A CORPORATE RETREAT CENTER MIANGO-JOS

Integrating architecture with nature to enhance restoration

BY

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M.Sc./Env.Des.39985/02-03

December 2006

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M.Sc./Env.Des. /36685/02-03

A THESIS SUBMITTED TO THE
POSTGRADUATE SCHOOL,
AHMADU BELLO UNIVERSITY, ZARIA
NIGERIA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTERS DEGREE OF SCIENCE (M.Sc) IN ARCHITECTURE.

DEPARTMENT OF ARCHITECTURE,
FACULTY OF ENVIRONMENTAL DESIGN,
AHMADU BELLO UNIVERSITY, ZARIA.
NIGERIA

DECEMBER, 2006

DECLARATION

I, RUTH RAKIYA MAIRABO do hereby declare that this thesis entitled, A CORPORATE RETREAT CENTER: Integrating architecture with nature to enhance restoration is an original work carried out by me in the Department of Architecture under the supervision of Arc. S. S. Tulpule and Dr. M. L. Sagada.

The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this project has been accepted in any previous publication for a higher degree or diploma at any University.

_____	_____	_____
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CERTIFICATION

This thesis entitled, A CORPORATE RETREAT CENTER: Integrating architecture with nature to enhance restoration. by RUTH RAKIYA MAIRABO meets the regulations governing the award of the degree for a Masters of Science in Architecture from the Ahmadu Bello University, Zaria and is approved for its' contribution to knowledge and literary presentation.

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5. _____ _____
   Dean, Post-graduate School, A.B.U. Date

DEDICATION

For Mom and Dad……..

My mentors and heroes;

For Rhoda Esther, Mimi and Kasham…….

My truest friends

If God had let me choose my own family, I couldn't have done a better job

ACKNOWLEDGEMENT

I wish to give praise to God without whom all this would not have been possible.

I would like to thank: My parents for giving much of their time and resources toward the completion of this work, my sisters and husband for their ceaseless prayers and encouragement, my supervisors, Arc. S. S. Tulpule and Dr. M. L. Sagada for their time, resources and guidance, to my classmates for years of fun and laughter through all the stress, to my friends for being there, to all the staff of Miango Rest House (MRH) and Nigerian Institute for Policy and Strategic Studies (NIPSS) for giving me 101 percent cooperation, and to my lecturers who pointed me in the right direction.

ABSTRACT

Corporate executives all over the world are under a lot of stress due to increasing competitiveness in the workplace, traveling and family demands. Stress costs companies in terms of employee's health and reduced output and efficiency. Companies have realized the benefits of sending their executives on paid holidays to rest, recuperate and be rejuvenated; especially in natural peaceful environments, totally removed from the working environment.

Mayo (1958) says that to be at rest an executive must be removed from the working environment but to deal with stress he must be exposed to at worst a simulated working environment. A corporate retreat is an ideal opportunity to manage stress because it is an environment without the distractions of everyday life that aims at increasing motivation by stimulating and rejuvenating the body and mind while allowing a corporate group to have exclusive use of a facility for team building, brainstorming, prioritizing, strategic planning and more.

Various theories on the restoration of an individual are based on the exposure to nature, natural elements and processes. Kaplan and Kaplan (1989) in looking for a setting that helps people function better developed a model called the reasonable person model. This model is based on the framework that people are more reasonable, cooperative, helpful satisfied and constructive when the environment satisfies their basic informational needs. Their research indicates that aesthetic natural settings not only give pleasure and are satisfying to experience, they also: support human functioning, provide a context in which information can be managed effectively, permit people to move about and explore with comfort and confidence, and provide for recovery from mental fatigue. To them nature is seen as a restorative environment and an effective stress reducer because it provides a kind of cognitive quiet, necessitating fewer decisions based on external demands.

The main function of a retreat environment is restoration, whether mental physical or otherwise. A natural environment is said to be a restorative one; this thesis aims to enhance the restorative elements of nature found in retreat environments primarily through the integration of nature and architecture.

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CHAPTER ONE

INTRODUCTION

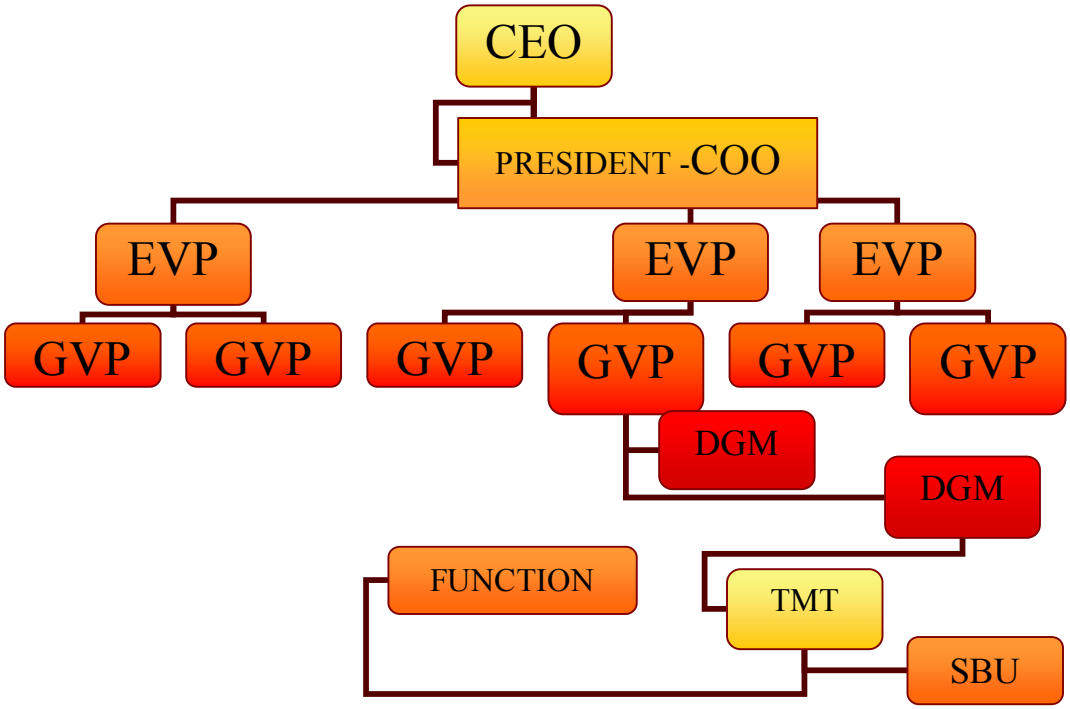
1.0 CORPORATE STRUCTURE AND FUNCTION

As defined by Wikipedias Free Encyclopedia (2006), a corporate body is an organization or group of persons that is identified by a particular name and that acts, or may act, as an entity. Typical examples of corporate bodies are associations, institutions, business firms, nonprofit enterprises, governments, government agencies, religious bodies, local churches, and conferences.

The Oxford Advanced Learners Dictionary (2001) defines a corporate executive as anyone of three things:

1. A person who has an important job as a manager of a company or organization.
2. A group of people who run an organization or company.
3. The part of government responsible for putting laws into effect.

Sathe (2003), described a large diversified company as having managers at the corporate headquarters, the top managers being the corporate executives and the division managers as the other members of the management team as shown in the diagram on the next page.



CEO - GVP - Corporate Executives

DGM - SBU/FUNC - Division Managers

CEO - Chief Executive Officer

COO - Chief Operating Officer

EVP - Executive Vice-president

GVP - Group Vice-president

DGM - Division General Manager

TMT - Division Top Management Team

SBU - Strategic Business Unit (Cross-Functional Team)

FUNCTION - Engineering, Manufacturing, Marketing, Sales

FIG. 1.1 Top Managers in a Large Diversified Company
(Source: Corporate Entrepreneurship by Vijay Sathe 2003)

1.0.1 Stress as a major cause of corporate dysfunction

Stress is a part of life. Various articles suggest that it has physical and emotional effects and can create positive or negative feelings. As a positive influence, stress can help compel action; it can result in a new awareness and an exciting new perspective. As a negative influence, it can result in feelings of distrust, rejection, anger, and depression, which in turn can lead to health

problems such as headaches, upset stomach, rashes, insomnia, ulcers, high blood pressure, heart disease, and stroke. Stress is experienced as adjustments are made in life. In so adjusting to different circumstances, stress acts as a stimulant or a hindrance depending on how individuals react to it.

Troxler and Wetzler (1981) assessed that workers under stress find themselves doing a partial job, take actions based on superficial views of problems, respond too quickly, and thus make partial decisions instead of well-considered ones, take on more tasks than they can handle and start feeling frustrated at not doing a good job thus their confidence in their ability to do a good job is shaken; noting also that finding enough hours in the day for work, family, business, kids, and themselves is among the most serious dilemmas they face.

A newsletter from a clinic in Jacksonville, Florida (2004 April) states that more executives admit that stress is affecting their jobs, family life and health. This is compounded by an unpredictable economy, pressure to maintain profitability and increased responsibilities and concerns about travel and workplace security.

Stress is said to cost companies in terms of employees' health and vitality, capacity for critical thinking, innovative competencies, and competitiveness. According to the Nutrition Health Center, Chesterton, Indiana, surveys carried out in 2000 by Princeton Survey Research Associates, Northwestern National Life Insurance Company, St. Paul Fire and Marine Insurance Company, The Families and Work Institute and Yale University, Stress in the work place costs the United States business segment more than 300 billion dollars every year because stress has cause both physical and emotional problems. Stress in the work place can lead to migraines, tense muscles, heart

attacks, insomnia as well as problems with relationships.

Stress in the Nigerian work place is growing. Some of the costs for companies associated with stress in the work place include workers' compensation, costs related to absenteeism, accidents, medical, legal, and insurance costs and training costs. According to the Nutrition Health Center, Chesterton, Indiana (2000), several studies and surveys have indicated stress in the work place has increased in the past few decades, especially in countries like USA and UK but it is fast creeping into the Nigerian workplace.

Corporate retreats in a different environment, with no interruptions for teams and individuals in organizations are now a common occurrence. They promote personal development, harmony and balance in life and work; and they aim to ultimately produce passionate and committed employees who make a difference in their workplace. Groups usually retreat to a different environment with no interruptions to brainstorm, strategize and relax in peace and privacy with each other, families, and friends or on their own. Many companies/ organizations have discovered that the setting and facilities that retreats offer inspire new ideas and increase productivity. They have also discovered that their executives, managers and employees are re-vitalized by visiting the peaceful setting of a resort or just changing their environment.

Almost any kind of hotel setting is not going to help anyone relax and may not be conducive for creating a comfortable space. A total change of environment that moves the participants out of their comfort zone is what is required to create a meaningful rest. The benefits of hosting them in beautiful surroundings without the distractions of everyday life is ideal for brainstorming, prioritizing strategic planning and most importantly stress relief. It also increases morale and shows care about the overall well being of the employees. For some

projects, business planning, strategy reviews, budgeting, and scenario planning, uninterrupted time is essential; for others, confidentiality is needed or just a change of environment.

Whatever the peculiarities of any sort of retreat, they all have a few things in common; there is a change of environment to a remote place of peace for time to deal with whatever one is retreating from. Mayo (1958) says that for an executive to go away on a retreat he may at first need total rest and seclusion from the working environment, but to deal with stress he needs an environment where he can at worst be exposed to a simulated working environment and still be at rest.

To work but still be at rest, one would imagine an environment where healthy rest and leisure are promoted with the interjection of a few urban elements to get just the right amount of work done without imitating the office environment.

1.0.2 Principle stressors of Nigerian corporate workers

To many Nigerians, stress has always been a way of life. The awareness that stress is a problem that the Nigerian workforce is subject to is growing. There are a whole lot of things that are causing this stress, and as the country moves into the twenty-first century the stressors are increasing. Stress is not a single problem, but a combination of stressors leads to a condition where a person is stressed. Maisamari (2002, pg. 12) wrote "Nigeria is growing more and more complex, insecure, and a large portion of Nigerians' are being moved from the protection of their simple and less complex traditional environments to the complex heterogeneous and less protective modern ones. For these reason problems such as overcrowding crime, high cost of living.… abound."

Egwuonwu (1989, pg.2) wrote, "Stress is beginning to kill the Nigerian workforce in their thousands……." when he issued a letter inviting Nigerian chief executives to a national workshop on stress management. Seminars and workshops are being held with increased frequency to warn the Nigerian workforce, especially the executives of organizations, on the sources, consequences and the management of stress. In April 2002, the National center for women's development held a workshop on stress management and obesity, an article on stress relief and therapy was published in the Vanguard, November 2002. Articles in 'Our Society', 'Tell', and 'Management in Nigeria', encourage executives to escape from the stresses of work to a natural tranquil setting. Advertisements for holiday spots all promote their locations with promises of a private natural haven where one can be relaxed renewed and revitalized.

A self authored questionnaire in 2006 and related articles showed that over the past two years the principal stressors of the Nigerian workforce could be summarized as follows:

a. Inadequate machinery in the workplace frustrate the workers efforts.
b. The constant electricity and fuel problems make it hard to complete work on time.
c. The average government worker works from, eight a.m. to four p.m., but due to traffic or a backlog of work they get home late and exhausted
d. Some workers spend twelve-hour days on work related duties and many more have more demanding hours.
e. Growing psychological demands as we increase productivity demands and work longer hours.
f. The need to gather and apply growing amounts of information
g. Job insecurity

h. Demographic changes such as aging workers, female participation in the workforce, and the integration of a growing population of ethnic and racial minorities into the workplace

i. The need for both men and women to balance obligations between work and family as women enter the workforce worldwide

1.1 DEFINITIONS OF A RETREAT

The term '"retreat"' has several meanings, all of which have in common the notion of safety and removing oneself from regular society for a time. It can also refer to a building used for the purpose of conducting a retreat. Every retreat is different, for some it is a time for peaceful reflection about one's life and faith, for others it is a time of healing, using the resources of prayer, meditation, or ritual. Others may use a retreat as a time for decision-making or preparation for a major task. And others may want to learn more about the mystical traditions of their religion and need instruction in techniques of prayer or meditation.

Every religious tradition has seen value in being in retreat. The following are different definitions that have been given to a retreat.

a. The Oxford Advanced Learners Dictionary (2001) defines a retreat as a quiet, private place that you go to get away from your normal life.

b. Morris (2005) defines a retreat is a block of time set aside for a temporary relief from regular daily activities. It is a time to get away from “normalcy” to try something new.

c. A retreat is a removal from every day life and responsibilities in order to pursue study, explore personal or strategic decisions, meditation, prayer, communication, self improvement, usually with the assistance of a director. (www.Articles.htm 2005)

d. A term literally meaning, "to withdraw", it can be used to refer to secular or religious gatherings where participants are invited to explore some topic, theme or issue. Within a religious context, retreats center on your relationship with God. A retreat tries to explore all the consequences of that relationship, including your decisions and your actions. (St. Anthony Messenger Press, 2002.)

e. A "retreat" is generally a time of solitude and prayer conducted in a remote location, such as a monastery or a center specifically used for this purpose. This is popular with many Christian churches.

f. A "retreat" is also a private haven or get-away area, often in the country, to which one escapes periodically. (Dictionary of Meaning 2005)

g. The place to which anyone retires; a place or privacy or safety; a refuge; an asylum.

h. A special season of solitude and silence to engage in religious exercises.

i. A period of several days of withdrawal from society to a religious house for exclusive occupation in the duties of devotion; as, to appoint or observe a retreat.

j. A retreat is a peaceful, simplistic area surrounded by beautiful nature, with hiking trails.

k. A time to stop and rest so you can go on again. A time to return to basics: basic attitudes, basic beliefs, and the basic balance of life. Above all, a retreat is a rest in God, in whom "we live and move and have our being."

l. "A retreat is time to spare for God ... The purpose of retreat is the deepening of communion with God, with others, and with ourselves. (www. Kempis.htm 2005)

A retreat in the context of the proposed work and the above definitions is a time that a group of people with a common goal change their environment to see how they can best reach their goal.

1.1.1 Purposes and activities of a retreat

Throughout the existence of man there has been the need to withdraw once in a while to a place of solitude. People and groups have different reasons why they choose to retreat. A careful review of literature on this issue has shown many reasons why individuals and groups chose to retreat, some of which are listed below.

a. In early times the prophet Moses retreated to a private place to be alone with God.

b. In 110A.D. Pliny, (called Pliny the Younger) or Caius Plinius Caecilius Secundus, a Roman senator, nephew of Pliny the elder, governor of Bithynia-Pontus (109A.D.-111A.D.), had a villa in Laurentine, seventeen miles from Rome whose details he documented in detail in a letter to a friend. He considered his villa a retreat from Rome and his business there. He returned there daily from Rome after a hard days work. He owned another villa in Tuscany, where he retreated from the interruptions of troublesome clients.

c. Cosimo de Medici, in 1450 A.D. scion of a powerful Italian family, pressured with business and civic affairs also had a retreat in Fiesole, in the hills east of Florence which was a retreat from the pressures of Florentine business and social life.

d. In two century A.D. Emperor Hadrian of Rome had a 200-acre pleasure retreat in Tivoli, sixteen miles west of Rome.

e. The sixteenth century Villa d'Este of the Cardinal Ippolito d'Este, sixteen miles northeast of Rome was a retreat for leisure and Otium.

f. Persian Emperors were lovers of luxury and beauty. They had private garden retreats along the countryside so that even when they were traveling, the Emperor could assure himself, despite the dryness of the countryside of a watered cool shaded retreat from the harshness of the semi desert.

g. Indian yogis and Tibetan monks regularly retreated to caves, mountains and monasteries to find solitude so that their minds and bodies could be at one.

h. Located seventy miles from the White House, in the Catoctin Mountains of Maryland, Camp David was established in 1942 as a retreat for the presidents of the United States of America to relax, unwind, contemplate, and entertain distinguished guests in an informal setting and cope with the pressures of modern day society.

i. Some people retreat to get away from the stress of family, noise, and their inability to cope with the pressures around them.

Not everyone can afford to own and maintain a private haven. In past and recent times hotels and resorts have been and are being used for the purposes of retreats. The need for more focused group getaways which could provide more privacy for the activities led to the need for retreat centers. Many of the first retreat centers evolved from specialized resorts and camping grounds.

With time different types of retreat centers and activities have evolved. A brief summary of the types of retreat centers is listed below.

a. Religious/ Spiritual Retreat Centers- these are usually characterized individual Ascetic cells for meditation, guest accommodation, and rooms for spiritual retreat.

i Christian Retreat Centers

ii. Meditation Retreats

iii. Celtic Prayer Retreats

iv. Monasteries

b. Non-Denominational Retreats-these are usually for individuals or groups who want to meet without the hassles of a tourist center.

c. Executive Retreat Centers -these are usually characterized by open areas suitable for seminars and group events with private helicopter and light aircraft access.

i. Corporate Retreats

ii. Executive Retreats

d. Health Retreats- these are usually characterized by spas and health treatment centers.

i. Naturopathic Retreat Centers

ii. Yoga Retreats

e. Nature Retreats- these are classified based on location.

i. Garden Retreats

ii. Oceanic Retreats

iii. Tropical Retreats

iv. Mountain Retreats

f. Artists Retreat Centers

g. Private Retreats -usually at high altitudes for privacy and good security

i Presidential retreats

ii Lifestyle exclusive retreats

1.1.2 Differences between a retreats and resorts

The focus for Retreats is individual experiences; they are small and intimate. The aim is to be indulged in every sense, so guests can expect luxurious accommodation in keeping with the retreat's style and surrounding environment. Retreats are typically held in secluded peaceful environments and offer the opportunity for self discovery and reflection.

While the retreats are small and intimate, Resorts are larger in size with an emphasis on providing guests with an extensive range of activities. They offer traditional activities such as golf, tennis, swimming, gym, and health and beauty facilities, as well as those that are a highlight in the resort's surrounding area.

1.2 DEFINITION OF A CORPORATE RETREAT

The Brefi group (2004) defines a corporate retreat as a planned meeting held away from the business setting once or twice every year so that the participants will not be disturbed by outside intrusions; and it gives them the ability to get back on track, re-energized and focused.

Various internet searches show that a number of organizations are finding that a little time spent going “back to the basics” helps a lot in molding corporate character. Executives discover much about teamwork when the meeting environment eliminates outside distractions causing participants to interact both at the planned sessions and during non-meeting hours. Participants get acquainted with each other on an entirely different level while engaging in outdoor activities or relaxing in a quiet natural environment; which provides a calming, natural and healthy way to interact with

colleagues and friends outside the office. A retreat also gives the participants a much needed rest; a sort of change from the everyday activities. A total change of environment is what is required to create a meaningful rest. In fact helping the participants step out of their comfort zone is part of what is necessary to create a meaningful rest.

1.2.1 Purposes of a corporate retreat

Corporate retreats are necessary because regularly dealing with daily problems, phone calls, and other interruptions cannot clear peoples' heads to effectively discuss firm issues during the workday or after work hours when they are tired. In addition, many retreat topics require an extensive amount of time for discussion and resolution, and the relaxed atmosphere of a retreat setting tends to reduce tension and fosters more cordial discussions and communication. The opportunity to escape daily work interruptions and the need for a more open communication for a longer period of time are all valid reasons for choosing a retreat setting for business discussions and resolutions. The purposes of a corporate retreat can be summarized as follows:

a. Reduction of office related stress
    i. Meditation
    ii. Walking
    iii. Time out for oneself
    iv. Taking baths
    v. Reading
    vi. Doing breathing exercises
    vii. Receiving back rubs/massages
    viii. Listening to relaxation tapes
    ix. Writing in a journal
    x. Meeting with a friend

xi. Napping

xii. Walking

xiii. Dancing

xiv. Engaging in spiritual reflection

xv. Stretching

xvi. Listening to music

b. Teambuilding (interaction to form cohesive decisions)

i. Strengthening or Building relationships - staff to get to know each other better, build a team to work together better, be more innovative, or to get down to work on strategy.

ii. Growth and Maturity to build unity and improve morale.

iii. To establish open & honest communications between colleagues.

iv. To reach consensus on an organizational structure for administration and management of substantive departments.

v. To identify common goals and develop plans for their accomplishments.

vi. To consider approaches to improve profitability.

c. Change of physical environment from the business setting to tackle a problem

i. Changing ones environment helps to reduce stress, relax, and stimulates ones mind.

ii. Nature supposedly helps a person relax, improves the quality of air and gives one a feeling of spiritual mental and physical well being and promotes human and cognitive and mental development, human emotion and healing.

iii. Physical separation from the office environment

d. Rejuvenation-physical as well as mental

i. Writing in a journal

ii. Biofeedback -This is basically a simple process of monitoring one or more of the physiological functions of the human body with some sort of instrumentation and translating the recorded activity into audio or visual signs which are transmitted directly to the individual whose functions are being monitored. The theory is that the individual may by observing these signals. Learn to exercise some degree of control over the particular function being monitored. Biofeedback instruments exist for many body processes.

iii. Concentration on one particular area in life

iv. Exercise- exercise for someone in good physical condition tends to reduce tension and facilitates turning off the emergency response resulting from stress.

v. Sound nutrition - diet does to some degree influence how one will recover from and respond to stress.

vi. Environmental and therapeutic healing

vii. Stimulation and inspiration for new ideas creative solutions and insights to problems sometimes enter consciousness during times when we are alone and undistracted.

e. Leisure and relaxation

i. Solitude for Thinking or Contemplation- solitude promotes contemplation, autonomy, rejuvenation, creativity, and recovery. In essence, solitude acts as a psychological and physiological reset button.

ii. Engaging in spiritual reflection

iii. Dancing

iv. Reading

v. Rest and Relaxation

vi. Napping

vii. Listening to music

f. Sound quality time with family members

1.3 PROBLEM STATEMENT

Retreats are fast becoming a trend in the corporate world. There has been an increase in the number of organizations that go for retreats all over the world in the past few years. Even in Nigeria retreats are becoming common and resorts and hotels in major towns are booked continuously for such events. Retreats for religious groups have existed for a long time in Nigeria; the need for a retreat center for corporate groups apart from a hotel or resort would give the added advantages of privacy, security, less distractions, and a much needed change of environment.

Stress is fast becoming a known and much talked about problem in the working environment. In a corporate retreat where work and leisure are combined for an already stressed group of people the problem is combining the two successfully without increasing stress levels but rather leaving the group feeling rested and rejuvenated. Retreat centers have definite functions depending on their particular type, but they all aim at restoration be it physical, mental or spiritual. The elements in retreat environments are aimed at restoration, the design problem will be how to enhance these elements using architecture and nature.

1.4 RESEARCH QUESTIONS

To understand what types of building forms make a natural environment serve a restorative function for a stressed corporate worker and at the same time enhance the

functions of a retreat center that are aimed at restoration the following questions could serve as guidelines:

a. What is the nature of stress; what causes it and what are its consequences?

b. What are corporate functions and what hampers their execution?

c. What are the elements of a restorative environment?

d. What elements of design and planning help to reduce stress and enhance corporate function?

e. What are the various models used to explain the management of stress?

f. What are the qualities of a corporate retreat environment that make it different from other retreat environments?

g. What are the needs of corporate groups in terms of facilities and how can they be designed to enhance restoration?

1.5 AIMS AND OBJECTIVES

The main aim of this study is to enhance the restorative elements of nature in a retreat environment so that it will serve as a restorative function for a stressed corporate worker and also be functional for use by other individuals and groups. The objectives of this study are:

a. To document what executive stress is and how can be managed.

b. To identify the restorative elements in a retreat environment.

c. To enhance natural ventilation

d. To provide frequent and spontaneous contact with nature.

e. To provide views of nature from building interiors.

f. To provide access to indoor sunlight.

g. To provide clear spatial organization.

1.6 SCOPE AND LIMITATIONS

Statistics show that the most frequent retreat goers are religious group and non-governmental organizations. Banks are a close second and others groups do not stay for as long periods of time. The facilities provided will tend more towards the needs of the most frequent users.

The size of the retreat will be tied to retreat activities and the average number of participants that attend a retreat at the same time, which upon examination is between one to two hundred people at a time. This will include accommodation facilities, conference and meeting rooms' cafeteria and kitchen and supporting facilities for body therapy, relaxation and user requirements.

The main focus of the work will not be the physical size of the retreat but the details in the structures and the environment, which will be aimed at restoration.

1.7 SIGNIFICANCE AND JUSTIFICATION

Workers deserve to be pampered when they are being asked to make a greater effort or change the way they have been doing things. The same old conference room may even trigger memories of past unsuccessful meetings, hardly the right setting for positive new and creative thinking. Hotels have their distractions, especially when other groups with different agendas are sharing common space.

The executives of many organizations look for a setting conducive for a retreat and not finding a place resort to going overseas. Workers in both the public and private sectors are being sensitized about the effects of stress in the workplace. Stress should not only be managed during a short week annual leave or when it mutates to a serious medical condition. Workers spend most of their time in the office or pursuing office related activities, this is why stress should be managed.

1.8 METHODOLOGY

To effectively formulate a design brief and present a suitable design proposal to accomplish the stated aims and objectives, data will be collected and analyzed in the following ways:

a. Questionnaires to organizations selected through purposive sampling to find out when, where, and how they go for retreats.

b. Oral interviews with randomly selected executives to find out what they require when they retreat.

c. Internet searches on executive retreats and solitude will be made to ascertain what the latest and historical trends are.

d. Literature sourced from the library and previous works of other authors.

e. Case studies will be used to find the relevant independent and dependant variables.

f. A site exploration to find a location that best meets the requirements of a retreat center.

CHAPTER TWO

STRESS MANAGEMENT

2.0 BRIEF OVERVEIW

A vast literature links the physical environment to stress reduction and restoration. This section looks at some of the research findings on stress, its management and nature's role in stress reduction and restoration.

2.1 STRESS

The study of stress is important not only to the health of an individual but also to the economic and social problems of today's society, in terms of sick leave pay, lowered effectiveness and efficiency, illness, death accidents and a host of other maladies. Stress is inevitable, in fact without some sort of stress in our lives we would all probably be dead, but too much or prolonged stress can lead to all sorts of physical and mental disorders. There are many symptoms that show that people are stressed. Tenant (1978) and Woolfok (1995) recorded some symptoms as: anxiety, anger, depression, intrinsic thoughts obsession, altered motivation, impaired intellectual activities, aggression, substance abuse, avoidance, lack of concentration and loss of interest in activities that were eagerly sought for.

Stress means different things to different people. The following are various definitions that have been given to stress.

Stress (a word derived from Latin) was used popularly in the seventeenth century to mean hardships, straits, adversity, or affliction (Shorter English dictionary, 1933). Hinkle (1973) noted that only during the eighteenth and nineteenth century did its use evolve to denote force pressure strain or strong effort, with reference also to objects, but still primarily to a person or person's organs or mental powers.

Stress is anything that requires the body to change. Since the only objective evidence of life is growth, and growth is a change, then it follows that stress is an inherent part of life. McGarth, (1970, pg 10) wrote that there is potential for stress when the capabilities and resources of any individual cannot adequately meet the demands imposed by the environment. This definition implies that the environment a person is in and his ability to cope with that environment is what causes stress, meaning that individual reactions to a situation determine the degree of stress a person is subject to. To further enforce the fact that stress is experienced not by groups but by individuals, Gardner and Taylor's 1975 (pg.140) definition of stress shows that it is an individual phenomenon, which is subjective in nature and can occur in anyone who feels he or she is under pressure, which can be felt in many ways and ultimately affect a person's body and mind.

Fontana (1989, pg.66) defines stress as, "a demand made upon the adaptive capacities of the mind and body", while Selye (1974, pg.32) describes stress as physical and psychological reactions or responses of the body to demanding stimulus events.

For every action there is a reaction. If the body is under pressure it tends to react in an attempt to balance the effects of the stress it is under. This can be seen in Cofer and Appley's 1964 definition of stress as the state of an organism where he perceives that his well-being or integrity are endangered and he must divert all his energies to its' protection. This is the person's attempt at coping or using whatever means available to combat this pressure. Unfortunately some of the coping techniques used tend to aggravate stress, for example smoking, drinking, overeating and a lot more, this can only lead to more stress. Thus another apt definition of stress is given by Maisamari (1996, pg 10) as a situation, which arises when one's coping skills are inadequate for meeting particular problems in life.

From the above definitions it can be seen that stress is an individual phenomenon caused by a person's response to his external or internal environment, which puts pressure on both the body and mind forcing the person to look for a way to cope, which can be a further cause of stress. Stress can be seen as a physical physiological, as in the case of tiredness or fatigue or social/psychological as in the case of worries related to work.

2.1.1 Types of stress

The classifications of the type of stress are not based on the particular individuals or groups exposed to similar stressors but on the degree of the extent to which the individuals or groups feels stressed. Chevins (2001) made the following classification on the types of stress.

a. Acute stress is the reaction to an immediate threat, commonly known as the fight or flight response. It makes itself felt through tension headaches, emotional upsets, gastrointestinal disturbances, feelings of agitation and pressure. Common acute stressors include: noise, crowding, isolation, hunger, danger, infection, and imagining a threat or remembering a dangerous event.
b. Chronic Stress -There is a common urge to suppress ongoing stress; it then, becomes chronic. Chronic stress is the most serious of all. It is the stress that never ends. It can be treated, even reversed, but it takes time - sometimes two to three years-and often requires professional help. Common chronic stressors include: on going highly pressured work, long-term relationship problems, loneliness, and persistent financial worries.
c. Episodic acute stress - This is more serious and can lead to migraines, hypertension, stroke, heart attack, anxiety, depression, and serious

gastrointestinal distress. It is quite treatable, but it takes general life style readjustments, four to six months, and often requires professional help.

d. Traumatic stress- this is the result of massive acute stress, the effects of which can reverberate through our systems for years. Post-traumatic stress disorder is treatable and reversible and usually requires professional aid.

2.1.2 Effects of stress

In prehistoric times, the physical changes of groups and individuals in response to stress were an essential adaptation for meeting natural threats. Even in the modern world, the stress response can be an asset for raising levels of performance during critical events such as sporting activities, an important meeting, or in situations of actual danger or crisis. If stress becomes persistent however, all parts of the body's stress apparatus (the brain, heart, lungs, vessels, and muscles) become chronically over or under-activated. This may produce physical or psychological damage over time.

Some of the effects of stress are summarized below from a report published by the Well-connected reports group in 2001 on stress.

a. Psychological effects
b. Heart disease and stroke
c. Susceptibility to infections and immune disorders
d. Gastrointestinal and eating problems
e. Sleep disturbances
f. Sexual and reproductive dysfunction
g. Loss of memory and concentration
h. Self-medication with unhealthy lifestyles

Chevin (2001) identified that people respond to stress differently depending on different factors:

a Abusive behavior towards children causing long-term abnormalities.

b Personality traits that cause people to over-respond to stressful events.

c Genetic factors

d Certain diseases that are associated with immune abnormalities (such as rheumatoid arthritis or eczema) may actual impair a response to stress.

e The length and quality of stressors

2.1.3 Nature and sources of Corporate work stress

Stress response is always basically the same, differing only in the degree of reactivity of the individuals and individual organs. There are two possible significant differences between corporate work stress and the stress to which other individuals are subject.

a Corporate workers as a class may be subjected to exposure to certain types of stressors to greater extent than other individuals.

b Corporate workers as a class may be particularly susceptible to some of the adverse effects of stress.

Greenwood (1979pg. 44-48) says that corporate work stress is not a particular type of stress as there are a variety of stressors and the adverse effects are as many. Therefore all executives are not exposed to the same kind of stress and some are more susceptible to some of the adverse effects than others. Some people regard stress as occupational strain, job stress, work tension, burn out or job demands. A civil servant who has much less identification with the results of his organization and whose failures are buttressed by the knowledge that others are not really dependant on his decisions for their livelihood may not be subject to the same stressors or be subject to the same degree of stress as management

staff, although because the same line of work is involved the stressors may be similar and affect the non-managerial staff by association.

Cooper and Marshall (1978) identified forty interacting factors, which might be source of managerial stress, but they identified seven major categories, which included:

a. Factors intrinsic to the job: Stress can be caused by too much or too little work, time pressures and deadlines, having too many decisions to make, fatigue from the physical strains of the working environment, excessive hours, long travel, power failure, old machinery, inadequate machinery, poor working conditions and so on.
b. Role in the organization: This is usually associated with lack of clarity about the work objectives associated with ones role in the office or conflicting ideas about how an individual is asked to do work and how he wants to do the work. Being responsible for the output of other workers but not having any real authority at high levels of authority is another source of work stress.
c. Relationships at work: Bad relationships with superiors, subordinates and even colleagues make it hard to get the full potential out of people and this leads to all sorts of stress.
d. Career development: The two major stressors here are lack of job security, under or over promotion and frustration at having reached ones' career peak.
e. Extra-organizational sources of stress: These include family problems, conflicts of personal beliefs with company policies, conflicting time demands of family and company and financial problems.
f. Organizational structure and climate: Stressors here include little or no participation in the decision making, poor communication, and no sense of belonging office politics and so on.

They showed the relationship between these factors in the following diagram.

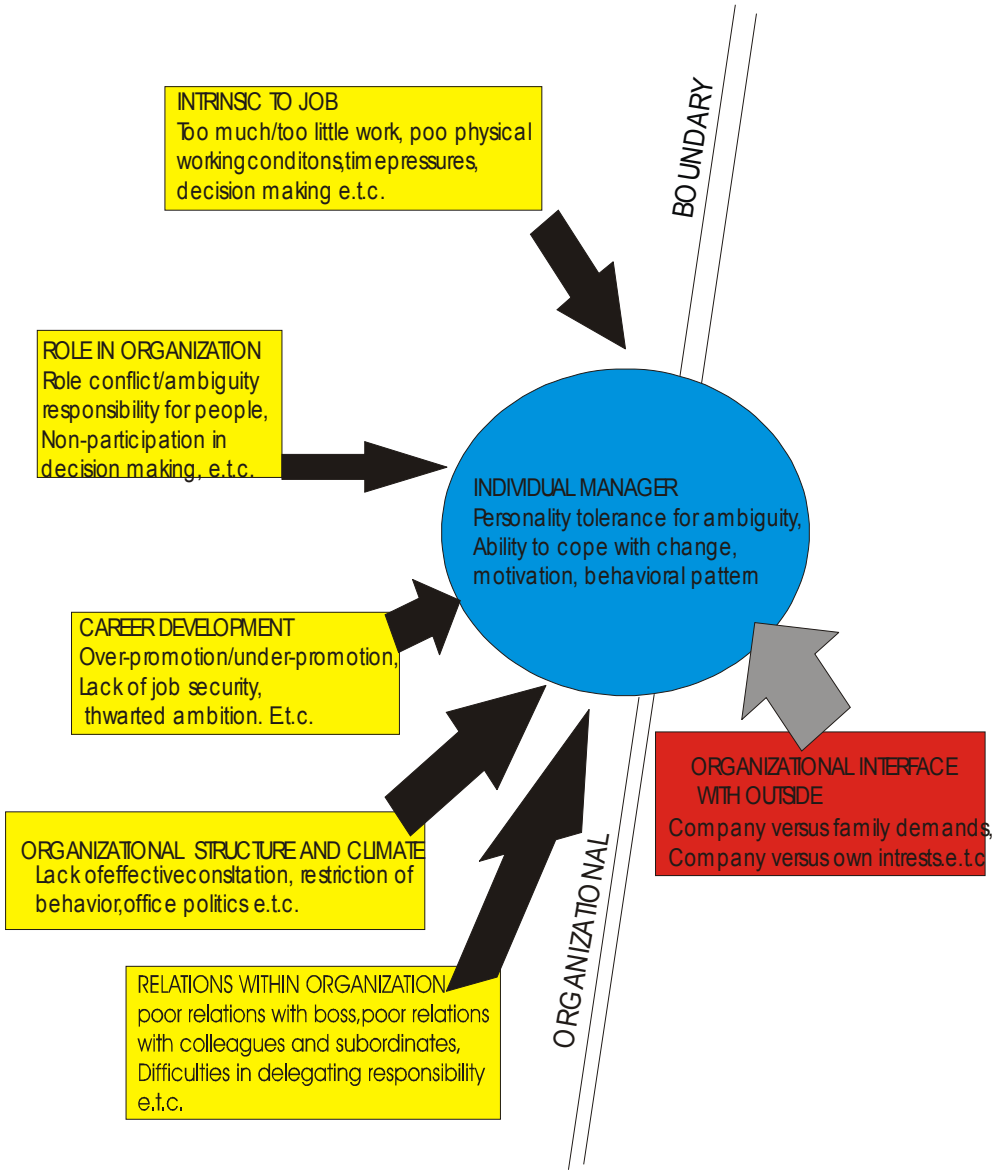


Fig. 2.1 Diagrammatic representation of sources of stress
(Source: Stress at work, edited by Cooper and Payne 1979)

2.2 APPROCHES TO THE MANAGEMENT OF STRESS

There are basically three different approaches to the study of stress; the stimulus based or engineering approach, the response based or medico-physiological approaches and the psychological based (Cox and Mackay, 1981). The engineering approach treats stress as a stimulus characteristic of the persons environment, while the medico-

physiological approach considers stress as a 'generalized and non-specific' response to noxious environmental stimuli. These first two approaches were found to be inadequate because they failed to take into account peoples individual differences in relation to stress and the processes which underpin these differences. The more psychological models have attempted to overcome the weaknesses in the first two approaches and are mostly categorized as either interactional or transactional in nature.

The transactional model of occupational stress developed by Cox and Mackay (1978) stress was originally described in terms of five stages. The first stage represented the source of demand faced by the person and reflects the characteristics of their environment, the second stage identifies the persons perceptions of these demands in relation with their ability to cope, the third stage has to do with the recognition of the psychological and physiological changes associated with the self realization of the stress state one is in, the fourth stage deals with coping with the fifth stage general feedback. The model was further developed and in summary is basically that stress response is based on the balance or imbalance resulting from the interaction of four phenomena namely:

a. Ones internal values and needs

b. The external environment

c. Its' demands and constraints i.e. the environment.

d. Personal resources and the supplies of the environment

The transactional model says that when stress is experienced some psychological and physiological functions change; this is called coping, which is a specific response initiated to overcome stress.

Coping tends to imply progress if not success with a problem as people tend to say 'they are coping' in response to how they are doing. Matheny et al (1986) defined coping as any effort, healthy or unhealthy, conscious or unconscious, to prevent,

eliminate it weaken stressors, or to tolerate their effect in the least hurtful manner. Papalia and Olds (1985) on the other hand defined coping as a response to stress that has two major functions. The first implies solving the problem and the second allows us to manage stress related emotional and physical response, so that we can keep up our morale and continue to function.

Ejiogu and Aderounmu (1989) in a socio-psychological approach to stress developed a framework for stress management planning under three main headings; removal or avoidance, immediate response and long-term protection. Lazarus and Folkman (1984) distinguished between problem and emotion focused coping. Endler and Parker (1990) added avoidance as a part of coping.

A summary of the factors involved in these coping techniques are: understanding the problem, developing alternatives be they logical, emotional or fanciful, seeking a group with a similar stressful condition so coping skills can be developed as a group or just plain denial.

Cooper and Payne (1993) note that people exposed to the same stressors tend to respond in similar ways, this means that the same methods can possibly be used to reduce or manage their stress. Studies have shown that the same coping strategies can be used by individuals with different personalities. This means that individuals with different characters but who are trying to cope with a similar problem tend to cope better as a group and despite their differences they usually adopt the same or similar coping strategies. Whatever coping strategies are used the main focus is on getting the individual to relax both in mind and body using whatever means to overcome the effects of stress.

Greenwood (1979) says that since executive stress is inevitable the executive should seek not to eliminate it, because such efforts would be futile, but rather manage it.

Some of the following coping strategies have been suggested:

a. Meditation and relaxation

b. Body therapy

c. Exercise

d. Dieting

There are many methods and approaches to coping with and managing stress, but in coping and managing organizational stress the important thing is to make sure that the coping techniques used is relevant to the individual and his particular organization.

Coping is a response that is determined by the environment that an individual is in at the time he has to deal with the stress he is under. The Person-Environment (P-E) Fit model, developed in the early 1970s by researchers at the University of Michigan, states that strain develops when there is a discrepancy between the motives of the person and the supplies of the environment (job), or between the demands of the job and the abilities of the person to meet those demands. This means that a job becomes stressful to the point that the abilities of the individual fall below the demands of the job. Motives include factors such as participation, income, and self-utilization. Demands include work load and job complexity (Kaplan et al., 1975; Van Harrison, 1978; Baker, 1985).

The P-E fit emphasizes that job stress will not be reduced by general programmes which treat all individual identically. This implies that to reduce job stress for all persons, programmes must allow for individualized treatment of a worker, which would prove to be highly expensive and hardly workable.

The phenomenon of behavior setting postulates that whatever our individual differences in personality the setting tends to dictate how we behave; reflective in a church, business like in an office and so on. In looking for a setting that helps people

feel and function well, reduce stress, promote creativity, and combat depression .Gallagher (1999) found that people feel better in settings that foster a sense of control, impose few restraints and offer multiple options. Kaplan and Kaplan (1989) in looking for a setting that helps people function better developed a model called the reasonable person model. This model is based on the frame work that people are more reasonable, cooperative, helpful satisfied and constructive when the environment satisfies their basic informational needs. They summarized these informational needs into three:

a. Exploration and understanding meaning that people are comfortable in non-confusing scenes offering discovery and learning without getting lost.
b. Meaningful action meaning that people have to participate in a process to avoid feeling helpless.
c. Restoration meaning that exposure to natural elements combats a decline in effectiveness and reasonableness due to mental fatigue.

The Kaplan's concept of a restorative environment is - an environment in which the recovery of mental energies and effectiveness is enhanced. The word "restorative" refers to a person's return of strength, or health, by means of enhancing his/her renewing abilities (Fischl, 2006). They believe that the natural environment has a special relationship to each of the four factors that are important to a restorative experience which can be summed up in one of the most accepted approaches to understanding restorative experiences; the Attention Restoration Theory (ART). ART describes four aspects of a restorative experience:

a. Being away - getting distance from some regularly present aspects of one's life;
b. Extent - the structure of perceptual and conceptual environmental details;
c. Fascination - an experience with aesthetically pleasing stimuli; and
d. Compatibility - the match between person and environment.

Kaplan and Kaplan (1989) are careful to point out, however, that far away nature or a vast wilderness is not the only setting for experiencing restorative experiences.

2.3 NATURE AND RESTORATION

Nature is seen as an effective stress reducer because it provides a kind of "cognitive quiet," necessitating fewer decisions based on external demands. Barnes (1994) suggests that nature serves to reduce our stress by reducing physiological arousal.

These 'restoration perspectives' have been dominated by Kaplan and Kaplan's (1989) attention restoration theory and Ulrich's (1983) psycho physiological stress reduction framework (Korpela and Hartig, 1996; Kaplan, 1973; Kaplan and Kaplan, 1987; Hartig *et al*, 1991). Kaplan and Kaplan, (1989) suggest that stress results from our efforts to deal with "information overload". The Kaplans suggest that nature provides innately interesting stimulation that allows us to rest from the "directed attention" needed for the pursuit of daily activities. In contrast, Ulrich's studies document the physiological benefits in reducing arousal through natural environment access.

Ulrich wrote:

"*If an observer's state prior to a visual encounter is one of stress and excessive arousal, an attractive natural view might elicit feelings of pleasantness, hold interest and block or reduce stressful thoughts, and therefore foster psycho physiological restoration...Even the passive intellectual contemplation of a natural setting can be quite adaptive if it provides a breather from stress...or gives the observer a sense of competence in terms of mental prowess or efficacy, thereby contributing to a sense of identity* (1983, p. 95)."

Research has shown that natural landscapes can lower stress levels (Ulrich 1984). Research studies have found that nature provides a therapeutic effect on our physiological systems. In a study conducted by Ulrich (1984) he found that visual

exposure to nature settings produces significant recovery from stress within only five minutes, as indicated by changes in physiological measures such as blood pressure and muscle tension. A decrease in metabolism as well as a slowing of the heart rate and respiratory system takes place with visual exposure according to the study by Ulrich and Parsons (1984). Another study documented people's ability to recover from stress through exposure to nature settings with plants by quantifying physiological measures such as muscle tension, skin conductance, and pulse (Ulrich and Simons, 1986).

Honeyman, (1991) in a study to examine the common assumption that exposure to features found in the natural environment alleviate human stress found that introduction of green vegetation into the urban landscape may be of important psychological benefit to humans.

It is common in Nigerian villages to see older people still going about their daily activities with little signs of stress except those imposed by old age. They are constantly exposed to natural vegetated settings and by the nature of their work which is mainly farming their bodies are regularly exercised. When people want to go away for holidays they tend to look for places that have a natural setting, away from the hustle and bustle of the environments they are retreating from. A list of some of the tourist attractions in Nigeria (refer to appendix 1) shows that most of the attractions in the country are natural, physical and cultural sites.

In 1984, Harvard biologist Wilson E.O. named this natural human desire to be close to nature, Biophilia, "the love of nature." He postulates that it is a feeling that dates back millions of years, to the age when the human brain evolved to attract us to elements and places that will most guarantee survival and reproductive success which is undoubtedly nature. He argued that there is a need, not preference for “deep and intimate associations with the natural environment, particularly its living biota” Wilson (1993). He proclaims a human dependence on nature that extends far beyond the simple

issues of material and physical sustenance to encompass as well the human craving for aesthetic, intellectual, cognitive and even spiritual meaning and satisfaction. He also talks of the role of nature in human and cognitive and mental development, human emotion and healing.

A natural landscape here tends to mean green lush landscapes not particularly arid ones. Studies show that people are more relaxed when viewing a natural landscape and are in direct contact with nature.

The environment influences the level of relaxation a person can achieve. Parsons (1991) says that exposure to nature fosters a sense of psychological well being, reduces the stress of urban living and promotes physical health.

Research on the physiological role of open space centers on the manner in which direct or natural encounters with the vegetated landscape helps to reduce stress, arousal, and anxiety. An early study in Ulrich's series (1979) demonstrated that subjects experienced more "wakeful relaxation" in response to slides showing vegetation only and vegetation with water as compared with urban scenes without vegetation. He suggests that such opportunity to focus on something other than normal life stresses, "provides a breather" by blocking or reducing stressful thoughts, and by fostering "psycho physiological restoration." These results have been confirmed in his studies of hospital patients (Ulrich 1983; Ulrich 1984). Recovery was faster, nurses made fewer negative evaluations in patient reports and there was less use of analgesic drugs among post-surgery patients who had a view of exterior greenery than among matched patients with views of buildings.

Kaplan and Kaplan (1989) stretch beyond the work of Ulrich *et al*, to focus on what nature does, for whom, under what circumstances. They show that vegetation and nature reinforce our spontaneous attention, allow our sensory apparatus to relax, and infuse us with fresh energy (Nilsson, 2002; Kaplan, 1992).

People relate to plants, that is the basis for therapeutic landscape design and horticultural therapy. Working with plants has been used therapeutically to relieve stress since earliest recorded history, and recent studies are beginning to document the value of working with plants (Doxon et. at, 1987). Plants have aesthetic, temporal and spiritual qualities. The annual dormancy and rejuvenation of plants mark time, and provides a sense of connection to the earth and to other living organisms. A garden can restore a sense of order, safety and privacy for those dealing with the chaos induced by illness. Evidence of restorative gardens can first be found during the Middle Ages in Europe. Medieval hospices integral to monasteries were the first restorative gardens to appear in the West. Patient's cells bordered an arcaded courtyard that offered sunlight, a lawn, seasonal plants and a place to sit or walk. Browne (1991) said that nature may have an impact on the promotion of well-being: aesthetics, environmental stimulation, social interaction, motivation for physical exercise, and self-expression. Marcus and Barnes (1992) wrote on how moving water creates a soothing sound and can create a psychological screen that helps the restoration process and how still water can promote meditation and peacefulness.

A study by Hans (2003) highlights that although restorative reactions do occur in bodily systems; restoration is often triggered by surrounding settings. The literature suggests that there are five key ways in which exposure to the natural environment is beneficial to human health. These are:

a. Enhanced personal and social communication skills.

Interaction with plants and earth enables sensory stimulation, provides an opportunity to keep warm through activity, and exposes the body to fresh air. It can also help people gain basic and social skills, obtain qualifications, rebuild their lives, and maintain or improve quality of life. It provides something to talk

about, a chance for enthusiasts to impart knowledge, it 'humanizes' institutions, provides motivation, induces aesthetic satisfaction, status and self-esteem (Ryan, 1992; Browne, 1992; Mattson, 1992; ed Morris 2003)

b. Increased physical health.

In the last two centuries walking has shifted from being a 'central mode of transport' to 'leisure activity'. Walking and outdoor sports such as cycling are being increasingly recognized as one of the best ways to improve people's physical health and mental well-being (Countryside Agency, 2000; Davis, 1999; Browne, 1992; ed Morris 2003). Psychological well-being does not necessarily have to be derived through physical activity. The aesthetics of natural and green landscapes can have an important impact upon mental health. Plants and aesthetically pleasing landscape design can help to create a more relaxing, home-like, and non-institutional setting for restoration and recovery (Browne, 1992). Browne (1992) has shown that elderly residents in one retirement community preferred superior viewing positions and panoramic views with long vistas framed by plants, in an informal setting with water, grass and trees. The opportunity to observe nature, variety, color and detail in vegetation were also significant to the regenerative experience.

c. Enhanced mental and spiritual health.

Exercise is also associated with improvements in psychological and spiritual health (Hickmann et al, 1999; Oxford Brookes University, 2001). Physical activity in the natural environment not only aids an increased life-span, greater well-being, fewer symptoms of depression, lower rates of smoking and substance misuse but also an increased ability to function better at work and home (Physical Activity Task Force, 2002; Oxford Brooks University, 2001;

Skelton and Young, 1999; Mersey, 1991). Outdoor activity is widely thought to enable one to escape from the pressures of modern living, achieve an enhanced state of relaxation and refreshment, tackle new challenges, and help reduce anxiety and stress levels (Scottish National Heritage, 2002). Walking in the natural environment, in particular, is widely conceived to be a valuable and enjoyable antidote to the stresses, complication, regulation and non-reflexive nature of modern urban life, a time in which the body 'comes alive' (Edensor, 2000; Duerden, 1978; Wallace, 1993).

d. Enhanced spiritual, sensory, and aesthetic awareness.

Outdoor recreation and, in particular, walking is a multi-sensual and stimulating experience which frees the mind and generates reflexivity, philosophical and intellectual thought, aesthetic contemplation and opens up a more 'natural' self (Edensor, 2000; Leed, 1991; Wallace, 1993; ed Morris 2003). Walking is a practice that can restore natural perception and reconnect human beings with the physical world of nature (Edensor, 2000; Duerden, 1978; Wallace, 1993).

e. Ability to assert personal control and increased sensitivity to one's own wellbeing.

Ulrich and Parsons (1992) note that a large body of research on recreational experiences has indicated that leisure activities in nature settings and vegetation are important for helping people cope with stress as well as in meeting other non-stress-related needs. Wilderness experiences and outward bound courses have long been promoted as effective forms of complementary therapy.

2.4 THE SOLITUDE OF NATURE

The common justification for using open space is the need for a place of contemplation and solitude. People are drawn to gardens, parks, and rural natural landscapes to sit passively or to engage more actively in exploratory behavior. Many say they seek places set apart physically, or separated from other people, while others seek to simply remove themselves from their daily rituals and need no physical or social separation. Natural environments are unique in their ability to provide solitude and privacy, no matter how we use them, or even whether we use them. The very idea that we can get away, whether or not we do so, provides a psychological "time-out." The solitude of natural environments also enables us to discover and explore our social and personal identities. (Brill 1989)

Odunlami (1976), in his work 'Retreat-Architecture for solitude' found that people retreated to non-crowded places where there were no planned excursions to get away from stress, noise, their inability to cope with the pressures around them and because the conventional pleasure that a holiday resort provided had palled. He considered different types of retreats and concluded that whatever their form, the retreat should be in direct contrast to whatever the person is fleeing from. He identified three categories of people who seek retreats, namely:

a. The temporal- the weary urbanite at the height of his career needing a temporary rest for meditation.

b. The creative- the artist withdrawing to find inspiration.

c. The sublime- the man-seeking communion with God.

He based his concept on meditative solitude saying that the forms used; the environment and size of spaces affected the behavior of man. His expressed solitude architecturally by:

a. Providing visual and auditory privacy while maintaining a sense of security for all the chalets.
b. Providing landscaped gardens for meditation at the highest point of the site.
c. The use of lights and color to create certain moods.

There are other forms of solitude apart from meditative solitude. The one the common to them all is that the solitude seeker must retreat for different periods of time.

A study which was conducted and coauthored by social scientist More (2004) was conducted using questionnaires and found that positive solitude experiences were most likely to occur in outdoor, natural settings, whereas seventy eight percent of negative solitude experiences occurred at home.

The benefits for both positive and negative solitude experiences include obtaining new perspectives on a problem and feeling stronger as a result of the experience. A sense of renewal, increased self-awareness, and goal clarification were the most commonly reported outcomes of positive solitude experiences.

2.5 DEVELOPING A CONCEPTUAL FRAMEWORK FOR THE STUDY

The frame work of this study is based on the concept that exposure to nature is restorative and reduces stress. The stressors that corporate workers are exposed to and the coping techniques they employ have been outlined above. A retreat can actually induce its' own stress because the ultimate aim of a retreat is to maximize the potentials of a group, which can put all sorts of pressure on the particular individuals involved.

People exposed to the same stressors tend to respond in similar ways, this means that the same methods can possibly be used to reduce or manage their stress. The phenomenon of behavior setting postulates that whatever our individual differences in personality the environment that an individual is in influences his behavior. The RPM goes further to say that if this setting satisfies the individual's informational needs he will be more reasonable, cooperative, helpful, satisfied and constructive.

Literature has shown that the most relaxing environment is the natural vegetated environment where a person can be in solitude, explore and be rejuvenated.

The coping techniques outlined in the transactional model each have a link with the natural environment and mans' perception of that environment. This implies that if stress is reduced when an individual is exposed to nature even for as little as five minutes, coping strategies would be highly effective if carried out in a natural setting.

Exposure to natural elements and processes for restoration in retreat environments is a conceptual framework that links restorative environmental factors with retreat activities meaning that people are more creative, healthy, and rejuvenated when combining work and leisure in a natural environment.

CHAPTER THREE

ENHANCING THE RESTORATIVE ELEMENTS IN RETREAT ENVIRONMENTS BY INTEGRATING ARCHITECTURE WITH NATURE

3.0 HUMAN PERCEPTIONS OF NATURAL ELEMENTS AND PROCESSES

Aesculapia, the Greek place of healing, is a model where nature is respected for its restorative qualities. It is said that the human experience is set in harmony with the environment, and an opportunity is created to allow a reconnection of human needs to the natural systems upon which all life is based. Applying these objectives to a retreat would embrace the primary senses; sight, hearing, smell, taste, and touch -which are incorporated into the visitor experience to enhance understanding of the environment's uniqueness. For the environment to be healing, visitors must experience an obvious organic connection with the natural and cultural context of the surroundings so as to appreciate their worth and to seek ways to minimize biological disturbances.

Nature connects to human consciousness through forms and colors. Obviously, any man-made structure that does not explicitly copy a natural structure will contrast with natural forms. If a structure corresponds to that of natural forms, then a man-made structure will be perceived as natural, even when its appearance is clearly artificial. Sommer, (1974) postulates that humans have a built-in need for structures with natural scaling thus they possess a basic instinct about forms that is linked to our ability to visually discern potential dangers in our surroundings.

A common feature of all natural forms is the existence of distinct scales. (Day, 1990) explained how Some free-form "organic" buildings may appear strange to academic architects, but give pleasure to their inhabitants, because such buildings need not have classical symmetry, or follow any recognizable archetypes. Alexander (1996) further assesses that according to traditional criteria that also govern Modernist forms, buildings without any obvious overall symmetry are not thought to be ordered, as most

people tend to identify "order" with symmetry. Yet those with scaling satisfy one of the several requirements for intrinsic order in a design.

Licklider (1996) explains that starting with Vitruvius, writers underline the necessity for architectural forms to have features on a scale to which human beings can relate. A building has to fit harmoniously into its environment. The relationship of an object to its surrounding space is determined by the hierarchy of scales. A proper boundary region connects the building to its surroundings. Gehl (1987) further stated that a building that draws attention to itself by either ignoring, or clashing with its surroundings, is ultimately unsuccessful. A scaling rule comprising part of a design theory derived by Alexander (1996) produced buildings that connect subconsciously to users by controlling internal subdivisions so the design can generate the same positive emotional response as natural forms. This implies that not only the buildings external form should imitate nature but also the internal spaces.

3.1 THE AESTHETICS OF SOLITUDE

Solitude means total privacy and isolation from others not forced by external circumstances or people. To be in solitude means to be alone and in silence. The word solitude may be split into sole (alone) and attitude. It means being physically alone and in isolation, psychologically in total privacy, detached and totally silent and absorbed, passively pondering or even working silently. In the natural moments of solitude, there is a feeling of total absorption; self-content and fullness. Being tension free, new ideas, solutions, themes arise to your mind which can change your life totally. Creative solutions naturally occur to one in solitude; solutions to even complex problems occur to one almost effortlessly at this time. Natural motives or goals are discovered in times of solitude. Many persons have admitted that some of their great ideas occurred to them

at one or other time of solitude. New ideas, new resolutions, new perspectives etc. are easy when one is in deep solitude.

This basically means that solitude promotes contemplation, autonomy, rejuvenation, creativity, recovery, and catharsis. In essence, solitude acts as a psychological and physiological reset button.

Solitude and concentration promote the dynamism of auto psychotherapy in two ways: by containing the areas of conflict and tension (i.e. by promoting relaxation) and further by transforming psychic conflicts into processes, which promote development. In your solitude, you can re-energize yourself. A primary reason why solitude can have so many therapeutic effects on the mind and body is that solitude is similar in many respects to the relaxation response, which involves a reduction in sensory input into the brain; lowers arousal, quiets the mind and produces states of mental quiescence that restore energy and promote positive mind/body interactions. Being in solitude is an important part of retreating. Retreats are designed to give individuals an opportunity to be alone even when he/she is part of a group. Esoteric traditions such as Buddhism and Zen use solitude as a means of enhancing the experience of this ancestral state of mind thus nearly all the arts in historical China and Japan derive their aesthetic principles from Taoism and Zen Buddhism. The guiding principles are Wabi and Sabi. The term Wabi-Sabi suggests such qualities as impermanence, humility, asymmetry, and imperfection. The design principles of Wabi-Sabi fall into several categories;

a. Type: The materials used are organic, not synthetic.
b. Form: The object is shaped naturally or organically, showing natural or intentional asymmetry or irregularity.
c. Texture: the texture remains rough, uneven, variegated, and random, with every appearance of pursuing an unimpeded natural process.

d. Beauty: Wabi-Sabi presses the absolute nature of permeability in the visual and sensual, so that the fragility and poignancy of conventional beauty lost in the passage of time is made real in the present space.

e. Colors are derived from natural sources, lacking uniformity or harshness.

f. Simplicity: Lack of adulteration and ostentation confirms the authenticity of the work and its conformity to the Wabi-Sabi spirit.

g. Space: Scale becomes an economy of space, but empty space conveys the nature of the universe.

h. Balance: The work reflects the physical balances found in the natural world. Hence no preconceived formula for symmetry is tenable because nature defines itself by circumstances: a tree grows tall or short, thin or thick, leafy, crooked, etc

i. Sobriety: Sobriety is the simple principle that art is sometimes better defined by what is left out than by what is put in.

Chan (1988) expresses the aesthetic principles of Wabi-Sabi in seven points. The three core principles are simplicity, tranquility, and naturalness. Simplicity is application of the minimum and the appropriate. Tranquility suggests the quality of feeling refreshed and touched within, but with solace and calm, not excitement or over-stimulation. Naturalness is the avoidance of contrivance. From Wabi come two core principles: non-attachment and subtle profundity. Non-attachment gives the work its fresh and original feeling. The object is somehow familiar but does not depend on anything else. Subtle profundity is the notion of depth. From Sabi come two core principles: austere sublimity and asymmetry. Asymmetry rejects symmetry in form and balance in order to conform to nature. It is a balance of object against space, of place and proportion. Austere sublimity maintains a strong emotive element.

Here is Chan's graphic illustrating the relationships of the aesthetic principles:

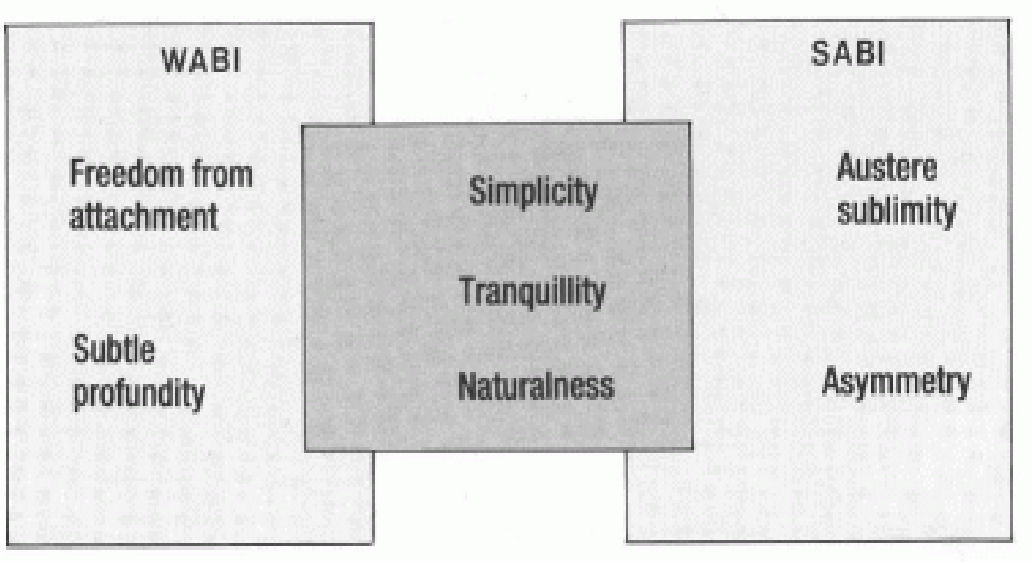


FIG.3.1 Relationship of Aesthetic Principles
(Source: Chan, P. 1988)

3.2 INTEGRATING NATURE WITH THE BUILT ENVIRONMENT

Interior landscapes have an integral role in green building design. Research has proven that plants improve indoor air quality, increase worker productivity, boost morale and provide a sense of tranquility. Trkanjec, (2004) outlined two of Le Corbusier's five points of modern architecture dealing with allowing nature to enter into homes and buildings; firstly, the building should be raised one level of the ground by the means of pillars, thus allowing for a garden beneath the house, and disrupting the existing environment on ground as little as possible. Second, the ground which was taken from nature for the location of the house should be compensated by turning the roof (flat roof) of the house in the garden-terrace. The courtyard design is also a way of bringing nature into the built environment. This is also an added benefit as it helps to regulate the internal temperature of the house especially in the tropics. Singh (2004) further notes that a building in harmony with nature is the one which compliments it and does not erase away in any way its essential elements and does minimum damage to nature both during its construction and while it functions including the materials that are

going into its construction and how much energy it would extract from nature to sustain itself. The standard in eco-architecture is to disturb the ecology of the site in the minimum. For example if the site is a contoured one then flattening may seem the easiest way out but surely not the best. A better approach would be to build around nature on the same levels. Finally the basic elements of nature trees, water, soil, air, sun, etc. can always be brought inside the built environment in a trial of giving back to nature what was snatched from it in the course of construction.

Bringing nature into the built environment has been achieved using skylights, courtyards and so on. Site potentials have been maximized with building lines following the natural contours of the site. In the past the structures in a place reflected the available building materials, but with the coming of modern building materials, the practice has been confined to the rural areas. This should not be the case; a house built on rock should have elements of rock and so on.

We tend to forget that a buildings response to climate is one of the ways of responding to nature. It is evident in the vernacular architecture of any place; which is why the vernacular architecture of hot and humid climate is very different from that of a hot and dry one. Depending on the climatic conditions, the primary role of the building could either be providing shade and relief from hot winds or providing shelter from rain but augmenting natural ventilation. Many non-indigenous building materials totally affect the microclimate of a particular built environment. Using these materials in an attempt to integrate or exclude nature has to compliment the architectural style and climate.

Nature does not mean plants alone but animals and insects. Some plants attract dangerous, destructive and annoying insects. A thought should also be given to how a building form can nurture the plants that have that have been integrated into the built environment without much human interference. Kashikar (2004) suggests that a holistic

approach to integration of nature and the built environment would therefore necessitate a broader understanding of nature and result in a process of construction which is sensitive to nature in terms of building materials used and the response to climate.

3.3 RESTORATIVE ELEMENTS IN RETREAT ENVIRONMENTS

To measure restorative experiences, Fischl (2005) tried to identify how a restorative environment is perceived through the eyes of professional designers and laypersons. He then categorized the components of a built environment that were perceived to be restorative, and tried to visualize such a perceived environment. A questionnaire was designed to gather qualitative information about an imagined, or existing, built environment. One-hundred participants were instructed to imagine themselves in a situation, wherein they experienced stress due to a prolonged concentration period under time pressure on the same task. Then, the participants were instructed to describe a built environment by narratives, where his/her attention resources could be renewed. The content of the responses was categorized under thirteen headings.

There were minor group differences in the perceptions of a restorative built environment, but their main concepts were similar. The ranking of the responses made it possible to find the most commonly perceived restorative built environmental components.

a. Ambience, the overall experience of the interior;
b. Color, the color of the environment;
c. Construction elements: floor, wall, ceiling, door, and window;
d. Furnishing, mobile or fixed furniture;
e. Layout, interior and exterior built environmental components
f. Lighting, the natural or artificial lighting;

g. Material;

h. Plant, the plant and its olfactory association;

i. Sound, noise and the music experience;

j. Textile, characteristics of textiles;

k. View, characteristics of a view from the interior;

l. Visual art, characteristics of the visual art; and

m. Others: including activity, animals, social, culinary, protection, entertainment and temperature.

The combined responses were put together and visualized by using an applied segmentation technique. This visualization is not available at present but the pattern of the responses points to the same principles listed in the biophilic design concepts listed below:

a. use of diffuse and direct sunlight

b. frequent opportunities for spontaneous contact with nature

c. use of local, natural materials

d. visual/material connections between interior and exterior surfaces

e. passive natural ventilation

f. direct physical connection to exterior from interior spaces

g. direct visual access to landscape from interior spaces

h. zero net energy consumption, or net energy production

i. access to open water

j. complexity and order

k. moments of enticement and even peril

l. prospect and refuge

Table summarizing human needs for restorativeness in a natural environment.

Social engagement	Comfortable meeting places, indoors and outdoors; circulation systems and layouts that support informal interaction; attributes that draw people to space and encourage conversation (views, humorous décor).
Cultural and Collective Meaning	Celebratory spaces; artifacts and symbols of cultural and group identity; sense of uniqueness.
Relaxation and psychological restoration	Quiet spaces with low sensory stimulation; connections to nature; distant views; outdoor seating or walking paths in visually appealing landscapes.
Visual and aural privacy as needed; movement between interaction and solitude	Enclosure or screening; distance from others; ability to regulate the desired degree of social interaction by moving between spaces or by manipulating personal space. Variety of informal social spaces to encourage relationship development.
Learning and information sharing	Good acoustics for training/learning environments; good visibility to support situation awareness; layouts, meeting spaces, and circulation that support conversation and information exchange without unduly disturbing others.
Connection to nature and natural processes	Daylight, views of nature outdoors, careful use of indoor sunlight, natural ventilation, interior plantings, nature décor, and nature patterns in spatial layouts, furnishings, and carpeting.
Sensory variability	Daylight access; indoor sunspots; variation in color, pattern, and texture; natural ventilation.
Sound levels similar to nature	Operable windows to allow connection to positive outdoor sounds; acoustic conditioning to reduce equipment and industrial noise, yet allowing for some human sound that is energizing.
Interesting visual environment with aesthetic integrity	Adoption of naturalistic, bio-inspired design; patterned complexity; reduced monochromatic environments; more organic layouts and forms.
Wayfinding and making sense	Landmarks, variability of space to serve as location cues, windows to orient by outdoor views, use of color and pattern on walls or carpeting to provide location and movement cues, appropriate signage and visual displays to develop overall sense of space.
Exercise	Indoor gym, outdoor bike and hiking paths, open stairways to promote interaction and walking, visually interesting landscape to entice exploration.
Sense of equity	Design of spaces and allocation of amenities that shows concern for the health and well being of all occupants, visitors and other users of the space.

Table 3.1 Links between Basic Human Needs and Environments
(Source: Heerwagen (2006) Psychosocial Value of Space)

3.3.1 Points of Interaction

A space that is filled with people suggests social interaction, group activities, people watching, public speaking, and vending. Less actively used spaces suggest quiet, reflective behavior, which are usually natural areas.

Buildings and landscaping can form outdoor "rooms" that facilitate various uses. Several rooms in sequence make for an interesting experience as pedestrians travel from one space to another. Such outdoor rooms need definition, features, and signage that give recognition to them and make them special.

a. Develop outdoor areas to reflect the amount and type of social interaction in each.
b. Facilitate functions that are recurring in outdoor areas.
c. Orient seating areas for solar warmth and protection against northwesterly winter winds.
d. Create a special character for each significant outdoor space.
e. Include focal points such as fountains to designate special outdoor rooms.
f. Name outdoor spaces and provide identification signage.

Entering an exterior space can be as memorable as entering a beautifully designed building and can contribute to the overall campus image. However, if an entrance is ill-defined or unkempt, one's perception of the entire space is undermined. If properly designed, entrances to exterior spaces can help with wayfinding. Lighting and landscaping such entrances instill a sense of safety, and such entrances are ideal locations for directional signage.

a. Better screen maintenance facilities (such as trash/recycling areas).
b. Use landscaping to frame and enhance transitions between outdoor spaces.
c. Consider changes in lighting to guide transitions between outdoor spaces.

Outdoor events are opportunities for health and recreation, but even more important, they are opportunities for social interaction. Exterior places to lounge and read also encourage social interaction and studying. Courtyards and forecourts can be good locations for these quiet, passive activities.

a. Retain the large, open, and relatively flat lawns for a diversity of recreational and social uses.
b. Provide facilities for a variety of sports.
c. Facilitate social interaction within outdoor spaces.
d. Encourage studying outdoors rather than perpetuating a "keep off the grass" approach.
e. Enhance lighting for evening safety and evening use of outdoor space, but avoid lights shining into sleeping rooms.
f. Better utilize the many existing forecourts of residential buildings.

Building forecourts are courtyards in front of buildings. They provide useful transition zones between larger outdoor spaces and the building entrances; their designs can also facilitate social interactions or quiet studying.

a. Incorporate forecourts into the design of new buildings.
b. Include site walls to change elevation, reduce the scale of buildings, define outdoor areas, and provide seating.
c. Use forecourts to accommodate both passive and active functions associated with their respective buildings.
d. Renovate landscape to enhance forecourt and building functions.

Entryways may or may not contain a forecourt. Each building entryway includes not just the door to the building but also the surrounding landscape plus

site accessories. Entryways, which can be an important place to meet and greet people, should be inviting, safe, and functional. New buildings' entries should be sheltered from the weather with cover over the doorways. Secondary entrances to buildings should be understated to emphasize the significance of the principal entrance(s).

The considerable effort put into designing beautiful buildings is undermined if the entryway area is poorly designed or inadequately maintained. Enhancing entryways is one of the least expensive outdoor area goals to achieve. Often maintenance, rearrangement of site accessories, and landscape pruning are all that is needed. Safety is improved by appropriate lighting; litter is reduced by installing trash receptacles; increased visibility enhances safety and wayfinding; and thoughtful selection and arrangement of plant materials increases wind protection and minimizes ice buildup on walks.

a. Use landscaping to frame and enhance building entrances.
b. Arrange site accessories and lighting to improve entryway aesthetics and safety.
c. Remove trash containers and dumpsters that visually detract from entrances.
d. Remove landscaping that blocks views of entrances.
e. Incorporate rain and snow protection when designing entryways.

3.3.2 Sensory Variability

Good visual access to daylight through the use of interior glazing increases satisfaction. Access to indoor sunlight is also associated with perceived cheerfulness of the environment as well as higher levels of positive affect and job satisfaction for the occupants. Daylight and indoor sun patches

create visual stimulation and may also improve psychological functioning of building occupants, as long as sun is not excessive or an impediment to work. This can be achieved using a clerestory window, a light shelf or a passive skylight.

A clerestory window which is vertical glazing located high on an interior wall. South-facing clerestories can be effectively shaded from direct sunlight by a properly designed horizontal overhang. A south-facing clerestory will produce higher daylight illumination than a north-facing clerestory. East and west facing clerestories have the same problems as east and west windows: difficult shading and potentially high heat gains. A light shelf is a horizontal light-reflecting overhang that extends from the exterior into the interior of a building, placed above eye-level with a transom window placed above it. This design, which is most effective on southern orientations, improves daylight penetration, creates shading near the window, and helps reduce window glare. Exterior shelves are more effective shading devices than interior shelves. Passive skylights provide a simple way of bringing daylight to the upper floor of a deep building. Skylights can create thermal problems, admitting heat in the summer and losing heat in cold climates. Skylights also lose light due to reflections in the shaft of the well between the roof and the ceiling.

3.3.3 Connection to Nature and Natural Processes

A growing body of research shows that building environments that connect people to nature are more supportive of human emotional well-being and cognitive performance than environments lacking these features. Whether nature's presence comes from daylight, fresh air, indoor plants, or landscape views, there is growing evidence of positive impacts on building occupants in a

wide variety of settings, from offices to hospitals and community spaces. To foster this sort of environment, large sheets of glass are used as walls to give people uninterrupted views of nature. Gardens and plants are planted within the building interior for maximum exposure to nature. Building designs now incorporate nature into the very heart of the building son that even as one walks through a building he will have a sense of being outdoors, which provides direct physical connection to exterior from interior spaces.

3.3.4 Wayfinding and Making Sense

Macminer (1982) discusses how understanding what way-finding or spatial orientation is, is essential to incorporating it into the built environment. Man has always relied on a sense of direction" and the ability to move from one place to another, and as a matter of fact, being good at this has meant life or death. Visual cues can include a variety of things, the most obvious are signs. Others include architectural elements such as stairs, elevators, lobbies, and corridors. Interior treatments can include the change of wall color, type and texture, changes of flooring, innovative uses of lighting technique to highlight or minimize certain areas, ceiling treatments and furniture arrangements. While these elements are most commonly used in creating aesthetically pleasing structures and environments, some thought should be given to using them in order to aid wayfinding, and make the environment friendlier to its intended users.

Lynch (1983) wrote long ago of people's profound terror of being lost or disoriented. Such fears are by no means restricted to making one's way in cities. In 1981, Reizenstein and Vaitkus reported that when visitors and patients were asked about their sources of stress in the hospital environment, getting lost

was highest on the list. Given the many other stresses associated with hospitals, this is all the more remarkable. Fear of being lost, in turn, can reduce the likelihood of exploration, which according to Kaplan and Kaplan (1989), is one of the informational needs of people that help them function better.

Exploration depends on way-finding. Way-finding can be assisted by signage and maps; it is also more directly enhanced by the way the environment is structured. Lynch (1983) found that some cities were far more supportive of effective way-finding than others. He identified distinctive landmarks as an important factor in reducing the danger of disorientation. Diversity of land-use patterns as well as the styles and ages of buildings also support the ease of finding one's way. The sameness of many recently built housing developments and shopping strips fail to offer such guidance.

Way-finding can also be strongly impacted by street patterns. In many newer communities, cul-de-sacs reduce automobile traffic but at the cost of discouraging walking and bicycling and making way-finding more difficult. When way finding and circulation are made easy stress is reduced. The frustration and anger one experiences on getting lost contributes to high stress levels.

3.3.5 Relaxation and Psychological Restoration

Research by Ulrich (1983) consistently shows that passive viewing of nature through windows or even surrogate contact) promotes positive moods and reduces stress. Similarly, research by Kaplan (2000) found that workers with the nature view had lower stress scores and were more satisfied with their jobs. Window views that provide contact with outdoor nature reduce stress and improve psychological functioning. In addition to the psychological and

emotional benefits, connection to nature also provides mini mental breaks that may aid the ability to concentrate. Research by Kaplan and Hartig (1996) found that people who went for a walk in a predominantly natural setting performed better on several tasks requiring concentration than those who walked in a predominantly built-up setting or who quietly read a magazine indoors.

3.3.6 Interesting Visual Environment with Aesthetic Integrity

All living organisms and life-like processes display complex design or adaptive complexity that may not be apparent at first glance, but which is discovered through sensory exploration. The desire to know more about a space or object with increased exploration is considered by many to be at the heart of learning: the more a person knows, the more he wants to know and the deeper the mystery becomes. In contrast to living forms and spaces, most built objects and spaces are readily knowable at first glance, and thus do not motivate learning and exploration. Although complexity is a desirable feature, spaces and objects that are too complex are difficult to comprehend. The key may be the combination of ordering and complexity that allows comprehension at higher levels first and then at lower levels with successive exploration. Kaplan and Kaplan (1989) classify this as one of the three basic informational needs of an individual for effective functioning; the need to discover without the fear of getting lost. Thus spaces should lead to the next logical space but still maintain the element of surprise

3.3.7 Passive Natural Ventilation

Passive cooling is based on the interaction of the building and its surroundings. This bioclimatic chart defines four passive cooling strategies

based on temperature and relative humidity. You can use this chart to determine which passive cooling strategies are appropriate for the climate at the building site.

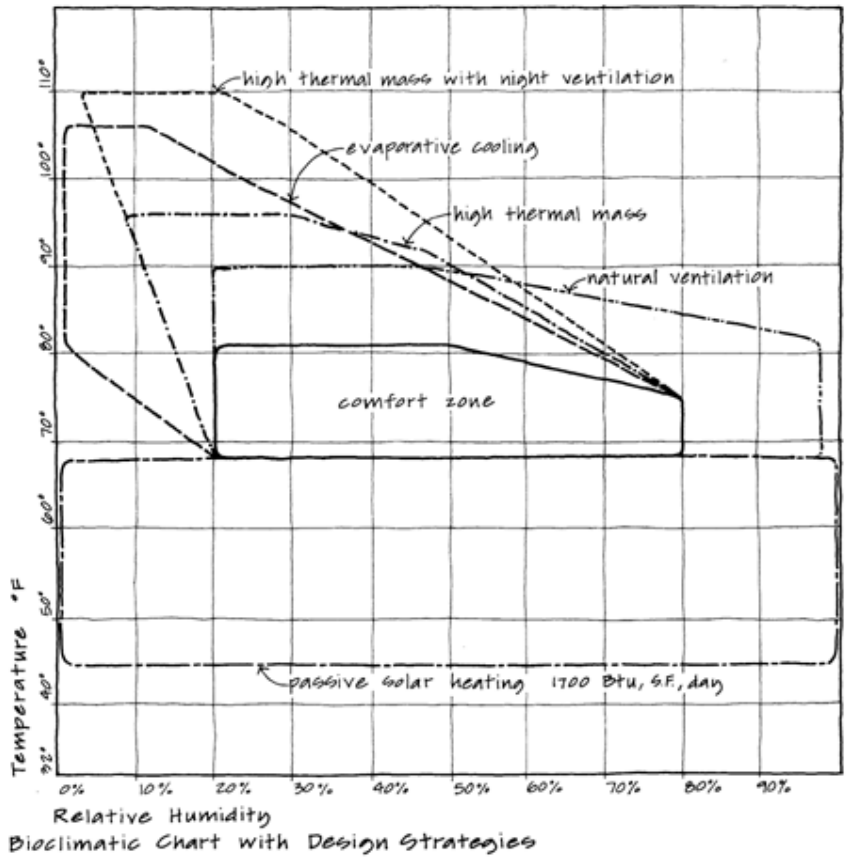


Fig 3.2 Bioclimatic Chart with Design Strategies
(Source: V. Cartwright, 1985)

First, the following local weather information is found for each of the months of the year:

a. average maximum temperature

b. average minimum temperature

c. average maximum relative humidity

d. average minimum relative humidity

On the bioclimatic chart, plot two points for each month. The first point is the minimum temperature and the maximum relative humidity (RH). The

second point is the maximum temperature and the minimum RH. (Note that the highest temperature is paired with the lowest RH and vice versa.) Connect these points with a line. Plot a similar line for each month. Each line represents the change in temperature and RH over an average day. Passive cooling strategies are shown on this version of the bioclimatic chart as overlapping zones. When your lines cross zones, it indicates that this strategy may work for your climate Passive Cooling Strategies include:

a. Natural ventilation depends solely on air movement to cool occupants. Window openings on opposite sides of the building enhance cross ventilation driven by breezes. Since natural breezes can't be scheduled, designers often choose to enhance natural ventilation using tall spaces within buildings called stacks. With openings near the top of the stack, warm air can escape, while cooler air enters the building from openings near the ground. Ventilation requires the building to be open during the day to allow air flow.

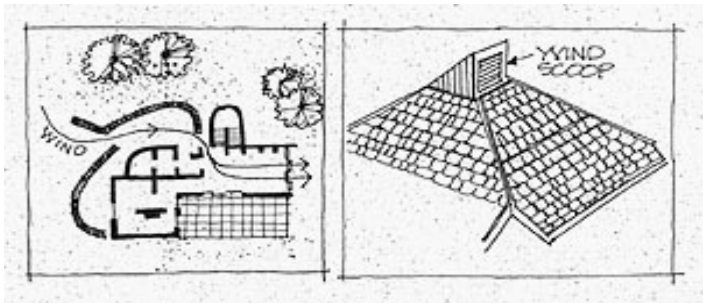


Fig 3.3 Wind air flow
(Source: N, Kimon (1941) The Natural Way to Draw)

b. High thermal mass depends on the ability of materials in the building to absorb heat during the day. Each night the mass releases heat, making it ready to absorb heat again the next day. To be effective, thermal mass must be exposed to the living spaces. Residential buildings are considered to have average mass when the exposed mass area is equal to the floor area. So, for

every square foot of floor area there is one square foot of exposed thermal mass. A slab floor would be an easy way to accomplish this in a design. High mass buildings would have up to three square feet of exposed mass for each square foot of floor area. Large masonry fireplaces and interior brick walls are two ways to incorporate high mass.

c. High thermal mass with night ventilation relies on the daily heat storage of thermal mass combined with night ventilation that cools the mass. The building must be closed during the day and opened at night to flush the heat away.

d. Evaporative cooling lowers the indoor air temperature by evaporating water. In dry climates, this is commonly done directly in the space. But indirect methods, such as roof ponds, allow evaporative cooling to be used in more temperate climates too. Ventilation and evaporative cooling are often supplemented with mechanical means, such as fans. Even so, they use substantially less energy to maintain comfort compared to refrigeration systems. It is also possible to use these strategies in completely passive systems that require no additional machinery or energy to operate. Nature can be an asset by evaporating in hot, dry climates to cool and humidify the air (a natural air-conditioning). Techniques for evaporative cooling include placing facilities where breezes will pass over water features before reaching the facility, and providing fountains, pools, and plants.

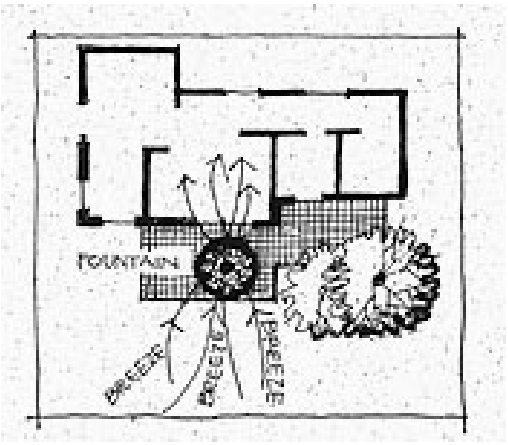


Fig 3.4 Evaporative Cooling
(Source: N, Kimon (1941) The Natural Way to Draw)

Moving water is said to instill a sense of clam and well being in individuals. The soothing sound of its movement or the peacefulness of its stillness promotes meditation and peacefulness.

3.3.8 Organic Shapes

Nature is not rectilinear. The shapes of natural objects are determined by fractal growth patterns, as noted above, and by the limitations imposed by the conditions of life on earth, especially sunlight and gravity. Although there is not a great deal of research on this topic, there is some indication that people respond positively to organic shapes and curvilinear spaces in buildings, landscapes, and artifacts.

3.3.9 Prospect and Refuge

According to geographer Jay Appleton, people prefer to be in places where they have good visual access to the surrounding environment (high prospect), while also feeling protected and safe (high refuge). Conversely, negative reactions are common when visual access is denied or when the sense of refuge is absent and one feels "on view" to

others. The sense of refuge can be created by canopy-like features as well as by vertical enclosure. Prospect includes both internal and external views through windows or view corridors.

Interior view corridors are greatly enhanced by interesting elements at the end of the corridor—such as a window, a piece of art, or just light on the wall. A study by Suzanne Scott found that built spaces with nature, moderate degrees of complexity, and a sense of refuge coupled with high prospect were more preferred than spaces lacking these characteristics. People especially liked spaces with vertical and horizontal expansiveness that were subdivided into smaller zones. Scott suggests that zoned spaces provide users with the potential to survey the surroundings, but still enjoy partial concealment. Many of the preferred settings also had soft, rounded forms and irregular layouts. Institutional spaces with minimum décor and embellishments.

In looking for a suitable design that will facilitate and enhance the purposes a retreat and at the same time reduce or help manage stress, the following variables have been drawn up so that their effectiveness can be measured against existing structures.

a. Building forms

i. Building and site elevation should be in harmony

ii. The scales of buildings and rooms in relation to individuals should reflect or be able to induce the desired mood.

iii. The use of irregular, natural and organic forms because if a structure corresponds to that of natural forms showing natural or intentional asymmetry or irregularity, then a man-

made structure will be perceived as natural, even when its appearance is clearly artificial.

b. Building materials

i. The use of sustainable materials

c. Aesthetics

i. The use of natural earthy colors, the texture of the building remains rough, uneven, variegated, and random, with every appearance of pursuing an unimpeded natural process

ii. Exposure to views of nature from and integration of nature with the built environment

iii. Simplicity and lack of adulteration and ostentation

iv. Colors are derived from natural sources, lacking uniformity or harshness.

d. Planning

i. Good spatial organisation for easy circulation, contact with natural elements and economy of space.

ii. Visual stimulation and stress reduction through exposure to nature and natural elements

iii. The use of open space to provide a tranquil environment

CHAPTER FOUR

CASE STUDIES

4.0 CRITERIA FOR SELECTING CASE STUDIES

Natural settings not only give pleasure and are satisfying to experience, they also: support human functioning; provide a context in which information can be managed effectively; permit people to move about and explore with comfort and confidence; and provide for recovery from "mental fatigue." These environments accomplish all this by redirecting ones attention through interaction with nature which compels a person to tailor their functions after natural elements and processes. These characteristics of nature make it a "restorative environment

Studies indicate that restorative natural environments have the ability to relieve stress, induce relaxation, increase awareness and perception, and promote positive physical and emotional states.

In order to properly asses how nature can enhance the effective functioning of a corporate worker, we will look at existing situations and study the variables that support the concepts.

In order to choose suitable case studies the following criteria were considered:

a. For an environment to be restorative one must feel a sense of distance, of 'being away' and a feeling of escape from some aspects of life that are ordinarily present - distractions, obligations, pursuits, purposes and thoughts. The environment in which the case study was located had to be physically distant from the main urban area.

b. Restoration is often triggered by exposure to the natural environment. The study had to be located in a natural vegetated environment that was physically attractive.

c. The study had to be located in a cool climate so that adequate comparisons in the area building form and use of materials could be made.

d. Marcus and Barnes (1992) wrote on how moving water creates a soothing sound and can create a psychological screen that helps the restoration process and how still water can promote meditation and peacefulness. A water body would be an added advantage.

The following variables will be used to assess the following case studies.

a. The available facilities should encourage people have to participate in a process to avoid feeling helpless.

b. Clear spatial organisation and interesting terrain for nature walks so that people are comfortable in non-confusing scenes offering discovery and learning without getting lost.

c. Views of nature from within and without building interiors because exposure to natural elements combats a decline in effectiveness and reasonableness due to mental fatigue.

d. Use of environmentally friendly building materials promote a sustainable environment and natural or organic building forms, showing natural or Intentional asymmetry or irregularity are said to reduce stress levels; this will also be assessed.

e. Levels of patronage need to be known to under stand the how the development can sustain itself and what spaces are required.

4.1 CASE STUDY ONE - MIANGO REST HOME (MRH), JOS, PLATEAU STATE

This case study was chosen to document an existing retreat center in Nigeria. MRH is a Christian Retreat and conference center which is located in Miango, Plateau Sate of Nigeria. It was opened in March 1913 by Rev. C. Sanderson and Rev. A.

Gunderson to become a place of rest and refreshment for S.I.M. (Sudan interior missions) missionaries who had just come in from the field. Later it became a popular conference center for other missions, church groups and individuals in Nigeria and across West Africa.

4.1.1 Spatial organization

The vehicular transportation core is at the center of the site forming a circular loop at the front of the administrative block, access being at the south end of the site. Parking is limited to this core for reasons of security and privacy so that guests are not disturbed by motor sounds at all hours.



Plate 4.1 Drive Way towards Administrative Block
(Source: field work)



Plate 4.2 Drive Way from the Administrative Block
(Source: field work)

The cottages are linked by a series of footpaths. The administrative block is at the north side of the site while the cottages are on the east west and south sides. The conference center and playground are opposite the parking lot. Recreational facilities are at the north side of the site, behind the admin block.



Plate 4.3 Driveway towards the exit of Miango Rest Home
(Source: field work)



Plate 4.4 Driveway into Miango Rest Home
(Source: field work)

4.1.2 Available facilities and user requirements

There are a total of forty-five rooms of varying sizes which can accommodate a maximum of 156 participants for conferences and thirty-five couples, which include:

a. Three lodges each containing three to four self-contained rooms

b. Four three-bedroom family units which can contain six to seven people each

c. Two two-bedroom units with bathrooms

The conference hall has a 140-person capacity with two smaller meeting rooms, which can accommodate fifteen people each. Beside the admin block is a connected building which house the dinning room, lounge with attached children's' play room and library.

There are three administrative staff bungalows at the three corners of the compound so that the activities can be monitored. The twenty-five permanent and fifteen staff live in the surrounding town. The recreational facilities include

a six-hole miniature golf course, tennis court, children's playground, table tennis, volleyball, basketball and hiking trails.

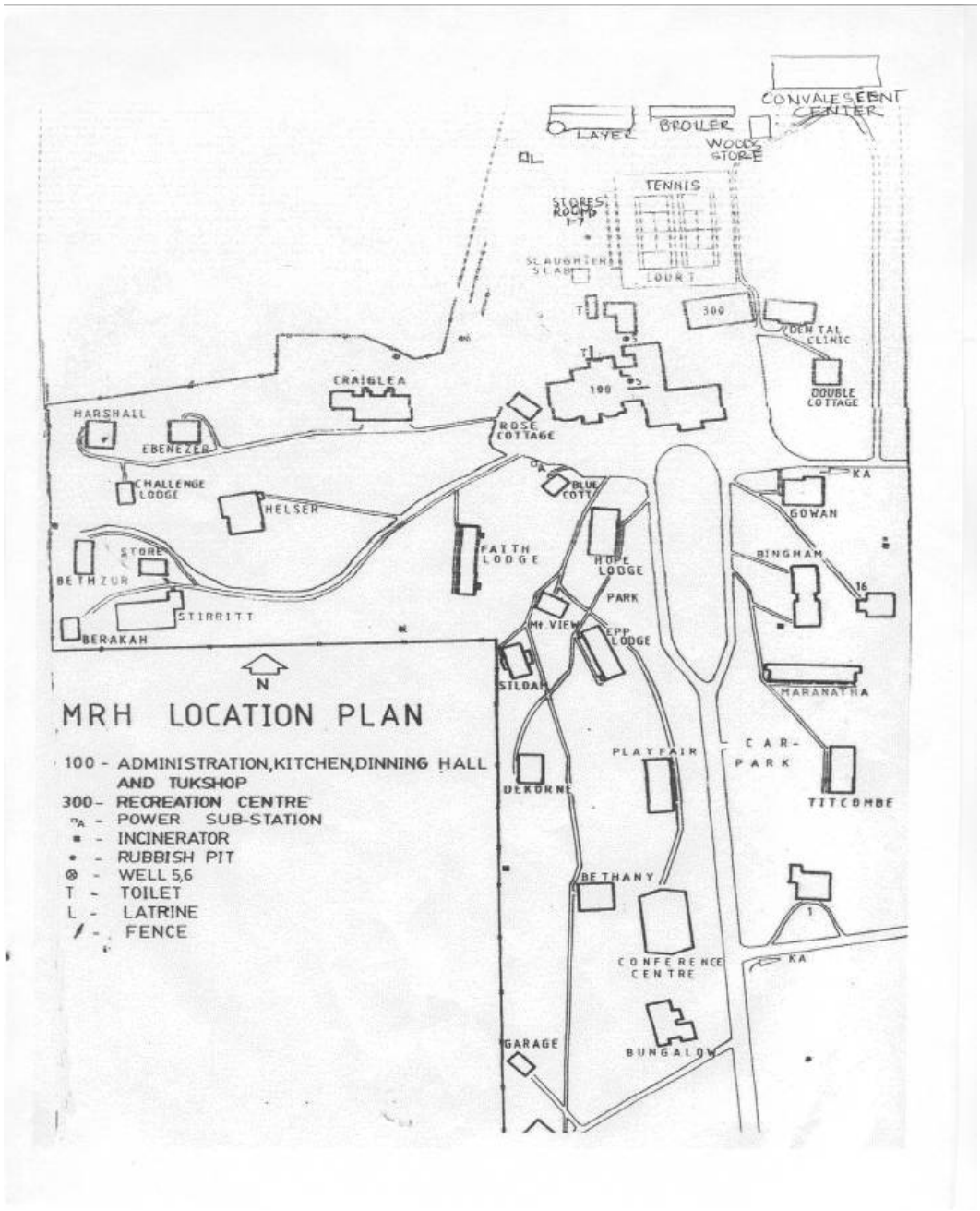


Plate 4.5 Site Layout of Miango Rest Home
(Source: Miango Rest Home)



Plate 4.6 Bungalows
(Source: field work)



Plate 4.7 Bungalows
(Source: field work)



Plate 4.8 Admin block
(Source: field work)



Plate 4.9 Dining hall
(Source: Field work)



Plate 4.10 Play Ground
(Source: field work)



Plate 4.11 Tennis Court
(Source: field work)

The ancillary facilities include a maintenance shed, tuck shop, butcher's shop, water tank, chapel, dental clinic and convalescence center. The main light supply is from N.E.S.C.O., Jos Plateau State.

4.1.3 Building forms and materials

The buildings are all rectangular in form and they all have concrete and stone foundations. The walls are all constructed with mud and have sand –cement

plaster. Maintenance is carried out every ten years and the roofing material used is zinc. Painted wood ceilings are used for the interior of the general facilities, while celotex ceiling boards are used for the accommodations. Oil paints are used in public rooms to make cleaning walls easier.



Plate 4.12 Mud wall covered with cement plaster
(Source: field work)



Plate 4.13 Lounge interior
(Source: field work)



Plate 4.14 Exterior view
(Source: field work)

There are no air-conditioners used only ceiling fans because the temperature is cool most of the time. The kitchen has four sections, the pantry, baking, cooking and deserts section.



Plate 4.15 Kitchen Interior
(Source: field work)



Plate 4.16 Kitchen Exterior
(Source: field work)

4.1.4 Topography, vegetation and aesthetic factors

The site slopes gently towards the north side. The site is landscaped with trees for shade, green lawns, walkways to facilitate way finding, and there are gazebos enclosed with a little open space and plants creating a private atmosphere where two or three people can sit and relax.



Plate 4.17 Gazebo
(Source: field work)



Plate 4.18 Landscaping
(Source: field work)

4.1.5 Merits and demerits

The merits of this case study are:

a. The pathways leading to the accommodation, are visible and pleasantly landscaped

b. The buildings are in harmony with the landscape.

c. Sustainable building materials were used.

d. The building designs are simple.

e. Open spaces are put to good use.

The demerits are:

a. The building forms are too regular.

b. The landscaping elements could have been integrated more into the building interiors.

c. Some building interiors have poor daylighting

4.2 CASE STUDY TWO

NIGERIAN INSTITUTE FOR POLICY AND STRATEGIC STUDIES (NIPSS), KURU, PLATEAU STATE

This is an institution that seeks to provide a forum for initiators and executors of policy from all sectors of the economy to integrate economy, promote harmony, and understanding and communication among them. It serves as a high level center for reflection, research and dialogue. The institute is located in Kuru, Plateau state by a lake.

4.2.1 Spatial organization

Two gates access the institute; the main gate leading directly to the administrative core and the other leading to the staff quarters and participants chalets. The main access road forms an oval as it winds around the administrative core while the roads to the accommodations and other services branch off from this road.



Plate 4.19 Main Entrance Gate

The administrative core is at the center of the site, the staff quarters and new participant's chalets to the east side, the old participants chalets at the far north end, the V.I.P. and directors quarter's to the west and far northwest of the site respectively the recreational and dining facilities and mosque are at the southwest side while the chapel and shopping facilities are the southeast side.



Plate 4.20 Recreation Center
(Source: field work)

4.2.2 Available facilities and user requirements

The available facilities are as follows: one-bedroom chalets for participants, one to four bedroom accommodations for senior and junior staff, offices, shopping plaza , filling station, clinic, cafeteria and industrial kitchen, 500 KVA generator, club house, tennis and squash courts, golf course, chapel, mosque, department of studies, department of research, computer center, and other administrative offices. The institute hosts a maximum of fifty five participants at a time.



Plate 4.21 Participants Chalets
(Source: field work)



Plate 4.22 Participants Chalets
(Source: field work)

4.2.3 Building forms and materials

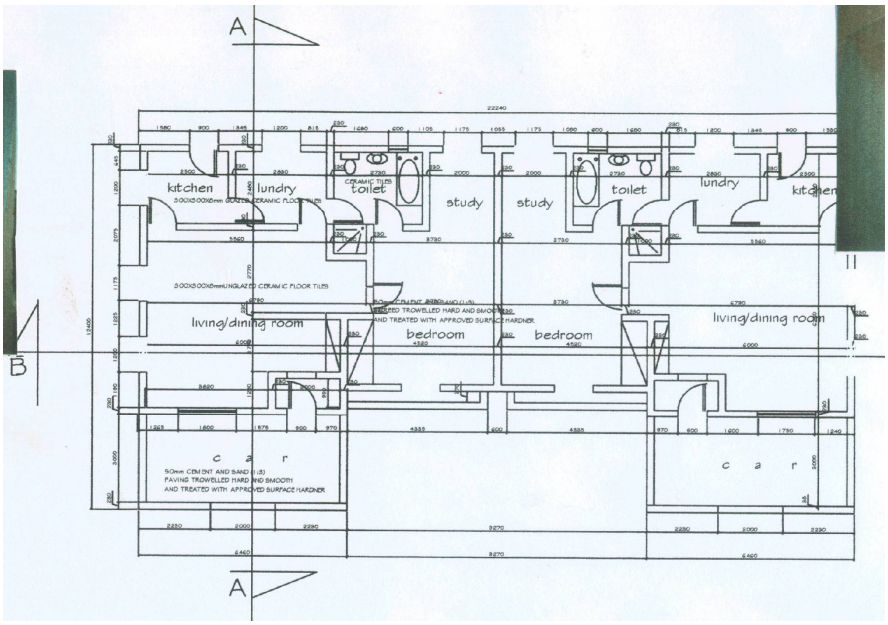


Fig 4.1 Typical Floor Plan of Participants' Chalets
(Source: field work)

The old structures were made out of mud, but the newer structures are made out of concrete and blocks. A typical floor plan for a participant's chalet contains one-bedroom, parlor, laundry, kitchen, study and a bathroom. The floor finish used is ceramic tile paladinia, and the ceiling material is celotex ceiling board.



Plate 4.23 Car Port
(Source: field work)



Plate 4.24 Ceiling Boards
(Source: field work)

4.2.4 Topography, vegetation and aesthetic factors

The site slopes gently towards the south. There are no water bodies on the site but there is a lake by the site that offers scenic beauty. There are beautifully landscaped gardens all around the site. Walkways lead from one point to the other.



Plate 4.25 Landscaped Gardens
(Source: field work)



Plate 4.26 Lake
(Source: field work)

4.2.5 Merits and demerits

The merits of this case study are:

a. The spaces in the chalet are adequate for each participant.

b. The landscaping is beautiful.

The demerits are:

a. Wayfinding is not facilitated by signs.

b. Nature is not integrated into the building interiors.

4.3 CASE STUDY THREE

ULUSABA ROCK LODGE, SABI SAND NATURE RESERVE, MPUMALANGA, SOUTH AFRICA

Ulusaba Private Game Reserve is part of the Sabi Sand Reserve which is a 66,000-hectare reserve bordering the Kruger National Park. There are two lodges at Ulusaba one is perched on the summit of a hill and is called the rock lodge at the other is the safari lodge. Ulusaba's private airstrip is five minutes drive away from both lodges. Ulusaba is accessible for guests that prefers to self-drive.

4.3.1 Spatial organization

The Rock Lodge spans the cliff face of Ulusaba Mountain, 800 feet above sea level.

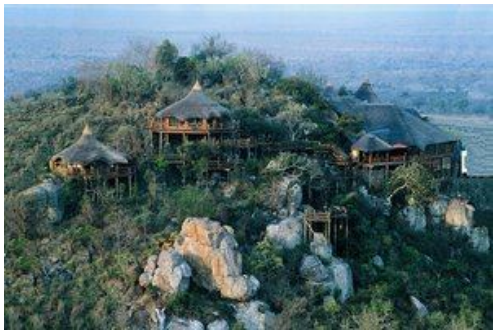


Plate 4.3.1 Arial view of the rock lodge
(Source: www.eyesonafrica.net)



Plate 4.3.2 Sketch of Layout the of the Rock Lodge
(Source: www.eyesonafrica.net)

4.3.2 Facilities and user requirements

Accommodation comprises of two Makwela Suites, four Rock Cliff Rooms, and a stunning stand alone, split level Master Suite. The Rock Suite which comprises of two bedrooms, each with en-suite. Each of the luxurious bedrooms is air conditioned with private decks overlooking the far-reaching savannah below.



Plate 4.3.3 Bathroom
(Source: www.eyesonafrica.net)

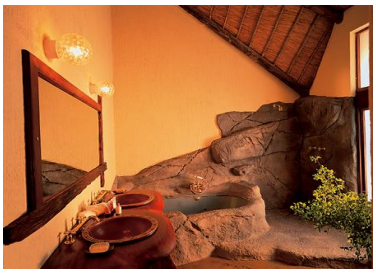


Plate 4.3.4 Bathroom
(Source: www.eyesonafrica.net)



Plate 4.3.5 Bedroom
(Source: www.eyesonafrica.net)



Plate 4.3.6 Bedroom
(Source: www.eyesonafrica.net)



Plate 4.3.7 Living room
(Source: www.eyesonafrica.net)



Plate 4.3.8 Living room
(Source: www.eyesonafrica.net)

The stunning infinity pool, with its natural waterfall, is the ideal location to enjoy the tranquility of the African bush.



Plate 4.3.9 Infinity pool
(Source: www.eyesonafrica.net)



Plate 4.3.10 Infinity pool
(Source: www.eyesonafrica.net)



Plate 4.3.11 Outdoor deck
(Source: www.eyesonafrica.net)



Plate 4.3.12 Lower pool deck
(Source: www.eyesonafrica.net)

4.3.3 The structures and building materials

The structures are made up of a combination of woo and glass while they roofs are made of well treated thatch, in an attempt to blend in with the natural environment.

4.3.4 Topography, vegetation and aesthetic factors

The lodge also includes two tennis courts with a viewing pavilion, a swimming pool and a fully equipped gymnasium.



Plate 4.3.13 Tennis pavilion
(Source: www.eyesonafrica.net)



Plate 4.3.14 Swimming pool
(Source: www.eyesonafrica.net)

The other of Ulusaba's luxury safari accommodation offerings is the Safari Lodge which is built along the banks of the dry Mabrak riverbed. The accommodation consists of three luxury Elephant rooms and four outstanding River suites, for a maximum of twenty guests. The rooms are built 'tree house' style. Each with an en suite bathroom, shower, twin hand basins, mosquito nets, intimate and private viewing deck, personal electronic safe and telephone. Each room has its' own spectacular view. Wooden swing bridges connect the buildings to each other.



Plate 4.3.15 Safari lodge
(Source: www.eyesonafrica.net)



Plate 4.3.16 Rope Bridge
(Source: www.eyesonafrica.net)

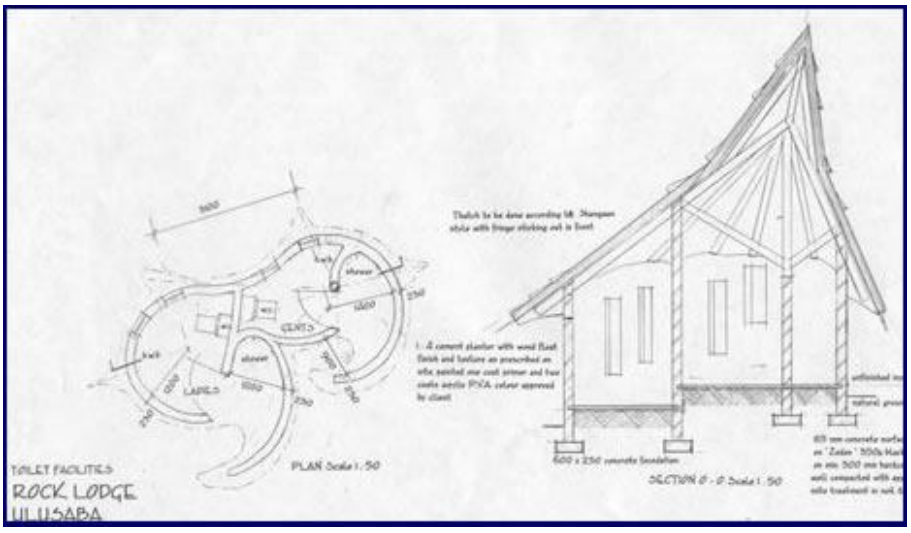


Plate 4.3.17 Toilet Facilities
(Source: www.eyesonafrica.net)



Plate 4.3.18 Lodge
(Source: www.eyesonafrica.net)



Plate 4.3.19 Lodge
(Source: www.eyesonafrica.net)



Plate 4.3.20 Breakaway area
(Source: www.eyesonafrica.net)



Plate 4.3.21 Tree house style chalets
(Source: www.eyesonafrica.net)

Safari Lodge has a well-stocked curio shop. A well-equipped air-conditioned conference venue seating forty delegates is situated in a quiet corner away from the central guests' areas. The room consists of: Air conditioning and overhead fans, tiled and carpeted floor and a breakaway area - Patio/Balcony/Deck for tea breaks and smokers.

4.3.5 Merits and demerits

The merits of this case study are:

a. The spaces in the chalet are adequate for each participant.

b. The landscaping is beautiful.

c. Nature is integrated into the building interiors.

a. The use of natural forms and shapes provides a sense of tranquility and discovery

4.4 CASE STUDY FOUR

NTSHONDWE CAMP, ITALA GAME RESERVE,LOUWSBURG, KWAZULU NATAL,SOUTHAFRICA.

Itala Game Reserve is about 290 km². Established in 1973, its' governing body is Ezemvelo KZN Wildlife. The altitude varies from 400 m to 1450 m. Ntshondwe camp is the main accommodation at the reserve, but there are other smaller camps around the reserve .It is camouflaged against a plateau at the foot of the cliffs after which it is named and is virtually invisible until the moment of arrival.



Plate 4.4.1 View across the forested valley in which the Ntshondwe Camp has been established
(Source: www.eyesonafrica.net)

4.4.1 The layout, site zoning and spatial organization

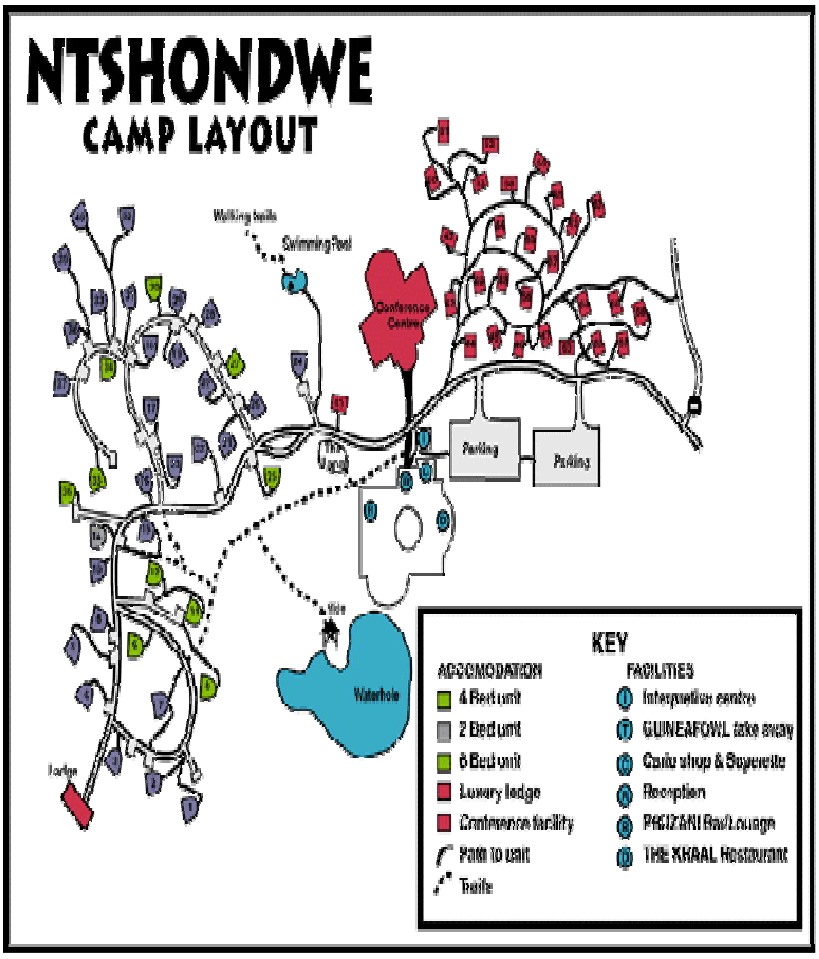


Plate 4.4.2 Camp layout
(Source: www.eyesonafrica.net)

The roads have been designed to be as narrow as possible with varied vertical and horizontal alignment to reduce traffic speed. Car parking is adjacent to the access road to minimize the impact on the camp. The network of footpaths is treated with brick paving to blend in with the construction.

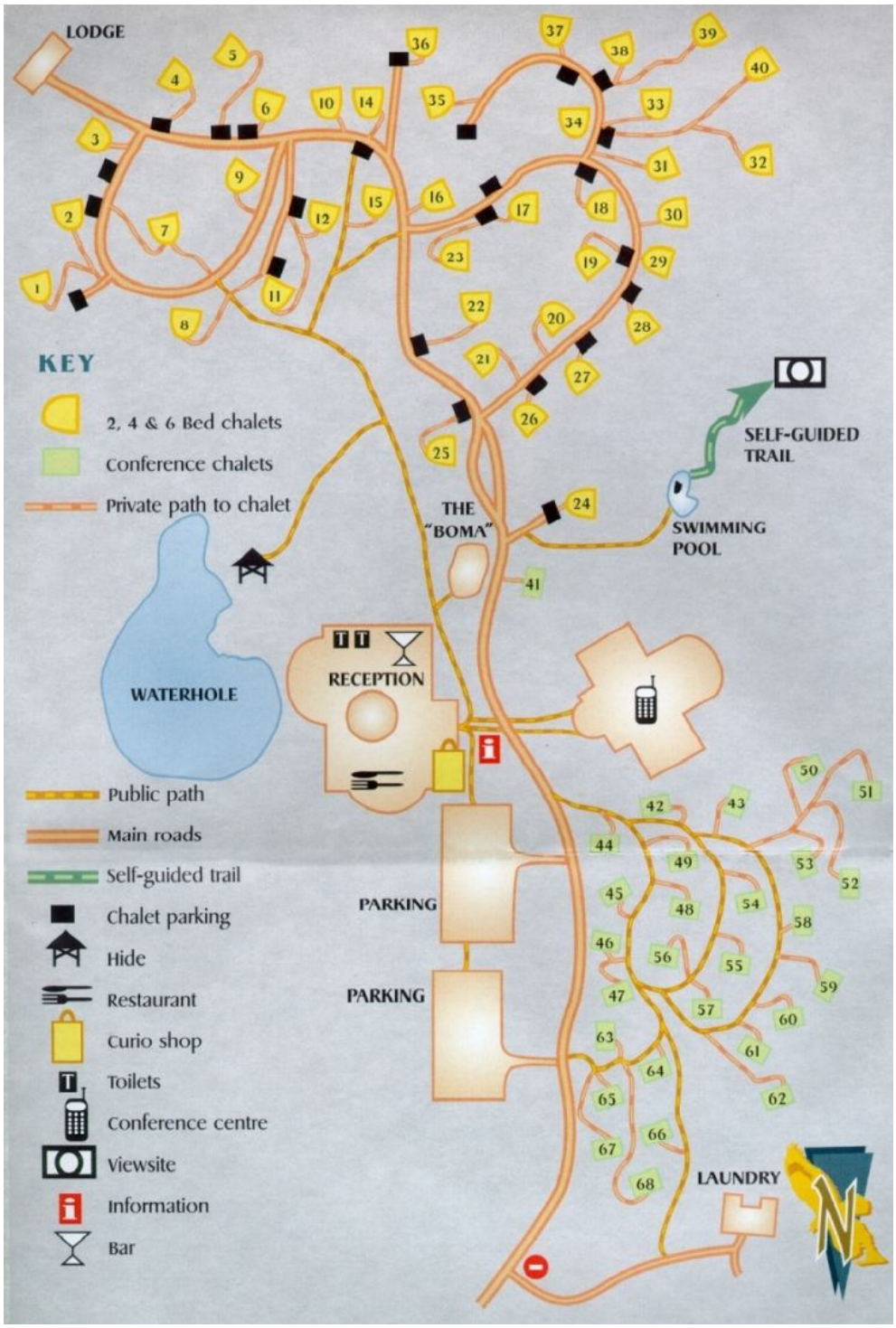


Plate 4.4.3 Camp layout
(Source: www.eyesonafrica.net)

There is a 1 200 meter tarred airstrip to suit most light commercial aircraft, plus a tarred access road leading right into the camp.



Plate 4.4.4 Airstrip



Plate 4.4.5 Entrance gate to the Itala Game Reserve, built in the form of a traditional Zulu structure with round conical roof consisting of thatch
(Source: www.eyesonafrica.net)



Plate 4.4.6 Reception at Ntshondwe Camp
(Source: www.eyesonafrica.net)

4.4.2 Facilities and user requirements

Accommodation at Ntshondwe's is in a variety of thatched chalets plus the Ntshondwe Lodge. The brief specified accommodation for 200 people. The thirty-nine chalets blend into the natural environment. The accommodation is geared to suit all from the sophisticated international eco-tourist or business executive, to large tour groups and family parties. A summary of the

accommodation offered at Ntshondwe include: 1x6-bed lodge, 4x2-bed chalets, 21x2-bed chalets, 12x4-bed chalets, 2x6-bed chalets and 28x2-bed non self catering units. These chalets are situated around the visitors' centre which has a fully licensed restaurant, a bar and an open game viewing deck which overlooks a small pan. Other amenities include a swimming pool built around a giant rock , a fully-equipped conference centre, and an imaginatively stocked curio shop, as well as swimming pool and a nearby boma, where delegates may enjoy a meal.

Ntshondwe Lodge accommodates six guests in three en suite bedrooms with a small swimming pool, sun deck and a barbeque area overlooking the valley. The services of a cook are available. The exclusive luxury Nthshondwe lodge offers complete privacy in spectacular surroundings.



Plate 4.4.7 Ntshondwe lodge
(Source: www.eyesonafrica.net)



Plate 4.4.8 Ntshondwe lodge
(Source: www.eyesonafrica.net)

Camp chalets vary from units with two beds to a limited number of four or six beds each, some of which have been designed for use by the physically challenged. These chalets have a separate lounge and terrace area. The self catering units are fully equipped with linen, crockery, cutlery, stove, refrigerator and cooking utensils. Visitors can either bring their own provisions or make use of the restaurant, coffee shop and bar. There are also 2-bed non-self catering chalets (without kitchen). Each chalet has two single beds, toilet and shower en suite. All units are serviced daily.



Plate 4.4.9 Family or group accommodation is in self-contained thatched cottages with 2-3 bedrooms
(Source: www.eyesonafrica.net)



Plate 4.4.10 Family or group accommodation is in self-contained thatched cottages with 2-3 bedrooms
(Source: www.eyesonafrica.net)



Plate 4.4.11 Two Bedded Chalet kitchen
(Source: www.eyesonafrica.net)

The other 'conference chalets' (28 twin share units) have a slightly higher standard of furnishing but with an integrated sitting room/study area within the room rather than a separate lounge.



Plate 4.4.12 Conference accommodation next to the auditorium comprise thatched cottages with twin beds, for 1 or 2 sharing
(Source: www.eyesonafrica.net)



Plate 4. 4.13 Interior of conference cottages at Ntshondwe Camp
(Source: www.eyesonafrica.net)

The Conference centre is situated at the foot of the Ngotshe plateau. It's a beautiful thatched complex consisting of a foyer, a large verandah, the main auditorium and two smaller conference halls or breakaway rooms. It offers a cinema style seating arrangement for up to 90 people, a lecture style for 60 or a single U-shape for 30 people. The two breakaway rooms are also air-conditioned and each offers a cinema-style seating arrangement for 22 people, lecture style for 18 and single U-shape for 16.





Plate 4.4 .14 a & 4.4.14 b
The Ntshondwe Conference Centre is barely visible between the mature mountain forest preserved throughout the camp grounds
(Source: www.eyesonafrica.net)

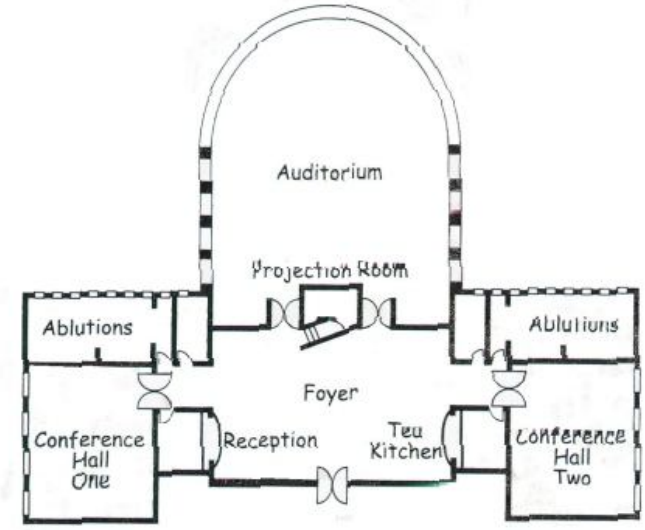


Fig 4.2 Plan of conference venue
(Source: www.eyesonafrica.net)



Plate 4. 4.15 Verandah
(Source: www.eyesonafrica.net)



Plate 4. 4.16 Verandah
(Source: www.eyesonafrica.net)

The central complex comprises the reception, coffee shop, bar, outside dining under the thatch and inside dining in the Kraal Restaurant with superb views from the deck tables over the valley, sun deck wining and dining, information centre and curio shop - all a stone's throw from the conference rooms.



Plate 4.4.17 The bar sundeck - direct on the waterhole
(Source: www.eyesonafrica.net)



Plate 4.4.18 Swimming pool
(Source: www.eyesonafrica.net)



Plate 4.4.19 Terrace overlooking a waterhole
(Source: www.eyesonafrica.net)

4.4.3 The structures and building materials

The structures basically have a curvilinear form. Thatch is used for the roof and a variety of wood for the floors and ceilings.

4.4.4 Topography, vegetation and aesthetic factors

A number of self-guided trails traverse the wooded mountainside above Ntshondwe camp, inviting guests to enjoy glimpses of the indigenous wildlife while stretching their legs. Ithala has a number of well laid out auto trails with

markers at points of interest. There is easy access on foot to a waterhole in front of the camp. Self-guided walks and a hide within the camp grounds provide convenient bird watching and game viewing.




Plates 4.4.20 a & 4.4.20 b

Access pathways within the Ntshondwe Camp have been carefully routed within the natural mountain slope indigenous forest
(Source: www.eyesonafrica.net)

4.4.5 Merits and demerits

The merits of this case study are:

d. The spaces in the chalet are adequate for each participant.

e. The landscaping is beautiful.

f. Nature is integrated into the building interiors.

b. The use of natural forms and shapes provides a sense of tranquility and discovery.

c. The conference chalets are physically separated from the other chalets which provide a sense of privacy for different user groups.

4.5 CASE STUDY FIVE
PONDEROSA RETREAT CENTER

The retreat is located in larkspur, Colorado

4.51 Spatial organization

The parking is centralized and the lodges are all towards the center. The recreational facilities are spread around the perimeter of the site.

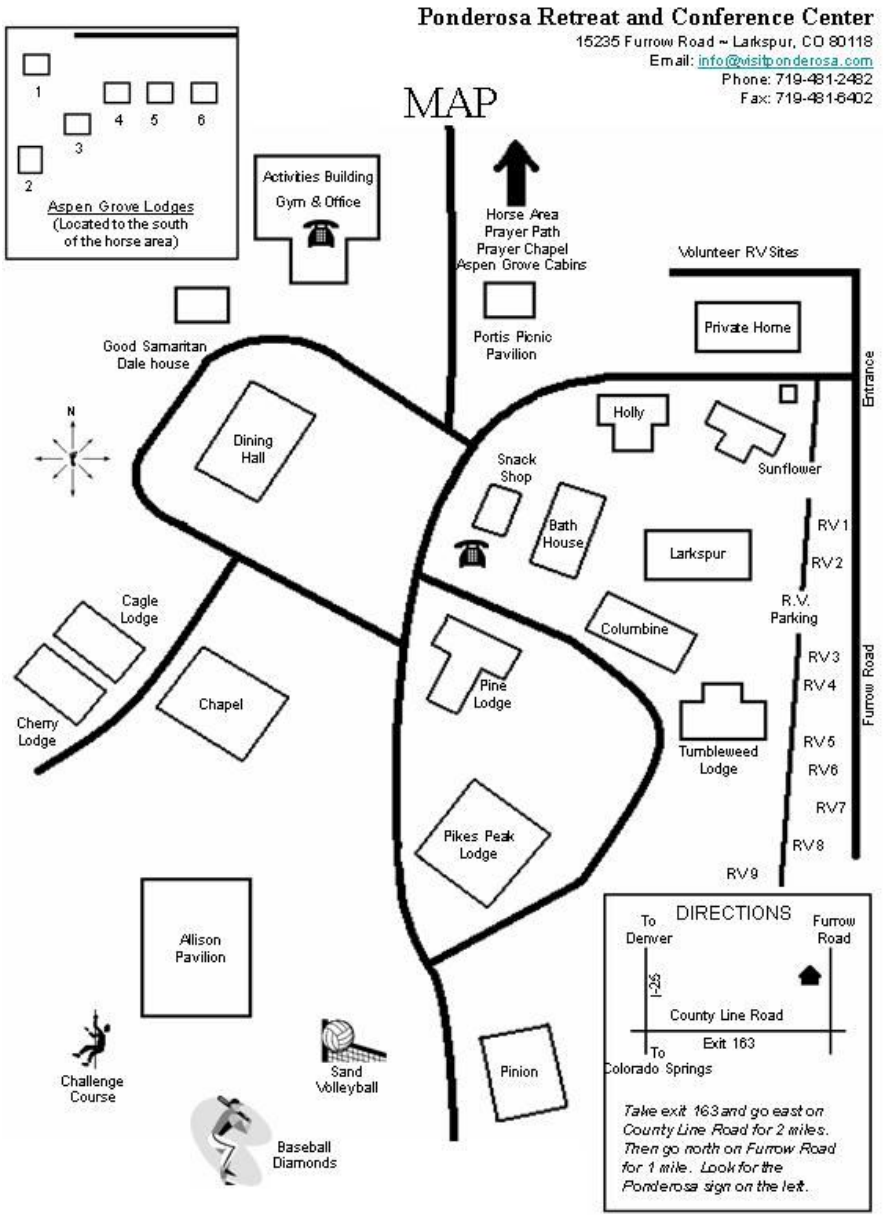


Plate 4.5.1 Site layout of ponderosa retreat center
(Source: www.visitponderosa.com)

4.5.2 Available facilities and user requirements

Groups of up to 400 use this facility. Ponderosa offers a variety of conference rooms.

a. Allison Pavilion is an open air facility that seats 400.

b. Chapel has seating for up to 300 and includes a piano and sound system.

c. The dining hall has a seating capacity of 160 with round tables.

d. A porch room off of the main dining hall provides another fifty four seats. Each table seats eight.

e. Portis picnic pavilion is a great summer place for a smaller group. It has an outdoor grill, outdoor chapel, and campfire pit. It will accommodate a group of approximately thirty people.

Ponderosa offers a variety of accommodation. Aspen Grove Lodge each have hotel-style lodging, including linens, mini-refrigerator, a microwave and a private bathroom with a shower, toilet and two sinks. .Aspen 1, 2 and 4 have a queen bed and two twin beds. Aspen 3 has a king bed and two twin beds. Aspen 5 and 6 have a queen bed, two twin beds and a sleeper sofa. The Aspen Conference Room, included with the Aspen Grove Lodges, offers a central meeting area. The attached bedroom has an additional queen bed.



Plate 4.5.2 Aspen Lodge
(Source: www.visitponderosa.com)

Dale House is a spacious apartment with a private bedroom (queen bed), living room with sofa sleeper, dining area, and a full kitchen that includes a refrigerator, stove, pots, pans and dishes for four people.



Plate 4.5.3 Rooms in Dale House
(Source: www.visitponderosa.com)



Plate 4.5.4Rooms in Dale House
(Source: www.visitponderosa.com)

Good Samaritan consists of a spacious apartment with two sleeping rooms (one with bunk beds and one with a twin bed), a snack area with a small refrigerator, microwave, and coffee maker, and a living/dining area with a table and chairs and a sofa sleeper. Sunflower Lodge is a deluxe lodge that has four private rooms, each uniquely decorated with a different theme. The attached conference/lounge area is equipped with coffee maker. All rooms include a queen and twin bed, table and chairs, and dresser. Sunflower 1 has a bunk bed in place of the twin bed. Cherry and Cagle have four levels that can accommodate 32 people on bunk beds in each lodge. Each is equipped with a conference area with a gas fireplace. The Garden Level can also be used as a small meeting room. The two carpeted sleeping levels have 4 bedrooms each that sleep 4 to a room and have a shared bathroom with two showers, three toilets, and three sinks. There is also a snack area with a refrigerator, microwave, and counter sink each lodge.

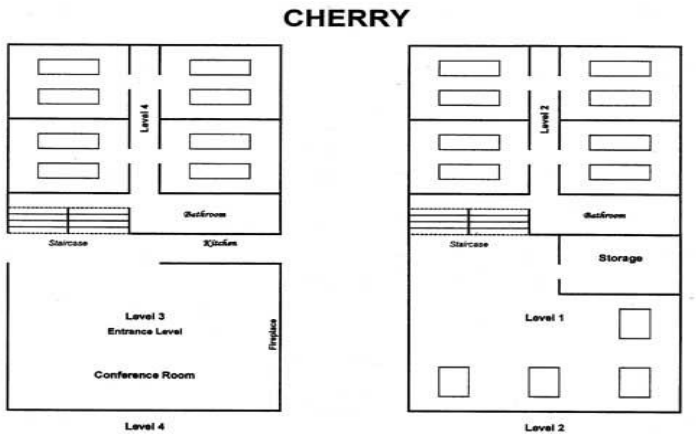


Fig. 4.3 Floor plans of Cherry and Cagle lodge
(Source: www.visitponderosa.com)

Holly Lodge is a deluxe lodge that includes three private rooms sharing a lounge equipped with wood-burning stove and coffee maker. All rooms include a queen and twin bed, table, chairs, and dresser. Holly 3 is handicap accessible and is equipped with a handicap bathroom with shower.



Plate 4.5.5 Side view of Cherry and Cagle lodge
(Source: www.visitponderosa.com)

4.53 Building forms and materials

Wood is a major building material in this retreat for both the structure and the interior.

4.54 Topography, vegetation and aesthetic factors

The area is a forest region with a gentle slope.

4.55 Merits and demerits

The merits of this case study are:

a. The different variety of accommodation makes it good for multifunctional use.

b. The re is a good usage of organic material.

The demerits are:

a. The building forms are too rectilinear

4.6 CASE STUDY SIX
SIMPSONWOOD CONFERENCE CENTER

4.6.1 Spatial organization

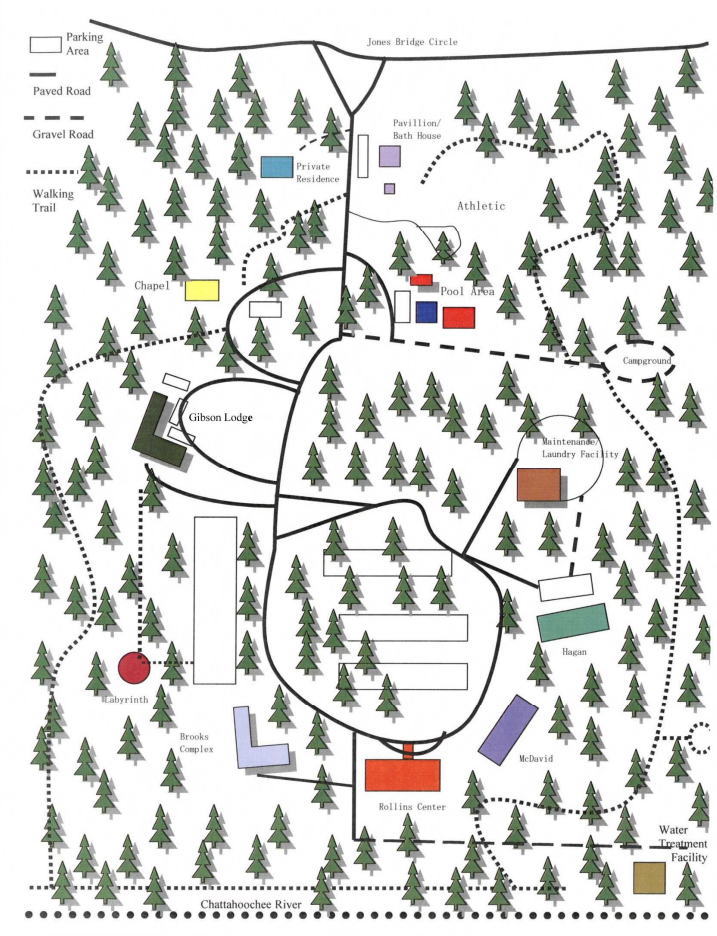


Plate 4.6.1 Site layout
(Source: www.simpsonwood.org)

The vehicular circulation is around the central core but it is curvilinear, encouraging the driver to go round the nature scenes. Parking is not centralized it is different for each lodge. The walking trails skirt the built up area but are within site of the camp.

4.6.2 Available facilities and user requirements

The Elizabeth Jane Sanders Simpson Chapel, which seats up to 100, is available for worship, private prayer, and special occasions.




Plates 4.6.2 a & 4.6.2 b
Chapel interior and exterior
(Source: www.simpsonwood.org)

Informal gathering spaces with stone fireplaces and porches with rockers invite relaxation and fellowship.



Plate 4.6.3 Lounge
(Source: www.simpsonwood.org)

Attractive, comfortable guestrooms feature two double or queen beds, individual temperature control, and private baths. Larger rooms and handicap accessible rooms are available




Plates 4.6.4 a & 4.6.4 b Accommodation
(Source: www.simpsonwood.org)

Meeting space can accommodate groups from 10 to 350. Flexible seating can be arranged to meet your needs.





Plates 4.6.5 a & 4.6.5 b Conference facilities
(Source: www.simpsonwood.org)

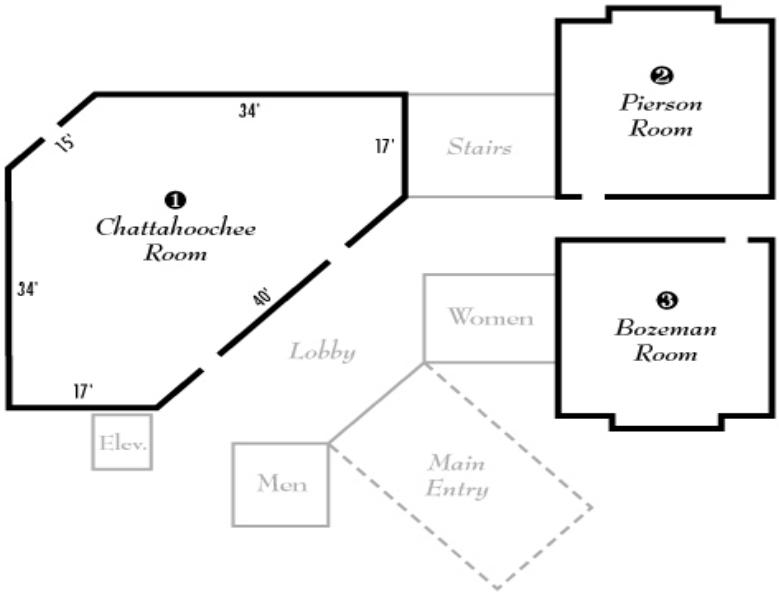


Fig 4.4 Plan of conference center
(Source: www.simpsonwood.org)

4.6.3 Topography, vegetation and aesthetic factors

Simpsonwood offers recreation for mind and body. Quiet walks along three miles of trails through woods and beside the Chattahoochee River, or the outdoor swimming pool, tennis courts, volleyball and basketball courts, athletic field, and the facilities of the Robert D. Fowler Family YMCA nearby




Plates 4.6.6 a & 4.6.6 b Playing fields
(Source: www.simpsonwood.org)



Plate 4.6.7 Landscape
(Source: www.simpsonwood.org)

Over three miles of quiet nature paths wind gently throughout the conference center grounds. Beautiful trails follow the Chattahochee River. Woodland trails meander serenely and are home to many forms of local flora and fauna.




Plates 4.6.8 a & 4.6.8 b Trails
(Source: www.simpsonwood.org)

4.6.4 Merits

The trails skirt the property allowing one to discover the natural terrain but with a view of the center which gives a feeling of security.

4.7 SUMMARY OF CASE STUDIES

From the Miango rest home case study, the following can be summarized:

a. The vehicular circulation and parking being centralized provides the occupants of the chalets from auditory privacy from traffic.
b. The centralized parking is good for security but is mot too convenient for the car users.
c. The series of footpaths follow interesting lines of nature
d. The variety of room types is good for different groups
e. The conference room has two smaller meeting use for convenient use by smaller groups
f. Recreation facilities are provided for both children and adults both inside and outside
g. The building forms are simple and rectangular but does not show any obvious integration with the natural environment
h. The building materials used are easy to maintain.
i. The windows offer the same limited view of the environment outside.

From the NIPPS case study, the following can be summarized:

a. The circular drive provides a good opportunity to view the changing landscape.
b. The drive way also served to effectively separate the accommodation facilities from the administrative section.

c. Parking is provided for each individual chalet.

d. Accommodation for drivers is provided.

e. The views from the building interiors are not too interesting.

f. The landscaped gardens are not too accessible for the participants to relax in.

From the rock lodge case study, the following can be summarized:

a. The recreational facilities are higher up the hill encouraging the users to walk.

b. The raised buildings provided good views

c. The rocks are integrated into the building interiors.

d. Natural materials are used for the construction.

e. The sheet glass windows provide continuous views of nature.

Form the Ntshondwe case study the following can be summarized:

a. The roads have been designed to be as narrow as possible with varied vertical and horizontal alignment to reduce traffic speed.

b. Car parking is adjacent to the access road to minimize the impact on the camp.

c. The network of footpaths is treated with brick paving to blend in with the construction.

d. The buildings blend into the natural environment

Form the Ponderosa case study the following can be summarized:

a. The recreational facilities are zoned towards the perimeter of the site offering both

visual and auditory privacy from the accommodation.

b. The varieties of accommodation make provision for meeting rooms within various lodges.

c. The window the same views

Form the Simpsonwood case study the following can be summarized:

a. The vehicular circulation is at the center of the site but curves to offer changing views of nature.

b. The hiking trails are at the perimeter of the site but still maintain a clear view of the site.

c. Each lodge has its own parking.

d. The conference room is flexible for multiple use and users.

4.8 CONCLUSIONS DRAWN FROM FINDINGS

a. Access roads should be as narrow as possible to reduce traffic speed.

b. The roads should follow contour to capture the changing views of nature.

c. The parking should be at individual chalets for convenience for the user.

d. Meeting rooms should be convenient for use by both small and large groups.

e. The buildings should blend into the natural environment.

f. Window orientations should offer different views of nature.

g. To bring nature inside, materials found on the site should be used inside.

h. Footpaths and resting places should be integrated into the landscaped gardens

4.9 CONTRIBUTIONS OF CASE STUDIES TO PROPOSED DEVELOPMENT

Case study one was chosen to document an existing case study in Nigeria. Case study two was chosen to examine how executives in Nigeria live when at work away fro the office for a period of time. Case studies three and four were chosen to document tropical case retreat centers. Case studies five and six were chosen to document other non tropical case studies so that the differences and similarities could be documented.

CHAPTER FIVE

THE SITE

5.0 CRITERIA FOR SELECTING A SITE

To get a site that is attractive for retreat development, it must possess outstanding natural or otherwise unique characteristics so that visitors will want to experience it but it must also be in a relatively remote zone where external distractions will be at a minimum. Before choosing a specific site the following were used as guidelines;

a. The microclimate had to be conducive for work even in instances when mechanical ventilation would not be available.

b. Preferably there had to be a water body on the site.

c. The site had to have good aesthetic qualities.

d. The site had to be physically distant for the urban centers, to give the people retreating a sense of being away.

e. It had to be a natural environment.

5.1 JUSTIFICATION FOR SITE LOCATION

All the state and their capitals and the natural attractions in the towns were considered (see appendix two). Considering the guidelines above the states narrowed down were Plateau, Adamawa, Lagos, and the FCT. The results from a questionnaire administered to companies, and individual corporate workers using purposive sampling, showed the preferred retreat locations as Lagos, Jos, and Abuja, as shown in the chart below.

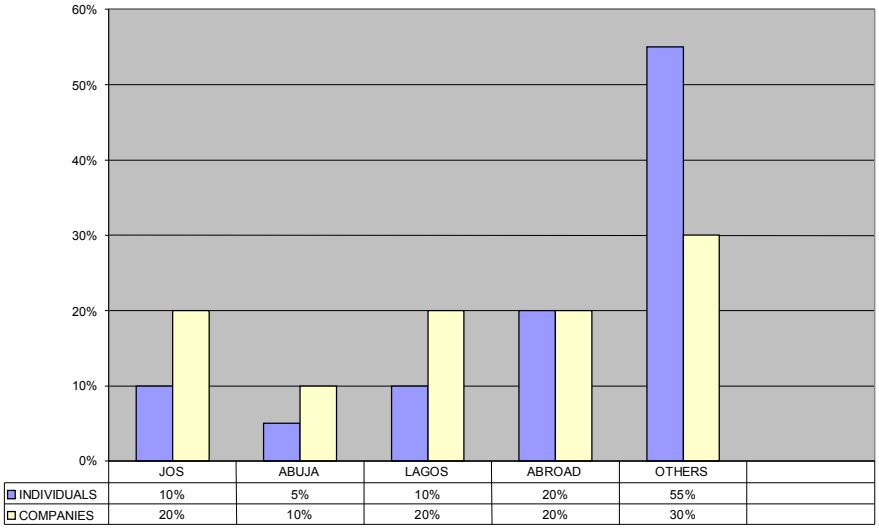


Fig 5.1 Retreat locations
(Source: questionnaire)

The graph above shows that Jos and Lagos and the most frequently used retreat locations.

To further narrow down the choice of site, the questionnaire also narrowed down the reasons for the choice of retreat location.

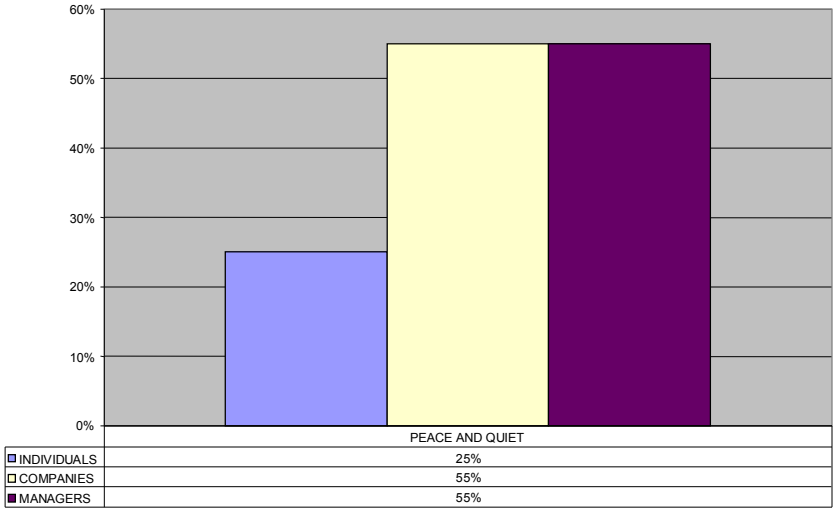


Fig 5.2 Peace and quiet
(Source: questionnaire)

One of the reasons given for choosing the retreat venue was peace and quiet. Companies and managers indicated a greater desire for peace and quiet in a retreat venue.

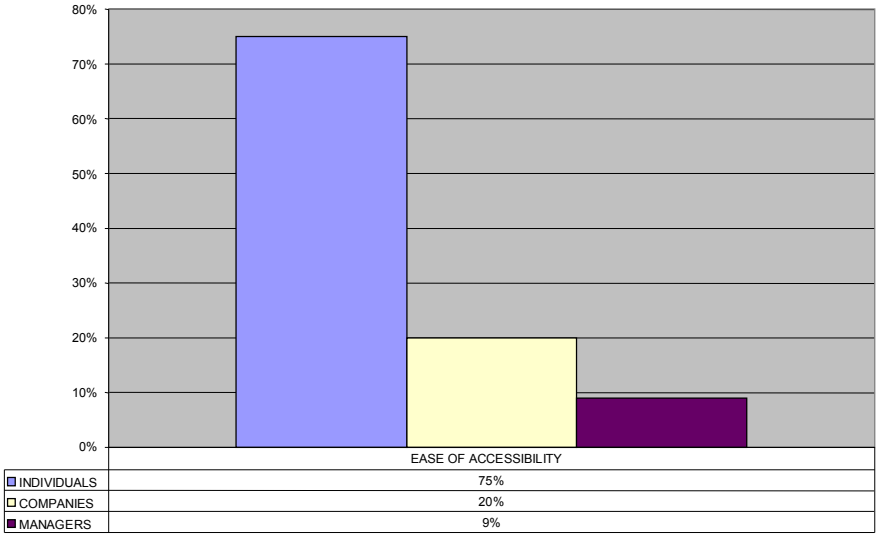


Fig 5.3 Ease of accessibility
(Source: questionnaire)

Another reason given for choosing the retreat venue was ease of accessibility. Individuals indicated a greater desire for easy access to a retreat venue.

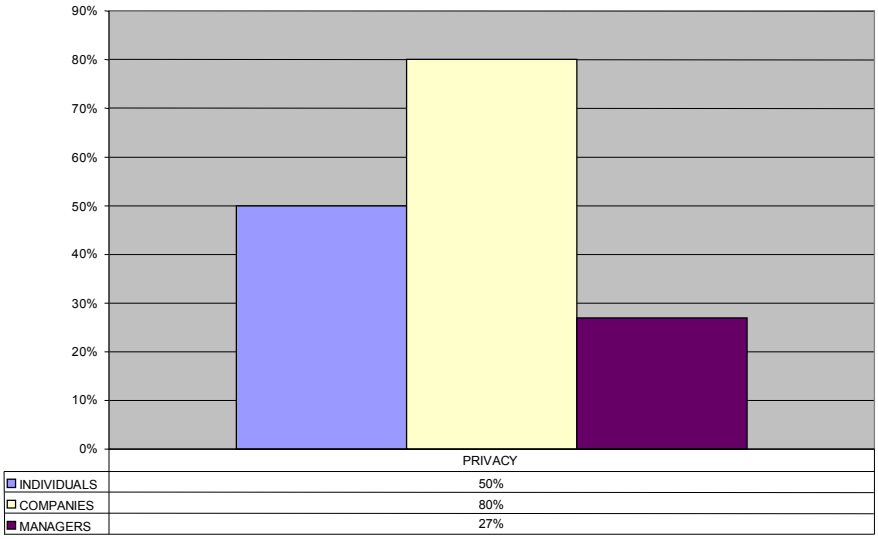


Fig 5.4 Privacy
(Source: questionnaire)

Another reason given for choosing the retreat venue was privacy. Companies indicated a greater desire for privacy in a retreat venue.

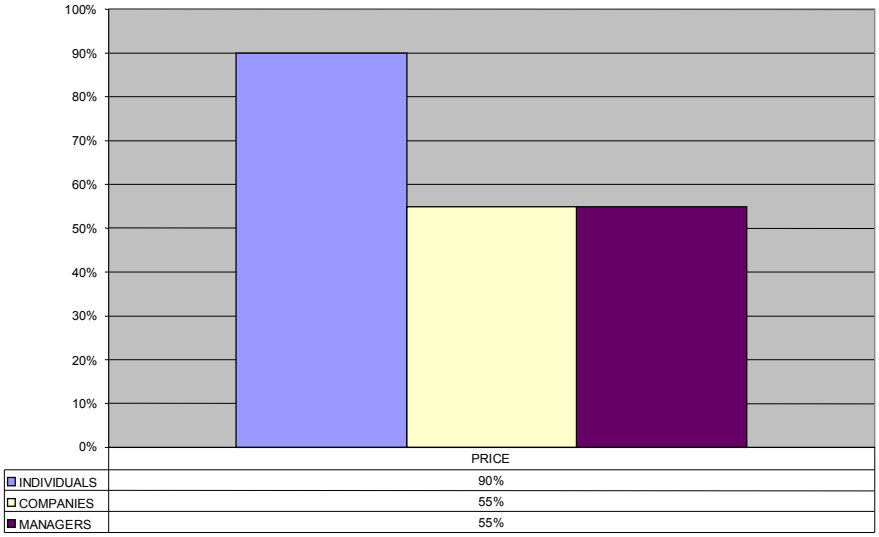


Fig 5.5 Price
(Source: questionnaire)

Another reason given for choosing the retreat venue was the price. Individuals expressed a greater desire for less costly retreat venues.

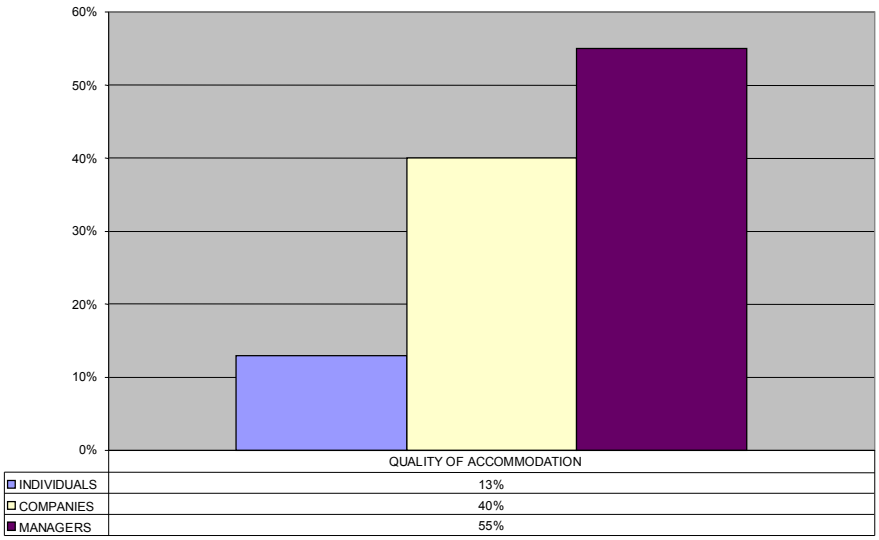


Fig 5.6 Quality of Accommodation
(Source: questionnaire)

Another reason given for choosing the retreat venue was the quality of accommodation. Managers indicated a greater desire for good quality accommodations in a retreat venue.

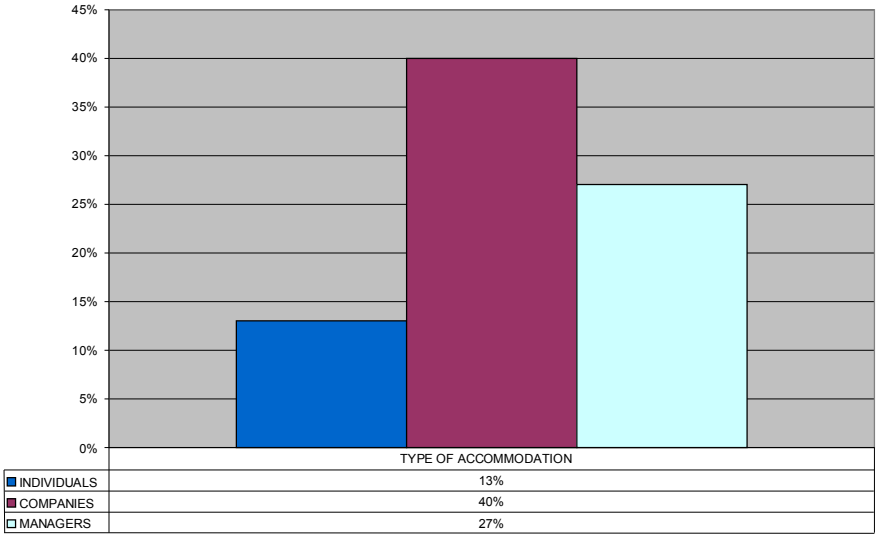


Fig 5.7 Type of Accommodation
(Source: questionnaire)

Another reason given for choosing the retreat venue was the type of accommodation. Companies indicated a greater concern for the type of accommodation provided in a retreat venue.

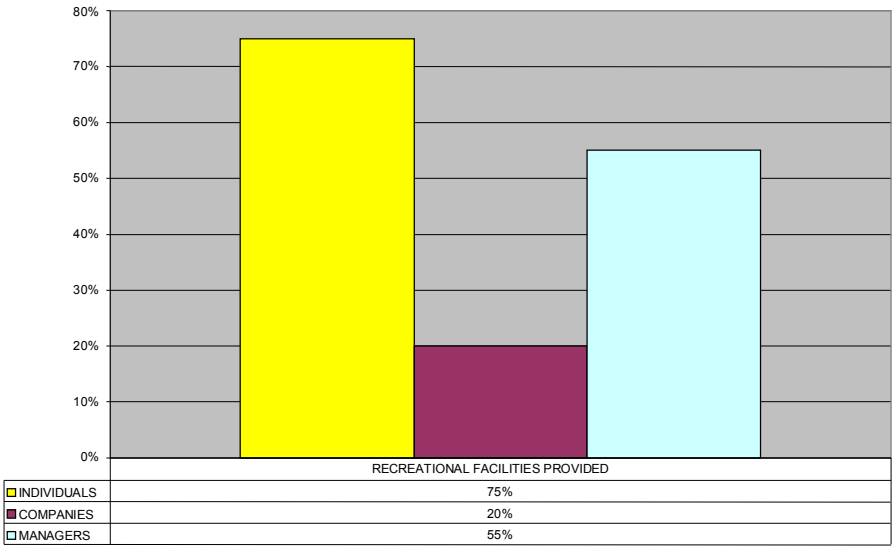


Fig 5.8 Recreational Facilities Provided
(Source: questionnaire)

Another reason given for choosing the retreat venue was the recreational facilities provided. Individuals indicated a greater desire for recreational facilities in a retreat.

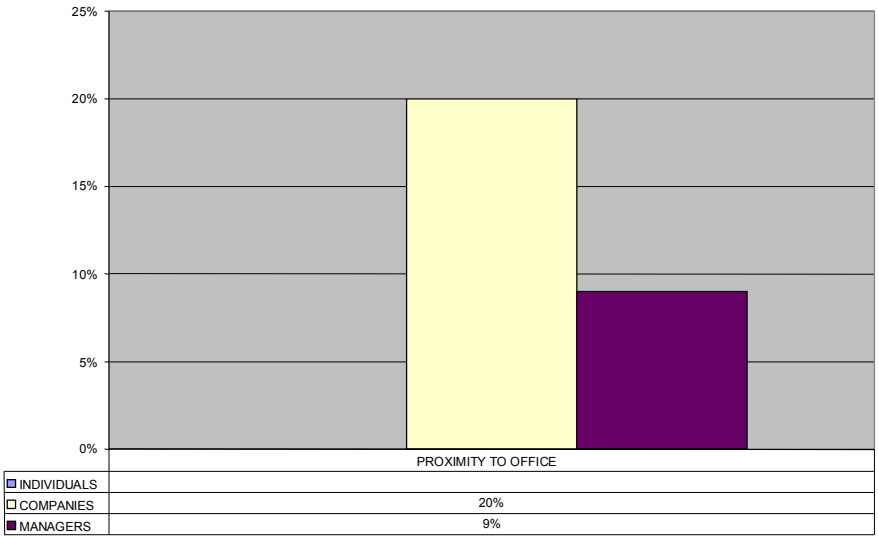


Fig 5.9 Proximity to Office
(Source: questionnaire)

Another reason given for choosing the retreat venue was the proximity to the office. Companies indicated a greater desire for the location of the retreat center to be near the office.

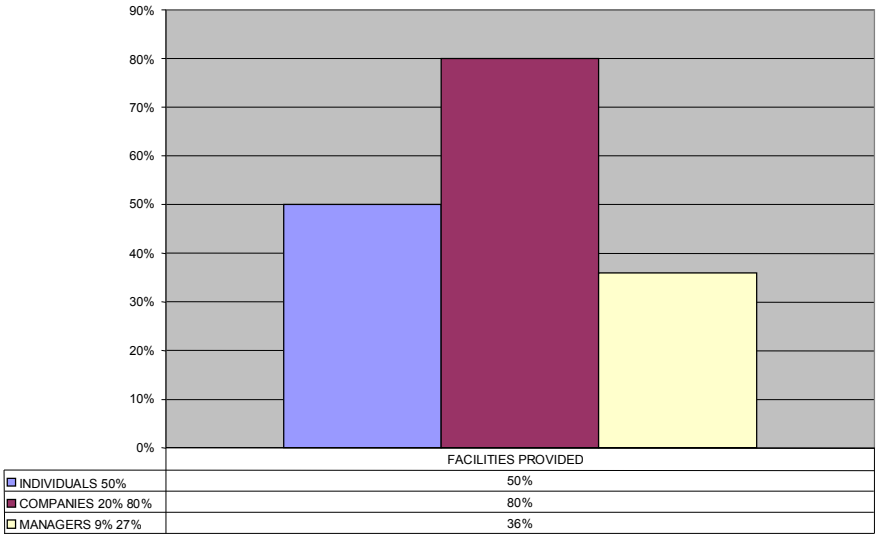


Fig 5.10 Facilities Provided
(Source: questionnaire)

Another reason given for choosing the retreat venue was the facilities provided. Companies indicated a greater need for good facilities in a retreat venue.

5.2 HISTORIC AND CULTURAL FACTORS

The site chosen is the Jos Plateau. Its central area covers about 3,000 sq mi (8,000 sq km) and has an average elevation of 4,200 ft (1,280 m); the surrounding high plains often exceed 3,200 ft. The adjoining highland area on the east is occasionally designated the Bauchi Plateau. The Jos Plateau is composed of eroded gneiss formations, with granite intrusions forming massifs, and has numerous extinct volcanic cones which are surrounded by basaltic flows, especially around Panyam in the south and around Vom and Miango in the west. There are also including several containing crater lakes. Its highest points are Mt. Shere (5,843 ft) and Peak Sara (5,544 ft) in the Wadi Hills—both near Jos town.

The plateau has a cool rainy climate and is the source of numerous rivers, including the Kaduna, Karami, and N'gell, which feed the Niger River; the Mada, Ankwe, Dep, Shemanker, and Wase, which flow to the Benue; the Lere, Maijuju, and Bagei, which supply the Gongola; and the Kano, Delimi, Bunga, Jamaari, and Misau, which intermittently nourish Lake Chad. The plateau's steep, irregular southern slopes have many waterfalls.

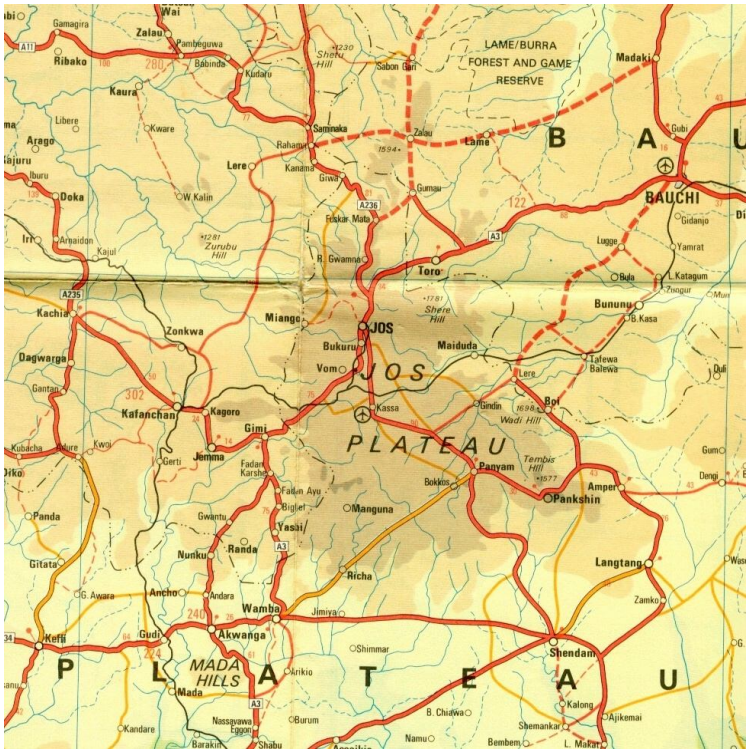


Plate 5.1 Map of Jos plateau
(Source: Shell road map 1985)

Plate 5.2 Map of Miango and Surroundings
(Source: Northern Nigeria Survey, 1958)

5.2.1 Proximity to Services

The site chosen is in Miango of Bassa, local Government, in Jos Plateau state; a small village whose residents are mainly farmers. It is approximately fifteen kilometers from the Rukuba military barracks; twenty kilometers form Jos town and forty kilometers from the airport. The closest towns to the site are northbound Miango and southbound Kwall which are approximately three and ten kilometers from the site respectively. Kwall has an area of about nine kilometers square and a population of 2000 while Miango has an approximate area of twelve kilometers square and a population of approximately 3000. There is clinic, Taxi Park and a small market in Miango. There is a nine meter tarred access road by the site. There are a variety of natural features around the site. There are extinct volcanoes about twelve kilometers from the site, a pine forest at ten kilometers from the site and a number of rock formations.

5.2.2 Existing land use and facilities

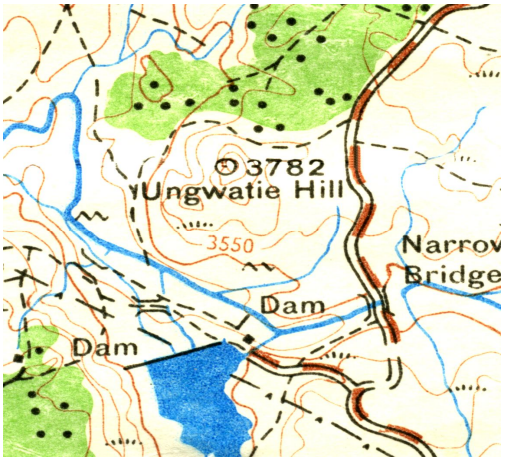


Plate 5.3 The Site
(Source: Northern Nigeria Survey 1958)

There are no existing buildings on the site; the area around the site is used as farmland. Around the area where the site is located is a dam owned by NESCO which is a private power generating plant.

5.2.3 Traffic circulation

To the east of the site is a tarred access road that runs from Jos through Miango town to Kwall and Vom beyond. There are a number of dirt tracks and footpaths leading to the site area.



Plate 5.4 Main access road
(Source: field work)



Plate 5.5 Dirt track
(Source: field work)

5.2.4 Building regulations

See appendix three

5.3 NATURAL FACTORS

5.3.1 Topography

The general rock type is igneous rock as the area was formerly a volcanic region. The general area has an undulating slope due to its' hilly nature but the main site has a gradient of ten degrees though it also undulates somewhat. The gradient is good for site drainage as the site slopes towards the river which is south of it. Topography can potentially provide vertical separation and more privacy for individual structures. Changes in topography can also enhance and vary the way a visitor experiences the site by changing intimacy or familiarity



Plate 5.6 Site area
(Source: field work)

5.3.2 Hydrography

The slow to medium speed stream flowing by the site is a good visual and recreational resource. It is part of the Kwall stream used for the dam but the part flowing by the site is not used by the dam.





Plates 5.7 a & 5.7 b
Views of the river
(Source: field work)

5.3.3 Soil types and uses

By the river banks, there is a fine silt soil which has been washed up by the river. It can be used to form an artificial beach. On the higher banks there exist s the loamy soil which is favored by the farmers but due to the many rocks on the site the farmers prefer to use the gentler slopes which are closer to the river banks for irrigation.



Plate 5.8 River bank
(Source: field work)

5.3.4 Vegetation





Plates 5.9 a & 5.9 b Vegetation on the Site
(Source: field work)

There are a variety of wooded trees on the site and a few fruit trees and palm trees. The site shows good potentials for planting. Some trees will need to be added for aesthetic value, wind protection, shade, buffer zones screens and backdrops for outdoor seating.

5.3.5 Climatic factors

The micro-climate in Jos is one of the most comfortable in the country because weather is not too hot and dry and there is not excessive rain. The environment is characterized by a cool climate that negates the need for mechanical ventilation most times of the year. A comparative analysis of the different variations over a period of time shows that the weather in Jos has been stable over a period of years.

PLATEAU, ALTITUDE 1290M, LONGITUDE 08º52'E
(Source: National Meteorological Society)

DATE	J	F	M	A	M	J	J	A	S	O	N	D
1964	0.0	0.0	0.0	70	165	225	317.5	315	182.5	42.5	2.5	2.5
1972	0.0	0.0	40	50	235	225	247.5	16.3	407.5	5	0.0	10
2003	00	00	00	199.9	185.2	183.7	160.9	283.1	246.3	36.3	00	00
2004	00	00	1.2	141.4	216.7	223.8	246.3	249.4	129.0	4.1	00	00

Table 5.1 Rainfall (mm)

DATE	J	F	M	A	M	J	J	A	S	O	N	D
2003	28	26	29	31	29	28	25	28	28	28	31	29
2004	28	27	31	32	28	27	27	26	27	29	30	29

Table 5.2 Maximum Temperature (ºC)

Where sun is abundant, it is imperative to provide shade for human comfort and safety in activity areas (e.g., pathways patios). The most economical and practical way is to use natural vegetation, slope aspects, or introduced shade structures.

DATE	J	F	M	A	M	J	J	A	S	A	N	D
2003	327	220	234	209	260	219	197	186	154	141	102	104
2004	119	171	165	204	208	186	184	179	156	148	116	199

Table 5.3 Wind Speed (Km/h)

The major advantage of wind is its cooling aspect. For example, trade winds in the tropical environments often come from the northeast to the southeast quadrant, orientation of structures, and outdoor gathering places to take advantage of this cooling wind movement, or "natural" air conditioning.

5.4 AESTHETIC FACTORS

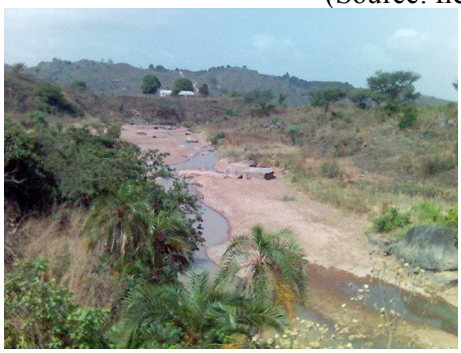
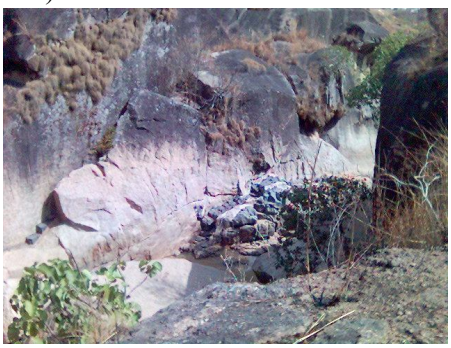
The aesthetic features on the site are mostly natural and because the landscape is untouched by man made interference, it is a peaceful environment.

5.4.1 Natural features

The igneous rocks found in the site area have interesting formations mainly due to the wear and tear of the water over the years. The rock outcrops on the site can be incorporated into the architecture and site development. Designing with geologic features such as rock outcrops can enhance the sense of place. For example, integrating rocks into the design of a bridge or walkway brings the visitor in direct contact with the resource & the uniqueness of a place.




Plates 5.10 a & 5.10 b Natural features on the site
(Source: field work)

Plates 5.10 c & 5.10 d
Natural features on the site
(Source: field work)

5.4.2 Spatial Patterns

The views on the site vary depending on is standing. From the top of the hill, the undulating hills around the site towards the south side can be seen and on the east side the river valley. On the lower slopes the river can be seen as is flows by, but when the rain has come and gone and the dam waters have reached zero level, one can walk in the river bed and examine the rocks on the river floor.

Another interesting feature are the concrete gates on the two side of the cliff faces between which the river waters flows from which a rope swinging bridge used to hang. The bridge no longer exists but the gates still stand.



Plates 5. 11 a & 5.11 b
Views from the site
(Source: field work)



Plates 5.12 a & 5.12 b
River Bed
(Source: field work)



Plates 5.13 a &5.13 b
The Swinging Bridge
(Source: field work)

CHAPTER SIX
DESIGN

6.0 THE DESIGN BRIEF

The proposed corporate retreat center in Jos is a center where corporate executives can work and still be at leisure in a place that gives the a feeling of being away from the office ,and offer opportunities to experience restoration which comes when one is exposed to the natural elements of nature in a natural environment. The design will attempt to integrate architecture with the natural element found on the site. To make the project sustainable, accommodation will be provided for users who wish to rest in natural surroundings with their family.

6.1 CONCEPTS

The different concepts discussed here aim to show how the various design stages evolved. To integrate nature with architecture, the elements used should be as sustainable as possible to ensure

6.1.1 Site Access

Site access refers to not only the means of physically entering a development but also the en route experience route. Considerations for enhancing the experience of accessing a developed area include:

a. Select corridors to limit environmental impacts and control development along the corridor leading to the facility.

b. Provide anticipation and drama by framing views or directing attention to landscape features along the access route.

c. Provide a sense of arrival at the destination.

A curvilinear alignment should be designed to flow with the topography and add visual interest; crossing unstable slopes should be avoided. Steep grades should be used as needed to lay road lightly on the ground. The road should have

low design speeds (with more and tighter curves) and a narrower width to minimize cut-and-fill disturbance. Access corridors should be provided for multiple purposes - e.g., visitors, maintenance, security, emergency vehicles, and underground utilities. Secondary access (road, dock, or helicopter landing site) should always be provided to permit emergency entry and evacuation in the event of a natural disaster. Automobiles are usually restricted to the edges of the development. Paths should be laid out to avoid sensitive resources. In areas that are particularly environmentally sensitive or very steep, elevated walkways can be used. Elevated walkways also limit indiscriminate pedestrian access to fragile vegetation.

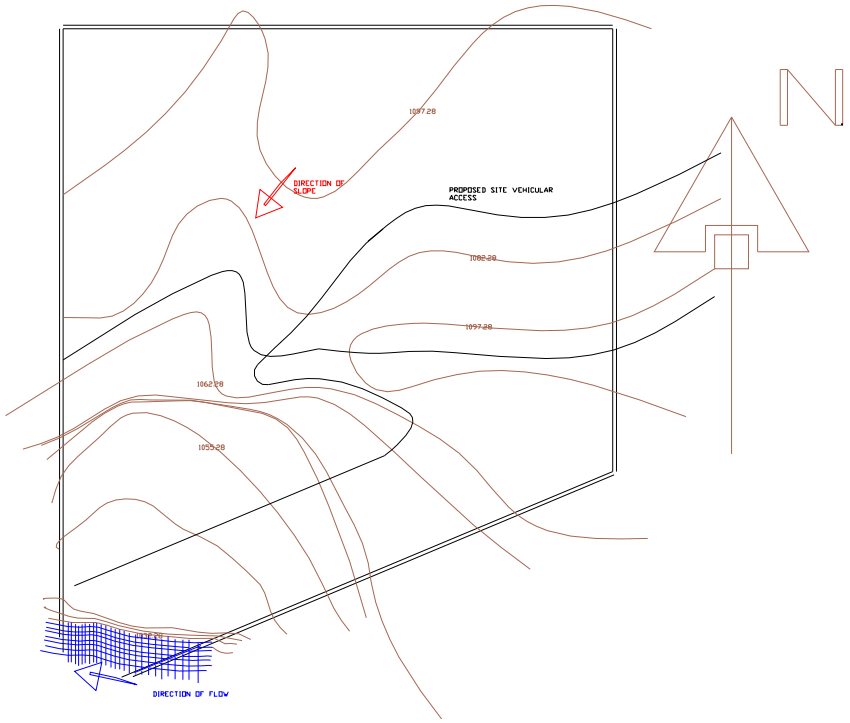


Fig.6.1 Site Access
(Source: Thesis drawings)

6.1.2 Building Design

The following are to be considered in the building design.

a. minimize solid enclosure and thermal mass
b. use elongated or fractured floor plans to minimize internal heat gain and maximize exposure for ventilation
c. separate rooms and functions with covered breezeways to maximize wall shading and induce ventilation
d. isolate heat-generating functions such as kitchens and laundries from living areas
e. provide shaded outdoor living areas such as porches and decks
f. use site features and vegetation to provide shading to walls with eastern and western exposure use shading devices such as louvers, covered porches, and trellises with natural vines to block sun without blocking out breezes and natural light
g. maximize/minimize exposure to wind through plan orientation and configuration, number and position of wall and roof openings, and relationship to grade and vegetation
h. use natural vegetation and adjustments in building plan to diminish the visual impact of facilities and to minimize imposition on environmental context
i. use landforms and the sensitive arrangement of buildings to help diminish the visual impact of facilities, enhance visual quality by creating a rhythm of open spaces and framed views , orient visitors to building entrances and accentuate key landmarks, vistas, and facilities.
j. Minimize excavation and disturbance to groundcover.

k. capture views and consider advantages/disadvantages of off water breezes in corporate views of natural and cultural resources into even routine activities to provide opportunities for contemplation, relaxation, and appreciation

l. limit height of development to below top of tree canopy to preserve visual quality of natural and cultural landscape

m. Locate service and maintenance functions away from public areas space lodging units and interpretive stops so that natural, not human, sounds dominate

n. use vegetation to create sound baffle between public and private activities

o. orient openings toward natural sounds such the lapping of waves, babbling of streams, and rustling of leaves by the wind

p. allow natural fragrances of vegetation to be enjoyed

6.1.3 Water Storage

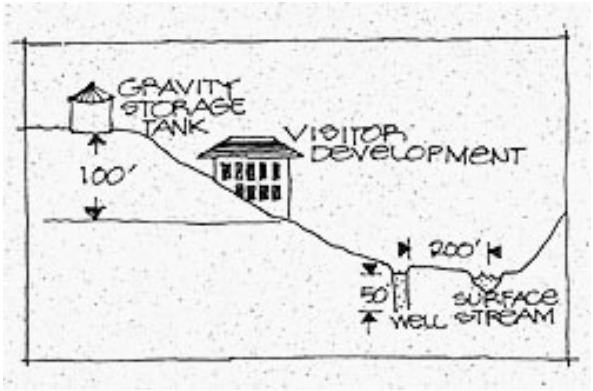


Fig 6.2 Water Storage
(Source: N, Kimon, 1941 The Natural Way to Draw)

The gravity storage tank acts as an accumulator to store water for heavy demand periods or for days when the wind does not blow or the sun does not shine. For every one foot of elevation a storage tank is located above a use point.

As gravity storage tanks are located in an elevated location, visual quality will be important. Multiple smaller tanks may be easier to screen than one large tank. Multiple tanks also provide greater flexibility in operation. Tank materials should be non corrosive and sectioned for minimal transportation requirements to the tank site.

6.1.4 Sewage Disposal

The site has a good soil which has the ability to absorb and degrade effluents quickly. This will take care of problems such as water pollution and the small of raw sewage.

6.1.5 Power supply

The general source of electrical power in the area is from N.E.S.C.O., which has a power generating plant nearby. There are already existing power transmission lines that feed local users in the area, so the power lines can be drawn from there.

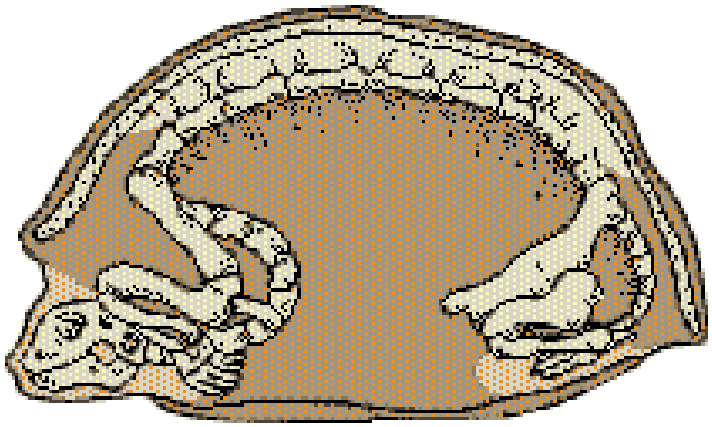
6.1.6 Form Concept

The form adopted for this design is the turtle. By its nature the turtle has a hard outer organic shell which protects it from dangerous external natural elements.



Plate 6.1Turtle
(Source: Microsoft ® Encarta ® Premium Suite 2004.)

When it senses danger it quickly retreats into its shell by pulling its head and legs into it. The shell also serves as a good camouflage because it blends into the natural environment.



Fig, 6.3 Turtle Folded into shell
(Source: Microsoft ® Encarta ® Premium Suite 2004.)

When the danger has passed the turtle emerges once again, exposing itself to nature and natural processes.

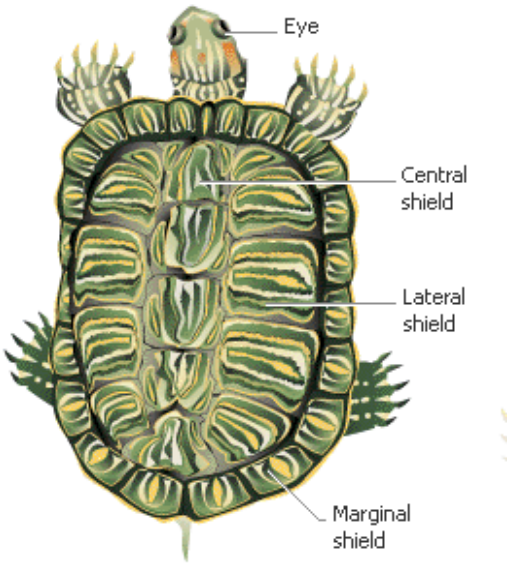


Fig 6.4 Turtle parts
(Source: Microsoft ® Encarta ® Premium Suite 2004.)

The plan form has been conceptualized from a cross section through the longitudinal axis of the skeletal form. It has a semi circular shape following the curve of the shell, while the relatively flat underside is the point of entry. Similarly, the elevation is generated from the same section; the legs forming columns which raise the building above the ground so that nature will not be disturbed and the shell forming the curved shall roof.



Plate 6.2 Section through Turtle's skeletal frame
(Source: Microsoft ® Encarta ® Premium Suite 2004.)

6.2 PLANNING CONSIDERATIONS

Responses from a questionnaire and related articles were used to determine what facilities were to be made available in a retreat based on individual and group opinions, in companies and organizations.

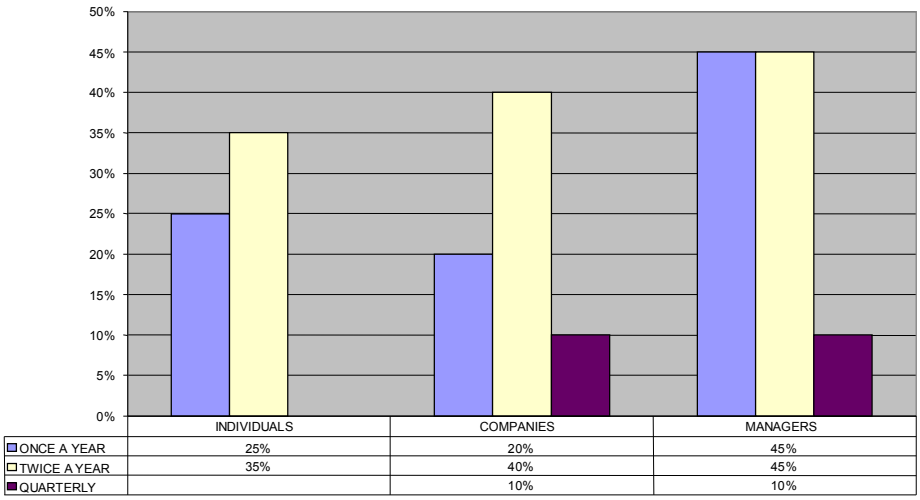


Fig. 6.5 Frequency of Retreats
(Source: questionnaire)

The graph above indicates that most of the respondents go for retreats biannually.

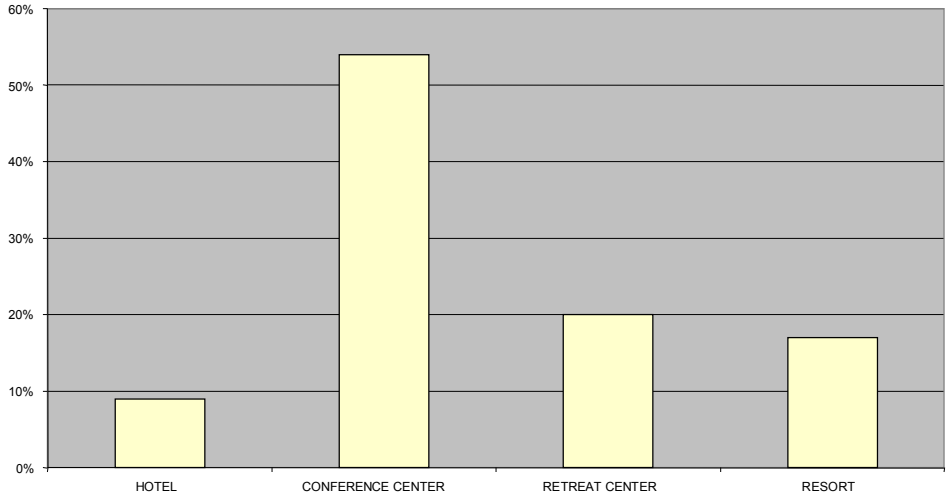
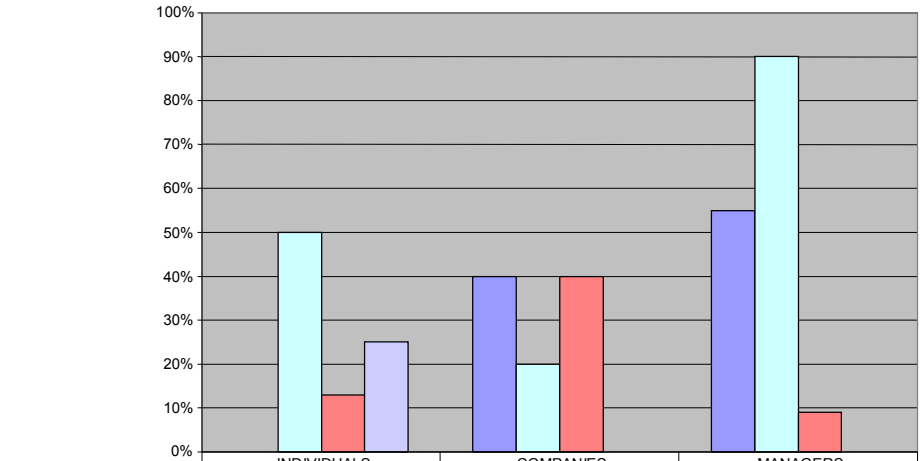


Fig. 6.6 Retreat Venues
(Source: questionnaire)

The graph above indicates that most used venues for retreats are conference centers. Based on several oral interviews with a few of the respondents, the reason for this was partly due to the fact that that was what was readily available.

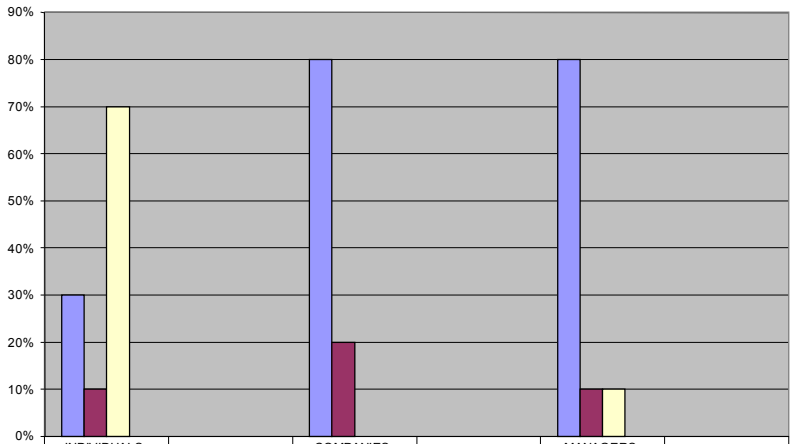


	INDIVIDUALS	COMPANIES	MANAGERS
BEGINNING OF THE YEAR		40%	55%
YEAR END	50%	20%	90%
MIDYEAR	13%	40%	9%
ANYTIME	25%		

Fig.6.7 Time of the year they go on retreats
(Source: questionnaire)

The graph above indicates that people retreat mostly at the end or beginning of the year.

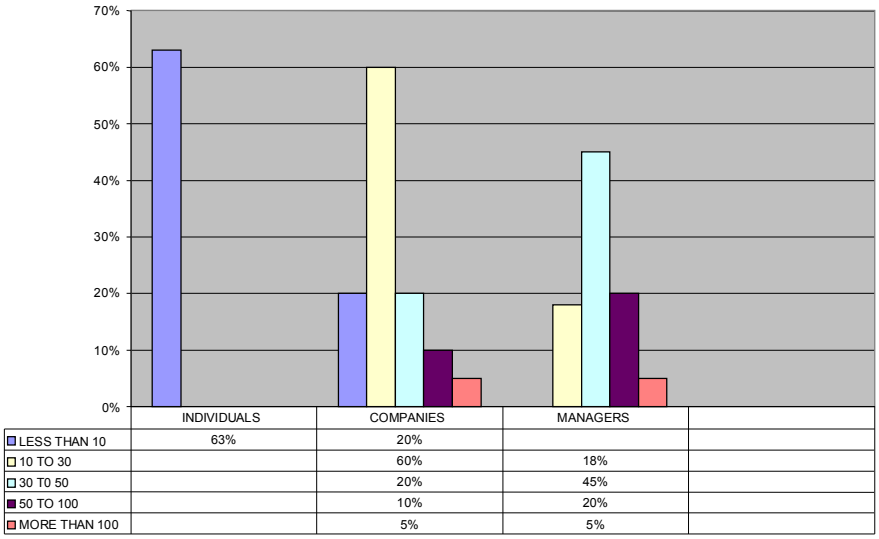
The percentage of usage within the year is between ten to forty percent.



	INDIVIDUALS		COMPANIES		MANAGERS	
YES	30%		80%		80%	
NO	10%		20%		10%	
WOULD LIKE TO	70%		0		10%	

Fig. 6.8 Percentage that go for retreats
(Source: questionnaire)

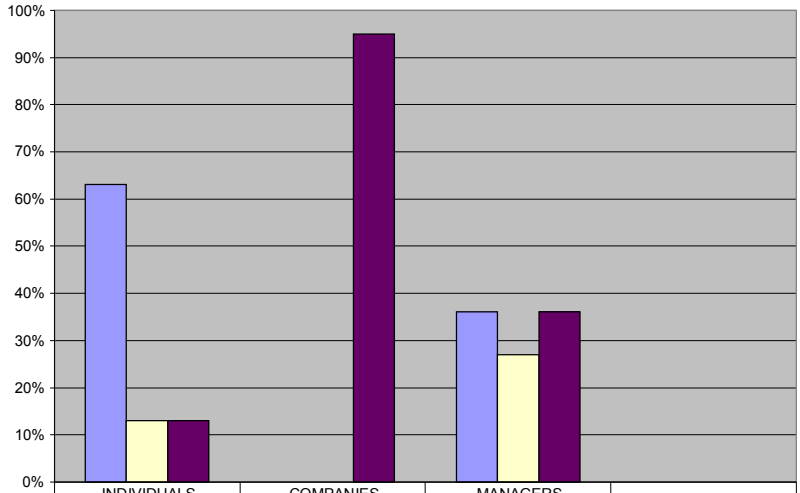
The graph above indicates that managers and groups from companies are the most frequent retreat goers.



	INDIVIDUALS	COMPANIES	MANAGERS	
LESS THAN 10	63%	20%		
10 TO 30		60%	18%	
30 T0 50		20%	45%	
50 TO 100		10%	20%	
MORE THAN 100		5%	5%	

Fig. 6.9 Number of participants
(Source: questionnaire)

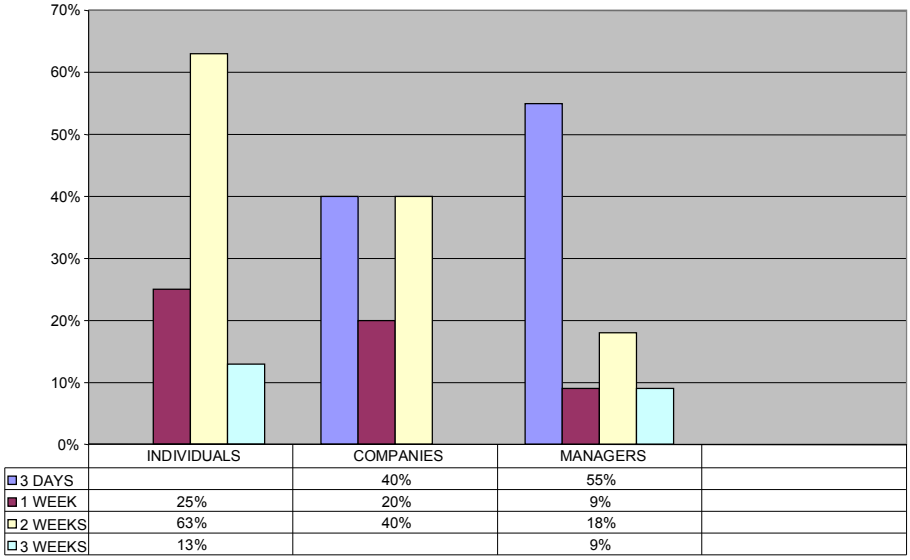
The graph above indicates that the number of units to be made available for use at one time is between ten and fifty.



	INDIVIDUALS	COMPANIES	MANAGERS	
FAMILY	63%		36%	
FRIENDS	13%		27%	
OFFICE MEMBERS ONLY	13%	95%	36%	

Fig. 6.10 Who to go on a retreat with
(Source: questionnaire)

The graph above indicates that corporate bodies as a group prefer to retreat without family and friends, which is in sharp contrast to those retreating on their own.

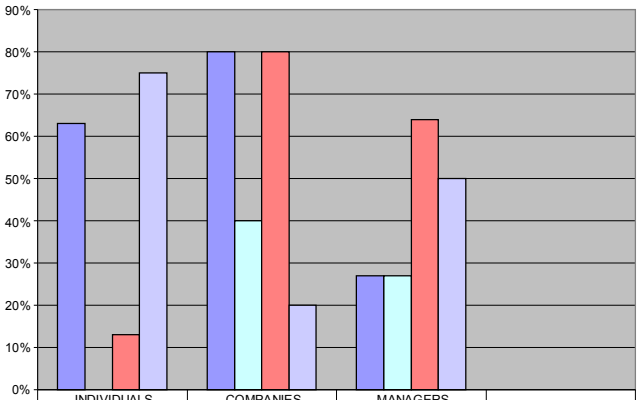


	INDIVIDUALS	COMPANIES	MANAGERS	
3 DAYS		40%	55%	
1 WEEK	25%	20%	9%	
2 WEEKS	63%	40%	18%	
3 WEEKS	13%		9%	

Fig. 6.11 Length of stay
(Source: questionnaire)

The graph above indicates that retreats last for a period of between three days to two weeks.

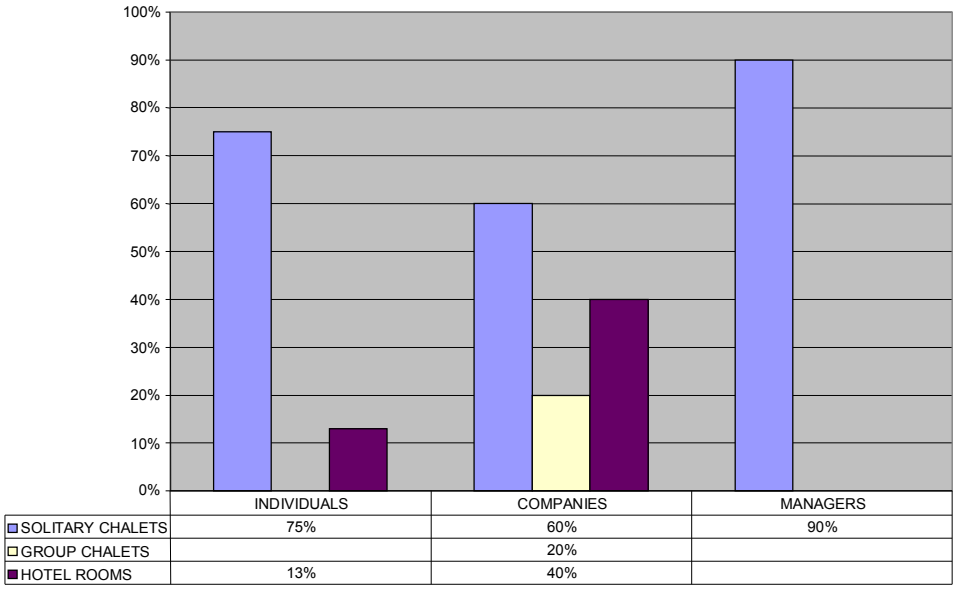
6.2.1 User requirements



	INDIVIDUALS	COMPANIES	MANAGERS	
AUDIOVISUAL ROOM	63%	80%	27%	
CONFERENCE HALL		40%	27%	
MEETING ROOMS	13%	80%	64%	
RECREATIONAL FACILITIES	75%	20%	50%	

Fig. 6.12 Facilities needed
(Source: questionnaire)

The graph above shows a marked preference by the respondents fro less formal meeting rooms and audiovisual rooms.



	INDIVIDUALS	COMPANIES	MANAGERS
SOLITARY CHALETS	75%	60%	90%
GROUP CHALETS		20%	
HOTEL ROOMS	13%	40%	

Fig. 6.13 Preferred accommodations
(Source: questionnaire)

The graph above indicates that the respondents prefer solitary chalets.

6.2.2 Construction Methodology

To determine what materials would best satisfy the requirements for the retreat center, a brief study of a table sourced from the guiding principles of sustainable design was used to asses which materials would be used.(See appendix four). The table indicates asphalt and concrete have a longer life span and lower maintenance implication than gravel. For trails, stone chips and brick paver appear to be the most suitable. Concrete proves to be the most durable as per construction, while tile are good for roofing and the exterior.

6.2.3 Environmental impact analysis

To properly asses the environmental impact of the proposed development, a matrix sourced from the inter-net was used as a practical means of anticipating and minimizing possible negative impacts of the development on the environment, (See appendix five). Identifying negative impacts through the matrix is intended to provide the most appropriate design for sustainability. The

potential impacts are arranged into three categories - pollution, physical processes, and biological systems. Under these categories are the resultant impacts of an approach or activity. A solid black dot indicates a negative impact.

The results from the table indicate that the use of more natural materials and sustainable construction methods have a less hazardous impact on the environment.

6.3 SCHEDULES

6.3.1 Zoning of schedule of requirements

The site will be zoned according to the following categories:

a. Access
   i. Reception
   ii. Administration
   iii. Parking
   iv. Baggage handling
   v. Security

b. Recreation / leisure
   i. Pools
   ii. Outdoor games
   iii. Restaurant
   iv. Bar
   v. Trails

c. Accommodation

d. Services
   i. Maintenance
   ii. Laundry
   iii. Kitchen

iv. Store

v. Power generation

vi. Refuse disposal

vii. Water storage

e. Meeting facilities

6.3.2 Schedule of accommodation

Spaces	**unit/person**	**number required**	**Area required**
MEETING FACILITIES			
Indoor meeting room	$0.2m^2$/p	200 p/1	$40m^2$
Outdoor meeting space	$0.8m^2$/p	50 p/1	$40m^2$
Audiovisual room	$7.5m^2$/100 p	200p/1	$15m^2$
Entrance lobby	$0.2m^2$/p	100 p/1	$20m^2$
Tea room	$0.02m^2$/p	200p/1	$4m^2$
Conveniences	1@$1.2m^2$/20 p	200p/10	$12m^2$
		Total area	**$171m^2$**

ACCOMMODATION			
Single bedroom	$16.5m^2$	1	$16.5m^2$
Double bedroom	23 m^2-$25m^2$	1	23 m^2-$25m^2$
Living room	$15m^2$	1	$15m^2$
Bathroom	$3m^2$	1	$3m^2$
Public area	$10m^2$	1	$10m^2$
		Total area	**$20x70m^2$**

ADMINISTRATION			
Entrance lobby	$0.2m^2$/p	200p/1	$40m^2$
Reception	$0.2m^2$/p	20p/1	$4m^2$
Protocol	$3m^2$	1	$3m^2$
Public relations	$3m^2$	1	$3m^2$
Manager	$6m^2$	1	$6m^2$
Secretary	$6m^2$	1	$6m^2$
Lounge	$0.4m^2$	100p/1	$40m^2$
Communications	$0.2m^2$	10p/1	$2m^2$
Accounts	$3m^2$	1	$3m^2$
Records	$3m^2$	1	$3m^2$
Store	$36m^2$	1	$36m^2$
		Total area	**$172m^2$**

RECREATION/ LEISURE			
Restaurant	$3m^2$/p	50	$150m^2$
Walking trails	-	-	-
Landscaped gardens	-	-	-

Total area 150m^2

SERVICES			
Laundry	$36m^2$	-	-
Kitchen	$08m^2$/seat	50	$40m^2$
Store	$36m^2$	-	-
Water store	-	-	-
Maintenance facilities	$36m^2$	-	-
Emergency facilities	$36m^2$	-	-

Total area 40m^2

Grand total 1,933m^2

Total site area 87,750m^2

6.4 SUMMARY AND CONCLUSIONS

Various authors have theorized on the restorative potentials in naturals environments. This implies to an extent that the group of people whose need for a natural environment is more pronounced is the group under stress, because they are more in need of restoration from mental fatigue. Since nature serves to restore the mind by redirecting ones attention away from the stressful environment through the arrangements of these natural elements, a building or landscape may not resemble nature but it should imitate natural processes. That is, it should be an archetypal image of the natural world. The integration of nature with architecture is about the two existing in harmony as if one were growing out of the other.

This study has tried to show that stressed individuals can work better in natural environments which will redirect their attention from the sources of their stress.

The enhancing of these restorative elements in nature may bring about restoration for these individuals in a shorter time as retreat periods do not last for a long time.

6.5 RECOMMENDATIONS

Studies on the restorative potentials of nature are varied and vast, from the reasons why these environments are preferred to the characteristic of nature that aid restoration. Primary landscape is abundant in Nigeria, and is a non costly way of increasing health if all the studies are to be believed. An in-depth study into this should be encouraged to see what other resources can be tapped from our natural environment. Stressed corporate workers are just a minority. Ways can be found to reduce the stressors of other groups inexpensively through nature for enhanced functioning of the individual.

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APPENDICES

APPENDIX 1: QUESTIONAIRE

SECTION 1- STRESS MANAGEMENT

1. HAVE YOU EVER BEEN UNDER ANY FORM OF WORK STRESS?

A. Yes [ ]
B. No [ ]
C.

2. WHAT KIND OF STRESS WERE YOU SUBJECTED TO?

A. executive stress [ ]
B. others----------

3. WHAT ARE THE MAJOR CAUSES OF STRESS IN YOUR WORKPLACE?

(Check all that apply.)

A. Factors intrinsic to the job [ ]
B. Role in the organization [ ]
C. Relationships at work [ ]
D. Career development [ ]
E. Organizational interference with outside sources [ ]
F. Organizational structure and climate [ ]
G. Others_____
H.

4. HOW DO YOU PERSONALLY MANAGE WORK STRESS? (Check all that apply.)

A. Relaxation [ ]
B. Exercise and body therapy [ ]
C. Meditation [ ]
D. Psychological therapy [ ]
E. Avoidance of certain stressors [ ]
F. Diverting attention from certain stressors [ ]
G. Controlling effect of stressors through personal time management [ ]
H. Others_____

SECTION 2 -RETREATS

1. **HOW MANY CLASSES OF EXECUTIVES DO YOU HAVE IN YOUR ORGANIZATION, AND WHAT IS THE APPROXIMATE NUMBER OF EACH CLASS OF EXECUTIVE**?

   Class of executive number

   i. ----------

   ii. ----------

   iii. ----------

   iv. ----------

   v. ----------

2. **DO THE MEDICAL BENEFITS OF EXECUTIVES INCLUDE SENDING THEM TO A PLACE WHERE THEY CAN RECUPERATE IN PEACE AND SOLITUDE?**

   A. Yes[ ]

   B. no[ ]

3. **DO THEY GO FOR RETREATS**?

   A. Yes[ ]

   B. no[ ]

4. **WHERE DO THEY GO FOR THE RETREAT(S)**?

   State town name of location

   i. ----------

   ii. ----------

   iii. ----------

5. WHAT DICTATES THE CHOICE OF LOCATION FOR THE RETREAT?

i. Proximity to company location [ ]

ii. Privacy [ ]

iii. Facilities provided [ ]

iv. Availability of accommodation [ ]

v. Accessibility to all executives [ ]

vi. Availability of recreational facilities e.g. golf [ ]

vii. Others ----------

6. DO THEY ALWAYS GO TO THE SAME PLACE?

A. yes [ ]

B. no[ ]

7. WOULD YOU LIKE TO RETREAT OCCASIONALLY TO GET AWAY FROM YOUR DAILY ROUTINE?

A. yes[ ]

B. no[ ]

8. WHAT WOULD BE YOUR REASON FOR GOING FOR A RETREAT?

A. rest [ ]

B. meditation [ ]

C. recovery [ ]

D. need for inspiration [ ]

E. other ----------

9. HAVE YOU EVER BEEN FOR A RETREAT? (If your answer is no you can stop here)

A. Yes [ ]
B. No [ ]

10. APPROXIMATELY HOW MANY RETREATS HAVE YOU ATTENDED?

A. 1-10 [ ]
B. 11-20 [ ]
C. more [ ]

11. HOW IMPORTANT IS EACH OF THE FOLLOWING CHARACTERISTICS IN YOUR CHOICE TO ATTEND OR PLAN A RETREAT AT A SPECIFIC LOCATION? (Circle one rating for each item.)

A. I would not participate in a retreat in any setting [ ]

	Very important		Important		Not important
B. Quality meeting/gathering space	5	4	3	2	1
C. Adequate meeting space (breakouts, room size)	5	4	3	2	1
D. Quality meals served	5	4	3	2	1
E. Hotel style bedrooms with bathrooms	5	4	3	2	1
F. As inexpensive as possible	5	4	3	2	1
G. Comfortable, attractive furnishings	5	4	3	2	1
H. Indoor and outdoor recreation year-around	5	4	3	2	1
I. Retreat resources available	5	4	3	2	1
J. Internet access	5	4	3	2	1
K. Handicapped accessible	5	4	3	2	1
L. Worship space	5	4	3	2	1
M. Privacy	5	4	3	2	1
N. Facilities for body therapy and exercise	5	4	3	2	1
O. Facilities available for shopping	5	4	3	2	1
P. Totally inaccessible	5	4	3	2	1
Q. Accessible to a select few	5	4	3	2	1
R. high altitude plateau environment	5	4	3	2	1
S. hilly grass land	5	4	3	2	1
T. Tropical forest	5	4	3	2	1
U. Seaside	5	4	3	2	1
V. Secluded valley	5	4	3	2	1

12. WHICH GROUPS IN YOUR ORGANIZATION GO FOR RETREATS?

A. Executives [ ]

B. Different departments [ ]

C. individuals selected on a certain criteria [ ]

D. others----------

13. WHAT IS THE AVERAGE SIZE GROUP THAT GOES RETREATS OR CONFERENCES?

A. Less than 15 [ ]
B. 16-25 [ ]
C. 26-50 [ ]
D. 51-75 [ ]
E 76-99 [ ]
F. 100+ [ ]

14. AT WHICH TYPE OF FACILITY DOES YOUR GROUP MOST OFTEN HOLD RETREATS OR CONFERENCES?

A. Hotel [ ]
B. Conference Center [ ]
C. Retreat Center [ ]
D.
E. Resort [ ]
F. Other [ ]

15. PLEASE LIST THE REASONS WHY YOUR GROUP CHOSE THE TYPE OF FACILITIES LISTED IN QUESTION #14.

A. Type of sleeping accommodation. [ ]
B. Quality of accommodations [ ]
C. Recreation opportunities [ ]
D. Distance traveled [ ]
E. Number/size of management rooms [ ]
F. Quality of food [ ]
G. Price [ ]
H. Other (please comment)----------

16. IN WHAT MONTHS ARE THE RETREAT EVENTS IN YOUR ORGANIZATION LIKELY TO HAPPEN? (Check all that apply.)

January	April	July	October	Don‘t know
February	May	August	November	
March	June	September	December	

17. IN YOUR OPINION, HOW FAR WILL A RETREAT GROUP FROM YOUR ORGANIZATION TRAVEL (ONE WAY) **TO ATTEND AN OVERNIGHT RETREAT/EVENT**? (Check only one.)

A. 1 hour [ ]
B. 1 ½ hours [ ]
C. 2 hours [ ]
D. More [ ]

18. HOW MANY TIMES A YEAR WOULD A GROUP OR GROUPS FROM YOUR ORGANIZATION GO FOR A RETREAT?

A. Once a year [ ]
B. Twice a year [ ]

C. Three times a year [ ]
D. More [ ]

19. WHO WOULD YOU LIKE TO GO FOR A COMPANY RETREAT WITH?

A. By yourself [ ]
B. With your family [ ]
C. With friends [ ]

20. HOW LONG DO YOUR COMPANY RETREATS LAST?

A. Less than a week [ ]
B. One week [ ]
C. Two weeks [ ]
D. Three weeks [ ]
E. More [ ]

21. WHAT TYPES OF ACCOMMODATIONS DO YOU PREFER?

A. Solitary individual chalets [ ]
B. Hotel like accommodation [ ]
C. Others_____

22. HOW WOULD YOU LIKE YOUR FOOD TO BE PREPARED AND SERVED?

A. In a general cafeteria [ ]

B. Have a private chef [ ]

C. Room service [ ]

D. Cook yourself [ ]

E. Other_____

21. DO YOUR PROGRAMS REQUIRE ANY SPECIAL FACILITIES?

A. Yes [ ]

B. no [ ]

23. WHICH OF THE FOLLOWING FACILITIES ARE NEEDED FOR MEETINGS

A. Audiovisual rooms [ ]

B. Conference halls [ ]

C. Meeting rooms [ ]

D. Others_____

APPENDIX TWO: TOURIST ATTRACTIONS IN NIGERIA

STATE	CAPITAL	ATTRACTION	TYPE OF TOURISM
ABIA	UMUAHIA	●Arochukwu Cave ● National War Museum, Umuahia. ●Akwette Weaving Centre ●Azumini Blue River Tourist Village	●National / physical ●Monument ●Arts and crafts ●National / manmade
ADAMAWA	YOLA	●Gashaka Gumti national park ●Sukur (UNESCO world heritage site) ●Larmude Hot Springs ●Three Rock Sisters ●Mandara Mountains	●Eco-tourism (wild life) ●Monument ●Natural/ physical Monument ●Natural / physical ●Natural / physical
AKWA IBOM	UYO	●Ibeano Sand Beach / Mobil Oil Treatment Centre ●Oron Museum, Oron ●Mary Slessor House / Tomb	●Natural / manmade ●Monument ●Monument

ANAMBRA	AWKA	●Ogbunike Caves ●Rojeny Tourist Village ●Agulu Lake / Gully	●Natural / physical ●Manmade ●Eco-tourism
BAUCHI	BAUCHI	●Marshal Caves, Yankari Park ●Wikki Warm Springs, Yyankari Park ●Yankari National Park, Yankari ●Tafawa Balewa Tomb ●Geji Rock and Painting	●Natural ●Natural ●Eco-tourism ●Monument ●Monument
BAYELSA	YENAGOA	●Oloibori Oil Museum ●Scale Tranoit Hall ●Ogidi Shrine	●Monument ●Resort/ manmade ●Cultural
BENUE	MAKURDI	●Ushongo Hills, Ushongo ●Ikwe Holiday Resort ●Enemabia Warm Springs, Okpoba ●Montane Game Reserve ●Dajo Pottery, Makurdi	●Natural / physical ●Natural / man made ●Natural ●Wild life/ eco tourism ●Resort / manmade

BORNO	MAIDUGUDRI	●Lafi Falls, .Kuya L.G.A ●Chad Basin National Park ●Gwoza Hills ●Kyarimi Amusement Park	●Natural ●Eco tourism ●Natural ●Resort / manmade
CROSS RIVER	CALABAR	●Kwa Falls ●Agbokim Falls, Ikom L.G.A ●Obudu Cattle Ranch ●Cross Rriver National Park ●Rock With FootPprints ●Drill Ranch, Calabar	●Natural ●Natural ●Resort / manmade ●Wild life / eco tourism ●Natural ●Eco tourism
DELTA	ASABA	●Chief Nana's Palace ●Koko Port ●Escravo Beach	●Cultural ●Natural / man made ●Natural / manmade
EBONYI	ABAKALIKI	●Umuana-Afikpo ●Golden Sand Beach	● Natural ● Natural
EDO	BENIN	●Fugar Caves ●Okomo Wildlife Sanctuary ●Obas Palace, Benin ●Ramat Park ●Skpoba Holiday Resorts	●Physical ●Eco tourism ●Cultural ●Monument ●Resort / manmade ●Physical

		●Samovikai Hills	
EKITI	ADO-EKITI	●Arinta Water Falls, Ekiti West L.G.A ●Oloscenta Hills, Ikene ●Ikogosi Warm Springs Resort, Ekiti West L.G.A	●Physical ●Physical ●National / manmade
ENUGU	ENUGU	●Mmwanwu Festival ●Nike Lake Holiday Resort ●Uzo uwanni Natural Paint ●Iva Coal Mine	●Cultural ●Natural / manmade ●Natural ●Natural
F.C.T	ABUJA	●Abuja Garden Central Area ●Ecowas Secretariat ●Aso Rock ●Usman Dam ●Ibb Golf Course ●Jabi Dam and Holiday Resort.	●Manmade / resort ●Manmade ●Physical / natural ●Manmade ●Sport ●Manmade
GOMBE	GOMBE	●Tula Highlands / Hill ●Tangale Dome / Shaped Rock / Hill Formations ●Dadin kowa Dam / Tomato Factory and Farms	●Physical ●Physical ●Manmade

IMO	OWERRI	●Oguta Lake Resort ●Ikeji Festival, Arondi Zogu ●Palm Beach Resort, Awo-Amana	●National/manmade ●Cultural ●Natural / manmade
JIGAWA	DUTSE	●Hadejia / Nguru Wetland and Bird Sanctuary ●Ringim Dyeing Pit ●Baturiya Bird Sanctuary	●Eco-tourism (wild life) ●Cultural ●Wildlife
KADUNA	KADUNA	●Jacaranda Pottery ●Nok Terracotta Village ●Matsrga Water Falls, Kafanchan	●Souvenir ●Cultural ●Natural
KANO	KANO	●Korar Mata Dyeing Pit ●Emir of kano's Palace ●Cooky Amusement park ●Bagauda Lake / Tiga Lake Resort	●Cultural ●Cultural ●Man made ●Natural / manmade
KASTINA	KASTINA	●300 Year Old Gobarau Minaret ●10th Century Kusogo Well, Daura ●Emir of Kastina's Palace	●Monument / cultural ●Monument / cultural ●Cultural

KEBBI	BIRNIN KEBBI	●Argungu Fishing Festival ●Kanta Museum, Argungu ●Grimace Shrine, Zuru	●Natural / physical Museum / ●monument ●Cultural
KOGI	LOKOJA	●Ita-Okueta weaving, Okene ●Kpata Rock, Bassa ●Confluence Zone, Lokoja ●Lord Luggards Residence and Office, Lokoja	●Cultural ●Physical ●Natural ●Monument
KWARA	ILORIN	●Owu Water Falls, Owa Kajoda ●Owe Kajita Falls ●Ubo Aiyegunle lake	●Natural ●Physical ●Physical
LAGOS	IKEJA	●Bar Beach, Lagos ●Slave Relics, Badagry ●First Storey Building, Badagry ●Takwa Bay Beach, Oba's Palace	●Physical/manmade ●Monument ●Monument ●National / manmade cultural

NASSARAWA	LAFIA	●Captain Tomb / Hills ●Farin Ruwa Water Falls ●Ara Rocks / Festival ●Keana Salt Village, Keana ●Doma Dam, Doma	●Natural / physical ●Natural / physical ●Wildlife / eco tourism ●Natural ●Monument
NIGER	MINNA	●Gurara Water Falls, Gurara ●Zuma Rock, Suleja ●Kainji Lake National Park ●Mayanka Water Falls	●Natural / physical ●Natural / physical ●Wildlife / eco tourism ●Natural
OGUN	ABEOKUTA	●Olumo Rock, Abeokuta ●Adire Market, Itoku ●Ancient Palace of Aleke of Egba Land	●Physical ●Cultural ●Cultural / monument
ONDO	AKURE	● Idanre Hills, Idanre ●Owo Museum ● Ipale Iloro Waterfalls	●Physical ●Monument/Cultural ●Natural

OSUN	OSHOGBO	● Mat Weaving, Ipetu-Ijesha ● Ooni,s Palace Ile-Ife ● Ife Bronze, Ile-Ife	● Arts and crafts / souvenir ● Cultural ● physical
OYO	IBADAN	● Igbetti Hills, Igbeti ● Captain Bower's Tower, Ibadan ● Aso-Oke Weaving, Iseyin ● Old Oyo National Park ● Alaafin of Oyo's Palace ● Agodi Gardens, Ibadan ● Ado-Awage Suspended Lake	● Physical ● Monument ● Traditional / souvenir ● Wildlife / eco tourism ● Cultural ● Manmade ● Natural
PLATEAU	JOS	● Assop Falls, Riyom ● Shere Hill, near Jos ● International Youth Tourism Centre, Kuara Falls ● Jos Wildlife National Park ● Solomon Lar Amusment Park	● Physical ● Physical ● Physical / manmade ● Wildlife / eco-tourism ● Manmade

RIVERS	PORT HARCOURT	●Monument of King Jaja of Opobo ● Ifoko Beach, Ifoko ● Okrika Aquatic Sadium ● Port Harcourt Tourist Beach ● Isaac Boro Park, Port Harcourt	● Monument ● Physical ● Manmade ● Physical ● Manmade
SOKOTO	SOKOTO	● Tomb of Usman Dan Fodio, Sokoto ● Sultan's Palace, Sokoto ● Sokoto Museum	● Monument ● cultural ● Monument
TARABA	JALINGO	● Mambilla Holiday Resort, Gembo	● Manmade

(Source: Nigerian Tourism Development Corporation, 2005)

APPENDIX THREE: THE JOS TOWNSHIP BUILDING RULES

{SECTION 48}

Rules

8of1940 .

4 of 1944

N.R.L.N.
52 of 1958 Date of commencement: 8th August 1940

1.
These rules may be cited as the township building rules and shall be compiled within all the townships of Northern Nigeria in the case of any building the erection of which is begun after the date upon which these rules come into force.

2. Definitions:
"approved" means approved by the local authority "medical officer" has the same meaning in the Public health Law "residential plot" means any plot which is used wholly or partly for human habitation; "residential purpose" means used wholly or partly for human habitation

3.
(1) No new building shall be erected in a township until the plans of the proposed building together with a block plan showing the position of the buildings and erections on the same and immediately adjoining plots and a description in writing of the building materials and drainage shall have been submitted to the Local authority and his sanction in writing obtained.
(2) Plans of proposed buildings should be drawn to scale of not less than one-eighth to an inch to one foot and block plans to a scale of not less than one inch to forty feet. Such plans shall specify what rooms in the proposed new building are intended for residential or nonresidential: purposes.

(3) Plans and descriptions of buildings. drainage and materials to he used shall be submitted in triplicate to the l local authority drawn on ink and in durable material to the satisfaction if the l local Authority who if he sanctions the plan and description and erection of the building shall return to the applicant two copies with such sanction endorsed thereon, the plans first having been endorsed by a medical oil officer and an engineer of the Ministry of Works if they are available.

4.
In lieu of preparing plans builder may apply to the Local Authority for permission to erect an approved type of house, for the copy of the plan of which there shall he a charge fee of one shilling: Provided that in the case of the single story hut and other small buildings not exceeding three hundred square feet in the area to he erected for non-residential purposes the Local Authority may. if he thinks fit, dispense with the production of such plans and exempt such building from any or all the provisions of these rules.

(1) Not more than one third of the area of the residential plot and not more than one half of the are of the a non- residential plot shall be built upon

(2) If eaves extend more than three feet beyond the outer face of the wall then for the purpose of this rule the whole area covered by the roof excluding any part within three feet of the extremity of the eaves shall be deemed to have been built upon.

(3) No building shall be built in front of the approved building line, and no portico, porch, verandah, step, or other like projection shall project beyond the building line of any public street upon which a building may front.

5.
(1) With the exception that a latrine or wash place may be built against a boundary wall if permission is granted by the Local Authority in his discretion, every building shall have a clear space free from any erection whatsoever of five feet between it and the boundary walls.

(2) There shall be a free space free from any erection whatsoever of not less then ten feet between a building and any other on the plot and in the case often or more storied buildings such space between it and any other building whether on the same or on an adjoining plot shall not be less than fifteen feet.

6. The projection of the eaves beyond the walls of any building shall be so limited that a vertical line drawn from the extremity of the eaves shall not be closer to the boundary of the plot than three feet in the case of the single storey buildings and six feet in the case of double storey buildings and shall not be closer to similar line drawn from the extremity of the eaves of any adjacent building than six feet or if either building is a storey building closer than nine feet. In no case shall the eaves be lower than six feet six inches from the ground level and they shall not in any way obstruct the opening of any window.

7.
(1) The site on which the new building is to be erected shall be cleared leveled and drained to the satisfaction of the Local Authority.

(2) No new building shall be erected on a site tilled up with animal vegetable or other offensive matter until the same has been removed or destroyed.

(3) No drain shall he laid or constructed for the purpose of a new building that when such building is erected the drain will pass through or under it.

(4) No person shall dig any well in areas where public pipe-home water supply is provided: provided that the I local Authority may sanction in such areas the digging of wells in such places and subject to conditions as he may think fit.

(5) Wells sunk in premises where an offensive trade is being conducted shall not he used in connection with any other purpose than that of that trade.

8.
(1)The whole ground surface within the external walls of any building shall he made as impermeable as possible: and if of dried mud must he beaten smoothed and leveled to the satisfaction of the Local Authority.

(2) The level of the ground floor of every building shall he at least six inches above the level of the highest ground adjoining except in the case of timber floors when the level shall be twelve inches above the highest adjoining ground.

(3) All walls shall have an adequate damp proof course placed below the lowest wood member in the case of a wooden floor and not less than half an inch below the surface of solid floors.

(4) Double walls are prohibited except in the case of walls built of permanent rat-proof material. Double wall means walls of such construction as will include cavities in the walls liable to harbor rodents.

(5) Rooms with wooden floors shall be provided with adequate ventilation beneath floors. All ventilation holes and all cavities shall be made rodent proof

9.
(1) Except in such cases as may be approved, no roof shall be constructed of thatch or other inflammable material, and after such approval has been given no building shall be erected, whether on the same or adjoining plot, so that the extremities of the eaves are within fifteen feet of the approved building: provided that nothing in these rules shall prevent the placing with the approval of the Local Authority of the thatch on top of a nonflammable roof covering to be approved of by the local authority in each case.

(2) No kitchen shall be erected with a thatched roof or grass sides.

(3) No rain gutters shall be permitted except wit the sanction of the Local Authority. All drainage of water from roofs of other surfaces shall be disposed of in a manner as not to cause damage to any drain or road or any other thing maintained by the local authority or any other person.

10.
In the case of boarded ceilings access should be provided to the space between the ceiling and the roof by a trap door not less than twenty-four by fifteen inches.

11.
(I) All buildings should have adequate through and through ventilation

(2) . If windows, or a window and door arc not placed on opposite sides of the room, there shall he provided on the wall of a room or passage, opposite a window a ventilator having a clear area of at least one-sixteenth of the floor are of the room.

(3) All rooms shall contain at least one window opening into the external air, and the area of such window or windows exclusive of such frames shall be not less than one-tenth of the floor space.

(4) Every window must be constructed so that one-half at least may be opened and so

that the opening may extend in every case to the top of the window which shall be at least seven feet above the floor level of the room.

(5) Staircases shall be of a minimum width of three feet six inches between stringers in public buildings and two feet six inches between stringers in all other buildings.

(6) All staircases, landings and passages shall he provided with adequate light and ventilation.

(7) All storerooms shall be rat proof.

12.
Every room intended or used for human habitation shall have a floor area of at least one hundred and twenty square feet. Every such room shall have a width of not less than eight feet and an average height measured from floor to ceiling of not less than ten feet. No room shall be constructed wholly or partially in the roof Upstairs rooms shall be limited to buildings with a proper upper storey

13.
(1) No earth closet within any building shall communicate directly with any living room, All earth closets shall be adequately ventilated and provided with approved withdrawal arrangements, The floor of every earth closet shall be flagged or paved with cement, or other non-absorbent material and the entire surface of the floor of such closets shall be so constructed as to not be less than six inches above the level of the surface of the ground adjoining. The floor of earth closets of the squatting plate type shall have a fall towards the opening in the squatting place of at least half an inch to the floor. The minimum dimensions of all earth closets and wash places shall be five feet by four feet and six feet by four feet respectively. Every earth closet shall contain a suitable movable receptacle and shall at all times be supplied with an adequate supply of earth or sawdust or other deodorizing substance.

2) Efficient means for the disposal of domestic effluents shall be secured by suitable measures to the satisfaction of the Local Authority.

(3) The floor of every bathroom and wash place shall he paved with cement or other non-absorbent material in such manner as to prevent water or other fluid from being absorbed by the floor or walls.

14.
Notice of the commencement and completion of a building shall he given in writing to the local Authority and no person shall let or occupy a new building until the local Authority has conveyed his approval and opinion in writing that the building with the drainage is fit for occupation.

15.
A building shall during construction be open to inspection by the Local Authority, a Ministry of works Engineer, or a health officer. or any person duly authorized by any of them. A copy of the building plans approved shall he kept upon the site and shall he available for inspection at all times during working hours. Alteration whether internal or external from approved plans shall not be made without permission from the Local Authority.

16.
If any work of which plans have been sanctioned by the Local Authority is not complete within eighteen months of such sanction, the Local Authority may, if he considers it desirable, regard the plans as lapsed and call for new plans.

17.
(1). Save as provided in paragraph (b) of this rule the maximum height of hedges, fences or walls around plots shall be six feet. (2) Where any hedge, fence or wall appears to the local Authority to be likely to obstruct the view or passage of road traffic, the Local Authority may serve a notice on the owner or occupier directing him:

[al to alter the height or character of the hedge, fence or wall or any specified part thereof so as to make it conform with any requirements specified in the notice.

[b] not to allow such hedge fence or wall or of any specified part thereof to be of greater height above the ground than that specified in the notice.

(3)Fences and walls shall not be constructed of any material which will allow the harboring of rodents. In the case of live fences these shall be kept properly trimmed.

18.
Any person responsible for the contravention or the contravening or failing to comply with any of the provisions of these rules shall be liable to a fine often pounds in respect of each offence, and in any case where the offence continues after conviction he shall be deemed guilty of a further offence and shall be liable to a daily penalty often shillings, provided that the maximum fine which may be imposed in respect of such daily penalties shall not exceed forty pounds.

19.
A Local authority may in his discretion exempt from all or any of these rules any building to be erected by a native authority.

APPENDIX FOUR: Table 6.1**:** Maintenance Implications for Common Construction Materials
(Source: www.nps.gov)

Construction Materials	Material Frequency	Cycle Frequency	Specialized Training	Specialized Equipment	Employee Health Hazard	Renewable Resource Requirement	Maintenance Costs	Disposal Problems
ROADS								
Gravel	3	3	1	1	1	3	3	1
Asphalt	1	1	2	2	1	2	1	2
Concrete	1	1	2	2	1	2	1	2
TRAILS								
Gravel	2	3	1	1	1	3	3	1
Stone Chips	1	2	1	1	1	3	3	1
Native Soil	3	3	1	1	1	3	3	1
Wooden Boardwalk	2	2	2	2	1	1	2	3
Concrete	1	1	3	2	1	2	2	2
Asphalt	1	1	3	2	1	2	1	2
BUILDING MATERIALS								
Foundations								
Concrete	1	1	2	3	1	2	2	3
Block	1	1	2	2	1	2	3	2
Treated Plywood	3	2	2	1	2	1	2	2
Exterior Walls								
Wood	2	2	1	1	2		2	2
Plaster	1	1	2	1	1		3	1
Concrete	1	1	2	2	1		2	1
Block	1	1	2	1	1		2	2
Stone	1	1	1	2	1		3	1
Roofing								
Tile	1	1	2	2	1	2	1	1
Sheet Metal	2	2	2	2	2	2	1	2
Interior Walls								
Sheet Rock	3	3	2	1	1	3	2	2
Plaster	1	1	2	1	1	3	2	2
Tile	1	1	3	2	1	2	1	2
Treated Plywood	2	2	1	1	2	1	2	3
Carpet	3	3	1	1	1		2	3
Wood	2	2	1	1	2		2	2
Key to Ratings:								
	1 = long	1 = low longevity	1 = little training replacement	1 = general required	1 = low health	1 = minimizes use of nonrenewable resources	1 = low cost of nonrenewable resources	1 = low
	3 = low life expectancy	3 = high degree of training	3 = high degree of training	3 = specialized equipment	3 = high health hazard	3 = requires high degre of nonrenewable resources	3 = high costs	3 = high
	V = varies	v = varies	v = varies	v = varies	v = varies	v = varies	v = varies	v = varies

APPENDIX FIVE: Table 6.2: Environmental Impacts of Development
(Source: www.nps.gov)

POLLUTION

DEVELOPMENT TYPE/ ACTIVITY	Noise increased	Air quality deteriorated	Toxics released during construction	Toxic materials spilled or discharged	Pollutants introduced by vehicle transport	Petroleum Products spilled	Toxics or Sewage Discharged by vessels	Odors released	Hot water discharged
SITE ACCESS									
Roads	X	X	X	-	X	X	-	-	-
Trails	X	-	-	-	-	-	-	-	-
Helicopter pad	X	X	X	-	X	X	-	-	-
Airport/ strip	X	X	X	-	X	X	-	-	-
CONSTRUCTION AND LANDSCAPING									
SITE PREPARATION									
Excavation	X	X	-	-	X	X	-	-	-
Filling	X	X	-	-	X	X	-	-	-
Draining	-	-	-	-	-	-	-	-	-
Grading	X	X	-	-	X	X	-	-	-
FOUNDATION									
Slab	-	-	-	-	-	-	-	-	-
Excavated	X	X	-	-	-	-	-	-	-
Elevated	-	-	X	-	-	-	-	-	-
LANDSCAPING									
Shaping/ planting	X	X	-	-	-	-	-	-	-
Ponds	-	-	-	-	-	-	-	-	-
Swimming pools	-	-	-	-	-	-	-	-	-
Restoration	X	X	-	-	-	-	-	-	-
ENERGY									
SUPPLY SOURCE									
wood-local	-	X	-	-	-	-	-	-	-
Solar	-	-	-	-	-	-	-	-	-
Windmill- local	-	-	X	-	-	-	-	-	-
Hydroelectric (with dam and storage	-	-	X	-	-	-	-	-	-

Hydroelectric (small- scale, water wheel or ram)	-	-	-	-	-	-	-	-	-
Electric- local	X	X	X	-	X	X	-	-	-
Natural Gas	-	-	X	X	-	-	-	-	-
TRANSMISSION									
POWERLINES									
Above ground	-	-	X	-	-	-	-	-	-
Buried	-	-	X	-	-	-	-	-	-
PIPES									
Above ground	-	-	X	X	-	-	-	-	-
Pipes	-	-	X	X	-	-	-	-	-
Vehicle- bulk (also requires road access)	X	X	-	X	X	X	-	-	-
WATER									
SUPPLY									
Wells	-	-	-	-	-	-	-	-	-
Cisterns	-	-	X	-	-	-	-	-	-
Impoundments	-	-	-	-	-	-	-	-	-
Diversions	-	-	-	-	-	-	-	-	-
Importing	X	X	-	X	X	X	-	-	-
DISTRIBUTION									
Above ground pipes	-	-	X	-	-	-	-	-	-
Buried pipes	-	-	X	-	-	-	-	-	-
Vehicle transport	X	X	-	-	X	X	-	-	-
WASTE DISPOSAL AND STORAGE									
Human/ organic (secondary, onsite)	-	-	X	X	-	-	-	X	-
Solid/ Trash (landfill, offsite	X	X	-	-	X	X	-	X	-
COMMUNICATION									
Radio/ microwave transmission tower	-	-	X	-	-	-	-	-	-
Satellite	-	-	-	-	-	-	-	-	-
WALLS AND FENCES									
Stone wall	-	-	-	-	-	-	-	-	-
Cement/ Brick wall	-	-	X	-	-	-	-	-	-
Wooden fence	-	-	X	-	-	-	-	-	-
Wire fence	-	-	-	-	-	-	-	-	-

Open trench	-	-	-	-	-	-	-	-	-
OPERATIONS & MAINTENANCE									
Machinery/ vehicles	X	X	-	-	X	X	X	-	-
FIRE MANAGEMENT									
Fire breaks	-	-	-	-	-	-	-	-	-
Controlled burns	-	-	-	-	-	-	-	-	-
VEGETATION MANAGEMENT									
Poisoning	-	-	X	-	-	-	-	-	-
Cut/ clear	-	-	-	-	-	-	-	-	-
Natural Controls	-	-	-	-	-	-	-	-	-
VISITOR ACTIVITIES *(may require access roads, trails, docks, structures)*									
Hiking	X	-	-	-	-	-	-	-	-
Boating	X	-	-	-	-	X	X	-	-
Camping	X	X	X	-	X	X	-	-	-
Nature study	X	-	-	-	-	-	-	-	-

PHYSICAL PROCESS

Development Type/ Activity	**Erosion increased**	**Sedimentation/ siltation increased**	**Soil disturbed or compacted**	**Soil removed and disposed of**	**Surface water flow disrupted**	**Groundwater supply reduced**	**Groundwater supply depleted**	**Long-shore dirt/ beach dynamics altered**	**Dredging potentially required**
SITE ACCESS									
Roads	X	X	X	X	X	X	-	-	-
Trails	X	X	X	-	X	-	-	-	-
Helicopter pad	X	X	X	-	-	-	-	-	-
Airport/ strip	X	X	X	X	X	-	-	-	-
CONSTRUCTION AND LANDSCAPING									
SITE PREPARATION									
Excavation	X	X	X	X	X	-	-	-	-
Filling	X	X	X	X	X	-	-	-	-
Draining	-	-	-	-	X	X	-	-	-
Grading	X	X	X	-	X	X	-	-	-

FOUNDATION									
Slab	-	-	X	-	X	-	-	-	-
Excavated	-	-	X	X	X	-	-	-	-
Elevated	-	-	-	-	-	-	-	-	-
LANDSCAPING									
Shaping/ planting	X	X	X	-	-	-	-	-	-
Ponds	-	-	-	X	X	-	-	-	-
Swimming pools	-	-	-	X	X	X	-	-	-
Restoration	-	-	-	--	-	-	-	-	-
ENERGY									
SUPPLY SOURCE									
wood-local	-	-	-	-	-	-	-	-	-
Solar	-	-	-	-	-	-	-	-	-
Windmill- local	-	-	--	-		-	-	-	-
Hydroelectric (with dam and storage	-	-	X	X	X	-	-	-	-
Hydroelectric (small- scale, water wheel or ram)	-	-	X	-	-	-	-	-	-
Electric- local	-	-	X	-	-	-	-	-	-
Natural Gas	-	-	X	-	-	-	-	-	-
TRANSMISSION OF									
POWERLINES									
Above ground	-	-	X	-	-	-	-	-	-
Buried	-	-	X	-	-	-	-	-	-
PIPES									
Above ground	-	-	X	-	-	-	-	-	-
Pipes	-	-	X	-	-	-	-	-	-
Vehicle- bulk (also requires road access)	-	-	-	-	-	-	-	-	-
WATER									
SUPPLY									
Wells	-	-	-	-	-	X	X	-	-
Cisterns	-	-	-	-	-	-	-	-	-
Impoundments	-	-	X	X	X	-	-	-	-
Diversions	-	-	-	-	X	-	-	-	-

Importing	-	-	-	-	-	-	-	-	-
DISTRIBUTION									
Above ground pipes	-	-	X	-	-	-	-	-	-
Buried pipes	-	-	X	-	-	-	-	-	-
Vehicle transport	-	-	-	-	-	-	-	-	-
WASTE DISPOSAL/STORAGE									
Human/ organic (secondary, onsite)	-	-	X	-	X	X	-	-	-
Solid/ Trash (landfill, offsite	-	-	-	-	-	-	-	-	-
COMMUNICATION									
Radio/ microwave transmission tower	-	-	-	-	-	-	-	-	-
Satellite	-	-	-	-	-	-	-	-	-
WALLS AND FENCES									
Stone wall	-	-	X	-	X	-	-	-	-
Cement/ Brick wall	-	-	X		X	-	-	-	-
Wooden fence	-	-	-	-	-	-	-	-	-
Wire fence	-	-	-	-	-	-	-	-	-
Open trench	-	-	X	X	X	-	-	-	-
OPERATIONS AND MAINTENANCE									
Machinery/ vehicles	-	-	-	-	-	-	-	-	-
FIRE MANAGEMENT									
Fire breaks	X	X	X	-	X	-	-	-	-
Controlled burns	-	-	-	-	-	-	-	-	-
VEGETATION MANAGEMENT									
Poisoning	-	-	-	-	-	-	-	-	-
Cut/ clear	X	X	-	-	-	-	-	-	-
Natural Controls	-	-	-	-	-	-	-	-	-
VISITOR ACTIVITIES *(may require access roads, trails, docks, structures)*									
Hiking	X	-	-	-	-	X	-	-	-
Boating	-	-	-	-	-	-	-	-	-
Camping	-	-	-	-	-	-	-	-	-
Nature study	-	-	-	-	-	-	-	-	-

BIOLOGICAL SYSTEMS

Development Type/ Activity	Vegetation altered	Vegetation destroyed	Habitat altered	Habitat destroyed or fragmented	Barriers to wildlife movement created	Collisions or road kill on wildlife increased	Exotic/ alien species directly introduced	Diseases introduced	Life cycles of wildlife disrupted
SITE ACCESS									
Roads	X	X	X	X	X	X	-	-	X
Trails	X	X	X	-	-	-	-	-	-
Helicopter pad	X	X	X	-	-	-	-	-	-
Airport/ strip	X	X	X	X	X	-	-	-	-
CONSTRUCTION AND LANDSCAPING									
SITE PREPARATION									
Excavation	X	X	X	X	-	-	-	-	-
Filling	X	X	X	X	-	-	-	-	-
Draining	X	X	X	X	X	-	-	-	X
Grading	X	X	X	X	X	-	-	-	-
FOUNDATION									
Slab	-	X	-	X	-	-	-	-	-
Excavated	-	X	-	X	-	-	-	-	-
Elevated	X	-	X	-	-	-	-	-	-
LANDSCAPING									
Shaping/ planting	X	X	X	-	X	-	X	X	X
Ponds	-	X	-	X	-	-	-	-	-
Swimming pools		X	-	X	-	-	-	-	-
Restoration	X	X	-	-	-	-	-	-	-
ENERGY									
SUPPLY SOURCE									
wood-local	X	X	X	-	-	-	-	-	-
Solar	-	-	-	-	-	-	-	-	-
Windmill- local	X	-	-	-	-	-	-	-	-
Hydroelectric (with dam and storage	X	X	X	X	X	-	-	-	-

Hydroelectric (small- scale, water wheel or ram)	X	-	X	-	-	-	-	-	-
Electric- local	X	-	X	-	-	-	-	-	-
Natural Gas	X	-	X	-	-	-	-	-	--
TRANSMISSION OF									
POWERLINES									
Above ground	X	X	X	-	-	X	-	-	X
Buried	X	-	X	-	-	-	-	-	-
PIPES									
Above ground	X	-	X	-	X	-	-	-	-
Pipes	X	-	X	-	-	-	-	-	-
Vehicle- bulk (also requires road access)	-	-	-	-	-	-	-	-	-
WATER									
SUPPLY									
Wells	-	-	-	-	-	-	-	-	-
Cisterns	-	-	-	-	-	-	-	-	-
Impoundments	X	X	X	X	X	-	-	-	-
Diversions	X	X	X	-	-	-	-	-	-
Importing	-	-	-	-	-	X	-	-	-
DISTRIBUTION									
Above ground pipes	X	-	X	-	X	-	-	-	-
Buried pipes	X	-	X	-	-	-	-	-	-
Vehicle transport	-	-	-	-	-	X	-	-	-
WASTE DISPOSAL/STORAGE									
Human/ organic (secondary, onsite)	X	-	X	-	-	X	-	-	-
Solid/ Trash (landfill, offsite	-	-	-	-	-	-	-	X	-
COMMUNICATION									
Radio/ microwave transmission tower	X	-	-	-	-	X	-	-	-
Satellite	-	-	-	-	-	-	-	-	-
WALLS AND FENCES									
Stone wall	-	X	-	X	X	-	-	-	X
Cement/ Brick wall	-	X	-	X	X	-	-	-	X
Wooden fence	-	-	-	X	X	-	-	-	X
Wire fence	-	-	-	X	X	X	-	-	X

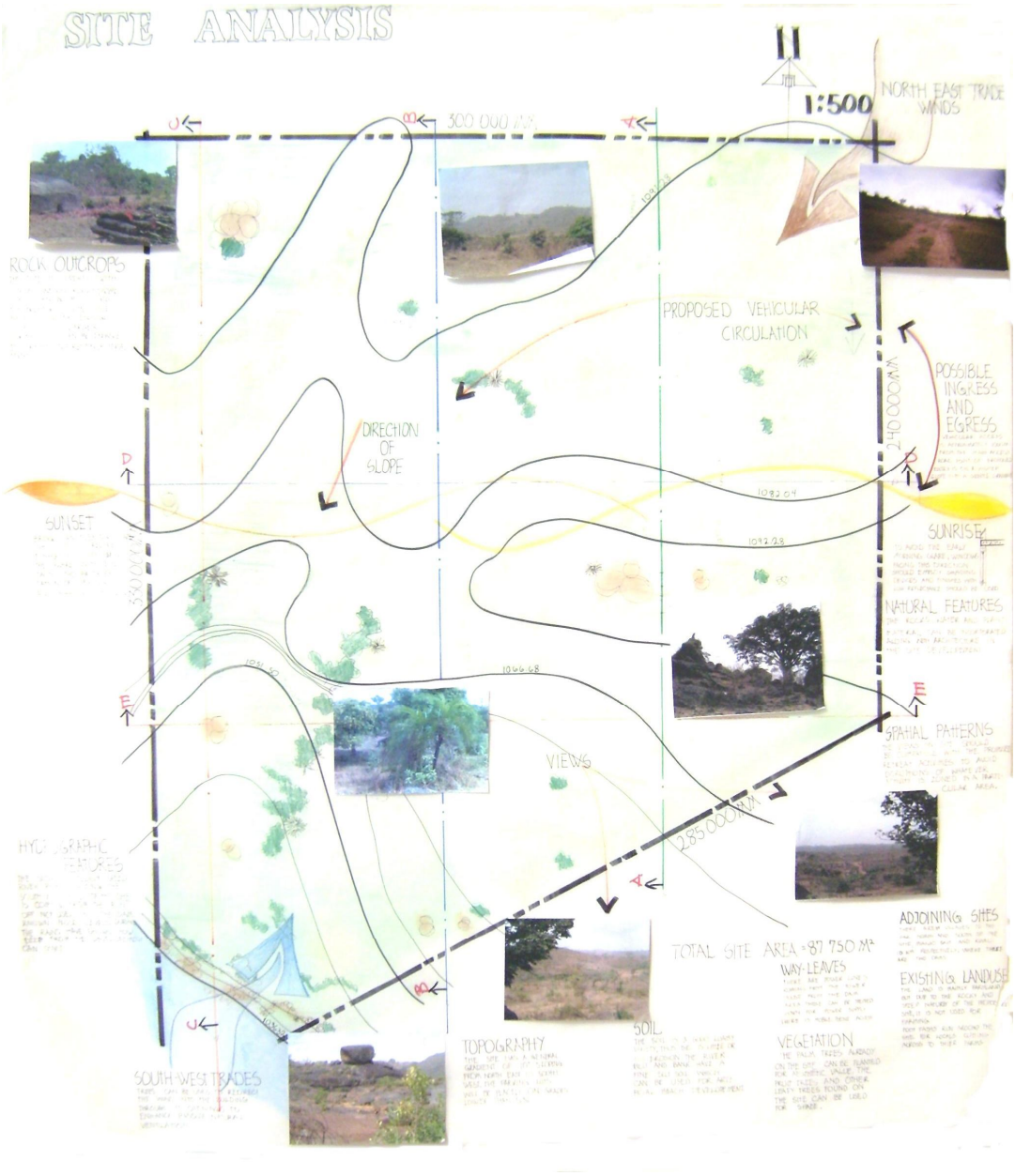
Open trench	-	X	X	X	X	-	-	-	-
OPERATIONS AND MAINTENANCE									
Machinery/ vehicles	-	-	-	-	-	-	-	-	-
FIRE MANAGEMENT									
Fire breaks	-	X	X	X	X	-	-	-	X
Controlled burns	-	-	-	-	-	-	-	-	-
VEGETATION MANAGEMENT									
Poisoning	X	X	X	X	-	-	-	-	-
Cut/ clear	X	X	X	X	-	-	-	-	-
Natural Controls	-	-	-	-	-	-	-	-	-
VISITOR ACTIVITIES *(may require access roads, trails, docks, structures)*									
Hiking	-	-	-	-	-	-	-	-	-
Boating	-	-	-	-	-	X	-	-	-
Camping	-	-	-	-	-	-	-	-	-
Nature study	-	-	-	-	-	-	-	-	-

APPENDIX SIX: THE DRAWINGS



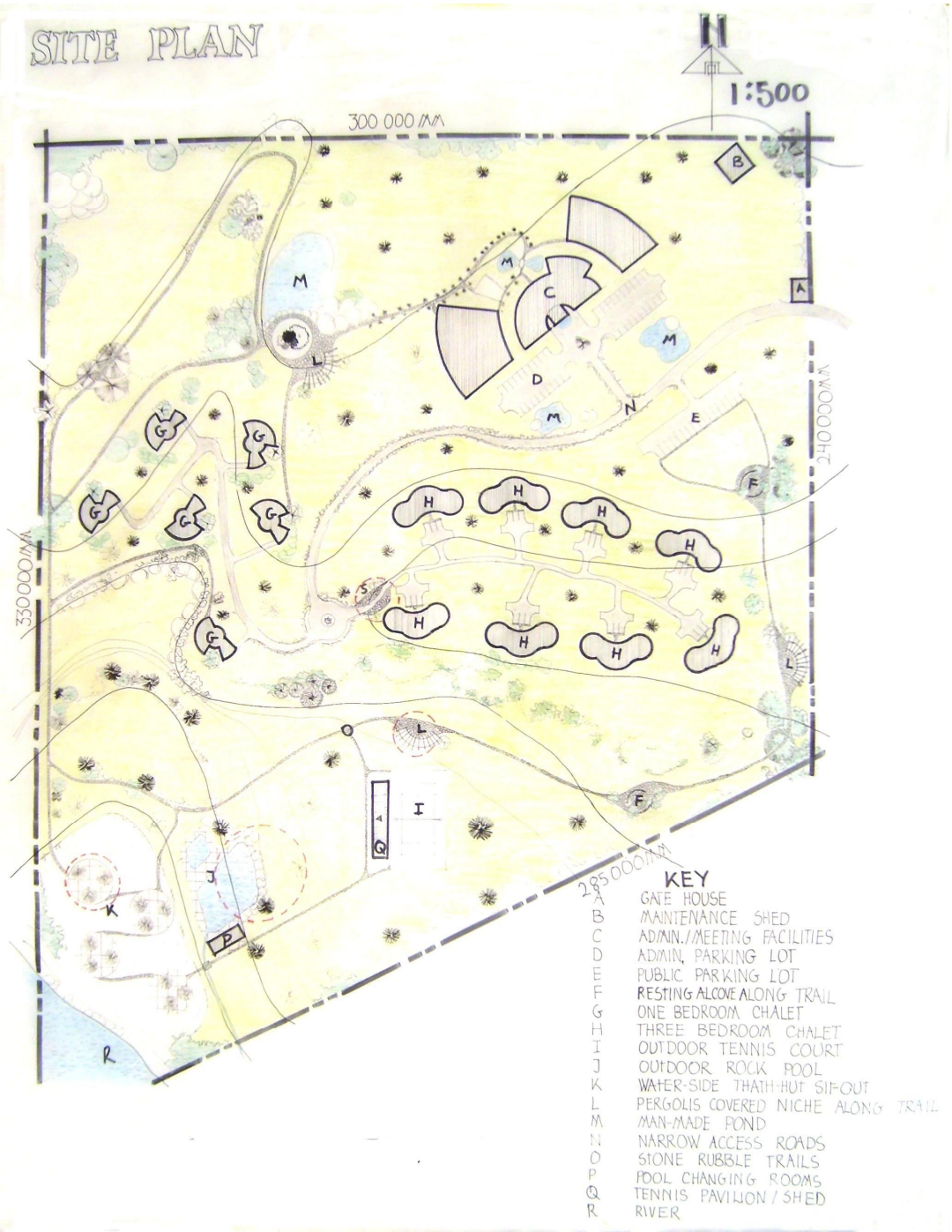
SITE LOCATION

SCALE 1:25000



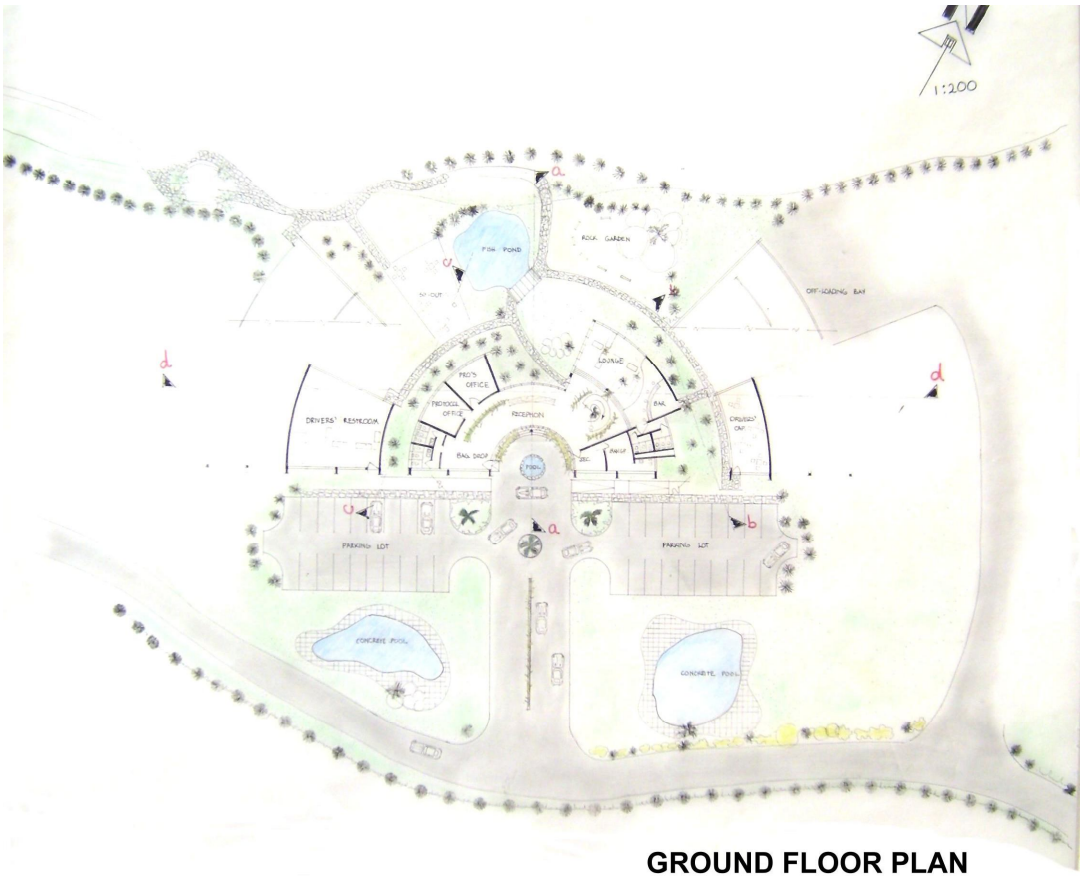
SITE ANALYSIS

SCALE 1:500



SITE PLAN

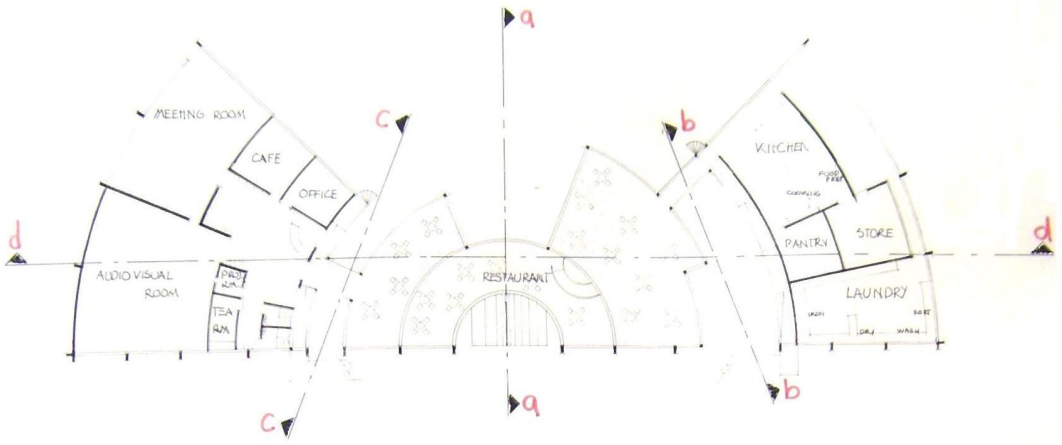
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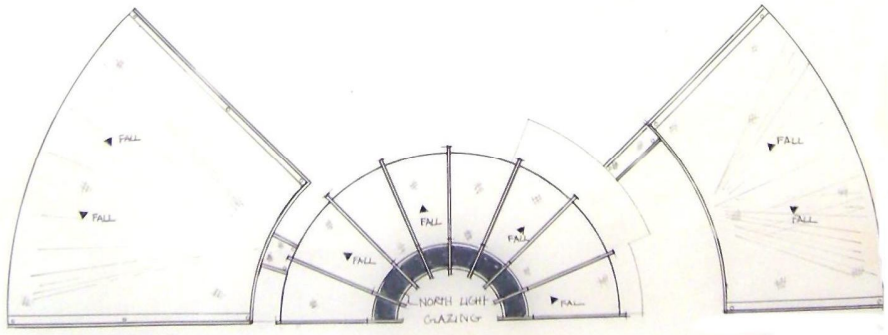
GROUND FLOOR PLAN

ADMINISTRATION AND MEETING FACILITIES

SCALE 1:200



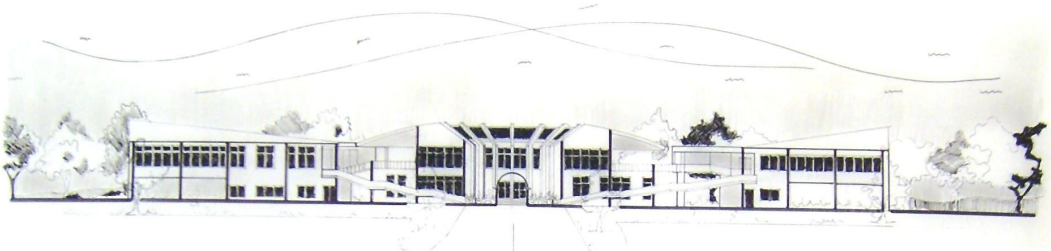
FIRST FLOOR PLAN



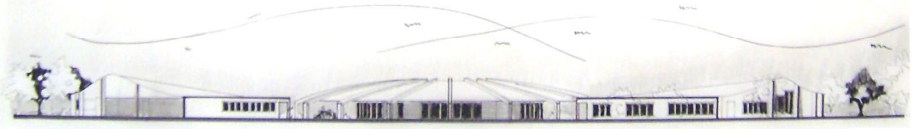
ROOF PLAN

ADMINISTRATION AND MEETING FACILITIES

SCALE 1:200



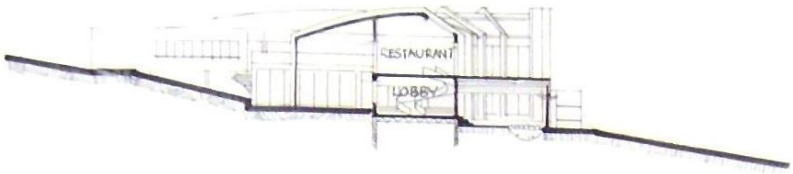
APPROACH ELEVATION 1:200



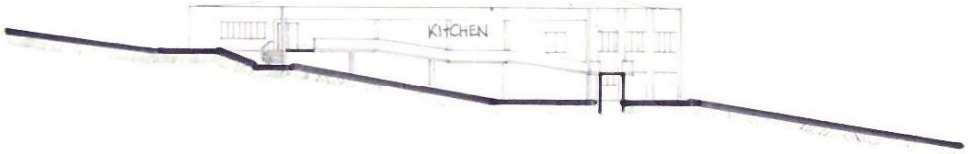
REAR ELEVATION 1:200

ADMINISTRATION AND MEETING FACILITIES

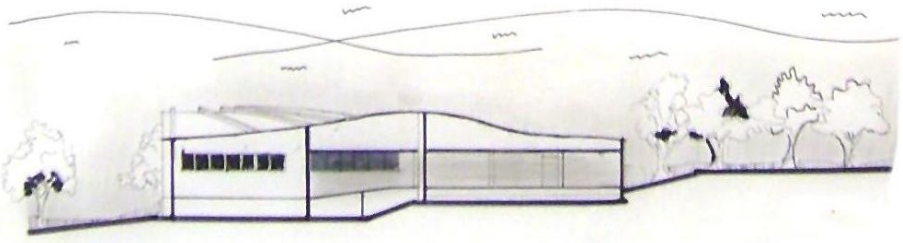
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SECTION A-A 1:200



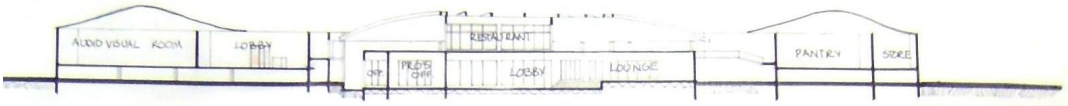
SECTION B-B 1:200



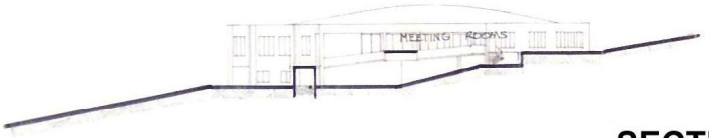
RIGHT SIDE ELEVATION 1:200

ADMINISTRATION AND MEETING FACILITIES

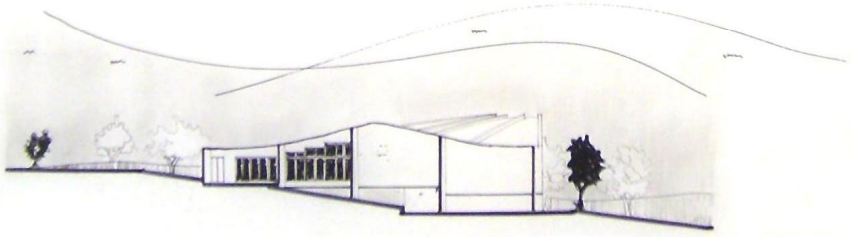
SCALE 1:200



SECTION D-D 1:200



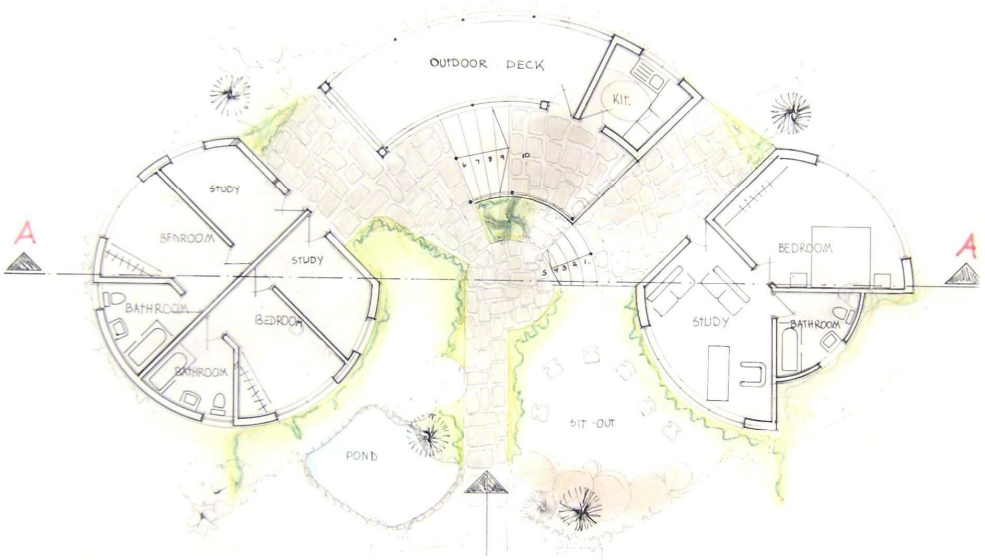
SECTION C-C 1:200



LEFT SIDE ELEVATION 1:200

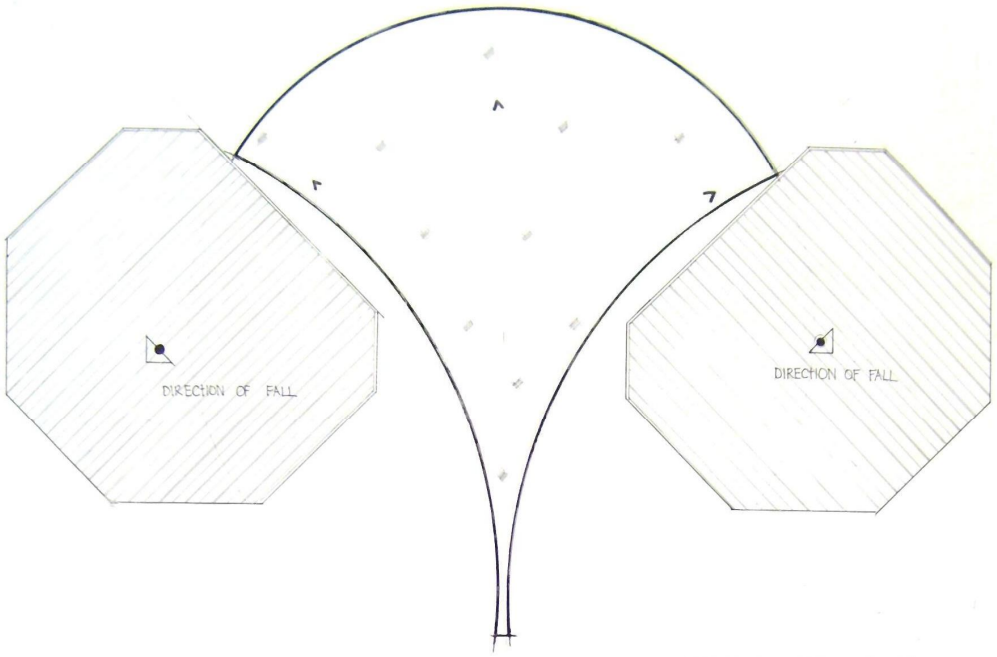
ADMINISTRATION AND MEETING FACILITIES

SCALE 1:200

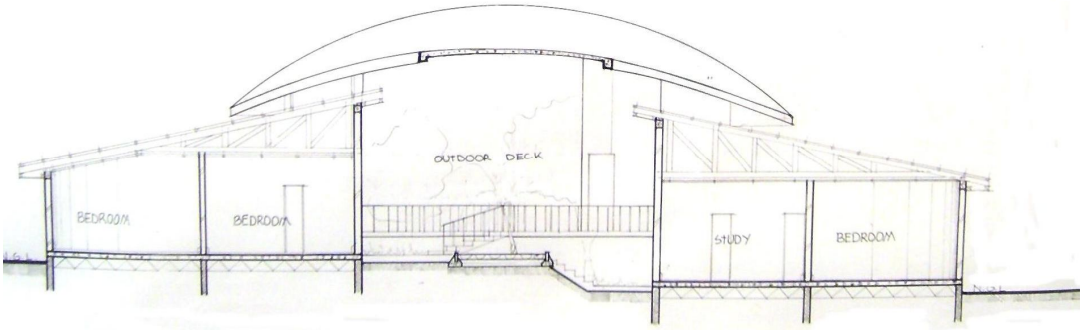


GROUND FLOOR PLAN

THREE BEDROOM CHALET
1:50

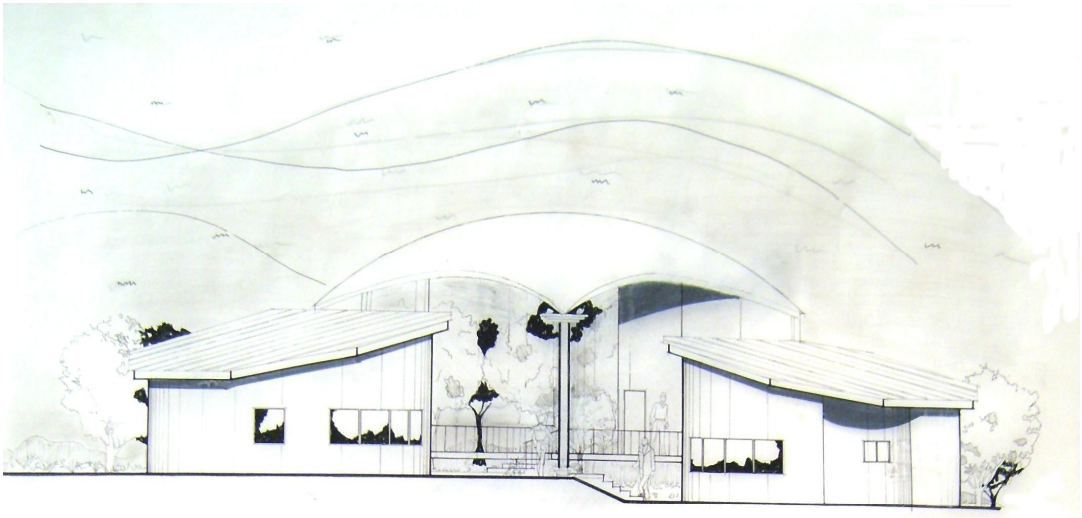


ROOF PLAN 1:50

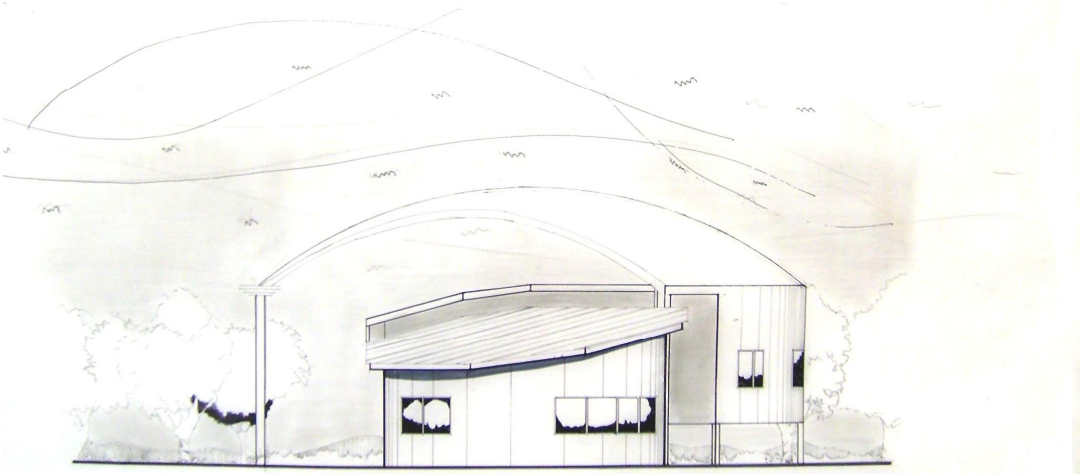


SECTION A-A 1:50

THREE BEDROOM CHALET
1:50

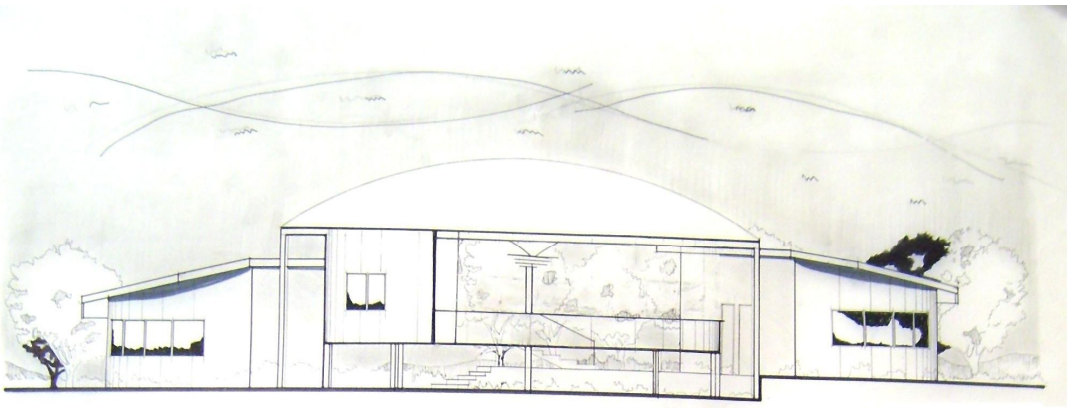


APPROACH ELEVATION

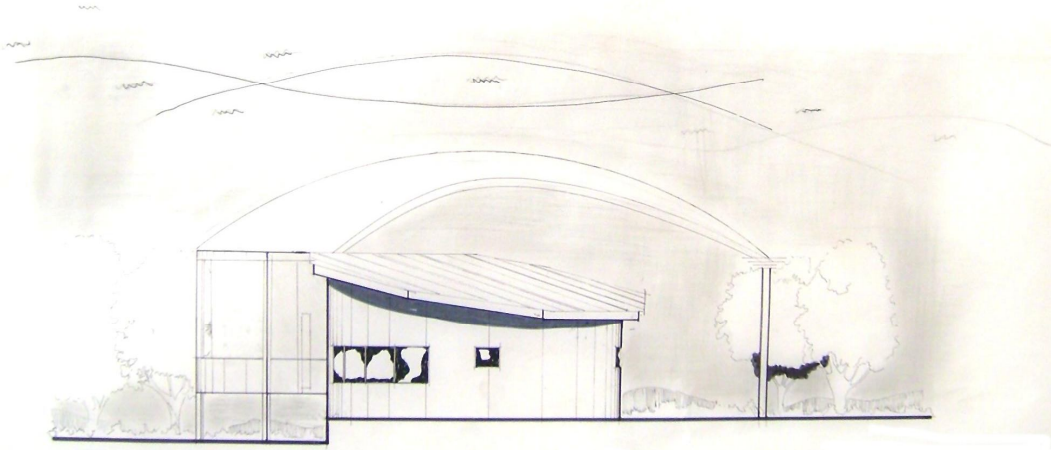


RIGHT SIDE ELEVATION

THREE BEDROOM CHALET
1:50



REAR ELEVATION 1:50



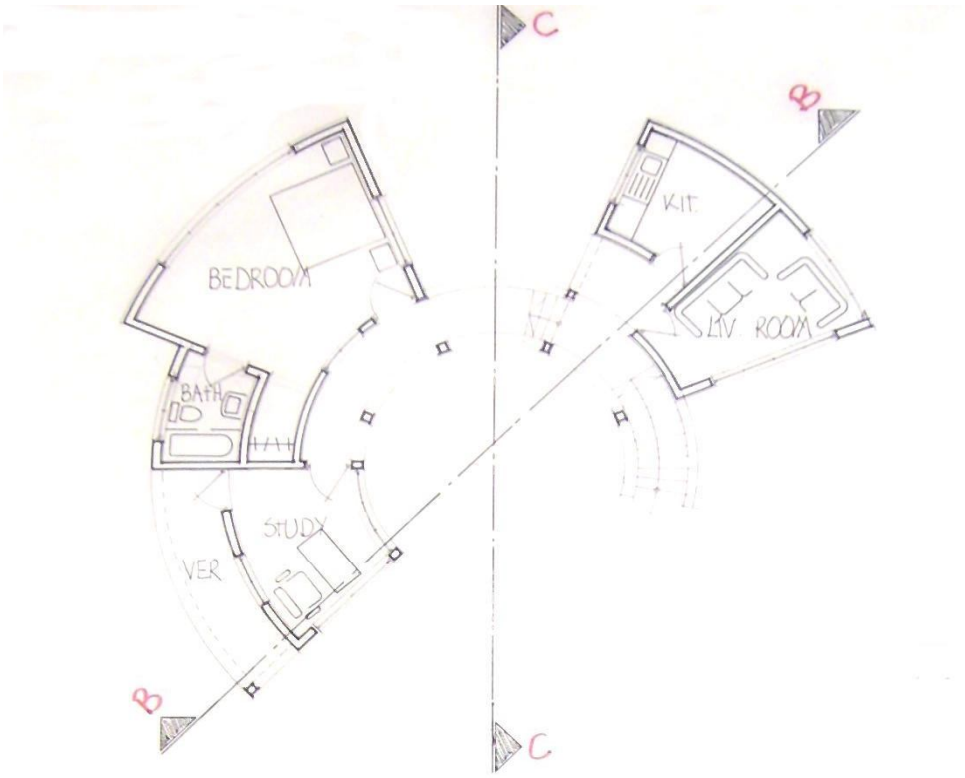
LEFT SIDE ELEVATION 1:50

THREE BEDROOM CHALET
1:50

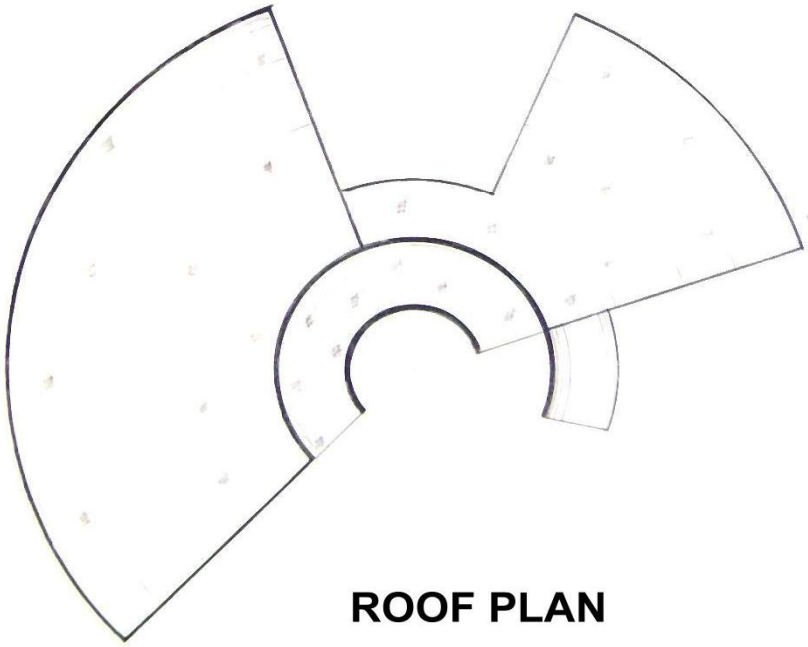


GROUND FLOOR PLAN

ONE BEDROOM CHALET
SCALE 1:50

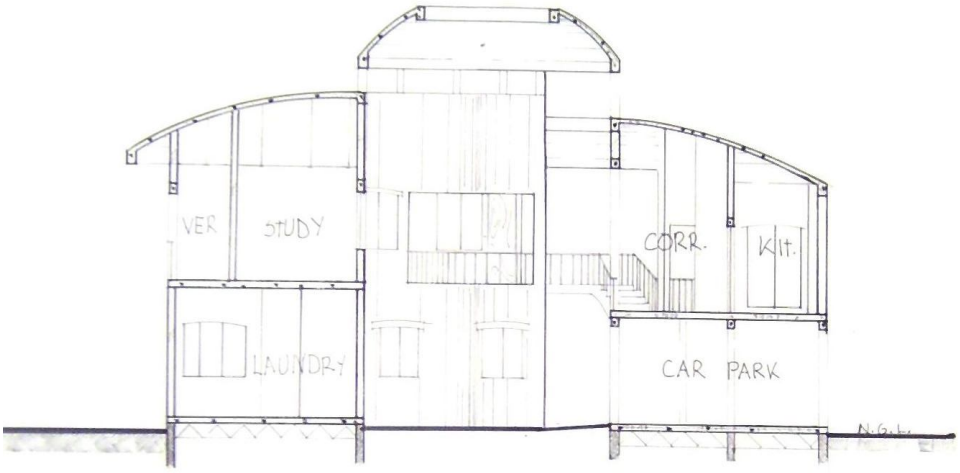


FIRST FLOOR PLAN

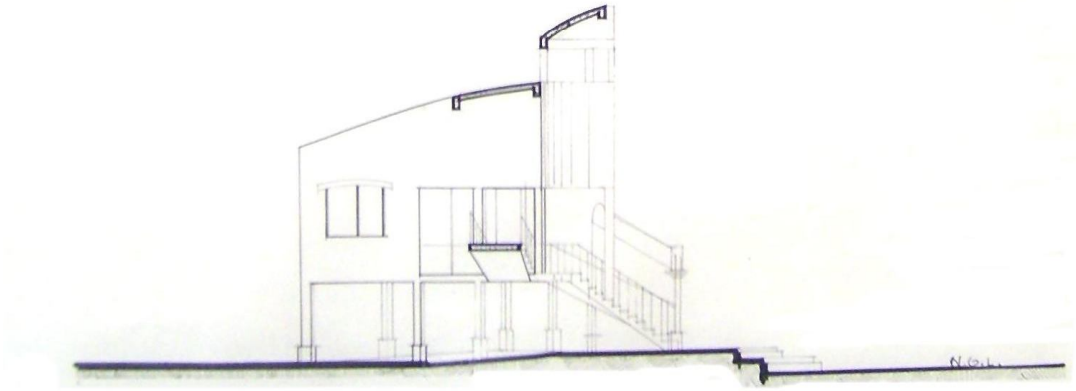


ROOF PLAN

ONE BEDROOM CHALET
SCALE 1:50

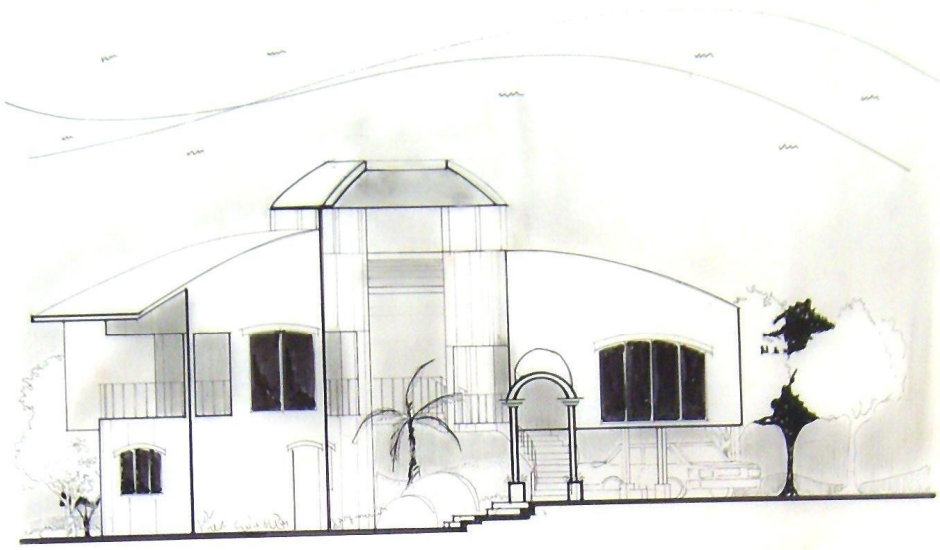


SECTION B-B 1:50

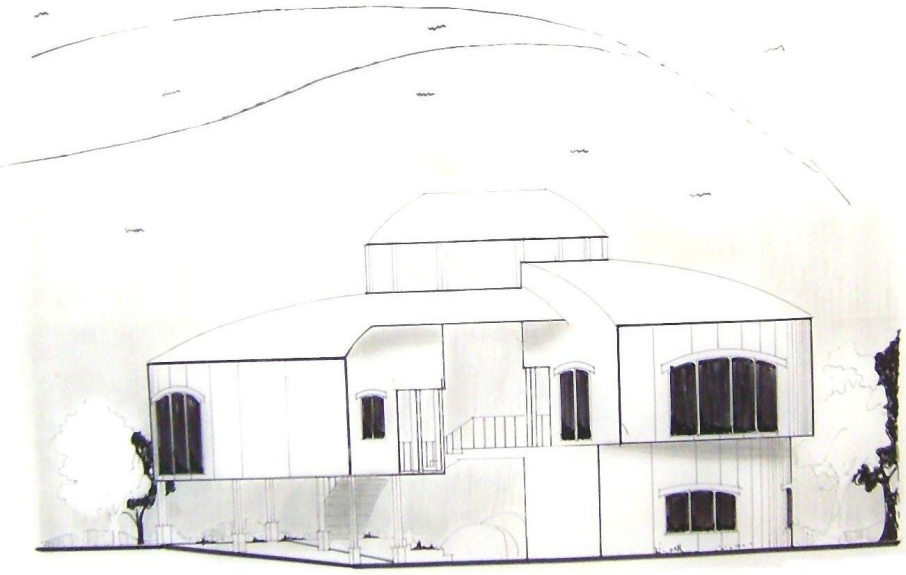


SECTION C-C 1:50

ONE BEDROOM CHALET
SCALE 1:50

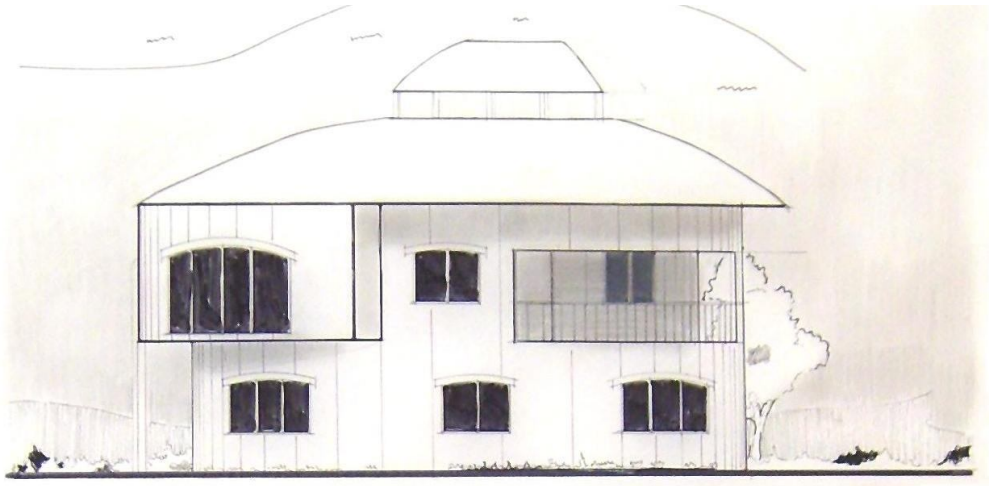


APPROACH ELEVATION 1:50

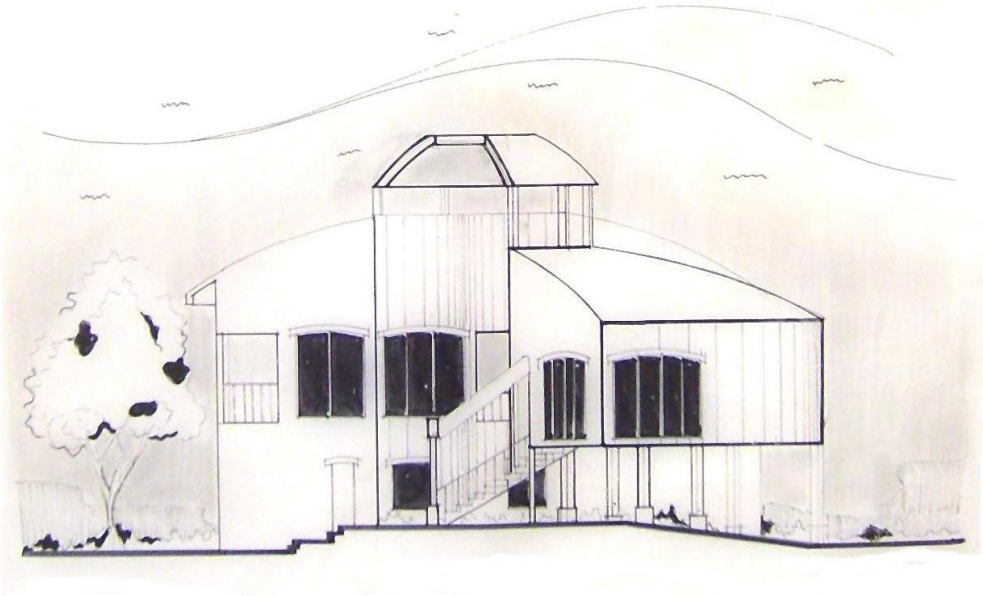


REAR ELEVATION 1:50

ONE BEDROOM CHALET
SCALE 1:50



LEFT SIDE ELEVATION 1:50



RIGHT SIDE ELEVATION 1: 50

ONE BEDROOM CHALET
SCALE 1:50



MODEL OF ADMINISTRATIVE AND PROGRAM FACILITIES BUILDING



MODEL OF ONE BERDROOM CHALET