COMPARATIVE STUDIES
FOR THE
PHYSICAL ENVIRONMENT
OF
CORRECTIONAL INSTITUTIONS

by

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THESIS ABSTRACT

"COMPARATIVE STUDIES FOR THE
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Submitted to the Department of Architecture
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the requirements for the degree of
Master of Architecture in Advanced Studies.

This thesis relates correctional institutions, with their physical environments and architecture. It is a study of the field of corrections from the architectural viewpoint.
The thesis includes two parts: the research or analysis, and the comparative designs.

The first part includes, the evolution and history of prisons, along with a thorough analysis of all the physical, psychological and sociological issues, present in a correctional environment. The issues, are analyzed from the inmate and the administrative perspective. For a clear understanding of the problems in corrections, comparisons of cell layouts, cell clusters and cells become basic components.
A time scheduling analysis and programming indicate fixed daily schedules, affecting inmates, their lives and the correctional environment.

The second part of the thesis, includes an analysis of all the prison functions and a building program developed for a medium security correctional institution, accommodating two hundred inmates. Those, are followed by three comparative designs which indicate the variations available in the architecture of correctional institutions, and the conclusive statements.

Since the thesis progressed through two distinct periods: research in the beginning, with design following, a summary of all research efforts and all thesis reviews, is included as an appendix to the thesis.

Thesis Supervisor: Eduardo F. Catalano
Professor of Architecture, M.I.T.

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Dedicated to my parents, Anthony and Fotini.

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INTRODUCTION

"One can measure the level of freedom of a prisoner, by the number of different spaces he passes through everyday".

Claude Leroy.

Jails and prisons are a part of our society and they have been neglected through the years. One out of a thousand Americans lives behind bars. This ratio is much higher for developing countries. Most jails and prisons are over one hundred years old, in bad physical conditions, and provide only minimal living standards.

Jails and prisons are two different kinds of institutions. Jails are for pretrial detention, while prisons house people convicted from the courts, usually for longer periods of time. There are differences in their design. For example, jails keep planned as maximum security settings. Prisons have three different security classifications: minimum, medium and maximum. Minimum prisons are for persons convicted of misdemeanants, and small offenses, while medium prisons are for those involved in cases such as robberies or car thefts. Prisoners charged with felonies such as murder, rape and armed robbery are handled in maximum prisons. There are no defined security classifications according to the crimes committed, hence it is very difficult to determine each security level.

Besides differences in confinement time and security requirements there are other contrasts between jails and prisons. Jails have more area alloted to guidance and counseling than prisons. In addition to residential cells, prisons have facilities for rehabilitative purposes such as educational and vocational and work spaces. Educational spaces are for the purposes of instructing prisoners and providing the opportunity for high school and collegiate certification. The vocational areas of prisons, teach inmates trades and useful skills such as carpentry and automotive repair and develop creative abilities in art, photography and theater.

This study of the correctional field was begun with limited experience and knowledge of the subject and its implications. More

than architectural skills are needed to analyze and develop it effectively. The field of Corrections involves an understanding and synthesis of Behavioral Psychology, Sociology, Urban Planning, Criminology, and Architecture, in conjunction with the technical skills of Transportation Studies and Correctional officers staffing techniques. It is a very complex problem with no apparent solutions.

In the beginning of this study, four correctional institutions in the Commonwealth of Massachusetts were visited several times. The institutions ranged from a minimum to a maximum security environment. Every prison visited projected a different image. There were the images of many people required to live behind bars in depressing and monotonous environments. Prisoners having been deprived of their liberties, privacy, identity and individuality, have lost even the few existing chances for socialization. Liberty is revealed as an illusion, a fiction. Overcrowding has increased aggressiveness and revolts. A prisoner is turned into an object, a number. Incarceration exists as a punishment, retribution, expiation, deterrence and rehabilitation. The hardest of all things to achieve in a prison environment is rehabilitation.

How can a prison be designed, that would be able to solve most of the problems of current correctional institutions? This was the primary concern in developing criteria for creating a more humane, natural, and creative environment. The intention was to achieve a situation more closely reminiscent of society rather than confined even further. Expanding the potential of true rehabilitation by placing the emphasis on educational, vocational and work programs, seems to be a solution for affecting a better environment.

After further research of correctional institutions it became apparent that inmates are only one component in a prison. The other components are correctional officers, prison administrators, government politicians and the society at large. There are many different opinions regarding the proper prison environment. Inmates desire more privacy, freedom, and rights, while guards want more physical control of the institutions. The prison administrators are concerned with satisfying the required security conditions within limited

budgets. Politicians try to please their constituency and maintain modern, secure environments, at the same time that society wishes to punish all criminals in a strict and secure prison.

Many issues must be studied prior to the design of a new prison. Different points of view are always present, culminating in a complicated program which can be translated into many varied solutions. Eventually in this study it became apparent that all the issues and problems had to be analyzed individually. The task was compounded with recognition of the unlimited approaches for any given issue. Privacy, could often conflict with safety, inmates rigths with administrative rules and societal goals.

Following the analysis of all issues, criteria for design were developed. Functional relationships were defined within the physical limits of a prison, and alternate possibilities and program organization were investigated within the framework of the goals set up by inmates and administration. Useful creative designs, can influence the prison environment and create a physical atmosphere more conducive to rehabilitation. In order to illustrate and present the new ideas prevailing in the correctional field, alternate plans and layouts for a prison have been developed. Varied functional arrangements translate the concepts into physical form, suggesting that new options should be sought in the design of a correctional facility.

A prison should be designed as a natural human environment, where inmates can feel secure and able to socialize with adequate recreational, educational, vocational and work opportunities. It should be an environment that provides the essential needs of life, and designed in the image of a city with hierarchies of circulation, focal points, activities and interaction.

The designs concluding this study are attempts to solve the correctional problems in a creative, realistic and progressive way.

CHAPTER I

THE HISTORY AND EVOLUTION OF PRISONS

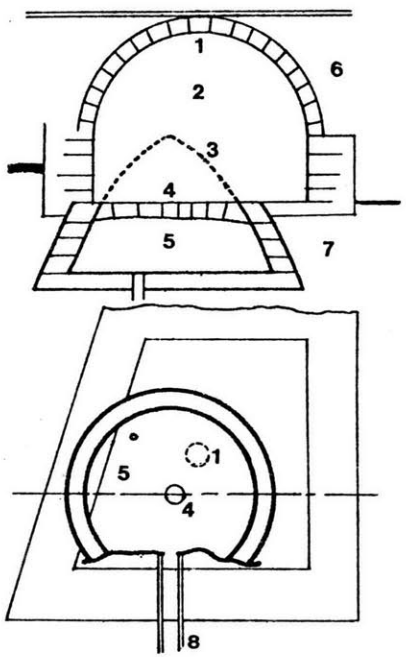
Throughout history built environments have always communicated a society's values and attitudes. This phenomenon is most apparent in the physical expressions of a society's institutions, particularly the institutions of religious and secular power. It is these institutions, the church and the government, that have most profoundly been able to control society's material and human resources; consequently to communicate their power in symbolically imposing buildings. In similar way politically subordinate institutions have also historically expressed a physical form that responds to the prevailing social and cultural attitudes. Prisons as institutions of correction for social outcasts and legal offenders are an example of this principle.

As governments developed codified laws and organized political structures, they also developed prisons. One of the earliest legal codes, the code of Hammurabi, "an eye for an eye and a tooth for a tooth", left little room for imprisonment. Retribution for crime was explicitly defined and swiftly dispensed by the ruling authority. In Classical Greece during an era when people developed democracy and the first laws of justice, Plato in his "De Legibus" described the necessary structures of imprisonment. "Let there be three prisons in the city, one for the safe keeping of persons awaiting trial and sentence, another for the amendment of disorderly persons and vagrants, those guilty of misdemeanors, to be called a 'sophronesterion' or house of corrections; a third to be situated in the country away from the habitations of man, and to be used for the punishment of felons." Incredibly his model description of that time, is in existence today.

After Plato's "De Legibus", the first archaeological evidence of a built prison, dates back to the period of the Roman Republic, at a time when most places of imprisonment were stone quarries. The Mamertime prison in Rome was characteristic of specially built public

prisons of the day, that were used for holding offenders for trial or execution. It was constructed under the Cloaca Maxima in Rome and consisted of two levels. The upper level, received light from the ceiling through a small hole and the lower level, the place of imprisonment, was completely dark. Prisoners were simply lowered into their confinement. During classical times prisons were only used for people of high rank, as those of lower rank were sentenced to hard labor, execution or possibly slavery. For the most part, the imprisonment was the result of a codified judicial process.

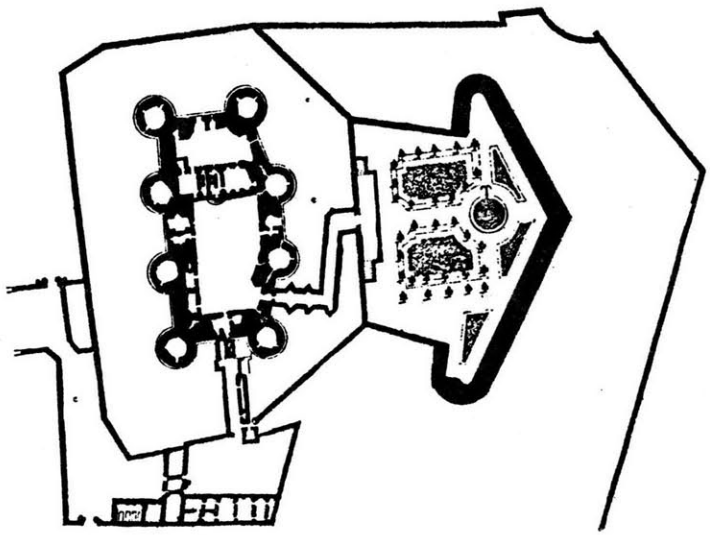
In the medieval period of Western Europe, following the decline of the Roman Empire, new social, economic and political institutions were formed. There were two societal authorities, the feudal lord and the church. Each had its own form of imprisonment. In the case of the secular authority, prisoners were kept in any available form of secure structure such as a fortress, castle, town gate or cellar in a municipal building. More often than not, imprisonment was in a simple wooden stockade in the castleyard. During this time imprisonment was only for those awaiting trial



One possible reconstruction of the Mamertine prison, Rome.
Key: 1 Opening in vault; 2 Upper prison; 3 Original dome;
4 Opening into tullianum;
5 Tullianum (lower prison);
6 Earth.
7 Tufa rock
8 Drain

by the lord, or execution after trial. The most common punishment was corporal and was meted out after trial without need of imprisonment.

With the development of military technology in the 14th century, castles were recycled as jails. The Bastille, the former residence of the French King, was the most infamous of these castles and was used as a prison until the French Revolution in 1789.



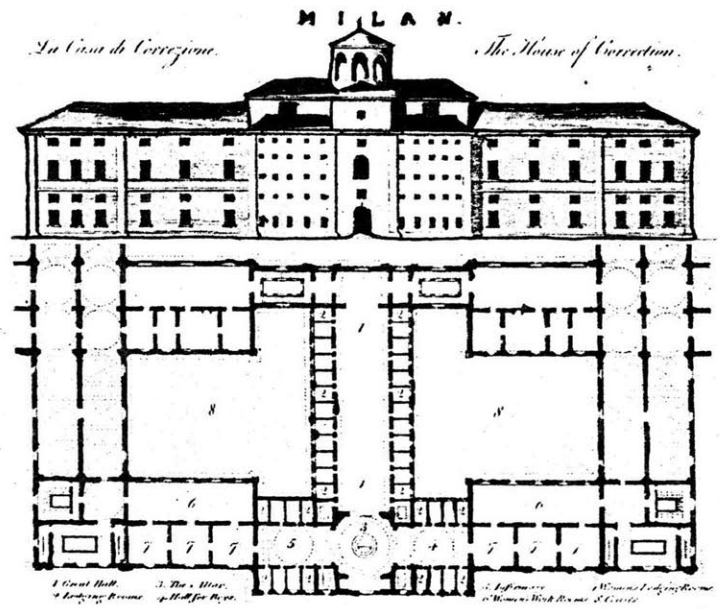
Plan of the Bastille, Paris.

The other major power during the medieval period was the christian church, that owned land, controlled serfs, provided religious instruction in monasteries and villages, and made war in order to extend its territorial rule. The notion of placing prisoners in cells, began with the punishment philosophy of the early medieval church. All the people working under the control of the church, were subject to its administrative law.

When judgement occured in the cannon courts, the wrong doer was sentenced to seclusion or solitary confinement, not simply as punishment, but as a way of providing conditions under which penitence would most likely

occur. Monks guilty of disobeying rules were simply confined to their cells. On the other hand, serfs or non-clerical were kept in special prison rooms especially designed for that purpose. Many churches during this period had underground rooms were prisoners were kept in isolation. One of the most famous abbey prisons, was at the island monastery of Mt. San Michel in France, where there were two cells directly below the ecclesiastical court in the Abbot's residence. During the period of the reformation and the ensuing inquisition, the church built large subterrenean rooms where religious deviants were imprisoned and tortured, in an effort to force acceptance to "the one truth faith". It is ironic that the archetype of prisons came from the church with its medieval philosophy of cellular solitude and suffering in order to purify the soul through mortification of the body. In placing the emphasis on preparing the soul for afterlife, the church had little concern for the physical well being of the prisoner.

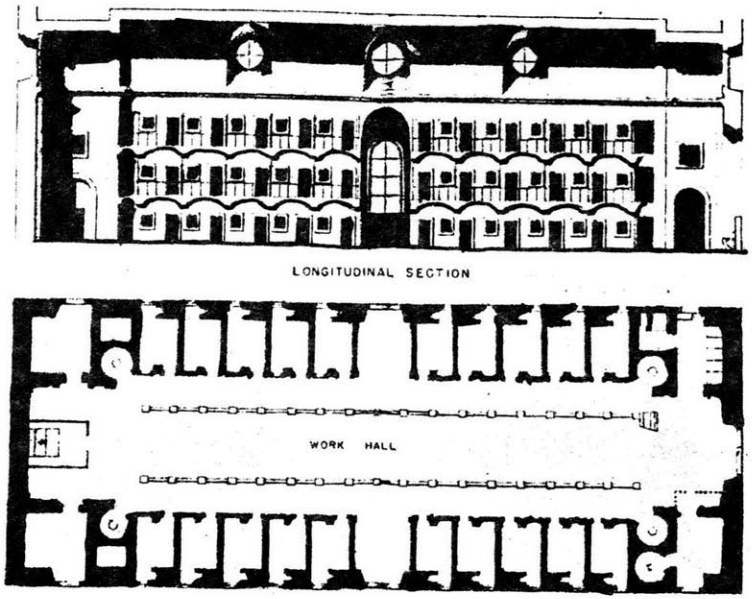
With the decline of feudalism, the rise of the merchant oriented cities and the land closure movements, there was a great deal



Part plan and section of the House of Correction, Milan.

of social and economic upheaval in Europe. People freed from the land, wandered from city to city and contributed to a dramatic rise in crime. At the same time, the spirit of humanism of the times demanded an end to the corporal punishment that was given out for petty crimes. As an alternative, vagrants and misdemeanants were sent to work houses built around the rehabilitative programs of work and the formation of "regular habits of industry." In 1576, English Parliament passed a law calling for each country to erect a house of corrections. This idea quickly spread throughout Western Europe. Although the workhouses represented a major shift in the concept of punishment, the physical form remained that of the medieval cloiser.

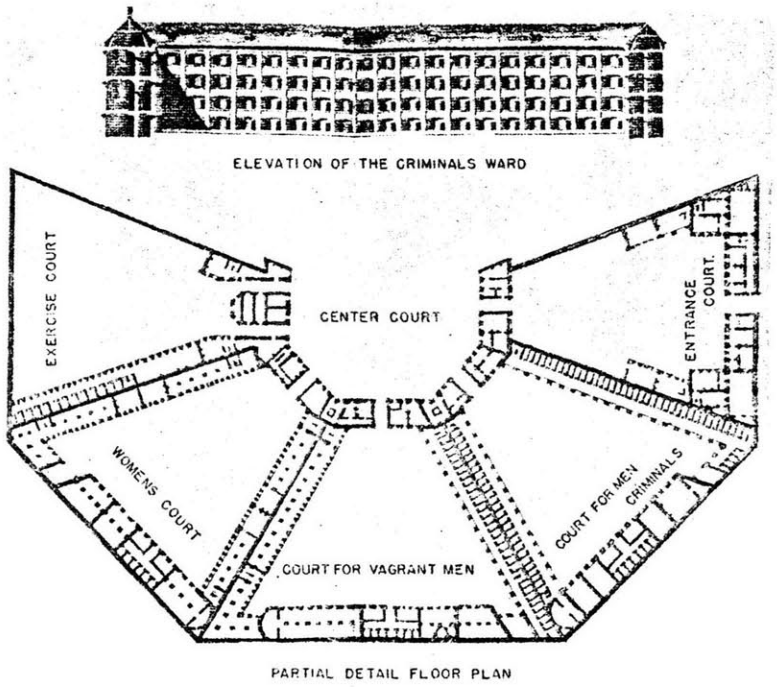
Perhaps at that time, the most famous "house of corrections", was the Hospice of San Michele in Rome built in 1704. Thirty rooms were arranged around a courtyard, which was used for work, church services and dining. In the cells young boys were chained in leg irons to work in silence for the Vatican State.
St. Michele's gave the prison its first institutional expression.



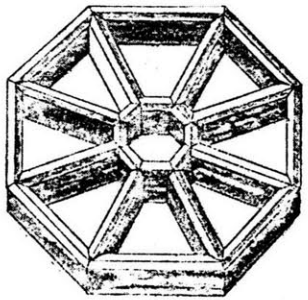
Plan and section of St Michael's Prison, Rome, showing tiers of individual cells each side of work hall, with altar one end.

The most innovative workhouse of that period, was built in Ghent, Belgium by Empress Maria Theresa of Austria. In an effort to deal with vagabonds, beggars and petty thieves, she applied management principles in new combinations: night isolation of prisoners, separation of the sexes and separation of prisoners of the same sex, according to categories based on age, degrees of criminality and length of sentence. The prison plan was octagonal and allowed for incremental growth by trapezoidal sections. Each section isolated a certain type of prisoner in a cell along the walls, while the core area held service facilities. The House of Corrections at Ghent, was a highly original institution and very advanced for the times. It influenced many of the new reform prisons in the centuries to come.

Prisons in Rome and Ghent, were studied by the famous prison reformer of the 1780's, John Howard, in his book the "State of Prisons" which was influential in the 18th century movements. The most innovative prisons, inspired Johm Howard to write his book decrying the terribly abusive conditions in the average house of corrections.

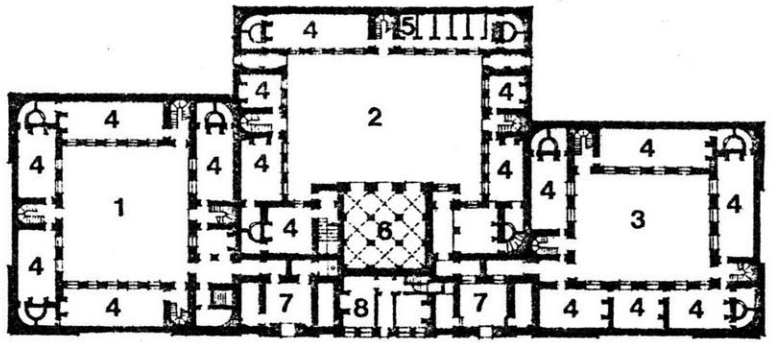


Cellular prison at Ghent. **a** the completed portion; **b** the proposed finished prison.



From the 16th century onwards, an increasing number of petty offenders were being placed in prisons and workhouses. Consequently, governments started to build rather ill-conceived buildings for the increasing number of prisoners. These jails or prisons, often contained large rooms, with little attempt to separate the sexes, adults from children, hardened offenders from the more inexperienced, or the sick from the healthy. There was little heat, weather protection, sanitation provisions, or food for those without the money to buy it. The jails, were continually overpopulated and frequently were depopulated by "jail fever", or typhus. The majority of these jails in the major European cities, were non-descript and consisted of courtyards surrounded by cells. Newgate Prison in London, England, built in 1769, was typical.

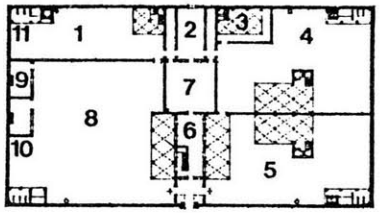
This inhumane treatment of prisoners, caused a reform movement in England in the 1780's. The movement spread to other parts of the world and the United States. The reform movement started with the humble efforts of John Howard who had traveled extensively in Europe and wrote in detail about the conditions that he witnessed. In England, Howard's



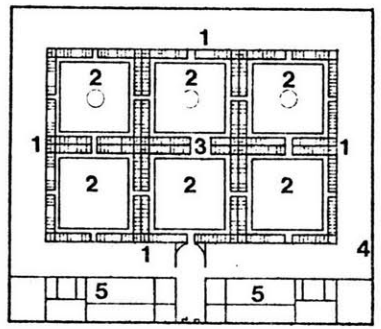
Plan of Newgate Prison, London, by George Dance.
Key: 1 Debtors' quadrangle; 2 Men felons' quadrangle; 3 Women felons' quadrangle; 4 Wards; 5 Cells; 6 Arcade under chapel; 7 Turnkey's lodge; 8 Keeper's house.

book caused a parliamentary inquiry into the conditions of the prisons. The ensuing reforms were concerned with improving surveillance and maintaining health. In the first case, reformers learned that reform was nearly impossible while prisoners were allowed to freely mingle and corrupt each other. Because, it was too expensive to construct individual cells in prisons to isolate the prisoner, it was decided to organize prison layouts in a way that would make possible the supervision of the prisoners throughout their daily routines. In a similar way, care was taken to provide for bathing, toilet facilities, covered sewers, clean water and infirmaries to isolate the sick, as well as for lighting ventilation and heating.

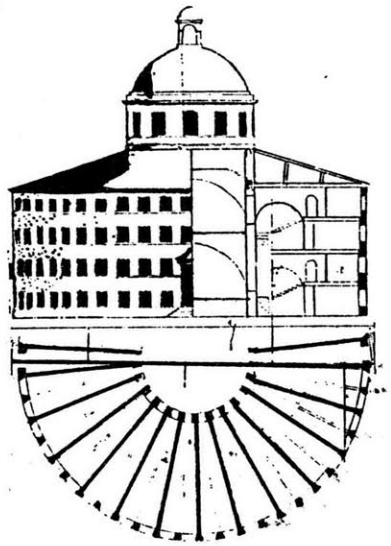
New forms of prisons were conceived, to solve these physical problems. In addition to the square plan, circular and radial plans were developed by the prison administrators and architect-builders of the day. The most forceful advocate of the circular prison, was the 18th century criminal law reformer, social philosopher and political economist, Jeremy Bentham, who proposed the panopticon. In this semi-circular prison, the cells were to



Howard's Ideal County Gaol.
Key: 1 Women felons' central ward; 2 Chapel; 3 Infirmary; 4 Young criminals' court and ward; 5 Men felons' court and ward; 6 Gaoler's house over; 7 Garden; 8 Men debtors' court and ward; 9 Day room; 10 Workshop; 11 Closets, bath, oven.

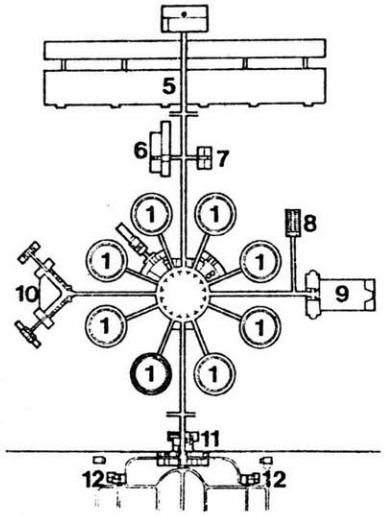


Howards' Ideal Penitentiary.
Key: 1 Cell blocks; 2 Court; 3 Chapel; 4 Security wall; 5 Administration.



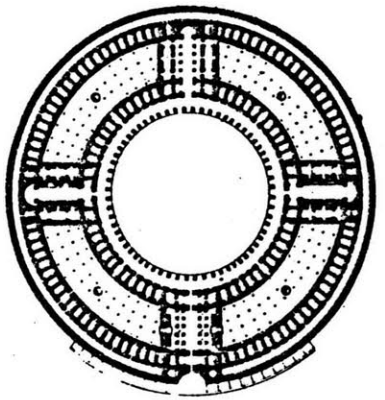
Bentham's proposed panopticon surmounted by circular chapel.

have barred fronts, and to be heated in winter and artificially cooled in the summer, by means of air forced over ice and directed through flues into the cells. Speaking tubes would connect each cell with the keeper's tower in the center of the prison. By these means, the keeper could have continual unseen visual and auditory surveillance over the inmates. This solution was never built in Bentham's times but was built later in other countries. In the United States a panopticon type prison was built at Stateville, Illinois, called the Illinois State Penitentiary.



Original plan of Illinois Penitentiary at Stateville. Only four of the panopticons were ever built.
Key: 1 Panopticon cell houses; 2 Dining hall; 3 Kitchen; 4 Bakery; 5 Workshops; 6 Laundry and shower; 7 School; 8 Special cell house; 9 Chapels; 10 Hospital; 11 Administration; 12 Wardens' houses.

Another reformer of the time was William Blackburn, who experimented with different arrangements around a central governor's house, that would provide surveillance. Different classes of prisoners were kept in separate cellular blocks by a party wall, so that a variety of classifications and separations could occur. An example of this plan was the Suffolk Jail in Ipswich.

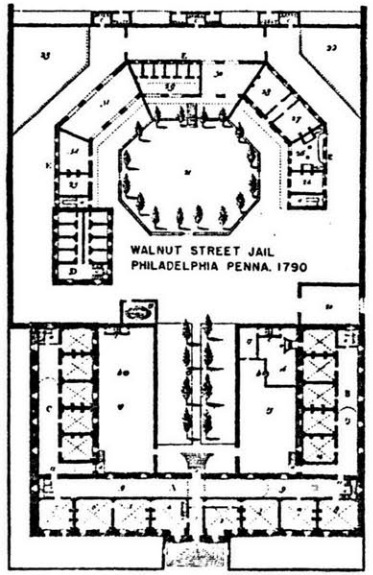


French panopticon design by Bellet.

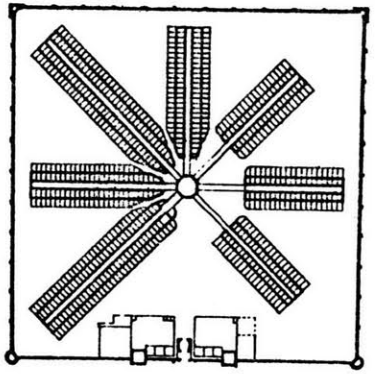
The radial plan, became extremely popular in England throughout the 19th century. The writings of journalists, captivated by these

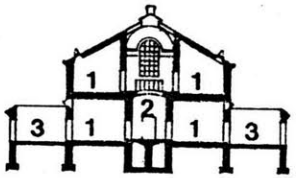
rationalistic plans spread solutions in all of Europe as well as to the American Colonies. In these prisons, the typical cell had no toilets or running water. Construction was of stone and occasionally there were hot air furnaces at the lower level and stoves at each corridor level. Doors were of iron or wood with a small viewing window for observation.

In the United States, prison design paralleled that of England. Colonial jails were similar to the Newgate Prison. It was in the Quaker colonies of Pennsylvania that the innovations of the American prison system occured, from outrages against the Newgate method. The quakers developed a reform program for rehabilitation which called for isolating the inmate so that the solitude would give him time for reflection and contrition. This would also protect the naive, from exploitation from the more hardened criminals and would prevent inmates from participating in riots, escapes or violence against the prison officers. The program was designed to punish, but also to permit religious instruction and visits from the philanthropically involved.



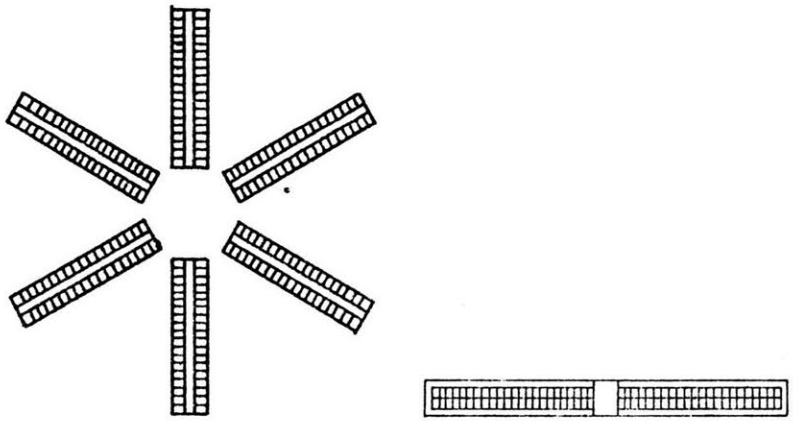
Walnut Street Jail, Philadelphia; the first American prison to attempt segregation of prisoners.





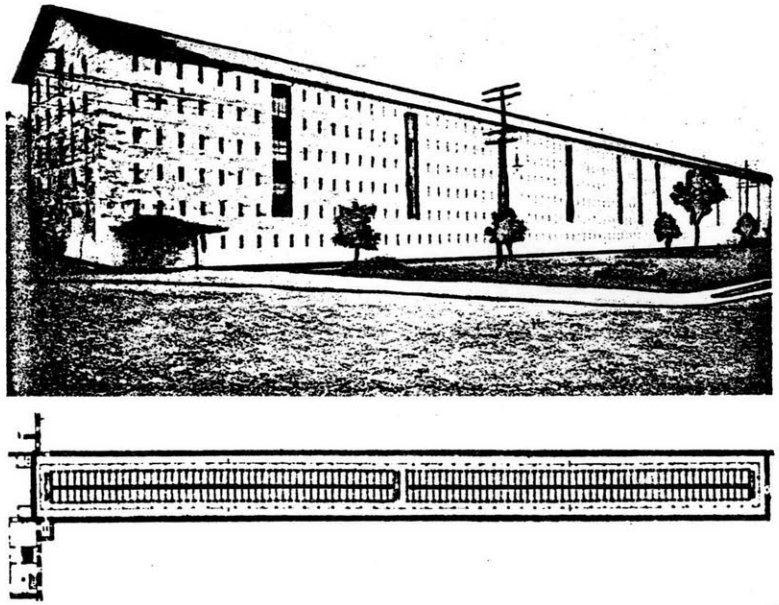
Eastern Penitentiary, Pennsylvania. The basic radial plan shape for all other 'Pennsylvania' prisons

The first formal expression of these principles, was an Eastern Penitentiary at Cherry Hill, Pennsylvania, which was built in 1827 and used until 1966. The architect, John Haviland, chose a radial scheme with a central building for a laundry, kitchen and chapel. The cells, contained running water, toilets, and had adjacent exercise yards. The inmate, stayed in his cell throughout his entire stay in prison. This prison, became the prototype for prisons in Europe during the 19th century.



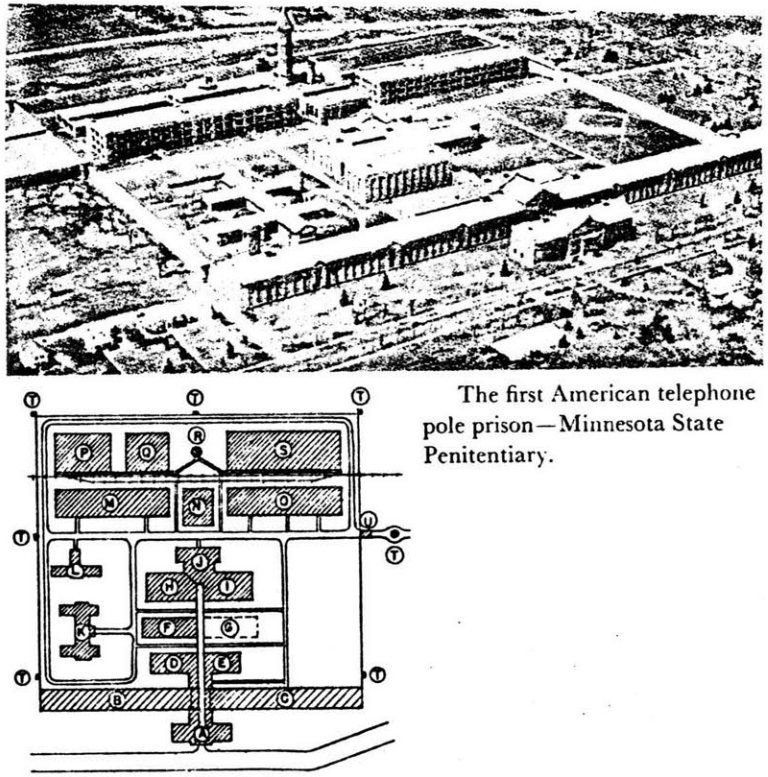
Two typical plan forms of the two basic American penal systems: the radial plan of the Pennsylvania system, the stick form of the Auburn system.

Together with the Pennsylvania system, another important prison type developed in the United States. This new type of prison, was the Auburn System. It arranged inmates in back to back cells, within a larger cell block, with a perimeter corridor as opposed to the central corridor of the Pennsylvania System. It called for, congregated work in open spaces by day, with solitary confinement during the night. The system was cheap to build, required less maintenance, and created a more productive inmate work force. This made the system very popular in the United States, as the puritan ethic of the Americans would not allow the inmates to be partially



productive, as in the Pennsylvania prison system. However, unlike the Pennsylvania system, the Auburn system provided no toilet facilities within the cell. The most famous Auburn prison, was built at Sing Sing in 1825, a prison that was to remain in use until 1943. This was the standard prison form during the 19th century.

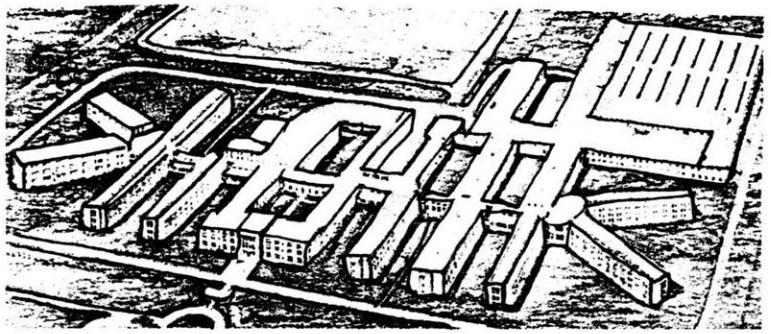
A third form of prison, which developed in the later 19th century, was the telephone pole plan, which consisted of a series of cell blocks, service areas and shops flanking a long central corridor. The scheme came with the gradual relaxation of the need for maximum security and isolation of the inmate in favor of allowing the inmate, to freely move from one portion of the prison to another. This movement allowed for rehabilitation programs, vocational education training and professional services. The first example of this scheme, was the State Prison at Stillwater, Minnesota. In this prison, a central connecting spine joined Auburn-like cell blocks with service wings and dining areas. Shops and industrial service areas, were not connected.

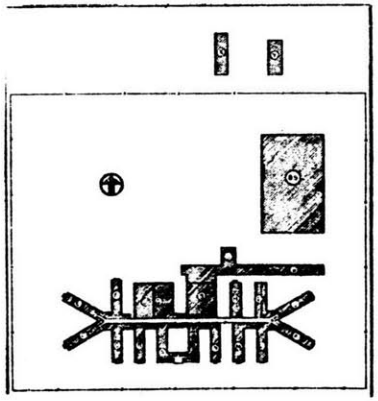


The first American telephone pole prison—Minnesota State Penitentiary.

A similar and more refined telephone pole scheme was built as the Federal Penitentiary in Lewisburg, Pennsylvania. The prison had several grades of security adjacent to the circulation spine. Maximum security was within the inside cells(Auburn) and the medium security was with outside cells(Pennsylvania). It was the first prison to be built around classification, with 75% of the felons not requiring maximum security. The model of Lewisburg, was the standard prison design throughout the 1960's.

The telephone pole plan prison, reached its logical conclusion with the construction of the maximum security prison at Camp Cook, California. Here, 1500 inmates were kept in varying degrees of maximum security in a facility built as late as 1947. A similar prison was built at Soledad, California, which also housed 1500 inmates. These ultimate correctional institutions required personnel to use a bicycle to get from one end of the facility to the other. This form of telephone pole plan institution was copied by unimaginative architects for facilities throughout the United States.



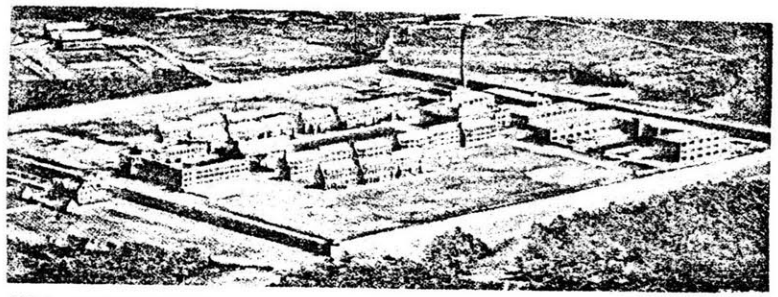


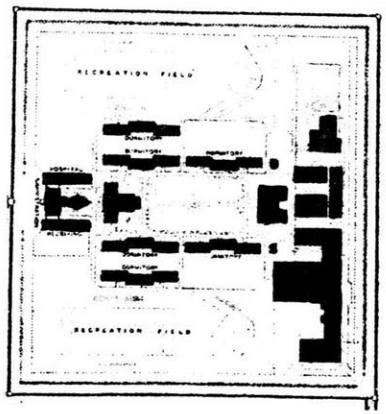
Maximum security disciplinary barracks, Camp Cooke, California.

During the mid-20th century, it became apparent that the emphasis on classification, academic, and vocational training wasn't working to rehabilitate the inmates. Reform efforts were then directed, towards creating a more natural setting for inmates to live.

New medium security prisons were built, patterned after college campus layouts. Norfolk Prison, Massachusetts, built in 1927, was an early example of this kind of instituyion. Inmates lived in dormitory settings in either private or shared rooms. Vocational, educational and social services were located around a village green, where inmates were free to circulate. Initially the prison was built with only a fence surrounding it, but later officials insisted on building an enclosing wall.

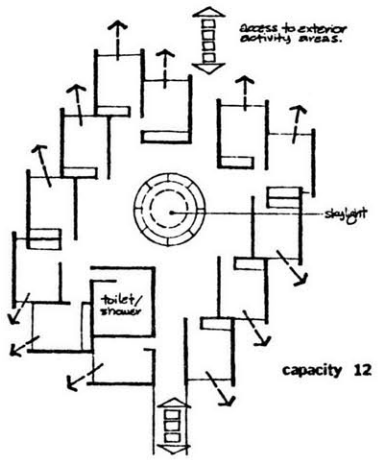
The campus planned prisons, proved to be very successful in rehabilitative efforts and did much to encourage new behavioral research and program experimentation by prison planners; in physical settings that might encourage better rehabilitation. Today, these experiments are going on in earnest, as older outmoded prisons are in



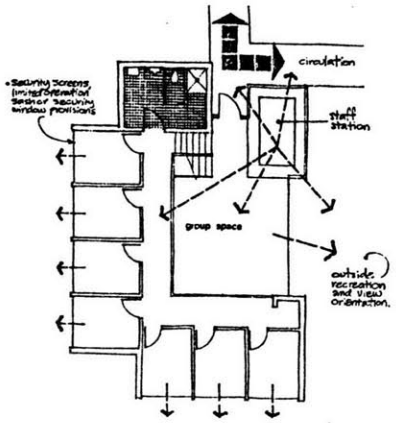


The Norfolk Community Prison, Massachusetts. An experiment in allowing relative freedom within a secure perimeter.

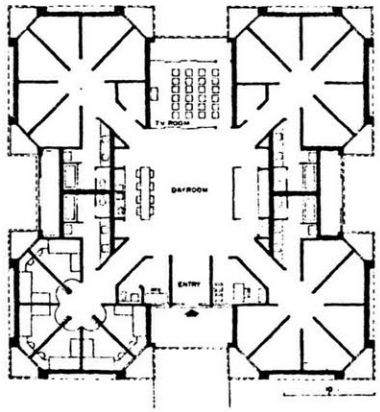
need of replacement. Present directions call for smaller, more decentralized facilities within communities and physical environments that will restore human dignity and self esteem. Even with these seemingly positive new approaches, there is still disagreement among correctional policy makers, about the direction of future reform. It should constitute improvement of the physical environment or improvement of existing rehabilitation programs.



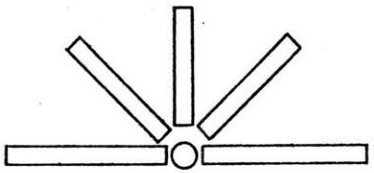
More informal grouping of single rooms around central activity space.



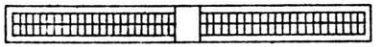
Seven rooms at upper level, seven rooms at lower level, group space and entry at middle level.



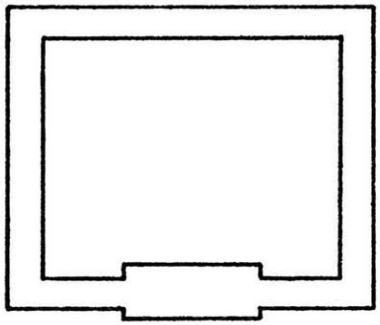
Cell arrangement for South Carolina Womens' Institution at Columbia. Cells are grouped in four units of six each. Each cell has a small window and cells are orientated so that inmates can converse comfortably. TV rooms and washrooms act as buffers between living units and open on to a central recreation space.



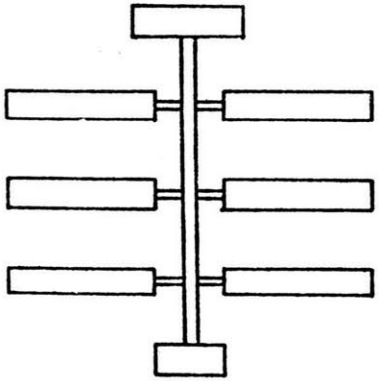
Radial plan.



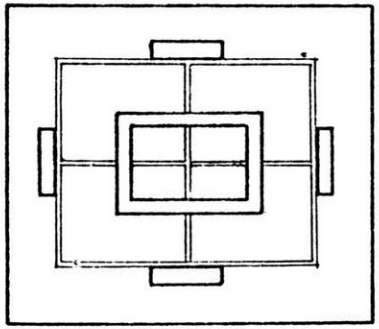
Auburn/Sing Sing plan.



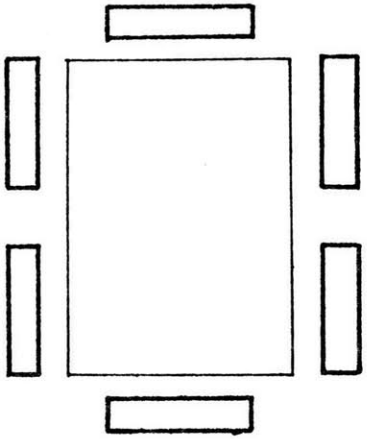
Self-enclosing plan.



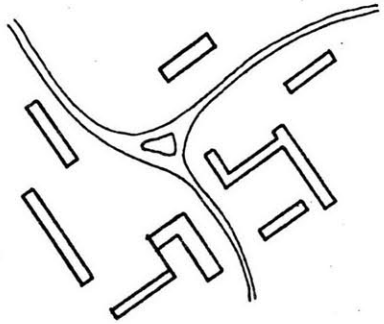
Telephone pole plan.



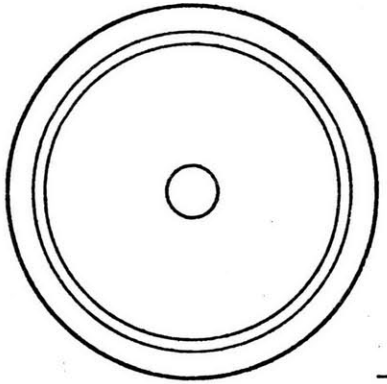
Courtyard plan.



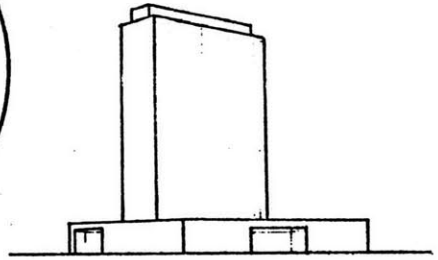
Campus plan.



Free layout.



Panopticons.



Skyscrapers.

CHAPTER II

ISSUES IN A CORRECTIONAL INSTITUTION

In a prison environment, there are many beliefs and philosophies present. Some become ideals and evolve into goals for the designer and others are considered with more skepticism. In the design of a correctional institution, those conceivable approaches should be well understood. An in-depth study of the issues is necessary to assess the involvement of inmates, prison administration and guards in the physical environment of correctional institutions.

The following material is an intensive analysis of the issues and ideals, inherent in a prison environment as seen related to inmates, the administration and the guards.

ISSUES RELATED TO INMATES:

Privacy
Flexibility and Adaptability
Social Interaction
Safety
Environmental Issues
Personalization, Identity
Adequate Stimulation
Variety
Communication and Mobility

ISSUES RELATED TO ADMINISTRATION:

Security, Surveillance
Maintenance, Serviceability
Health Regulations, Codes, Sanitation
Transportation, Mobility
Communication, Efficiency

ISSUES RELATED TO CORRECTIONAL OFFICERS:

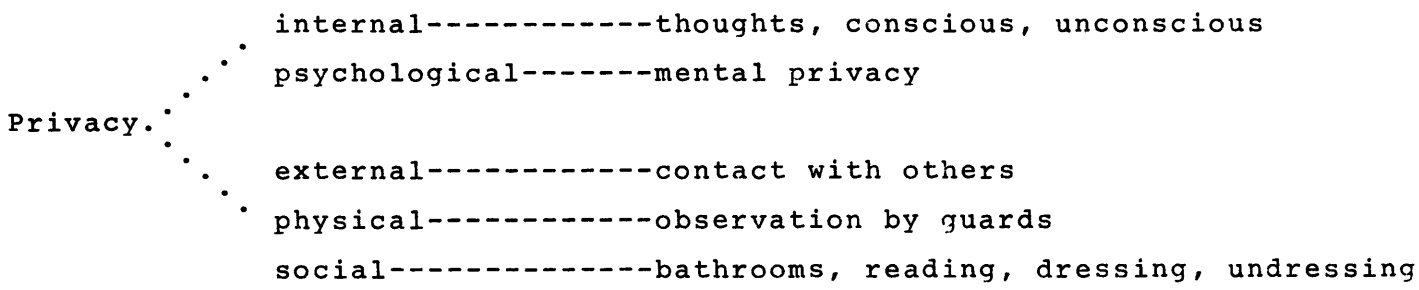
Security, Control

PRIVACY

Privacy is the quality or state of being apart from others. It is a neccessary, vital part of life and an anticipated component of the day. In a prison environment, privacy is associated with the amount of freedom available and is related to the prevailing security conditions. Privacy is of two kinds : internal or psychological and external or physical. Internal privacy is a conscious or subconscious mental perception of secrecy and independence. External privacy is related to independent bodily activities, physical seclusion and observation by other humans.

Privacy alters in different environments. Privacy in public spaces such as restaurants, schools, airports, subway stations, varies from privacy in bedrooms, bathrooms and prison cells. As a result of the long confinement of inmates in prison, physical privacy becomes more significant. Within a correctional institution, privacy differs with the degree of required security. It becomes more controversial in a maximum security circumstance rather than a minimum one. Conflict arrises from inmate supervision by the enforced rules set up by administration. Such rules require maximum visibility of all prison functions.

Activities which require privacy in society are not handled similarly in correctional institutions. For security reasons, toilets and sinks in a prison cell are visible to the guards at all times. Observation of toilet or sink use is a violation of personal privacy. Considering that cell doors are usually nonexistent in a maximum or medium security prison, human functions such as dressing, reading, writing a letter or watching television, become public acts. The opportunity for physical separation from other inmates and guards should be provided at all times. Of course, there are limits to privacy and a balance should be achieved. Because prison inmates spend most of their time in their cells, the prison cells should be alloted more privacy. That can be achieved by the use of solid doors, curtains and partition walls around toilet and sink fixtures.

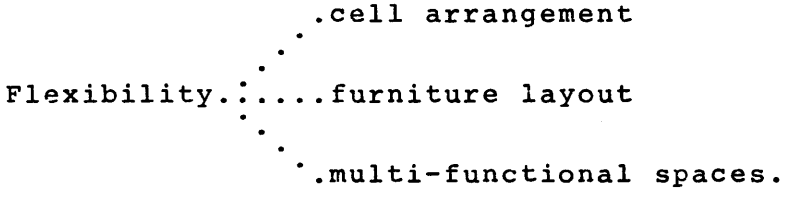

internal----------thoughts, conscious, unconscious
psychological-------mental privacy
Privacy.
external----------contact with others
physical----------observation by guards
social------------bathrooms, reading, dressing, undressing

FLEXIBILITY AND ADAPTABILITY

Flexibility and adaptability are key words in the vocabularies of modern architects, but their meanings are complicated, diverse and often misunderstood. Flexibility is the altering of existing conditions, while adaptability is the changing of future situations. In a correctional environment both factors have great importance. The level of security suggests the different categories of flexibility. Maximum security is the least flexible for the reason that no unnecessary movements are permitted. In medium and minimum security conditions, movement and activities have increased flexibility.

Programs of correctional institutions usually govern the flexibility of an architectural design. In the lifespan of a prison, program changes are anticipated, and emphasize the importance of adaptability as a factor.

To keep pace with a continuously evolving society, prisons should be capable of accomodating new ideals. People, society and their environments are in a constant state of flux. Efforts should be directed towards designing structures that will accomodate the future societal standards. Those changes can be the resultant of transformations in the physical environment of correctional programs. The physical alterations could involve inmate arrangement of furniture, choise of his cell wall color, and the location of his cell. Other changes could include the conversion of a classroom into a shop, an auditorium into a chapel and a recreation room into a dining area. Flexibility is a humane prison circumstance in both the humane and administrative point of view.



SOCIAL INTERACTION

Man struggles to survive in society. Though he may be free to move about in the world or be confined in a prison environment, community life exists and is significant. In a prison the society has all the complexities and conflicts of the outside world. The same cohesiveness and trust coexists with inequalities and injustices. The prison community is comparable to a feudal state of the Middle Ages. There are the same territorial constraints and contemporary societal values. Behavior modification of an inmate in a correctional institution results from exposure to other inmates leading to the formation of groups with similar backgrounds and characteristics.

All behavioral variations identified by sociologists subsist in prisons. The street corner society familiar to the free world, is transferred in the correctional setting to areas such as the showers and the drinking fountains. Often, newly committed inmates, ignorant of the prison community are influenced and governed by more experienced inmates. Having been deprived of societal freedoms, inmates form a protective association with common values. Friendships in prison are encouraged, and are dependent upon the size of the institution and the level of security. These acquaintances are frequently problematic. Inside a prison, contacts are under pressure from other inmate groups, the correctional officers and the administration. A strong friendship fostered in a prison environment, can be more powerful than relationships formed in the outside world.

A correctional institution should typify the outside society by attempting to provide for these normal human relationships. To allow a chance for inmate rehabilitation, this relationship should be encouraged. The transition from the community to and from a prison should be less traumatic. Perhaps a prison with both male and female inmates should be encouraged as a more natural solution. As a result of existing laws and traditions of required security, sexes and at times ages and even races are separated for greater control of the inmate population. Such segregation should not be encouraged in minimum

and medium levels of security. Undoubtedly, a maximum condition is the hardest environment in which to allow social interaction.

An increased relationship between inmates in prison and their families outside the walls should be fostered. This valuable, positive link provides the desire for a non-institutional life. Some correctional facilities in the United States afford conjugal visits for married prisoners, once or twice a month. If universalized, this program could positively affect the relationships of inmates and their spouses, by maintaining family ties, during prison confinement.

One of the most difficult tasks for a released inmate is adjustment to life outside bars. An inmate becomes institutionalized by the strict authoritative environment. When released, he is disorientated and confused. Maintaining social interaction while in prison, will deter the pattern of crime repetition by ex-inmates.

SAFETY

All citizens have a right to life. No person has the authority to removed the right and it must be ensured in society. Safety assures the protection of life, and within a correctional institution, it becomes an important issue. In a prison life, life is endangered by fire, drugs and other inmates acts. Inmates as well as guards are constantly aware of the hazards surrounding them. Safety is a function of the activities, the private or social environment, inmate behavior and the design of a prison. The materials and furniture used correspond with the level of security.

To illustrate the issue of safety, it has been found that an area with more than one function such as a dayroom, creates more danger than a private cell, which is less prone to hazard and tensions. A two-man cell, also accomodating multiple functions, is equally less safe. The prisoner's state of mind varies immensely and positive behavior can quickly change to the opposite effect, adding more problems to the issue of safety.

Prison designs should be carefully executed from the architectural point of view. Blind corners should be avoided for reasons of safety and economy, because additional staffing would be required for adequate supervision. Sufficient means of egress should be provided to meet fire regulations and prevent other hazards. The building materials, furniture and hardware utilized should be foolproof, soundproof and safe. As the level of security increases it becomes more difficult to maintain a competent level of safety.

Since safety is affected by many variables, expecting to design a completely secure prison is a utopian idea.

Safety=f(activities, environment,inmate behavior, design, building materials, furniture, hardware and level of security).

ENVIRONMENTAL ISSUES / proper ventilation, heating, adequate natural light, environmental awareness.

Environmental issues are important in all buildings, especially in large scale structures such as correctional institutions. Environmental control can become critical and problematic. Many existing prison facilities have difficulty regulating temperature, providing adequate natural light and visual access to the exterior. Unacceptable environmental conditions affect inmate behavior and instigate violence and abnormal behavior.

Ventilation and heating systems should be sufficient in power, unaccessible to inmates and efficient in all seasons. Natural light is important to human beings, therefore it should be utilized as much as possible. It stimulates the awareness of the outside environment and allows an inmate a limited relationship with the outdoors. In this way a prisoner is conscious of the seasons, the weather and the time of day. Natural light can enter a prison via cell windows, skylights located on top of stairtowers, corridors and ceilings of large spaces. Light dispersed

with variant angles and geometries is diffused and instead of appearing harsh, stems softer and warmer.

The prison environment can be enriched with a variety of spaces, vistas and unexpected interior formations. Life in a correctional institution could become more stimulating and less oppressive, than it has been. A richly varied environment can bestow a more humane and natural existence on a long prison incarceration.

PERSONALIZATION, IDENTITY

Each human being is unique with nonidentical voices, hair, eyes and personality. Habitats and lifestyles are also different. Based on that assumption cells in a prison should vary accordingly. Functionally and economically, it would be idealistic to propose diverse cells, but the spaces should still accomodate individual expression by the inhabitants.

An inmate desires a cell with no resemblance to his neighbor's. This space emerges as his personal, private world isolated from other inmates and guards. The cell should be a place reflecting the interests, creativity and character of an inmate. Identity of a space and personalization are critical in a correctional institution, since inmates are deprived of many important freedoms.

A more personal identifiable environment could be achieved by allowing participation of an inmate in his own space. Allowing the painting of cells, arrangement of furniture decoration of walls and choise of neighbors would realize the desire for identity. Personalization of a space can conflict with

socialization, but a balance should me determined. A limited amount of freedom is necessary to relase moods, emotions, frustrations and accomodate interests. There should be a chance for experimentation with materials, furniture, planning layouts, wall arrangement and color variation.

ADEQUATE STIMULATION

Stimulation is a basic constituent of life. Most creatures require some form of stimulation for survival. Man enjoys observation of others, moving, interacting and conversing, as well as the movement of inanimate objects. Everything, from the swinging of the pendulum, to the movement of an automobile, becomes an interesting vision.

In a prison environment, there are opportunities for such stimulation. Inmates usually have a choise between looking at a dark wall or through high windows at the sky. Minimal stimulation limits the chance for rehabilitation and the desire to work and achieve.

Integration of multiple prison functions in a common location, is one way of supplying adequate stimulation. Dining areas, work spaces, classrooms, and recreation rooms located near the cells, would encourage more animation.

Inmate time spent in a cell ranges from one half to three fourths of their total confinement period.

The time an inmate spends in a cell is more than the average time a person spends in a bedroom. The result of such time leisure is excessive boredom, that can be released by increasing activities and job opportunities in the cells. Hopefully rehabilitation would be fostered by the example of others working or studying. An increased emphasis on common areas and their relationship to the cells could alter the existing stale and hostile environment.

VARIETY

The environment of a correctional institution is confined and insipid, allowing few changes by an inmate during his time in the institution. Prison life is governed by a routine schedule of daily activities with minimal variety and special events. Inmates have many responsibilities to uphold, and rules and strict regulations to obey. They are asked to follow the timetable unalterably, hence there is no provision for diversity and stimulation. In most prisons for example, breakfast is served at eight o'clock and the first head count is always at nine o'clock. The rest of the day follows on a precise and strict time schedule that increases frustrations and lessens the possibilities for self expression and identity.

In a correctional institution, there should be a variance of events and activities based on multiple programs and time schedules. This variety could be instituted by altering jobs and leisure time or by creating open multifunctional areas. In the Architectural design, additional changes could affect sensory perception by diversity of movement

light, sounds and smells. A critical balance of the proposed variations is essential. Clearly formulated principles should be adhered to. A change becomes significant, when it occurs suddenly and results from a long period of stability.

COMMUNICATION AND MOBILITY

Prison communication is subject to specific rules and guidelines. Mail is censored, telephone calls are limited and visits are supervised and monitored. An intensive screening process is in operation at all times. For security reasons, mail is censored to apprehend drugs and information on escape attempts. Telephone calls are restricted to intensify security and visits are supervised for detection of contraband and importation of tools and weapons into the prison. Both factions, the inmates versus the guards and administration have logical constraints, but the enforced rules pertaining to communication incite inmate aggrevation and develop more frustrations. Basic human rights are violated. The procedure of communication with visitors through bulletproof glass, is an unnatural method of association.

As security intensifies in a correctional institution, the unsupervised movement decreases. A minimum security environment allows free, unrestricted movement. In medium security, ambulation is monitored, so that the positions and directions of every inmate are

known to the security force. An inmate is continuously guarded once outside his cell, in a maximum condition. These rules are subject to exceptions, in a case such as the dining period, when all inmates eat together supervised by a small group of correctional officers.

In a prison, communication among inmates and with society along with increased mobility in the environment, conflict with administrative goals demanding rigorous supervision and security. There is a possibility of increased elasticity of the rules, more frequent and lengthy visits, privacy of personal mail and the liberty to move through the prison with less restriction and supervision. As the correctional system closely resembles society, the chances for rehabilitation of the inmates are augmented.

ISSUES RELATED TO ADMINISTRATION

SECURITY , SURVEILLANCE

Security in a prison is usually not dependent on the type of crime committed but rather on the potential behavior of the inmate. The necessity of security in a correctional institution is imposed by the laws of the government and society. Prisons are intended to be for the safekeeping of criminals, thus they should be secure environments. A prison environment can be physically secure in three ways. At first by the use of solid long lasting materials and correct architectural design. Secondly with adequate staffing in correctional officers-guards and also with new technologies such as electronic surveillance via cameras and hidden controls. The physical and the electronic resources are both used jointly to maintain adequate protection.

Security in an institution conflicts with inmate privacy and identity. Steel bars in doors and windows can be replaced with bullet proof glass, which requires low maintanance and provides a more aesthetically pleasing atmosphere.

Split level design can be used in a prison cellblock to afford better surveillance while still providing acceptable cell privacy. With the use of geometries, an architect can design desirable angles of vision, lighted corners and corridors. The peaceful coexistance of adequate surveillance and security with inmate privacy is the goal of both the architect and the administrator.

MAINTENANCE , SERVICEABILITY

Long life, good maintenance records and adequate service are goals of the administration regarding the structural entity and the machinery of a correctional institution. Inmates are usually responsible for most of the maintenance in a prison environment. To simplify upkeep, there is a need for durable, simple and long lasting material and construction. Items such as floors, ceilings, walls, lighting fixtures and other hardware should be safe and adaptable to a changing prison environment, yet easily maintained and serviced.

For adequate cleanliness in a correctional institution even floor to wall details are important. An example of this situation is a vertical wall meeting the floor with a curve instead of the conventional ninety degree angle. The advantage of this is the reduction of dirt accumulation in corners.

HEALTH REGULATIONS, CODES, SANITATION

Institutions are subject to health and code regulations established by the state and the federal government. A portion of them concern proper sanitation, ventilation and adewuate light. Most human beings prefer inhabiting a clean, well painted warm environment, yet a prison evokes the image of a desolate cold place. With the continual fluctuation of the inmate population in correctional institutions, it is difficult to maintain quality living standards. Special attention should be given to the design of such institutions so that they will be durable, healthy and clean.

Rules regarding building materials, are at times arbitrary and reflect a lack of concern for the inmate. Walls could be designed with washable materials, to allow for the inmates expression of ideas and feelings. There should be adequate provision for a multifunctional space which would not sacrifice security.

TRANSPORTATION, MOBILITY
COMMUNICATION, EFFICIENCY

Large sums of money are spent annually for housing convicted persons in prison. Current figures indicate that the number of dollars spent per inmate is approximately eleven thousand dollars. A large percentage of this money is used for the transportation of inmates from one place to the other, within a prison. In a maximum security setting the transportation problem becomes critical. Large costs are attributed to the processing of individuals inside the correctional system and movement to and from the court house.

From the beginnings of the architectural process, these expenses could be greatly reduced through sensitive and efficient design. The creation of a simulation model to test alternative ways to move people around along with the use of high technology applications and maximization of the ratio of inmates to guards, are some of the necessary steps.

Most of the problems confronting the administration with a prison, deal with maintaining of order during transition periods. Such periods as departing for work and moving to the dining room and classrooms, are the times when riots, muggings, rapes and murders occur. During those periods the ratio of guards to inmates is very small, inmates outnumber the guard force and problems can evolve. For the success of a correctional institution, staffing transportation and correct programming of activities are a necessity.

A good communication system should also exist. Loud speakers, walkie-talkies and back up generators should be available. Such systems could be supportive in critical moments, as power failures, strikes, vandalism and riots. These efficiently designed systems should be the forces behind maintaining order and safety in a correctional institution.

ISSUES RELATED TO CORRECTIONAL OFFICERS

SECURITY, CONTROL

Correctional officers are in charge of maintaining order in a prison. This task,involves the supervision of all inmate activities, controlling of unforseen circumstances, direction of movement in the prison and occasionally informal counseling of the inmates. Another task is reporting to administration about the prison happenings and the behavior of the inmates. The life of the guards are in constant danger. Inmates view them as an authoritative representation of the administration. At times prisoners physically express their frustrations at them. The critical part of the guard's job is trying to maintain control of the prison population and also being impartial about it. The task requires fairness, toughness and overall good judgement.

On the design of a correctional institution the placement of the guards is important. Economically, each necessary location represents thousands of dollars of wages. Three to four guards are required to man such a post around the clock. Therefore, location of the guard stations in strategic positions become a serious design and programmatic consideration. The guards being in constant physical contact with the inmates end up under tremendous tensions. This strain lessens the correctional officer's ability to make fair and intelligent decisions.

The ratio of guards to inmates, necessary to control a correctional institution, varies according to the level of security, racial mix, sexes and type of institution. The correctional officers are faced with two problems. The first is that they are not allowed to carry any weapons or guns and the second is that, they are usually outnumbered by inmates.

CHAPTER III

CELL COMPARISONS - ISSUES

The possibilities available to a designer or an administrator, are indicated by the cell, as a basic prison element, through an extensive analysis. A cell, the most frequently utilized space in prison, is the center of the inmate's private life during incarceration. It is the space, that should allow many of the basic human needs and functions, and also allow for, issues previously analyzed, to become realized.

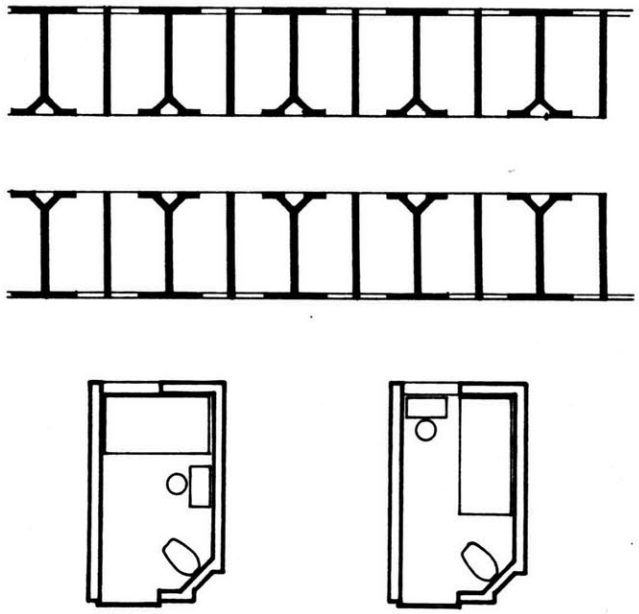
There is a need for privacy of the inmate, a degree of stimulation and socialization, along with a need for the expression of personalization and identity. Administrative viewpoints, such as adequate security and level of safety, should not be neglected.

The following drawings of cell blocks or cell clusters, and exploded views of cells indicating, varied door and window arrangements within the cells, show some of the options available. The cells are briefly introduced and are followed by an analytical chart, that further compares them according to the basic issues.

TYPE 1

Typical cell pattern, that exists in many institutions, today. A double loaded corridor, with many cells arranged in rows, f.e. (Walpole C.I.)

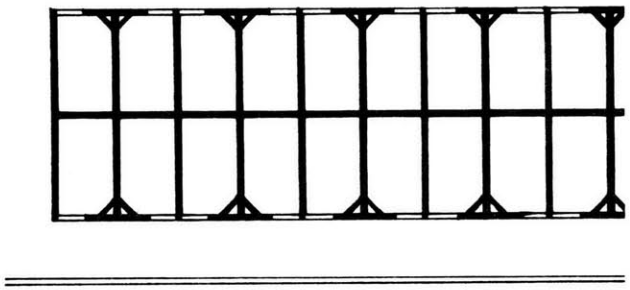
*Very little natural light, monotonous.

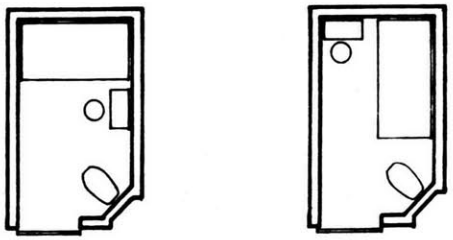


TYPE 2

Back to back interior cells, with corridors on the exterior - Double loaded cell block - Pattern existing since the 1700's, still in operation (M.C.I. Walpole)

*Almost no natural light presenr, unless it is introduced via skylights.



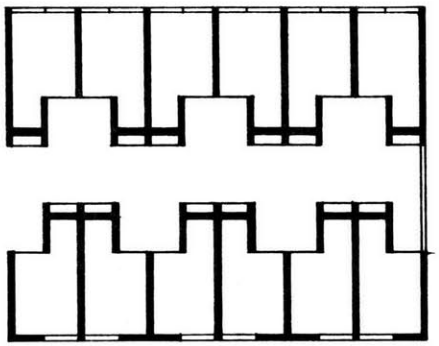


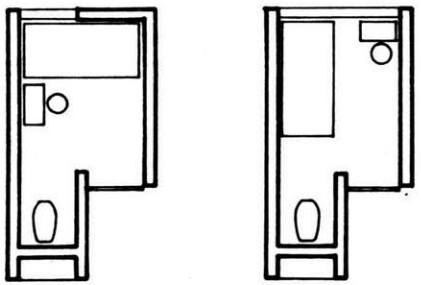
2

TYPE 3

Cells are of the "L" type, arranged for physical openness and occurence of activities between them. - Cells are grouped in two's to stimulate socialization

*Toilet has complete privacy.



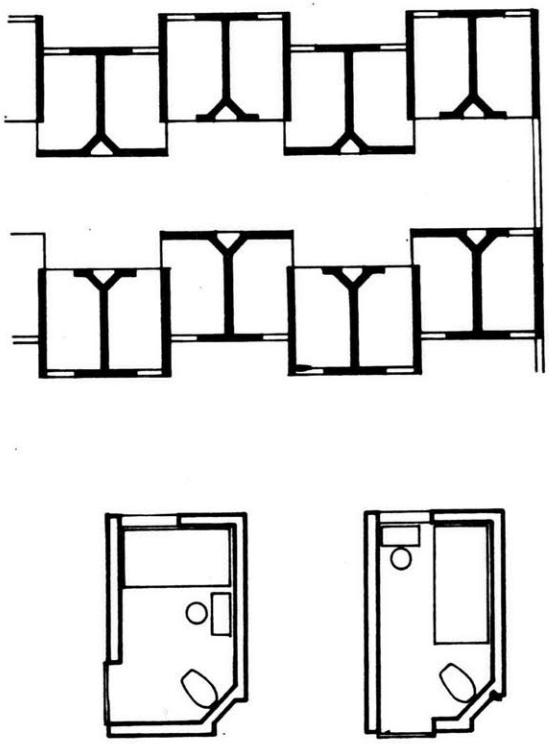


3

TYPE 4

Repetitive pattern, to introduce the neighborhood concept within a typical double-loaded cell block. Four neighboring cells, form a cluster.

*Differences in entrances and window views.

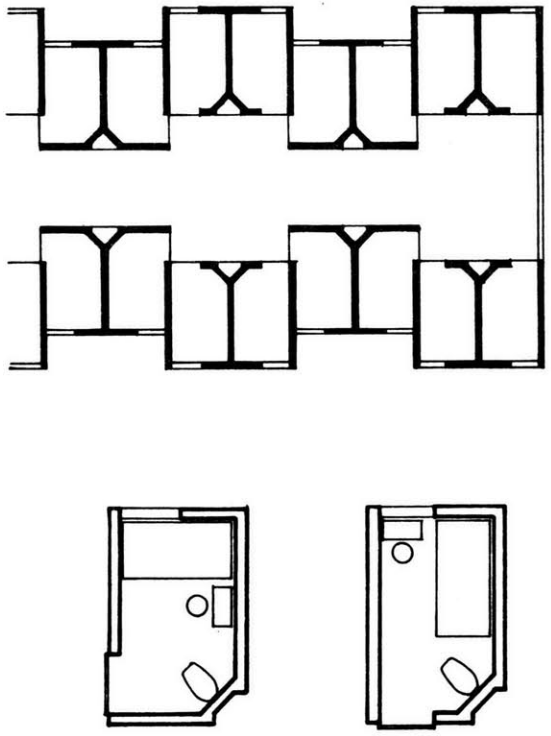


4

TYPE 5

This type, emphasizes the neighborhood even further than type 4. - Cell clusters, comprised of eight cells, can be formed, four on each side of the corridor.

*Hard to supervise

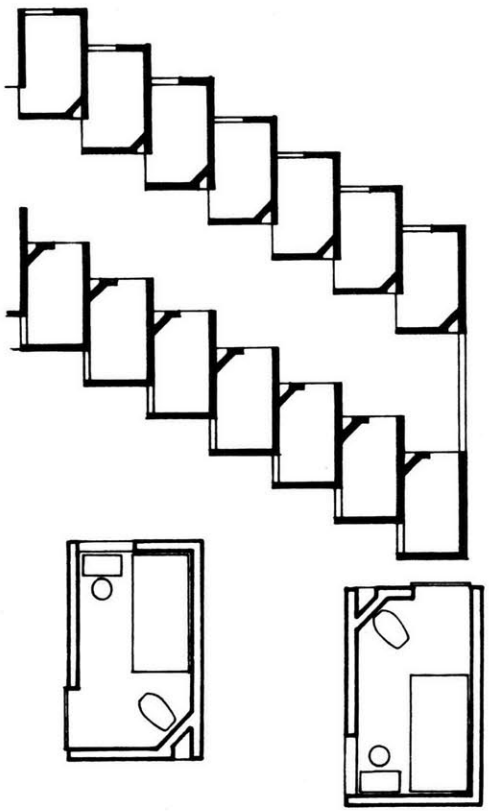


5

TYPE 6

Powerful introduction of the angled scheme, with two possible views from each cell - Privacy is achieved with the door locations, visible from a guard's location and not from another inmate's cell.

*Hard to supervise - too many corners.

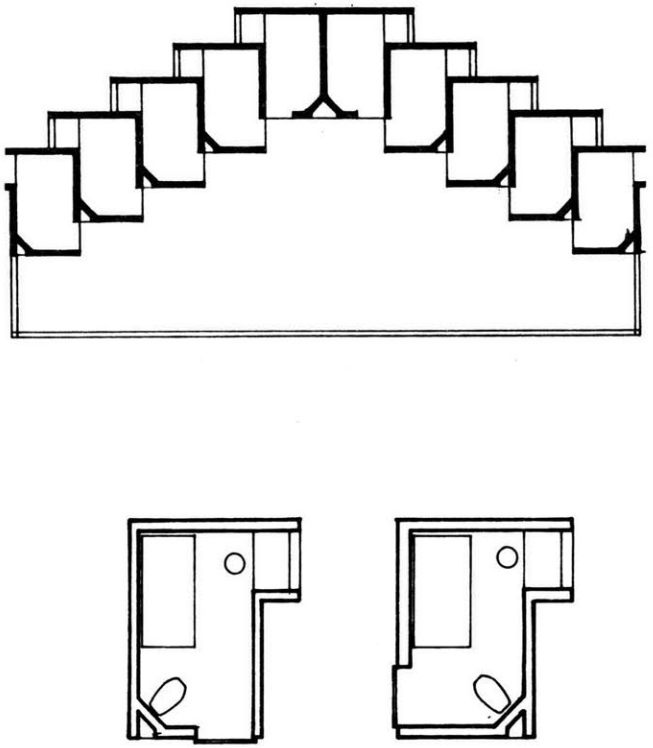


6

TYPE 7

The arrangement of the rectilinear cells around a cluster, creates an atmosphere for "cohesiveness" and a multifunctional space.

*Dayroom is advantageous, since it utilizes wasted corridor space.

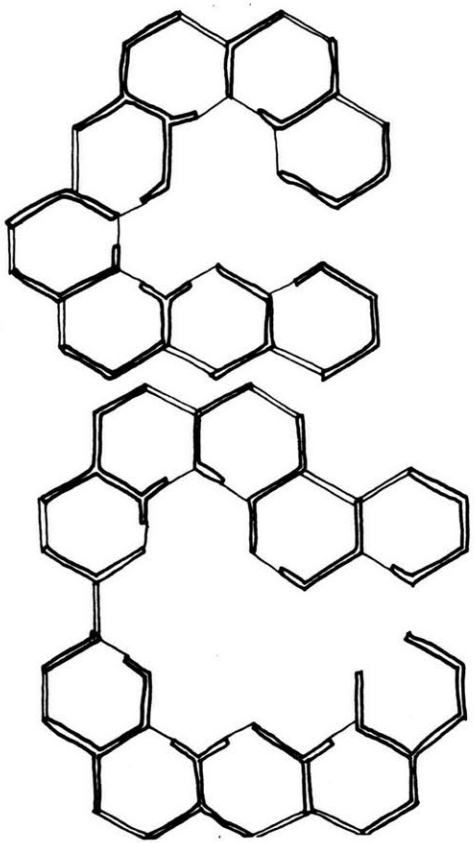


7

TYPE 8

Multi-directional cell clustering, uses hexagonal geometry - Through this geometry, spaces are diversified both from the interior dayroom and the exterior building envelope.

*Neighborhood, created along with different views, vistas and increased privacy for the cells.

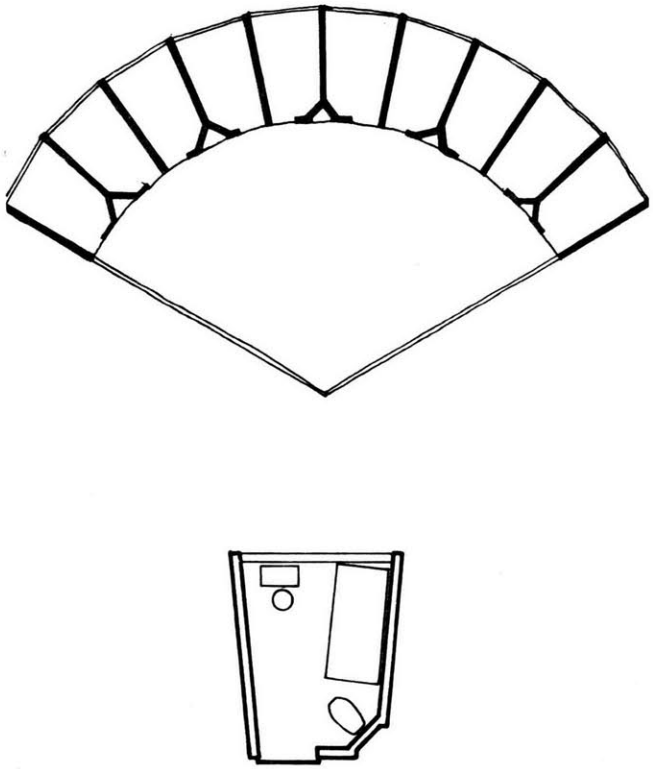


8

TYPE 9

This type utilizes, the principle of the supervision on the 120 degrees angle - The centralized, "wedged" design, is based on the central security control point, which is ideal for security and surveillance.

*Ideal for supervision.



9

CELL TYPES / ISSUES, COMPARISONS

	Level of Privacy	Level of Security	Surveillance	Socialization	Environment	Natural Ligthing
TYPE 1	minimum	medium, maximum	easy	across corridor	monotonous	adequate
TYPE 2	medium	maximum	difficult	non-existing	monotonous	bright
TYPE 3	medium	minimum, maximum	difficult	in pairs	interesting	adequate
TYPE 4	increased	minimum, medium	difficult	good in fours	identity	adequate
TYPE 5	medium	minimum, medium	difficult	in group of (8)	friendly	adequate
TYPE 6	maximum	minimum, medium	problematic	non-existing	rigid	adequate
TYPE 7	bad	medium, maximum	easy	isolation	identity	indirect
TYPE 8	excellent	min., med., max.	easy	in group of(3,4)	varies	good
TYPE 9	minimal	maximum	optimum	not satisfactory	monotonous	excellent

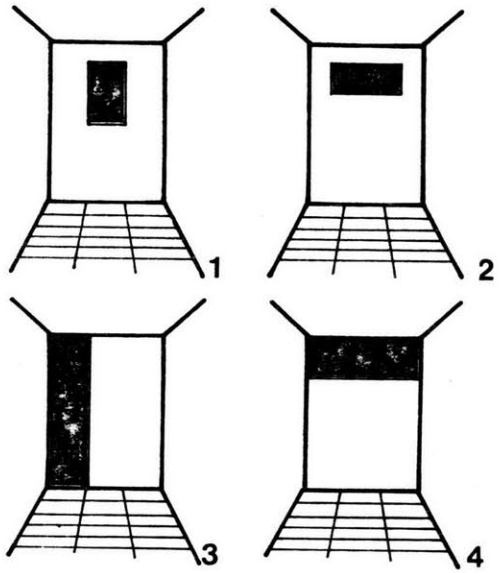
CELL COMPARISONS

Issues
- ..Environmental awareness
- ...Natural Light
- ..Stimulation

1,2, Windows are small and appear "punched" out of a bearing wall. For an inmate, it is difficult to relate to outside activities and environment. Light enters the cell harshly, from a small opening, resulting in shadows on most of the walls.

3,4, There are more human relationships to outside, with continuous glass panels from floor to ceiling as in case #3 or from wall to wall as in case #4. More light, is distributed uniformly in the cell. Light comes into the cell with a softer and warmer effect, and less contrast than in previous cases.

*A window location, is a very important aspect of prison design and should be considered by the architect.



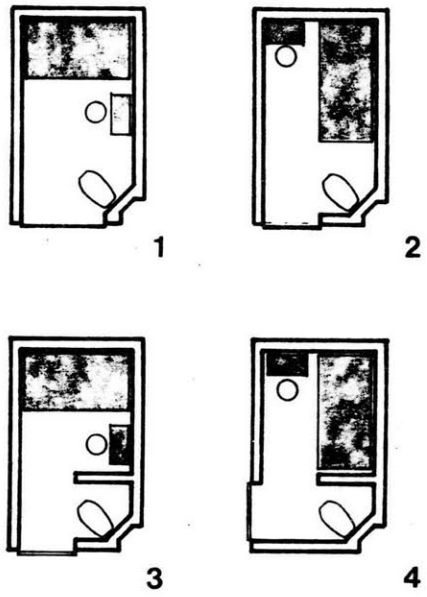
Issues.
- Privacy
- Variety
- Identity

1, Large door openings do not provide any privacy in the cells.

2, A small wall separating, direct visual contact between guard and inmate helps identify some degree of privacy.

3,4, Both bathroom area and bedroom study, have an even higher degree of privacy, although from the administrative point of view, walls create problems for surveillance and security.

*A door carefully located and small walls, can create a more identifiable, private environment.



CHAPTER IV

TIME SCHEDULING AND PROGRAMMING

The study in this chapter is based on actual data collected from the daily programs of the Middlesex County House of Corrections in Billerica, Massachusetts. This data is helpful for analyzation of the inmate's use of time. It becomes useful in understanding how programming can effect the life of the inmates.

There are six basic classifications for the scheduling of a twenty four hour day: eating, working, leisure, shower time, cells - sleeping and head count. Eating is the sum of the periods spent for the three daily meals, breakfast, lunch and dinner. Working, is the morning and the afternoon time spent in the prison jobs. Leisure, is the free time remaining after work or educational responsibilities. In general, leisure ends at ten o'clock in the evenings, when inmates are required to be in their cells. Shower time occurs daily between four and five o'clock and sleeping is the period spent in the cell between lock-up and wake-up time. Head count, is done for administrative and security reasons. It is scheduled three or four times a day to maintain security and quick identification of escapees.

The charts at the end of this chapter, show the quantity of time spent daily and weekly for each of the activities. Some assumptions are made concerning the two variables, work and leisure, knowing that sleeping, head count and shower time along with eating are constants. Other charts show the results of maximization of leisure within a cell.

The results of this time scheduling study show that inmates usually spend the largest part of their time within their cells and the least amount, at work or classroom. In conclusion, it can be asserted that all areas in a correctional institution are significant and that spaces such as cells should be given more priority.

After the examination of the programmatic

changes of such a study, it is realized that the scheduling of activities in a prison environment is a very important issue. Work is neglected and should be alloted more time consideration. Four hours and fifteen minutes a day, five days a week is very minimal, when others in society work an average eight hour day. A certain irony is apparent in such a comparison. Although, work is rehabilitative, the findings show that, leisure and sleep are instead encouraged. More importance should be given to such activities as work and educational - vocational skills, than relaxation and recreation. If a prison is to be rehabilitative, working should become at least as important as sleeping.

Time is one of the factors for improving programming, but not the only one. Another factor is the type and quality of work and the kind of leisure. Manufacture of automobile license plates requires less skills than carpentry or automobile repair. The paradox that exists in prisons, is that administrators avoid making prisons realistic schools of training out of fear that prisons will become ideal places to live and work. A tendency could develop of crimes committed with the intent of conviction to prisons resulting a steady and secure job. Despite the conflict, a reprogramming of prison activities is required, placing the emphasis on work, creative vocations and education.

WEEKDAYS MONDAY through FRIDAY

Activity	Time spent daily		Per five days		Leisure maximum		Cells maximum	
	Minutes	Percent	Min.	Percent	Min.	Percent	Min.	Percent
Eating	90	6	450	6	450	6	450	6
Working	255	17	1275	17	0	0	0	0
Leisure	300	21	1500	21	2775	38	0	0
Shower	60	4	300	4	300	4	300	4
Cells	630	46	3150	46	3150	46	5925	84
Head Count	90	6	450	6	450	6	450	6

WEEKEND SATURDAY, SUNDAY

Activity	Time spent daily		Weekend		Leisure maximum		Cells Maximum	
	Minutes	percent	Min.	Percent	Min.	Percent	Min.	Percent
Eating	90	6	180	6	180	6	180	6
Working	0	0	0	0	0	0	0	0
Leisure	570	40	1140	40	1260	44	0	0
Shower	60	4	120	4	0	0	0	0
Cells	630	44	1260	44	1260	44	2520	88
Head Count	90	6	180	6	180	6	180	6

TIME SPENT FOR SEVEN DAYS - Average

Activity	Time spent weekly		Leisure maximum		Cell maximum	
	Minutes	Percent	Min.	Percent	Min.	Percent
Eating	630	6	630	6	630	6
Working	1275	12	0	0	0	0
Leisure	2640	26	3915	38	0	0
Shower	420	4	420	4	420	4
Cells	4410	46	4410	46	8325	84
Head Count	630	6	630	6	630	6

PERCENTAGE IN VARIANCE

Activity	Regular	Leisure Maximum	Cell Maximum	Variance
Eating	6	6	6	constant
Working	12	0	0	0-12
Leisure	26	38	0	0-38
Shower	4	4	4	constant
Cells	46	46	84	46-84
Head Count	6	6	6	constant

PART II-COMPARATIVE DESIGNS

CHAPTER V

PROGRAM AND FUNCTIONAL DIAGRAMS OF A CORRECTIONAL INSTITUTION

DESCRIPTION OF PROGRAM COMPONENTS IN A CORRECTIONAL INSTITUTION/200 CELLS, MEDIUM SECURITY

PROGRAM COMPONENTS	NET AREA (SQ.FT.)	CIRCULATION (+50%)	GROSS AREA
Administration	4240	2120	6360
Medical	2970	1485	4455
Cells, Residential	23400	11700	35100
Educational, Work, Vocational, Industrial	11330	5665	16995
Dining and Building Services	10690	5345	16035
Recreation Indoors	8385	4192.5	12577.5
Outdoors	14000		14000
		Total Gross Area:	105523.5 SQ. FT.

ADMINISTRATION

Entrance, Reception Area	200
Visitor's Center	
Waiting Room	100
Lockers	50
Vending	80
General Storage	100
Toilets 2 @ 80sf	160
Inmate Intake/Release	
Office, Receiving, Clerk	120
Records	80
Fingerprinting, Clothing Storage	150
Control Operator Booth	50
Holding Rooms 3 @ 70sf	210
Toilet, Shower	30
Medical Examination Unit	100
Clothing, Changing 5 @ 12sf	60
Treatment, Classification, Education, Vocational, Work	
Educational Director	100
Recreational Director	100
Vocational Director	100
Volunteer's Coordinator	100
Parole Board Office	200
Employment Office	100
Finance Office	100
Job Placement Counsellors (3)	250
Work Release Office	200
Social Programs	100
Other Administrative	
Mail, Reproduction Room	120
Telephone, Communications	120
Conference	150
Director	150
Associate Director	150
Arsenal	100
Central Security Control	150
Staff, Guard's Quarters	300
Toilets 2 @ 80sf	160

MEDICAL

Entrance	50
Waiting Area	100
Screening, Security	50
Doctor's Offices 2 @ 100sf	200
Dentist's Work Area	160
Nurse's Station	100
First Aid, Emergency	300
Cells for Treatment 10 @ 70sf	700
Counselling, Psychiatry 3	300

Surgery, Laboratory	200
Drug Storage (Security)	150
Inmate Testing, Research	500
Staff Toilets 2 @ 80sf	160

CELLS, RESIDENTIAL

Cells 200 @ 70sf	14000
Screening, Security	800
Dayroom(s) 35sf per inmate	7000
Showers 50@ 15 sf	750
Visiting Area (special)	400
Clothing, Furniture Storage	450

EDUCATIONAL, WORK, VOCATIONAL, INDUSTRIAL

Educational Teacher's Offices	300
Vocational Offices	300
Classrooms 2 @ 750sf	1500
Arts & Crafts	80
Carpentry Shop	1200
Automotive Shop	1200
Chapel, Auditorium	2500
Audio Visual Room	200
Special Projects Lab.	750
High School Equiv./Classroom	750
Offices, Small Shops	1000
Industrial Area	1000
Small Art Studios 5 @ 100sf	500
Dark Room	50

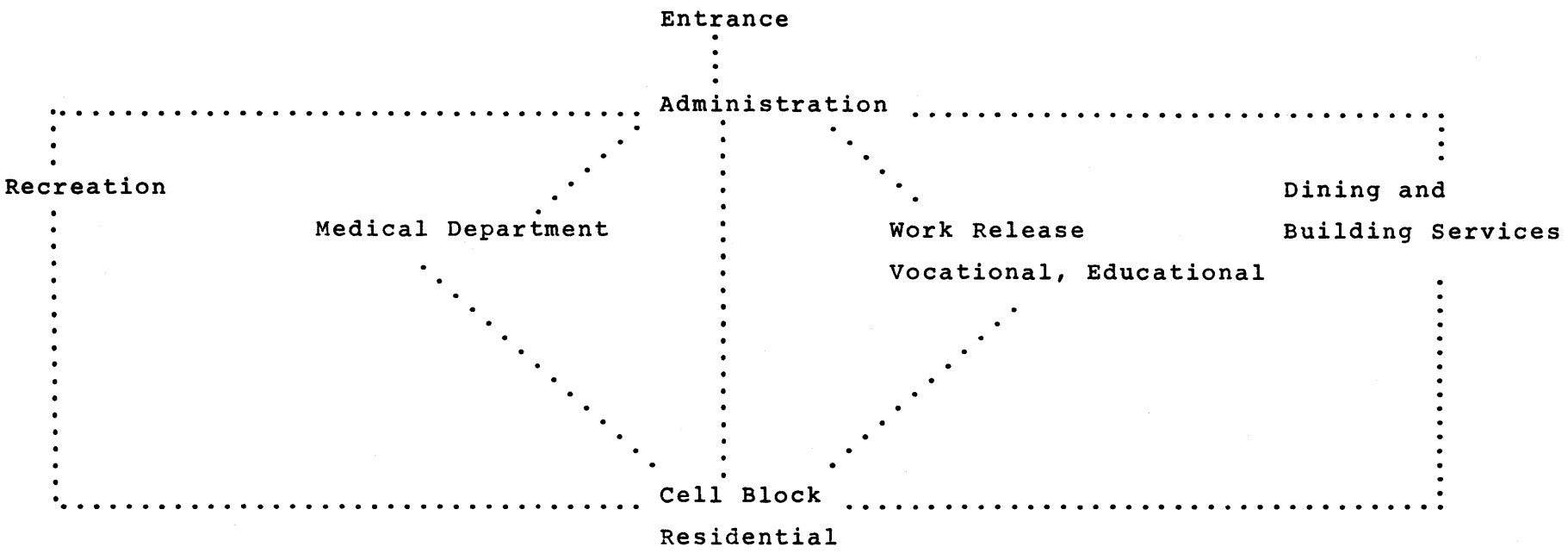
DINING AND BUILDING SERVICES

Manager's Office	100
Receiving Room	300
Building Services,Maintenance	300
Warehouse	1500
Secure Storage	250
Laundry Room	
Intake Laundry	100
Machinery/Washers, Dryers	400
Out Laundry	100
Kitchen	
Pantry Food Storage	300
Freezer	200
Refrigeration	200
Food Preparation, Cooking	1400
Dishwashing	100
Garbage Area	80
Dining Room	
Dining Area 200 @ 12sf	2400
Power Plant, Sanitary	
Emergency Generators	2500
Sanitary Station	300
Toilets, Staff 2 @ 80sf	160

RECREATION

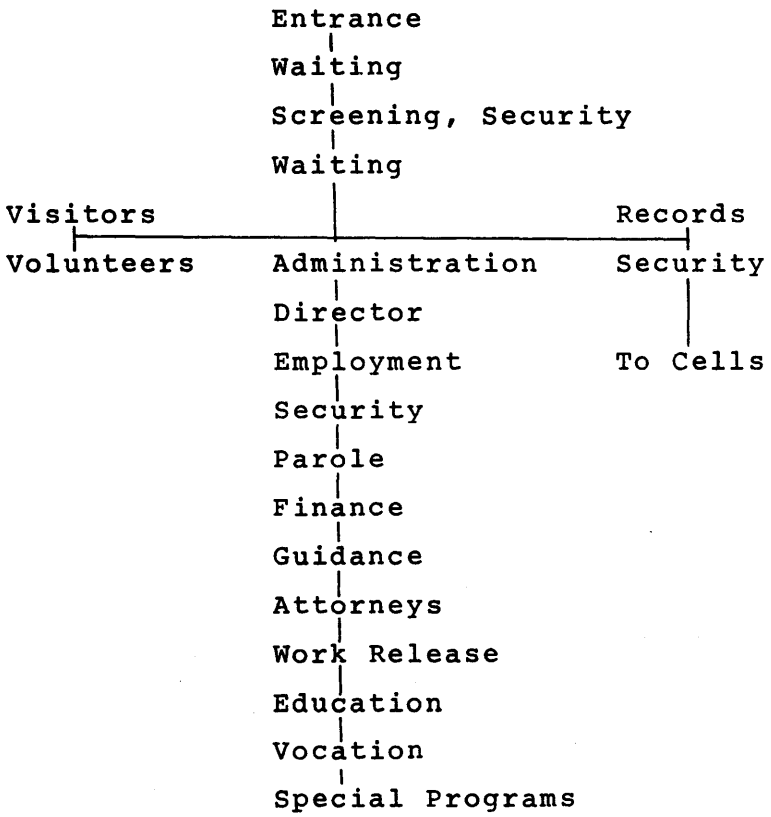
Indoors		
	Control Room	120
	Pool Room	225
	Showers, Lockers	200
	Basketball Court	5000
	Weights, Exercise Area	300
	Meeting Rooms 4 @ 200sf	800
	Small Games Area	500
	Athletic Equipment Storage	200
	Library	800
	Barber Shop	80
	Toilets 2 @ 80sf	160
Outdoors		
	Playing Fields, Baseball, Football, Soccer	9000
	Basketball Court 50'x 90'	4500
	Exercise Yards	500
	Other Field Areas	varies

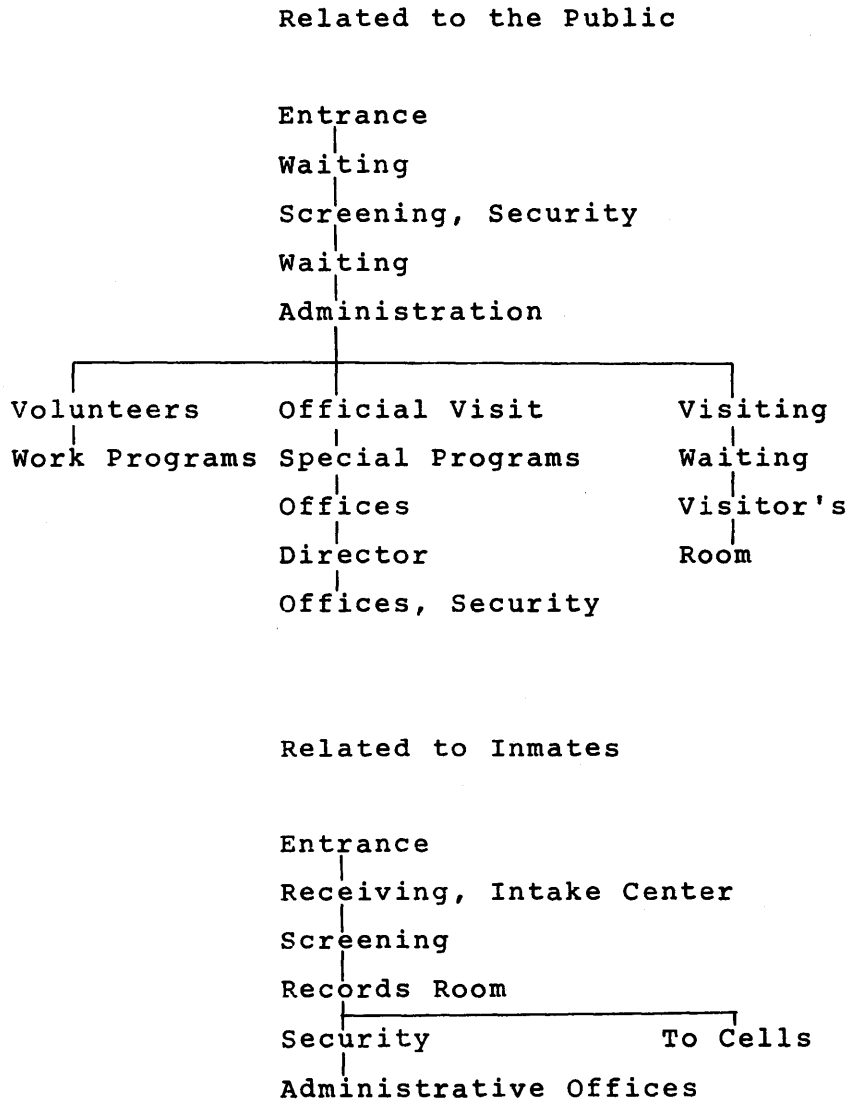
FUNCTIONAL DIAGRAMS OF A CORRECTIONAL INSTITUTION



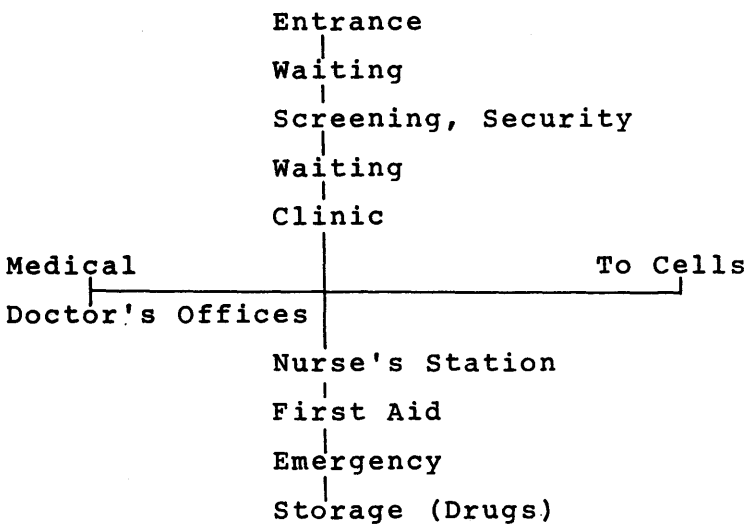
Most of the functions in a correctional institution are interrelated. The Administrative block is the main nerve center of the prison. The other parts of the building, relate to tha administration directly or indirectly. The residential area of the cells is the secondary center from where all the inmates and their movements are regulated. Work and educational areas should be more closely related to the cell area than the administration, since inmates constantly use these spaces. On the other hand, teachers and volunteers should have easy access to them, without interference with other functions. The same relations should exist for the medical and the dining and recreational areas.

ADMINISTRATION





MEDICAL



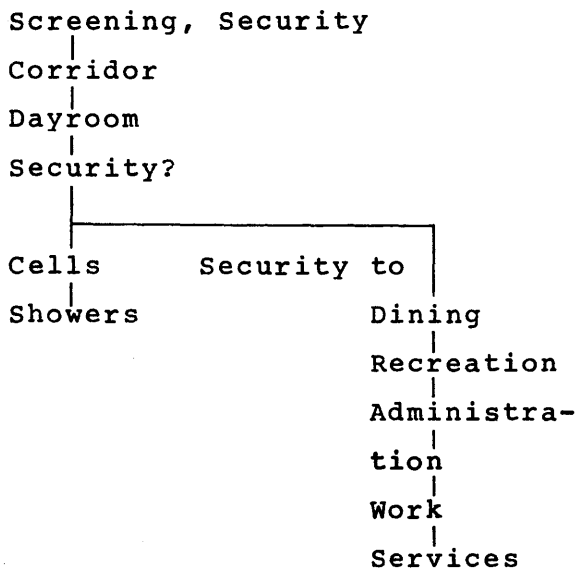
Related to the Public

Visitors of sick inmates
Employed, nurses,doctors
Volunteers
Different Research Groups

Related to the Inmates

Testing
Hospitalization
Emergency, First Aid, Surgery
Counseling with Psychiatrists

CELLS

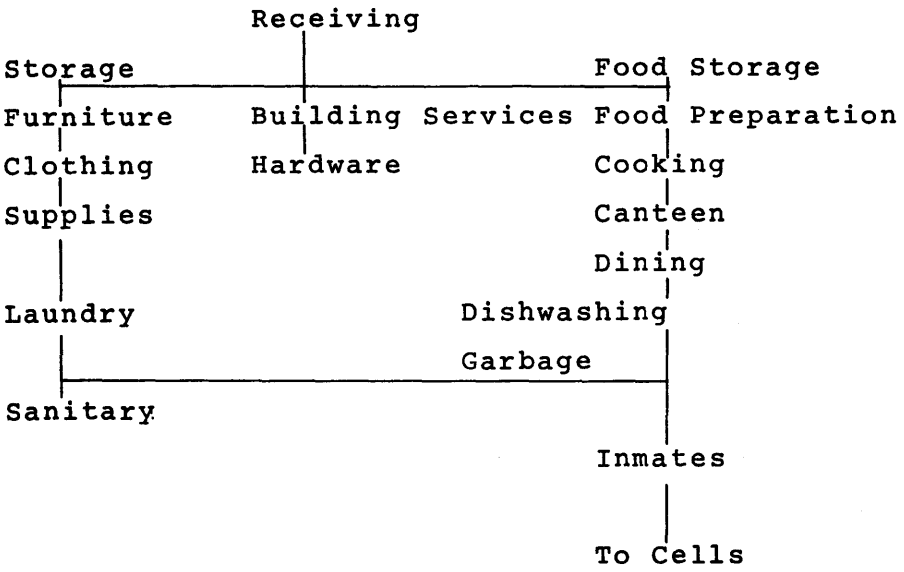


Public relates to the cells for:
Visiting
Research

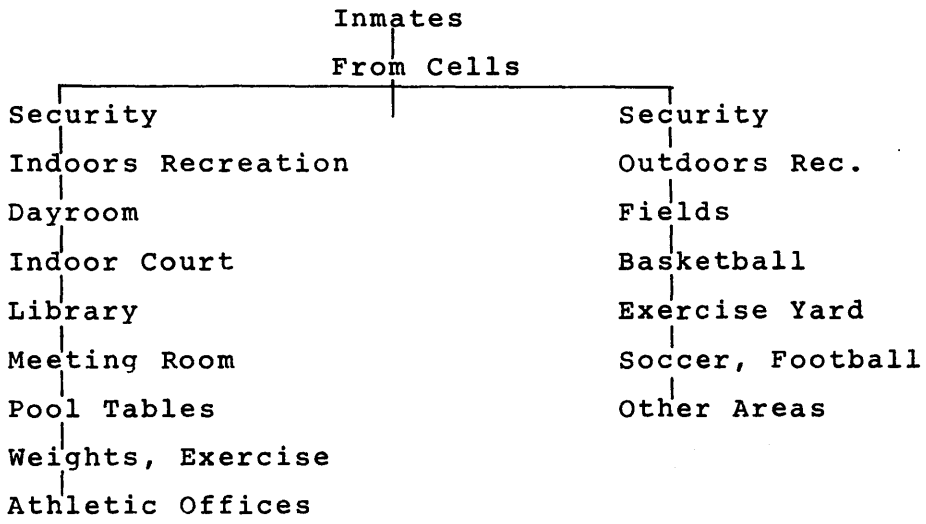
Inmates relate to the cells for:
Living
Recreation
Dining
Work, Education

Guards relate to the cells for:
Safety
Security
Surveillance

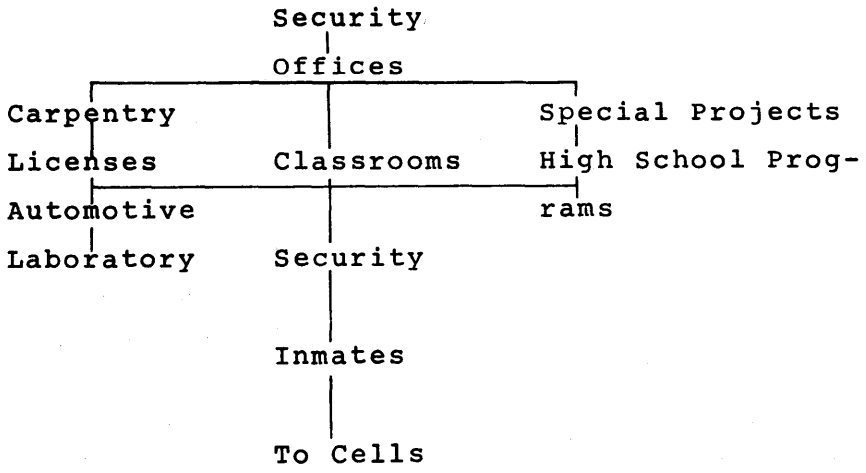
DINING & BUILDING SERVICES



RECREATION



WORK, VOCATIONAL, EDUCATIONAL



CHAPTER VI

COMPARATIVE DESIGNS

The following designs, are efforts presented to illustrate possible solutions to the correctional problems. The schemes are based on a functional analysis and a program, developed for a two hundred cell medium security correctional institution. However, the population varies between the three schemes. The linear scheme has an inmate population of one hundred and seventy six(176), the courtyard and the radial schemes of two hundred and four(204).

The program was developed after an analysis of existing correctional institutions. The emphasis is placed on educational, learning and vocational training, and all the previously analyzed issues, are part of the design philosophy.

The schemes, are not based on an existing site therefore, a flat site is assumed. The linear and radial schemes, are designed for the northern climates, while the courtyard concept, is more conducive to warmer, southern climates.

The schemes emphasize the philosophy of rehabilitation through the physical environment, with the assumption that architecture, is a basic constituent of the correctional institution. Schemes are designed in the concept of a city, with hierarchies of circulation, vistas, focal points of activities. Security, safety and surveillance are maintained, through correct geometric planning.

The schemes are examples, of the potentials of the physical environments of correctional institutions, intended to react to current trends and existing philosophies.

CELLS, DAYROOM, DINING

Cells, dayroom and dining, formulate the primary ideas of the following designs. Cells, the most private of the prison places, are the residential sector in a prison. Dayrooms, accomodating a capacity between twenty and twenty eight inmates, function as spaces for social interaction of small groups of inmates. In these semiprivate areas, small games, activities and gatherings of inmate groups occur.

Inmates from three dayrooms, congregate in one large area designated for dining, recreation, meetings and lectures. This space has a capacity of sixty eight inmates, and serves as a control point between all the clusters and the remaining prison. Hence, it should be well guarded and secure.

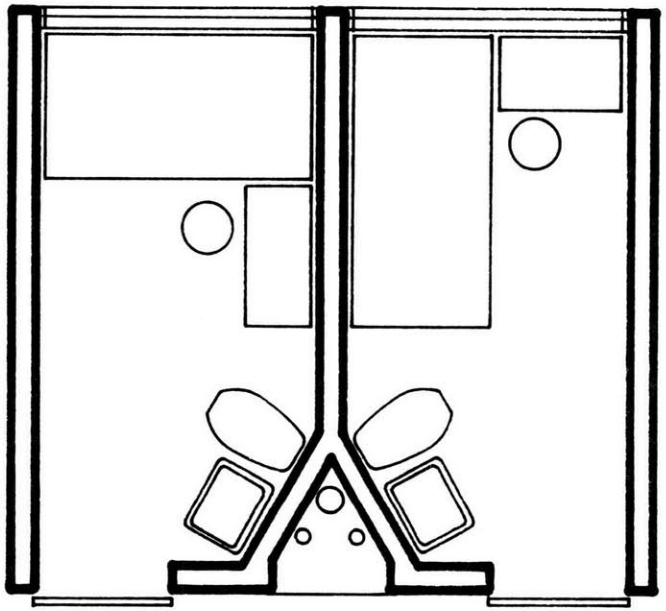
The level change between the two story cells, the dayroom and the dining, differentiates the three functions and creates a hierarchical structure, physically and sociologically.

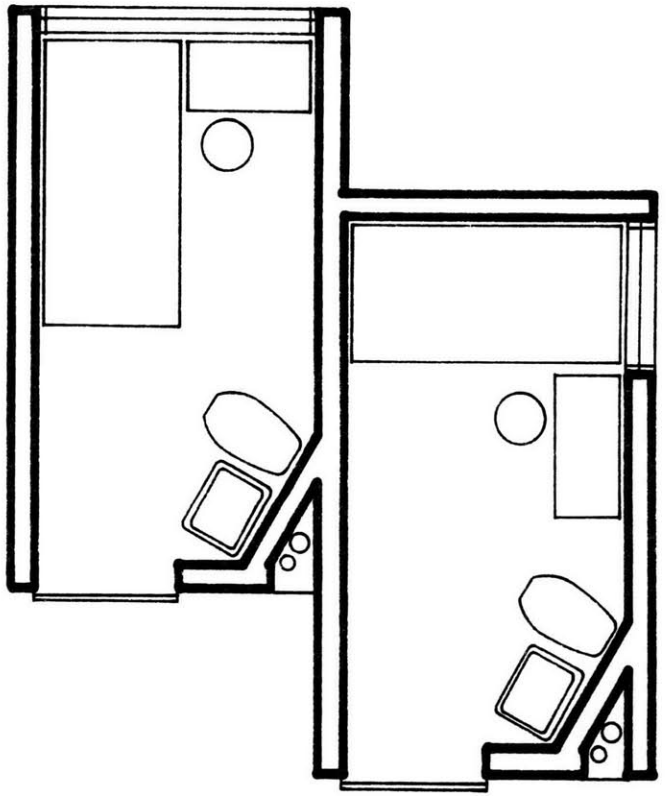
Light, enters the cells via large bullet-proof glass windows, the dayrooms via skylights and the dining room through both skylights and direct exposure to outdoor courts.

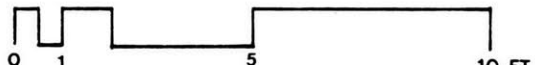
The geometry of the design and the cell layout, emphasize the need for visual separation of the cells, while maintaining the visibility and surveillance required by the prison administration.

The progression of spaces, from larger to smaller and vice versa, helps to identify each cell as a significant element, and indicates the use of larger areas for inmate social gatherings.

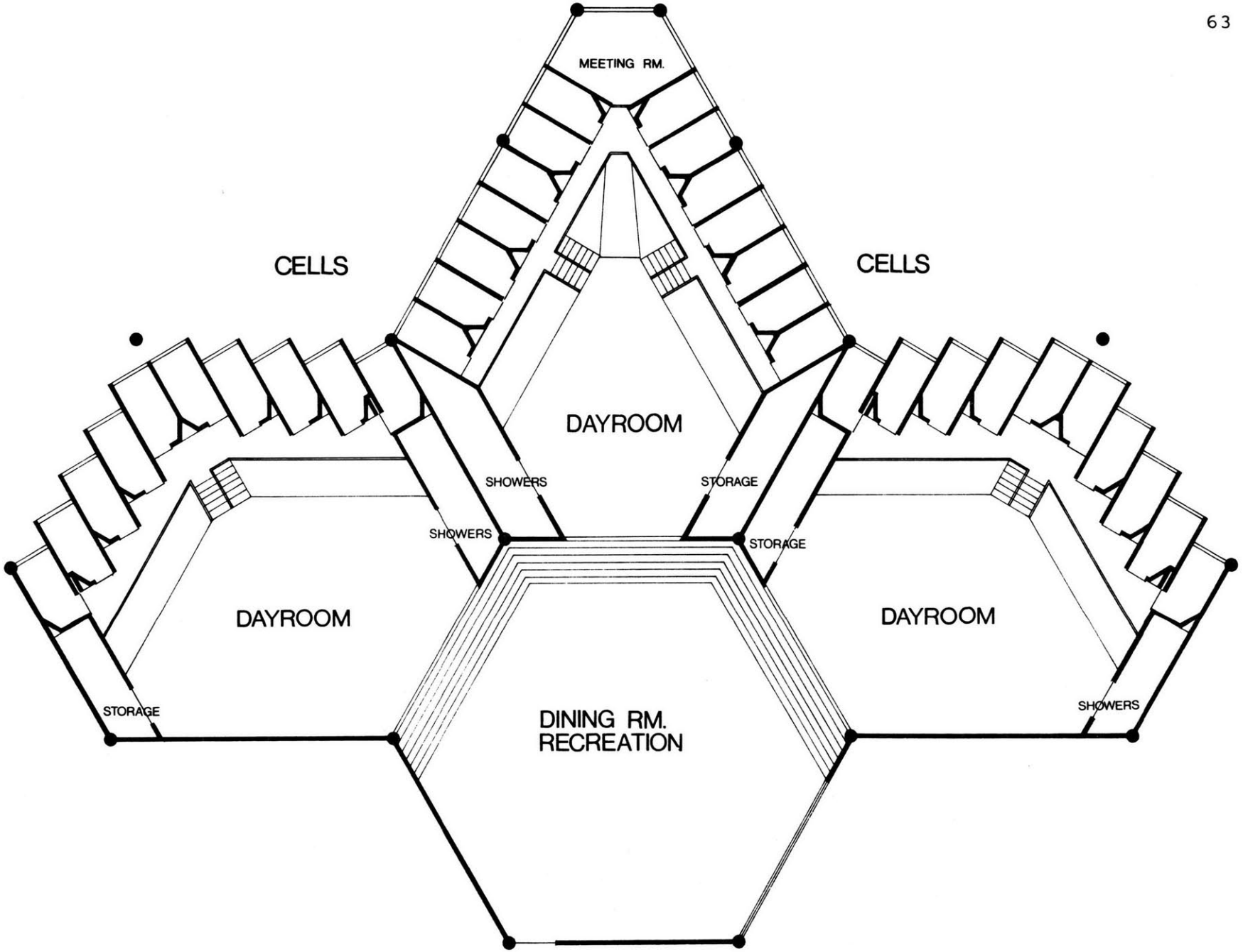
The theme of the cell, dayroom, dining room design, is separation of functions and inmates, harmonized with possibilities for surveillance, flexibility and environmental awareness.



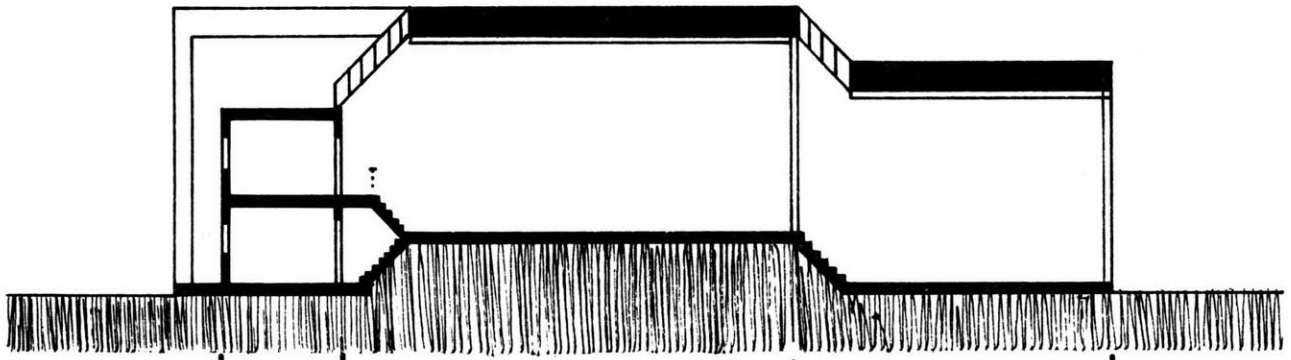




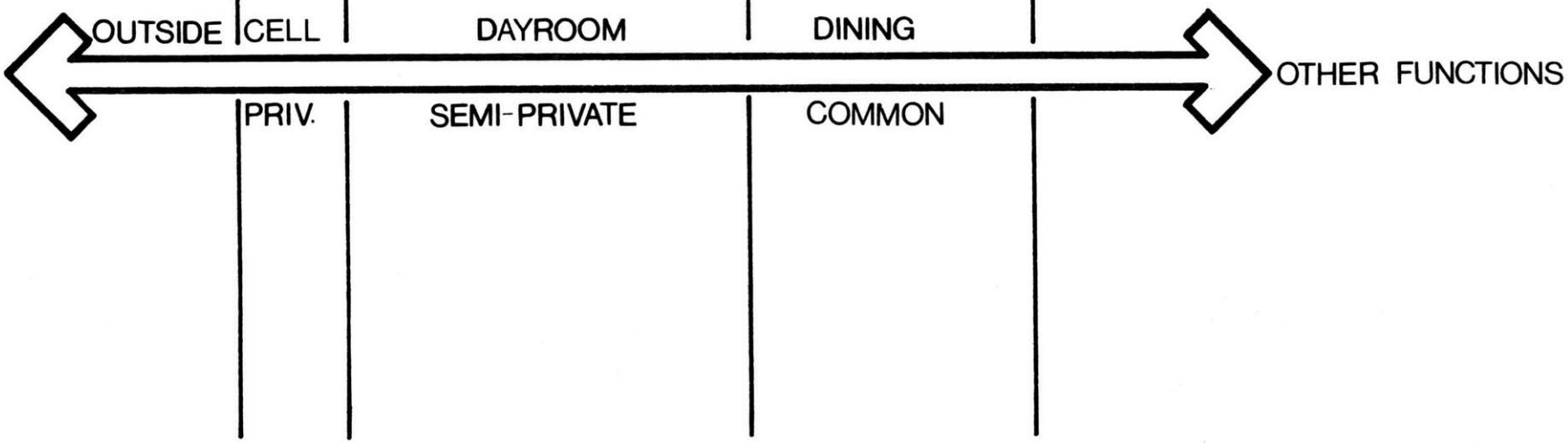
CELL PLANS



CELL CLUSTER PLAN



SECTION



ZONING

LINEAR SCHEME

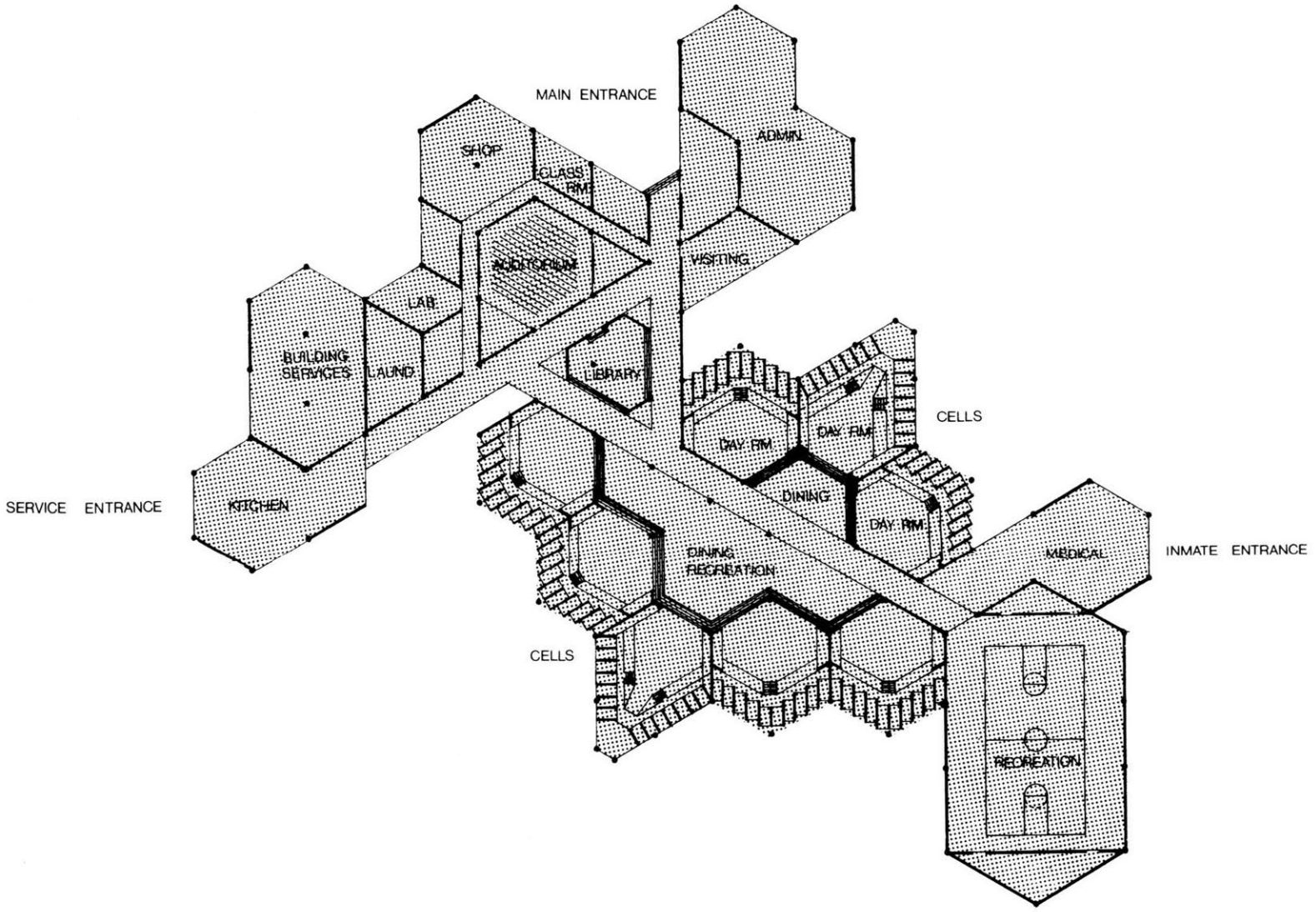
The linear scheme solution, is based on a central street of circulation: the main spine of activities within the prison. Cells, which are the main residential area, are located in the center. Medical department, intake center and indoors recreation are situated in a position, that allows for separation of inmates from the employees of the prison. The administration is separated from the cells, while visiting, educational, vocational and building services are in closer proximity.

The entrances to the prison, are separated. There is a main entrance, next to administration for all employees and visitors. The intake and release of inmates is located on the other side of the building, through the medical department; while the third entrance adjacent to the building services, allows for access by service vehicles.

The primary prison spine, becomes a significant element in the inmate's lives. The library of the prison, located in the heart of the circulation pattern, places the emphasis on the academic and educational environment, rather than the recreational sector. The dining areas assume an active part of the life of the inmates, and in conjunction with the dayrooms, they act as activity centers that stimulate the inmates towards rehabilitation. The cells, which are on two levels, face towards the dayrooms illuminated via skylights.

The dayrooms, handle a capacity of twenty(20), up to twenty eight(28) inmates, and become the centers of daily activities, small games and socialization. The dayrooms then lead to the dining and recreation areas, that can evolve into multifunctional spaces, for approximately sixty eight(68), to one hundred and eight(108) inmates. In the dining areas, there is opportunity for social interaction, variety of activities and adequate stimulation.

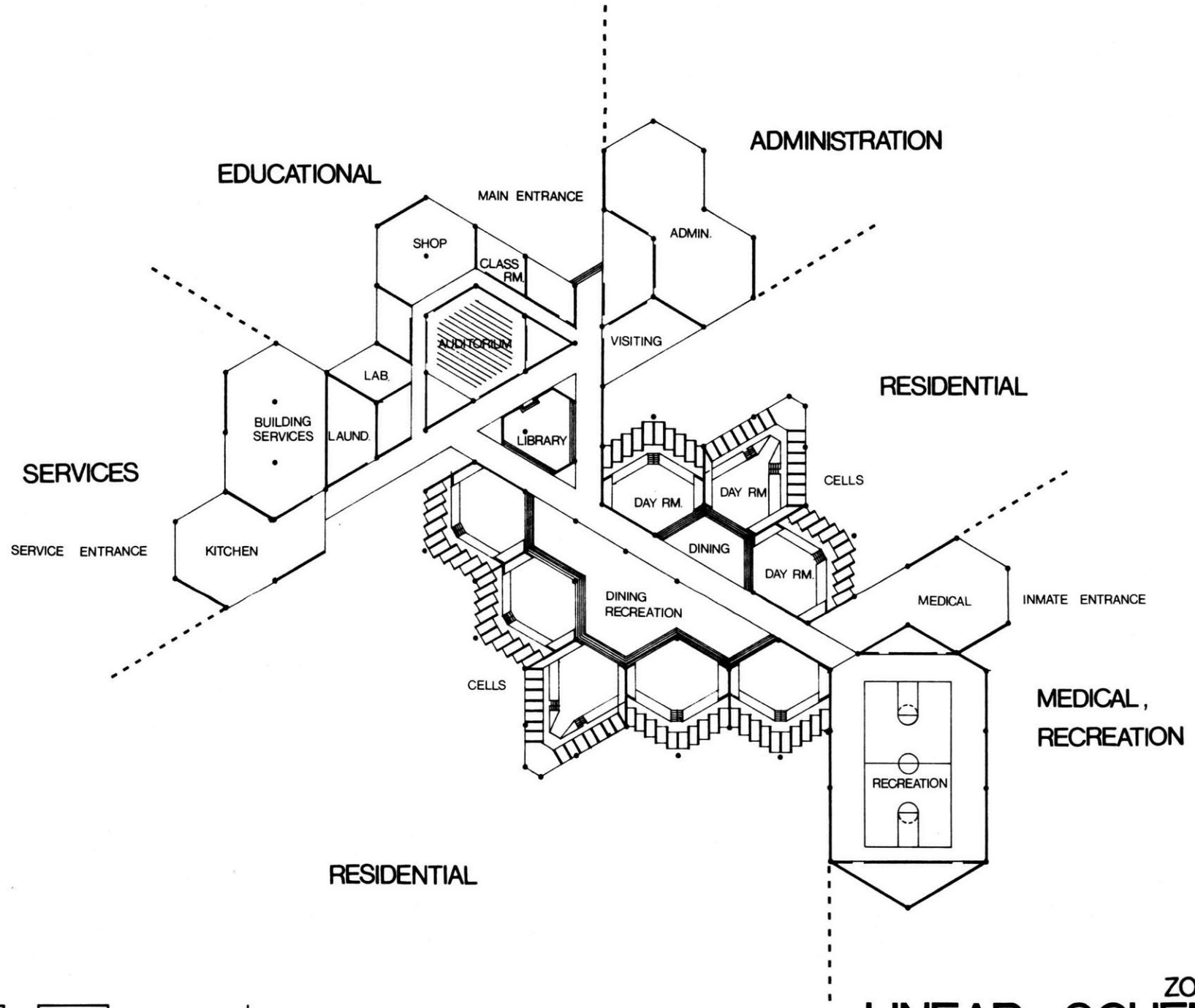
The main theme of the linear scheme, is a focus along the central axial corridor and creation of a city environment with hierarchies of circulation, different views and focal points.



0 10 20 40 80 160 FT.

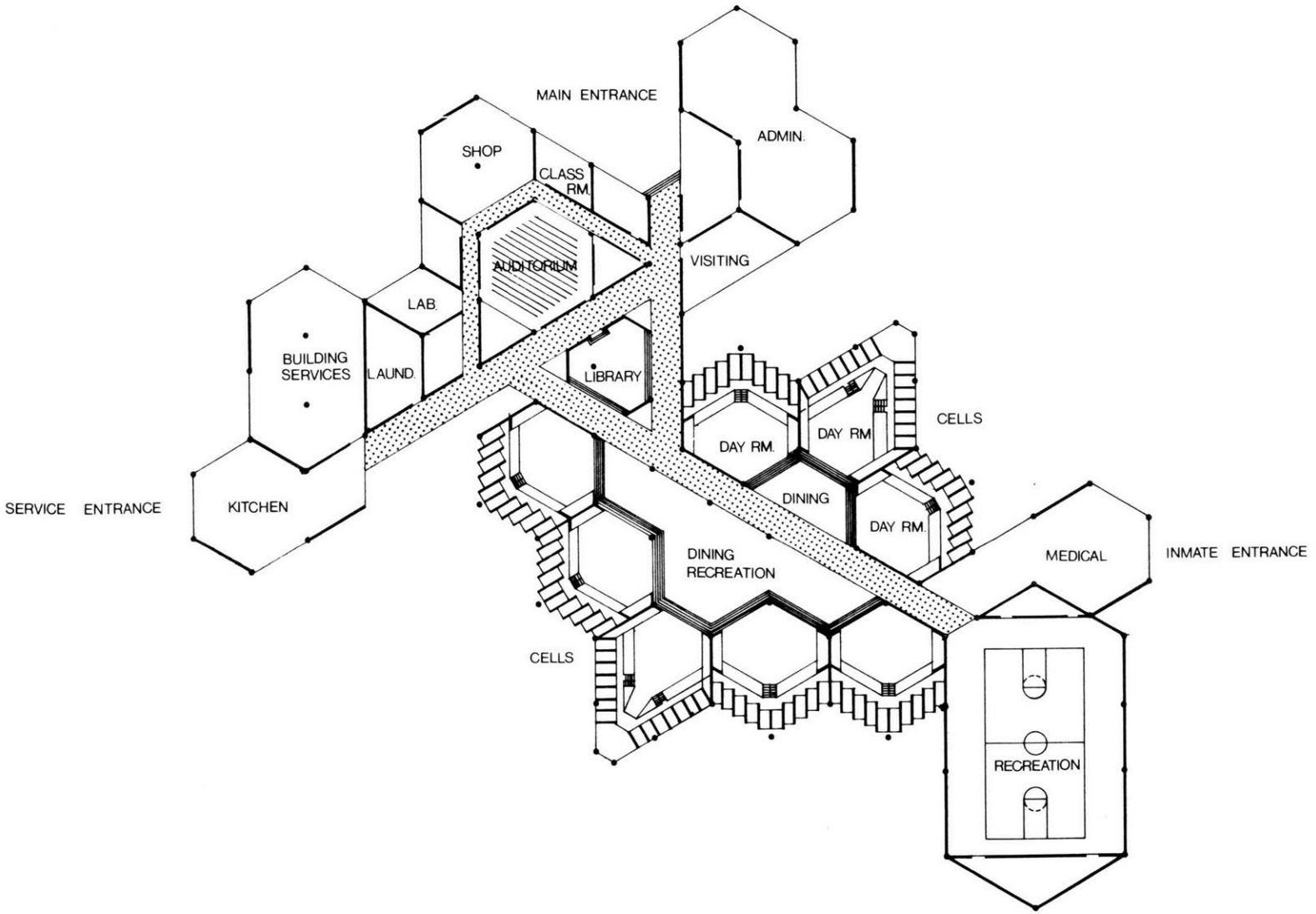
PLAN

LINEAR SCHEME



ZONING

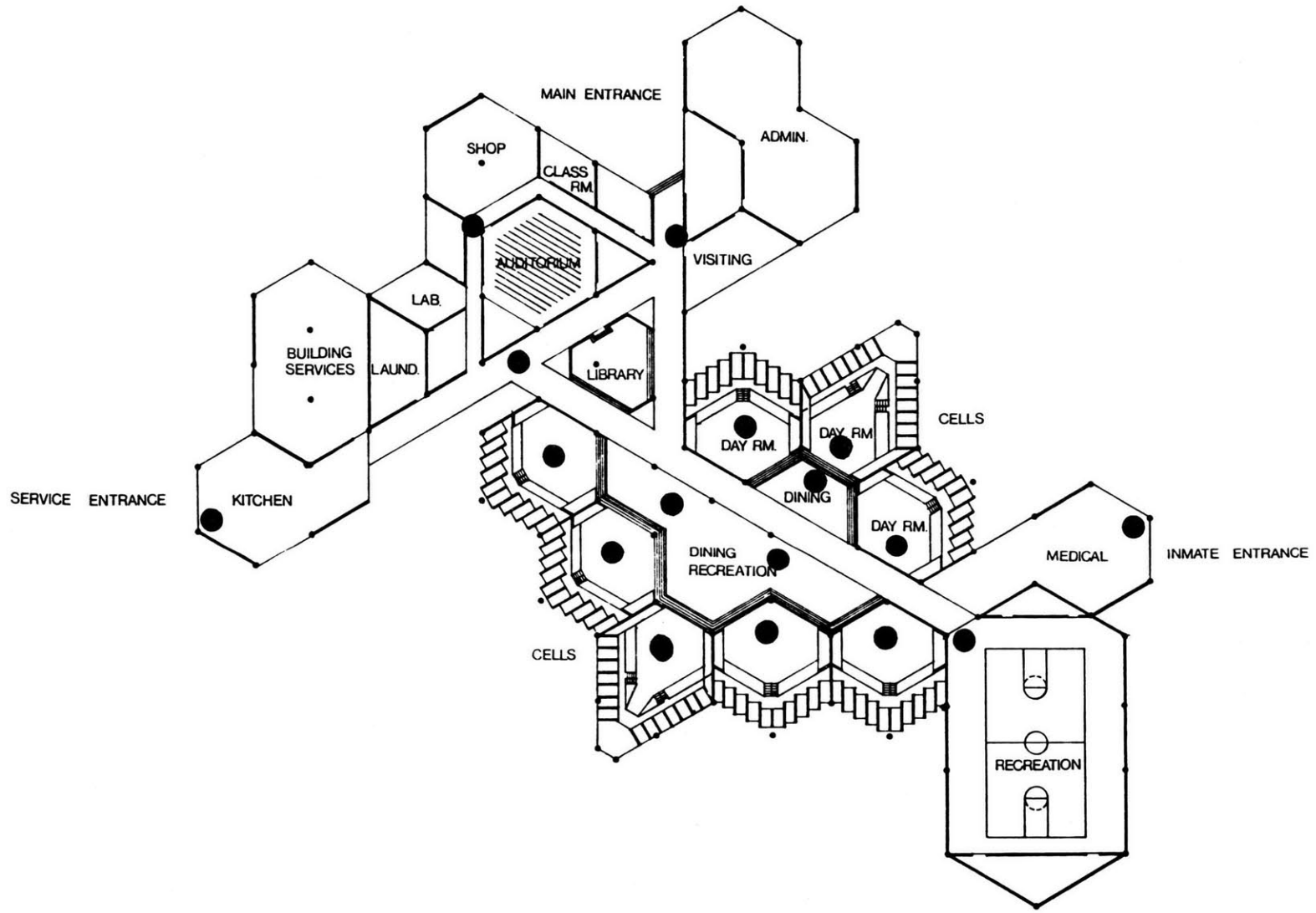
LINEAR SCHEME



0 10 20 40 80 160 FT.

CIRCULATION

LINEAR SCHEME



0 10 20 40 80 160 FT.

GUARD LOCATIONS

LINEAR SCHEME

COURTYARD SCHEME

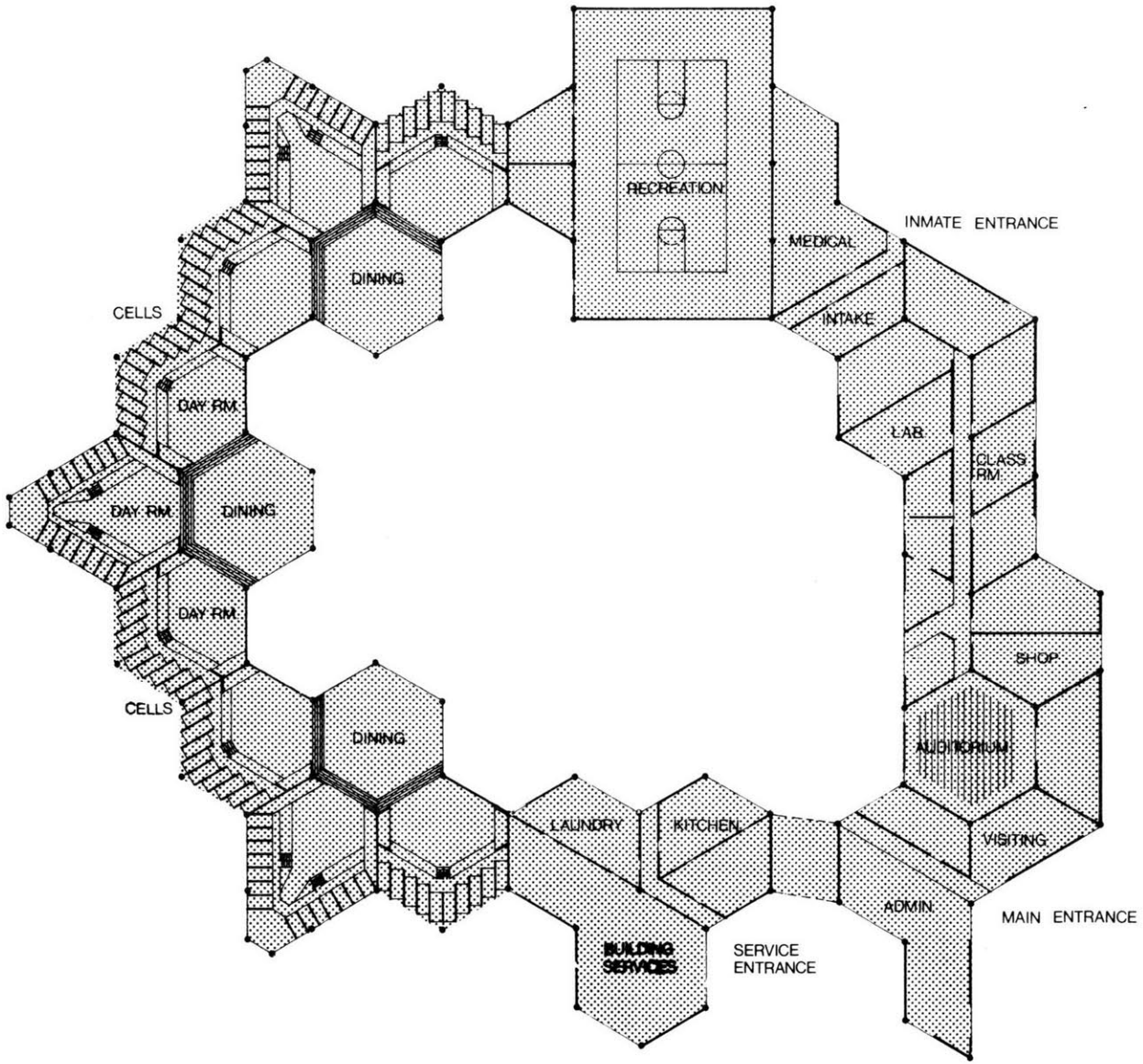
The main characteristic of the courtyard scheme, is a central open space surrounded by prison buildings. The structure is based on a hexagonal structural pattern, that evolves around an open yard.

This scheme, assumes circulation between all the functions, occuring through the outside court. One of the advantages of this solution is, that inmates become involved with the environment, and are aware of the outside weather conditions. This creates a more direct relationship between society and the prison environment. In an urban environment, the streets and squares are used for relationships and understanding of location and weather conditions. Likewise, the court will allow an inmate the chance to appreciate the outdoors and maintain the strong relationship of man and nature. The disadvantage of this scheme is that it precludes warm climates, to operate efficiently.

The courtyard becomes the heart of the correctional institution and every activity is located on its perimeter. Medical, intake and release center, along with recreation, are located on one side of the prison cells, to maintain a close contact, for minimal circulation paths. On a similar, symmetrical location, building services, kitchen and laundry are in close proximity. This permits easy access by employed inmates. Educational, vocational and administration, are the furthest locations from the cell clusters. This separation is necessary, to further introduce the open green space in the transition between sleeping and working, studying or visiting activities.

The entrances to the prison are also separated, to accomodate three distinct functions; public and employees, inmates and services.

The theme of this scheme, is to bring an inmate closer to nature and stimulate rehabilitation, by emphasizing the relationship of society and prison.



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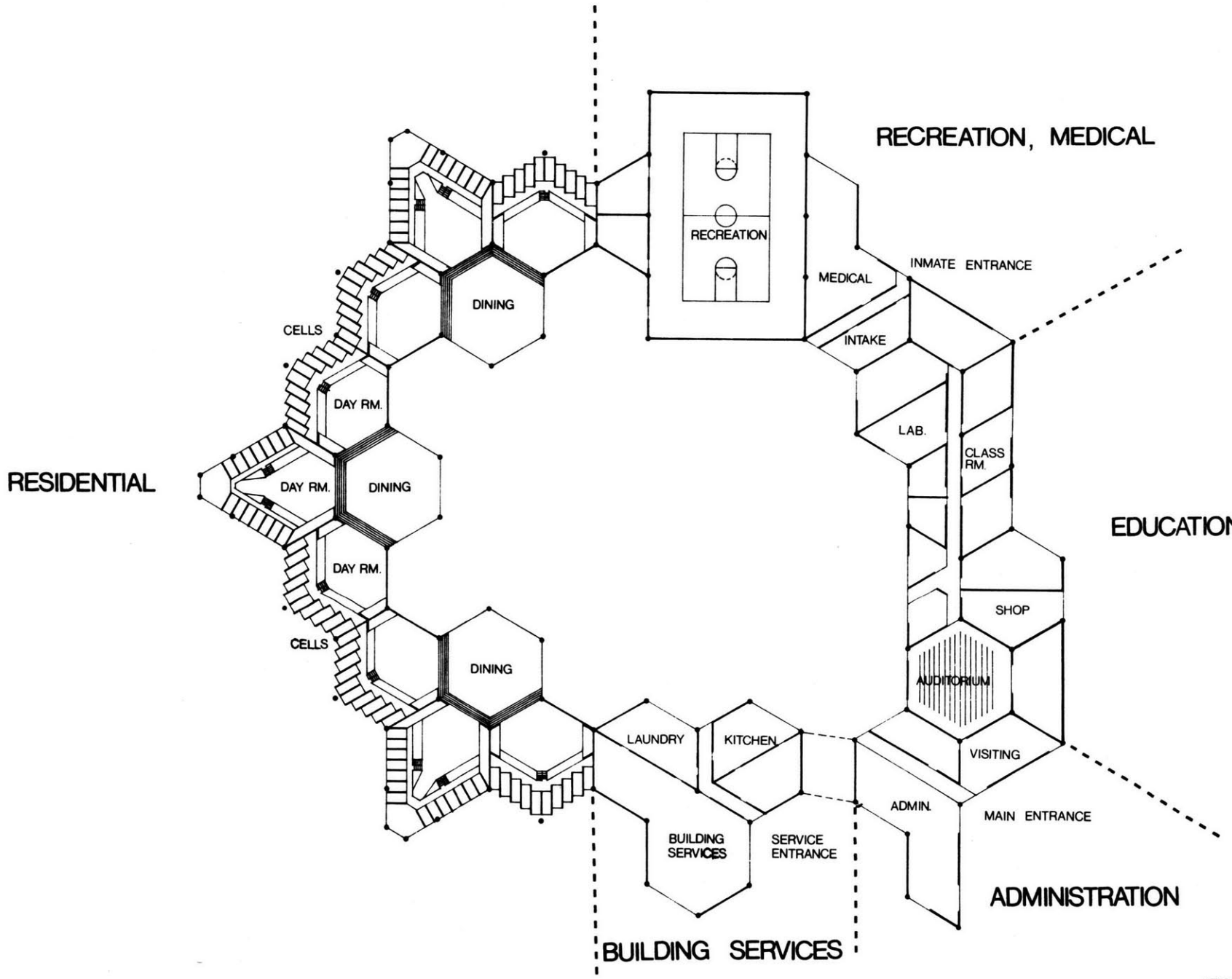
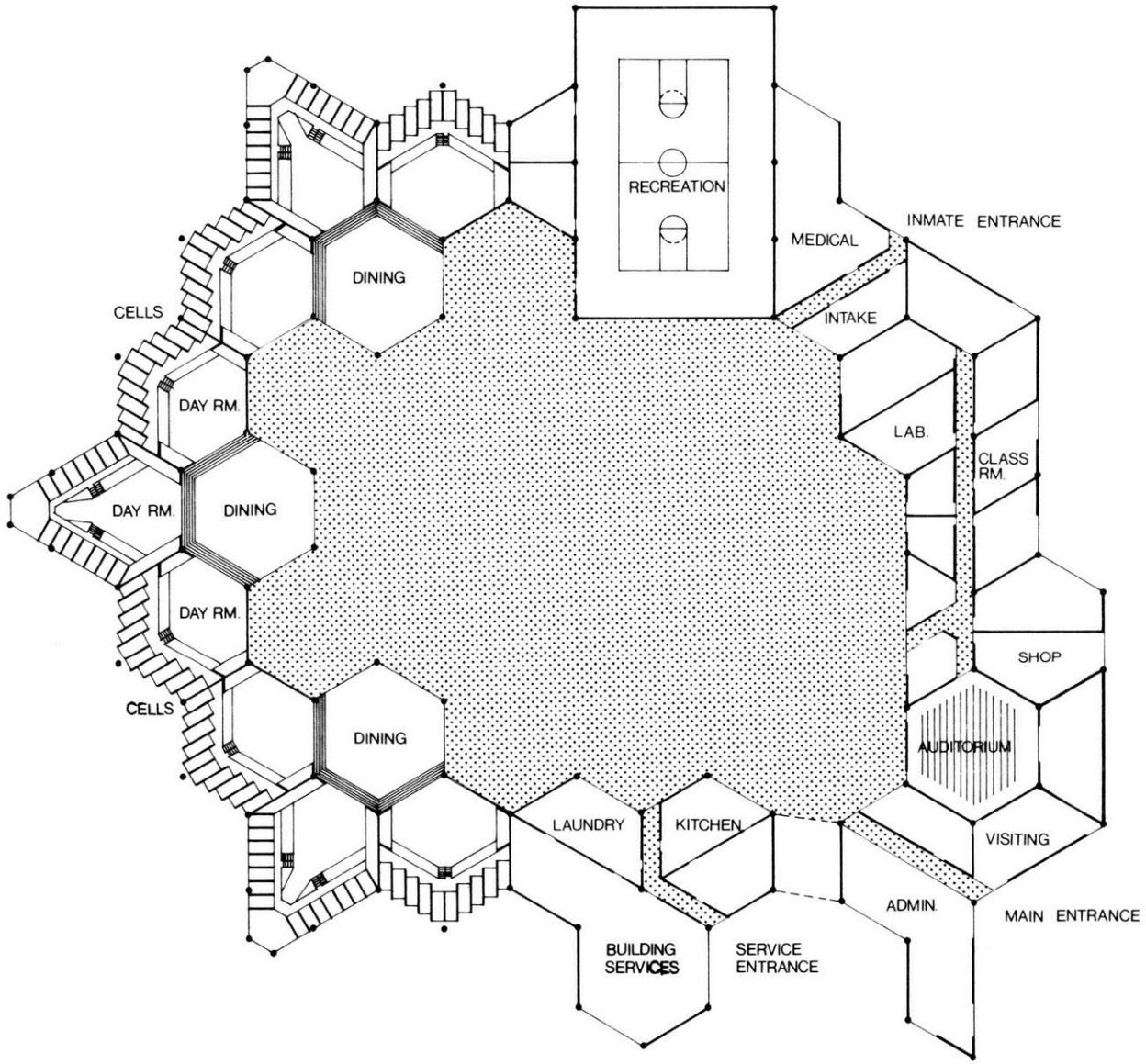
PLAN

COURTYARD SCHEME



ZONING

COURTYARD SCHEME



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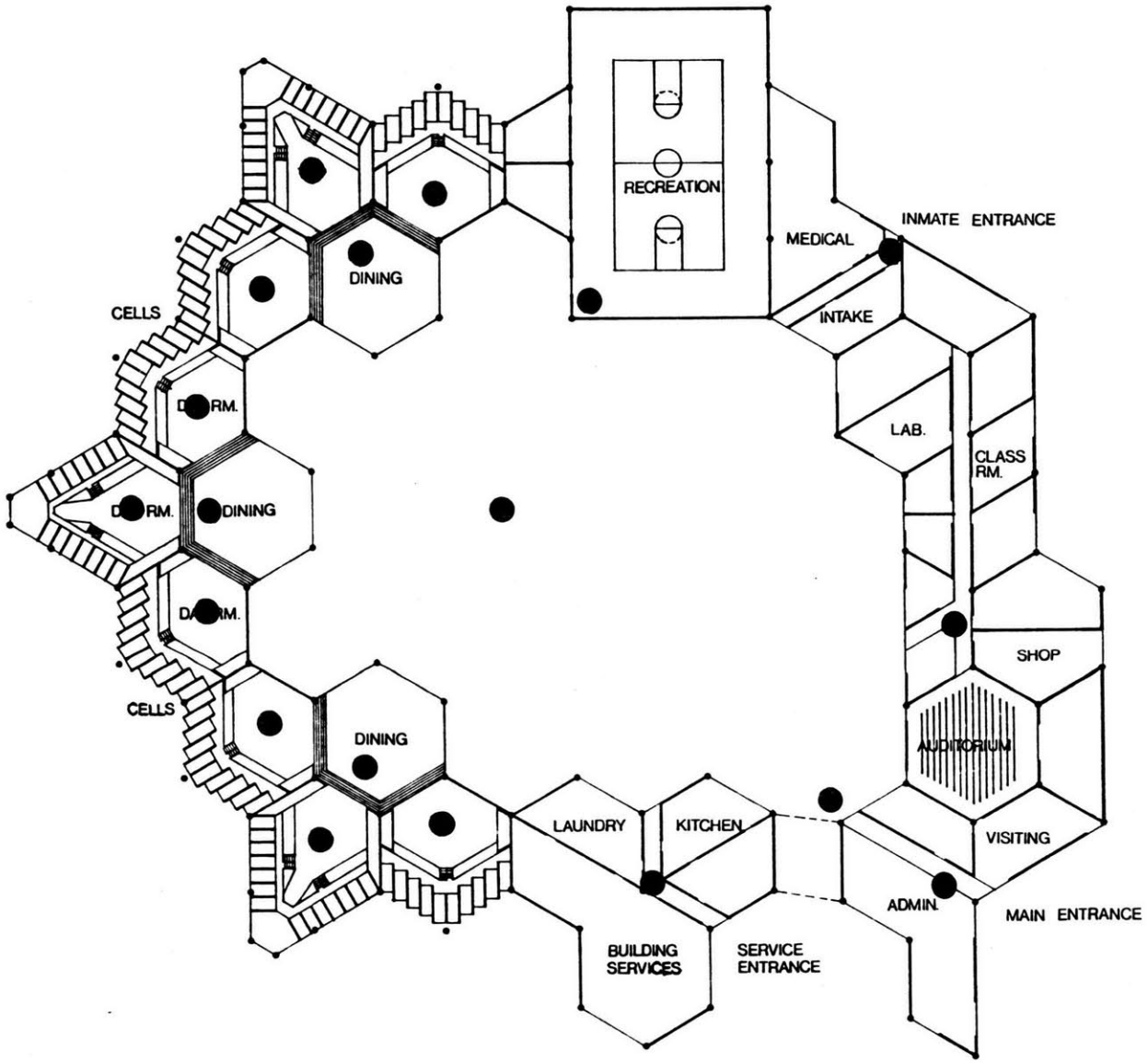
CIRCULATION

COURTYARD SCHEME



GUARD LOCATIONS

COURTYARD SCHEME

RADIAL PLAN

This scheme radiates around a central hexagonal space,used as a recreation area. Corridors in all six directions of the hexagon, further emphasize the core of the design.

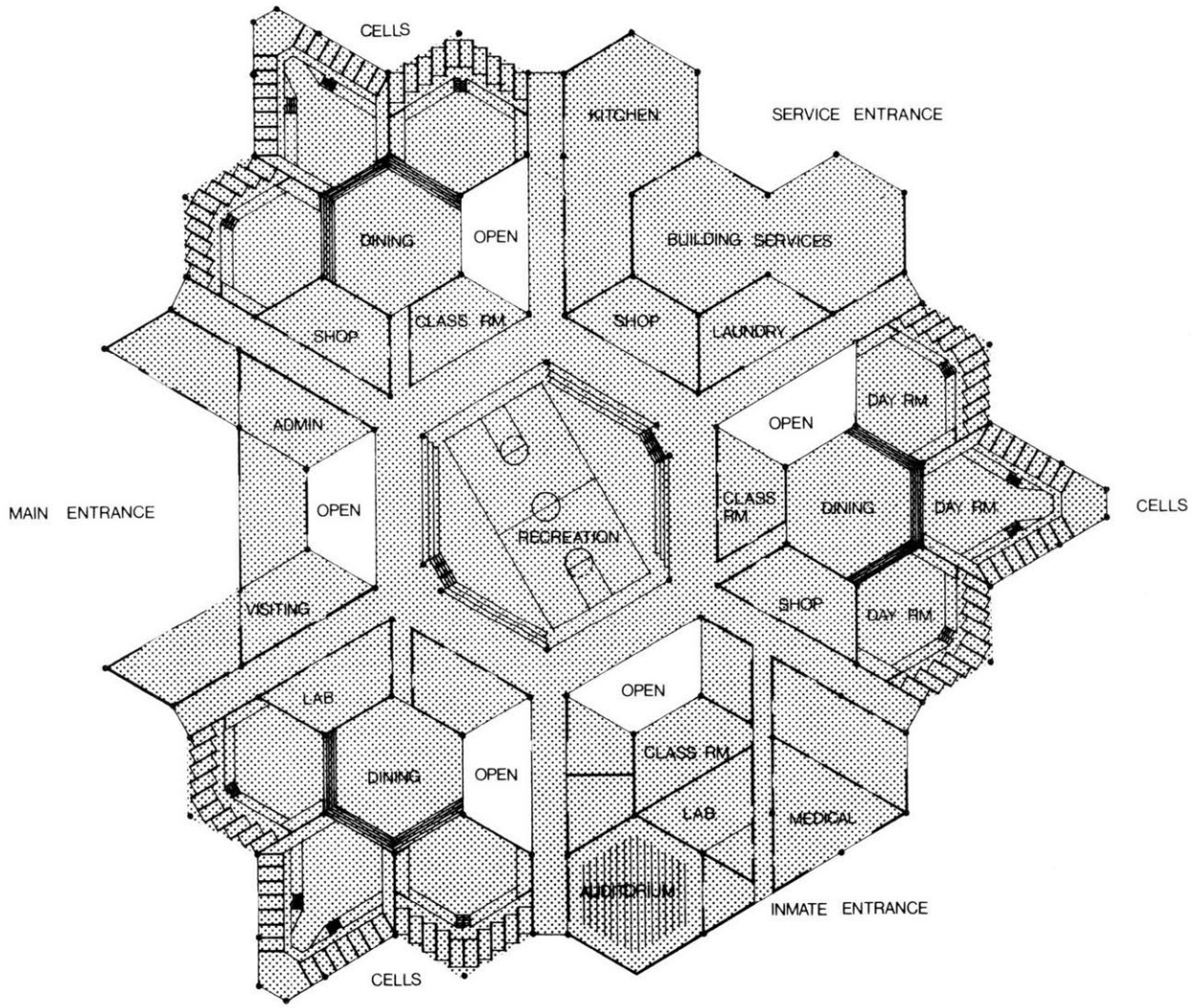
The cells, are removed from the center and are located at the extreme perimeter of the prison, creating a design easily adaptable to a maximum level of security. Educational and vocational functions are decentralized throughout the prison and become part of the cell clusters, or the building services grouping.

Indoor courts, are strategically located to introduce natural light in all dining and classrooms of the clusters. Two additional courts, introduce natural light and strengthen the relationship with the outdoor environment, in the central recreation and activities area.

Administration, is separated from the rest of the prison, by a court, making the visiting room a transition element between prison and administration.

The radial scheme, is applicable to urban sites, because it doesn't require a long, linear lot, or a large, circular site, which the previous designs needed.

The theme of the radial scheme, is decentralization of educational and vocational activities, with direct relationship to the cells. It places importance on the indoors multifunctional area and emphasizes the complete separation of the sixty eight(68), inmate,clusters.



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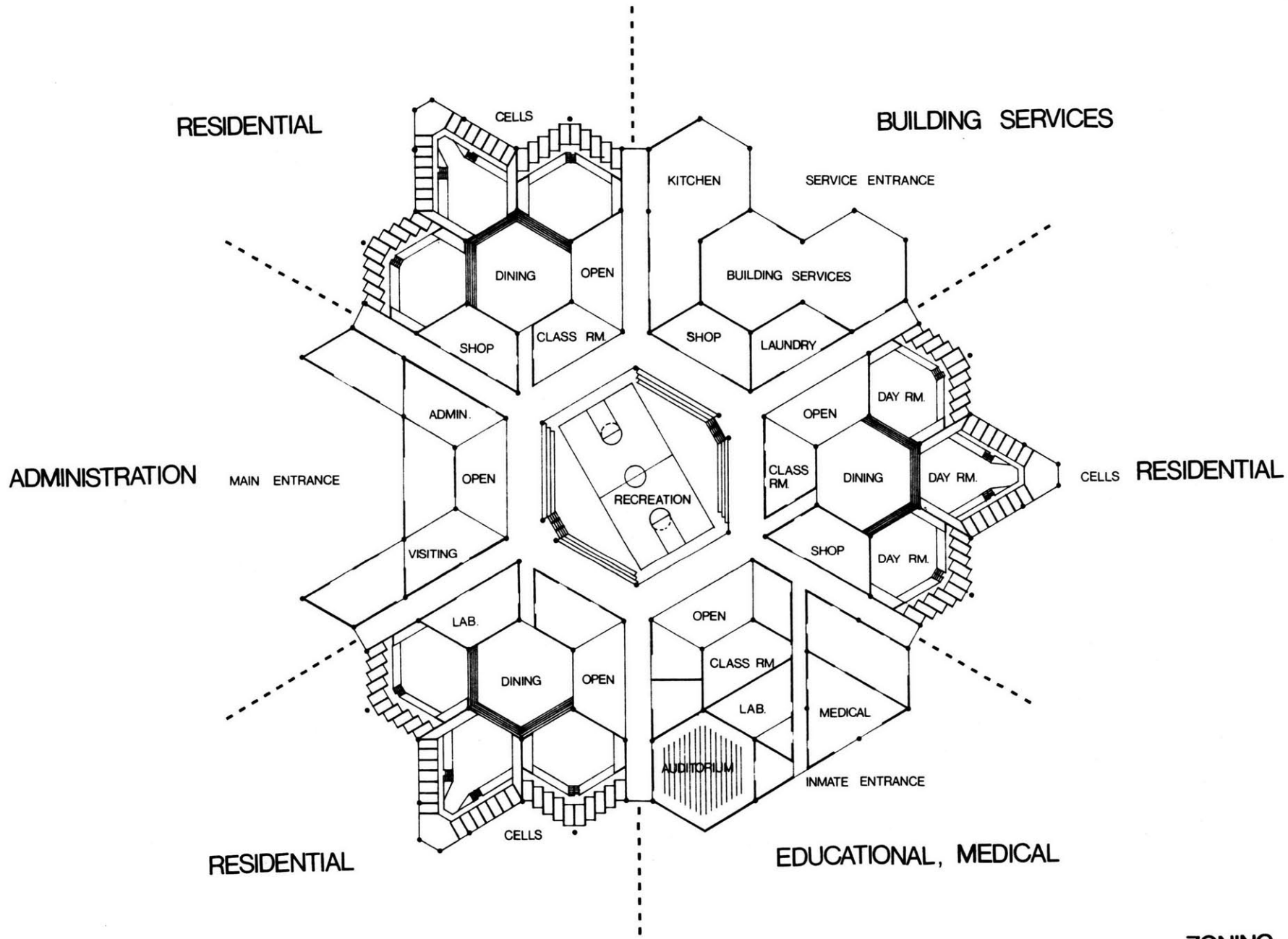
PLAN

RADIAL SCHEME



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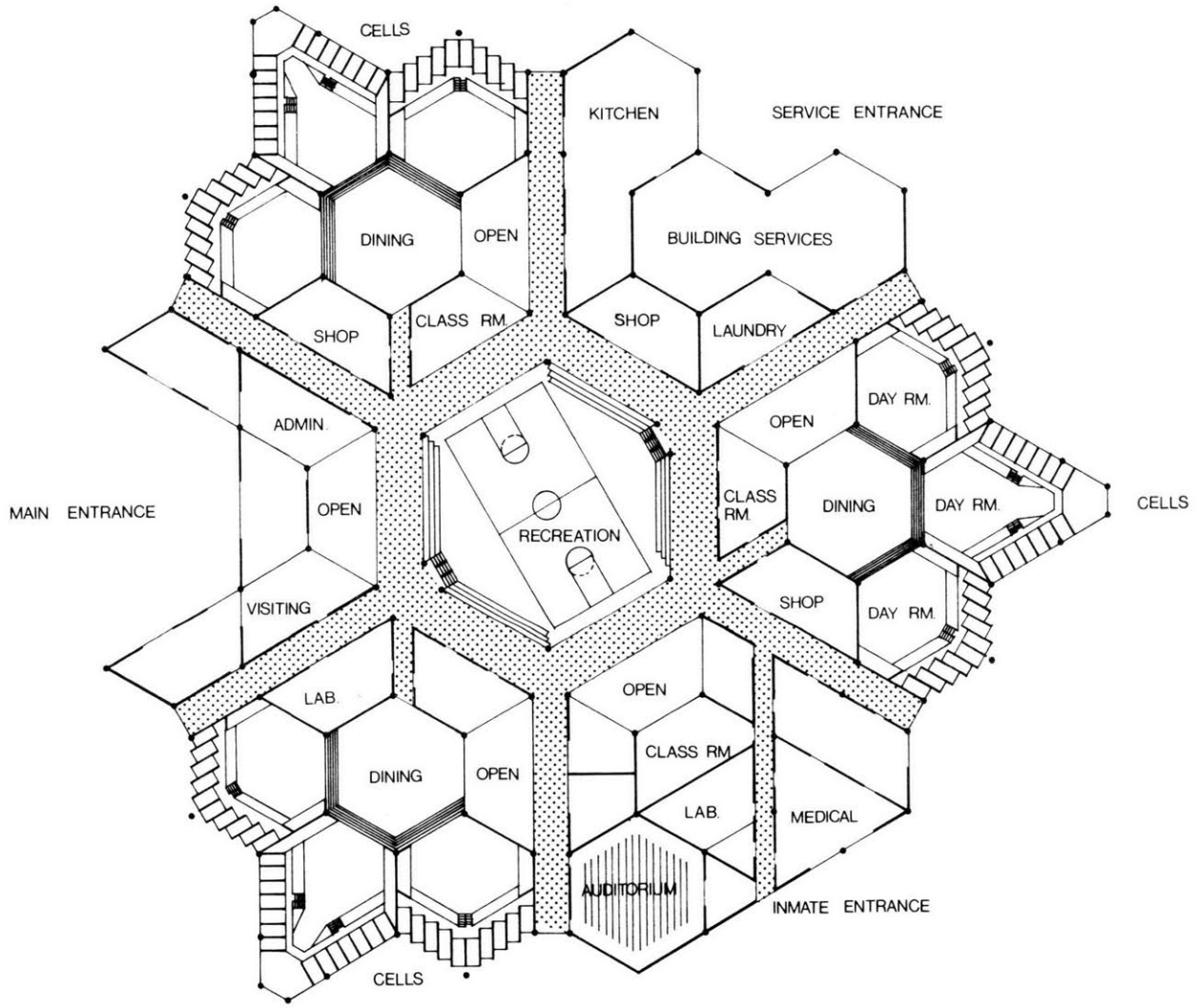

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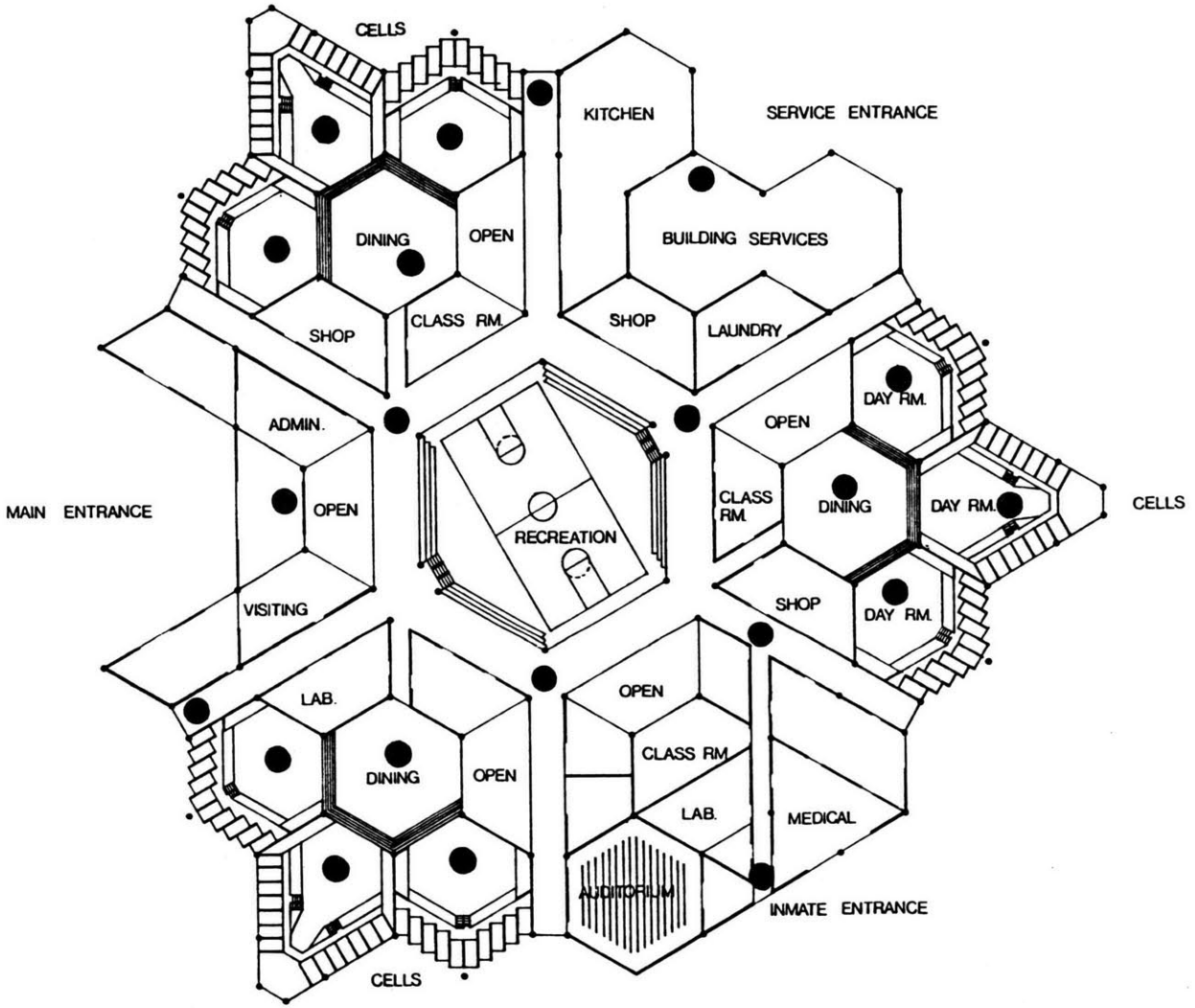
CIRCULATION

RADIAL SCHEME



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GUARD LOCATIONS

RADIAL SCHEME

SCHEME COMPARISONS

Related to Physical	Linear Scheme	Courtyard Scheme	Radial Scheme
Three Separate Entrances	*	*	*
Circulation	indoors	indoors-outdoors	indoors
Main Focus is the:	library	open green court	multifunctional area
Cell Clusters are:	concentrated	spread around court	decentralized
Number of Inmates	184	204	204
Number of Needed Guards	17	19	21
Ratio of Inmates/Guards	10.82 or 11	10.73 or 11	9.71 or 10
Security (Indoors)	secure	least secure	secure
Surveillance	easy	moderate	most difficult

CHAPTER VII

CONCLUSION

Environments of correctional institutions, have always been centers of punishment, control and rehabilitation conflict, in depressive and medieval prison settings. The inmate in that environment, is totally isolated from society. Thus, it is very hard to create or further develop normal human relationships. Prisons, include besides inmates, correctional officers-guards and the administrative forces, that at times conflict with each other. Prisons, also have other tremendous problems: they are , overcrowded, unhealthy, depressing and monotonous.

Most of the prison problems, can be solved through a careful study of all the issues involved, based on a thorough analysis and creative solutions. The prison buildings, should be rehabilitated along with the programs and philosophies. Architecture, can provide for the physical environment and stimulate the programming of the institutions. The physical spaces of a cell, a dayroom and a dining room in a correctional institution, are the three most important prison areas. The functions of dining, leisure and sleeping are very important, since the inmates spend more than one half of their time in those areas. They should, therefore, be studied more analytically.

Rehabilitation, can only occur, if a societal balance is achieved inside the prison. Extremes of leisure time, or work, can destroy natural life. Inmates should be encouraged to become more educated, learn skills and maintain jobs in prison.

Life in prison, should equate life as much as possible. Inmates should be given more freedoms and basic human rights, so that their chances for rehabilitation will increase. Emphasis in prisons, should be on work and education, instead of recreation and leisure programs. Work can be less monotonous and repetitive, and more productive and stimulating.

Social interaction should be balanced with the degree of security. A correctional institution, can become rehabilitative on a correct programming of daily activities, with a productive work force, less leisure time and structured on an urban model with hierarchies of circulation, vistas and focal points, strongly related to positive societal models. It should be designed, with an architecture that is sensitive to change, and adaptable to future programs, bringing forward a new spirit of policies directed towards rehabilitation of inmates, along with satisfaction of administrative rules and societal goals.

The impacts of the physical environment, structure, walls, angular geometry, heights, windows, bars and other material, should be carefully studied and analyzed, to allow imaginative design decisions.

Since, the field of corrections involves Behavioral Psychology, Sociology, Urban Planning, Criminology, Architecture, Transportation Studies and Correctional Officers Staffing techniques; a clear understanding of all the relationships is necessary. Planning and Architecture, should be given more consideration, since they involve the totality of the physical environment.

If, all the above statements are met, there will be a chance for creating a more satisfying, healthy, interesting and stimulating environment, with rehabilitative qualities and hope for a better future.

APPENDIX A - RESEARCH AND THESIS REVIEWS

As background information for the thesis stusy, the following visits, interviews and meetings, indicate the efforts that lead to the completion of the research part of the thesis.

Nov.10,1976	Interview with Maria Cruz of the M.D.C.
Nov.18,1976	Visit Massachusetts Correctional Institution - Walpole.
Nov.18,1976	Visit M.C.I. Norfolk
Nov.22,1976	Interview with Const. Karalis.
Dec. 2,1976	Visit Middlesex County House of Corrections - Billerica.
Dec. 6,1976	Interview with Kenneth Poole
Dec. 7,1976	Interview with Thomas Sellers
Dec. 8,1976	Visit M.C.I. Norfolk Reception Diagnostic Center
Dec.15,1976	Visit the Suffolk County Jail in Boston, Interview with Mr.Langlois.

The second part of the thesis, after the collection of all research information, was the study, in drawing form, of the prison environment. For that part a review board was organized.

Members of the review board where:
Leonard G. Buckle, Assistant Prof., M.I.T.
Suzann R. Buckle, Assistant Prof., M.I.T.
Eduardo F. Catalano, Professor, M.I.T.
Maria Teresa Cruz, Architect, M.D.C.
Sandra Howell,Professor, M.I.T.
Constantine Karalis, Architect.

There were three review dates, on February 14, March 2 and April 7, 1977. Most of the review members were present at all times in the above dates. Experts of the review meetings that follow, are helpful in realizing the significance of the problems in today's prisons.

In addition to the scheduled reviews, there were weekly individual critiques of the thesis progress, with each one of the review members. The final three reviews are outlined and summarized in the following pages. Only the comments directly related to prisons and architecture were outlined.

THESIS REVIEW I

Presentation:

The design presented attempts to be a solution of prison problems in minimum, medium and maximum security prisons. The major consideration in the design was security. Other factors were surveillance and privacy. The design was a wedge shape, with two storey cells, and dayrooms with high ceilings used for television and recreation games. Dining areas are part of the dayrooms and transportation of food is handled with individual food carts. Cell wings are multifunctional and circulation is minimized in an attempt to save wasted space and use it for dayrooms.

Studies and more drawings indicating site planning, clusters with daylight and different materials were also presented. Each modular wedge was one hundred and twenty degrees, so that about three wedges formed a complete circle. A design was indicating a high rise prison proposal for the new Jail for the Suffolk County.

Synopsis of Review member's reactions:

-Maximum, medium and minimum security facilities are defined by the degree of interaction, freedom of circulation and the supervision needed for safety.

-In the field of corrections, there is one thing that is very clear concerning security and that is that, it is relatively easy to lower level of security by changing administrative procedures, but it is very hard to increase security; because you need not only increased physical barriers but more manpower.

-The main problem in maximum security is transportation of inmates back and forth from the cellblock to work or recreation. These movements become not only dangerous but also problematic.

-Maximum security prisons due to the strict confinement of the inmates, create a very institutionalized environment.

THESIS REVIEW II

Presentation:

The second review included a thorough analysis of all issues in a correctional institution. Issues such as privacy, flexibility, surveillance, maintenance, security and control were analyzed. Then followed an analysis of the physical parts of a prison, with functional diagrams charts and cell layouts.

Comparative charts and matrces were derived indicating advantages and disadvantages of different cell block designs. Experimentations with different forms of cell clusters, mainly hexagonal, were exhibited along with a historical survey of prisons around the world, based on prototypical designs.

Synopsis of Review member's reactions:

-Staffing in a correctional institution is a very important factor and it should not be neglected. Architecture directly affects staffing. Every invisible corner has to be protected and supervised, in order to maintain a safe prison environment.

-A basic humanistic issue in a prison should be stimulation. Even the most basic animal creatures need stimulation. The most interesting fact in the family of man is watching people move, meet, talk and play. The second most interesting issue is watching people work, or objects in motion.

-There are two subissues in security. One is keeping unwanted people outside and the other is keeping the inmates from escaping.

-Worse enemy of people incarcerated is not the wall but boredom.

THESIS REVIEW III

Presentation:

In the third and final review three designs were presented. The program was for a prison of medium security for two hundred inmates, to be built on a relatively flat site. The first, was the linear scheme, were all prison activities are arranged along a central street axis. The scheme provided complete separation of cells and administration.

The second scheme, was the courtyard approach to a prison solution. Here the problem was for circulation between different prison functions. Because of the courtyard, every movement in prison had to be done through the outside yard, thus creating a hazard during bad weather conditions.

The third scheme was the radial plan, where cells, dayrooms and dining rooms were located in the center of the site, surrounded by all the other activities, branching off them, radially. Detailed plans of security stations and circulation diagrams were also presented.

Synopsis of Review member's reactions:

-In a prison, there is a need for social interaction, like the interaction happening in society. Interaction will help ease tensions and create a comfortable environment. You have to create interactions of a socially acceptable nature, as opposed to interactions you have on the street.

-When one talks about dining facilities in a correctional institution, it is understandable that dining serves more than the functional purpose. It also serves the purpose of socializing, therefore getting to the dining area three times a day becomes a social act that should be preserved and emphasized.

-In a medium and maximum level of security, a correctional officer should be able to have a complete visibility of the inmate's cell. In minimum security that is not the case, and the design can be more flexible.

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