PROPOSED HEALTH RESORT,

GURARA FALLS

UTILIZATION OF BIOPHILIC DESIGN ATTRIBUTES TO CREATE HEALING ENVIRONMENTS

By

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DECLARATION

I declare that the work in the dissertation entitled "PROPOSED HEALTH RESORT, GURARA FALLS: UTILIZATION OF BIOPHILIC DESIGN ATTRIBUTES TO CREATE HEALING ENVIRONMENTS" has been executed by me in the Department of Architecture under the supervisions of Dr. M. L. Sagada and Arc. Ahmed Sani.

The information derived from the literature has been duly acknowledged by the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at any university.

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Bawa, Hajara Garba

CERTIFICATION

The dissertation entitled "PROPOSED HEALTH RESORT, GURARA FALLS: UTILIZATION OF BIOPHILIC DESIGN ATTRIBUTES TO CREATE HEALING ENVIRONMENTS" by Bawa, Hajara Garba meets the regulations governing the award of the degree of Master of Science of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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I dedicate this piece of work to my ever loving parents, Alh Garba M. Bawa & Haj Hauwa G. Bawa.

ABSTRACT

For thousands of years, man lived majority of his life outside of walls and depended on the natural environment to sustain life. In today's culture, man spends about 80% of his life indoors, blocking out the natural world. Also, we as individuals have more demanded of each of us to meet expectations, and thereby stress or associated illness is usually an outcome (Fiset, 2004). As a result, non-traditional alternatives are being considered as healthful options. Research has also shown that human beings have an innate and evolutionary based affinity for the natural environment.

This research work is built on the subject of biophilia and its design attributes in the creation of optimal healing environment. The thesis attempts to understand and utilize, in a design, how the built environment can connect people with the natural environment. It draws its background to the study of relevant literature and case studies. The site and its suitability for the project were also studied. The culminations of this research led to the development and design of a health resort. In conclusion, the research draws attention to the fact that biophilic design can be used to create healing environments by enhancing human psychology experience and also human comfort.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Over the past decade people around the world have taken an active interest in their health and as a result of this, the health tourism travel sector evolved so as to fill customer needs. Health tourism as defined by the International Tourism Organization is the part of the tourism sector which attracts tourists by deliberately promoting its health-care services and facilities, in addition to its regular amenities. These health-care services may include medical examinations by qualified doctors and nurses at the resort or hotel, special diets, acupuncture, vitamin-complex intakes, special medical treatments for various diseases such as arthritis, and herbal remedies (www.discovermedicaltourism.com/health-tourism).

Health tourism is a much broader concept centered mainly on resorts designed to pamper or improve the body and relax the mind. Hundreds of health resorts and spas exist round the world, offering specialized beauty and fitness services, and extensive programs to improve on the health of individuals. These resorts are almost always located in stunning natural environments (www.discovermedicaltourism.com/health-tourism).

Destination spas and spa resorts are the most common and popular health travel venue. They offer a comprehensive range of services, from therapies to outdoor recreation facilities. The goal of these resorts is to send their guest home feeling happier, healthier, fitter and more relaxed. Everything is contained within the health spa resort, allowing guests to relax and focus on themselves.

Health as defined by Encarta dictionary is the general condition of the mind or body, especially in terms of the presence or absence of illnesses or impairments. Ideally, health should be something that an individual achieve for themselves and not in most cases, that doctors should do so for them. Therapies, be they physical and non conventional and physical exercises are major elements towards achieving health without exclusively relying on synthetic drugs to attain a good health.

On the other hand, healing environments are those environments created to serve as an opportunity for its users to transform and transcend their usual states of consciousness (associated with illness and despair), and move into a more optimistic and healing attitude for their health and well-being. Intuitively, design professionals planning healing environments should know that the spaces they design have an effect on the users and occupants within that space.

This research will study how current health spa resorts approach therapy and how, through the use of biophilic design attributes, healing environments can be enhanced; one that is more pleasant and comfortable and can also reduces stress levels of the guests.

1.2 PROBLEM STATEMENT

Health Spa Resort environments are expected to provide and offer holistic healing methods to both the mind and body. Healing in this context is seen as an improvement of the overall well being that incorporates the mind as well as physical. However what is offered is not what it is. The healing methods offered in most spa resorts are mostly concerned with physical activities the guests engage in, and less consideration is

given to the environment for the physical, social, creative and psychological wellness it can promote.

Therefore, there is a need to create such an environment that offers the essential holistic healing to the mind and body.

1.3 AIM & OBJECTIVES

The project aims at creating a connection between people and the built environment by utilizing biophilic design attributes to create healing environments through the following objectives:

i. To study resorts, with emphasis on health resorts;
ii. To study the connection between biophilia and healing environments;
iii. To explore ways in which biophilic design attributes can be applied to create healing environments;
iv. To apply these attributes in the design of a health resort so as to create an optimal healing environment.

1.4 SCOPE & DELIMITATION

The research shall involve an in-depth study of health resorts, biophilic design and the extent of its application in creating healing environments. The study of the health resorts shall be reviewed in an attempt to ascertain the degree to which healing environments are considered in the designing of such resorts and how, with the use of biophilic design attributes these optimal healing environments can suitably be enhanced.

The scope shall be limited to the aspect of biophilic design that is rooted in a passion for life and nature in the creation of optimal healing environments.

1.5 METHOD OF STUDY

The method of study is qualitative and is grouped into:

i. Literature review: Review of existing literature: government policy documents (considerations for choice of site and location of building), architectural magazines, (building repertoire, technology, materials) architectural reviews, architectural data books, journal articles, unpublished thesis projects in the research area.

ii. Case Study: the case study research is basically qualitative. The following methods were used:

   a) Physical observation: Visit of the building and careful observation of its features, guided tour around the building and its facilities.
   b) Structured interview: Interview of administrative staff of the resort on several aspects: its history, construction, administration, events hosted and other relevant information. These interviews are required to get detailed and precise information on the functionality of the building.

The data collection of the case studies shall be done through the following ways:

Data analysis and presentation

Data collected on each case study will be analyzed and represented in different forms:

Photographs: Pictures of the existing buildings will be taken and documented showing the resort facilities and how healthcare design was applied, (if applied).

Tables: Data collected on this research will be documented and presented on case study assessment tables.

Descriptive Analysis: The selected case studies will be described so as to show the extent to which each applied healthcare design after the case study analysis was done; this can be viewed under the case study summary and conclusion sheets.

1.6 MOTIVATION & JUSTIFICATION

This research is motivated towards the desire to understand how the built environment can connect people with nature, as well as provide a positive physical and psychological experience.

The Gurara waterfall is a very appropriate location for a spa resort. The site possesses a unique characteristic for the creation of such an environment; not only does it have a very appealing scenic view of a natural feature but also a tranquil and serene surrounding. This can serve as a justification for this research; to stress and highlight the importance of optimal healing environments in the creation of health destination resorts so as to achieve the maximum therapeutic benefits of such resorts. This is to provide a clear guideline for environmentally-conscious future spa resort development in Nigeria, and also to improve the quality of tourist's experience and to increase the economic livelihood of the Niger people.

CHAPTER TWO

REVIEW OF RESORTS

2.1 RESORT DESCRIPTION

A **resort** is a place used for relaxation or recreation, attracting visitors for holidays or vacations. Resorts are places, towns or sometimes commercial establishment operated by a single company. Such a self-contained resort attempts to provide for most of a vacationer's wants while remaining on the premises, such as food, drink, lodging, sports, entertainment, and shopping (www.wikipedia.org).

The modern tourist associates the resort experience with relaxation, luxury, service and care and expects to be pampered. These pleasures are enhanced by the opportunity to participate in a wide variety of sports, recreation and entertainment and also escape from day to day stresses.

Traditionally, resorts have been places to make social contacts, attend social occasions, and improve health and fitness. The social pursuits continue, and many other interests have been added; golf and theme parks especially have gained enormous popularity, while ski, beach and urban amenities have also become favorites. The traditional social orientation has expanded to include the exploitation of other cultures, with guests joining educational lectures and tours (Huffadine, 1999).

2.2 CLASSIFICATION (STAR) OF RESORTS

Stars are often used as symbols for classification purposes. They are used by reviewers for ranking things such as restaurants and hotels (www.wikipedia.org).

Food services, entertainment, view, room variations such as size and additional amenities, spas and fitness centers, ease of access and location may be considered in establishing a standard.

The more common classification systems include 'star' rating, letter grading, from 'A' to 'F', diamond or simply a 'satisfactory' or 'unsatisfactory' footnote to accommodation such as hostels and motels.

The star classification system is a common one for rating hotels and resorts. Higher star ratings indicate more luxury. From the Wikipedia encyclopedia, the starring of resorts includes:

a. **One-star Resort:** These are resorts that have fair and acceptable standard with modest quality in overall standard of services and guest care.

b. **Two-star Resort:** These resorts have good standard, offering good quality in overall standard of services and guest care.

c. **Three-star Resort:** These resorts have overall good standard with superior quality and high standard of services and guest care.

d. **Four-star Resort:** These resorts have overall excellent standard with excellent quality with a very high standard of services and guest care.

e. **Five-star Resort:** These resorts have overall exceptional standard with exceptional quality and luxurious facilities matching international standards of services and guest care.

2.3 TYPES OF RESORTS

2.3.1 Destination Resort

A destination resort is a resort that contains, in and of itself, the necessary guest attraction capabilities to attract its public. A commercial establishment at a resort destination such as a recreational area, a scenic or historic site, a theme park, a gaming facility or other tourist attraction may compete with other businesses at a destination (www.wikipedia.org). Another characteristic of a destination resort is that it offers food, drink, lodging, sports, entertainment, and shopping within the facility so that guests have no need to leave the facility throughout their stay. Commonly these facilities are of higher quality than would be expected if one were to stay at a hotel or eat in a town's restaurants.

2.3.2 Ecotourism Resort

Ecotourism is an insightful, mindful and participatory travel experience to natural and cultural environments, assisting the well-being of the local cultures and environments for future generations. At the same time ecotourism produces viable economic opportunities for the host areas (www.ecotourism.org).

Originally, ecotourism was defined as purely nature based, forgetting the impact tourism had on the local villages and culture. However, it quickly became apparent that trying to create a new type of tourism, which only focused on wildlife and the environment, while excluding the local villages, simply did not work. The new concepts of ecotourism and eco-resort have arisen from the interests of:

i. Providing a natural wildlife experience.
ii. Ensuring minimum environmental damage. (Huffadine, 1999)

In ecotourism resorts, the guests are encouraged to learn about the local ecology and total environment. The resort's management and staff are committed to permanent preservation principles and extent the traditional hospitality function to include programs that interpret the surrounding natural and cultural resources.

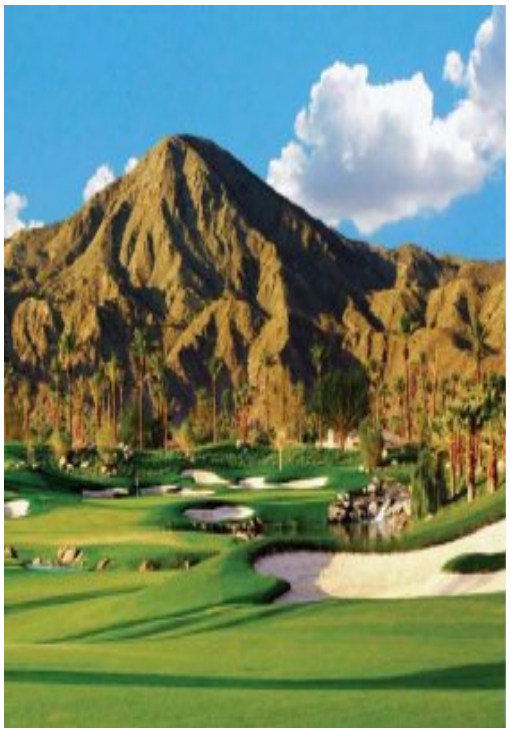

Plate 2.1: Rear View of ~
Renaissance Esmeralde Resort, California
Source: www.resortsandgreathotels.com

Plate 2.2: Aerial View of ~

2.3.3 Golf Resort

Golf resorts are resorts that cater specifically to the sport of golf, and include access to one or more golf course and or clubhouse. Golf resorts typically provide golf packages that provide visitors with all greens and cart fees, range balls, luxury accommodations and meals.

This type of resort has grown faster in popularity than any other resort on recent years. When golf is the major amenity, a resort usually takes the form of a country

club, and groups of vacation and perhaps residences form a second-home community (Huffadine, 1999).

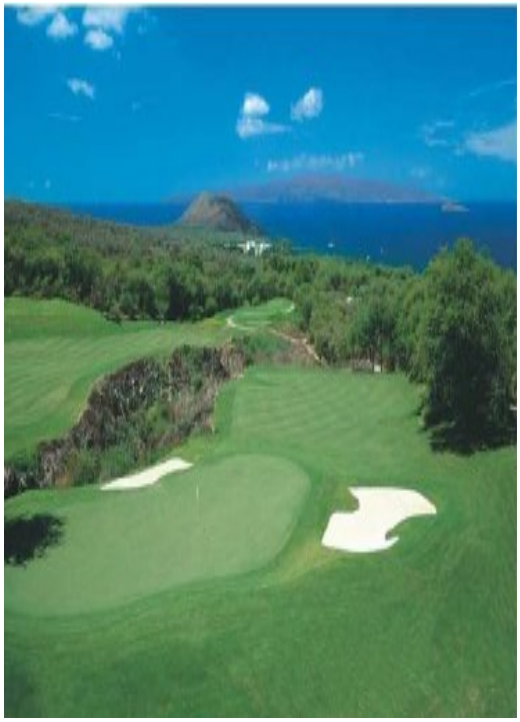

Plate 2.3: Golf course of ~
Maui Prince Golf Resort, Hawaii
Source: www.resortsandgreathotels.com

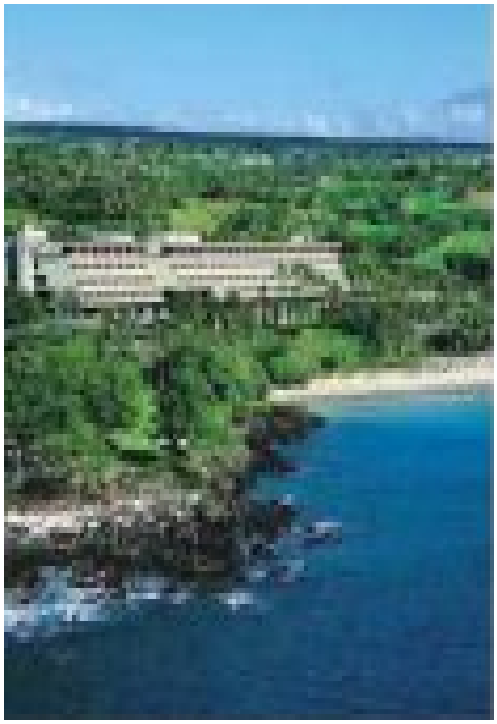

Plate 2.4: Rear View of ~

2.3.4 Ski Resort

A ski resort is a ski area plus amenities to make it a destination resort. This includes accommodations and other amenities adjacent to the ski area. Some ski resorts offer lodging options on the slopes themselves, with ski-in and ski-out access allowing guests to ski right up to the door (www.wikipedia.com). Ski resorts often have other activities, such as snowmobiling, sledding, horse-drawn sleds, dog-sledding, ice-skating, indoor or outdoor swimming, and hot tubbing, game rooms, and local forms of entertainment, such as clubs, cinema, theatre and cabarets. Ski resorts may be self-contained and entirely devoted to ski tourism, or they may be near a village or town that had a significant existence before the ski resort was built.

2.3.5 Seaside Resort

A seaside resort is a resort located on the coast. Where a beach is the primary focus for tourists, it may be called a beach resort (www.wikipedia.org).

Visitors to such resort are primarily beach and nature lovers who seek a resort that is well integrated into the surrounding landscape. They are typically developed in environmentally sensitive areas with casita-type building construction. The facilities found in this type of resort include extensive use of water for recreational or sports activities such as swimming, power boating, etc.

Plate 2.5: Grande Velas Beach Resort, Maya
Source: www.resortsandgreathotels.com

2.3.6 Urban Resort

This type of resort usually relies on local cultural amenities to attract a market and provide guests with opportunities to attend cultural events and visit shopping areas, entertainment venues, restaurants, museums and historic places (Huffadine, 1999).

Tours may include planned educational courses. The development therefore requires in-depth preliminary research involving a detailed evaluation of all the city's historic buildings and cultural outlets.

Plate 2.6: Old Bahama Bay Resort, Bahama Island
Source: www.resortsandgreathotels.com

2.3.7 Health/ Spa Resort

This is an establishment that offers ways of improving health, fitness and quality of life through a controlled set of programs. This type of resort has become popular once again and renowned both for treatments, which include relaxation programs and the pampering they provide their guests. This resort is also complemented with other recreational pursuits, especially golf and tennis (Huffadine, 1999).

Guests visit such resort primarily to improve health and may spend a month or more recuperating from the pressures of daily expectations. It combines indoor-outdoor amenities such as hot and cold baths, Jacuzzis, whirlpools and other body treatments.

Plate 2.7: Alive Health Resort, British Columbia
Source: www.resortsandgreathotels.com

2.4 SPA CLASSIFICATION

Spas are contributing to the major attractions of large, multi-amenity and smaller resorts of all kinds. They enhance local estate values, attract residential ownership and connect the resort with the local community. The spa management provides a combination of services for the vacation, social and business conference guest, and during social events. The resort may also offer monthly or daily membership fitness programs and treatments as a marketing incentive for non-residents.

The spa industry is made up of the following segments, each with its own characteristics and operational opportunities:

a) Destination spas
b) Day spas
c) Medical spas
d) Mineral spring spas

e) Club spas
f) Resort spa (health resort)

2.4.1 Destination Spa

A destination spa is one whose sole purpose is to provide programs and facilities that support lifestyle improvements and enhance guest health. The services offered are professionally administered and include fitness, education, and lectures on lifestyle, nutrition, and disease prevention. Because of their healthful orientation, destination spas often provide programs that support postoperative conditions, address various addictions, and provide tools to cope with serious, prolonged illness.

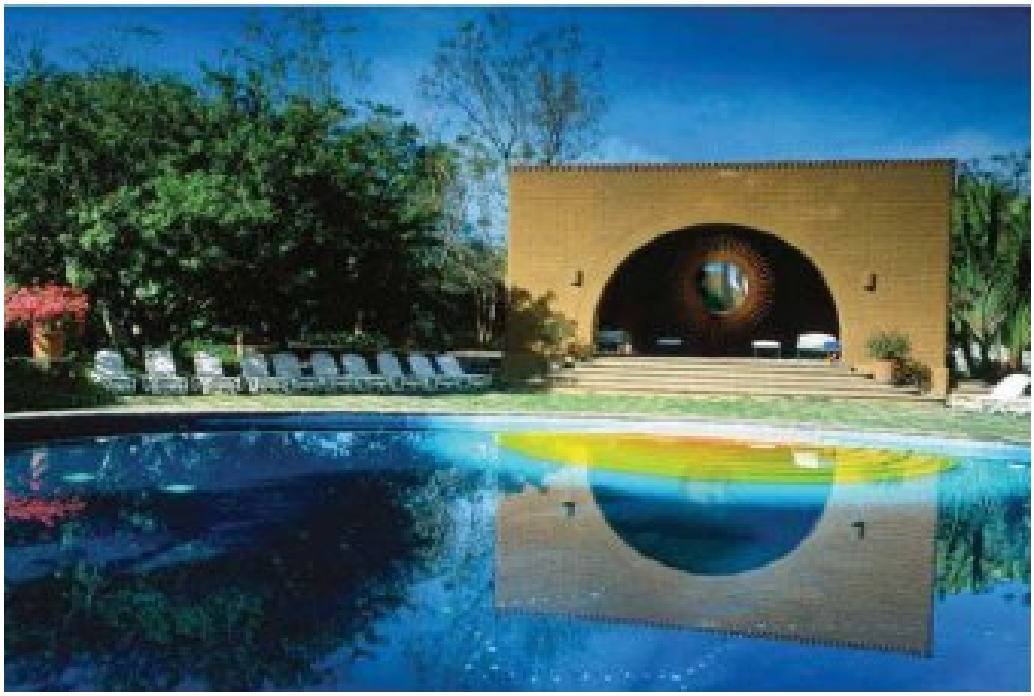

Plate 2.8: Mision Del Soro Spa, Mexico
Source: www.resortsandgreathotels.com

2.4.2 Day Spa

Day spas are designed to provide a healing, beautifying, or pampering experience in a short period. Guests may book individual treatments that last as little as an hour or a package of treatments that take up to a whole day. Found throughout North America,

day spas are freestanding or located in health clubs, hotels, and department stores. The large percentage of day spas and their growth pattern reflect spa goers' time crunch. Day spas can be owner-operated or chain-affiliated.

Plate 2.9: Riviera Day Spa, Palm Springs
Source: www.resortsandgreathotels.com

2.4.3 Medical Spa

Medical treatments in various spa environments represent a significant trend in the scope, depth, and inclusiveness of numerous spas. Medical spa treatments can range from elective, reconstructive surgery to noninvasive Eastern modalities incorporating elements of Eastern philosophy that draw on the body-mind-spirit connection to create positive, measurable changes in the client/patient. From the ISPA 2004 survey, slightly over half (51 percent) of the medical spas in North America have a partnership with a medical doctor, and 26 percent have a doctor on staff. The remaining configurations include being located in a doctor's office or having licensed

staff members. Botox and micro dermabrasion are the two most popular treatments, followed by chemical peels and laser hair removal.

In North America, allopathic or Western medical procedures found in medical spas often incorporate Eastern-based treatments. Day, destination, and resort/amenity spas (health resorts) are adding medical treatments to their spa menus. Part of this trend is directly attributed to market demand, and part is attributed to health insurance plans that reimburse for some procedures. According to the ISPA 2004 survey, medical spas are the fastest-growing spa segment with respect to number of locations.

2.4.4 Mineral Spring Spa

Many mineral springs spas are considered to be the original spa prototype, where guests go to "take the waters." Mineral springs spas, by definition, are located at naturally occurring mineral springs. The ISPA survey states that the popularity of mineral spring spas is reflected in a cumulative growth from 1999 to 2004 of 143 percent. Growth from 2002 to 2004 represents only 15 percent, implying that the number of sites available directly affects the growth in this segment.

2.4.5 Club Spa

Club spas lack a lodging component, and their primary objective is to facilitate daily fitness activities. Many club spas' services complement the primary fitness component of the club by offering sports massage (deep tissue), chiropractic services, physiotherapy, and related treatments that address issues of pain management, flexibility, and mobility. By location, club spas represent 5.8 percent of the total spa industry in North America and account for approximately 3.7 percent of the industry's revenues. Growth in the club spa portion of the spa industry is the lowest of all spa

segments. Between 2002 and 2004, cumulative club spa growth was only 3 percent (ISPA survey, 2004).

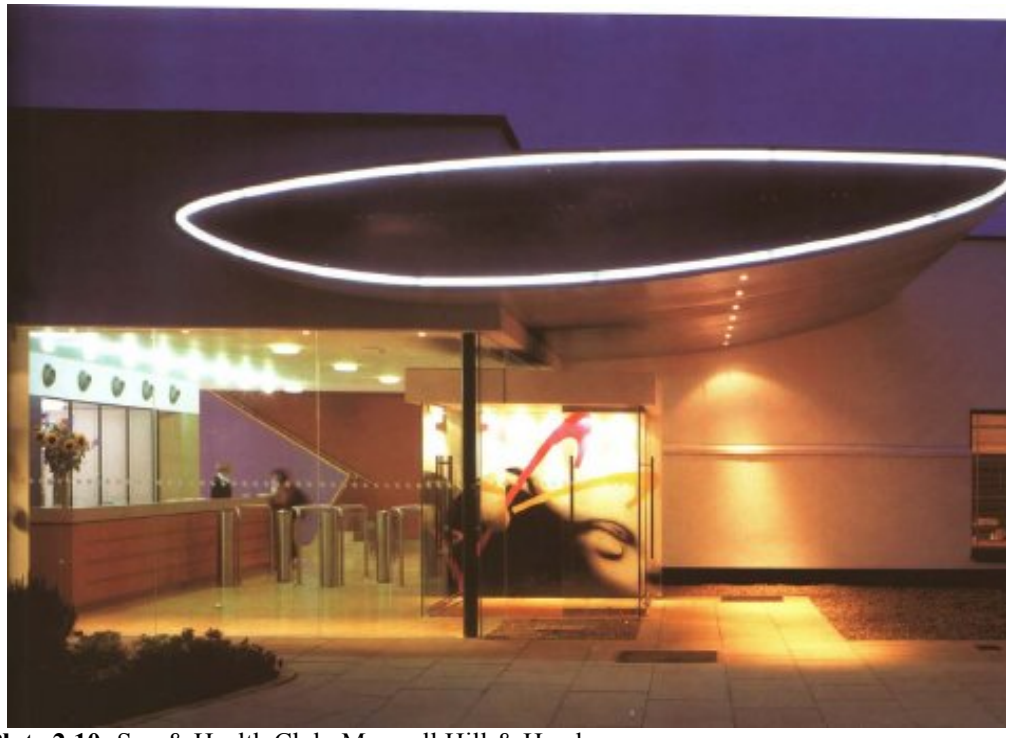

Plate 2.10: Spa & Health Club, Muswell Hill & Hendon
Source: Mostaedi, A. 2001

2.4.6 Spa Resort (Health Resort)

Resort spas are located on the grounds of vacation resorts where treatments for mind, body, and spirit are offered to complement other resort activities such as golf, tennis, horseback riding, skiing, and water sports. Healthful spa cuisine is on the menu as an option, complementing traditional offerings. In the evenings, guests can enjoy resort pastimes like dancing and live entertainment. Children's programs are also offered. A luxury resort spa has the ambience of a secluded retreat on the grounds of a first-class resort. Set in beautiful surroundings, these resorts commonly have world-class golf courses and other excellent recreational facilities. Gourmet dining and exceptional spa therapies are not only expected but demanded.

Plate 2.11: Natur-Med Health Resort, Turkey
Source: www.hotels-world.com

2.5 DESIGN AND PLANNING OF HEALTH RESORTS

The developmental possibilities of special regions have often been brought into focus through recommendations of independent travelers. Resorts make the most of the environment and add amenities to attract customers.

A sense of place, which is created by the resort's sensibility and relationship to external environmental factors, is essential to long term viability. Elements that are fundamental to planning and construction are also those that can be utilized to achieve this objective, for example:

i. What are the topographical characteristics and climatic variables of the site?
ii. Are there any natural features outside the site that can be visually incorporated?

iii. Are there any natural features within the site that already form or can be developed into attractive features?

iv. How are traditional man made elements incorporated into the landscape?

These issues are correlated with the findings from the targeted market, such as:

a) The special tourist segment that will be attracted to the resort,

b) The amenities planned for it. (Huffadine, 1999)

2.5.1 Development of Health Resorts

The development of health resorts derived from the therapeutic benefits of local mineral springs and other related forms of treatment. Traditional health resorts are well established, particularly in Europe and Japan, and have experienced resurgence in demand arising from a combination of several factors: increasing concerns over stress, diet, health and fitness: and, in some other countries, health insurance reimbursement of treatment costs (Lawson, 1999).

Modern health resorts cater for a variety of needs and include wide-ranging provisions for individual and family recreation. In existing resorts, many hotels have undergone extensive refurbishment, installing the latest equipment.

Depending on location, health resorts may give emphasis to: intensive sport and fitness programs, health and beauty rejuvenation, treatment of rheumatoid and other conditions, stress relief and body toning or dietary and weight loss regimes.

2.5.2 Planning Of Health Resorts

The planning of health resorts is similar to other vacation resort destinations, with additional structures and facilities to house and accommodate spa functions.

Operational efficiency depends on the way that the health resort is planned and the patterns of internal circulation of guests and day visitors. Design factors are influenced both by the type and degree of importance the facility holds within the general concept of the resort (Singer, 2005).

Spa design & architecture is a special discipline of planning. The unique spatial settings have an effect on all senses and allow guests to feel relaxation and wellness. The focus is on creating a sense of vacation and experiencing perfection.

Surface materials, color compositions, room fragrance, temperature ranges, humidity, illumination, acoustic irradiation and disinfection are only a few of the characteristics the guest notices. These days, they are naturally complemented with important aspects such as energy efficiency, sustainability as well as economic and ecological architecture.

Indeed, the structural and climatic conditions vary greatly and need to be taken into consideration for the successful planning. In addition, the integration of the respective prevalent bathing culture is crucial to the success of a spa.

Spa facilities can be grouped into separate wet and dry areas with access via a reception area and changing rooms. The locker and changing facilities for men and women are also usually separated and some spa areas may be designed for exclusive use by men or women. Pools may be arranged on different levels, or separated into leisure-exercise and spa treatments are often surrounded by alcoves or rooms for individual treatments. Similarly, the dry areas for exercise, body toning and fitness may be associated with the clubhouse facilities for sports (golf, tennis, squash, etc).

2.6 EMERGING TRENDS IN SPA DESIGN

Over the last few years the international tourism industry has been boosted by the spa industry. Within the last 20 years spas have increasingly gained importance. Yet, spas are subject to constant change and within the next years changes will occur at an even faster pace.

Heinz Schletterer (2000), a spa designer, sees two aspects in the future development of spa and tourism companies: One is further specialization; the other is personalizing the range of services offered. There are three ways to go for holiday resorts: Hotels built around a central theme such as health or sports, hotels focusing on a specific target group such as children or seniors, and low-function hotels addressing a larger, cosmopolitan target group. The latter offer a limited but high-quality product range at a favorable price. Simultaneously a new trend is emerging. All over the world numerous medical spa hotels are opening. These hotels integrate health and medical care by specialists into spas.

In the future also, those spa concepts will succeed which focus on preventative health care. Medical examinations will soon be part of medical spas. Furthermore there will be multifunctional concepts which offer a number of treatments and therefore are cost-efficient. Spa equipment shall increasingly address all senses, must be state-of-the art and blends in with the whole concept.

There is one thing that all future target groups will have in common: a get away from everyday life, experience new things and be surprised. Due to the current medical development and the increased life expectancy one of the most important target groups will be the older generation. Their newly gained agility and cosmopolitanism to make them regulars of future tourism.

2.6.1 Hybrid Spa Concept

As spas become more mainstream people want to live in places that have a spa which gives them a quality of life; fitness and wellness activities; life enrichment programs; educational and motivational opportunities so they can assume more self-responsibility for their well-being and having a better quality of life; purposeful leisure; and an environment in which to rest, relax and feel re-stored.

The hybrid spa is a blend between the best features of the resort spa and those of the destination spa. At the resort spa, the focus is more on a "feel good, look good, life is good" vacation. At the destination spa, people are focused on a "change my life" experience void of many of life's pleasures which the spa refers to as "temptations". The hybrid approach gives the programming flexibility to maximize the appeal and utilization of the spa. During the peak season and weekends, the spa might do very well just by offering a la carte treatments and maybe some half-day spa experience packages. During the off-season and maybe during the mid-week, some multi-day themed programs for behavior modification, lifestyle enrichment, etc could be offered. The hybrid concept can be effectively used to yield manage the spa as well as the resort (www.hFdspa.com).

There are a lot more people who will go to a resort for business or pleasure and will use the spa as part of a vacation (whether it be a weekend while at a conference or a multi-day relaxation vacation) verses those who will go on a dedicated spa vacation.

2.6.2 Centers for Life-Enrichment

The concept of spas will expand in order to meet the personal, physical and professional needs of more people. The spa will be a new type of social and business center or club as well as a place for personal renewal. This could be popular as a

networking venue especially for professional women and for people who work from home. The spa will be a place where people can go to take care of themselves and to take care of business if they feel the need to stay "turned on and connected." It would be good for the spa to have access to meeting facilities, a business center and dining. These can be part of the resort facilities.

The idea of spas as social centers and places of celebration is trending and will continue to do so. Spas will be designed to have more all-in-one spa suites and lock-off rooms with private spa lounges so that people can gather for spa parties, inter-generational family get-togethers, etc.

Spas will expand their offerings to include life-enriching seminars and programs that focus on activities such as wine tasting, art, music, cooking, pain management, healthy aging, etc. There will be a focus on programs that are life-stage and lifestyle oriented. Spas will be places where people can go to be educated, motivated, inspired and/or entertained. Spas will be learning centers with guest speakers, workshops and "artists" in-residence programs.

Spas can become centers for well-being with programs on fitness, wellness, integrated medicine, behavior modification, etc. This can be the bridge between traditional medicine and complementary alternative medicine. Advancements in skin care and the continuous integration of Eastern and complementary medicine will enable spas to help guests' look and feel younger and to age naturally and gracefully. There will be a focus on "spaceuticals" which are truly customized and maybe even "prescribed" spa products and services. The mind/body connection will be an even greater component of spas as the spiritual aspect of healing and reducing stress becomes commonplace.

Spas may have an aroma therapist on staff that will be like the pharmacist of today, i.e., someone to really talk to; who listens and understands the person's entire

body…physically, mentally and emotionally. Spa service providers will be an important part of a person's health care team.

Plate 2.12: Use of energy efficient lighting becoming a practise
Source: Sercu, 2005

Spas used to be about giving treatments or bundling treatments into packages. Next came, the creation of experiences that touch people. Now it will be into personal transformation journeys. People want more from the time and money they spend; therefore, the staff will be trained to be "experience makers." Their focus will not be just on giving a service but rather how to provide a personalized, memorable and results-oriented service.

Spas can also be training centers or labs for universities so that more college students understand the career opportunities in one of the fastest growing segments of the hospitality industry.

2.7 HEALTH & RECREATION

Recreation is any activity carried out that is different from the normal everyday activities. From the earliest times, man has always sought one form of recreation or the other. The evolution and development of recreation has led to the establishment of parks, gardens, fitness centers, resorts and such other recent innovations of the modern world.

The idea of recreation gives rise to fitness and fitness gives rise to health living. Fitness or keeping fit is to avoid ill health, resistance to the mental and physical fatigue that makes us vulnerable to infections and feel more pleasant in being alive. The idea of health & recreation is the health-oriented recreation as opposed to ordinary recreational activities that are fun oriented or for mere fact of physical fitness. Health-recreation involves more than the ordinary keep fit activities. It includes exercises such as meditation, yoga and other forms of therapy that often involve the use of experts in group or individually.

Plate 2.13: Yoga Class
Source: Velux, 2007

Recent trends have combined all aspects of recreation and leisure to provide health recreation which in turn is expressed to give full or complete fitness and the self fulfillment that is so much sought. Modern spa resorts have facilities which include therapy as well as amusement and game areas for entertainment and leisure activities.

Plate 2.14: People cycling
Source: Velux, 2007

2.7.1 Water & Health-Recreation

The early spring spas were built around the natural healing powers of these springs both for the physical and emotional effect it has on people through the conditions created around them.

Water is attractive, and there is always that urge to “feel”. Often, the visual and visual experiences are not sufficient, thus, an urge to go beyond these and make the

experience complete by actual contact. Water is often associated with meditation, contemplation, poetry and music.

A psychological case can be that the very sound of water has a calming effect and creates a sense of anticipation. Water produces endless range of sound as it flows over and around obstacles and obstructions as it sprays into the air and then returns to the surface, as it falls over the rocks into the pools, as it pulls air into its folds and combines with it to produce even greater nuances, all sounding very pleasing to the ears.

Plate 2.15: People swimming
Source: Mostaedi, A. 2001

CHAPTER THREE

NATURE & HEALING ENVIRONMENTS

3.1 CONCEPT OF WELLNESS

"Quality of life," "wellness," and "healing" are phrases that embody concepts being recognized with increasing importance in the 21st-century. Also, in today's culture as individuals are having more demanded of each to meet expectations— ours, our families, and our employer's/employee's, stress or associated illness can be an outcome. As a result, non-traditional alternatives are being considered as possible healthful options (Fiset, 2004).

Healing is the process of re-establishing harmony within an individual. Illness implies a loss of this balance and the need for integration with the body's natural ability to heal and regenerate. Healing cannot be understood in isolation from the factors that operate in the dynamic life of an individual. These include the self, the family, the community; the environmental context within which life is carried forth (Stark, 2000). Healing is dependent on re-establishing successful relationships and developing reciprocity between these factors. In fact, healing is not a process of curing or fixing, but rather a return to balance between all of these components. Health, therefore, is understood as the presence of this balance; illness is its lack.

Far from being inert containers, spaces can be understood to be fully participant in the healing experience. Working with these elements can result in conscious co-creation of spaces that are not only useful, but which are vibrant and alive, and therefore capable of their own contributions towards healing (Stark, 2000).

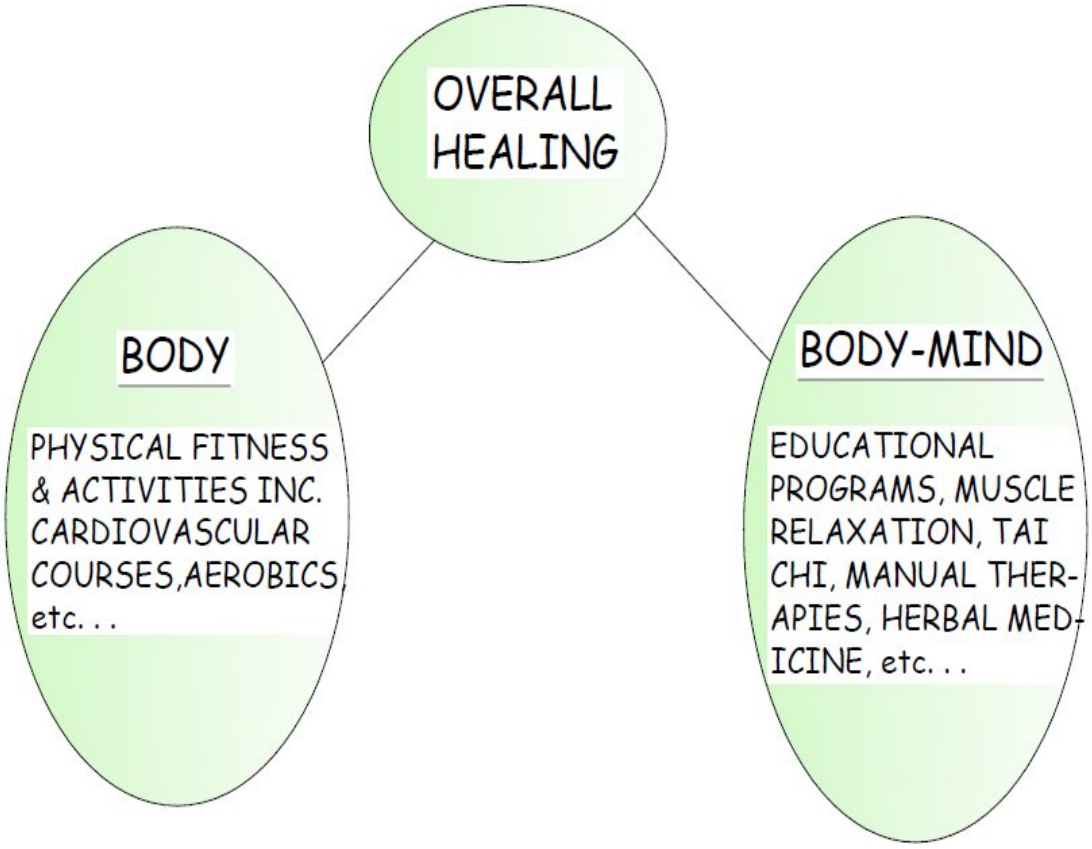

Figure 3.1: Overall holistic healing sketch
Source: Author's sketch

3.1.1 Defining Wellness

Although wellness is not a new term, the awareness of the importance of human wellness is a topic with growing significance. Wellness not only involves individual health, but also is of importance to family members and employers.

To study and make a correlation between the impacts of the design of built environments on wellness, there is value beginning with a shared definition of wellness. Wellness is a term that means different things to different people or groups. To some wellness means physical fitness, and is focused on exercise, diet and nutrition. To others, wellness means the health of an individual as a combination of

the concept of body, mind and spirit. Diverse user groups use partial definitions of the term wellness to focus on their specific business objectives or work area.

The National Wellness Institute (NWI, 2003) defines "wellness as an active process of becoming aware and making choices toward a more successful existence." The mission statement of the NWI is "Progress towards wellness is met through improvement in these interrelated areas: social, physical and emotional."

Also, (seekwellness.com, 2006) has introduced a new wellness model that has three domains: the physical domain, mental domain and meaning and purpose domain. Each domain has skill areas that relate to that domain title. The physical domain includes skills such as: exercise and fitness, nutrition, appearance, adaptations/challenges and lifestyle habits. The mental domain skills are emotional intelligence, effective decision, stress management, factual knowledge, and mental health. Meaning and purpose, relationships, humor, and play are skills within the meaning and purpose domain.

From the above definitions, wellness can be said to be a continuous moving toward a greater awareness of yourself and the way in which your environment, interpersonal relationships, nutrition, fitness, stress, and other factors influence you. Wellness pertains to the quality of life, not quantity. Wellness stresses self-responsibility, education, a monitoring of personal balance, and supporting activity.

3.1.2 Features of Wellness

a. **Physical wellness:** This recognizes the need for regular physical activity. Physical development encourages learning about diet and nutrition, while discouraging the use of tobacco, drugs and excessive alcohol consumption.

Optimal wellness is achieved through the combination of good exercise and eating habits. Personal effort spent building physical strength, flexibility, and endurance while also including medical self-care contributes to physical wellness (Hettler, 2003).

The physical feature of wellness entails personal responsibility and care for minor illnesses and knowing when professional medical attention is needed. Physical benefits of looking good and feeling terrific most often lead to the psychological benefits of enhanced self-esteem, self-control, determination and a sense of direction.

b. **Emotional wellness:** This recognizes awareness and acceptance of one's feelings. Includes the degree to which one feels positive and enthusiastic about oneself and life. Emotional wellness includes the capacity to manage one's feelings and related behaviors including the realistic assessment of one's limitations, development of autonomy, and ability to cope with stress. A well person maintains satisfying relationships with others and accepts a wide range of feelings in oneself and others (Hettler, 2003).

   One is able to arrive at personal choices and decisions based up on the synthesis of feelings, thoughts, philosophies, and behavior. One lives and works independently while realizing the importance of seeking and appreciating the support and assistance of others.

c. **Social wellness:** This encourages contributing to one's environment and community. Social wellness emphasizes interdependence between others and nature. Social wellness provides a value and understanding of the importance to preserve the beauty and balance of nature for the healing and strength it provides in personal decision making (Hettler, 2003).

Social wellness involves a personal awareness of the importance of each person and their ability to positively influence their multiple environments. Social wellness supports making healthy living choices, initiating better communication with others, and building a better world for everyone.

3.2 HEALING ENVIRONMENTS

How can architecture contribute to healing? This question touches upon the essence of architecture. Architecture is conceived of as a discipline that has far more fundamental issues to solve than the visual appearance of buildings. Currently, large buildings such as hospitals are required to fulfill a complex amalgam of physical, aesthetic, social and symbolic functions. Finding ways to optimize these functions is a major challenge for modern architecture. Before even thinking about what a project will eventually look like, the architect has to identify the intended functions of the project. Doing so is not only part of the discipline of architecture, but its essence. It implies an active role of the architect in the entire building process, including the development of the program of requirements.

In the context of healthcare architecture, there is one particular aspect of design that has received increasing attention over the past decade. This function concerns the potential properties of healing environments (VanDer Berg, 2005).

It's a well-documented fact that individuals experience considerable stress. From a psychological standpoint, stress can be manifested in feelings of helplessness or depression. Physiologically, stress can cause increased blood pressure, muscle tension and high levels of circulating stress hormones. The negative mind-body connection delivers a one-two punch that saps a patient's ability to get better faster. Conversely,

thinking well promotes feeling well. The key is to find the triggers that help the mind and body connect in a positive fashion.

3.2.1 Optimal Healing Environment

Over the past few years, there has been an increasing interest in defining and creating "healing environments"—spaces in which people can find solace from the suffering and stresses of life, begin to recover from injuries and illness, and environments that, by themselves, add to the vitality of the inhabitants (Madison, 2006). The temples and healing centers, both ancient and current, all had and have that role—place where people could come for recovery and rejuvenation, and learn the skills necessary to create and maintain optimal health. In general, the focus has been on the two major aspects of such environments—the activities that take place there, and the physical design of these spaces (Chez et al, 2004).

The goal of the 'healing environment' is to utilize the given environment to create an opportunity for its users of to transform and transcend their usual states of consciousness (associated with illness and despair), and move into a more optimistic and healing attitude for their health and well-being. Historically, there have always been three important contributions to creating healing environments. These are:

i. The users themselves are seeking vitality and balance;
ii. Relationships and interactions between the users of the space are healing and regenerative; and
iii. The space itself is alive, free of sources of negativity and toxins, and provides energy qualities that support aliveness and balance (Chez et al, 2004).

A healing environment cannot be considered as so without considering sustainable green design. In the ideal condition, green design would have no negative impact on

the environment, would use only renewable resources, and all materials would be recycled. In addition, the environment would support health and well-being. Economic, social, and environmental factors often seem to clash in the healthcare environment. However, healthy people are not possible without healthy facilities (McLellan, 1978).

In relation to the designing of healing environments, green design takes various forms. On a larger scale, the building should respect the existing site and incorporate with the natural surroundings physically and ecologically. On a smaller scale, interior finishes should be constructed of natural, non-toxic materials especially for a facility intended to promote healing and rejuvenation. As research has shown, “Most things in the interior of a building contain chemicals that are harmful to people at some dosage...Many times when fires occur, in buildings, it is the chemicals released in the materials that kill people before the fire itself does” (McLellan, 1978). In an effort to create a healthy environment, it will be important for the purposes of this project to choose materials that do not emit the harmful chemicals known as Volatile Organic Compounds (VOCs). Materials should also be obtained from renewable sources and preferably from local manufacturers (in an effort to lessen the pollution produced during transport). Local materials will also help to create a strong connection between the buildings, the natural context, and its cultural context.

3.3 NATURE AND ITS FEATURES

Nature, in the broadest sense, is equivalent to the natural world, physical world, or material world. Within the various uses of the word today, "nature" may refer to the general realm of various types of living plants and animals, and in some cases to the processes associated with inanimate objects–the way that particular types of things

exist and change of their own accord, such as the weather and geology of the Earth, and the matter and energy of which all these things are composed (www.wikipedia.org). It is often taken to mean the "natural environment" or wilderness–wild animals, rocks, forest, beaches, and in general those things that have not been substantially altered by human intervention, or which persist despite human intervention. Nature provides the ultimate metaphor, in forms, sounds, sights and smell. A re-examination of ancient beliefs and notions, as well as emerging paradigms about nature, may offer a new perspective on the crucial relationship between what man builds and how to "bring human habitation into an intimate and stimulating rapport with the expressive processes and cycles of human growth" (Neutra & Richard, 1989). In architecture, this can be interpreted into a new way of seeing the world, its underlying form, and the forces that give it shape (Dieterich, 1996).This model may serve as the desired connection between architecture, people, and the natural environment.

Nature is our guide to balance and harmony. Nature-based designs draw upon the innate intelligence found in nature—when plants turn their leaves to the sun for light, when a bird sits on eggs, and ultimately, when our body knows how to heal itself. Nature has restorative effects such as lowering blood pressure, contributing to a positive emotional state, lowering the levels of stress hormones, and boosting energy (Kaplan and Kaplan 1989). According to a new study in the American Journal of Preventive Medicine, nature can have an impact on healing.

3.3.1 Environmental Features

The coordination and effective use of environmental elements contribute to the overall success of the design of healing environments. Environmental features consist of the following:

i. **Vegetation:** this consists of shrubs, ground covers, vines and turfs. They are fundamental to human existence as sources of food, fiber, fodder, and other aspects of sustenance and security. The mere insertion of plants into the built environment can enhance comfort, satisfaction, well-being, and performance. They serve many of the following purposes:

   a) Visual enhancement-vegetation strengthens the appearance of the installations and improves the users' quality of life.

   b) Wind control-strategic placement of trees and shrubs helps to break, guide and deflect wind currents.

   c) Erosion control-ground cover and turf reduce the amount of soil surface exposed to natural forces. The root structure binds the soil, thereby reducing erosion potential.

   d) Climate modifications-vegetation helps reduce temperatures by shading the ground and by the cooling effects of water emitted from its foliage.

   e) Energy conservation-deciduous trees shade building surfaces during the hot season and as a result reduce the demand on air conditioning systems. Also, during the cold season sunlight passes through the trees to provide natural solar heat for the building's interior.

   f) Glare and reflection reduction-plants can effectively soften glare and reflection from manmade materials.

Plate 3.1: trees serving as wind control and glare control
Source: Stark, A.

ii. **Water features:** Water is among the most basic human needs and commonly elicits a strong response in people. Water features include ponds, lakes, fountains and reflective pools. They can be located along green space corridors or in developed plazas. Water features provide the following:

a) Visual enjoyment/ focal points-an area that is a source of natural beauty and special interest areas that attract attention.

b) Micro-climate modification-a localized cooling effect created by the spray mist from a fountain or bubbler.

c) Recreational opportunities

d) Retention ponds-on-site storm water retention and detention facilities. These can eliminate the need to upgrade existing storm water to accommodate new development.

Plate 3.2: water fountain providing visual relief and recreational opportunities
Source: Stark, A.

iii. **Land forms & Vistas:** People express a strong and consistent preference for exterior views, especially when the vistas contain natural features and vegetation. These views are often most satisfying when the scale is compatible with human experience. Earth berms, terracing and retaining walls are examples of landform elements. These elements should be in harmony with the site's natural topography or contrast and respond to the architectural form. Retaining walls preserve the vegetation, minimize grading requirements on steep slopes and create visual interest.

Plate 3.3: retaining walls which help preserve vegetation
Source: Stark, A.

3.4 NATURE'S THERAPEUTIC FEATURE

Nature has the added benefit of reminding people that humankind evolved in concert with nature, and that environmentalism is a necessity, not a luxury. Frumkin compiled research that suggests people can benefit from distinct types of encounters with nature: contact with animals, plants, natural landscapes, and the wilderness.

We evolved from the natural world, leaving behind caves and open savannah to move to man-made environments in which we control the elements. Our ancestors honored nature as a ubiquitous force in their lives. Nature provided shelter, clothing, food, light, heat, and water.

As healthcare facilities are planned and designed, it is important to keep in mind the values derived from the natural world. As we are mindful of these values, we form a strong bond with nature. This bond is biologically based and is especially important in

the medical environment that often seems so harsh and barren of nature. Incorporating the beauty of nature through aesthetics is a simple task. For example, we can add natural gardens, plants, and fish. The symbolic aspect of nature can also be useful. Tapping into our natural curiosity, nature can be defined within our design.

Plate 3.4: the glass building creating a pleasant atmosphere with the indoor vegetation
Source: Dreiseitl, 2001

Designing with nature provides health benefits. According to Baker (2002), "a growing body of research suggests that this human affinity to nature—plants, animals, and landscapes—is something hard-wired into us. Scientists call it 'biophilia.'" E.O. Wilson (1998) popularized the term "biophilia" as "the connection that human beings subconsciously seek with the rest of life." Barker reported links between natures—windows with views, companion animals, fish gazing, access to gardens— with positive health impacts. According to Ornstein and Sobel (1990), "Flooding our brains with rich natural visual stimulation helps us recover from surgery, tolerate pain, manage stress, and attain wellbeing." They also state, "Pictures of ponds, streams, trees, and other vegetation produce lower levels of arousal and higher alpha brain

waves, a brain state associated with wakeful relaxation, than pictures of treeless urban streets." Longings for nature are therefore more than aesthetic preferences.

3.4.1 Restoration & Attention

According to environmental psychologists Rachel and Stephen Kaplan, (1989) the contact with the natural environment can have a psychologically restorative effect on people. They call these types of settings restorative environments. Restorative environments whether they be in the context of nature or the built environment, incorporate elements that function therapeutically by reducing cognitive fatigue and alleviating stress. These environments provide opportunities for rest, recovery, contemplation, and isolation.

The Kaplans also hypothesized that "a preferred environment is thus more likely to be a restorative environment. Since nature plays such a powerful role in what is preferred, in general terms there is a theoretical basis for expecting natural environments to be restorative".

3.4.2 Recovery from Stress

The positive effects from contact with nature or natural views have proven to be greatest when people are experiencing high levels of stress or are confined to situations like hospitals, prisons and work environments. In these cases frequent direct, indirect or symbolic contact with nature continues to have a positive physical and psychological effect on human well-being (Ulrich, 2003). Several studies of patient groups have consistently shown that simply looking at environments dominated by greenery, flowers, or water as compared to a built environment that lacks natural elements is significantly more effective in promoting recovery from stress and illness.

3.5 BIOPHILIC DESIGN ATTRIBUTES

Biophilic design attributes are elements and qualities of the physical environment that connect us to the physical, psychological, and cognitive benefits derived from direct experiences with nature. These natural attributes are preferred in part because they literally bring buildings to life physically through the use of design strategies and materials, and symbolically through an understanding of deeply rooted affiliations, associations, and meanings (Stewark-Pollack, 2006). These attributes are as follows:

3.5.1 Natural Lighting and Ventilation

There are a number of components of the design element lighting that relate lighting and wellness. The most significant difference between our experience of natural light and artificial light is that natural light is constantly changing in direction and intensity, and healing environments can incorporate this cycle of nature. Changing patterns of brightness and shadow, sparkle, and reflection capture and redirect our attention, helping to relieve stress and mental fatigue (Stewark-Pollack, 2006). Therefore, the correct placement and orientation of windows and skylights in buildings is critical to capturing dynamic natural light.

When it also comes to natural ventilation, there is a critical importance of indoor air quality to health and well-being. The quality of the air and the volume of air, or airflow are the two most important components. Fresh air is needed to prevent the buildup of moisture in a room. The movement of fresh air through a space changes everything. It alters our perception of temperature and changes the static environment into one of subtle movement (Stewark-Pollack, 2006).

Dynamic natural lighting and ventilation go hand in hand in the creating of optimal healing environments as they are both significant and crucial to the quality of health and well-being.

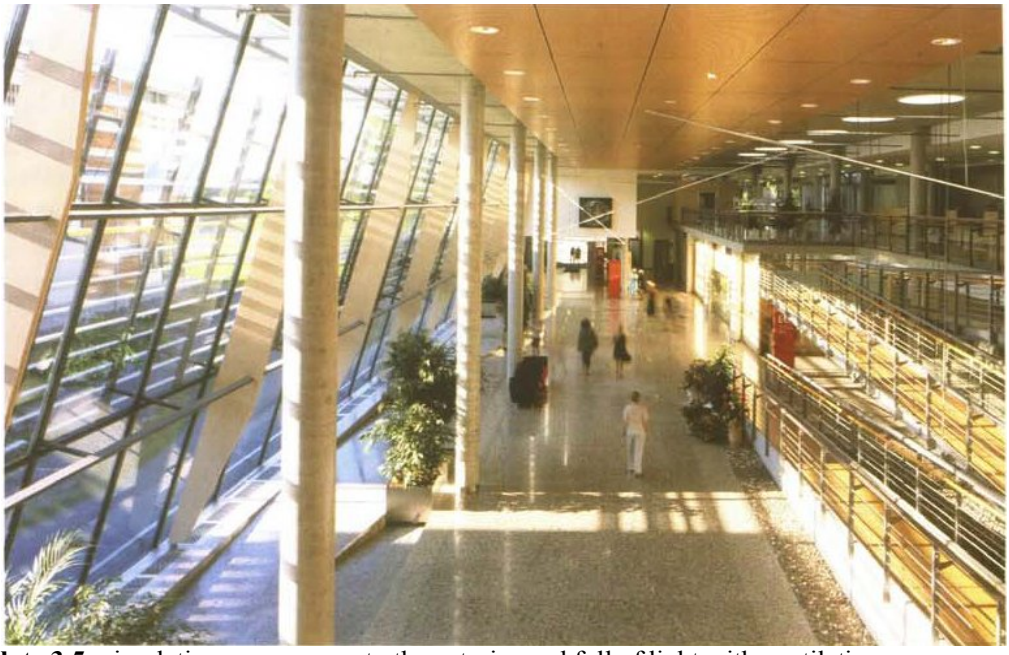

Plate 3.5: circulation spaces open to the exterior and full of light with ventilation
Source: Mostaedi, A. 2001

3.5.2 Curvilinear Forms and Shapes

An evolutionary-ecological approach to aesthetics suggests that the incorporation of curvilinear shapes and forms, actual or symbolic, into the built environment should have a strong positive impact on people (Joyce,2005) .This includes representations and simulations of the natural world often found on building façades and within interiors.

Natural shapes and forms are often curvilinear, sinuous, flowing, and adaptive in responding to forces and pressures found in nature. Natural features are thus rarely revealed as straight lines and right angles characteristic of human engineering and manufactured products and structures. Curved forms are preferred because they are more often associated with cuteness, beauty and approach, while sharp, straight

designs are presumable more related to technical, analytical and cold reactions. Angled shapes elicit more arousal, are more provocative, and are more attention-grabbing than rounded forms,

Plate 3.6: Sydney Opera House, building juxtaposing bird and sail like forms
Source: Encarta, 2009

while curves are experienced as less arousing and attractive, but will probably give rise to more 'harmonious' and 'peaceful' emotions. Coss further argues that the arousing properties of angles could be due to the danger associated with piercing forms, (Coss, 2003). The large-scale modern built environment has often been characterized by standardized and rigid shapes. People nonetheless generally prefer designs that resemble the tendency of natural forms to resist hard mechanical edges, straight lines and angles.

3.5.3 Sensory Connections to Nature

While most built environments provide somewhat shallow and limited sensory experiences as compared to nature, biophilic design deeply engages all of the senses–

–in much the same way as sitting near the ocean, walking through the forest, climbing a mountain, or working in the garden. It is not a passive experience, but rather one that reminds us every moment that we are alive and a part of the life of the planet (Stewark-Pollack, 2006). The surrounding natural setting of the environment itself should be compelling, in part because it should provide such a rich source of this attribute, and the site specific architectural design should also take full advantage.

Plate 3.7: Fallingwater house, having connection to the hillside and adjacent stream course
Source: Encarta, 2009

Interior materials, colors, patterns, textures, and artwork should draw the qualities and features of the architecture and landscape inside enhancing a seamless interior/exterior sensory experience. This does not mean necessarily using exactly the same materials, but rather materials that embody the qualities and features most desired from the architecture and the landscape.

3.5.4 Opportunities for Spontaneous Interaction with Nature

Biophilic design should view the site and building as a series of exterior and interior spaces woven together in a tapestry. By integrating the natural elements of the site

into the form of the architecture itself, unique relationships between interior and exterior form multiple perspectives as we move from space to space are experienced (Stewark-Pollack, 2006). Visual and physical barriers between indoor rooms and outdoor spaces dissolve into a mosaic of inside-outside spaces. Both distant views and views of nearby nature are important to this experience. Distant views link us to the greater natural order of the site, while nearby nature links us to the intricacies and immediate sensory pleasures of the site.

Plate 3.8: the grotto providing space for informal gatherings
Source: landscape architecture magazine, 2009

In the creation of healing environments, free-flowing movement between indoor and outdoor spaces should be enhanced by multiple transition areas such as covered walkways, courtyard and a garden that visually and physically extends the livable space into the natural environment (Stewark-Pollack, 2006). Pervious surfacing of the driveways, parking areas, and walkways maintain stronger connections with the natural immediate surroundings by eliminating solid pavement and retaining all potential runoff in the immediate watershed. The natural flow from the inside to the

outdoor paths should also link the buildings to nearby walking trails, gardens and riding trails so as to further connect the occupants to the site and its natural surroundings.

3.5.5 Façade Greening

Buildings with vegetative façades, such as ivy walls or green roofs, often provoke interest and satisfaction. This likely reflects the historic benefits associated with organic materials as sources of insulation, camouflaging protection, or even food. Plants on buildings and constructed landscapes can also evoke a powerful vernacular, such as the thatched or vegetative roofs of many cultures (Kellert, 2005).

A green roof is a roof of a building that is partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane. It may also include additional layers such as a root barrier and drainage and irrigation systems. Also known as "living roofs", green roofs serve several purposes for a building, such as absorbing rainwater, providing insulation and helping to lower air temperature.

Plate 3.9: example of a green roof
Source: www.google.com/green-roof

The other type of green façade is the green wall which is a wall, either free-standing or part of a building that is partially or completely covered with vegetation and, in some cases, soil or an inorganic growing medium. The vegetation for a green façade is always attached on outside walls; with living walls this is also usually the case, although some living walls can also be green walls for interior use.

Plate 3.10: wall of living plants near Atocha Station, Madrid
Source: www.wikipedia.com/greenwall

Although the aesthetics and uniqueness of façade greenings are undoubtedly the driving force behind its popularity, there are many environmental benefits of façade greening:

i. Reduction of thermal loading to buildings; lowers heating and cooling costs and lowers carbon emission,
ii. Less reflected heat,
iii. Storm water attenuation,

iv. Air purification; plants are efficient filters of pollution which helps lower disease rates,

v. Helps to insulate buildings for sound. (www.suite101.com/the-future-of-green-walls)

3.5.6 Health Benefits of Plants

The relationship with plants is a powerful connection with life. Venolia and Dadd (1988) state that caring for plants "releases us from our mental ruts, physical tensions, and sense of alienation; we become meaningful to our plants' flourishing, as they do to ours." Healing environments should incorporate this flexible tool. Green plants effectively purify the environment, absorbing carbon dioxide and releasing oxygen. They release moisture, preventing aridity. Plants filter toxins and other pollutants caused by cigarette smoke and chemical cleaners.

Plate 3.11: San Diego healing gardens
Source: www.msucares.com/landscape/types

The more we seal up our buildings to save energy, the staler the air becomes. Airtight buildings with double-glazed and inoperable windows provide low quality

environments, and healing environments require high-quality air. Designing with plants is one of the easiest ways to support healing in a manmade environment. They accent any design or style.

The calming influence of natural environments is very conducive by increasing a person's ability to concentrate. Natural aesthetic beauty is soothing to people, and incorporating plants around a building is an excellent way to levels of stress and anxiety. As a result of the positive energy derived from the environment, the chances of suffering from stress-related depressions are decreased as well (Brethour, 2007).

According to research also, another health benefits of plants is that an extended exposure to nature increases people's compassion for each other as it increases people's compassion for the environment in which they live. In short, being around plants help to improve relationships between people and increase their concern and empathy toward others (Rappe, 2005)

Healing gardens can bring all natural elements together allowing people to interact directly with nature. With variations in color, size, shape, and location, those seeking to design a healing environment find that gardens provide a versatile tool.

Healing gardens in particular are often linked with healthcare design as spaces for patients to reflect, relax, and enjoy the outdoors. Clare Cooper Marcus (1999) states "Gardens can be healing and restorative via a number of mechanisms. The most obvious is the aesthetic of nature; that is, creating a beautiful, verdant place that will be a powerful enticement to go outdoors. Being outdoors in a natural or quasi-natural setting, experiencing sunlight, viewing trees, and listening to the sounds of water or birdsong—the combination of these and other elements that make up a garden can have a measurable stress-reducing benefit."

Plate 3.12: Healing Garden in Ayurvedia farm, Mexico
Source: www.msucares.com/landscape/types

3.5.7 Health Benefits of Water

One cannot discuss the healing aspect of nature without emphasis on water. Water is essential to life. We think of water in nature as being rivers, lakes, and ponds, but it is also rain, ice, and snow. Rain droplets mixed with sunshine give us a rainbow, the symbol of hope. Water infiltrates the ground and it gives us wells and springs. Water has been linked with cleanliness and good hygiene since the time of Hypocrites, who connected Water is an element of nature that also delights.

Water that is incorporated into the built environment can be effective in fostering a connection between people and nature as well as having positive psychological effects. Some of the most successful designs that incorporate the use of water are those that mimic water in its natural state such as waterfalls which obey the laws of gravity as opposed to up shooting fountains which seem to deny it.

Plate 3.13: Fountain garden, Jardin H'orta
Source: Stark, A.

Water reacts to all of the senses: sight, sound, touch, and even smell (Moore, 2005). The appropriate use of sounds of water can produce satisfying results. Designers can use sound to connect people to the natural flow of water which can be relaxing or block out undesirable noises by creating "white noise". The reflective properties of water can be used to relieve feelings of claustrophobia and can even expand spaces to make them feel larger (Moore, 1994).

We are attracted to the sound of water, its gentle trickle, its bubbling or waves lapping at the shore. It is said to have a calming effect and feeling of regeneration of the spirit. We are simply attracted to water—and for this reason water features have often been a focal point of healthcare facilities.

CHAPTER FOUR

CASE STUDIES

4.1 SELECTION CRITERIA

The selection criteria for the case studies on this research are based on purposely selected resorts specifically for health purposes and health facilities and the identification of these resorts that have applied the attributes of biophilic design to create healing environments.

Each case study was analyzed based on an individual general documentation under the creation of appropriate healing environments. The purpose of this documentation is to analyze each and consider to what extent the biophilic design attributes are utilized in creating the healing environments.

4.1.1 Variables

i. Building form & layout:

Harmonious, well-balanced environments help to reduce stress and liberate vitality and creativity, which enhance healing. Harmony in design can be achieved through a combination of harmonious dynamic proportions and clear layout. Distribution of functions within the structure must be practical, but should also consider orientation and position within the building envelope.

ii. Harmony with site:

The placement of a structure on the site must consider its orientation in relation to landmasses, river systems and building form. The configuration of land or

building masses is most important. The site should also enjoy a focal point in the distance. Buildings should be placed and shaped in such a way that they create positive and usable outdoor spaces in relationship to naturally occurring rocks and trees.

iii. Building materials:

The choice of selection of building materials should depend on certain factors so as to reduce the impacts on the natural environment and health. The building materials to be used should be of low thermal capacity to enhance heat loss. Interior finishes should also be constructed of natural, non-toxic materials.

iv. Nature integration:

Integrating nature is crucial as it purifies the environment by absorbing carbon dioxide and releasing oxygen into the air. It also can stimulate the senses, improve vitality and promote recuperation from physical, emotional and mental stress through user interaction with nature.

4.2 DATA COLLECTION

The collection of data carried out for the research is basically qualitative. The following methods were used:

i. Physical Observation: Visit of the building with careful of its features, guided tour round the building and its facilities.

ii. Structured Interview: Interview of the administrative staff of the resort on several aspects of the resort: its history, construction, administration, events hosted, maintenance issue and other relevant information.

4.3 CASE STUDY ONE: CHIVA-SOM HUA HIN HEALTH RESORT

4.3.1 Brief Background

Located on the beachside in Hua hin, this international health spa resort is a holistic sanctuary with an emphasis on integrative medicine. In addition to the resort's usual range of spa treatments, physiotherapy or injury rehabilitation is offered. Unique to Chiva-Som is the use of diagnostic techniques such as iridology, live blood analysis, bio-terrain testing, and electro-dermal screening—tools that can often identify issues orthodox medicine may have missed.

Plate 4.1: View of the Chiva-som Spa Resort
Source: www.gayot.com/toptenhealthretreats

A secluded world of beauty and serenity, Chiva-Som is the "Haven of Life." Nestled within seven acres of lush tropical gardens, this beachfront health resort represents tranquility at its best with luxurious accommodation comprising 58 stylish rooms;

Thai Pavilions offer traditional charm and Ocean View rooms and suites provide spectacular views of the Gulf of Thailand.

Plate 4.2: View of the lodging facilities
Source: www.gayot.com/toptenhealthretreats

4.3.2 Health & Wellness Programs Offered

Focusing on greater well-being and vitality, Chiva-Som offers extensive physiotherapy, fitness, spa and holistic health facilities to help guests relax, restore and rejuvenate. Ancient therapies of the East with Western diagnosis techniques are combined to encompass the mind, body and spirit. Personalized programs and treatments are available for everyone from weight management and stress reduction to skin rejuvenation and longevity.

Fitness can be improved with Tai Chi, Pilates and personal training classes and mind-body healing with yogic technologies, complementary therapies and medical services.

Plate 4.3: Yoga area
Source: www.gayot.com/toptenhealthretreats

Plate 4.4: Pool area of the resort
Source: www.gayot.com/toptenhealthretreats

Building Form & Layout: conventional buildings but with a dynamic flow of the site layout.

Respect for Site: minimal intrusion of site topography with a high retention of trees.

Building Materials: building materials used for construction were mostly timber and concrete.

Nature Integration; natural elements of landscaping was predominantly used.

4.4 CASE STUDY TWO: NATUR-MED THERMAL SPRINGS AND HEALTH RESORT

4.4.1 Brief Background

Natur-med is a new and distinguished (the first) health resort in Turkey. Natur-Med is located on the Aegean Coast and on Samson Mountains, is far from motorways and industry and enjoys a mild climate and over 273 days of sun annually, making it an ideal thermal health resort destination all year round. Natur- Med offers body-mind-spirit rejuvenation, purification and anti-aging programs, treatments for chronic disease, weight loss programs, pain treatments and quit smoking therapies.

Natur-Med is the first health center in Turkey that applies Matrix Rhythm Therapy, Ozone Therapy and Colon Hydrotherapy under the supervision of a professional medical team. Set in native forest covered mountains with spectacular views, Natur-Med has everything to offer the inquisitive visitor in search of the ultimate in thermal bathing. This celebrated region of Turkey has an exceptionally mild climate rich in oxygen with negligible humidity. The thermal springs - in addition to the clear mountain air which in itself counts as "nature's medicine" - can offer excellent health, fitness and beauty facilities which are second to none. Natur-Med is amidst pine, olive and tangerine trees, and the sun shines generously throughout all seasons.

Plate 4.5: Exterior view of the resort
Source: www.hotels-world.com

Plate 4.6: Rear view of the resort showing the pool area
Source: www.hotels-world.com

Plate 4.7: site plan of the resort (artist's renderings)
Source: www.hotels-world.com

There are marvelous indoor and outdoor thermal pools, an outdoor swimming pool, and a pool for children, Infrared Medical Saunas and a Turkish bath (Hamam). All these features constitute the crucial elements for climatotherapy.

Building Form & Layout: conventional buildings but with a dynamic site concept.

Respect for Site: minimal intrusion of site topography with a high retention of trees.

Building Materials: building materials used for construction were concrete, bricks, timber and excessive use of glass.

Nature Integration; natural elements of landscaping was predominantly used.

4.5 CASE STUDY THREE: BAD BRAMBACH SPA FACILITIES

4.5.1 Brief Background

Located in Germany, this spa and fitness facility was designed by Peter Holzer, Auer Weber & partners. Together with Bad Elster and the bohemia spas of Franzerbad,

Marienbad Karlsbad is a region of traditional region of spas at the convergence of the areas of Saxony, Bavaria and the Czech Republic. The spa building was located on the edge of the Brambach Health Park, which houses the medicinal therapy facilities of the state spas.

Plate 4.8: View of the Bad Brambach Spa Facilities
Source: Mostaedi, A. 2001

An enormous park is located between the new spa and the old building. An enormous terraced hall responds to the topographical situation and houses the lobby with the restaurant and the sauna that connects with the bathing level. The idea of bathing in the park is expressed through the incorporation of an external pool that emerges from the façade of the building, and through the projection of wide windows that wrap the area of the covered pools. The landscape of the park thus seems to flow through the building and encounters the bathing area. The large glazed surface is covered by a thin roof supported by steel columns. Over the terraced bathing area is a two storey area of therapeutic treatments with services including mud baths and massages. The façade on one side was made of glass, while for the main façade it was decided to use

larch panels painted bright red. Horizontal wooden slats filter the sunlight creating a warm and introverted atmosphere.

Plate 4.9: Rear view of the Bad Brambach Spa Facilities
Source: Mostaedi, A. 2001

Plate 4.10: Indoor pool of the Bad Brambach Spa Facilities
Source: Mostaedi, A. 2001

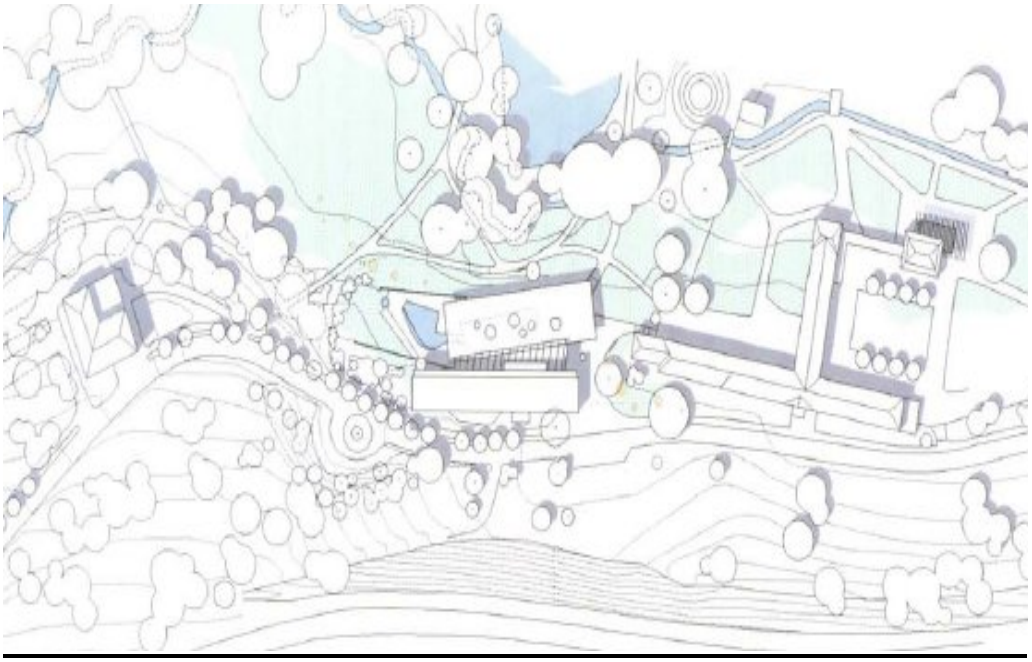

Plate 4.11: site plan of the Bad Brambach Spa Facilities (artist's renderings)
Source: Mostaedi, A. 2001

Building Form & Layout: conventional building forms with a rigid site layout.

Respect for Site: minimal intrusion of site topography with a high retention of trees.

Building Materials: building materials used for construction was mostly concrete, steel and excessive use of glass. They also made use of roof gardens which aids in cooling the internal spaces.

Nature Integration; natural elements of landscaping was predominantly used.

4.6 CASE STUDY FOUR: VIDAR CLINIC

4.6.1 Brief Background

The Vidar Clinic was designed by Erik Asmussen, a Swedish architect, and located in Sweden. The architecture of the clinic was designed to encourage healing and harmony. The design was preceded by the architect along with a dozen doctors, nurses, accountants, therapists and others involved went to hospitals in Germany and

Switzerland with the same focus and goals. With the best of medicine, the clinic creates a whole that promote healing. It has a caring and harmonious environment, and offers nutritious diet.

Hospital area comprises three buildings which are parallel to an elongated, undulating mountain lot with beautiful vegetation. There is a hospital with four wards and one patient facility. Building materials are brick, plaster and wood. The ventilation system in patient rooms can be adjusted individually. Other rooms have active ventilation from and supply air. Heating is provided by heat pumps that use salt water from the Baltic Sea. Clinic water needs are met by local water utilities in the area.

Plate 4.12: Approach view of the Vidar Clinic
Source: www.vidarclinic.com

4.6.2 Health Programs Offered

The Vidar Clinic offers specialized in general medicine, and also have clinic, entertainment and home care. It also offers specialist care and rehabilitation of stress-

related disorders, long standing extensive pain, severe and chronic somatic medicine diseases and cancers of all stage, including palliative care.

Conventional medications are maintained and during hospitalization can often be modified based on the achieved therapeutic results. Treatment team follows up with patient treatment. Nursing process is documented and continuing outpatient treatment is planned in conjunction with regular care provider.

Vidar Clinic offers specialist cancer care and rehabilitation at all stages, including palliative care . In addition to this, the clinic offers care and rehabilitation of patients with severe and chronic somatic medicine diseases and long-term comprehensive pain and stress related disorders .

Treatments are supplemented with herbal medicine, physical and artistic therapies as well as anthroposophic nursing.

Plate 4.13: Vidar Clinic
Source: www.vidarclinic.com

Building Form: the building form was organic and harmonious in style which encourages healing and harmony.

Respect for Site: the hospital buildings were parallel to an elongated undulating mountain lot with beautiful vegetation. This shows minimal intrusion of the site topography. There is also a dynamic equilibrium of spatial organization.

Building Materials: the building materials used for the construction were brick, plaster and wood.

Nature Integration: natural elements of landscaping were adequately used allowing for the direct interaction of patients with nature.

4.7 CASE STUDY FIVE: AQUA VISTA HEALTH FARM

4.7.1 Brief Background

Located in Calabar, this is one of the three health resorts in Nigeria with adequate spa facilities, physiotherapy and trauma center. Aqua Vista Farms has a magical charm of equatorial greenery and is tucked away from the madness of the city, in the ancient beautiful community of Calabar. The resort is surrounded by gorgeous landscaping, giving it a tropical feel.

The resort is located in a tranquil environment and offers varied recreational facilities which could aid weekend experiences for workers as well as vacation for tourist. The resort also offers a rich culture of Nigeria. Guests can enjoy a fabulous fish barbecue outdoors during the lunch time or into the evening. During the day you can enjoy a refreshment or picnic at the water's edge, while listening to the sound of birds chirping.

Plate 4.15: Approach view Aqua Vista Health Farm
Source: www.nigeria-direct.com/healthresorts

Aqua Vista Farms has plenty of great activities to keep the entire family entertained, as well as physiotherapy at the Hannah Foundation Clinic & Trauma Center.

Plate 4.16: Recreation area of the Aqua Vista Health Farm
Source: www.nigeria-direct.com/healthresorts

Building Form: rigid and conventional.

Respect for Site: buildings are few in number and small in size thus there is a minimal intrusion of the site topography.

Building Materials: the building materials used for the construction was concrete with aluminum roofing sheets

Nature Integration: natural elements of landscaping were adequately used allowing for guests interaction with nature.

4.8 SUMMARY OF EMPIRICAL FINDINGS

From the above findings, it can be summarized that:

30% employed the use of curvilinear shapes and forms;

90% applied the principle of respect for site;

60% embraced the usage of sustainable building materials;

90% incorporated natural landscaping elements in health spa resort design

CHAPTER FIVE

SITE STUDY

5.1 SITE SELECTION CRITERIA

Choosing a viable site with natural attractive features is paramount to the development of a spa resort so as to not only influence patronage but also for the infinite access to nature. Two sites were selected: site 1 is located at the new built up Kaduna Millennium City of Kaduna State and site 2 is located at the Gurara Falls region of Niger State. The following under listed criteria were used to weigh the suitability of each of the sites and thus the most appropriate site was selected:

i. Location/ Accessibility
ii. Size of site, possibility for expansion, suitability and availability
iii. Visual and aesthetic potentials (scenic beauty)
iv. Services

CRITERIA	SITE 1 (KADUNA NEW CITY)	SITE 2 (GURARA FALLS)	REMARKS
LOCATION/ ACCESSIBILITY	4	4	Site 1 is more developed
SIZE OF SITE, SUITABILITY & AVAILABILITY	3	5	Site 2 is more spacious
AESTHETIC POTENTIALS	1	5	Site 2 has a scenic view of the falls
SERVICES	5	4	Site 1 has better
TOTAL	13	18	Site 2 is more suitable

5.2 SITE ATTRIBUTES

It is very paramount to identify the site attributes to properly identify conditions on the site which will inevitably have a bearing upon the design solution which is to be proffered.

Gurara falls development site has the following attributes:

i. **River Gurara and Waterfalls:** the river flows from the North to South direction.
ii. **Topography:** the site is undulating giving visitors an interesting terrain to explore.
iii. Beach **sand** is found along the river banks, this is visible only in the dry season.
iv. The **vegetation** on site is lush and evergreen especially along the river banks.
v. The site shows evidence of a **well drained soil.**

5.3 SITE LOCATION

The site for the proposed health spa resort is located around the Gurara Falls in Bonu village of Gurara local government area of Niger State. The state is located in the Savannah region of Nigeria between latitudes $8^{o}20'$N and $11^{o}30'$N and longitudes $3^{o}30'$E and $7^{o}20'$E. It lies wholly with the physical and cultural zone of transition described as the "middle belt of Nigeria". The state is also bounded by Kebbi State to the north, Kwara State to the south, and Kaduna State and the Federal Capital Territory to the East (Udo & Mamman, 1993).

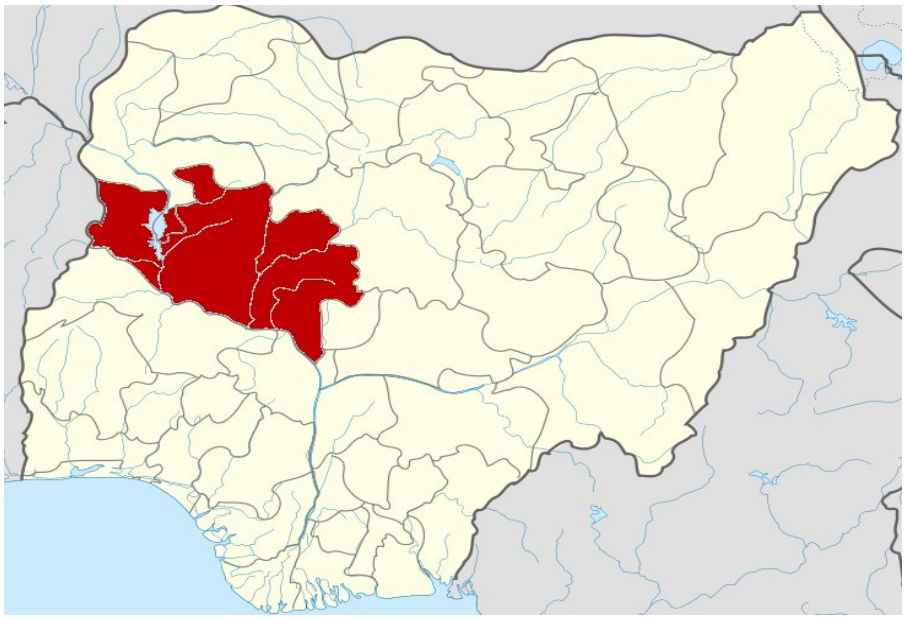

Plate 5.1: Map of Nigeria highlighting the location of Niger State
Source: Researcher's fieldwork

The location of the proposed site is at kilometer 69 along the Minna-Suleja road and the waterfalls site is 4km off the road. The villages that surround the proposed site are Bonu village 1.7km north-east; Padawa village 3km south; and Boru village 3.2km south-west of Gurara Falls.

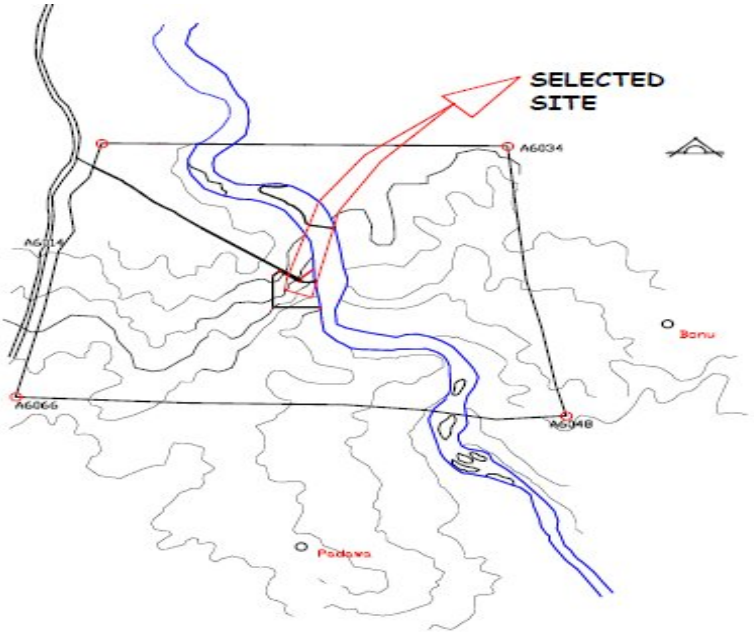

Figure 5.1: map showing site for the proposed develoment
Source: Researcher's fieldwork

5.3.1 Physiography

The area is lies on the lowlands within the Kebbi plains and the Niger-Benue trough. The topography of the region is rough low lying below 300meters above sea level. The topography consists of steep and gentle slopes including a few comparatively flat areas. The site has a gradient of 2.6% slope south-west and 3.1% slope south. Rocky outcrops dot the winding riverbeds which are made visible by low water volume during the dry season (Udo & Mamman, 1993).

5.3.2 Geology

Geologically, the state is covered by two main formations:

a) Sedimentary rocks, consisting of sandstones and alluvial deposits which cover the Niger trough and substantial parts of Lapai, Bida, Wushishi, Borgu local government areas.

b) To the north, on the other hand, the bulk of the state is underlain by basement complex rocks. The landscape of this part is characterized by granitic outcrops called inselbergs. These outcrops are common around Minna, Suleja, Shiroro, Mariga and Gurara local government areas. (Udo & Mamman, 1993)

5.3.3 Soils

The soil of the state bears a close relationship to its geology, since soils are derived from geological parent materials. The soils are usually deep, red and enriched with clay subsoil. For the greater part of the state, including the Gurara region, ferruginous tropical soils predominate. The soil is generally permeable and the bedrock is 10meters below the surface (Udo & Mamman, 1993).

5.3.4 Vegetation

Niger State is located in the middle belt of Nigeria. This therefore implies that the state lies in the transitional zone between the forested South and the continental semi-arid grass plains of the North. The vegetation has open woodlands, with densely clustered trees and elephant grass (Udo & Mamman, 1993).

5.3.5 Climate

The climate of Niger State is typical of the guinea savannah with these attributes:

Temperature: the hottest months of the year are March and April with main daily maximum temperature of about 32^{o}C for most of the year. There is a drop in the average minimum temperature to about 26^{o}C during the peak of the rainy season from July to early September.

Rainfall: the rainy season lasts for seven months, from April to October in the south but decreases to six months in the north with a mean annual rainfall of between 1000mm to 1500mm.

Wind: the air masses that dominate the region are the southwest Monsoon which is prevalent during the rainy season and the dry dusty north-east winds that blow from the Sahara during the dry season.

Relative Humidity: the relative humidity at sunrise is 72% while it could be as low as 40% in the afternoon, resulting in a dual variation of 32% (records taken over 25 years). The values may be as low 20% in the afternoon in the month of January as compared to 71% in the afternoon in the month of July. This results in a seasonal afternoon range of about 50%. In January, the average early morning relative humidity is 31% and the value in July is an annual high of 96% giving a seasonal variation of 65%.

Sunshine and Cloud Cover: the amount of sunshine received depends on the season. The site lies in the tropics where sunshine is abundant but not very intense, because of

the presence of the falls and the many trees, making a forest. During the dry season the sunshine received is more than is recorded in the wet season. The average duration of sunshine hours is between 5-7 hours daily. The longest period of sunshine is recorded in the months of November and February which have the clearest skies (Udo & Mamman, 1993).

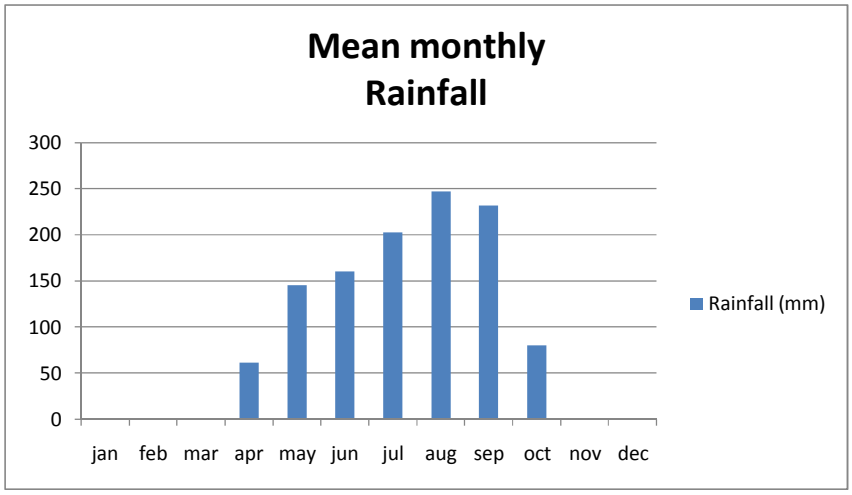

Figure 5.2: mean monthly rainfall distribution chart
Source: Meteorological Department, Niger state

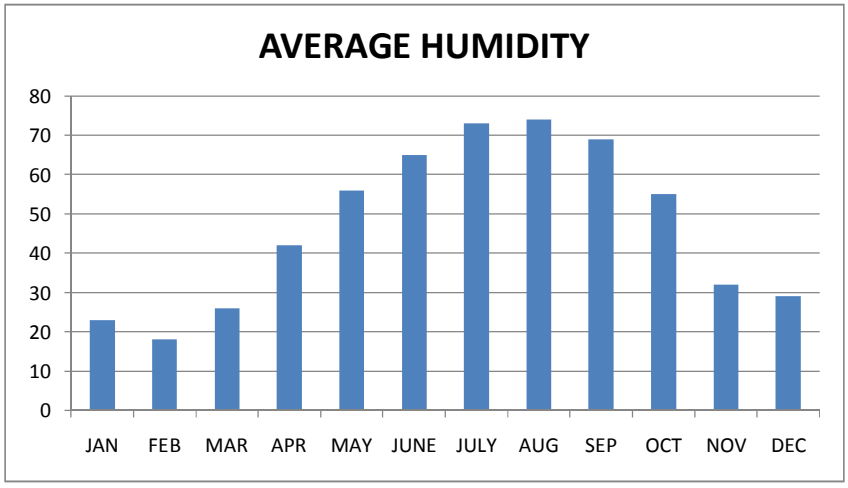

Figure 5.3: average humidity distribution chart
Source: Meteorological Department, Niger state

Variable	J	F	M	A	M	J	J	A	S	O	N	D
Insolation, kW h/m²/day	6.03	6.54	6.63	6.38	6.08	5.56	4.98	4.55	5.17	5.65	6.06	5.86
Clearness, 0 - 1	0.69	0.69	0.65	0.61	0.59	0.54	0.49	0.44	0.51	0.58	0.68	0.69
Temperature, °C	24.44	26.14	27.32	26.00	25.02	23.97	23.07	22.94	23.57	23.85	25.02	24.65
Wind speed, m/s	3.29	3.18	3.59	3.51	3.58	3.18	3.12	3.01	2.72	2.75	3.07	3.31
Precipitation, mm	1	5	13	59	134	160	218	250	244	109	4	1

Figure 5.4: solar energy and surface meteorology distribution chart
Source: www.gaisma.com

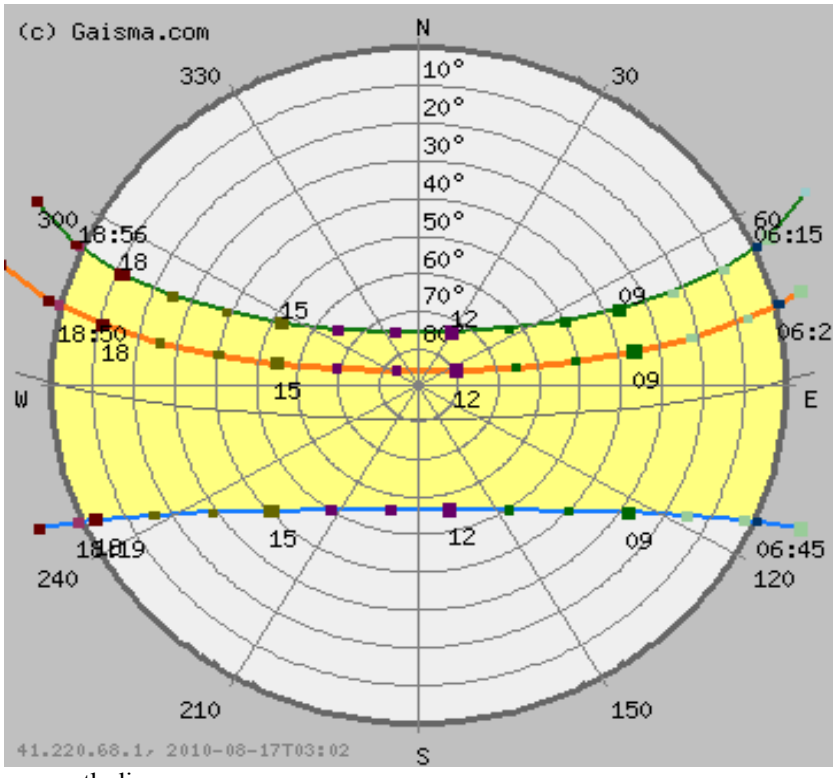

Figure 5.5: sun path diagram
Source: www.gaisma.com

5.4 INFRASTRUCTURE ANALYSIS

i. Power Supply

The 11kva power holding cooperation of Nigeria electric power line along the road that bound the site serves as potential power source to the center. Due to the erratic power supply experience around the site, a substation with power generating sets is necessary for the resort.

ii. Water supply

There is adequate supply of water to the site. Nonetheless, the water can be stored in water tanks which can then be pumped into the building, and other necessary locations.

iii. Telecommunication

Telephone line has been extended to the area and the source is Nigeria telecommunication commission. Intercoms will also be provided at sensitive facilities within the resort.

iv. Solid Waste Disposal

There is no defined network of solid waste disposal in the area. The waste should be disposed using Niger State Environmental Sanitation Board waste management network.

v. Sewage Disposal

As no central sewage disposal system exists for Minna, septic tank system should be adopted. At random, vehicular disposal system should be used to convey the sewage to the nearest treatment plant by Niger State Environmental Sanitation Board or any other agency.

5.5 SITE ANALYSIS

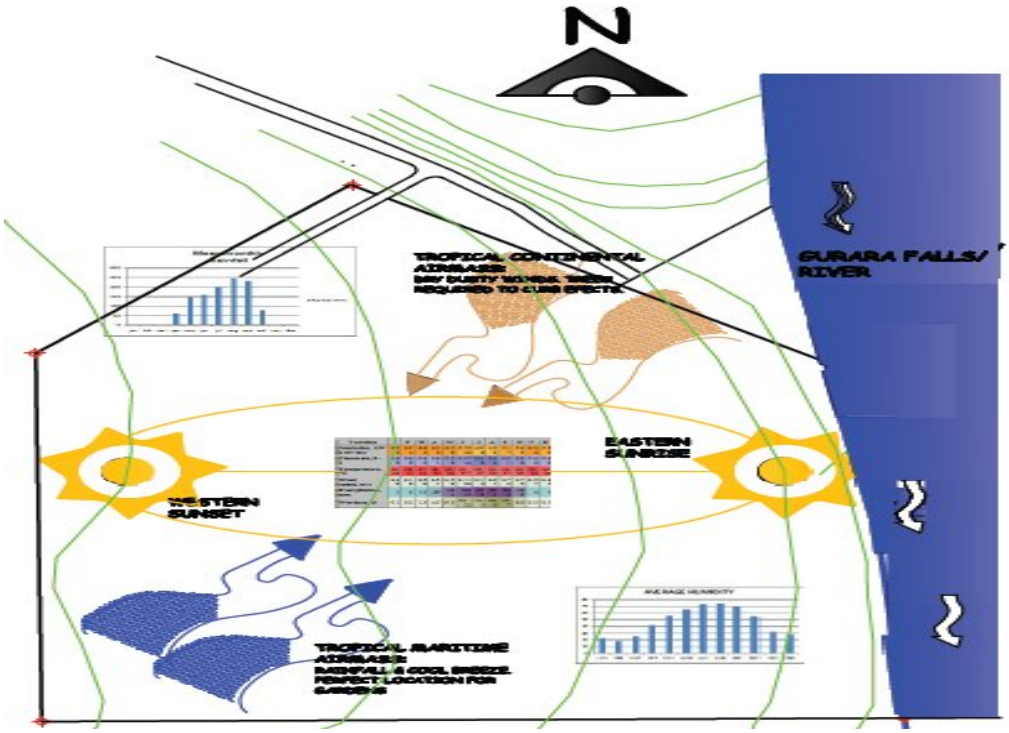

Figure 5.6: climatic analysis
Source: Researcher

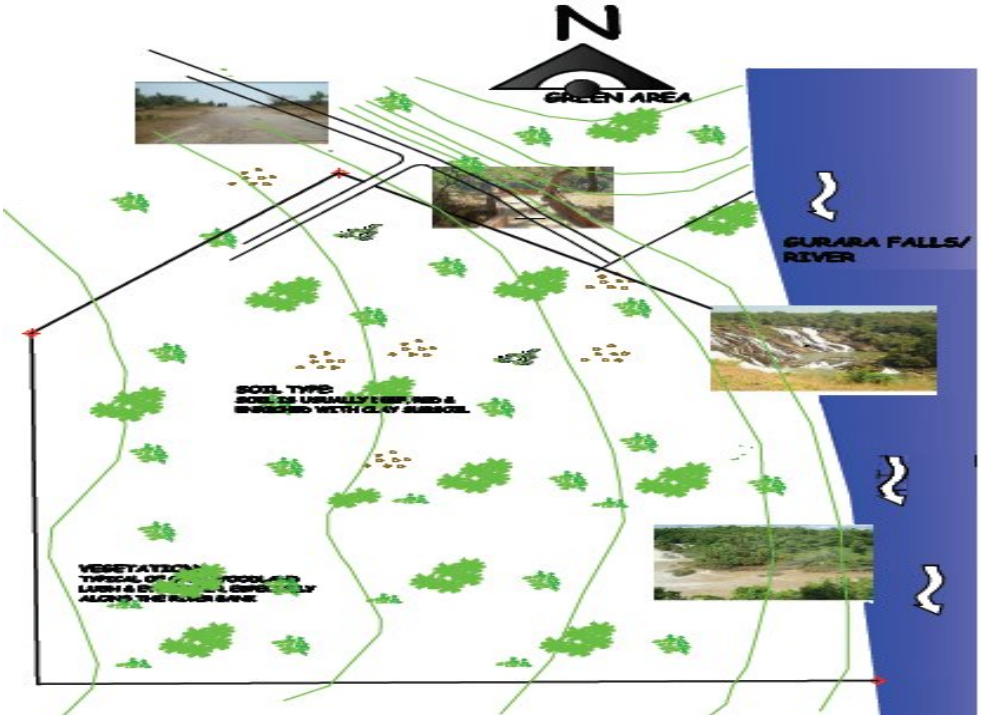

Figure 5.7: soil conditions & features
Source: Researcher

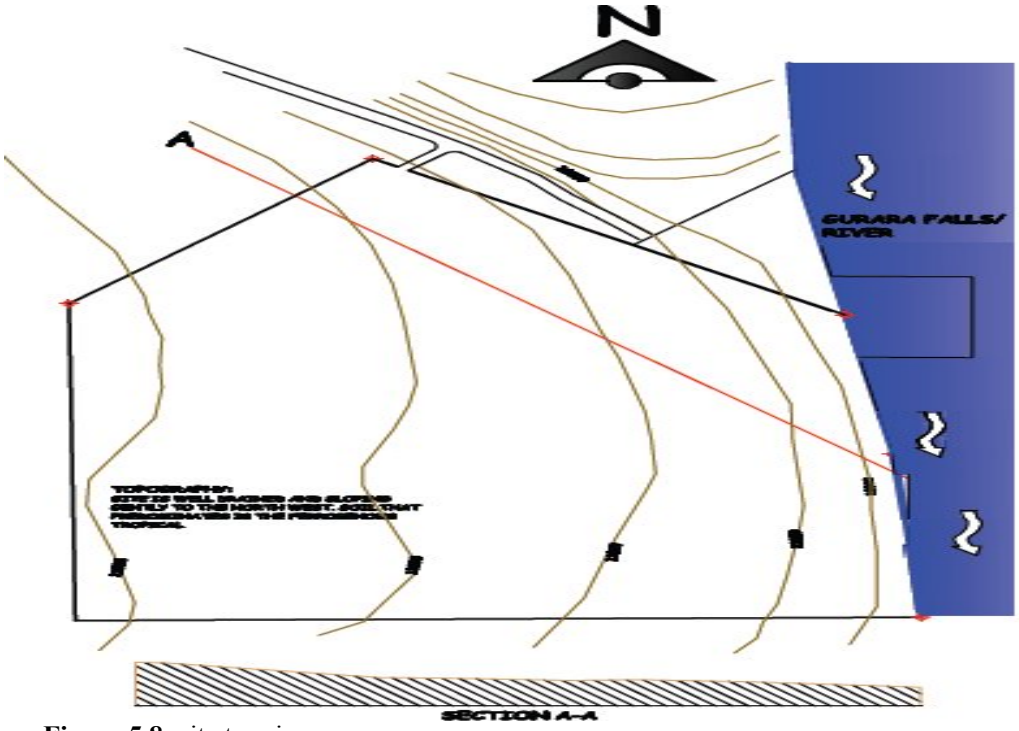

Figure 5.8: site terrain
Source: Researcher

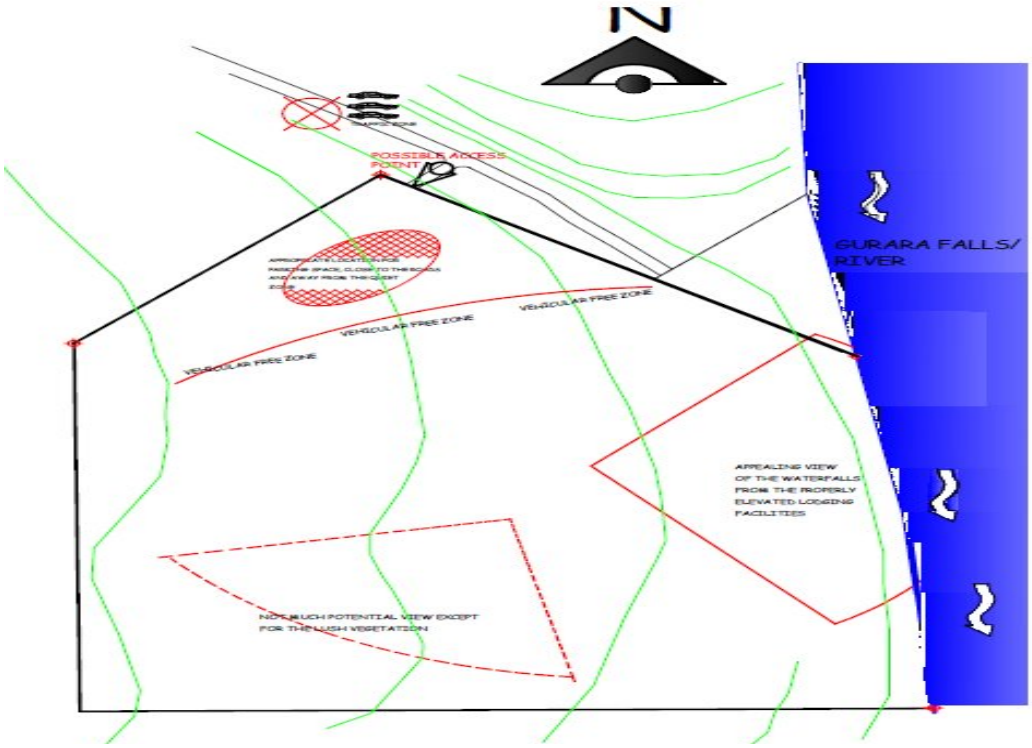

Figure 5.9: visual & traffic analysis
Source: Researcher

CHAPTER SIX

DESIGN REPORT

6.1 DESIGN BRIEF/ PROPOSAL

The project will involve the design of a health resort with lodging facilities of about fifty units. Using biophilic design attributes, the proposed site will be evaluated and a design solution that will connect its users to the natural environment and promote physical and psychological well-being, socialization, creativity and collaboration. The chosen site for the facility provides a diverse natural landscape, which will assist in the designs' restorative quality.

The proposed facility will serve as a vacation grounds for families as well as to corporate workers. The main objective for the design will be to harmonize the facility with the natural environment by incorporating biophilic design attributes.

6.1.1 Brief Development

The proposed health resort will consist of the following facilities:

i. **The core building:** this forms the focal point of the entire resort, and has the following facilities:

    a) Administrative offices: these are the offices for the staff that will run the resort.

    b) Retail shops: these provide outlets for the sale of general goods to guests at the resort and as well as to other visitors.

    c) Conference and seminar rooms: these are rooms for meetings and educational lecture classes for visitors.

ii. **Health & Spa facilities:** these comprise of the programs and therapies that aid in the improvement of the physical and mental wellness. It also houses facilities for diagnostics as well as treatment of ailments using natural remedies and touch therapies.

iii. **Outdoor cardio circuit facilities:** these are facilities that aid in physical wellness of individuals. These facilities include squash, racket ball and tennis, jogging, bike paths and hikes. These are basic wellness requirements.

iv. **Leisure facilities:** this includes:

a) Restaurant: this serves Nigerian dishes, continental dishes and health diets. It also has an open air restaurant at the roof garden above the restaurant.

b) Landscaped areas: this includes sit outs, picnic areas, children's playgrounds, swimming pools and aromatherapy gardens.

v. **Lodging facilities:** these are the accommodation units and are of two types: one bedroom chalet and two bedroom guest chalet.

vi. **Ancillary facilities:** these consist of supporting facilities used by the staff, such as maintenance, laundry services and housekeeping.

6.2 SCHEDULE OF ACCOMMODATION

CHECK IN/ADMINISTRATIVE OFFICES

SPACE	NO. REQUIRED	AREA (m^2)
reception/check in	1	116.9
conference room	1	51.24
seminar room	1	51.24

Check in/Admin offices cont'd

SPACE	NO. REQUIRED	AREA (m^2)
lounge	1	94.5
cashier's office	1	15.4
manager's office	1	44.5
secretary's office	1	15.4
assistant manager's office	1	28.3
administrative offices	3	24.2
staff meeting room	1	44.2
lecture room	1	190.4
lecture room toilet (male & female)	2 each	2.0
retail shop	1	15.4
storage room	2	12.5
toilet (male & female)	4 each	2.0
canteen	1	85.3
canteen toilet (male & female)	2 each	2.0
cooking area	1	27.1
servery	1	18.5
kitchen store	2	7.2
changing room & toilet (male & female)	2 each	22.5

RESTAURANT

SPACE	NO. REQUIRED	AREA (m^2)
central eating area	1	180.9
side eating area	1	112.5

Restaurant cont'd

SPACE	NO. REQUIRED	AREA (m^2)
roof garden sit out	1	112.5
cafe	1	15.5
cooking area	1	84.3
store	4	12.5
changing room & toilet (male & female)	2 each	22.5

CLINIC & SPA

SPACE	NO. REQUIRED	AREA (m^2)
reception	1	90.0
consulting room (spa & clinic)	2 each	24.5
dispensary	1	24.5
massage room (spa & clinic)	1 each	48.2
sauna (male & female)	1 each	63.3
hydrotherapy area	3 pools	99.6
rest room	1	51.2
clinic waiting lounge	1	115.4
ward room	8	12.5
acupuncture room	3	40.1
chiropractic room	3	40.1
physiotherapy room	2	37.2
homeopathy room	2	37.2
facial & body treatment room	1	51.2
group fitness class	1	98.4

Clinic & Spa cont'd

SPACE	NO. REQUIRED	AREA (m^2)
gym	1	99.6
indoor swimming pool area	1	297.3
changing room & toilet (male & female)	4 each	22.5
sit out (clinic)	2	98.1

GUEST CHALETS

SPACE	NO. REQUIRED	AREA (m^2)
Single lodge	40	54.3
Family lodge	10	95.1

ANCILLARY UNIT

SPACE	NO. REQUIRED	AREA (m^2)
common room	1	18.0
laundry	1	22.5
housekeeping	1	15.3
room service	1	12.5
changing room & toilet (male & female)	2 each	22.5

6.3 DESIGN & PLANNING CONSIDERATIONS

i. General Planning:

The whole resort was designed to radiate from one focal point. This makes accessibility easy and quick. The longer stretch of the arrangement of the buildings is

in the north-south axis to limit exposure to solar axis. Layout and circulation routes are clear, and ample storage spaces were provided. Consideration for noise, type of activity, likely timing of activities and age groups when locating facilities were also made.

ii. Circulation:

Conscious design efforts to separate pedestrian and vehicular traffic were made. The parking lots are arranged on one wing as the building is approached. The traffic zone was designed in such a way that it is segregated from the vehicular free zone. This arrangement curbs traffic around the buildings and also reduce toxic pollution away from the health facilities and lodging facilities as well.

iii. Lighting & Ventilation:

The whole facility was designed in such a way to manipulate and optimize the entrance of natural light so as to facilitate mobility, curiosity, imagination and exploration. The building is glazed using the insulating glass unit (double glazing) so as to filter the ultraviolet rays that may enter the building.

Stack and cross ventilation methods are used in the building. These ventilation techniques have been found to be effective in this type of building structure as they aid in freshening up of the indoor air so as to prevent moisture build up.

iv. Landscaping:

This is an important factor in the design of such a facility as it helps in creating scenic and relaxation experiences. Trees and hedges are put in place to enhance the micro climate and environmental features within the resort. The calming

influence of plants is very conducive by increasing a person's ability to concentrate. Emphasis is placed on ample provision of well landscaped environments to aid in relaxation and complement activities of the resort. Stone paving were used for walkways to emphasize the use of natural materials.

6.4 SITE ZONING

The site planning concept was based on the zoning of the resort which was into three parts: public zone, semi-public zone and quiet zone.

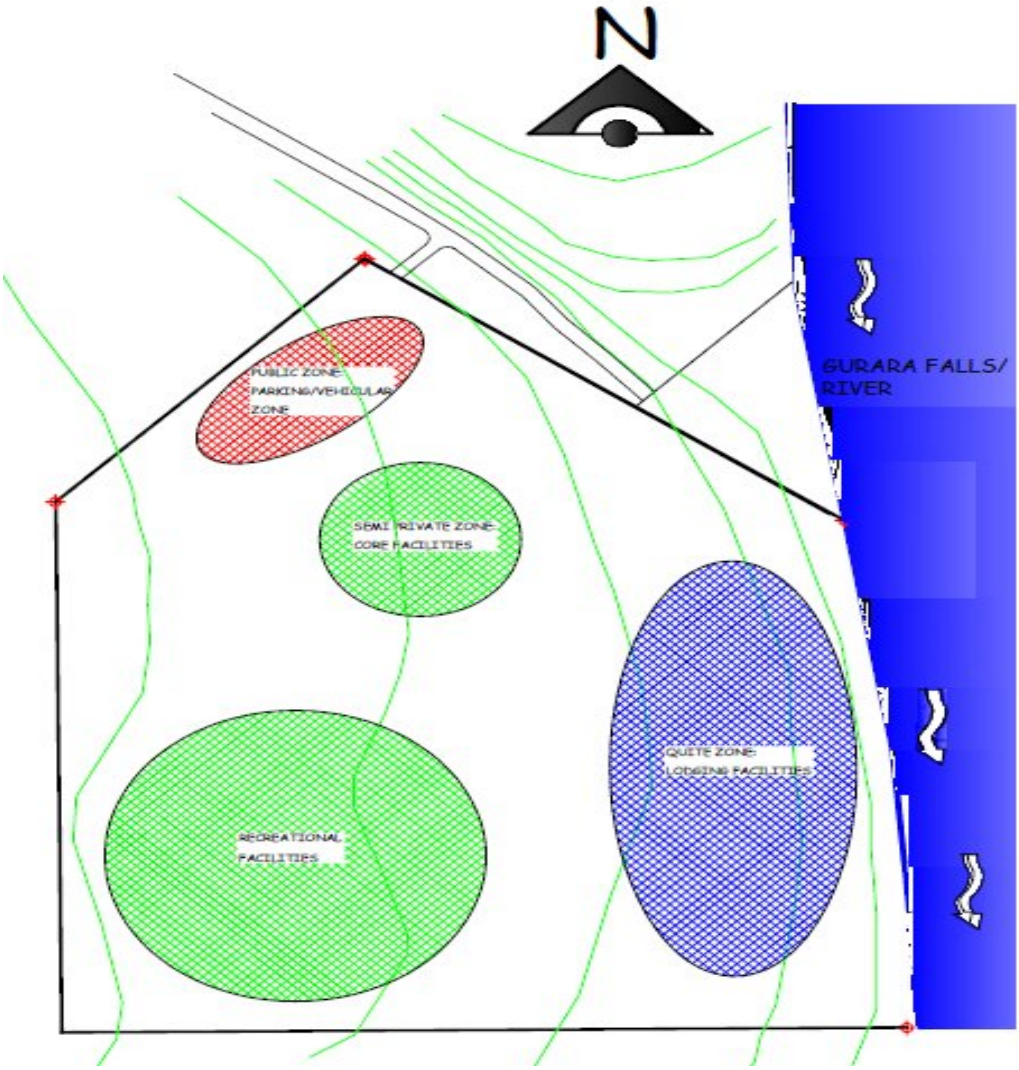

Figure 6.1: zoning of site
Source: Researcher

Public Zone: this is the noisiest part of the resort which accommodates the vehicular parking, where all vehicles are parked and is segregated from the other part of the resort.

Semi-public Zone: this is the central part of the resort where there is a good view of the natural features of the site, where also the core and health facilities are located. This allows the visitors of the resort to achieve the healing power of the natural features of the site. Recreational facilities are also situated within the zone.

Quiet Zone: this zone is close to the waterfall and stream, the only source of noise being the sound of the waterfall and flowing water of the stream and chirping sounds of birds. This is the most appropriate location of the lodging facilities.

6.5 CONCEPT DEVELOPMENT

Concept is a guiding principle of a thought or an idea relating to something abstract. Concept architecturally, is a series of intentions or solutions originated in the mind to solve a particular architectural problem while considering other design factors.

Planning Concept

The site concept is derived from the abstracted form of an open chamomile herb flower. The flower has petals all over surrounding the core. The core of the flower represents where the main buildings of the resort are while the petals represent parking spaces and landscaped areas and at the base of the flower is the location of chalets.

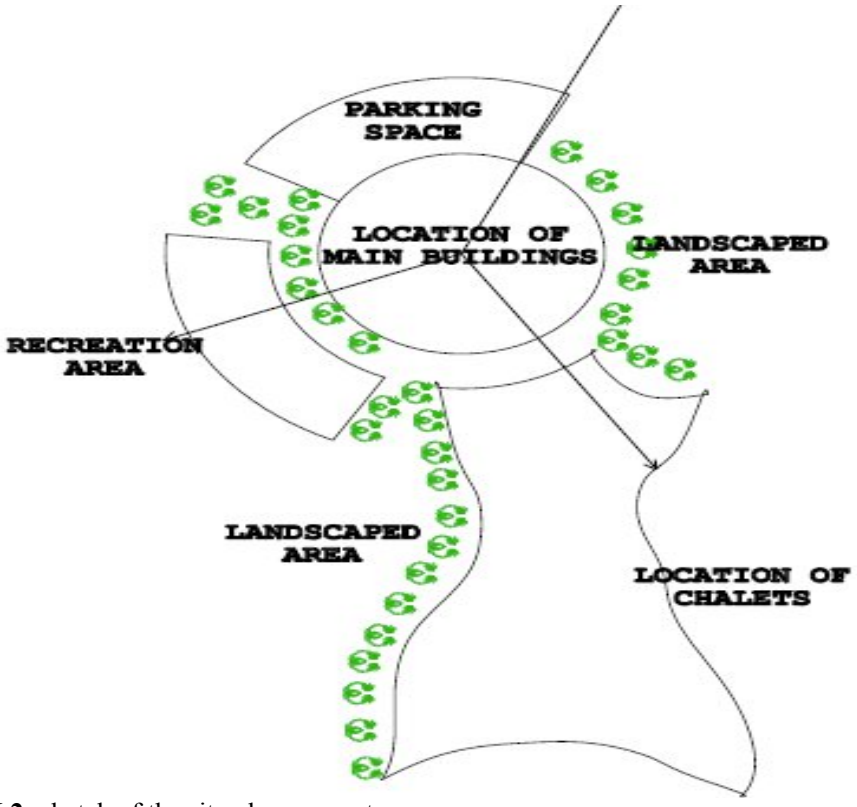

Figure 6.2: sketch of the site plan concept
Source: Researcher

Figure 6.2 shows a sketch of how the site plan concept was derived which was basically based on the **use of dynamic forms** (curvilinear paths and shapes) abstracted from the features of the flower. This continuous dynamic flow within the environment provides a rich source of seamless sensory experience with nature, which is essential in creating healing environments. The circulation pattern is also free which promotes interaction in the resort and offers simplicity in the organization of the spaces.

The resort is accessed from the north eastern part of the site from an existing access road, as shown in figure 6.3. The parking lot is located along the north western axis not far from the entrance, making it a traffic zone and so also to curb toxic pollution

emitted by the vehicles away from the health facilities. A service entrance is also provided leading straight to the ancillary service area of the restaurant.

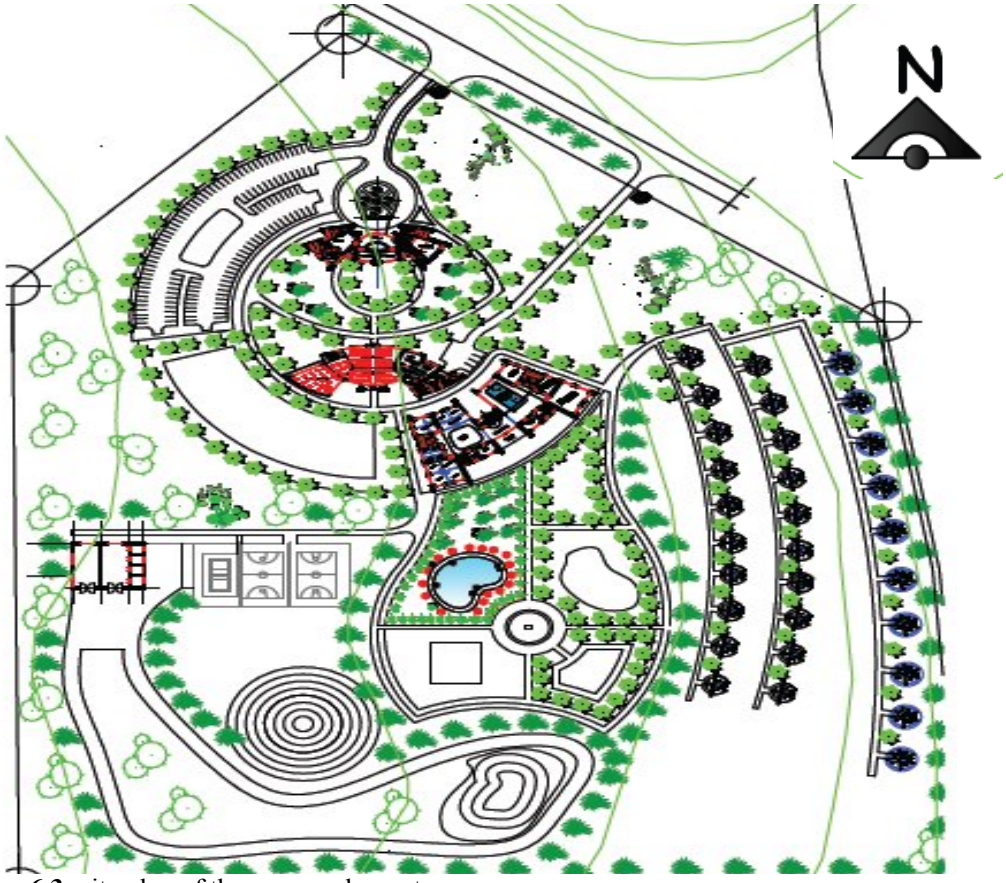

Figure 6.3: site plan of the proposed resort
Source: Researcher

The first building approached from the entrance is the administrative block/ resort check in. Directly behind it is a two storey building restaurant. Adjacent to the restaurant is the health and spa facilities consisting of the wet and dry spa on one wing, and an alternative medicine clinic on the other wing. These three major buildings are located in a radial manner interconnected with walkways.

Along the eastern axis of the site, towards the river bank are the lodging facilities. The lodging facilities are so located there as it is the quiet zone of the site, and the only source of noise being the calming sounds of the waterfall and the flowing stream.

Towards the southern part of the site are the recreation facilities. These facilities consist of cycling and hiking paths, courts for racket and ball games and moulds created artificially for physical activities. The recreation facilities are so located there so as to reduce noise pollution away from the tranquil and serene surroundings of the lodging facilities. Right in between the recreation facilities, lodging facilities and health facilities is the gardens consisting of sit outs, outdoor swimming pools, yoga area, children's playground and the aromatherapy garden.

Floor Plan Concept

The basic **design concept** that was used on the individual building **floor plans** are asymmetric forms which evolved from dynamic curvilinear forms so as to achieve that continuous flow with the other buildings in the site. Figure 6.4 shows the curvilinear design plan concept picking the restaurant as an example.

The restaurant is a two storey building with a capacity of 200 seats having a double volume central seating area flanked by a kitchen with its service entrance to the south east and another seating area to the south west.

Figure 6.4: researcher's rendered ground floor plan of restaurant
Source: Researcher

The restaurant also has a roof garden sit out at the south west overlooking the lush garden and the recreational area as well. Figure 6.5 shows the seating arrangement of the roof garden sit-out as well as the roof plan details. The central part of the restaurant is covered with a double glazing sky light roofing system which allows light to reach the interior, without compromising vision through to the exterior. .

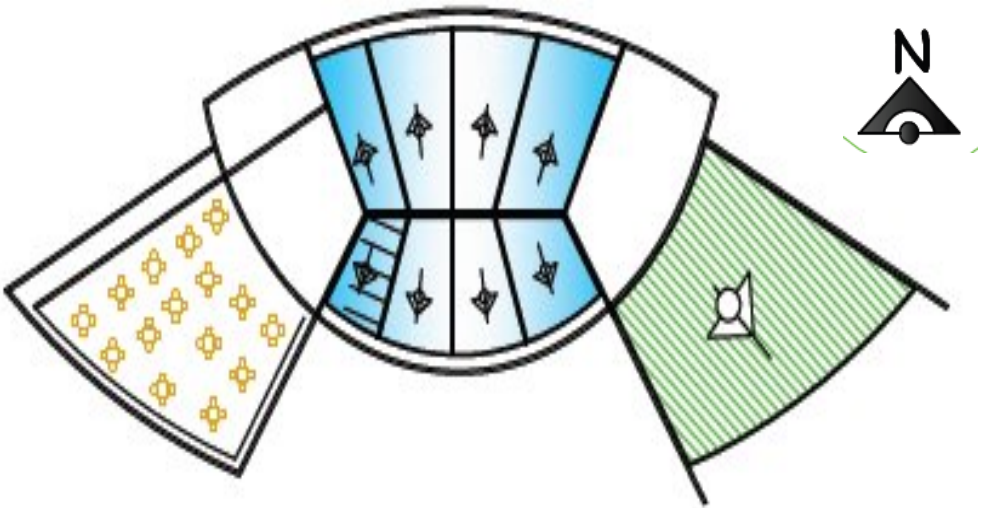

Figure 6.5: researcher's rendered roof garden sit-out of the restaurant
Source: Researcher

Another floor plan that is explained is the spa and (alternative) medical clinic. Its longer stretch is partly tilted facing the North West – South East axis (but a greater part of it towards the north south). It is flanked by the wet and spa areas on the right and the clinic on the left, but sharing a common entrance, reception and stairway. The wet spa area which consists of the indoor swimming pool, saunas, the hydrotherapy room and changing rooms are in the ground floor level for ease of piping and drainage systems. To the left of the wet spa area is the waiting room of the clinic with consultation and therapy rooms for acupuncture, chiropractic and physiotherapy. Figure 6.6 shows the ground floor plan of the spa and clinic.

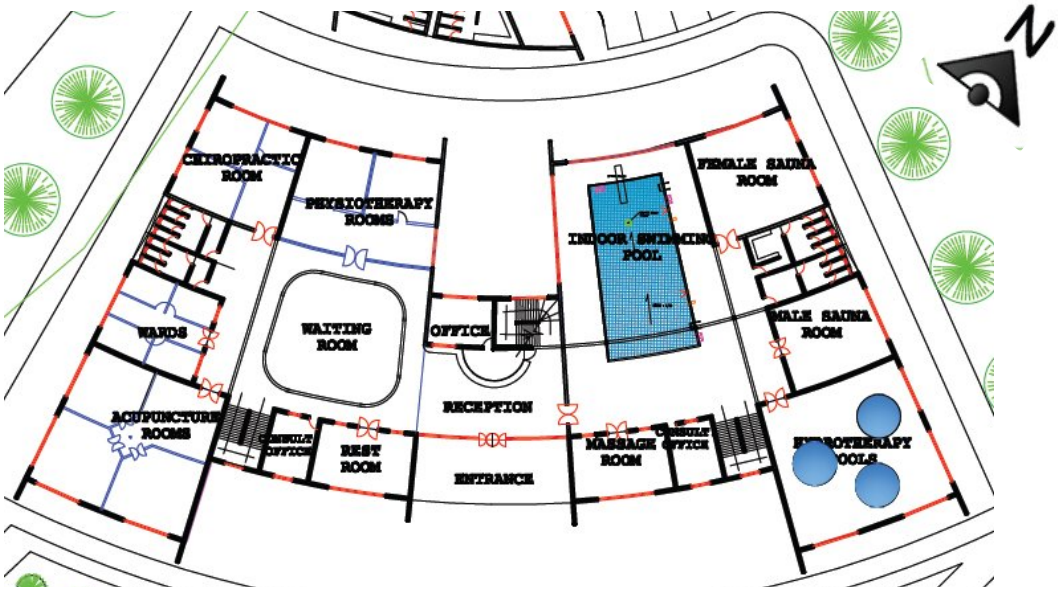

Figure 6.6: researcher's rendered ground floor plan of spa & health facility
Source: Researcher

The upper floor of the spa and clinic has a lobby linking the spa area with the clinic. The upper floor spa area consists of the massage rooms, gym and a group fitness class while the clinic upper floor has wards and sit-outs for the users to enjoy the views of the lush gardens it is overlooking. Figure 6.7 shows the floor plan.

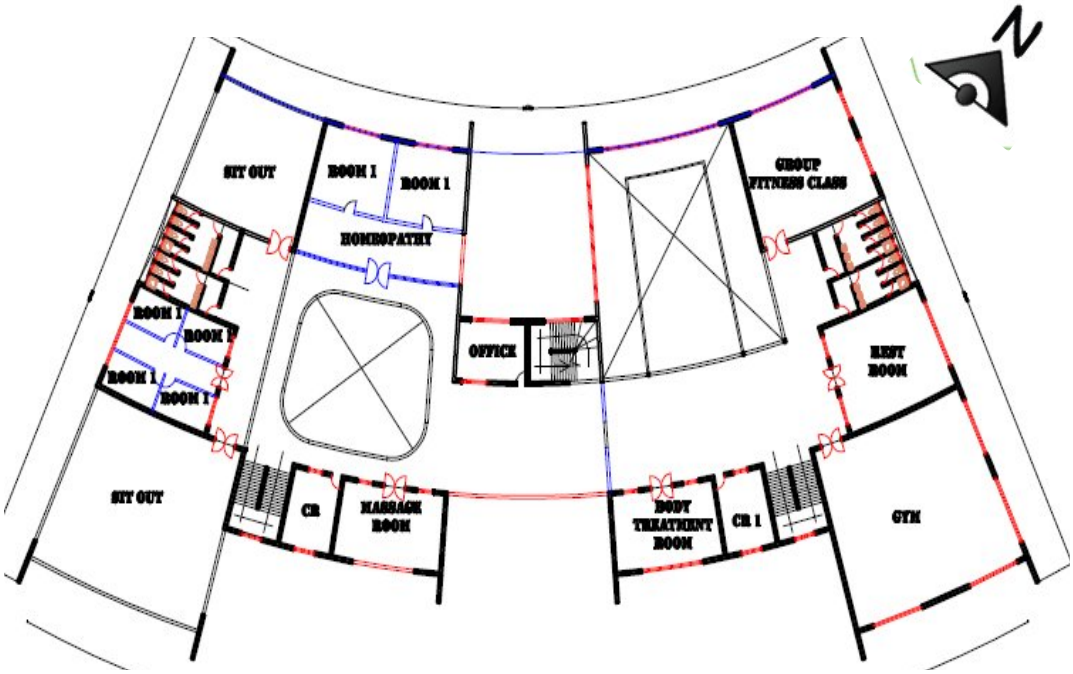

Figure 6.7: researcher's rendered upper floor plan of spa & health facility
Source: Researcher

Floor plan renderings of the other buildings of the resort are attached in the Appendix.

Form Concept

The building forms were purely based on functional and aesthetics which embody the articulation of architectural forms to achieve harmonious relationship, maintaining balance aesthetically. The massing of the building shows the unity of architectural forms and enhances good visual perception.

On the elevations of the buildings, the basic concept was the use of façade greening on certain paths so as to give a continuous flow of the horizontal landscape on the vertical plane of the buildings. Glass was also used to soften the building's massing. Geometric forms were also played with on the facades so as to give them a more aesthetic appeal.

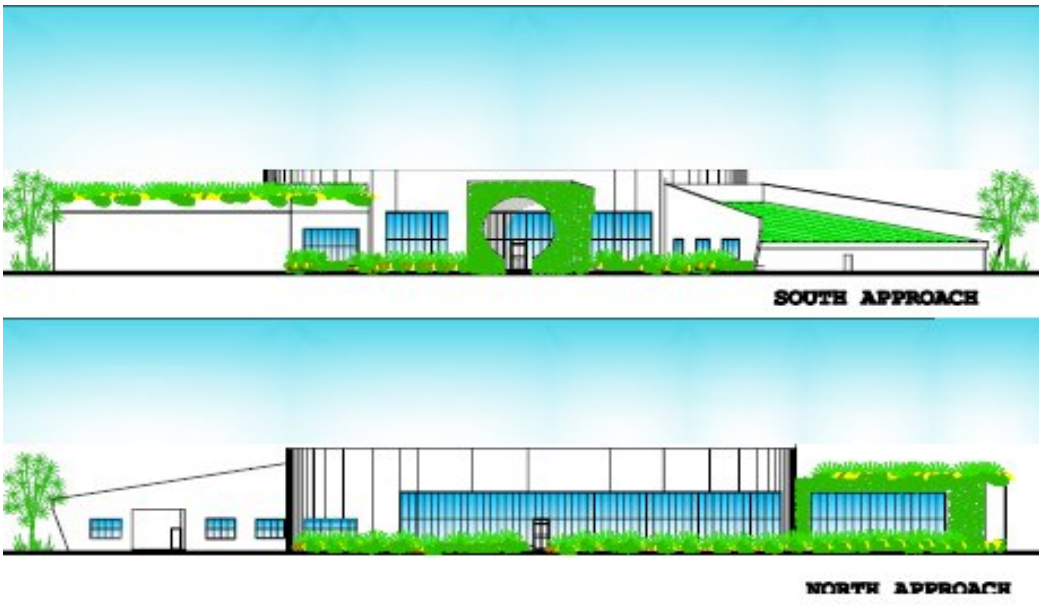

Figure 6.8: renderings of the north & south elevations of the restaurant
Source: Researcher

The north & south elevations are the longer stretch of the restaurant building. The entrance is located at the southern axis and has adequate glazing for aesthetic appeal and also for the good view of the garden adjacent to it. The roof garden sit-out is also

located at that same south axis so as to have a good visual perception of the site features. Figure 6.8 shows the north & south elevations of the restaurant.

Figure 6.9: renderings of the east & west elevations of the restaurant
Source: Researcher

The east and west elevations of the restaurant are the shorter stretch of the building where the kitchen is located on one end and a part of the seating area of the restaurant on the other. The glazing of these elevations is not as much as there are on the north and south elevations and hence shading devices are provided so as to reduce the amount of glare that may tamper with the customers' entertainment. Figure 6.9 shows these elevations.

For the spa and the alternative medical clinic, the longer stretches of the elevations face the north-west south-east of the cardinal. The entrance is located on the north-west and adequately glazed with fins provided at strategic places for shading. The sit out on this approach also overlooks the lush garden directly opposite. Figure 6.10 shows the elevations.

Figure 6.10: renderings west elevations of the spa & clinic
Source: Researcher

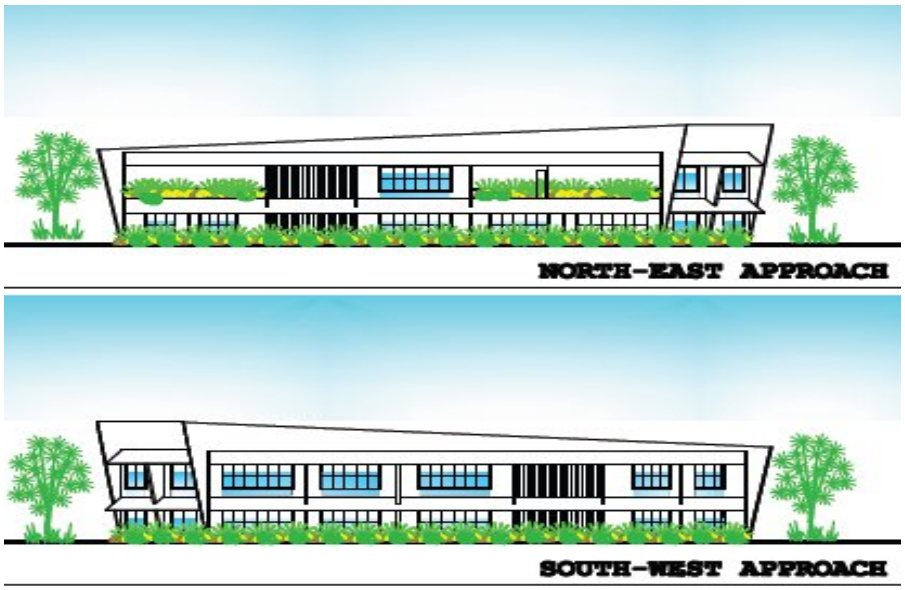

Figure 6.11: renderings west elevations of the spa & clinic
Source: Researcher

The shorter stretches of the spa and clinic face the north-east south-west of the cardinal. The south-west elevation overlooks the recreational area; hence it is adequately glazed for good visual perception but provided with fins for shading. The north-east elevation on the other hand has the advantage of the beautiful view of the waterfalls. Figure 6.11 shows the elevations.

Elevation renderings of the other buildings of the resort are attached in the Appendix.

Building Expression

One feature peculiar to the buildings in this resort were basically curvilinear forms, and this also being a health resort, renewable or local materials should be used for construction so as to help to create a strong connection between the buildings, the natural context, and its cultural context. For this reason, masonry bricks were dominantly used due to their desirable nature in resorts development. Masonry is a well proven building material possessing excellent properties in terms of appearance, thermal and acoustic insulation as well as fire and weather protection. It is also relatively cheap but durable.

Building materials used for outdoor facilities were of local materials such as thatch, stone and timber so as to create harmony with nature.

SUMMARY AND CONCLUSION

This research was built on the utilization of natural features to create healing environments, the problem definition being that biophilic design attributes offer a better connection between people and the natural environment. This draws its background to the study of relevant literature.

The introductory chapter discussed briefly on the research topic, stated the problem that resulted to the research, outlined the aim and objectives and also justified the research topic. The scope and methodology of research that was employed was also discussed.

Chapter two discussed an overview of resorts, classes and various types of resorts. The discussion was emphasized mostly on spas and health resorts with the various types of spas and how they were classified according to their functions. The design and planning of spa resorts was also discussed, briefly mentioning the trends and concepts of future spas, and also the relationship between health-oriented activities and recreation.

Chapter three began with the concept of wellness and healing environments. Relevant literature on nature, its features and its therapeutic features was then assessed. Biophilic design and those attributes that can support and encourage restorative (healing) environments were also assessed. These attributes include: dynamic natural lighting and ventilation, curvilinear shapes and forms, sensory and direct interactions to nature, façade greening and health benefits of plants and water. These attributes, from research, were understood to help de-stress individuals for restoration and recovery.

Case studies were analyzed in chapter four. Each of the case studies were chosen based on purposive sampling using general variables recognized in spas and health resorts and also analyzed based on certain predetermined variables with emphasis on the degree to which healing environments were considered in the design and planning.

Selection of site and analysis of the chosen site for the proposed design was done in chapter five. Attributes of the site were discussed as well as physical, geological and climatic analysis.

Chapter six discussed the development of the site brief as according to the intended scope of the work. The concept of the proposed spa resort evolved from the general perception of health resorts and with the biophilic design attributes that were discussed in the literature reviews. The design was developed through an understanding and analysis of the requirements of those attributes that would facilitate the appropriate positive experience for the user. With the utilization of these attributes, the designing of the resort exploited nature's grandeur and produced a functional environment and at the same time a restorative environment which will help to promote physical, cognitive and psychological well-being fostered between the connections of the users with nature.

In conclusion, the study expressed the relevance of the attribute of biophilic design which enhances human psychology, comfort, movement and sustainability in the resort environment. The utilization of these attributes to achieve the desired outcome offered the unique and essential quality so also with the various activities in the resort. This study therefore emphasized that biophilic design provides an essential tool to proffer solutions to the insufficient methods of healing in spa resorts, as regards to the environment.

CONTRIBUTION TO KNOWLEDGE

Having carried out this research, the contribution to knowledge cannot be overstated. The establishment of the design goes in conformity with the natural environment. It has been established that as individuals spend more time in naturally landscaped environments, this helps in de-stressing and reducing the likelihoods of certain stress related diseases. Therefore, through careful studies of the site and its features and how it can be used in design to enhance restoration, this can be adhered to by designers to improve and design health facilities and resorts that are highly functional, aesthetically pleasing and comforting, structurally stable and healthy be it a hospital, spa and fitness facility or any other related healthcare facility.

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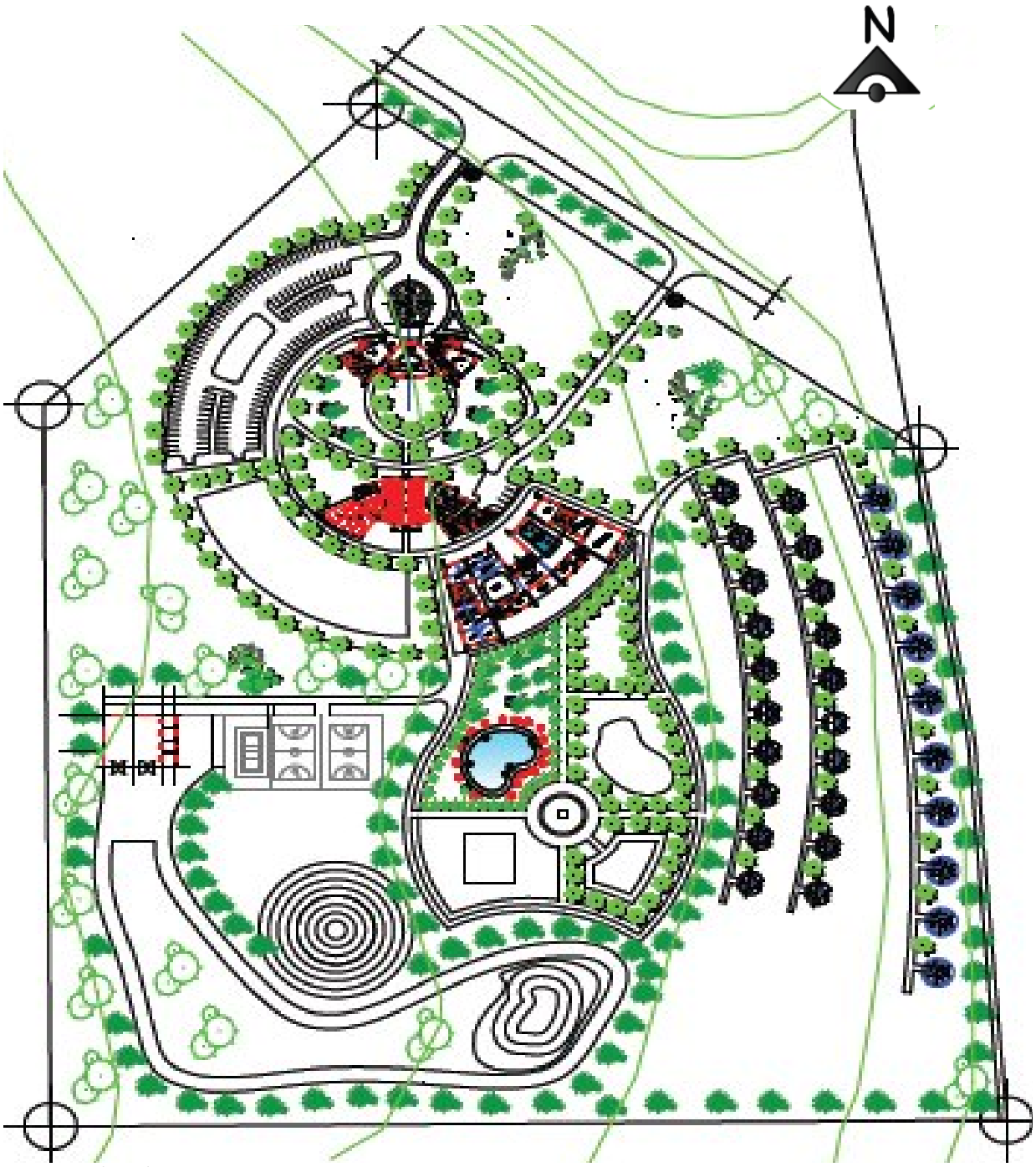
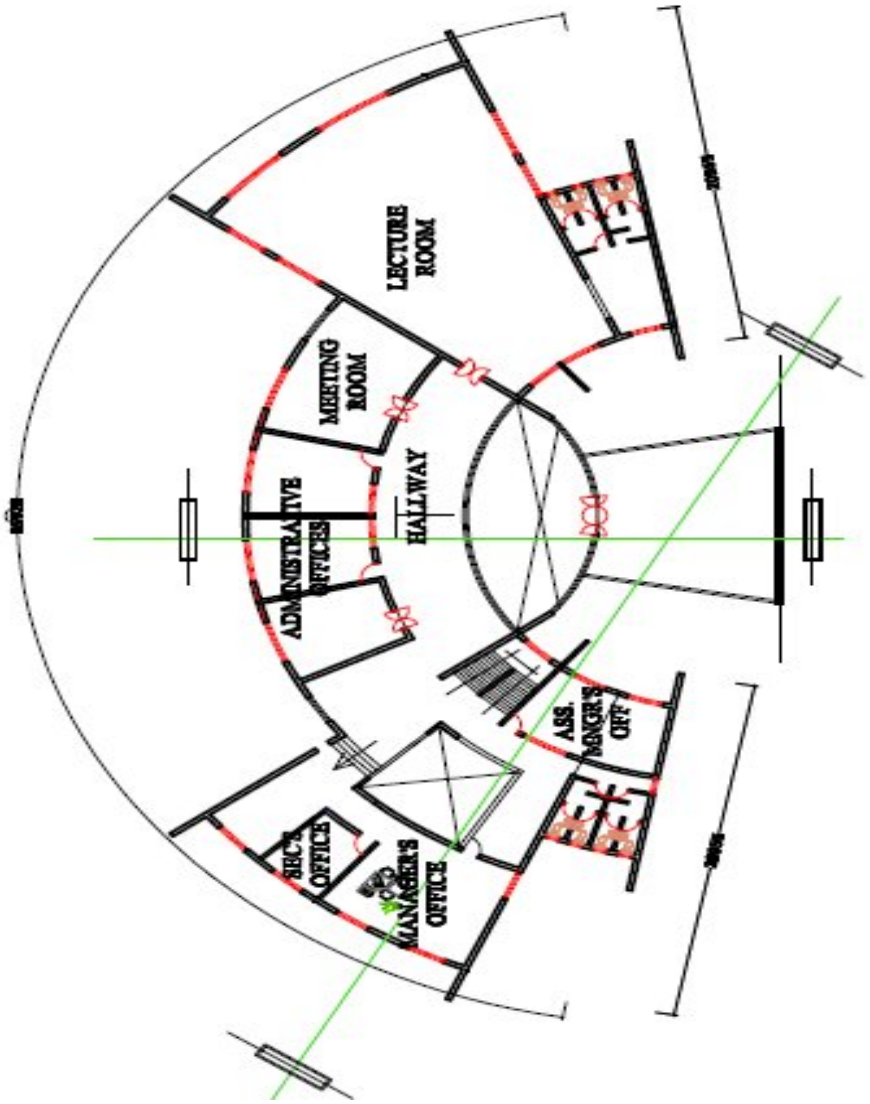
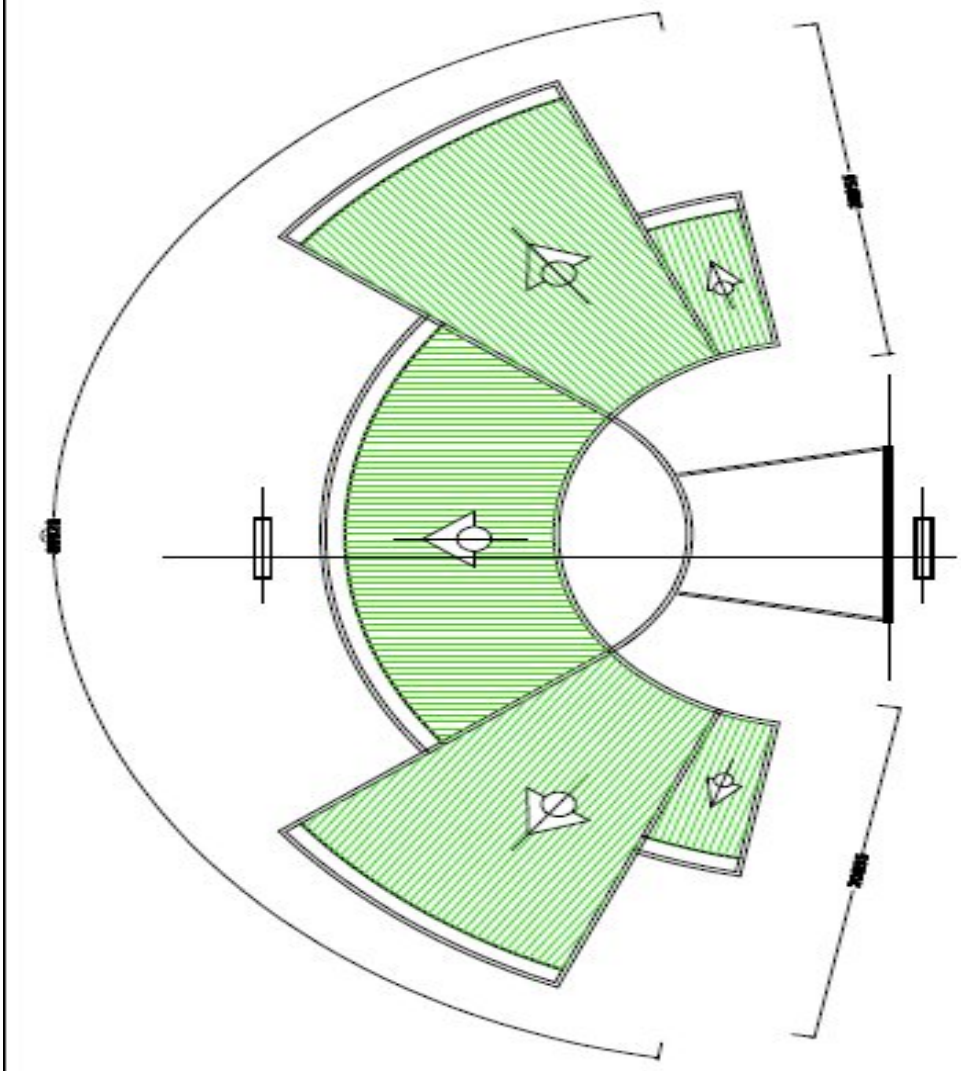


App. 1: site plan

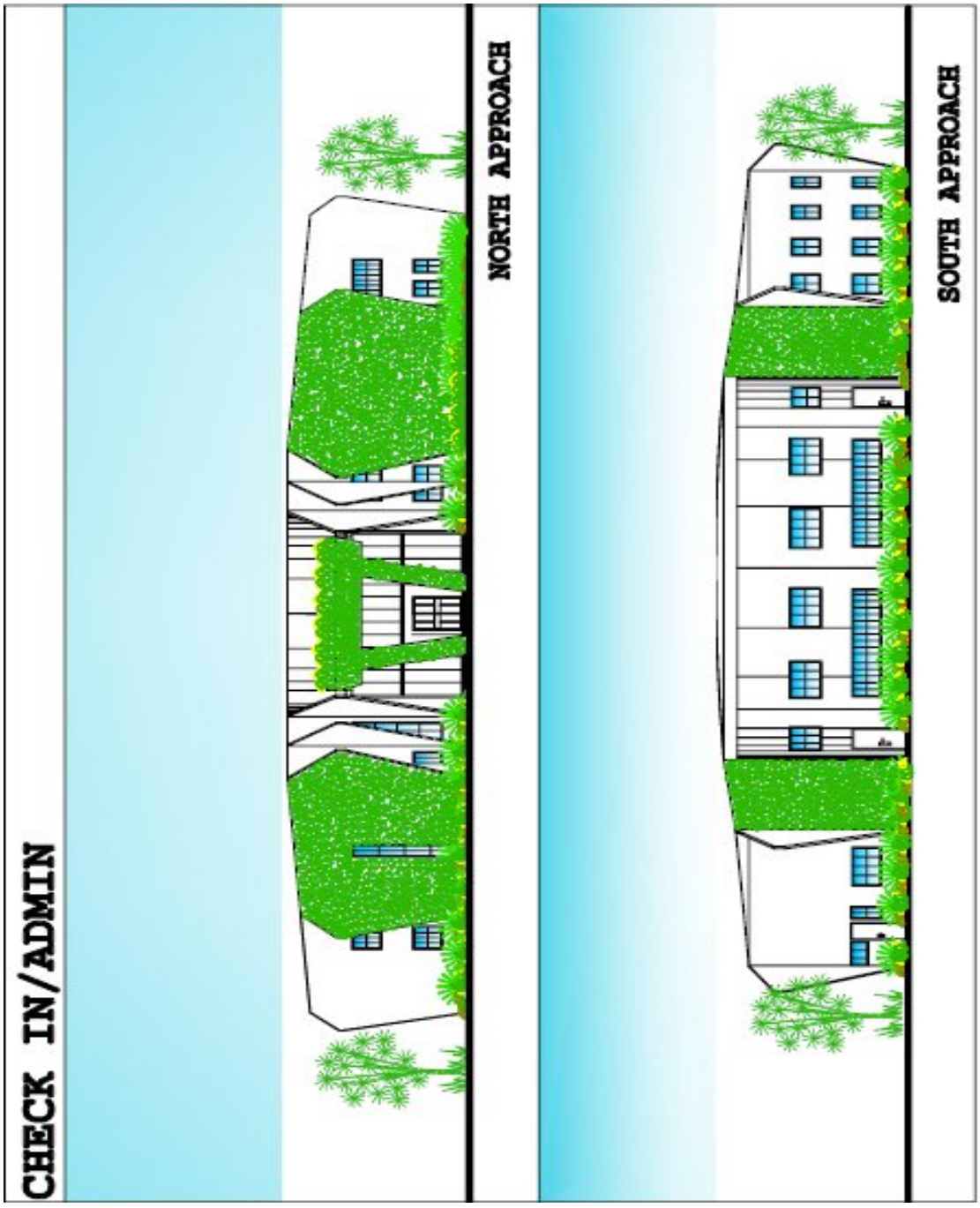
App. 2: check in/admin ground floor plan



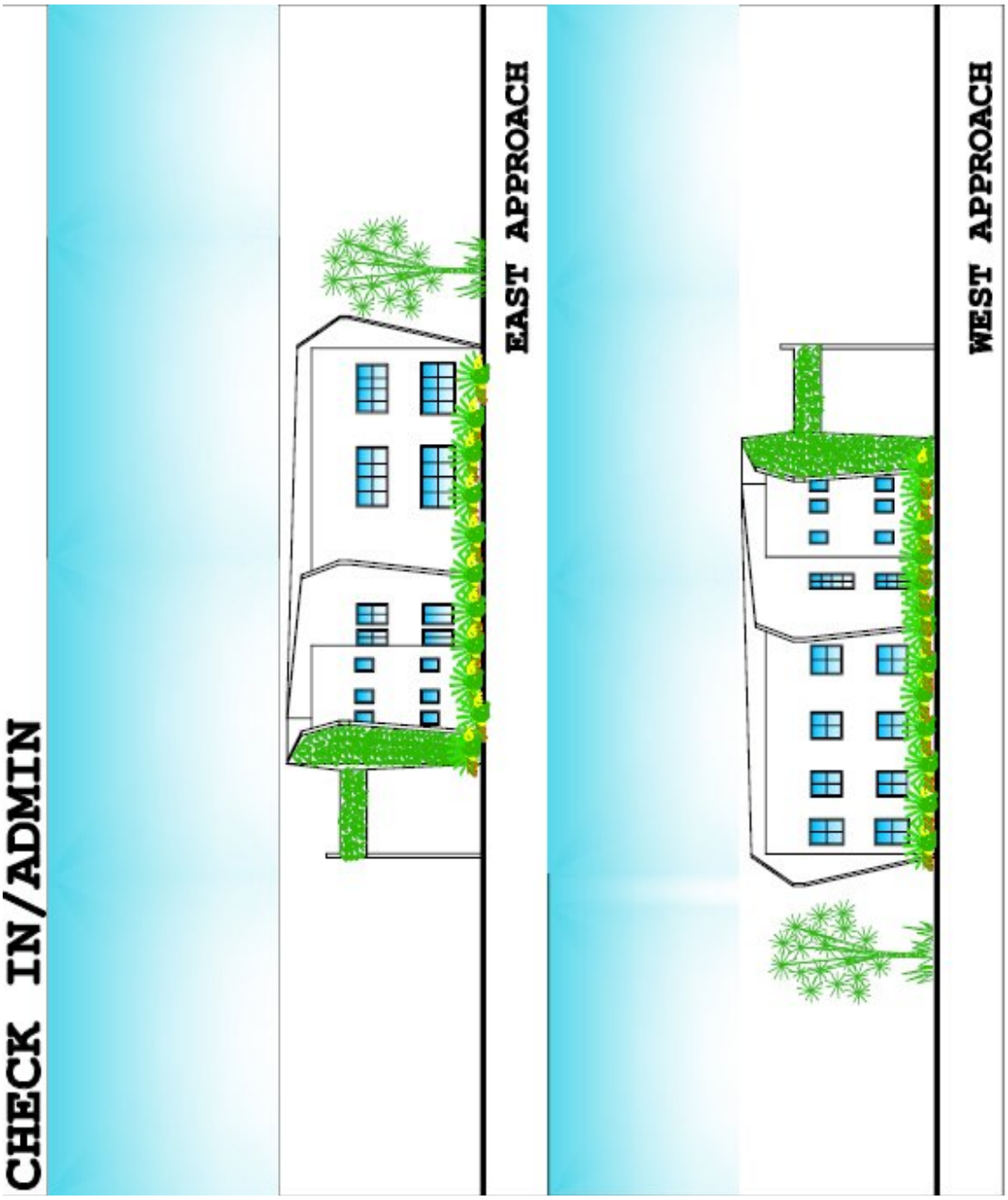
App. 3: check in/admin upper floor plan



App. 4: check in/admin roof plan



App. 5: check in/admin elevations



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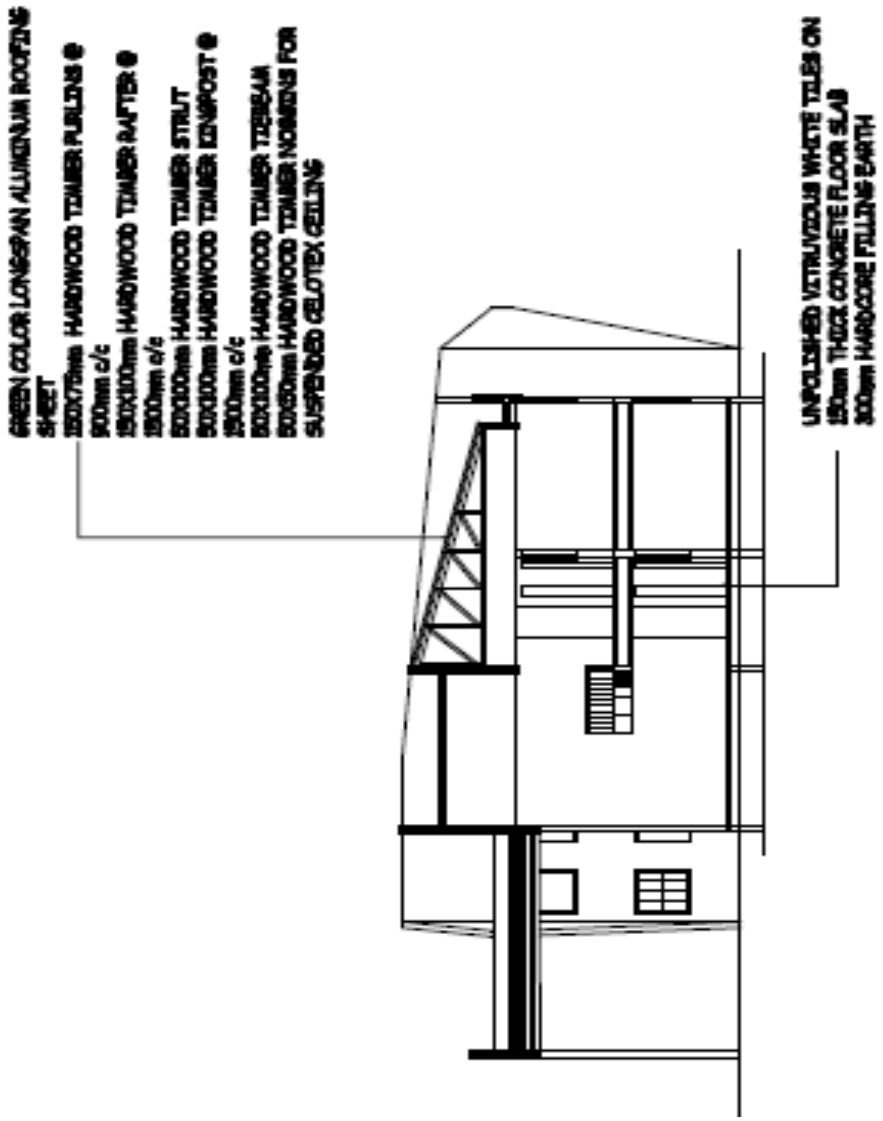
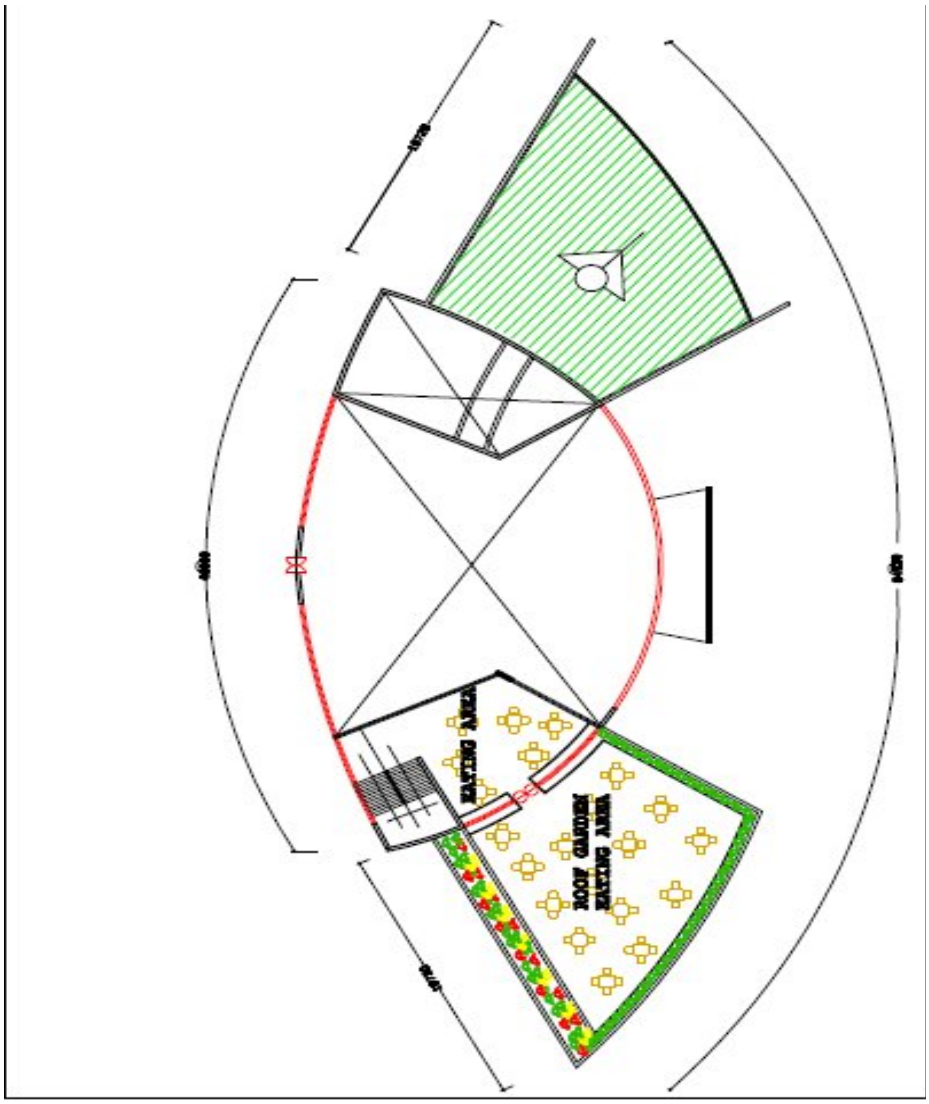
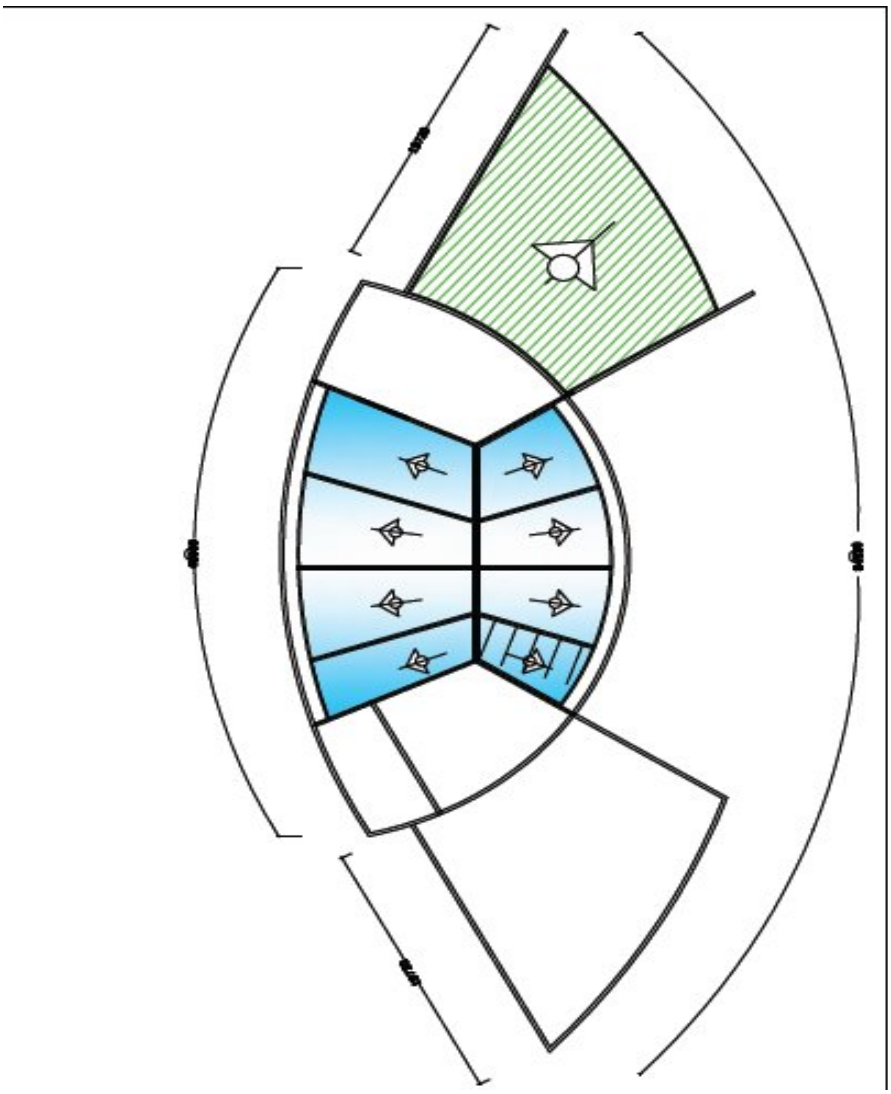


App. 7: check in/admin section

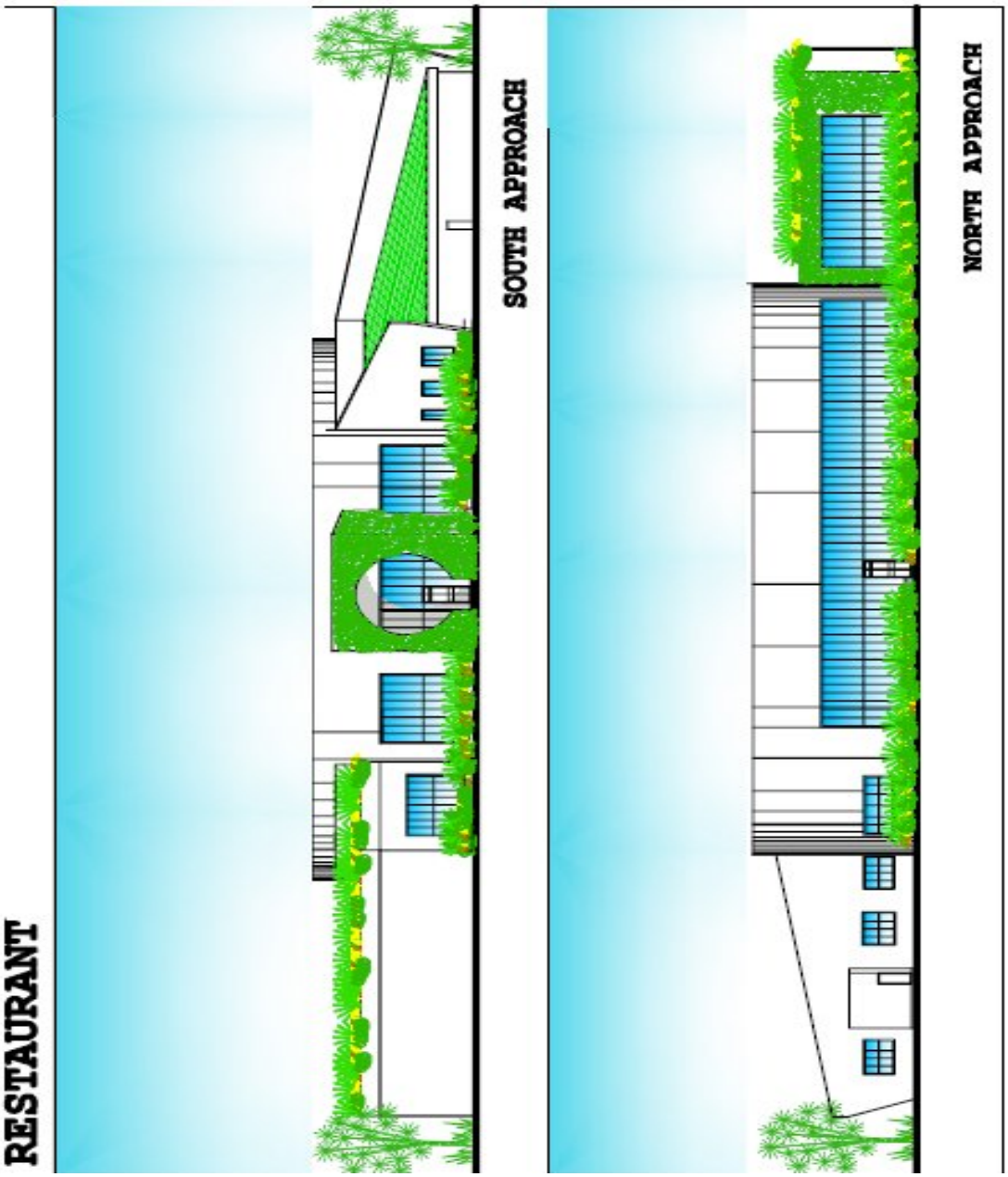
App. 8: restaurant ground floor plan



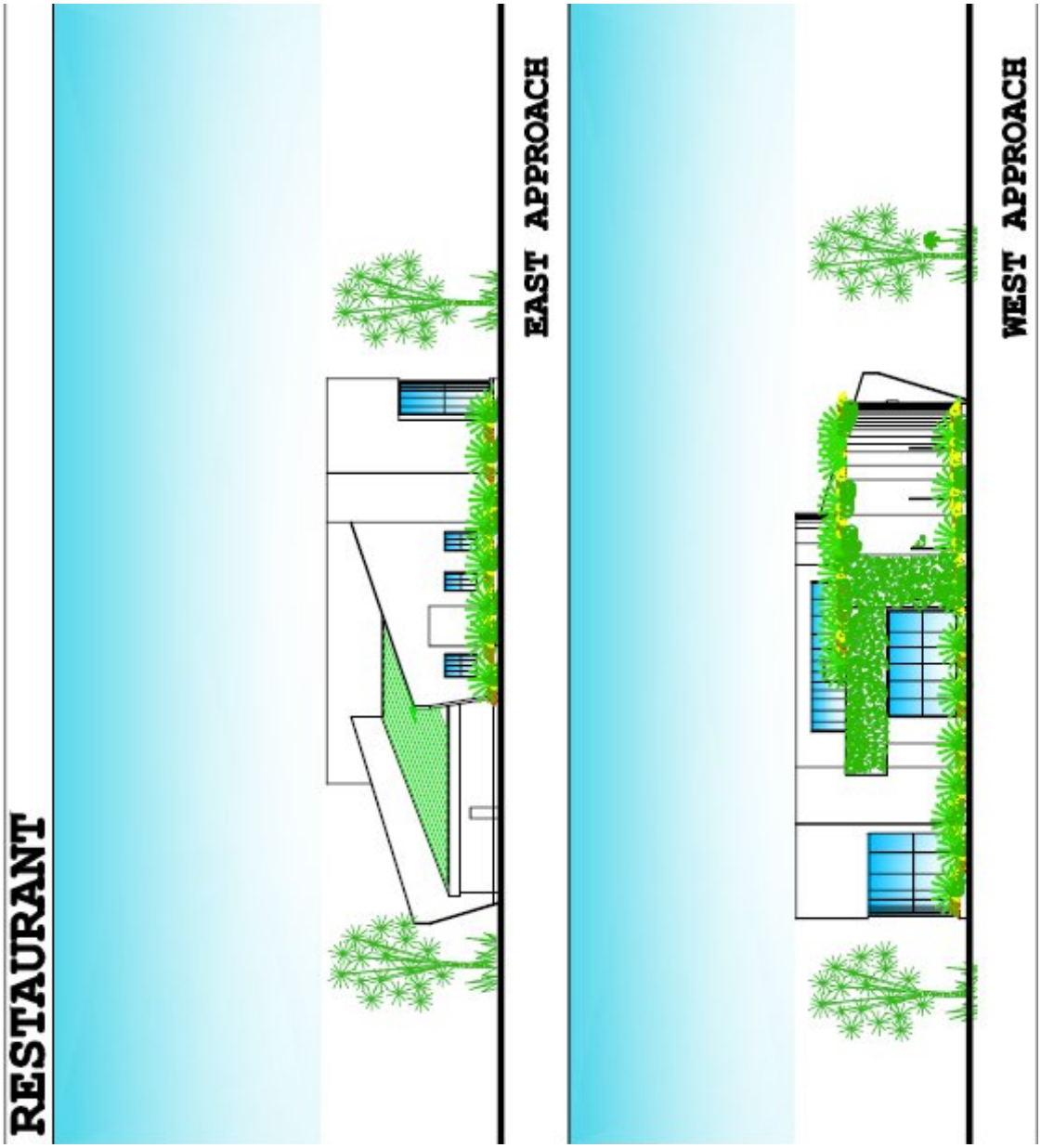
App. 9: restaurant upper floor plan



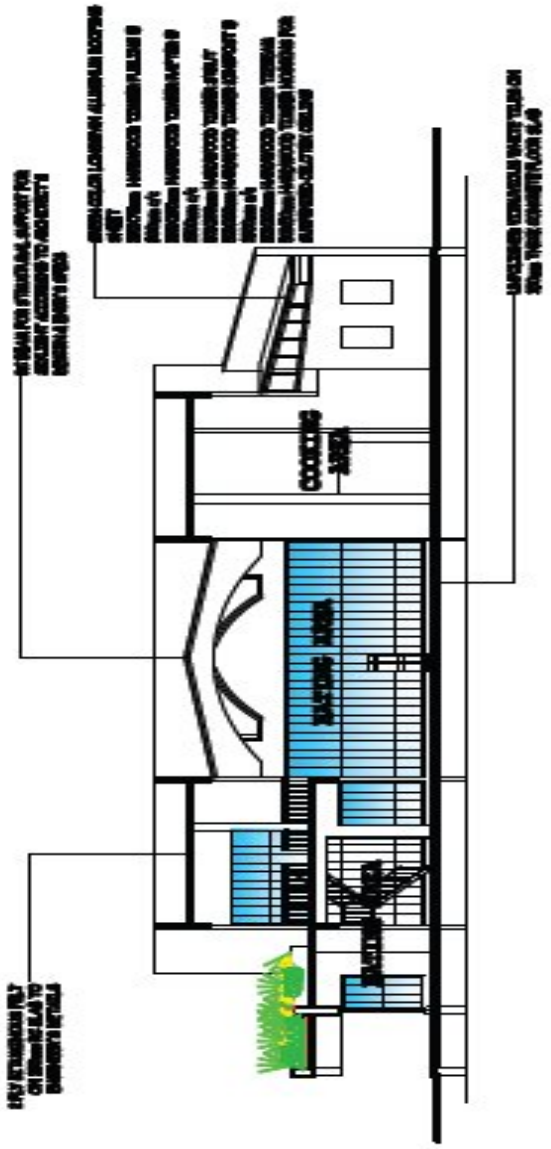
App. 10: restaurant roof plan



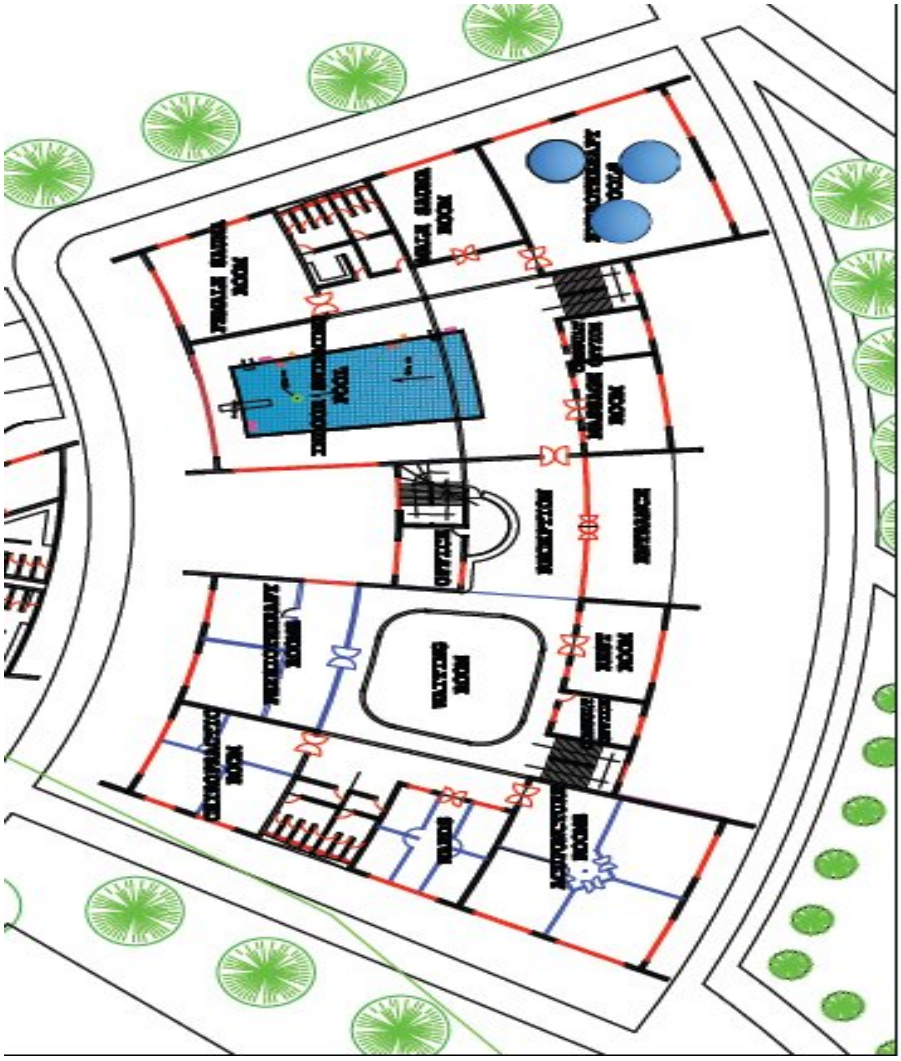
App. 11: restaurant elevations



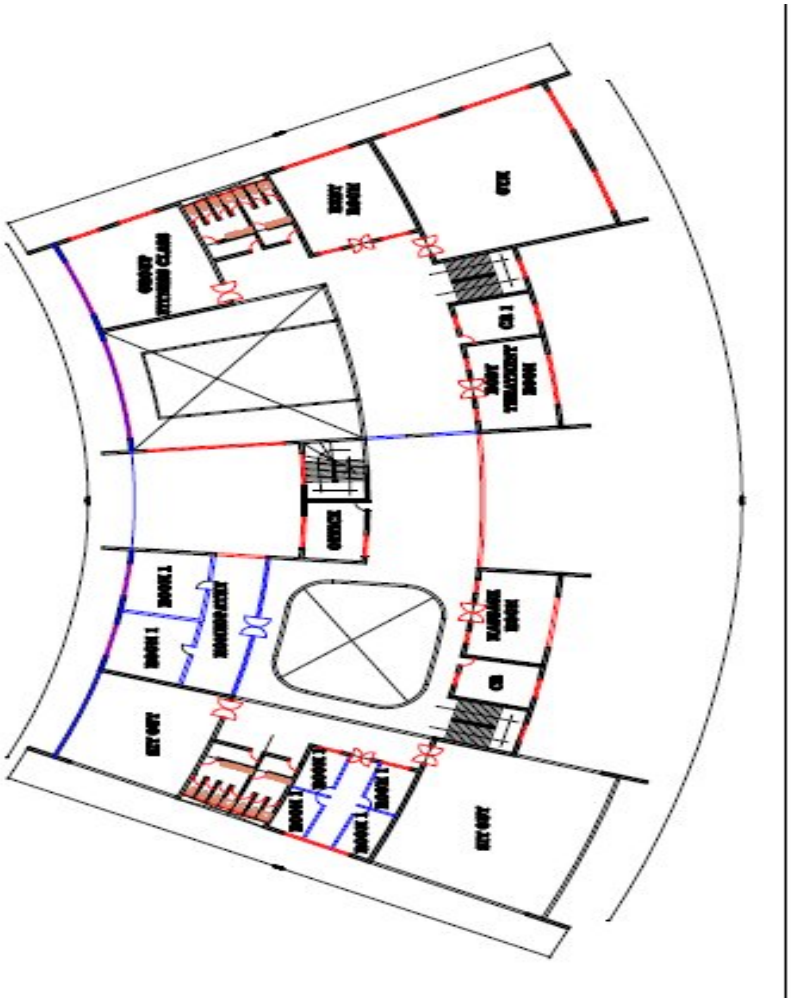
App. 12: restaurant elevations



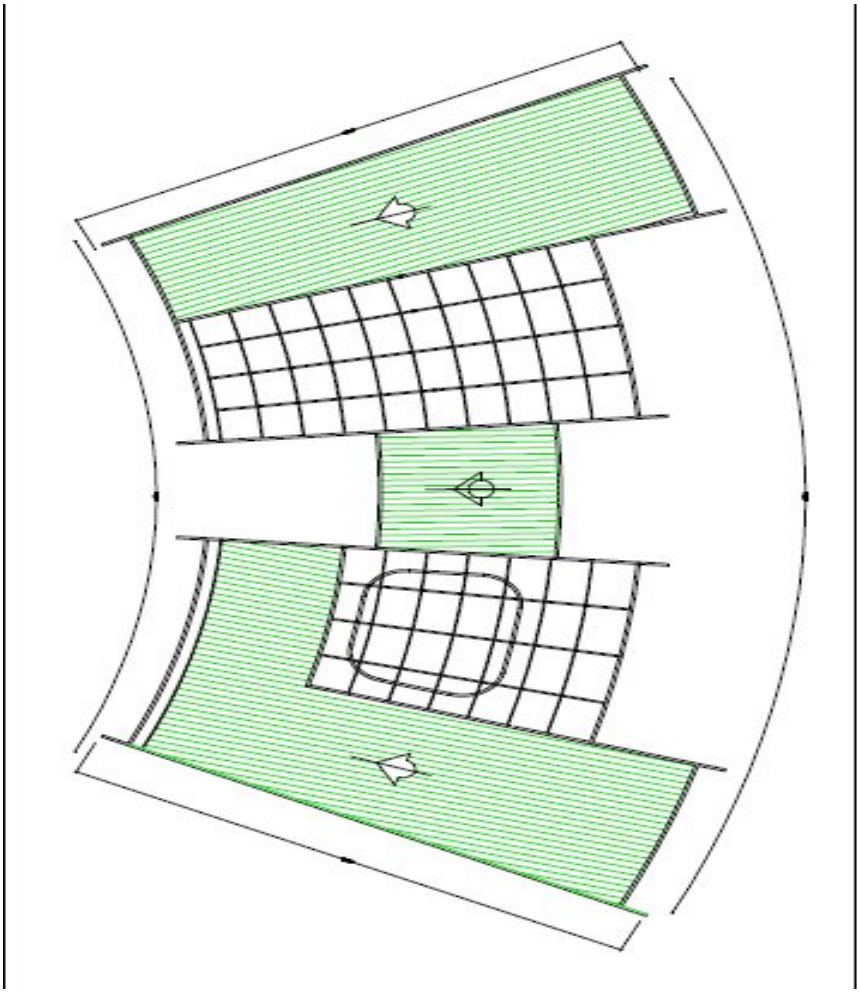
App. 13: restaurant section



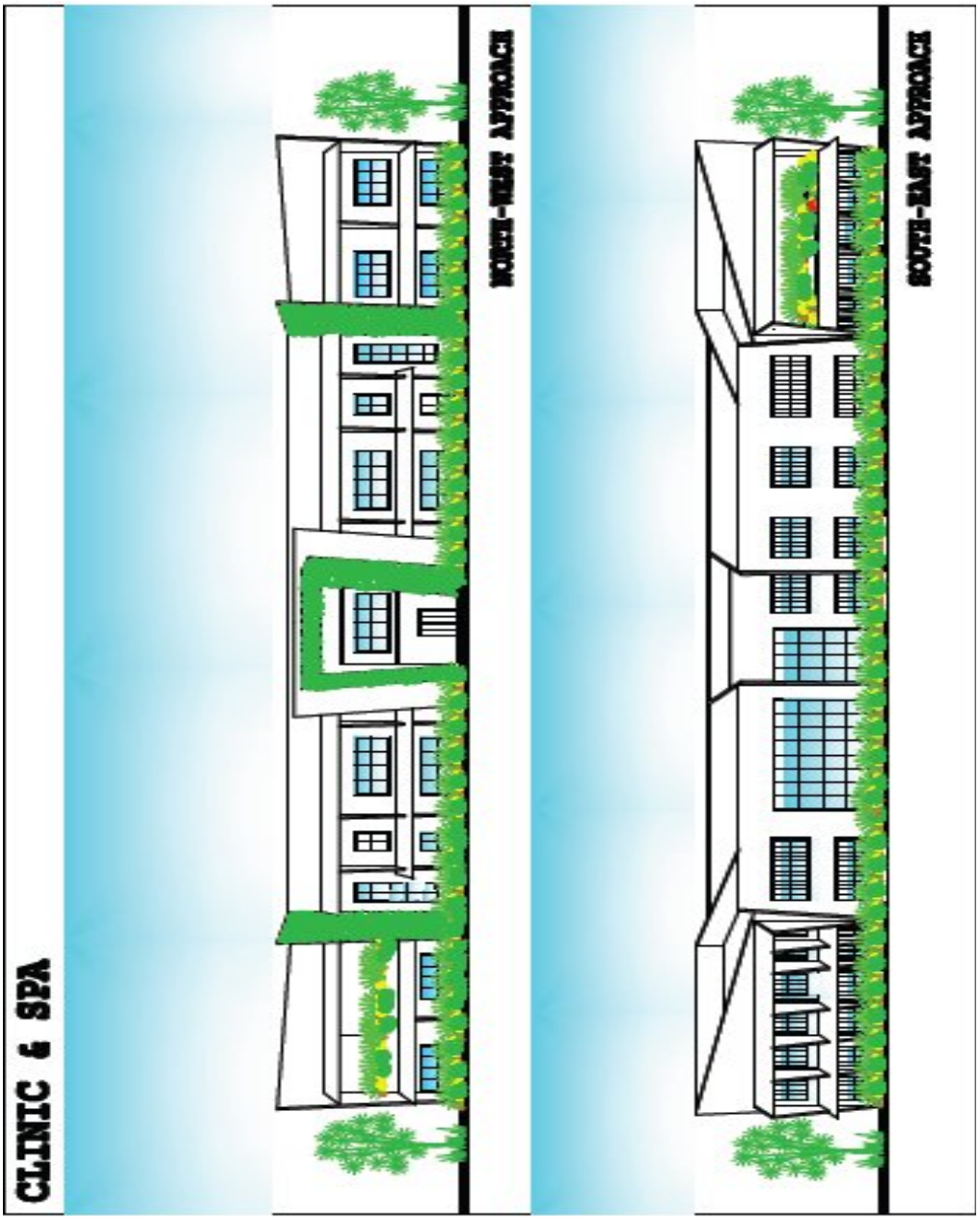
App. 14: clinic & spa ground floor plan



App. 15: clinic & spa upper floor plan

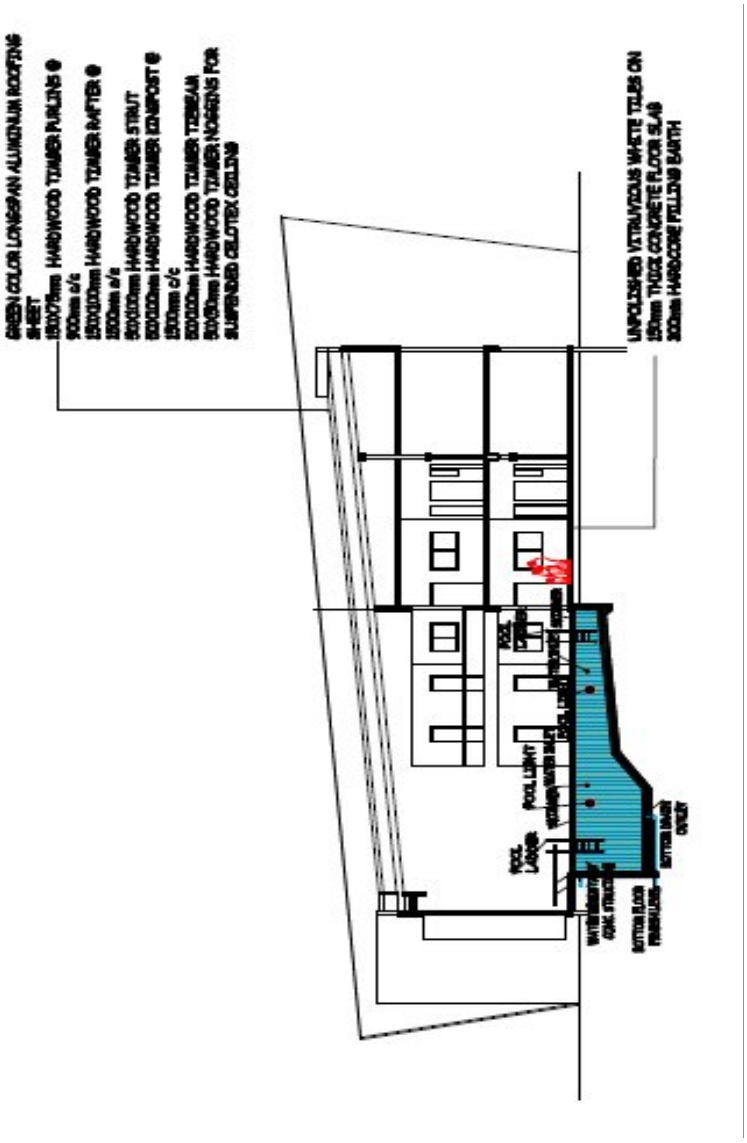


App. 16: clinic & spa roof plan

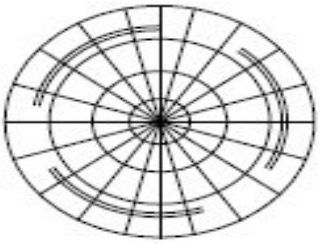


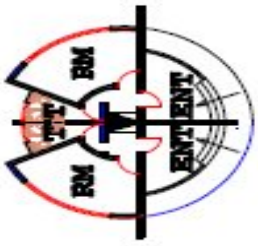
App. 17: clinic & spa elevations

App. 18: clinic & spa elevations

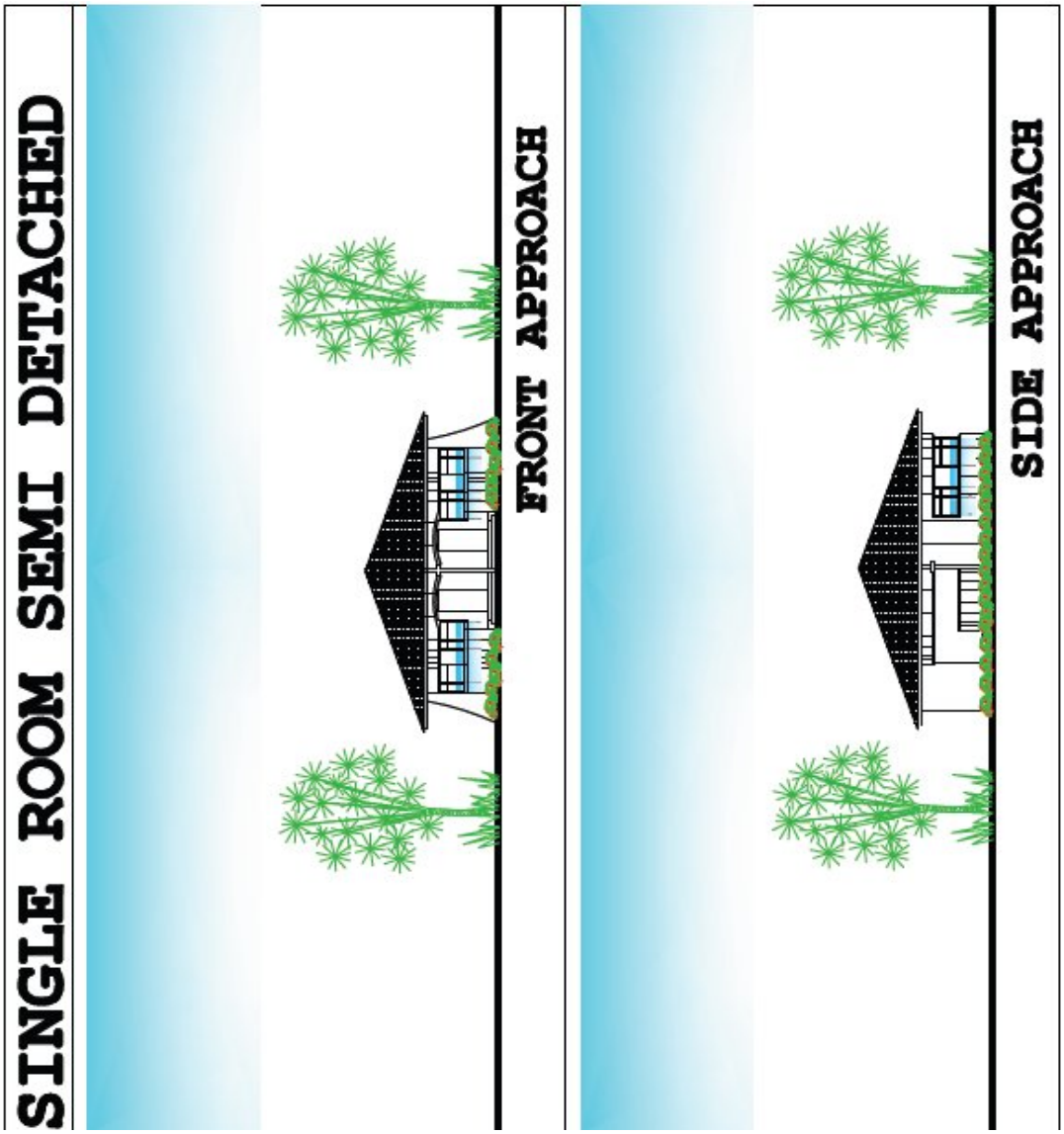


App. 19: clinic & spa section

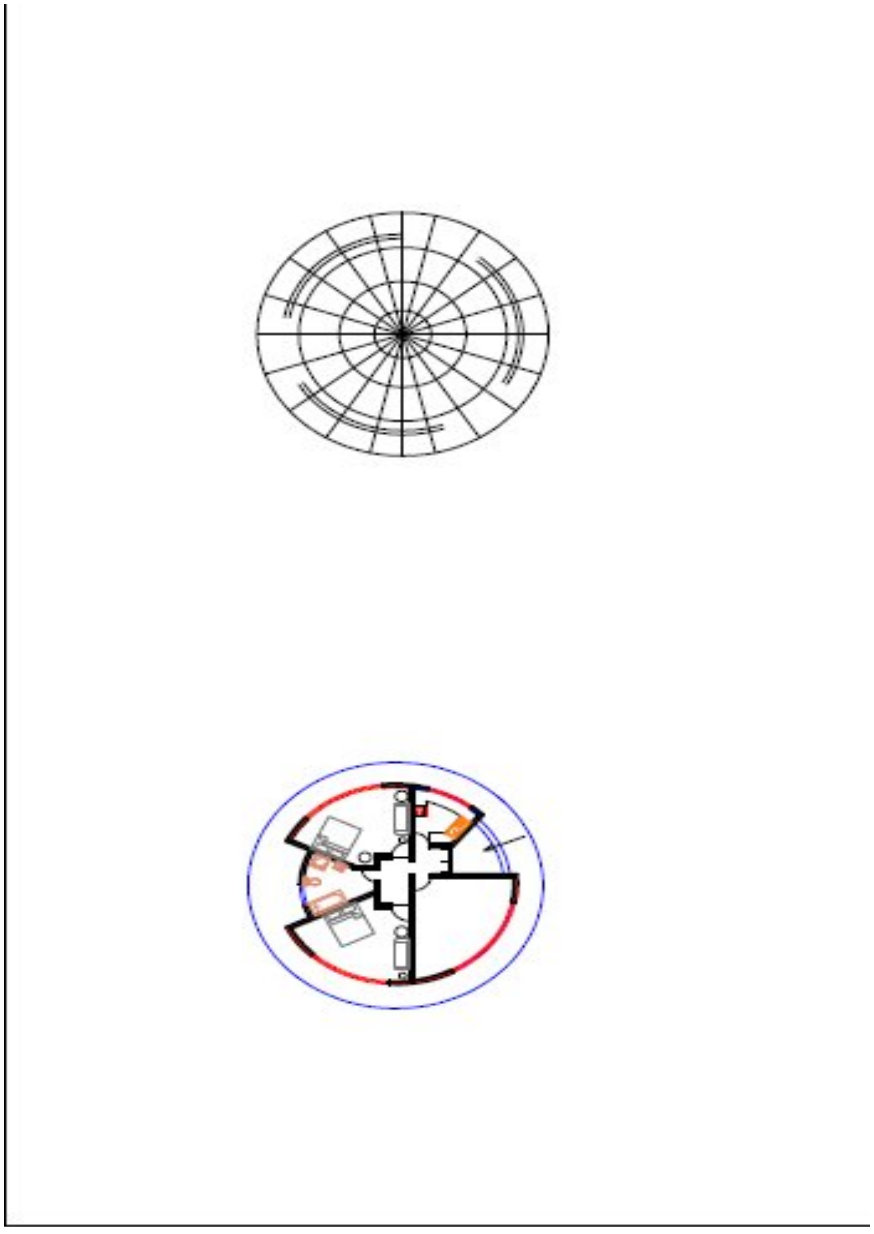




App. 20: single room semi-detached guest chalet floor & roof plans



App. 21: single room semi-detached guest chalet elevations



App. 22: double room guest chalet floor & roof plans

App. 23: double room guest chalet elevations