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MEDIUM SECURITY CORRECTIONAL FACILITY
(TITRINU, HO)



A THESIS REPORT PRESENTED TO THE DEPARTMENT OF ARCHITECTURE, IN
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DECLARATION

I declare that I have wholly, under supervision, undertaken this study herein submitted.



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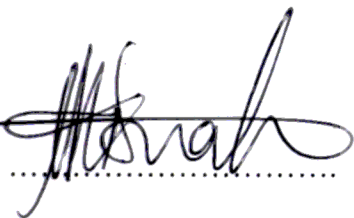
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I declare that this project was written under my supervision and that the candidate has been consistent in his interaction with me for guidance and direction. I confirm that the student has my permission to present it for assessment.

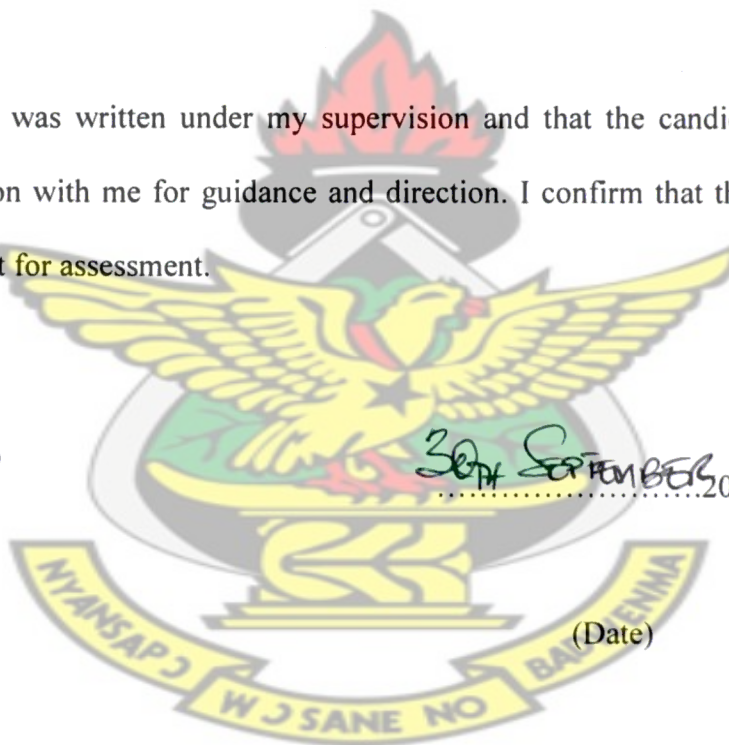


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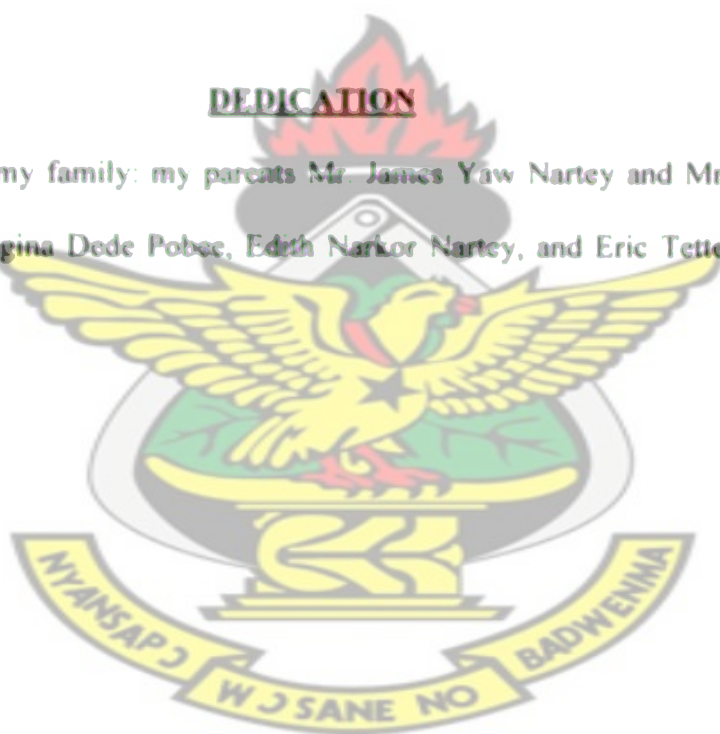
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DEDICATION

I dedicate this book to my family: my parents Mr. James Yaw Nartey and Mrs. Veronica Aku Nartey, my siblings, Regina Dede Pobee, Edith Narkor Nartey, and Eric Tetteh Nartey. I love you all.



ACKNOWLEDGEMENTS

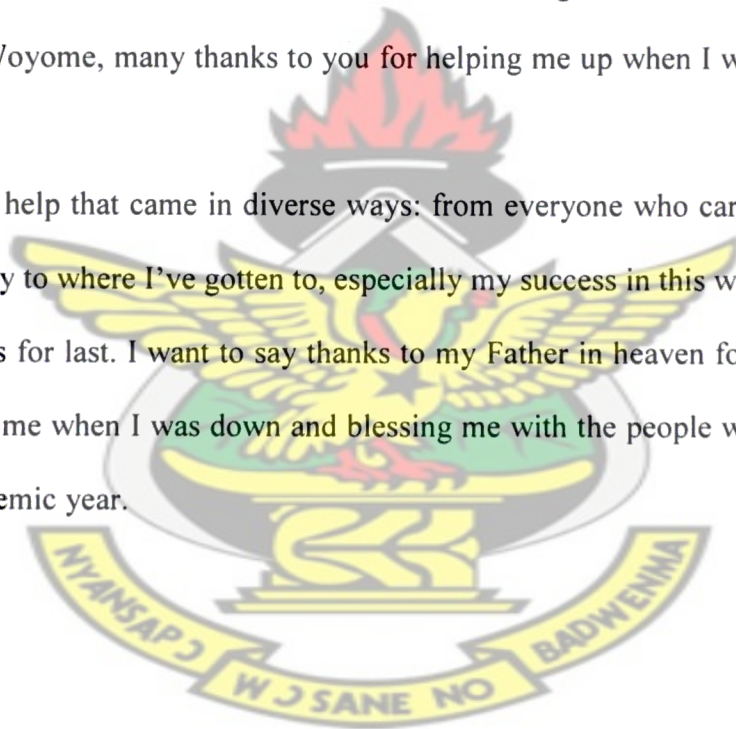
I hold a deep sense of gratitude to the following people for the great help offered when I most needed it. Mr. D. Y. A. Duah can never escape unnoticed. His guidance, patience encouragement has contributed to what I have achieved today.

The great support of my parents and siblings cannot be over looked. I smile today because of their prayer, financial and emotional support. They have been of wonderful help both in hard and difficult moments. I don't know what I would do if God had not given them to me.

My best friend Adeline Woyome, many thanks to you for helping me up when I was down. God richly bless you.

I really appreciate all the help that came in diverse ways: from everyone who cared and prayed and contributed in any way to where I've gotten to, especially my success in this write up.

Saving the greatest thanks for last. I want to say thanks to my Father in heaven for the strength, grace and favour he gave me when I was down and blessing me with the people who were there throughout this final academic year.



ABSTRACT

Correctional facilities or prisons are very essential components of our society. Developed societies have for a long time sought to keep their societies together (united) and peaceful by ensuring that crime is punished to deter people from being lawless. Prisons were the most popular means used to achieve this singular purpose to some degree.

When the concepts of prison were introduced in the country by the Europeans, colonial structures such as the forts and castles were eventually converted into prisons.

The design of a correctional facility is one that **has to consider** a number of issues including first and foremost security that is safe custody and welfare of prisoners, rehabilitation and reformation of inmates. Reintegration of ex-convicts into society by institutionalised programmes such as vocational and technical training, formal education, religious instructions and counselling.

Imprisonment is a legal penalty which **basically confines** or restricts a person from a range of liberties. Social interaction has been **prescribed** as one way of reducing deviant behaviours, so inmates should be allowed to interact and mingle in the midst of physical barriers in such facilities by the integration of courtyards, playgrounds and recreational areas.

In dealing with the group of people who **occupy such a facilities**, various literature were use to understand the state of housing in terms of housing types and materials for construction to find out what can be durable to withstand abuse and arson at the same time pleasant. Guiding principles of affordable and energy efficient design for tropical region were also attained from books and the internet.

To sum it all the design of the physical environment related to the well being of the inmates in the institution and society will be analyzed.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Since the beginning of human existence, behaviours considered as deviant have been penalised in one way or the other. Nevertheless lawlessness is still on the rise, hence the need for confining such lawless people was necessitated and as such lead to the concept of jailing and imprisonment.

Correctional facilities or prisons are conventionally institutions, which form part of the criminal justice system of a country, such that imprisonment or incarceration is a legal penalty that may be imposed by the state for the commission of a crime.(Encarta, 2007)

In Ghana a number of historical structures (dotted all over the country) were left from its colonial era. They range from the forts and castles to the houses of the European settlers. These have been used for different purposes at various times and have to some extent served as important historical reference points for this country. Some of these colonial buildings have been converted into prisons because of their fortified nature. As it stands now, it is only Nsawam Medium Security Prison built in 1962, which was actually designed with a prison in mind together with the only maximum security prison in Ghana situated at Ankafu which is almost completed.

1.2 PROBLEM STATEMENT

Overcrowding in prisons has become the phenomenon all over the world because of the high level of crime rate in recent times. In Ghana the current rate of overcrowding stands at 76 percent. Congestion in the prisons was worsened by the closure of other facilities which led to evacuation of the prisoners to other prison facilities. Other factors that contributes to overcrowding is judicial system (remand prisoners overstaying in prisons due to prolonged resolve of cases) and the budget of Ghana not been able to sustain the issues brought up by the prison service, because constructing and managing prisons are extremely expensive tasks.

1.3 JUSTIFICATION

The research into prisons as buildings and institutions is worthwhile due to recent report of worsening condition due to mainly overcrowding and other factors. Hence reforms are necessary and cannot be ignored any longer. To be able to do this the view of the major stakeholders including the society need to be change. Prisons as we would come to understand forms an important part of the Security services of this country because it hold the social fabric together by reducing crime and maintaining the peace of society.

To be able to reform our prisons to an acceptable level the history and concepts behind Prisons, their structural system and facilities need to be researched. This research document hence becomes helpful by appraising what exists today and help establish how it could be improved.

1.4 AIMS AND OBJECTIVES

The study will seek to pursue the following objectives.

- Define what a prison is, its history with particular emphasis on modern trends. Thus to know the various transformation it has gone through over the years leading to its present state.
- Help identify specific facilities and services that constitute the prison and their spatial configuration; how far they have aided in the achievement of the role of prison as correctional facilities.
- Improve upon the quality of life of inmates by tapping their potentials into useful and productive activities.
- Decongest some overcrowded prisons around the country to reduce the stress and pressure on those facilities
- House convicts from all walks of life and correct them through discipline, rejuvenation and rehabilitation over a period of time.

1.5 SCOPE OF STUDY

- Studying some of the functions of the prison such as reformation of inmates and how they translate into structures.
- Studying organizational structure of the prison and relating them to the facilities on the site.

1.6 TARGET GROUP

Over the past few years there have been problems of overcrowding and recidivism in our prison systems. The group that suffers most are the convicts and those on remand. Hence the need to provide them with a facility that has a humane environment and can correct them.

1.7 SITE AND LOCATION

The project is situated in Titrinu, in Ho Municipality of the Volta Region of Ghana, 30km from Ho.

1.8 CLIENT

Government of Ghana, Ministry of Works and Housing.

1.9 METHODOLOGY

- Literature reviews
- Personal observations
- Interviews
- Photographic documentation
- Internet
- Documentaries
- Special and case studies



CHAPTER TWO

LITERATURE REVIEW

2.1 DEFINITION OF A CORRECTIONAL FACILITY

A correctional facility or prison is a place in which individuals are physically confined or interned and usually deprived of a range of personal freedoms. Prisons are conventionally institutions, which form part of the criminal justice system of a country, such that **imprisonment** or **incarceration** is a legal penalty that may be imposed by the state for the commission of a crime. (Wikipedia)

A prison is also defined as a secure place where somebody is confined as punishment for a crime or while waiting to stand trial. (Encarta)

2.2 HISTORY OF PRISONS

From the American heritage dictionary on the history of prisons elaborates on how the word and concept came into being. From this dictionary, it is found that; "the word prison can be traced back to the Latin word *prænsiō*, the action or power of making an arrest. This in turn is derived from the verb *prehendere* or *prændere*, which meant to take hold of, take into custody, arrest. *Prænsiō* then surfaces in the Old French of the 12th century with the form *prison* and the senses capture and place of imprisonment. This new sense could have already been developed in Latin and not been recorded, but we have to wait until the 12th century to see it, the

sense captivity being added in the same century. From Old French as well as the Medieval Latin word *priso*, *âœprison*, derived from Old French, came our Middle English word *prisoun*, first recorded in a work written before 1121 in the sense imprisonment.

The sense place of imprisonment is recorded shortly afterward in a text copied down before 1225 but perhaps actually written in the Old English period before the Norman Conquest.

(www.adprs.org/prisons/history)

Historians note the existence of prisons in ancient Greece and Rome. For example, the Mamertine Prison, constructed in Rome in the 7th century BC, consisted of a vast network of dungeons under the city's main sewer. These subterranean cells held political dissidents and criminals for short periods of time in cramped, miserable conditions. However, the practice of confining wrongdoers for long periods as a form of punishment was not widespread until after the 15th century. (Encarta, 2007)

For most of history, imprisoning has not been a punishment in itself, but rather a way to confine criminals until corporal or capital punishment was administered. There were prisons used for detention in Jerusalem in Old Testament times. Dungeons were used to hold prisoners; those who were not killed or left to die there often became galley slaves or faced penal transportations. In other cases debtors were often thrown into debtor's prisons, until they paid their jailers enough money in exchange for a limited degree of freedom.

Only in the 19th century, beginning in Britain, did prisons as we know them today become commonplace. The modern prison system was born in London, as a result of the views of Jeremy Bentham. The notion of prisoners being incarcerated as part of their punishment, and not simply as a holding state till trial or hanging, was at the time revolutionary.

The first "modern" prisons of the early 19th Century were sometimes known by the term "penitentiary" (a term still used by some prisons in the USA today): as the name suggests, the goal of these facilities was that of penance by the prisoners, through a regimen of strict disciplines, silent reflections, and maybe forced and deliberately pointless labor on tread wheels and the like. This "Auburn system" of prisoner management was often reinforced by elaborate prison architectures, such as the separate system and the panopticon. It was not until the late 19th Century that rehabilitation through education and skilled labor became the standard goal of prisons.

Finally, through the history of prisons the main aim has been to reform people and put them back into the society. However the substandard subhuman conditions which were the hallmark of the history of incarceration is still found in our twenty-first century prisons. It is however not so pathetic since the pressure from human right activist have made law makers, designer, and managers of criminal justice system more responsive towards achieving prisons that response to basic human right of inmates and the fundamental purpose of reform, thus reduction in crime.

(Encarta, 2007)

2.3 THE PHILOSOPHY OF PRISONS

If the centre cannot hold then things will definitely fall apart (paraphrased, Chinua Achebe, 1995). In every society there is a piece of architecture in the centre that holds things together, many try recognise it but only few try understanding it. Many authorities have established many theories to help us understand the what, why and who's of these facilities.

Poetic Justice

Build prisons
Not day-care
Lock 'em up
What do we care?
Hire cops, not counsellors
Staff courts, not clinics
Wage warfare
Not welfare
Invest in felons
Ripen 'em like melons
Eat 'em raw, then
Ask for more
More poverty
More crime
More men in prison
More fear in the street
More ex-cons among us
Poetic justice

Robert Johnson

2.3.1 Philosophy of punishment

Punishment involves the act of causing pain to someone and therefore can be said to be wrong if hurting someone is wrong. However the intent and their end result must be taken into consideration before judgement is passed. Philosophers over the years have expressed differences in views resulting in the retributive and the utilitarian rationales.

2.3.2 Rationale for imprisonment

Retribution rationale is based on the theory that the society has the right to punish and the offender the right to be punished due to the social contract both find themselves in. This contract states that punishment, strictly is not evil hence grounds enough for imprisonment.

Utilitarianism or utilitarian rationale is also based on the principle that what is good is that which benefits the many. Even if it was painful to the individual but the majority benefit from the same act it would be defined as good. If punishment did deter or incapacitate or facilitate rehabilitation, then “the many” (all Society) would benefit, and punishment, by definition, would be good. Jeremy Betham (1748-183), the classical advocate of utilitarian punishment proposed that punishment could be calibrated to deter crime. His idea of a hedonistic calculus involved two concept : first , that mankind was essentially rational and hedonistic(pleasure seeking), and would seek to maximize pleasure and reduce pain in all behaviour decisions and secondly that a legal system could accurately determine exactly what measure of punishment would be necessary to outweigh the potential pleasure or profit from any criminal act. This according to him would cause all people rationally to choose to be law abiding.

Under the utilitarian rationale, punishment is evil, but it is justified when punishment accomplishes more good than the evil it represents. Punishment should explicitly be used to foster deterrence as summarized in the following statement –Punishment should not be administered if;

- 1) Where it is groundless: where there is no mischief for it to prevent the act not being mischievous upon the whole.
- 2) Where it is inefficacious: where it cannot act so as to prevent the mischief.
- 3) Where it is unprofitable, or too expensive: where the mischief it would produce would be greater than what it prevented.
- 4) Where it is needless: where the mischief may be prevented, or cease of itself, without it.

The ex post facto laws is a situation in which punishment does not deter offense to be committed because offender cannot be deterred from what they do not know to be illegal by law. Examples of such situations are infancy and insanity.

2.3.3 Other ways the utilitarian approach seeks the good of many

These are incapacitation and rehabilitation which are not really related to punishment at all.

Incapacitation

Incapacitation prevents an individual from inflicting further harm for at least as long as the individual is under control. Strictly speaking, it is not punishment because it does not necessarily imply pain.

Incapacitation however cannot be used to prevent crime that might be committed in future because prediction of offender's behaviour has been found to be in the error rate of 44-55 percent. Aurehahn, (1999).

Because incapacitation is forward-looking, it is assumed that the incapacitative period should last as long as the risk exists. This may be inconsistent with the laws of justice.

Rehabilitation

Rehabilitation is not punishment either, although punishment may be used as a tool of reform.

Rehabilitation is defined as internal change that results in a cessation of the targeted negative behaviour. It may be achieved by inflicting pain as learning tool (behaviour modification) or by other interventions that are not painful at all (for example, self-esteem groups, education, or religion). Under the retributive philosophy described earlier, rehabilitation and treatment are considered more intrusive and less respectful of the individuality of each person than pure punishment because they attack the internal psyche of the individual. They seek to change offenders.

In conclusion, the utilitarian rationale for punishment must determine that the good of punishment outweighs the inherent evil associated with punishment. It should be seen in the light of correction not as retaliation. The beneficial aspects of punishment include deterrence, incapacitation, and rehabilitation or reform. The above concepts could therefore be said to form the basis of the restorative justice philosophy which will be defined.

2.4 PHILOSOPHY OF IMPRISONMENT

The philosophy of imprisonment is further derived from the above rationales of punishment. There are three major schools of thought on imprisonment, an act described as “psychological punishment” (Mickunas 1990). Various ideologies in the form of the conservative, liberal and radical ideologies are brought to light and can be linked directly to the various eras of prison development.

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Conservatism

Conservatism having been the main ideology of the early era of prison history, had the notion of Incapacitation which applies in the sense that prison became a form of banishment, once offenders were put away the society was then protected from them. This conservative ideology further operates under the assumption that human beings have freewill, can make rational choices and deserve the logical outcomes of their choices. This ideology is geared more towards deterrence and incapacitation. As such prison sentences are to be made as painful as possible to deter offences from being committed or repeated; this however called for longer sentences and more labour intensive prison life.

Liberalism

This ideology predominantly could be said to be of the early 19th century. Brutal punishment were substituted for a system that gave the chance for offenders to reform whiles “paying for their sin”, hence reformation and rehabilitation became the main goal under which inmates

where thought various lesson for reintegration into normal society through religion, vocational training, psychiatry and others.

Prison names even changed to “correctional facilities”; marking the “rehabilitation era”.

This new era of correctional reform began with the establishment of the Elmira State Reformatory in Elmira, New York, in 1876. The Elmira Reformatory experimented with new rehabilitative philosophies. Because it incorporated the latest, state-of-the-art scientific advancements in correctional methods, criminologists considered Elmira “the new penology.” For example, officials directed prisoners into productive activities—including educational and vocational-technical programs—where their good behavior and productivity could earn them time off of their sentence. To instill discipline in inmates and help reform them, Elmira officials implemented a military model. Prisoners were trained in close-order drill, wore military uniforms, and marched about with wooden rifles. (Encarta, 2007)

At Elmira, officials attempted to address the needs of individual prisoners, rather than merely warehouse large groups of offenders. Another innovation at Elmira was the large-scale use of indeterminate sentencing. A prisoner who receives an indeterminate sentence is confined to prison for a range of years. The actual amount of time served is determined by a parole board, based on the inmate’s behavior while in prison.

The reformatory concept, however, did not reform significant numbers of inmates and slowly died out during the early 1900s. States built vast new prisons to replace reformatories. Increasing numbers of prisons were built with prison labor in mind. States constructed prison factories in new prisons and established prison industries. In rural areas, prison farms flourished. Inmates worked in fields and assisted with the harvesting of crops.

Despite the demise of the reformatory, the goal of rehabilitation became an accepted tenet of penal philosophy. From 1900 to 1970 rehabilitation-oriented prisons provided psychological services, counseling, vocational and technical training, education, and other services aimed at improving inmate self-esteem. Experts generally agree that little rehabilitation among inmates actually occurred. Since the 1970s, U.S. prisons have reduced the scope and availability of rehabilitative programs. (Encarta, 2007). This era however according to history ended in the 1980s.

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Radicalism: Prison and Economics

Radicalism as an ideology outlines prison as a method of punishment because of the desire to exploit and train captives (Rusche and Kirchheimer). This ideology is founded on the principle that the society is the offender due to its unfair policies that prevent equal economic opportunities.

This group even goes further to suggest that prison would not be in existence if not for economic reasons. An example is given as in the “factory prison” model in which inmates are housed and work together and were better utilized in the factory like conditions (Melossi and Pavarini 1981). Labour is therefore described as exploitive and not reformative. The radicals hence believe imprisonment is futile without addressing social problems such as unemployment, homelessness, poverty, discrimination, inadequate health care, and unequal education. According to writers this view is not very popular amongst various authorities.

Amongst the above, the Liberalist stance would seem to be the most beneficial for all the interest groups with the society benefiting most, however is confronted with problem of economics and management. This system of reformation if handled with care could serve the total interest of the many. A lot could be achieve if people are made to be productive (engaged in constructive work)

and learn to be law abiding through reform and rehabilitation even in prison serving a legal sentence and after. A newer philosophy hence emerges. Joycelyn M. Pollock, Texas state university- Sans Marcos

2.5 PURPOSE OF PRISONS

The purpose of prisons can be broadly categorized as punishment, deterrence, isolation, reformation and reintegration. Though society has become benign, rational and more concerned with the rehabilitation of the offender, prisons still act as agents of punishment on behalf of the society. The very existence of prisons prevents the general public from indulging in unlawful activities. This is due to the fact that most people have a fear of being imprisoned, which is considered a social stigma. Also, a convicted prisoner is deterred from taking to crime after his sentence is over¹¹. The idea behind isolation of the criminal is to prevent contamination of law-abiding members of society and also to protect them from potential danger to their lives or property. Reformation has received a major emphasis in the recent years with advances in penology. The concept of reformation begins with the fact that deviant human behaviour has specific physical, moral, mental, social, vocational or academic causes. Therefore, if the cause for the errant behaviour can be ascertained, the offender can be treated by suitable psychological therapy and counseling. Reintegration of the offender is only a more practical and realistic extension of the reformation philosophy. Like the reformative model, it views the offender as needing help and at the same time realizes that errant behaviour is often a result of disjunction between the offender and society. Reintegration thus attempts to bring the offender close to the society by exposing him to the positive elements of a free environment.

2.5.1 Deterrence

Here the criminal is used as a "threat to themselves and others". By subjecting prisoners to harsh conditions, authorities hope to convince them to avoid future criminal behaviour and to exemplify for others the rewards for avoiding such behaviour; that is, the fear of punishment will win over whatever benefit or pleasure the illegal activity might bring. The deterrence model frequently goes far beyond "an eye for an eye", exacting a more severe punishment than would seem to be indicated by the crime. Torture has been used in the past as a deterrent, as has the public embarrassment and discomfort of stocks, and, in religious communities, excommunication. Executions, particularly gruesome ones (such as hanging or beheading), often for petty offenses, are further examples of attempts at deterrence. One criticism of the deterrence model is that criminals typically have a rather short-term orientation, and the possibility of long-term consequences is of little importance to them. Also, their quality of life may be so horrible that any treatment within the criminal justice system (which is compatible with human rights law) will only be seen as an improvement over their previous situation. However, if that's the case, this points to a far more severe social problem.

2.5.2 Rehabilitation/Reformation/Correction

("Reform" here refers to reform of the individual, not to reform of the penal system.) The goal is to "repair" the deficiencies in the individual and return them as productive members of society. Education, work skills, deferred gratification, treating others with respect, and self-discipline are stressed. Younger criminals who have committed fewer and less severe crimes are most likely to be successfully reformed. "Reform schools" and "boot camps" are set up according to this model. One criticism of this model is that criminals are rewarded with training and other items which

would not have been available to them had they not committed a crime. However, it must be noted that criminals or potential criminals who do not have access to such educational resources are only acting in their best interests by gaining access to these prisons; if a prison is successful at providing resources to individuals who were unable to get these resources through "acceptable" channels, then perhaps what would be next needed, in the implementation of this model, is societal reform.

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2.5.3 Removal From Society

The goal here is simply to keep criminals away from potential victims, thus reducing the number of crimes they can commit. The criticism of this model is that others increase the number and severity of crimes they commit to make up for the "vacuum" left by the removed criminal. For example, incarcerating a drug dealer will result in an unmet demand for drugs at that locale, and an existing or new drug dealer will then appear, to fill the void. This new drug dealer may have been innocent of any crimes before this opportunity, or may have been guilty of less serious crimes, such as being a look-out for the previous drug dealer.

2.5.4 Restitution/Repayment

Prisoners are forced to repay their "debt" to society. Unpaid or low pay work is common in many prisons, often to the benefit of the community. In some countries prisons operate as labour camps. Critics say that the repayment model gives government an economic incentive to send more people to prison. In corrupt or authoritarian regimes, such as the former Soviet Union under the control of Joseph Stalin, many citizens are sentenced to forced labour for minor breaches of the law, simply because the government requires the labour camps as a source of

income. Community service is increasingly being used as an alternative to prison for petty criminals.

2.6 HISTORICAL OVERVIEW OF PRISONS IN GHANA

There was no prison system in traditional Ghanaian society. In the mid-nineteenth century, the British council of merchants established a network of harsh prisons in forts such as Cape Coast Castle. By 1850 four such prisons could hold up to 129 prisoners. Convicts usually worked on road gangs. The Prisons Ordinance of 1860 outlined regulations for the safe-keeping of prisoners. Later ordinances further defined the nature of the colony's prison regimen, or "separate system," which required solitary confinement by night, penal labor, and a minimum diet. By the early 1900s, British colonial officials administered the country's prisons and employed Europeans to work as guards in the prisons. After World War II, Ghanaians gradually replaced these individuals. By 1962 Ghanaians staffed all positions in the prison system. (<http://www.country-data.com>)

Under Nkrumah's regime, the government showed little concern for reform and modernization of the penal system. After Nkrumah's overthrow, the National Liberation Council (NLC) authorized a civilian commission to investigate the prison system and to make recommendations for improvements. The commission's report, issued in 1968, revealed numerous problems. Of the country's twenty-nine prisons, nine were judged unfit for human habitation, two were suitable only for police lockups, and thirteen were appropriate only for short-term detainment. Because of corruption and incompetence, however, the NLC failed to act upon the commission's recommendations. (<http://www.country-data.com>)

As a result, prison conditions continued to be substandard, with poor ventilation, sanitation, and food preparation facilities.

Ministerial responsibility for the prison system has shifted periodically since independence, but the operation of prisons is fixed by statute and is divided into adult and juvenile correction. The former is governed by the Prisons Ordinance, which outlines rules for prison operation and treatment of prisoners. The constitution of 1969 established a Prison Service, the director of which is appointed by the chief executive and is responsible to the minister of interior. The Criminal Procedure Code determines procedures for handling young offenders.

Persons convicted and sentenced to a period of police supervision (parole) rather than imprisonments are subject to a licensing arrangement. Violations of the license terms are punishable by one-year imprisonment. Upon convicting an offender of any age, a court may release that individual on probation for six months to three years. Failure to comply with the terms of the probation can result in the probationer's having to serve the sentence for the original offense. Probation has been used mainly for young persons.

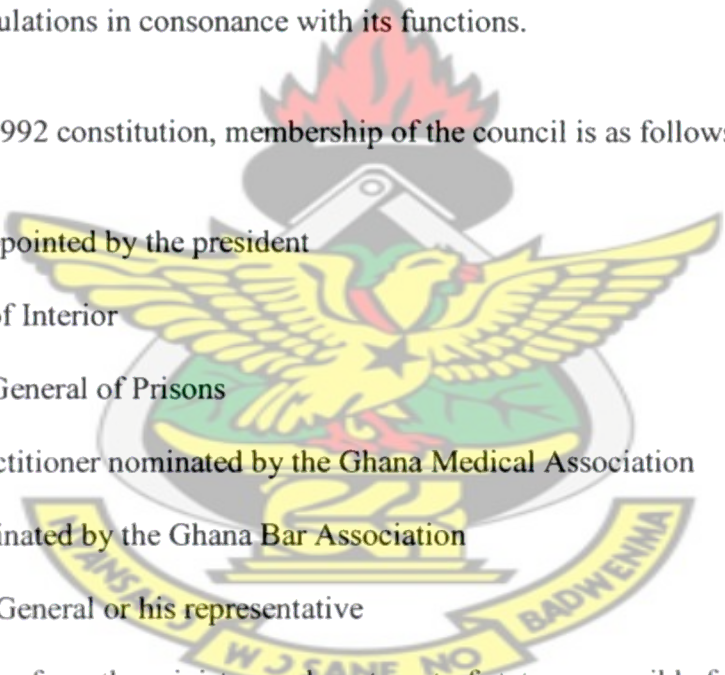
Source: <http://www.country-data.com>

2.7 THE PRISON SYSTEM IN GHANA

According to the Ghana Prisons Service annual report 2007, the Ghana Prisons Service is governed by the Prisons Service Council which is an advisory and supervisory body. The council advises the president on matters of policy in relation to the organization and maintenance of the prison system in Ghana.

It is also responsible for ensuring the efficient administration of the Prison Service and the promotion of superior officers above the rank of assistant director of prisons. When necessary, the council makes regulations in consonance with its functions.

By provisions of the 1992 constitution, membership of the council is as follows:

- 
- i. A chairman appointed by the president
 - ii. The Minister of Interior
 - iii. The Director-General of Prisons
 - iv. A medical practitioner nominated by the Ghana Medical Association
 - v. A lawyer nominated by the Ghana Bar Association
 - vi. The Attorney-General or his representative
 - vii. A representative from the ministry or department of state responsible for social welfare
 - viii. A representative from religious bodies
 - ix. Two members of the Prison Service, one of whom shall be of a junior rank
 - x. A representative of the National House of Chiefs
 - xi. Two other members appointed by the President

To ensure the welfare and the proper treatment of prisoners, the constitution requires the Prisons Service Council to make regulations for the review of prison conditions at intervals of not less than two years. Reports of unjustified treatment of prisoners and recommendations for reform measures are required of the board.

The prisons service is a career establishment with a promotion system based on training and merit; its members have retirement privileges similar to those of other public services. Prisons service standards require one staff member for every three prisoners, but the ratio in many institutions has risen to one to five or more. Although understaffing has been a long-standing problem, the quality of prison officers and guards has improved over the years. Women are included in both categories. Although recruited from all over the country, prison personnel largely come from the Ewe and Ga ethnic groups. The prisons service maintains a training school and depot at Mamobi, near Accra. This facility offers a six-month training course for senior staff members, special courses for matrons, and preparatory courses for promotion examinations.

Source: <http://www.country-data.com>

The Prisons Service Council also administers the country's prisons. From the Ghana Prisons Service Annual Report as at 2007, the Prison Service was made up of forty five establishments and they are as follows:

- i. Prisons Headquarters
- ii. Prison Officers' Training School
- iii. Senior Correctional Centre, SCC (Formerly Ghana Borstal Institution)
- iv. 7 Female Prisons
- v. 7 Central Prisons

- vi. 15 Local Prisons
- vii. 2 Open Camp Prisons
- viii. 10 Agricultural Settlement Camp Prisons
- ix. 1 Medium Security Prison

2.8 PRISON ARCHITECTURE

One may wonder and even doubt if prison buildings could be referred to as architecture of any form or to any degree. That which differentiates architecture from all the arts and sciences is the fact that it deals with the moulding of spaces, volumes and the general environment for use. In Tom Vanderbilt's submission about prison architecture he states , "Ultimately, architecture can be used to make a prisoner's stay more or less oppressive and can keep them from getting out but to keep them from getting in , we need to look elsewhere".

According to Tom Vanderbilt's article ([http:// www.stim.com](http://www.stim.com)),most contemporary prisons vary wildly from their historical precedent. Prison design over the years have changed pretty much to look less like "prison" whiles other architecture has changed to look more like prisons. Security has come to define many aspect of the built environment, from the razor wire atop building to the sophisticated systems in modern building.

Completeness has always been the underlying theme of prison design. For the building needs to be designed with an eye towards its inhabitants total life. According to Jean Genet , the machinery, the materials , the proportions and the architecture are in harmony with a moral unity which make these dwelling indestructible so long as the social form of which they are a symbol endures.

Prison architecture offers little space for creativity and even less hope of inspiring the public. The structure of the prison is meant to convey a certain fear yet hold out hope for reform. Its security functions make it one of the costliest structures to design yet budget are often tight or nonexistent. They are meant to blend into their surroundings so as not to evoke alarm, a task made difficult by those same security features (bars, fences, gates, etc).

In the last several decades, prison designs have moved away the oppressive monoliths, attempting through the use of smaller cellblocks to create a "sense of place" within a larger institution. This according to research yields impressive results in terms of reform. To cut down on staffing needs and construction cost many prisons use cheap non-distinguishable materials and rely on video cameras and electronic warning systems (roboprison) which have been criticized for their detrimental effect on the rehabilitation process.

[http:// www.stim.com](http://www.stim.com)

Marin County prison in the United States of America demonstrates in the extreme that prisons are no longer built as public monuments meant to instil fear or respect of the law, but as secluded security zones. (Tom Vanderbilt).

Research on over- crowding have come out with new design concept which ensures that correctional arrangement affords inmates greater degree of perceived control and privacy. This suggested that the need is not for more room for inmates but rather for moderate amount of room with some degree of privacy.

Design can also be used to check or rectify problems of overcrowding and related stresses in correctional facilities. Unwanted interactions and simulations, such as noise can heighten the

adverse effect of crowding. Here the use of material is carefully detailed to avoid acoustical problems. Bare and hard surfaces and metal-on-metal contacts are done away with as far as practicable.

A poorly designed physical environment can cause frustration and reduce well being. This as such applies also to all correctional facilities.

2.9 PRISON DESIGN CONSIDERATIONS

(Changes in prison facilities as a function of correctional philosophy)

Historically there has been three stages in the evolution of correctional design which are the First, second and third generational facilities. This is due basically to changes in philosophies of prison and economic issues and the available technology. It is believed that rehabilitation will not occur until the physical environment of these facilities improve or change.

First – Generation Facilities:

This is a linear design with intermittent surveillance and includes designs and management styles that dated and was in effect before the last twenty years.

Second – Generation facilities:

This system was operational in the early 1970s and was developed by NCCJPA (National Clearinghouse for Criminal Justice Planning and Architecture).

<http://www.cpted-security.com/publication>

Design principle: was based on providing centralized services to inmates who required movement and escort.

Operational assumption: That inmate would exhibit negative behaviours simply because they are inmates.

Main features

KNUST

1. Is based on the premise that barriers should be placed between inmates and the correctional staff.
2. Separation of daily activities from the living module which necessitated supervised movement of inmate to a variety of location in the facility.
3. Podular housing area was divided into manageable sized unit of 12-24 people.
4. Typical units had single occupancy cells around a common dayroom with an officer in a secured booth supervising activities.
5. Officers were only in areas where they could monitor inmates but had no direct contact with them.

These types of facilities were geared toward containing negative behaviours.

Third – generation facilities:

Is basically a modular design with direct supervision which developed from the second generation facility around 1979 founded in the concept of the functional unit management.

Design principle: Based on the principle that a normalized environment would evoke normal behaviour.

Main features

1. Various services are located close to inmates thereby reducing movement between areas, hence less supervision.
2. Housing unit of 36-60 people with one officer responsible for minimizing negative behaviour.
3. Non-conforming inmates are segregated or put in isolation.
4. Furnishes and finishes constitute of non-institutional commercial grade such as porcelain sink and toilet because vandalism is not the norm.
5. Relies on officers' ability to supervise and interact and not structural or technological barriers as in the second generation facility.
6. Facilities such as TV, access to telephone, area for exercising (dayrooms) are incorporated. Food is taken to inmate living area for heating and serving.

The main intent is to prevent negative behaviour before it occurs.

<http://www.cpted-security.com/publication>

2.9.1 Design considerations

Security considerations make prisons expensive buildings. It is worthwhile to make imaginative efforts to ensure that capital costs and recurring expenditure required for construction and operation of prisons be utilized for objectives other than merely detaining inmates. There has to

be scope for education, training and opportunities for physical and mental growth of prisoners leading to their integration within society as productive, responsible citizens. Prisons have a complex structure and they must be designed after taking into account several factors, such as

- Secure accommodation
- segregation of various categories of inmates
- sanitation and hygiene
- daily routines of inmates
- opportunity for exercise and physical activity
- medical services
- education and religion
- social behaviour and factors influencing it

Designers need to become aware of the problems associated with correctional facilities. With a better understanding of inmates, staff and user needs, they can develop a model prison that will incorporate skills training. The resultant effect will be new ex-convicts sufficient with skills to participate in economic development. Thus value for money that has been spent on them whilst in prison. The bottom line is that skills training should complement incarceration in the new correctional facility.

2.9.2 Design and facilities

Male and female prisoners are typically kept in separate locations or separate prisons altogether.

Prison accommodation, especially modern prisons in the developed world are often divided into wings. A building holding more than one wing is known as a "hall".

Amongst the facilities that prisons may have are:

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- A main entrance, which may be known as the 'gate lodge' or 'sally port' (stemming from old castle nomenclature)
- A chapel, mosque or other religious facility, which will often house chaplaincy offices and facilities for counselling of individuals or groups
- An 'education facility', often including a library, providing adult education or continuing education opportunities
- A gym or an exercise yard, a fenced, usually open-air-area which prisoners may use for recreational and exercise purposes
- A healthcare facility or hospital
- A segregation unit (also called a 'block' or 'isolation cell'), used to separate unruly, dangerous, or vulnerable prisoners from the general population, also sometimes used as punishment (see solitary confinement)
- A section of vulnerable prisoners (VPs), or protective Custody (PC) units, used to accommodate prisoners classified as vulnerable, such as sex offenders, former police officers, informants, and those that have gotten into debt or trouble with other prisoners
- A section of safe cells, used to keep prisoners under constant visual observation, for example when considered at risk of suicide

- A visiting area, where prisoners may be allowed restricted contact with relatives, friends, lawyers, or other people
- A death row in some prisons, a section for criminals awaiting execution
- A staff accommodation area, where staff and guards live in the prison, typical of historical prisons
- A service/facilities area housing support facilities like kitchens
- Industrial or agricultural plants operated with convict labour
- A recreational area containing a TV and pool table

Prisons are normally surrounded by fencing, walls, earthworks, geographical features, or other barriers to prevent escape. Multiple barriers, concertina wire, electrified fencing, secured and defensible main gates, armed guard towers, lighting, motion sensors, dogs, and roving patrols may all also be present depending on the level of security. Remotely controlled doors, CCTV monitoring, alarms, cages, restraints, nonlethal and lethal weapons, riot-control gear and physical segregation of units and prisoners may all also be present within a prison to monitor and control the movement and activity of prisoners within the facility.

Modern prison designs, particularly those of high-security prisons, have sought to increasingly restrict and control the movement of prisoners throughout the facility while minimizing the corrections staffing needed to monitor and control the population. As compared to the traditional landing-cellblock-hall designs, many newer prisons are designed in a decentralized "podular" layout with individual self-contained housing units, known as "pods" or "modules", arranged around centralized outdoor yards in a "campus". The pods contain tiers of cells laid out in an open pattern arranged around a central control station from which a single corrections officer can

monitor all of the cells and the entire pod. Control of cell doors, communications and CCTV monitoring is conducted from the control station as well. Movement out of the pod to the exercise yard or work assignments can be restricted to individual pods at designated times, or else prisoners may be kept almost always within their pod or even their individual cells depending upon the level of security. Goods and services, such as meals, laundry, commissary, educational materials, religious services and medical care can increasingly be brought to individual pods or cells as well.

KNUST

Conversely, despite these design innovations, overcrowding at many prisons, particularly in the U.S., has resulted in a contrary trend, as many prisons are forced to house large numbers of prisoners, often hundreds at a time, in gymnasiums or other large buildings that have been converted into massive open dormitories.

Lower-security prisons are often designed with less restrictive features, confining prisoners at night in smaller locked dormitories or even cottage or cabin-like housing while permitting them freer movement around the grounds to work or activities during the day.

2.10 PRISON DESIGN LAYOUTS

Throughout the history of prison construction, there have been basically four models of prisons. The layouts are the radial design, the telephone-pole design, the courtyard style, and the campus style.

The Radial Design

The radial design looks a lot like an asterisk. This is a linear design with cells aligned in rows down the cell blocks. In the radial design, the cell blocks and program buildings extend from a

central hub. This design has not been copied in prisons built over the past 75 years. This is probably because that all the inmate traffic and movement comes to one point in the prison. This congestion in the prison presents a dangerous situation, particularly in high-security prisons.

The Telephone Pole Design

The telephone-pole design is another linear style. This was used extensively between the 1920s and 1970s. Inmates and staff move along a main corridor down the centre or the pole, and the cell blocks and program buildings extend from that corridor. It was popular mostly because it was easy to erect barred grills across the "pole," and close them to isolate smaller groups of offenders in case of a riot or disturbance. These telephone-pole designed prisons were designed specifically to control prison violence. They were built like fortresses that appeared to be quite secure. Unfortunately, on the inside there were many hard-to-monitor corners and other places that were ideal for stabbings, beatings and other forms of violence.

The Campus style

Campus style prisons have been used more recently. This style was first initiated by the Federal Bureau of Prisons (FBP). The first of these designs included the buildings being separated and spread out over several acres within the secure perimeter. It was believed that forcing inmates to move from one building to another, walking outside instead of within a corridor, has a positive effect on the environment of the prison. Also, with the decentralized location of the buildings, there is little inmate congestion as they move through the prison. This decreases the likelihood of dangerous tension. The campus style prisons remain very popular today, as institutions adapt the design to best fit their purpose.

The Courtyard Style

This model was developed to take advantage of the benefits available from both the telephone-pole and campus designs. With the courtyard style, buildings are attached to a corridor that runs around the prison, leaving a courtyard in the middle. The corridor can be used for inmate movement during much of the day, allowing prison administrators to contain and isolate inmates in the corridor by closing grills across it. The recreation yard is in the middle of the courtyard. This style is often used in high-security institutions.

2.11 CLASSIFICATION OF INMATES

Classification involves matching the offender's risk and needs with the available correctional resources. "There is no "perfect" classification scheme, but a "good" one will avoid two common errors: over classification (unnecessarily sending low-risk inmates to maximum security settings); and misclassification (making a mistake in diagnosing or classifying an inmate's risk or needs)." Edward Murrow

Classification Objectives:

From State of Alaska's department of corrections policy document.

1. Placing each prisoner into the proper security and custody level through an assessment

Of violence and the risk of assault to staff and other prisoners;

2. Assigning each prisoner to the least restrictive custody and security level consistent with the prisoner's need for supervision, housing and programs within available resources

3. Identifying individual prisoner requirements regarding special needs, program services, and other administrative considerations; and
4. Developing specific and accurate information on the prisoner population for monitoring, program planning, and budgeting.

Whenever the above mentioned (over classification or misclassification) occurs both the offender and the institution is threatened. Since there is a possibility of-

1. That particular offender becomes a threat to other inmates and guards.
2. Recidivist tendencies could be developed with time.
3. Development of violent and aggressive behaviours resulting in security threats.

2.12 TYPES OF PRISON

Super-Max or Maxi-Maxi prisons

The highest security-level facilities are super-max or maxi-maxi prisons also called "control units". These prisons or areas within prisons have extraordinarily severe restrictions. Human contact is minimal. Inmates are kept in solitary confinement in small (typically six feet by eight feet) cells for long periods each day. They eat alone in their cells. No opportunities for work or socialization exist. Outdoor recreation is permitted only once a week. Restraints such as leg irons are used whenever inmates leave their cells.

Maximum-Security Prisons

Those sentenced to serve time in maximum-security facilities are usually the most dangerous, high-risk offenders. Maximum-security prisons have many stringent rules and restrictions.

Inmates are isolated from one another in solitary cells for long periods. Maximum-security facilities have few amenities, and the cells are sparsely furnished. Closed-circuit video cameras enable correctional officers to observe prisoners in their cells or in work areas. Many maximum-security institutions confine prisoners to their cells for 23 hours a day, allowing them out for only a short period to shower and exercise.

Medium-Security prison

Medium-security facilities are a catchall, because often both extremely violent and nonviolent offenders are placed in common living areas.

Inmates in medium-security facilities typically occupy cells that accommodate more than one prisoner. At medium-security facilities, freedom of movement, privileges (such as participation in sporting events), and access to various educational, vocational, or therapeutic programs are greatly restricted. Prison officials limit visitation and carefully monitor communication between inmates and visitors. The visiting parties face one another through a glass partition and speak on a telephone. Although medium-security facilities sometimes offer inmates opportunities for work release, furloughs, and other types of transitional programs, only a small percentage of prisoners are allowed to participate in these programs.

Minimum-Security Prisons

Minimum-security prisons are designed to house low-risk, first-time offenders convicted of nonviolent crimes. These institutions sometimes function as transitional housing for prisoners from maximum- or medium-security prisons who will soon be paroled. In 1998 minimum-

security facilities made up about one-fifth of all U.S. prison space. About one-quarter of federal facilities in Canada are minimum-security.

Housing in minimum-security facilities is often dormitory-like, and the grounds and buildings of a minimum-security facility resemble a university campus. Inmates assigned to such facilities are trusted to comply with prison rules.

Juvenile Correctional Institutions

Minors (individuals who have not reached the legal age of adulthood) are not sent to prisons with adults. Instead, they are housed in facilities known as juvenile correctional institutions. Most individuals incarcerated in such facilities are minors who have committed acts that would also be crimes if adults committed them, for example, theft, robbery, rape, and murder. These individuals are known as juvenile delinquents. Some institutions also house status offenders that is, minors who have committed acts that would not be crimes if adults committed them, but which are prohibited to minors. Examples of such acts include running away from home, violating a curfew, and truancy (missing school).

Correctional institutions for juveniles may be secure or nonsecure. Secure institutions for juveniles are similar to prisons for adults. However, most juvenile institutions have dormitory-like atmospheres and individual rooms similar to those on college campuses. Officials lock juveniles up at night and require them to participate in various programs during daytime hours. These programs may include basic education, vocational and technical training, and counseling on an individual or group basis. Nonsecure settings may be camps or ranches where youths participate in supervised outdoor activities and learn various skills.

(Encarta 2007)

2.13 OVERCROWDING AND ITS EFFECTS

Definition of overcrowding:

Studies by researchers into the effects of overcrowding on inmates have also meant defining overcrowding and describing what the basic effects of crowding can be on humans. Crowding research has concentrated mainly on the spatial density and the social density of crowding.

Spatial density: is defined as the amount of space (number of square feet) available per person in a particular housing unit.

Social density is defined as the number of individuals sharing a housing unit and is considered the factor which contributes most to the adverse effects of crowding. (John Howard Society of Alberta)

However, it has been suggested that density alone does not explain the total effects of crowding.

Researchers have found other factors that might lessen or heighten the impact of density, such as personal control and the physical environment itself.

Crowding is said to be only indirectly related to mere numbers or density of people .this is to say what the individual feel and their individual responses play a major role.

It is possible to feel crowded in the presence of a few people, or not crowded in the presence of many. The significant element appears to be the frustration in the achievement of some purposes because of the presence of other people.

The prison environment is characterized by factors which can have adverse effects on individual inmates. In the prison setting crowded conditions are chronic, people prone to anti-social

behavior are gathered, there is an absence of personal control and idleness and boredom can be prevalent.

Effects of overcrowding

Researchers have outlined three types of effects on the daily prison environment.

First, there is less of everything to go around, so the same space and resources are made to stretch even further. The opportunities for inmates to participate in self-improvement and rehabilitative programs, such as academic, employment and vocational training are curtailed. The lack of work or work opportunities lead to inmate idleness, often reinforcing the maxim that idleness breeds discontent and disruptive behaviour.

The unavailability of resources can have two fold consequences. One is the frustration or unpleasantness of being limited or denied a resource, and the other is the fact that competition and conflict over limited resources often lead to aggression and violence.

The second effect of overcrowding is on the individual inmate's behaviour. Crowding creates stress and this, in conjunction with other factors in a prison setting, can heighten the adverse effects of crowding. Idleness, fear, the inability to maintain personal identity or to turn off unwanted interaction and stimulation, such as noise, all add to the stress of crowding. The adjustment process for inmates to cope with excess stress varies; it could be withdrawal, aggression or depression.

The third effect involves a combination of the correctional system's inability to meet the increased demand for more space and the resulting harm to individual inmates. In an attempt to

cope with the limited space available and the resulting overcrowding, there has been a strong tendency to misclassify offenders.

To a certain degree, overcrowding has resulted in offenders being classified on the basis of the space available rather than the security level and programs most suitable for the offenders.

Most studies indicated that crowded conditions could be reasonably well tolerated for short periods, but in terms of a long term crowded environment, prisons contained unusually high concentrations of the stress-inducing features.

Overcrowding of inmates has been connected with higher rates of psychiatric commitment, higher rates of illness complaints and with an increased likelihood of recidivism. Also to add other ripple effects such as, increase rate of violence, suicide and other forms of violent deaths and disciplinary infractions.

The director of the Howard league (UK), Frances crook emphasizes the problems of overcrowding. She said: "The consequences of overcrowding are jeopardizing both the safe running of the prison system and the rehabilitation of individual offenders". (John Howard Society of Alberta)

These effects all too well makes our prisons mere excuses for reforming and reintegrating offenders back into normal society. Their adverse effect on the community is tremendous because of the possibilities of offender coming out worse after their sentence.

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the various medium through which this research was carried out. Different research approaches and methods were adopted with its resultant limitations and constraints.

3.2 METHODOLOGY

Various methods were employed in gathering the information for the research which included interviews, reading books and articles related to the topic and observations from visit to places of interest, internet and photographs.

3.2.1 Literature Research

Literature was collected from various libraries and the internet and presented in a systematic manner.

3.2.2 Case Studies

To identify special considerations necessary for correctional institution designs, case studies of facilities in like manner were undertaken. For this purpose, the Sekondi Central prison in the

Western region of Ghana and the North Branch Correctional Institution (NBCI), Baltimore, USA were selected.

Security systems employed for use in some banks in the country has also been studied to enable the implementation of the best possible system as regards cost implications.

3.2.3 Photographic Recordings

For the purpose of depicting precise conditions and situations, pictures were taken where ever possible for visual references.

3.2.4 Interviews

To ascertain first hand information about conditions in prisons and their operations, interviews were conducted with some prison officers in the country (Ghana). This was targeted more on the personal experiences and expectations which broadened my scope of what to provide in my project.

3.2.5 Personal Observation

The situations observed personally upon visit to the prisons for the purpose of this study and also visiting others there had enlightened and guided me into making meaningful and realistic interventions for the project in terms of security systems used in checking both inmates and staff.

3.3 LIMITATIONS AND CONSTRAINTS

The non-cooperation of some stake holders to release relevant data has hampered the smooth progress of this report. Since most issues dwell on security, access to some of the institutions were not allowed hence some documented works were used for the research.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 INTRODUCTION

This chapter emphasizes the deductions gathered from the literature on correctional institutions and facilities here in Ghana and abroad and discusses the pertinent issues relevant to the area of study.

The importance of security considerations in the design of any correctional institution cannot be underplayed as such would be given paramount attention in my design as juxtaposed to cost implications.

The type of layout to be employed to achieve best possible results for a specific security level of correctional institution has also been noted for consideration.

Previous and current data on prisons in the country and their conditions and operations were also noted to be help during decision making process for the project.

4.2 CASE STUDY

Because of the importance of security considerations in the design of any correctional institution, a supermax prison which presents modern security considerations and a local prison have been studied. The intermediate between these two security extremes will be considered in the design of the new correctional institution. These are the North Branch Correctional Institution (NBCI), USA and the Sekondi Central prison in Ghana.

4.2.1 North Branch Correctional Institution (NBCI)

NBCI is a maximum security correctional institution. It is one of the most technologically advanced correctional institutions in the United States.

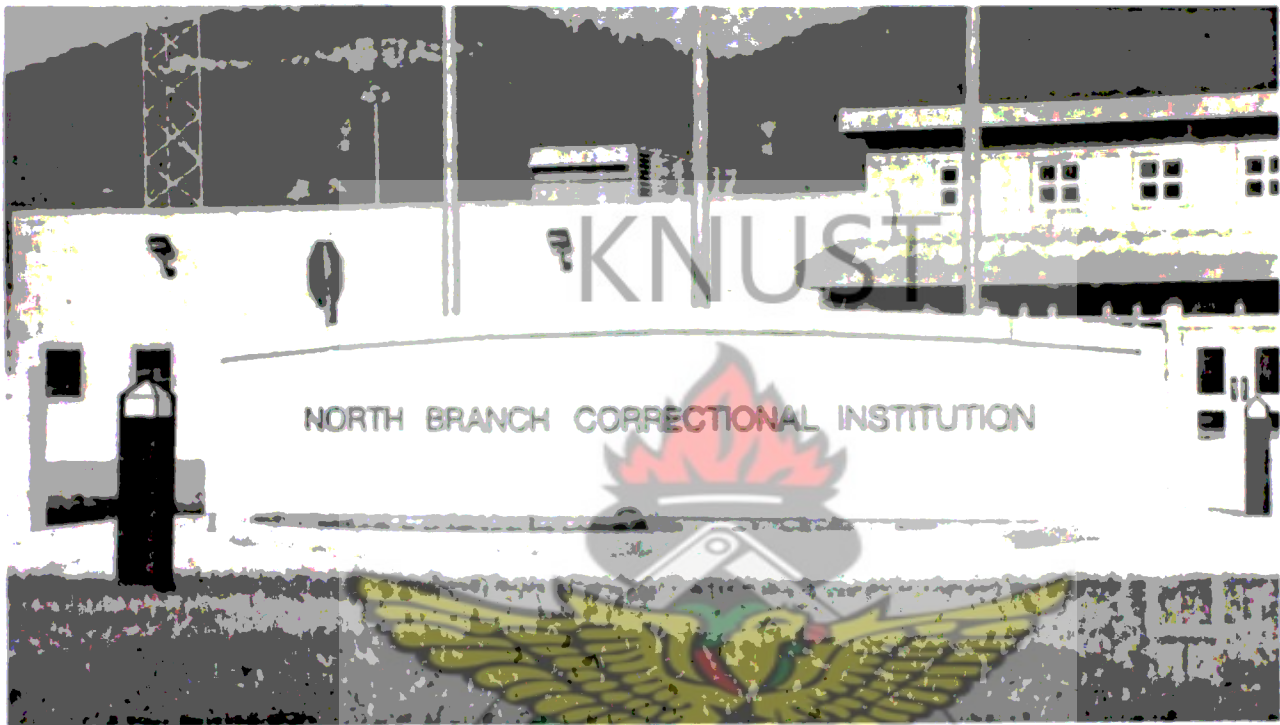


Fig 4.2.1a Front view of the North Branch Correctional Institution (source: channel.nationalgeographic.com)

Location

NBCI is located on a large stretch of land in western Maryland about two hours drive from Baltimore and Washington D.C, located near an existing correctional institution (Western Correctional Institution).

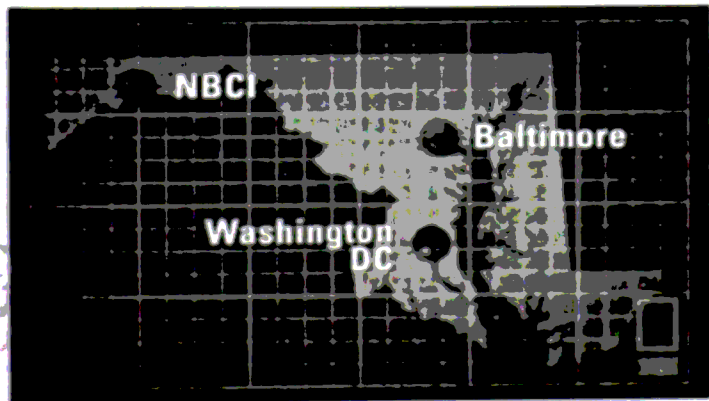


Figure 4.2.1b Picture showing the location of NBCI on a map (source: www.nationalgeographic.com)

Site characteristics

It covers 80 acres of land. The sites natural features was an added advantage to the inverted fortress, thus an escape to the east was hindered by the Appalachian Mountains the west by the Alleghenies and to the south one had to cross the Potomac River.



Figure 4.2.1c Appalachian Mountains and Potomac River as natural defences around site
(source: www.nationalgeographic.com)

Reasons for study

- The design of the layout allows for the phasing allows for the phasing of the project lessening the financial burden of outright construction.
- The use of the courtyard system which helps lessen problems associated with institutionalization.
- It is also noted to be one of the high tech prisons in the United States. It thus have high security feature that is worth studying

Design concept

The design of the prison will be based on the concept called the INVERTED FORTRESS. In the past fortresses were so that no one could get into it but from it they could see the outside. This concept was turned inside out looking inward in all directions and securing the facility right from the thick concrete walls of individual cell through the high tech defences of the housing units, the multi layer perimeter and the buffer zone.

Layout

The facility is made up of four housing units with a massive support building at the centre with an all seeing central control tower at the mid section. This separation of the housing units from one another to form smaller units increases control and visibility. It also helps in segregation and reduces the tendency of massive revolting by inmates of the various housing units.

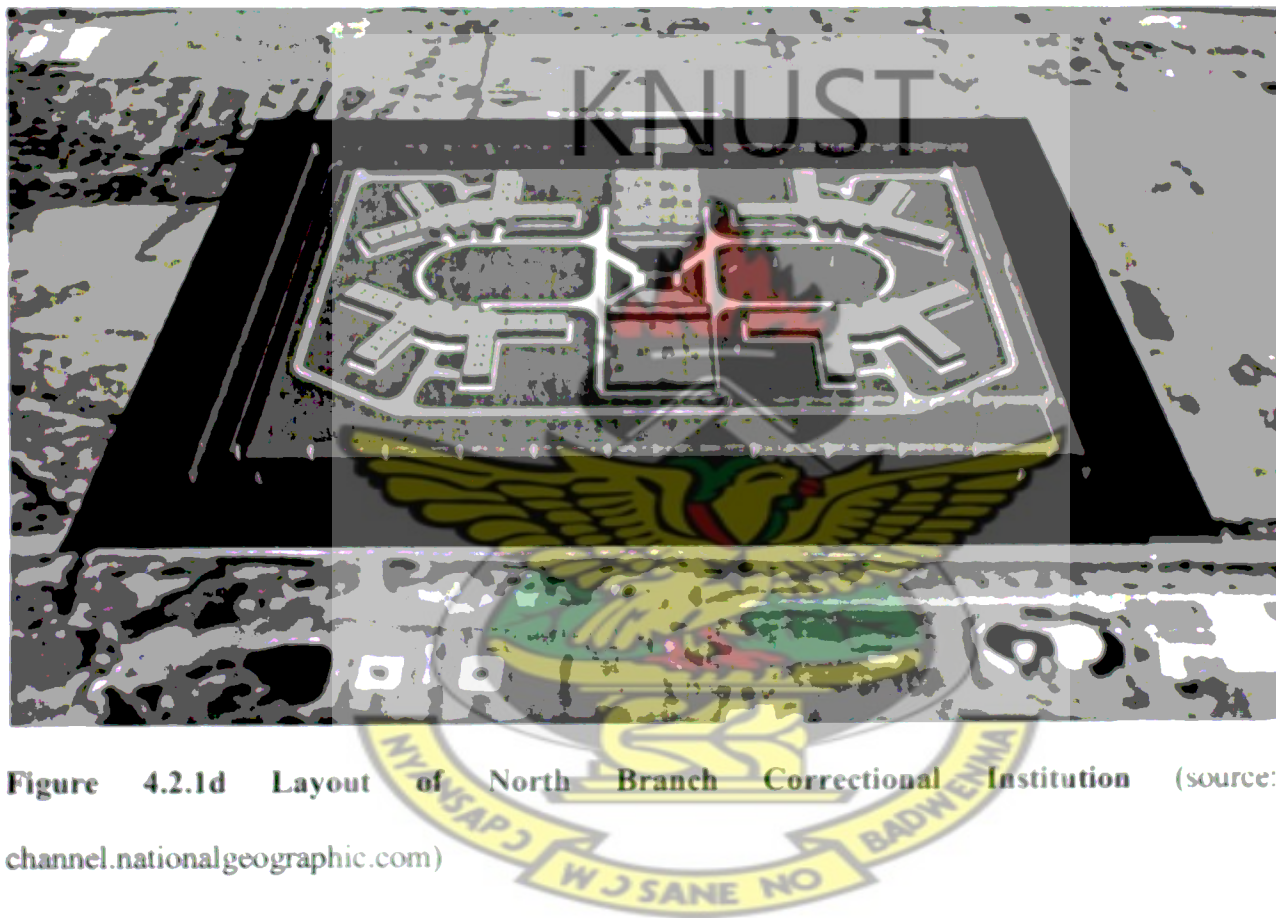


Figure 4.2.1d Layout of North Branch Correctional Institution (source: channel.nationalgeographic.com)

Building materials and construction technique

The main materials for construction were concrete, steel and glass. The cells were made of precast reinforced concrete, vault thick steel door as well as concrete filled steel frames. Fencing of the facility was made from stainless steel and steel razor ribbons. Windows of the control tower are made of two inches thick bullet proof glass with stainless steel frames.

Security

Security in this prison starts from the individual cells, fittings and fixtures in cells are caste together such that there are no cracks to aid in escape. Cuff slots are placed in the door to help offices get inmates out without them get off and attacking officers. Intercom facilities and cameras are place in each cell to help listen and watch their every activity in the cells. The intercom facility helps communicated to aggressive inmate without getting in touch with them. Every activity in the cells are connected to the central control unit, thus the control officer can dim or brighten lighten to control prisoners. The control officer can also check the flow of water in flashing the toilet so as to discourage the use of drugs. The control centre thus sees everything, hears everything and controls everything.

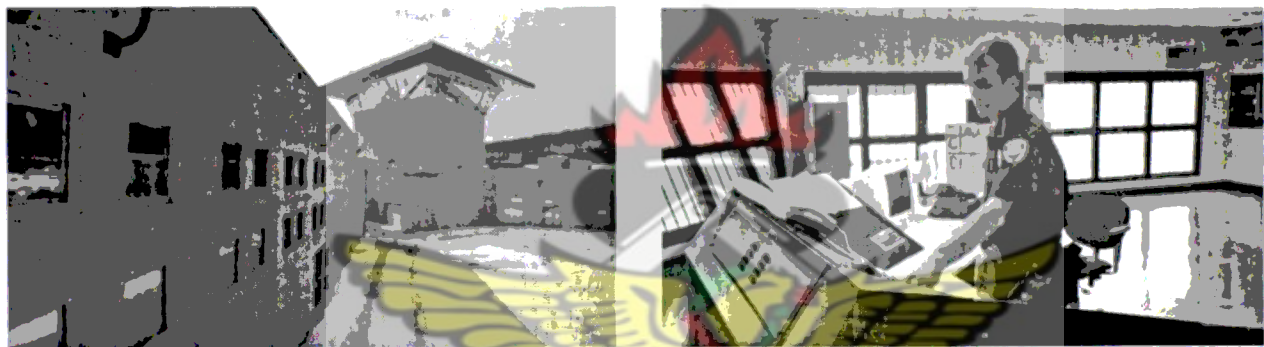


Figure 4.2.1e Exterior and interior views of the central control tower

In the dining halls, inmates receive foods from a hatch to prevent attack on kitchen staff. There are tear gas inlet slots at the dining hall to control inmates in case of revolt. There is also the mezzanine floor where offices patrol and keep an eye on inmates constantly.

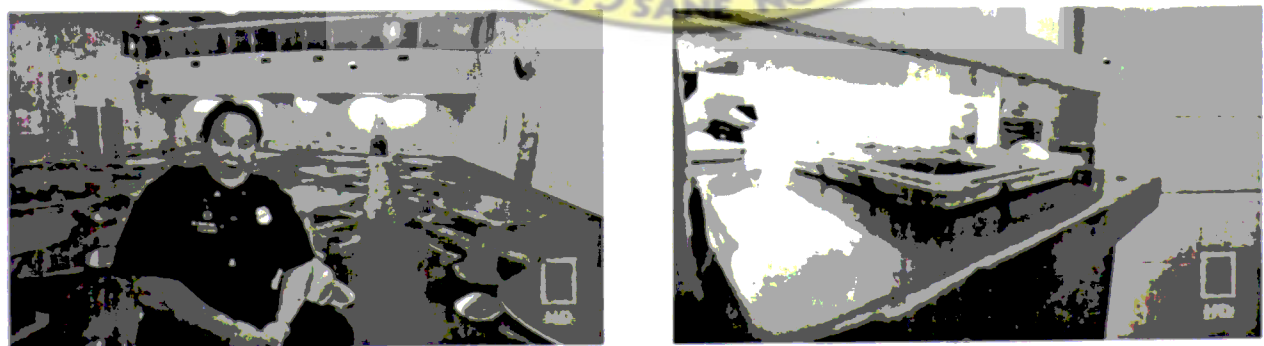


Figure 4.2.1f Views inside the dining hall showing security features (source: channel.nationalgeographic.com)

Beyond the cells and housing units, the inmates get out to work and learn this prison has therefore create a thick barrier making it difficult to get out. There is an intricate system of zone containment that will check all inmates leaving the housing unit. This has been designed to have an intricate web of pneumatic looking double doors, high stainless steel fences and closely guarded gates. These are configured such that no matter where the inmate is located, there are at least six barriers between the inmate and the outside world, and no matter where an inmate goes he would be in the direct line of sight form the control centre or surveillance camera.

In all this the prison would have to finally rely on it outer defences to prevent any escape. The perimeter is an intimidating battlement circling the inverted fortress. Two insurmountable fences topped with razor ribbon form the perimeter, an electronic censored no man's land filled with flesh tearing coils runs between them together they create an unreachable barrier that run about a mile in length. The fence also has feature such as the motion detectors such as the microwave beam s ensors t hat is found b etween the walls of t he prison a nd t he fence a nd t he vibration detection system on the fence itself. There are defences underneath the prison making escape underneath impossible. The whole perimeter is also illuminated with a high security lighting system.

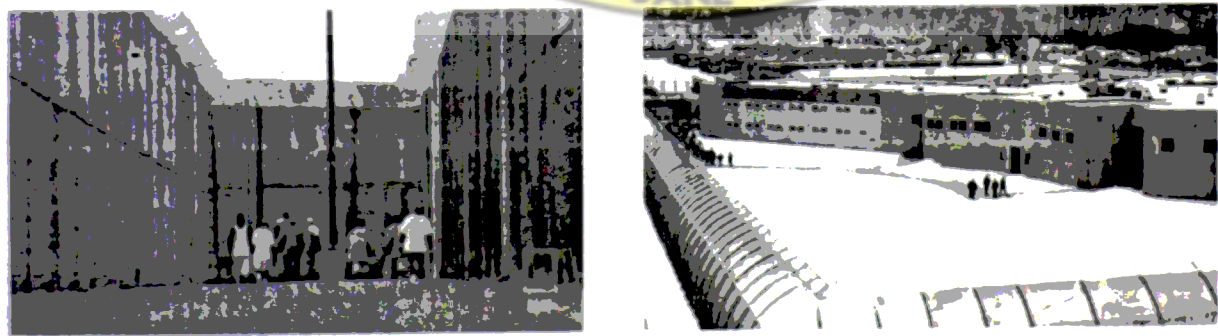


Figure 4.2.1g Perimeter and containment fencing (source: www.nationalgeographic.com)

Beyond the perimeter is the buffer zone, this is where a roaming security officer patrols the facility always.

The entry gates are also reinforced with crash beams making it impossible for crash attacks.

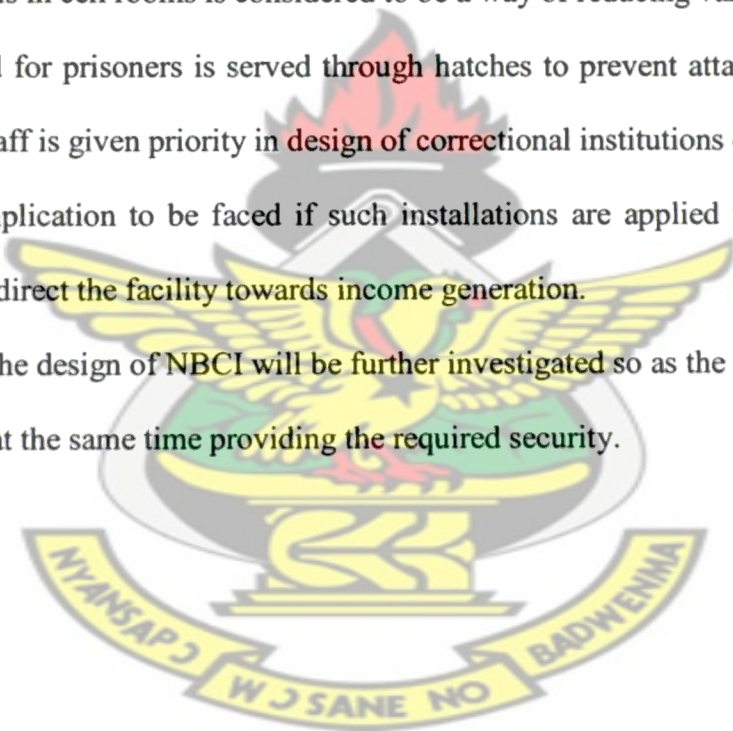
Conclusion

The security systems used in the facility, especially the perimeter fence wall and the use of closed circuit television cameras is necessary to forestall attempts at escaping. The use of stainless steel toilet bowls in cell rooms is considered to be a way of reducing vandalism and cost (in the long term). Food for prisoners is served through hatches to prevent attack by prisoners.

Security and safety of staff is given priority in design of correctional institutions of such nature.

There is a high cost implication to be faced if such installations are applied to the Ghanaian scene hence the need to direct the facility towards income generation.

The positive aspects of the design of NBCI will be further investigated so as the least of facilities will be achieved whilst at the same time providing the required security.



4.2.2 Sekondi Central Prison

The Sekondi Prison was built in 1906, primarily to decongest the Fort Orange Prison of the Colonial era and also to serve as a place where the bad nuts within the society could be kept away from the European.

The Prison received its first inmate and became operational however, in 1912. The prison serves as the regional headquarters for all the prisons in the region



Figure 4.2.2a Front view of the Sekondi central prison from across the main road (source: Author, 2009)

Location

It is located today adjacent and across the street from the Metropolitan offices in Sekondi, Western region.

Reasons for the study

- It has unique Architectural features dating back to those colonial days. As such the structure would be explored to detail out the various features that have served those colonial purposes of security (prison) and continue to do so up to today
- The facility is a two-storey building in terms of massing and has various blocks in the form of the Administration, cell block and other facilities fenced away from the rest of the community by a high rise secured wall.

Building materials and construction techniques

Main materials used for the structures were stone as was the case in most buildings of the European settlers in the late eighteenth century who built it. These walls today bear the same colour (white-washed walls) as those of the castles and forts, but what is not clear is the reason for this particular colour; probably for the facility to appear neat but definitely not to attract anyone. The courtyards are covered in gravel chippings to allow rain water to easily drain or soak away. This is a better option to other ground finishes.

There is evidence of the use of timber (single layer of wooden board) serving both as an intermediate floor and at the same as a ceiling to the lower floor. This can be seen in the administration block which also has a wooden staircase that leads to the offices on the upper floor. However the upper floors have ceilings made of plywood below their gable roofs. Another major use of timber can be seen in the sentry posts.

Roofs to the various structures range from simple gables to combinations of mono-pitched roofs covered in asbestos sheet; a material that has been proven not to be so good health wise.

Layout

The various blocks of the prison have been dispersed within the secure perimeter of the building. This could be described as the campus layout type.

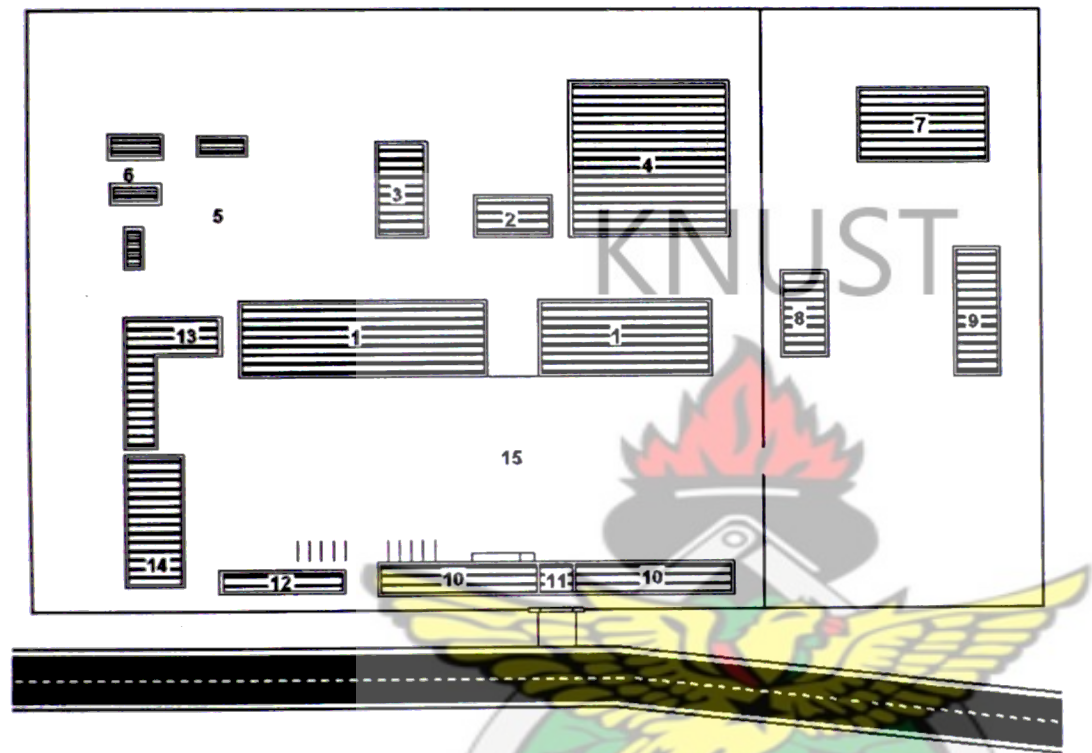


Figure 4.2.2b Layout of Sekondi Central Prison (source: Author, 2009)

LEGEND

- | | | |
|--------------------------|-----------------------|---------------|
| 1. MAIN CELL BLOCK | 8. CAPENTRY WORKSHOP | 15. FORECOURT |
| 2. CHURCH | 9. STORES | |
| 3. KITCHEN | 10. ADMINISTRATION | |
| 4. DOOR MAT WORKSHOP | 11. CHECKPOINT | |
| 5. EUROPEAN YARD | 12. PROPOSED INFIRMRY | |
| 6. ISOLATION | 13. TAILORING | |
| 7. BLACKSMITH'S WORKSHOP | 14. INFIRMARY | |

Security

In the design of prisons all else is compromised for the sake of good security. How successful the security apparatus are is not one of the purposes of this study. There are several features that the study seeks to outline.

The gate

The gate in physical terms serves as the main security feature of the facility; it is that which “holds in” all the inmates. The gate has been described philosophically as the eye of the prison. All that comes in and goes out has to pass through the view of the eye.

The gate of the Sekondi Central Prison is made of steel with no openings in them and fitted into thick stone wall. This setup basically allows only official and service cars through. Behind the gate sits the administration through which cars drive after routine checks.

The solid wall in which the gate is positioned is flanked on both sides by blind arches and in front of the gate are canons mounted to further drive home the message of absolute and confinement once offenders are placed behind them.



Figure 4.2.2c View of the prison gate and mounted canon (source: Author, 2009)

Sentry tower, inner lane and main fence wall

These two features ensure that no escapes are possible.

The inner lane is a fenced (wire fenced) space of about 1.5-2m to the main wall. This serves as buffer zones together with the sentry in their towers overlooking the entire prison. These two features (sentry tower and inner lane) together with the razor wired walls provide a good degree of security.

Doors and windows

Doors and windows are either made of steel or have steel reinforcements in the openings with wooden frames. There is a general absence of advanced equipment such as automatic openings, steel doors, cameras and other handy security gadgets. A lot of improvement could be made in this regard. Enhancing the strength of material for these openings will in turn guarantee the safe custody of inmates.

Merits

- Multipurpose use of spaces in the facility is very good
- The facility has a number of workshops which forms part of the rehabilitation process of inmates
- There is daylight being introduce into cell blocks through the roof
- Segregation of housing units into smaller unit increases control and visibility

Demerits

- Facilities are dispersed on site due to lack of proper zoning
- The prison is too close to a major road (Sekondi- Takoradi road).
- The prison does not have a secured outdoor recreational area where inmates can have some outdoor activities after long hours in their cells.

4.3 SITE SELECTION CRITERIA AND JUSTIFICATION

The following elements where consider in the selection of a good site for a prison.

- The site should be an open piece of land, flat and large enough to contain the facility, its peripheral activities and also accommodate expansions in the future. Fairly flat nature of site will reduce cost by avoiding complex construction.
- There should be no hills or trees on site to hinder supervision but site could have some physical barriers in terms of water bodies.
- Already existing road networks that link the site to major towns reduce cost of planning and providing one.
- The cost of land should be relatively affordable.
- Large stretch of clay deposit on the southern side of the site can be harness as raw material for the ceramic industry.
- It should not have any drainage problems. Services (electricity and water) can be easily accessed from the site.

Potentials

The site is virgin land, allowing for most effective planning with very little limitations. It is also large enough to create room for growth of the facility.

4.3.1 Location

The 75acre site is situated at Titrinu in the Ho Municipality which lies between latitudes 6° 20' N and 6° 55' N and Longitudes 0° 12' E and 0° 53' E and covers an area of 2,660 sq kilometres. It is about 15 minutes drive from Ho, the Volta Regional capital. The site is accessed by a feeder road connected to the Ho- Aflao highway road.

Location Maps

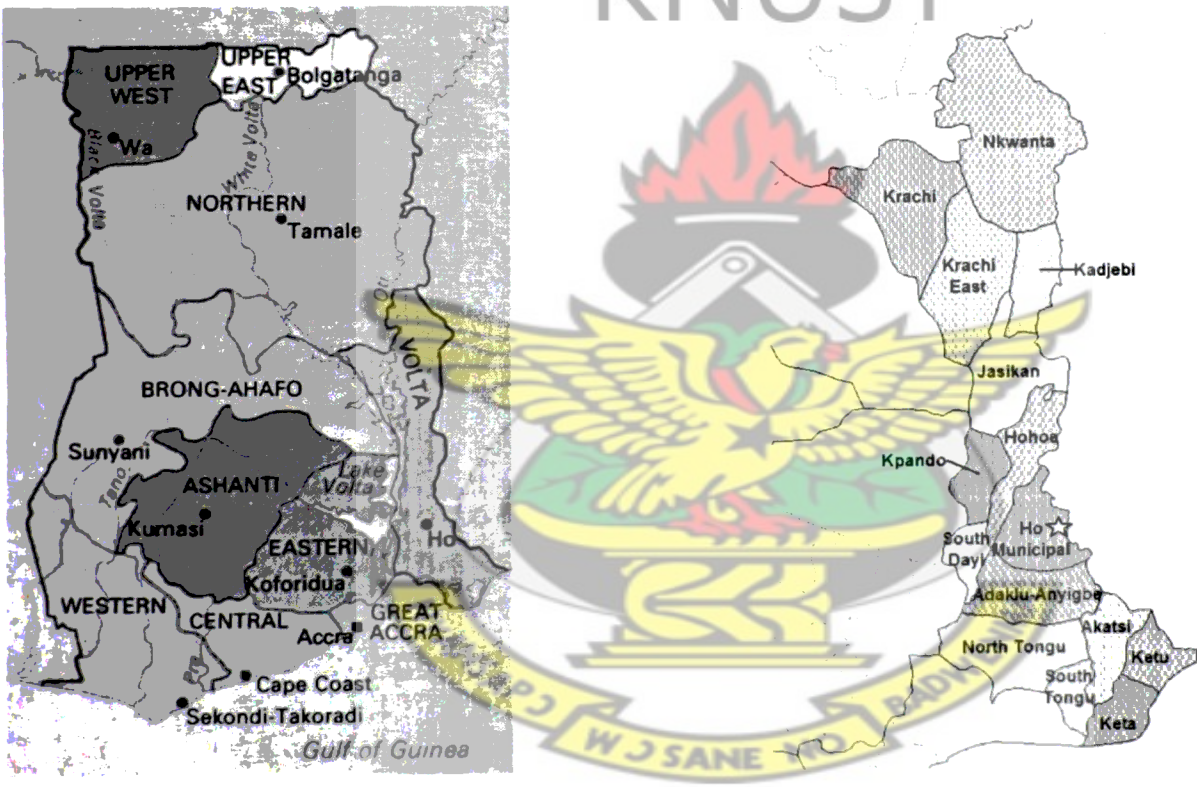


Figure 4.3.1 Ghana Map and Volta Regional map locating site marked with a star

4.3.2 Present state of site

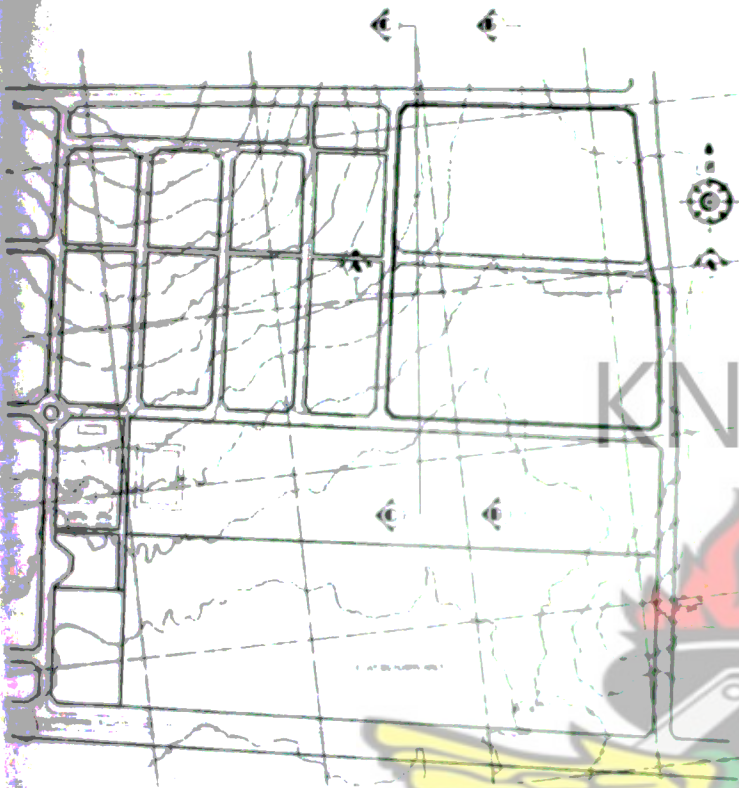


Figure 4.3.2a Map of proposed site (shown edge red) (source: Author, 2009)

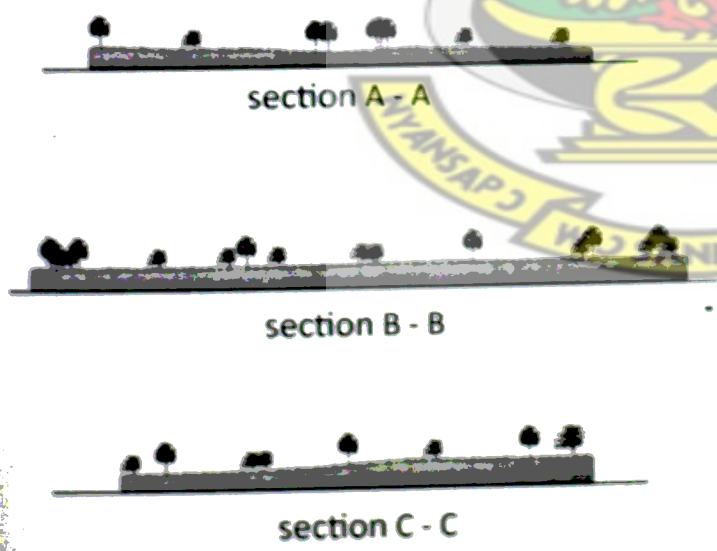


Figure 4.3.2b Section through site (source: Author, 2009)

Site inventory

- The site is a mass of dense forest
- The only structure located on the land is a farmhouse.
- To the southern part of the site is a massive deposit of clay
- The site can be accessed by a feeder road which connects to the Ho-Aflao highway.
- Site is relatively flat and well drained

4.3.3 Site analysis

Climate

Generally, mean monthly temperatures range between 22°C and 32°C while annual mean temperatures range from 16.5°C to 37.80°C . In effect, temperatures are generally high throughout the year.

Rainfall

Mean annual rainfall figures are between 20.1mm and 192mm. The highest rainfall occurs in June and has mean value of 192mm while the lowest rainfall is in December recording a value of 20.1.

Vegetation

The two types of vegetation prevalent in the area are the savannah woodland and the moist semi-deciduous forests of the hilly areas.



Figure 4.3.3 Vegetation types on site (source: Author, 2009)

Topography

Land is fairly flat and with vegetation and slopes very gently to the south which can aid in drainage.

Relief

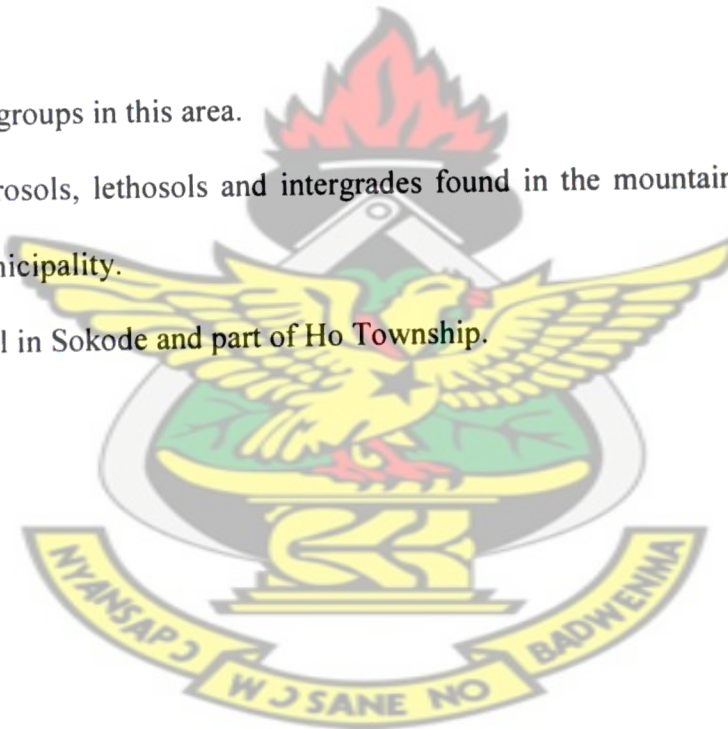
The general relief of the Ho municipality falls into two main parts: the mountainous part and the low land areas. The mountainous areas are mostly to the north and north east, which are part of Togo ranges and have heights between 183-853 meters.

Soil

There are two major soil groups in this area.

Forest Soil: - forest ochrosols, lethosols and intergrades found in the mountainous and wetter northern areas of the Municipality.

Savanna Soil: - sandy soil in Sokode and part of Ho Township.



CHAPTER FIVE

DESIGN EVOLUTION

5.1 BRIEF DEVELOPMENT

Gate lodge

- Gate
- Security post
- Exhibition room

Administration

- Entrance foyer
- front desk/ enquiries
- appeal court
- washrooms

Inmate visitation

- visitors lounge
- contact visitation
- washrooms

Multipurpose hall

- main hall
- washrooms
- changing rooms

- minimart
- washrooms
- staff and visitors checkpoint
- conference room
- finance office
- general offices
- inmate search
- non-contact visitation



Educational facility

classrooms
library
computer laboratory

washrooms
training centres

Workshops

Working area
Changing rooms
Store

supervisor's office
washrooms

health facility

first aid
consulting rooms
theatre
dispensary
laboratory
ambulance bay

wards
x-ray room
dental unit
washrooms
waiting areas
nurses workstation

inmate admission/ transfer/ release unit

waiting and processing area
general cleansing area
inmates property stack room
fingerprint and photo studio
clothing, bedding and room allocation

screening room
inmate search
barbering
sally port

housing units

cell blocks
bath houses
dining hall
officers lodge

common rooms
indoor games
unit control area

kitchen

matron's office
servery
washroom
kitchen yards

stores
cooking areas
washing areas

KNUST



5.2 ACCOMMODATION SCHEDULE

Facility/ Space	Area (m ²)	Number
GATE LODGE		
Security post	12	3
Washrooms	16	3
Minimart	24	1
Exhibition room	24	1
ADMINISTRATION		
Entrance foyer	24	1
Staff and visitors checkpoint	32	1
Front desk/ enquiries	16	1
Conference room	72	1
Appeal court	54	1
Account office	48	1
Washrooms	16	2
General office	56	4
Superintendant office	24	1
VISITATION AREA		
Visitors lounge	48	1
Washrooms	4	2
Sally port	12	1
Contact visitation	78	1
Inmate search	16	2
Non-contact visitation	32	2
MULTIPURPOSE HALL		
Foyer	24	1
Main hall	1200	1
Stage	40	1
Washrooms	24	2
Changing rooms	24	2

Facility/ Space	Area (m ²)	Number
Offices	24	1
Stores	24	1
EDUCATIONAL FACILITY		
Classrooms	50	4
Library	200	1
Computer laboratory	120	1
Training centers	50	4
Washrooms	18	2
WORKSHOPS		
Working area	80	8
Supervisor's office	16	8
Store	24	8
Changing/ washrooms	32	2
Exhibits	32	2
HEALTH FACILITY		
Wards	64	2
Consulting rooms	18	1
Surgical theatre	80	1
Dental unit	32	1
Washrooms	32	2
Laboratory	32	1
Dispensary	16	1
Waiting areas	24	2
Nurses workstation	16	2
Ambulance bay	24	1
INMATE ADMISSION/ RELEASE		
Waiting and processing area		1
Screening room	16	1
General cleansing area/ barbering	32	1
Clothing and room allocation	16	1

Facility/ Space	Area (m ²)	Number
Sally port	24	1
Fingerprint and photo studio	12	1
Inmates property stack room	32	1
Inmate search	16	1
HOUSING UNITS		
Cell blocks	6	960
Dayrooms	81	4
Bath houses	96	4
Dining hall	516	2
Gym	48	2
Unit control	42	4
Officer's lodge	54	4
KITCHEN		
Matron's office	16	2
Stores	24	6
Servery	27	2
Cooking areas	98	2
Changing/ washrooms	32	2
Washing areas	24	2
Kitchen yards	24	2
INDOOR/ OUTDOOR GAMES		
Table tennis	98	4
Pool table	40	8
Volley ball	162	2
Basket ball	182	2
Football pitch	600	1
CENTRAL CONTROL TOWER		
Garrison	96	1
Stores	18	2
ICT room	96	2

Facility/ Space	Area (m ²)	Number
Washrooms	4	4
Office	32	2
CAR PARKS		
Visitors	15	120
Staff	15	60
TOTAL		

Table 5.2 showing accommodation schedule for a correctional facility (900 inmates)

5.3 DESIGN PHILOSOPHY AND CONCEPT

5.3.1 Design Philosophy

FREEDOM UNDER CONFINEMENT

Ensuring security, safety, and wellbeing of incarcerated inmates together with increased social interactions and unrestricted internal movements.

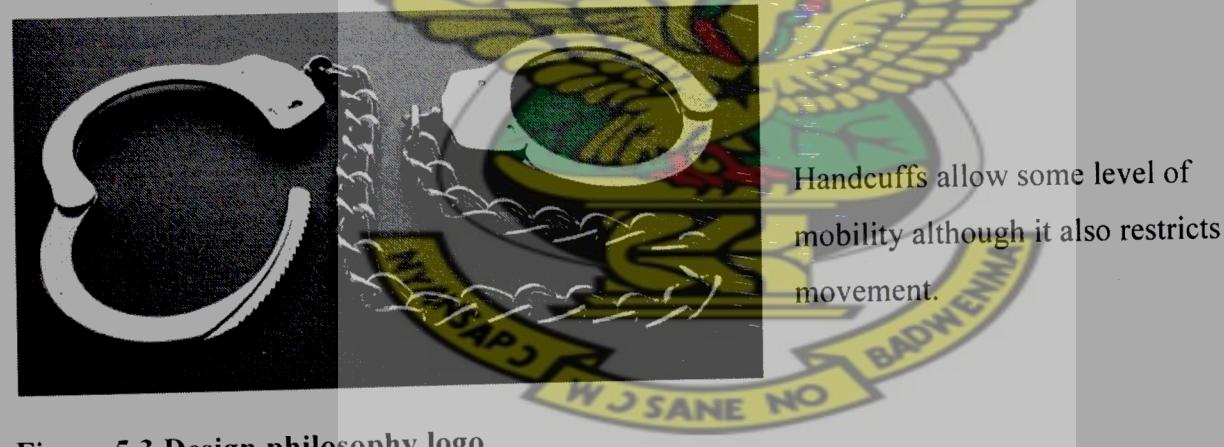


Figure 5.3 Design philosophy logo

5.3.1 Design Concept

1. Proper orientation promotes the most effective means of making the facility energy efficient.
2. Some level of privacy is achieved which does not interfere with security

3. Zoning has improved the quality of life in the facility by facilitating the day to day activities.
4. Proper integration of courtyards for outdoor activities will greatly influence social interactions between inmates. It will also aid in lighting and ventilation without compromising on security.
5. Provision of recreational and general purpose areas centrally will create easy accessibility to all and reduce cost
6. Sports, religion, music, formal and informal training scheduled into the day to day activities of inmates will help a great deal in reintegrating them into society.

5.4 FUNCTIONAL RELATIONSHIP

5.4.1 Functional relationship for the whole facility

This relationship shows networks between various units in the facility which functions as a community.

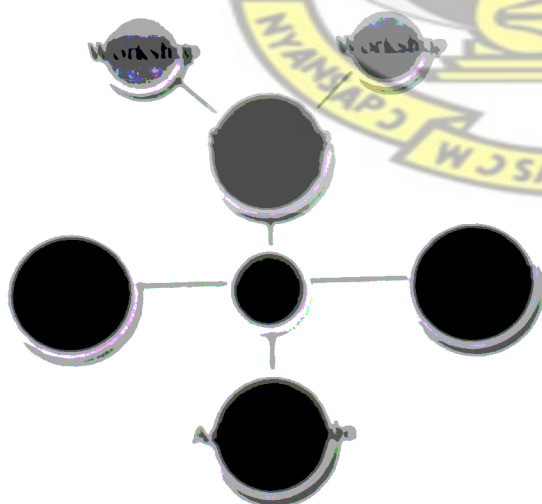


Figure 5.4.1 Functional relationship between supporting facilities and housing unit

5.4.2 Functional relationship for housing units

The importance for providing functional diagrams for housing unit ensures that spaces are well linked and circulation areas are reduced.

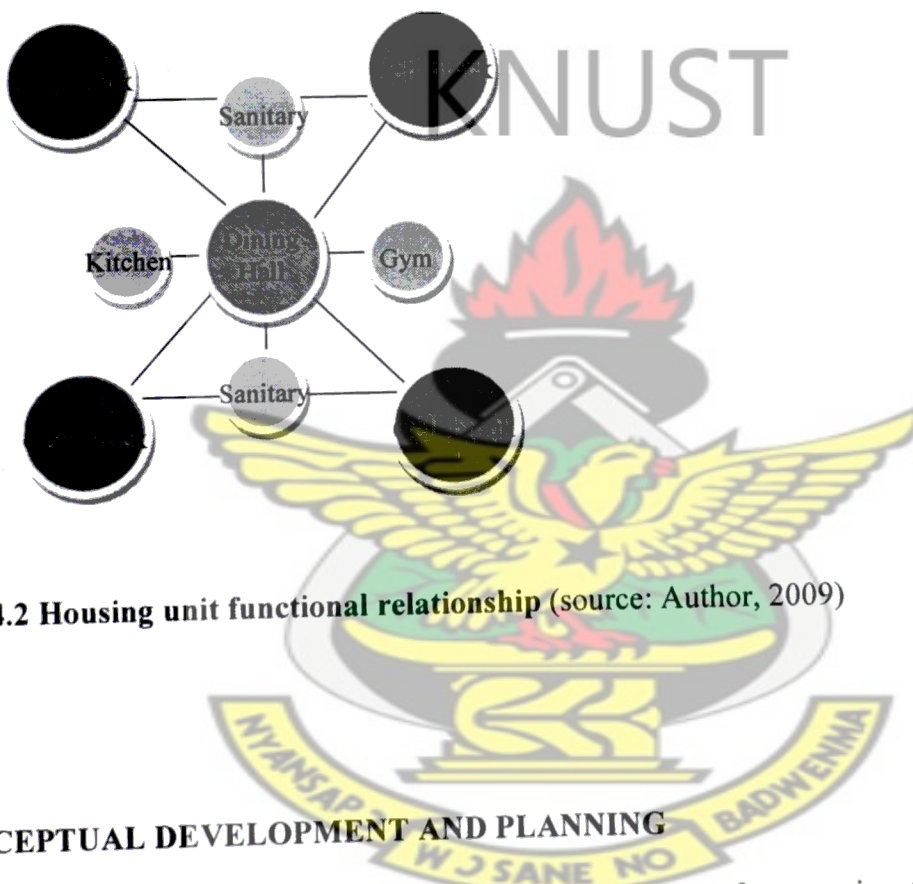


Figure 5.4.2 Housing unit functional relationship (source: Author, 2009)

5.5 CONCEPTUAL DEVELOPMENT AND PLANNING

The process of planning was carried out in phases. This starts from zoning the whole prison community down to individual facilities.

The creation of zones for the specific development of activities ensures proper relationship between the various functions the site will be used for.

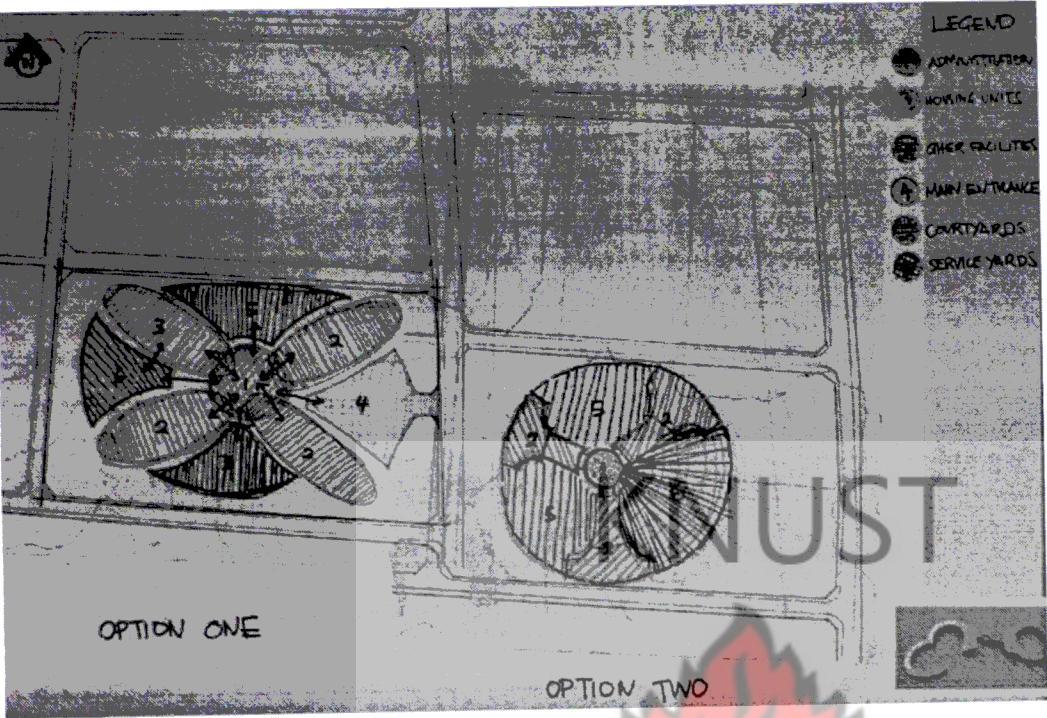


Figure 5.5.1 Conceptual planning (source: Author, 2009)

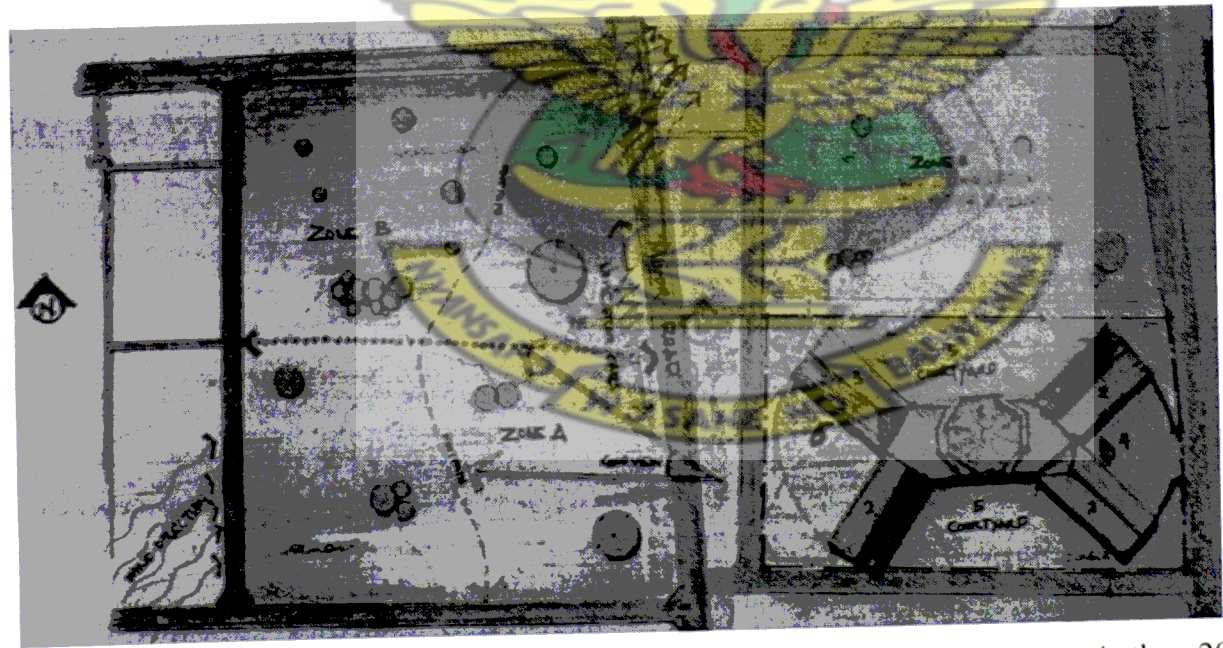


Figure 5.5.2 Courtyard aiding ventilation and facilitation of activities (source: Author, 2009)

5.6 DESIGN SOLUTION

The final design employed the various principles and elements of design. Orientation was a key factor in the design which solves issues of ventilation and lighting and also reduces the cost of running the facility and promotes energy efficiency.

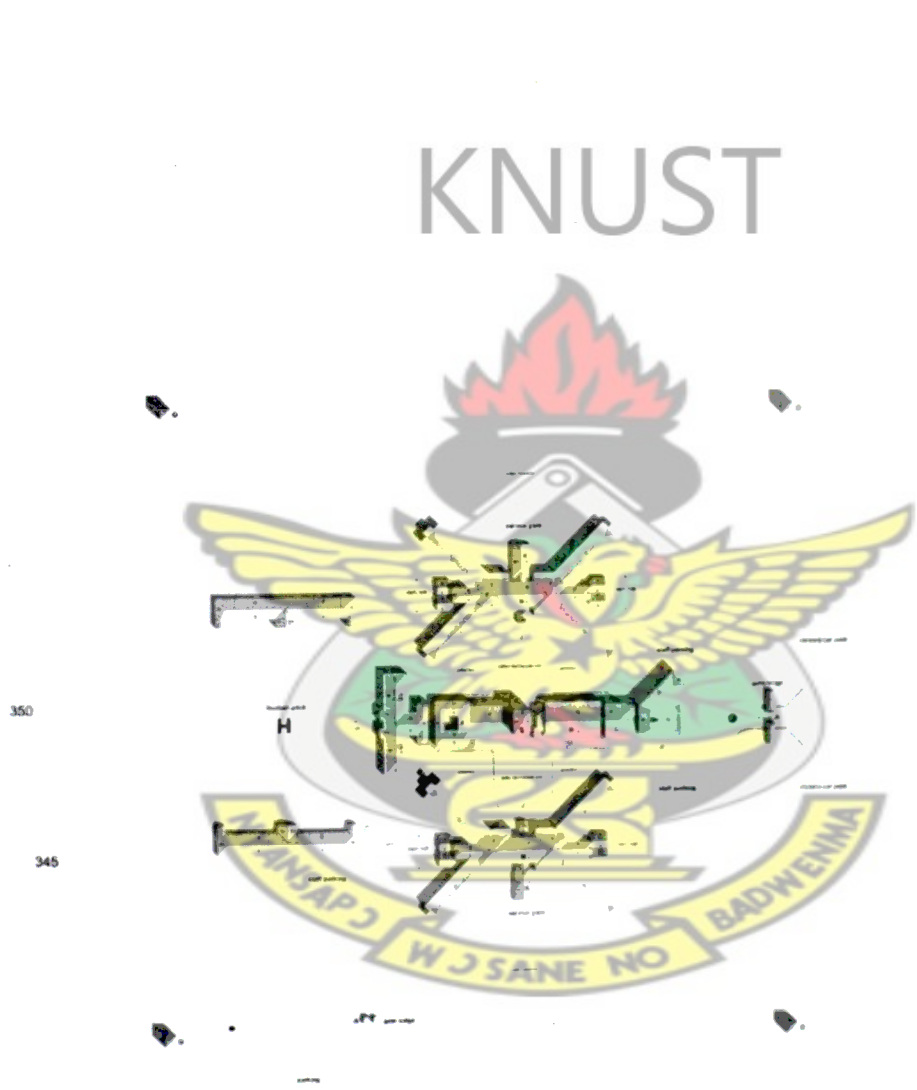


Figure 5.6.1 Block plan

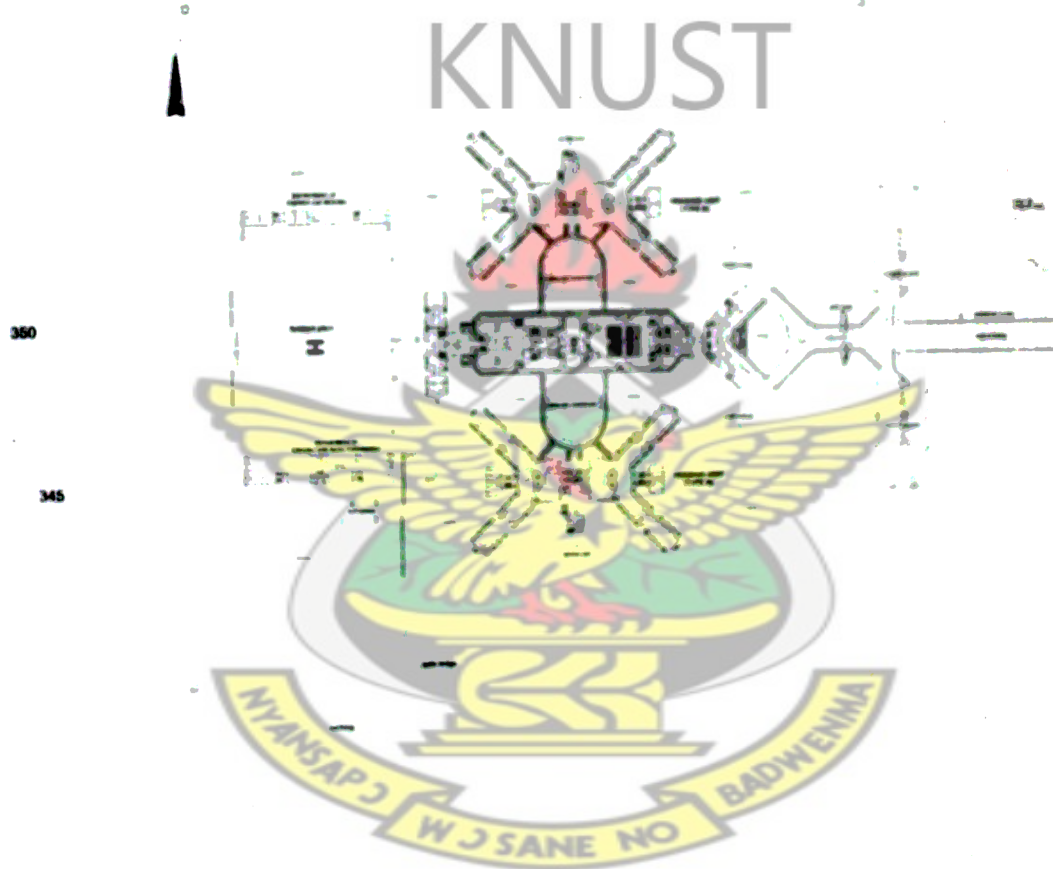


Figure 5.6.2 Site layout

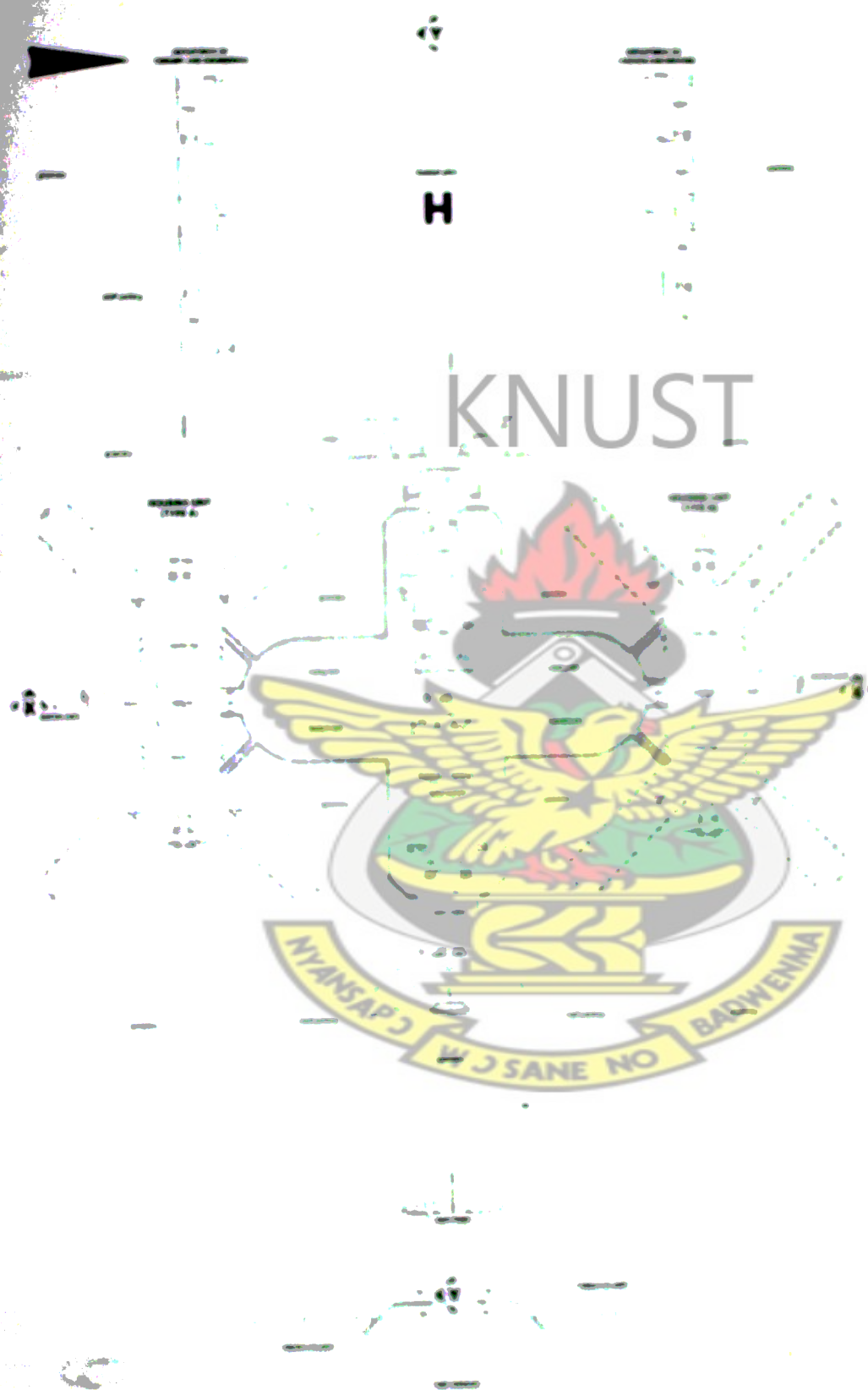


Figure S.6.3 Ground floor plan

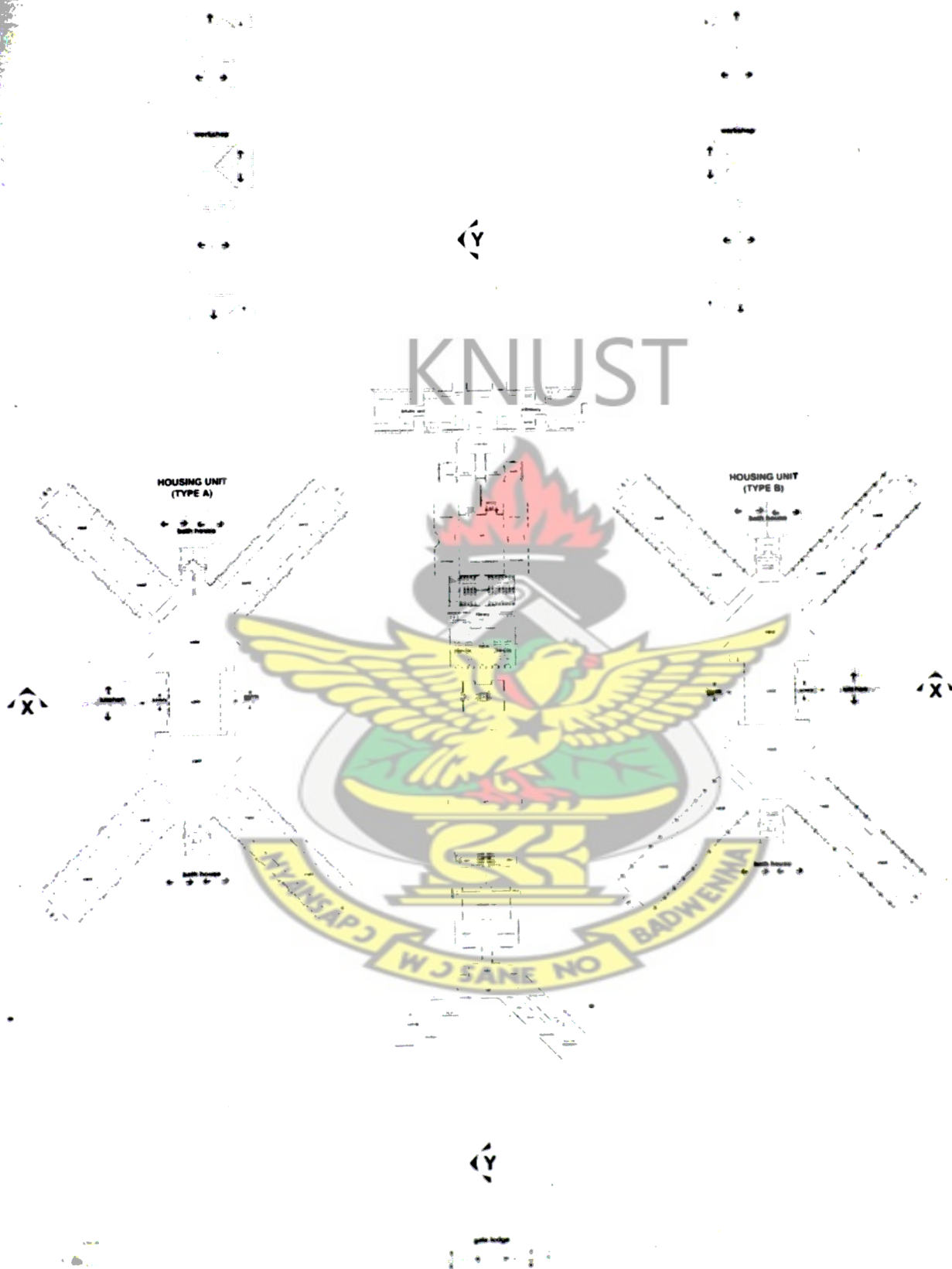


Figure 5.6.4 First floor plan

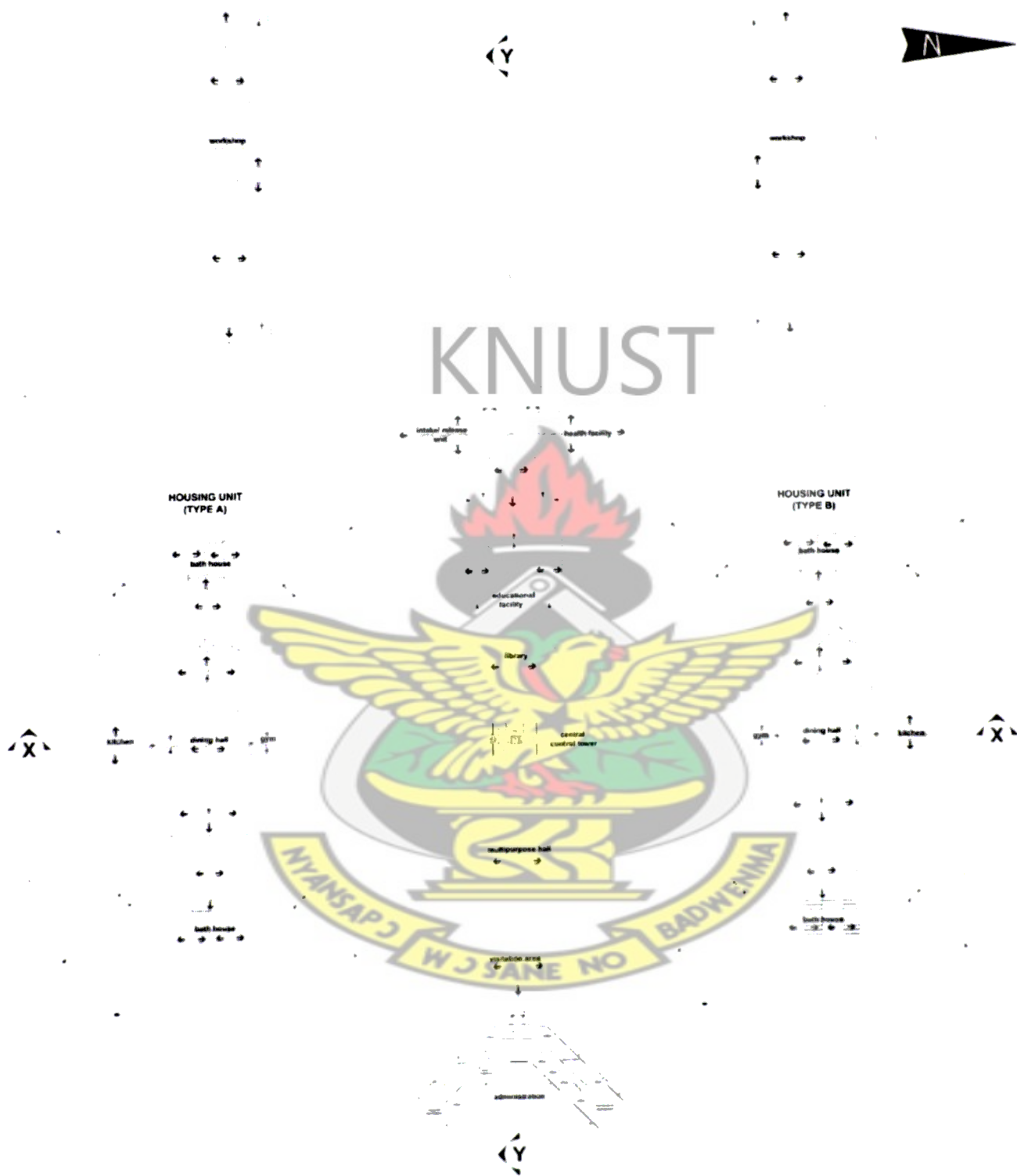


Figure 5.6.5 Second floor plan

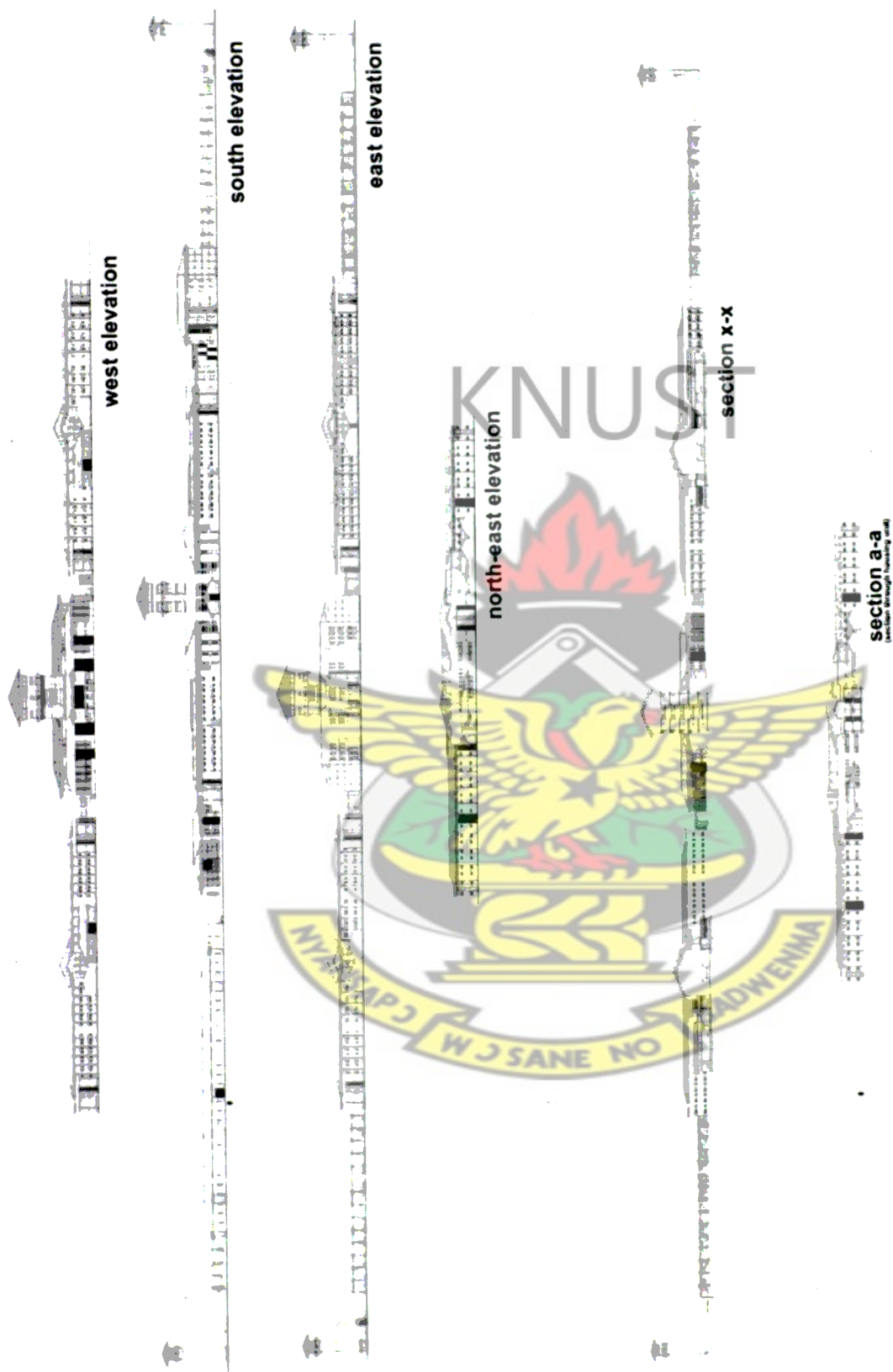


Figure 5.6.6 Long elevations and sections

5.7 SERVICES

Electric power, water, telephone and Internet lines are basic amenities that cannot be avoided in the design. Secondary provision has been made in the area of electricity and water that is in the form of a standby generator and overhead storage tank respectively.

5.7.1 Electricity

Electricity will be tapped from the main line that already runs along the Ho-Aflao road. A transformer will however be introduced to the area to cater for the large number of people who will be using the area.

5.7.2 Lighting and Ventilation

Natural lighting has been will be used to light space for the full twelve hours that the sun is out. Artificial lighting will be provided to light space both indoors and outdoors when it is dark. Natural ventilation will be predominantly used due to good orientation and introduction of courtyards for both ventilation and lighting.

5.7.3 Fire

Hydrants have be placed at 45m intervals to cater for fire situations that may occur

5.7.4 Water Supply

Water will be taped from the GWCL main lines that run at southern side of the site. An underground water reservoir will store water which is later pump into an overhead tank for distribution. This will be supported by a borehole system. Reservoirs should hold water for at least a month in case of no supply from the mains.

5.7.6 Telecommunication

Mobile telecommunication exits in the area with good reception.

5.7.7 Sewage

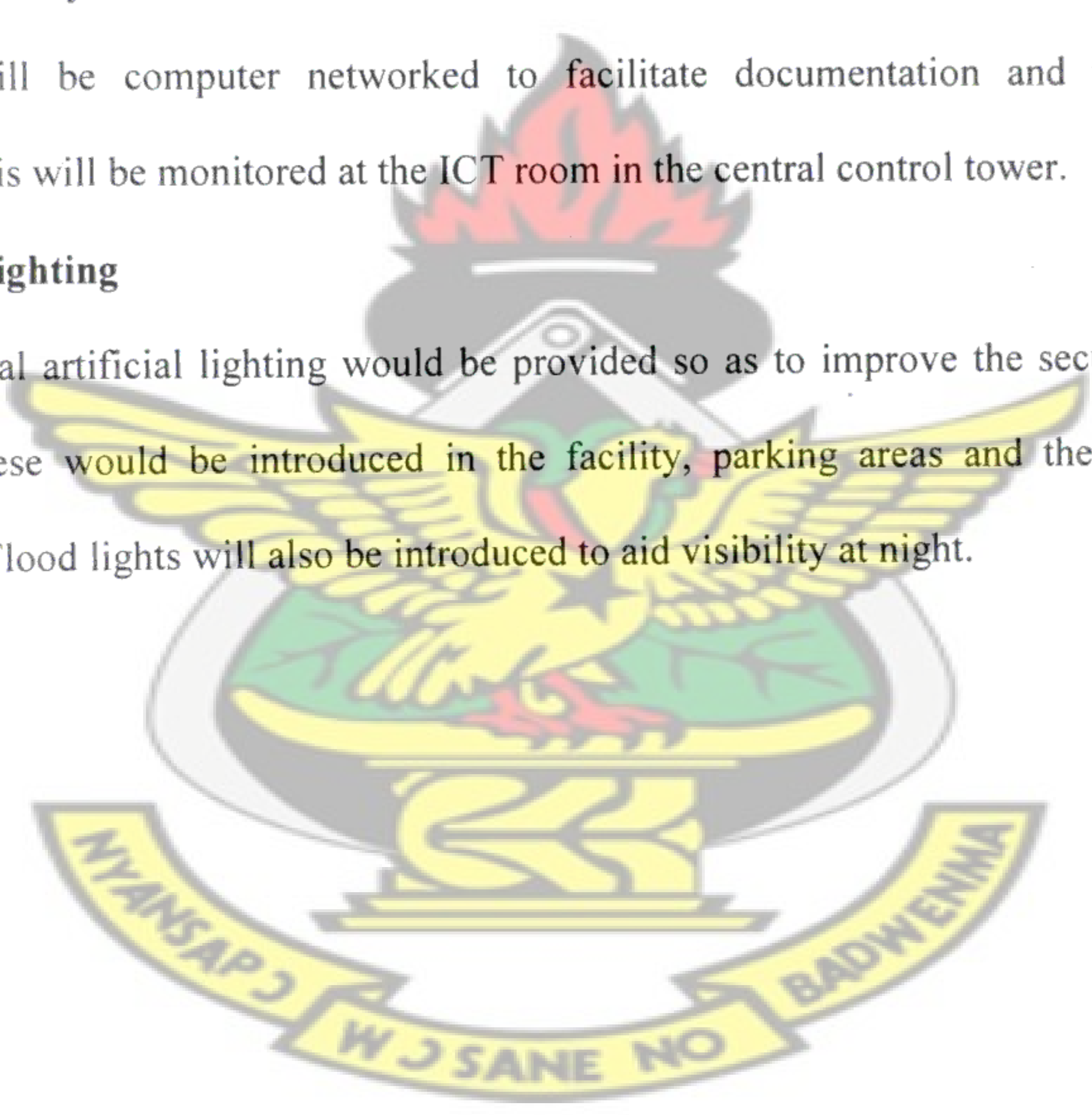
Sewage will be treated by a central sewage plant on site. Water will be treated and channeled to various stand pipes in the facility for landscaping. Solid waste will be used in the production of biogas.

5.7.8 Information system

The facility will be computer networked to facilitate documentation and transfer of information. This will be monitored at the ICT room in the central control tower.

5.7.8 Security lighting

External and internal artificial lighting would be provided so as to improve the security of the place at night. These would be introduced in the facility, parking areas and the pedestrian circulation routes. Flood lights will also be introduced to aid visibility at night.



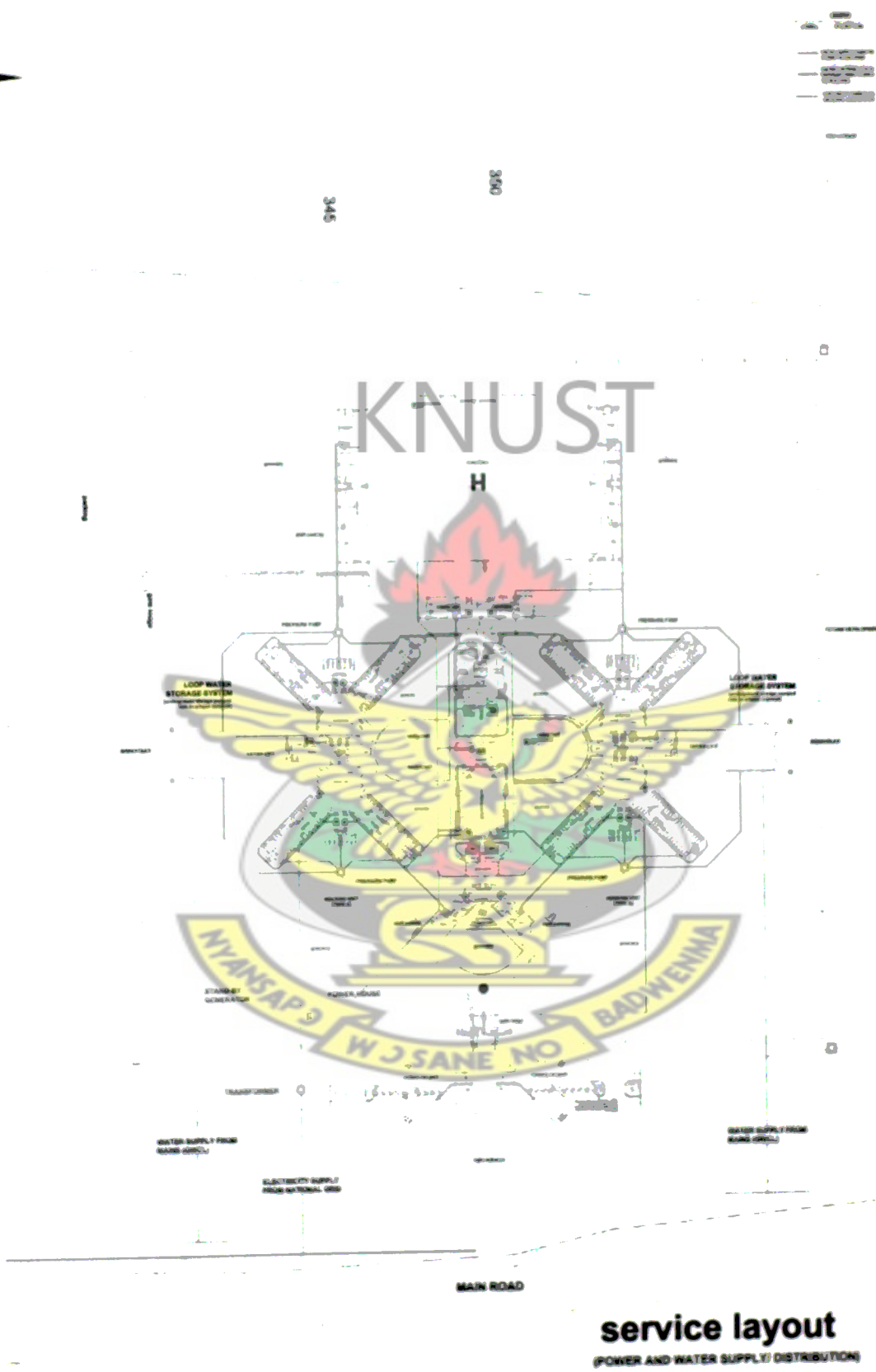


Figure 5.7.1 Power and water supply/ distribution

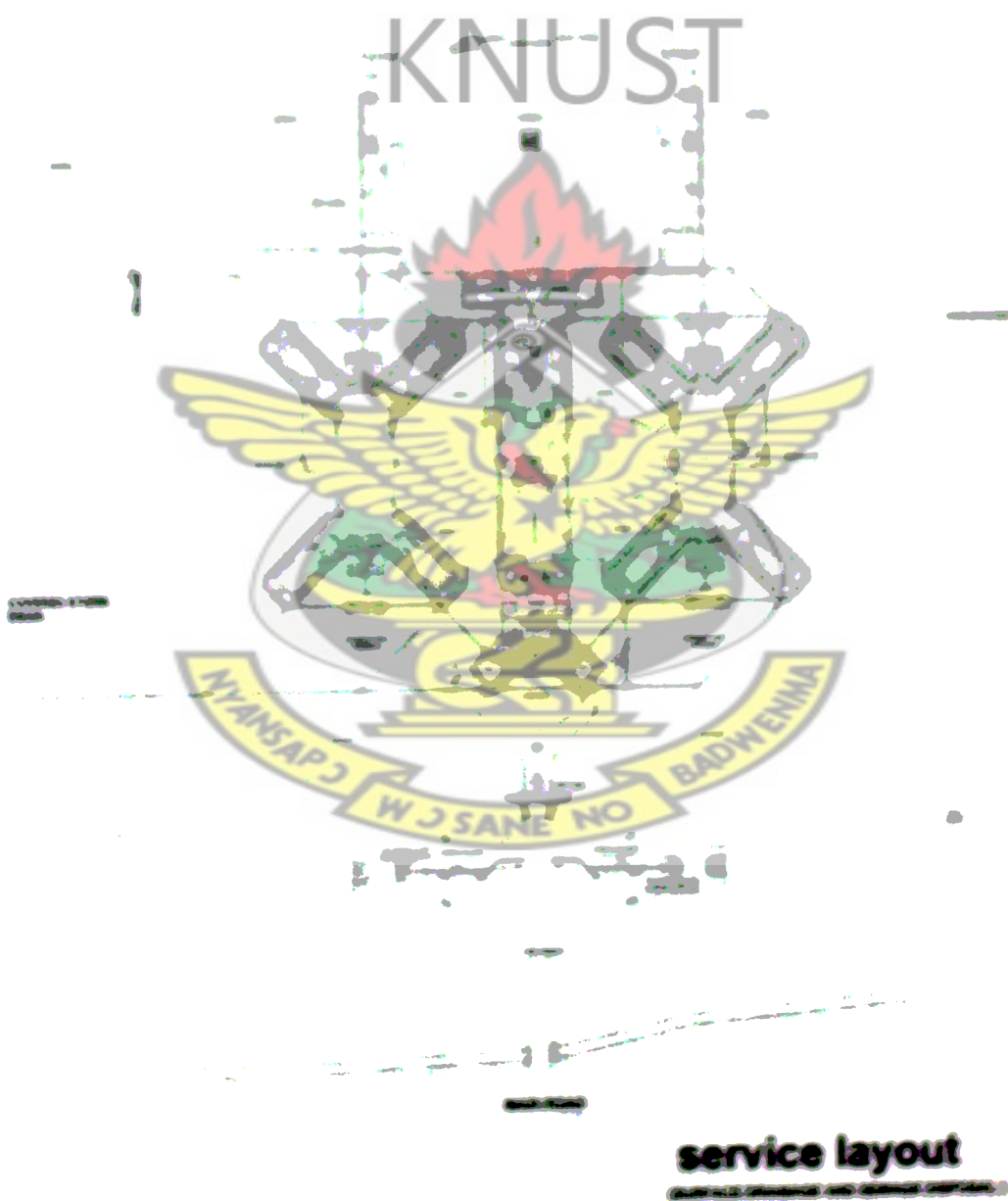


Figure S.2.2 Surface drainage and sewage disposal



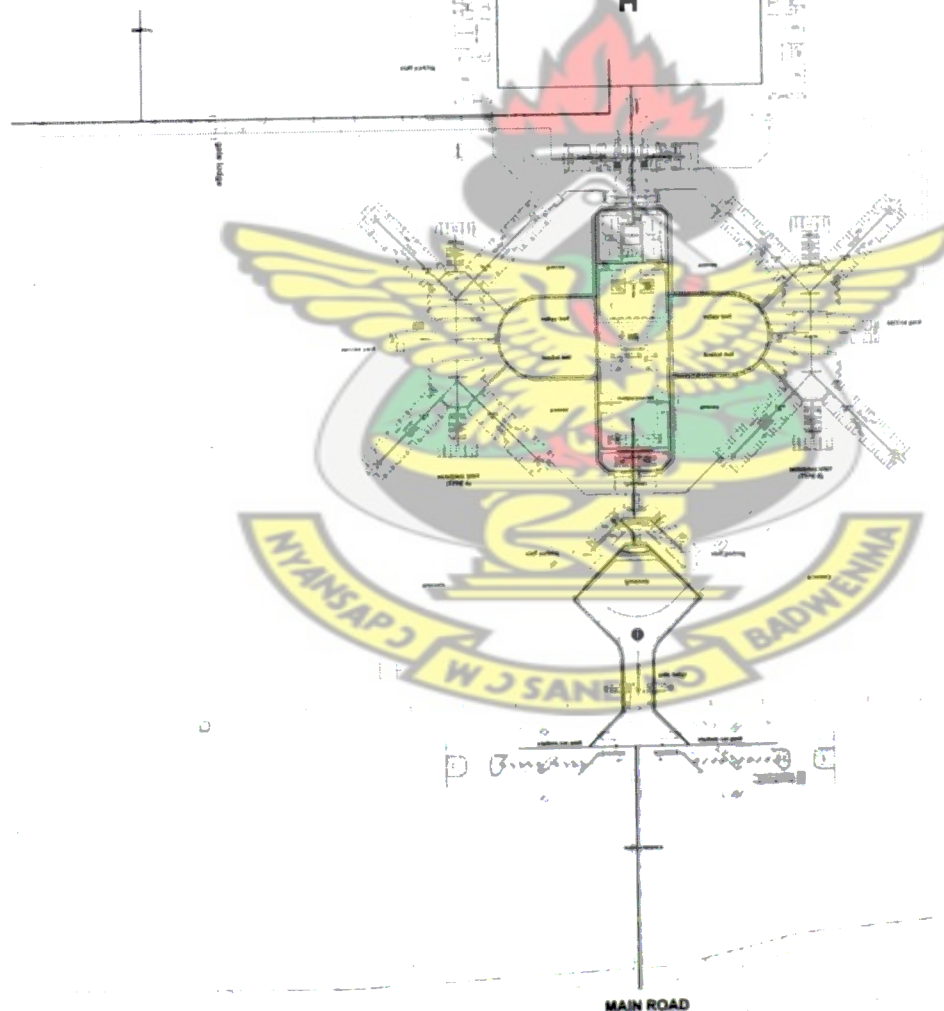
LEGEND
CIRCUIT DESCRIPTION
— DEPARTURE PATH
— VISITOR PATH
— STAFF PATH

345

350

KNUST

H



circulation plan

Figure 5.7.3 Plan showing circulation patterns

5.8 LANDSCAPING

For the purpose of attaining a serene environment and an energy efficient one, it is important to create an environment that does not encourage the radiation of heat into the atmosphere. Hence several systems of soft landscaping were employed. However it is inevitable that to maintain proper soft landscape the introduction of hard landscape is also necessary

5.8.1 Soft Landscaping

i. Hedges

To provide boundary between private open spaces the duranta yellow was used as a hedge. This will be allowed to grow to a height of 0.5m. This will provide sufficient boundary without cutting away air movement and light.

ii. Lawn/ open space

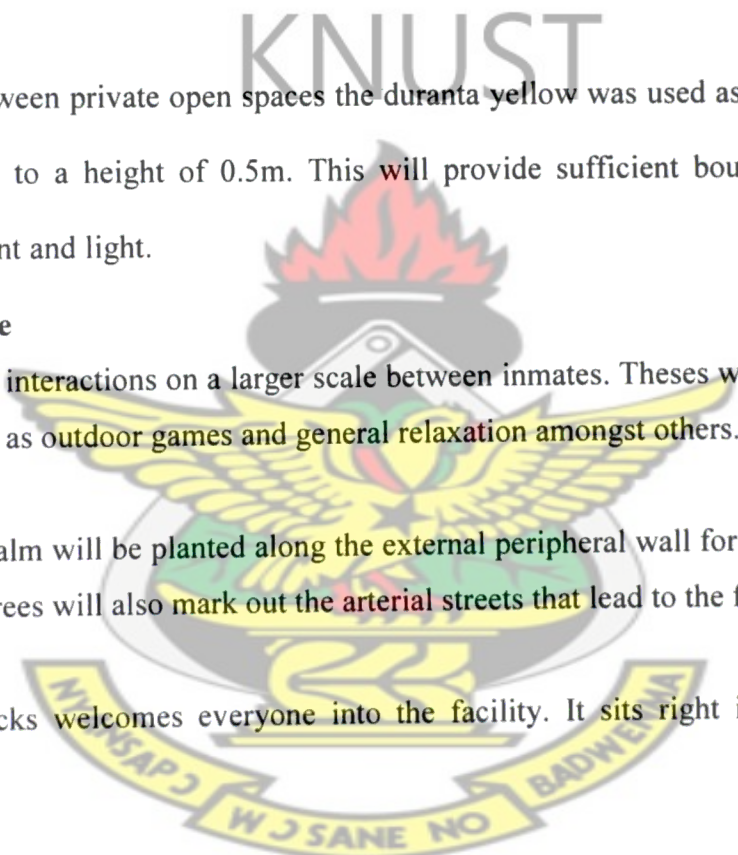
This will allow for social interactions on a larger scale between inmates. These will be provided mainly for activities such as outdoor games and general relaxation amongst others.

iii. Ornamentation

Trees such as the royal palm will be planted along the external peripheral wall for the purpose of beautification. Coconut trees will also mark out the arterial streets that lead to the facility.

iv. Fountain

A water fountain on rocks welcomes everyone into the facility. It sits right in front of the administration block.



5.8.2 Hard Landscape

i. Side Walks

These will provide authorized pedestrian movements to prevent treading along lawns. It will also provide shorter routes to various destinations within and around the community.

ii. Car parks

These provide safe zones for staff and visitors with vehicles to park.

5.9 CONSTRUCTION TECHNOLOGY

5.9.1 Structural systems

The main structural system employed is concrete walls casted on strip foundation due to the fortified nature of the facility. All external walls are load bearing and as such reinforced. Wall thickness varies from 100mm for partition walls and 150mm for external walls. The depth of the foundation can only be determined on site during excavation. The width of the foundation is determined by the wall size and the addition of 200mm to either sides of the wall.

A double concrete roof system was used for the housing unit together with trusses.

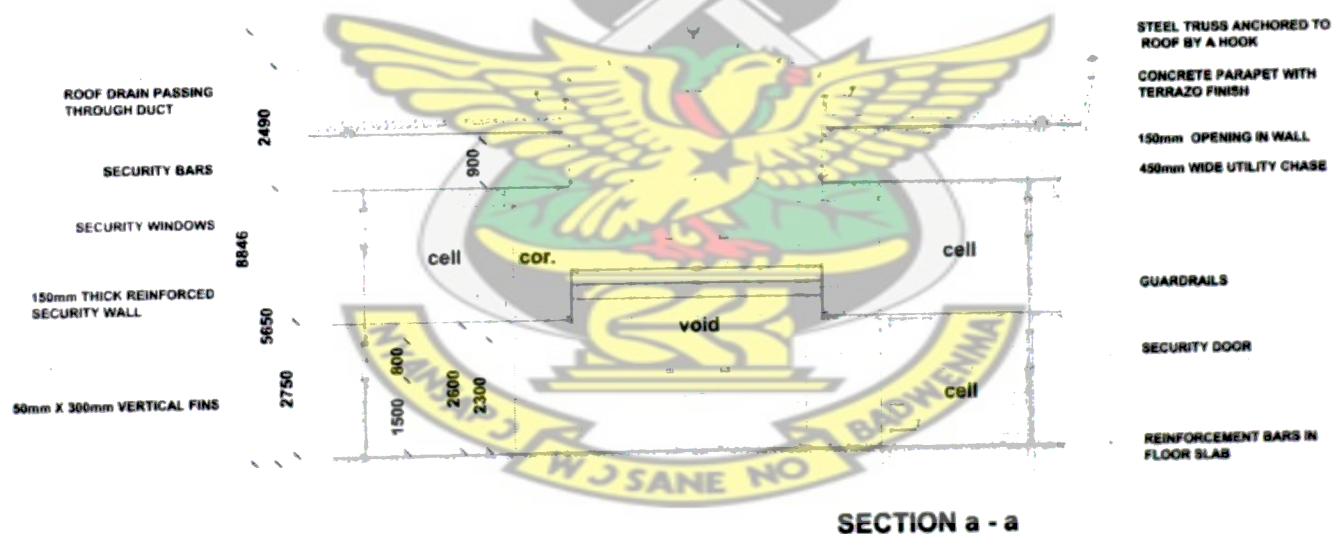


Figure 5.9 Section through a housing unit

5.9.2 Material and Finishes

The predominant material used in construction was concrete followed by steel which also formed part of the structure.

i. Walls

Concrete forms the structure for the walls. The walls need only painting after being casted since its surface is presentable without plastering. Bathroom walls will have tiles provided for the shower to make it water proof. Wall areas in the kitchen such as the sink area will also have tiles as finishes.

ii. Floors

Floors will consist of concrete with reinforcement as the main structural element for upper floor construction. The ground floor of the housing unit will be casted with reinforcement. Floor will be finished with PVC tiles.

iii. Roofing

The roofing system will use flat concrete slabs with steel trusses.

iv. Fence

Wire mesh fences and barbed wires made of steel is used to define containment areas and peripheral demarcations.

5.10 COSTING

5.10.1 Cost of land

Information received from the town and country for the Ho municipality pegs 29 x 30 meter plot at Titrinu at an average of 400 Ghana cedi which is to include the cost of servicing the site. Hence based on the number of inmates (960) occupying a total area of 75 acres. Land will cost an average of GH¢

5.10.2 Cost of construction

This costing is an estimate which gives the client an idea of the financial investment the project will need. The price per square meter for the construction of this project is currently quoted between 350-400 Ghana cedis. To arrive at the estimated total cost, the total area of the design should be multiplied by the cost per square meter (For this project GH¢400 will be used).

Administration block

Ground floor area	810 m ²
First floor area	750 m ²
Second floor area	785 m ²
Cost of construction	$(810+750+785) \times \text{GH¢}400$ $= \text{GH¢}938,000$

Gate lodge

Ground floor area	76 m ²
Cost of construction	$76 \times \$400$ $= \text{GH¢}30,400$

Visitation unit

Ground floor area	331 m ²
First floor area	331 m ²
Cost of construction	$(331+331) \times \text{GH¢}400$ $= \text{GH¢}264,800$

Multipurpose Hall

Ground floor area	1,050 m ²
Gallery	99 m ²
Cost of construction	$(1,050+99) \times \text{GH¢}400$ $= \text{GH¢}459,600$

Educational facility

Ground floor area	994 m ²
First floor area	1,102 m ²
Cost of construction	$(994+1,102) \times \text{GH¢}400$ $= \text{GH¢}838,400$

Health / intake facility

Ground floor area	1,066 m ²
First floor area	1,066 m ²
Cost of construction	$(1,600+1,066) \times \text{GH¢}400$ $= \text{GH¢}852,800$

Workshops

Ground floor area	2,328 m ²
Cost of construction	$2,328 \times \text{GH¢}400$ $= \text{GH¢}931,200$

Housing unit

Ground floor area	4,832 m ²
First floor area	3,120 m ²
Cost of construction	$(4,832+3,120) \times \text{GH¢}400$ $= \text{GH¢}3,180,800$

Central control unit

Ground floor area	108 m ²
First floor area	108 m ²
Second floor area	108 m ²
Third floor area	108 m ²
Fourth floor area	108 m ²
Fifth floor area	108 m ²
Sixth floor area	108 m ²
Cost of construction	$(108 \times 7) \times \text{GH¢}400$ $= \text{GH¢}302,400$

Total cost of construction

GH¢938,000

GH¢30,400

GH¢264,800

GH¢459,600

GH¢838,400

GH¢852,800

GH¢931,200

GH¢3,180,800

GH¢302,400

GRAND TOTAL

GH¢7,798,400



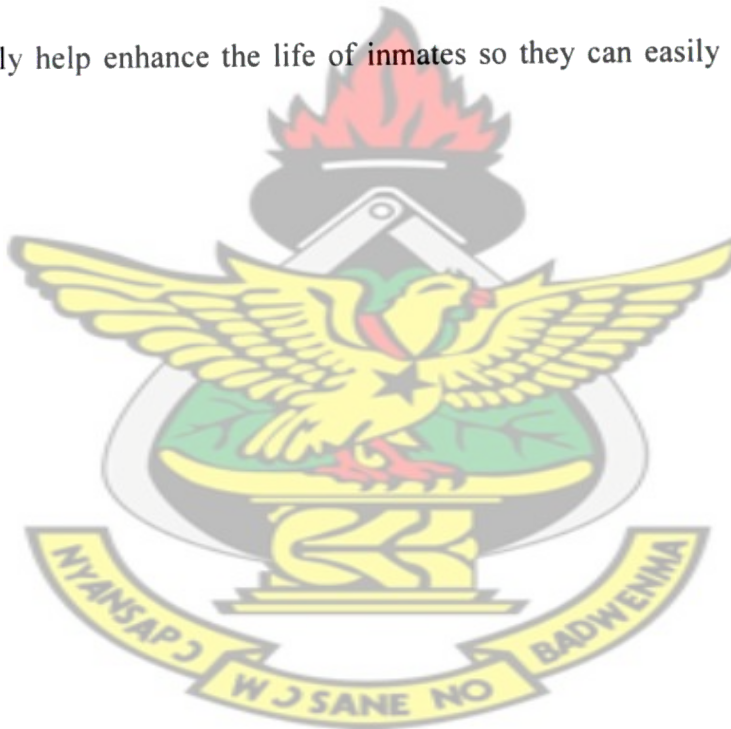
CONCLUSION

When the medium-security correctional facility is built it will ease the congestion in our prisons.

The facility will provide a friendly atmosphere for all its users, being staff, visitors and inmates which will be needed for the rehabilitation and reformation of inmates.

Measures have been taken to provide uninterrupted flow in the supply of services such as water and power (electricity). Should there be any emergency situation such as riots and fire, there are measures in place to cater for such situations.

The facility will definitely help enhance the life of inmates so they can easily reintegrate into society.



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