TRANSIT REST AREA, ABUJA:
A PROTOTYPE DESIGN

BY

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Being a Thesis submitted to the Postgraduate School, Ahmadu Bello University, Zaria, in partial fulfillment for the award of Master of Science Degree in Architecture

DEPARTMENT OF ARCHITECTURE
FACULTY OF ENVIRONMENTAL DESIGN
AHMADU BELLO UNIVERSITY, ZARIA

November, 1999

DECLARATION

I hereby declare that myself have composed the content of this thesis and that it is a record of my own work. It has not been accepted in any previous application for a higher degree.

All quotations are distinguished by quotation marks and references are specifically acknowledged by means of references.



USMAN, IBRAHIM BALA
November, 1999

CERTIFICATION

This thesis report, entitled: **Transit Rest Area, Abuja (A Prototype Design)** by **USMAN, Ibrahim Bala**, meets the regulations governing the award of the degree of Master of Science in Architecture of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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To my parents, Alhaji Usman Ubandoman Lapai and Hajia Rahanatu Usman.

ABSTRACT

Among all the modern means of transportation in Nigeria, road transportation is the most popular and cheaper. This is as a result of its easy accessibility to both urban and rural centres in Nigeria. According to the *Annual Abstracts of Statistics* of the Federal Office of Statistics (1997), "about 62 per cent of Nigerians travel by road (domestic only) either by public or private transport." Other means of road transportation include lorries, trailers, tankers, etc.

Road transportation in Nigeria has tremendous impact on our socio-economic way of life. Despite its importance, adequate attention has not been given to the aspect of road users facilities on our highways as found in many developed and some developing countries.

One would expect that much attention shall be given to the users facilities along with the road network in Nigeria to make it convenient to travellers. Unfortunately, this has been neglected. Most of the existing roads lack users facilities and in areas where attempts have been made to provide these facilities locally, they are inadequate and not properly co-ordinated and organised.

One can hardly find a situation where all facilities required by travellers are integrated together in a well-organised environment. This is probably why one finds our major highways in a chaotic situation. Vehicles are parked on both sides of the roads and people make indiscriminate use of spaces, including street hawking, thereby constituting hazard to motorists on our highways.

The exigencies of the problems faced by road users in Nigeria with respect to support facilities on its highways dictates the purpose of this thesis work which is aimed at encouraging the construction of parallel support facilities along with its highways by integrating various users parallel facilities flowing together as a complex within our highways to alleviate the sufferings of road users on our highways and reduce risks, break monotony and boredom of driving long distance, and so on.

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Finally, I submit this work to readers' kind forbearance, hoping that despite its shortcomings and imperfections it will fill a need and help in the studies of Architecture, especially the passenger facilities on transit.

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CHAPTER ONE

INTRODUCTION

This work is a study of existing condition of user facilities or infrastructures on Nigerian highways, most especially the major highways and the need to provide basic travelers facilities and improve on them. The research took the researcher to several locations and sites in Nigeria, including the Federal Ministry for Works and Housing, Abuja, the Nigerian Police Headquarters, the Federal Road Safety Commission, motels, Federal Office of Statistics, National Union of Road Transport Workers and sites like Lokoja, Jebba, Tafa, Dumex, Abuja.

Visits to existing sites within Nigeria highlights the problems faced by drivers, passengers and other road users, the type of facilities they would require for their convenience and safety.

It was found that most of the existing facilities were inadequate and not integrated. Services are scattered and uncoordinated. This proposal is a prototype rest complex for transit on Nigeria highways to serve both passengers on private and public transport with their needs while on transit and shall contain all the prerequisites of a modern rest complex as obtainable in developed countries, such as United States of America, Canada and France, viz.:

(i) Accommodation facilities

(ii) First aid and emergency facilities

(iii) Supermarkets and shops

(iv) Restaurants and cafeterias/bukaterias

(v) Fuel station and service workshops

(vi) Public conveniences

(vii) Parking spaces for all categories of vehicles

(viii) Adequate security

The provision of these facilities will in many ways improve the life of road users and encourage them to plan their trips by stopping at these designated places for services and rest/relaxation after tedious and long distance driving and sitting in the vehicle; and thus reduce the rate of road accident on our motor ways.

1.1 FOCUS

Passengers and drivers most often run into dilemma of where to obtain facilities such as accommodation, restrooms, restaurant, supermarket, first aid and public conveniences while on journey on Nigeria's highways and most are frustrated by what is obtainable because they are insecure, unhygienic and far below their expectations. Majorities of the road users are forced by circumstances to forego their needs till they get to their final destination, which could sometimes be far away.

These basic facilities are lacking, hence the sanitary condition around us today remains very poor, unsatisfactory and disease prone. It is not an uncommon sight to see people urinating and stooling on the vicinity of these unplanned existing facilities.

An attempt is hereby made in this proposal in solving the highlighted problem that affect road users through the provision of these basic facilities for the comfort of road users in Nigeria and improving the sanitary condition within the complex.

It is hoped that this thesis will help in improving the life of road users and reduce their problems with regards to users facilities on our highways, it is also hoped that the introduction of the improved facilities will encourage an organised economic activity along our highways as obtainable in developed countries of the world.

1.1.1 TYPES OF PASSENGERS

a. Bus Passengers

Bus travel fascinates many that wish to travel economically to dispense with the responsibility of using their own cars, to see the country more intensively than they can from planes and trains and to enjoy a leisurely pace. But, for many others it is an absolute necessity. Their destinations can be reached only by bus, and such places are constantly increasingly in number as new roads are built and many places urbanised – and especially as the railway lines are limited to certain districts.

But, passengers include family groups encumbered with young children and heavy loads, (which is usual with many of our bus customers who are mainly market women). These people must be properly cared for. Rest areas should be provided on our highways for the convenience of these people, individualized attention and privacy. Old people who are neither strong nor well are occasional bus passengers; they too must be comfortably cared for. Everyone likes personal considerations and freedom from annoyance. Those who travel for recreation; like the trip to have an air of excitement, they also want gaiety as well as comfort, for them a flag, spotlight, or a pitch of colour will give the rest area a festive air. Tour information; guide books and quality posters

Invest any of travel with allurement. When buses make as much as these materials as ships and plane have done, they too will be thought as glamorous and those who are sensitive about the fact that they must travel economically will feel much better disposed towards buses when the rest areas are built.

However, the researcher has considered all these points and has tried to strike a satisfactory compromise as best he could. Hence, the proposed design would meet the demands of people of various taste, habits and classes – ranging from the poorest and most humble travelers to the richest and don't-touch-me types.

b. Car passengers

The pride associated with travelling in small cars either private or public type is incontestable. Hence, people of various classes and tastes travel on this type of vehicles. For many, it is not a necessity but pride.

Family groups, business class, children, old and sick people also travel in this medium. Hence the need to cater for them as they travel on our highways. Rest areas should be provided on our highways for their convenience and rest. As most of these small vehicles have no enough room space for stretching of legs. Sometime, it is very uncomfortable, especially if it is overloaded. However, this class of people and their needs are also considered in the proposed design.

1.1.2 TRAVELLING HOURS

Many of the passengers are traders, businessmen and they usually have to travel as early as possible in the early hours of the morning so as to reach their trading stations

or business before dawn. Others prefer to travel in the evening so as they could reach their trading stations by the early hours of the next day. Some people are forced to answer urgent calls in nearby or far away towns and they have to travel as early as possible. For the above-mentioned class of people, they sometimes have to take their breakfast, lunch and dinner in transit. People start travelling as early as 4.30 am till the next day.

1.1.3 TRAVELLING HABITS

It is hoped that the proposed Transit Rest Area shall change the travelling habits of the travelling passengers for better.

The traditional habit of patronizing hawkers will give way to something more orderly. With the proposed design, even the most foolish passenger will not encounter any difficulties in finding his way through the waiting lobby into other facilities. The habit of passengers buying food from inside the bus while the bus is in motion or about to move shall have to disappear. With the proposed design, it is expected that all selling and buying shall end in the shops within the rest area.

1.1.4 REST AREA AND OTHER PROTOTYPES

It is within the range of this thesis work to design a Transit Rest Area for Abuja. But it would be necessary for the efficient running of the facilities and vehicles if there are some other modern prototypes spread along the highways all over Nigeria; distances of coverage shall be determined by the relevant government organisation.

In view of this, it is suggested that the prototype should be built in various places in Nigeria with minimal or no distortion at all from the original design to help reduce the difficulties faced by Nigerians who travel long distances. This, the researcher believes, shall extend further leisure people take more interest on stopping at these rest areas and improve its level of economic activity on the highway.

1.2 MOTIVATION

It is the researcher's belief that it is not just enough providing good roads aimed at providing comfort for drivers and passengers, but equally important to evaluate the kind of problems road users face while on transit and identify the road users needs. The peculiarities of transportation problems on Nigerian highways are factors in the researcher's consideration for the formulation of plans for improving and solving road users problems by providing for them, their basic needs on transit.

These problems are peculiar because, proper research into the requirement by road users had not been conducted and solutions provided. This has motivated the researchers to "take the bull by the horn" in carrying out this research work.

1.3 AIM AND OBJECTIVE

1.3.1 AIM

This thesis proposal seeks to provide support back up facilities for road users in a well coordinated organised complex aim at improving the life of road users and also attempt an architectural solution which will enhance smooth flow of various parallel facilities within the complex and the free flow of traffic within the complex.

1.3.2 OBJECTIVES

The above aim could be attained through the following objectives:

(i) To identify the categories of vehicles that plies the roads.

(ii) To identify the type of passengers that plies the road.

(iii) To identify the needs of road users in transit.

(iv) To identify the distance which a driver and passenger will cover before seeking rest and also the distance which a vehicle will require to refuel and cool its engine.

(v) To identify the distance between major towns in Nigeria.

(vi) To study the existing traffic characteristics and pedestrian environment in the selected areas and developed countries with a view of identifying the problems associated with them, especially user facilities.

(vii) To identify the transport modes in relation to number of passengers, frequency of operation and destination.

(viii) Identify nodal points on major Nigerian highways.

(ix) Study the many parallel users facilities and functions within the limit of economy and land available.

(x) Evolving an architectural strategy for the development of a rest area in an attempt to solve road user problems.

1.4 SCOPE AND LIMITATIONS

1.4.1 SCOPE

This research work will be in two phases:

(a) An attempt on general development and organisation of site, parking and road network.

(b) An architectural design of rest area with users facilities such as accommodation, restaurants, supermarkets, shops, public convenience, first aid, fuel station and workshop, parking spaces and etc.

1.4.2 LIMITATION

It is important to note that no such complex exist in Nigeria. It therefore becomes imperative to conduct my own case study survey to determine parameters for my design. Other constraints, which were faced, include:

(a) lack of constant electricity and phone line which affected the frequency of my contact with case studies abroad via e-mails and telephone;

(b) most passengers were not ready to fill questionnaires as they claim the atmosphere is not conducive to them, and had no much time to write anything.

(c) conflicting space requirements for different facilities;

(d) designing of fuel service station as each marketer is expected to come up with his design of the oil producing company he is marketing for.

1.5 RESEARCH METHODOLOGY AND SOURCES OF DATA

1.5.1 Research Methodology

(a) Interviews with relevant government and private agencies.

(b) Interviews with individual road users (passengers).

(c) Physical survey of existing situations on our roads in the study area.

(d) Study of published and unpublished materials relevant to the subject.

(e) Case studies of existing situation in Nigeria and rest areas in the USA.

(f) Space requirements for the different user facilities.

(g) Space requirements for the different categories of vehicles.

(h) Visual experience, survey of the existing conditions in the study area (photographic documents and general observations).

(i) Statistics of road accidents and traffic counts in the study area.

1.5.2 SOURCES OF DATA

(a) Primary sources:

Library sources: This includes current books in the field of road transportation, user facilities, and past works on road transportation, journals on transportation, motels, etc. Newspaper articles.

(b) Secondary sources:

Field work: Interviews, Questionnaires, Visual experience survey, Photographs, Site visits, etc.

1.6 ARCHITECTURAL SIGNIFICANCE

This piece of work is believed by the researcher to be of architectural significance in that it attempts to solve problems and improve human physical environment along our highways. It helps in realising the role road transportation plays in Nigeria and the importance of user facilities to road users and how it seeks to improve the life of road users and social progress and economic development of Nigeria.

This thesis tries to improve the image quality of our community and highways, integrating facilities the researcher believes will go a long way in reorganising and improving the transit users facilities of Nigeria; reduce the monotony and boredom while travelling, meets passengers and road users needs and generate healthy economic competition in services provided for passengers and road users. It will also reduce road accidents and casualties and improve sanitary conditions in rest areas on our highways. The rest areas will also serve as landmarks on our roads.

1.7 USERS

(a) Users of Nigerian road

(b) Commuters and passengers

(c) Traders

(d) Entrepreneurs

1.8 OWNERSHIP

It is interesting problems to think of who will be responsible for the construction and efficient running of the rest area. At this stage, however, a careful consideration is

necessary because any mistake made in dedicating the new rest area to the wrong hands may result in a complete loss. At present, what could be termed existing rest areas are in the charge of local authorities, and there has been a total decline in the efficient maintenance of these user facilities. This had caused many vehicle owners and passengers to stop using facilities in these existing rest areas. Whereas with the government and (worse still) with the local councils, the employees may often be conscious of the fact that they are not directly under the control of any individual and this makes them idle and also do many other uncomplimentary acts. In view of these, it is considered advisable that the ownership of the proposed transit rest areas should go to certain group of oil companies (multinationals) or tyre manufacturers, vehicle assembling plants, transport service owners or organised private sectors who are prepared to work together and share proportionally any interest accruing from the running of the rest areas. These organised private sectors shall in turn pay rent to the Federal Ministry for Works and Housing who are the real owners of the rest areas. The construction of the rest areas is strictly the affairs of the Federal Ministry of Works and Housing, Abuja.

CHAPTER TWO

LITERATURE REVIEW

Extensive works have been conducted all over the world by researchers on road transportation. These works cover areas like road management, history, policy making, economics and highway engineering and general architecture of transport. To justify this thesis and possibly contribute to this wide field of architecture, the researcher here feels obliged to review all previous works of other researchers in the area of road transport architecture to familiarize himself with the subject, find and review inherent problems in this area of architecture, discover and open up new areas of study in the field of road transport architecture, especially those that affect users and avoid repetition of previous works.

2.1 TRANSPORTATION

Transportation involves the movement of people, goods and services from one place to another in search of peace, infrastructures, business and employment, social interaction and the likes. It is also an economic activity that is concerned with increased human satisfaction by changing the geographical position of people and goods. This includes movement of finished goods/products to the consumers and the movement of finished products to places where services required is available.

Solade, A.O. (1964) asserts that social mobility within any country is an essential requirement before economic progress can be a continuous process and says

"transportation is the organic nucleus which alone can give cohesion to the whole community." He shows how transportation brought ethical mixing in Nigeria."

Wilbur Smith (1966) realizes the importance of transportation when he said, "efficient transportation has become one of the challenges confronting the modern urban region, since the vitality of an urban centre relates directly to the quality of its transportation services." He showed that transportation issues are long term in their solutions.

Idachaba, J. (1981) asserts that transportation is the total of all that make for human existence. He contends that along side the process of urbanisation and growth of towns and cities is the evolution of transportation modes from foot to motor vehicles.

For transportation to overcome the handicap posed by distance, it must reduce cost, inconvenience and time. It must reach all aspect of human life (medical, housing, jobs, cultural and recreation). Many factors play important role to the development of transportation of any country, some of the most important are the economic, geographical, political and social factors.

2.2 LAND USE AND TRANSPORTATION

Transportation is a function of land use. The type of land use and transport that comes into existence is determined by the land use potential and transport capabilities. It therefore becomes important that planning a land use transport system is efficient balance between land use potential and transport capabilities.

An imbalance occurs when we mismatch the land use and transport components and facilities to the environment in which they occur.

Land use potential is a measure of socio-economic activity that takes place on a given area of land, work, recreation motel, hospital, school, workshop, supermarket, restaurants, toilets, filling stations, etc. It thus possess a potential to generate traffic flow to such areas where these services are provided. It becomes important that such areas are serviced by a good system of transportation and facilities. Such a system must take into account the requirements of vehicles and pedestrians and support facilities. Traffic generation is therefore a unique measure of land use activity.

Table 2.1: Land Use for Transport System

	TYPE OF LAND USE	MEASURE
1.	Motels	Number of rooms, capacity of lounges, bars and dining rooms
2.	Restaurant	Area, Parking spaces
3.	Shopping Centres	Retail trading area, parking spaces, number of retail channels
4.	Filling station and workshop	Parking spaces, service areas, etc.
5.	Public conveniences	Number of WC and showers and capacity
6.	Parking spaces	Number of vehicles

Source: W.R. Blunden, *The land use transport system*, 1971.

All of the various types of land use listed above generate traffic. The traffic could be in term's vehicular or pedestrian traffic. Adequate plan should be made to avoid conflict between these two types of traffic and also to reduce congestion and confusion to such areas, especially where they are located along our highways.

It does suggest that while the number of road users is on the increase, there is no adequate provision to meet the needs and expectations of road users, whether they are for

the movement of people or goods. It is no wonder that there is always chaotic situation on our roads.

2.3 BRIEF

A transit rest area is basically a complex where user facilities are provided for road users on transit. The building of this complex is a new re-development of our highway facilities, especially in developed nations like America and Canada. These seem to be the only way of coordinating several user facilities under one roof and integrating them into the structure.

These user-facilities in the existing situation are often the least efficient part of an otherwise supposed to be adequate system. They are normally designed in developed countries to suit the existing transport network to serve passengers and road users.

However, the existing situation where initial plans were not made for such facilities and the level of activity within the highway existing situation reaches a point threatening the efficiency of the transport system. These facilities are incorporated within existing buildings; such buildings usually accommodate houses, offices, shops and restaurants.

2.4 FUNCTIONS

Traffic (that is goods and passengers) needing to be transported must be provided with facilities to make the trip conducive, safe and convenient to the transporter. The location of these facilities should be at reasonable intervals on our highways, so that

passenger could rest, sleep, eat, refuel and repair their vehicles. These demarcated areas of rest are called "transit rest areas".

The user-facilities for transit perform the following functions.

(i) Providing a haven for road users seeking rest from the monotony and stress of long distance travelling.

(ii) Providing a nodal point for emergency stop and information on the highway.

(iii) Provide a place for road users to eat and use public convenience facilities.

(iv) Enable road users plan their trips as per points of stopping, resting, sleeping before continuing the trip.

People and goods to be transported are referred to, collectively, as "traffic". A specific lot of goods sent forward at one time, by one consignor, for one consignee, to one destination, are called a "consignment". It is not usual to refer to one passenger or group of passengers as a consignment. But for convenience when discussing traffic, consignment can be used in that way.

2.5 DESIGN PRINCIPLES

There are three principles for the development of transit rest complex. They are complimentary and of course are not separable. These principles are:

2.5.1 Functional Principles

The access tree. This is a principle for dealing with several functional problems of the rest area relating to the business areas.

In general, it is a way to plan for efficient circulation enhanced job choice and creates social interaction, which is a requirement of an office, and transit rest area. Also, it shows the importance of taking the underground into account; it demonstrates the relationships among the various parts of the main pedestrian movement systems; and it demonstrates the linkages between the essentially horizontal public transportation system and vertical circulation in private buildings.

Other elements of the rest area facilities can be, and occasionally are designed as sub-systems including good movements and the flow of water, waste and power information. If the design of the major system were coordinated, the inherent from determining power of the rest area facilities could be consciously exploited to achieve selected design objectives.

2.5.2 Physical form principles

Highs and lows. This principle tries to cater for the need of improving visual coherence and "grasp" of the area, to increase the sense of identity of the individual parts; to provide visual variety and to create new spaces and views.

This is achieved by separating high clusters with low clusters and some open spaces. The lows have an important functional as well as visual aspect. Some of these places today have a wide range of essential and specialized small scale activities within them, including eating places, small hotels, services areas and scores of different kinds of stores.

An improved relationship with nature calls for minimising visual and physical barriers between man and sun, sky, trees, grass and water. Underground areas should be

brightened not just with more artificial light but by the sun and sky. There should be adequate parks. Access to nature will be easiest to provide in good weather. However, there should be better protection against inclement weather. The effort should be to provide detail rest area design elements, which will permit a range of protection against bad weather conditions while allowing positive access to nature when the conditions are favourable.

Provision of weather oriented amenities requires a subtle combination of man-made and natural elements. Trees, water and other elements can modify the effects of wind, sun and driven rain – Arcades, overhangs, walls and covered passages can offer protection from precipitation and severe temperatures.

Fountains can provide a source of heat relief and their spray may actually cool the passersby. Wide circulation paths can lower human density and reduce the effect of body heat. Rest areas can facilitate recovery from heat reduced fatigue.

Visual amenities can be divided into essentially utilitarian items and those which are primarily, aesthetics, signs symbols, patterns textures or three dimensional arrangements which have to do with important public information regarding safety or orientation should take precedence in their size placement frequency and inherent design elements.

CHAPTER THREE

3.0 GROUND WORK INVESTIGATIONS AND FINDINGS

In this chapter, the researcher tries to analyse and summarise all the traffic data collected (most of which was collected on the dual carriage way by the researcher and checked with the Highway Unit of the Federal Ministry for Works and Housing).

The chapter is further divided into five sections, which are as follows:

1. Peak hour,
2. Vehicles parking at facilities area at peak hours,
2 Vehicular occupancy
3 Accident rate, and
4 Conclusion from traffic data.

These form the basis for determining the size of the various facilities to be provided assuming a 30% increase in traffic by the year 2005.

Every day, the highest traffic flow occurs between 3.00 pm and 6.00 pm and so, the time 4.00 pm-5.00 pm was regarded as the peak hour on major Nigerian highway traffic. An average of vehicles passing at peak hour was taken over a week and the following figures were obtained:

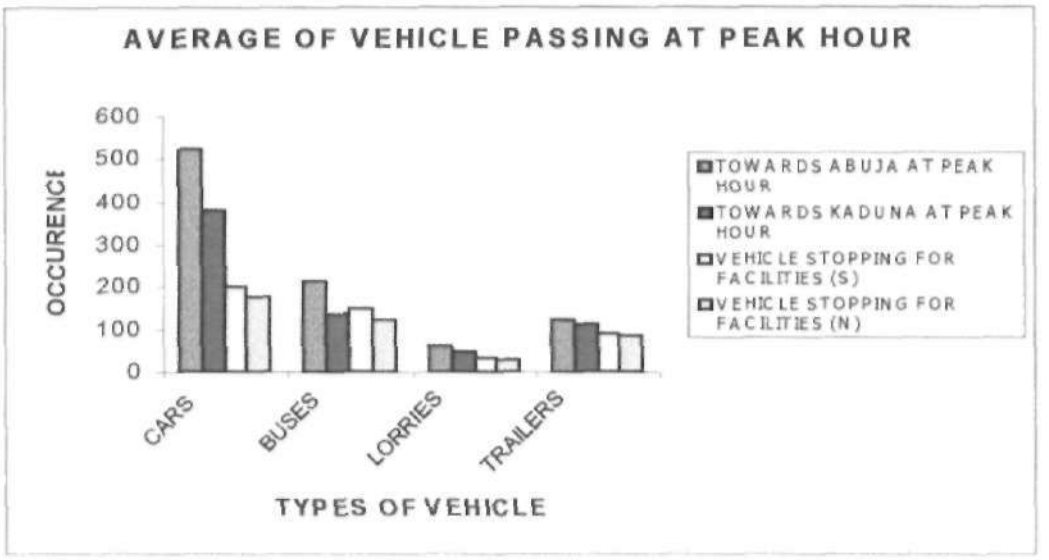


Fig. 3.1: Average of Vehicle Passing at Peak Hour

Of these vehicles, the average numbers of vehicles stopping at the rest area at the peak hour are given on the table above.

3.1 VEHICULAR OCCUPANCIES

Table 3.1

VEHICLE TYPE	CAR	BUS	COMMERCIAL
Vehicular Occupancies	3.81	20.40	3.22

- Figures obtained from (Scott W. Ison Kirkpatrick and Partners).

From the above figures, we can arrive at the number of people passing and stopping at peak hour in the rest areas.

NUMBER OF PEOPLE PASSING AT PEAK HOUR

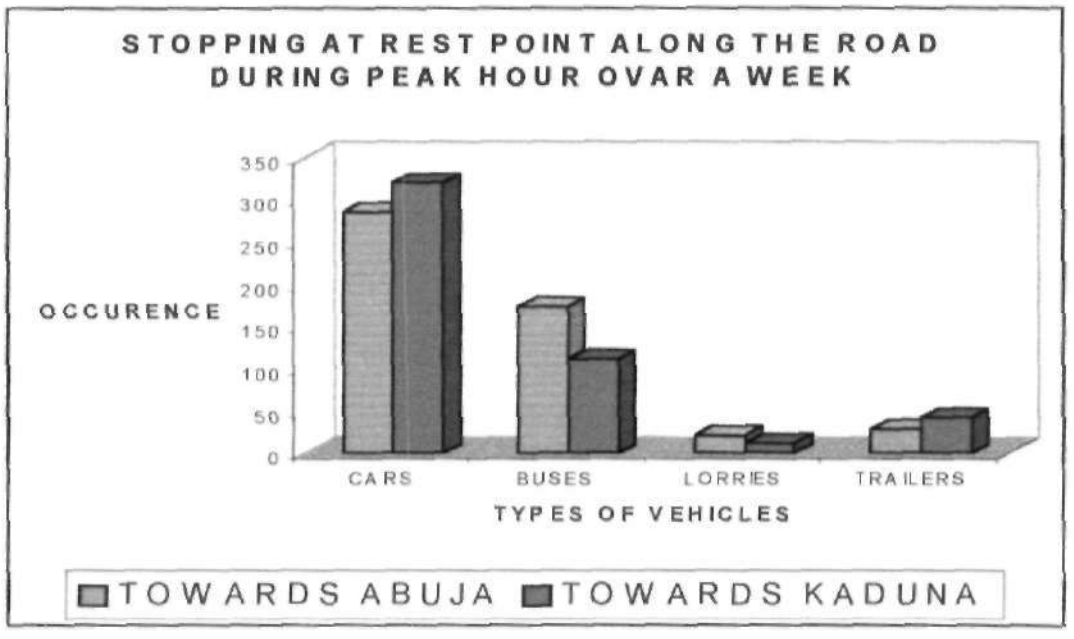


Fig. 3.2:

3.3 ACCIDENT STATISTICS

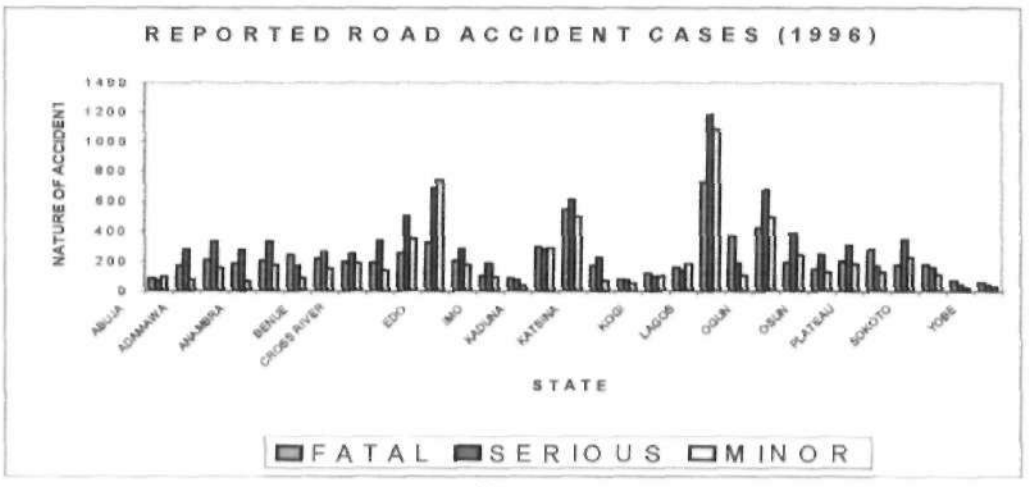


Fig. 3.3: Accident Statistics (1996)

The Kano-Abuja dual carriage way is a major Federal Government highway, which connects Abuja to the north, and at Zuba it connects Abuja to the south and eastern parts of Nigeria.

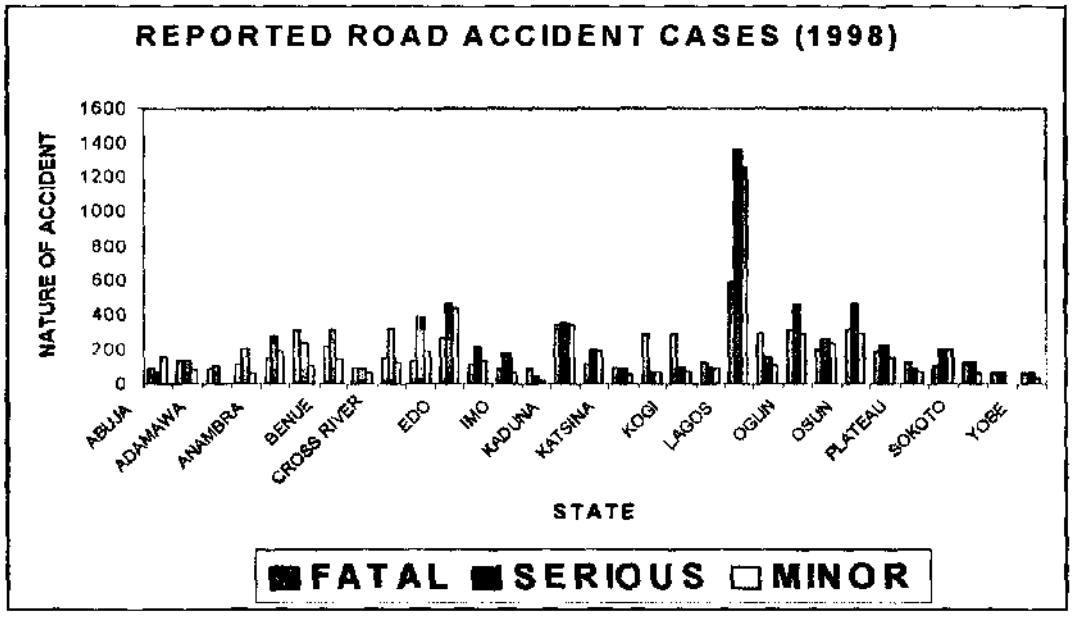
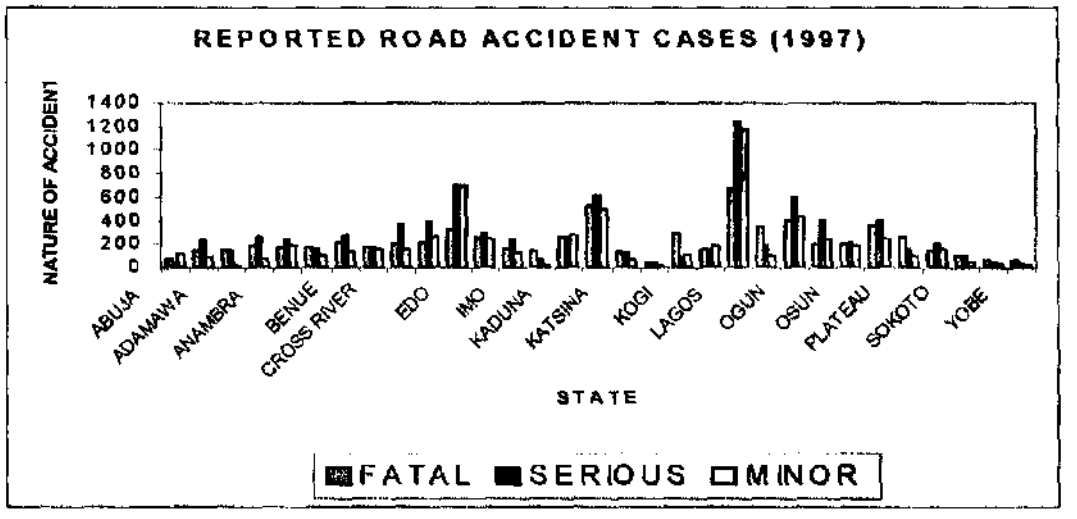
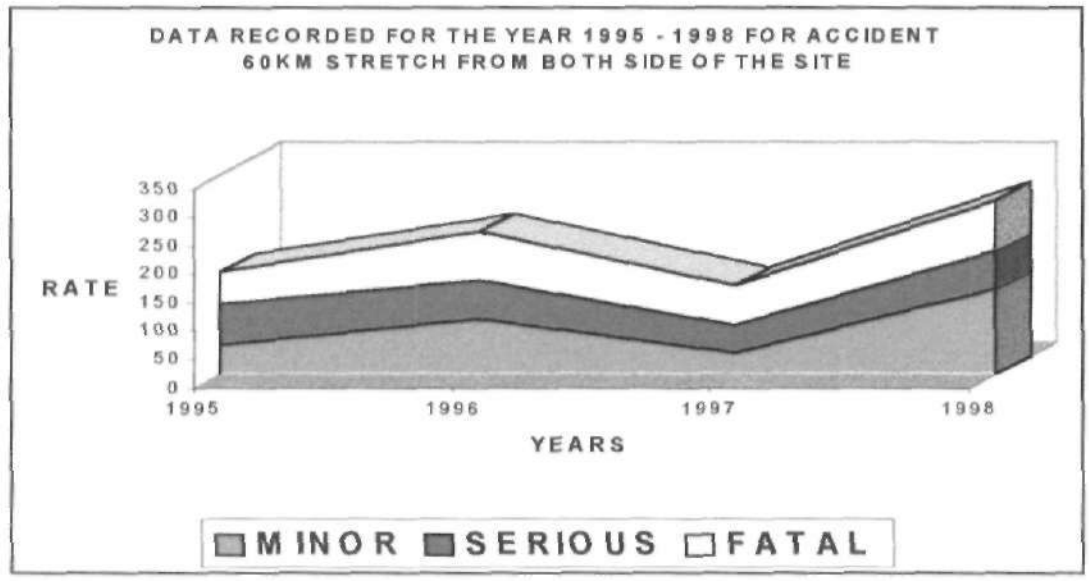


Fig. 3.5: Accident Statistics (1998)

The following data were the accident statistics recorded 60 km stretched from the site on both sides (that is towards Abuja and towards Kano). The data were obtained



from the Nigerian Police Force, Abuja.



SOURCE: The Nigerian Police Force, Abuja.

Fig. 3.6: Crime Rate

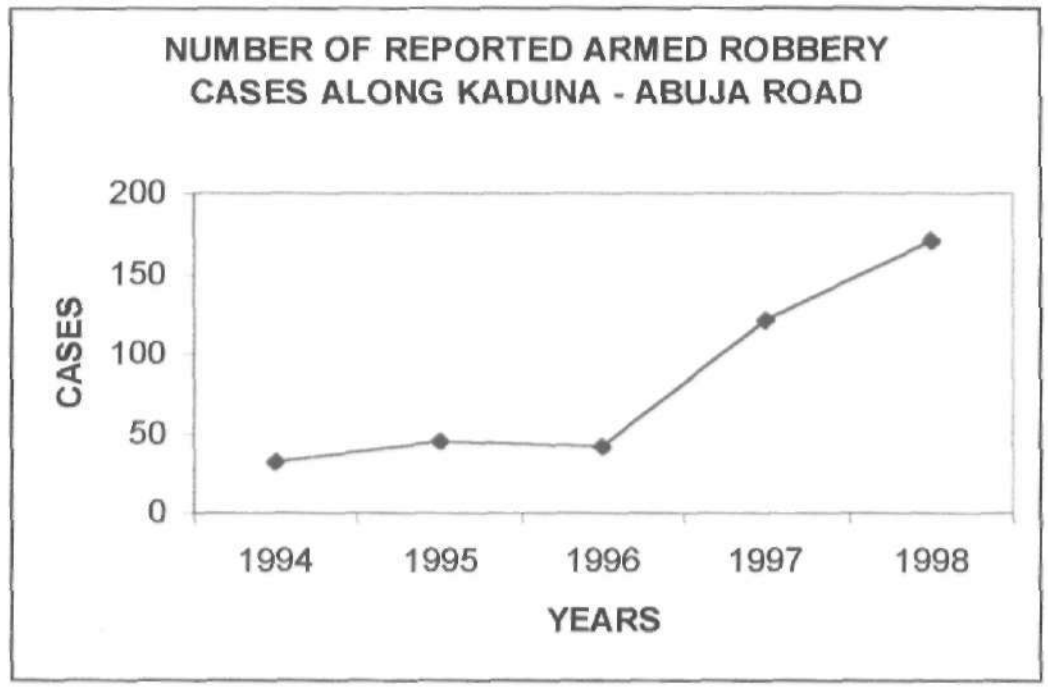


Fig. 3.7: Crime Rate

3.5 CONCLUSIONS

Since vehicles moving towards Abuja direction are more and greater than the ones moving towards Kaduna at peak hour on the average; the facilities will be located on the side toward Abuja. The facilities should be designed to accommodate peak hour traffic, i.e. the number of:

(i) Parking spaces,

(ii) catering facilities,

(iii) Shopping plaza,

(iv) Accident clinic,

(v) Police post,

(vi) Fuel service station, and

(vii) Toilets.

The accident statistics suggest that the size of the emergency clinic should accommodate a reasonable number of accident victims at a time.

CHAPTER FOUR

4.0 CASE STUDIES: TAFA

4.1 Introduction

An indepth study of the planning and operation of existing users facilities area was conducted here to identify the circulation problems, peak hour traffic, hygiene, space requirement, facilities provided for vehicles, passengers and administration, architectural form language, structural systems, and general functional layout problems. Also looked into is the kind of services passengers usually required at this area and how activities are conducted. It should however, be noted that since no standard rest area exist in Nigeria, the studied cases were mainly from the existing situation from the local rest points along Nigerian highways with the aim of improving on the shortcomings of the existing situation. An appraisal of these facilities on the site was conducted to determine the physical basis and data for the design.

4.2 EXISTING SITUATION

4.2.1 Location

Tafa Village is located along the Kaduna-Abuja express way (dual carriage way) and it is about 30 minutes drive to Abuja. The town emerged as a result of the social need of tanker drivers who usually stop over at this point after strenuous long journey to rest and see their women and socialize.

As a result of this social implication, the women who are mostly

prostitutes results to providing catering services as a means of encouraging more road users (tanker drivers) to stop over at this point so that they could enjoy wide patronage of their services (prostitution and catering services).

Tafa is also a border town between Kaduna and Niger State. Most of the people that stop at this point are tanker and trailer drivers.

4.2.2 Description and Size

The village is built up of many unorganised buildings with numerous make-shift shops in linear form. In some cases, houses are converted to shops, restaurants and brothels to serve the needs of the other customers who are mostly tanker drivers. The village is a very small community with many of its youths engaged in the sale of black market fuel by the roadside. Most of the tankers that stop over here park on the shoulders of the road (on both shoulders) as provisions for parking was not made. There also exist several other antisocial activities in the town.

KASHIM IBRAHIM LIBRARY



Plate I: Facilities along the Express Road at TAFA near Abuja

4.2.3 Circulation

This is arbitrary and creates difficulty in pulling out tankers or parking them. There are also no provision for parking and often you will see vehicles parked on the shoulders of the road leaving only small space for vehicles to park. This could expose vehicles to accident. There is also no consideration for pedestrian user.

4.2.4 Traffic

The dual carriage way passes through this linear settlement and since there is no existing car parking space, vehicles tend to park on both sides of the road; creating a chaotic situation resulting on traffic jam. Further, there is an indiscriminate parking of vehicles.

4.2.5 Number of Vehicles Parking at Peak Hour

The peak hour in this area is between 5.30 pm and 6.30 pm.

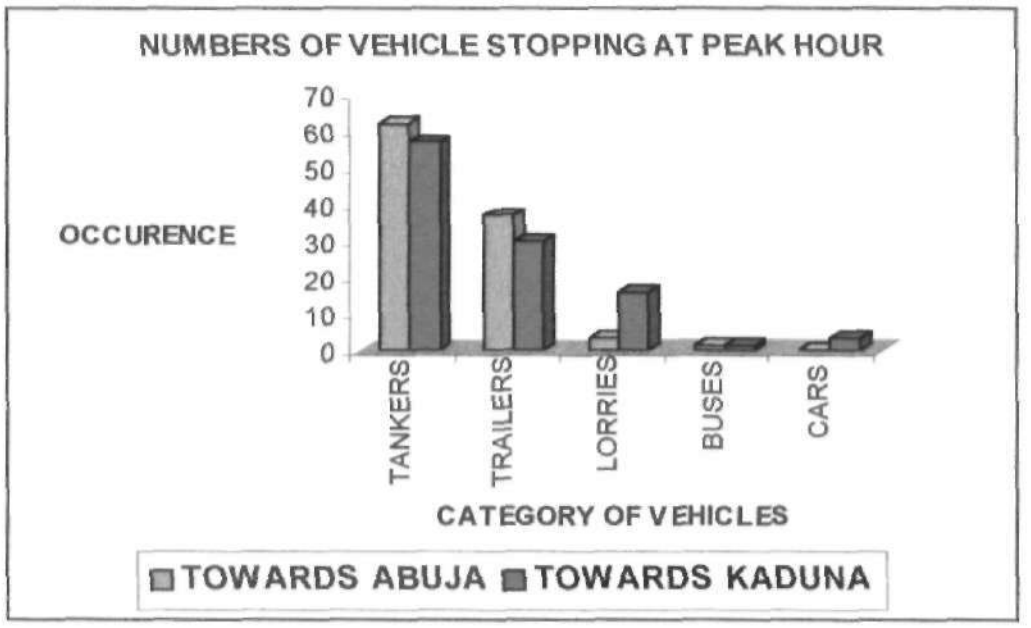


Fig. 4.1: Peak Hour Traffic at TAFA

4.2.6 Capacity

The site has a capacity to accommodate all activities that take place in a rest area and to cater for passengers travelling far and wide.

4.2.7 Pedestrian and Passenger Facilities

There is no consideration for pedestrian users and this tends to cause pedestrian and vehicular conflict thereby exposing pedestrian life to risk of accident. Everywhere hawkers and touts present eventful chaos and confusion. The passengers are mostly, however, tanker drivers and their boys.

4.2.8 Services and Sanitation

Scanty services, for example vehicle repairs, refueling, sales, bukaterias and accommodation are noticed on the site. Services are provided under trees, houses, makeshift shops, etc public. Toilet and conveniences are completely absent with poor drainage system. There is also no adequate electricity. People pass faeces indiscriminately on open spaces.

4.2.9 Appraisal

This linear unorganised site makes expansion difficult. The infiltration of various commercial activities shows the degree of activities of tanker drivers. The site is not patronised by other road users, as only

tanker drivers usually stop here.

4.3 CASE STUDY: LOKOJA

Detail studies of the planning and operations of existing facilities for road users here at Lokoja was conducted by the researcher, aimed at identifying the circulation problems, peak hour traffic, hygienic situation, space requirements and usage, facilities for vehicles and passengers, administration architectural form and language, structural systems and general functional layout problems.



Plate II: A Bus Parked at Lokoja Rest Area.Notice Commercial Activities Taking Place

4.3.1 Existing Situation



for commercial purpose to serve motorists and passengers on transit with



Plate V: Vehicles parked on roadside at Lokoja Rest Area. This is dangerous to other road users.

The filling station is very unorganised and has very little inefficient pump heads vehicles, i.e. buses have to wait for a long time before getting fuel/gas.

There is also no enough space for vehicle especially buses maneuvering in the filling station. A lot of hawking activities takes place here with a lot of vendors roaming round vehicles and selling their wares.

4.3.4 Circulation

The circulation is arbitrary and creates difficulty in pulling out buses from the filling station into the main road. There is also no ample space for turning for buses. Other vehicles are parked on the shoulders of roads. There is the risk of pedestrian and vehicular traffic.

The shops are situated too close to the road here, endangering the lives of

patronisers and proprietors.

4.3.5 Traffic

There is a very high risk of pedestrian and vehicular traffic clash. Parking is chaotic and unorganised as provision is not made for vehicular parking.



Plate VI: A Car on speed on the highway. Notice other parallel activities.



Plate VII: The ever-busy Lokoja Rest Area.

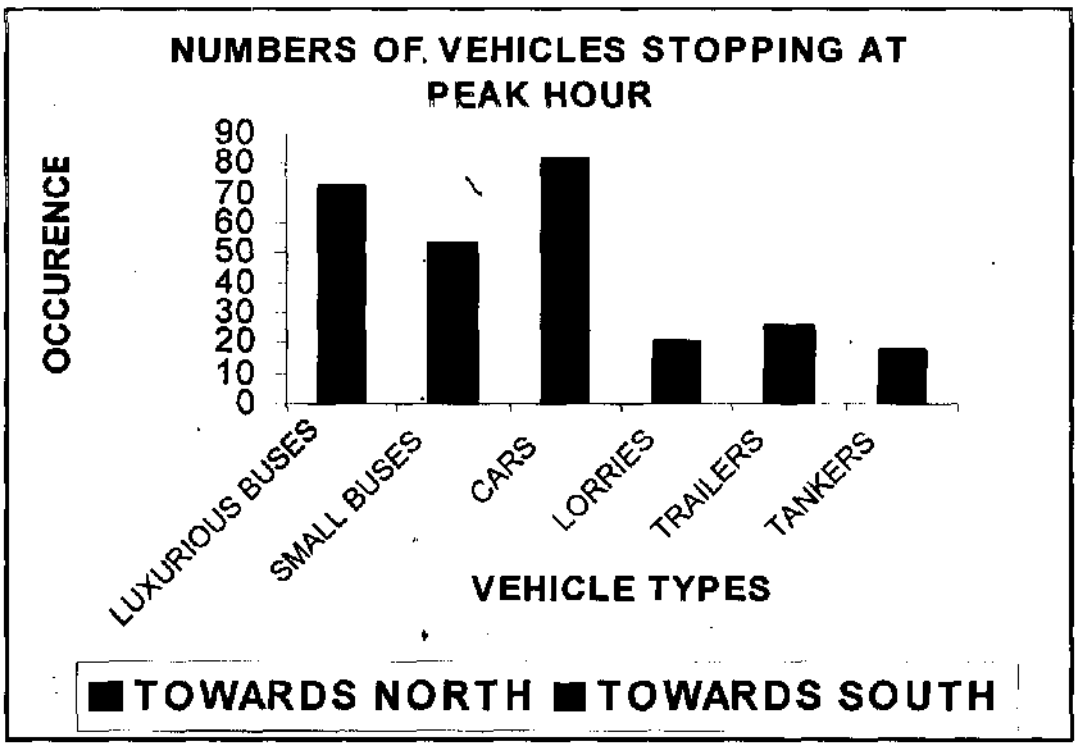


Fig. 4.2: Peak Hour Traffic at Lokoja

4.3.6 Capacity

The site has capacity to accommodate all the activities that take place in a rest area, but has the disadvantage of the topography or terrain, which is steep, slope and could be costly.

4.3.7 Services and Sanitation

Scanty services are provided. Services are provided in illegal structures and some make shift structure. Sanitary condition is very poor and unhygienic; no toilet facilities provided. The environment is also filthy.

4.3.8 Appraisal

The infiltration of various hawkers and vendors on the site shows the degree of buying passengers do while on transit. This also shows the demand by passengers of such services.

4.4 CASE STUDY: JEBBA

4.4.1 Introduction

Detail study of the planning and operation of the existing situation and facilities or users facility at Jebba was conducted by the researcher, aimed at identifying the circulation problems, functionality and space requirements. Also, studies of the hygienic environment, peak hour traffic, architectural form and



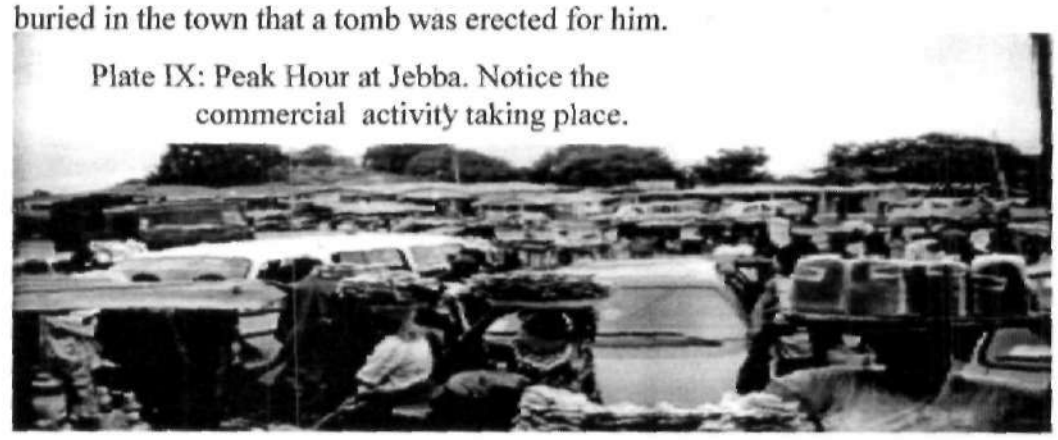
Plate VIII: The Famous Jebba Bridge

language, structural systems and general layout were carried out.

4.4.2 Location

Jebba is a small town situated along the bank of the River Niger. The town is historic with the legend story of Mungo Park who is said to have been buried in the town that a tomb was erected for him.

Plate IX: Peak Hour at Jebba. Notice the commercial activity taking place.



Jebba is also home of the Jebba dam which provides power to Nigeria. It is also some distances away from the famous Kainji dam.

Jebba has a linear settlement and on bother sides we can say the settlement pattern is linear, both by the road and on the basin of the River Nigeria. There is also a kilometer long Jebba bridge.



Plate X: Commercial activities at Jebba Rest Area



Plate XI: Restaurant and other parallel activities at Jebba

The area under study comprises of a group of built up structures mainly serving as a restaurant. The buildings were constructed by the Local Government, aimed at serving road users with their food need. It is an improvement over the former situation, where they have\make shift bukaterias and zinc structures housing restaurants.

There exist some filling stations about 100 metres away from the restaurant facilities. However, all these facilities are independent of each other.



Plate XII: Makeshift shops at Jebba Rest Area

4.4.4 Circulation

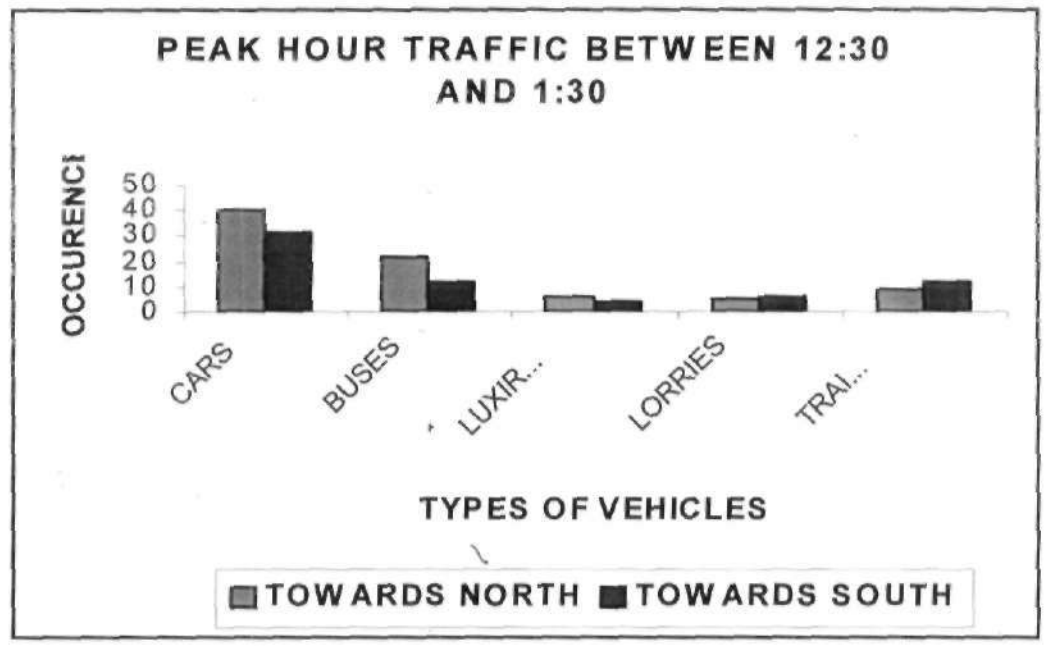
Circulation is nt defined as pedestrian and vehicular traffice conflicts, thereby endangering life and property.

Plate XIII: Commercial Activities at Jebba Rest Area



4.4.5 Traffic

There is no separation of pedestrian and vehicular traffic. There is



however a very high traffic on this highway.

4.5 GOLDEN GATE TRANSIT SERVICE, USA

4.5.1 Location

The Golden Gate Transit Service was first major way transit service

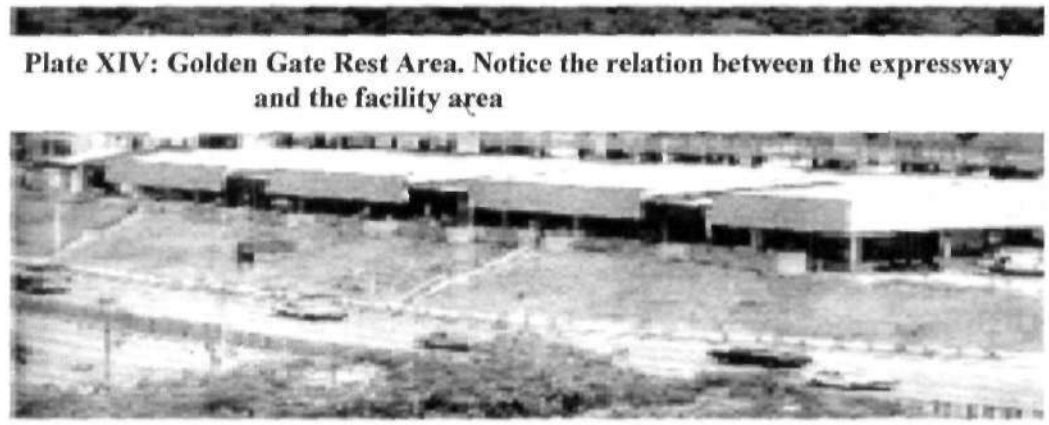


Plate XIV: Golden Gate Rest Area. Notice the relation between the expressway and the facility area

Fig. 4.3: Peak Hour Traffic at Jebba

building to be build in Plymouth for five years. The Golden Gate Transit Service is a new modern motorway service regarded as a centre a traveller lodges from which the visitors either proceed to the next post house bedrooms.

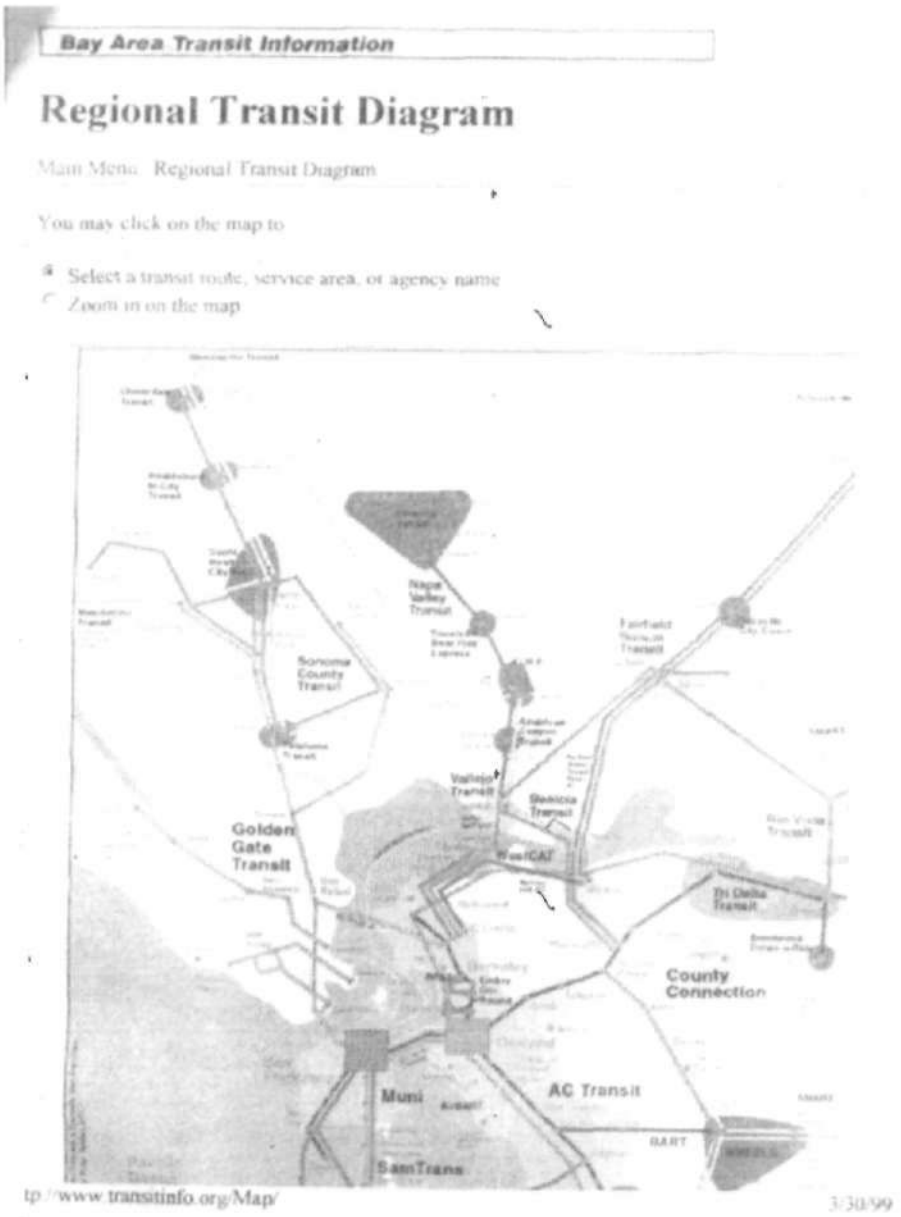


Fig. 4.4: Regional Transit Diagram for Golden Gate Rest Area

4.5.2 Planning/Layout

The motorway service building comprises of three restaurants each accommodating about 50 dinners and an outside terrace which has room for a further 60 persons.



Plate XV: Food Canteen at Golden Gate Rest Area

The building, designed by architects Walter Schrepfo, Wolfgang Groundhoff and Heinz Greber, has a total volume of 5,400 m2 and was constructed at a total cost of DM3.3 million currency. The building was awarded the 1969 BDA Scarland prize for good design.

Plate XVI: Interior of Food Canteen at the Golden Gate Rest Area



The planning and layout has been well structured and coordinated facilities to satisfying as it does many criteria for location of a such motorway services intended to pull the motorist, tourist and businessmen and women from the close distance airport along the highway. The planning was to take care of the transit problems, their needs, security, health services and facilities.

Golden Gate Transit Services was a well-designed motorway service building with high class restaurant facilities both indoor and open type, and with incorporation of other commercial facilities.



Plate XVII: Exterior of Food Canteèn at Golden Gate Rest Area

The transit motorway facilities is an elegant and interesting environment for total satisfaction of the people on transit. There are well planned and layout parking spaces, i.e. services accessible by cars, lorries and buses on the site complex are high class accommodation facilities for total relaxation of passengers and road users.



4.5.3 Appraisal

What is transit station? Does not imply the duel in and help yourself in your capacity type of services, but rather a traditional form of facilities or services accessible by car.

The site has been well chosen satisfying as it does many criteria for location of transit motor way facilities wishing to attract the motorist, tourist and other road users.

Plate XIX: Covered Outdoor Activity Area



There is a high class restaurant and other commercial facilities all well integrated together.

An advantage for such services away from the town centre is of course that of land values is expected to be less and as here allow for purchase of enough land to provide for future expansion.

4.6 ESSO PETROLEUM TRANSIT STATION, BRITAIN

4.6.1 Introduction

Esso Petroleum Transit Station is located in Union City along the major highway. Esso decided to expand its down of motor highway facilities in Europe by building a 100-bedroom hotel with other road user facilities such as filling station, restaurants, off the 4m at Maindenhead. The facilities were to act as a way of boosting the market orientation of the organisation's product, and as a promotional strategy of promoting corporate image.

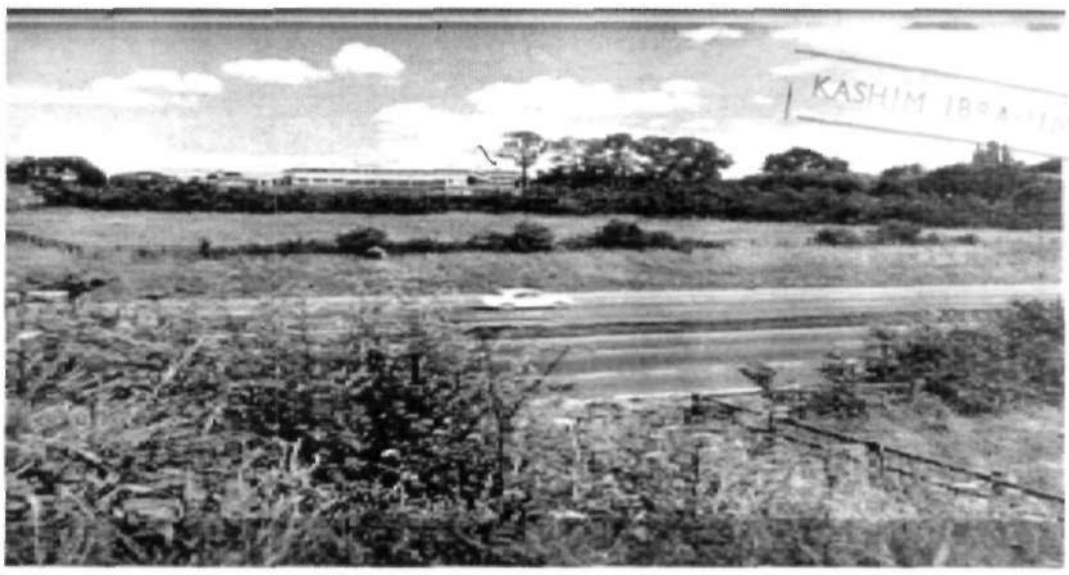


Plate XX: View of the Esso Transit Area from the Expressway

4.7.2 Planning and Layout



Fig. 4.5: Layout of Esso Rest Area

The possible routes for driving to the hotel are east from Reading or west from London along the motorway or from the town of Maidenhead. From Maidenhead, the entrance itself is well signposted. The entrance itself is however rather confused with access to the adjoining petrol station.

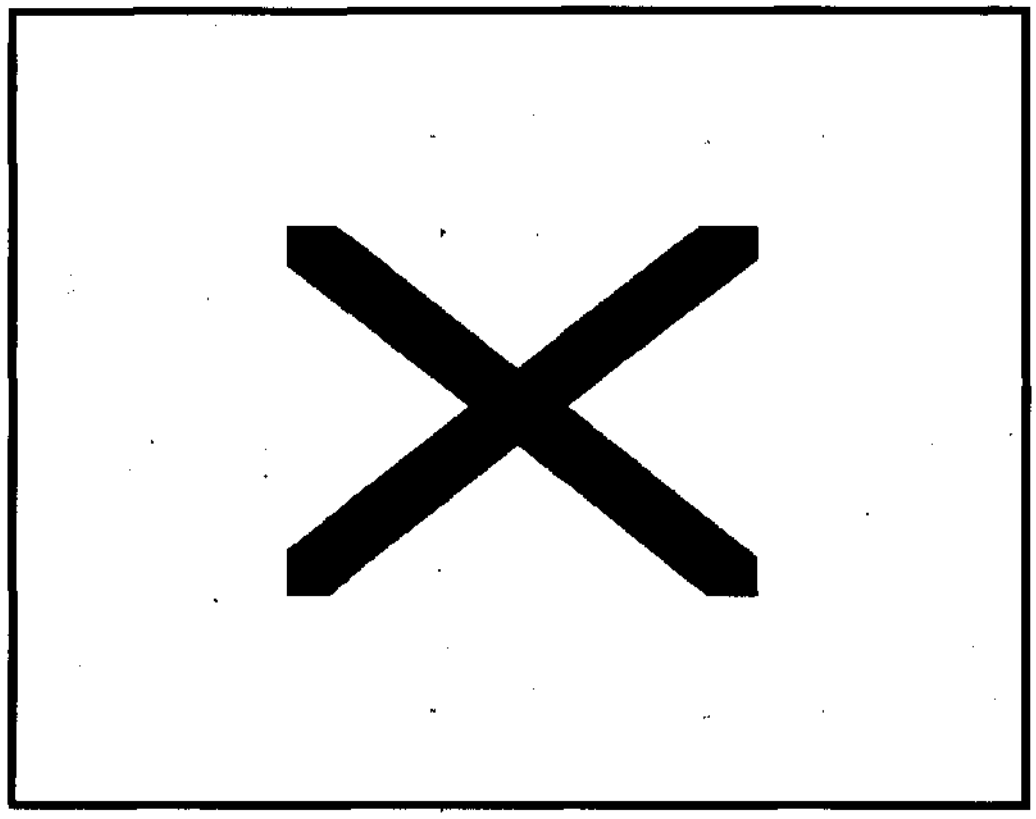


Fig. 4.6: Regional Layout of Union City Rest Area

The visitor drives to the entrance of the bedroom only rather than to the main reception entrance, while all service vehicle are required to drive past the main entrance to reach the loading bay. Visitors' cars are parked in the open on three sides of the motel.

4.6.3 Planning

The planning and layout has been well planned to satisfying as it does many criteria for location of a hotel wishing to attract the motorist, tourist and businessmen.

The planning was designed to take care of the traffic problems and noise from the town centre, yet is within easy reach of Heathrow Airport, London.

4.6.4 Service and Facilities

Twenty-four car servicing facilities was an integral part of the development. The existing shopping-hangers manor house, built in 16th century style on the same site, was converted and expanded to provide high class restaurant and other commercial facilities and accommodation facilities in the complex for the road user rest area.

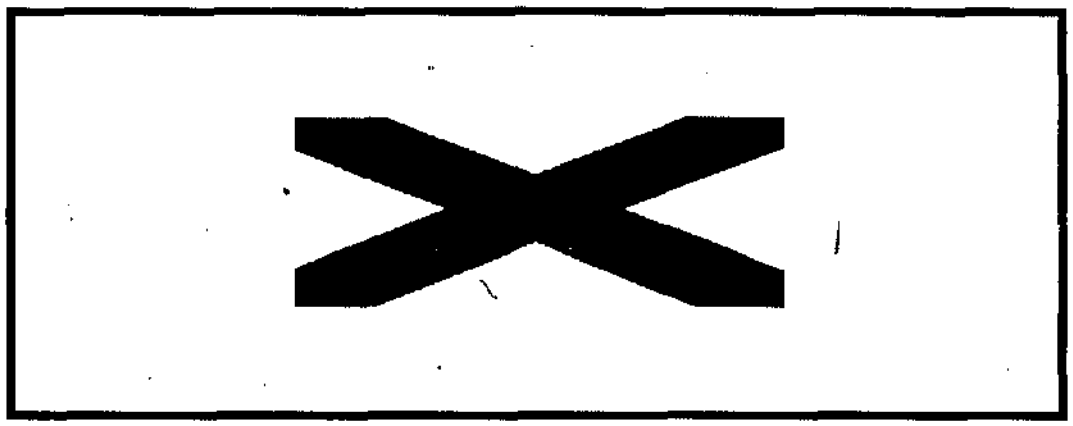


Plate XXI: Fuel Station at the Entrance of Esso Rest Area

The site include about 21 acres pastureland situated to the north of the M4, five minutes by car from the centre of Maidenhead and twenty minutes from the Heathrow Airport, London.

Adequate parking spaces are provided with an enhanced car services, repair and refuelling for the motorist on the highway.

4.6.5 Appraisal

The site is located at a strategic location for easy accessibility of the people on transit for their basic needs while on transit.

Adequate parking spaces are provided with little emphasis on the car services facilities but with an enhanced high class restaurants and accommodation facilities wishing to attract motorists.

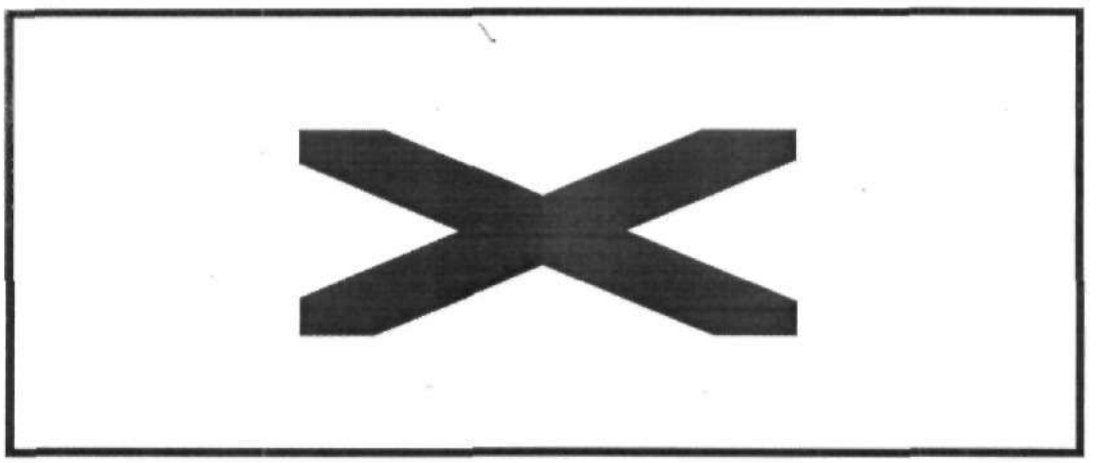


Plate XXII: Accommodation Block at Esso Rest Area

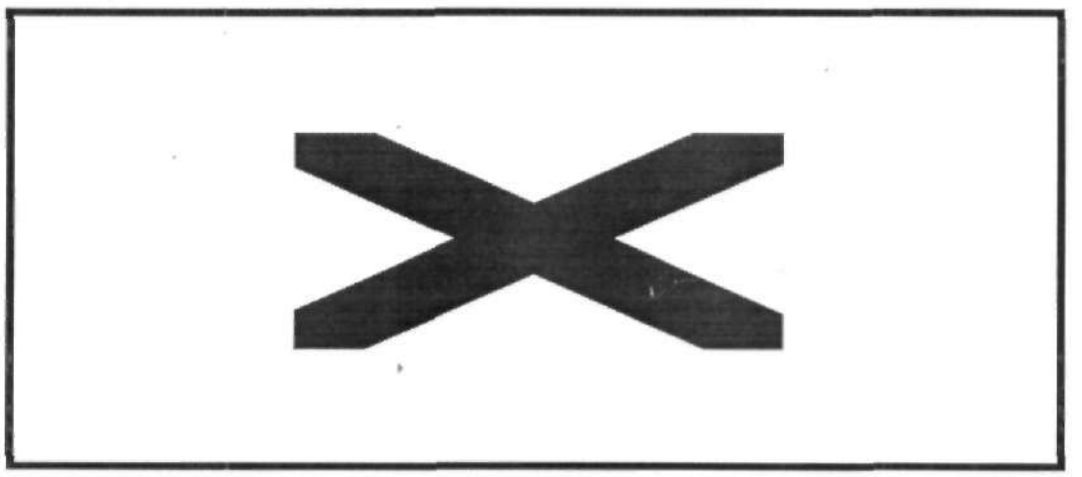


Plate XXIII: Side View and Parking Facilities at Esso Rest Area

CHAPTER FIVE

5.0 ABUJA (THE SETTING)

5.1 PHYSICAL ENVIRONMENT, CLIMATIC CONDITIONS AND CONSIDERATIONS

A comfortable living environment will depend on maximising the aspect of environment, which reduces heat and the effect of humidity, and protect from rain and dust. Planning with climate and designing with climate should take place at all scales. The climate has a distinct dry and wet seasons.

5.1.1 Temperature-Humidity

In human terms, net radiation is felt as air temperature, the response to which is greatly influenced by the humidity condition in the air. The site records its highest temperature during the dry season (FCT Masterplan) when there are few or no clouds. Changes in temperature of as much as 17°C has been recorded between the highest and the lowest temperature in a single day. During the rainy season, the maximum temperature is lower due to the dense cloud cover. Diurnal annual range is also much lower, sometimes no more than 7°C in July and August.

Human sensibility to temperature is greatly affected by relative humidity. During the dry season, relative humidity falls in the afternoon to as low as 20 per cent around the site zones. This relative low humidity, coupled with high afternoon temperatures, accounts for desiccating effects of the dry season. In the rainy season, the relative humidity is much higher, especially in the morning hours when it can reach as high as 95 per cent. Even though the temperature is

slightly lower, the effect is to create heat-trap. When this situation occurs, the general feeling is so uncomfortable and hot.

5.1.2 Rainfall

The start of the rainy season around the site is around April. The rain tappers off very rapidly after the 20th of October. Thus, the duration of the rainy season is between 180 days to 190 days. The mean monthly distribution shows a tendency of concentration in three or four months. In the Abuja area, 60 per cent of the annual rainfall is in the months of July, August and September. This concentration of rainfall shows the need for drainage systems that can handle large volume of water very quickly and roof that can drain water easily also there is need for care projection to protect the walls.

The Abuja area has frequent occurrences of squall lines, which begins with dense, dark, cumulo-nimbus clouds with thunder and lightning, followed by strong wind and intense rainfall. The intense rain may last for up to one and half hour, and is then followed by drizzle of several hours' duration. This condition is then replaced by a few days of bright, clear skies. It is thought to originate from the Jos-Plateau region, and to travel from east to west across the site. It is most common in the afternoons at the beginning and end of the rainy season, and often causes serious property damage.

5.1.3 Wind Dust

Two major air masses dominate the climate of Abuja. These are the tropical maritime air mass and the tropical continental air mass. The tropical

maritime is formed over the Atlantic Ocean to the south of Nigeria and is therefore warm and moist. It moves inland generally in the southwest to northeast direction. The tropical continental air mass is developed over the Sahara Desert and therefore is warm and dry and blows in the opposite direction – northeast to southwest.

The oscillation between these two air masses produces the highly seasonal characteristics of weather conditions in Nigeria. The tropical continental tropical maritime mass creates the wet season.

5.1.4 Sun and Cloud Cover

In Nigeria, there is a general increase in the total hours of sunshine further north of the Atlantic coast. The amount of sunshine ranges from a minimum of 1,300 hours in the Niger Delta to over 3,200 in the extreme northeast of the country. The area around the site exposed over 2,500 sunshine hours (Mabogunje, 1977).

5.1.5 Climatic Requirement

Due to heavy rainfall most of the year round, the problem envisaged is rain water. As such,

(i) roof should be quite steep to allow easy drainage of rain water;

(ii) ample roof overhang should be provided to protect openings from rain and also to provide shade;

(iii) an efficient drainage system should be provided for the whole site, to facilitate easy water drainage;

(iv) since the site slopes reasonably, it is not likely to create much problem of drainage;

(v) cross-ventilation should be provided in all the units and spaces provided with openings and wide openings and could be buttressed with artificial ventilation;

(vi) since the facilities are going to be provided along the highway or expressway, excessive glazing should be minimised in order to prevent glare where this cannot be avoided, low reflective glass should be used;

(vii) building plan should be relatively compact to reduce heat gained during the day and heat lost at night.

5.1.6 Geology

Plains including the older Precambrian unit of metamorphic sedimentary rock and an intrusion of younger Precambrian igneous rock. The major rock units underlying the Federal Capital Territory are in three categories:

- Metamorphic, including biotite muscovite schist, limited to four narrow outcrop bands along ridge tops at the ester edge.
- Igneous rock, including biotite granite, large intrusive masses commonly elliptical in shape forming dissected zones of Zuma-Bwari-Aso Hills and outcrops of the Gwagwa plains.
- Sedimental rock, including alluvium, located in streambeds throughout the territory. Consisting of largely sand, with bush gravel beds and local deposits of clay.

The above rock types have not presented any major geotechnical constraints to the type of structure proposed for the transit rest area, Abuja, over most of the site.

5.1.7 Surface Water

The network of stream valleys and depressions covering the Federal Capital Territory when looked at vertically is in rough fan shape, draining the crescent of the development area.

5.1.8 Vegetation

Generally, the vegetation of Abuja is characterised by park savanna. Riverine depressions are typical skirted by fringes of thickets and high trees. There are occasional patches of forest or heavily wooded areas within Abuja itself the objective is to protect stream watercourses. These will serve as channels to storm water runoff, since the great variation in stream flow during the rainy season frequently make culverting impracticable. Park savanna is typically a stratified community with discontinuous canopy, shrub, and grass layer. The tree stratum is less dense than that of savanna woodland, but more substantial than that of the shrub of savanna. Structurally, the park savanna may include a thick tall grass layer consisting of Andopogon and Hyperrhenia species and a shrub layer in which Termillia, Piliostigma Amona, Nauclea, and Bombax are most common.

Shrub savanna vegetation occurs on flatter plains and undulating terrain. It is comprise primarily of shrub vegetation, with a well-developed grass layer and a few scattered emergent trees. Human use and five play an important role in removal of cover.

5.1.9 Topography

The area is typified by gently undulating terrain interlaced by riverine depressions. Generally, the height variations from crest of hill to watercourse vary around 50 metres, more or less. This produces, in the immediate vicinity of some one on the ground, rather short views of a mile or less. These views are made even shorter by the typical park savanna vegetation of the site. Clearing of vegetation for roads and other construction will no doubt broaden this visual environment.

On slopes in excess of 25 per cent, hazards and constraints for development are severe, and no development is proposed. Construction cost to mitigate impacts of accelerated runoff and erosion and engineering cost to overcome site constraints related to slope and bearing capacity could be very high. In general, rock outcrops and areas of slopes greater than 25 per cent, particularly on the sheer sides of the iselbergs and residual hill of the dangara plains, have been proposed for reservation in their natural condition whenever possible.

5.2 INTER-REGIONAL TRANSPORTATION

This is mainly composed of air and road transportation. Railway and water transportation is absent.

5.2.1 Inter-regional Traffic by Air

The Nnamdi Azikiwe International Airport operates both domestic and recently international direct flight from Abuja. The domestic flights link all

regions of Nigeria and some state capitals to the Federal Capital. Abuja is centrally located that it takes five hours flight from any part of Africa to Abuja.

5.2.2 Inter-regional Traffic by Road

Four regional roads link Abuja with the rest of the country: Kano Road, Lokoja Road, Minna/Bida Road and Keffi Road.

Of these roads, the Kano-Abuja-Lokoja road is mostly busy with a total of 8,872 PCU traffic passing in 24 hours. This is followed by Lokoja road and Abuja-Lapai-Bida-Ilorin road and the Keffi-Jos road.

Table 5.1: Volume of traffic in 24 hours on different regional roads in Abuja

STATION	VOLUME OF TRAFFIC NO. OF VEHICLES	PCU
Kaduna/Kano	8,387	8,872
Lokoja Road	2,926	1,956
Bida/Lapai/Ilorin	2,669	2,859
Jos/Keffi	2,279	2,075

Source: Federal Ministry for Works and Housing, Abuja.

More than half of air traffic on Kaduna road and Kano road is composed of light vehicles, i.e. cars, taxis, mini-buses, etc. The heavy vehicles on the two roads share about 20-23 per cent, while 60% of traffic on Ilorin/Bida road and 40% traffic on Jos road.

CHAPTR SIX

6.0 SITE STUDIES

Three sites were chosen for the purpose of this research work. They were assessed on the basis of the undermentioned parameters and other minor considerations to determine the suitability of each of them. The best of the three will be selected and further analysed.

6.1 SITE SELECTION CRITERIA

(i) Location with respect to routes and distance:

Since the transit rest area will be located along Nigerian major highways and to serve road users, its location must enhance the following:

- a distance at which the driver and passengers will require rest or at which they begin to get tired'
- a distance at which the vehicle will be required to refuel, i.e. a distance at which a full tank will be reading reserve;
- a distance at which the engine might require to cool;
- easy linkage from the highway;
- Should be located at distance between which all the above factors will be attained.

(ii) Land use provisions as regards location of rest areas or related. This suggests that such a facility (rest) area be located outside the residential and commercial land use, but may be closer to them (for infrastructural support). The location should be in less intensive land use area and should be at reasonable intervals spread across the country. It should also as

much as possible avoid environmental hazards associated with such facilities (i.e. pollution both noise and gas). Further, site location must enhance easy accessibility to commuters and passengers.

(iii) Essential services should be provided and should be close by. Services such as electricity, water supplies and telephones services.

(iv) Traffic flow around chosen site must be proper and organised. This is essential to avoid collusion conflict and general traffic congestion in the area under use.

(v) Area with incentive for transport business. This is important, especially with regards to vehicle maintenance, repairs and services and sales of spare parts. Area should be reasonably close to population area.

(vi) The site should be located along the major high way.

(vii) Topography. Very essential for economic construction, the site should be relatively flat with gradient not more than five per cent as heavy vehicles cannot climb steep gradients. Swampy and waterlogged sites are difficult to treat particularly for road construction. Therefore, a site with hard subsoil or underlying granite bed will be adequate for the location of the rest area.

6.2 SITE STUDIED AND LOCATION

6.2.1 Site One (Abuja)

The site exists between the Dumex area and Zuba town in the FCT area, along the major express way linking Kano with Abuja. The expressway is also interlinked by a trunk A road from Minna and another one from the southeast via

Lokoja. The site is some distance away from the magnificent Zuma Rock, Abuja. The site is about four to five hectares and occurs in a virgin land with a very good potential for future development, particularly commercial.

6.2.2 Merits

- The site has good subsoil bedding, suitable for a rest area and parking for heavy-duty vehicles.
- The site is located strategically to cater for long distance travellers need.
- Falls along the dual carriage way and it falls also along the requirement for minimum distance at which a driver begins to get tired and passengers might require to stretch their legs and vehicles requires refueling and cooling of engine.
- Has a good potential for future development particularly for commercial activity.
- The site is relatively flat.
- Easy accessibility to support infrastructure, i.e. electricity and water.

6.2.3 Demerits

- Since there is no fly over, traffic on the other lane of the expressway will find it difficult linking the site.
- U-turn at 1.5 kilometres away from the site could expose road users to danger.

- Risk infiltration of anti-social elements and activities from the nearby towns of Zuba.
- Might cause traffic problem on the expressway.

6.3 SITE TWO (TAFA)

Located along the Abuja-Kano road and it is about 60 km away from Abuja. Already there exist some facilities for travellers, but they are not planned nor coordinated. They are basically makeshift facilities. The sanitary condition of the site is very poor and could be disease-prone.

There seems to be only one category of vehicles that stop over at this point, and they are tankers and trailers only. The site is not very flat and the subsoil is not very stable soil.

6.3.1 Merits

- The site lies on a major highway.
- Has a potential as a transport centre.
- There exist support facilities for passengers.

6.3.2 Demerits

- The land is not very flat, hence will affect the economy of construction and movement of vehicles.
- The distance between it and Kaduna or Kano does not require rest or refuelling for road users. It is inadequate.
- Only one category of vehicle patronizes existing facilities.
- Anti-social activities take place on the site.

6.4 SITE THREE (GWAGWALADA)

Gwagwalada lies along the Abuja-Lokoja road. The road is not dualized. The site is on a valley and it is close to the road linking Abuja to Lokoja. It has a steep slope with a good subsoil.

6.4.1 Merits

- Good subsoil bedding suitable for transport activity
- Sited along a major busy road.
- There exist support infrastructural facilities.

6.4.2 Demerits

- The road is not flat.
- Creates a confused condition in the transportation, as it will attract traffic to already congested area.
- Road network around site not adequate.
- The road is not dualized.

6.5 CONCLUSION

Site One (the site between Zuba and Dumex) satisfies all earlier discussed site selection criteria and is analysed as shown in the site analysis diagram plate.

There should be possibility for a transit rest area within a defined space without travelling too far away. Back up support facilities such as accommodation, restaurant, and religious facilities should be provided to make the rest area effective. The site should be such that both passengers, drivers, and

the vehicle could rest after a certain distance covered and should also be able to refuel the vehicle after long distance covered before continuing the trip.

Abuja, being Nigeria's capital city and an important route for road transport, becomes an important route to site the rest area (prototype). Other prototype could be sited at a distance of not less than 300-400 km away that is at a point when a driver and passengers begin to get tired and the car engine also begins to get hot and the tyres too. At this point also, the vehicle might need to be refueled. So at rest areas both drivers, passengers and the vehicles rest.

It therefore becomes necessary to harness this rest area properly and spread it at distance reasonable enough base on above considerations and criteria all over the country.

CHAPTER SEVEN

7.0 DESIGN BRIEF

The design is broken down into the following components:

- Accommodation facilities
- Restaurant facilities
- Shopping facilities
- Fuel and workshop facilities
- Public convenience facilities
- Parking facilities
- Security facilities
- Emergency aid facilities

7.1 CONCESSION AREAS

In the existing situation from case studies, concession plays a very active part in the day-to-day activities of rest areas. Here you find make shift restaurants where passengers could have our local meals. There are also soft drink bars and other petty trading activities. This goes to show the importance of concession in the economy of a transit rest area.

Newspapers, magazines, bread selling, fruit selling, fish selling, barbing, shoe making, sun shading glasses selling, soft drink selling, etc are very important concession activities from case studies carried out.

In view of the above, it has become important to incorporate all these moneymaking rentable areas in the proposed design. All the available spaces shall be developed fully for concession use.

7.2 ACCOMMODATION

Although this facility is not a necessary requirement for some rest areas, interviews carried out shows that a large percentage of road users would not mind passing the night at the rest area, if such facility exists. Most especially for people who travel to Abuja daily and lack accommodation in Abuja and had to travel back to their destinations and return to Abuja the next day. This rest area could serve them. Also, the long distance travellers could pass the night over there, road users whose vehicles developed problem in transit could take a rest at the nearest rest area.

Accommodation facilities should be located far inside the site where the traffic and other noise are least heard. However, since lodgers will be using the same facilities with other motorists, they should not be too far into the site.

7.3 SUPERMARKET

This should be sited in an obvious position and may be organised on a service or assistant service basis. A large part of the facade should be glazed for display.

7.4 FIRST AID

This section should be located outside and independent of other functions and should be in close proximity for supervision and convenience of access.

7.5 FUEL STATION AND GARAGE WORKSHOP

These should be located as the first facility as you are entering the rest area it should also be located as the last facility before leaving the rest area. As most motorists are intent on reaching the catering building after turning into a rest area and only later discover they need fuel. The design of the fuel station should however be left for the oil companies who are co-sponsors of the complex as each might have a unique design symbolic of its organisation, but, space is provided at the entry and exit points.

7.6 EATING AND DRINKING SPACES

The availability of areas where passengers eat drinks (not alcohol) and relax is of a paramount importance to the economy of any rest area such as the proposed transit rest area.

(a) Though there is much interest in travelling by bus and cars, passengers have to travel long distance, at times without taking breakfast, lunch or dinner before arriving their destinations. By this time, some iced soft drink, hot tea or coffees or even something edible might be quite helpful.

(b) Many passengers have to wake up very early in the morning without taking breakfast before leaving their homes. It may therefore become necessary for them to take breakfast or lunch at the nearest transit rest area.

(c) Passengers arriving transit rest areas after a long distance travel might not only be thirsty but also very hungry. These will definitely be thankful for

some refreshments or even meals immediately they arrive the transit rest area.

i. Restaurant

The restaurant shall be waiter service restaurant and shall have a capacity of at least twenty-five people at a time. The quality of service should equal that of any standard restaurant that could be found anywhere. It should also be in a very good sanitary condition. There should be a toilet for customer's usage. A kitchen and changing room attached to the restaurant.

ii. Bukateria

Here, the Nigerian local meals (Eba, Amala, pounded yam, yam, rice, etc) are provided. It is a self-service Bukateria and an improvement over what is locally termed "Mama Put" canteen. Food here shall be quite cheap enough for the ordinary purse and since there shall be many people to patronise it, it is expected that the canteen shall be quite large enough to serve its purpose effectively. However, it is hoped that the proposed transit rest area canteen shall conveniently serve one hundred and twenty seaters at a time, allowing 18 sq ft per seater.

iii. Tea Room

Some of the passengers prefer to patronise tea canteen popularly known as *Mai shayi*. Here, they take tea with fried egg and bread. For this reason, consideration is given for the provision of a tea and coffee shop to meet the demand of road users.

The teashop shall contain at least 20 per sons at a time.

iv. Suya Spot

There shall be *Suya* spot for roasted meat sellers and consumers. Here, two shops shall be provided along the walkways for ease patronage by the customers. By *Suya*, the researcher means roasted meat.

v. Kitchen to Restaurant

This shall be based on at least a third of the canteen floor area, and it shall adjoin the entry section. The kitchen shall have a private service door from outside. It shall contain storage and other kitchen amenities.

7.7 OFFICES AND SHOPPING FACILITIES

Generally speaking, an ideal transit rest area should be provided with administrative offices for an efficient day-to-day running of the complex.

The manager's office: This shall be provided with a separate toilet and a secretary's office. Its location must be such that an efficient supervision of the important passengers and facilities units might be easy.

In such a transit rest area, the importance of the efficient checking of the income from time to time is necessary. In the light of this the auditor's office cannot be ruled out. This office shall accommodate the audit officer and say one or two audit clerks working under him. The office however has no direct link with the public.

i. Police Security Office

To keep peace at the rest area and to safeguard life and properties, the rest complex shall be provided with a mini police station, which shall contain not less than eighteen policemen at any time.

ii. Car and Bus Parking Facilities

It has become imperative to provide the rest area with car parking facilities within the rest complex. The car park shall have an easy access to the waiting area and restaurants, while for the accommodation area the cars could be parked close to the rooms.

The extent of the vehicles parking was evaluated on the following basis:

- Traffic data
- Average stopping time of vehicles

iii. Public Toilets and Showers

Since there are the most heavily used facility in the rest area, they should be very visible facility to the passenger's enroute between the parking and eating areas. Also, since the public as a whole will use these facilities, special toilet facility should be provided allowing persons in a wheel chair sufficient space to swing out of the chair into the toilet.

Privacy of the users should also be considered. Segregation of male and female conveniences should be encouraged.

iv. **Walkways**

All the walkways are not stepped; they are sloped in a ramp form to allow easy usage of the handicapped. It is a deliberate consideration for the handicapped and children who might likely be running around. Also, it will be to the advantage of the old and the tired who are not likely to like stepping up.

There exist group-shopping facilities on the shopping plaza wing within the complex. Varieties of passengers shopping needs are provided here.

The site is accessed via the Kano-Kaduna-Abuja dual carriageway, and it has its only approach tapped from this dual carriageway. The site is some distance skirted by a village called Zuba, and there is a very good view of the famous magnificent Zuma Rock from the side.

A major advantage in the sociological relation of the site to its environment is that the site has been thoughtfully kept away from residential areas, towns, schools, etc and other buildings where noise is most undesirable.

The proximity of the dual carriage expressway to the site is an advantage location of the transit rest area and this advantage has been enhanced by the separation of the dual routes, i.e. to and fro.

The transit rest area has an advantage that it could be developed as an economic centre aimed at improving human life.

The attached pie chart shows the statistics of traffic flow on the main express road adjacent to the site.

7.8 SOLUTIONS

It has been indicated in the preceding chapters that the proposed transit rest area shall be sited in Abuja and shall be a prototype design proposal, which will be replicated on other suitable sites across Nigeria with minimal distortions to the original design. A detail study has already been made of the existing situations from various case studies in Nigeria as compared to other developed countries like the United States. After having made the necessary considerations as shown on the subsequent pages, a decision has been reached that the proposed transit rest area be sited along the Abuja-Kaduna-Kano carriage way and shall be repeated in other sites spreading between 300 and 400 km across the country. This decision will be reinforced by the Federal Survey Department and Traffic Unit of the Federal Ministry for Works and Housing, Abuja, which shall help to determine the appropriate distance at which a driver and passengers might require rest or begin to be tired after a tedious long distance travel.

The Department of Federal Surveys has helped in furnishing the researcher with some information on the complexities of different sites with regards to terrain, soil and topography.

The site will be seen with all the parallel sides measuring about 250 m2 and it is almost a flat land, sloping somehow towards the expressway.

7.9 SCHEDULE OF ACCOMMODATION

	FACILITY	NO. OF FACILITY	AREA (M^2)
1.	**Accommodation**		
a.	Waiting Reception	1	64.0
b.	Manager Office	1	36.0
c.	Secretary Office	1	20.0
d.	Bedroom	14	24.0
e.	Laundry	1	36.0
f.	General Store	1	20.0
g.	Control	1	
h.	Entry II	1	
2.	**Police Office**		
a.	Waiting Area	1	270.0
b.	O.C. Office	1	20.0
c.	General Office	1	50.0
d.	Toilet	1	1.8
e.	Cell	1	5.0
3.	**Arrival and Departure Area**	1	290.0
4.	**Traffic Patrol Office (Federal Road Safety)**		
a.	Patrol Team Office	1	60.0
b.	Commander's Office	1	12.0
c.	Reception Area	1	20.0
5.	**Accident Clinic**		
a.	Waiting	1	36.0

b.	Treatment Room	1	36.0
c.	Consultation Room	1	32.0
d.	Recovery Ward	1	42.0
6.	**Shopping Complex**		
a.	Shop for Vehicle Tyres	1	64.0
b.	Supermarket	1	108.0
c	Boutique	1	50.0
d.	Barbing Saloon	1	18.0
e.	Beauty Saloon	1	30.0
f.	Toilets. WC	8	32.0
g.	Toilets. Showers	8	32.0
h.	Suya Spot	1	30.0
7.	**Food and Beverages**		
a.	Coffee Room	2	40.0
b.	Restaurant	2	100.0
c.	Kitchen for Restaurant	2	24.0
d.	Store	2	4.0
e.	Kitchen Yard	1	16.0
f.	Delivery Bay	1	48.0
g.	Bukateria	2	350.0
h.	Kitchen	8	55.0
i.	Kitchen Yard	4	25.0
8.	**Parking Space**		
a.	Cars	1 Nos.	100.0
b.	Buses	2	410.0

CHAPTER EIGHT

8.0 DESIGN PROPOSAL

8.1 DESIGN TASK

Based on the deduction from the studies conducted, the design tasks are as follows:

i. Design a rest area along major Nigerian Highways that will serve road users with facilities they require in transit. The rest area will be prototype design.

ii. Designing with the site as regards utilization of site features i.e. terrain, topography, road, access etc.

iii. Actualization of developmental sales.

iv. Proper organization and integration of facilities

v. Design to enhance easy movement in and out of the site.

vi. Site selection is of primary importance and should not easily be swallowed and should be with expansion possibility.

8.2 SITE CONCEPT AND ZONING

Site zoning is based on the following criteria:

a. Accessibility

b. Circulation pattern

c. Convenience

d. Possible links between all facilities

e. Expansion possibilities

f. Security and control

g. Fire safety considerations

Different approaches were utilized and compromise was reached between them to evolved the utilized one. (Fig. 7). The utilized concept is an hybrid of the others based on a conscious attempt at separating vehicular traffic with pedestrian traffic to avoid collusion, provision of a common arrival hall to enhance control and interaction among transit and passengers. Success was achieved in separating accommodation facilities and administrative from the noisy areas (shopping areas, Bukaterias, Restaurant and parking). In the final evolved concept meets the functional requirements by integrating many parallel functions required by passengers together.

8.3 DESIGN CONCEPT OF FORM

The three-pyramid form was adopted from the natural mountain along the transit vehicular road network. These natural mountains, water bodies and trees are points of obstruction.

The three pyramid forms are integrated together with a curve linear road network. As illustrated above, this arrangement shall form the basic composition of this project.

The transit vehicular roads are constructed to avoid the various natural obstructions such as mountain, water bodies, trees, etc. This invariably leads to the curve linear pattern of transit vehicular roads network.

Natural pedestrian footpath follows a curve linear pattern. This shall be a point of consideration for the form development of the project design.

8.4 DESIGN APPRAISAL

The design was conceived as a whole complex with functions flowing into one another. The brief included Administration, accommodation, restaurant Bukateria, entrance lobby, toilets parking shopping plaza, maintenance, service station, and fuel station and concession area. Attempt was made to integrate arrivals with departure to enhance interaction and this was achieved by the zoning of facilities and the symmetry of the form with the entrance and departure lobby on the middle.

The facilities are made by with the provision of courtyard to enhance cross ventilation. A feel of lightness is created by the entrance hall. The arrival/departure hall is made clear and wide to ease passenger movement. Signs and symbols are utilized to ease accessibility. Ramps and low floor steps were utilized due to considerations given to disabled.

The proposal achieved a meaningful circulation pattern within the complex that at certain points a view of 70% of the facilities is achieved. There is also a meaningful separation of pedestrian and vehicular traffic where the flow is parallel and opposite. Low concrete walls and balustrade were used to separate and control pedestrian traffic. Soft landscape and hard landscaping were also visible to create that feelings of natural environment.

Drop off point for cars and buses were provided in the main entrance lobby to the complex. Transit accommodation is provided as you approached the complex from the highway, it also has an Enquirer offices were passengers confirm the availability of room before checking in. The enquiry is at the

accommodation reception near the administrative office. The idea is for the separation of the reception from the main entrance hall to reduce traffic.

Meanwhile, there are basically one type of room provided, all the rooms are self-contained to make guest feel at home and to provide security and safety to the guest. This is due to the categories of the expected users. Affordability was the criteria as occupancy is short timed. Its parking is separated from the general parking space.

The administration is within the complex to enhance supervision and control. It is located very close to the accommodation facilities.

Just before the shopping plaza is the accident clinic which series road accident victims for first aid treatment, it also serves transit/passengers requiring urgent medical attention. The clinic will run a 24-hour service.

There is also a police station, which will have 18 heavily armed policemen at a time, which will run three shifts in a day. The police are to serve as a security for passengers, guest and road users along the highways and also may help in reducing crime rates within the complex.

The entrance flows into shopping plaza and other facilities without any real separation so that activities can go on twenty-four hours.

8.4.1 Site Planning

The site planning was determined by the nature of the site and the site physical features (The dual carriageway etc).

Vehicles access the site through the proposed entrance on the Kaduna-Abuja axis with the departing vehicle exit from the proposed exit road.

8.4.2 Circulation

The circulation concept is based on the reduction of vehicular and pedestrian conflict and separation of small vehicle parking from the luxurious vehicle parking. Circulation parts are of two forms. Road peddry and paved walkways.

8.4.3 Orientation

The Direction of the prevailing wind in Abuja was given due consideration. The whole complex was aligned to take advantage of the super composition of the sun path and the two dominant wind directions. Hence, the longer axis of the complex is away from the sun path and the general complex can get a free airflow.

Courtyard planning was utilized to cater for extreme climatic nature of Abuja.

Landscape was also used to effect control on the heat content, which is acaused by the hard road bedding and clear walkways, and the mountainous nature of the surrounding environment functionally related to such proposal.

8.5 SPECIAL CONSIDERATIONS

8.5.1 Planning

The planning of the proposed transit rest area has been achieved with fair considerations for the bus movement, car movement, passengers and the staff.

In planning, the bust movement area has been completely segregated from the passenger movement areas. The bus drop off passengers and the passengers

drops and enter the entrance lobby while the bus proceeds to the parking area. The passengers later enter the bus at the parking bay and proceeds on the journey.

While for the smaller cars the passengers are dorp at the drop off point by the main entrance and the passengers drop and enters the lobby while the driver proceed to park at the parking space opposite the main entrance hall.

Also, petrol shall be collected at the point of entry or at the point of exit.

The passenger's main entrance has been planned with effective openness to the main road. The rest area is made easy to get into and easy to get out of. Its bustle, seen from the outside could be allowing as this provides a good show.

It has been considered desirable to keep the staff offices and guest accommodation away from the public through sections such as shopping plaza, restaurant, Bukateria and at concession areas. This however, has been achieved as the guest and staff can easily enter through a different entrance from that of the public.

The major planning consideration and achievement of this design is the way in which facilities are integrated as well as the ease of flow of traffic within the facilities.

Of course, it would be admitted generally, that the solution achieved is actually the result of an extremely careful and thoughtful planning and, even, at the worst, the evolved possible solution would be regarded as "an idea" in its own extremity.

8.5.2 Disabled Persons

An attempt was made to enhance utilization by the disabled by incorporating

Ramps, which function also is for the easy movement of wheel chairs. Low floor steps were also used.

8.5.3 Security

Security of life and properties of passengers were given due consideration by the use of control post at the entrance reception. Also, a mini police station, with a capacity of twenty-eight (28) policemen at a time, was incorporated in the central facility. Further, a desperate attempt was made at avoiding corners, which may be hideout for criminals. Courtyards were wide and surrounded by either glazed internal walls or are part of an interior partitioning wall to avoid criminal activities.

8.5.4 Car and Bus Parks

Separation was made between administration car parks, guest car park, general car parks and bus parks. At the entrance gate a card code tally system is proposed to give safety to vehicles in all the parings.

Guest also parks their vehicle in front of their accommodation rooms to provides psychological assurance to the guest.

8.5.5 Foot Traffic

Exposure of all shops within shopping plaza of the complex to the maximum amount of foot traffic is the best assurance of high sales volume. Sub-urban business real estate often has been evaluated on the basis of passing automobile traffic, an evaluation that overlooks the fact that automobiles do not buy merchandise. It is only after the driver of even the most expensive car leaves it and becomes a pedestrian that he can become a buyer. Therefore, if shopping centres are to prosper, dense foot traffic must be created. "Shopping traffic", the act of walking from store to store, creates the lifeblood of a shopping centre; and proper circulation of this shopping traffic ensures business success.

8.5.6 Orderliness, Unity and Beauty

The concept of orderliness, unity and beauty is a major planning principle. It is applied to every major and minor aspect of this project, and it permeates all architectural expressions, landscaping signs, the architecture of structures, architectural treatment of spaces between structures, composition of structures in relation to one another, colours and materials - all adhering to this vital principle.

8.6 STRUCTURAL SYSTEM

Structural simplicity was the watchword, post and beam designs was used. The construction was a concrete framed construction.

A planner structural grid of 6m x 6m was used with columns as necessary to support the roof structure. The foundation bed was a strip foundation.

For partition, cement sand screed blocks were used all walls though glazed were utilized to give lightness, airiness, natural lighting to the whole complex. This was a conclusion attempts to enhance the illusive floating feeling of speed, which the traveller is about to be face, or faced with.

8.7 FINISHES

Since in Nigeria we lack maintenance culture, and more so, since this facilities are likely to be sited in the bush. Low maintenance cost was considered in the selection of finishes. Also of importance consideration is durability in a setting of low maintenance culture.

For the walls sandtex wall finished and mosaic tiles were used for easy cleaning. Floors were of in-situ terrazzo unglazed floor tiles and water-resistant unglazed tiles for interior space. The walkways were of precast interlocking concrete parity stones with various color finishes.

The toilets shall be given a terrazzo flossity, and ceramic tiles shall be used for the walls from floor to a level just above the wash basin top.

The ceilings shall be suspended acoustic panels in the rooms.

The vehicle movement ground and parking shall be of concrete finish with tinted cement to prevent glare.

There shall be decoration walls on the approach elevations and on walls supporting the columns in the bukaterias these shall project travel pictures and shall be integral and not applied decorations.

8.8 SERVICES

8.8.1 Lighting

In the tropics there is a lot of day light penetration into buildings generally, except where there are deep inets as in the Bukateria. The problem of lighting acuased by the deep inset in the bukaterias is however solved by the provision of dwarf walls and the provision of clear storey room space.

Artificial lighting has been employed generally only to give some interest to certain parts of the building. This is also necessary as all facilities shall be in use until late night.

8.8.2 Electricity

Electricity is tapped from the national grid (NEPA) lines, which own along Zuba Dikko road on the periphery of the site and complemented by a 500KVA standby Generator plant provided in the general maintenance section of the complex.

8.8.3 Water Supply

The Water Supply on the site is tapped from the high pressure main points from Suleja dam to Suleja along the periphery of the site which supply first the 20,000 gallons water reservoir located in the maintenance area, through gravitational pressure, from where, distribution to other areas of the complex is achieved. Proposed areas also incorporated dug on site a private borehole. Also seven hydrant pumps are located at 75m intervals to serve a mini fire hydrant.

8.8.4 Communication

There is the telephone boot located at the entrance lobby, and at the reception hall, accommodation and other places within the complex.

Also incorporated is a postal agency within the complex to cater for passengers. Further the intercom announcement system was integrated into the information system of the complex. Also incorporated into the scheme are sharp pulsating signs and symbols to further entrance directing. There is also an e-mail Internet office.

8.9 STORM WATER DRAINAGE

All storm on the site are channelled to the main water drainage gutter along the express way. Site gutters are treated with nive wash screen at internals and designed to easy cleaning to avoid blockage. All road surfaces are treated with drainage sumps by their side covers with slabs as walk ways.

8.9.1 Sewage and Foul Water

For ease of maintenance and avoidance of short down of all convenience facility due to problem of centralised sewage, single sewage disposal system is utilized (i.e. septic tanks, man hole and sewage tank system).

8.9.2 Refuse Collection

This is done by the use of bins and paladins type refuse collection located at strategic point in the entire complex. This are to be emptied on daily basis to a central refuse collecting point located somewhere far behind the Bukateria.

8.10 COST

A rough estimate has been made for the proposed design, and the total cost of the building is about ₦80,345,000.00 (Eighty Million, Three Hundred and fourty five Thousand Naira only)

This figure of course, gives only a rough idea of the total cost but a more reliable figure shall be prepared by a quantity surveyor that is specially trained for this.

It has also been calculated that this money shall be recovered as a profit in less than six years time assuming that the complex is managed efficiently and all the dreams of this proposals are adhered to and respected and there is an efficient transport system in Nigeria.

CHAPTER NINE

9.0 CONCLUSION

9.1 SUMMARY

The thesis started by attempting to show clearly the need for a properly coordinated transit facilities along the Nigerian high ways, to be known as a transit rest area for our roads and functions effectively.

Generally, the study made about the variety problems faced by road users in Nigeria while on transit dictates the necessity for this proposal.

Conscious efforts must be made to define locations of which these facilities will be sited.

Car ownership in Nigeria, and rate of bus movement and passenger movement in Nigeria has shown the need for these facilities.

The thesis in chapter two and three attempts to concretize the problems facing passengers while on transit or facing road users and case studies of high technology, finely rest areas against low developments, Nigeria existing facilities were deducted. The design proposal made a concession between high technology and low development. In chapter four and five Abuja environment and site environment was studied for climate, soil and vegetation peculiarities to determine the design parameter for Abuja, where the site is located.

Also an appraisal of existing facilities (unconventional) was done for raw data our number of vehicles and demands of passengers etc. Further a site was selected which related to major high way and enhances the complementary nature of highway transportation by road.

In chapter six and seven, design was formulated and the basis of all data collected in the proceeding chapters. The design was conceived as a whole complex with all arrivals and departures (vehicles and passengers) with her backup facilities like transit accommodation, administration shopping plaza, restaurant and Bukaterias. Accident clinic, security, maintenance, petrol service and service workshops, convinieces, parking and concession areas. Chapter eight is the summary and conclusion of the thesis writes up.

9.2 CONTRIBUTION TO KNOWLEDGE

The thesis has contributed to transport Architecture in Nigeria and indeed the entire world. Especially the under developed (third world) countries with low technological development in the following areas.

(i) Showing the importance of site selection on the design of such facilities (transit rest area) site selection must be located outside towns, residential areas and on land use, which will enhance the complementary role to be played by the transit rest area.

ii. Coordination and integration of facilities as centralized to enhance control, flow of activities into each other, interaction and security and effective management and maintaining. This is particularly significant in that attempt was made to centralized facilities.

9.3 AREAS OF FURTHER RESEACH

(i) Total separation of vehicular movement from pedestrian movement to further reduces accident hazards.

(ii) Provisions for trucks and trailers on the complex and control of traffic

9.4 ARCHITECTURAL CHARACTER

The architectural character of the rest area has now been defined. The empty unplanned bush site has now assumed its own architectural character.

In designing a building in such site what the architect has to aim at is either harmony or contrast with the surrounding environment. In this particular design contrast has been achieved with horizontality.

Simplicity has been achieved generally in every point of the building by having clean facing naming round the block.

Dishonesty has been given no place in the design to a passer by the external appearance in any part reflects what goes on behind.

With all these, the transit rest area has now assumed an agreeable possible impact on the conciseness of all that are to see it. The design goes on impression of rightness.

9.5 CONCLUSION

The intention of these thesis was to examine the integration of various users facilities require by roads users can be coordinated and build up as a transit rest area that could be used to alleviate, the sufferings of road users in Nigeria, which is a very big country with wide distances apart from town to town. It is

clear that for any such facility to be successful the site on which it is located is of paramount importance as transport oriented infrastructure tends to generate traffic within or without the site.

Further factors of importance are the routes, the highways, the various regions, traffic generations, types of vehicles the distance between towns, general site circulation and passenger comfort.

In the past, proposal such as these is left in the hands of the transport engineer where considerations are basically mechanical without a feel for the passengers and pedestrians. This leads to lack of such coordinated integrated facility complex and the use of hard tar surfaces which generates a log of heat as parking spaces. Hence high level of energy consumption is required to achieve a favourable environment.

The thesis proofs concretely, the need for an transit rest area (such facilities) for our road users to fulfill our desires for satisfaction and increase productivity and shall also make a useful contribution not only to increase mobility but also to Architectural advancement within out community.

The researcher hopes that this proposal will generate for the students in this area and might be a starting point for a more integrated transportation system in Nigeria and Africa.

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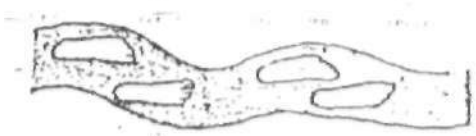
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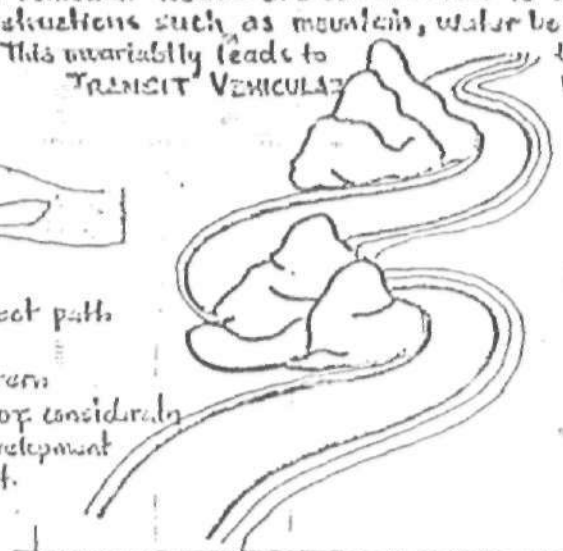
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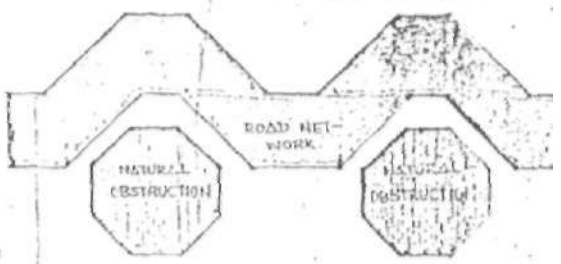
The transit Vehicular Roads are constructed to avoid the various natural obstructions such as mountain, water bodies, trees etc
This invariably leads to the curve linear pattern of TRANSIT VEHICULAR ROADS NETWORK..



Natural pedestrian foot path
Follows
a curve linear pattern
This shall be a point of consideration for the form development of the project.





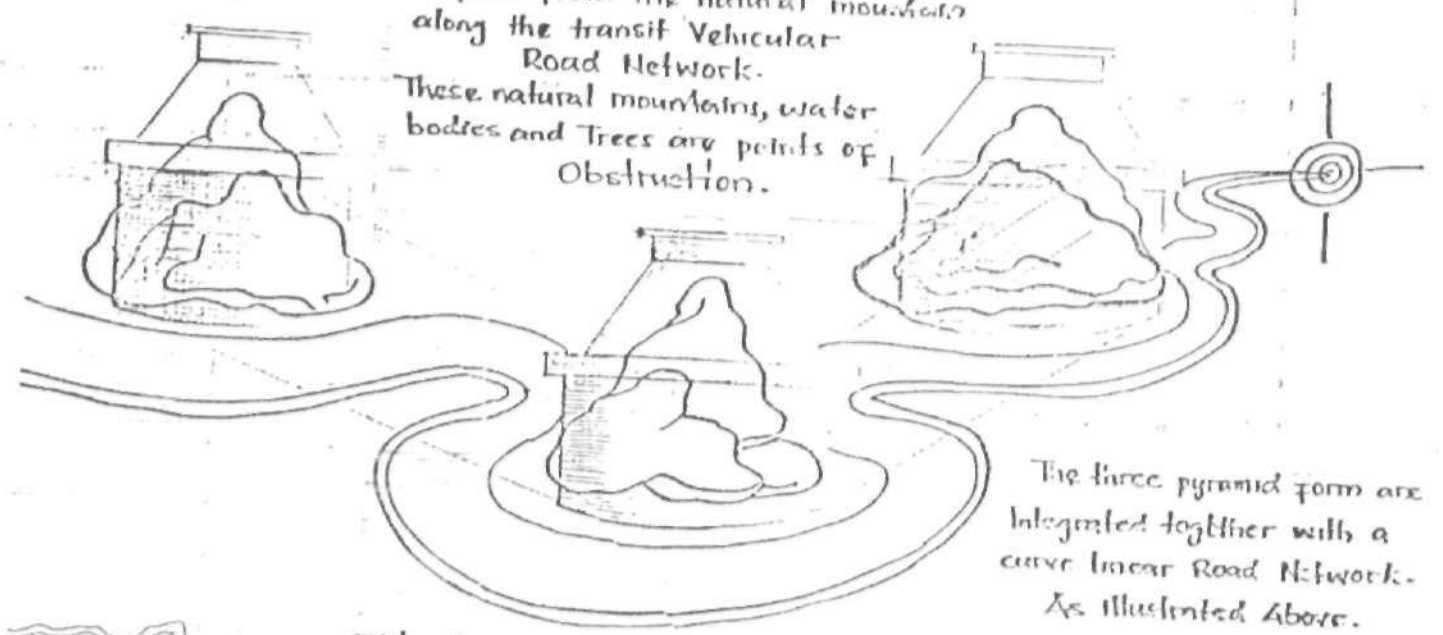


ADOPTED PLAN FORM.
DESIGN CONCEPT.



POSSIBLE ADOPTED DESIGN CONCEPT.

The three pyramid form was Adopted from the natural mountain along the transit Vehicular Road Network.
These natural mountains, water bodies and Trees are points of Obstruction.



The three pyramid form are Integrated together with a curve linear Road Network. As Illustrated Above.

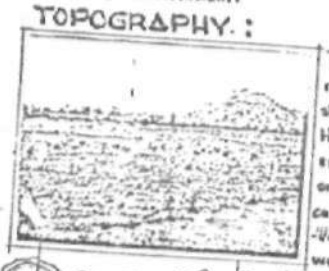
This Arrangement shall form the basic Composition OF This PROJECT.

CLIMATE:



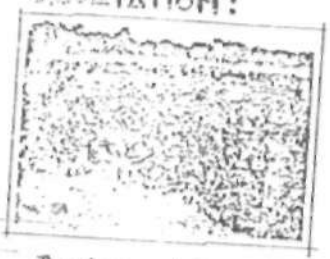
The climate conditions on the site is basically the same as occurs in other parts of Abuja in general with micro-climatic variations which are due to the slight differences in altitude, topography, presence of numerous distributed vegetation. The low level of development of artificial obstructions around the site also, allows free flow of air and more direct solar radiation with very high relative humidity around the site climatic environment.

TOPOGRAPHY. :



The site is generally regular in shape and undulating with the highest peaks occuring on the two hills located in the north-West and south-west corner of the site. The slope of the site is gently towards the gently to the south.

VEGETATION :



The site is partly bare and with scattered traces of shrubs and grass, a few trees and other categories of plants, though the surrounding areas exhibit some heavy uninterrupted woodlands as we move deep into the site North-East and south-West zones of the site.

The bare nature of the site coupled with the other natural landscape elements throw a challange to the ingenuity of the architect or landscape designer as well as the engineer.

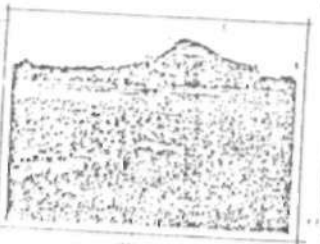
ACCESSIBILITY:



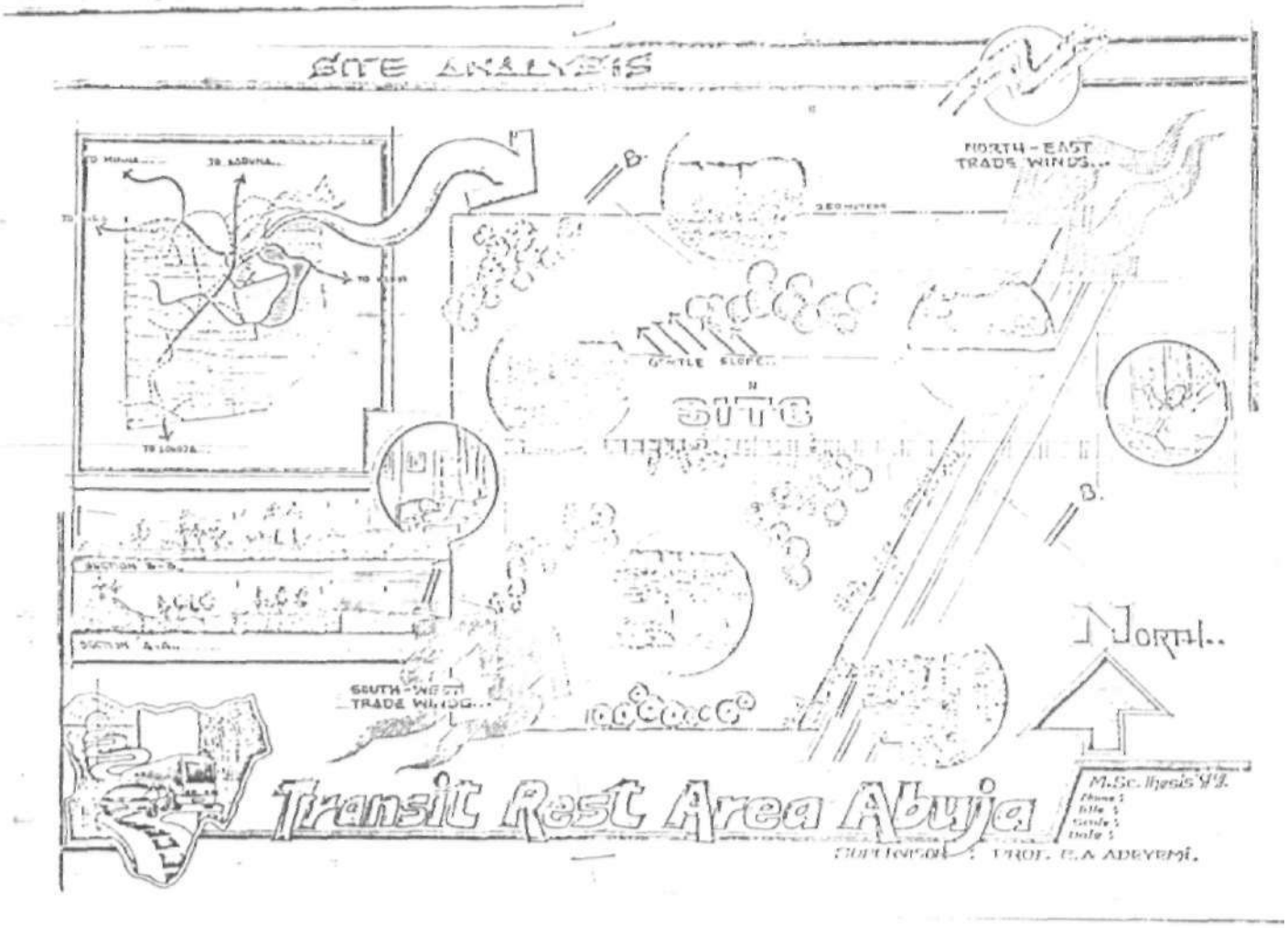
The site is advantageously located interms of accessibility.

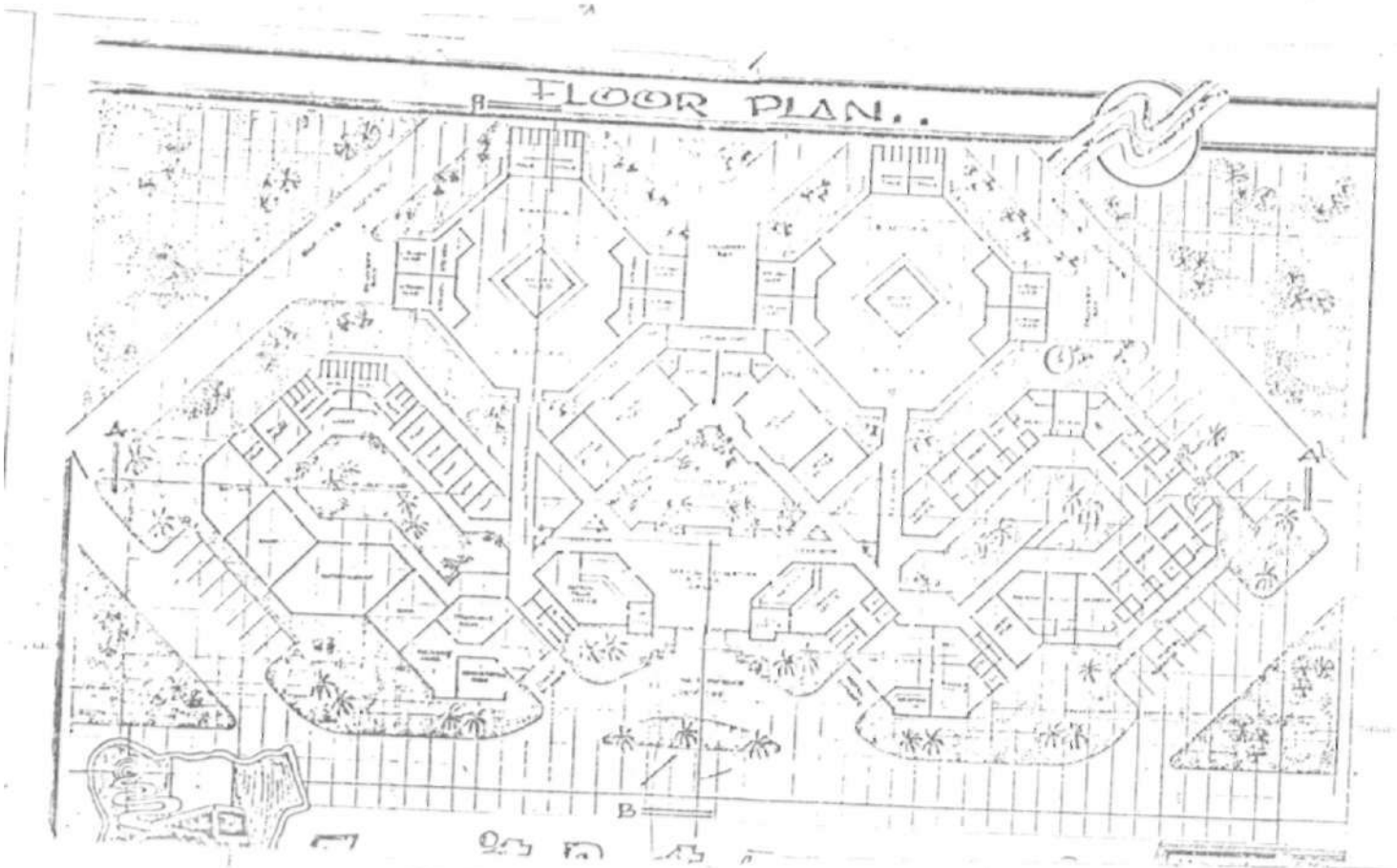
It is position along Kaduna-Abuja express highway and at a reasonable kilometer distance from federal capital Abuja Airport. Furthermore, the site is accessible from the major highway and is located within a reasonable distance from the main connecting point of all vehicles coming from various parts of the country.

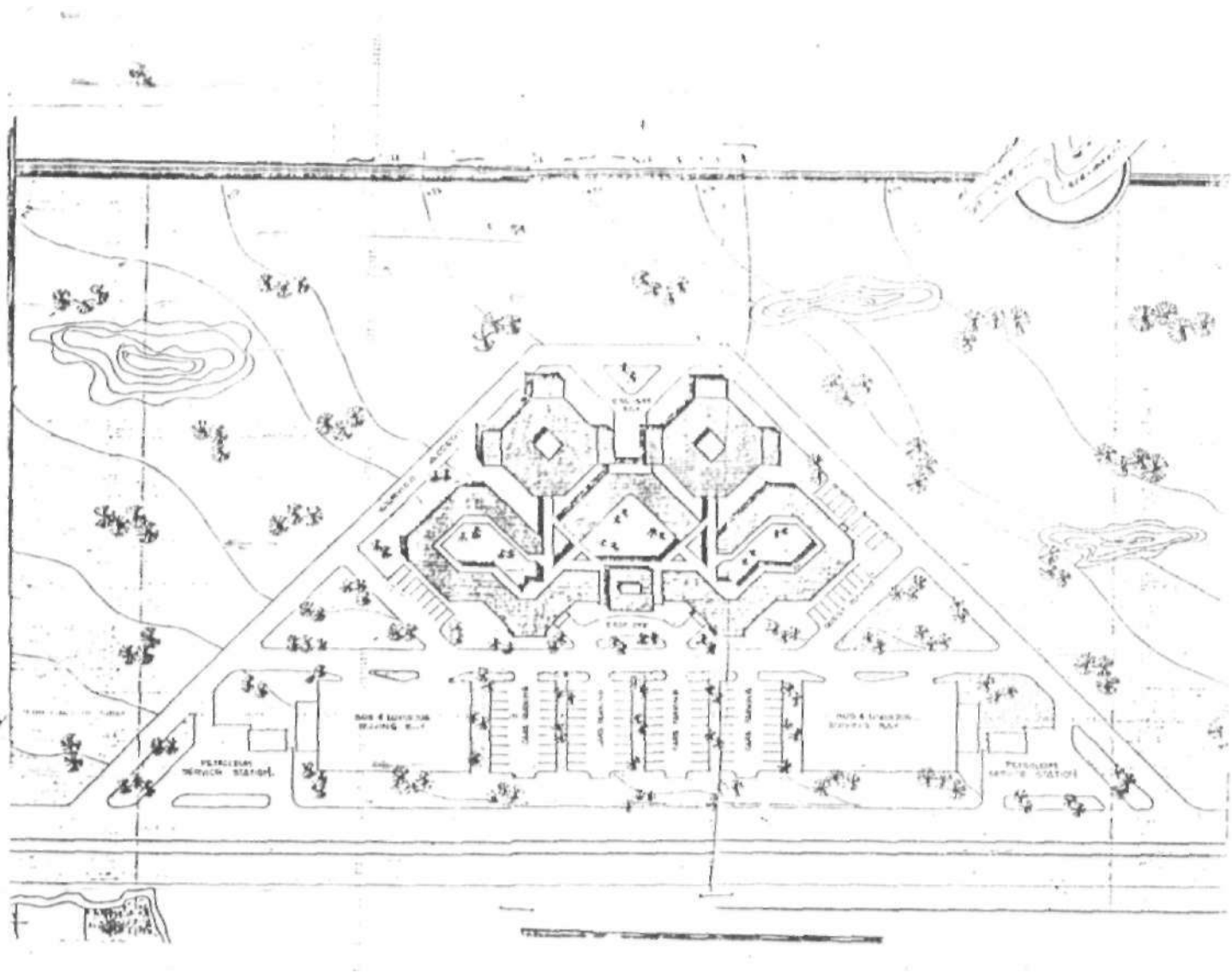
GEOLOGY :



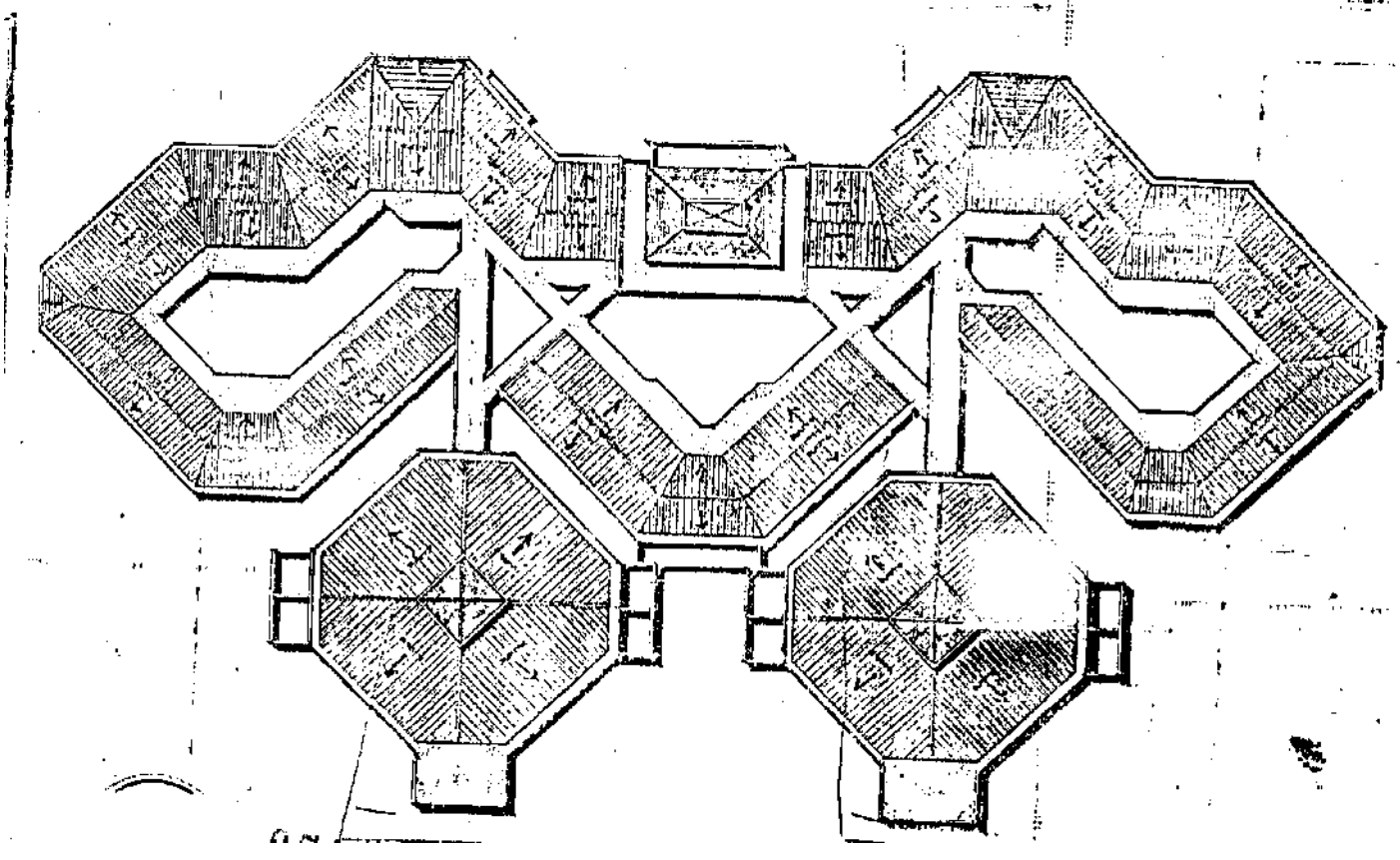
The boundaries of the federal capital territory, Abuja is largely determined by the distribution of hills and young granite which are found on the site. The young granites are marked by abrupt breaks and are associated with rugged topography.


SITE ANALYSIS
NORTH-EAST TRADE WINDS...
GENTLE SLOPE...
SITE
SOUTH-WEST TRADE WINDS...
North..
Transit Rest Area Abuja
M.Sc. Thesis '93.
PROF. E.A ADEYEMI.

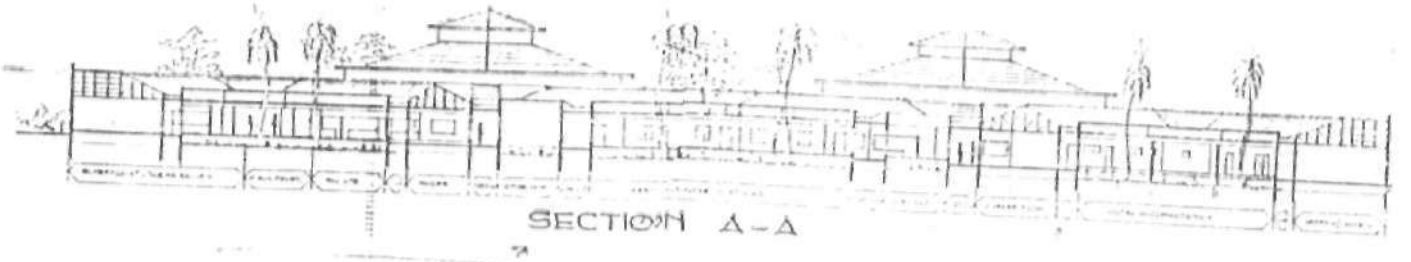

FLOOR PLAN..
A
A1
B



KASHMIR BRANCH LIBRARY



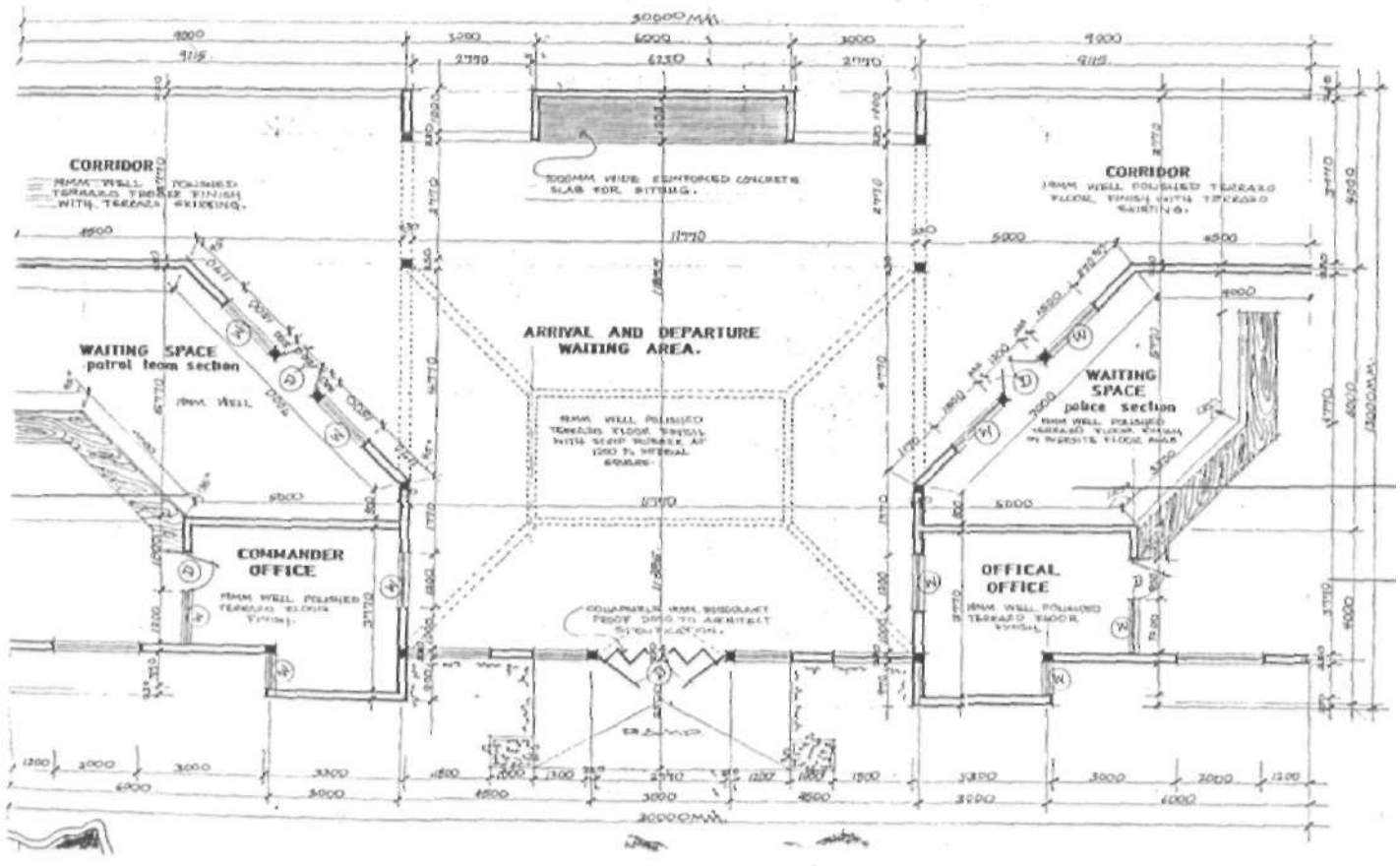

NORTH - WEST ELEVATION...
SOUTH - WEST ELEVATION...



SECTION A-A



SECTION B-B.


CORRIDOR
WAITING SPACE
patrol team section
COMMANDER
OFFICE
ARRIVAL AND DEPARTURE
WAITING AREA.
CORRIDOR
WAITING
SPACE
police section
OFFICAL
OFFICE

WORKING DRAWING...

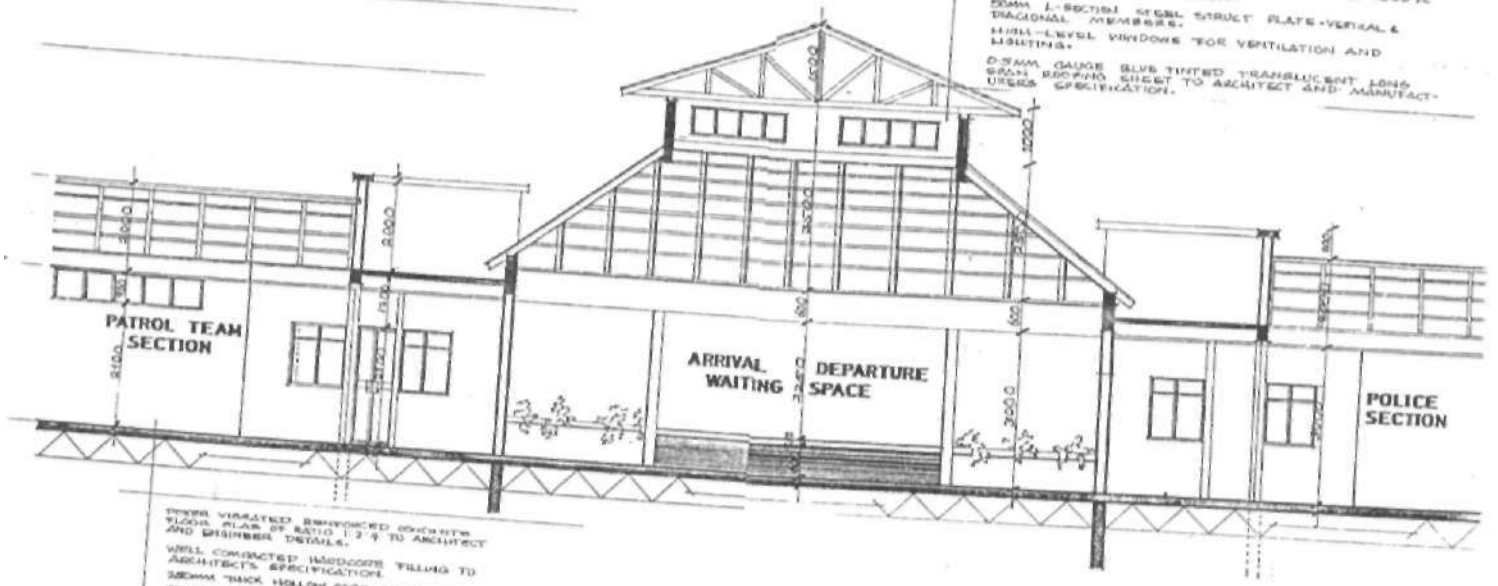


Approach Elevation...

SCALE 1:50.



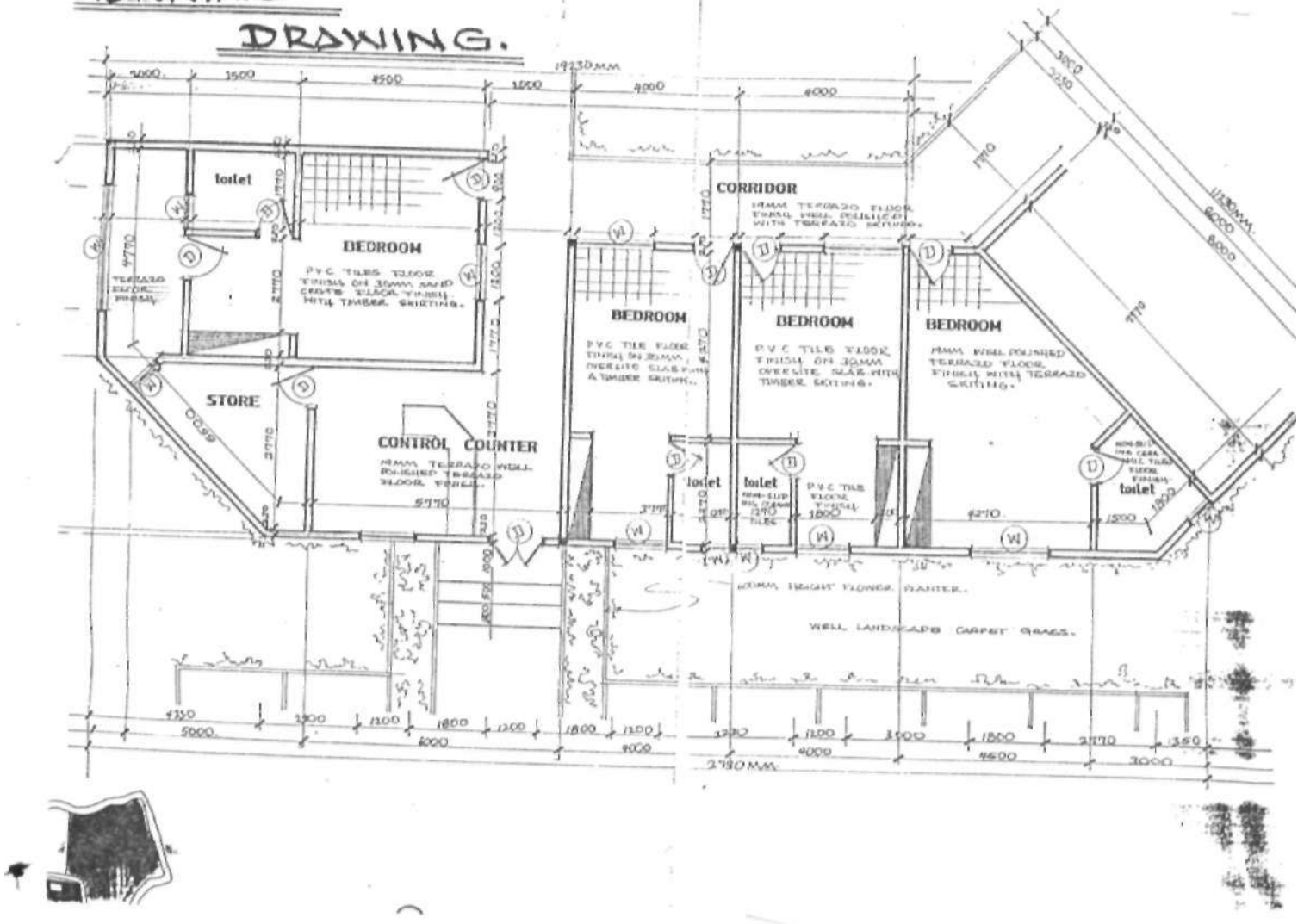
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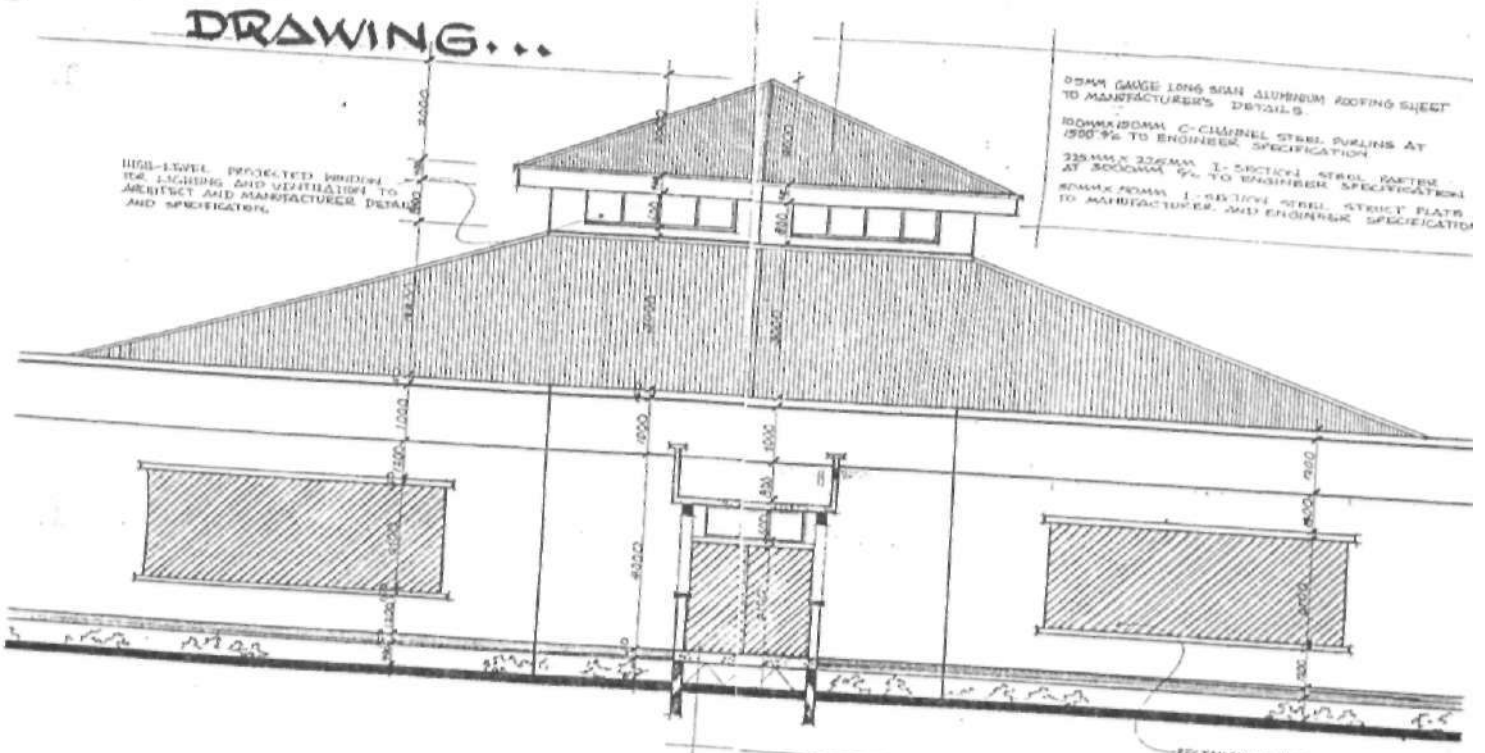
Section A–A...

ft Area Abuja

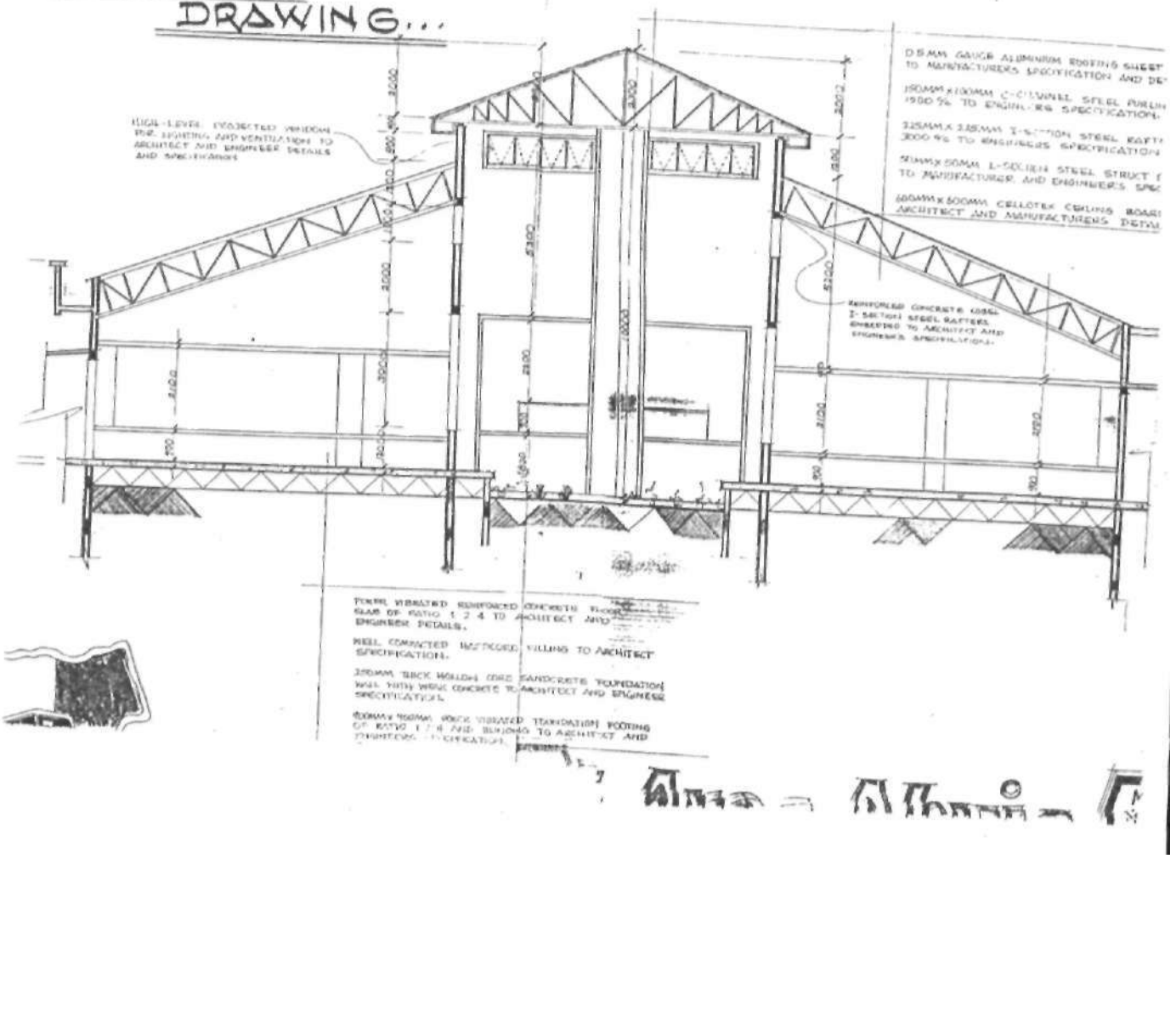
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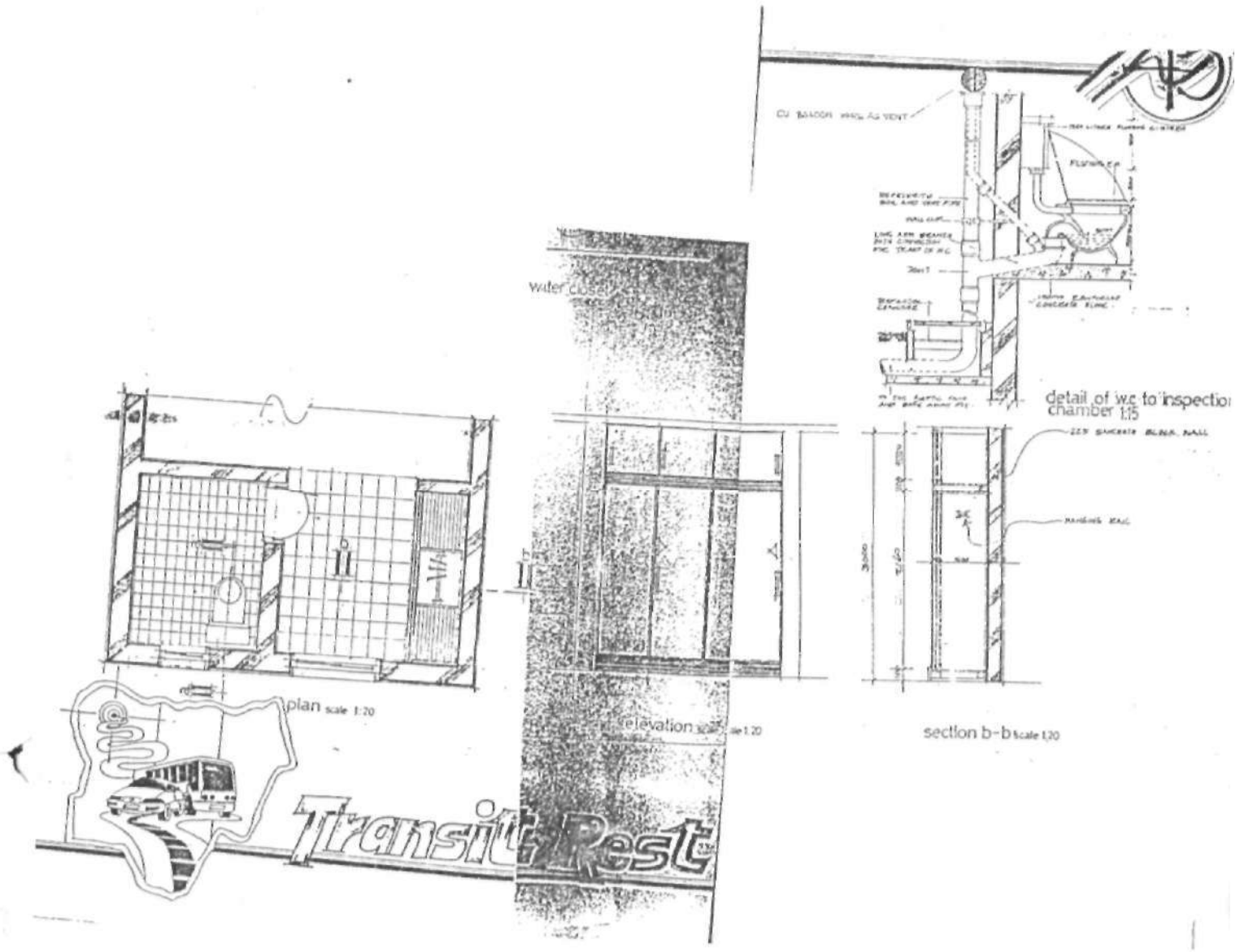


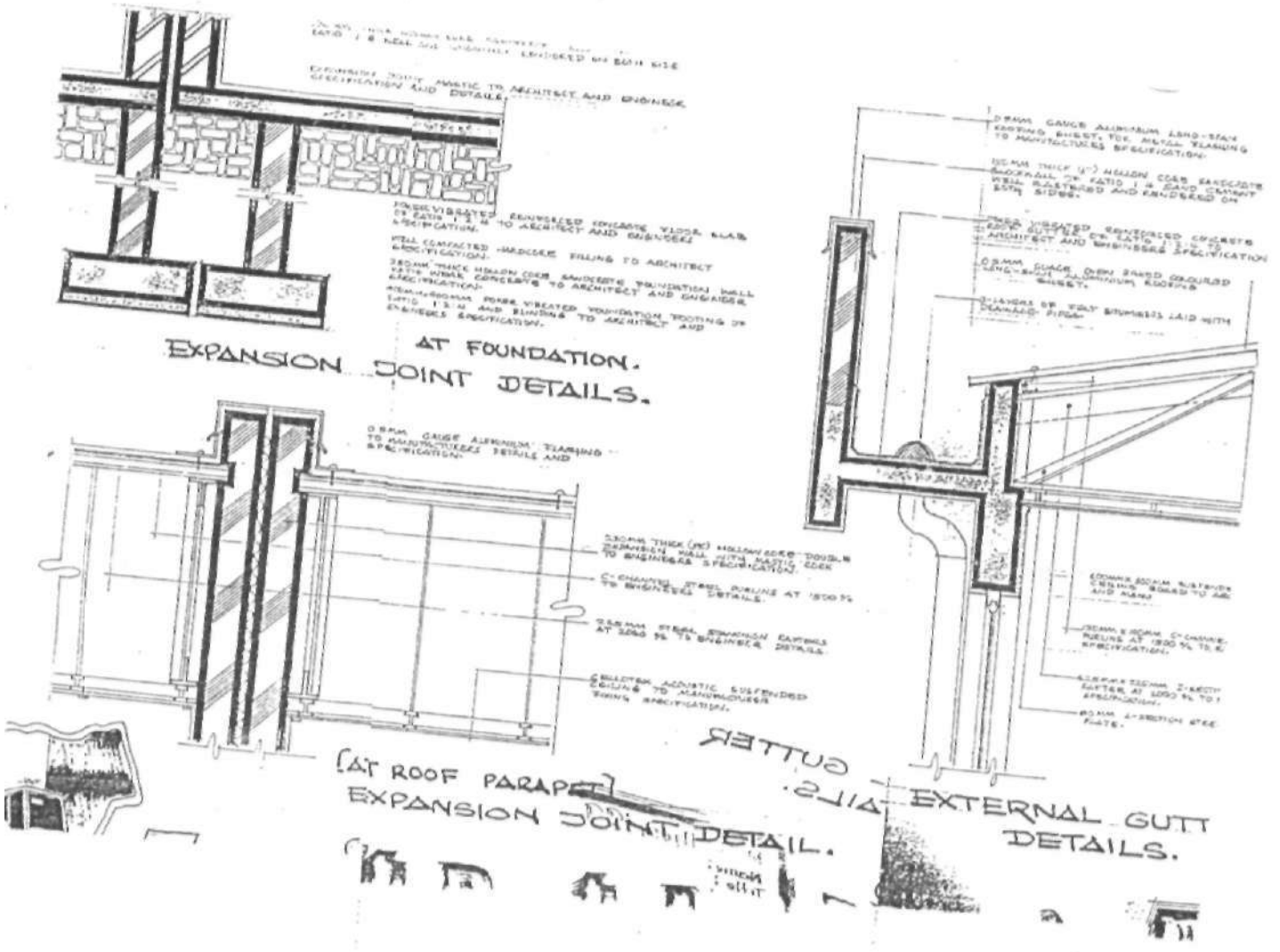
WORKING DRAWING...



WORKING DRAWING...




plan scale 1:20
elevation
section b-b scale 1:20
detail of w.c to inspection chamber 1:15
Transit Rest


EXPANSION JOINT DETAILS.
AT FOUNDATION.
[AT ROOF PARAPET]
EXPANSION JOINT DETAIL.
EXTERNAL GUTTER
DETAILS.