MODERN RAILWAY STATION MINNA

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DECLARATION

I ROTTY OWOLABI hereby declare that this thesis is my authentic work under the close supervision of ARC. Ania. All right are reserved and reproduction in any form must be by permission of the recognised appropriate authorities.

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FEBRUARY 1998.

The underlisted certify that they have read, and recommended to the school Board (i.e School of Environmental Technology, Federal University of Technology, Minna) for acceptance this project title Modern Railway Station Minna submitted by ROTTY S. OWOLABI 90/1472 in partial fulfilment of the requirements for the degree of Master of Technology in Architecture.

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DEDICATION

To the "Holy Spriti" my senior partner in life,

The reason for my existence

The God and the love of my life

To hold, cherished and appreciate

Be all Glory, bonour and my worship

Forever. Amen.

ACKNOWLEDGEMENT

I am very grateful to my beloved mother Mrs Maryam Rotimi who inspired me so much that she makes this race seems cheap and easy.

Up till now I do not see the race to have been now, but this is one thing I do. Forgetting those things which have passed and reaching for those in the future. For I am able to do all things through him that strengthens me. (Jesus Christ).

How does one acknowledge all the assistance and support that one has received in the accomplishing of a task of this nature? It is virtually impossible since one would have to search back through his development to select those people who most guided and aided this training and progress, as well as those who directly facilitate the production of this final synthesis. Only a few people may be selected therefore and these fortunately would be almost entirely restricted to person in the later category, with this in mind, I wish to express my sincere gratitude to my Church members Brother Folorunsho Olubiyo of FEMA NURSERY AND PRIMARY SCHOOL, Brother James Josiah the typist in Federal University of Technology Minna, Baba Funmi the Mechanic and Brother Shola the Vulcanizer for their priceless and irreporable contribution to my educational careers.

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ABSTRACT

The federal Millitary Government headed by General Sanni Abacha in his maiden broadcast of 1st October 1996 directed the Petroleum Trust Fund to rehabilitate, revive and reconstruct the railway station in the country. Afterward, the Nigeria transport minister signed countract on behalf of Federal Government with the Chiness construction civil Engineering Company to carry out a repair and reconstruction of railway line and its communication system across the country; also to redesign and construct new lines.

Before this time Nigeria Railway which was constructed in 1898 has suffered a set back from problems of administration, poor facilities and poor building facilities. Therefore there is every justification to give a greater consideration to the progress of rail transport in Nigeria, and to provide modern railway technology as well as organised rail terminal in the national capital development projects.

Minna, like any other state capital in the country with railway station, needs a standard (modern) and organised railway terminus as well as bus terminus. Here, emphasis shall be laid on railway sector of the transportationsystem in the state. The necessity arises in order to meet up with its advancement in socio-economic, political, cultural and religions activities.

In planning and designing of any rail terminal in Nigeria, architects should have proper relation of functions within the complex with respect to human activities in order to achieve desire goal, comfort and aesthetic uvalues. Also architectural solution should be catered for in space utilizations and forms. Therefore, architects must have to resolve the public confidence by ensure adequate design that shall meet demand of functionality, structural stability, and aesthetical value.

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1.0 INTRODUCTION

A railway is a form of land transportation in which a locomotive, or self propelled motor unit, draws a train of cars over a track of two paralled rails placed on a permanent road way. The flange wheel rolling on iron or steel rails, which involves relatively little friction, furnishes a very economical and reliable mode of transportation. Therefore, railway station is a terminus where train wait for a while in other for perssengers to board the train and get-off the train, loading and onloading of cargos, repairs, fuelling and addition of coaches and general overhauling.

The general objectives of railway coustruction in Nigeria between 1898 and 1927 was partty to maintain links between the Central seat of colonial government in Lagos and other parts of the country. It was also intended as stated in the act setting up the Nigeria Railway corporation as carriage of perssengers and goods in a manner that will offer full value for money, meet cost of operation, improve market share and quality of services, ensure safety of operation and maximum efficiency, meet social responsibility in a manner that will meet the requirement of rail wsers, trade, commerce, industry, government and the public.

The construction of the first rail lime from Lagos (Iddo) to Otta, a distance of 32 kilometers started in 1898 while other lines from the South to the North were constructed thereafter around 1927. Out of the 3,505 kilometers route of rail network, 1055 kilometer consist of curved track, thus making the maximum permissible speed on the rails is only about 65 kilometers, per hour, where as the main line locomotive are calibrated for speeds of 720 kilometers per hour.

Since the exist of the colonial masters, the rail structure has remained the same with the exception of new externsion like the Namoda - Argungu and Minna-Baro rail lines where the proposed modern railway station shall be cited.

From the earliest times the conditions in which main lines have been powerfully influenced by the ease and speed with which he has been able to move himself and his materials from directly and indirectly, man has been able to explore and exploit the Earth's Mesources. The chief land marks in the history of transportation - the weel, the sail, the steam engine, the internal combustion engine, the electric motor, and the greet technological break through of flight - promise, as the 21st century approaches, to be capped by the rocket engine, which frees man from dependence on Earth's atmosphere and permits him to visualize travelling to other planets.

1.1 AIMS AND OBJECTIVES

The proposed railway station is aiming at:

(1) Ensuring most efficient use of resources within the railway transport sector.

(2) To meet demand for explosive growth of the nation's urban centre which generate large demand for mobility.

(3) To promote a commuter service between Minna - Kaduna rail, Minna - Baro and the proposed Minna - Abuja (Federal Capital Territory).

(4) To promote a transportation system that is far more efficeint in its use of fuel compare to the highway transportation and air way transportation.

(5) To promote a transportation system that can convey large volume of passengers to both the Northern and the Southern part of the country.

(6) To promote a transportation system that will not destroy the natural environment compare to other form of transportation system.

1.2 ECONOMIC FEASIBILITY OF RAIL CONNECTION TO THE FEDERAL CAPITAL TERRITOTY (ABUJA) FROM MINNA.

With careful analysis of the rate of traffic generated by rail, there is good justication for the connection of National Rail system to Abuja. At expected rates of traffic generation, the expected daily volume of rail service would only substitute for about 50 daily trucks to and from the city, at full development of 3.1 million inhabitants. During the build-up of the city, the demand for goods movement creates a large, but transitory potential market for rail service to the city.

The shortest possible rail connection to the main line at Minna would involve construction of approximately 138 kilometers of rail line. At a cost of ₦400,00 per kilometer and a capital cost of 70%.

The rail line would incur a fixed annual cost of construction of ₦4.0 Billion. By applying this cost to the ton - kilometers carried in the three phases, it would give a range of capital cost per ton - kilometer from ₦0.42 per ton - kilometer.

In future, certain factors could contribute toward an imrpved economic feasibility of a rail connection to the F.C.T. some of these factors are;

(a) Upgrading of the operation of the entire National Rail system, with substantial improvements in both the access (that is number of locations served) and the shipment times for goods movement.

(c) Conversion to standard guage.

(d) Disproportionate escalation in the cost of motor fuels, tending to favour the fuel efficiency of rail transport.

1.3 THE ROLE OF RAIL EXTENTION IN NATIONAL ECONOMY

The general objective of railway construction in Nigeria between 1898 and 1927 was partly to maintain links between the central seat of colonial government in Lagos and other patts of the country.

It was also intended as staeed in the act setting up the Nigerian Railway corporation as "carriage of passengers and goods in a manner that will offeer full value for money, meet cost of operation, improve market shaire and quality of services, ensure safety of operations and maximum efficiency, meet social responsibility in a manner that will meet the requirements of rail users, trade, commerce, industries, government and public.

The construction of first rail line from Lagos (i.e Iddo) to Otta, a distance of 32 kilometers started in 1898 while other lines from the south to the north were constructed there after out of the 3,505 kilometers route of rail network, 1055 kilometers consist of curved track, thus making the maximum permissioble speed on the rails only about 65 kilometers per hour, whereas the main line locomotive are calibrated for speeds of 120 kilometers per hour.

The problem of the railways over the years is the after-effect of the collapse of the agrarian economy. The decline in Agriculture produce in the early 70s was a consequential effect of the discovery of oil/petroleum. Agricultural activities were no longer attractive there by necessitating a shift in attention and government policies. In the ensured neglect of the agricultural sector, the railway suffered in terms of capacity utilization, revenue and skilled manpower.

It is therefore in frantic effort at finding a lasting solution to the intractable transportation problem in our country, as evident in the chaotic traffic situation, high accident rate, acute shortage of public transport vehicles and insufficient transportation infrastructures for mass transit that the present administration introduced various measurement with the chinese government entered into a pact with a view to seeking the technical assistance of China in providing the infrastructural facilities and telecommunication required to resuscitate the Nigerian Railway corporation. The pact can best be described as a vision on the part of this present administration as similarly geared towards administrative cum infrastructural facilities rather than the latter and sound technical knowledge to sustain the corporation.

As expected, the pact has elicited the lost zeal of all railmen thorughout the country. The chinese technical partners are now in the country and in the next three years or so we shall be able to re-appraise their performance based on the term of agreement and the traffic as well as revenue accuring during this period.

Good enough, salaries are now regular and that is the only necessary pre-requisite needed to boost the morale and output of workers. The question that readily, comes to mind is whether the present measures put in place by government are enough to enhance viability of the Nigerian Railway corporation? This question has become necessary in view of the fact that the present rail structure was constructed to suit the whims and caprices of the colonial masters.

Since the exist of the colonial masters, the rail structure has remained the same with the exception of new extention like the Minna =Baro and the Kanra Namoda - Argungu rail lines and the proposed extension from Minna-Abuja rail lines.

Another development that has been made in the rail sub-sector is the itakpe Ajaokuta rail line which was constructed mainly to transport iron one form Itakpe to the iron and steel plant for processing.

How ever, there are many other viable rail rotes that can enhance the profitability of the corporation, if developed. The erstwhile Minister of Transport, Ebenezer Babatope raised the hope of the populace when he said that the Federal government has approved the feasibility of the East-West rail line. The project has since remained a dream, thus necessitating the question as to why the extension of new rail tracks to other parts of the country did not form part of the agreement with the Chinese government in the current revitalization programme.

The present Minister of Transport. Major General Ibrahim Gumel, donsed all hope when he put the estimated cost for the construction of the East-West rail line as stipulated by the Chinese expert at ₦11 billion.

The Minister made it clear that the soil withing the zone (i.e the East-West) is marsly and would require a lot of resources to make it rail worthy.

He contended that the government has suspended the idea in view of the limited resources available to it. In other words, the technical partners are only expected to strong then the rail curves, increase availability of locomotives, wagons and coaches, as well as improved telecommunications equipments.

Much as the reason given by the Minister is tenable the overall benefit of extending rail-lines to other parts of the country can not be over emphasized. The chaotic traffic situation coupled with the high accident rate would be drastically reduced if the venture is under taken.

Again, prices of most staple food and cash crops would be reduced as these can be transported in bulk (at a cheaper rate) from East in the West/North and vice-verse.

The Onne Port-Harcourt rail extension is another viable rail link that could enhance the viability of the Nigerian Railway corporation.

The fertilizer at Onne can be marketed through the extention of rail-line to this zone. Currently, fertilizers are being transported to formers by road and the total cost is reflected in the final cost of their crops which is transferred to the consumers. Also, the cement factories are begging for rail line. The Nkalagu, Ashaka and Ewekoro cement factories among others should be considered for possible rail lines.

This will also go a long way in bringing down the escalating prices of cement there by reducing the cost of building houses and by extenssion tenancy.

The proposed extension to Abuja from Minna is also a good venture for the fact that it will goes along way to solve the problem of transporting food material from Niger state (food basket state) to federal capital Territory. More importantly, some of the workers that are not housed in Abuja but that are living in Minna, Suleja and Paiko can be easily transported cheaply to Abuja.

1.4 TRANSPORTATION PROBLEM IN NIGERIA

Good and efficient transportation system is the sine quanon for the development of any nation and most countries of the world are quiet aware of this and do not play with it. For instance, since the unification of the German Democratic Republic (GDR) with the west in August, 1990 nearly 9,000 kilometres of roads and 5,500 kilometres of trace have been improved, nehabilitated on constructed newly. And as at last year, the country has spend additional DM10 billion for improvement of its transport infrastracture.

In Nigeria and Lagos for example right from independence, there was little doubt that government had spent a lot in the provision of roads, seaport and other infrastructures for purposes of development of the transport sector of the economy.

Rail system is the ddest of them all; And between 1879 and 1920, the rail trac had lean built to transverse the main areas of present Lagos state and other parts of the country where condity products needed by Britain were produced in commercial quantity was the attraction. Today, Nigeria boasts of more roads air ports, sea parts and rail tracks though the increasing population of the state makes these provision a farcry of the expectation.

The mass of people waiting endlessly for vehicles that are nowhere to be found attests to this Nigeria transportation problems may be the worst in Africa if not in the entire world. Prompted by this and the effect of the devegulation of the economy was anticipated to have on the masses, the Defedal Government floated the Federal Urban Mass Transit Agency (FUMTA)

in 1988, with an initial take-off grant of ₦700 million to be disbursed to state governments to establish the programme - the Federal Government assisted Mass Transit.

Many Nigerias leaved a sigh of relief when the programme stated. It was believed the much expected relief had come. The local government quickly joined in the programme, while many private transporters also joined the business. Mass transit buses and cars become ubiquitous of Nigeria roads.

Realising that workers are the most hard hit in the transportation problems, the Federal Government budget ₦100, million in 1991 as loan to labour uniors throughout the country to establish their own urban mass transit programme. The states, local governments and private transporters were ecstatic with the programme.

However, the enphoria soon fizzled out as commuters started complaining that the available number of vehicles fails to match the rate of growth of Nigeria whose population was put at more than 100 million two years ago and classified as one of the most populons countryes in the united Nations Development programme (UNDP).

Transportation problem is a big monster confronting an average Nigerian. At bus stops long-facod, frustrated and humiliated Nigeria commuters stand waiting endlessly for vehicles that are not in sight. And when available, they (commuters) already on the starting line, engage in unannounced vace to secure seats, and up being parked like sardine in a moving contraption.

Paul Ogwuma, governor of the Central Bank,, accepts the fact that Nigeria has big transportation problem. Responding to quetion in an interview with the Americam International magazine Leaders in its October - December edition of 1995, he said "Most Nigerians dream of owning a car because there aren't enough adequate transportation systems in a country like ours" He added "where as owning a car may not be a major dream of people in developed countryes, here in Nigeria owning it is no longer a huxury. Its more of a necessity. So, part of the deeam is to own a car to be able to move from point A to point B without having to resort to public transportation which is inadequately developed at this time".

Truely, Nigerians responded to this problem of acquiring their own cars, especially the fairly used ones refered to locally as tokunboh. For example, from 1989 to 1994, the importation of cars into the country jumped from 44,476 to 443,598 and this number may have bean surpased since then with the largest chunk of the cars, being in Lagos. The same thing applies to motorcycle popularly known as Okada. which is a new phenomenon in public transportation in Nigeria.

Chuma ifedi a social commentator and a retired staff of the Nigerian Railway corporation (NRC) believes mass transit programme cannot function efficiently on roads alone. In countries with large population like Nigeria, the focusis not on the road but rail. Countries like India, China and Malaysia with large population have been able to take care of their transport problem by emphasising on the rail.

The rail has the capacity to move a large number of people at once.

Mr. Ifedi believes that the rail holds the four aces as far as solving Nigeria mass transportation problem is concerned. But the problem here is that the system is not give adequate attention at all. Even its workers are bedeviled with the problems of unpaid salaries. Realising the importance if the rail system in the movement of people in a city thickly populated towns like Nigerias and with the tendency for the population to grow more.

Bring - Gen. Stephen Ikya (rtd) Sole administrator of the Federal Urban mass Transit Agency, gave a thought on metre line, said the programme may or may not likely be realised because of the huge cost of building the metroline. He said that metroline comes in three forms, the underground popularly known as the tube in Britain, the surface - (the normal one we are used) and the suspended type. Each of the three, he said is expensive to instal because of the value of the naira to the dollar and because of the component requirement like electricity.

However, the sole administrator of the NRC says six locomotive beingines, five coaches and 20 vail cars were delivered to the management of the corporation by china civil Engineering construction corporation (CCEC) recently.

The CCECC was contracted for three years to help revive the ailing railway system, which is the most popular means of transportation globally. Deutches Balin, a Germany out fit realising the inportance of rail transportation system to its economy too and in the movement of its citizenry has set far itself an ambitions goal for the year 2002. By then it will have invested approximately DM70 billion in order to bring the rail equipment and facilities in erethshile East Germany up to western standard.

In fact, a school of thought believes that the poor state of telecommunication in Lagos is also contributing to the poor state of transportation in the country. The believes that efficient telephone system many people will not have reason to be on the road because they will use telephone to do business and pass their messages. Indian China, Malaysia and Indonesia are among nations that have been able to achieve this; Germany hppes to connect 95 percent of all house holds before 1997 runs out and this is expected to have a salutary effect on that country's transport situation and economy.

With the poor state of tranpostation in Nigeria, many people have now resorted to acquiring personal cars even when they cannot afford to maintain them. The effect is that traffic hold up in the state is high and most times it is caused by broken-down vehicles and bad driving culture.

The headache has now prompted Lagos state to adopt traffic reduction measures. As it is, total reactivation and improvement on the rail road and favy transportation system may prove the elixir to Nigeria transportation problem. But this requires

appropriate government policies to be pursued vigovously, and with the interest of the masses at heart. This is the only solution to transportation quagonire in the country.

1.5 MODERN RAIL ROAD TECHNOLOGY

With the 20th Century the rail road reach maturity. Rail road building continued on a fairly extensive scale in some parts of the world, notably in Canada, the Soviet Union, and in Africa. But in the more developed countries construction tapered off, except for improvements or retirements of existing systems. The technological emphasis shifted to faster operations, more amenities for perssengers, larger and more specialized freight cars, safer and more sophisticated signallings and traffic -control systems, and new types of motive power. Rail roads in many of the more advanced countries also found themselves operating in a new climate of intense competition with other forms of tranport.

By mid-20th century, railroad in such countries as the United States, Britain, and Ireland, as well as in western Europe generally, were beginning to abandon secondary and branch lines that had become uneconomic. But in Soviet Union, China, Japan, Anstralia, and Canada, Important new lines were being built. In Soviet Union the Trans-Siberian line was double tracked and by 1970, had been largely electried. At that time, additional construction had raised the Soviet system to a total of 86,691 route miles (139,511 kilometers), making it the largest single railroad system in the world a question of increasing complexity.

1.6 URBAN MASS TRANSPORTATION

Urban mass transportation includes the movement of people and materials within any town or city but particularly with the large metropolitan areas. In the last third of 20th century, such movement was primarily by automobile and truck powered by internal-combustion engines, despite the fact that mass transit had been recognised in all developed countries as desirable and necessary.

Before taking up the problems and possible solutions within the frame work of Urban transportation itself, it should be observed that solutions may come from technological advances outside the system. The picture phone, facsimile transmission, and other developments in communications may reduce the need for person - to - person contacts and eliminate many trips now considered necessary. Energy presently transported by railroads or trucks in the form of coal or oil can also be moved by pipelines. Generating plants can be built at mine mounths or other non urban areas, and electricity can be transmitted by buried, hig-voltage power lines to the urban area. Advances in building construction may also have large impact on transportation by facilitating development of more efficiently organised urban agglomerations.

1.7 PROBLEMS OF URBAN TRANSPORTATION

The antomobile readiness and versatility has been the catalyst of spectacular suburban growth in almost all developed countries, making possible the exploitation of unused land areas forther out from the central city. The experience of Japan, Europe, and the U.S. has been the same; those can afford new houses can afford antomobiles to reach them.

Yet even apart from the inevitable pattern of overgrowth and congestion, public transit systems are indispensable for the large groups of persons who cannot drive motos, such as the poor, the very young or the very old, and the disabled. In recent years need for public transit has been shown in cities as small as 30,000.

Traditionally, transportation problems have been considered under the headings of cost and convenience, meaning primary speed of travel. To these aspects have now been added such questions as pollution abatement and safety, the latter

High costs. In most countries the history of mass transit has been a history maintenance problems versus using fores. Lengthened trips combined with popular resistance to fare increases create maintenance problems; when these become acute, faresrise, often sharply. Flat fares discourage the short distance rider, who many pay two or three tdmes as much per mile as the long tripper.

Social effects. The high cost of urban transportation has invariably fallen most heavily on the poorest classes, who pay a higher proportion of family income for transportation, and often cannot find adequate means of reaching employement. In modern industrial centres new jobs bend to be located away from the congested districts where the poor traditional live.

Pollution. The relationship between air pollution and health began to be investigated in the 1950s, with London pioneering in researet and abatement. The importance of antonomobile emissions in air pollution in urban centres was established by 1970. The diesel engines, widely used in freight movement by truck and railroad both in Europe and U.S., has been found to contribute a relatively minor amount as compaired with the gasoline engine almost universally used on passenger vehicles. Because urban travel is largely start and stop and emissions are generally higher when vehicles are idling, it can probably be assumed that more than half of the motor-vehicle pollutants are concentrated in Urban areas.

Planning problems. Attempts by govenment agenecies and others to plan systems to meet urban transit needs encounter chronic problems. The type and quality of transit that may be technically feasible a few years hence are difficult to predict safely, in addition, the public response even to improved versions of existing systems is difficult to determine.

Safety hazard. Through transportation in all ages has involved hazards to life and limbs, the appalling toll in deaths and injuries brought by the automobile in the 20th century raises entirely new questions. Even if private automobiles can be shown to provide a substantially greater convinience, it is uncertain that a rationale can be supplied for their use in competition with safer public transit.

1.8 LITERATURE REVIEW

This chapter shall ensure perfect analysis of what Government bodies and individual have discussed with regards to the transportation.

1.9 TRANSPORTATION GOAL YET TO BE ACHIEVED

With respect to the saying of the transportation Minister, Major General Ibrahim Gumel, he said that, "Nigeria is yet to achieve its target of fast and economical transportation services". He was speaking at the premise where the Chinese Government that was asked to rehabilitate the railway transportation system and network is signing the contract. Recounting allocations to the transport sector in the various National Development plan.

Dr. Kalu said in the 1962 - 68 Development plan, the transport sector got 19 percent of the total plan investment, 23 percent in 1970 - 80 plan, and 15 percent in the 1981 - 85 Development plan. "However inspite of the huge investment on the sector, it is fair to say that we are yet to achieve the expeted target set both in the 1965 government white paper, on the standford Research Institute Report on Economic Co-ordination of Tranpost in Nigeria".

He said that, the inanguration of a committee in 1986 to draw up a dynamic transport policy for the country

borne out of the need to change "this trend". Government decision to revitalise and expand the nations urban mass transit services, which rail transport is no exception, Dr. Kalu said was in appreciation of the fact that the major Urban centers were experiencing acute transport problems.

Presently, the head of state commander in Chief of Arm Forces announce the commitment of Government towards improving the transportation system in the country. He directed the petroleum Trust fund headed by

1.9.1 RESEARCH METHOD

The research method of this project shall be carried out in the following ways:

By data collecting and opinion sampling of the relevance of the proposed project to the affected community. Also case study shall be reviewed to substantiate the knowledge of the poposal.

Available literature shall be throughly review to determine the standard to be adopted.

CHAPTER TWO

2.0 PHYSICAL AND SOCIAL CULTURAL BACKGROUND

Minna which is the headquarter of Niger state was created on April 1 1976 from the formet North Western state. It is a sprawling landmass of about 74,244 square kilometres. Its climate, soil, and hydrology allow for the cultivation of virtually every crop known to the topics. Cotton, weat, Maize, guinea corn and sorghum thrive in the state. Others are Yam, soyabean, ground nut, (peanut), and melon Annual vainfall varies from 1,100 mm in 210 days or more, from the north to the southern part of the state. About 85 percent of the population is engaged in agriculture, and so aboundant is food in the state, that it is Christened the food basket of the nation.

Niger state sits in the middle of the Nigerian Map. Its neighbours are sokoto state to the north, Kebbi state to the West, Kaduna state to the north east and Abuja to the South east. The Republic of Benin also shaves common borders with the state along Borgn and Agwara Local Government Areas.

The 1991 census figures estimate the state's population at over 2.4 million. It is a multiethnic society well - known for its peace and tranquility, Nupe, Gwari and Hausa are widely spoken. Others are Fulani, Kadara, Koro, Kambari, Pangu, and Dukawa. A tolerant population, there exists among them are highly integrated presence of other diverse Nationalities that make up Nigeria, Chief among them Igbos and Yorubas. The result of this co-habitantion of veterognous groups is the existence in the state of a rich and colorful mosail.

Niger state often reads like a fairy tale, a land abounding with precious stones of different descriptions. The king of which is gold. Gold exists in commercial quantity in all of the states 19 local Government Areas. In other, silicon, Kassivite can be found. But despite its resources, the state is paradoxically, poor. Agriculture is still the mainstay of its economy, and this is largely non-mechanised and small scale.

Industrialists have been show to take advantage of the relative peace and cheap labour to establish industries that will exploit solid minerals and agricultural potentials in the state whose internal revenue base cemains weat.

Still, ample opportunities abound for tourism development, water resources for fishing, and strategic hydro-electric development. It is not by accident that Niger state is the "Power state" of Nigeria; for all the three hydro-electric projects in the country namely, Kainji, Jebba and Shiroro dams, are situated in the state. More opportunities to establish hydro-electric power stations at Zungeru and Baro are being exploned.

The political configuration of the state has changed over the years. From a nine Local Government structure at its inception, the state today comprises 29 Local Government Areas. They are Agaie, Agwara, Bida Borgu, Bosso, Gbako, Gurara and Kontagora Local Governments. Others are Lapai, Lavun, Magama, Minna, Mokwa, Paikoro, Rafi, Rijau, Suleja and Wushishi Local Governments.

2.1 SITE SELECTION

The selection of a site for the proposed facility (railway station) is by itself dependent upon the opportunity and constraints the environment possesses. A comprehensive study has therefore been carried out withing the area chosen in determining the most suitable site. Minna, Niger state has been selected for case study.

2.2 GEOGRAPHICAL LOCATION OF MINNA TOWN

Minna is capital of Niger state (Nigeria), situated on latitude $9^{o}37'$ North, and longitude $6^{o}33'$ East. It is typically sparely populated and covers an estimated area of 885 Hectares, with a residential population of about 150,000 peoples mostly in the working class.

It is of Note, especially based on observational evidence, that Minna lacks a suitable and functional Train station that can meet the needs of its large number of Train Users which spread across the length and breadth of the state.

Mean annual rainfall is about 1,100mm while highest mean monthly rainfall (usually in september) is about 300m. Mean monthly teniprature stands at $30.5^{o}c$ with a lower limit of $25.1^{o}c$ - suggesting an averagely hot town.

2.3 2.3 CLIMATIC CONDITION

2.4 2.4 TEMPRATURE

During the period from January untill the onset of the rains both daily maxima and minima are rising to their annual peak just before the raing season. During the rainy period daily maxima drop to a low level in August, while the reduction in minima is less pronounced and the minimum temperatures remain fairly steady. After the rains the maxima begin an increase which is fairly sustained until the raise after January, while minima drops steadily, also until the cycle repeat.

MONTH	MAXIMOM	MINIMUM	MEAN
January	34.3	19.9	27.1
February	36.4	22.2	29.3
March	36.9	24.1	30.5
April	34.8	24.4	29.6
May	32.5	23.3	27.9
June	30.2	22.2	26.2
July	29.0	21.8	24.5
August	28.4	21.7	25.1
September	29.6	21.4	25.5
October	31.4	21.3	26.3
November	34.3	19.2	26.7
December	31.8	19.1	26.9

Table

Mean monthly maximum, minimum and average temperatures for Minna.

2.5 RELATIVE HUMIDITY

Evaporation from open water and soil, and transportation, from soil microflora, natural vegetation and crops, are together termed evapotranspiration. The transfer of water to the atmosphere by evapotranspiration can account for up to 85% of rainfall annually.

Potential evapotranspiration (PET) is the amount of moisture which would be lost from a soil /vegetation surface if water is not a limitation. In other words it is the maximum demand of water for evaporation and transpiration (PET) can be explained by a variety of measurements and empivical or empirical/ theoretical formulae.

Because of the rainfall regime of the state, at a certain times of the year there is ample water in the soil to satisfy the evapotranspiration demand, and so evapotranspiration takes place at the potential rate, while in the dry season water is limited and evapotranspiration takes place at a much reduced rate.

Like other synaptic meterological station in Niger state, Minna's mean annual PET exceed mean annual rainfall. Actual evapotranspiration over a year therefore is always less than the potential value.

Annual evapotranspiration totals (PET Means) are listed in table below.

MONTH	STATION: MINNA
January	136.6
February	140.0
March	155.4
April	142.0
May	133.6
June	106.7
July	91.7
August	82.6
September	93.0
October	117.9
November	118.1
December	116.1
Annual Total	1430

2.6 2.6 RAINFALL

Minna has a mean annual rainfall of 1334mm (52 inchos) taken from an exceptionally long record of 54 years. The higherst mean monthly rainfall is in September with almost 300mm (11.7 inches). The rainy seasons starts on average between the 11th to 20 April and lasted for at least 170 to 200 days.

2.7 2.7 GEOLOGY AND TOPOGRAPHY

Minna is on a gelogical base of undifferentiated Basement complex of mainly gneiss and magmatite.

The oldest rocks to be found in Niger state are those of the Basement complex, formed during the pre-cambian and cambian time. Withing the pre-cambian alone, cycle of sedimentation and entrusion appear to represent a complex and vost period in the history of the area. The majority of the original sedimente and minor entrustire rocks may well have been subjected to several period of metamorphism pard, crystalline gneisses and magmatities predominate among the precambian rocks. Some of the original sediments have not been altered so readily and these include quartzites, quarter-chist, quarter-sillimanite rocks, phyllites and some other schists, all commonly referred to as the metasediments. Igneons rock include granite of

the older granite suite. Amphibolites, diorites and gebbro, representing basic igneous rocks, are also presented in some places, though the alter tow are of such limited extent that they have been classed with the older granite.

2.8 POTOGRAPHY

To the North-East of the town a more or less continus steep outcrop of granite occours limiting any urban development in that direction. A major drainage valley flows from the centre of the town South-West words with many minor drainage channels feeding into it with storm of water run - off from the hills to the east. In places these streams forms large areas of fload land. There are large but isolated rock outcrops in this landscape and also some areas of scattered rock.

2.9 2.0 SOCIOL- CULTURAL

2.9.1 2.9.1 SOCIOL POLITICAL STRUCTURES

Minna is basically a Gwari town and got its name from a ritual performed yearly by the Gwari founders of the town to observe the beginning of the new year. The word itself in Gwari means "to spread fire".

The early settlers and founders of the town lived on the top of the range of hills which live the eastern and northern sides of Minna. Evidence of early settlement on the hill top remains in the form of delapidated foundations, broken pots and many baobab trees that characterized ancient town in the north.

Before the town became the modern city that as it is now, it went through four metamprphoses,

The first was in 1905 when the construction work of the vail line got to the area. There was no local labour at that time so the recruits for the construction works were the Gwaris, Nupes and Hausas. The Various groups were accomodated in different camps to aid easy access and to prevent desertation. The Gwari camp was cituated in the areas of the present Keterengwari, while the Nupes had their camp at the present Kwangila and the Hausas were at Kasuwan Zambarma or Limawa. These camps later

became permanent seltlements and eventually formed some of the present wards of the towm.

In 1908 the second face lift for the town took place when an Alkali (Judge) was provided for the camps. A permanent house for the Alkali was built and withing the compound there was provision for a prison. Later, the first contingent of police was introduced.

The third metamorphosis was in 1910 when the Gwari in habitants decided to move from the hill top to settle down on the areas of the present Paida one of the wards of Minna and thus the abode of the funders of the town.

In 1911, the construction of the main rail line withing Minna had been completed and the first locomotive engine, Wushishi, arrived in the town. It was one of the first in Nigeria and is presently preserved at Minna Railway station by the Nigerian Railway corporation.

Other significant events that took place include the building of the present aerodrome in 1920 as one of the first three aerodromes in Nigeria, Bosso Dam was constructed in 1949 and served as the Sole pipe water supply to the town until the late sixties when the Chanchaga waters

was built. In 1962 the National Electric Power Authority (then ECN) was established, has put in all efforts to give Minna a face lift befitting of a state capital. From general social and political structure and setting of Minna one can confortably say the peoples of Minna are very accomodating to settlers and are open handed to anything new.

2.9.2 2.9.2 ECONOMIC AND COMMERCE

The economic of the state since 1979 is still the invitial stages of development. Very little is vealised by way of internal vevenue but provisions has been made and is being made to change the present situation, since internal revenue is the most reliable source of funds to sustain any economy. Having one of the lowest population densities, the land presents the main asses of the state.

All the productive units are small scale. Most of the existing industries are small scale enterprises consisting mainly of traditional craft work, food processing plants, and repair and service workshops. Most of the people in the state depend mainly on agriculture for their livelihood but the small are small and productivity is low. There has recently concrete efforts by the Government to assist the Local farmers by providing farm inputs at standardized rates and loan with low interest rates. However, it is expected that the productivity on the farms will improve substantially withing the next few years.

There are only a few known deposits of minerals in commercial quatity. It is hoped that the clay around Bida, Abuja and Minna, the sand silical around Bida, and the marble in Kwakuti will lend themself for future exploitation and provide base for the development of cevamic, glass nad tervazzo tiles industries.

2.9.3 2.9.3 COMMERCE

The expanding market around Minna might soon attract some of the established commercial institutions like leventis, Challarams and Kingsway to move into Minna. or now the available commercial centres are the Minna main market and Gwari market.

There are quite a number of supermarkets available with depart mental goods such as Donles, Thy-will, Jonapal, Systems, Onigbinde, Niger supermarket and Cyril.

The Government is improving on the condition of the various vest houses (Niger motel, Motel annex) and the only major three star hotel, shiroro hotel. There are other private hotels such as Jafaru Guest Inn and Masfala but they are not sufficient for this fast frown town.

Though Minna is still developing, its economy is relatively low compared with other states.
As such one will expect the architecture implication would be that the structure should be designed such that the building cost would be moderate. But Minna is a place that takes on challenges and brighter. Future start somewhere. This has already been observed in the ultra-modern cultural centre. (U.K. Bello Arts Theatre) and the central mosque. Therefore, it is seen as a challenge to the future rather than a misfit.

The examination of three years' budget statements for Niger state shown that expenditure runs up to ₦200 million per annum.

	77/8 NM	78/9 NM	79/8 NM
Recurrent Revenue	94	68	128
Capital Revenue	74	78	80
	168	146	208
Recurrent Expenditure	77	64	81
Capital Expenditure	122	126	76
	199	190	157
Shortfall (surplus)	31	44	51

Table showing three years budget semmeries.

The internally generated revenue can be seen to be improving steadily, although it only contributes about 3% to the overall budget.

	77/78 ₦000	78/79 ₦000	79/80 ₦000
Fees	1838	2820	2906
Assessed Taxation	965	1400	1800
Rents/interests	240	490	340
Unallocated sales	1338	600	1000
Total	4381	5310	6046

Table showing internally generated revenue in Niger state. Over three years.

The crafts centre thus help to boost the economy and commerce of Minna as the products will be marketed both withing and outside the town and state serving a source of internal revenue to the state. It would also open doors for investors to Minna to set up other industries such as a furniture and home decorating.

	1977/78	1978/79	1979/89
	NM%	NN%	NM%
Share of apportioned stock assets (capital revenue)	7537.5	7841.1	8138.9
Share of federal recuirent assets (petroleum oil monry	6030.0	5528.9	9043.3
Other federal grants	105.0	73.7	83.8
Once-and-for-all liquidation of assests	2010.0	---	---
Internal generated finance.	52.5	63.2	62.9
Short fall (syrplus)	3015.0	4423.2	52-

2.9.4 2.9.4 TRANSPORTATION AND TRAFFIC FLOW

The town of Minna is physically divided into two halves by the railway lines that run east to west It separates the Tundun Wada Housing area and present temporary secretariat to the south from the core area; G. R. A. and Bosso in the North.

This, therefore implies a great traffic conflict between the train and motor vehicles by the creation of level crossings. There are two level crossings in the town (one at the town centre and the other at the Kuta road before Gbadata) before the decision to construct flyovers, although there is an un-official one at the western part of the town near the ministry of works yard, used mainly by construction traffic.

Generally, the road in Minna have suffered a relatively slow pace of development in the past years. This may be due to the lack of high demand for the use of roads in the town. But with the change in status from a Divisional Headquarter to a state capital in 1976, more people are being attracted to the town and the demand for road renewal programme, has been embarked upon partly for prestige reasons but also to provide a sound base for the traffic organisation in the town.

On the east side of Bosso road, from the round-about at the Hospital Road/Bosso Road, the market road is extended eastwards diagonally across the Minna main market (involving the demolition of many of the stalls and dividing the market into two): and to join Sabon Gari road, itself graded to the junction with Kuta road.

The last three road - Keteren Gwari Road, Market Road and Kuta Road form what is theoretically termed the "by-pass to by-pass" Link road on the assumption that there will be an eastern by-pass as at some time rooted, and that the western by-pass, presently under road construction. Since the by-pass do not currently from part of the road network they have been omitted from our survey of existing conditions but are discussed later.

Presently, the town is not facing a very serious problem in terms of congestion. But a great percentage of the traffic flow is along the Bosso Road (dual carriage way spine). A level of car ownership and the fact that only few visitors come to the town daily.

However, there are some observable traffic problems that are worth mentioning. The disadvantage of widening the Bosso road on its old alignment and thus through the centre of the greatest activity withing the town, briefly pointed out earlier. Apart from diverting and taking both the internal and through traffic, some dangerous conflicts are always observed along the town especially between pedestrian and motor vehicles. A spectacular one is the section of the road where the primary schools are located. The conflict between pedestrian school children and motor vehicles is dangerous although overhead foot bridges are planned. Another major problem is in the market area where the new road which non divides the market into two posses a great traffic botle-nect. The volume of parking along this road reduces its performance below the practical capability. There is also the pedestrian/motor vehicle traffic people who attend the market. The present construction work going on some roads like Bosso road, Sabon Gari road and Kuta road has naturally distrupted the traffic flow. This is expected to be a temporary situation but has, of course, affected our surveys.

Recentry, there has been an up-grading of all foulty roads in Minna and construction of new ones. This had made it rather enter prising for transporters such as Taxts, Buses, Motocycles and private car owners that moving around in town is done with so much pleasure and ease thus making the traffic flow effective and fast.

The factories location of the west by-pass creates a good link between the factory and the outskirts of the town thereby avoiding the the internal volume of traffic. This makes the crafts centre easily accessible.

2.9.5 2.9.5 EXISTING LAND USE

2.9.6 9.6 IRRIGATION

At present there are a number of private dry season market gardens and one official (MANR) Vegetable scheme serving Minna. The MANR Scheme is a small area of sprinkler irrigation south of Minna on the right bank of the Chanchaga River. The private traditionally Irrigated (by shaduf) schemes are scattered around the Minna area in the river valleys where alluvial water is available through the dry season. One garden in the western part of Minna town taps the waste water and surface borne untreated sewage effluent of the River Suka at a point where the river is carrying nearly all of Minna's waste water.

Except where irrigation is being carried out with grossly polluted water, the traditional private market gordens should be encouraged by MANR have the local Government Authority Agricultural Officer. Assist once should be given, not by administration of farming land, but by making available to the farmers appropriate irrigation equipment such as small, portable diesel pumps. It is very important though that farmers who operate dry season gardens he allowed to retain their independence.

2.9.7 2.9.7 FISHERIES

There is a significant potential for fish farming in Minna area. In addition the Shiroro reservoir is likely to be useful source of fish if well managed. There should be close liason between the management of Shiroro lake fisheries and the Kainji lake Research institute.

Close to home, the Tagwai reservoir could be used as the water source for intensive fish farming or alternatively could be stocked and fished as a whole if properly managed.

2.9.8 2.9.8 INDUSTRIES

A part from availability of raw materials, industrial development in Niger state is dependent on water and electrical power.

Minna is situated on rocks of the Basement complex and therefore, has little potential for the development of ground water resources especially in localised area. Natural flows of surface streams and rivers are very low in the dry season and therefore cannot be used for industries which required year - round reliable supplies.

The recently completed Tagwai dam can supply as estimated about 130,000m/day (28 mgd) through out five months of dry season, and therefore relieves Minna of any serious water shortage for many years to come.

2.9.9 2.9.9 SCHOOLS

Primary schools are essentially a local service and should be as chose to the people as possible. No primary school child should have to walk than 60 meters (less than half a mile) to school.

CHAPTER THREE

3.0 CASE STUDIES

Architecture contribution towards revamping and boasting of nations economy cannot be overlooked because not only do they offered theoretical solution, feasible design works, well planned and scheme with all necessary requirements fulfilled are also proposed. Similar architectural works proceeding this research include:

Geographically there are some of these case studies that are situated in Nigeria, thus in common, they share the so many factors affecting the railway station problems. It is therefore the need to analysis and ascertain existing problems on existing situation, so as to avoidance of such short coming in the proposed plan for the Minna modern railway station.

3.1 VANSBERD MODERN RAILWAY TERMINAL (SANFRANASCO)

This is an international case study. Most of the international railway systems are underground and this Vansberd Modern Railway Terminal is not exception.

3.2 DESCRIPTION

The terminal consists of three levels.

- The entrance and stairways are at the street level;
- The intermediate, mezzamine level contains the fare collection system which divides it into a fuse area which is the transit terminal;
- The third level is with plat forms and tracks at which boarding of train takes place. The mezzanine area is located above the plat forms in a lateral position to the street. Some times geometric conditions and operation factors allow combining the mezzanine level with either the street or the plat form level, so that the terminal has only two levels.

The Messanine floor is based not only for fare collection, but also for various stores, display areas, telephone, as well as grade - separated pedestrian crosing to the sorrounding buildings.

The decision regarding different levels of terminal designed depends on some factors such as:

(a) Passenger Volume (high volume require three levels)

(b) Uses of the mezzanine area

(c) Construction costs

(d) Operational cost

(e) Supervision etc.

3.2 3.2 MINNA TRAIN STATION

The station (Minna Railway station) is located in the centre part of the town. It can be access both from the Northern part of town through hospital/market road and it can also be accessed from the Southern part of the two through the Bosso station road, The location of Minna railway station took the advantage of Niger state transport authority garage in Mobil for its passentage to get bus to their various destination in town after gettin off from the train.

MERITS

- The station is contrally located
- The station enjoy the advantage of good access from two major roads in the two (Bosso road and market road).
- The availability of natural landscape
- There is available land which can gives room for future expansion.
- There is enough circulation area around the station.

DEMERITS

- There is no station house that can accommodate arrival and departure.
- No proper planning and zonning of the station.
- There is no provision for medical facilities.
- There is no adequate staff quarters.
- Maintenance unit is not well pronounce in the station.
- No proper arrangement of facilities in the building.
- The passengers plantform is inadequately design.

APPRAISALS:

Having take a careful look into the advantages of the minna railway station the proposed design shall encourage and adopt some of these merits. The demerits of the station shall be focused and the necessary solution shall be provided.

3.3.3 IDDO TRAILWAY TERMINUS

This station is located in the hub of the city centre a long carter bridge and Oyingbo Road. It is situated directly apposite iddo Motor park. Terminal is in a rectangular form. With Oyingbo Road in the North - South axis direction, the terminals is at the East while Iddo Motor park is at the West.

TRAFFIC SITUATION

The external parking spaces are inadequate at the peak period. At this period, the site experiences traffic problems and in-organise ways of passengers car parking as well as those on-loading their baggage from their car to the terminal building.

MERITS:

The terminal is nearer to Iddo motor park passengers could easily be transfered from the bus -stop to the terminal building, and from terminal to their various destination by buses. It has enong circulation area withing the building.

DEMERITS:

- It has in adequate seating area for perssengers.
- No clear delination for arrival and departure.
- Inadequate perssengers amerities.
- Limited staff accommondation
- The terminal building is too close to the express road and flyover bridge which were constructed after the terminal has been sited, so there is problem of set back.
- These is no room for future expansion, since the terminus is bounded by both existing express way and sorrounding permanent structure.

3.4 3.4 BILLESTEDT TERMINAL (HAMBURG)

The terminal is an international study designed with extensive transfering to and from feeder routes so that passengers have short convinient poths, preferably without crosing readways. There is provision for by passing or allows many stopping locations and temporary storage for vehicles prior to peak hours.

Access from outside streets are controlled due to an integrated fare collections. There is provision for bus platform which has a stair way leading to a mezzanine perpendicular bays to the vail terminal plat form. The bay are covered, giving good weather protection. Examples of these designs are found in Toronto and Sao Paolo.

Ostbahnhof in Munich, is an interesting combination of loops for buses and rail (donble track) for terminal mareuvers, and parallel bays for stops connected with the station by an undergrounded pedostriam passage.

3.5 3.5 IMPROVEMENT OF RAIL TRANSPORT

The existing rail service in Nigeria has a strong coastal interior alignment with two main lines extending from the port cities North Westerly to the interior of the country. About two thirds of all ton-kilometers of goods carried on the entire system, are carried on the entire system, are carried on the Lagos - Nguru line, while the remaining one-third is carried on the Port-Harcourt - Maiduguri. On the Lagos - Nguru line, Deak tonnage occours South of Abeokuta (about 800 to 900

thousand tons annually, on both directions). But in between Abeokuta and Kaduna, there is fairly constant annual tonnage of about 700 to 800 thousand tons annually. While on the North of Kaduna, tonnage declines, to about 400 thousand tons annually on the Kaduna - Kano section, and to about 100 thousand tons annually on the Kano - Nguru section.

On the Port-Harcourt - Maiduguri line, Peak tonnage occours between Port Harcourt and Enugu, (about 300 to 400 thousand tons annually). Tonnage remains fairly constant, at 300 to 350 thousand tons annually in Kafanchan. Also to the North-West of Kafanchan, tonnage falls off, between 200 to 300 thousand tons annually.

A fairly consistent pattern of goods movement generation is observed with the average for 12 states, being 1352 annual tons loaded per 1,000 population. For goods movement by rail in the interior of the country quantities of goods movement by rail in the interior of the country quantities of goods attracted exlibit a vatio 250% of goods produced. This implies that about two and one - halftimes the volume of goods is shipped to the interior destinations by rail. There is direction inbalance of goods movement by rail which is simply a manifestation of the goods- movement pattern of imports, food stuffs and building materials.

CHAPTER FOUR

4.0 DESIGN CONSIDERATION

In designing Railway station of this nature a number of problems has to be checked and solved in order to arrive at an appropriate design in term of production flow i.e the flow of perssengers from the source to the railway terminal and the flow of workers, good working condition of safety of workers and hygeine.

And generally there are different appreaches railway station design depending on the size of the station either, small, medium and can be built on a single level while medium size producing one or two products may be a single level or a storey building but it should be noted that some equipment require about two storey height for their operation.

In all the workshops, a single level building will not be adequate to meet the functional requirement. Althoug, taking onto consideration the cost of excavation and foundation work, therefore buildings on floor is of advantage.

4.1 4.1 SITE ANALYSIS

4.2 4.2 Site location:

The city location of the project is Minna, the state capital of Niger state. Minna lies at latitude $9^{o}37$, North and logitude $6^{o}33'$.

The proposed site location of the project is Minna industrial layout. It is situated off the western bypass which creates a good access link with the 3 major entrance to Minna town.

4.3 4.3 Site character:

From the map the western by-pass runs North west to sout East. The site location which is off the western by-pass road has its major entrance also in this direction thus the rain carrying wind (South westerly warm) and North East dry hamattan winds blon's through the site.

4.4 4.4 WIND

Minna generally characterised by two major winds viz the south west trade wind for mosoon wind), which is always warm and brings rain, it normally start from the month of March to September, It is been blow from Atlantic oceam and carries moisture ladeen (regarded as moisture ladden wind). It is usually having a cool effect on the adjacent neighbouring units. The second is the North East trade wind

(North easterly) which is always very dry and bringings hamattan. It is characterised by dust particles and blows about the air borne diseases. The dust is blown by this wind comes from Sahara desert. Hedges, and trees will be planted to serve as buffers against this winds at the site. Openings (windows and doors) along this axis shall be carefully protected with projections like hood, canopies etc.

4.5 4·5 TEMPERATURE

Minna is generally very hot, it has a mean monthly temperature at its highest in March at 30.5°c (810) and lowest in August at 25°c (77°F). The use of air conditioning system is evitable here because an ideal operatory condition in the offices and other utilities unit is 21°c with little variation of 3°C. Threfore, high cross windows will be used at the workshops for both lighting and ventilation.

4.6 4.6 RAINFALL

The mean annual rainfall in Minna is 137mm (52 inches) this is taken from an exceptionally long record of 70 years.

The rany seasons normally startes in March or April and slightly drizzled. The rainy season normally ends in September or October. The drainage system will be provided round the building to collect all the storm water, this will then be connected to the central sewers. All decked roofs will be protected with three layers of bituminous falt; walls especially the exterior wall will be protected against rain by the use of protective coating paints. The roof gutter and storm water drainge will be clean regularly to avoid blockage.

4.7 4.7 TOPOGRAPHY

The site is relatively flat with a gentle slope of about 5^{o} to the west and east side of the site. The building will be located at the centre of the site which is flat. Drainage will be constructed to follow the natural slope of the site.

4.8 4.8 VEGETATION

Minna generally lies in the sudam savanna vegetation which is made of sparsely dusted trees joined by shrubs and low grass. The site is made of low grass, shrubs and some harwood decidons tress like locus bean tree, cashew nuts and dota tree. Care will be taken as much as possible not to kill the natural vegetation of the site during construction, but most of the feature will be maintained as much as possible except where if may cause obstruction. Furthermore other trees which are not available at the site now will be introduced such as palm trees, eucalyptus and flam of the forest as well as jackarander.

4.9 4.9 GEOLOGY

The site is composed of gneiss and magnatit due to the presence of sedimentary rock the form below the strata layer in the soil. Thereby I employ the idea of wide strip foundation will be use at the site this is to avoid the idea of differential setlement of the structure.

4.9.1 4.9.1 ACCESSIBILITY

The site is accessible through all the four sides by pedestrians, at a low angle to the buildings.

The mean annual rianfall is 1334mm and the mean monthly temperature is $30^{o}5'$ (highest) and $25^{o}1'$ (lowest). The comtours on the map show that the general topography of the site is of a gentle slope along the North west direction with an average slopw of 1.30. The total slope difference right through the site is 244 - 236 = 8m for a distance of 250 metres.

4.9.2 SITE PLANNING

On the site major interfaces are considered, the threshold between the public infrastructure and the home territory, and the transition between the outside and the inside environment. In each of the problem areas factors such as the nature of the adjoining spaces, time-motion schedule and the order of communication are investigated and organised.

The entry and exit are completely articulated with the dimensions of space and time to make for cohesion. In all of life arrival and departure are important and in the middle belt parts of Nigeria these occasions are ritualised and celebrated. Again, arrival, entry and departure occur in organised spaces and settings.

Entering, we know very well, is an emotionally difficult experience. It can sometimes put a visitor coming for the first time at a terrible disadvantage. An individual intending to explore and unknown space or teritory has to be prepared by design for the experience; the design of the entrance shoyld make it easy for people to be friendly and hospitable. For this reason the parking and other open spaces in front of the station house are carefully scheduled to achieve the appropriate moods; majesty, impresiveness and

friendliness because of the ritualistic importance of the entrance, the family's relationship to the arriving guest is a very touchy one. The atmosphere created at the point of entry really suggests that degree of ritual which occupants of the neighbourhood enjoy and are familiar with.

4.9.3 MOVEMENT

The very idea of space flow connotes movement; movement in turn is the essence of sequential planning sequential actions which arouse curriosity and give a sense of anticipation will, nevertheless, beckon and impel one to continually advance in the direction of the goal.

People live in space as well as in time. The purpose of structuring space and time in a composition is to organise and structure movement and communication. All spaces, interior and exterior, are expenrienced by people penetrating and traversing them in a definite order and sequence and, therefore, in time, Random spaces occur in isolation, but when laced together they take on meaning and become a source of human experience. The effect of sequencing depends, therefore, on the ordering systems, that which comes before and after; spaces are thus revealed as a chain

of events to the individual, the main objective of the space chain being to create drama through the juxtaposition of events, and to excite curiosity to what lies beyond the visual range.

4.9.4 CAR PARK

Parking lots will be provided for both visitors and staff of the station. The parking lots will be reasonable close to the centre so as to enhance appreciating the focuse on the objects display in the gallary, it is planned in such a way that it will be easily be accessible and there would not be much traffic congestion as vehicles moves in and out of the station.

4.9.5 THE BUILDING

The building is oriented in such a way that the shortest sides are facing the westest axis. This is to reduce the direct penetration of sun ways to the interior which may cause discomfort furthermore, the south west trade wind and North east trade wind are well taken care of by proper orientation of the building.

4.9.6 UTILITIES

Security lighting are provided at strategic points withing the site, water hydrants are located at strategic points withing the site. Drainnage are constructed to avoid flooding during the rain in the site. All the under ground cables are well concealed.

4.9.7 LANDSCAPE

A building is not yet complete without peffect and functional lanscape. Therefore to make this project a complete one, the general landscape of the site was put into consideration. The landscaping will not only be used to generate a pleasing and satisfying visual effect but also used to achieve satisfying their performance. Landscaping will be used to reduce possible air-born sound/noise, dust catching and air filteration, visual privacy and reduction of sun glare.

The natural landscape elements stand to be used in this project are the carpet grass, palm strees, hedges, flame of the forest, pride of Barbados, locusbean, cashew trees etc. Furthermore, lard landscape such as precast concrete slab for used in this project.

4.9.8 CONCEPTUAL ANALYSIS

A building must have a strong concept that is architectural. A concept is an idea that integrates the various notions, observations and belief into a whole. It implies appropriatencess and has to support the main intentions and goals of the project.

In the case of the Railway station, there is a strong central idea involving the requirements are the way these spaces are interconnected, their manner of growth and progression, that are vital and of great interest.

When a door opens a great deal of space is pushed forward, spilling into adjoining areas in either a confronting or embracing mode, this continous action releases a set of perspectives which accentuate pre-planned focal points. The integration of the space in the manner just described implies a degree of complexity of arrangement which permite the individual or visitor to enter into a personal relationship with the home environment. Since indoor and outdoor environments are equal parts of our life the progression from the interior spaces outwards and Vice-versa are planned as a study and experience in movement, transition and connections.

Architecture is an expresion of a society and it is truly organise when planned for human happiness and experiences. A good building is the greatest of

poems; it is a living entity, an individual, and and should embody and express life. Houses are, therefore, extensions of people and are most satisfactory when they reflect the individual. In recent times house have become clearly an instrument of the family's social role, status identification are love, sociability and a sense of belonging, the cardinal objective of housing is to make people feel physically and emotionally happy.

Every building site has an existence of its own and should be seen in the context and tradition of its region. At the start, the architect must, for each new building, identify, analyse and synthesise all factors. This means that he is obliged to carry out a comprehensive study of the relationship between the proposed building and its site. Between the site and it large environment and between the environment and public infrastructure.

A global approach to site problems, which includes the inventory and analysis of the behavioural environment, will no doubt highlight design constraints and opportunities to be considered in the design process. The usual practice, whereby buildings are designed out of environmental context, stems from the great urge in creative persons to rape a virgin site and abscond.

4.9.9 4.9.1 DESIGN APPROACH

Essentially the Railway station shall comprises of station house Arrival, Departure and staff office, a passive canteen that will suport the entire staff strength, staff anxilliary facilities whose scattered nature allows for easy distribution of traffic both human and vehicular. The good landscape area, Engineering Complex, staff quarters, Generator's house, and vehicular shed e.t.c. Shall constitute the anxilliary zone.

Also its upheld here, as a philosophical base, that the proposed railway station shall be a meeting point of human activities, cutting across states, racial and age barriers, and affording men and women of all walks of life an atraction base. In societal terms. Therefore, the ensuring proposal shall strive to enhance human relations in the bad to promoting peaceful co-existence and therefore become desirable for humanity.

It is the objective of this design proposal to achieve the above through the synthesis of three forms of activities.

(a) Transportation (b) Welfare centre (c) Recreation centre.

MACRO-SPATIAL CONFIGURATION

CHAPTER FIVE

5.0 FUNCTIONAL NEEDS, DESCRIPTION AND GUIDELINE

The railway station shall be self sustaining in term of facilities so as to enhance production efficiency. In other to achieve these objectives the following functional facilities shall be provided.

- Site and Access
- Station house
- Perssanges (1) Departure (2) Arrival (3) Platform
- Ware house
- staff facilities
- Anxilliary facilities
- Gallery
- Work shops
- Commercial facilities.

5.1 5.1 STATION HOUSE

The station house which is the main focus of this design shall take into consideration, the pessengers, Loads handling, railway staff, holiday makers, commercial activities as well as security of the facilities in the sorrounding adjoining properties. To achieve all these aforementioned goals, the necessary facilities and standard spaces provided in the design of the ground floor includes:-

NO	FACILITIES	UNIT	LENGTH	BREADTH	AREA
1.	DEPATURE HALL				
2.	ARRIVAL HALL				
3.	PLATFORM AREA				
4.	LUGGAGE WEIGHING AREA				
5.	TICKET OFFICE				
6.	INFORMATION UNIT				
7.	LUGGAGE ROOM				
8.	STORE				
9.	POLICE ROST				
10.	BUFFET				
11.	CORNER SHOP				
12.	WARE HOUSE				
13.	LOADING BAY				
14.	CUSTOMS OFFICE				
15.	PHONE BOOTH				
16.	GENERAL OFFICE				
17.	TELECOMMUNICATION ROOM				
18.	Signa R				

18. SIGNAL ROOM
19. STAFF OFFICES
20. TOILETS
21. KITCHEN
22. CLOAK ROOM
23. PREDARATION ROOM
24. RESTAURANT
25. CLEANER ROOM
26. DROP OFF
27. LOBBY
28. ENTRANCE PORCH
29. STAIR CASE.

In the first floor of the station house, the facilities and the space provided includes:

NO	FACILITIES	UNIT	LENGTH	BREADTH	AREA
1	BANKING SPACE	1			
2.	LETTRABLE OFFICE SPACE	1			
3	CLINIC UNIT	1			
4.	SUPERMARKET	1			
5.	OFFICE SPACE	4			
6,	SHOPS SPACE	10			
7.	STORE	5			
8.	GALLERY	1			
9.	CONTROL ROOM	1			
10.	EXECUTIVE WAITHING ROOM	1			
11.	BAR AREA	1			
12.	POSTAL SERVICE	1			
13.	BALCONY	1			
14.	TOILETS	20			
15.	SIT-OUT	1			
16.	PASSAGE	4			
17.	VOID AREA.	2			

5.2 5.2 MAINTENANCE AND ENGINEERING WORKSHOP

The maintenance unit of the railway station is to aclomodate all the aspect of engineering maintenance which shall be over-seing to the repaire and rehabilitation of the station. The engineering shall carry out day to day running of maintenace and each aspect of the engineering shall specialized on the erea of concentration. To achieve these the following unit has been here mark in the maintenance workshop.

NO	FACILITIES	UNIT	LENGTH	BREADTH	TOTAL
1.	CAPENTARY WORKSHOP				
2.	ELECTRICAL WORKSHOP				
3.	MECHANICAL WORKSHOP				
4.	CIVIL ENG. WORKSHOP				
5.	FABRICATION WORKSHOP				
6.					
7.					
8.	STORE				
9.	DISPENSARY				
10.	CANTEEN				
11.	KITCHEN				
12.	STORE				
13.	TOILETS				
14.	CLOAK ROOM				
15.	SCULLERY				
16.	PANTRY				
17.	LOADING BAY				

NO	FACILITIES	UNIT	LENGTH	BREADTH	TOTAL
18.	PLATFORM				
19.	SERVICING PIT				
20.	GENERAL STORE				
21.	GENERAL OFFICE				
22.	OFFICE				
23.	STORE				
24.	BALCONY				
25.	STAIR CASE				
26.	VERANDER.				

5.3 5.3 STAFF ACCOMMODATION

To cater for the welfare and living condition of the staff in other words will enhance their production efficiency and capacity. The following facilities shall be provided for the senior staff, a detachable 3-bed room flat, in each of the flat the following facilities shall be provided.

5.4 5.4 SENIOR STAFF

NO	FACILITIES	UNIT	LENTH	BREADTH	AREA
1.	BED ROOM				
2.	TOILET				
3.	BATHROOM				
4.	STORE				
5.	KITCHEN				
6.	PATI				
7.	WARDROBE				
8.	SITTING ROOM				
9.	DINING ROOM				
10.	LOBBY				
11.	VERANDER				
12.	COURTYARD				
13.	PARKING SPACE				
14.	ACCESS ROAD.				

5.5 5.5 JUNIOR STAFF

NO	FACILITIES	UNIT	LENGTH	BREADTH	AREA
1.	BEDROOM				
2.	TOILET				
3.	KITCHEN				
4.	BATHROOM				
5.	STORE				
6.	PATIO				
7.	WARDROBE				
8.	SITTING ROOM				
9.	DINING ROOM				
10.	LOBBY				
11.	VERANDER				
12.	COURTYARD				
13.	ACCESS ROAD				
14.	WALK WAY.				

5.6 5.6 AUXILLIARY FACILITIES

Since the centre is said to be self sustaining and an independent unit, there is the need to provide some facilities listed below.

NO	FACILITIES	UNIT	LENGTH	BREADTH	TOTAL
1.	GOOD ACCESS ROAD	-	-	-	-
2.	WALK WAYS (COVEREO)	-	-	-	-
3.	GOOD LANDSCAPE	-	-	-	-
4.	VEHICULAR SHED	5	1750	5000	26250000
5.	WATER TANK	4	4000	3500	1400000
6.	INSINERATOR	8	2100	1200	2520000
7.	GENERATOR HOUSE	1	3000	2500	7500000
8.	GATE HOUSE	1	3000	2500	7500000
9.	BYCYCLE SHED	4	3000	2500	7500000

CHAPTER SIX

6.0 CONSTRUCTION AND SERVICES

In selecting materials for building construction like the railway station it entails alot of careful paramenters. These parameter may be broadly classified into economic cirterial, mechanical properties aesthetic qualities and functional qualities.

Economic consideration in the use of materials are done on the basic of cost maintenance/fire resistivity, replaceability and durability. Usually the mechanical properties of behavious of a materials are the bases for the economic rational and aesthetic qualities, therefore becomes the main factor in this project. In the site planing, the lobbies, the courtyards and the building facade, aesthetics and functionality becomes the sole determinant.

Furthermore, durability is never forgetten, structural properties of shear, tensilc, compression, creep, plasticity, hardness resistance to errosion elasticity, softness, electrical and acoustic qualities are all of paramount importance in mechanical consideration in this project. The materials composition especially in places like the roof, walls, floors and finishes are to be carefully chosen in relation to their properties. Areas like the workshop

areafloor. Arrival and departure floor, canteen and platform floor etc. These floors has to durable and also has to satisfy the basic requirements of economy of construction and maintenance. For this project Jam using, Reinforced concrete floor slab which is to be finished with tewazo floor finish. This system of flooring is very flexible, thin is because repairs can be carried out anytime without affecting the network system of the building itself.

6.1 6.1 CONSTRUCTION MATERIALS AND SERVICES

Divers materials are employed in the design of the railway station buildings. These are concrete, steel, timber, ceramictiles, aluminium roofing sheets, blocks and bricks.

6.2 6.2 CONCRETE

Concrete is a mixture of a paste binding together an inert filler, or aggregate. The paste is formed by the chemical reaction between cement and water. The usual proportion by (Volume) range from 22 percent paste (15 percent water and 7 percent cement) and 78 percent aggregate for, stiff mixture to 34 percent aggregate for rich, workable mixture. Compressive strength, in addition to being the most important quality of concrete, is dictive of its other properties tensile and sharing strength, modules of elasticity, durability and impermeability are all divectly related to compressive strength.

6.3 6.3 MOTAR

Motar is an artificial stone - like materials consisting of a hardened mixture of carefully selected and proportioned binders, fine aggregate (sand), and water. In contrast to concrete mortar has no coarse aggregate (broken stone or grave). Some special purpose motar include acoustic motar, decorative motar and grouting motar, may contain five aggregates other than sand, mineral pigments and various admixture.

6.4 6.4 GLASS

Glass is a suspended liquid, one that is physically solide but urcrystalized, which has sufficient viscosity to prevent the formation of crystals. It is thermoplastics materials (it melts) that can be shape at temperature above 2800°F (1261°C). In it is molten state the various chemicals tend to crystallise. If it allows to cool to slowly, the compound will crystallize out of the solution.

6.5 6.5 STEEL

Steel use in building industry can be classified according to their quality, manner of manufacture and treatment, and purpose. The quality of steel is largely determined by the percentage of harmful impurities, namely sylphur (which impairs the mechanical strength of steel and is the cause of red shortness or cold brittleness), and some non-metallic enclusion. The most used grade is common carbon steel, although allow steels also find quite a number of applications.

6.6 ALUMINIUM

In the 1960s, an advance manufacturing process was integrate into practice, which made it possible to combine the continous casting of the metal with rolling. The aluminium allow band manufactured by this technique flat, corrugated, and channeled aluminium alloy sheets. Their faces could be anodized or cover with polimerfilm to protect them against corrossion and to give them a pleasing appearance.

6.7 TIMBER

Timber are classified into hardwoods and soft-woods but these are botanical names and do not always relate to hardness.

Hardwood: are from broad leave tress most of which are decidous, although only certain oaks and the majority of tropical trees are evergreens. Hard-woods include the dense, stringest and most durable timber. Some hardwoods contain vesins and/ or oils which interfer with the hardning of paints.

Softwood: Not all softwood are soft some of this variety are very hard, strong and durable while certain softwood have greater moisture movement than any softwood.

6.8 CONSTRUCTION

6.8.1 SITE CLEARANCE

Building construction usually starts off properly with the site preparation. This entails site clearance, mobilization of materials and workers to the site. It is at this stage essential things like electricity, telephone and water lines will be brought to the site. The proposed site for this centre has two existing roads along the South and west axis, this makes the site easily accessible through this two major roads, two roads access road will be constructed from the two major roads.

6.8.2 FOUNDATION AND STRUCTURAL SYSTEM

For a railway station of this nature the technology of construction, quality and durability of work are very important to the realization of the desired objective.

Though quality of construction are often affected by lack of funds change in administration, time wasting etc. especially this part of the world care must be taken in during the cause of the design to bring out the best and most economical solution to this design.

The structural element shall be mainly insitu, framed reinforced, concrete, in full (urtain walls glasing) and non load bearing walls will serve as partition walls. The foundation will be mainly of wide strip and pile foundation this is because the storey height nad the activities that the centre will undergo after construction. The foundation will be designed in such a way that it can accomodate additional one or two floors in the near future.

6.8.3 FLOOR

Various conditions in railway station will not permit one siggle type of floor construction throughout. But generally a good concrete base with various types of surfaces to suit each requirement, has been accepted. The floor must also withstand certain amount of chemical action, moisture and heavy trusking and must be sanitarilly and easily clean. The poor resistance of the concrete to acid and alkalis can be improved by using high alumina cement. Then to consider the type of floor at various sections of the factory.

6.8.4 WALLS, DOORS, WINDOWS

The walls of the proposed station house will be cement sand crete block. The workshop and preparatory room walls will be of non combustible material, this will be made possible non combustible point like epox or lab urethere will be outside coat will be finished with clay bricks.

Doors and window will be made of fire resisting materials. Electro-mechanical device for holding will be attached to the doors. Furthermore, anti theft and burglar proof will be fixed to the doors and windows.

6.8.5 CEILING AND ROOF

The roof is basically of universal steel column covered with the long spam aluminium roofing sheets with the exception of the semi courtyard that is partially roof with a Reinforced concretedeck. The choice of Universal steel girder for the roof of this centre was due to the fact that steel though very expensive but it resist the spread of five. And if well constructed and perfectly taking care of is very durable. False ceiling (suspended ceiling) will be used to the storey height of the enclosure and alos to accomodate some essential services like electric cables, telephone cables, plumbing pipes e.t.c.

6.9.9 FITTINGS

6.9.9 SERVICES

6.9.0 PLUMBING

All the plumbing work in the toilets kitchen and changing room will be concealed inside duct with service outlet in case of any repairs.

6.9.0 ELECTRICAL POWER SUPPLY AND INSTALLATION

This is the backbone of any railway station, because modern station can not be operated manually i.e it will not function with electricity since all the machines and gadget equipments and devices need electricity.

For this reason power supply to this centre should be steady in nature but increase it flunctuates from time to time on large unit single or multiple phase voltage stabilizer should be used such system are either located near the centre or near the sectoral fuse boxes.

In Nigeria the power supply ration to railway station is normally 220 volts 60Hz alternating current (A.C) while and distributed to various but puts or suckets that are either 13 AMP or 15 AMP. The amperage of the socket should never be less than the minimum value becuase of over loading.

Electrict components should be allocated to different phases of power, example all kilns in engineering workshops one phase, another phase to

machines. The source of voltage may have a total variation of 10 percent of the vated voltage including transient and steady state. Frequency must be withing ½ cycle. Both 60 cycle and 4000 cycle power are distributed withing the system, the 400 cycle being produced by a converter contained in the EDP instollation.

It is important also to provide for security and safety and internal emergency lighting system. Furthermore a standby automatic generator is required in case of power failure because an un interruptable power supply,(ups).

6.9.4.7.1 AIR CONDITIONING

This is best known to man of providing fine control of the environment inside a building complete air conditioning means, heating, cooling huminifying, dehumidifying, circulation and cleaning the air.

Both the station house, staff quarters, engineering blocks require very chose control of air temperature and humidity. The working efficiency staff are enhanced in air condition environment because of the heat generated during the working house. Dehumidifying is necessary in arriva rall section of the station house to enable cloth to dry of the sweating perssanger. The amonth of heat dissipated by a single kiln in engineering workshop is about (1000 cal/h) which is the amount of energy dissipated by an oven on a average basis.

The use of central air conditioning systems is fast being with partial central/spit air conditioning system that have a central air fan cooler and water chiller but individual temperature exchange. In the administrative block, instruction class and canteen the raised floors are to have wents that would keep air withing the raised floor in circulation. Three components split air condition design will be used. It is designed such that two of the three can handle 1.8 x 10^{o} BTO/He, while the third will be standby unit.

6.9.2.e ACCOUSTIC

Due to the location of the centre (i.e) market road) which is major source of noise, the walls will be well treated especially the station house unit walls and main staff quarter. Windows will be provided just for lightining and for ventilation. The wall will be treated with epoxy. Working in railway station require long hours it meticuours work (even engineering work also require concentration), and as such any little distraction from noise outside will annoy the users and this shall effects productivity.

6.9.3 FIRE PROTECTION

Railway station and management are generally very expensive also information are very vital therefore, in designing this railway station carefuly sedection of onon combustible materials were made especially for the engineering workshop area and station house units.

Although station house cannot cause fire but engineering workshop canteen that required kiln to burn their products can ignite fire, therefore care has been taken to locate this kiln to the outside and away from combustible materials. Also it is well finished with fire resistant materials. Most importantly the following precantion should be followed.

Fire proof construction materials such as bricks should be used in finishing the niterior walls of the product halls.

Fire proof construction materials such as fibre glass should be used on the wall of engineering block and canteen.

Waste papers should be discarded appropriately.

Fire alarm should be located at strategic place, while smoke detector should be located at each product on hall.

Combustible materials should be treated with fibre retandant e.g Lab utherane epoxy.

Rugs should be limited only to the station house.

Entrance into the production rooms should be through solidly constructed fire door.

Combustible material should not be stored in the production hall.

Fire fighting equipment such as carbondioxide conventional fire extinguisher or the central halogen gas should be used in the centre.

Water sprinler should be avoided, but bucket for storing sand can be provided.

Circuit breakers should be located at strategic locations as spenified in the B.S 476 part ':1972.

6.9.4 DUST CONTROL

Dust particles destroy the already clean walls and floors, form a thing firm on any metals and coat the surface of Black smith products, give it an unplessant appearance. As a result of this fast preventive measure is taken during the design in order to minimised the effect of dust on their finished products, and provision of air lock clobbies, and the use of high level windows, in the ware house. The window in the production area are covered with fire wire mess with tempered double glazing. This is to prevent dust as well as intensive solar glave from entering the units.

6.9.5 SECURITY

This is a very important aspect that need to be considered at the design stage considering the fact that the railway station is always regarded has hide out for truantrand thieres, furthermore care was taken to avoid niche and recess in walls in the railway station therefore their safety is of prime-important. Various security systems are to be employed in the centre to prevent theft and arson of valuable perssengers lugagge.

Limited numbers of enterance doors are provides to the centre (to be precised three in numbers). One for customers one of staff and one for lugagges. This is to control too many movement to and from the station.

Furthermore equire. Check point is located at the enterance foyer with the main sucurity/control room. The entire security networking is through the use of Digital Automated video instruction Derice (DAVID) that is a security system that makes use of sensorables that is burried on the ground at strategic points, and when an intruder matches if the sensor cable sends a signal which can be monitored on catbute vay tube screen (inform of a TV) in the security room, furthermore the sensor cables will ignite the security alarm inform of sound which will alert everybody in the centre, all this happened withing second one person matches the sensor zone which is about 4 meters apart.

Furthermore, all the windors and doors will be provided with burglary proof and the windows to the store and ware house are securely thight. The doors to the ware house is well guarded with burglary proof and the staff entrance is well secure against theft. The ppposite sides with different elements in the middles to break the monotony. More must be said on the semicircular element which were intentionally created to bring visual of alluminium alloy on the sereen is to rythm the entire outlook.

CHAPTER SEVEN

7.0 GENERAL APPRAISAL

The form for any institutional building like railway station are basically guided by elements of functionality and standards because of its uses.

Therefore, the aftermath of this project is product of through reason into railway station design putting into consideration general basic requirements, the processes, products and the users on order to achieve the desive foal.

In order to make the building stands the test of time, I try to make the design flexible through the use of suspended ceiling, this makes it easier to add socket lay-out to the whole area wherever necessary with affecting the building. circulation was made easier through simple but through planning. Natural ventilation and lighting in the lobbies were made possible through the introduction of two central courtyards. All the cables are neatly concealed in the suspended ceiling and plastic compartments. The general landscape is simple but creative, existing and man made future are taken into consideration and through careful planning, I was able to married the two together (i.e the existing landscape and proposed landscape).

7.1 CONCLUSION

The Minna railway station is an example of a modern railway terminal with adequate facilities for the perssengers and largoes processing and display of safety in transportation. If careful consideration are taken in the design of station house and other buildings in Nigeria such as with the Minna case, then one would have a highly effective and efficient industrialised rail transportation nation wide with no forestalls in effectiveness levels.

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