\Rightarrow$ 27 + 30 + 62 + 28 + 29 = 176 days
BC = 651,785.50
AC = 861,785.50
Difference = AC – BC = 150,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 03/03/00 | 16/03/00 | 13 | 16/03/00 | 20/03/00 | 4 |
| 2 | 08/05/00 | 10/05/00 | 2 | 10/05/00 | 26/05/00 | 16 |
| 3 | 02/07/00 | 02/07/00 | 0 | 02/07/00 | 04/07/00 | 2 |
| 4 | 04/10/00 | 06/10/00 | 2 | 06/10/00 | 16/10/00 | 10 |
| | | | ∑ = 17<br>Average = 4.25 | | | ∑ = 32<br>Average = 8.00 |

## PROJECT 107

Type: Public
Nature: Building (LGA Secretariat Complex)
Location of Project: Kaugama
Duration of Project: 1 year
SCD = 28/12/2003
ACD = 15/11/2004
Difference = ACD – SCD = 21 months ⇒ 365 + 155 + 90 + 15 = 625 days
BC = 32,576,420.00
AC = 40,347,671.56
Difference = AC – BC = 7,771,251.56

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 30/06/02 | 05/07/02 | 5 | 25/07/02 | 31/07/02 | 6 |
| 2 | 27/09/02 | 30/09/02 | 3 | 30/09/02 | 27/10/02 | 27 |
| 3 | 25/11/02 | 27/11/02 | 2 | 30/11/02 | 29/06/03 | 181 |
| 4 | 20/08/03 | 30/08/03 | 2 | 30/09/03 | 02/05/04 | 214 |
| 5 | 15/07/04 | 05/10/04 | 82 | 20/10/04 | 28/12/04 | 69 |
| | | | ∑ = 94<br>Average = 18.80 | | | ∑ = 497<br>Average = 99.40 |

## PROJECT 108

Type: Public
Nature: Building (NUT Secretariat)
Location of Project: Kaugama
Duration of Project: 2 months
SCD = 01/04/2004
ACD = 12/12/2004
Difference = ACD – SCD = 8 months ⇒ 27+124+90+12 = 253 days
BC = 2,395,743.25

AC = 2,964,941.76
Difference = AC – BC = 569,198.51

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 22/02/04 | 22/02/04 | 0 | 25/02/04 | 27/02/04 | 2 |
| 2 | 25/03/04 | 26/03/04 | 1 | 03/04/04 | 05/04/04 | 2 |
| 3 | 20/04/04 | 04/12/04 | 228 | 12/12/04 | 12/12/04 | 0 |
| | | | $\sum = 229$<br>Average = 76.33 | | | $\sum = 4$<br>Average = 1.33 |

## PROJECT 109

Type: Public
Nature: Building [(ICT Building (INEC HQ Phase II)]
Location of Project: Maitama Abuja
Duration of Project: 18 months
SCD = 02/06/2005
ACD = 02/08/2005
Difference = ACD – SCD = 2 months $\Rightarrow$ 28+31+2 = 61 days
BC = 253,000,000.00
AC = 348,000,000.00
Difference = AC – BC = 95,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 01/12/03 | 02/12/03 | 1 | 08/12/03 | 09/12/03 | 1 |
| 2 | 05/01/04 | 08/01/04 | 3 | 12/01/04 | 15/01/04 | 3 |
| 3 | 02/02/04 | 06/02/04 | 4 | 09/02/04 | 13/02/04 | 4 |
| 4 | 01/03/04 | 02/03/04 | 1 | 08/03/04 | 09/03/04 | 1 |
| 5 | 05/04/04 | 07/04/04 | 2 | 12/04/04 | 15/04/04 | 3 |
| 6 | 03/05/04 | 03/05/04 | 0 | 10/05/04 | 11/05/04 | 1 |
| 7 | 07/06/04 | 09/06/04 | 2 | 14/06/04 | 18/06/04 | 4 |
| 8 | 05/07/04 | 07/07/04 | 2 | 12/07/04 | 14/07/04 | 2 |
| 9 | 02/08/04 | 05/08/04 | 3 | 09/08/04 | 12/08/04 | 3 |
| 10 | 06/09/04 | 07/09/04 | 1 | 13/09/04 | 15/09/04 | 2 |
| 11 | 04/10/04 | 07/10/04 | 3 | 11/10/04 | 14/10/04 | 3 |
| 12 | 01/11/04 | 03/11/04 | 2 | 08/11/04 | 11/11/04 | 3 |
| 13 | 06/12/04 | 06/12/04 | 0 | 06/12/04 | 10/12/04 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | 03/01/05 | 07/01/05 | 4 | 10/01/05 | 14/01/05 | 4 |
| 15 | 07/02/05 | 08/02/05 | 1 | 14/02/05 | 16/02/05 | 2 |
| 16 | 07/03/05 | 10/03/05 | 3 | 14/03/05 | 18/03/05 | 4 |
| 17 | 04/04/05 | 04/04/05 | 0 | 11/04/05 | 11/04/05 | 0 |
| 18 | 02/05/05 | 02/05/05 | 0 | 09/05/05 | 09/05/05 | 0 |
| 19 | 06/06/05 | 07/06/05 | 1 | 13/06/05 | 13/06/05 | 0 |
| 20 | 04/07/05 | 05/07/05 | 1 | 11/07/05 | 11/07/05 | 0 |
| 21 | 01/08/05 | 01/08/05 | 0 | 08/08/05 | 09/08/05 | 1 |
| | | | $\sum = 34$<br>Average = 1.62 | | | $\sum = 45$<br>Average = 2.14 |

## PROJECT 110

Type: Private
Nature: Building (Residential)
Location of Project: Otukpo
Duration of Project: 16 weeks
SCD = 11/01/2004
ACD = 10/02/2004
Difference = ACD – SCD = 5 weeks $\Rightarrow$ 20 + 10 = 30 days
BC = 4,595,860.90
AC = 4,995,450.45
Difference = AC – BC = 399,589.55

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | **D1VWD** | **DAV** | **DIDV (Days)** | **DPWD** | **DPWAM** | **DIPD (Days)** |
| 1 | 11/10/03 | 12/10/03 | 1 | 12/10/03 | 22/10/03 | 10 |
| 2 | 29/10/03 | 30/10/03 | 1 | 10/11/03 | 21/11/03 | 11 |
| 3 | 29/11/03 | 31/12/03 | 2 | 23/12/03 | 24/12/03 | 1 |
| 4 | 15/01/04 | 16/01/04 | 1 | 16/01/04 | 31/01/04 | 15 |
| | | | $\sum = 5$<br>Average = 1.25 | | | $\sum = 37$<br>Average = 9.25 |

## PROJECT 111

Type: Public
Nature: Building (Health Centre)
Location of Project: Tsakuwa
Duration of Project: 4 months
SCD = 15/04/2002
ACD = 10/11/2002
Difference = ACD – SCD = 6 months $\Rightarrow$ 15+124+60+11 = 210 days
BC = 13,500,000.00
AC = 14,400,000.00

Difference = AC – BC = 900,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 15/02/02 | 15/02/02 | 0 | 28/02/02 | 25/03/02 | 25 |
| 2 | 25/06/02 | 25/06/02 | 0 | 28/06/02 | 10/09/02 | 12 |
| 3 | 02/10/02 | 02/10/02 | 0 | 11/10/02 | 28/10/02 | 17 |
| | | | ∑ = 0<br>Average = 0.00 | | | ∑ = 54<br>Average = 18.00 |

## PROJECT 112

Type: Public
Nature: Building (Hospital)
Location of Project: Kundila, Kano
Duration of Project: 4 months
SCD = 25/07/1999
ACD = 15/10/1999
Difference = ACD – SCD = 3 months ⇒ 6+31+30+15 = 82 days
BC = 13,500,000.00
AC = 13,700,000.00
Difference = AC – BC = 200,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 25/04/99 | 25/04/99 | 0 | 30/04/99 | 30/04/99 | 0 |
| 2 | 25/05/99 | 03/06/99 | 9 | 10/06/99 | 15/06/99 | 5 |
| 3 | 25/06/99 | 30/08/99 | 67 | 05/09/99 | 05/09/99 | 0 |
| 4 | 25/07/99 | 25/09/99 | 62 | 10/10/99 | 28/10/99 | 18 |
| | | | ∑ = 138<br>Average = 34.50 | | | ∑ = 23<br>Average = 5.75 |

## PROJECT 113

Type: Public
Nature: Building (Shopping Complex)
Location of Project: Kaduna North
Duration of Project: 1 year
SCD = May, 2000
ACD = January, 2001
Difference = ACD – SCD = 8 months ⇒ 8 x 30 = 240 days
BC = 217,000,000.00
AC = 251,000,000.00

Difference = AC – BC = 34,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 16/08/99 | 13/09/99 | 28 | 12/10/99 | 18/10/99 | 6 |
| 2 | 05/11/99 | 05/11/99 | 0 | 08/12/99 | 12/12/99 | 4 |
| 3 | 11/01/00 | 13/01/00 | 2 | 12/02/00 | 15/02/00 | 3 |
| 4 | 14/03/00 | 18/04/00 | 35 | 17/04/00 | 20/06/00 | 64 |
| 5 | 17/07/00 | 19/07/00 | 2 | 18/08/00 | 19/09/00 | 32 |
| 6 | 20/10/00 | 14/11/00 | 25 | 13/12/00 | 16/12/00 | 3 |
| 7 | 15/01/01 | 15/01/01 | 0 | 19/01/01 | 28/02/01 | 40 |
| | | | $\sum = 92$<br>Average = 13.14 | | | $\sum = 152$<br>Average = 21.71 |

## PROJECT 114

Type: Public
Nature: Building (House of Assembly Members' Offices)
Location of Project: Yola
Duration of Project: 3 months
SCD = 04/09/1998
ACD = 30/10/1998
Difference = ACD – SCD $\Rightarrow$ 27 + 29 = 56 days
BC = 315,000,000.00
AC = 413,000,000.00
Difference = AC – BC = 102,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 06/07/98 | 07/07/98 | 1 | 06/08/98 | 10/08/98 | 4 |
| 2 | 30/10/98 | 11/11/98 | 12 | 10/12/98 | 05/01/99 | 26 |
| | | | $\sum = 13$<br>Average = 6.50 | | | $\sum = 30$<br>Average = 15.00 |

## PROJECT 115

Type: Public
Nature: Building (Lecture Theatre)
Location of Project: Kano
Duration of Project: 48 weeks
SCD = October, 2002
ACD = July, 2004

Difference = ACD – SCD = 21 months ⇒ 21 x 30 = 630 days
BC = 92,000,000.00
AC = 100,000,000.00
Difference = AC – BC = 8,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 01/06/02 | 05/06/02 | 4 | 01/07/02 | 01/08/02 | 31 |
| 2 | 02/10/02 | 02/10/02 | 0 | 04/10/02 | 05/11/02 | 32 |
| 3 | 05/02/03 | 09/02/03 | 4 | 11/02/03 | 09/04/03 | 57 |
| 4 | 01/07/03 | 03/07/03 | 2 | 07/07/03 | 09/10/03 | 64 |
| 5 | 03/11/03 | 07/11/03 | 4 | 11/11/03 | 10/01/03 | 60 |
| 6 | 01/03/04 | 05/03/04 | 4 | 09/03/04 | 08/04/04 | 30 |
| 7 | 11/05/04 | 17/05/04 | 6 | 21/05/04 | 25/07/04 | 65 |
| | | | ∑ = 24<br>Average = 3.43 | | | ∑ = 339<br>Average = 48.43 |

## PROJECT 116

Type: Public
Nature: Building (Maternity Clinic)
Location of Project: Gwarzo
Duration of Project: 4 months
SCD = July, 1999
ACD = September, 1999
Difference = ACD – SCD = 2 months ⇒ 2 x 30 = 61 days
BC = 2,846,950.70
AC = 4,150,370.20
Difference = AC – BC = 1,303,419.50

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 20/04/99 | 22/04/99 | 2 | 22/04/99 | 29/04/99 | 7 |
| 2 | 02/06/99 | 02/06/99 | 0 | 02/06/99 | 09/06/99 | 7 |
| 3 | 26/07/99 | 28/07/99 | 2 | 28/07/99 | 29/07/99 | 1 |
| 4 | 07/09/99 | 11/09/99 | 4 | 11/09/99 | 25/09/99 | 14 |
| | | | ∑ = 8<br>Average = 2.00 | | | ∑ = 29<br>Average = 7.25 |

## PROJECT 117

Type: Not indicated
Nature: Building (Laboratories)
Location of Project: Bauchi (College of Arts and Science)
Duration of Project: 16 weeks
SCD = 22/12/2002
ACD = 29/09/2003
Difference = ACD – SCD = 10 months ⇒ 9+155+28+60+29 = 281 days
BC = 19,276,500.60
AC = 20,270,800.60
Difference = AC – BC = 994,300.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 03/10/02 | 03/10/02 | 0 | 06/10/02 | 21/10/02 | 15 |
| 2 | 07/11/02 | 07/11/02 | 0 | 06/11/02 | 18/11/02 | 12 |
| 3 | 07/12/02 | 07/12/02 | 0 | 18/12/02 | 20/12/02 | 2 |
| 4 | 10/05/03 | 12/05/03 | 2 | 14/05/03 | 30/05/03 | 16 |
| 5 | 10/06/03 | 12/06/03 | 2 | 15/06/03 | 25/07/03 | 40 |
| 6 | 08/09/03 | 16/09/03 | 8 | 19/09/03 | 28/10/03 | 9 |
| | | | ∑ = 12<br>Average = 2.00 | | | ∑ = 94<br>Average = 15.67 |

## PROJECT 118

Type: Public
Nature: Building (Primary Health Centre)
Location of Project: Doka
Duration of Project: 12 weeks
SCD = 05/03/2003
ACD = 31/03/2003
Difference = ACD – SCD = 4 weeks ⇒ 26 days
BC = 2,350,982.00
AC = 2,389,750.00
Difference = AC – BC = 38,768.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 15/01/03 | 17/01/03 | 2 | 24/01/03 | 30/01/03 | 6 |
| 2 | 20/02/03 | 21/02/03 | 1 | 28/02/03 | 10/03/03 | 10 |
| 3 | 31/03/03 | 01/04/03 | 1 | 08/04/03 | 15/05/03 | 37 |

| | |
|---|---|
| ∑ = 4<br>Average = 1.33 | ∑ = 53<br>Average = 17.67 |

## PROJECT 119

Type: Public
Nature: Building (Utilities Board Complex)
Location of Project: Jos
Duration of Project: 12 months
SCD = 21/12/2000
ACD = 18/11/2004
Difference = ACD – SCD = 47 months ⇒ 3x365+10+186+2 + 60 + 18 = 1397 days
BC = 120,532,722.50
AC = 147,336,923.50
Difference = AC – BC = 26,804,201.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 03/03/00 | 15/03/00 | 12 | 22/03/00 | 28/03/00 | 6 |
| 2 | 28/06/00 | 05/07/00 | 7 | 12/07/00 | 26/04/04 | 1,383 |
| 3 | 15/08/04 | 21/08/04 | 6 | 27/08/04 | 28/09/04 | 32 |
| 4 | 09/11/05 | 18/11/05 | 9 | 25/11/05 | 25/11/05 | 0 |
| | | | ∑ = 34<br>Average = 8.50 | | | ∑ = 1421<br>Average = 355.25 |

## PROJECT 120

Type: Public
Nature: Building (Law Auditorium)
Location of Project: University of Jos
Duration of Project: 5 months
SCD = 10/02/1993
ACD = 20/07/1994
Difference = ACD – SCD = 17 months ⇒ 365 + 18 + 62 + 60 +20 = 525 days
BC = 37,767,265.23
AC = 46,452,394.01
Difference = AC – BC = 8,685,128.78

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 05/12/92 | 07/12/92 | 2 | 15/12/92 | 03/02/94 | 415 |
| 2 | 06/04/94 | 06/04/94 | 0 | 13/04/94 | 13/04/94 | 0 |
| 3 | 20/07/94 | 27/07/94 | 7 | 27/07/94 | 15/08/94 | 19 |

| | |
|---|---|
| ∑ = 9<br>Average = 3.00 | ∑ = 434<br>Average = 144.67 |

## PROJECT 121

Type: Public
Nature: Building (Pharmaceutical Department Complex)
Location of Project: University of Jos
Duration of Project: 16 months
SCD = 12/06/1991
ACD = 20/12/1995
Difference = ACD – SCD = 54 months ⇒ 365x4 + 18 + 124 + 60 + 20 = 1682 days
BC = 141,864,275.09
AC = 221,526,776.03
Difference = AC – BC = 79,662,500.94

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 05/05/90 | 09/05/90 | 4 | 16/05/90 | 26/05/90 | 10 |
| 2 | 03/07/90 | 10/07/90 | 7 | 10/07/90 | 28/07/90 | 18 |
| 3 | 29/10/90 | 05/01/91 | 68 | 12/01/91 | 22/02/94 | 1136 |
| 4 | 15/04/94 | 20/04/94 | 5 | 22/04/94 | 25/04/94 | 3 |
| 5 | 25/07/94 | 28/07/94 | 3 | 05/08/94 | 05/08/94 | 0 |
| 6 | 10/12/95 | 10/12/95 | 0 | 20/12/95 | 20/12/95 | 0 |
| | | | ∑ = 87<br>Average = 14.50 | | | ∑ = 1167<br>Average = 194.50 |

## PROJECT 122

Type: Public
Nature: Building (Laboratory Complex)
Location of Project: VOM VET, Jos
Duration of Project: 6 months
SCD = 10/08/1999
ACD = 05/08/2000
Difference = ACD – SCD = 12 months ⇒ 21 + 186 + 120 + 28 + 5 = 360 days
BC = 11,514,336.00
AC = 13,014,346.00
Difference = AC – BC = 1,500,010.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 10/03/99 | 15/03/99 | 5 | 22/03/99 | 28/03/99 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 15/06/99 | 16/06/99 | 1 | 24/06/99 | 25/04/00 | 336 |
| 3 | 22/06/00 | 25/06/00 | 3 | 02/07/00 | 09/08/00 | 38 |
| | | | $\sum = 9$<br>Average = 3.00 | | | $\sum = 380$<br>Average = 126.67 |

## PROJECT 123

Type: Public
Nature: Building (Admin. Block)
Location of Project: VOM VET, Jos
Duration of Project: 8 months
SCD = 25/09/1991
ACD = 12/04/95
Difference = ACD – SCD = 55 months $\Rightarrow$3x365+5+124 + 30 + 28 + 12 = 1294 days
BC = 47,529,131.00
AC = 85,352,697.60
Difference = AC – BC = 37,823,566.60

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV | DPWD | DPWAM | DIPD |
| 1 | 15/03/91 | 02/04/91 | 18 | 22/03/91 | 28/04/91 | 37 |
| 2 | 25/06/91 | 10/07/91 | 15 | 06/07/91 | 12/09/94 | 1163 |
| 3 | 12/12/94 | 16/12/94 | 4 | 19/12/94 | 5/01/95 | 17 |
| 4 | 12/04/95 | 22/04/95 | 10 | 18/04/95 | 28/04/95 | 10 |
| | | | $\sum = 47$<br>Average = 11.75 | | | $\sum = 1227$<br>Average = 306.75 |

## PROJECT 124

Type: Not indicated
Nature: Building (Residential)
Location of Project: Aminu Kano Way, Kano
Duration of Project: 2 months
SCD = April 2004
ACD = November 2004
Difference = ACD – SCD = 7 months $\Rightarrow$ 7 x 30 = 210 days
BC = 96,000,000.00
AC = 124,000,000.00
Difference = AC – BC = 28,000,000.00

**PAYMENT PATTERN**

| S/No | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | DIVWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | Dec, 02 | Dec, 02 | 10 | Jan, 03 | Mar, 03 | 35 |
| 2 | May, 03 | May, 03 | 7 | Jan, 03 | Aug, 03 | 42 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | Dec, 03 | Jan, 03 | 11 | Feb, 04 | Feb, 04 | 7 |
| 4 | May, 04 | May, 04 | 8 | May, 04 | Jun, 04 | 14 |
| 5 | Aug, 04 | Aug, 04 | 7 | Sept, 04 | Nov, 04 | 60 |
| | | | ∑ = 43<br>Average = 7.17 | | | ∑ = 158<br>Average = 31.60 |

## PROJECT 125

Type: Public
Nature: Building (Residential)
Location of Project: Kaura - Wali
Duration of Project: 15 months
SCD = 03/04/2002
ACD = 16/04/2004
Difference = ACD – SCD = 2 years ⇒ 365 x 2 + 13 = 743 days
BC = 6,683,043.15
AC = 7,679,980.15
Difference = AC – BC = 996,937.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 01/05/02 | 15/05/02 | 14 | 15/05/02 | 13/06/02 | 29 |
| 2 | 03/08/02 | 13/08/02 | 10 | 13/08/02 | 27/08/02 | 14 |
| 3 | 06/11/02 | 14/11/02 | 8 | 14/11/02 | 22/05/03 | 189 |
| 4 | 14/05/04 | 24/05/04 | 10 | 24/05/04 | 14/09/04 | 112 |
| 5 | 03/04/05 | 13/04/05 | 10 | 13/04/05 | 21/06/05 | 69 |
| | | | ∑ = 52<br>Average = 10.40 | | | ∑ = 413<br>Average = 82.60 |

## PROJECT 126

Type: Public
Nature: Building (2 N0 Laboratories, HUK Poly, Kastina)
Location of Project: Kastina
Duration of Project: 14 months
SCD = 10/05/2004
ACD = 18/05/2004
Difference = ACD – SCD = 8 days
BC = 106,748,360.00
AC = 114,220,745.00
Difference = AC – BC = 7,472,385.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 09/04/03 | 14/04/03 | 5 | 21/04/03 | 30/04/03 | 9 |
| 2 | 05/05/03 | 15/05/03 | 10 | 26/05/03 | 29/05/03 | 3 |
| 3 | 24/06/03 | 27/06/03 | 3 | 26/06/03 | 09/07/03 | 13 |
| 4 | 28/07/03 | 31/07/03 | 3 | 04/08/03 | 18/08/03 | 14 |
| 5 | 27/08/03 | 01/09/03 | 5 | 05/09/03 | 19/09/03 | 14 |
| 6 | 24/09/03 | 30/09/03 | 6 | 01/10/03 | 13/10/03 | 12 |
| 7 | 28/10/03 | 31/10/03 | 3 | 05/11/03 | 17/11/03 | 12 |
| 8 | 25/11/03 | 27/11/03 | 2 | 02/12/03 | 15/12/03 | 13 |
| 9 | 22/12/03 | 25/12/03 | 3 | 29/12/03 | 16/01/04 | 18 |
| 10 | 23/01/04 | 18/02/04 | 26 | 24/02/04 | 27/02/04 | 3 |
| 11 | 23/03/04 | 25/03/04 | 2 | 29/03/04 | 15/04/04 | 17 |
| 12 | 26/04/04 | 10/05/04 | 14 | 18/05/04 | 15/06/04 | 28 |
| | | | $\sum = 82$<br>Average = 6.83 | | | $\sum = 156$<br>Average = 13.00 |

## PROJECT 127

Type: Public
Nature: Building
Location of Project: Jalingo
Duration of Project: 12 months
SCD = 08/03/2000
ACD = 15/09/2000
Difference = ACD – SCD = 6 months $\Rightarrow$ 23 + 60 + 93 + 15 = 191 days
BC = 68,560,000.00
AC = 73,125,000.00
Difference = AC – BC = 4,565,000.00

**PAYMENTS PATTERN**

| S/NO | VALUATIONS DATES (Days) | | | PAYMENTS DATES (Days) | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV | DPWD | DPWAM | DIPD |
| 1 | 12/03/99 | 15/03/99 | 3 | 16/03/99 | 22/03/99 | 6 |
| 2 | 20/06/99 | 24/06/99 | 4 | 26/06/99 | 30/06/99 | 4 |
| 3 | 20/09/99 | 25/09/99 | 5 | 27/09/99 | 30/09/99 | 3 |
| 4 | 13/12/99 | 15/12/99 | 2 | 16/12/99 | 19/12/99 | 3 |
| 5 | 13/3/00 | 16/03/00 | 3 | 21/03/00 | 26/03/00 | 5 |
| 6 | 14/06/00 | 16/06/00 | 2 | 21/06/00 | 26/06/00 | 5 |
| 7 | 04/10/00 | 09/10/00 | 5 | 18/10/00 | 23/10/00 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8 | 12/04/01 | 16/04/01 | 4 | 24/04/01 | 30/04/01 | 6 |
| | | | ∑ = 28<br>Average = 3.50 | | | ∑ = 37<br>Average = 4.63 |

## PROJECT 128

Type: Private
Nature: Building (Shopping Centre)
Location of Project: Kaduna
Duration of Project: 18 months
SCD = November 2005
ACD = December 2005
Difference = ACD – SCD = 1 month ⇒ 31 days
BC = 120,614,121.50
AC = 129,047,657.50
Difference = AC – BC = 8,433,536.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 05/07/04 | 07/07/04 | 2 | 12/07/04 | 26/07/04 | 14 |
| 2 | 07/09/04 | 10/09/04 | 3 | 17/09/04 | 21/09/04 | 4 |
| 3 | 04/11/04 | 09/11/04 | 5 | 16/11/04 | 29/11/04 | 3 |
| 4 | 06/01/05 | 11/01/05 | 5 | 18/01/05 | 25/01/05 | 7 |
| 5 | 03/03/05 | 07/03/05 | 4 | 19/03/05 | 27/03/05 | 8 |
| 6 | 09/05/05 | 13/05/05 | 4 | 14/05/05 | 23/01/05 | 9 |
| 7 | 01/07/05 | 04/07/05 | 3 | 07/07/05 | 14/07/05 | 7 |
| 8 | 08/09/05 | 12/09/05 | 4 | 15/09/05 | 28/09/05 | 13 |
| 9 | 01/11/05 | 03/11/05 | 2 | 07/11/05 | 18/11/05 | 11 |
| 10 | 02/12/05 | 05/12/05 | 3 | 08/12/05 | 20/12/05 | 12 |
| | | | ∑ = 35<br>Average = 3.50 | | | ∑ = 88<br>Average = 8.80 |

## PROJECT 129

Type: Private
Nature: Building (Residential)
Location of Project: Kaduna
Duration of Project: 24 months
SCD = 02/09/2003
ACD = 20/08/2004
Difference = ACD – SCD = 12 months ⇒ 28 + 186 + 90 + 28 + 20 =352 days
BC = 230,000,000.00
AC = 258,860,000.00
Difference = AC – BC = 28,860,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 03/01/02 | 17/01/02 | 14 | 28/02/02 | 15/03/02 | 15 |
| 2 | 22/07/02 | 07/08/02 | 16 | 04/09/02 | 10/09/02 | 6 |
| 3 | 19/02/03 | 05/03/03 | 14 | 07/04/03 | 15/04/03 | 8 |
| 4 | 22/09/03 | 06/10/03 | 14 | 04/11/03 | 11/11/03 | 7 |
| 5 | 19/04/04 | 04/05/04 | 15 | 03/06/04 | 10/06/04 | 7 |
| | | | ∑ = 73<br>Average = 14.60 | | | ∑ = 43<br>Average = 8.60 |

## PROJECT 130

Type: Public
Nature: Building (LGA Secretariat)
Location of Project: Guri, Jigawa State
Duration of Project: 12 months
SCD = 26/04/1999
ACD = 13/05/1999
Difference = ACD – SCD = 17 days
BC = 22,788,708.43
AC = 24,098,314.13
Difference = AC – BC = 1,309,605.70

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 26/05/98 | 27/05/98 | 1 | 27/05/98 | 30/05/98 | 3 |
| 2 | 25/06/98 | 28/06/98 | 3 | 28/06/98 | 01/07/98 | 3 |
| 3 | 25/07/98 | 29/07/98 | 4 | 29/07/98 | 30/07/98 | 1 |
| 4 | 24/08/98 | 26/08/98 | 2 | 26/08/98 | 02/09/98 | 7 |
| 5 | 23/09/98 | 28/09/98 | 5 | 28/09/98 | 02/10/98 | 4 |
| 6 | 23/10/98 | 28/10/98 | 5 | 28/10/98 | 31/10/98 | 3 |
| 7 | 22/11/98 | 26/11/98 | 4 | 26/11/98 | 29/11/98 | 3 |
| 8 | 22/12/98 | 24/12/98 | 2 | 24/12/98 | 24/12/98 | 0 |
| 9 | 21/01/99 | 23/01/99 | 2 | 23/04/99 | 28/01/99 | 5 |
| 10 | 22/02/99 | 24/02/99 | 2 | 24/02/99 | 28/02/99 | 4 |
| 11 | 22/03/99 | 24/03/99 | 2 | 24/03/99 | 31/03/99 | 7 |
| 12 | 21/04/99 | 25/04/99 | 4 | 25/04/99 | 29/04/99 | 4 |
| | | | ∑ = 36<br>Average = 3.00 | | | ∑ = 44<br>Average = 3.67 |

## PROJECT 131

Type: Not indicated
Nature: Building (Residential)
Location of Project: Maitama Abuja
Duration of Project: 16 months
SCD = 20/01/2006
ACD = 20/03/2006
Difference = ACD – SCD = 8 weeks ⇒ 11 + 28 + 20 = 59 days
BC = 24,151,640.00
AC = 28,442,890.00
Difference = AC – BC =4,291,250.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 01/11/04 | 15/11/04 | 14 | 22/11/04 | 25/11/04 | 3 |
| 2 | 31/03/05 | 28/04/05 | 28 | 05/05/05 | 06/05/05 | 1 |
| 3 | 29/07/05 | 31/07/05 | 2 | 07/08/05 | 10/08/05 | 3 |
| 4 | 16/01/06 | 20/01/06 | 4 | 27/01/06 | 31/01/06 | 3 |
| | | | ∑ = 48<br>Average = 12.00 | | | ∑ = 10<br>Average = 2.50 |

## PROJECT 132

Type: Private
Nature: Building (Shopping Centre)
Location of Project: Kano
Duration of Project: 60 weeks
SCD = 01/07/2005
ACD = 21/08/2005
Difference = ACD – SCD = 7 weeks ⇒ 30 + 21 = 51 days
BC = 96,000,000.00
AC = 99,800,000.00
Difference = AC – BC = 3,800,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 25/04/04 | 25/04/05 | 0 | 25/04/05 | 28/04/05 | 3 |
| 2 | 01/10/04 | 02/10/04 | 1 | 02/10/04 | 05/10/04 | 3 |
| 3 | 02/05/05 | 06/05/05 | 4 | 06/05/05 | 07/05/05 | 1 |
| 4 | 25/08/05 | 26/08/05 | 1 | 26/08/05 | 02/09/05 | 7 |
| | | | ∑ = 6<br>Average = 1.50 | | | ∑ = 14<br>Average = 3.50 |

## PROJECT 133

Type: Public
Nature: Building (Lecture Theatre)
Location of Project: Jos
Duration of Project: 15 months
SCD = 11/11/2004
ACD = 27/02/2005
Difference = ACD – SCD = 3 months $\Rightarrow$ 20 + 62 + 27 = 109 days
BC = 15,783,245.55
AC = 19,327,585.35
Difference = AC – BC = 3,544,339.80

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 19/12/03 | 21/12/03 | 2 | 22/12/03 | 28/12/03 | 6 |
| 2 | 16/12/04 | 17/02/04 | 1 | 20/02/04 | 24/02/04 | 4 |
| 3 | 17/04/04 | 18/04/04 | 1 | 22/04/04 | 25/04/04 | 3 |
| 4 | 14/06/04 | 16/06/04 | 2 | 20/06/04 | 30/06/04 | 10 |
| 5 | 16/08/04 | 06/09/04 | 21 | 10/09/04 | 15/09/04 | 5 |
| 6 | 19/10/04 | 27/10/04 | 8 | 01/11/04 | 11/11/04 | 10 |
| 7 | 16/12/04 | 19/12/04 | 3 | 21/12/04 | 22/12/04 | 1 |
| 8 | 18/02/05 | 29/02/05 | 11 | 02/03/05 | 12/03/05 | 10 |
| | | | $\sum$ = 49<br>Average = 6.13 | | | $\sum$ = 49<br>Average = 6.13 |

## PROJECT 134

Type: Private
Nature: Office Complex (Laison)
Location of Project: Maitama, Abuja
Duration of Project: 20 months
SCD = 22/09/2003
ACD = 30/10/2003
Difference = ACD – SCD = 38 days
BC = 50,287,000.00
AC = 58,655,730.00
Difference = AC – BC = 8,368,730.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 25/04/02 | 02/05/02 | 7 | 09/05/02 | 25/05/02 | 17 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 25/07/02 | 08/08/02 | 14 | 08/08/02 | 19/08/02 | 11 |
| 3 | 28/11/02 | 09/12/02 | 11 | 12/12/02 | 18/12/02 | 6 |
| 4 | 24/04/03 | 01/05/03 | 7 | 08/05/03 | 27/05/03 | 19 |
| 5 | 18/09/03 | 02/10/03 | 14 | 02/10/03 | 20/11/03 | 49 |
| | | | $\sum = 53$<br>Average = 10.60 | | | $\sum = 101$<br>Average = 20.40 |

## PROJECT 135

Type: Private
Nature: Building (Residential)
Location of Project: Kano
Duration of Project: 6 months
SCD = 10/11/2003
ACD = 12/01/2004
Difference = ACD – SCD = 2 months $\Rightarrow$ 20 + 31 + 12 = 63 days
BC = 3,500,000.00
AC = 4,000,000.00
Difference = AC – BC = 500,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 15/06/03 | 17/06/03 | 2 | 30/06/03 | 30/06/03 | 0 |
| 2 | 10/08/03 | 14/08/03 | 4 | 16/08/03 | 20/08/03 | 4 |
| 3 | 31/10/03 | 01/11/03 | 1 | 02/11/03 | 03/11/03 | 1 |
| 4 | 22/01/04 | 22/01/04 | 0 | 28/01/04 | 31/01/04 | 3 |
| | | | $\sum = 7$<br>Average = 1.75 | | | $\sum = 8$<br>Average = 2.00 |

## PROJECT 136

Type: Private
Nature: Building (School)
Location of Project: Benin
Duration of Project: 6 months
SCD = 06/02/2003
ACD = 20/02/2003
Difference = ACD – SCD = 2 weeks $\Rightarrow$ 14 days
BC = 7,000,000.00
AC = 7,350,000.00
Difference = AC – BC = 350,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 18/09/02 | 20/09/02 | 2 | 24/09/02 | 25/09/02 | 1 |
| 2 | 12/11/02 | 14/11/02 | 2 | 17/11/02 | 19/11/02 | 2 |
| 3 | 25/02/03 | 26/02/03 | 1 | 01/03/03 | 02/03/03 | 1 |
| | | | ∑ = 5<br>Average = 1.67 | | | ∑ = 4<br>Average = 1.33 |

## PROJECT 137

Type: Private
Nature: Building (Shopping Complex)
Location of Project: Benin
Duration of Project: 2 years
SCD = 20/02/1999
ACD = 10/11/1999
Difference = ACD – SCD = 9 months ⇒ 8 + 155 + 90 + 10 = 263 days
BC = 8,750,000.00
AC = 9,000,000.00
Difference = AC – BC = 250,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 19/04/97 | 19/04/97 | 0 | 22/04/97 | 29/04/97 | 7 |
| 2 | 10/10/97 | 13/10/97 | 3 | 20/10/97 | 21/10/97 | 1 |
| 3 | 21/03/98 | 22/03/98 | 1 | 30/03/98 | 31/03/98 | 1 |
| 4 | 16/08/98 | 20/08/98 | 4 | 23/08/98 | 25/08/98 | 2 |
| 5 | 05/01/99 | 12/01/99 | 7 | 15/01/99 | 20/01/99 | 5 |
| 6 | 13/03/99 | 13/03/99 | 0 | 15/03/99 | 19/03/99 | 4 |
| 7 | 06/08/99 | 10/08/99 | 4 | 12/08/99 | 13/08/99 | 1 |
| 8 | 25/11/99 | 30/11/99 | 5 | 10/12/99 | 05/01/00 | 26 |
| | | | ∑ = 24<br>Average = 3.00 | | | ∑ = 47<br>Average = 5.88 |

## PROJECT 138

Type: Private
Nature: Building (Office Block)
Location of Project: Kano
Duration of Project: 12 months
SCD = 19/09/2005
ACD = 25/01/2005

Difference = ACD – SCD = 36 days
BC = 18,500,000.00
AC = 21,000,000.00
Difference = AC – BC = 2,500,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 12/09/04 | 12/09/04 | 0 | 12/09/04 | 12/09/04 | 0 |
| 2 | 10/11/04 | 17/11/04 | 7 | 28/11/04 | 05/12/04 | 7 |
| 3 | 04/03/05 | 15/03/05 | 11 | 20/03/05 | 30/03/05 | 10 |
| 4 | 08/08/05 | 21/08/05 | 13 | 29/08/05 | 15/09/05 | 17 |
| 5 | 25/10/05 | 30/10/05 | 5 | 15/11/05 | 26/11/05 | 11 |
| | | | ∑ = 36<br>Average = 7.20 | | | ∑ = 45<br>Average = 9.00 |

## PROJECT 139

Type: Public
Nature: Building (Residential)
Location of Project: Abuja
Duration of Project: 8 weeks
SCD = 03/09/1997
ACD = 20/10/2002
Difference = ACD – SCD = 5 years, 2 months ⇒ 5 x 365 + 27 + 20 = 1872 days
BC = 76,238,060.23
AC = 87,673,769.26
Difference = AC – BC = 11,435,709.03

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 27/10/97 | 27/10/97 | 0 | 05/11/97 | 07/11/97 | 2 |
| 2 | 09/03/98 | 09/03/98 | 0 | 23/03/98 | 24/03/98 | 1 |
| 3 | 30/03/98 | 30/03/98 | 0 | 14/04/98 | 14/04/98 | 0 |
| 4 | 30/05/98 | 30/05/98 | 0 | 14/06/98 | 14/06/98 | 0 |
| 5 | 06/05/99 | 06/05/99 | 0 | 28/05/99 | 28/05/99 | 0 |
| 6 | 27/04/00 | 27/04/00 | 0 | 13/05/00 | 13/05/00 | 0 |
| 7 | 22/08/01 | 22/08/01 | 0 | 18/10/01 | 18/10/01 | 0 |
| 8 | 20/03/02 | 20/03/02 | 0 | 11/04/02 | 11/04/02 | 0 |
| 9 | 22/10/02 | 22/10/02 | 0 | 25/11/02 | 25/11/02 | 0 |
| | | | ∑ = 0<br>Average = 0.00 | | | ∑ = 3<br>Average = 0.33 |

## PROJECT 140

Type: Private
Nature: Building (Residential)
Location of Project: Bauchi
Duration of Project: 12 weeks
SCD = 19/08/2002
ACD = 17/09/2002
Difference = ACD – SCD = 4 weeks ⇒ 12 + 17 = 29 days
BC = 4,600,000.00
AC = 5,200,000.00
Difference = AC – BC = 600,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 29/06/02 | 01/07/02 | 2 | 08/07/02 | 09/07/02 | 1 |
| 2 | 20/07/02 | 28/07/02 | 8 | 04/08/02 | 06/08/02 | 2 |
| 3 | 18/08/02 | 27/08/02 | 9 | 29/08/02 | 29/08/02 | 0 |
| 4 | 03/09/02 | 08/09/02 | 5 | 13/09/02 | 18/09/02 | 5 |
| 5 | 27/10/02 | 30/10/02 | 3 | 02/10/02 | 06/10/02 | 4 |
| 6 | 05/11/02 | 07/11/02 | 2 | 09/11/02 | 15/11/02 | 6 |
| | | | ∑ = 29<br>Average = 4.83 | | | ∑ = 18<br>Average = 3.00 |

## PROJECT 141

Type: Private
Nature: Building (Residential)
Location of Project: Tudun Wada
Duration of Project: 3 months
SCD = 29/06/2002
ACD = 15/07/2002
Difference = ACD – SCD = 2 weeks ⇒ 16 days
BC = 3,500,000.00
AC = 3,950,000.00
Difference = AC – BC = 450,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS) | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 11/04/02 | 13/04/02 | 2 | 20/04/02 | 24/04/02 | 4 |
| 2 | 28/04/02 | 01/05/02 | 3 | 08/05/02 | 18/05/02 | 10 |
| 3 | 22/05/02 | 25/05/02 | 3 | 30/05/02 | 03/06/02 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | 06/06/02 | 16/06/02 | 10 | 23/06/02 | 28/06/02 | 5 |
| | | | ∑ = 18<br>Average = 4.50 | | | ∑ = 23<br>Average = 5.75 |

## PROJECT 142

Type: Not indicated
Nature: Building (Shopping Complex)
Location of Project: Kaduna
Duration of Project: 6 months
SCD = 16/08/2001
ACD = 20/09/2001
Difference = ACD – SCD = 1 month ⇒ 15 + 20 = 35 days
BC = 62,200,550.00
AC = 70,626,100.00
Difference = AC – BC = 8,425,550.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 16/01/01 | 16/01/01 | 0 | 16/01/01 | 16/01/97 | 0 |
| 2 | 22/01/01 | 22/01/01 | 0 | 22/01/01 | 22/01/01 | 0 |
| 3 | 29/01/01 | 29/01/01 | 0 | 29/01/01 | 29/01/01 | 0 |
| 4 | 12/02/01 | 12/02/01 | 0 | 12/01/01 | 12/01/01 | 0 |
| 5 | 27/02/01 | 27/02/01 | 0 | 27/02/01 | 03/03/01 | 4 |
| 6 | 15/03/01 | 15/03/01 | 0 | 15/03/01 | 15/03/01 | 0 |
| 7 | 01/04/01 | 01/04/01 | 0 | 01/04/01 | 01/04/01 | 0 |
| 8 | 22/04/01 | 22/04/01 | 0 | 22/04/01 | 22/04/01 | 0 |
| 9 | 05/05/01 | 05/05/01 | 0 | 15/05/01 | 15/05/01 | 0 |
| 10 | 28/05/01 | 28/05/01 | 0 | 28/05/01 | 03/06/01 | 6 |
| 11 | 16/06/01 | 16/06/01 | 0 | 16/06/01 | 27/06/01 | 11 |
| 12 | 04/07/01 | 04/07/01 | 0 | 04/07/01 | 16/07/01 | 12 |
| 13 | 03/08/01 | 03/08/01 | 0 | 03/08/01 | 11/08/01 | 8 |
| 14 | 30/08/01 | 30/08/01 | 0 | 30/08/01 | 30/08/01 | 0 |
| 15 | 20/09/01 | 20/09/01 | 0 | 20/09/01 | 27/09/01 | 7 |
| | | | ∑ = 0<br>Average = 0.00 | | | ∑ = 48<br>Average = 3.20 |

## PROJECT 143

Type: Not indicated
Nature: Building (Internet Cafe)
Location of Project: Kaduna
Duration of Project: 2 months

SCD = 02/04/2000
ACD = 06/04/2000
Difference = ACD – SCD = 4 days
BC = 1,300,360.00
AC = 2,362,950.00
Difference = AC – BC = 1,062,590.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 10/02/00 | 12/02/00 | 2 | 12/02/00 | 12/02/00 | 0 |
| 2 | 21/02/00 | 21/02/00 | 0 | 21/02/00 | 03/03/00 | 10 |
| 3 | 07/03/00 | 07/03/00 | 0 | 07/03/00 | 11/03/00 | 4 |
| 4 | 22/03/00 | 22/03/00 | 0 | 22/03/00 | 25/03/00 | 3 |
| 5 | 02/04/00 | 02/04/00 | 0 | 02/04/00 | 02/04/00 | 0 |
| 6 | 06/04/00 | 06/04/00 | 0 | 06/04/00 | 07/04/00 | 1 |
| | | | ∑ = 2<br>Average = 0.33 | | | ∑ = 18<br>Average = 3.00 |

## PROJECT 144

Type: Private
Nature: Building (Residential)
Location of Project: Yanyan, Abuja
Duration of Project: 4 months
SCD = 16/05/2001
ACD = 15/08/2001
Difference = ACD – SCD = 3 months ⇒ 15 + 30 + 31 + 16 = 92 days
BC = 8,000,000.00
AC = 8,200,000.00
Difference = AC – BC = 200,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 16/02/01 | 18/02/01 | 2 | 20/02/01 | 25/02/01 | 5 |
| 2 | 15/03/01 | 15/03/01 | 0 | 16/03/01 | 30/03/01 | 14 |
| 3 | 15/04/01 | 15/04/01 | 0 | 16/04/01 | 15/05/01 | 29 |
| 4 | 15/05/01 | 15/05/01 | 0 | 16/05/01 | 05/07/01 | 50 |
| | | | ∑ = 2<br>Average = 0.50 | | | ∑ = 98<br>Average = 24.50 |

## PROJECT 145

Type: Private
Nature: Building (Residential)
Location of Project: Wuse II, Abuja
Duration of Project: 8 months
SCD = August 2004
ACD = October 2004
Difference = ACD – SCD = 2 months ⇒ 30 + 31 = 61 days
BC = 13,700,000.00
AC = 15,000,000.00
Difference = AC – BC = 1,300,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 28/01/04 | 28/01/04 | 0 | 01/02/04 | 02/02/04 | 1 |
| 2 | 01/03/04 | 01/03/04 | 0 | 02/03/04 | 02/03/04 | 0 |
| 3 | 04/04/04 | 04/04/04 | 0 | 06/04/04 | 06/04/04 | 0 |
| 4 | 02/05/04 | 02/05/04 | 0 | 03/05/04 | 20/05/04 | 17 |
| 5 | 28/05/04 | 20/06/04 | 23 | 30/05/04 | 15/07/04 | 46 |
| | | | ∑ = 23<br>Average = 4.60 | | | ∑ = 64<br>Average = 12.80 |

## PROJECT 146

Type: Public
Nature: Building (Computer Centre Complex)
Location of Project: Bayero University, Kano
Duration of Project: 40 weeks
SCD = 31/10/2002
ACD = 27/10/2003
Difference = ACD – SCD = 52 weeks ⇒ 186 + 120 + 28 + 4 = 338 days
BC = 88,601,292.10
AC = 101,736,070.70
Difference = AC – BC = 13,134,778.60

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 27/12/01 | 27/12/01 | 0 | 10/01/02 | 24/01/02 | 14 |
| 2 | 21/03/02 | 03/04/02 | 13 | 03/03/02 | 07/04/02 | 35 |
| 3 | 02/05/02 | 07/05/02 | 5 | 28/05/02 | 04/06/02 | 7 |
| 4 | 13/06/02 | 17/06/02 | 4 | 17/07/02 | 19/07/02 | 2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5 | 23/08/02 | 27/08/02 | 4 | 24/09/02 | 26/09/02 | 2 |
| 6 | 21/10/02 | 22/10/02 | 1 | 19/11/02 | 25/11/02 | 6 |
| 7 | 16/12/02 | 17/12/02 | 1 | 14/01/03 | 15/02/03 | 32 |
| 8 | 17/02/03 | 20/02/03 | 3 | 20/03/03 | 10/04/03 | 21 |
| 9 | 20/05/03 | 22/05/03 | 2 | 19/06/03 | 10/07/03 | 21 |
| 10 | 14/07/03 | 15/07/03 | 1 | 12/08/03 | 10/10/03 | 59 |
| 11 | 27/10/03 | 28/10/03 | 1 | 25/11/03 | 05/02/04 | 72 |
| 12 | 25/05/04 | 25/05/04 | 0 | 08/06/04 | 22/06/04 | 14 |
| 13 | 19/10/04 | 14/11/04 | 23 | 11/11/04 | 09/02/05 | 90 |
| | | | ∑ = 58<br>Average = 4.46 | | | ∑ = 375<br>Average = 28.85 |

## PROJECT 147

Type: Private
Nature: Building (Residential)
Location of Project: Gwarimpa II, Abuja
Duration of Project: 8 weeks
SCD = 20/07/2002
ACD = 31/07/2002
Difference = ACD – SCD = 11 days
BC = 11,660,487.90
AC = 11,973,846.50
Difference = AC – BC = 313,358.60

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 04/06/02 | 04/06/02 | 0 | 06/06/02 | 07/06/02 | 1 |
| 2 | 18/06/02 | 18/06/02 | 0 | 20/06/02 | 22/06/02 | 2 |
| 3 | 02/07/02 | 04/07/04 | 2 | 08/07/02 | 09/07/02 | 1 |
| 4 | 15/07/02 | 15/07/02 | 0 | 16/07/02 | 18/07/02 | 2 |
| 5 | 29/07/02 | 30/07/02 | 1 | 31/07/02 | 31/07/02 | 0 |
| | | | ∑ = 3<br>Average = 0.60 | | | ∑ = 6<br>Average = 1.20 |

## PROJECT 148

Type: Public
Nature: Building (Hospital)
Location of Project: Kaura
Duration of Project: 6 months
SCD = 20/12/1999
ACD = 30/03/2000

Difference = ACD – SCD = 3 months ⇒ 11 + 31 + 28 + 30 = 100 days
BC = 35,000,000.00
AC = 41,000,000.00
Difference = AC – BC = 6,000,000.00

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 10/08/99 | 10/08/99 | 0 | 12/08/99 | 19/08/99 | 7 |
| 2 | 29/10/99 | 29/10/99 | 0 | 29/10/99 | 29/11/99 | 31 |
| 3 | 02/12/99 | 02/12/99 | 0 | 04/12/99 | 08/12/99 | 4 |
| 4 | 12/02/00 | 12/02/00 | 0 | 14/02/00 | 14/02/00 | 0 |
| 5 | 07/03/00 | 07/03/00 | 0 | 18/03/00 | 22/03/00 | 4 |
| | | | ∑ = 0<br>Average = 0.00 | | | ∑ = 46<br>Average = 9.20 |

## PROJECT 149

Type: Private
Nature: Building (Mosque)
Location of Project: Dutse
Duration of Project: 4 years
SCD = 19/12/1998
ACD = 15/12/2003
Difference = ACD – SCD = 5 years ⇒4x365+12+ 186 + 28 + 120 + 15 = 1821 days
BC = 10,421,960.59
AC = 18,000,000.00
Difference = AC – BC = 7,578,039.41

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 14/09/94 | 14/09/94 | 0 | 21/09/94 | 28/09/94 | 7 |
| 2 | 22/01/99 | 29/01/99 | 7 | 05/02/99 | 19/02/99 | 14 |
| 3 | 12/04/99 | 21/04/99 | 9 | 28/04/99 | 12/05/99 | 14 |
| 4 | 17/07/99 | 20/07/99 | 3 | 27/07/99 | 10/08/99 | 75 |
| 5 | 14/12/99 | 19/12/99 | 5 | 26/12/99 | 09/01/00 | 14 |
| 6 | 10/05/02 | 12/05/02 | 2 | 19/05/02 | 10/07/02 | 52 |
| 7 | 01/03/03 | 15/03/03 | 14 | 22/03/03 | 25/03/03 | 3 |
| 8 | 03/11/03 | 10/11/03 | 7 | 17/11/03 | 12/12/03 | 25 |
| | | | ∑ = 47<br>Average = 5.88 | | | ∑ = 204<br>Average = 25.50 |

## PROJECT 150

Type: Public
Nature: Building (CBN Staff Quarters)
Location of Project: Maiduguri
Duration of Project: 4 months
SCD = June 2003
ACD = November 2004
Difference = ACD – SCD = 5 months ⇒ 5 x 30 = 150 days
BC = 14,191,575.00
AC = 14,252,002.65
Difference = AC – BC = 60,427.65

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 24/04/03 | 29/04/03 | 5 | 29/05/03 | 12/06/03 | 14 |
| 2 | 31/07/03 | 07/08/03 | 7 | 07/09/03 | 21/09/03 | 14 |
| 3 | 06/10/03 | 08/10/03 | 2 | 08/11/03 | 22/11/03 | 14 |
| 4 | 08/01/04 | 10/01/04 | 2 | 10/02/04 | 24/02/03 | 14 |
| | | | ∑ = 16<br>Average = 4.00 | | | ∑ = 56<br>Average = 14.00 |

## PROJECT 151

Type: Not indicated
Nature: Building (Hospital)
Location of Project: Ilorin
Duration of Project: 16 weeks
SCD = 08/12/1997
ACD = 04/02/1998
Difference = ACD – SCD = 8 weeks ⇒ 23 + 31 + 4 = 58 days
BC = 15,589,520.50
AC = 18,625,470.80
Difference = AC – BC = 3,035,950.30

**PAYMENT PATTERN**

| S/NO | VALUATIONS | | | PAYMENTS | | |
|---|---|---|---|---|---|---|
| | D1VWD | DAV | DIDV (Days) | DPWD | DPWAM | DIPD (Days) |
| 1 | 30/09/97 | 05/10/97 | 5 | 10/10/97 | 25/10/97 | 15 |
| 2 | 31/10/97 | 07/11/97 | 7 | 15/12/97 | 30/12/97 | 15 |
| 3 | 30/11/97 | 04/12/97 | 4 | 22/01/98 | 05/02/98 | 14 |
| 4 | 31/12/97 | 30/01/98 | 30 | 20/02/98 | 25/03/98 | 33 |
| 5 | 31/01/98 | 03/03/98 | 31 | 27/04/98 | 15/05/98 | 18 |
| 6 | 05/02/98 | 06/04/98 | 60 | 08/05/98 | 10/08/98 | 94 |
| 7 | 05/08/98 | 10/08/98 | 5 | 16/09/98 | 25/12/98 | 100 |
| | | | ∑ = 142<br>Average = 20.29 | | | ∑ = 289<br>Average = 41.29 |

## APPENDIX III

## SUMMARY OF THE DATA REQUIRED FOR THE DETERMINATION OF THE RELATIONSHIP BETWEEN DELAYED PAYMENTS AND TIME AND COST OVERRUNS

Table 1 Summary of the data required for the determination of the relationship between delayed payments and cost overruns on the basis of the combined public and private building projects.

| **Project** | A | B | C=AxB | $D=A^2$ | $E=B^2$ |
|---|---|---|---|---|---|
| | Delay in payment (days) | Cost overrun (₦) | | | |
| | $X_c$ | $Y_c$ | $X_cY_c$ | $X^2_c$ | $Y^2_c$ |
| 1 | 1,164.00 | 34,899,493.79 | 40,623,010,771.56 | 1,354,896.00 | 1.21797E+15 |
| 2 | 442.00 | 13,134,778.60 | 5,805,572,141.20 | 195,364.00 | 1.72522E+14 |
| 3 | 338.00 | 1,225,950.00 | 414,371,100.00 | 114,244.00 | 1.50295E+12 |
| 4 | 1,430.00 | 2,580,018.00 | 3,689,425,740.00 | 2,044,900.00 | 6.65649E+12 |
| 5 | 40.00 | 1,125,000.00 | 45,000,000.00 | 1,600.00 | 1.26563E+12 |
| 6 | 74.00 | 9,000,000.00 | 666,000,000.00 | 5,476.00 | 8.1E+13 |
| 7 | 32.00 | 700,000.00 | 22,400,000.00 | 1,024.00 | 4.9E+11 |
| 8 | 243.00 | 3,850,174.00 | 935,592,282.00 | 59,049.00 | 1.48238E+13 |
| 9 | 40.00 | 3,000,000.00 | 120,000,000.00 | 1,600.00 | 9E+12 |
| 10 | 60.00 | 3,500,000.00 | 210,000,000.00 | 3,600.00 | 1.225E+13 |
| 11 | 40.00 | 5,000,000.00 | 200,000,000.00 | 1,600.00 | 2.5E+13 |
| 12 | 115.00 | 18,552,209.68 | 2,133,504,113.20 | 13,225.00 | 3.44184E+14 |
| 13 | 90.00 | 11,022,282.95 | 992,005,465.50 | 8,100.00 | 1.21491E+14 |
| 14 | 160.00 | 400,000.00 | 64,000,000.00 | 25,600.00 | 1.6E+11 |
| 15 | 31.00 | 440,000.00 | 13,640,000.00 | 961.00 | 1.936E+11 |
| 16 | 171.00 | 950,000.00 | 162,450,000.00 | 29,241.00 | 9.025E+11 |
| 17 | 149.00 | 2,050,000.00 | 305,450,000.00 | 22,201.00 | 4.2025E+12 |
| 18 | 116.00 | 2,105,988.60 | 244,294,677.60 | 13,456.00 | 4.43519E+12 |

| | | | | | |
|---|---|---|---|---|---|
| 19 | 24.00 | 650,200.00 | 15,604,800.00 | 576.00 | 4.2276E+11 |
| 20 | 281.00 | 1,120,000.00 | 314,720,000.00 | 78,961.00 | 1.2544E+12 |
| 21 | 64.00 | 6,400,016.00 | 409,601,024.00 | 4,096.00 | 4.09602E+13 |
| 22 | 436.00 | 18,225,125.00 | 7,946,154,500.00 | 190,096.00 | 3.32155E+14 |
| 23 | 173.00 | 886,678.32 | 153,395,349.36 | 29,929.00 | 7.86198E+11 |
| 24 | 357.00 | 3,926,250.00 | 1,401,671,250.00 | 127,449.00 | 1.54154E+13 |
| 25 | 224.00 | 3,750,000.00 | 840,000,000.00 | 50,176.00 | 1.40625E+13 |
| 26 | 273.00 | 2,428,520.00 | 662,985,960.00 | 74,529.00 | 5.89771E+12 |
| 27 | 350.00 | 2,280,128.00 | 798,044,800.00 | 122,500.00 | 5.19898E+12 |
| 28 | 13.00 | 1,885,350.00 | 24,509,550.00 | 169.00 | 3.55454E+12 |
| 29 | 166.00 | 799,904.88 | 132,784,210.08 | 27,556.00 | 6.39848E+11 |
| 30 | 190.00 | 4,296,355.00 | 816,307,450.00 | 36,100.00 | 1.84587E+13 |
| 31 | 151.00 | 500,000.00 | 75,500,000.00 | 22,801.00 | 2.5E+11 |
| 32 | 173.00 | 4,200,990.00 | 726,771,270.00 | 29,929.00 | 1.76483E+13 |
| 33 | 98.00 | 1,121,256.80 | 109,883,166.40 | 9,604.00 | 1.25722E+12 |
| 34 | 194.00 | 1,580,958.91 | 306,706,028.54 | 37,636.00 | 2.49943E+12 |
| 35 | 403.00 | 4,070,000.00 | 1,640,210,000.00 | 162,409.00 | 1.65649E+13 |
| 36 | 49.00 | 1,500,000.00 | 73,500,000.00 | 2,401.00 | 2.25E+12 |
| 37 | 70.00 | 556,733.88 | 38,971,371.60 | 4,900.00 | 3.09953E+11 |
| 38 | 34.00 | 7,378,000.00 | 250,852,000.00 | 1,156.00 | 5.44349E+13 |
| 39 | 116.00 | 780,132.09 | 90,495,322.44 | 13,456.00 | 6.08606E+11 |
| 40 | 9.00 | 1,712,209.40 | 15,409,884.60 | 81.00 | 2.93166E+12 |
| 41 | 12.00 | 1,128,361.75 | 13,540,341.00 | 144.00 | 1.2732E+12 |
| 42 | 146.00 | 1,712,209.00 | 249,982,514.00 | 21,316.00 | 2.93166E+12 |
| 43 | 362.00 | 62,000,000.00 | 22,444,000,000.00 | 131,044.00 | 3.844E+15 |
| 44 | 166.00 | 42,500,000.00 | 7,055,000,000.00 | 27,556.00 | 1.80625E+15 |
| 45 | 19.00 | 245,071.75 | 4,656,363.25 | 361.00 | 60060162648 |

| | | | | | |
|---|---|---|---|---|---|
| 46 | 116.00 | 10,780,000.00 | 1,250,480,000.00 | 13,456.00 | 1.16208E+14 |
| 47 | 76.00 | 300,000.00 | 22,800,000.00 | 5,776.00 | 90000000000 |
| 48 | 121.00 | 3,200,000.00 | 387,200,000.00 | 14,641.00 | 1.024E+13 |
| 49 | 16.00 | 1,725,117.00 | 27,601,872.00 | 256.00 | 2.97603E+12 |
| 50 | 101.00 | 400,000.00 | 40,400,000.00 | 10,201.00 | 1.6E+11 |
| 51 | 526.00 | 1,796,200.00 | 944,801,200.00 | 276,676.00 | 3.22633E+12 |
| 52 | 353.00 | 6,320,000.00 | 2,230,960,000.00 | 124,609.00 | 3.99424E+13 |
| 53 | 9.00 | 115,510.00 | 1,039,590.00 | 81.00 | 13342560100 |
| 54 | 87.00 | 6,268,319.00 | 545,343,753.00 | 7,569.00 | 3.92918E+13 |
| 55 | 42.00 | 60,250.00 | 2,530,500.00 | 1,764.00 | 3630062500 |
| 56 | 77.00 | 84,725,000.00 | 6,523,825,000.00 | 5,929.00 | 7.17833E+15 |
| 57 | 39.00 | 290,250.00 | 11,319,750.00 | 1,521.00 | 84245062500 |
| 58 | 18.00 | 1,319,065.00 | 23,743,170.00 | 324.00 | 1.73993E+12 |
| 59 | 50.00 | 850,300.00 | 42,515,000.00 | 2,500.00 | 7.2301E+11 |
| 60 | 14.00 | 600,000.00 | 8,400,000.00 | 196.00 | 3.6E+11 |
| 61 | 28.00 | 1,347,540.00 | 37,731,120.00 | 784.00 | 1.81586E+12 |
| 62 | 177.00 | 2,712,500.00 | 480,112,500.00 | 31,329.00 | 7.35766E+12 |
| 63 | 549.00 | 53,850,002.00 | 29,563,651,098.00 | 301,401.00 | 2.89982E+15 |
| 64 | 20.00 | 364,192.00 | 7,283,840.00 | 400.00 | 1.32636E+11 |
| 65 | 167.00 | 1,483,770.00 | 247,789,590.00 | 27,889.00 | 2.20157E+12 |
| 66 | 74.00 | 300,000.00 | 22,200,000.00 | 5,476.00 | 90000000000 |
| 67 | 25.00 | 2,000,000.00 | 50,000,000.00 | 625.00 | 4E+12 |
| 68 | 72.00 | 250,000.00 | 18,000,000.00 | 5,184.00 | 62500000000 |
| 69 | 21.00 | 100,000.00 | 2,100,000.00 | 441.00 | 10000000000 |
| 70 | 8.00 | 300,000.00 | 2,400,000.00 | 64.00 | 90000000000 |
| 71 | 28.00 | 4,004,772.80 | 112,133,638.40 | 784.00 | 1.60382E+13 |
| 72 | 278.00 | 2,000,000.00 | 556,000,000.00 | 77,284.00 | 4E+12 |

| | | | | | |
|---|---|---|---|---|---|
| 73 | 84.00 | 500,004.32 | 42,000,362.88 | 7,056.00 | 2.50004E+11 |
| 74 | 122.00 | 22,101,066.00 | 2,696,330,052.00 | 14,884.00 | 4.88457E+14 |
| 75 | 119.00 | 5,581,623.00 | 664,213,137.00 | 14,161.00 | 3.11545E+13 |
| 76 | 5.00 | 2,893,012.00 | 14,465,060.00 | 25.00 | 8.36952E+12 |
| 77 | 10.00 | 3,965,617.00 | 39,656,170.00 | 100.00 | 1.57261E+13 |
| 78 | 68.00 | 611,413.25 | 41,576,101.00 | 4,624.00 | 3.73826E+11 |
| 79 | 31.00 | 1,102,012.08 | 34,162,374.48 | 961.00 | 1.21443E+12 |
| 80 | 39.00 | 1,115,112.08 | 43,489,371.12 | 1,521.00 | 1.24347E+12 |
| 81 | 23.00 | 1,398,000.00 | 32,154,000.00 | 529.00 | 1.9544E+12 |
| 82 | 39.00 | 150,000.00 | 5,850,000.00 | 1,521.00 | 22500000000 |
| 83 | 1,101.00 | 384,018,581.00 | 422,804,457,681.00 | 1,212,201.00 | 1.4747E+17 |
| 84 | 75.00 | 65,834,080.22 | 4,937,556,016.50 | 5,625.00 | 4.33413E+15 |
| 85 | 71.00 | 700,000.00 | 49,700,000.00 | 5,041.00 | 4.9E+11 |
| 86 | 61.00 | 8,000,000.00 | 488,000,000.00 | 3,721.00 | 6.4E+13 |
| 87 | 77.00 | 5,795,000.00 | 446,215,000.00 | 5,929.00 | 3.3582E+13 |
| 88 | 14.00 | 600,000.00 | 8,400,000.00 | 196.00 | 3.6E+11 |
| 89 | 18.00 | 250,000.00 | 4,500,000.00 | 324.00 | 62500000000 |
| 90 | 15.00 | 420,000.00 | 6,300,000.00 | 225.00 | 1.764E+11 |
| 91 | 8.00 | 200,000.00 | 1,600,000.00 | 64.00 | 40000000000 |
| 92 | 56.00 | 2,500,000.00 | 140,000,000.00 | 3,136.00 | 6.25E+12 |
| 93 | 149.00 | 6,108,068.54 | 910,102,212.46 | 22,201.00 | 3.73085E+13 |
| 94 | 128.00 | 3,429,645.38 | 438,994,608.64 | 16,384.00 | 1.17625E+13 |
| 95 | 75.00 | 2,323,651.97 | 174,273,897.75 | 5,625.00 | 5.39936E+12 |
| 96 | 5.00 | 200,000.00 | 1,000,000.00 | 25.00 | 40000000000 |
| 97 | 26.00 | 2,500,000.00 | 65,000,000.00 | 676.00 | 6.25E+12 |
| 98 | 12.00 | 2,500,000.00 | 30,000,000.00 | 144.00 | 6.25E+12 |
| 99 | 441.00 | 2,050,000.00 | 904,050,000.00 | 194,481.00 | 4.2025E+12 |

| | | | | | |
|---|---|---|---|---|---|
| 100 | 19.00 | 80,000.00 | 1,520,000.00 | 361.00 | 6400000000 |
| 101 | 13.00 | 1,154,310.00 | 15,006,030.00 | 169.00 | 1.33243E+12 |
| 102 | 30.00 | 1,500,000.00 | 45,000,000.00 | 900.00 | 2.25E+12 |
| 103 | 66.00 | 20,200,000.00 | 1,333,200,000.00 | 4,356.00 | 4.0804E+14 |
| 104 | 55.00 | 1,175,848.00 | 64,671,640.00 | 3,025.00 | 1.38262E+12 |
| 105 | 8.00 | 60,000.00 | 480,000.00 | 64.00 | 3600000000 |
| 106 | 32.00 | 150,000.00 | 4,800,000.00 | 1,024.00 | 22500000000 |
| 107 | 497.00 | 7,771,251.56 | 3,862,312,025.32 | 247,009.00 | 6.03924E+13 |
| 108 | 4.00 | 569,198.51 | 2,276,794.04 | 16.00 | 3.23987E+11 |
| 109 | 45.00 | 95,000,000.00 | 4,275,000,000.00 | 2,025.00 | 9.025E+15 |
| 110 | 37.00 | 399,589.55 | 14,784,813.35 | 1,369.00 | 1.59672E+11 |
| 111 | 54.00 | 900,000.00 | 48,600,000.00 | 2,916.00 | 8.1E+11 |
| 112 | 23.00 | 200,000.00 | 4,600,000.00 | 529.00 | 40000000000 |
| 113 | 152.00 | 34,000,000.00 | 5,168,000,000.00 | 23,104.00 | 1.156E+15 |
| 114 | 30.00 | 98,000,000.00 | 2,940,000,000.00 | 900.00 | 9.604E+15 |
| 115 | 339.00 | 8,000,000.00 | 2,712,000,000.00 | 114,921.00 | 6.4E+13 |
| 116 | 29.00 | 1,303,419.50 | 37,799,165.50 | 841.00 | 1.6989E+12 |
| 117 | 94.00 | 994,300.00 | 93,464,200.00 | 8,836.00 | 9.88632E+11 |
| 118 | 53.00 | 38,768.00 | 2,054,704.00 | 2,809.00 | 1502957824 |
| 119 | 1,421.00 | 26,804,201.00 | 38,088,769,621.00 | 2,019,241.00 | 7.18465E+14 |
| 120 | 434.00 | 8,685,128.78 | 3,769,345,890.52 | 188,356.00 | 7.54315E+13 |
| 121 | 1,167.00 | 79,662,500.94 | 92,966,138,596.98 | 1,361,889.00 | 6.34611E+15 |
| 122 | 380.00 | 1,500,010.00 | 570,003,800.00 | 144,400.00 | 2.25003E+12 |
| 123 | 1,227.00 | 37,823,566.60 | 46,409,516,218.20 | 1,505,529.00 | 1.43062E+15 |
| 124 | 158.00 | 28,000,000.00 | 4,424,000,000.00 | 24,964.00 | 7.84E+14 |
| 125 | 413.00 | 996,937.00 | 411,734,981.00 | 170,569.00 | 9.93883E+11 |
| 126 | 156.00 | 7,472,385.00 | 1,165,692,060.00 | 24,336.00 | 5.58365E+13 |

| | | | | | |
|---|---|---|---|---|---|
| 127 | 37.00 | 4,565,000.00 | 168,905,000.00 | 1,369.00 | 2.08392E+13 |
| 128 | 88.00 | 8,433,536.00 | 742,151,168.00 | 7,744.00 | 7.11245E+13 |
| 129 | 43.00 | 28,860,000.00 | 1,240,980,000.00 | 1,849.00 | 8.329E+14 |
| 130 | 44.00 | 1,309,605.70 | 57,622,650.80 | 1,936.00 | 1.71507E+12 |
| 131 | 10.00 | 4,291,250.00 | 42,912,500.00 | 100.00 | 1.84148E+13 |
| 132 | 14.00 | 3,800,000.00 | 53,200,000.00 | 196.00 | 1.444E+13 |
| 133 | 49.00 | 3,544,339.80 | 173,672,650.20 | 2,401.00 | 1.25623E+13 |
| 134 | 101.00 | 8,368,730.00 | 845,241,730.00 | 10,201.00 | 7.00356E+13 |
| 135 | 8.00 | 500,000.00 | 4,000,000.00 | 64.00 | 2.5E+11 |
| 136 | 4.00 | 350,000.00 | 1,400,000.00 | 16.00 | 1.225E+11 |
| 137 | 47.00 | 250,000.00 | 11,750,000.00 | 2,209.00 | 62500000000 |
| 138 | 45.00 | 2,500,000.00 | 112,500,000.00 | 2,025.00 | 6.25E+12 |
| 139 | 3.00 | 11,435,709.03 | 34,307,127.09 | 9.00 | 1.30775E+14 |
| 140 | 18.00 | 600,000.00 | 10,800,000.00 | 324.00 | 3.6E+11 |
| 141 | 23.00 | 450,000.00 | 10,350,000.00 | 529.00 | 2.025E+11 |
| 142 | 48.00 | 8,425,550.00 | 404,426,400.00 | 2,304.00 | 7.09899E+13 |
| 143 | 18.00 | 1,062,590.00 | 19,126,620.00 | 324.00 | 1.1291E+12 |
| 144 | 98.00 | 200,000.00 | 19,600,000.00 | 9,604.00 | 40000000000 |
| 145 | 64.00 | 1,300,000.00 | 83,200,000.00 | 4,096.00 | 1.69E+12 |
| 146 | 375.00 | 13,134,778.70 | 4,925,542,012.50 | 140,625.00 | 1.72522E+14 |
| 147 | 6.00 | 313,358.60 | 1,880,151.60 | 36.00 | 98193612194 |
| 148 | 46.00 | 6,000,000.00 | 276,000,000.00 | 2,116.00 | 3.6E+13 |
| 149 | 204.00 | 7,578,039.41 | 1,545,920,039.64 | 41,616.00 | 5.74267E+13 |
| 150 | 56.00 | 60,427.65 | 3,383,948.40 | 3,136.00 | 3651500885 |
| 151 | 289.00 | 3,035,950.30 | 877,389,636.70 | 83,521.00 | 9.21699E+12 |
| **TOTAL** | 23,926.00 | 1,588,290,300.67 | 801,541,413,287.40 | 13,714,416.00 | 2.02338E+17 |

Table 2 Summary of the data required for the determination of the relationship between delayed payments and time overruns on the basis of the combined public and private building projects.

| **Project** | A | B | C=AxB | $D=A^2$ | $E=B^2$ |
|---|---|---|---|---|---|
| | Delay in payments (days) | Time overrun (days) | | | |
| | $X_t$ | $Y_t$ | $X_tY_t$ | $X_t^2$ | $Y_t^2$ |
| 1 | 1,164 | 243 | 282,852 | 1,354,896 | 59,049 |
| 2 | 442 | 361 | 159,562 | 195,364 | 130,321 |
| 3 | 338 | 328 | 110,864 | 114,244 | 107,584 |
| 4 | 1,430 | 379 | 541,970 | 2,044,900 | 143,641 |
| 5 | 40 | 96 | 3,840 | 1,600 | 9,216 |
| 6 | 74 | 121 | 8,954 | 5,476 | 14,641 |
| 7 | 32 | 30 | 960 | 1,024 | 900 |
| 8 | 243 | 483 | 117,369 | 59,049 | 233,289 |
| 9 | 40 | 150 | 6,000 | 1,600 | 22,500 |
| 10 | 60 | 90 | 5,400 | 3,600 | 8,100 |
| 11 | 40 | 24 | 960 | 1,600 | 576 |
| 12 | 115 | 471 | 54,165 | 13,225 | 221,841 |
| 13 | 90 | 281 | 25,290 | 8,100 | 78,961 |
| 14 | 160 | 46 | 7,360 | 25,600 | 2,116 |
| 15 | 31 | 38 | 1,178 | 961 | 1,444 |
| 16 | 171 | 176 | 30,096 | 29,241 | 30,976 |
| 17 | 149 | 110 | 16,390 | 22,201 | 12,100 |
| 18 | 116 | 104 | 12,064 | 13,456 | 10,816 |
| 19 | 24 | 30 | 720 | 576 | 900 |
| 20 | 281 | 120 | 33,720 | 78,961 | 14,400 |
| 21 | 64 | 420 | 26,880 | 4,096 | 176,400 |
| 22 | 436 | 98 | 42,728 | 190,096 | 9,604 |
| 23 | 173 | 141 | 24,393 | 29,929 | 19,881 |
| 24 | 357 | 304 | 108,528 | 127,449 | 92,416 |

| | | | | | |
|---|---|---|---|---|---|
| 25 | 224 | 121 | 27,104 | 50,176 | 14,641 |
| 26 | 273 | 59 | 16,107 | 74,529 | 3,481 |
| 27 | 350 | 95 | 33,250 | 122,500 | 9,025 |
| 28 | 13 | 30 | 390 | 169 | 900 |
| 29 | 166 | 63 | 10,458 | 27,556 | 3,969 |
| 30 | 190 | 193 | 36,670 | 36,100 | 37,249 |
| 31 | 151 | 209 | 31,559 | 22,801 | 43,681 |
| 32 | 173 | 273 | 47,229 | 29,929 | 74,529 |
| 33 | 98 | 18 | 1,764 | 9,604 | 324 |
| 34 | 194 | 264 | 51,216 | 37,636 | 69,696 |
| 35 | 403 | 1,800 | 725,400 | 162,409 | 3,240,000 |
| 36 | 49 | 10 | 490 | 2,401 | 100 |
| 37 | 70 | 52 | 3,640 | 4,900 | 2,704 |
| 38 | 34 | 330 | 11,220 | 1,156 | 108,900 |
| 39 | 116 | 129 | 14,964 | 13,456 | 16,641 |
| 40 | 9 | 17 | 153 | 81 | 289 |
| 41 | 12 | 35 | 420 | 144 | 1,225 |
| 42 | 146 | 542 | 79,132 | 21,316 | 293,764 |
| 43 | 362 | 289 | 104,618 | 131,044 | 83,521 |
| 44 | 166 | 561 | 93,126 | 27,556 | 314,721 |
| 45 | 19 | 420 | 7,980 | 361 | 176,400 |
| 46 | 116 | 477 | 55,332 | 13,456 | 227,529 |
| 47 | 76 | 28 | 2,128 | 5,776 | 784 |
| 48 | 121 | 184 | 22,264 | 14,641 | 33,856 |
| 49 | 16 | 438 | 7,008 | 256 | 191,844 |
| 50 | 101 | 13 | 1,313 | 10,201 | 169 |
| 51 | 526 | 15 | 7,890 | 276,676 | 225 |
| 52 | 353 | 73 | 25,769 | 124,609 | 5,329 |
| 53 | 9 | 5 | 45 | 81 | 25 |
| 54 | 87 | 336 | 29,232 | 7,569 | 112,896 |
| 55 | 42 | 8 | 336 | 1,764 | 64 |

| | | | | | |
|---|---|---|---|---|---|
| 56 | 77 | 113 | 8,701 | 5,929 | 12,769 |
| 57 | 39 | 12 | 468 | 1,521 | 144 |
| 58 | 18 | 60 | 1,080 | 324 | 3,600 |
| 59 | 50 | 41 | 2,050 | 2,500 | 1,681 |
| 60 | 14 | 26 | 364 | 196 | 676 |
| 61 | 28 | 2 | 56 | 784 | 4 |
| 62 | 177 | 20 | 3,540 | 31,329 | 400 |
| 63 | 549 | 759 | 416,691 | 301,401 | 576,081 |
| 64 | 20 | 84 | 1,680 | 400 | 7,056 |
| 65 | 167 | 1,244 | 207,748 | 27,889 | 1,547,536 |
| 66 | 74 | 63 | 4,662 | 5,476 | 3,969 |
| 67 | 25 | 49 | 1,225 | 625 | 2,401 |
| 68 | 72 | 8 | 576 | 5,184 | 64 |
| 69 | 21 | 16 | 336 | 441 | 256 |
| 70 | 8 | 19 | 152 | 64 | 361 |
| 71 | 28 | 84 | 2,352 | 784 | 7,056 |
| 72 | 278 | 51 | 14,178 | 77,284 | 2,601 |
| 73 | 84 | 40 | 3,360 | 7,056 | 1,600 |
| 74 | 122 | 29 | 3,538 | 14,884 | 841 |
| 75 | 119 | 63 | 7,497 | 14,161 | 3,969 |
| 76 | 5 | 14 | 70 | 25 | 196 |
| 77 | 10 | 14 | 140 | 100 | 196 |
| 78 | 68 | 137 | 9,316 | 4,624 | 18,769 |
| 79 | 31 | 97 | 3,007 | 961 | 9,409 |
| 80 | 39 | 45 | 1,755 | 1,521 | 2,025 |
| 81 | 23 | 181 | 4,163 | 529 | 32,761 |
| 82 | 39 | 14 | 546 | 1,521 | 196 |
| 83 | 1,101 | 618 | 680,418 | 1,212,201 | 381,924 |
| 84 | 75 | 149 | 11,175 | 5,625 | 22,201 |
| 85 | 71 | 124 | 8,804 | 5,041 | 15,376 |
| 86 | 61 | 365 | 22,265 | 3,721 | 133,225 |

| | | | | | |
|---|---|---|---|---|---|
| 87 | 77 | 235 | 18,095 | 5,929 | 55,225 |
| 88 | 14 | 3 | 42 | 196 | 9 |
| 89 | 18 | 10 | 180 | 324 | 100 |
| 90 | 15 | 8 | 120 | 225 | 64 |
| 91 | 8 | 7 | 56 | 64 | 49 |
| 92 | 56 | 61 | 3,416 | 3,136 | 3,721 |
| 93 | 149 | 224 | 33,376 | 22,201 | 50,176 |
| 94 | 128 | 253 | 32,384 | 16,384 | 64,009 |
| 95 | 75 | 185 | 13,875 | 5,625 | 34,225 |
| 96 | 5 | 2 | 10 | 25 | 4 |
| 97 | 26 | 20 | 520 | 676 | 400 |
| 98 | 12 | 7 | 84 | 144 | 49 |
| 99 | 441 | 972 | 428,652 | 194,481 | 944,784 |
| 100 | 19 | 124 | 2,356 | 361 | 15,376 |
| 101 | 13 | 70 | 910 | 169 | 4,900 |
| 102 | 30 | 89 | 2,670 | 900 | 7,921 |
| 103 | 66 | 120 | 7,920 | 4,356 | 14,400 |
| 104 | 55 | 103 | 5,665 | 3,025 | 10,609 |
| 105 | 8 | 81 | 648 | 64 | 6,561 |
| 106 | 32 | 176 | 5,632 | 1,024 | 30,976 |
| 107 | 497 | 625 | 310,625 | 247,009 | 390,625 |
| 108 | 4 | 253 | 1,012 | 16 | 64,009 |
| 109 | 45 | 61 | 2,745 | 2,025 | 3,721 |
| 110 | 37 | 30 | 1,110 | 1,369 | 900 |
| 111 | 54 | 210 | 11,340 | 2,916 | 44,100 |
| 112 | 23 | 82 | 1,886 | 529 | 6,724 |
| 113 | 152 | 240 | 36,480 | 23,104 | 57,600 |
| 114 | 30 | 56 | 1,680 | 900 | 3,136 |
| 115 | 339 | 630 | 213,570 | 114,921 | 396,900 |
| 116 | 29 | 61 | 1,769 | 841 | 3,721 |
| 117 | 94 | 281 | 26,414 | 8,836 | 78,961 |

| | | | | | |
|---|---|---|---|---|---|
| 118 | 53 | 26 | 1,378 | 2,809 | 676 |
| 119 | 1,421 | 1,397 | 1,985,137 | 2,019,241 | 1,951,609 |
| 120 | 434 | 525 | 227,850 | 188,356 | 275,625 |
| 121 | 1,167 | 1,682 | 1,962,894 | 1,361,889 | 2,829,124 |
| 122 | 380 | 360 | 136,800 | 144,400 | 129,600 |
| 123 | 1,227 | 1,294 | 1,587,738 | 1,505,529 | 1,674,436 |
| 124 | 158 | 210 | 33,180 | 24,964 | 44,100 |
| 125 | 413 | 743 | 306,859 | 170,569 | 552,049 |
| 126 | 156 | 8 | 1,248 | 24,336 | 64 |
| 127 | 37 | 191 | 7,067 | 1,369 | 36,481 |
| 128 | 88 | 31 | 2,728 | 7,744 | 961 |
| 129 | 43 | 352 | 15,136 | 1,849 | 123,904 |
| 130 | 44 | 17 | 748 | 1,936 | 289 |
| 131 | 10 | 59 | 590 | 100 | 3,481 |
| 132 | 14 | 51 | 714 | 196 | 2,601 |
| 133 | 49 | 109 | 5,341 | 2,401 | 11,881 |
| 134 | 101 | 38 | 3,838 | 10,201 | 1,444 |
| 135 | 8 | 63 | 504 | 64 | 3,969 |
| 136 | 4 | 14 | 56 | 16 | 196 |
| 137 | 47 | 263 | 12,361 | 2,209 | 69,169 |
| 138 | 45 | 36 | 1,620 | 2,025 | 1,296 |
| 139 | 3 | 1,872 | 5,616 | 9 | 3,504,384 |
| 140 | 18 | 29 | 522 | 324 | 841 |
| 141 | 23 | 16 | 368 | 529 | 256 |
| 142 | 48 | 35 | 1,680 | 2,304 | 1,225 |
| 143 | 18 | 4 | 72 | 324 | 16 |
| 144 | 98 | 92 | 9,016 | 9,604 | 8,464 |
| 145 | 64 | 61 | 3,904 | 4,096 | 3,721 |
| 146 | 375 | 338 | 126,750 | 140,625 | 114,244 |
| 147 | 6 | 11 | 66 | 36 | 121 |
| 148 | 46 | 100 | 4,600 | 2,116 | 10,000 |

| | | | | | |
|---|---|---|---|---|---|
| 149 | 204 | 1,821 | 371,484 | 41,616 | 3,316,041 |
| 150 | 56 | 150 | 8,400 | 3,136 | 22,500 |
| 151 | 289 | 58 | 16,762 | 83,521 | 3,364 |
| **TOTAL** | 23,926 | 33,607 | 12,500,632 | 13,714,416 | 26,251,583 |

Table 3 Summary of the data required for the determination of the relationship between delayed payments and cost overrun on the basis of public building projects.

| **Project** | **A** | **B** | **C=AxB** | **$D=A^2$** | **$E=B^2$** |
|---|---|---|---|---|---|
| | **Delay in payment (days)** | **Cost overrun (N)** | | | |
| | **$X_c$** | **$Y_c$** | **$X_cY_c$** | **$X^2_c$** | **$Y^2_c$** |
| 4 | 1,430.00 | 2,580,018.00 | 3,689,425,740.00 | 2,044,900.00 | 6.65649E+12 |
| 5 | 40.00 | 1,125,000.00 | 45,000,000.00 | 1,600.00 | 1.26563E+12 |
| 6 | 74.00 | 9,000,000.00 | 666,000,000.00 | 5,476.00 | 8.10000E+13 |
| 7 | 32.00 | 700,000.00 | 22,400,000.00 | 1,024.00 | 4.90000E+11 |
| 8 | 243.00 | 3,850,174.00 | 935,592,282.00 | 59,049.00 | 1.48238E+13 |
| 10 | 60.00 | 3,500,000.00 | 210,000,000.00 | 3,600.00 | 1.22500E+13 |
| 11 | 40.00 | 5,000,000.00 | 200,000,000.00 | 1,600.00 | 2.50000E+13 |
| 16 | 171.00 | 950,000.00 | 162,450,000.00 | 29,241.00 | 9.02500E+11 |
| 17 | 149.00 | 2,050,000.00 | 305,450,000.00 | 22,201.00 | 4.20250E+12 |
| 18 | 116.00 | 2,105,988.60 | 244,294,677.60 | 13,456.00 | 4.43519E+12 |
| 22 | 436.00 | 18,225,125.00 | 7,946,154,500.00 | 190,096.00 | 3.32155E+14 |
| 24 | 357.00 | 3,926,250.00 | 1,401,671,250.00 | 127,449.00 | 1.54154E+13 |
| 25 | 224.00 | 3,750,000.00 | 840,000,000.00 | 50,176.00 | 1.40625E+13 |
| 26 | 273.00 | 2,428,520.00 | 662,985,960.00 | 74,529.00 | 5.89771E+12 |
| 27 | 350.00 | 2,280,128.00 | 798,044,800.00 | 122,500.00 | 5.19898E+12 |

| | | | | | |
|---|---|---|---|---|---|
| 29 | 166.00 | 799,904.88 | 132,784,210.08 | 27,556.00 | 6.39848E+11 |
| 30 | 190.00 | 4,296,355.00 | 816,307,450.00 | 36,100.00 | 1.84587E+13 |
| 31 | 151.00 | 500,000.00 | 75,500,000.00 | 22,801.00 | 2.50000E+11 |
| 32 | 173.00 | 4,200,990.00 | 726,771,270.00 | 29,929.00 | 1.76483E+13 |
| 33 | 98.00 | 1,121,256.80 | 109,883,166.40 | 9,604.00 | 1.25722E+12 |
| 34 | 194.00 | 1,580,958.91 | 306,706,028.54 | 37,636.00 | 2.49943E+12 |
| 35 | 403.00 | 4,070,000.00 | 1,640,210,000.00 | 162,409.00 | 1.65649E+13 |
| 36 | 49.00 | 1,500,000.00 | 73,500,000.00 | 2,401.00 | 2.25000E+12 |
| 37 | 70.00 | 556,733.88 | 38,971,371.60 | 4,900.00 | 3.09953E+11 |
| 38 | 34.00 | 7,378,000.00 | 250,852,000.00 | 1,156.00 | 5.44349E+13 |
| 39 | 116.00 | 780,132.09 | 90,495,322.44 | 13,456.00 | 6.08606E+11 |
| 40 | 9.00 | 1,712,209.40 | 15,409,884.60 | 81.00 | 2.93166E+12 |
| 41 | 12.00 | 1,128,361.75 | 13,540,341.00 | 144.00 | 1.27320E+12 |
| 42 | 146.00 | 1,712,209.00 | 249,982,514.00 | 21,316.00 | 2.93166E+12 |
| 43 | 362.00 | 62,000,000.00 | 22,444,000,000.00 | 131,044.00 | 3.84400E+15 |
| 44 | 166.00 | 42,500,000.00 | 7,055,000,000.00 | 27,556.00 | 1.80625E+15 |
| 45 | 19.00 | 245,071.75 | 4,656,363.25 | 361.00 | 6.00602E+10 |
| 46 | 116.00 | 10,780,000.00 | 1,250,480,000.00 | 13,456.00 | 1.16208E+14 |
| 51 | 526.00 | 1,796,200.00 | 944,801,200.00 | 276,676.00 | 3.22633E+12 |
| 52 | 353.00 | 6,320,000.00 | 2,230,960,000.00 | 124,609.00 | 3.99424E+13 |
| 54 | 87.00 | 6,268,319.00 | 545,343,753.00 | 7,569.00 | 3.92918E+13 |
| 56 | 77.00 | 84,725,000.00 | 6,523,825,000.00 | 5,929.00 | 7.17833E+15 |
| 61 | 28.00 | 1,347,540.00 | 37,731,120.00 | 784.00 | 1.81586E+12 |
| 63 | 549.00 | 53,850,002.00 | 29,563,651,098.00 | 301,401.00 | 2.89982E+15 |
| 64 | 20.00 | 364,192.00 | 7,283,840.00 | 400.00 | 1.32636E+11 |

| | | | | | |
|---|---|---|---|---|---|
| 65 | 167.00 | 1,483,770.00 | 247,789,590.00 | 27,889.00 | 2.20157E+12 |
| 66 | 74.00 | 300,000.00 | 22,200,000.00 | 5,476.00 | 9.00000E+10 |
| 67 | 25.00 | 2,000,000.00 | 50,000,000.00 | 625.00 | 4.00000E+12 |
| 69 | 21.00 | 100,000.00 | 2,100,000.00 | 441.00 | 1.00000E+10 |
| 71 | 28.00 | 4,004,772.80 | 112,133,638.40 | 784.00 | 1.60382E+13 |
| 75 | 119.00 | 5,581,623.00 | 664,213,137.00 | 14,161.00 | 3.11545E+13 |
| 79 | 31.00 | 1,102,012.08 | 34,162,374.48 | 961.00 | 1.21443E+12 |
| 80 | 39.00 | 1,115,112.08 | 43,489,371.12 | 1,521.00 | 1.24347E+12 |
| 81 | 23.00 | 1,398,000.00 | 32,154,000.00 | 529.00 | 1.95440E+12 |
| 82 | 39.00 | 150,000.00 | 5,850,000.00 | 1,521.00 | 2.25000E+10 |
| 83 | 1,101.00 | 384,018,581.00 | 422,804,457,681.00 | 1,212,201.00 | 1.47470E+17 |
| 85 | 71.00 | 700,000.00 | 49,700,000.00 | 5,041.00 | 4.90000E+11 |
| 89 | 18.00 | 250,000.00 | 4,500,000.00 | 324.00 | 6.25000E+10 |
| 91 | 8.00 | 200,000.00 | 1,600,000.00 | 64.00 | 4.00000E+10 |
| 92 | 56.00 | 2,500,000.00 | 140,000,000.00 | 3,136.00 | 6.25000E+12 |
| 97 | 26.00 | 2,500,000.00 | 65,000,000.00 | 676.00 | 6.25000E+12 |
| 98 | 12.00 | 2,500,000.00 | 30,000,000.00 | 144.00 | 6.25000E+12 |
| 102 | 30.00 | 1,500,000.00 | 45,000,000.00 | 900.00 | 2.25000E+12 |
| 105 | 8.00 | 60,000.00 | 480,000.00 | 64.00 | 3.60000E+09 |
| 106 | 32.00 | 150,000.00 | 4,800,000.00 | 1,024.00 | 2.25000E+10 |
| 107 | 497.00 | 7,771,251.56 | 3,862,312,025.32 | 247,009.00 | 6.03924E+13 |
| 108 | 4.00 | 569,198.51 | 2,276,794.04 | 16.00 | 3.23987E+11 |
| 109 | 45.00 | 95,000,000.00 | 4,275,000,000.00 | 2,025.00 | 9.02500E+15 |
| 111 | 54.00 | 900,000.00 | 48,600,000.00 | 2,916.00 | 8.10000E+11 |
| 112 | 23.00 | 200,000.00 | 4,600,000.00 | 529.00 | 4.00000E+10 |

| | | | | | |
|---|---|---|---|---|---|
| 113 | 152.00 | 34,000,000.00 | 5,168,000,000.00 | 23,104.00 | 1.15600E+15 |
| 114 | 30.00 | 98,000,000.00 | 2,940,000,000.00 | 900.00 | 9.60400E+15 |
| 115 | 339.00 | 8,000,000.00 | 2,712,000,000.00 | 114,921.00 | 6.40000E+13 |
| 116 | 29.00 | 1,303,419.50 | 37,799,165.50 | 841.00 | 1.69890E+12 |
| 117 | 94.00 | 994,300.00 | 93,464,200.00 | 8,836.00 | 9.88632E+11 |
| 118 | 53.00 | 38,768.00 | 2,054,704.00 | 2,809.00 | 1.50296E+09 |
| 119 | 1,421.00 | 26,804,201.00 | 38,088,769,621.00 | 2,019,241.00 | 7.18465E+14 |
| 120 | 434.00 | 8,685,128.78 | 3,769,345,890.52 | 188,356.00 | 7.54315E+13 |
| 121 | 1,167.00 | 79,662,500.94 | 92,966,138,596.98 | 1,361,889.00 | 6.34611E+15 |
| 122 | 380.00 | 1,500,010.00 | 570,003,800.00 | 144,400.00 | 2.25003E+12 |
| 123 | 1,227.00 | 37,823,566.60 | 46,409,516,218.20 | 1,505,529.00 | 1.43062E+15 |
| 125 | 413.00 | 996,937.00 | 411,734,981.00 | 170,569.00 | 9.93883E+11 |
| 126 | 156.00 | 7,472,385.00 | 1,165,692,060.00 | 24,336.00 | 5.58365E+13 |
| 127 | 37.00 | 4,565,000.00 | 168,905,000.00 | 1,369.00 | 2.08392E+13 |
| 130 | 44.00 | 1,309,605.70 | 57,622,650.80 | 1,936.00 | 1.71507E+12 |
| 133 | 49.00 | 3,544,339.80 | 173,672,650.20 | 2,401.00 | 1.25623E+13 |
| 139 | 3.00 | 11,435,709.03 | 34,307,127.09 | 9.00 | 1.30775E+14 |
| 146 | 375.00 | 13,134,778.70 | 4,925,542,012.50 | 140,625.00 | 1.72522E+14 |
| 148 | 46.00 | 6,000,000.00 | 276,000,000.00 | 2,116.00 | 3.60000E+13 |
| 150 | 56.00 | 60,427.65 | 3,383,948.40 | 3,136.00 | 3.65150E+09 |
| **Total** | **17,165.00** | **1,224,390,038.79** | **725,804,486,380.06** | **11,253,471.00** | **1.93042E+17** |

Table 4 Summary of the data required for the determination of the relationship between delayed payments and time overrun on the basis of public building projects.

| Project | A | B | C=AxB | $D=A^2$ | $E=B^2$ |
|---|---|---|---|---|---|
| | Delay in payment (days) | Time overrun (days) | | | |
| | $X_t$ | $Y_t$ | $X_tY_t$ | $X_t^2$ | $Y_t^2$ |
| 4 | 1,430 | 379 | 541,970 | 2,044,900 | 143,641 |
| 5 | 40 | 96 | 3,840 | 1,600 | 9,216 |
| 6 | 74 | 121 | 8,954 | 5,476 | 14,641 |
| 7 | 32 | 30 | 960 | 1,024 | 900 |
| 8 | 243 | 483 | 117,369 | 59,049 | 233,289 |
| 10 | 60 | 90 | 5,400 | 3,600 | 8,100 |
| 11 | 40 | 24 | 960 | 1,600 | 576 |
| 16 | 171 | 176 | 30,096 | 29,241 | 30,976 |
| 17 | 149 | 110 | 16,390 | 22,201 | 12,100 |
| 18 | 116 | 104 | 12,064 | 13,456 | 10,816 |
| 22 | 436 | 98 | 42,728 | 190,096 | 9,604 |
| 24 | 357 | 304 | 108,528 | 127,449 | 92,416 |
| 25 | 224 | 121 | 27,104 | 50,176 | 14,641 |
| 26 | 273 | 59 | 16,107 | 74,529 | 3,481 |
| 27 | 350 | 95 | 33,250 | 122,500 | 9,025 |
| 29 | 166 | 63 | 10,458 | 27,556 | 3,969 |
| 30 | 190 | 193 | 36,670 | 36,100 | 37,249 |
| 31 | 151 | 209 | 31,559 | 22,801 | 43,681 |
| 32 | 173 | 273 | 47,229 | 29,929 | 74,529 |
| 33 | 98 | 18 | 1,764 | 9,604 | 324 |

| | | | | | |
|---|---|---|---|---|---|
| 34 | 194 | 264 | 51,216 | 37,636 | 69,696 |
| 35 | 403 | 1,800 | 725,400 | 162,409 | 3,240,000 |
| 36 | 49 | 10 | 490 | 2,401 | 100 |
| 37 | 70 | 52 | 3,640 | 4,900 | 2,704 |
| 38 | 34 | 330 | 11,220 | 1,156 | 108,900 |
| 39 | 116 | 129 | 14,964 | 13,456 | 16,641 |
| 40 | 9 | 17 | 153 | 81 | 289 |
| 41 | 12 | 35 | 420 | 144 | 1,225 |
| 42 | 146 | 542 | 79,132 | 21,316 | 293,764 |
| 43 | 362 | 289 | 104,618 | 131,044 | 83,521 |
| 44 | 166 | 561 | 93,126 | 27,556 | 314,721 |
| 45 | 19 | 420 | 7,980 | 361 | 176,400 |
| 46 | 116 | 477 | 55,332 | 13,456 | 227,529 |
| 51 | 526 | 15 | 7,890 | 276,676 | 225 |
| 52 | 353 | 73 | 25,769 | 124,609 | 5,329 |
| 54 | 87 | 336 | 29,232 | 7,569 | 112,896 |
| 56 | 77 | 113 | 8,701 | 5,929 | 12,769 |
| 61 | 28 | 2 | 56 | 784 | 4 |
| 63 | 549 | 759 | 416,691 | 301,401 | 576,081 |
| 64 | 20 | 84 | 1,680 | 400 | 7,056 |
| 65 | 167 | 1,244 | 207,748 | 27,889 | 1,547,536 |
| 66 | 74 | 63 | 4,662 | 5,476 | 3,969 |
| 67 | 25 | 49 | 1,225 | 625 | 2,401 |
| 69 | 21 | 16 | 336 | 441 | 256 |
| 71 | 28 | 84 | 2,352 | 784 | 7,056 |

| | | | | | |
|---|---|---|---|---|---|
| 75 | 119 | 63 | 7,497 | 14,161 | 3,969 |
| 79 | 31 | 97 | 3,007 | 961 | 9,409 |
| 80 | 39 | 45 | 1,755 | 1,521 | 2,025 |
| 81 | 23 | 181 | 4,163 | 529 | 32,761 |
| 82 | 39 | 14 | 546 | 1,521 | 196 |
| 83 | 1,101 | 618 | 680,418 | 1,212,201 | 381,924 |
| 85 | 71 | 124 | 8,804 | 5,041 | 15,376 |
| 89 | 18 | 10 | 180 | 324 | 100 |
| 91 | 8 | 7 | 56 | 64 | 49 |
| 92 | 56 | 61 | 3,416 | 3,136 | 3,721 |
| 97 | 26 | 20 | 520 | 676 | 400 |
| 98 | 12 | 7 | 84 | 144 | 49 |
| 102 | 30 | 89 | 2,670 | 900 | 7,921 |
| 105 | 8 | 81 | 648 | 64 | 6,561 |
| 106 | 32 | 176 | 5,632 | 1,024 | 30,976 |
| 107 | 497 | 625 | 310,625 | 247,009 | 390,625 |
| 108 | 4 | 253 | 1,012 | 16 | 64,009 |
| 109 | 45 | 61 | 2,745 | 2,025 | 3,721 |
| 111 | 54 | 210 | 11,340 | 2,916 | 44,100 |
| 112 | 23 | 82 | 1,886 | 529 | 6,724 |
| 113 | 152 | 240 | 36,480 | 23,104 | 57,600 |
| 114 | 30 | 56 | 1,680 | 900 | 3,136 |
| 115 | 339 | 630 | 213,570 | 114,921 | 396,900 |
| 116 | 29 | 61 | 1,769 | 841 | 3,721 |
| 117 | 94 | 281 | 26,414 | 8,836 | 78,961 |

| | | | | | |
|---|---|---|---|---|---|
| 118 | 53 | 26 | 1,378 | 2,809 | 676 |
| 119 | 1,421 | 1,397 | 1,985,137 | 2,019,241 | 1,951,609 |
| 120 | 434 | 525 | 227,850 | 188,356 | 275,625 |
| 121 | 1,167 | 1,682 | 1,962,894 | 1,361,889 | 2,829,124 |
| 122 | 380 | 360 | 136,800 | 144,400 | 129,600 |
| 123 | 1,227 | 1,294 | 1,587,738 | 1,505,529 | 1,674,436 |
| 125 | 413 | 743 | 306,859 | 170,569 | 552,049 |
| 126 | 156 | 8 | 1,248 | 24,336 | 64 |
| 127 | 37 | 191 | 7,067 | 1,369 | 36,481 |
| 130 | 44 | 17 | 748 | 1,936 | 289 |
| 133 | 49 | 109 | 5,341 | 2,401 | 11,881 |
| 139 | 3 | 1,872 | 5,616 | 9 | 3,504,384 |
| 146 | 375 | 338 | 126,750 | 140,625 | 114,244 |
| 148 | 46 | 100 | 4,600 | 2,116 | 10,000 |
| 150 | 56 | 150 | 8,400 | 3,136 | 22,500 |
| **Total** | **17,165** | **23,714** | **10,642,776** | **11,253,471** | **20,222,138** |

Table 5 Summary of the data required for the determination of the relationship between delayed payments and cost overruns on the basis of private building projects.

| **Project** | **A** | **B** | **C=AxB** | **$D=A^2$** | **$E=B^2$** |
|---|---|---|---|---|---|
| | **Delay in payment (days)** | **Cost overrun (N)** | | | |
| | **$X_c$** | **$Y_c$** | **$X_cY_c$** | **$X^2_c$** | **$Y^2_c$** |
| 1 | 1,164.00 | 34,899,493.79 | 40,623,010,771.56 | 1,354,896.00 | 1.21797E+15 |
| 2 | 442.00 | 13,134,778.60 | 5,805,572,141.20 | 195,364.00 | 1.72522E+14 |
| 3 | 338.00 | 1,225,950.00 | 414,371,100.00 | 114,244.00 | 1.50295E+12 |

| | | | | | |
|---|---|---|---|---|---|
| 9 | 40.00 | 3,000,000.00 | 120,000,000.00 | 1,600.00 | 9.00000E+12 |
| 12 | 115.00 | 18,552,209.68 | 2,133,504,113.20 | 13,225.00 | 3.44184E+14 |
| 13 | 90.00 | 11,022,282.95 | 992,005,465.50 | 8,100.00 | 1.21491E+14 |
| 14 | 160.00 | 400,000.00 | 64,000,000.00 | 25,600.00 | 1.60000E+11 |
| 15 | 31.00 | 440,000.00 | 13,640,000.00 | 961.00 | 1.93600E+11 |
| 19 | 24.00 | 650,200.00 | 15,604,800.00 | 576.00 | 4.22760E+11 |
| 20 | 281.00 | 1,120,000.00 | 314,720,000.00 | 78,961.00 | 1.25440E+12 |
| 21 | 64.00 | 6,400,016.00 | 409,601,024.00 | 4,096.00 | 4.09602E+13 |
| 23 | 173.00 | 886,678.32 | 153,395,349.36 | 29,929.00 | 7.86198E+11 |
| 28 | 13.00 | 1,885,350.00 | 24,509,550.00 | 169.00 | 3.55454E+12 |
| 47 | 76.00 | 300,000.00 | 22,800,000.00 | 5,776.00 | 9.00000E+10 |
| 48 | 121.00 | 3,200,000.00 | 387,200,000.00 | 14,641.00 | 1.02400E+13 |
| 49 | 16.00 | 1,725,117.00 | 27,601,872.00 | 256.00 | 2.97603E+12 |
| 50 | 101.00 | 400,000.00 | 40,400,000.00 | 10,201.00 | 1.60000E+11 |
| 53 | 9.00 | 115,510.00 | 1,039,590.00 | 81.00 | 1.33426E+10 |
| 55 | 42.00 | 60,250.00 | 2,530,500.00 | 1,764.00 | 3.63006E+09 |
| 57 | 39.00 | 290,250.00 | 11,319,750.00 | 1,521.00 | 8.42451E+10 |
| 58 | 18.00 | 1,319,065.00 | 23,743,170.00 | 324.00 | 1.73993E+12 |
| 59 | 50.00 | 850,300.00 | 42,515,000.00 | 2,500.00 | 7.23010E+11 |
| 60 | 14.00 | 600,000.00 | 8,400,000.00 | 196.00 | 3.60000E+11 |
| 62 | 177.00 | 2,712,500.00 | 480,112,500.00 | 31,329.00 | 7.35766E+12 |
| 63 | 72.00 | 250,000.00 | 18,000,000.00 | 5,184.00 | 6.25000E+10 |
| 70 | 8.00 | 300,000.00 | 2,400,000.00 | 64.00 | 9.00000E+10 |
| 72 | 278.00 | 2,000,000.00 | 556,000,000.00 | 77,284.00 | 4.00000E+12 |
| 73 | 84.00 | 500,004.32 | 42,000,362.88 | 7,056.00 | 2.50004E+11 |

| | | | | | |
|---|---|---|---|---|---|
| 74 | 122.00 | 22,101,066.00 | 2,696,330,052.00 | 14,884.00 | 4.88457E+14 |
| 76 | 5.00 | 2,893,012.00 | 14,465,060.00 | 25.00 | 8.36952E+12 |
| 77 | 10.00 | 3,965,617.00 | 39,656,170.00 | 100.00 | 1.57261E+13 |
| 78 | 68.00 | 611,413.25 | 41,576,101.00 | 4,624.00 | 3.73826E+11 |
| 84 | 75.00 | 65,834,080.22 | 4,937,556,016.50 | 5,625.00 | 4.33413E+15 |
| 86 | 61.00 | 8,000,000.00 | 488,000,000.00 | 3,721.00 | 6.40000E+13 |
| 87 | 77.00 | 5,795,000.00 | 446,215,000.00 | 5,929.00 | 3.35820E+13 |
| 88 | 14.00 | 600,000.00 | 8,400,000.00 | 196.00 | 3.60000E+11 |
| 90 | 15.00 | 420,000.00 | 6,300,000.00 | 225.00 | 1.76400E+11 |
| 93 | 149.00 | 6,108,068.54 | 910,102,212.46 | 22,201.00 | 3.73085E+13 |
| 94 | 128.00 | 3,429,645.38 | 438,994,608.64 | 16,384.00 | 1.17625E+13 |
| 95 | 75.00 | 2,323,651.97 | 174,273,897.75 | 5,625.00 | 5.39936E+12 |
| 96 | 5.00 | 200,000.00 | 1,000,000.00 | 25.00 | 4.00000E+10 |
| 99 | 441.00 | 2,050,000.00 | 904,050,000.00 | 194,481.00 | 4.20250E+12 |
| 100 | 19.00 | 80,000.00 | 1,520,000.00 | 361.00 | 6.40000E+09 |
| 101 | 13.00 | 1,154,310.00 | 15,006,030.00 | 169.00 | 1.33243E+12 |
| 103 | 66.00 | 20,200,000.00 | 1,333,200,000.00 | 4,356.00 | 4.08040E+14 |
| 104 | 55.00 | 1,175,848.00 | 64,671,640.00 | 3,025.00 | 1.38262E+12 |
| 110 | 37.00 | 399,589.55 | 14,784,813.35 | 1,369.00 | 1.59672E+11 |
| 124 | 158.00 | 28,000,000.00 | 4,424,000,000.00 | 24,964.00 | 7.84000E+14 |
| 128 | 88.00 | 8,433,536.00 | 742,151,168.00 | 7,744.00 | 7.11245E+13 |
| 129 | 43.00 | 28,860,000.00 | 1,240,980,000.00 | 1,849.00 | 8.32900E+14 |
| 131 | 10.00 | 4,291,250.00 | 42,912,500.00 | 100.00 | 1.84148E+13 |
| 132 | 14.00 | 3,800,000.00 | 53,200,000.00 | 196.00 | 1.44400E+13 |
| 134 | 101.00 | 8,368,730.00 | 845,241,730.00 | 10,201.00 | 7.00356E+13 |

| | | | | | |
|---|---|---|---|---|---|
| 135 | 8.00 | 500,000.00 | 4,000,000.00 | 64.00 | 2.50000E+11 |
| 136 | 4.00 | 350,000.00 | 1,400,000.00 | 16.00 | 1.22500E+11 |
| 137 | 47.00 | 250,000.00 | 11,750,000.00 | 2,209.00 | 6.25000E+10 |
| 138 | 45.00 | 2,500,000.00 | 112,500,000.00 | 2,025.00 | 6.25000E+12 |
| 140 | 18.00 | 600,000.00 | 10,800,000.00 | 324.00 | 3.60000E+11 |
| 141 | 23.00 | 450,000.00 | 10,350,000.00 | 529.00 | 2.02500E+11 |
| 142 | 48.00 | 8,425,550.00 | 404,426,400.00 | 2,304.00 | 7.09899E+13 |
| 143 | 18.00 | 1,062,590.00 | 19,126,620.00 | 324.00 | 1.12910E+12 |
| 144 | 98.00 | 200,000.00 | 19,600,000.00 | 9,604.00 | 4.00000E+10 |
| 145 | 64.00 | 1,300,000.00 | 83,200,000.00 | 4,096.00 | 1.69000E+12 |
| 147 | 6.00 | 313,358.60 | 1,880,151.60 | 36.00 | 9.81936E+10 |
| 149 | 204.00 | 7,578,039.41 | 1,545,920,039.64 | 41,616.00 | 5.74267E+13 |
| 151 | 289.00 | 3,035,950.30 | 877,389,636.70 | 83,521.00 | 9.21699E+12 |
| **Total** | **6,761.00** | **363,900,261.88** | **75,736,926,907.34** | **2,460,945.00** | **9.29572E+15** |

Table 6 Summary of the data required for the determination of the relationship between delayed payments and time overruns on the basis of private building projects.

| **Project** | **A** | **B** | **C=AxB** | **D=$A^2$** | **E=$B^2$** |
|---|---|---|---|---|---|
| | **Delay in payment (days)** | **Time overrun (days)** | | | |
| | **$X_t$** | **$Y_t$** | **$X_tY_t$** | **$X_t^2$** | **$Y_t^2$** |
| 1 | 1,164 | 243 | 282852 | 1,354,896 | 59,049 |
| 2 | 442 | 361 | 159,562 | 195,364 | 130,321 |
| 3 | 338 | 328 | 110,864 | 114,244 | 107,584 |
| 9 | 40 | 150 | 6,000 | 1,600 | 22,500 |
| 12 | 115 | 471 | 54,165 | 13,225 | 221,841 |

| | | | | | |
|---|---|---|---|---|---|
| 13 | 90 | 281 | 25,290 | 8,100 | 78,961 |
| 14 | 160 | 46 | 7,360 | 25,600 | 2,116 |
| 15 | 31 | 38 | 1,178 | 961 | 1,444 |
| 19 | 24 | 30 | 720 | 576 | 900 |
| 20 | 281 | 120 | 33,720 | 78,961 | 14,400 |
| 21 | 64 | 420 | 26,880 | 4,096 | 176,400 |
| 23 | 173 | 141 | 24,393 | 29,929 | 19,881 |
| 28 | 13 | 30 | 390 | 169 | 900 |
| 47 | 76 | 28 | 2,128 | 5,776 | 784 |
| 48 | 121 | 184 | 22,264 | 14,641 | 33,856 |
| 49 | 16 | 438 | 7,008 | 256 | 191,844 |
| 50 | 101 | 13 | 1,313 | 10,201 | 169 |
| 53 | 9 | 5 | 45 | 81 | 25 |
| 55 | 42 | 8 | 336 | 1,764 | 64 |
| 57 | 39 | 12 | 468 | 1,521 | 144 |
| 58 | 18 | 60 | 1,080 | 324 | 3,600 |
| 59 | 50 | 41 | 2,050 | 2,500 | 1,681 |
| 60 | 14 | 26 | 364 | 196 | 676 |
| 62 | 177 | 20 | 3,540 | 31,329 | 400 |
| 63 | 72 | 8 | 576 | 5,184 | 64 |
| 70 | 8 | 19 | 152 | 64 | 361 |
| 72 | 278 | 51 | 14,178 | 77,284 | 2,601 |
| 73 | 84 | 40 | 3,360 | 7,056 | 1,600 |
| 74 | 122 | 29 | 3,538 | 14,884 | 841 |
| 76 | 5 | 14 | 70 | 25 | 196 |

| | | | | | |
|---|---|---|---|---|---|
| 77 | 10 | 14 | 140 | 100 | 196 |
| 78 | 68 | 137 | 9,316 | 4,624 | 18,769 |
| 84 | 75 | 149 | 11,175 | 5,625 | 22,201 |
| 86 | 61 | 365 | 22,265 | 3,721 | 133,225 |
| 87 | 77 | 235 | 18,095 | 5,929 | 55,225 |
| 88 | 14 | 3 | 42 | 196 | 9 |
| 90 | 15 | 8 | 120 | 225 | 64 |
| 93 | 149 | 224 | 33,376 | 22,201 | 50,176 |
| 94 | 128 | 253 | 32,384 | 16,384 | 64,009 |
| 95 | 75 | 185 | 13,875 | 5,625 | 34,225 |
| 96 | 5 | 2 | 10 | 25 | 4 |
| 99 | 441 | 972 | 428,652 | 194,481 | 944,784 |
| 100 | 19 | 124 | 2,356 | 361 | 15,376 |
| 101 | 13 | 70 | 910 | 169 | 4,900 |
| 103 | 66 | 120 | 7,920 | 4,356 | 14,400 |
| 104 | 55 | 103 | 5,665 | 3,025 | 10,609 |
| 110 | 37 | 30 | 1,110 | 1,369 | 900 |
| 124 | 158 | 210 | 33,180 | 24,964 | 44,100 |
| 128 | 88 | 31 | 2,728 | 7,744 | 961 |
| 129 | 43 | 352 | 15,136 | 1,849 | 123,904 |
| 131 | 10 | 59 | 590 | 100 | 3,481 |
| 132 | 14 | 51 | 714 | 196 | 2,601 |
| 134 | 101 | 38 | 3,838 | 10,201 | 1,444 |
| 135 | 8 | 63 | 504 | 64 | 3,969 |
| 136 | 4 | 14 | 56 | 16 | 196 |

| | | | | | |
|---|---|---|---|---|---|
| 137 | 47 | 263 | 12,361 | 2,209 | 69,169 |
| 138 | 45 | 36 | 1,620 | 2,025 | 1,296 |
| 140 | 18 | 29 | 522 | 324 | 841 |
| 141 | 23 | 16 | 368 | 529 | 256 |
| 142 | 48 | 35 | 1,680 | 2,304 | 1,225 |
| 143 | 18 | 4 | 72 | 324 | 16 |
| 144 | 98 | 92 | 9,016 | 9,604 | 8,464 |
| 145 | 64 | 61 | 3,904 | 4,096 | 3,721 |
| 147 | 6 | 11 | 66 | 36 | 121 |
| 149 | 204 | 1,821 | 371,484 | 41,616 | 3,316,041 |
| 151 | 289 | 58 | 16,762 | 83,521 | 3,364 |
| **Total** | **6,761** | **9,893** | **1,857,856** | **2,460,945** | **6,029,445** |