

# **REGIONAL CORRECTIONAL CENTRE -NKETIA ASHANTI REGION, GHANA**

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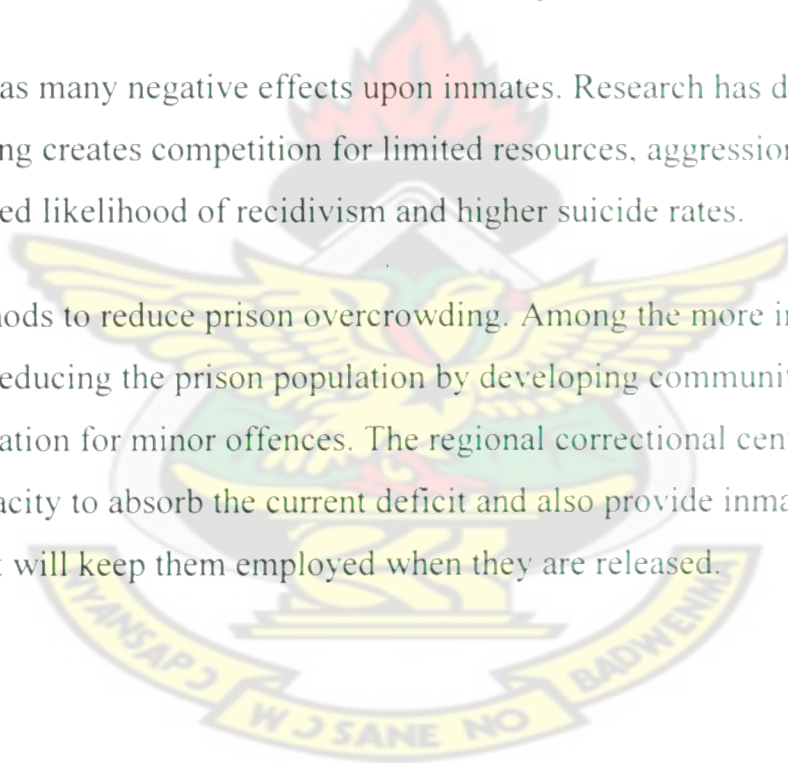
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## ABSTRACT

Prison overcrowding continues to haunt Ghana's prison institutions. All adult prison facilities in Ghana are currently operating above their rated or design capacities. Data as at February 6, 2009 indicates that the prison system in Ghana is heavily overcrowded with the national rate of overcrowding standing at 78 percent. The overcrowding situation is more pronounced in Ashanti, Eastern, Western, and Northern and Upper West regions. The Ashanti region recorded an overcrowding rate of 182 percent. All the six prison establishments in the region have a total design capacity of 886 but as at February 6, 2009, there were a total of 2501 inmates confined in the six prisons.

Prison overcrowding has many negative effects upon inmates. Research has demonstrated that prison overcrowding creates competition for limited resources, aggression, higher rates of illness, increased likelihood of recidivism and higher suicide rates.

There are various methods to reduce prison overcrowding. Among the more influential are prison design and reducing the prison population by developing community based alternatives to incarceration for minor offences. The regional correctional centre shall provide additional capacity to absorb the current deficit and also provide inmates with vocational training that will keep them employed when they are released.



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- To my dear friends and colleagues especially Lee, Adjah and Sammy for their encouragement and support

Above all, my greatest appreciation goes to the Almighty God for his guidance and protection.



## DECLARATION

I hereby declare that, except where references have been duly cited, the report is a research of my own.

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 PREAMBLE

The concept of imprisonment, its practical application and justification during the past half-century, has shown a marked drift away from retribution in favour of reform and rehabilitation of offenders. The period following the 1970s was referred to as the "Rehabilitation era". During this period, the general philosophy and mission of prisons changed to one of reformation and rehabilitation. Even the name of the prison changed to "correctional institution" and correctional programmes proliferated. (Pollock, 2004)

Reformation was the dominant theme of the 1970 American Prison Congress which laid out the "Principles of Corrections" and these were endorsed again in the 2002 Prison Congress. The 1970 Prison Congress endorsed such philosophical principles as:

*"Corrections must demonstrate integrity, respect, dignity, fairness ..."*

*... "sanctions imposed by the courts shall be commensurate with the seriousness of the offence," and*

*... "offenders ... shall be afforded the opportunity to engage in productive work, participate in programmes ... and other activities that will enhance self worth*

*community integration and economic status "* - (American Correctional

Association , 1970).

Unfortunately, such noble principles of corrections are threatened by prison overcrowding which has placed extreme pressure on prison facilities. Overcrowding



continue to haunt Ghana's prison institutions as the pressures of an increasing inmate population has resulted in shortage of living spaces for inmates. All adult prison facilities in Ghana are currently operating above their rated or design capacities. Data as at February 6, 2009 indicates that the prison system in Ghana is heavily overcrowded with the national rate of overcrowding standing at 78 percent. (Ghana Prison Service, 2009).

The situation is more pronounced in Ashanti, Eastern, Western, Northern and Upper West regions. The Ashanti region recorded an overcrowding rate of 182 percent. All the six prison establishments in the region have a rated capacity of 886 but as at February 6, 2009, there were 2501 inmates giving us a deficit of 1615. (Ghana Prison Service, 2009).

The availability of empirical data indicating that crowded prison conditions are stressful and create conditions contrary to any aim at rehabilitation has increased efforts to find ways of reducing overcrowding. Reducing overcrowding in our prisons can be fought on two fronts. One is by making changes to the design and operation of the physical environment of corrections facilities and the second is by reducing the number of incarcerated persons through the use of alternatives to incarceration, such as community supervision and intermediate sanctions, ranging from fines to parole release for persons who have committed minor offences. (John Howard Society, 1996)

There is the need to reduce crowding in the prisons using both approaches; new facilities for serious offences and fines or community service for persons who have committed minor offences.



## **1.2 PROBLEM STATEMENT**

Correctional literature is replete with references to the prison environment and the damage a dysfunctional environment can have on staff, prisoners and the community. The Kumasi Central Prison, one of six prisons institutions operated by the Ghana Prison Service and the only one in the Ashanti Region for confining persons serving long term prison sentences i.e. two or more years, is currently heavily overcrowded. The facility which was built in 1908 currently has a rated capacity of 416 but as of February 6, 2009 there were as many as 1753 inmates locked up within the facility resulting in an excess capacity of 1337 (321 percent overcrowding)- ( Ghana Prison Service, 2009). The pressures of increasing inmate population have resulted in serious shortage of living spaces for inmates. Also, the opportunities for inmates to participate in self- improvement and rehabilitative programmes such as academic, employment and vocational training are curtailed thus increasing the rate of recidivism.

The need for more correctional facilities to absorb the excess capacity at the Kumasi Central Prison and provide inmates with adequate rehabilitative programmes like counselling and religious services, vocational training and employment opportunities that will make them turn away from crime when they are released cannot be compromised.

## **1.3 OBJECTIVES OF THE STUDY**

The primary objective of the study is to design a correctional centre to absorb the excess capacity at the Kumasi Central Prison. The facility also incorporates sustainability and green technology in the design to cut down not only its operating costs in energy and

water consumption but also the capital cost of constructing the facility through the choice of building materials and finishes.

#### **1.4 SCOPE OF DESIGN**

The correctional centre will have facilities both within and outside the secure perimeter (double fence security wall). Facilities within the secure perimeter will include visitation and staff development services, intake/ release building, religious services, medical/ segregation block, vocational/educational area, workshops, warehouse and inmate housing units. The administration building, car parks (visitors and staff), garage and staff residence will be located outside the secure perimeter.

#### **1.5 TARGET GROUP**

1.6 The correctional centre is medium security facility. It will be used to confine inmates serving longer sentences- two or more years.

#### **1.6 CLIENT**

Ghana prisons service

#### **1.7 FUNDING**

The project will be financed by the government of Ghana through the Ministry of Interior

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 HISTORY OF PRISONS

A prison, penitentiary or correctional facility is a place in which individuals are physically confined or interned and usually deprived of a range of personal freedom.

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. Prisons may also be used as a tool of political repression to detain political prisoners, prisoners of conscience and “enemies of the state”, particularly by authoritarian regimes. In times of war or conflict, prisoners of war may also be detained in prisons.

For most of history, imprisoning has not been a punishment in itself but rather a way to confine criminals until corporal or capital punishment had been administered. There were prisons used for detentions 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 debtors prisons, until they paid their jailers enough money in exchange for a limited degree of freedom. (Catholic Encyclopaedia, 1913).

Only in the nineteenth 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 a holding state till trial or hanging was at the time revolutionary.

The first “modern” prisons of the early nineteenth century were sometimes known by the term “penitentiary”: 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 labour on trade wheels and the like. This “Auburn system” of prisoner management was often reinforced by elaborate prison architecture, such as the separate system and the panopticon. It was not until the late nineteenth century that rehabilitation through education and skilled labour became standard goal of prisons. (Johnson, 1973)

## 2.2 PRISON ARCHITECTURE

The architecture of prisons in the early nineteenth century was influenced by prisoner management styles. Elaborate prison architecture such as the *panopticon* and the *separate system* were developed to support a regimen of strict disciplines, silent reflections and deliberately pointless labour on treadwheels.



### 2.2.1 PANOPTIC PRISON DESIGN

The panopticon as illustrated in figure 2.1 is a type of prison building designed by English philosopher and social theorist Jeremy Bentham in 1785. The concept of the design is to allow an observer to observe (- *opticon*) all (*pan*-) prisoners without the prisoners being able to tell whether they are being watched, thereby conveying what an architect has called the “sentiment of an invisible omniscience”.(Lang, 2004). Bentham himself described the panopticon as “a new mode of obtaining power of mind over mind, in a quantity hitherto without example”. (Bozovic, 1995).

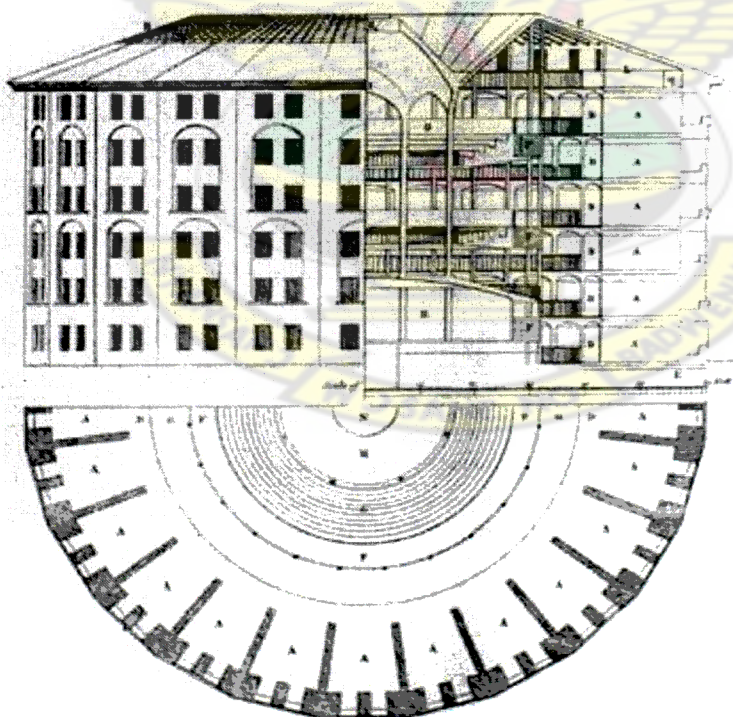
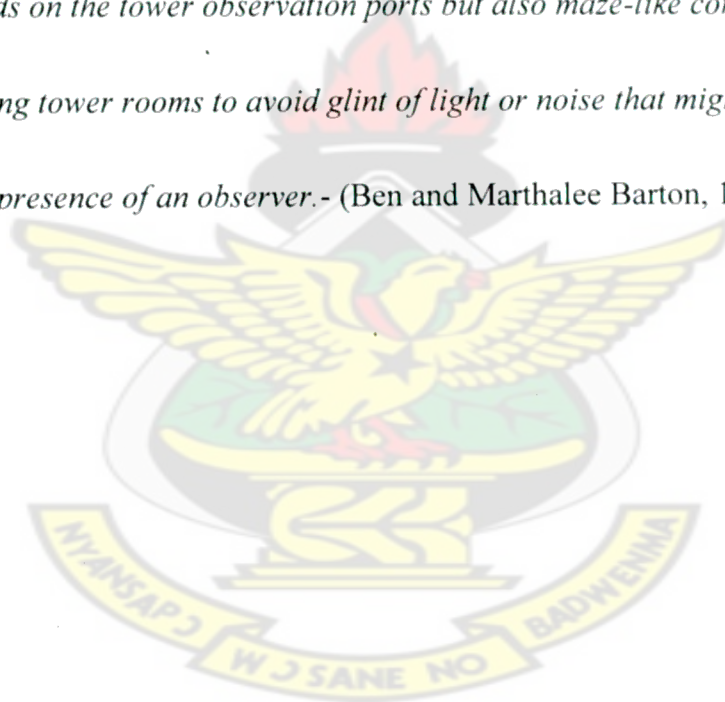


Figure 2.1 Panopticon blueprint (Bentham, 1791)

## The architecture

*Incorporates a tower central to a circular building that is divided into cells, each cell extending the entire thickness of the building to allow inner and outer windows. The occupants of the cell are thus backlit, isolated from one another by walls, and subject to scrutiny both collectively and individually by an observer in the tower who remains unseen. Toward this end, Bentham envisioned not only Venetian blinds on the tower observation ports but also maze-like connections among tower rooms to avoid glint of light or noise that might betray the presence of an observer. - (Ben and Marthalee Barton, 1993).*



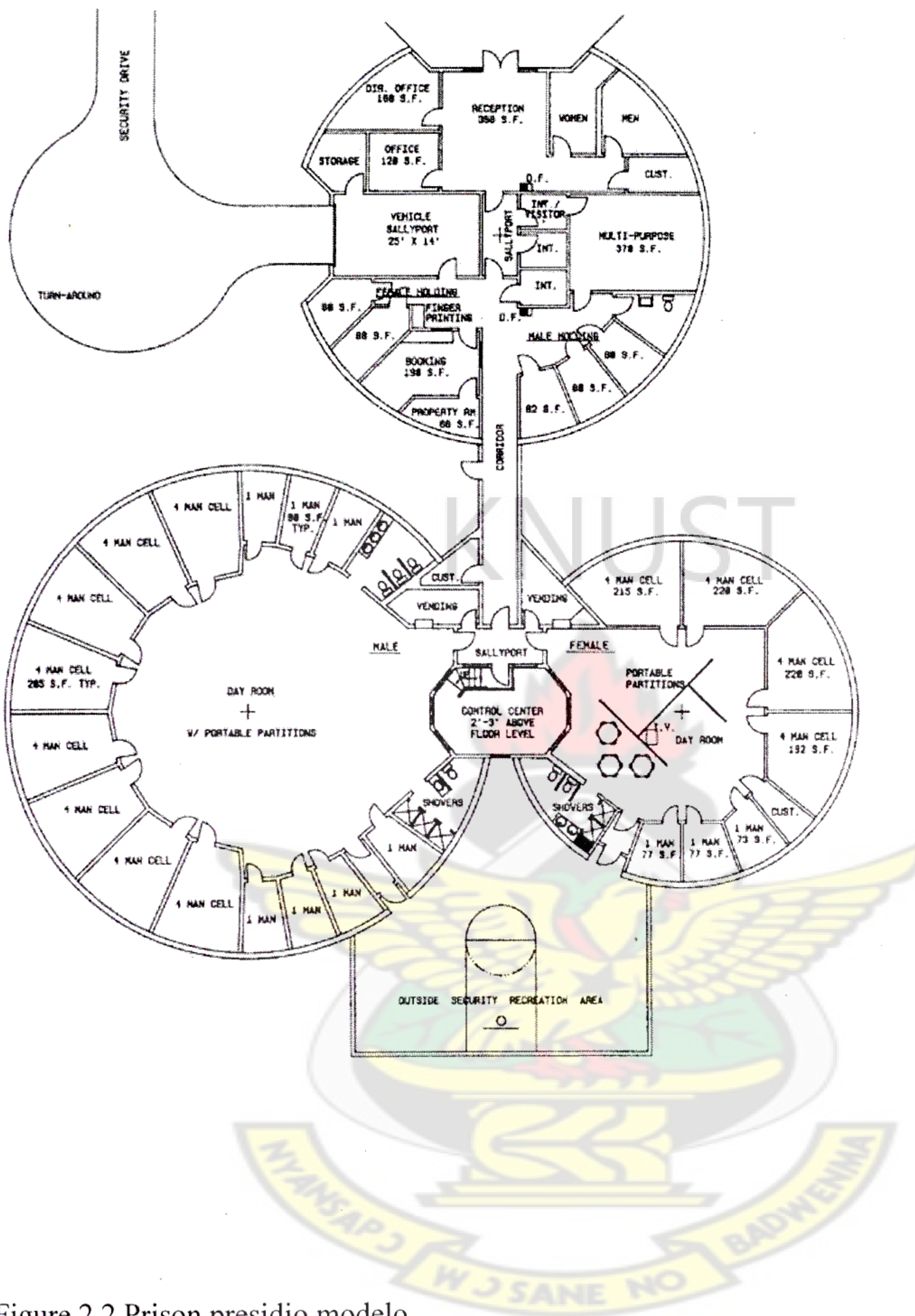


Figure 2.2 Prison presidio modelo



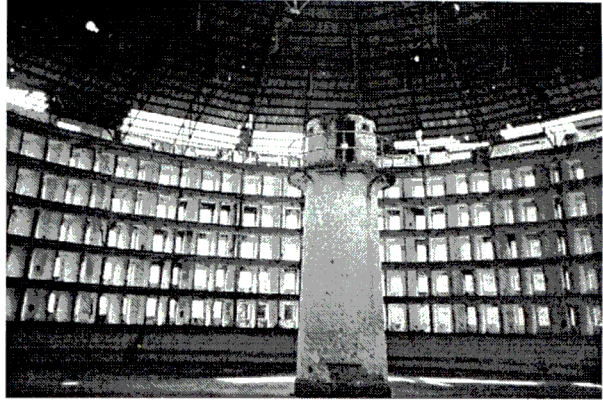


Figure 2.3 Prison presidio modelo,(Isis,2005) fig2.4 prison presidio modelo, inside one of the buildings, (Isis, 2005)

## 2.2.2 THE SEPARATE SYSTEM

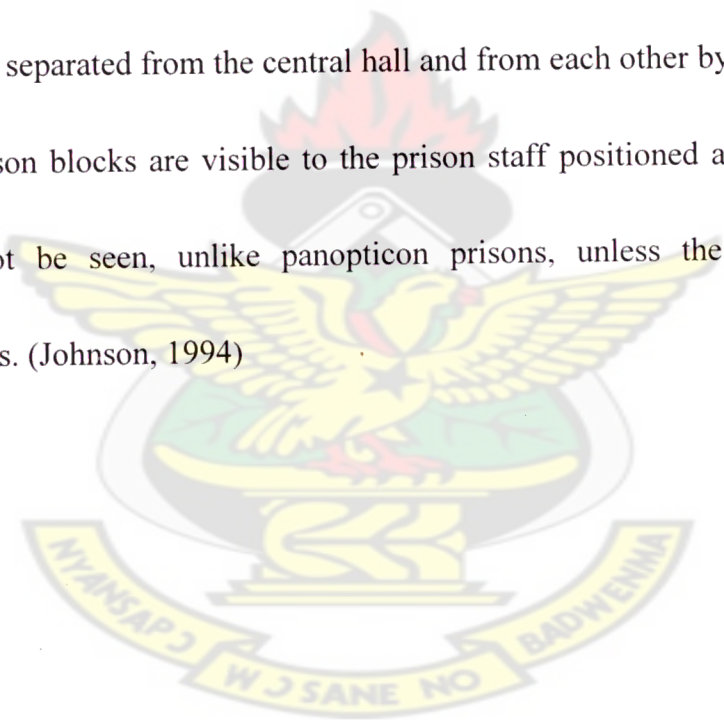
The Separate system is a form of prison management, the principle of which is to hold prisoners in solitary confinement. When first introduced in the early 19th Century, the objective of such a prison or "penitentiary" was that of penance by the prisoners through silent reflection. More commonly however, the term "separate system" is used to refer to a specific type of prison architecture built with such a prison management system in mind. The "separate system" was more about prisoner isolation than prisoner surveillance. The initial architectural form or plan was a series of perpendicular lines of cells extending from a central corridor. These wings were configured like spokes of a wheel or as rectangular buildings containing tiers of cells, one atop the other in front of a walkway along which correctional officers patrol. The cells were located back to back, sharing a centralized plumbing chase. The cell tiers looked out to an atrium space, with

window walls at the exterior for natural light but which were not accessible to inmates.

These forms became the basis of most architectural solutions in designing jails and prisons.

The first prison built according to the separate system was the Eastern State Penitentiary (1829-1971) in Philadelphia, Pennsylvania designed by British Architect John Haviland.

The design was later copied by over 300 prisons worldwide. Common features of a separate system prison include a central hall, with several (from four to eight) radiating wings of prison blocks, separated from the central hall and from each other by large metal bars. While all the prison blocks are visible to the prison staff positioned at the centre, individual cells cannot be seen, unlike panopticon prisons, unless the staff enter individual prison blocks. (Johnson, 1994)



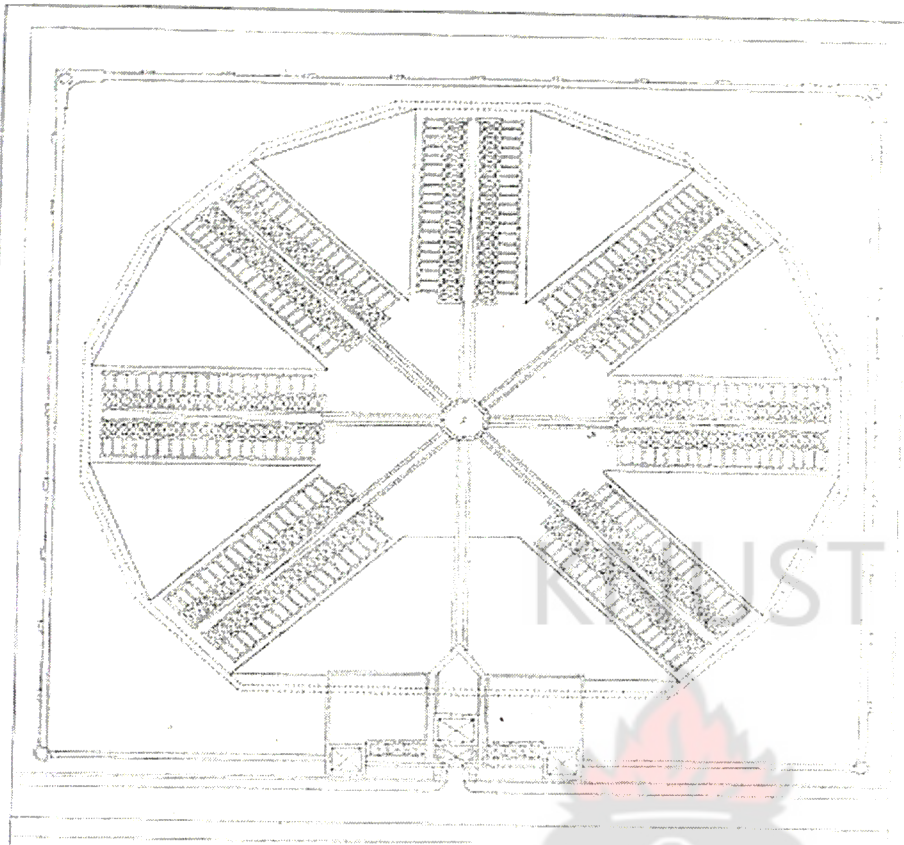


Figure 2.5 Plan - Eastern state penitentiary (Greenwood, 1974)

The spaces between the prison blocks and the prison wall are used as exercise yards. When the separate system was first introduced, prisoners were required to be in solitary confinement even during exercise. Many of these separate system prisons from the 19th century continue to house prisoners to this day; moreover the separate system continues to influence modern prison architecture.

Designers of these penal institutions drew heavily on monastic solitary confinement in order to both destroy the identity of the inmate (and thus make him easier to control) and



to crush the "criminal subculture" that flourished in closely-populated prisons. (Jebb, 1844)

Prisoners incarcerated in separate system prisons were reduced to numbers, their names, faces and past histories eliminated. The guards and warders charged with overseeing these prisoners knew neither their names nor their crimes, and were prohibited from speaking to them. Prisoners were hooded upon while exiting a cell, and even wore felted shoes to muffle their footsteps. The result was a dumb obedience and a passive disorientation that shattered the "criminal community." (Hughes, 1986)

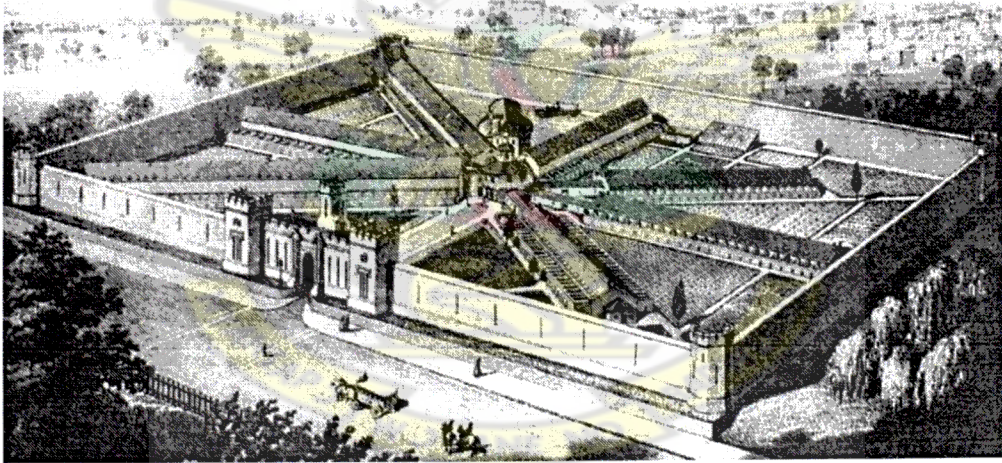


Figure 2.6 Aerial view- Eastern state penitentiary, 1829 (Greenwood, 1974)

Many newer prisons built today are in decentralized “podular” designs influenced by the panopticon design, in intent and basic organization if not in exact form. These prisons are often constructed with triangular or trapezoidal-shaped buildings known as “pods” or “modules”. In these designs, cells are laid out in three or fewer tiers arranged around an elevated central control station which affords a single correctional officer full view of all cells within either a  $270^{\circ}$  or  $180^{\circ}$  field of view ( $180^{\circ}$  is usually considered a closer level of supervision). Control of cell doors, closed-circuit television (CCTV) monitors and communications are all conducted from the control station. The correctional officer depending on the level of security may be armed with non-lethal or lethal weapons to the pod as well. Movement out of the pod to the exercise yard or work assignment can be restricted to individual pods at designated times. Goods and services such as meals, laundry, commissary, educational materials, religious services and medical care are increasingly being brought to individual pods or cells as well. These designs serve to maximize the number of prisoners that can be controlled and monitored by an individual, reducing staffing as well as restricting prisoner movement as tightly as possible.

### **2.2.3 PRISON FACILITIES OR COMPONENTS**

Amongst the facilities that prisons may have are:

1. A *main entrance*, which may be known as the 'gate lodge' or 'sally port' (stemming from old castle nomenclature)
2. A chapel, mosque or other religious facility, which will often house chaplaincy offices and facilities for counseling of individuals or groups
3. Education unit which includes a library and computer laboratory.
4. A *gym* or an *exercise yard*, a fenced, usually open-air-area which prisoners may use for recreational and exercise purposes
5. A *healthcare facility* or *hospital*
6. A *segregation unit* used to separate unruly, dangerous, or vulnerable prisoners from the general population. They are also sometimes used as punishment. Vulnerable prisoners (VPs) such as sex offenders, former police officers, informants, and those that have gotten into debt or trouble with other prisoners are accommodated in *protective Custody* (PC) units.
7. A *visiting area*, where prisoners may be allowed restricted contact with relatives, friends, lawyers, or other people
8. A *death row* is a section for criminals awaiting execution

9. A *staff accommodation* area, where staff and guards live in the prison, typical of historical prisons

10. A *service/facilities area* housing support facilities like kitchens

11. Industrial or agricultural plants operated with convict labour.

12. 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, non-lethal and lethal weapons, riot-control gear and physical segregation of units and prisoners may 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



## 2.3 PRISONER MANAGEMENT

The two most common styles of prisoner management are direct and indirect supervision.

**2.3.1 DIRECT SUPERVISION:** This relates to the hands-on physical presence of an officer in managing the day-to-day inmate operations. This concept is applied most visibly in the design of the housing unit, where an officer is responsible for overseeing all inmate activities within the dayroom, generally from an open workstation with cell and other door controls but without physical barriers between him/her and the inmate population. This interaction and rapport between staff and inmates can minimize tensions and resolve problems and conflicts in a proactive manner often before they surface. In addition, as the officer moves freely within the housing unit, inmate territorial issues can be eliminated. Housing officers are supported by roving staff for relief during scheduled breaks and on as-needed basis. The direct supervision concept generally begins at intake and carries through the entire facility supported by the facility's architectural design. (Krasnow, 1998)

**2.3.2 INDIRECT SUPERVISION:** This relates to an officer's use of visual observation and electronic control systems from within a control room which is protected with secure walls and glazing. The control officer is generally limited to observing inmate behaviour and intervenes when there are minor infractions. He calls for backup staff at major

incidents. Communications with inmates is by intercom or public address system. Whether located within a housing unit or positioned between several housing units, the officer's responsibilities are to control access to rooms and housing activity areas and to monitor inmate behaviour from this secure position. In prison jurisdictions, the secure indirect supervision post is used to backup housing unit officers on the floor working with inmates. A direct supervision operation has been proven to reduce violence and vandalism and to create a more normalized living environment. Although there are many advantages to direct supervision, it cannot be applied to all housing area designs. In particular, housing units that are subdivided into smaller groups, requiring an officer in each subunit, would be inefficient and expensive to operate under direct supervision. These units would also be inappropriate for housing inmates who are disruptive and violent. (Krasnow, 1998)

## **2.4 TYPES OF PRISONS**

Prisons include borstal (juvenile) prisons, boot camps, death row, jail and prison camps as discussed below.

### **2.4.1 BORSTAL**

A borstal was a specific kind of youth prison in the United Kingdom, run by the Prison Service and intended to reform seriously delinquent young people. The word is

sometimes used, incorrectly, to apply to other kinds of youth institution or reformatory, such as Approved Schools and Detention Centres. The court sentence was officially called "borstal training". Borstals were originally for offenders under age twenty-one, but in the 1930s the age was increased to twenty-three. (The Cadogan Report, 1938)

The Gladstone Committee (1895) proposed the concept to separate youths from older convicts in adult prisons. It was the task of Sir Evelyn Ruggles-Brise (1857-1935), a prison commissioner, to introduce the system, and the first such institution was established at *Borstal Prison* in a village called Borstal, near Rochester in north Kent, England in 1902. The system was developed on a national basis and formalized in the Prevention of Crime Act 1908. The regime in these institutions was designed to be "educational rather than punitive", but it was highly regulated, with a focus on routine, discipline and authority. The Criminal Justice Act 1982 abolished the borstal system in the UK, introducing youth custody centres instead.

#### 2.4.2 BOOT CAMPS

Boot camps have been part of the correctional and penal system of the United States since the early 1980s. Modeled after military recruit training camps, the programs are based on shock incarceration grounded on military techniques. In most US states, participation in boot camp programmes is offered to young first-time offenders in place

of a prison term or probation. In some states, a youth can also be sentenced to participate in such a programme. The time served can range from 90 to 180 days, which can make up for prison sentences of up to 10 years. How serving time and boot camp time is equated differs among facilities and states. Offenders who do not finish a program must serve the original prison sentence. (Jones, 1994)

Participants typically engage in military-style exercises and marching. They cannot go home until the course is done. The child has no contact with parents, family, or friends. They serve a wide range of ages. It is common to find educational and counseling components among such programs.

In the last few years boot camps have included a number of rehabilitation-type programs such as education, counseling, vocational training or special programs to address the needs of drug offenders. Boot camps also offer programs as "quick-fix solutions" for kids of parents who hope to regain lost control of their teens or who desire behavior modification. In advertisements they claim to "scare kids straight", "help defiant adolescents improve their behavior" and guarantee "97% parent satisfaction". In these cases it is not a judge but the parents who decide the fate of a teen and they cover the quite considerable costs. The consent of the teen is not required (Conner, 2005)

### 2.4.3 DEATH ROW

Death row is a term that refers to the section of a prison that houses individuals awaiting execution. It is also used to refer to the state of awaiting execution, even in places where a special section of a prison does not exist ("being on death row").

After individuals are found guilty of an offense and sentenced to execution, they will remain on death row while following an appeals procedure, if they so choose, and then until there is a convenient time for execution. Due to the lengthy, expensive and time consuming appeals procedure that must be followed before an execution can be carried out, prisoners may wait years before execution; nearly a quarter of deaths of prisoners on death row in the U.S. are in fact of natural causes. (Johnson, 1973)

Before Great Britain abolished capital punishment, prisoners were conventionally reprieved if they were not executed within 99 days of being sentenced. In some Caribbean countries where execution is still authorized, the Judicial Committee of the Privy Council is the ultimate court of appeal. It has upheld appeals by prisoners who have spent several years under sentence of death, stating that it does not desire to see the death row phenomenon emerge in countries under its jurisdiction.

Opponents of capital punishment claim that a prisoner's isolation and uncertainty over their fate constitute a form of mental cruelty and those especially long-time death row



inmates are liable to become mentally ill, if they are not already. This is referred to as the death row phenomenon.

#### 2.4.4 JAIL

Jail, or remand prison, is a correctional institution used to detain persons who are in the lawful custody of the state. This includes either accused persons awaiting trial or for those who have been convicted of a crime and are serving a sentence of less than one year. Jails are generally small penitentiaries run by individual counties and cities, though some jails in larger communities may be as large and hold as many inmates as regular prisons. "Jail" is also a synonym for "prison" in most countries (excluding the United States), especially when the facility is of a similar size as a correctional facility. As with prisons, some jails have different wings for certain types of offenders, and have work programmes for inmates who demonstrate good behaviour.

#### 2.4.5 PRISON CAMPS

Prison camps are used to house inmates who have a few months to complete their prison term. They are minimum security institutions with dormitory housing, no fences and low staff-inmate ratio, primarily focused on work but programme oriented. The objective of these centres is to provide opportunities for prisoners to establish or re-establish support system in the community and will concentrate on life skills and programmes that enhance

a prisoner's prospects of restoring and maintaining family contacts, securing employment and generally readjusting to life in the community. (Krasnow, 1998)

## **2.5 SECURITY CLASSIFICATION OF PRISONS**

Security level of correctional facilities is based on crime violence level. They may be minimum, medium or maximum security prisons. Minimum security is mostly white-collar crimes. These are less expensive to construct and operate. Medium security consists of felonies, hold-ups and burglaries while maximum security includes capital crimes, murder and repeat offenders.

## **2.6 SECURITY CONCEPTS**

The security of a correctional facility is achieved by utilizing a combination of elements: security perimeters, security zoning, building construction and electronic technology. Balancing these elements require the awareness of the types of inmates incarcerated, types of area activities, and the number of staff provided to supervise inmates, activities and areas in the most efficient manner. (Krasnow, 1998)

### **2.6.1 PERIMETER SECURITY SYSTEMS**

Prisons are normally surrounded by fencing, walls, earthworks, geographical features, or other barriers to prevent escape. Multiple barriers, concertina wire, electrified fencing,



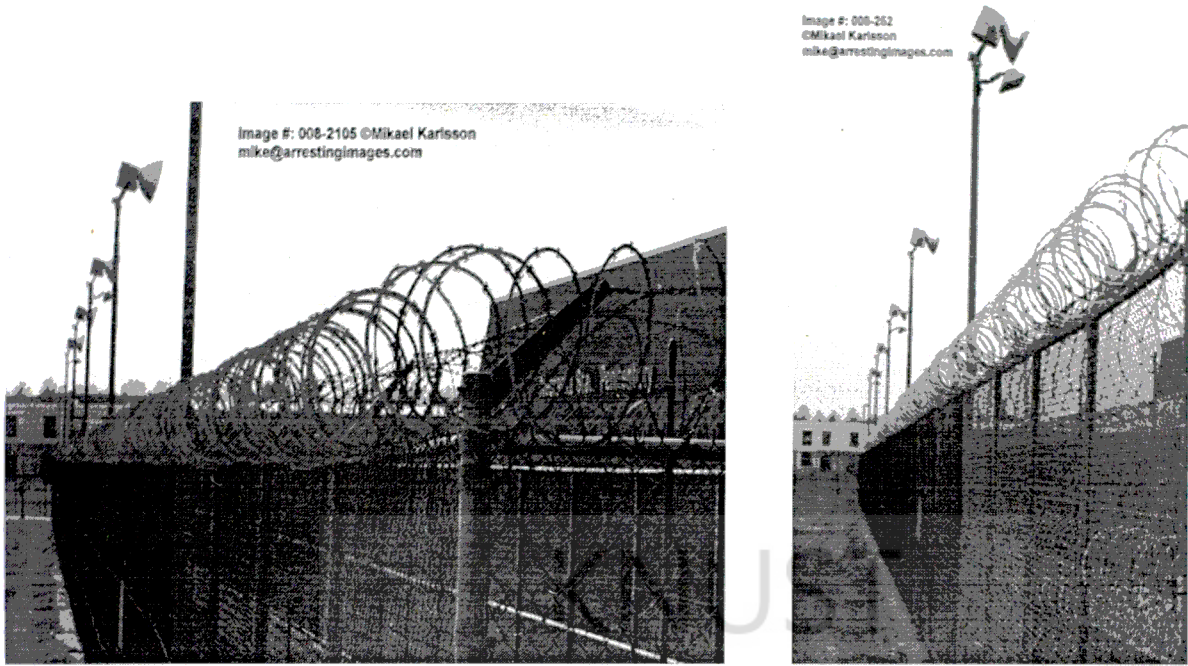


Figure 2.8 perimeter fences with barbed and concertina wire- Nebraska State Penitentiary, Lincoln (Karlsson, 2004)

### 2.6.2 SECURITY ZONES

Facilities are often divided into five zones to offer control in maintaining security. These areas require different security and are defined by purpose, level, and type. All movements within and outside the facility can be monitored and controlled by direct staff observation, electronic surveillance, and the building construction. Each security zone creates its own control point(s) for monitoring and controlling vehicles, visitors, staff, and inmate movement in and out of any particular zone. Based on classification and/ or

policy, the admission or rejection or passage from one zone to another can be maintained (Krasnow, 1998.)

#### ZONE ONE: building perimeter.

This is generally limited to the functions that are located outside of the secure perimeter, such as public lobby, administrative offices, and employee services. Access is achieved with monitoring and control by direct staff observation and/ or with electronic support.

(Krasnow,1998.)

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#### ZONE TWO: security perimeter.

This is generally defined as the facility's building or security fences. This would include areas like intake/release, programme areas, inmate housing areas and support areas where inmates are employed. Interior and exterior walls provide for security zoning. Accesses through these areas are generally via security valves with interlocking doors.

#### ZONE THREE: local (unit) control.

This is generally often associated more with jails than prisons. This area supervises and controls movement in the areas of inmates, staff, and other authorized persons' movement in this area. (Krasnow, 1998.)

ZONE FOUR: housing unit (pod) control.

This is generally defined as the control officer who is responsible for all inmate activities within this unit. This station can directly supervise from an open desk area or indirectly supervise from within a secure control room. Either way, the officer is responsible for all movements in and out of the unit. (Krasnow, 1998.)

ZONE FIVE: cells.

This is generally defined as the individual cell enclosure within each housing unit. Access into and out of the cells is supervised and controlled by the living unit (pod) officer. Restrictions of access to cells are determined by inmates' classification and the facility's operational policy. (Krasnow, 1998.)

## **2.7 GHANA PRISON SERVICE**

The operation of the prisons is established by statute and is divided into adult and juvenile correction. The former is governed by the prison ordinance, which outlines rules for prison operation and treatment of prisoners. The 1992 constitution of Ghana establishes a prisons service council. The chairman of the prison service is appointed by the president and is responsible to the president. The prison service council formulates prison policies and regulations. It conducts inspections and investigates reports of unjustified treatment. The board consist of the Minister of Interior, the Director General

of the prisons, a Medical Officer of the Ghana Medical Association, a representative of the Attorney General, the principal secretary of the Ministry of employment and Social Welfare and three other appointed members, one of whom must be a woman and two of whom must be representatives of religious organizations. (Republic of Ghana, the 1992 Constitution)

The Service performs the following functions:

- a. Ensuring safe custody of prisoners and execution of sentences in a humane manner.
- b. Ensuring the welfare of prisoners through the protection of their rights and providing them with good health care, clothing, bedding, feeding, and recreation and library facilities among others.
- c. Ensuring the reformation and rehabilitation of prisoners offering them opportunities to develop their skills through trade, training and moral education.

#### 2.7.1 PRISON ESTABLISHMENTS

The Prison service is made up of forty- five (45) establishments. (Ghana Prison Service Annual Report, 2007). These include Prisons Headquarters, Prison Officers' Training school, Senior Correctional Centre- juveniles, 7 female prisons, 7 central prisons, 15 local prisons, 2 open camp prisons, 10 agricultural settlement camps and 1 medium security prison.



2.7.2 INMATE STATISTICS

Table 2.1 Regional population Figures (Ghana Prison service, 2009)

Region	No. of Prisons	Convicted Prisoners	Remands	Total	Aliens	Design Capacity	Net Capacity	% overcrowdin
Gt. Accra	1	504		504		560	+ 56	
Eastern	6	1919	2167	4086	387	1723	- 2363	137
Central	6	1662	257	1919	68	1541	- 378	24.5
Western	5	1252	330	1582	81	761	- 821	108
Ashanti	6	2036	465	2591	62	886	- 1615	182
Volta	4	705	233	938	30	588	- 350	59.5
B. Ahafo	5	1068	214	1282	84	998	- 284	28
Northern	5	451	169	620	57	280	- 340	121
Upper West	1	140	65	205		50	- 155	310
Upper East	2	170	88	258		148	- 110	74
TOTAL	41	9907	3988	13895	764	7535	- 6360	84

CHART SHOWING CATEGORIES OF PRISONERS

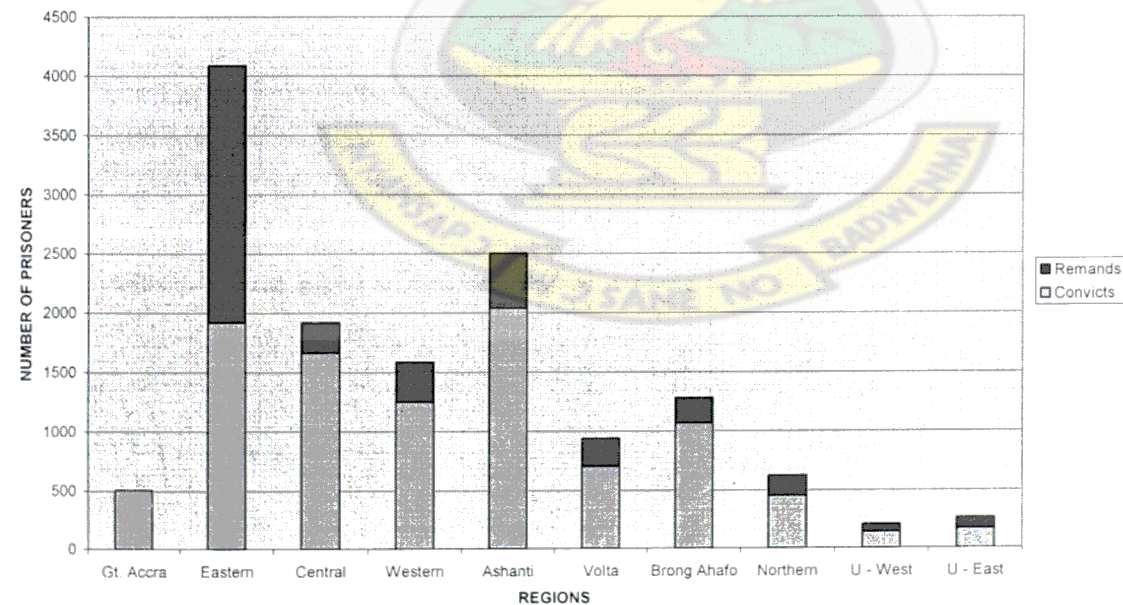


Figure 2.9 inmate categories



Eastern region recorded the highest population with 4,086 inmates. Ashanti and central regions followed with 2501 and 1919 respectively.

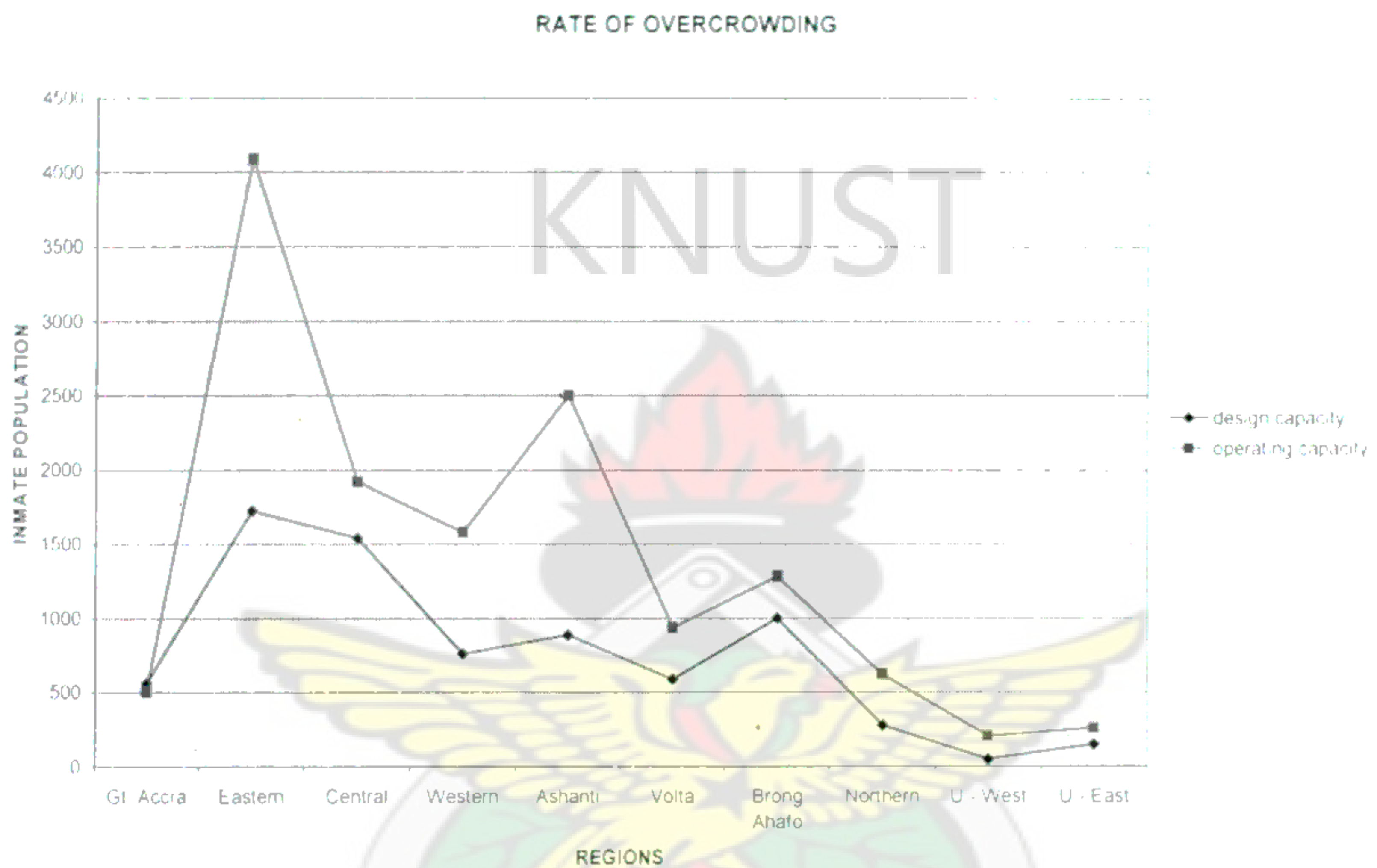


Figure 2.10 Rate of overcrowding

Ashanti region has a rate of overcrowding of 182%, compared with 137% of the Eastern region.

2.7.3 ASHANTI REGIONAL STATISTICS

Table 2.2 Extent of overcrowding (Ghana Prison service, 2009)

Prison	Operational Capacity	Rated Capacity	Excess Capacity ( overcrowding)	Rate %
Kumasi ‘C’	1753	416	1337	321
Kumasi ‘ F’	44	30	14	46.7
Manhyia Local	181	120	61	50.8
Obuasi Local	238	100	138	138
Amanfrom Settlement Camp	161	140	21	15
Ahinsan Local	124	80	44	55
TOTAL	2501	886	1615	182

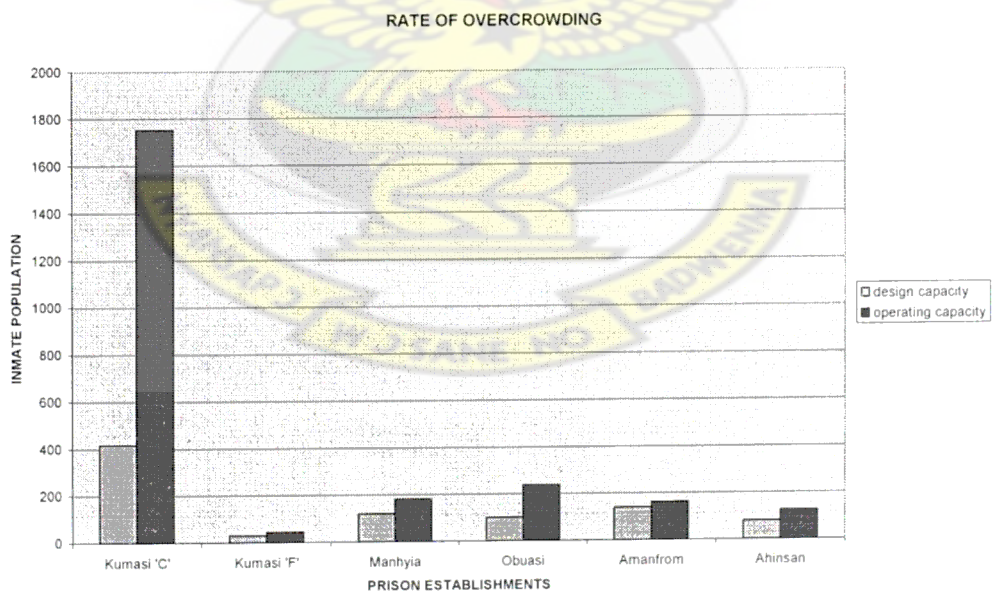


Figure 2.11 Rate of overcrowding

As of February 6, 2009, all the six prisons in Ashanti were operating above their rated capacities. The 886 capacity of the region had been exceeded by 1615 representing an overcrowding rate of 182% compared with the national average of 78%.

### 2.7.4 GENDER DISTRIBUTION OF PRISONERS

**Table 2.3 Gender Distribution of Inmates( Ghana Prison service, 2009 )**

Category	Convict population	Remand population	total	Rated capacity	Excess capacity
Male	2009	448	2457	856	1601
Female	26	18	44	30	14
Total	2035	466	2501	886	1615

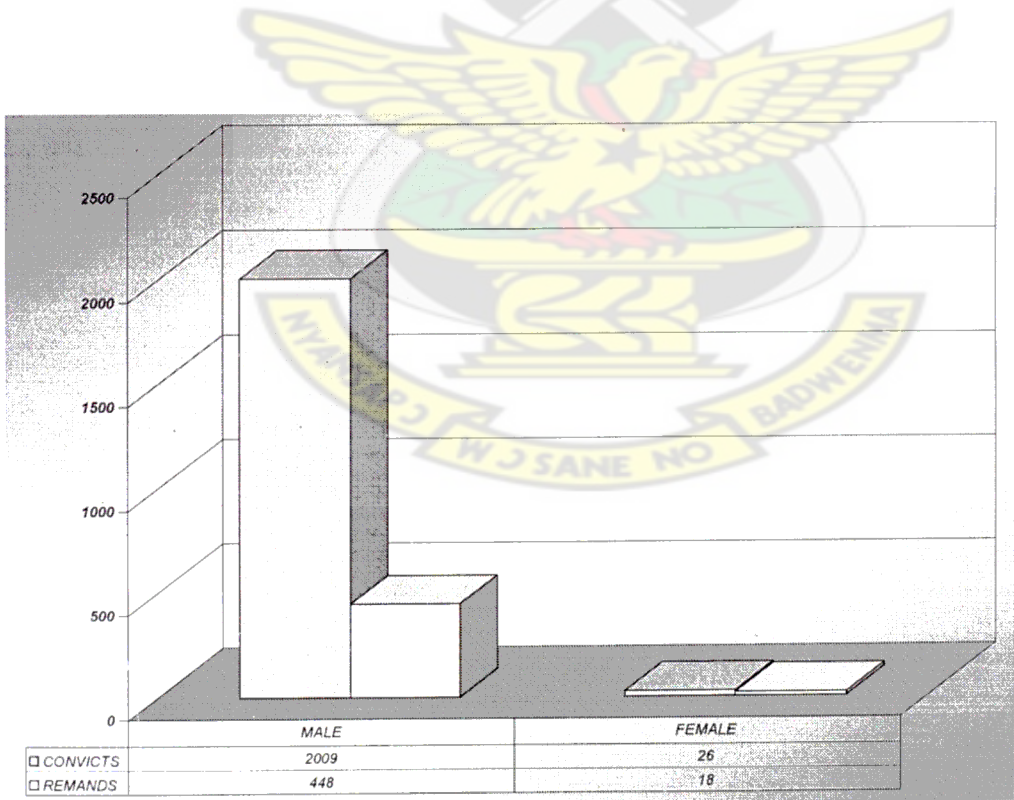


Figure 2.12 Gender distribution

2.8 CASE STUDIES

2.8.1 NSAWAM MEDIUM SECURITY PRISON

The facility is at Nsawam in the eastern region of Ghana. It also serves the Greater Accra Region following the closure of the James Fort Prison in 2007. The facility has a campus configuration. Basically all building functions are separate; separate building for administration, programmes, services and housing. It is a low-rise, single level housing/ support services and two story administration. The facility has a rated capacity of eight hundred and fifty but due to increased inmate population, it is currently housing three thousand inmates.

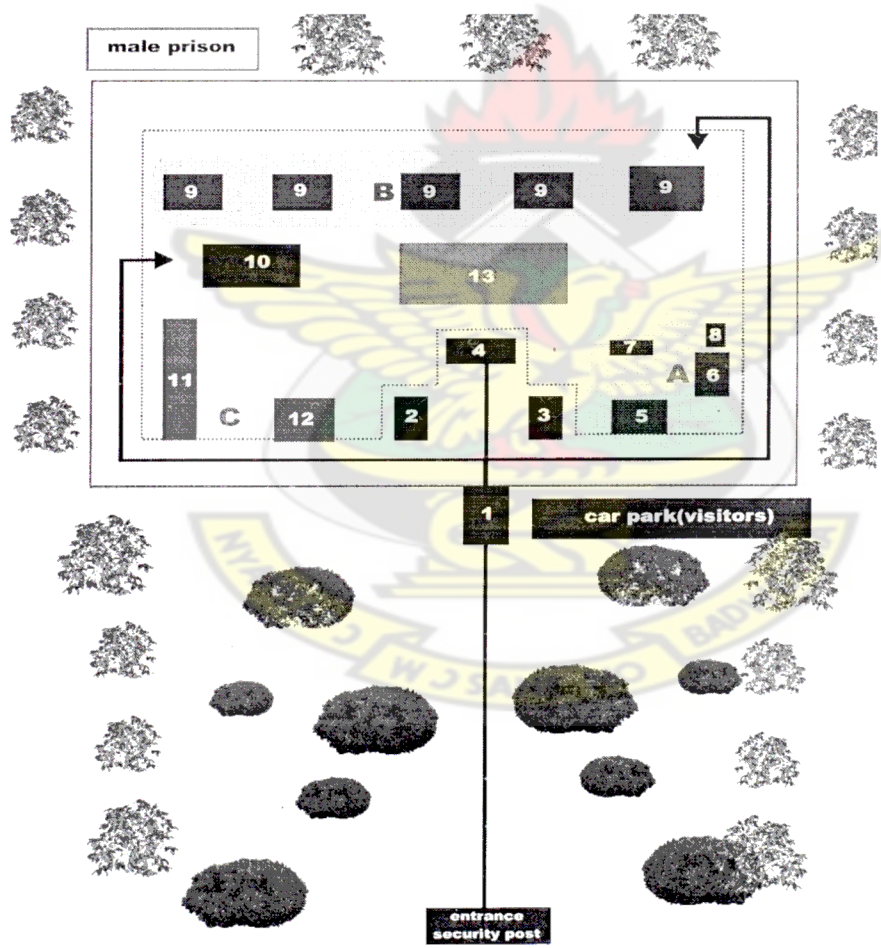


Figure 2.13 site layout



## KEY

- |                        |                    |
|------------------------|--------------------|
| 1. Sally port          | 2. Reception       |
| 3. Visitors' lounge    | 4. Administration  |
| 5. Education block     | 6. Infirmary       |
| 7. Chapel              | 8. Mosque          |
| 9. Housing units       | 10. Kitchen        |
| 11. Workshop block     | 12. General stores |
| 13. Outdoor recreation |                    |

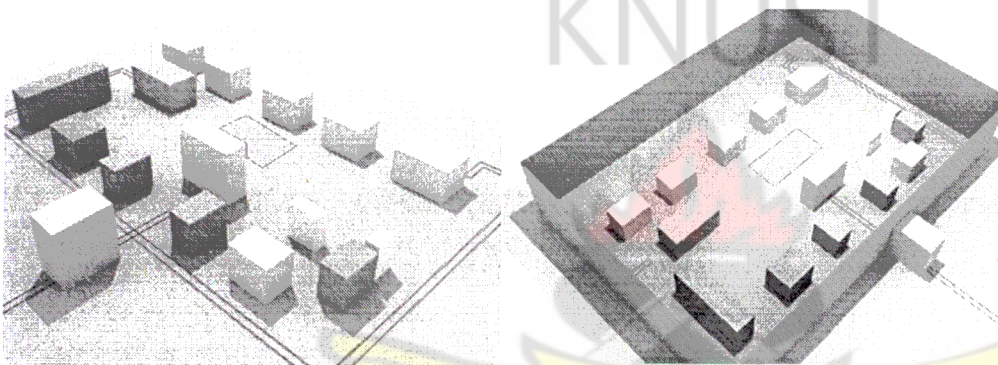


Figure 2.14 Building heights

There is one entry and exit into the prison. The facility has a double fencing system; an outer security fence in concrete and a recent addition of barbed and concertina wires. Visitors and official vehicles entering and exiting the facility are searched at the sally port. To prevent escapes, all cell windows are fitted with vertical steel bars at 150mm centres and all the walls are in concrete.

Materials used for the Nsawam Prison include is-situ concrete, tool resistant steel bars and blocks. Concrete forms ninety percent of the buildings' envelope. Glass blocks have been successfully used to provide natural light into spaces.



## CONCLUSION

A major demerit of the facility's design is the position of the administration building. Persons doing business with administrative personnel have to walk through the facility to the administration block. This could compromise security.

### 2.8.2 FEDERAL CORRECTIONAL INSTITUTION (FCI), Manchester, Kentucky

When the need for a new federal correctional facility arose, the Federal Bureau of Prisons in the United States decided to focus on improving building performance and minimizing environmental impact. As a result, Federal Correctional Institution (FCI) became the first federal prison project to incorporate green building design principles.

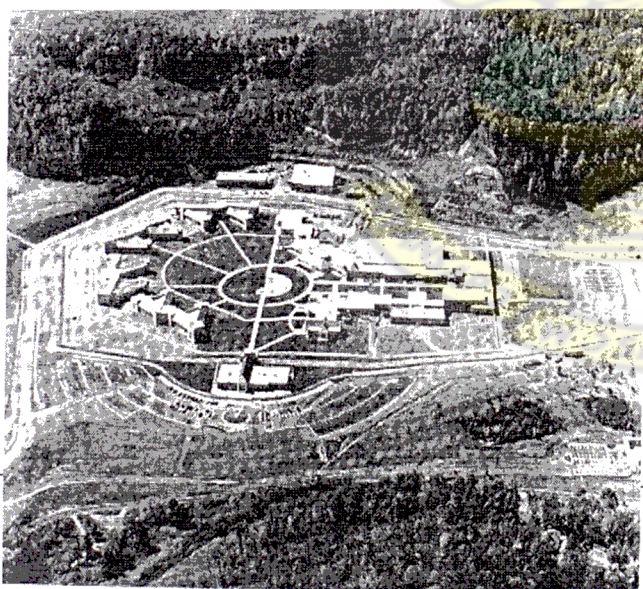
The design-build team of Hensel Phelps Construction Co. and Moseley Architects took an integrated approach to the facility's design and construction. All aspects of the project were taken into consideration, including energy consumption, water use, location on the site, materials used, and indoor environmental quality.

Incorporating green and energy-efficient strategies into FCI's design resulted in an energy cost savings of 30 percent compared to a similarly sized facility built simply to code. The design team was able to reduce the facility's energy consumption by decreasing lighting and cooling loads. Elements that are not typical of traditional facilities, such as high-efficiency lighting and additional insulation, contributed greatly to the building's energy-efficient profile. (Krasnow, 1998)

Additionally, water-conserving strategies helped to reduce the facility's water use by 33 percent compared to a standard facility complying with the Energy Policy Act of 1992. Low-flow urinals and ultra low-flow lavatories, showers and sinks comprise the plumbing fixtures throughout the facility. Landscaping consists wholly of low-growing grasses and does not require irrigation.

More than 70 percent of the waste generated during construction was recycled. Because the project site was located in the vicinity of wetlands and waterways, the design team was very careful to situate the facility on the site in a manner that would decrease its impact on the surrounding environment. The site design includes preserving open space and using strategies to control runoff

#### A. FACILITY COMPONENTS AND RELATIONSHIPS



The federal correctional institution in Manchester is campus modified style design on a forty five acre site with combined buildings for programmes/ services and separate inmate housing and administration. It is a low rise, single –level support services and on storey housing with mezzanine.

*Figure 2.15 Aerial view (Krasnow, 1998.)*

It uses exterior circulation from housing to all other building functions.

The 554,663 square foot facility consists of 15 separate buildings. It includes administration, training centre, garage and camp warehouse located outside of the secure perimeter and programmes/services and inmate housing unit located within the secure perimeter (double fence with detection devices). The programmes/services area is a combined building including visiting/staff lounge, medical, segregation, recreation, education, multi-use, food services, personal services and maintenance.

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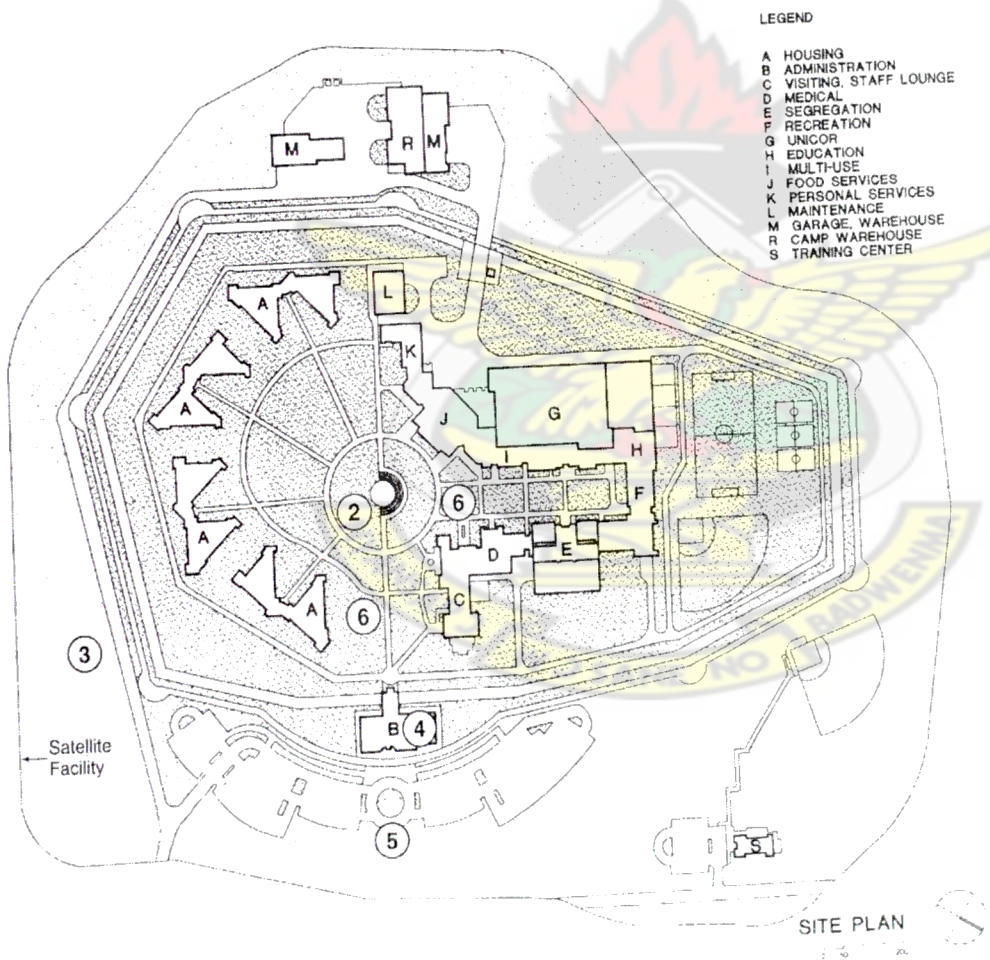


Figure 2.16 Facility plan (Krasnow, 1998)

## B. INMATE HOUSING

The housing unit consist of sixty-four cell units per control; two sixty-four units per building. There are four housing buildings on the facility and a total of five hundred and three individual cells.

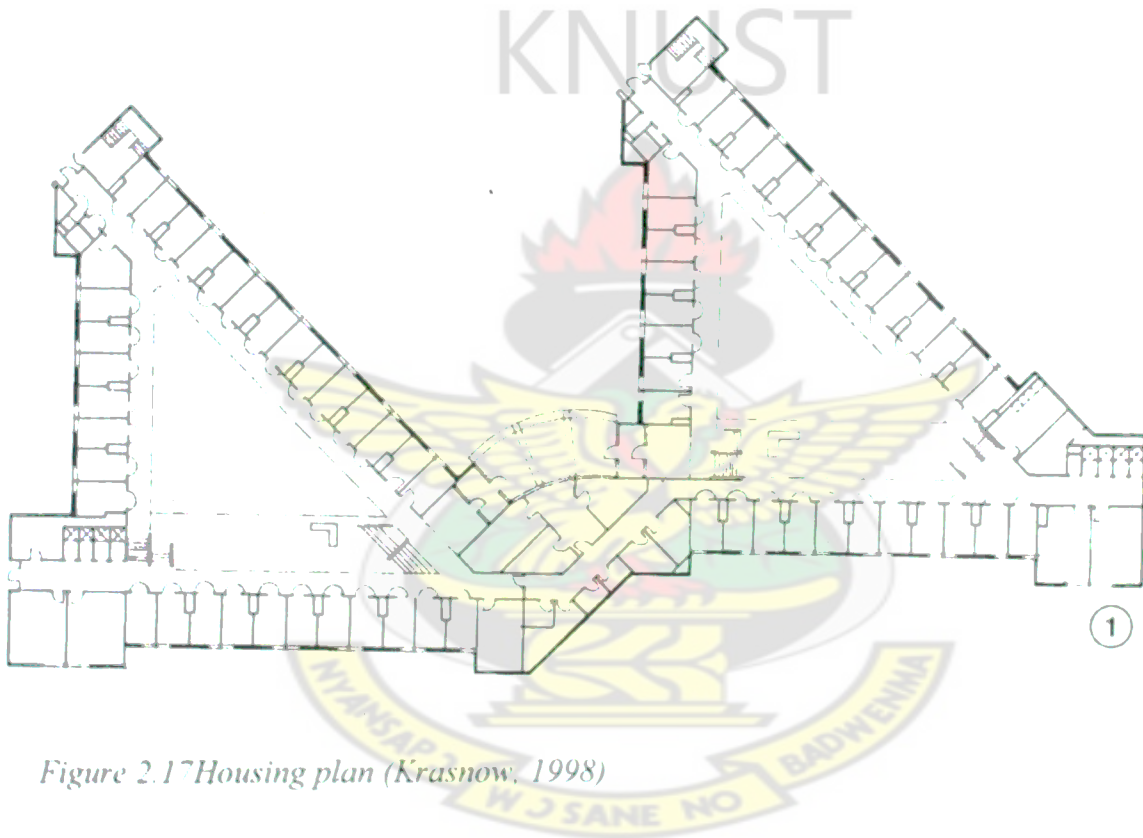


Figure 2.17 Housing plan (Krasnow, 1998)

The correctional institution employs the direct supervision management style where there is an officer to oversee inmate activities in the dayroom.



### C. FOOD SERVICES

This component provides wholesome, nutritious meals to inmates, three meals per day, and seven days a week. It also provides special meals for inmates requiring diet therapy for medical reasons. There is a central food preparation area, supply storage area and the dispensing area.

### D. CAMP WAREHOUSE

The warehouse is located outside the secure perimeter because it reduces costs and efforts of delivery and also prevents vendor intrusion into the secure perimeter. The space includes storage for all dry goods, material storage, secure storage and inactive inmate files. Raw materials and finished products of the prison industry are stored in the warehouse.

### E. MAINTENANCE

This department maintains the facility's mechanical, electrical and plumbing systems. It also maintains the plants, equipment and facility grounds in good conditions as well as ensuring the daily cleaning of the facility.

### F. CONCLUSION

There is a centralized campus amphitheatre focus for passive inmate activities. The architecture utilized a mountain on site to separate two facilities and public view of inmate campus screened at entrance. Also, the green and energy-efficient strategies incorporated in the FCI's design resulted in considerable cost savings.



### 2.8.3 NIAGARA COUNTY JAIL, Lockport, New York

The facility was established in 1996 on a five acre site. The building has a total area of 150000 m<sup>2</sup> with a rated capacity of 448 and a direct supervision management style. The mission of the facility is to provide and maintain a safe and secured facility to lawfully detain inmates as well as operate the facility in a cost-effective manner. The health, safety and well-being of inmates are maintained by providing nutritional diet, adequate medical care, and various life skills development opportunities. (Krasnow, 1998)



Figure 2.18 Niagara county jail (www.lockportNY.com)

The facility is located in Lockport, New York in the United States of America. The whole facility is contained and stacked. All building functions are connected, combined administration, programs and services functions. The components of the facility include public lobby, visitation, administration, case management, staff development,

intake/transfer, classification, communications, master control, operations, inmate housing, education, recreation, food service, health service, education and warehouse

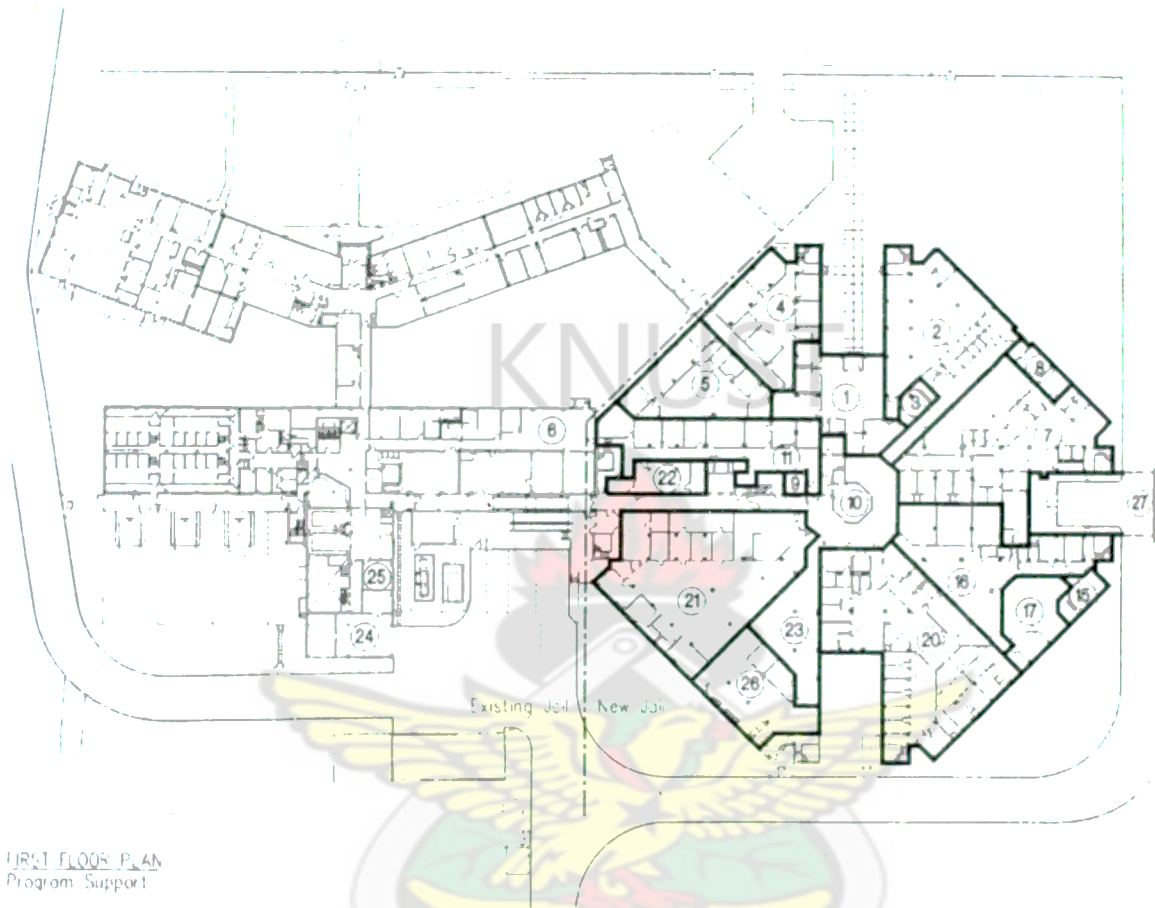


Figure 2.19 Facility plan (Krasnow, 1998)

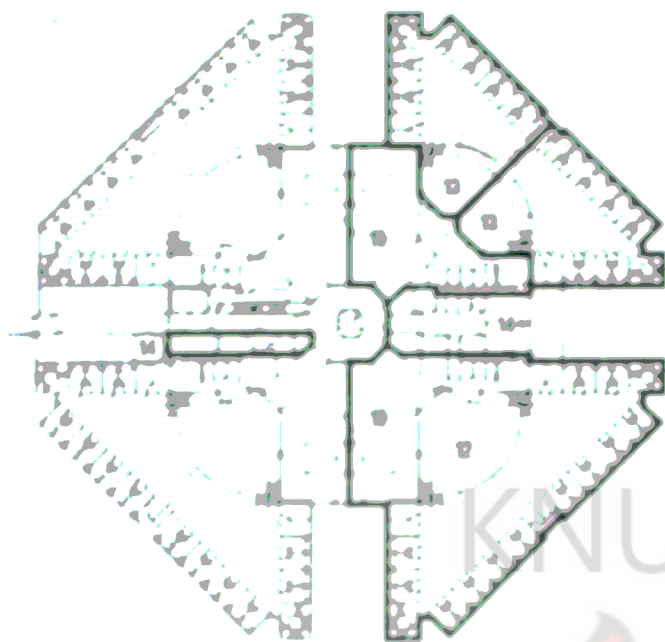


Figure 2.20 shows a housing plan (Krasnow, 1998). The housing plan is a detailed architectural drawing of a prison cell block. It shows a central corridor with several rooms branching off. The rooms are arranged in a symmetrical, cross-like pattern. The drawing is in black and white, with some areas shaded to indicate different materials or furniture. The overall layout is functional and compact.

Figure 2.20 housing plan (Krasnow, 1998)

Inmates are permitted two (2) hours of visitation per week; each visit is considered one (1) hour. Cancelled visits due to improper conduct by the visitor or inmate counts as a visit. Inmates are permitted (3) visitors per visit: a Two (2) Adults and one (1) child or two (2) children and one (1) adult.

After processing, the inmates enter the Reception Housing area. Inmates are detained in Reception Housing for a maximum of three (3) business days. While being detained in Reception Housing, each inmate is evaluated by the Reception Housing Officer and classified by the Classification Officer. After the booking procedure is completed, inmates are issued an identification bracelet. This bracelet contains the inmate's

identifying information. The bracelet remains on the inmate's left wrist until such time they are released from the Niagara County Jail.

The housing unit incorporates four separate 56-cell direct supervision housing pods arranged around a unit control centre, permitting observation of inmate outdoor recreation activity.

## CONCLUSION

The design of the housing unit incorporated dayrooms with natural sunlight for inmate passive activities like playing cards and watching television. Inmates are supervised directly from the dayroom by a housing officer. This interaction and rapport between inmates and staff minimize tensions and solve problems and conflicts in a proactive manner before they surface.



## **CHAPTER THREE**

### **3.0 RESEARCH METHODOLOGY**

Information used to write this thesis was acquired through interviews, literature review, photographic recording and field observation. They are expatiated below.

#### **3.1 Interviews**

Correctional administrators were interviewed to know their policy direction with respect to the project and design brief. Members of the nearby community where the facility is to be situated were also interviewed to ascertain their response to having to live with such a facility.

#### **3.2 Literature Reviews**

Published literature on correctional facilities was reviewed. This involved the examination of written material such as books, journals, periodicals and video recordings. Existing facilities both home and abroad were studied to determine their components and how they operate. It also involved technical aspects such as plumbing systems and renewable energy technologies.

#### **3.3 Field Observation /Photographs**

Site visits to ascertain the nature of the site in terms of topography, climate, geology, vegetation, service lines, existing structures and peripheral activities among others. These were recorded through personal observations, photography and freehand sketches.



## **CHAPTER FOUR**

### **FINDINGS AND DISCUSSIONS**

Chapter four is in three parts. Part one discusses the site; part two is about planning and design while part three discusses materials and services.

#### **PART I SITE STUDIES**

##### **4.1 SITE LOCATION:**

The Regional correctional centre shall be located at Nketia in the Atwima Nwabiagya District of Ashanti Region. The site is about eighteen (18) kilometers north – west of Kumasi the Regional Capital. The site is in a rural setting with vast acres of arable land available for agricultural purposes. The section of the site for the correctional facility useful covers land areas of 31500mm. The site is bounded to the west by the Kumasi-Barikese road, north by Buggie farms and 1 mile south in Nketia township.



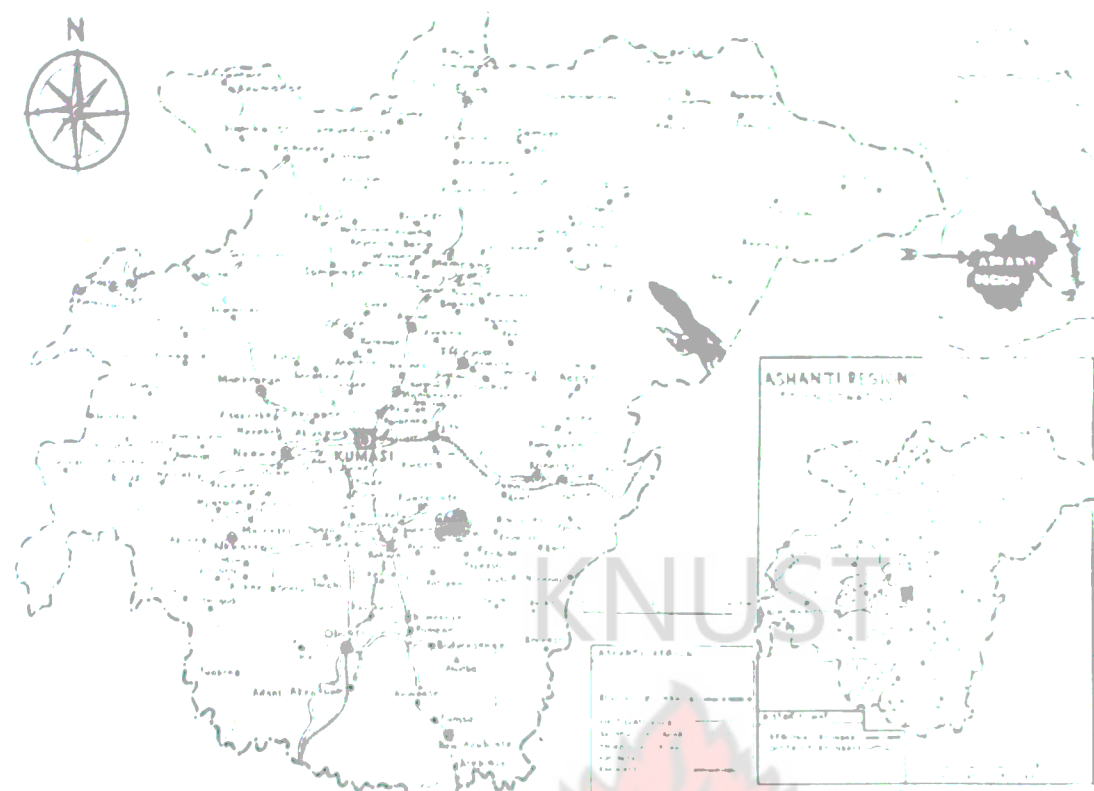


Figure 4.1 Map of Atwima Nwabiagya District (Town and Country Planning Department)

#### 4.2. CHOICE AND JUSTIFICATION OF SITE

Balancing the Ghana prison service's policy of becoming self-sufficient in food production to cut down government expenditure on the feeding of inmates and the need for the correctional centre to be in close proximity with major support services like the courts at the Regional capital and the major Hospital in the region as well as the transportation nerve led to the selection of the site at Nketia. The site provides good arable land for the cultivation of food crops and the raising of livestock and poultry. There is also the availability of basic infrastructure such as road, electricity and water.

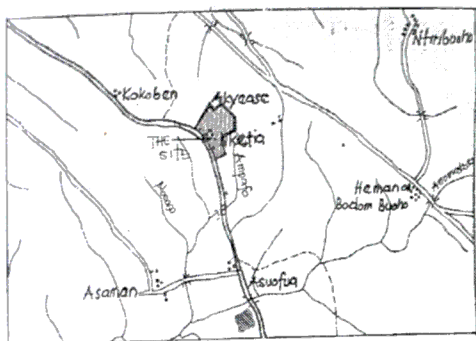


Figure 4.2 key plan

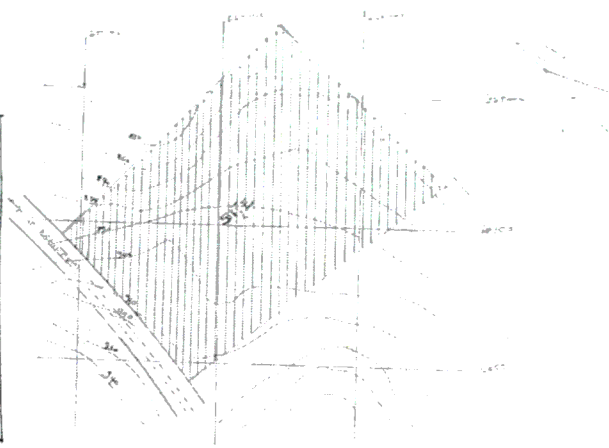


figure 4.3 site plan

### 4.3 CLIMATE:

Nketia has a tropical rainforest climate with two seasonal changes in a year; wet season and dry season. Annual average rainfall is between 1200mm-1500mm (Ghana Meteorological Service department, 2009) and is experienced in the months of April and October. The dry north eastern wind from the Sahara set in from November to March and is often characterized by hot dry winds and dry cold lazy nights.

Average temperature read about 19<sup>0</sup>c at night and 37<sup>0</sup>c during the day. Mean temperatures during the dry season vary between 40<sup>0</sup>c day temperatures to 27<sup>0</sup>c night temperature.

Average relative humidity all year round is about 70%-90% during the rainy season. (Ghana Meteorological Service department, 2009)

4.4. SITE ANALYSIS

The site is presently undeveloped with peasant farming at its peripheries

The site is habited by density populated grass types can also be seen on the site. The general topography of the site is relatively flat with a slight slope towards the north-eastern side of the site. Gradient of the slope is 1:120. The site is rectangular in shape with its longer sides facing North- South. The vegetation, wind direction and other features existing on the site have been captured in figure 4.4 below. This was achieved by physical experience of the site by the author. A citrus grove buffer shall be introduced at the western side to screen the facility from the main road.

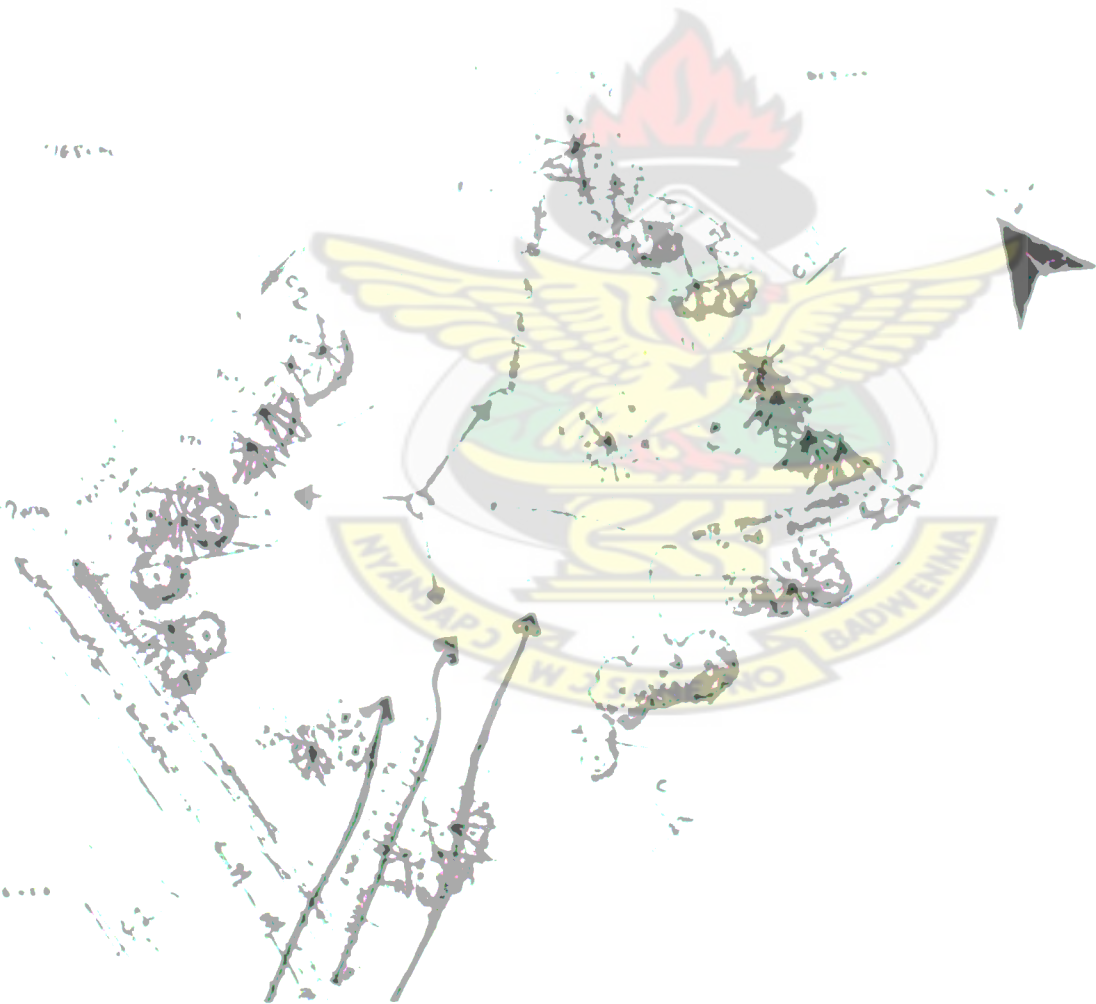


Figure 4.4 site analysis



## 4.5 DESIGN BRIEF

A study of similar and existing correctional facilities as well as careful consideration of clients needs resulted in a developed brief. This consist of car park, Administration, visiting centre, staff development training area, infirmary, admissions/ release area, transport and maintenance unit, educational and vocational training block, workshops, kitchen/ dining, inmate housing units and staff accommodation.

### A. ADMINISTRATION

Spaces within the administration block include conference room, records unit, accounts and private offices.

### B. VISITING AREA

The visiting area has the following spaces: waiting room, pre-visit waiting room, visitation rooms and toilets.

### C. STAFF DEVELOPMENT AND TRAINING

This unit has spaces for roll call, physical training, classrooms, library and armoury.

### D. EDUCATIONAL UNIT (FORMAL)

Spaces within the education block include library, computer laboratory, internet café, classrooms, staffroom and offices.

#### E. ADMISSIONS/ RELEASE AREA.

The spaces within this block include intake lounge, group holding area, individual holding, clothing exchange, property store and release lounge.

#### F. INFIRMARY

This block has an Out patients Department, consulting rooms, laboratories, dispensary, X-ray, wards and staff rooms.

#### G. CARPENTRY

The spaces include open work area, log and tools store, office and toilet.

#### H. TAILORING

The spaces within this unit include a sewing pool, store room, work area, cutting room and toilets.

#### I. KENTE WEAVING

This unit has an open work area, store, supervisor's office and toilets.

#### J. BASKET WEAVING

This unit has an open work area, store, supervisor's office and toilets.

#### K. KITCHEN/ DINING

The spaces within this block include service yard, changing rooms, food preparation area, storage, servery, dish wash area and dining rooms.

L. INMATE HOUSING UNIT

The housing unit has cells, dayrooms and exercise yard.

4.6 SCHEDULE OF ACCOMMODATION

A. ADMINISTRATION

	Quantity	Area (m <sup>2</sup> )
Accounts and payroll	1	75
Records unit	1	130
Conference room	1	40
Offices	10	250

B. VISITING AREA

	Quantity	Area (m <sup>2</sup> )
Unscreened waiting	1	150
Screened waiting	1	150
Official visitation	1	100
Family and friends	1	150
Visitor toilet	1	10
Inmate toilet	1	10

C. STAFF DEVELOPMENT AND TRAINING

	Quantity	Area (m <sup>2</sup> )
Roll call	1	84
Physical training	1	63
Changing rooms	2	40
Classrooms	2	200
Library	1	81
Armory	1	40

D. FORMAL EDUCATION

	Quantity	Area (m <sup>2</sup> )
Staff offices	10	225
Library	1	81
Computer Lab	1	81
Internet Café	1	55
Classrooms	8	360
Staff toilet	2	24
Inmate toilet	2	20

## E. ADMISSIONS

	Quantity	Area (m <sup>2</sup> )
Intake Lounge	1	100
Group hold	1	25
Individual hold	4	32
Clothing exchange	1	25
Inmate property store	1	80
Release Lounge	1	80

## F. INFIRMARY

	Quantity	Area (m <sup>2</sup> )
OPD	1	150
Consulting rooms	2	57.6
Laboratory	1	45
Dispensary	1	125
x-ray	1	55
Mini theatre	1	110
General ward	1	380
Isolation ward	1	270
Staff rest rooms	2	120
Dining	1	25

## G. CARPENTRY WORKSHOP

	Quantity	Area (m <sup>2</sup> )
Work area	1	180
Log store	1	49
Tools store	1	30
Supervisor's office	1	15
Inmate toilet	1	10

## H. TAILORING

	Quantity	Area (m <sup>2</sup> )
Work area	1	180
Store room	1	49
Cutting area	1	30
Supervisor's office	1	15
Inmate toilet	1	10



# I. KENTE WEAVING

	Quantity	Area (m <sup>2</sup> )
Work area	1	180
Store room	1	49
Tools store	1	30
Supervisor's office	1	15
Inmate toilet	1	10

# J. BASKET WEAVING

	Quantity	Area (m <sup>2</sup> )
Work area	1	180
Store room	1	49
Tools store	1	30
Supervisor's office	1	15
Inmate toilet	1	10

# K. KITCHEN / DINING

	Quantity	Area (m <sup>2</sup> )
Service yard	1	375
Garbage collection	1	15
Corn mill	1	45
Staff changing	2	150
Storage	2	45
Inmate break	1	50
Food preparation	1	245
Servery	2	50
Dish wash	1	45
Dining halls	2	900

# L. INMATE HOUSING

	Quantity	Area (m <sup>2</sup> )
Cells	540	4536
Dayrooms	7	1750
Exercise yard	4	5472
Showers	9	275

# M. OUTDOOR RECREATION

	Quantity	Area (m <sup>2</sup> )
Soccer	1	5000

## **PART II: PLANNING AND DESIGN**

### **4.7 PHILOSOPHY AND CONCEPT OF THE DESIGN**

The Regional correctional centre shall illustrate the Brutalism style (a strand of the International Architectural style) in totality. This stems from the need to provide a durable, difficult to damage and easy to maintain building. The defining features of the style employed in the design include the use of textured or bush hammered exterior concrete surfaces, extensive use of fins and egg- crate elements to hold windows as holes within the building structure.

The design of the facility is based on the concept of “positive interaction”. The centre has been designed to promote interaction between users based on the direct supervision management style of corrections. Direct supervision relates to the hands-on physical presence of an officer(s) in managing the day-to-day inmate operations. For promoting interaction between inmates and correctional staff, spacious dayrooms have been provided where an officer oversees all inmate activities from an open workstation.

### **4.8 CONCEPTUAL SITE PLANNING AND DESIGN**

#### **4.8.1 FUNCTIONAL RELATIONSHIPS**

The regional correctional centre is a medium security institution with facilities for vocational training, formal educations, medical care as well as inmate housing. These

functions must be managed carefully so that security for users and the general public is not compromised.

The main users include correctional staff, convicted prisoners and visitors. The facility component as established by client's brief must be carefully arranged to facilitate easy movement within the facility. Below is the general functional Diagram showing movement patterns.

4.8.2 CONCEPTUAL SITE PLANNING OPTIONS

OP. 1.

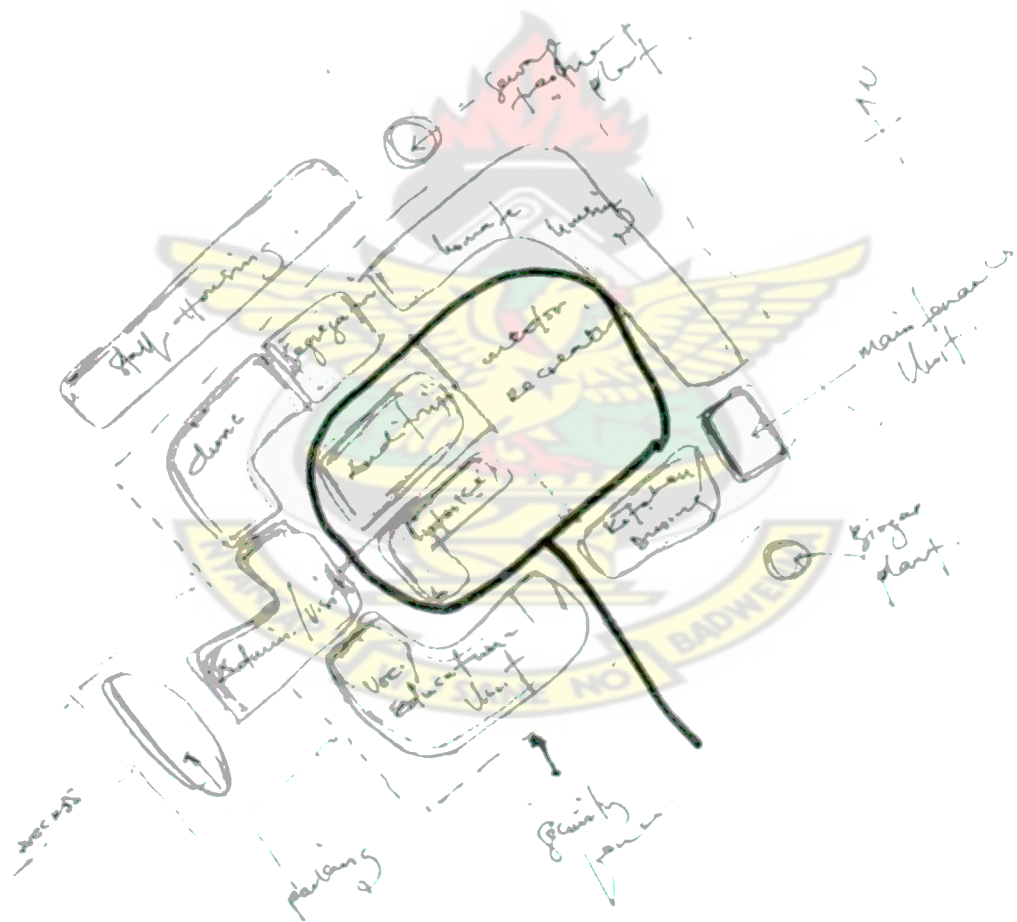


Figure 4.5 Concept layouts: Option 1

## Merits

- Administration structure located outside of secure perimeter to service the general public.
- Buffer zone to screen the facility from the highway.
- Centralized recreation for occasional inter-housing games.
- Patrol road for swift response to all escapes.

### Demerits

- Maintenance/ transport far away from intake point
- Educational unit/ workshops not close to inmate housing.

OP. 2. ✓

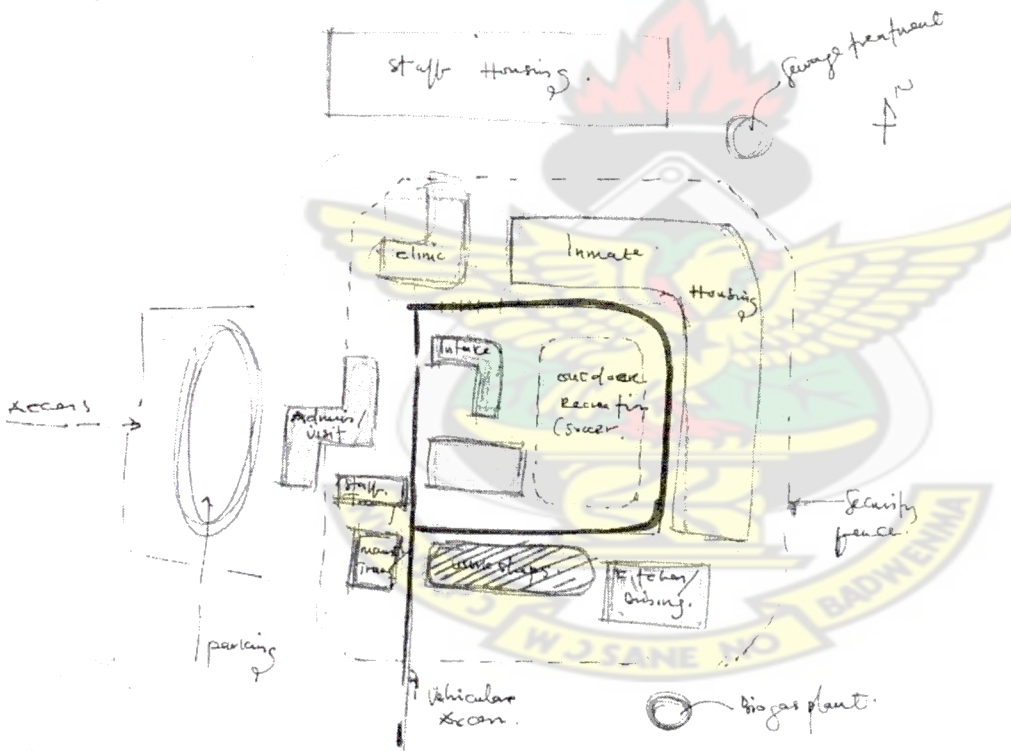


Figure 4.6 Concept layout : Option 2

## Merits

- Administration structure located outside of secure perimeter to service the general public.
- Buffer zone to screen the facility from the highway.
- Centralized recreation for occasional inter-housing games.
- Patrol road for swift response to all escapes.
- Spacious car park.
- Single vehicle point of entry/ exit to the secure perimeter for effective security control.

### 4.8.3 DESIGN EVOLUTION

Option 2 will be adopted and developed further. The choice of this option is mainly influenced by the clear distinction of spaces as well as security considerations. The idea is to keep the visiting general public outside of the facility and also increase the response time to all incidents with the provision of a patrol road.



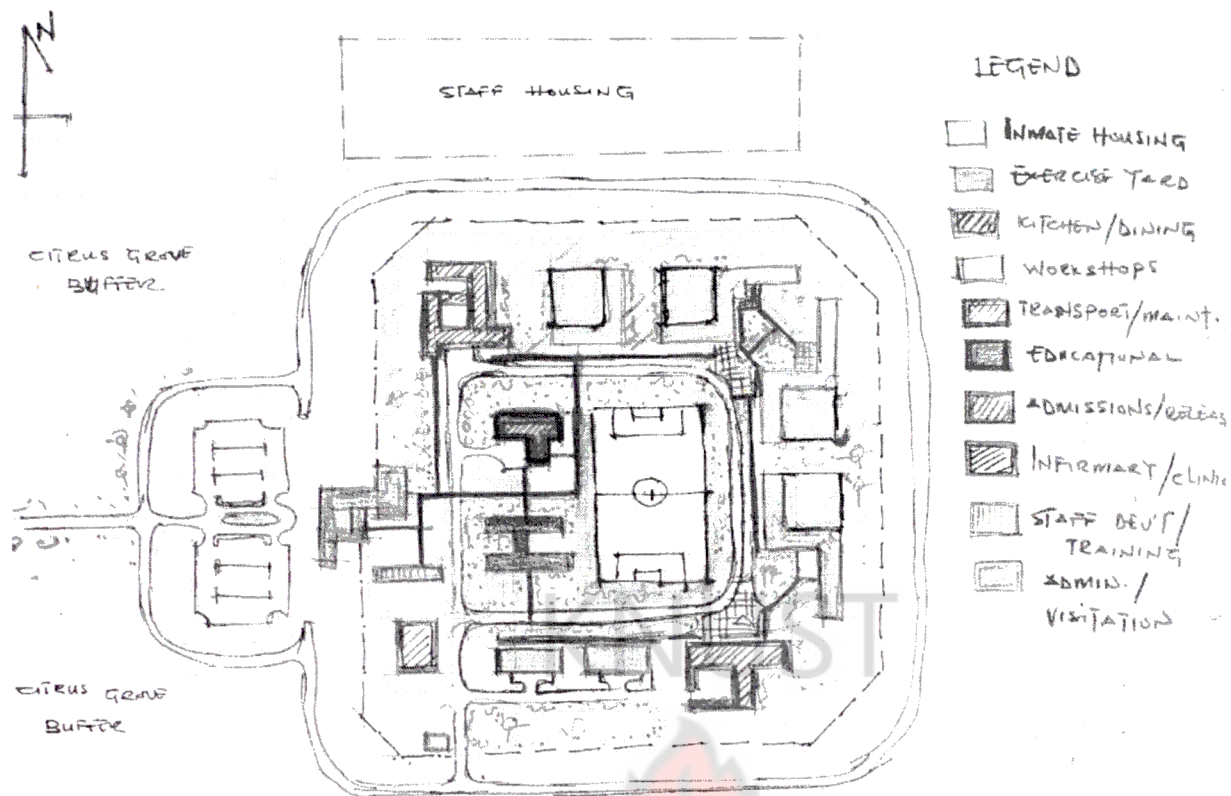


Figure 4.7 conceptual site plan

#### 4.8.4 BUILDING FORM AND HEIGHT

The facility shall be composed of different blocks and linked by paved walkways and soft landscape elements. The administration, educational unit and inmate housing units are intended to be two stories each in height. The rest of the facilities are single story in height as shown in figure 4.8 below.

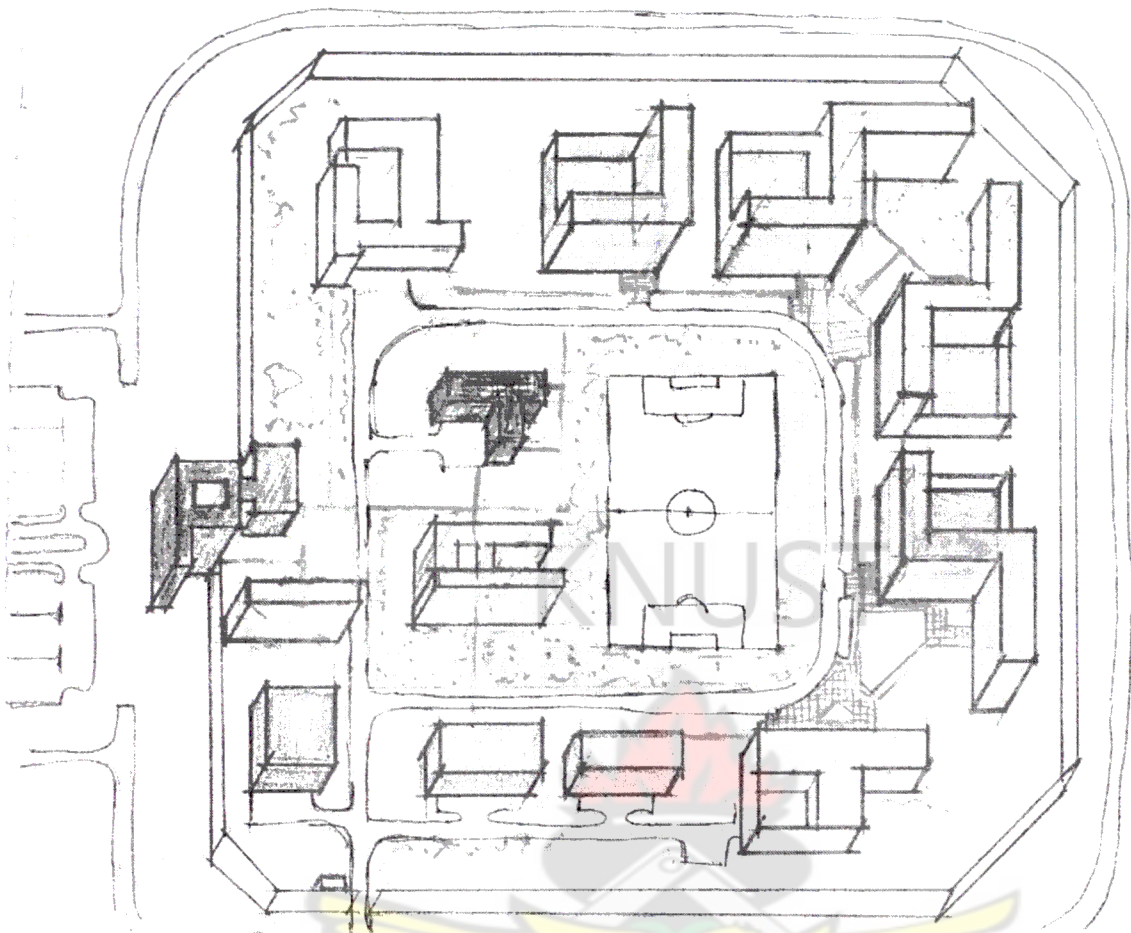


Figure 4.8 Building form and height

## 4. 9 DESCRIPTIONS OF DESIGN ESSENTIALS

### 4.9.1 APPROACH AND ENTRANCE:

Approach and entrance to the facility is at the western end through a security gate where vehicles and pedestrians entering the facility are first checked. From the security gate, an asphalted drive leads to a car park. The administration/visiting block is the first point of call to the facility and is partly located outside the security fence to permit the general

public to do business with the correctional centre without entering the secure side of the facility. A perimeter patrol road has been provided around the secure perimeter to increase the facility's response time to all escapes. There are two points of entry to the secure side of the facility: one vehicular access for official vehicles only at the southern end of the facility and the other point of entry for pedestrians is through the administration building

#### 4.9.2 ADMINISTRATION/ VISITATION

The Administration and visitation block, the first point of call at the centre has two entrances; one for visitors and the other for staff. Visitors to the facility are admitted at the public lobby and taken through a screening process before they visit inmates or administrative staff. The visiting area has spaces for contact and non contact visitation as well as two distinct spaces for family/friends' visitation and one for lawyers and the clergy. The administrative wing house offices and conference room for staff and inmate records unit.

#### 4.9.3 INMATE HOUSING UNIT

The individual housing units are managed under two distinct control units with each unit having a double volume dayroom for inmate passive activities. The housing units consist of seventy four cell units per control, two- seventy four units per building. There are four housing blocks on the facility: three general housing blocks and one segregation block. There are a total of five hundred and forty individual cells planned for double occupancy with attached toilet

## PART III: BUILDING MATERIALS AND SERVICES

### 4.10 MATERAILS AND FINISHES:

Main building materials used for the Regional Correctional Centre include in-situ concrete, steel bars, woven wire mesh and glass blocks. The exterior surfaces are finished in textured or bush-hammered concrete to cut down maintenance cost. The interior furniture and fittings are fixed and mostly in steel to reduce vandalism and the manufacture of weapons from these materials.

#### 4.10.1 INMATE HOUSING UNIT

The walls of the correctional facility shall be made of the correctional facility shall be made of the following: poured- in- place concrete, masonry units and steel panels.

- Poured –in- place concrete shall have a minimum thickness of nine inches.
- Steel bar security walls shall be used to provide secure barriers on corridors.
- Woven wire mesh. It is used on cell fronts, Holding cells and tool crib storage. It is also used at the exercise yard to separate weight lifting area from the basket ball court.

Windows for the cell units shall be made of concrete louvers whilst that for the dayroom is made bottom hung hopper windows with security bars as part of the frame.

The intent of security ceilings is to prevent an inmate from gaining access into an interstitial space location between the ceiling and structure and/ or for hiding contraband and weapons as well as prevent inmate escapes.

Materials for the ceiling include concrete and metal security ceilings (a plunk system fabricated of 16- gauge steel).



Cells are equipped with a toilet and sink fixture and the following other furnishings: bunk with mattresses, Table with a secured stool and book shelf. The cell furniture is fabricated of steel and butcher- block desktops. The day spaces require furniture for activities such as card playing, television, reading and conversations. Stools and other furniture specified shall be constructed of steel and oak butcher block wood

#### 4.10.2 ADMINISTRATION/ VISITING BLOCK

The structural system for this block is reinforced frame with masonry block work in-fill. The floor finish shall be of polished terrazzo and the ceiling made of acoustic panels. The walls shall have a fair face finish whilst the interior shall be plastered and three coats of cream emulsion paint applied. The balustrade shall be of painted galvanized steel. The courtyard within the space shall have a soft landscape of grass and a shade tree under which visitors can relax.

#### 4.10.3 WORKSHOPS

The correctional centre shall have four workshop spaces for carpentry, basket weaving, tailoring and kente weaving. The structural system for the workshops shall be steel portal frames at six meter centres with corrugated aluzinc roofing sheets. The floor of the workshops shall be of granolithic screed and masonry block walls. The walls shall be of textured finish. The sanitary rooms shall have ceramic tile finish.

#### 4.10.4 KITCHEN/DINING BLOCK

The exterior walls shall have a textured finish. The dining halls shall have built-in single pedestal table and stools.



#### 4.10.4 CAR PARKS

Asphalt finishes and pavement blocks are used in varied ways for driveways and car parks. Pavement materials such as concrete blocks, stone finishes are used for steps and ramps.

### 4.11 SERVICES

#### 4.11.1 WATER SUPPLY

Water supply is required for the purposes of drinking, cleaning, washing, and fire fighting. Water is tapped from the mains, which runs along the road adjoining the site. Water is stored in underground tanks. It will be pumped by the use of pneumatic pumps into overhead tank and then redistributed by gravity. The main is however connected directly to areas such as hose reels and sprinkler systems. Receptacles shall be provided to collect rain water from the roofs to an underground 10000gallon capacity reservoirs located in the courtyards. This water shall be pumped up to serve toilets, showers and other non-consumption purposes.

#### 4.11.2 ELECTRICITY

The facility shall have a three-phase transformer. The facility therefore obtains its main power supply from the electricity company through the transformer. To forestall likely power outages at the centre, all exterior security lights shall be powered by a biogas plant. To this end, a biogas plant shall be installed to supply the lighting and fuel needs of the correctional centre. The biogas plant shall also be used to supply fuel to the kitchen for cooking purposes.

#### 4.11.3 FIRE PROTECTION AND PREVENTION

Fire controls systems such as smoke detectors and fire alarms systems are controlled from a central control board located at the maintenance unit. Sprinkler heads and hose reels supplied by mains are placed at strategic location within the buildings as a fire fighting measure. Automatic fire alarm systems are installed. These operate on the principle of heat sensing and smoke detection. It consists of fire alarm initiators, indication panels and bells. Smoke detectors are located at vantage points within the buildings. Fire extinguishers also located at strategic intervals within the facility is an additional source of fire control. Fire hydrants are located strategically on site to aid fire service when the need arises.

#### 4.12 LANDSCAPE

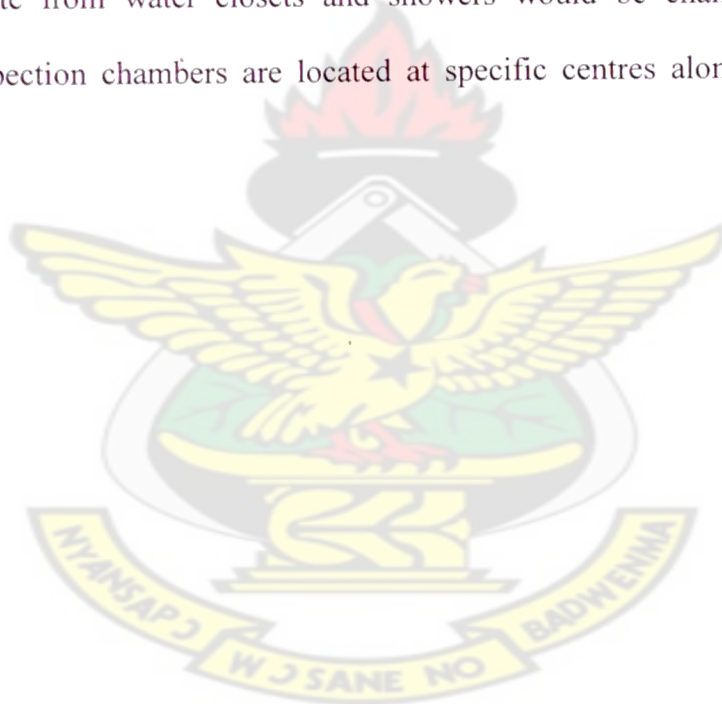
The correctional centre is landscaped to enhance the needed beauty and to create a microclimate against the harsh weather conditions. Some of the trees on site have been incorporated into an overall landscape with the introduction of more greens. The western side shall have a citrus grove buffer to screen the facility from the main road and also reduce the impact of noise from the road. Avenue trees shall adorn the main access road and parking areas would be provided with shady trees.

Easy maintenance, durability and aesthetic appeal is considered in the choice of hard paving elements. The driveways shall be surfaced with asphalt while the car park and pedestrian walks shall be finished with interlocking concrete paves interspersed with grass. The pavers blend with the rest of the landscape in both colour and texture.

#### **4.13 WASTE MANAGEMENT AND SEWERAGE SYSTEM**

Refuse collection point would be provided for the correctional centre. Collections bins shall be provided within the dayrooms and other vantage points. These shall be emptied to the central collection points daily by inmates. Organic waste from the kitchen and animal waste from the farms shall be used to feed the biogas plant to generate fuel for cooking.

The correctional centre has a sewage treatment plant sited at the north- eastern side of the site. All liquid waste from water closets and showers would be channelled to the treatment plant. Inspection chambers are located at specific centres along the sewage lines.



## CHAPTER FIVE

### 5.0 CONCLUSION AND RECOMMENDATIONS

The purpose of this design thesis is to arrest prison overcrowding by expanding the capacity and to incorporate sustainability in the design of correctional facilities in Ghana. Prison overcrowding has mainly concentrated on spatial and social densities of crowding. Spatial density of crowding is the amount of space (number of square meters) available per person in a particular housing unit whilst social density is defined as the number of individuals sharing a housing unit and this contributes most to adverse effects of crowding.

The Regional Correctional Centre addresses the various forms of overcrowding; the problem caused by large numbers of inmates sharing a housing unit is addressed with the design of a housing unit managed under two distinct control units with each unit having a double volume dayroom for passive inmate activities. The new correctional environment also affords inmates greater degree of freedom and privacy. The individual cells are designed for double occupancy and inmates have keys to their cells during daytime. The walls and floors of the dayroom are finished in acoustic materials not only to reduce noise but also to enhance social interaction. People discuss private matters more openly in such softly furnished setting than in a 'hard' one with bare floors and walls.

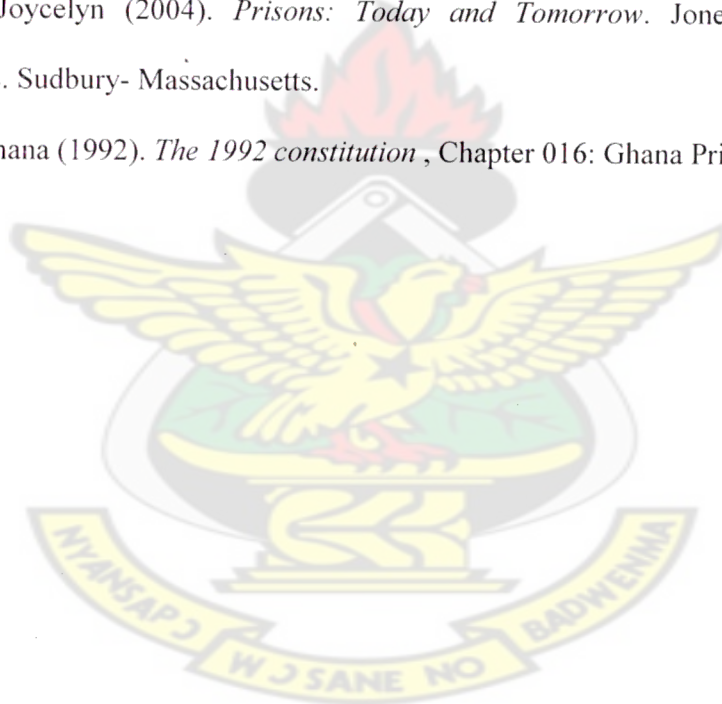
Finally, green and energy-efficient strategies have been incorporated in the design of the Regional Correctional Centre. A biogas plant has been constructed to maximize the use of renewable energy sources and the demand for potable water reduced through the use vacuum plumbing system and the re-use of water maximized.

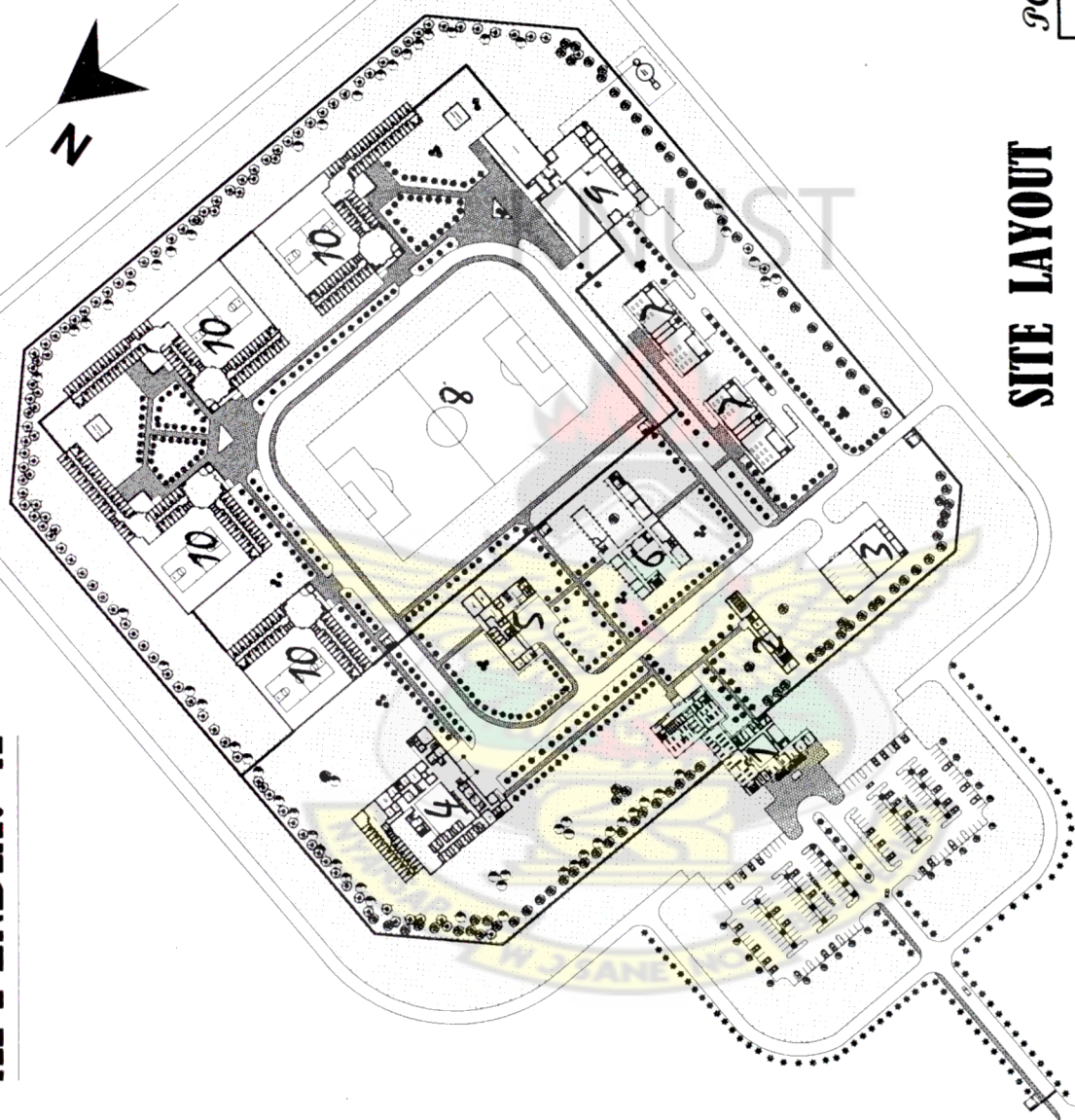
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**LEGEND**

- 1. ADMINISTRATION / VISITATION
- 2. STAFF TRAINING & DEV'T.
- 3. GARAGE / MAINTENANCE
- 4. CLINIC
- 5. ADMISSIONS / RELEASE
- 6. EDUCATION UNIT
- 7. WORKSHOPS
- 8. OUTDOOR RECREATION
- 9. KITCHEN / DINING
- 10. HOUSING UNIT

**SITE LAYOUT**

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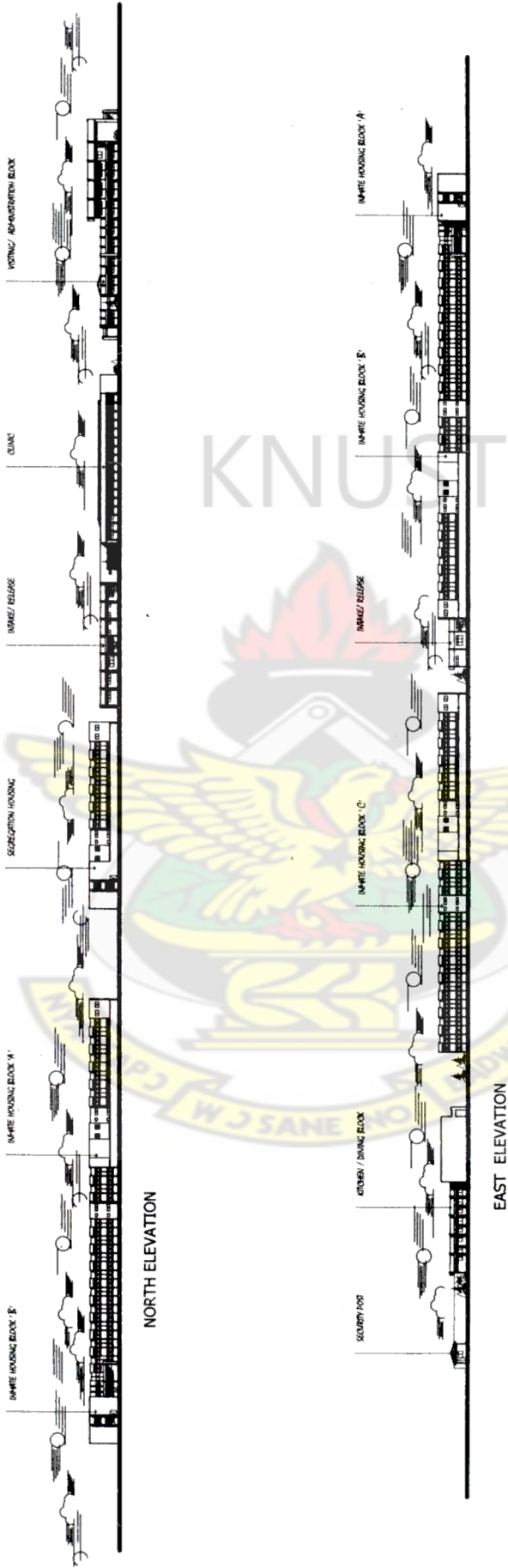
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**REGIONAL CORRECTIONAL CENTRE - NKETIA**

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APPENDIX: B

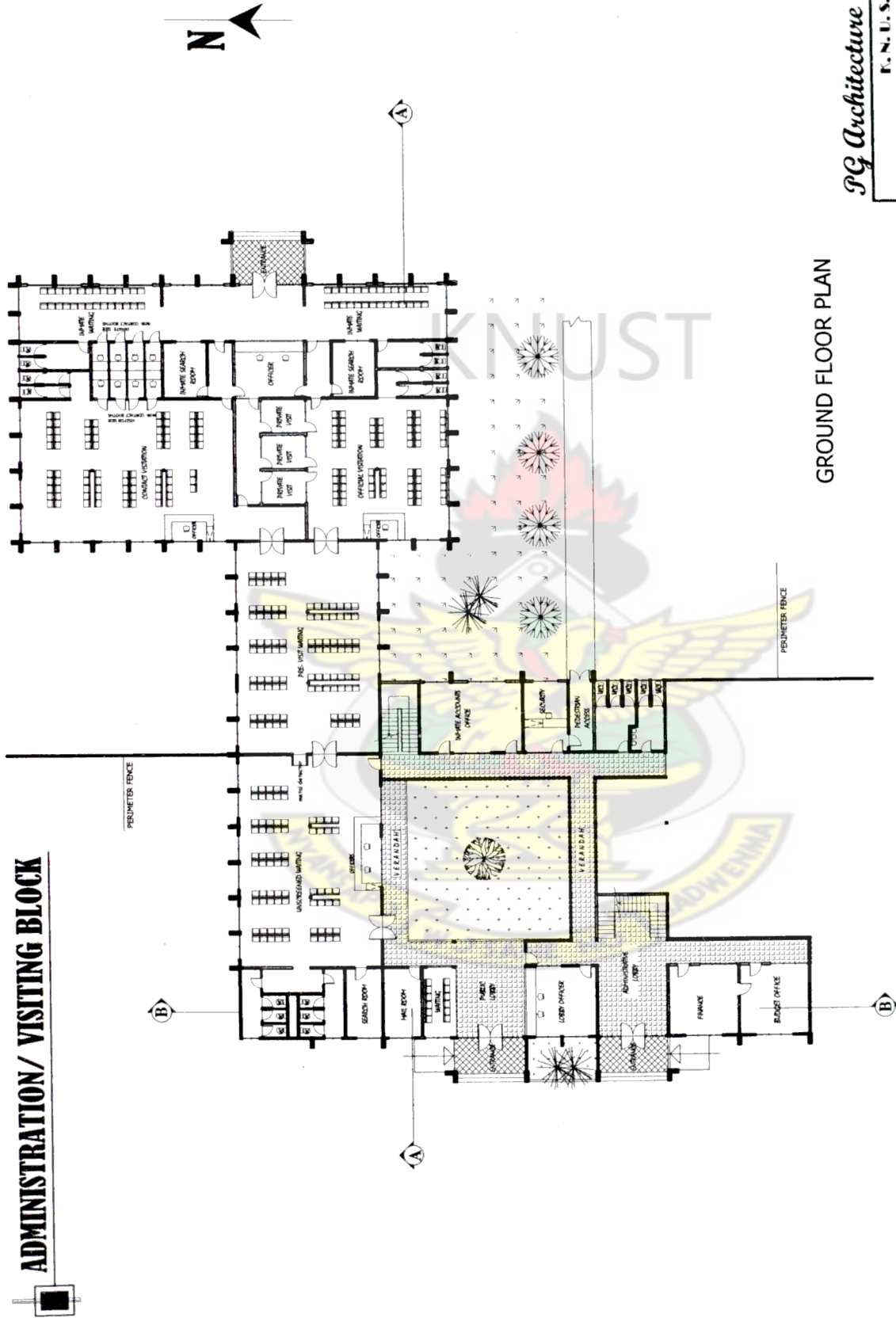


PQ Architecture Design Thesis

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# ADMINISTRATION/ VISITING BLOCK



GROUND FLOOR PLAN

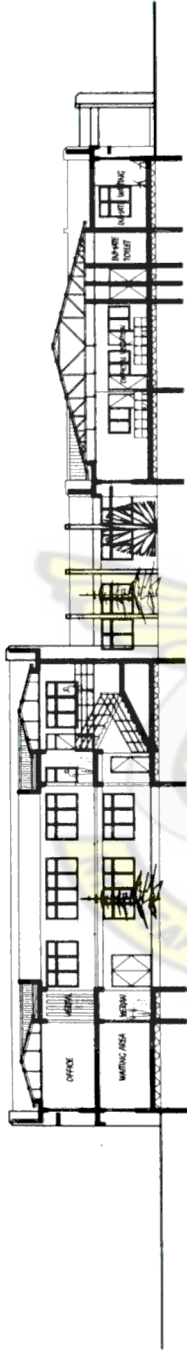
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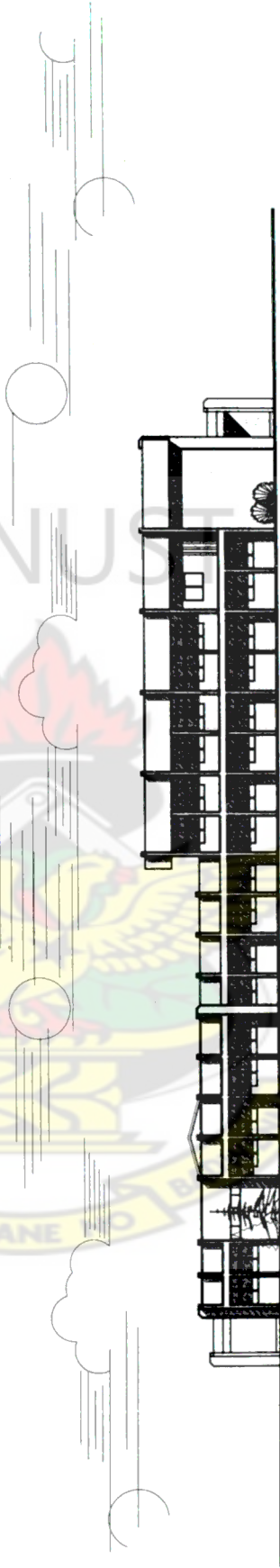
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ADMINISTRATION / VISITING BLOCK



SECTION B - B



NORTH ELEVATION



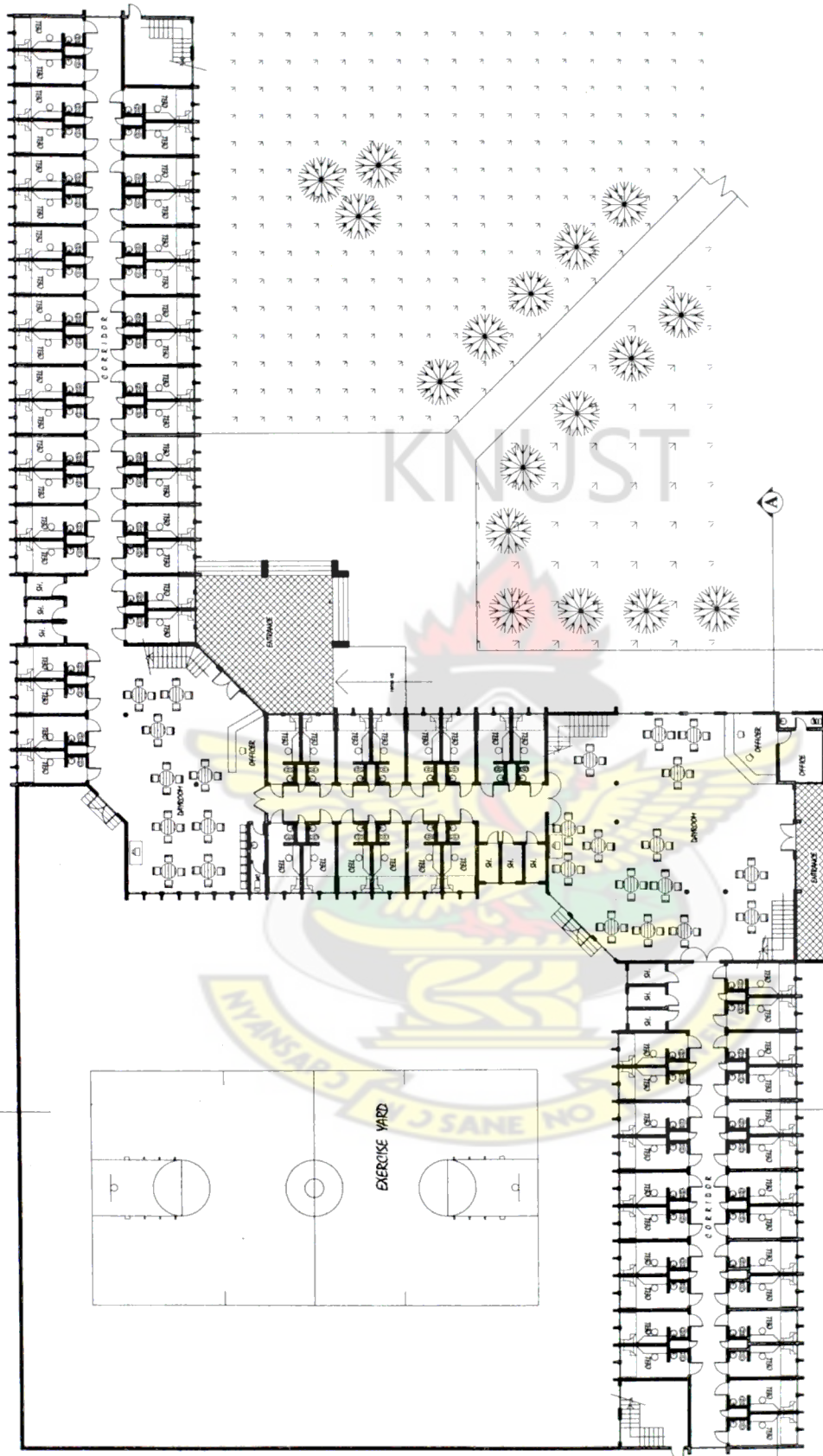
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INMATE HOUSING UNIT



GROUND FLOOR PLAN

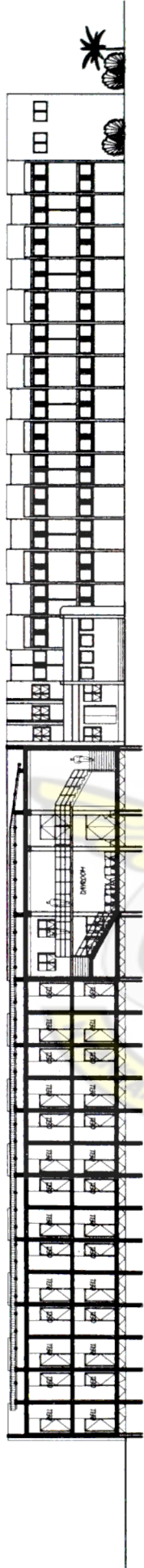


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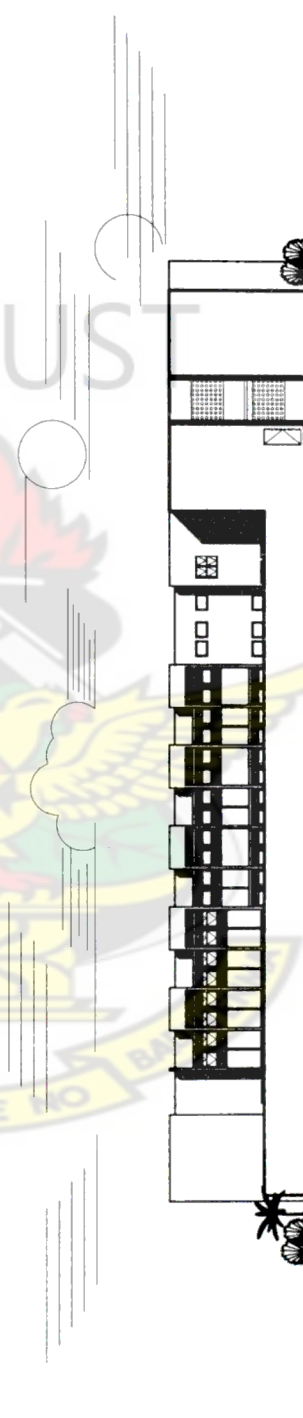
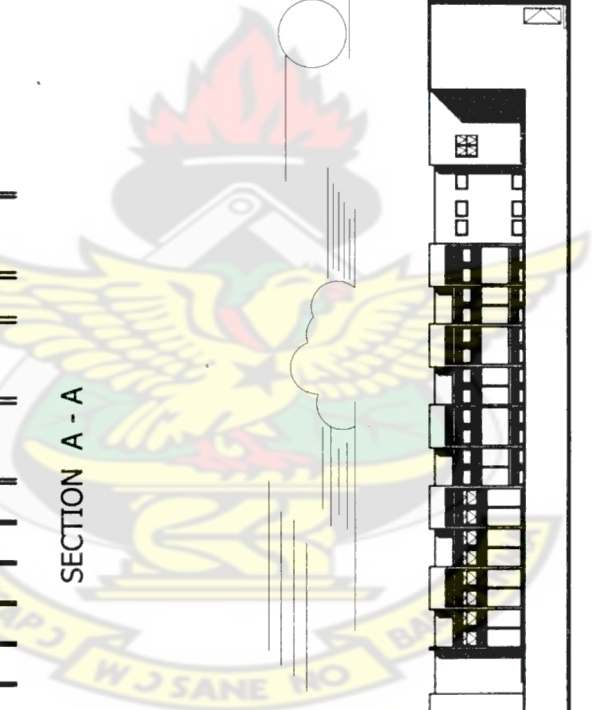
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INMATE HOUSING UNIT



SECTION A - A

KNUST



WEST ELEVATION

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