EVALUATING THE INFLUENCE OF ARCHITECTURAL CHARACTER ON INMATES IN THE DESIGN OF PRISONS IN NIGERIA

BY

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BY

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FACULTY OF ENVIRONMENTAL DESIGN
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NIGERIA.

FEBRUARY, 2015

DEDICATION

This thesis is first and foremost dedicated to the ALMIGHTY GOD and to all who seek advancement in penal system, promote the rehabilitation of individuals in the establishment of justice, and to architects who love to communicate humanity in their architecture.

DECLARATION

I declare that this research entitled "EVALUATING THE INFLUENCE OF ARCHITECTURAL CHARACTER ON INMATES IN THE DESIGN OF PRISONS IN NIGERIA" has been carried out by me in the Department of Architecture under the supervision of Dr. M.L. Sagada and Dr. S. N. Oluigbo.

The information from literatures has duly been acknowledged in the text and a list of references provided.

Odeh, Jessica Onahi		
Name of student	Signature	Date

CERTIFICATION

This thesis entitled "EVALUATING THE INFLUENCE OF ARCHITECTURAL CHARACTER ON INMATES IN THE DESIGN OF PRISONS IN NIGERIA, by Odeh, Jessica Onahi meets the regulations governing the award of the degree of Master of Science in Architecture of the faculty of Environmental design in Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

Dr. M.L. Sagada Supervisory Committee	Date
Dr. S. N. Oluigbo Supervisory Committee	Date
Dr. M.D. Ahmed (Head of Department)	Date
Prof. A. Z. Hassan (Dean, School of Postgraduate Studies)	Date

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ABSTRACT

The importance of the built environment in defining the character and behaviour of users has long been established. The architecture of any building is a reflection of the purpose the building is meant to fulfil. The prison system was introduced into the fabrics of society as a measure to instil justice and discipline. In recent times, the concept of rehabilitation has been introduced into the arena of prison architecture; placing emphasis on the need to create suitable environments that go beyond punishing offenders to influencing a change in their behaviour and re-introducing them into the society. This calls for architectural character which impact positively in the inmates and contributes to behavioural change. The architect has to resolve the basic problems of ease of supervision of the inmates, their security and control, with those of the usual architectural problems of function, circulation, ventilation and orientation, while at the same time ensuring that the building itself will reflect a spirit of enlightenment and humanitarianism which can contribute to the effectiveness of treatment programs for the inmates. With increasing human population, there is a consequent increase in the number of crimes and hence the number of prison inmates. It is no news that many prisoners leave the prison more hardened. The introduction of rehabilitative prison architecture will serve the purpose of reversing the trend of releasing unreformed prisoners into the society. The research evaluated the existing prison architectural character with a view to providing guidelines for the development of reformation. The study combined both quantitative and qualitative methods of research. Questionnaires were distributed to the selected prison facilities in Suleja and Kaduna (Open prison camp and Borstal training institution), visual survey, observation, and interview. The result from case studies states that only 40% of the require facilities are provided in two of the case studies visited 61.7% of the users agreed to the

fact that Nigerian prisons are in a horrible state. As a result of the above indicated the influence of Architectural character on inmates is as important and can be noticed hence a proposal for the redevelopment of Kaduna open prison camp with prominence placed on the issues raised.

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ABBREVIATION AND DEFINITION

FGN – Federal government of Nigeria

FCT – Federal capital territory

NPS – Nigeria prison service

Reformation: A general improvement in somebody's behaviour

Rehabilitation: the term given to the act of restoring an individual to a normal life.

Recidivism: The tendency to relapse into a previously undesirable type of behaviour, especially crime.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND STUDY

The prison as an institution does not attract a great deal of public attention, yet it remains a vital part of the structure of any civil society. The apparent neglect of this group of individuals and the conditions of the public prisons and other institutions mandated to manage this system can over time pose significant challenges to the well-being of the society at large (Fairweather & McConville, 2000).

Chase (1999) mentioned that the primary goal of corrections is safety for the community and for those housed and working within the facilities. Ekland-Olson (1986) stated that the increasing violence in prisons is as a result of poor prison management and control and more often than not this significant factor contributes to and promotes both individual and collective prison violence.

There is an urgent need therefore to rethink the underlying principles that governs and shape the prison infrastructural system and redevelop an effective architectural response that reflects a strong orientation towards the needs of the individual, with prominence placed upon rehabilitation rather than punishment. According to a British Politician and Prime minister of the United Kingdom of the 20th century, "*We shape our buildings and afterwards our buildings shape us"* (Winston Churchill, 1943).

Fairweather & McConville (2000) said that buildings affect people in so many ways. While some people are deeply influenced by their surroundings, others hardly will even notice their surroundings. They further stated that the physical, social and environmental conditions of the prison can be improved by an understanding of the psychology of the

users of the prison facility. Bechtel & Churchman (2002) stated that environmental irritants such as noise, lack of privacy and territory, crowding, and lack of colour can lead to aggressive behaviour, particularly in individuals already prone to violence. Well-designed buildings are those which are fit for purpose. The design of buildings can impact directly and indirectly on health (De Young, 2013).

Hence this study seeks to evaluate the influence of architectural character on prison inmates to establish a more effective design response for prison architecture.

1.2 PROBLEM STATEMENT

An unreformed prison inmate poses great danger to the well-being of individuals in the society when released. Most prisons are designed from a security and functional standpoint, even though focusing on the security aspect of prisons is important, this thesis seeks to highlight factors in prisons that do not get much attention, hence most prison architecture/design does not intentionally address issues of rehabilitation and reformation. It instead allows the rate of recidivism (the tendency to relapse into a previously undesirable type of behaviour, especially crime) to be a widespread trend among inmates in Nigerian prisons. Soyombo (2009) reported that Criminal recidivism in Nigeria in the year 2005 was about 37.3%, more also Abrifor (2010) estimated the rate of recidivism in Nigeria prison in the year 2010 to be about 52.4%. Furthermore, according to Nigeria prison data, the prisons have a capacity of about 46,698 and it houses about 47,177 inmates as at 30th June 2010, this is evidently seen as an indicator of overpopulation in the country prison and this inter alia, leads to an inadequate provision of prison facilities.

Another major cause of concern is that a good number of Nigerian prisons were built either by the colonial administration or native authorities. These prisons could be characterized as

old fashioned and most of them were constructed with substandard materials evident in their bad shape. This is beside the poor maintenance culture exhibited over the years. It is important to note that the quality and the characteristics of housing affect an individual directly and can be evident either in their physical or mental health (Wigle, 2003; Shaw, 2004).

1.3 JUSTIFICATION

In a comparison of the earlier society and today, it has been noticed that peace is gradually becoming distant and this could be traced down to the high rate of criminal recidivism. The prison system is meant for the rehabilitation of these inmates but the approach given to the handling of prison inmates release them into the society worse than when they were admitted.

The design will be done with a conscious consideration of the natural environment and how these architectural characters can aid in the reformation of these inmates.

1.4 AIM AND OBJECTIVES

Aim

This research seeks to evaluate the existing prison architectural character with a view to providing guidelines for the development of reformation.

The objectives of this research are:

i. To review the concept of prisons and its architecture.
ii. To determine the effects of architectural character on inmates reformation.
iii. To provide guidelines for the design of prisons that enhances reformation.
iv. To demonstrate the outcome of the research in the redevelopment of Kaduna open prison camp.

1.5 RESEARCH QUESTION

i. What relationships exist between architectural character and the reformation of prison inmates?

ii. Can architectural character influence individual psychology of inmates and aid in better social integration after imprisonment?

iii. How does poor prison design and condition influence prisoners?

1.6 SCOPE OF THE STUDY

This study covers the aspect of prison rehabilitation from an architectural perspective exploring how design elements and principles can be applied in prison design to contribute to the psychological reformation of prison inmates.

The study will assess the prisons and examine the extent to which the prison design addresses prisoners' reformation.

This study will highlight the importance and the role architectural character plays in the planning and designing of prison environments that are psychosocially supportive and of benefit to the inmates, the academia, the role players in criminal justice, the correctional practitioner and the society at large.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONCEPT OF PRISONS

A prison is a complex building in terms of functionality, it's a public icon where persons are physically confined and are denied their individual freedom as a means of punishment for a crime or as they wait to stand trial. Goffman (1995) said that a prison is a typical example of a total institution, a place of habitation where individuals with like situation are, cut off from the society for a considerable period of time to live an enclosed formally administered life. Opera, (1998) defines prison as a place enclosed and acknowledged by the law of the state and it is created to certify restraint and custody of individuals charged or convicted of disobeying the criminal laws of the state. Awofeso (2009) further stated that prisons and their variants are built environments whose purposeful intention is punishment, retribution, rehabilitation and deterrence. The Federal Government of Nigeria (FGN: 1990) stated that the Nigeria prisons services was founded as an institution to correct social deviants, punish and reform criminals and to complement the processes of legal adjudication and law enforcement, more also the federal government see prison as a place delimited and declared as such by the law of the nation and created to ensure restraint and custody of individuals, accused or convicted of violating the criminal law of Nigeria.

2.2 HISTORY OF PRISON

Various forms of high-custody and high-control prisons have existed over the years, these Prisons dating back to the earliest settlers at about the 7^{th} BC in ancient Greece and Rome. These prisons operated a variety of isolation cells or units commonly referred to as the

hole, networks of dungeons under the city's main sewer were generally used as a form of extra punishment for those who violated prison's rules repeatedly (Chase, 1999). Despoina 2011 stated in his thesis that the intent for the design of early prison was not a means of punishment but was to hold offenders until trial/punishment/death. Despoina further mentioned that the change was from a holding state to death penalty replacement with public gangs to a system of complete isolation of inmates and an incorporation of labour in each cell (this was an attempt to develop a rehabilitative program that will benefit the society), then came "New York silent system" in 1816 for Auburn state prison (prisoners laboured during the day and are confined at night in single cells and these inmates were asked to remain silent although their prison sentence).

In the late 18^{th} and early 19^{th} century a revolutionary change occurred which made the prison system a part of the punishment with intentions of reforming the soul, from this point the prison system has been in a constant change leading to the correctional philosophy (Despoina, 2011).

2.3 CONCEPT OF PRISON SYSTEMS

Throughout the world it can be said that prisons have many correlation, these prison location consist of diverse sizes of buildings enclosed by walls topped with razor wire. These buildings filled with armed guards and correctional officers support inmates under close supervision and control. Prison administrator place people displaying troublesome behaviour into separate housing units generally called segregation, or punitive segregation, disciplinary segregation, or another name that differentiates the units from general population housing units (Chase, 1999). In the 1980s, private prisons were seen as part of

the solution to meet the increasing pressure for prison bed space at a time (James & Garry, 2001).



PLATE I: The Rumbek Central prison in lakes and Juba central prison, S/Sudan state South Sudan

Source: Human rights watch (2012).

2.3.1 PRISON SYSTEM IN NIGERIA

Colonial prisons policy in Nigeria were said to be completely brutal at the very start particularly in the era when colonial rule was opposed. But when the colonial rule was resolutely established in Nigeria the concentration was moved from crude prisons to a more proactive prison management which focused more on the end of imprisonment in terms of policy and service delivery.

The Nigerian prison is funded and operated through the Federal Government. They make the laws that regulate the prisons. These prisons are placed under the supervision of the Ministry of internal affairs now Ministry of interior (Ayade, 2010). The Nigerian Prison Service (NPS) further stated that it now has a command structure that boast of 8 Zonal commands, 36 state commands, 1 FCT command, 144 prisons including farm centres and 83 satellite prisons with four training schools, one staff college and two Borstal institution. Osaze & Anselm (1996) said that for so long it has been claimed that the NPS is tripartite in nature, stating that:

i. The service is responsible for the safe custody of persons legally interned,

ii. The service provides treatment to the inmates, and

iii. It seeks to rehabilitate inmates.

The conditions that exist in most prisons today in the country can best be described as inhumane though, most prisons suffer overcrowding and lack of facilities that these inmates are entitled to. These prisoners get to face psychological and serious health problems.

Osaze & Anselm (1996) mentioned that some of the prison personnel are the administrators, and the correctional officers. Omorotionwman (2005) said that the Nigerian prisons are in sordid state and the conditions under which prisoners live are pathetic, unkind, wicked and anti-development, retrogressive and do not meet modern and international standards for prisons inmates all over the world.

2.4 PURPOSE OF PRISON

In general, this facility was created with the sole aim of using the facility to protect the society from criminals. The emphasis placed on the goals of a prison differs from country to country. Hence, differences in prison policies in different countries depend on the society's experience with managing criminals, as well as its trial with different ways of correcting and improving prisoner behaviour. For example, although prisons in the United States also include rehabilitation and reintegration programs, they place emphasis on

i. Societal protection,

ii. Crime deterrence, and

iii. Just-deserts justice (National Council on Crime and Delinquency, 2012).

The prison system of Germany places emphasis on

i. Strict discipline,

ii. Reflecting a trait commonly ascribed to German culture.

The administration of German prisons is military-like and rule-oriented. Consequently, inmates in German prisons experience a more highly regimented routine than inmates in most other prison systems in the world.

South Sudan prisons have several shortcomings because they are under-equipped, under-staffed, and under-trained, there are also cases of physical abuse, a clear violation of basic human rights standards. Human Rights Watch, (2012) stated in one of their journals that all the country is facing today is due to the neglect of the government on the issues of human right. The major purpose for the incarceration of defaulting individuals in a society could be as a result of; Societal protection and crime deterrence, Retribution, Rehabilitation and reintegration.

The prison system can be said to have been effective in the detaining of inmates for the duration of their imprisonment. However, the same cannot be said about the effectiveness of the prison system in producing a positive influence and achieving rehabilitation as shown by the high prevalence of recidivism (the relapse into a previous undesirable type of behaviour especially crime). This crime has consequences and implications for social and economic growth and development (Abrifor, 2010).

2.5 TYPES OF PRISON IN NIGERIA

According to Osaze & Anselm (1996), the prison system that has been established in Nigeria is of various classes. These are the Maximum security prisons, Convict/medium security prison districts, Prison lock-ups, Open prisons, Borstal institution and Prison farm centre.

2.6 SUITABLE LOCATION FOR PRISON FACILITY

Margot (2007) said that before the design proper of a prison the location of this facility should be thought of carefully. Though there has been serious conflict on the suitable location for a prison, some schools of thought think that a prison should be located within a neighbourhood so as to ease and reduce the feeling of alienation of the inmates, more also to aid their integration to the society but the fact about locating a prison in a neighbourhood is that many families will firmly oppose the inclusion of an incarceration facility within their neighbourhood.

Fairweather & McConville (2000), said in the book "Prison Architecture" that the incarceration facility should be placed within reasonable proximity from the society where the prisoners will feel close and connected to the community which they have their closest ties. It's important to have these prisons within reasonable distance so that the court will find it convenient to serve and also for the supporting legal community of defence, prosecution lawyers and probation officers. Fairweather & McConville further stated that it's important to note that an isolated prison is not desirable and more difficult for staff due to the fact that they need the support and facilities that a normal community can offer in terms of housing, shops, schools and leisure activities.

Margot (2007) further stated that the consideration of the plight of these prisoners that might be violent makes the location of these incarceration facilities to be slightly outside the community, making this the better option for the location. The placement of these incarceration facilities however should not be too far away from the society to totally exclude the potential involvement of the community with these inmates.

2.7 STANDARD FACILITIES REQUIRED FOR A PRISON

According to a web publication https://www.sdsheriff.net/jailinfo/title 15.pdf, some major facilities required in prisons are:

i. Lobby and visiting area with public restrooms adjacent, baby changing, telephone and a drinking fountain, visitors' locker for coats
ii. Intake, booking, classification, transportation, and release
iii. Administration, security administration, and central control
iv. Housing for staff
v. Separate units/cells/dormitories for inmates
vi. Inmate programs: library, education, counselling, religious programs, recreation, vocational training and industries
vii. Health services
viii. Food services/canteen
ix. Laundry
x. Maintenance
xi. Warehouse
xii. Space for visiting of inmates and contact visits
xiii. Dayroom
xiv. Exercise and recreation
xv. Barbering and cosmetology services etc.

2.8 PRISON ARCHITECTURE

2.8.1 CHARACTERISTICS OF EARLY PRISON ARCHITECTURE

Some examples of prison architecture could be seen in some of the early prison architecture:

i. The Panopticon prison which was designed by Jeremy Bentham in the year 1748-1832. This architecture of the prison is such that none of the prisoners can categorically say if they are been watched or not. the figure below shows the plan and an elevation of ponopticon prison.

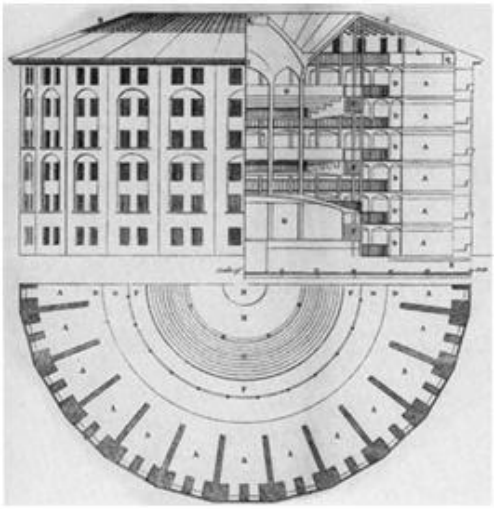


Figure 2.1 Ponopticon prison

Source: Hektoen international journal of medical humanities (2011)

Foucault, (1989) said the prison was designed such that it has a circular structure, a domed roof and cells arranged in tiers on the circumference of the circle. The centre contains the "inspection house," from which the warders are able to watch the prisoners. Bentham's idea brought the design of Dutch panopticon prisons and notable changes were made to the walls and doors of the cells to be solid, so that inspection is impossible.

ii. Radial design is also one of the early prison which was designed in 1830. The main intent of this design is that it serves its purpose. In early 1800's, model for intermittent surveillance was developed. This penal system with the aim for reformation in design permitted the design of separate confinement that enabled inmates' self- reflection a typical of this description can be seen in the fig below.

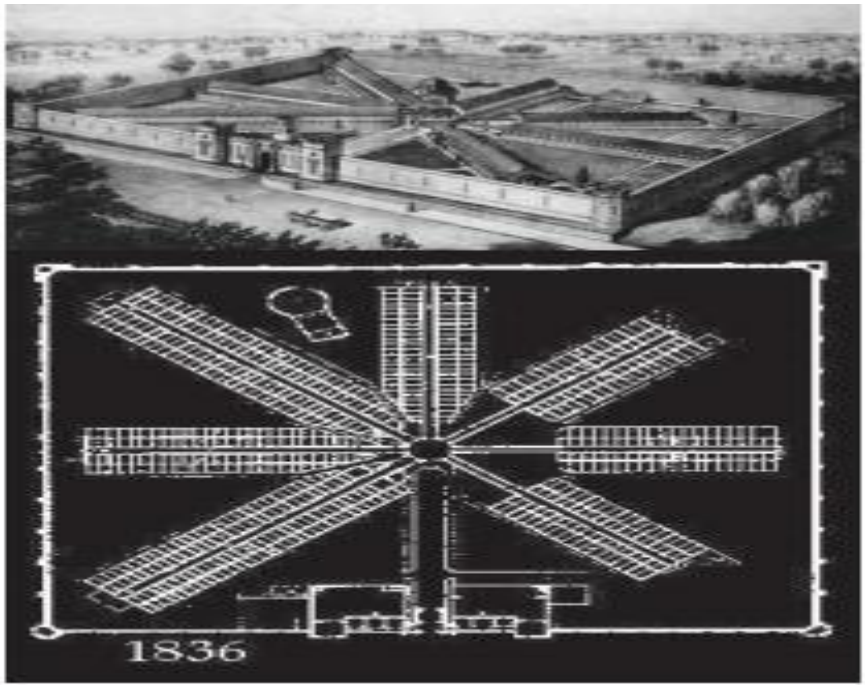


Figure 2.2 Eastern state penitentiary Philadelphia, Pennsylvania

Source: Despoina, 2011

The Eastern state penitentiary, Philadelphia, Pennsylvania was built in 1829 and it was the first to adopt the separate system. The architectural plan a control centre at the hub, with about four to eight radiating prison blocks. The prison blocks are visible to the staff but the staff can't see individual cells only if the staffs enter these individual prison blocks (Despoina, 2011).

iii. Centralized design is one of the early prisons, it was designed in 1970. This generation of prison facilities applied an indirect surveillance, the fig 3 below

shows that the design allowed for services to be centralized control with an aim of having a minimum security.

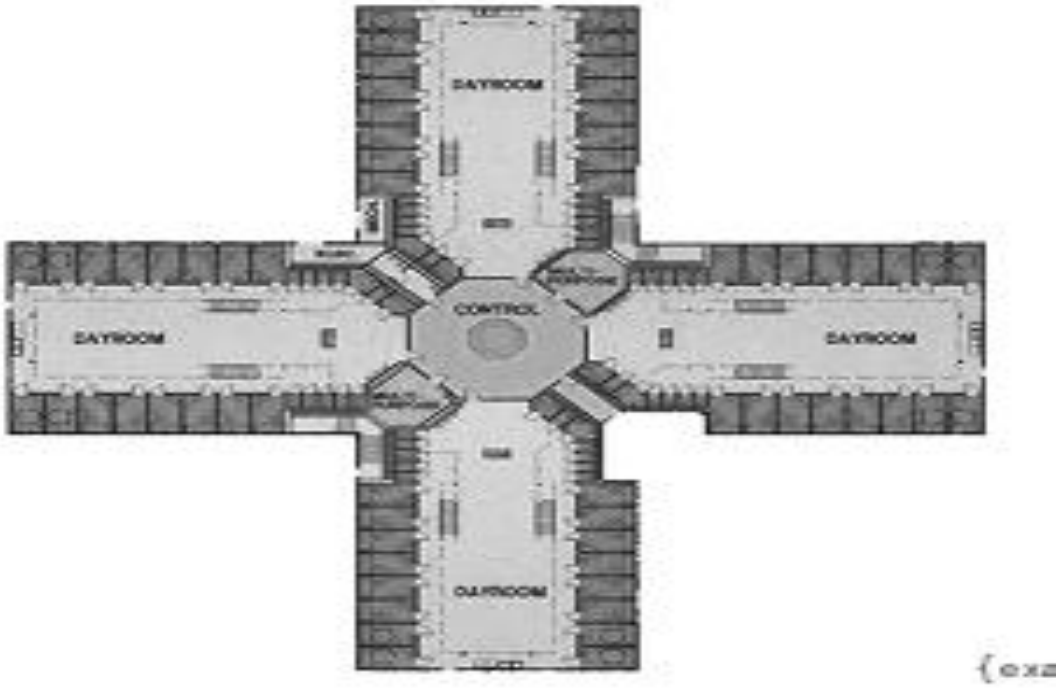


Figure 2.3 Centralized design

Source: Despoina, 2011

The program services and the activities took place within dayroom spaces; they had heavy barriers and supervised movement. This design was to resist abusive behaviour rather than preventing them. This design was a push to further studies.

iv. Decentralized/Podular design : This generation of prison had manageable units with no central service and no direct supervision, with an aim of providing inmates with a normal environment and to prevent negative behaviour. Large prisons are divided into small units and are controlled by prison staff. A key character of the facility was to confine inmates to an environment “as normal as possible” which

will be beneficial to both inmates and staff with their safety and security at heart. The diagram below shows the layout of this prison.

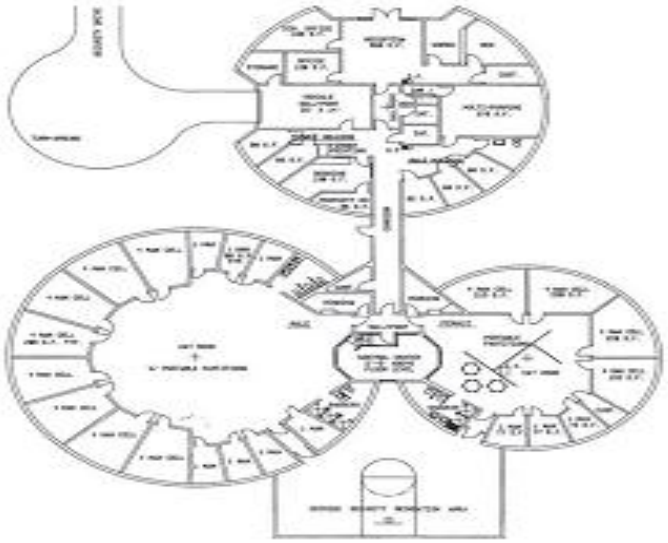


Figure 2.4: Decentralized/ podular design

Source: Despoina, 2011

2.8.2 EXAMPLES OF VERY RECENT PRISON ARCHITECTURE

i. Leoben prison: The prison was designed in 2009 by Muller architects (Josef Hohensinn), it was built in glass with structure of wood. The building has a shining office-like appearance. Some major features of this prison include: private rooms for all inmates, cafeteria, gym, indoor courts.



PLATE II: Interior/exterior of Leoben prison

Source: Despoina, 2011

ii. Halden prison: The Halden prison is located at Norway; it was designed to house about 252 inmates in the year 2010 by Architect Eric Moller. However there is a little of brutality when inmates arrive at the prison though, the perimeter walls are finely finished but they were constructed with intimidating mass of concrete. Some of the key features of this prison include: the sensitive landscape, light buildings with local timber on display, large window for interaction between inmates, staff and their surroundings.



PLATE III: Halden prison, Norway

Source: Sturley, (2010)

iii. Bastoy Island: This prison located at the Oslo Fjord is one with an unusual setting compared with the other prisons in the world. The facility is made up of four bedroom cottages with each inmate having his own space. This facility appears more functional, clean, humane, and professional than any building ever built and this correctional system focus on rehabilitation rather than punishment. The inmates here work and live a normal life with an aim of preparing them for release. The new arrivals are trained on how to cook, clean and look after themselves (Despoina, 2011). Although the facility made provision for a comfortable environment but the remote isolated location could cause a problem of reintegration.



PLATE IV: Bastoy prison

Source: Despoina, 2011

2.8.3 PROPOSAL FOR FUTURE PRISON

Henley, (2003) described the 21st century prison accommodation as U-shape around a central atrium open directly to a walled garden to the south lit by a large window facing

south and skylight. The spaces surrounding the cellular space include a house office, classroom and subject room, kitchen, gym as well as prisoners and staff WCs.

Despoina (2011) stated that the vertical prison designed by C.K. Toong in the year 2010 and the creative prison designed by W.Alsop in the year 2006 are to focus on activity and work to produce necessary resources to the outside world. The vertical prison is built on the top of an industry raised by structural steel columns.

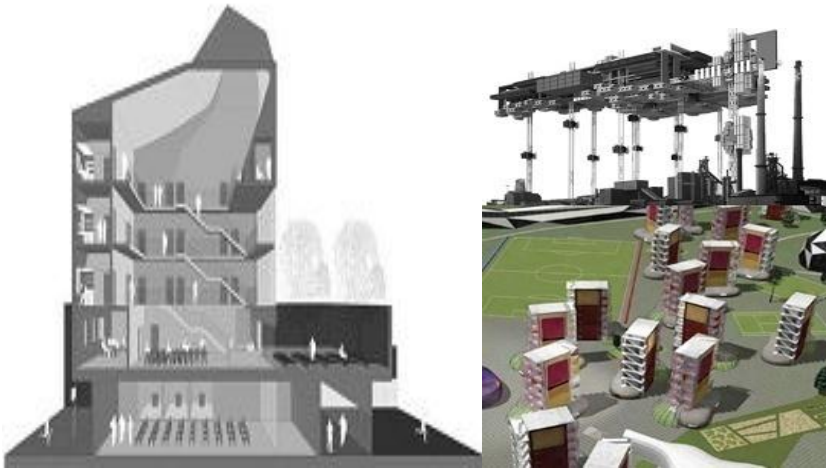


PLATE V: Future prison

Source: Henley, 2003

2.9 PSYCHOLOGICAL CONSIDERATION IN PRISON

Psychology is important because it attempts to appreciate the processes of development of human behaviour in persons and to highlight these factors which have significant effect, Psychology generally deals with human behaviour, feelings, thoughts, actions, motives and the emotions of both men and women (Girma, 2005). Psychology is the science of behaviour and mental processes of both humans and animals, it is the science of human

behaviour and experience; psychology is also the study of behaviour and mental processes (Coon & Mitterer, 2010).

Psychology as an experience to every individual irrespective of the age, the colour, the size and any characteristics of classification of human beings means in essence that there is a need to look at these general psychological needs that affect individuals in prison environments. Fairweather & McConville (2000) stated in their book Prison Architecture (Policy, Design and Experience) that the prison experience is generally traumatic and stressful for most inmates, and harmful to the physical and mental wellbeing of many but that there are some element common to most penal institutions, these include: the importance of the built environment, the location and the size of the institution, the operational philosophy, violence and the fear of violence, the satisfaction and perceived safety of the staff, and the relation of all these to design and construction. Fairweather & McConville further stated that the changes in behaviour may be as much as a result of management measures and personal characteristics of inmates and staff as of their environment.

The inability of staff to feel happy with the quality of their environment and the buildings, affects the working condition of the staff and this in turn will affect the inmates directly or indirectly. Stress related effects of confinement are fairly obvious and more in crowded maximum security prisons than in un-crowded minimum security prison environment hence these overcrowded prisons tend to be less effective. By creating supportive environments, which promote privacy, security and social interactions one can improve both the working conditions and the rehabilitation environment. Recent research has shown that healthcare environments that are welcoming, inviting, enriched by beautiful

objects and create space for social meetings can positively affect patients by making them more receptive to rehabilitation (Edvardsson, D. J., Sandman, P. O. & Rasmussen, B. H. 2005).

2.9.1 PSYCHOLOGICAL CHALLENGE IN PRISONS

There are various methods of influence and these methods vary according to the degree of harmony or conflict of interest between those who influence and those who are influenced. Hence, behaviour is the reaction of an individual to a particular environment, which means that the environment exerts influence on individuals and these individuals perceptions (a person's immediately experienced) differ. What appears spontaneously in consciousness is the result of thinking, not the process of thinking (Richards, 1999).A major challenge within the prison facility is as a result of the individual differences in behaviour, the way people do not react in a similar way to the same situation, and also the architectural design is one of many other variables that affect the change in behaviour of inmates and staff (Fairweather & McConville, 2000).

2.9.2 PERCEPTION IN PRISONS

This fundamental topic in psychology is concerned with the nature of information obtained through the senses and the way in which we interpret such information, more also Sensation and perception are the starting points for all other psychological processes (Girma, 2005).Perception can be defined as a process by which individuals organize and interpret their sensory impressions in order to give meaning to their environment (Robbins, 2001). Girma (2005) stated that in other to understand perception to have a better

understanding of the subject matter of sensation and perception, we need to talk about basic laws of perception.

Laws of perception

In the perceptual process, the senses work together to provide us with an integrated view and understanding of the world.

i. Gestaltists concept of perception:

Gestalt is a principle of how we organize and construct pieces of information into meaningful wholes. These principles are further explained through meaningful whole as: closure, proximity, similarity, and simplicity. These principles are said to be the laws of Gestalt perception Girma (2005).

ii. Form Perception

The sensory inputs we receive come into our awareness as shapes, patterns, and forms. We do not ordinarily perceive the world around us as patches of colour, variations in brightness, or loud sounds. Instead, we see tables, floors, walls, trees, and buildings; we hear automobile horns, footsteps, and words.

Van den Ban & Hawkins (1988) defined perception as the process by which we receive information or stimuli from our environment and transform it into a psychological awareness. Perception also refers to the way the world looks, sounds, feels, tastes or smells. The physical environment is a very vital cursor to our perception of the world and the work environment which encompasses a main chunk of our daily lives (Lynch, 1960). Our surrounding environment is perceived and can be assessed as a result of our impressions based on our sight, hearing and touch and can be emotionally gauged by our understanding (Lynch, 1960). Hence Toch (1977) recognized eight environmental

concerns of prison inmates: privacy, safety, structure, support, emotional feedback, social stimulation, activity and freedom.

In analyzing environmental perception in a prison environment the reaction of these inmates to their surrounding could be as a result of either a high quality design or a poor quality design, this in turn affects the way people behave. At least prisons should be very healthy both physically and mentally (Fairweather & McConville, 2000).

2.9.3 BEHAVIOURAL CONCERNS IN PRISONS

Behaviour when looked at in a broad sense talks about all types of human activities (Girma, 2005). The behaviour of an individual is as a result of the fact that our surroundings (Environment) influence not only the way we think but our intellectual development (Popow 2000). Environmental psychology is the study of transactions between individuals and their physical settings. In these transactions, individuals change their environments, and their behaviour and experiences are changed by their environments (Gifford, 2007).

The psychology of our Environment examines people's motivations illustrating that people naturally seek out places where they will feel competent, confident, where they will feel safe (Popow, 2000). Girma (2005) said that Psychology discovers and explains the underlying laws and principles of behaviour. Its goals are describing, explaining, predicting and finally modifying human behaviour within their environment. Girma further stated that Environmental psychology works at three different levels of analysis:

i. Fundamental psychological processes like perception of the environment, spatial cognition, and personality as they filter and structure human experience and behaviour,

ii. the management of social space: personal space, territoriality, crowding, and privacy, and the physical setting aspects of complex everyday behaviours, such as working, learning, living in a residence and community, and

iii. Human interactions with nature and the role of psychology in climate change (e.g., Gifford, 2008)

Prison as a space and as a "function" is not forcing them to a specific order but the spaces are to help inmates choose their own way and time of experiencing the space, function, and living (Despoina, 2011). Dilani (2008), opined that qualities within an environment that can be said to be psychosocially supportive stimulates and also engages people socially, mentally and supports an individual's sense of coherence (interconnection).

Fairweather & McConville (2000) mentioned that a prison has two effective layouts, these layout include the prisons using indirect supervision and the prisons with direct supervision. Prisons with indirect supervision are prison where inmates are allowed to occupy their own territories and staffs have their own territory to occupy too, this type of setting makes the supervision, control and the interaction of these two groups difficult. Some major characteristic of indirect prison supervision include: central open galleries with the cells off a series of landing and in enclosed corridors. Such design of a prison layout, presents every prisoner with a feeling of alienation and this further makes it difficult for the wardens to control and reach the inmates.

Prisons with Direct supervision are ones that have a much larger central association surrounded by one or two storey of cells, the central space provided could either be triangular or rectangular and this creates room for staff to inmates contact which leads to positive relationships and it also gives room for better surveillance of these inmates and also better security (Fairweather & McConville, 2000).

2.9.4 CONCEPT OF SPATIAL MEMORY

An attempt to describe the environment arises from the study of animal and human navigation and behaviour. It is generally taken for granted that specific spatial behaviour beyond the sensory horizon such as route planning needs some form of internal representation (Tversky, 1993; Montello, 2003; Wiener, 2004). A complex mixture of spatial attributes, auditory perception, personal history, and cultural values, auditory spatial awareness manifests itself in at least four different ways.

i. First, it influences our social behaviour. Some spaces emphasize aural privacy or aggravate loneliness; others reinforce social cohesion.
ii. Second, it allows us to orient in, and navigate through, a space. Hearing acoustic objects and surfaces supplements vision or, in the case of darkness or visual disability, actually replaces vision.
iii. Third, it affects our aesthetic sense of a space. Devoid of acoustic features, a space is as sterile and boring as barren, gray walls. Just as visual embellishments can make a space aesthetically pleasing to the eye, so aural embellishments can do so for the ear, by adding aural richness to the space.

iv. Fourth, auditory spatial awareness enhances our experience of the space. The physical acoustics of a space merge with sound sources to create a unified aural experience. Space then becomes an extension of the vocal art performed within it.

Richard (2002) writes that, "The Sense of place can be conceived as a collection of symbolic meanings, attachment, and satisfaction with a spatial setting held by an individual or group. Richard further stated that if an individual feels a great sense of attachment to a particular space and will likely act to protect the qualities of that place. Pol & Angela (2002) affirmed that people with a great sense of attachment are more likely to have a higher tendency to sustain behaviours. Many fields of research, like psychology, architecture, interior and graphic design, have taken a closer look at the built environment and human consciousness of spaces; and the consciousness of these spaces can have a direct impact on perception of space. Specifically, this perception has implications in the field of Rehabilitation design and the environment's capability to contribute to a person's feeling of privacy. Canter (2001) and Valena (1994) noted that one origin of the human interest in carefully designing architectural spaces has evolved from the experience of natural places. Space is more than an idealized category of experience, it is a pre-supposition of existence and life, hence the relation of consciousness to the environment is completely intentional but space is the medium for actions (Franz, 2005). Meanings are created by buildings and spaces; we read them as we pass through them. The built environment provides the setting and backdrop by which we live our lives, and impact our senses, our emotions, participation in physical activity and community life, our senses of community, and general wellbeing (Lain, 2000). A description of system that aims at covering the major physical factors influencing the effective experience of architectural

indoor spaces should include the following properties: Overall colour tone and intensity, Absolute dimensions, Space proportions, Degree of complexity, Order patterns, Openness of the space boundary. These systems alone cannot claim that they completely capture the emotion-affecting properties of architecture, but they do offer useful basis for more comprehensive description systems (Berlyne, 1972).

2.10 CONCEPT OF CORRECTIONAL FACILITY

Otero, Brownfield, Posner, Jacobs (2012) identified that correctional systems and prison systems are not the same. He further stated that corrections systems are systems that do not just contain and control prisoner but it is a system that provide the prisoners with an opportunity for change a successful re-entry into the society by offering education and vocational programs, drug treatment, and life skills training etc. hence correction is a process. Thigpen, Beauclair & Carroll (2011) stated that the primary goal of corrections is safety for those housed and working within the facility and the community. Former United State Supreme Court Justice Warren Burger said, "We must accept the reality that to confine offenders behind walls without trying to change them is an expensive folly with short-term benefits. A typical correction facility can be illustrated in the diagrams below:



Figure 2.5: The creative prison; creative thinking within the prison estate, rideout

Source: Mellor, 2006.

Todor 2012, stated that the design of a correctional facility and the environment has an effect on the moods, feelings and behaviours in the design of youth detention centres, Fig 6 is an illustration showing the relationship between the architecture, psychology and prison systems

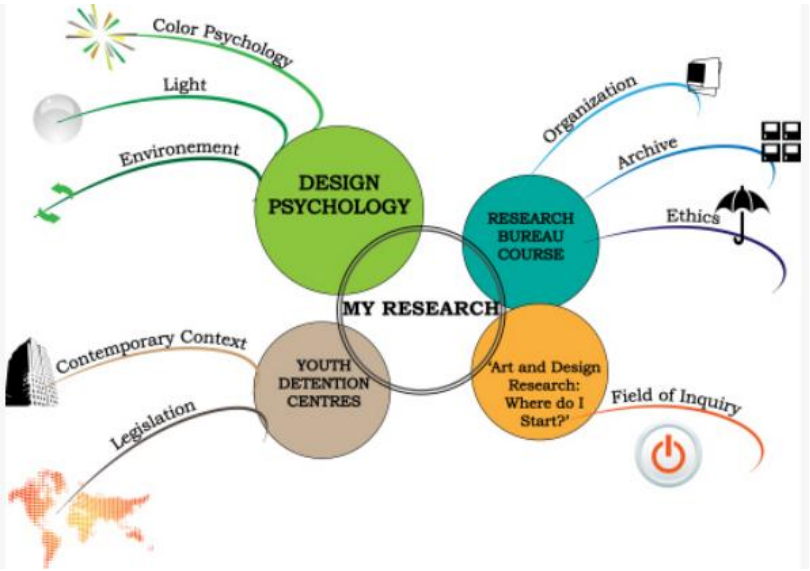


Figure 2.6: Rehabilitation by design

Source: Todor, 2012

According to designer Janet & Myron (1981), stated that in utilizing environmental design for a good interaction four factors are at the forefront of creating a positive experience within a Reformatory environment: (a) way finding, (b) physical comfort, (c) regulation of social contact for privacy, and (d) symbolic meaning.

However, Evans, (2003), hypothesized that certain architectural features in design elements may enhance restorative processes. He said that these architectural features support fascination, curiosity, or involuntary attention to enhance recovery from mental fatigue. Evan further gave some examples of such design elements that supports recovery as views of nature, indoor plants, fireplaces, fountains, aquariums and animals (e.g. an aviary) as well as paintings of landscapes and other coherent, tranquil scenes.

2.11 ARCHITECTURAL CHARACTER OF PRISONS

Architectural character can be seen as the composite of physical attributes and features that together display an overall integrity (Norman & James, 2008). Created spaces are made up of some detailed elements of design, the components, and the building blocks of design, these elements are ingredients of design and they include: line, shape, colour, value and texture. All these elements put together skilfully create effective visual communication (Tersiisky, 2004).These elements are used in the conceptualization and the design of architectural spaces and forms making them the necessary ingredients that are arranged to bring about the design principles, and these design Principles are: Balance, Unity, Variety, Emphasis, Pattern, Repetition, Proportion, and Rhythm (Brainard, 1998). Margot (2007) stated that the prison architectural character has been categorized into three and these include: the non-radial, Radial and circular. Most times the non-radial has been designed into U-shapes, or Hollow rectangles, and these designs were chosen because the health and

the security from escape were of top most priority. But these designs have been proven less desirable because they make the supervision of these inmates difficult due to the lack of one central location. Brainard (1998) further said that a number of design principles are applied to achieve a desired quality in the design of space and forms of buildings, as a result an interplay of these design principles combined together portray an architectural character**.** Architectural character is developed as a result of a systematic combination of design elements in architecture which by a careful harmony generate the principles of architecture, these principles when combined appropriately form the architectural characteristics that could be seen in different buildings. The element of a building is the canvas on which the paint of architectural character is portrayed. Some character of a building could be seen in the: Walls, Roof, The landscape, Windows, Doors, Gates, Entrance porches, Lobbies, Terrace, Floor. Since buildings in general have some characteristics, this means that there are some characteristics also for correctional facilities. Becker & Steele, (1995) contributed that the model of the physical settings (i.e. architecture) and its influence on individual and the organization value can be represented in a diagrammatic form shown below.

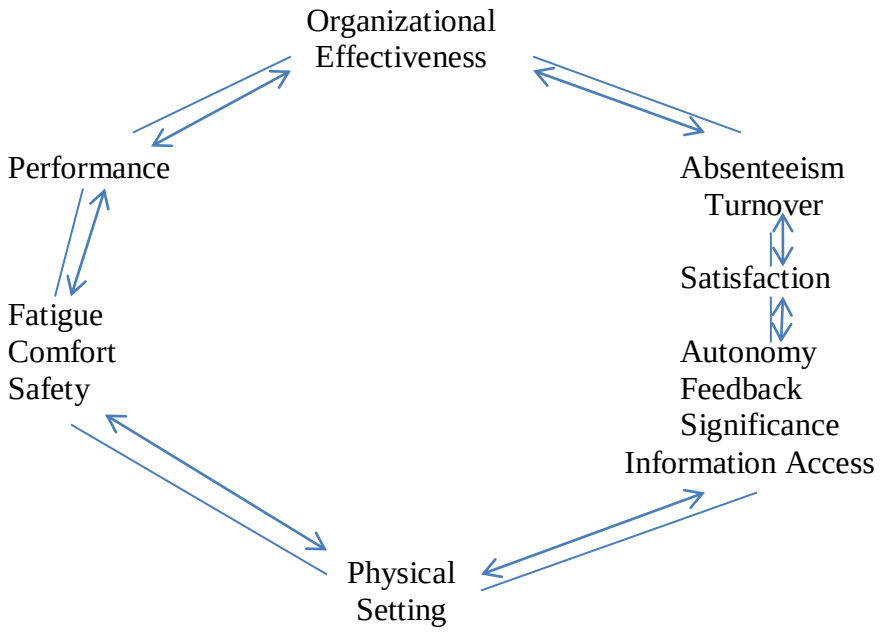


Figure 2.7: Architecture and it influence on individuals

Source: Becker & Steele, (1995)

Morris & Rothman, (1998) stated that a typical of early prison architecture was cellular design and this shows that prison architecture got their template from churches and monastery buildings but this obviously had an effect on prison architecture. Morris & Rothman further said that Modern prison design emerged from modern concepts of punishment, such as deprivation of liberty through austerity and lack of privacy. The implications of prison architecture, however, are far more than the mere idea of punishment, including effects on the health of inmates and custodial workers. But on the other hand security considerations and austere living conditions are the principles that brought about modern prison development, although attention is sparely paid to the healthy living environments for prisoners. Prison architecture is therefore a likely undervalued but important contributor to prisoners' health.

A Comparism of the architecture that characterized buildings from 1298 onwards, early prisons were characterized by thick walls, round arches, sturdy piers, groin vaults, large towers, decorative arcading and symmetrical plans. However, externally, many of these early prisons resembled fortresses, and some such as the Bastille prison in Paris were converted fortresses. Internally, however, the cells were built to resemble the "house of penitents" found in certain monasteries bare rooms with a solitary window and a door that enabled inmates to be seen by their jailers. The architectural character of a building can be pointed out through some influencing qualities and physical properties.

2.11.1 INFLUENCING PSYCHOLOGICAL QUALITIES

The following are some of the influences of the built environment: social influence of the built environment, psychological influences of the built environment, physical influence of the built environment (Neil, 2012). The social and the psychological influences are more inanimate and they are focused on the role the physical built environment plays on the reaction of individual. Grosenick & Hatmaker, (2000) the physical environment of a prison can be therapeutic in experience and these experiences in architectural design include:

i. Comfort:
ii. Conveniences
iii. Safety
iv. Attractiveness
v. Size
vi. privacy, and arrangement
vii. Welcoming environment
viii. Homelike environment

The experiences of these spaces are as a result of some influencing physical qualities.

2.11.2 INFLUENCING PHYSICAL QUALITIES

Some other influencing qualities and the physical properties which are visible to the eye include:

i. PROPORTION OF SPACES IN THE PHYSICAL ENVIRONMENT: An area created by colour, value or texture (Arntson, 1998 & Stewart, 2002). Stewart further said that the mass or volume is a three-dimensional shape with height, width and at least the appearance of depth. Choosing dimensions of a building in relation with another serve as a compositional link and this supports the internal consistency between different parts but in indoor spaces and this can be seen in how one can relate structural parts to each other. These parts include: the proportion of window to room size (Alexander, 1967).Even a high ceiling can contribute to a less sense of crowding. The area of a room might be the same but one differentiating factor between two rooms will be the ceiling height, and the sizes of the windows to the room size. People perceive room with a high ceiling as lighter and more spacious. A study carried out by Kaya and Erkip (2001) showed that some participant that were closely watched living in a room with higher ceiling were significantly more satisfied with their rooms than participants in the control group. A 1986 study by West as cited by Heerwagen (1986: p. 47-51) evaluated

> "*The effects of light on health by evaluating prison inmates with different window views. He found that inmates with windows facing a meadow or mountains had significantly lower rates of stress-related sick calls than inmates with a view of the prison courtyard and buildings. Furthermore, inmates on the second floor had lower rates of stress-related sick calls compared with inmates on the first floor. Reasons for the differences in sick calls included a more*

expansive view from the second floor, which provided increased positive psychological benefits. Inmates on the first floor had added stress from lack of privacy because of visibility to passersby".

ii. COLOUR: this is a property of light and it is usually visible when light is emitted or reflected (Lauer & Pentak, 1995). Colour can be determined by the wavelength of light (Bevlin, 1994). Colour has long been known to have an influence on human psyche and these emotional responses are said to be symbolical and also psychological (Lang, 1988). Mehrabian & Russell (1974) said that colour attributes causes emotional response in three different dimensions: valence, arousal, and dominance. Colour in a way bring pattern out, pattern with colour combination has the ability to act as stimulating or relaxing. Pattern can be applied to the floor, the walls and objects so as to increase the contrast within an environment (Brytton, 2010).

Table 2.1: Colour effect of perception on time, size and volume

Colour	Perception of time	Size	Volume
Warm colour: red, yellow, pink, ivory, cream, peach, lemon, coral, rose, wine.	Time is over estimated	Things seem longer and bigger	Decreases apparent size of rooms
Cool colour: green, violet, blue, bluish-green, turquoise, lilac, lime, jade, aqua	Time is under-estimated	Things seem shorter and smaller	Increase apparent size of rooms

iii. LIGHTING: Is a great concern because the influence of light is an important factor for the atmosphere of rooms. Flynn (1988) said that the artificial lighting of interior spaces is of three dimensions namely: the direct overhead light, indirect overhead light, and indirect peripheral illumination. La Garce (2004) tested the influence of different illuminations on Alzheimer patients and positive effects of illumination

daylight were found on patients' behaviour. A study by West that was made reference to in Heerwagen (2004) found that inmates who had various views from their windows, such as vegetation or mountains had lower sick related cells than the ones who had their windows oriented to the courtyard where noise from passers-by emanated. Natural light is generally known to be a remedy for curing skin diseases.

iv. DAY-LIGHT, SUNLIGHT AND WINDOWS EFFECTS ON HEALTH: The sun is the most significant source of light and we all are dependent on it (Jaeden, 2012). Jaeden further stated that the sun is very good and also free resource of light, sunlight can entre inside a room of approximately 20 meters. Robbins (1986) said that Day-lighting within interior spaces improved mood, enhanced morale, lower fatigue, and reduced eyestrain. One of the important psychological aspects from day-lighting is a need for get in touch with the outside living environment.

v. SPATIAL FORM: Spatial form is seen as the primary dimension of architecture but spatial form is composed of density of space, scale, interaction between colour and space.

vi. MATERIAL AND CONSTRUCTION: flooring, ceilings, walls the type of material used will determine the Noise and health promoting sounds an individual will get within a space.

vii. NATURE: the use of plants in healthcare facilities doesn't only have an effect on the employees, but it can ease users of the stress and the anxiety (Brytton, 2010). Natural environment helps individual to regain strength through relaxation in recreational areas (Dilani, 2008). Kaplan & Kaplan (1989) stated that there are two types of attention system the direct and the indirect attention system. When an individual faces

an intense period of direct attention that individual will need a time out to restore his strength or will be faced with mental exhaustion, such people often become impatient and irritated. Hence such individual become careless, less cooperative and less competent (Kaplan & Kaplan, 1989). (Kaplan & Kaplan 1989; Kaplan 1995; Herzog et al. 2003) said an atmosphere where an individual's need for compatibility and harmony are met could be only gotten in a natural environment.

viii. ACOUSTICS: **(**Fairweather, 2000; Janssen & Laike, 2006) stated that high noise level disturbs sleep, complicate communication, and increases stress level. (Dijk, Souman, De Vires, 1987) maintains that noise can lead to stress, contribute to irritation and cause stress related diseases. Noise can increase an individual's blood pressure, it can contribute to mental exhaustion and in turn negatively influence the healing process (Fife & Rappaport, 1976; Evans et al., 1998). Fairweather, (2000) added that creating a good acoustics within spaces is possible and also cost efficient.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter explains in detail the methods of study to be used. Methodology to be adopted is the qualitative and the quantitative methods of research. The qualitative research deals with issues that are subjective and this will involve interviews and an empirical analysis of all the data obtained and the result. The Quantitative deals with direct data that can be quantified and it uses both primary and secondary data from field survey. The field study is referred to case study with a view of getting general data for the research.

3.2 CASE STUDY

Case study is an experiential process of discovery that examines a present-day occurrence within its real life context through the use of numerous supply of evidence (Yin, 2004). Case study also is a research method or a part examination in detail, which involves 'the study of an example – a case – of the observable fact being researched (Veal, 2006). This study is a systematically assembling of information on a particular communal setting, person, event, or group to allow the researcher to effectively know how it functions. A predominant feature of a case study is the purposeful selection the place to be study and triangulation, and this as a result is co-ordinated by a means of multiple-methods of data collection (Johansson, 2010).

For the purpose of this research the case study method is a major tool used in gathering the information required. The population studied in this research include: the inmates, the wardens, and the administrative personnel.

3.3 CASE STUDY SELECTION/SAMPLING

Nnamdi (1991) stated that the procedure for drawing samples from a population is known as sampling. A sample is a part of the population. Ndagi (1999) said that a sample be defined as a limited number of element selected from a population which is representative of that population. Ndagi further stated that sampling consist of three phases: defining the population, drawing a sample from the population and statistical inference. For the purpose of this research the case study selection was based on random sampling to generate data that is representative of the types of prisons mention in 2.5 above.

3.3.1 RANDOM SAMPLING

Ndagi (1999) posits that every element in the population has an equal probability to be selected which implies that no element of the population is omitted deliberately. Nnamdi (1991) points out that random sampling gives every element an equal chance of appearing in the selection. In the course of this research, a random sampling of perception of inmates and prison staff was collated.

3.3.2 DATA ANALYSIS

In evaluating prison design, attempts has been made by (Farbstein & Wener, 1982) to assess the behavioural effects of prison designs through the use of a set of tools, these tools are for the assessement of the environment within to help provide the information that will be used in the planning and the design of new facilities. For this research, tools used include the interview, visual survey, observation and questionnaires which was completed by the inmates. The questionnaire focused on: space, amenities, convenience, appearance,

condition, crowding, privacy, control, safety, temperature and odours, noise, lighting, security and health.

3.4 INSTRUMENT OF DATA COLLECTION

The instrument of data collection include

i. Visual survey
ii. Observation
iii. The use of questionnaires
iv. interview

3.4.1 VISUAL SURVEY

This is a method used for the collection of data and the major approach is through the use of the eyes to take note of the static features around. This tool was used to collect visual data on the state of prison facilities, site planning and landscaping, spatial organisation, structure and material, aesthetic in the cases studied.

3.4.2 OBSERVATION

This technique of observation is applied within an experimental setting. Some of the variables affecting the behaviour of the respondent were identified.

3.4.3 QUESTIONNAIRE

A questionnaire consists of a set of questions designed to gather information or the date for analysis and the results are used to answer the research questions (Nnamdi 2008). The closed/structured type of questionnaire was used in this research to gather data on inmate

age and perception on space, amenities, convenience, appearance, condition, crowding, privacy, control, safety, temperature and odours, noise, lighting, security and health. A copyof the questionnaire used to gather data is given below:

Part I: PERSONAL DATA

1. Gender Male ☐ Female ☐
2. Age level 16-25 ☐ 26 -35☐ 36 – 45 ☐ 46 –55☐ 56 –65 ☐
3. Western education: Primary/secondary ☐ Tertiary institution ☐Post graduate ☐
   Others Specify ☐
4. Occupation before arrest: Student ☐ Unemployed ☐ Self-employed ☐
   Employed ☐ Retired ☐

Part II: PERCEPTION OF PRISON ARCHITECTURAL CHARACTER

a. PERCEPTION OF FACILITY

KEY

1. SD = Strongly disagree
2. D = Disagree
3. U = Undecided
4. A = Agree
5. SA = Strongly Agree

STATEMENT	SD	D	U	A	SA
My environment has a homelike feeling					
The ceiling height in my room will be better if it were high					
My environment offers me forms, scent, harmony and compatibility that help me forget my everyday stress					
An attractive view of a natural environment is beneficial to me and it helps in healing me					
Work spaces and correctional industries are safe					
The design engages me and gives me a sense of responsibility					

The environment is welcoming, enriched by beauty					
When I am within the institution I always feel sad					
The environment always makes me feel aggressive					
The spaces within my environment gives me a sense of competence					
The environment is not polluted					
I enjoy privacy, security, and social interaction, comfort, convenience, safety within my environment					

b. ADEQUACY OF FACILITIES

KEY

1. NATI = Not At All Important
2. NI = Not Important
3. N = Neutral
4. I = Important
5. VI = Very Important

1. Indicate the level of importance of each of these facilities to you?

FACILITIES	NATI	NI	N	I	VI
1. Visiting area with public restrooms adjacent etc.					
2. Separate units/cells/dormitories for inmates					
VOCATIONAL FACILITIES					
3. Library					
4. Education(classrooms)					
5. Counselling facility					
6. Religious facility					
7. Recreational area					
8. Health care facility					
9. Canteen					
10. Laundry					
11. Maintenance facility					
12. Dayroom					
13. Indoor Exercise facility					
14. Outdoor exercise facility					
OTHER PROVISION					
15. Institutional cleanliness/sewage disposal facility/Disposal of garbage and refuse					
16. Lighting facility					
17. Toilet facility					
18. Multipurpose hall					

19. Barbering and cosmetology facility					
20. Sizes of windows					
21. Furniture					
22. Space arrangement					

a. Formative character of spaces

2. How will you describe the provision of each of the following in the institution

i. NATA = Not At All Adequate

ii. NA = Not Adequate

iii. N = Neutral

iv. A = Adequate

v. VA = Very Adequate

FACILITIES	NATA	NA	N	A	VA
1. Visiting area with public restrooms adjacent etc.					
2. Separate units/cells/dormitories for inmates					
VOCATIONAL FACILITIES					
3. Library					
4. Education(classrooms)					
5. Counselling facility					
6. Religious facility					
7. Recreational area					
8. Health care facility					
9. Canteen					
10. Laundry					
11. Maintenance facility					
12. Dayroom					
13. Indoor Exercise facility					
14. Outdoor exercise facility					
OTHER PROVISION					
15. Institutional cleanliness/sewage disposal facility/Disposal of garbage and refuse					
16. Lighting facility					
17. Toilet facility					
18. Multipurpose hall					
19. Barbering and cosmetology facility					
20. Sizes of windows					
21. Furniture					
22. Space arrangement					

OTHER CONSIDERATION	NATA	NA	N	A	VA
1. Ventilation					

2. Lighting in spaces					
3. Thermal comfort					
4. Echo/sound					
5. Colour					
6. Size of spaces					
7. Access to day lighting					

The first part of the question collects demographic data, which gives the general idea of the age, sex, educational level and other details of individuals housed in these facilities. The second part which is the attitude statements, the statements were made to know the inmates perceptions of the entire facility to the detail of their comfort within these facilities. The third part of the questionnaire gives a general list of the facilities required for a prison and the inmates are been asked the level of importance of the spaces provided and the adequacy of these spaces.

3.4.4 INTERVIEW

This form of collection of data is a technique used for getting information from others in a face to face contact (Ndagi, 1999). The interview technique was used to gather reliable and valid information from the prison staff on number of inmates, category of inmate housed within the facility, inmate welfare, nature of prison, staff strength, type of training provided for inmate.

3.5 SCOPE AND LIMITATION

This study assessed some selected prisons and examined the extent to which the prison design addresses prisoners' reformation. Information in this type of institution is classified hence, access to them is restricted.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 INTRODUCTION

Three cases were selected for the purpose of this research. The studied cases include: a medium convict prison located in Suleja metropolis, an open prison camp located in Kaduna and the third a Borstal Training Institution in Kaduna. These cases were selected basically to evaluate existing prison structure and facilities in different prison settings in order to determine if the existing structures are rehabilitative or punitive. The reason for the selection of these cases is so as to see the different prison facilities provided and to focus on the one that places emphasis on what a rehabilitative prison environment should look like.

Suleja prison which is a minimum security prison and an operational facility as at the time of visit, it was built by the federal government located in Suleja metropolis Niger State, the design capacity is to house about 250 inmates but as at the time of visit the inmates were about 361. The facility has both female and male wing. The female wing has a capacity to house about 40 women. The facility has about 6 male Assistant Superintendent of Police (ASPs), 12 female ASPs, 4 Psychologist, and some other officers. The prison has no specific classification of prisoners due to lack of adequate space caused by overcrowding

The second case studied is the Kaduna open prison camp. Kaduna open prison camp which is still in use today was formerly known as Kakuri open prison camp. The facility is located very close to Barnawa, the entire area was said to have been a part of

Kakuri. The facility houses about 445 inmates but as at the time of visit it was housing about 71 prisoners. The uniformed staff and the non-uniformed staff are about a 100 plus. The open prison is a prison without the four perimeter walls of a conventional prison. The prison is also known as 'half way home' due to the fact that it is the final or the finishing ground for prisoners. These inmates are usually trained in character, trade, education and savings to engage in after their release to the society. The inmates housed within this facility include the categories of manslaughter, murder, bigamy, arson, slave dealing, counterfeiting, and forgery etc.

The third case studied is Borstal training institution. The Borstal training institution was commissioned in 1960 and was at its inception in 1962. It is located in the southern part of Kaduna metropolis, Barnawa in Kaduna state. It is a Centre surrounded by colleges, institutions and medical Centre of psychiatry. The facility is presently governed by the Nigerian Prisons Services of Nigeria. The institute only takes individuals who have gone through the chief magistrate court and has received a three years sentence on offenders punishable by imprisonment and who at the day of conviction is not less than 16 years and not more than 21 years of age. The facility was built to correct the morals of varying types among the youths. As at the 13th of February 2014 the institution housed a total lock up of about 400 inmates and the facility was built to house only a total capacity of 280 inmates. The facility has a total of about 130 trained staff including psychologist and social workers and public health officers from the medical unit that clean the surrounding.

4.2 SITE PLANING AND LANDSCAPING

The layout of Suleja prison is a tight site with little or no space for future expansion. The only little space that would have been a potential recreational facility is now been used for a new cell block. The prison was poorly planned. It barely even has a good space for good circulation and no space for landscaping, no recreational facilities. The layout of Suleja prison has its usual architectural problems of ease of supervision of the inmates, their control, problems of function, circulation, ventilation and the orientation. The prison general layout is more of a cluster with little space for circulation, their no available space for plantation of better still landscaping or a little portion for recreational facility. A typical of Suleja prison layout can be seen in the fig below:

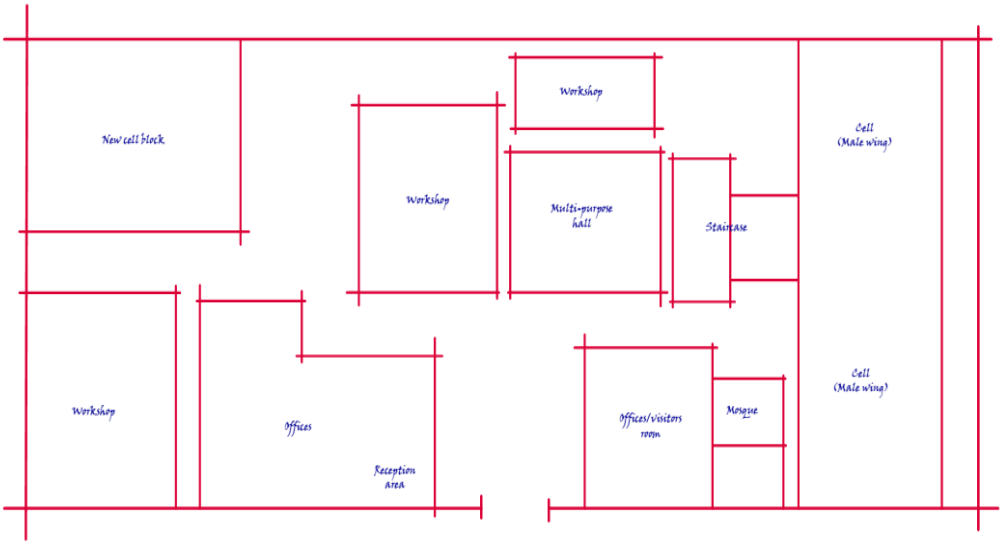


Figure 4.1: Layout of Suleja prison

The layout for Kaduna open prison camp is a large site with ample space for expansion. The traffic circulation within the site, the lighting, the utilities provided in the site are fair. The drainage of the site, the driveways, landscape preservation does need to be put into consideration and as such they need improvement. Some of the buildings within

this site for example about five cells are oriented along the North West south east axis while the other five cells are oriented along the north east south west axis. The administrative block, the staff housing, the kitchen and other maintenance buildings alongside the library/clinic facilities are oriented along the east west axis. A typical of this prison facility can be seen in the Google image below:



PLATE VI: Google image of Kaduna open prison camp

The layout of Borstal training institution passes for a redial site plan. It has all it facilities round about an open court yard. The drainage of the site cannot be said to be satisfactory. The driveway was limited to the entrance and hence a parking lot was made available for users. The lighting and other utilities were considered and provisions like solar panels and a direct connection to the water board was considered as well. The dormitories, some classes, and workshops are oriented along the North West south east

axis with the longer side facing the north east south west axis while other buildings like the administrative block, some classes. Multipurpose hall, kitchen and other facilities are oriented with their longer axis facing the North West south east axis. A typical of this facility can be seen in the image below:

4.3 SPATIAL ORGANISATION

The type of spatial organization adopted in Suleja prison is the clustered organization. This type of organization relies on the physical proximity of related spaces. The spaces within this facility have similar functions, shape and most orientation. The shape of these spaces is rectangular. A typical of a blown out plan of the female wing can be seen below.

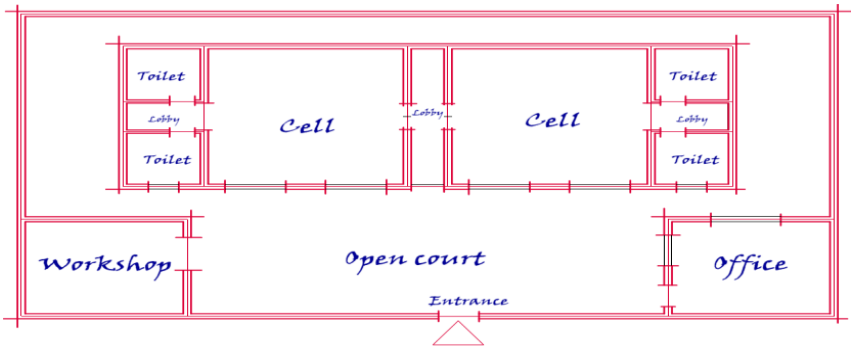


Figure 4.2: The female wing in Suleja prison

The type of spatial organization adopted in Kaduna open prison camp is a centralized organization. The centralized organization is used for exterior spaces while linear organization was used for interior spaces. A typical of a cell could be seen below:

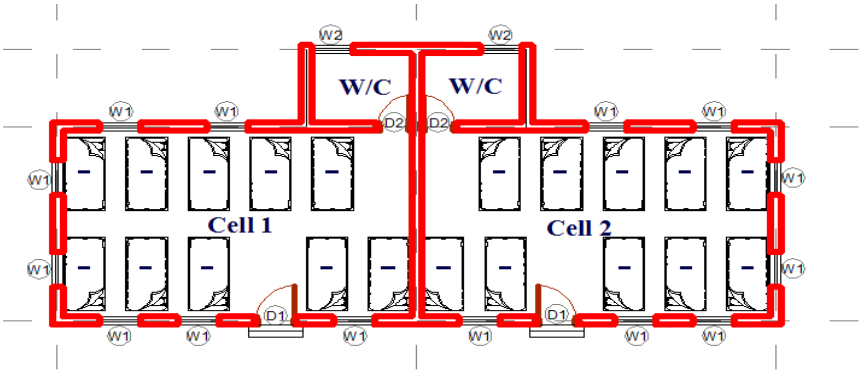


Figure 4.3: A block of cell in Kaduna open prison camp

The Borstal training institute adopted the centralized organization for exterior spaces while linear organization was used for interior spaces. These linear organizations consist of spaces which are alike in size, form, and function. A typical of this linear space is the dormitory shown below:

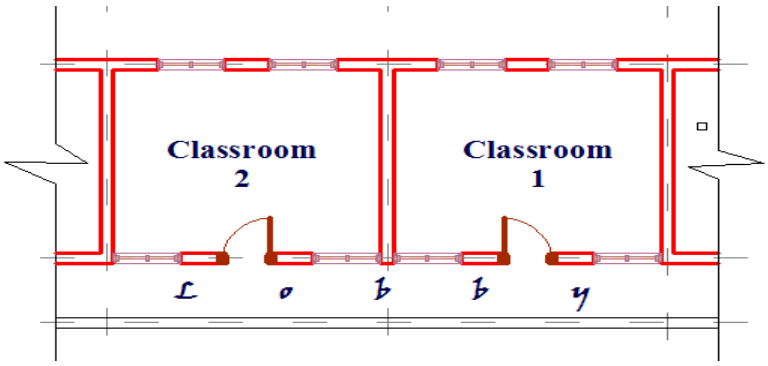


Figure 4.4: A classroom block in Borstal training institution

4.4 STRUCTURE AND MATERIAL

In Suleja prison, the structures used in this facility are of post and beam type for a two floor building. The structure of the two storey buildings consist of the horizontal spanning elements supported on vertical columns and walls, while the other structures within the facility are single floor. The materials used for the construction of the buildings

are material of steel, reinforced concrete, masonry, timber and the materials used for the roofing is aluminium roofing sheet.

In Kaduna open prison camp, the structure used is the post and the beam type of construction which consists of the horizontal spanning elements supported on vertical columns and walls. The materials used for the construction of the buildings are material of steel, reinforced concrete, masonry timber and aluminium roofing sheet. All the structures within this facility are single storey except for a part of the administrative block that is a two storey.

In Borstal training institution, the type of structure adopted is the post and the beam type of construction which consists of the horizontal spanning elements supported on vertical columns and walls. The materials used for the construction of the buildings are material of steel, reinforced concrete, masonry timber and aluminium roofing sheet. All the structures within this facility are single storey except for a part of the administrative block that is a two storey.

4.5 AESTHETICS

In Suleja prison, the use of nature which offers various colours, form, and scent, proper use of building material, use of colours, furniture were not used in and around the environment. The colours used are washed and the entire structure will be improved if renovated.

In Kaduna open prison, there are a good number of trees scattered across the site, a number of shrubs also, but these features of nature used were not used with the need for aesthetics in mind.

In Borstal training institution, trees and shrubs were arranged in a way they knew best but an environment that employs the skill of a landscape architect will to a large extent be an aesthetically pleasing environment.

4.6 TYPICAL PRISON SCHEDULE OF ACTIVITIES

Table 4.1: Typical schedule of prison activity

TYPE OF ACTIVITY	TIME OF ACTIVITY
Open out	6:00am
Labour parade	7:30am
Head count	10:30am
Head count	11:45am
Mid-day lock up	1:45pm
Inmates games	4:00pm
Warning to final lock up	5:45pm
Final lock up	6:00pm

4.7 FINDINGS FROM QUESTIONNAIRE SURVEY

The first set of questions were mainly on the perception of the facilities and structured in the form of attitude scaling (table 4.1).The key used is rated as; 1 – strongly disagree, 2 – disagree, 3 – undecided, 4 – agree, 5 – strongly agree. The result for Borstal training institution shows that for attitude statement 1: “My environment has a homelike feeling”, the disagreement level (strongly disagree and disagree) amounting to 18 representing 60% showing a strong level of disagreement. For attitude statement 2: “The ceiling height in my cell will be better if it were high”, the agreement level (agree and strongly agree) amounting to 15 representing 50%. This indicates a strong level of agreement with the statement. For attitude statement 3: “My environment offers me forms,

scent, harmony and compatibility that help me forget my everyday stress", the agreement level (agree and strongly agree) amounting to 15 representing 50%. This indicates a strong level of agreement with the statement. For attitude statement '4' –"An attractive view of a natural environment is beneficial to me and it helps in healing me", the agreement level (agree and strongly agree) amounting to 21 representing 70%. This indicates a strong level agreement with the statement. For attitude statement '5' – work spaces and correctional industries are safe – the agreement level (agree and strongly agree) amounting to 12 representing 40%. This indicates a strong level of agreement with the statement. For attitude statement '6' – the design engages me and gives me a sense of responsibility – the agreement level (agree and strongly agree) amounting to 18 representing 60%. This indicates a strong level of agreement with the statement. For attitude statement '7' – the environment is welcoming, and enriched by beauty – the agreement level (agree and strongly agree) amounting to 18 representing 60%. This indicates a strong level of agreement with the statement. For the attitude statement '8' – when am in the institution i always feel sad – the agreement level (agree and strongly agree) amounting to 17 representing 56.7%. This indicates a strong level of agreement with the statement. For attitude statement '9' - The environment always makes me feel aggressive – the agreement level (agree and strongly agree) amounting to 11 representing 36.7%. This indicated a strong level of agreement with the statement. For attitude statement '10' - The spaces within my environment gives me a sense of competence – the agreement level (agree and strongly agree) amounting to 17 representing 56.7%. This indicates a strong level of agreement with the statement. For attitude statement '11' – the environment is not polluted – the agreement level (agree and strongly agree) amounting to 19 representing 63.3%. This

indicates a strong level of agreement with the statement. For attitude statement ’12’ - I enjoy privacy, security, and social interaction, comfort, convenience, safety within my environment – the agreement level (agree and strongly agree) amounting to 19 representing 63.3%. This indicates a strong level of agreement with the statement. The table below shows the detail of their responses to their perception of architectural character:

Table 4.2: Respondents’ perception of the prison environment

STATEMENT	LEVEL OF AGREEMENT				
	SD	**D**	**U**	**A**	**SA**
1. My environment has a homelike feeling	12 40%	6 20%	5 16.7%	6 20%	0 0%
2. The ceiling height in my cell will be better if it were high	0 0%	9 30%	6 20%	15 50%	0 0%
3. My environment offers me forms, scent, harmony and compatibility that help me forget my everyday stress	5 16.7%	6 20%	3 10%	11 36.7%	4 13.3%
4. An attractive view of a natural environment is beneficial to me and it helps in healing me	1 3.3%	5 16.7%	2 6.7%	14 46.7%	7 23.3%
5. Work spaces and correctional industries are safe	5 16.7%	5 16.7%	7 23.3%	11 36.7%	1 3.3%
6. The design engages me and gives me a sense of responsibility	3 10%	4 13.3%	4 13.3%	15 50%	3 10%
7. The environment is welcoming, enriched by beauty	3 13.3%	6 20%	2 6.7%	15 50%	3 10%
8. When I am within the institution I always feel sad	2 6.7%	4 13.3%	6 20%	11 36.7%	6 20%
9. The environment always makes me feel aggressive	6 20%	4 13.3%	8 26.7%	7 23.3%	4 13.3%
10. The spaces within my environment gives me a sense of competence	4 13.3%	2 6.7%	6 20%	14 46.7%	3 10%
11. The environment is not polluted	5 16.7%	1 3.3%	4 13.3%	13 43.3%	6 20%
12. I enjoy privacy, security, and social interaction, comfort, convenience, safety within my environment	2 6.7%	4 13.3%	4 13.3%	11 36.7%	8 26.7%

The second question asked is based on the level of importance placed on each of these facilities. The keys used: 1 – not at all important, 2 – not important, 3 – neutral, 4 – important, 5 – very important. Hence the result for Borstal training institution shows that

for the visiting area, the level of importance (important and very important) amounting to 19 respondents representing 63.3% felt that this is important. For the cell, the level of importance (important and very important) amounting to 18 respondents representing 60% felt this is important. For the Library, the level of importance (important and very important) amounting to 27 respondents representing 90% felt that this is important. For the Religious facility, the level of importance (important and very important) amounting to 27 respondents representing 90% felt that this is important. For recreational area, the level of importance (important and very important) amounting to 22 respondents representing 73.3% felt that this is important. For the health care facility, the level of importance (important and very important) amounting to 22 respondents representing 73.3% felt that this is important. For the institutional cleanliness, the level of importance (important and very important) amounting to 23 respondents representing 76.7% felt that this is important. For the lighting facility, the level of importance (important and very important) amounting to 24 respondents representing 80% felt that this is important. For the toilet facility, the level of importance (important and very important) amounting to 23 respondents representing 76.7% felt that this is important. For the multipurpose hall, the level of importance (important and very important) amounting to 22 respondents representing 73.3% felt that this is important. For the sizes of the windows, the level of importance (important and very important) amounting to 26 respondents representing 86.7% felt that this is important. For the furniture provided, the level of importance (important and very important) amounting to 16 respondents representing 53.3% felt that this is important. For the space arrangement, the level of importance (important and very important) amounting to 19 respondents representing 63.3% felt that this is important.

Other facilities like the Counselling facility, Recreational facility, Dining hall, Laundry, Maintenance facility, Dayroom, Indoor facility, Outdoor facility, Barbing facility were not provided in this facility but the respondents show that there is a need for these facilities as well the details can be seen in the table below. The table shows the level of importance attached to facilities:

Table 4.3: Level of importance attached to various facilities by respondents

FACILITIES	LEVEL OF IMPORTANCE				
	NATI	**NI**	**N**	**I**	**VI**
Visiting area with public restrooms adjacent etc.	4 13.3%	3 10%	3 10%	11 36.7%	8 26.7%
Separate units/cells/dormitories for inmates	4 13.3%	6 20%	2 6.7%	5 16.7%	12 40%
Library	1 3.3%	0 0%	1 3.3%	12 40%	15 50%
Education(classrooms)	0 0%	2 6.7%	3 10%	10 33.3%	14 46.7%
Counselling facility	1 3.3%	3 10%	8 26.7%	6 20%	11 36.7%
Religious facility	1 3.3%	0 0%	1 3.3%	8 26.7%	19 63.3%
Recreational area	2 6.7%	1 3.3%	4 13.3%	9 30%	13 43.3%
Health care facility	2 6.7%	1 3.3%	4 13.3%	10 33.3%	12 40%
Dining hall	3 10%	1 3.3%	11 36.7%	11 36.7%	3 10%
Laundry	0 0%	4 13.3%	6 20%	10 33.3%	9 30%
Maintenance facility	3 10%	1 3.3%	4 13.3%	13 43.3%	8 26.7%
Dayroom	2 6.7%	7 23.3%	8 26.7%	10 33.3%	2 6.7%
Indoor Exercise facility	4 13.3%	6 20%	3 10%	11 36.7%	5 16.7%
Outdoor exercise facility	3 10%	5 16.7%	4 13.3%	8 26.7%	9 30%
Institutional cleanliness/sewage disposal facility/Disposal of garbage and refuse	2 6.7%	0 0%	4 13.3%	8 26.7%	15 50%
Lighting facility	2 6.7%	1 3.3%	2 6.7%	11 36.7%	13 43.3%
Toilet facility	2 6.7%	0 0%	4 13.3%	10 33.3%	13 43.3%

FACILITIES	LEVEL OF IMPORTANCE				
	NATI	NI	N	I	VI
Multipurpose hall	0 0%	3 10%	4 13.3%	14 46.7%	8 26.7%
Barbering and cosmetology facility	4 13.3%	5 16.7%	6 20%	8 26.7%	6 20%
Sizes of windows	1 3.3%	2 6.7%	10 33.3%	11 36.7%	5 16.7%
Furniture	2 6.7%	5 16.7%	6 20%	9 30%	7 23.3%
Space arrangement	1 3.3%	2 6.7%	7 23.3%	11 36.7%	8 26.7%

The third question asked is on the adequacy of these facilities provided. The keys used: 1 – not at all adequate, 2 – not adequate, 3 – neutral, 4 – adequate, 5 – very adequate. Hence the result for Borstal training institution shows that for the visiting area, adequate and very adequate amounting to 16 respondents representing 53.3% felt that this is adequate. For the Dormitories, (not at all adequate and not adequate) and (adequate and very adequate) amounting to 13 respondents respectively representing 43.3% felt that this facility is not adequate and it is adequate respectively. For the library, adequate and very adequate amounting to 20 respondents representing 66.7% felt that this is adequate. For the classrooms, adequate and very adequate amounting to 18 respondents representing 60% felt that is adequate. For the religious facility, adequate and very adequate amounting to 23 respondents representing 76.7% felt that this is adequate. For the health care facility, adequate and very adequate amounting to 20 respondents representing 66.7% felt that this is adequate. For the institutional cleanliness, adequate and very adequate amounting to 20 respondents representing 66.7% felt that this is adequate. For lighting facility, adequate and very adequate amounting to 18 respondents representing 60% felt that this is adequate. For the toilet facility, adequate and very adequate amounting to 21 respondents

representing 70% felt that this is adequate. For the multipurpose hall, adequate and very adequate amounting to 21 respondents representing 70% felt that this is adequate. For the sizes of windows, adequate and very adequate amounting to 18 respondents representing 60% felt that this is adequate. For the furniture, adequate and very adequate amounting to 12 respondents representing 40% felt that this is adequate. For space arrangement, adequate and very adequate amounting to 16 respondent representing 53.3% felt that this is adequate. Other facilities not provided in the institution but of course ticked by respondents can be seen in the table below: table showing the result from questionnaire of the adequacy of the existing facilities:

Table 4.4: level of satisfaction with provided facilities

FACILITIES	**LEVEL OF ADEQUACY**				
	NATA	**NA**	**N**	**A**	**VA**
Visiting area with public restrooms adjacent etc.	8 26.7%	1 3.3%	4 13.3%	8 26.7%	8 26.7%
Separate units/cells/dormitories for inmates	5 16.7%	8 26.7%	3 10%	6 20%	7 23.3%
Library	1 3.3%	5 16.7%	3 10%	10 33.3%	10 33.3%
Education(classrooms)	2 6.7%	4 13.3%	5 16.7%	11 36.7%	7 23.3%
Counselling facility	2 6.7%	4 13.3%	8 26.7%	9 30%	6 20%
Religious facility	2 6.7%	2 6.7%	2 6.7%	9 30%	14 46.7%
Recreational area	4 13.3%	3 10%	5 16.7%	8 26.7%	9 30%
Health care facility	3 10%	3 10%	3 10%	13 43.3	7 23.3%
Dining hall	5 16.7%	3 10%	16 53.3	4 13.3%	1 3.3%
Laundry	3	7 23.3%	11 36.7%	5 16.7%	3 10%
Maintenance facility	6 20%	1 3.3%	7 23.3%	8 26.7%	7 23.3%
Dayroom	4 13.3%	4 13.3%	12 40%	5 16.7%	4 13.3%
Indoor Exercise facility	6 20%	3 10%	3 10%	10 33.3%	7 23.3%

FACILITIES	LEVEL OF ADEQUACY				
	NATA	NA	N	A	VA
Outdoor exercise facility	3 10%	7 23.3%	3 10%	8 26.7%	8 26.7%
Institutional cleanliness/sewage disposal facility/Disposal of garbage and refuse	3 10%	1 3.3%	5 16.7%	9 30%	11 36.7%
Lighting facility	4 13.3%	4 13.3%	3 10%	9 30%	9 30%
Toilet facility	1 3.3%	5 16.7%	4 13.3%	14 46.7%	5 16.7%
Multipurpose hall	0 0%	1 3.3%	7 23.3%	12 40%	9 30%
Barbering and cosmetology facility	6 20%	4 13.3%	5 16.7%	6 20%	8 26.7%
Sizes of windows	2 6.7%	4 13.3%	5 16.7%	13 43.3%	5 16.7%
Furniture	5 16.7%	4 13.3%	8 26.7%	7 23.3%	5 16.7%
Space arrangement	4 13.3%	3 10%	6 20%	11 36.7%	5 16.7%

Other considerations for their adequacies in the institution show that for ventilation, (adequate and very adequate) amounting to 22 respondents representing 73.3% felt that this is adequate. For lighting in spaces, adequate and very adequate amounting to 18 respondents representing 60% felt that this is adequate. For thermal comfort(adequate and very adequate)amounted to 11 respondents also neutral amounted to 11 respondents representing 36.7%. For echo/ sound, not at all adequate and not adequate amounting to 17 respondents representing 56.7% felt that this is not adequate. For colour, adequate and very adequate amounting to 13 respondents representing 43.3% felt that this is adequate while 12 respondents representing 40% felt that this is not adequate. For size of spaces, adequate and very adequate amounting to 19 respondents representing 63.3% felt that this is adequate. For access to day lighting, adequate and very adequate amounting to 19 respondents representing 63.3% felt that this is adequate. The detail can be seen in table 4.4 below.

Table 4.5: level of satisfaction with other characteristics of the prison

OTHER CONSIDERATION	LEVEL OF ADEQUACY				
	NATA	**NA**	**N**	**A**	**VA**
Ventilation	2 6.7%	3 10%	2 6.7%	9 30%	13 43.3%
Lighting in spaces	1 3.3%	7 23.3%	3 10%	13 43.3%	5 16.7%
Thermal comfort	1 3.3%	6 20%	11 36.7%	7 23.3%	4 13.3%
Echo/sound	12 40%	5 16.7%	3 10%	4 13.3%	5 16.7%
Colour	5 16.7%	7 23.3%	3 10%	8 26.7%	5 16.7%
Size of spaces	1 3.3%	6 20%	3 10%	9 30%	10 33.3%
Access to day lighting	3 10%	5 16.7%	2 6.7%	10 33.3%	9 30%

The first question asked in Kaduna open prison is on the perception of the facilities and structured in the form of attitude scaling (table 4.1). The key used is rated as; 1 – strongly disagree, 2 – disagree, 3 – undecided, 4 – agree, 5 – strongly agree. The result for Kaduna open prison camp shows that for attitude statement "1" – My environment has a homelike feeling, the agreement level (agree and strongly agree) amounting to 14 respondents representing 46.7% showing a strong level of agreement. For statement "2" – the ceiling height in my room will be better if it were high, the agreement level (agree and strongly agree) amounting to 11 respondents representing 36.7% showing a strong level of agreement. For statement "3" - My environment offers me forms, scent, harmony and compatibility that help me forget my everyday stress, the agreement level (agree and strongly agree) amounting to 17 respondents representing 56.7% showing a strong level of agreement. For statement "4" - An attractive view of a natural environment is beneficial to me and it helps in healing me, the agreement level (agree and strongly agree) amounting to 16 respondents representing 53.3% shows a strong level of agreement. For statement "5" -

Work spaces and correctional industries are safe, the agreement level (agree) amounting to 10 respondents representing 33.3% shows a level of agreement. For statement "6" - The design engages me and gives me a sense of responsibility, the agreement level (agree and strongly agree) amounting to 15 respondents representing 50% shows a level of agreement. For statement "7" - The environment is welcoming, enriched by beauty, the agreement levels (agree and strongly agree) amounting to 13 respondents representing 43.3% shows a level of agreement. For attitude statement "8" - When I am within the institution I always feel sad, the respondents for disagree and agree were 8 respondents representing 26.7% shows undecided. For statement "9" - The environment always makes me feel aggressive, the agreement level (both disagree and agree) amounting to 8 respondents representing26.7% shows indecision. For statement "10" - The spaces within my environment gives me a sense of competence, the agreement level (agree and strongly agree) amounting to 11 respondents representing 36.7% shows a level of agreement. For statement "11" - The environment is not polluted, the agreement level (agree and strongly agree) amounting to 13 respondents representing 43.3% shows a level of agreement. For attitude statement "12" - I enjoy privacy, security, and social interaction, comfort, convenience, safety within my environment, the agreement level (agree and strongly agree) amounting to 15 respondents representing 50% shows a level of agreement. The details can be seen in the table 4.5.

Table 4.6: Respondents' perception of the prison environment.

STATEMENT	LEVEL OF AGREEMENT				
	SD	**D**	**U**	**A**	**SA**
1. My environment has a homelike feeling	0 0%	5 16.7%	1 3.3%	11 36.7%	3 10%
2. The ceiling height in my room will be better if it were high	0 0%	6 20%	3 10%	8 26.7%	3 10%
3. My environment offers me forms, scent, harmony and compatibility that help me forget my everyday stress	0 0%	0 0%	3 10%	16 53.3%	1 3.3%
4. An attractive view of a natural environment is beneficial to me and it helps in healing me	0 0%	1 3.3%	3 10%	13 43.3%	3 10%
5. Work spaces and correctional industries are safe	0 0%	2 6.7%	8 26.7%	10 33.3%	0 0%
6. The design engages me and gives me a sense of responsibility	0 0%	0 0%	5 16.7%	13 43.3%	2 6.7%
7. The environment is welcoming, enriched by beauty	0 0%	6 20%	1 3.3%	10 33.3%	3 10%
8. When I am within the institution I always feel sad	1 3.3%	7 23.3%	4 13.3%	8 26.7%	0 0%
9. The environment always makes me feel aggressive	2 6.7%	6 20%	4 13.3%	6 20%	2 6.7%
10. The spaces within my environment gives me a sense of competence	3 10%	3 10%	3 10%	7 23.3%	4 13.3 %
11. The environment is not polluted	1 3.3%	4 13.3%	2 6.7%	11 36.7%	2 6.7%
12. I enjoy privacy, security, and social interaction, comfort, convenience, safety within my environment	1 3.3%	2 6.7%	2 6.7%	10 33.3%	5 16.7 %

The second question asked is based on the level of importance placed on each of these facilities. The keys used: 1 – not at all important, 2 – not important, 3 – neutral, 4 – important, 5 – very important. Hence the result for Kaduna open prison camp shows that for the visiting area, the level of importance (important and very important) amounting to 12 respondents representing 40% felt that this is important. For the cell, the level of importance (important and very important) amounting to 17 respondents representing 56.7%felt that this is important. For the library, for the level of importance, 8 respondents

representing 26.7% were neutral about this. For the Religious facility, the level of importance (important and very important) amounting to 17 respondents representing 56.7% felt that this is important. For the health care facility, the level of importance (important and very important) amounting to 13 respondents representing 43.3% felt that this is important. For the sewage disposal facility, the level of importance (important and very important) amounting to 15 respondents representing 50% felt that this is important. For the lighting facility, the level of importance (important and very important) amounting to 14 respondents representing 46.6% felt that this is important. For the toilet facility, the level of importance (important and very important) amounting to 15 respondents representing 50% felt that this is important. For the sizes of windows, the level of importance (important and very important) amounting to 14 respondents representing 46.7% felt that this is important. For the furniture, the level of importance (important and very important) amounting to 12 respondents representing 40% felt that this is important. For the space arrangement, the level of importance (important and very important) amounting to 9 respondents representing 30% felt that this is important.

Other facilities like the Counselling facility, Recreational facility, Dining hall, Laundry, Maintenance facility, Dayroom, Indoor facility, Outdoor facility, Barbering facility were not provided in this facility but the respondents show that there is a need for these facilities as well the details can be seen in the table below which shows the level of importance attached to facilities:

Table 4.7: Level of importance attached to various facilities by respondents.

FACILITIES	LEVEL OF IMPORTANCE				
	NATI	**NI**	**N**	**I**	**VI**
Visiting area with public restrooms adjacent etc.	0 0%	2 6.7%	6 20%	3 10%	9 30%
Separate units/cells/dormitories for inmates	0 0%	1 3.3%	2 6.7%	11 36.7%	6 20%
Library	2 6.7%	3 10%	8 26.7%	5 16.7%	2 6.7%
Education(classrooms)	1 3.3%	4 13.3%	6 20%	6 20%	3 10%
Counselling facility	0 0%	4 13.3%	3 10%	9 30%	4 13.3%
Religious facility	1 3.3%	0 0%	2 6.7%	6 20%	11 36.7%
Recreational area	3 10%	2 6.7%	4 13.3%	8 26.7%	3 10%
Health care facility	1 3.3%	2 6.7%	4 13.3%	7 23.3%	6 20%
Dining hall	1 3.3%	3 10%	4 13.3%	7 23.3%	5 16.7%
Laundry	0 0%	1 3.3%	3 10%	11 36.7%	5 16.7%
Maintenance facility	1 3.3%	2 6.7%	7 23.3%	5 16.7%	5 16.7%
Dayroom	0 0%	4 13.3%	4 13.3%	8 26.7%	4 13.3%
Indoor Exercise facility	0 0%	3 10%	5 16.7%	6 20%	6 20%
Outdoor exercise facility	0 0%	4 13.3%	1 3.3%	7 23.3%	8 26.7%
Institutional cleanliness/sewage disposal facility/Disposal of garbage and refuse	1 3.3%	1 3.3%	3 10%	8 26.7%	7 23.3%
Lighting facility	1 3.3%	2 6.7%	3 10%	7 23.3%	7 23.3%
Toilet facility	1 3.3%	2 6.7%	2 6.7%	6 20%	9 30%
Multipurpose hall	1 3.3%	2 6.7%	9 30%	4 13.3%	4 13.3%
Barbering and cosmetology facility	0 0%	0 0%	7 23.3%	9 30%	4 13.3%
Sizes of windows	0 0%	2 6.7%	4 13.3%	9 30%	5 16.7%
Furniture	0 0%	3 10%	5 16.7%	7 23.3%	5 16.7%
Space arrangement	3 10%	0 0%	8 26.7%	6 20%	3 10%

The third question asked is based on the level of adequacy placed on each of these facilities. The keys used: 1- not at all adequate, 2 – not adequate, 3 – neutral, 4 – adequate, 5 – very adequate. Hence the result for Kaduna open prison camp shows that for the visiting area, the level of adequacy (adequate and very adequate) amounting to 10 respondents representing 33.3% felt that this is adequate. For the cells, the level of adequacy (adequate and very adequate) amounting to 8 respondents representing 26.7% felt that this is adequate. For the library, the level of adequacy (adequate and very adequate) amounting to 10 respondents representing 33.3% felt that this is adequate. For the religious facility, the level of adequacy (adequate and very adequate) amounting to 13 respondents representing 43.3% felt that this is adequate. For the health care facility, the level of adequacy (adequate and very adequate) amounting to 13 respondents representing 43.4 felt that this is adequate. For the maintenance facility, the level of adequacy amounting to 14 respondents representing 46.7% felt neutral about this. For the sewage disposal facility, the level of adequacy (adequate and very adequate) amounting to 14 respondents representing 46.7% felt that this is adequate. For the lighting facility, the level of adequacy (adequate and very adequate) amounting to 12 respondents representing 40% felt that this is adequate. For the toilet facility, the level of adequacy (adequate and very adequate) amounting to 8 respondents representing 26.6% felt that this is adequate. For the sizes of window, the level of adequacy (adequate and very adequate) amounting to 14 respondents representing 46.7% felt that this is adequate. For the furniture, the level of adequacy (adequate and very adequate) amounting to 10 respondents representing 33.3% felt that this is adequate. For the space arrangement, the level of adequacy (adequate and very adequate) amounting to 13 respondents representing 43.3% felt that this is adequate.

Table 4.8: Level of satisfaction with provided facilities

FACILITIES	LEVEL OF ADEQUACY				
	NATA	NA	N	A	VA
Visiting area with public restrooms adjacent etc.	2 6.7%	3 10%	5 16.7%	6 20%	4 13.3%
Separate units/cells/dormitories for inmates	1 3.3%	6 20%	5 16.7%	6 20%	2 6.7%
Library	1 3.3%	3 10%	6 20%	9 30%	1 3.3%
Education(classrooms)	2 6.7%	4 13.3%	8 26.7%	4 13.3%	2 6.7%
Counselling facility	0 0%	4 13.3%	11 36.7%	4 13.3%	1 3.3%
Religious facility	1 3.3%	3 10%	3 10%	9 30%	4 13.3%
Recreational area	0 0%	4 13.3%	10 33.3%	4 13.3%	2 6.7%
Health care facility	2 6.7%	2 6.7%	3 10%	11 36.7%	2 6.7%
Dining hall	3 10%	3 10%	4 13.3%	8 26.7%	2 6.7%
Laundry	1 3.3%	5 16.7%	4 13.3%	6 20%	4 13.3%
Maintenance facility	0 0%	1 3.3%	14 46.7%	4 13.3%	1 3.3%
Dayroom	2 6.7%	6 20%	9 30%	1 3.3%	2 6.7%
Indoor Exercise facility	3 10%	3 10%	8 26.7%	5 16.7%	1 3.3%
Outdoor exercise facility	2 6.7%	4 13.3%	7 23.3%	5 16.7%	2 6.7%
Institutional cleanliness/sewage disposal facility/Disposal of garbage and refuse	0 0%	3 10%	3 10%	11 36.7%	3 10%
Lighting facility	1 3.3%	4 13.3%	1 3.3%	11 36.7%	3 10%
Toilet facility	1 3.3%	6 20%	1 3.3%	7 23.3%	5 16.7%
Multipurpose hall	2 6.7%	2 6.7%	14 46.7	1 3.3%	1 3.3%
Barbering and cosmetology facility	2 6.7%	5 16.7%	7 23.3%	5 16.7%	1 3.3%
Sizes of windows	1 3.3%	2 6.7%	6 20%	8 26.7%	3 10%
Furniture	1 3.3%	5 16.7%	3 10%	7 23.3%	4 13.3%
Space arrangement	1 3.3%	4 13.3%	6 20%	7 23.3%	2 6.7%

Other considerations for their adequacies in the institution show that for ventilation, (adequate and very adequate) amounting to 14 respondents representing 46.6% felt that this is adequate. For the Lighting in spaces, the level of adequacy (adequate and very adequate) amounting to12 respondents representing 40% felt that this is adequate. For thermal comfort, 9 respondents representing 30% were neutral about this. For echo/sound, the level of adequacy (adequate) amounting to 14 respondents representing 46.7% felt that this is adequate. For Colour, the level of adequacy (adequate and very adequate) amounting to 14 respondents representing 46.6% felt that this is adequate. For size of spaces, the level of adequacy (adequate and very adequate) amounting to 13 respondents representing 43.3% felt that this is adequate. For access to day lighting, the level of adequacy (adequate and very adequate) amounting to 10 respondents representing 33.3% felt that this is adequate. The details can be seen in the table below which shows the level of satisfaction with the other characteristics of the prison facilities.

Table 4.9: Level of satisfaction with other characteristics of the prison

OTHER CONSIDERATION	**LEVEL OF ADEQUACY**				
	NATA	**NA**	**N**	**A**	**VA**
Ventilation	1 3.3%	2 6.7%	3 10%	10 33.3%	4 13.3%
Lighting in spaces	0 0%	4 13.3%	4 13.3%	10 33.3%	2 6.7%
Thermal comfort	2 6.7%	5 16.7%	9 30%	3 10%	1 3.3%
Echo/sound	0 0%	3 10%	3 10%	14 46.7%	0 0%
Colour	1 3.3%	3 10%	2 6.7%	10 33.3%	4 13.3%
Size of spaces	3 10%	3 10%	1 3.3%	12 40%	1 3.3%
Access to day lighting	3 10%	0 0%	7 23.3%	9 30%	1 3.3%

4.8 DISCUSSION OF CASE STUDY FINDINGS

30 questionnaires were distributed in Borstal training institution and Kaduna open prison camp respectively. Questionnaires were distributed to 30 inmates to ascertain their views on the prison environment. The number of inmates interacted with is as a result of the challenges (adequate sample size) in studying large population sample due to inconsistencies that may occur when gathering information, these inconsistencies include larger number of unreliable information, (Nwana, 1992). 30 questionnaires were returned from Borstal Training institution with only 29 answered. 30 questionnaires were also distributed in Kaduna open prison, 20 questionnaires were returned answered. The demographic pie chart below is a representation of the age range of inmates with a bulk of inmates housed in borstal training institution with a age range of 16 - 25, the second chart is a graphic representation of west education obtained by some inmates, the third graph a chart graphically representing the type of occupation done prior to arrest.

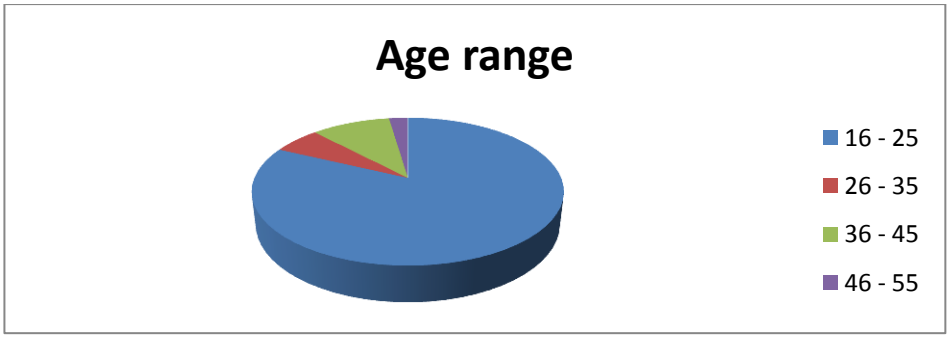


Figure 4.5: A cumulative pie chart with data of Age range of inmates housed in Kaduna open prison camp and Borstal training institution

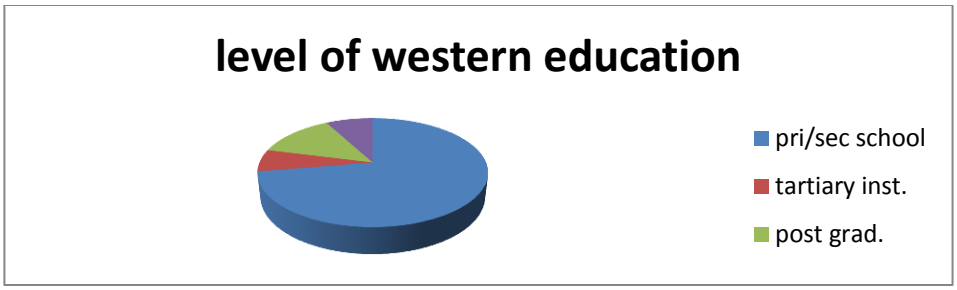


Figure 4.6: A cumulative data of level of western education obtained by inmates

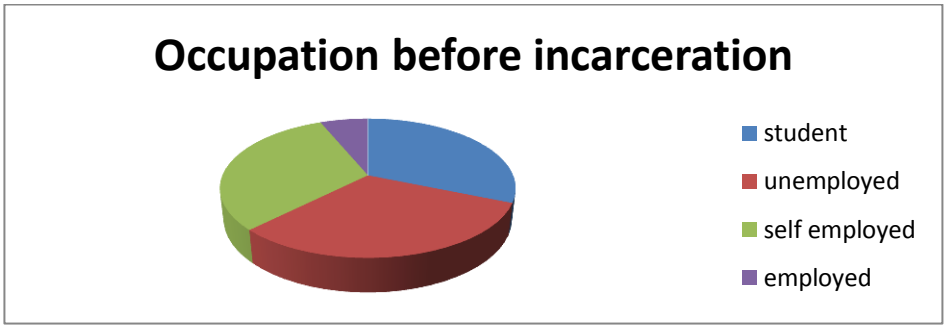


Figure 4.7: A cumulative data of inmate's occupation before incarceration

From attitudinal questions asked the following table shows a cumulative of both cases studied:

Table 4.10: Cumulative result of Statement questions from Borstal Training institution and Kaduna Open Prison Camp

S/N	STATEMENT	FREQUENCY		PERCENTAGE		REMARKS
		D	A	D	A	
1.	My environment has a home like feeling	23	20	38.3%	33.3%	Higher percentage of respondents disagree showing the need for a home like environment
2.	The Ceiling height in my room will be better if it were high	15	26	25%	43.3%	Higher percentage of respondents agrees showing the need for a higher ceiling
3.	My environment offers me forms, scent, harmony and compatibility that help me forget my everyday stress	11	32	18.3%	53.3%	Higher percentage of respondents agrees showing the need for a more welcoming environment

4.	An attractive view of a natural environment is beneficial to me and it helps in healing me.	7	37	11.6%	61.7%	Higher percentage of respondents agrees showing the need for an attractive environment
5.	Work spaces and correctional industries are safe	12	22	20%	36.7%	Higher percentage of respondents agrees showing the need for a safer working environment
6.	The design engages me and gives me a sense of responsibility	7	32	11.6%	53.3%	Higher percentage of respondents agrees showing the need for a more engaging design
7.	The environment is welcoming and enriched by beauty	15	30	25%	50%	Higher percentage of respondents agrees showing the need for a more beautiful environment
8.	When am within the institution I always feel sad	14	25	23.3%	41.7%	Higher percentage of respondents agrees showing the need for a happier environment
9.	The environment always makes me feel aggressive	18	19	30%	31.7%	Higher percentage of respondents agrees showing the need for a soothing environment
10.	The spaces within my environment gives me a sense of competence	12	28	20%	46.7%	Higher percentage of respondents disagrees showing the need for a more spacious environment
11.	My environment is not polluted	11	32	18.3%	53.3%	Higher percentage of respondents agrees showing the need for a cleaner environment
12.	I enjoy Privacy, security, social interaction, comfort, convenience, safety within my environment	9	34	15%	56.7%	Higher percentage of respondents agrees showing the need for a more comfortable, secure and private environment

Heerwagen et al. (1995) stated that the physical environment has an effect on human health and well-being and these factors include: formal and informal meeting points, personal control for regulating (daylight, lighting, sound, and temperature), access to private rooms for relaxation and quiet surrounding, access to nature and a good view.

The data recorded from the questionnaire shows that Perception of the prison facility shows that:

i. 38.3% desire to have a homelike environment, while 33.3% do not agree with a need for a homelike environment.
ii. 43.3% desire a high ceiling, while 25% do not agree with the need for a high ceiling
iii. 53.3% desire an environment offers form, scent, harmony and compatibility that help them forget everyday stress, while 18.3% do not agree.
iv. 61.7% desire an attractive view of a natural environment, while 11.6% agree to a need for an attractive view of a natural environment
v. 36.7% desire safe work spaces, while 20% do not desire safe work spaces.
vi. 53.3% desire a design that engages and gives them a sense of responsibility, while 11.6% do not desire such design
vii. 50% desire a welcoming environment enriched by beauty, while 25% do not desire a welcoming environment enriched by beauty.
viii. 41.7% always feel sad within the institution, while 23.3% desire an environment that will ease depression
ix. 31.7% feel aggressive within the environment, while 30% do not feel aggressive within the environment
x. 46.7% desire an environment that gives them a sense of competence, while 20% do not need an environment that give a sense of competence.
xi. 53.3% agree that they have an unpolluted environment, while 18.3% say that there is a need for an unpolluted environment.

xii. 56.7% agree that they enjoy privacy, security, social interaction, comfort, convenience, safety within the institution, while 15% do not enjoy privacy, security, social interaction, comfort, convenience, safety within the institution.

According to the respondents several factors are to add up to bring about total satisfaction with the facilities provided. According to Heerwagen et al. (1995), physical environment has an effect on human health and well-being and these factors include: formal and informal meeting points, personal control for regulating (daylight, lighting, sound, and temperature), access to private rooms for relaxation and quiet surrounding, access to nature and a good view. A health promoting environments is not only for the inmates but it is also necessary for prison employees, who work in a very stressful and emotionally intensive environment.

Some facilities provided in these institutions are the cells, religious facilities, sewage disposal facility, kitchen, healthcare facility, and some workshops. Other facilities listed like the visiting area, classroom, counselling facility, recreational area, dining, laundry, dayroom, indoor and outdoor facility, multipurpose hall were not considered in the design of these institutions.

Table 4.11: Cumulative result on the Level of importance attached to various facilities by respondents from Kaduna open prison camp and Borstal training institution.

SPACES	**AVERAGE**			**PERCENTAGE**		
	NI	**N**	**I**	**NI**	**N**	**I**
Visiting area	9	9	31	15%	15%	51.7%
Cells/dormitories	11	4	34	18.3%	6.7%	56.7%
Library	6	9	34	10%	15%	56.7%
Classrooms	7	9	33	11.7	15%	55%
Counselling facility	8	11	30	13.3%	18.3%	50%
Religious facility	2	3	44	3.3%	5%	73.3%
Recreational area	8	8	33	13.3%	13.3%	55%
Healthcare facility	6	8	35	10%	13.3%	58.3%

Dining hall	8	15	26	13.3%	25%	43.3%
Laundry	5	9	35	8.3%	15%	58.3%
Maintenance facility	7	11	31	11.7%	18.3%	51.7%
Dayroom	13	12	24	21.7%	20%	40%
Indoor exercise facility	13	8	28	21.7%	13.3%	46.7%
Outdoor exercise facility	12	5	32	20%	8.3%	53.3%
Refuse disposal	4	7	38	6.7%	11.7%	63.3%
Lighting facility	6	5	38	10%	8.3%	63.3%
Toilet facility	5	6	38	8.3%	10%	63.3%
Multipurpose hall	6	13	30	10%	21.7%	50%
Sizes of windows	5	14	30	8.3%	23.3%	50%
Furniture	10	11	28	16.7%	18.3%	46.7%
Space arrangement	6	15	28	10%	25%	46.7%

From Table 4.10 above all the facilities listed were rated as very important by the inmates hence the need to incorporate the design of these facilities in a redevelopment.

Table 4.12: Level of satisfaction with other characteristics of the prison.

REQUIREMENT	**AVERAGE**			**PERCENTAGE**		
	NA	**N**	**A**	**NA**	**N**	**A**
Ventilation	8	5	36	13.3%	8.3%	60%
Lighting in spaces	12	7	30	20%	11.7%	50%
Thermal comfort	14	20	15	23.3%	33.3%	25%
Sound	20	6	23	33.3%	10%	38.3%
Colour	16	5	27	26.7%	8.3%	45%
Sizes of spaces	13	4	32	21.7%	6.7%	53.3%
Access to day lighting	11	9	29	18.3%	15%	48.3%

CHAPTER FIVE

SITE STUDY

5.1 SITE ANALYSIS

The proposed site for this project will be located at Kaduna. The selection of a site that will be appropriate for the project is very important for the design of any prison facility (Rhoda, 2001). However choosing a site location is paramount for the convenient for visitors, close to a court, easily accessible, education and training institutions, health, welfare services and other amenities (Adley & Frank, 2006). Choosing a site for a prison of whatever magnitude should be such that the site will fulfil all the necessary criteria and on most cases based in compromise. Some of these criteria used in selecting a suitable site include:

i. A thorough check on the availability of some basic building services like water, electricity, sewage disposal systems, road network, transportation network etc.
ii. The compliance of the land use with the existing or the proposed land use.
iii. The relationship of neighbourhood buildings with the general environment that is in respect to the access to the social facilities, infrastructures, etc.
iv. The location of the site is it located where there will be ease of transportation.
v. Is the geography of the site having a good terrain, enough land, good topography, soil, etc.

The site is been analyzed based on the land use character, traffic analysis, structural analysis, circulation analysis, climatic analysis, drainage analysis, site accessibility and the topography of the site.

5.1.1 SITE LOCATION

The site is located in Barnawa Kaduna capital of Kaduna state. The study area lies in the south of Kaduna guinea savannah zone, the site is along coordinates 11° 03′ N, 07° 42′ E. Kaduna state is bounded by Nasarawa state, Plateau state Federal capital territory at the south, Bauchi state at the east, Zamfara state, Katsina state, Kano state at the north, and Niger state at the west. The location of the site can be seen in the fig provided below:

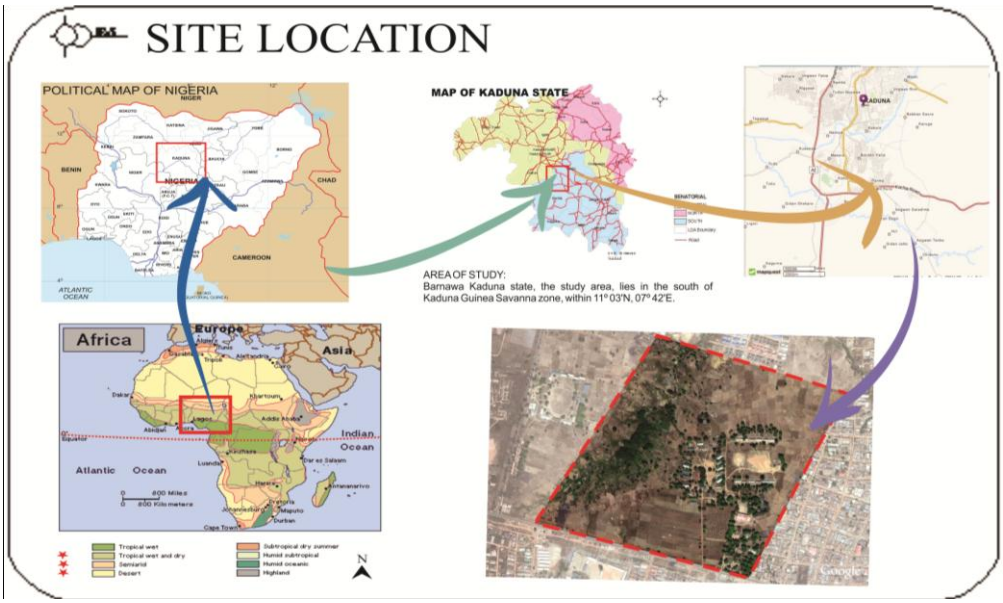


Figure 5.1: Site location

5.1.2 LAND USE CHARACTER

There are several structures both on and outside the site. The structures on the site include: 10 blocks of cells, 1 administrative building, a dilapidated mechanic workshop, a block of two classrooms, a mosque, a catholic cathedral, an uncompleted chapel, a block housing both clinic and library, a kitchen, some five blocks hardly used at the moment of the research, 18 blocks of houses for staff, a piggery, a dog section, a poultry and a fishery

farm, a new poultry farm, a new development of a shopping mall just at the entrance to the site.

Structures at the boundaries of the site are: Narayi housing, Shagari Low cost housing, Borstal and electrical distribution centre, and a major trunk road linking to southern Kaduna.



PLATE VII: Ariel view of the site

5.1.3 TRAFFIC ANALYSIS

There are no major traffic problems experienced along the access to the site, as a result one still need to proffer some solutions to the traffic that will in time be experience due to the new developing shopping mall just at the entrance to the site. Some solutions that will be required to aid efficient service along this route include the provision of pavements, pedestrian walkways, island, and strategic points for drop off, trees and shrubs,

street light. The provision of these facilities is to aid good view, a better streetscape to help organize the activities that will eventually be carried out on this particular location.

5.1.4 STRUCTURAL ANALYSIS/SCHEDULE OF DILAPIDATION

The structural system is composed of reinforced concrete columns, masonry block load bearing walls with cement screed flooring, zinc roofing, windows of aluminium and glass with some portion of the windows covered with paper and some completely cover with aluminium. Issues noted include, leakages, cracked walls, cracked floors, these issues lead to a careful study on the state of dilapidated. The pictures below are a typical of staff housing:





PLATE VIII: Rear view of staff housing Approach view of staff housing

Source: (Author) source: (Author)

The Table 5.1 is a table showing the state of dilapidation of facilities within the Kaduna open prison camp.

Table 5.1: Schedule of dilapidation of the facility: exterior conditions

CURRENT CONDITION		REMEDY	No.
Roof	Structurally sound. Roofing sheet in bad conditions	A change of the roofing sheet	
Wall	Structurally sound. Visible cracks on some walls with washed off paint walls	Scraping of some surface , plaster resurfacing or some sections and general repainting	
Drain gutter	Un constructed Areas dug to be used as drains/gutter	General design of drains/gutter required	
Walkways	No Kerb and Pavement units only visible foot path	Construction of walkways although the site	
Lighting	Security Lighting fittings not functional	Replacement of lighting fixtures and light bulbs	
Mechanical	Inspection chambers clogged , soak away pit not functional	General cleaning and flushing needed in points of inspection ,replacement of connection pipes and rebuilding of soak away pit	
Refuse disposal	There is no specific refuse /ash /bone disposal point visible – thus dumping of waste has no specified area	Design and construction of waste disposal point	
Overhead water tank	The overhead water tank has not been in use for a long time due to rust and leakage	Replacement of overhead tank along with complete installation of it mechanical controls and distribution channels	

Interior spaces and their conditions are shown in the table below:

Table 5.2: Schedule of dilapidation in interior spaces

SPACE	CURRENT CONDITION		REMEDY	No
A Admin	Floor	Terrazzo floor finish in good condition	General cleaning required	
	Walls	Wall paint finish still manageable, visible crack on wall.	Plaster resurfacing for fallen sections and general repainting	
	Ceiling	In good condition	Repainting of ceiling soffit	
	Windows	Windows generally in good condition	General cleaning and repainting of mullions	
	Doors	Access door structurally sound	-	
	Lighting	Some Lighting fittings not functional	Replacement of lighting features	
	Mechanical	Ceiling Fans in some offices and standing fans in some other offices	Replacement of new units	

B Cells	Floor	Terrazzo floor finish broken and depressed	Complete resurfacing: of oversight concrete and new floor finish	
	Walls	Wall paint finish old, damp swelling and peeling of plaster in some sections.	Plaster resurfacing for fallen sections and general repainting	
	Ceiling	Some sections damp, leaking and plaster peeled off	Plaster finish for some sections and repainting of ceiling soffit	
	Windows	Windows of 350mm by 350mm giving poor lighting to the interior	Reconstruction of the windows in cells	
	Doors	Access door not structurally sound	Replacement with new doors	
	Lighting	Lighting fittings not functional	Replacement of lighting features	
	Mechanical	No drains around the building		
	Roofing	Leaking roof	Replace leaking roof	
C Mechanic Workshop	Floor	Cement screed floor finish broken and floor depressed	Complete resurfacing: of oversight concrete and installing of tile floor finish.	
	Walls	Wall paint finish old, damp swelling and peeling of plaster in some sections. With fungi showing on wall	Plaster resurfacing and wall tiling to control damp, and general repainting	
	Ceiling	No ceiling	Install ceiling	
	Windows	Windows generally in good condition	General cleaning and repainting of mullions	
	Doors	Access door not structurally sound, no doors in stall compartments	Replacement of access door and installing of doors for stall unit	
	Lighting	Lighting fittings not functional	Replacement of lighting features and bulbs	
	Mechanical	Water closet not functional, urinal units not functional.	Replacement of sanitary fittings, and general plumbing maintenance needed	
D Offices	Floor	Terrazzo floor finish in good condition	General cleaning required	
	Walls	Wall paint finish old and dirty	Repainting of walls	
	Ceiling	Some sections damp, leaking and plaster peeled off	Repainting of ceiling soffit	
	Windows	Windows generally in	General cleaning and	

		good condition	repainting of mullions	
	Doors	Access door not structurally sound.	-	
	Lighting	Lighting fittings not functional	Replacement of lighting features	
	Mechanical	No Air condition	Installation of air condition where necessary	
E Entrance lobby	Floor	Floor tiles in good condition	General cleaning required	
	Walls	Wall paint finish old and dirty with visible cracks	Repainting of walls	
	Ceiling	Some sections damp, leaking and plaster peeling off	Cement sand screed plaster patch work	
	Windows	Windows generally in good condition	General cleaning, oiling of hinges and repainting of mullions	
	Doors	Access door structurally sound	-	
	Lighting	Lighting fittings not functional	Replacement of lighting features	
	Mechanical			
	Electrical F.	Ceiling fan, old and not functioning properly	Replacement with new ceiling fan	
F Kitchen	Floor	Cement screed floor finish in a bad condition with holes and cracks on the floor	Re installation of floor finish	
	Walls	Wall paint finish old	General repainting	
	Ceiling	Some sections damp, leaking and plaster peeled off	Repainting of ceiling soffit	
	Windows	Windows in a poor state	Fixing of new window set	
	Doors	No Access door	Replacement with new doors	
	Lighting	Lighting fittings not functional	Replacement of lighting features	
	Mechanical			
G Lobby	Floor	Cement screed floor finish in a bad condition	General cleaning required and reinstallation of flooring	
	Walls	Wall paint finish old, damp and peeling of plaster in some sections with fungi on walls	Cement sand screed plaster patch work and Repainting of walls	
	Ceiling	Some sections damp, leaking and plaster peeled off	Cement sand screed plaster patch work and Repainting of walls	
	Windows			

	Doors	Access door not structurally sound	Replacement with new doors	
	Lighting	Lighting fittings not functional	Replacement of lighting features	
	Mechanical			
H Poultry farm	Floor	Floor finish in bad condition with cracks and holes	Reinstallation of floor finish	
	Walls	Peeling paint with weak and rusty net	Repainting walls and a replacement of nets	
	Ceiling	-	-	
	Windows	-	-	
	Doors	Access door not structurally sound	Repainting of existing door	
	Lighting	Lighting fittings not functional	Replacement of lighting features	
	Mechanical	Brooding room not functional	Specialist overhauling of the unit	
I & J Fishery	Floor	Un levelled floor finish	Replacement of flooring with provision of slope to ease drainage	
	Walls	No visible paint due to visible fungi on walls	Repainting of walls	
	Ceiling	-	-	
	Windows	-	-	
	Doors	-	-	
	Lighting	-	-	
	Mechanical	No inspection chamber provided. Water drained has no slope for easy outlet	Replacement of new unit	
K New poultry farm	Floor	Cement screed floor finish in good condition Floor drain surface cover in good condition		
	Walls	Wall paint in good condition	-	
	Ceiling	Ceiling soffit in good condition	-	
	Windows	Windows generally in good condition	-	
	Doors	Access door in good condition Bulk delivery door sound	-	
	Lighting	Lighting fittings functional		
	Mechanical	drains have no defined slope	General cleaning , flushing of drains	

L **Kennel**	Floor	Cement screed in a manageable state	Replacement of flooring	
	Walls	Walls in a manageable state	Repainting of walls	
	Ceiling	Ceiling in a manageable state	Repainting of ceiling	
	Windows	Steel railings	Still useful	
	Doors	Steel railings	Still useful	
	Lighting	-	-	
	Mechanical	No drain for ease in washing the compartment No plumbing	Design of drain for ease in cleaning each space	
M **Piggery**	Floor	No floor finish	Replacement of floor finish	
	Walls	Un-plastered walls	Plaster walls and general repainting	
	Ceiling	-	-	
	Windows	Windows generally in good condition	-	
	Doors	Access door not structurally sound, no doors in compartments	Replacement of access door and installing of doors for unit	
	Lighting	Lighting fittings not functional	Replacement of lighting features and bulbs	
	Mechanical	No drain, plumbing	Replacement of sanitary fittings, and general plumbing maintenance needed	
N **Staff club**	Floor	Floor finish in bad condition	General cleaning and replacement of floor finish	
	Walls	Wall paint finish old, damp stained	Repainting of walls	
	Ceiling	Soffit paint finish old eave projection and a part of the ceiling eaten by moth	Repainting of ceiling soffit and replacement	
	Windows	Small windows	Replacement with bigger windows	
	Doors	Access door old, not functional	Replacement with new door	
O **Public toilet**	Floor	In a bad state	Replacement of floor	
	Walls	Wall not painted and some part broken	Re building the public toilet	
	Ceiling	No ceiling	-	
	Windows	No window	-	
	Doors	No doors	-	
	Lighting	Lighting fittings not functional	Replacement of lighting features and bulbs	
	Mechanical	No drains provide	Design of drains with	

		No plumbing available	inspection chambers General plumbing maintenance and replacement of ALL tap heads and valves	
	Electrical Controls.	-	Installation of electrical control points and installation of protection cover	
Q, P & R Staff housing	Floor	Cement screed finish with holes and cracks visible on the floor	Re placement of flooring	
	Walls	Washed off paint	Repainting of walls	
	Ceiling	Wooden eaves and ceilings eaten by moth	Replacement and redesigning of ceiling	
	Windows	Broken glasses with rusted mullions	Replacement of windows	
	Doors	Wooden doors	Replacement of doors	
	Roof	The existing roof is rusted, with lots leakage	Replacement of roofing sheet	
S Catholic/ Chapel	Floor	Catholic church in good condition Chapel still under construction	-	
	Walls	Catholic church in good condition Chapel walls not plastered or painted	-	
	Ceiling	Catholic church in good condition No ceiling yet	-	
	Windows	Windows in catholic church in good condition No windows installed	-	
	Doors	Doors in catholic church in good condition No installed doors	-	
T Library	Floor	Cement screed with cracks and small visible holes	Replacement of floor finish	
	Walls	Washed paint	Repainting of walls	
	Ceiling	Damp ceilings	Replacement of ceiling	
	Windows	Wooden windows	Replacement of windows	
	Doors	In good condition	-	
U clinic	Floor	Cement screed with cracks and holes on floor	Replacement of floor finish	
	Walls	Washed paint	General repainting of walls	

	Ceiling	Damp ceilings	Replacement of ceiling	
	Windows	Wooden windows	Replacement of windows	
	Doors	In good conditions	-	
V&W Primary school	Floor	Cement screed in good condition	-	
	Walls	Walls in good condition	-	
	Ceiling	Ceiling in good condition	-	
	Windows	Windows generally in good condition	-	
	Doors	Doors in good condition	-	
	Lighting	No lighting fittings	Install lighting fittings	
	Mechanical	No visible drain	Construction of drain	
	ROOF	Roof in good condition	-	
X Maintenance office	Floor	- Floor finish in good condition		
	Walls			
	Ceiling			
	Windows			
	Doors			
	Lighting			
	Mechanical			
	ROOF	The existing roof is low a flat reinforced concrete roof	Cement sand screed plaster resurfacing needed	
Y & **Z Parking/ walkways**	Floor	No parking space designed No walkways only foot path	Provision of parking for staff and visitors Replacement of foot path with paved walkways	
	Walls	-		
	Ceiling			
	Screen			
	Doors			
	Lighting			
	Mechanical			
	ROOF			

5.1.5 CIRCULATION ANALYSIS

The existing means for movement around the site is mainly footpath, which indicates that there were no planned circulation path considerations. Hence this unplanned

circulation gave the site a poor circulation network. To this effect some requirements to be introduced to the site include: pedestrians, pavement, and pavement etc.

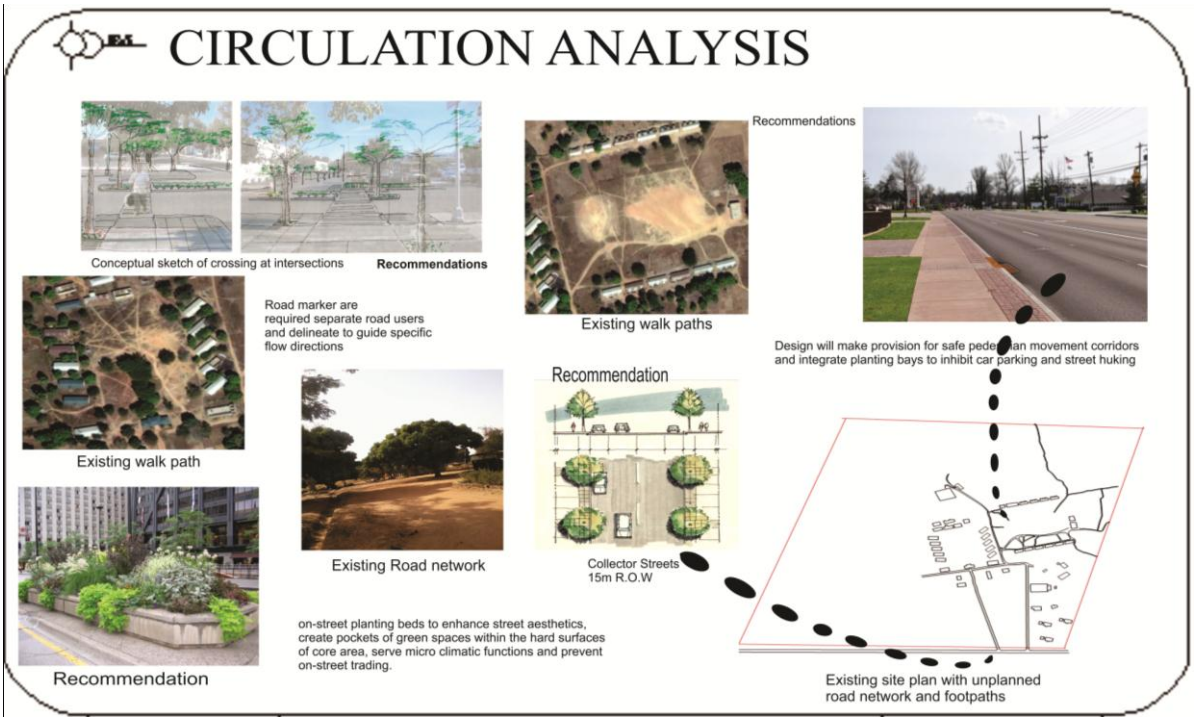


Figure 5.2: Circulation analysis of Kaduna open prison camp

5.1.6 CLIMATIC ANALYSIS

The climate of Kaduna is tropical. Rainfall is much less in winter in Kaduna than in summer. January is the driest month with 0mm while August is the month with the most precipitation falls with an average of 284mm with a average temperature of 23.3℃ the lowest temperature of the whole year, a total of about 1211mm of precipitation falls annually. The average temperature in Kaduna annually is 25.2 ℃. April is said to be the warmest month of the year with an average of 28.6℃. yearly the average temperature vary by 5.3℃.

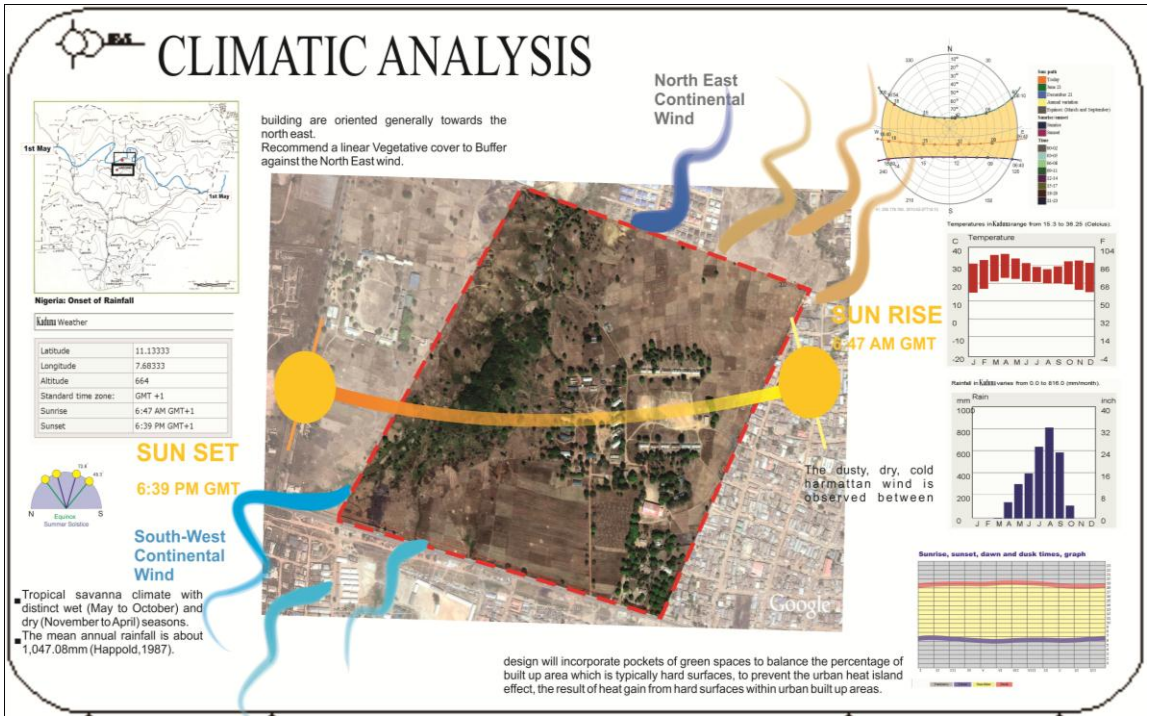


Figure 5.3: Climatic analysis of site

5.1.7 DRAINAGE ANALYSIS

The drainage system for the site were dug but left unattended to and as a result leading to backfill of dug soil. The proposed drainage system would be channelled towards the stream and properly collected, processed and recycled and returned for use in the institution. Some channels to be introduced for the collection of this waste include: gutter, sidewalks, at least two different surfaces with minimum falls to shed water and leave dry surfaces to prevent ponding. The fig below illustrates the drainage analysis of the site.

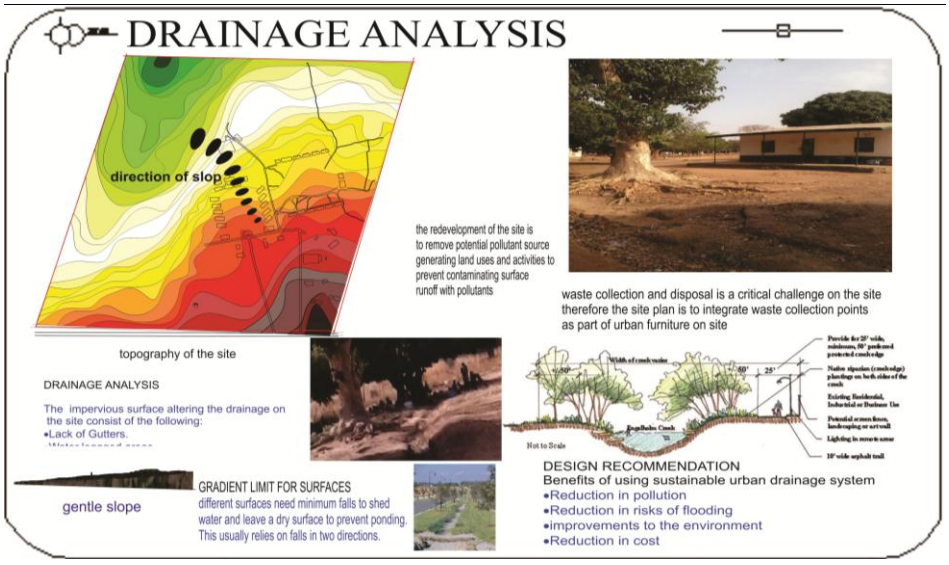


Figure 5.4: Drainage analysis

5.1.8 TOPOGRAPHY OF THE SITE

The topography of the site is more of a gentle slope, 625 is the highest point and 598 the lowest point. On the left side of the site is a stream passing through the site. It was said by some staff that there used to be a dame some years back and as at the time of visit the dame was already in a dilapidated state.

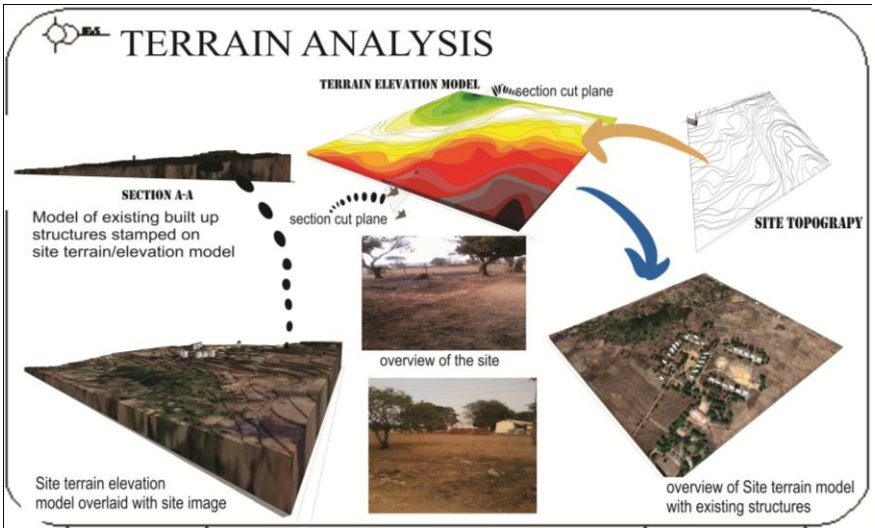


Figure 5.5: Topography analysis of site

5.1.9 SITE ACCESSIBILITY

The site has two major access gates; the two accesses are along the major trunk road leading to southern Kaduna. The first gate been the main gate leads directly to the administrative building while the second gate is used more by staff leading straight to the staff houses. The other accesses to the site are footpaths due to the fact that the prison has no visible fence.

5.2 SITE ZONING

The site is zoned into three. The first zone is the non-prisoners access zone, limited controlled prisoner access zone and general prisoner access zone. The Non prisoner access zone is to house the staff, visitors, and the vehicular access, the limited controlled prisoner access zone is to house the service building, reception, workshop, stores, kitchen, medical and health care facilities etc. the general prisoner access zone is to house the inmates accommodation, recreational facility, library/reading rooms, dayroom/multipurpose room, laundry, shower area and toilet facilities.

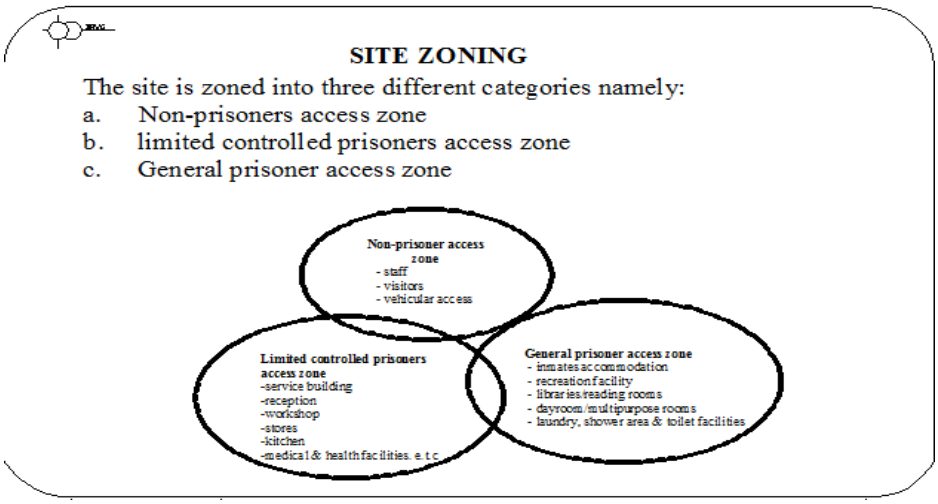


Figure 5.6: Site zoning

CHAPTER SIX

DESIGN REPORT

6.1 BRIEF DEVELOPMENT

The Nigerian government intends to improve or enhance the state of the Nigeria prisons to bring it to standard in accordance to global practice. The project will involve the redesign and in some cases the redevelopment of existing prison facilities.

In a bid to fulfil the basic requirement of the design, the physical and psychological characters that influence reformation were employed. These architectural characters are to provide a guide to what is needed for either the redesign or the redevelopment of prisons. These architectural characters include: the proportion of spaces in the physical environment, use of colours, lighting/day lighting within spaces, spatial form, material and construction, nature, acoustics of spaces, security of the facility.

As a result of the need for a change in attitude of inmates, it is important to plan an environment that identifies and fulfils the user's needs in all areas to improve efficiency of the institution. The design of prison should have the required factors that are safe, healthy, comfortable, durable, aesthetically pleasing, and accessible. The institution must be able to accommodate the specific facilities needed. More emphasis is given to individual spaces for the purpose of this design. The spaces are based on functionality hierarchy due to the nature of the institutions requirement. The spaces within the institution were discussed in 6.2 below. Based on this space listed below, a schedule of accommodation is provided.

i. Administrative block: this arm of the prison maintains the fiscal records for the total cost of operating the facility, this is also the arm that determines the welfare, the management of the prison e.t.c.

ii. Inmate housing unit

iii. Medical unit

iv. School for inmates

v. Workshop

vi. Laundry

vii. Kitchen

Well designed buildings are buildings which are fit for purpose and as such these partitions are according to functional requirements. Due to the nature of this institution, it is thereby divided into three: non- prisoner access zone, limited controlled prisoner's access zone, and general prisoner access zone. The components of a correctional facility are: administrative unit, inmates housing unit, medical unit, school, workshops, laundry, and kitchen etc.

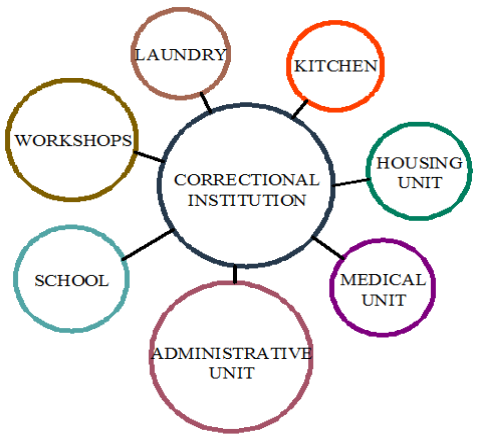


Figure 6.1: Relationship of components in a correctional institution

6.1.1 SCHEDULE OF ACCOMMODATION

This schedule of accommodation below shows the approximate value of spaces hence the table below reflects the number of spaces needed, the floor area and the total area.

Table 6.1: Schedule of accommodation

S/N	SPACES	UNITS	FLOOR AREA(M^2)	TOTAL AREA (M^2)
A. ADMINISTRATIVE UNIT				
1.	Sally port	1	40.5	40.5
2.	Reception	1	19.8	19.8
3.	Offices		9	9
7.	Holding room	1	20	20
8.	Control room		16	16
9.	Armoury	4	5	5
10.	Open registry	1	20	20
11.	Welfare officer	1	12	12
12.	Visitor screening office	1	20	20
13.	Closed visit	1	16	16
14.	Inmate waiting	1	9	9
15.	Asst. yard master	1	9	9
16.	Asst. house keeper	1	9	9
17.	Uniform	1	6	6
18.	Records		6	6
19.	Inmate property	1	9	9
20.	Examination room	1	9	9
21.	Processing	1	14	14
22.	Finger print	1	6	6
23.	Judge	1	9	9
24.	Court room	1	24	24
25.	Conference counselling	1	9	9
26.	Open visitation	1	50	50
27.	Secretary	3	7	7
28.	Toilets		3	3
29.	Stairs	2	12	12
B. INMATES HOUSING UNIT				
1.	Cells		8.6	8.6
2.	Cells	60	26	26
3.	Toilets		4	4
4.	Showers	1	14	14
5.	Dayroom	1	72	72
6.	Store	3	9.6	9.6

S/N	SPACES	UNITS	FLOOR AREA(M^2)	TOTAL AREA (M^2)
7.	Exercise yard	2	140	140
8.	Control room	33	45	45
C. MEDICAL UNIT				
1.	Consulting room	2	10	10
2.	Meeting room	1	24	24
3.	Interview room	1	15	15
4.	Ward	5	8	8
5.	General ward	1	24	24
6.	Toilets	18	2	2
7.	Antenatal/postnatal ward	2	8	8
8.	Theatre	1	20	20
9.	Pharmacy	1	4	4
10.	Changing room	2	8	8
11.	Radiology	1	15	15
12.	Admin secretary	1	10	10
13.	Central records	1	15	15
14.	Waiting area	1	58	58
15.	Consulting/examination room	2	15	15
16.	Laboratory	1	8	8
17.	Ophthalmologist	1	15	15
18.	Dentistry	1	15	15
19.	Pathology	1	15	15
20.	Medical director	1	16	16
21.	Ambulance parking	1	52	52
22.	Bulk store/Tranquilizers	2	10	10
23.	Injection/dressing	2	6	6
24.	Treatment room	1	20	20
D. CLASSROOM				
1.	Classroom	21	120	120
2.	Store		26	26
3.	Toilet	36	20	20
4.	Computer rooms	6	120	120
E. WORKSHOP				
1.	Warehouse (consumables)	1	300	300
2.	Warehouse (non-consumables)	1	300	300
3.	Control	2	5	5
4.	Loading bay	1	50	50
5.	Distribution	1	52	52
6.	Office	3	12	12
7.	Record room	1	12	12
F. MECHANIC WORKSHOP				
1.	Engine bay	1	300	300

S/N	SPACES	UNITS	FLOOR AREA(M^2)	TOTAL AREA (M^2)
2.	Admin office		15	15
3.	Reception	1	10	10
4.	Toilet		6	6
G. LAUNDRY				
1.	Drying area	1	100	100
2.	Clean cloths area	1	54	54
3.	Ironing area	1	54	54
4.	Washing area	1	50	50
5.	Collection/sorting	1	50	50
6.	Reception	1	12	12
7.	Finished clothes	1	15	15
8.	Control room	1	15	15
9.	Entrance porch	1	9	9
H. KITCHEN				
1.	Dining	1	300	300
2.	Counter	1	18	18
3.	Dry/cold store	1	20	20
4.	Kitchen	1	50	50
5.	Washing	1	9	9
6.	Waste	1	9	9
7.	Changing room	2	10	10
8.	Toilet		6	6

6.2 CONCEPT DEVELOPMENT

The architectural concept employed in this research is solution originated alongside other design factors incorporated. The concept adopted for this design comes from the ideology that a building should speak its identity and still have iconic features in its location. The building form is conceptualised from first of all the function of the spaces, the spaces required and from results of questionnaire survey.

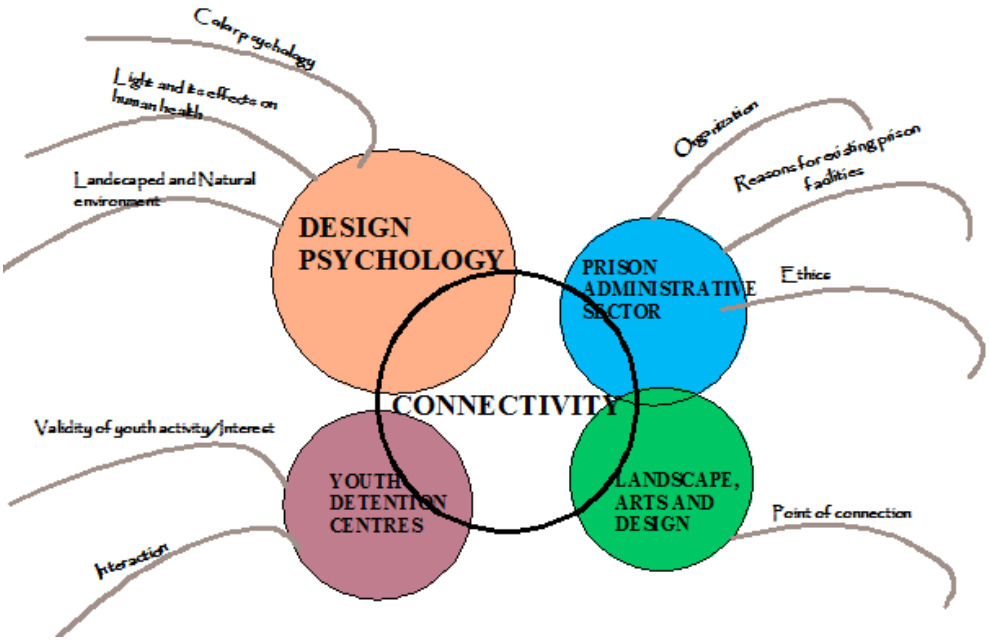


Figure 6.2: Concept development

6.3 DESIGN CONSIDERATIONS

From the case study findings, inmates' perception as reflected in the table 4.9 justifies the need for a redevelopment of a prison with an architectural form that influences inmate behaviour. Elements of these architectural form include: ceiling height, homelike environment, day lighting, Some design principles adopted in this project which are important include: cultural considerations, climatic considerations, the cost of construction, the purpose and the management strategy, flow of staff, detainee and vehicular traffic within the facility, maintenance. These considerations are dependent on the type of activity on site:

6.3.1 TYPICAL SCHEDULE OF ACTIVITIES

Table 6.2: A typical prison schedule of activity for Kaduna open prison camp

TYPE OF ACTIVITY	TIME OF ACTIVITY
Open out	6:00am
Labour parade	7:30am
Head count	10:30am
Head count	11:45am
Mid-day lock up	1:45pm
Inmates games	4:00pm
Warning to final lock up	5:45pm
Final lock up	6:00pm

It's important to note that the primary goal of correctional facility is for inmates to adjust to the outside life after been released and this can be achieved when they have been educated and trained appropriately and to this end some correctional training, reintegration programs are provided and a schedule of the location, and exposure rate to these programmes is of great significance the table below give a list of programs, the location, timing and space required for such program. These vocational training are to instil discipline of working life, order, timekeeping, work to meet deadlines, been under somebody (being managed and overseen). This will help these inmates become responsible, and better people when released. The table below is a proposed activity schedule for inmates to experience the different spaces provided within the facility.

Table 6.3: Proposed schedule of activity

PROGRAMS	SPACE REQ.	TIME	LOCATION	EXPOSURE RATE
i. Open out time/head count		6:00am	Dayroom	16.7%
ii. Labour parade /Education and vocational trade				
- Various courses		7:30am – 12:30pm	School	66.7%
- Animation			Poultry farm, fishery, kennel, piggery, e.t.c	
- Carpentry, plumbing, welding, painting			Workshop	
- Automotive repairs, electrical work			Mechanic workshop	
iii. Custom work				
- Tree cutting		7:30am – 9:30pm	Town services	33.3%
- Community work				
- Art				
PROGRAMS	**SPACE REQ.**	**TIME**	**LOCATION**	**EXPOSURE RATE**
- Music		7:30am – 9:30pm	Town service	33.3%
- Prison radio broadcasting, news e.t.c				
iv. Head count/lunch		12:30pm	Dayroom	16.7%
v. Mid day lock up		1:30pm	Cells	16.7%
vi. Inmates games		2:30pm	Garden/ football field	25%
vii. Technical vocational training		4:00pm		29.2%
viii. Warning to final lock up		5:45pm	Dayroom	4.2%
ix. Final lock up		6:00pm		

Design considerations for both individual building and layout of a correctional facility could be very elaborate and also complex. But the most important consideration is safety and security during the design of a prison. However, in the layout of the building the operational cost over the life span of the facility plays a major role and every decision made in the preliminary planning and design stage all result in operational, staffing and

maintenance cost savings even for the building life cycle. One other major consideration is that the building should be adaptable in order to accommodate different inmate needs. The design consideration is classified into physical consideration and psychological consideration.

6.3.2 PSYCHOLOGICAL CONSIDERATIONS

The psychological considerations used in this design include:

i. DAYLIGHTING/LIGHTING

The adequate use of day lighting improves human comfort within a space. Hence windows were provided where needed and also tubular skylights were provided where windows couldn't do so much. The lighting of a room is an important factor for the atmosphere of a room. Illumination of spaces using day lighting positively affects the behaviour of users.

ii. VENTILATION

The ventilation of each facility is dependent more on natural source there by the provision of some high windows will help address a portion of the issues of ventilation.

iii. COLOUR

The colour consideration applied in this design is to influence the psyche of human, warm and saturated colours are known to have arousing effect. The room colours are dependent on the colour bearing objects which include the surfaces like the floor, walls, and ceiling. Dominant colours are better towards the grounds, while less dominant colours (less heavy) are preferred up at the ceiling.

iv. ACOUSTICS

For the acoustics performance of the building the autoclaved aerated concrete can be used as an effective sound barrier. Sound of hospitality, invitation, intimacy, can be experienced in spaces. Sound unites an individual with the environment and it gives an awareness of participation in such spaces. Elements that serve as acoustical experiences of space include: rain water from the roof lead through a pipe introduces sound of flowing water etc.

v. AESTHETICS

The aesthetics of a building is seen as a result of direct perception, the design of interior spaces is a prominent issue. The building appearance has a good visibility or view from and to the prison.

vi. MATERIAL AND CONSTRUCTION

Materials and construction are common architectural practice with particular quality of expression. E.g. dark gray steel if conveys a massive technical atmosphere, glass conveys modernism and cleanliness, wood conveys homeliness and stone conveys durability. The design employs the use of materials and construction like the terrazzo flooring that gives variety of colour, concrete walls which could be designed to architects specification.

6.3.3 PHYSICAL CONSIDERATION

An environment with deteriorating features such as dilapidated buildings, damage, drawing, and litter can harm health. In view of this some physical considerations used in this research include:

i. SITE PLANING/ LANDSCAPING

A proper planning of a site enhances an ease in circulation, supervision of inmates also it makes it easier for the prison staff to handle cases adequately especially when the housing of the inmates are adequately classified. In landscaping the site the following were used: trees, shaded walkways, hedges and an area marked out for a recreational garden with adequate planning with the use of colours that can help stimulate emotional response with an interest in the reformation of prisoners. The introduction of these landscape elements in the design of this garden is to address self-worth, stress management, social interaction, skill development, appreciation and acceptance. The use of repeated circular forms creates a sense of unity and that the outer area design is to encourage movement around and through the space, and the inner chamber should enable inmates rest and contemplation. Access through the garden has been manipulated so that some angles invite exploration whilst others offer fulfilling views. The facilities located on site are arranged such that the inmates housing, workshop, dining, laundry, classrooms, garden, farmlands are located within the prisoners access zone. The administrative building the chapel, clinic, automobile workshop, parking lot are at the limited controlled prisoners access zone. The non prisoners access zone include: staff housing, visitors access zone. A detailed site plan, plan on site can be seen in the figs below.

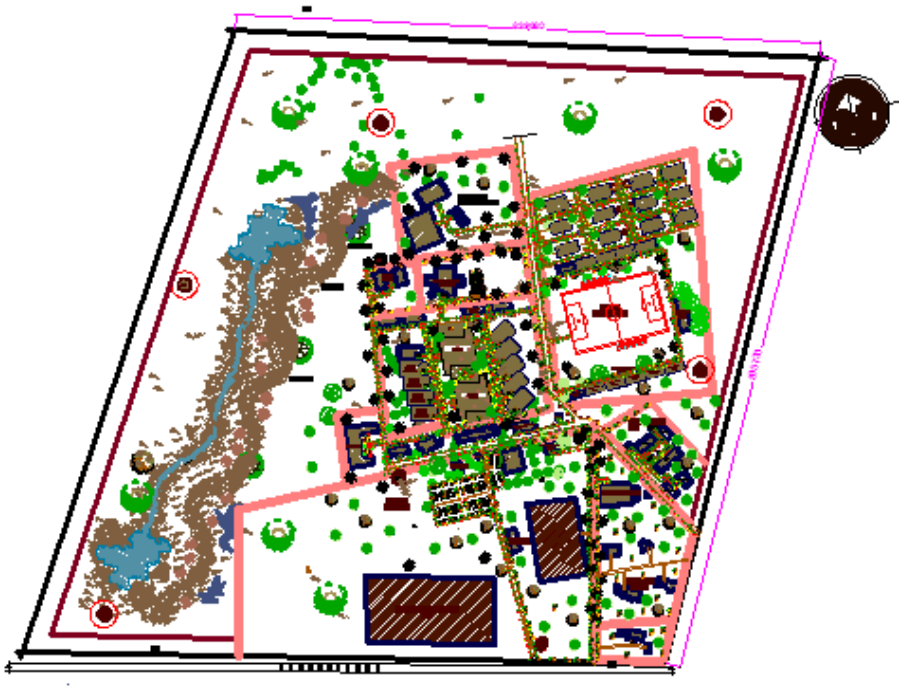


Figure 6.3: Site plan

The access to the site is through a major road network leading to southern Kaduna. The site has been analysed and it is said to fit the description of a location of a correctional facility. A parking area is designed mainly for visitors to the site, officers not residing within the facility, administrative block as the first point of contact to the facility, inmates housing surrounding a garden for inmates' relaxation. A typical of this site can be seen in the fig below.

ii. SECURITY CONSIDERATION

The proposed site which is an already existing site has no considerations for the security hence this project seeks to address the issues of security of the site through rethinking of the site design and the effective use of the built environment. Some of the principles

employed include: natural surveillance, natural access control, territorial support, maintenance and management, use of technology, sufficient lighting.

a. Natural surveillance: this form of surveillance can be achieved through the use of windows, lighting, and the removal of any obstructions so as to improve sight lines within the buildings and the facility at large.
b. Natural access control: this means of surveillance relies on the use of doors, fences, shrubs, adequate locks, window barriers and other physical elements to help keep intruders out of the facility and the inmates housed within the facility restricted to the environment. It is important to note that the proper location of entrances, exits, fencing, landscaping, and lighting can decrease criminal opportunities. Also non physical or psychological barriers can be used in the form of signs, paving textures, anything that speaks the integrity/uniqueness of an area. A reason behind use of psychological means is to make such area unattractive to potential criminals.
c. Territorial support: the use of fences, pavements, treatment, arts, signs, good maintenance, observation tower, landscaping are clear boundaries between public and private spaces which go as far as expressing the ownership of an area and makes it easier to identify intruders.

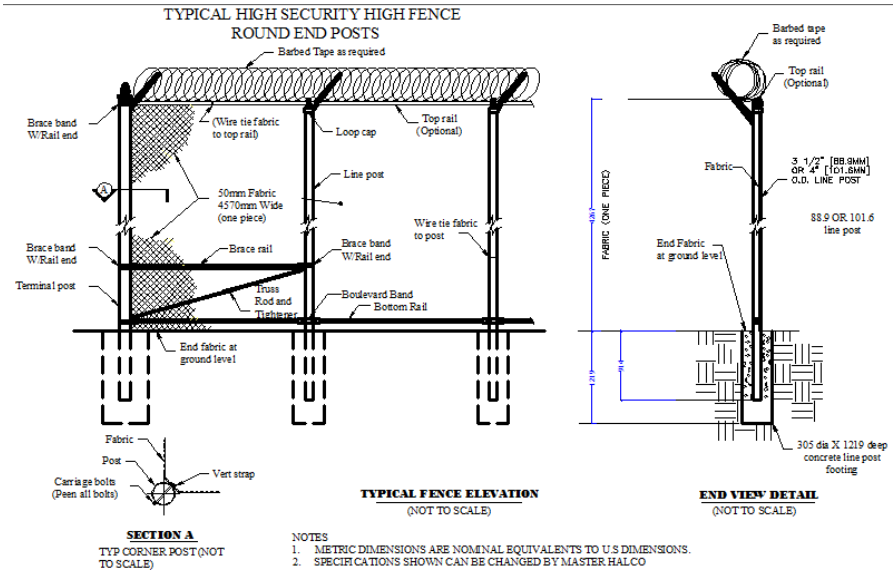


Figure 6.4: High security fence round end posts

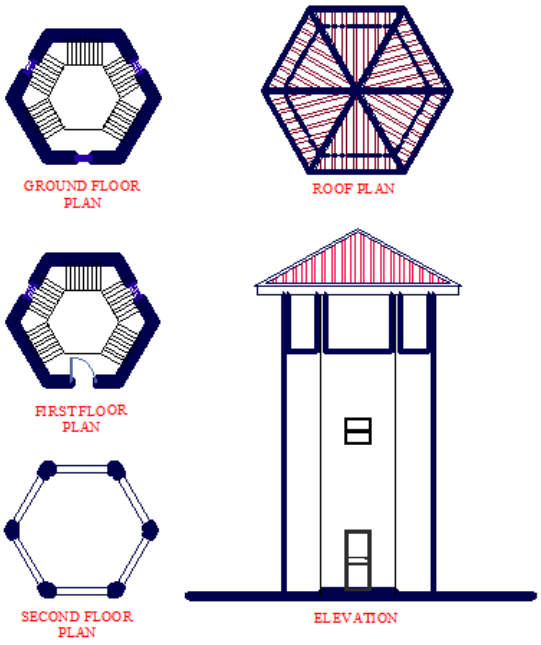


Figure 6.5: Observation tower

d. Maintenance and management: the use of material and finishes determine the kind of maintenance that will be sustained over time.

e. Use of technology: technology such as motion sensors for both intruders and inmates, radius tracker, CCTV areas where there are gathering of inmates in large numbers like the dining halls, workshops, classrooms, maximum security area.

f. Lighting: the provision of sufficient lighting is very important for people to see and be seen. The lighting of a space could serve as security of those spaces and reduce possible crimes in such areas using Good lighting which helps in the identification of a form in a distance of 10 meters.

iii. STRUCTURE AND MATERIAL

The structure require an arrangement of post and beams

The materials used for this construction are reinforced concrete, autoclaved aerated concrete, steel, aluminium and glass. The fluidity of the reinforced concrete makes it a good construction material, steel offers high strength and ductility and it is durable when protected from corrosion. Steel with high yield stress allows for smaller section and its low weight reduces foundation requirement. Autoclaved aerated concrete (AAC) blocks have low density and excellent insulation properties, AAC are used to form inner leaf of a cavity wall due to its excellent thermal insulation. AAC has advantage due to its 14-20% reduction in embodied energy of masonry, other advantages of autoclaved aerated concrete are

i. Its ability to reduce at least 30% of environmental waste, decreases over 50% of greenhouse radiation and over 60% integrated energy on the surface of brick.

ii. An excellent acoustics performance and it is a good sound barrier

iii. Its ability to reduce humidity in a building, allow for diffusion of water making it very airy and in turn helps prevent condensation.

These finishes were selected as a careful consideration of the cost, durability, maintenance, safety, and appearance of these materials. Floor finishes are determined by the function of space, though the predominant floor finishes used is terrazzo cast in situ. In using terrazzo floor finish, 4 to 10% overall reduction in volume of construction can be done, terrazzo flooring does not accumulate water, it absorbs water at a rate $1/10^{th}$ that of cementitious terrazzo, made of recycled material, it is environmentally friendly and it produces zero harmful chemicals, terrazzo floor finish enhances the indoor air quality.

iv. CIRCULATION

The circulation spaces were done with security as a major consideration, these circulation spaces both vertical and horizontal spaces were placed at visible locations for ease in monitoring. Inmates which are physically disabled are catered for as well by providing ramps at strategic locations for their wheel chairs. Sidewalks (pavements),

v. SERVICES

The services provided on site include water supply, power supply, waste water and sewage disposal, fire fighting system. Recyclable water supply is proposed for both flushing and washing with an overhead storage tanks. Power supply on site will be taped from an electric distribution point situated close to the site. Fire hydrants, fire extinguisher and smoke detectors would be provided and installed in all sections of the facility.

iv. ARCHITECTURAL EXPRESSION

The architectural expression used here is to ensure that every detail influences the healing of each user. The experience of any facility starts from the outside of the building and the impression everyone gets to have at first. The careful design of spaces outside the building can enhance inmates, staff, and visitor's experience. Well-designed surroundings are easy to negotiate, pleasant, well-designed and relaxed as possible. For the reduction of pain and stress of inmates:

a. Contact with nature reduces blood pressure, muscle tension and pulse rate, and can also have a subtle effect on our experience of pain.
b. Use of gardens to improve the mood and reduce stress and improve the inmates outcome especially when stress is accompanied by feelings of anxiety.
c. Walk in natural setting help mental health patients improve self-esteem, vigour and mood, and reduce tension.
d. Contact with nature help reduce irritability and aggressive behaviour.

Designing help create spaces which feel special, these spaces create

a. Sense of place: designs should be specific to its location, working with site will enhance the sense of place.
b. Building form: the building is an interdependent network of open areas with load bearing walls, the supports are provided by columns. The forms are reflected on the floor plan and elevation.
c. Material: for ease of construction, the design of this facility has been simplified using reinforced concrete, steel, autoclaved aerated concrete.

d. Building finishes: finishes are guided by cost, durability, maintenance, and safety. Floor finishes are determined by function of spaces, terrazzo floor finish is used for most of the spaces.

The design is built to help eliminate the use of expensive technology and making the use of such technology in areas where inmates are prone to harm each other as in the maximum security area.

6.4 DISCUSSION OF DESIGN

6.4.1 BUILDING ORIENTATION/ SPATIAL ARRANGEMENT

Some already existing structures on the site were properly oriented placing the longer side of the building along the North east trade wind and the south west trade wind and the shorter side of the building along the North West trade wind and the other side along the south east trade wind. The orientation of the buildings was such that there is an easy flow and thus the accessibility to each facility very easy and quick. The perception of interior spaces changes as we move around and inside these spaces. Interior spaces are defined by two distinct elements, solid and the void and it is the solid (walls, floor, ceiling, and roof) that defines the void which is the physical setting, these spaces are useful in the field of perception and visual preferences. The spatial arrangement was done based on the concept of these architectural spaces, the appropriateness of these spaces for specific activities with privacy as a very important topic. The arrangement of these spaces is to create a layout of the building that will enable users know and have an ability to react to emergencies and also help in terms of the relationship between environment and behaviour, the spatial

arrangement enables freedom of movement. The basic spatial qualities are: spaciousness, openness, complexity, order. This relationship in spaces can be seen in the plans below:

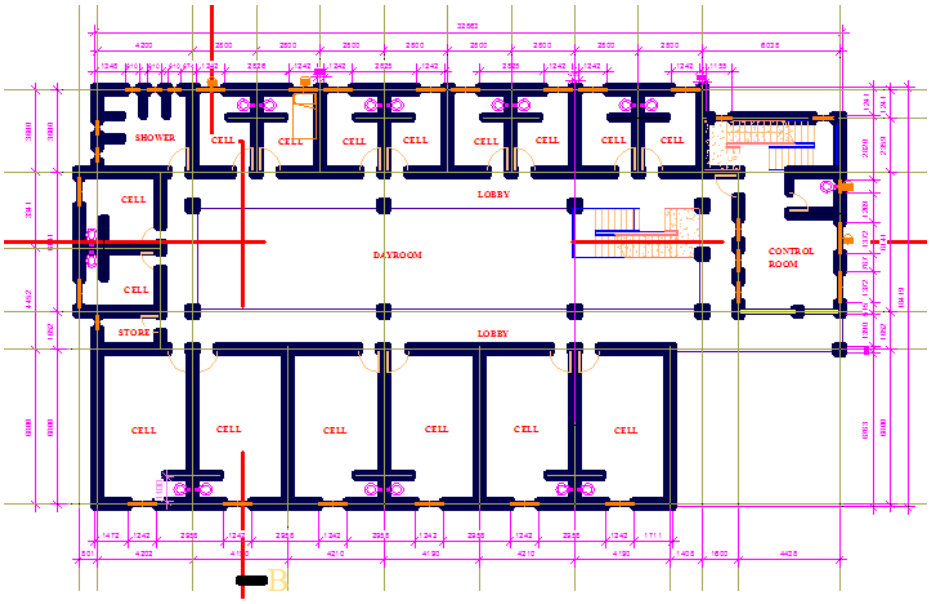


Figure 6.6: Proposed ground floor plan for minimum security cells/juveniles

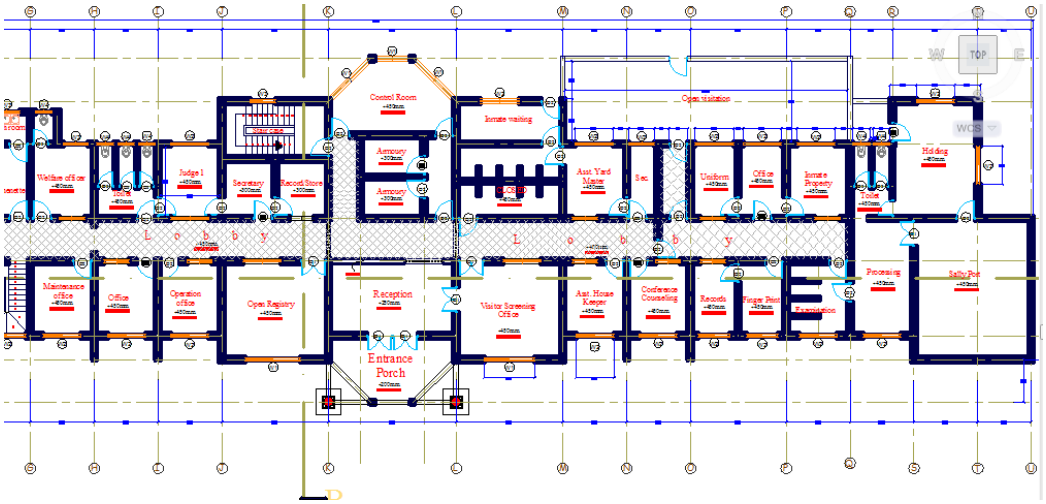


Figure 6.7: Proposed ground floor plan Administrative block

6.4.2 PROPORTION

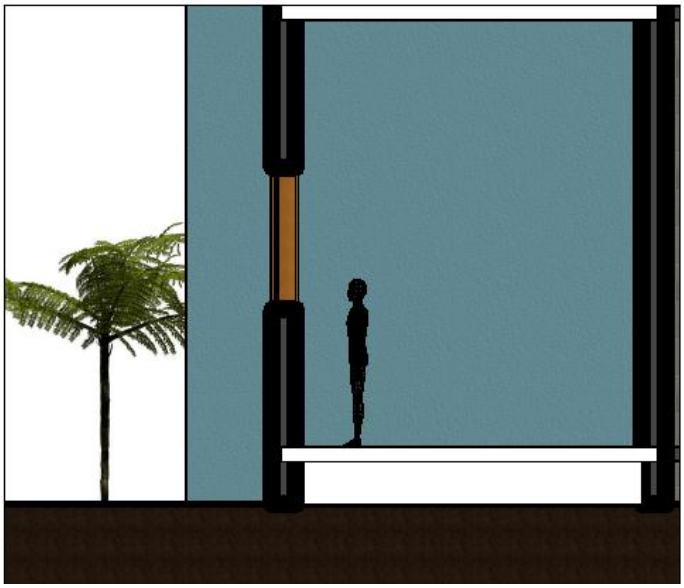


Figure 6.8: Proportion of a cell

The diagram above is a typical of the proposed cells windows linking inmates with the surrounding environment. The provision of windows in cells helps inmates connect with the outside making cells enjoy natural light, helps promote psychological health. Also on the other hand considerations of the head room is 4.5m this choice of headroom height in the maximum security housing is to discourage every suicide attempt, create a good sense of space the higher the headroom the bigger the room seems.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

7.1 SUMMARY OF FINDINGS

This research shows that architecture impacts on humans emotionally. The spaces provided are experienced immediately they are occupied and such feelings could either be comfort or ease while others are repelling, and discomforting. The aim of this research is to provide architectural indoor and outdoor spaces that yield effective responses. Some of the major issues addressed are analysis of both physical and psychological responses:

i. The review of effective responses based on models and findings of environmental psychology.
ii. Architectural character, and the effects on inmates reformation.
iii. Description of architectural character by general applicable physical qualities that captures a wide range of behavioural physical properties of architecture.

7.2 CONCLUSION

One aim of this research is to show how different factors in the physical environment can be supportive psychosocially and as well heath promoting, it is important to note that in making decisions concerning the built environment of an institution as this (the prison institution), it is necessary to work with people like psychologist, architects, landscape architects, doctors, behavioural scientists, health promoters, and other disciplines that are interested in building an environment that will help improve the inmates to be housed within the facility. It is very important to note that punishment can be spent in either a

destructive or a limited free environment although a destructive environment will cause an increase in destructive behaviour.

The saying “we shape our buildings and afterwards our buildings shape us” is a reality because architecture surrounds every human being everyday or better still it is not out of context to say that architecture is a very important part of life and there is a need to treat every detail of it with care. The influence of architecture on human behaviour could either encourage or discourage the creative process.

1. Light is hence shed on factors that promote health, well being, increased profitability and an increased productivity.
2. The research encourages that the decision makers decide to implement factors that are supportive and will in turn add value to inmates after release and re integration to the society.
3. It is important to note that the building we design impact on human behaviour in a very significant way.

7.3 RECOMMENDATION

With the challenges faced when trying to go about this research, the following are recommended:

1. The planning and design of prisons should go beyond just incarceration and punishment for crime committed but should also explore incorporating ‘healing architecture’ that meets both social, psychological needs of its user.

2. Proportion, lighting, ventilation, colour, texture, sound, safety, comfort, day lighting which help to stimulate an individual in an architectural environment should all be incorporated.

7.4 CONTRIBUTION TO KNOWLEDGE

This study found that:

1. The research established that the concept of prisons and its architecture in Nigeria adopts the dormitory setting which psychologically affects inmates and causes negative response hence the adoption of prison architecture that makes use of all the architectural character identified in this research which include: proportion of spaces, colour, lighting/day lighting, spatial form, material and construction, acoustics and natural environment will improve an inmate's well-being and facilitate her/his reintegration into the society.
2. The study demonstrates that the provision of vocational training facilities, use of architectural character, clear sight lines, and adequate circulation within an environment can enhance the psychological and physical well-being of inmates.

REFERENCES

Aborn, J., Van den Toorn, A., Hockin, J., Jordon, S., Nayvelt, M, & Finkelstein, M. (1999). The California prison and rehabilitation system: poverty and prejudice: breaking the chains of inner city poverty. EDGE: ethics of development in a global environment.

Abrifor, C. (2010). Perception on the Effectiveness of Physical Punishment: As a disciplinary measure in schools in Osun State.

Alexander, C. (1967). *Notes on the synthesis of form*. Cambridge, MA: Harvard University Press. *Design and health: essays within architecture and environmental aesthetics* (pp. 49–66). Aldershot, UK: Ashgate.

Anselm, C. O & Osaze, L. E. (1996). *Behind the Wall (New Revised Edition)*.A Publication of Civil Liberties Organization.

Arntson, A. (1998). *Graphic design basics*. Fort Worth, TX: Harcourt Brace College Publishers.

Awofeso, N. (2009). *Prisons as social determinants of infections. Public Health Reports, 125*

Awofeso, N. (2010). *Prisons as social determinants of hepatitis C virus and tuberculosis infections*. Public Health Reports, 125, *25–33.*

Ayade, E. A. (2010). *Problem of prison overcrowding in Nigeria: some lessons from South Africa and America.* Master's thesis. Central European University, Budapest, Hungary

Bartol, C. (1991). *Criminal Behaviour: A Psychosocial Approach 3rd ed*. Englewood Cliffs: Prentice- Hall. Basis for GIS (COSIT'93). Number 716 in Lecture Notes in Computer Science (pp.14–24). Berlin, Springer.

Bechtel, R. and A. Churchman [Eds.] (2002).*Handbook of Environmental Psychology*. New York, NJ: Hoboken.

Becker, F. and Steele, F. (1995). *Workplace by Design: Mapping the High Performance Workscape*. San Francisco, CA: Jossey-Bass Publishers.

Berlyne, D. E. (1972). *Aesthetics and Psychobiology*. New York: Appleton.

Bevlin, M. (1994). *Design through discovery, 6th edition*. Fort Worth, TX: Harcourt Brace College Publishers.

Brainard, S. (1998). *A design manual, 2nd edition*. Upper Saddle River, NY: Prentice-Hall.

Brytton, J. B. (2010). *Enhancing patient experience through environmental design in healthcare: A case study of privacy at Thielen Student Health Centre and McFarland Clinic in Ames, Iowa.* Masters thesis. Iowa State University. Ames, Iowa

Camp, S. D., Gaes, G. G., Langan, N. P., & Saylor, W. G. (2003). *The Influence of Prisons on Inmate Misconduct: A Multilevel Investigation*. Justice Quarterly, 20(3),701 734.

Canter, D. (2001). *Health and beauty: Enclosure and Structure. In Aesthetics, wellbeing*

Chase, R. (1999*). Supermax prisons: overview and general considerations*.

Coon, D. &Mitterer, J. O. (2010).*Introduction to psychology: Gateways to mind and behaviour* (12th ed.). Belmont, CA: Wadsworth.

De Young, R. (2013) *Environmental psychology overview*. In S. R. Klein and A. H. Huffman (Eds.) Green Organizations: Driving Change with IO Psychology. (Pp. 22-45) New York: Routledge Academic.

Despoina, P. (2011). Exit through the Prison. Master's thesis. Technical University of Delft.

Dijk, F.J.H Van, Souman, A.M., & De Vires, F.F. (1987). *Non-auditory effects of noise in industry.* VI. A final field study in industry. International Archives of Occupational and Environmental Health, 59, 133-145.

Dilani, A. (2008). *Psychosocially Supportive Design: A Health Promoting Approach on Prison Environments*. [Internet]. Available from: http://www.designandhealth.com/Media-Publishing/Book-Store.aspx>

Edvardsson, D. J., Sandman, P-O. & Rasmussen, B. H. (2005). *Sensing an atmosphere of ease: a tentative theory of supportive care settings*. Nordic College of Caring Sciences, 19, 344-353.

Ekland-Olson, Sheldon. (1986). *Crowding, Social Control, and Prison Violence: Evidence form the Post-Ruiz Years in Texas*. Law and Society Review 20.3: 389-421.

Evans, G. (2003). *Built Environment and Mental Health*. Journal of Urban Health: Bulletin of the New York Academy of Medicine, 80(4), 536-555.

Evans, G.W., Bullinger, M. & Hygge, S. (1998). *Chronic noise exposure and physiological response: a prospective study of children living under environmental stress.* Psychological science 9: 75-77.

Evans, P. & Thomas, M. (2004). *Exploring the elements of design*. Clinton Park, NY: Delmar Learning.

Fairweather L. &McConville S. (2000). *Prison Architecture: Policy, Design and Experience*. Oxford: Architectural Press.

Farbstein, J., Wener, R. (1982). "*Evaluation of Correctional Environments*," Environment and Behaviour. 14(6), 671-694.

Fife D, Rappaport E.(1976). Noise and hospital stay. Am J Public Health ; 66:680–1.

Flynn, J. E. (1988). *Lighting-design decisions as interventions in human visual space. In Environmental aesthetics: Theory, research, and application* (pp. 156–172). New York: Cambridge University Press.

Foucault, M. (1989). Discipline and punish – the birth of the prison. New York: Knopf .

Franz, G. (2005). *An empirical approach to the experience of architectural space*. Dissertation. Bauhaus-Universität Weimar. Max Planck Institute for Biological Cybernetics, Spemannstraße 38, D-72076 Tübingen, Germany. www.kyb.tuebingen.mpg.de

Giedion, S. (1941).*Space, Time and Architecture*. Cambridge, MA: Harvard University Press.

Gifford, R. (2007). *Environmental psychology: Principles and practice* (4th ed.). Colville, WA: Optimal Books

Gifford, R. (2008). *Psychology's essential role in climate change*. Canadian Psychology/

Gillner, S. &Mallot, H. A. (1998). *Navigation and acquisition of spatial knowledge in a virtual maze*. Journal of Cognitive Neuroscience, 10, 445–463.

Girma, L. (2005). *General psychology: lecture note for health science students*. Retrieved from: www.cartercenter.org/../ lecture notes.

Goffman, H. (1995). *Correctional health care: A public health opportunity*. Silver Press.

Grosenick, J. K. & Hatmaker, C. M. (2000). *Perceptions of the importance of physical setting in substance abuse treatment*. Journal of Substance Abuse Treatment. 18(1), 29–39.

Heerwagen, D. (2004). *Passive and active environmental control-Informing the schematic designing of buildings*. New York: McGraw-Hill Co. Inc.

Heerwagen, J. & D. Heerwagen, (1986). "*Lighting and Psychological Comfort." Lighting Design and Application*, Vol. 16 (4): 47-51

Henley S., eds. (2003). *The 21st century Model Prison: proceedings of the 4th international Space Syntax Symposium*, London.

Herzog, T. R., Maguire, C. P., and Nebel, M. B (2003). *Assessing the Restorative Components of Environments.* Journal of Environmental Psychology, 23, 159-170.

https://www.sdsheriff.net/jailinfo/title 15.pdf

International committee of the Red Cross (ICRC). (2012) *handbook: Water, Sanitation, Hygiene and Habitat in prison handbook.* Geneva. Chapter 1.6.

Jaeden, B. (2012). The importance of indoor lighting in interior design. Home decorating ideas. http://spelnionychmarzenswiatmoj.blogspot.com/2012/11/the-importance-of indoor-lighting-in.html.

James, A. & Garry, C. (2001). *Emerging Issues on Privatized Prisons. National Council on Crime and Delinquency*.NCJ 181249

Janet R. Carpman & Myron O.(1981). *Grant. Design That Cares: Planning Health Facilities for Patients and Visitors* (USA: American Hospital Publishing, 1981), 9 10.

Janssen, J., & Laike, T. (2006) Rum för återanpassning- den fysiska miljöns betydelse för ungdomsvården - en miljöpsykologisk översikt [Rooms for readapting - a physical environment´s meaning for youth care - an environmental psychological review]. Statens institutionsstyrelse (SIS). Rapport 2/06, Edita Stockholm 2006.

Johansson, R. (2010). *Case Study Methodology Reflected in Architectural Research*. Retrieved May 10, 2010 from http://www.infr.kth.se/~rolfj/Foufaces2003.pdf.

John F. & Dave H. (1979). *Architectural Signing and Graphics* (New York: Whitney Library of Design, 1979), 48.

Kaplan, R., and Kaplan, S. (1989). The Experience of Nature: A Psychological Perspective. New York: Cambridge University Press

Kaplan, S. 1995. The Restorative Benefits of Nature: Toward an Integrative Framework: *Journal of Environmental Psychology*, 15: 169-182.

Kaya, N. & Erkip, F. (2001). *Satisfaction in a dormitory building: The effects of floor height on the perception of room size and crowding*. Environment and Behaviour, 33(1), 93-110.

Kosslyn, S. M., Ball, T. M., & Reiser, B. J. (1978). Visual images preserve metric spatial information: evidence from studies of image scanning. *Journal of Experimental Psychology: Human Perception and Performance*, 4(1), 47.

La Garce, M. (2004). *Methodologies for assessing the impact of environmental lighting on physiological and behavioural changes of participants in the built environment*. In B. Martens & A. G. Keul (Eds.), Evaluation in progress - Strategies for environmental research and implementation (IAPS 18 conference proceedings on CD-ROM).

Lang, J. (1988). *Symbolic aesthetics in architecture: toward a research agenda. In Environmental aesthetics: Theory, research, and applicatio*n (pp. 45–55). New York: Cambridge University Press.

Lauer, D. & Pentak, S. (1995). *Design basics, 4th edition*. Ft. Worth, TX: Harcourt Brace College Publishers.

Lavin, T., Higgins, C., Metcalfe, O., & Jordan, A. (2006). *Health Impacts of the Built Environment: A review.* Published by the institute of Public Health in Ireland.

Lynch, K. (1960). *The Image of the City (Sixth Paperback Printing ed.).* Cambridge, Massachusetts: MIT Press.

Margot, E. (2007). *Blueprints and Bars: An Exploration into the effects of Architecture Upon Rehabilitation in Correctional Institutions* (A Senior Thesis, Haverford College, 2007). Triceratops.brynmawr.edu an exploration into the effects of architecture upon rehabilitation in correctional institutions.pdf

Mehrabian, A. & Russell, J. A. (1974).*An Approach to Environmental Psychology*. Cambridge, MA: MIT Press.

Mellor, P. (2006). *The Creative Prison: Inside the Architecture: the role of the consultation*. Rideout 2007; creative arts for rehabilitation. www.Rideout.org.uk

Montello, D. R. (2003).*A new framework for understanding the acquisition of spatial knowledge in large-scale environments*. In M. J. Egenhofer & R. G. Golledge (Eds.), Spatial and temporal reasoning in geographic information systems (pp. 143–154). New York: Oxford University Press.

Morris, N. & Rothman, D.J. (1998). *The Oxford history of prison: The practice of punishment in Western society*. New York: Oxford University Press.

Ndagi, J. O. (1999*). The Essentials of Research Methodology for Educators*. Ibadan: University Press PLC.

Neil, G. C. (2012). *Fostering sustainable behaviour through design: A study of the social, Psychological, and Physical influences of the built environment.* Master's thesis. University of Massachusetts Amherst. Massachusetts.

Nnamdi, A. (1991). *Research Methodology in the Behavioural Sciences*. Lagos: Longman Nigeria Plc.

Norman, K.B. & James, E. Hiss.(2008). *Residential landscape Architecture. Design process for the private residence.(5theds)*. USA, Pearson Prentice Hall.

Omorotionwman, J., 2005. *Prison Riots and Insecurity*. The Nigerian Observer, October 12, pp: 13.

Osaze, L.O., Anselm, C.O. (1996). *Behind the wall (New Revised Edition).* A publication of civil liberties organization.

Otero, M., Brownfield, W. R., Posner, M. H., Jacobs, J. L. (2012). *A Practical Guide to Understanding and Evaluating Prison Systems*. United States Department of States: Bureau of International Narcotics and Law Enforcement Affair Bureau of Democracy, Human Rights and Labor Bureau of Consular Affairs. http://www.state.gov/documents/organization/210347.pdf

Pol, E. & Angela, C. (2002).*City-identity-sustainability Research Network: Final Words* (Environment and Behaviour, 34.1, 2002) 155.

Popow, W. B. V. G. (2000). A Report on Psychology and Architecture. Vol. 1. Psychologie Canadienne, 49, 273–280

Richard, S. C. (2002). *Towards a Social Psychology of Place: Predicting Behaviour from Place-Based Cognitions, Attitude, and Identity* (*Environment and Behaviour,*34.5, 2002) 563.

Richards, J. H. (1999). *Psychology of Intelligence Analysis*. Central intelligence Agency.

Robbins, S.P. (2001). *Organisational behaviour. 9th ed*. NJ: Prentice Hall.

Shaw, M. (2004). *Housing and public health.* Annual Review of Public Health, 25, 397 418.

Soyombo, O. (2009). *Sociology and Crime Control: That We May Live in Peace.*

Steck, S. D. &Mallot, H. A. (2000).*The role of global and local landmarks in virtual environment navigation*. Presence. Teleoperators and Virtual Environments, 9(1), 69-83. Inaugural Lecture Delivered at the University of Lagos. University of Lagos Press.

Stewart, M. (2002). *Launching the imagination.* New York: McGraw-Hill.

Sturley R. (2010). Halden Prison, Norway. Leading the way? Architecture effectiveness put to the test. [Online] (http://www.worldarchitecturenews.com/index.php?fuseaction=wanappln.projectview&upload_id=15147)

Sykes, G. M. (1958). *Society of Captives: A Study of Maximum Security Prisons*. Princeton, NJ: Princeton University Press.

Tersiisky, D. (2004). *The elements and principles of design.* http://nwrain.net/~tersiisky/design/design.pdf

Thigpen, Morris. L., Beauclair, T. J., Carroll, S. (2011). *The Greening of Corrections: creating a sustainable system.* U.S. Department of Justice: National Institute of Corrections. http://www.bscc.ca.gov/downloads/024914.pdf

Toch, H. (1977). *Living in prison. The ecology of survival.* New York, NY: Free Press: Wormith, J., Tellier, M., & Gendreau, P. (1988). Characteristics of protective custody offenders in a provincial correctional centre. Canadian journal of criminology, 30, 39-58.

Todor, L. (2012). *Rehabilitation by design.* https://rehabilitationbydesign.wordpress.com/

Tolman, E. (1948). *Cogntive maps in rats and men*. The Psychological Review, 55(4), 189–208.

Tversky, B. (1993). *Cognitive Maps, Cognitive Collages, and Spatial Mental Models*. In A. Frank & I. Campari (Eds.), Spatial Information Theory: A Theoretical

Valena, T. (1994).*Beziehungen: Über den Ortsbezug in der Architektur*. Berlin, Germany: Ernst &Sohn.

Van den Ban, A.W. & Hawkins, H.S. (1988).*Agricultural Extension.*2nd Ed. Oxford: Blackwell Science.

Veal, A. J. (2006), Research Methods for Leisure and Tourism. 3rd Edition, Translation into Chinese. Beijng: China Renmin University Press, ISBN 9787300090191.

Wells, N.M., and Evans, G.W. (2003). *Nearby Nature: A Buffer of Life Stress among Rural Children, Environment and Behaviour*, 35(3), 311–330.

Wells, N.M., Evans, G.W. and Yang, Y. (2010). *Environments and Health: Planning Decisions As Public-Health Decisions*, Journal of Architectural and Planning Research, 27(2), 124–143.

Wiener, J. M. (2004). *Places and Regions in Perception, Route Planning, and Spatial Memory*. Ph.D. thesis, Eberhard-Karls-UniversitätTübingen.

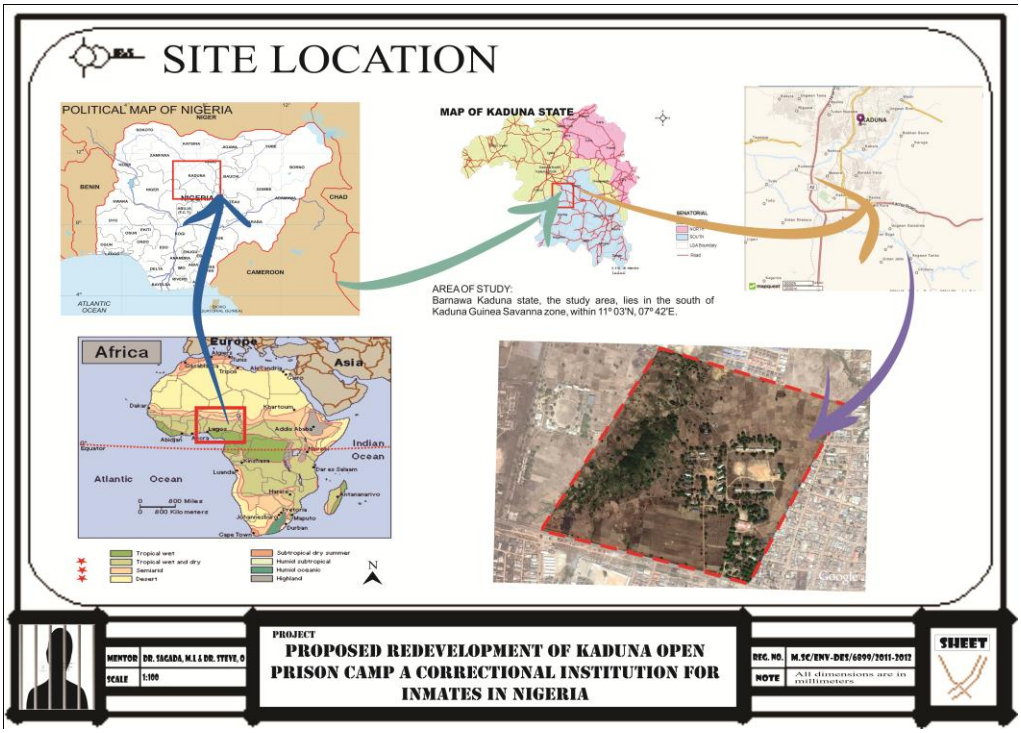
Wigle, D.T. (2003). *Child Health and the Environment.* New York: Oxford University Press.

Winston, C. (1943).”The Rebuilding of the Chamber: destroyed by an enemy bomb in May 10, 1941”. UK Prime Minister. Kansas City.

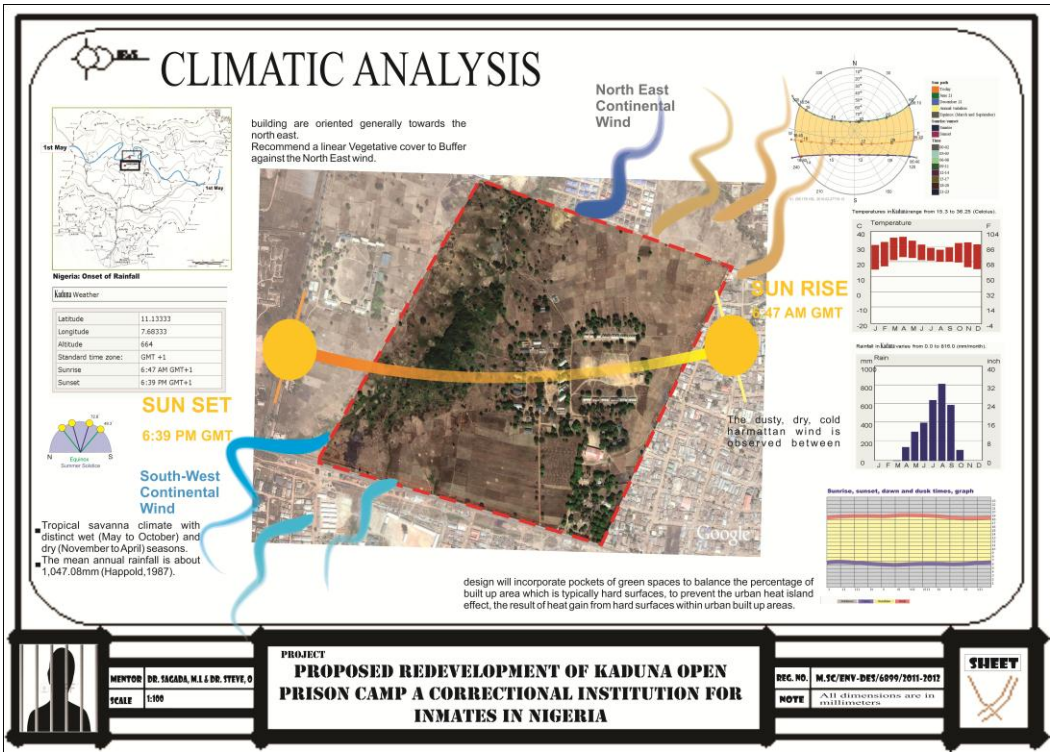
Yin, Robert K., ed., (2004). The Case Study Anthology. Thousand Oaks, CA: Sage Publication Inc.

Zelanski, P. & Fisher, M. (1996). *Design principles and problems, 2nd edition*. Fort Worth, TX: Harcourt Brace College Publishers.

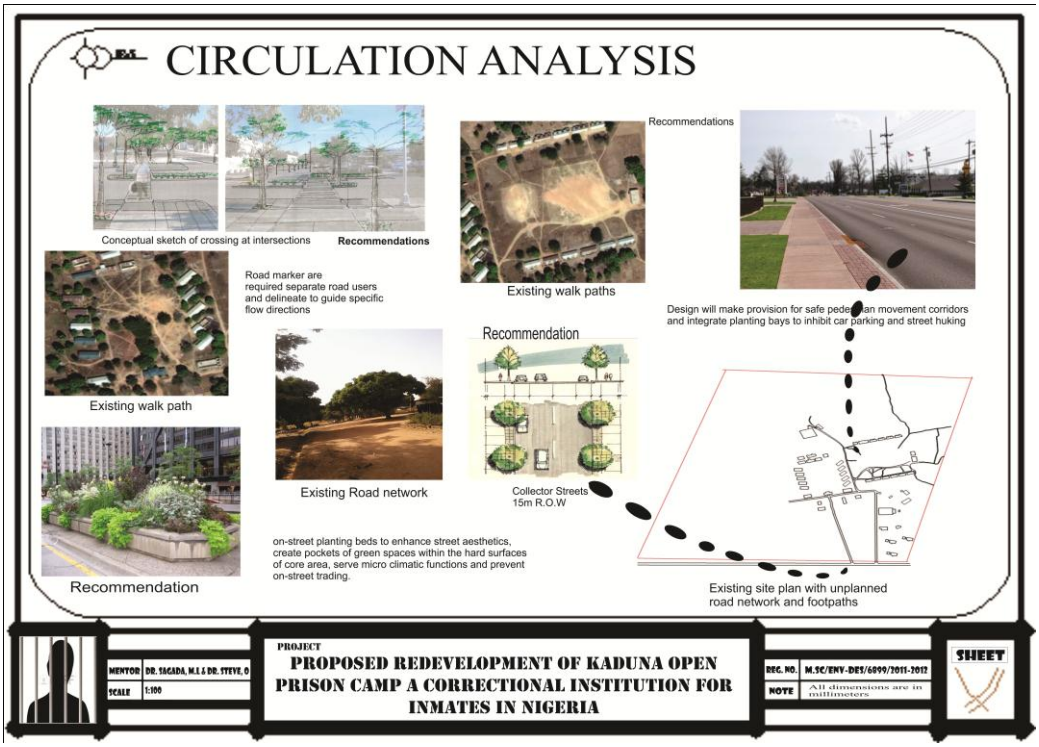
APPENDICES



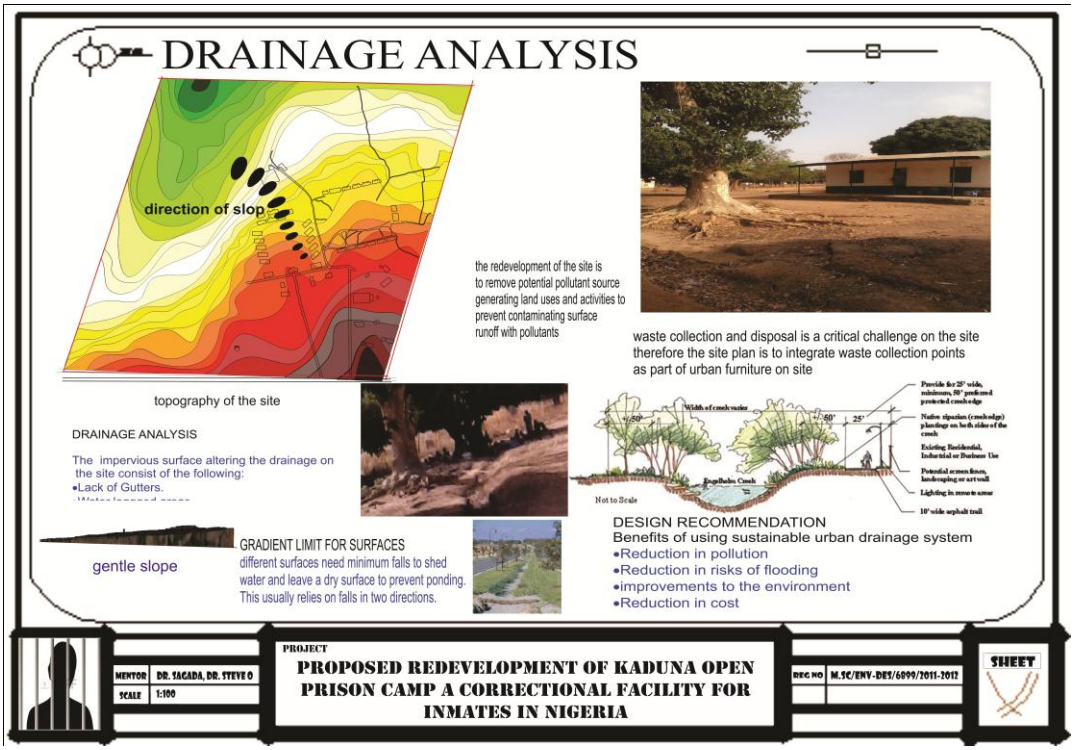
Appendix 1: Site location



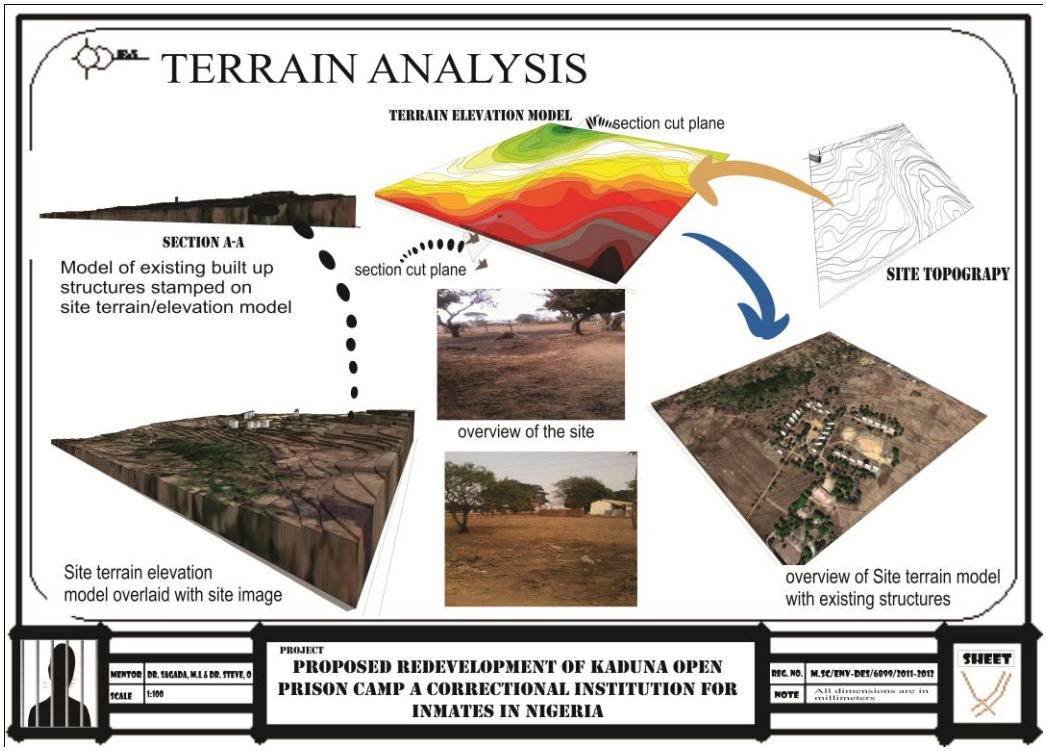
Appendix 2: Climate Analysis of the site



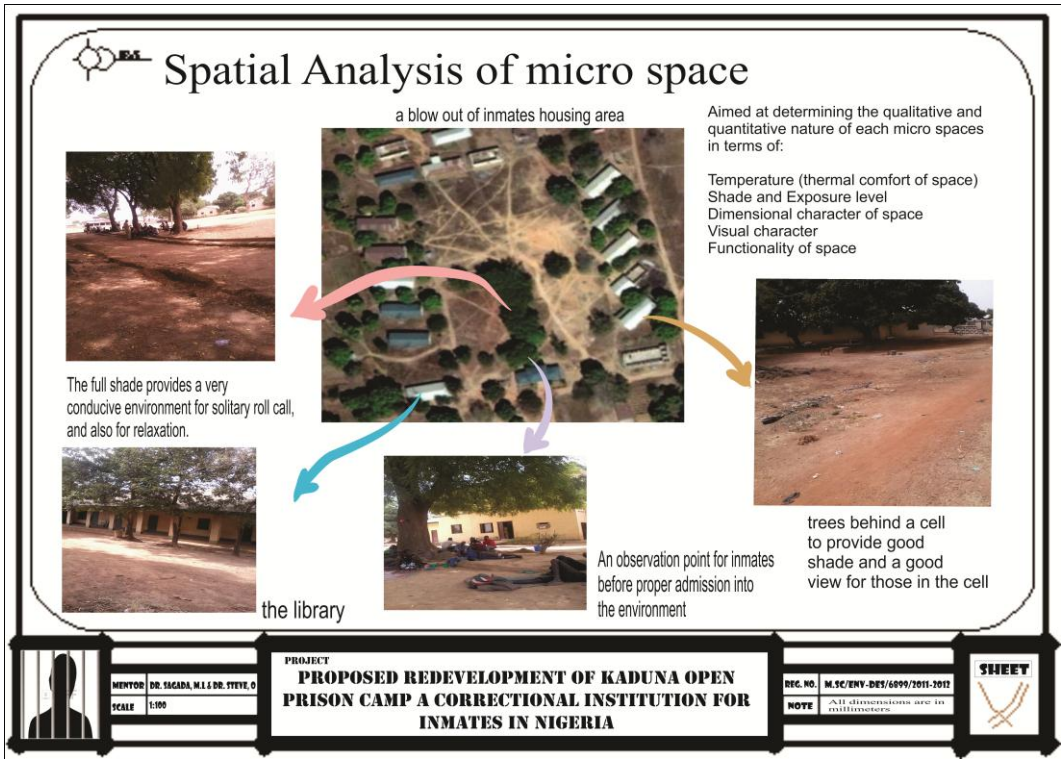
Appendix 3: Circulation analysis of the site



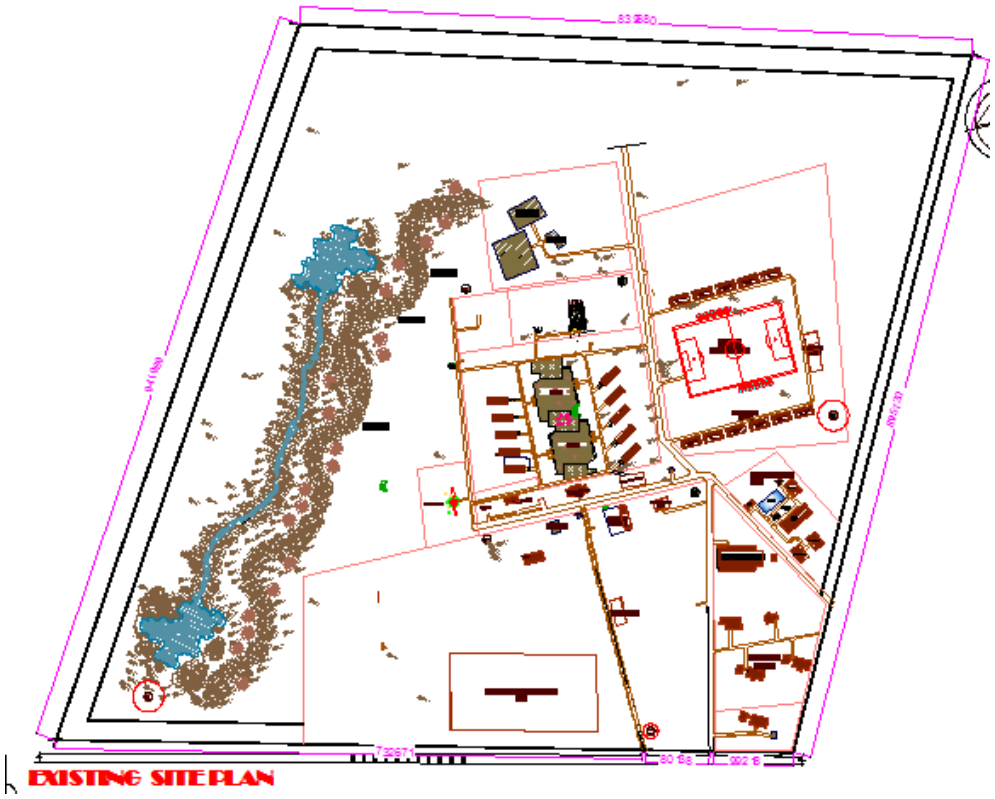
Appendix 4: Drainage analysis of the site



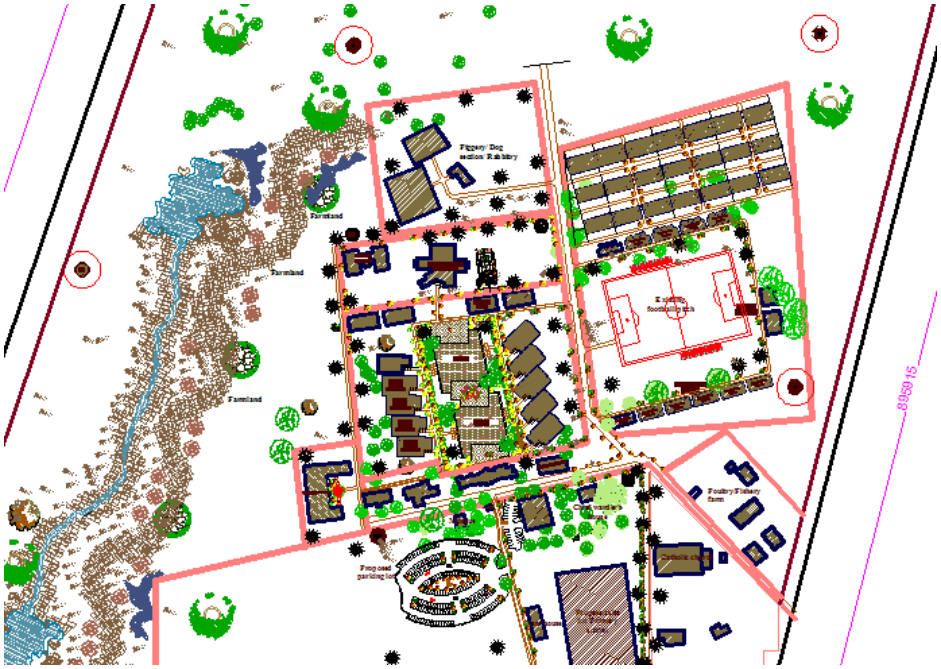
Appendix 5: Terrain analysis of the site



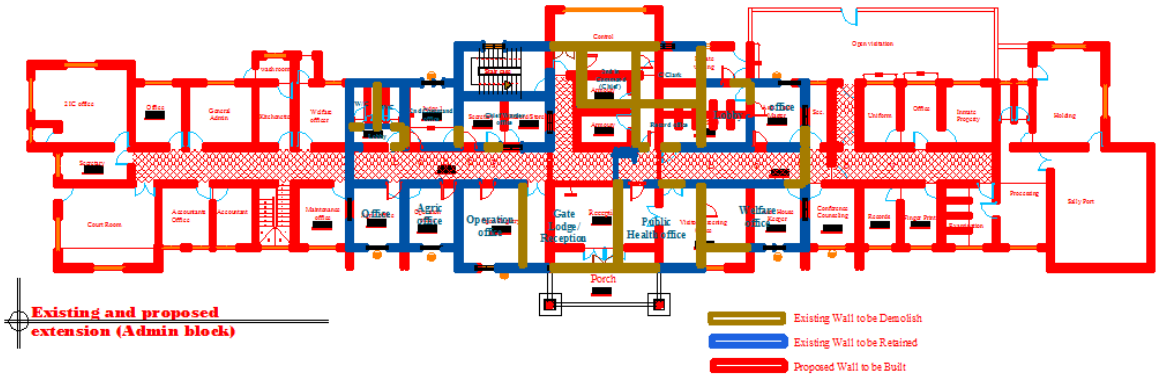
Appendix 6: Spatial analysis of the micro spaces on site



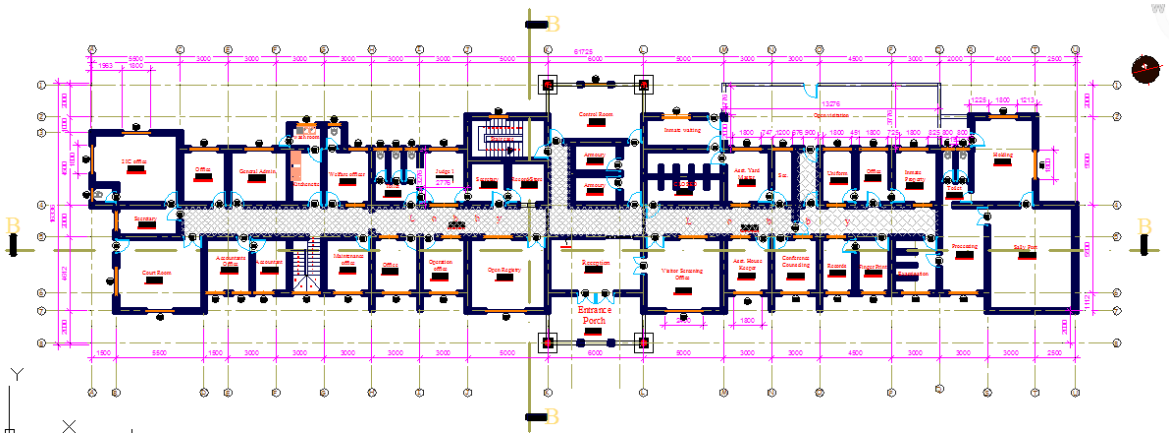
Appendix 7: Existing site plan



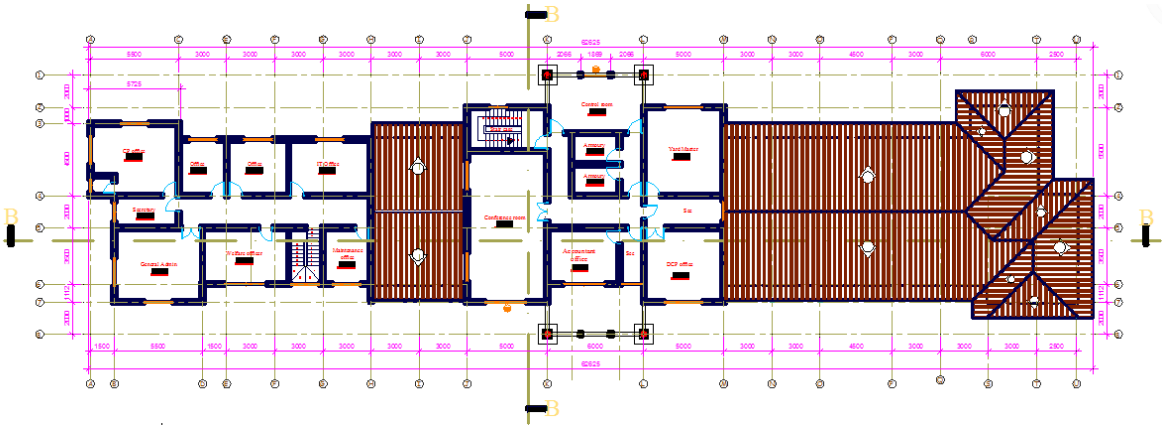
Appendix 8: Proposed Site plan



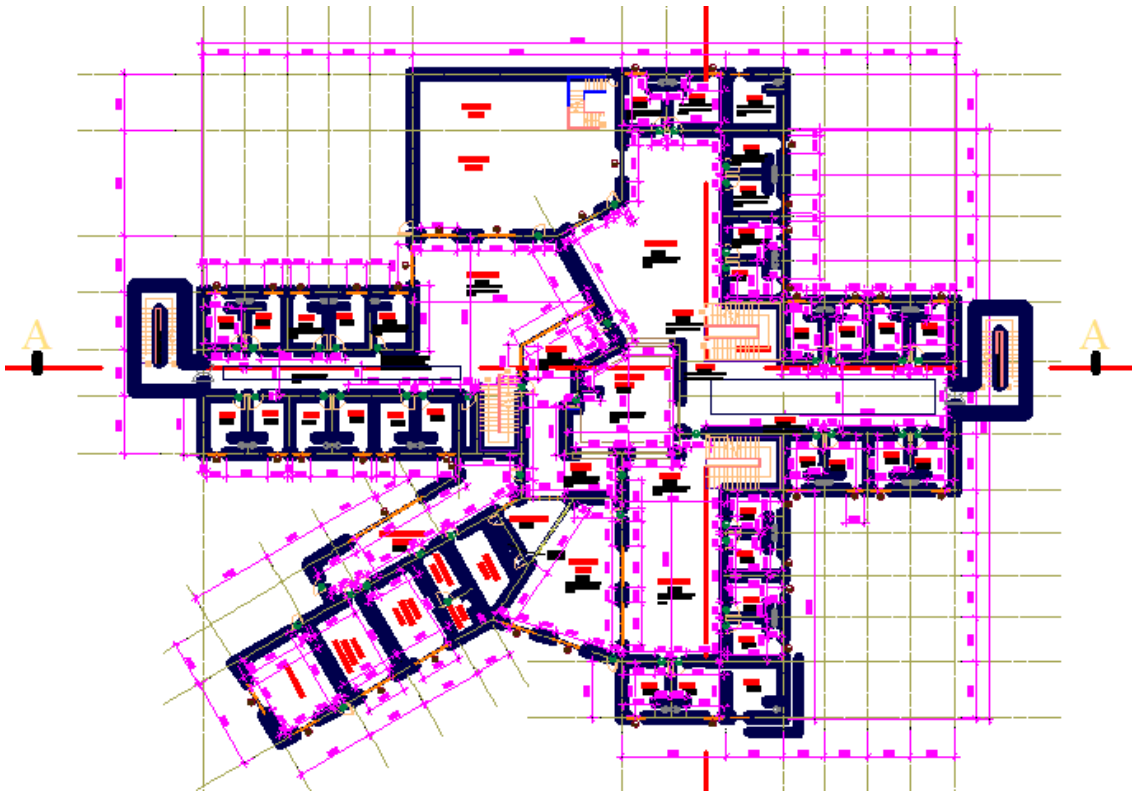
Appendix 9: Alteration floor plan showing existing and proposed floor plan (Administrative block)



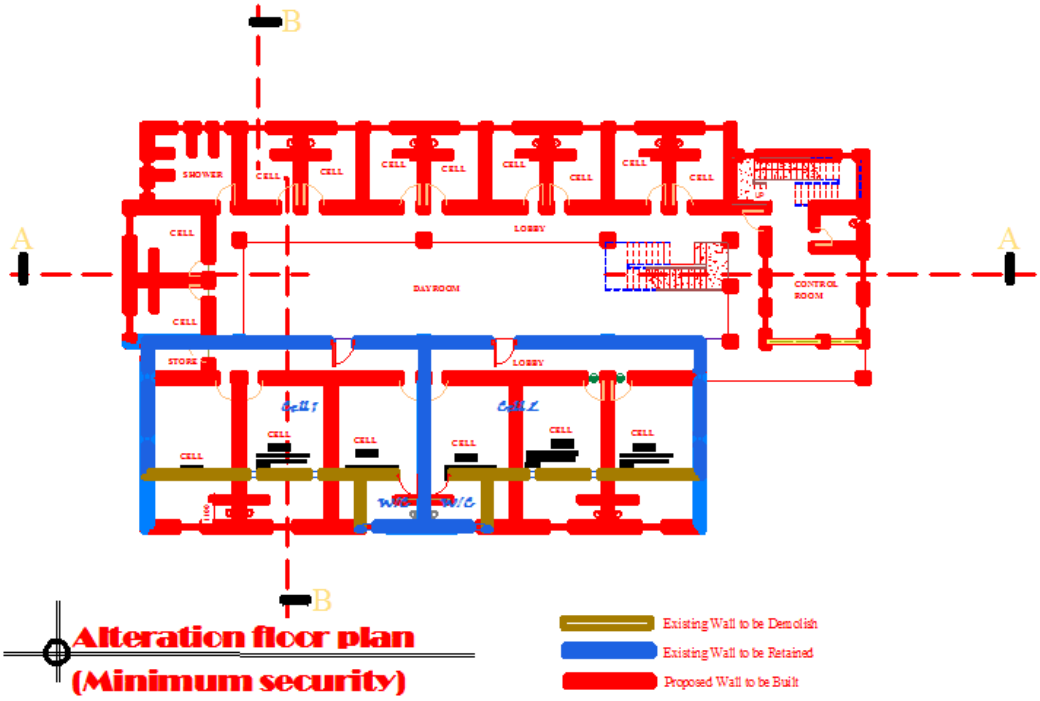
Appendix 10: Proposed floor plan (Administrative block)



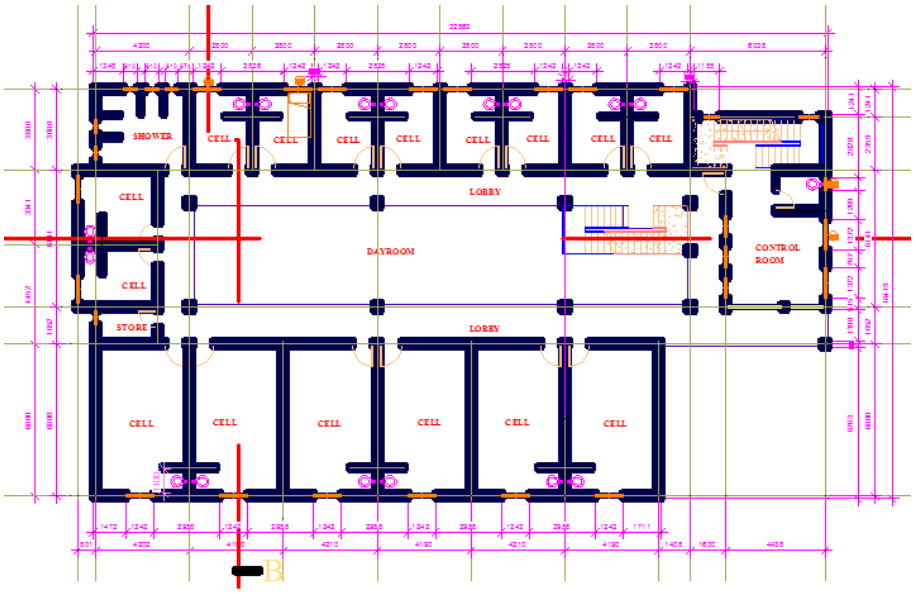
Appendix 11: Proposed first floor plan (Administrative block)



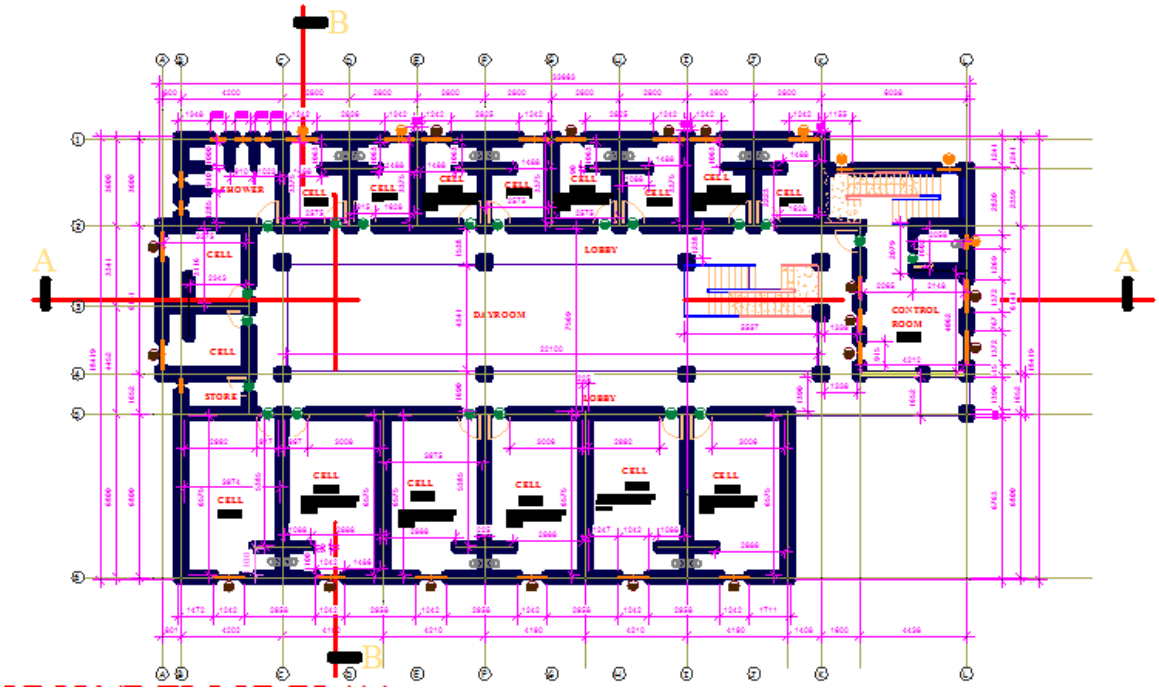
Appendix 12: Floor plan maximum security housing



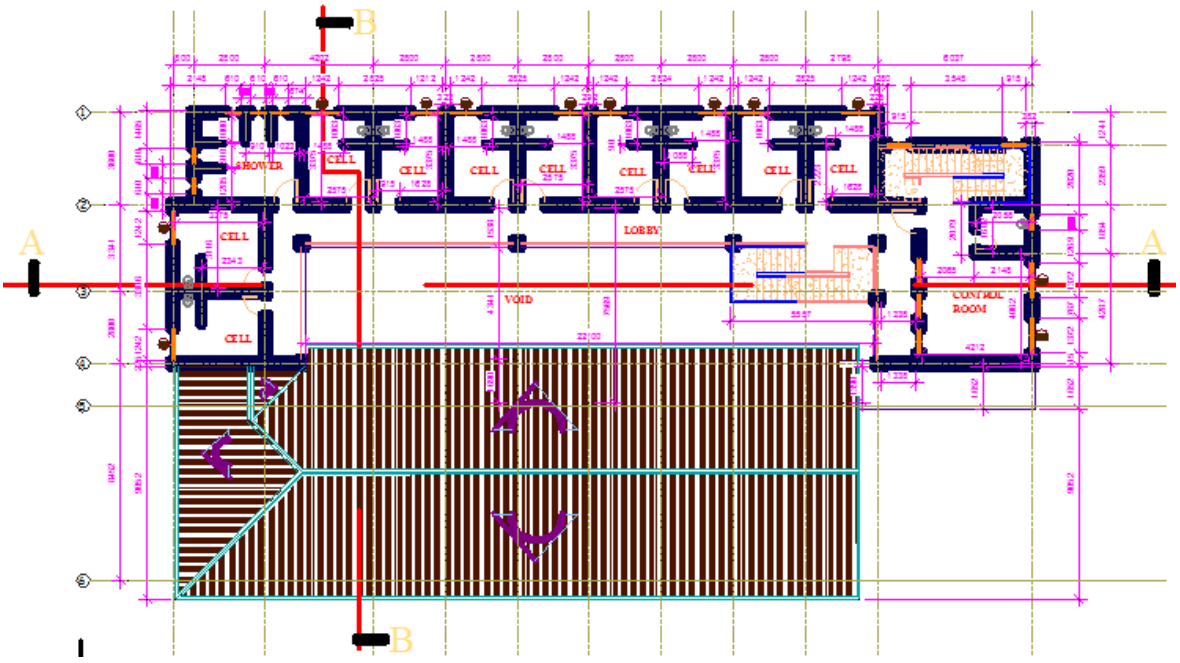
Appendix 13: Alteration floor plan showing existing and proposed floor plan (Minimum security housing)



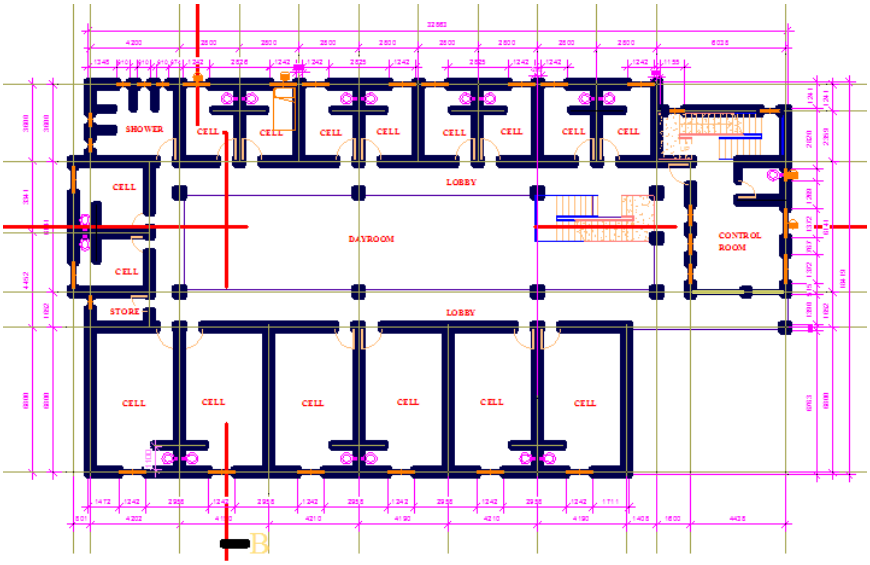
Appendix 14: Ground Floor plan (minimum security housing)



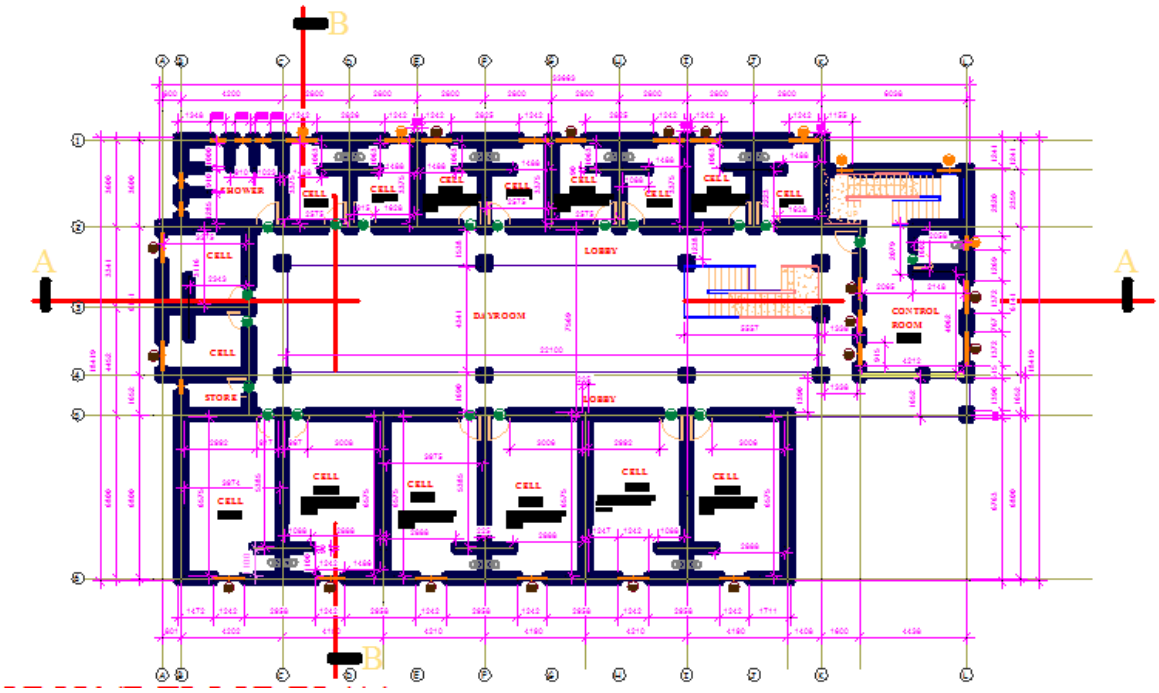
Appendix 15: Working Drawing Ground floor plan (Minimum security housing)



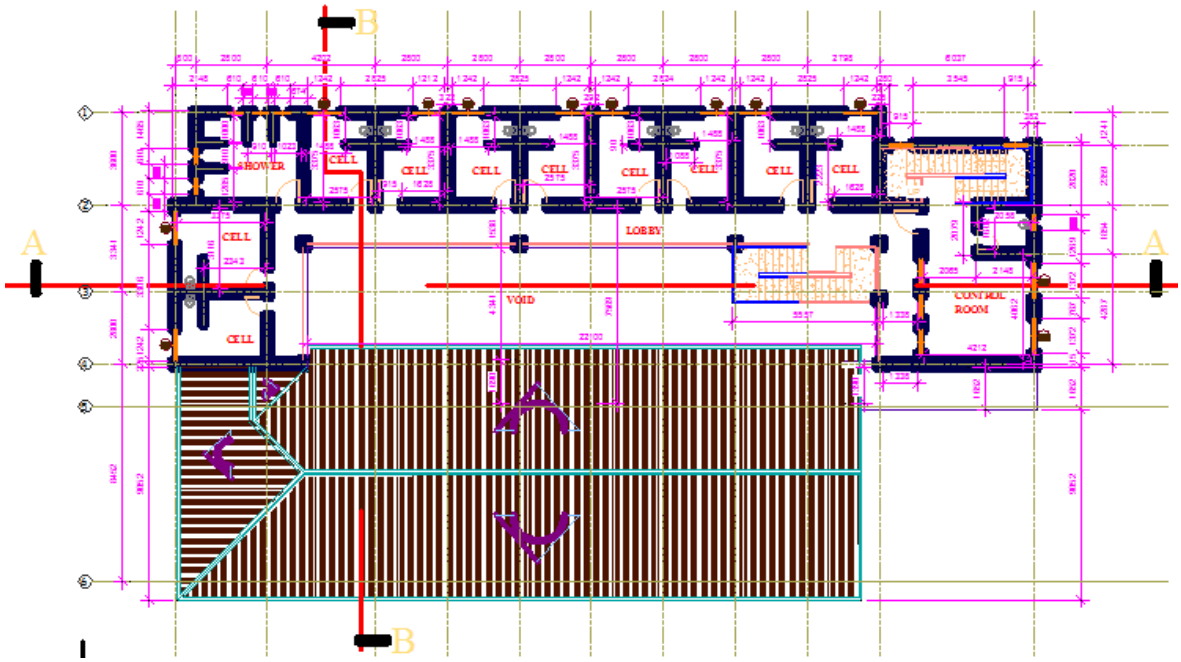
Appendix 16: Working drawing second floor plan (Minimum security floor plan)



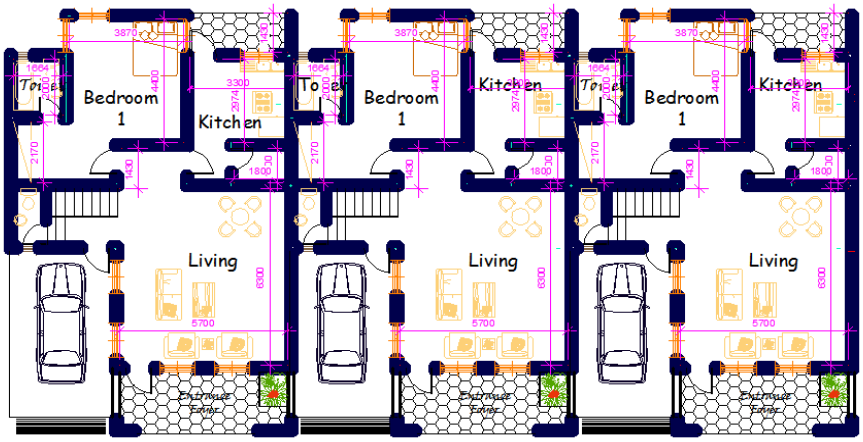
Appendix 17: Ground Floor plan (Juvenile housing)



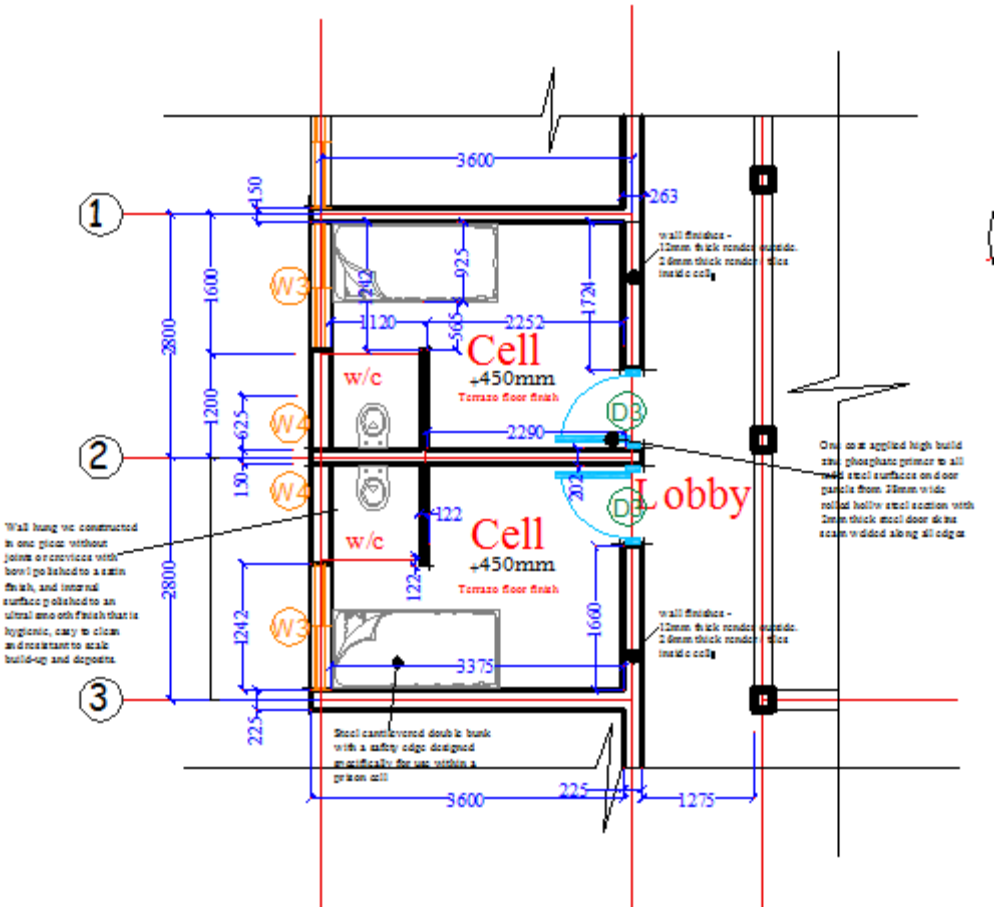
Appendix 18: Working drawing Ground floor plan (Juvenile housing)



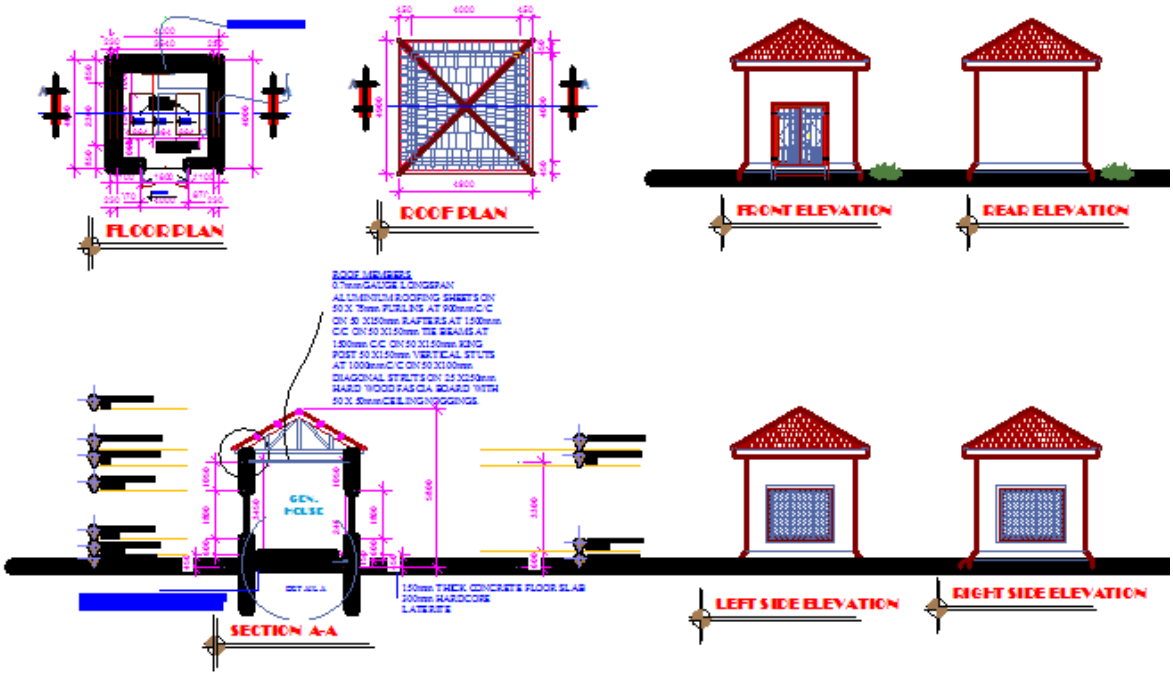
Appendix 19: Working drawing second floor plan (Juvenile housing)



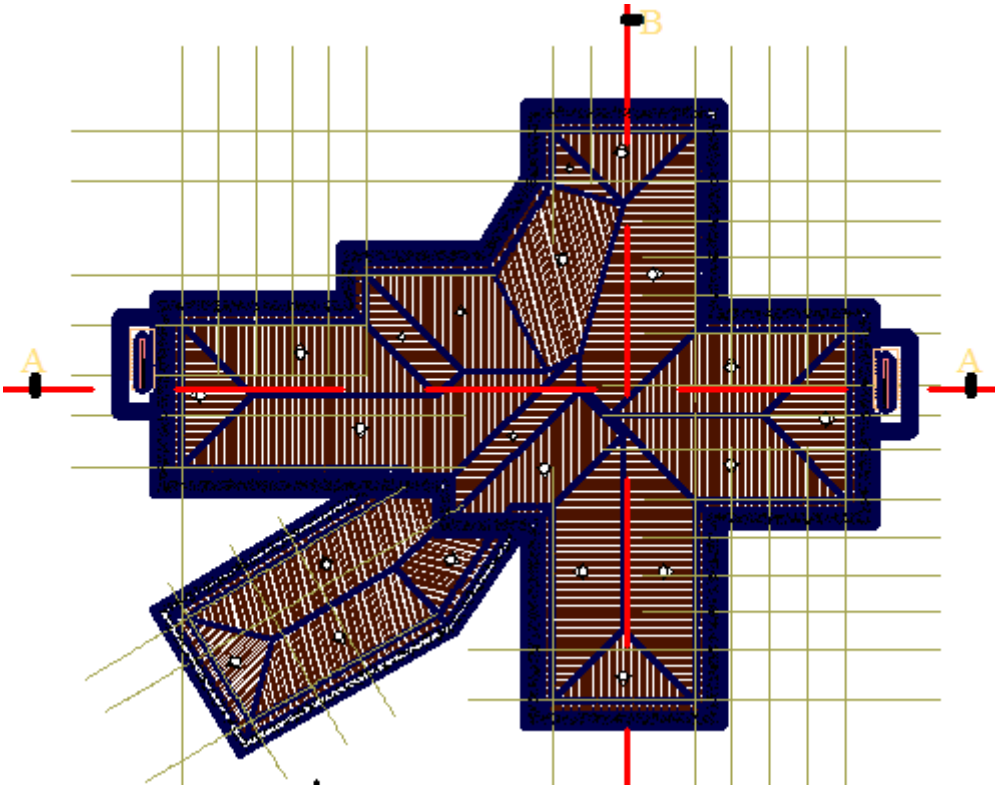
Appendix 20: Proposed ground floor plan (staff housing development)



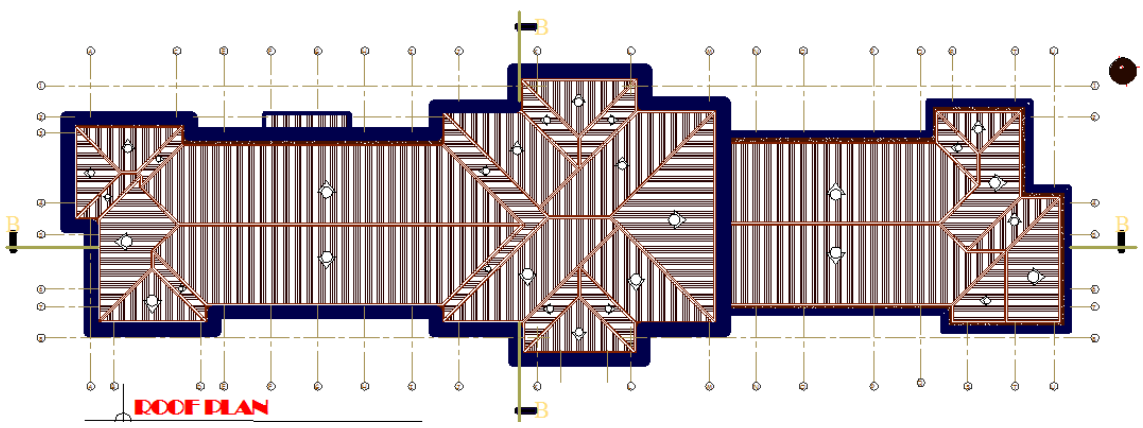
Appendix 21: Typical arrangement of a cell room



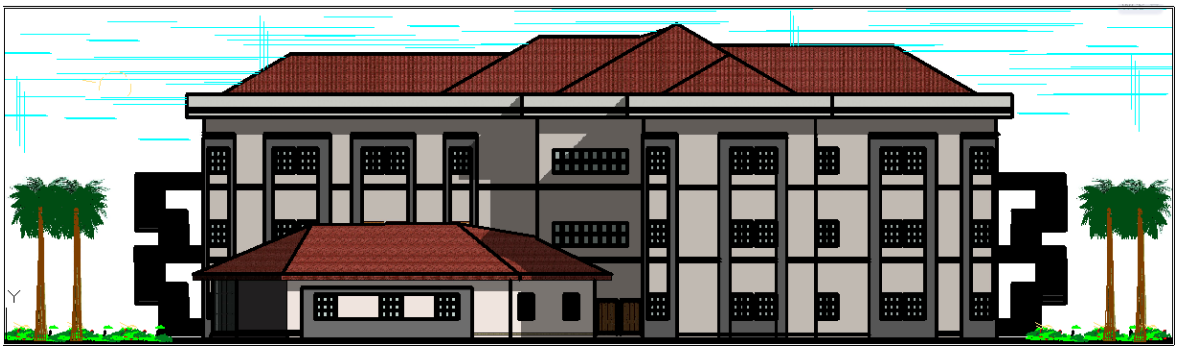
Appendix 22: Generator house



Appendix 23: Roof plan (Maximum security)



Appendix 24: Roof plan (Administrative block)



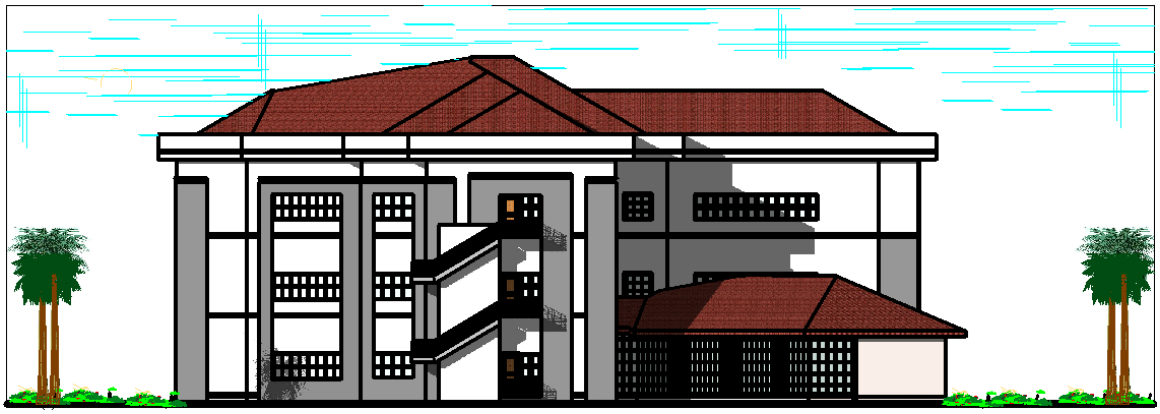
Appendix 25: Approach View (Maximum security housing)



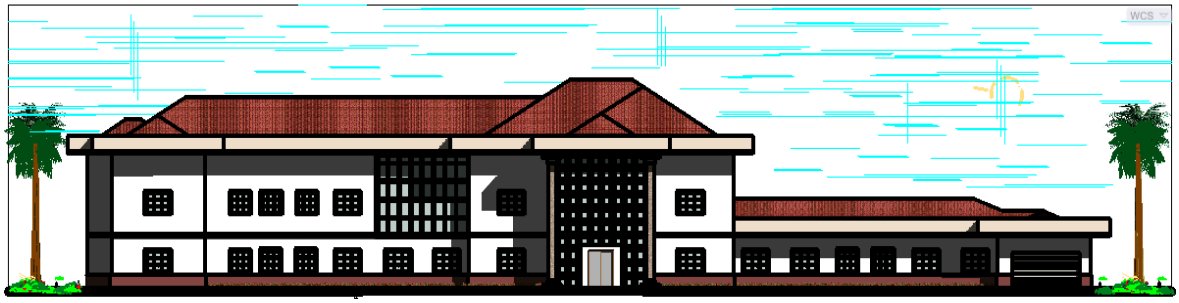
Appendix 26: Right View (Maximum security housing)



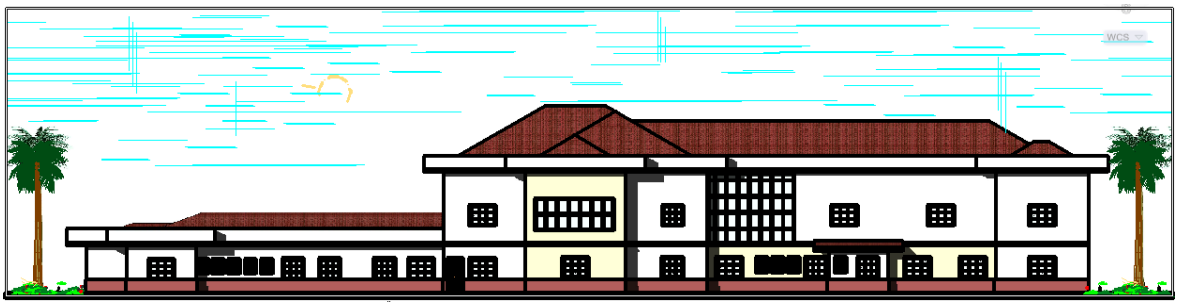
Appendix 27: Rear View (Maximum security housing)



Appendix 28: Left View (Maximum security housing)



Appendix 29: Approach View (Administrative block)



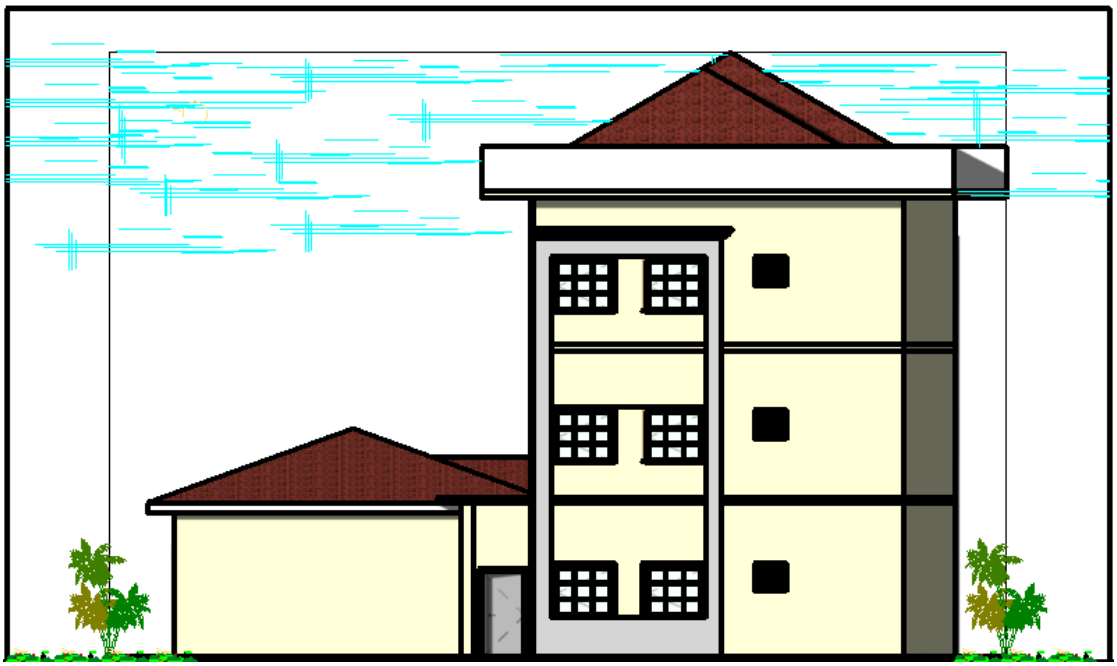
Appendix 30: Rear View (Administrative block)



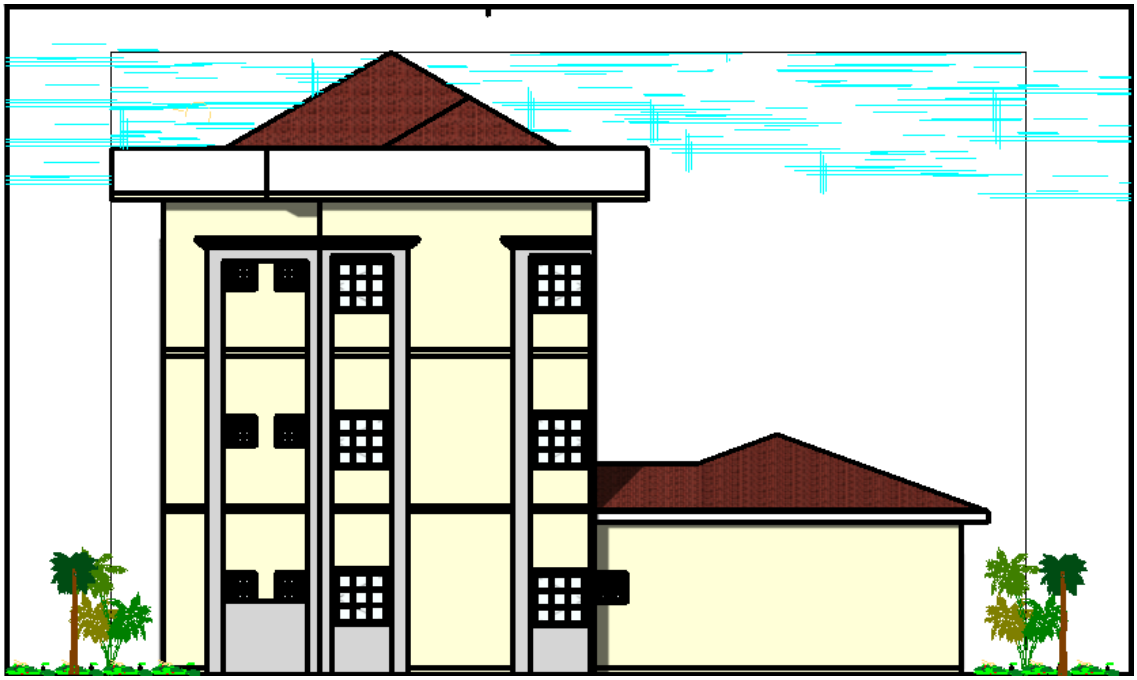
Appendix 31: Right View (Administrative block)



Appendix 32: Left View (Administrative block)



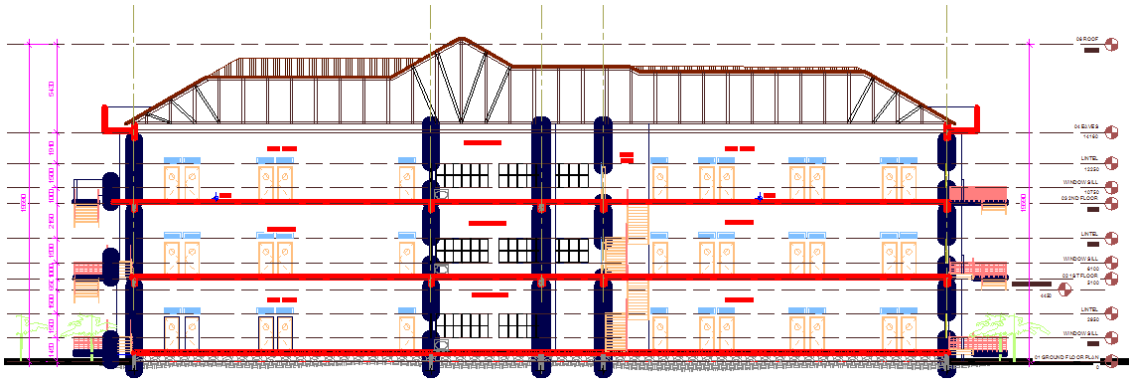
Appendix 33: Approach View (Minimum Security housing)



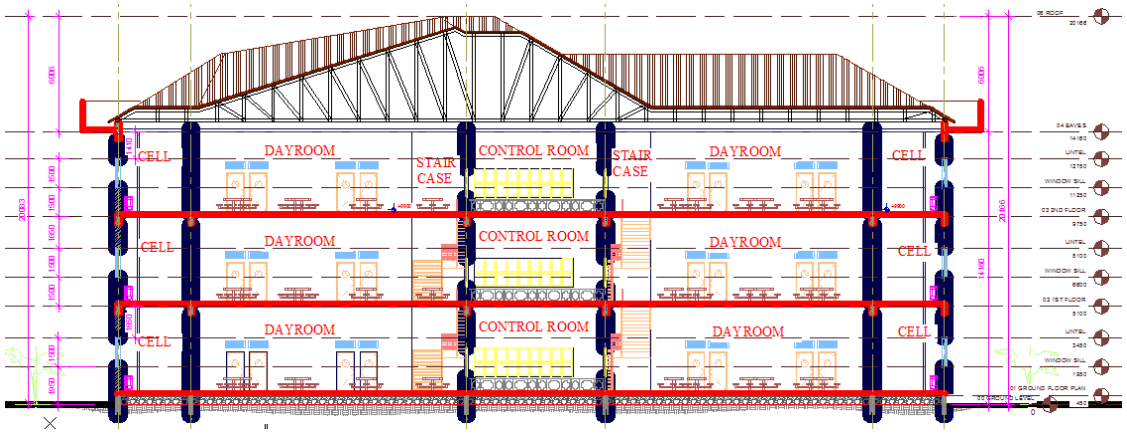
Appendix 34: Rear View (Minimum security housing)



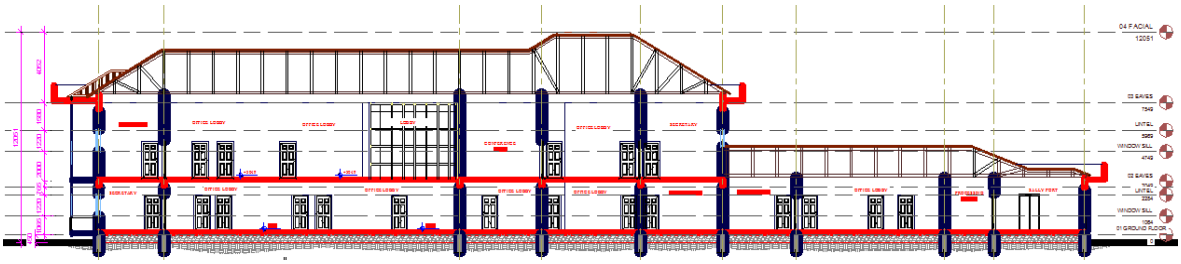
Appendix 35: Approach View (staff housing development)



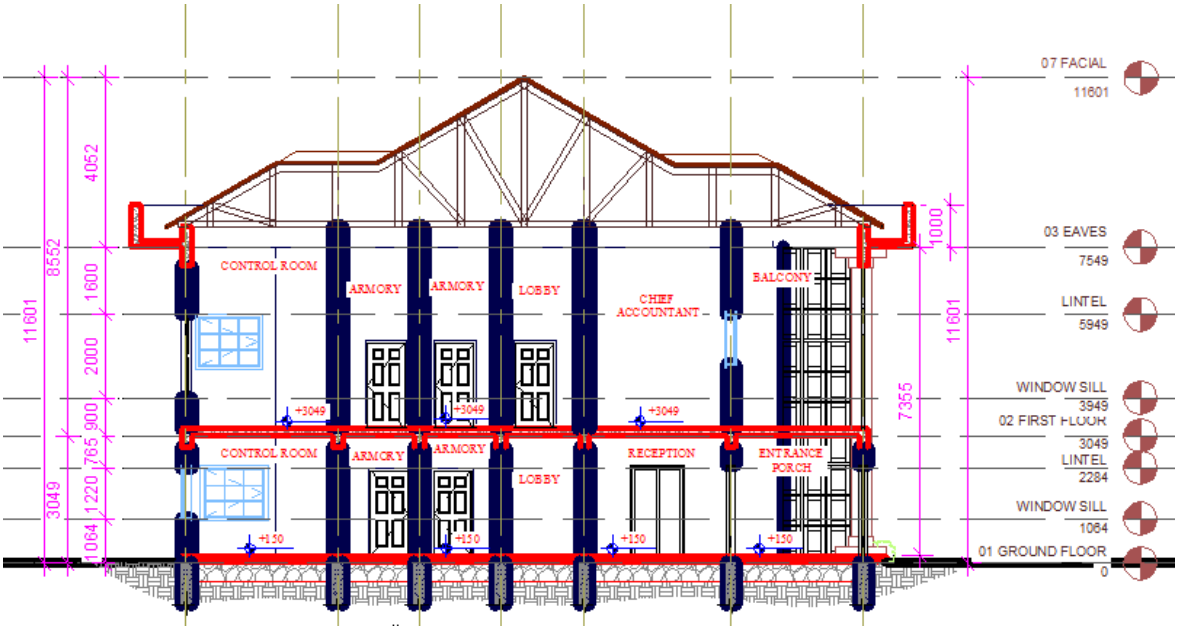
Appendix 36: Section A-A (Maximum security housing)



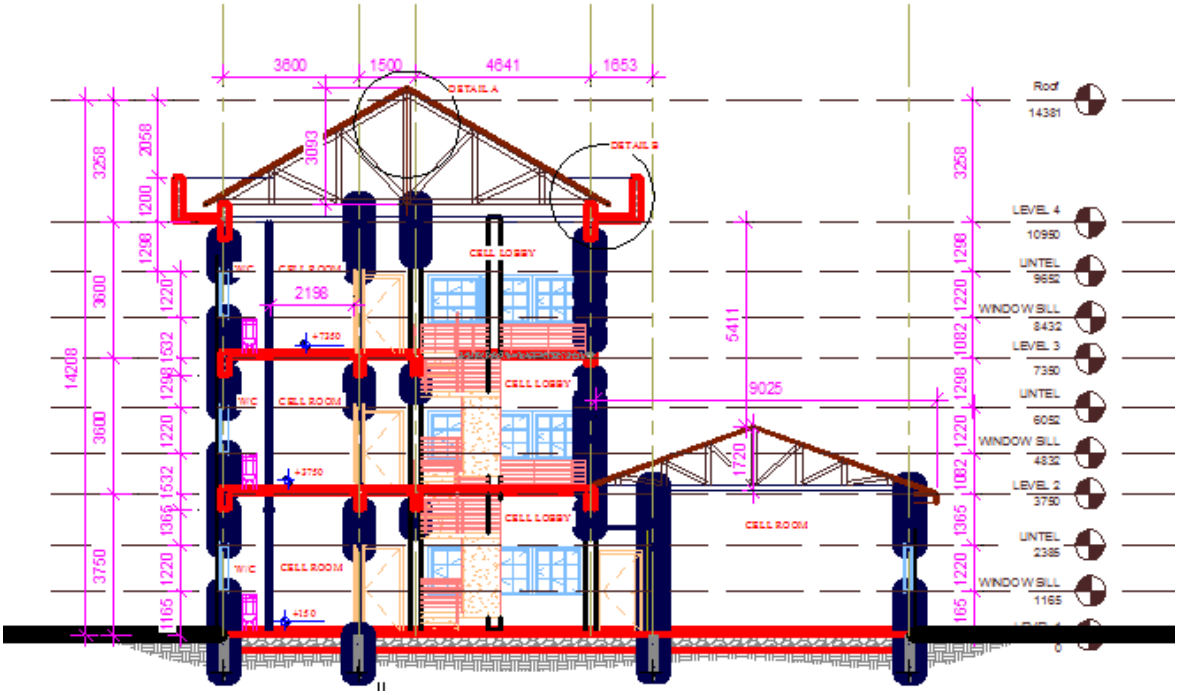
Appendix 37: Section B-B (Maximum security housing)



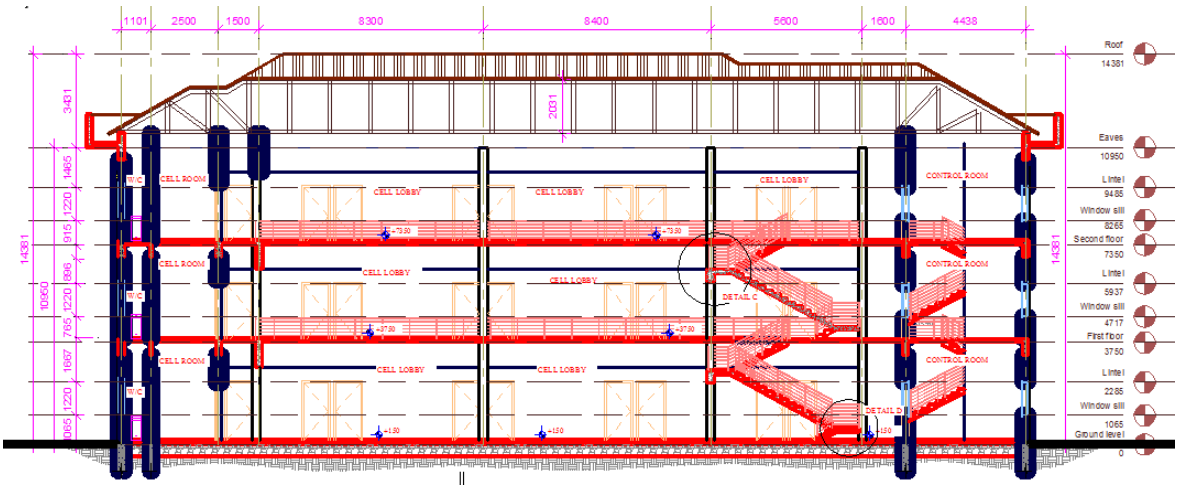
Appendix 38: Section A-A (Administrative block)



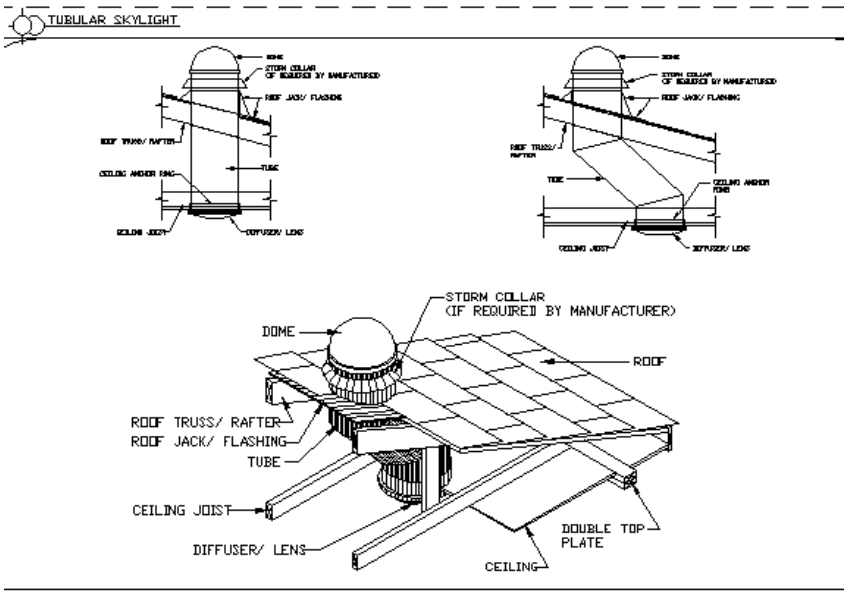
Appendix 39: Section B-B (Administrative block)



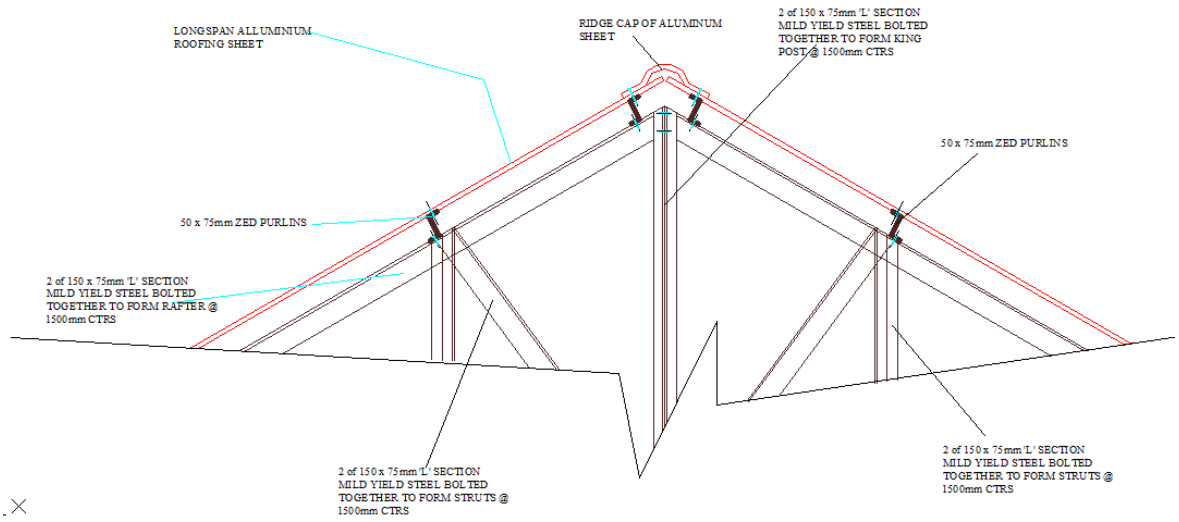
Appendix 40: Section A-A (Minimum security housing)



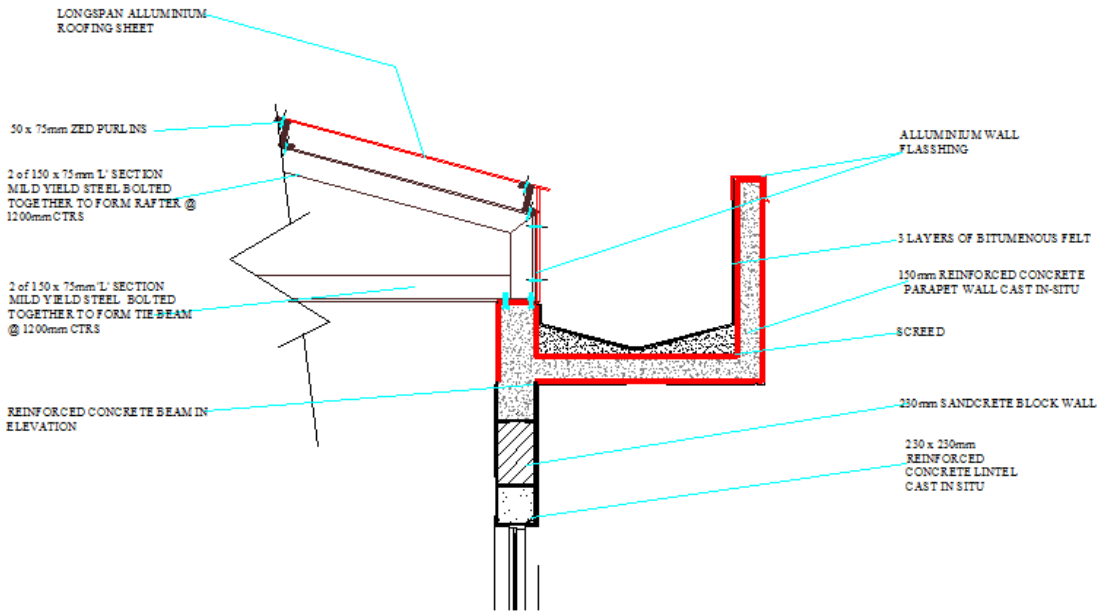
Appendix 41: Section B-B (Minimum security housing)



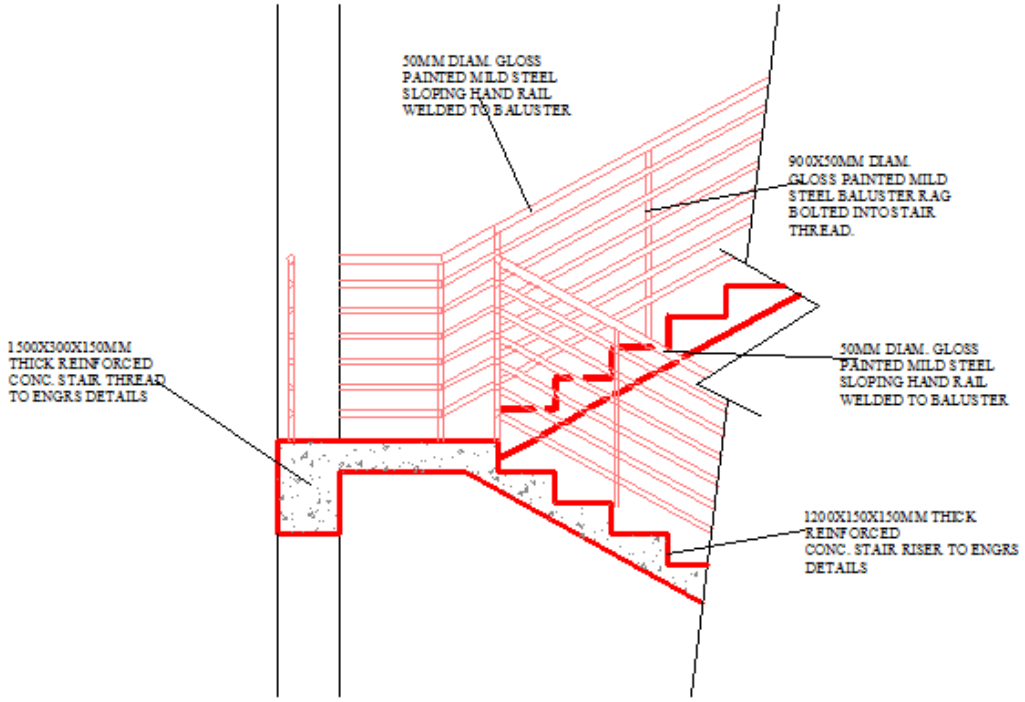
Appendix 42: Detail of tubular skylight



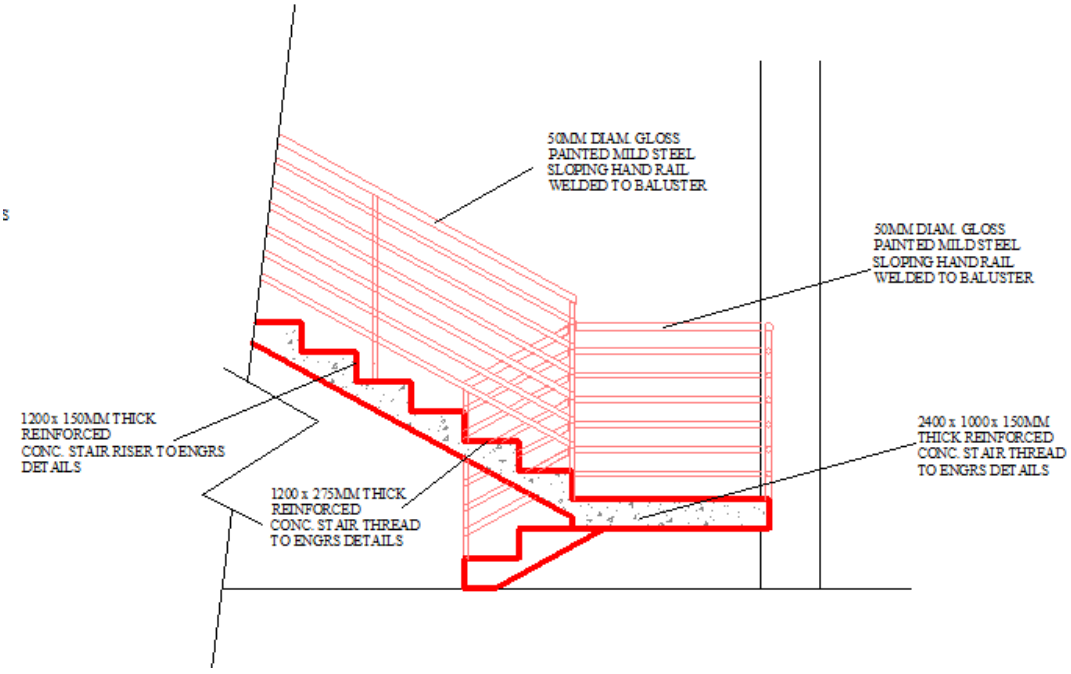
Appendix 43: Detail at Ridge cap



Appendix 44: Detail at Eaves Projection



Appendix 45: Detail at C



Appendix 46: Detail at D