A Proposed Shopping Mall for Ace Investment, Ibadan (Effective Daylighting Strategies to Enhance Circulation in Shopping Mall)

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Certification

This is to certify that **I, Eyitayo Adetunji AFOLABI** with matriculation number **LCU/PG/002152** carried out this research work titled "Effective Daylighting Strategies to Enhance Circulation in a Shopping Mall" in the Department of Architecture, Faculty of Environmental Design and Management, Lead city University, Ibadan, Oyo State, for the award of Master Degree (M.Sc.) in Architecture and has not been previously submitted.

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Dedication

The research work is dedicated to Almighty God for His Supremacy and being the Redeemer of my Soul.

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Abstract

Shopping malls makes a contribution to commercial enterprise extensively than conventional markets which were seemed for meeting Patrons supply and demand's need. The evolution of shopping mall concerned the changes in end-users' and retailers' behavioural sample. Malls attract customers and retailers supplying enough time to make alternatives in addition to leisure way of buying. Imperatively, daylighting system would be a better ideology to be applied within the interior of a shopping with a view to offer the revel in and out of doors daytime whilst within the mall. It will advantage to intensify circulation through adequate visibility and minimize the use of Mechanical means of lighting during day time. Introduction of French or High window heights to admit lighting into the deep and large spaces of the Mall. To sustain the effect of daylighting system within the shopping mall, a field survey was carried out to explore daylighting benefits from the Customers' point of views. This design report is targeted on examining the techniques of daylight adoption into the shopping centre through the window heights and Skylights (Atrium) that allows you to accentuate visibility of customers at some point of circulation in the mall. This study also found that illumination was rated as the most important element within the interior of a shopping mall.

Keywords: *Effective Daylighting, Shopping Mall, Customer perception, Daylighting strategies, Ibadan, Case Study*

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Chapter One

Introduction

1.1. Background to the study

The adoption of natural Daylighting in indoors areas of Shopping Malls is very essential due to the fact that power consumption would be reduced on a larger scale, with numerous patrons of the spaces may be improved, which undoubtedly have an positive effects on their fitness.

According to the Warnaby, G., & Medway, D. (2018), Shopping Mall or Mall is one or greater Buildings forming a rows of shops representing merchandisers, with connecting walkways permitting patrons to link stalls. While a few other centers within a Mall may encompass Cinema and food/drink outlets for undertaking cause. Shopping is a hobby, method and system has advanced extensively these days with new bureaucracy, styles and formats responding to needs for comfort and easy entry to physically and on line. There has been upward push and dominance of the essential multi-country wide outlets because of their electricity and energy within the market place vicinity, where many unbiased and local outlets often locate that they cannot compete in terms of rate or availability of products (Szymańska, A. I., & Płaziak, M. 2018).

In European towns, huge departmental shops have come to be vacationer attractions unto themselves (Khare, A., & Kautish, P. (2022). These days, there are extraordinary places to shop, which provide each sort of shop conceivable, massive car lots, display movie screen theatres, with wide sufficient form of activities that can have interaction the consumer the entire day. In Nigeria, there is a gradual movement from the historic Markets to Malls and Plazas. Though this is pretty first-rate in main cities like Abuja,

Lagos, and Port Harcourt, the old open market place forms have not been carried out away with. Although these new malls generally tend to perform lengthy hours, a few towns and concrete centres still function selected market place days (Khare, A. 2020).

According to "Kasim, S. B. (2020)." customers of cutting-edge purchasing centres are not handiest challenge approximately tenant mix and facilities supplied in the shopping centre but also building high-quality which give snug environment for them". The constructing pleasant consists of the facilities, outside and interior layout of the constructing. Each detail has special importance degree for the tenants. The shopping center has ideological influence on consumers, because its miles designed to represent comfort, desire and luxury, Rokka, J. (2021).

In regards to customers' comfort in Malls, it is imperative for good enough consideration to accept to the supply of sufficient and dependable lighting within the mall to enhance proper visibility of users even as transferring across the shopping mall with a purpose to avoid accidents. Due to the bad country of electricity supply in Nigeria it has become imperative for enough provision to be made for ok usage of daylight hours within buying department stores which saves cost. According to Xue, Y., & Liu, W. (2022) Daylight ought to always be the primary choice for illuminating an area at some point of the day, unless the feature particularly excludes it. It is beneficial due to its zero energy consumption, directionality, variability, intensity and color. People are tolerant of the range of mild ranges in the event that they realize that the light is daytime. However, it can grow to be a supply of annoyance and/or give upward push to a want for compensatory heating or cooling and consequently needs to be balanced towards excessive warmness loss, or unwanted solar gain or glare. Natural light need to therefore be taken into consideration along the view, the layout of areas and the activities" Wong, L. (2017).

According to Wong, L. (2017) lighting plays a widespread function within the human behavior. Chew, I., Karunatilaka, D., Tan, C. P., & Kalavally, V. (2017) said that lights impacts the human sensory response, favored impressions, expectations and subjective impressions (visible readability, spaciousness, rest, and sense of privacy). Lighting also has the power to direct activity. Haq, M. A., Hassan, M. Y., Abdullah, H., Rahman, H. A., Abdullah, M. P., Hussin, F., & Said, D. M. (2014), explored the effect of lighting fixtures on the selection of which passageway humans would use among a brightly lit passage and a poorly lit passage and then they located from their assessment that the greater brightly lit passage became the only that was utilized by most people.

According to Yüksek, I., & Karadayi, T. T. (2017) 35% of the strength used in buildings are utilized for lights. Energy consumption in Shopping Centre buildings which have big volumes and incredible wide variety of users may be reduced by the usage of day lighting. Considering the quantity, feature and consumer amount of the general public areas of purchasing facilities are the extra reasons for the use of daytime. Daylight is typically related to high window heights, high reflective ceiling and wall finishes, narrow floor plans, big facade and skylight openings with high transmittance glazing. Examples of some open buying middle structures constructed in countries. Obralic, A. (2021).

1.2 Statement of the problem

Due to the epileptic state of power supply in Nigeria, accidents could occur within the shopping mall. Therefore, Consideration of Day-lighting strategies during shopping mall design helps to avert such incidences.

1.3 Research question

1. The efficiency of electrical lighting system in shopping mall in relation to daylighting

2. The advantages of day-lighting is shopping

1.4. Justification of study

Ibadan, the capital metropolis of Oyo State is a city centre that witnesses high proliferation of commercial centres in unique locations. The boom in call for industrial properties such as stalls brought about a growth in the relative supply of such centres. This resulted inside the conversion of a number of the reason-constructed residential residences into commercial uses especially shopping centres in and at the fringe of the Central Business District. In famous Shopping Mall designs, little consideration is given to the use of daylight within the buildings to aid visibility of users while moving around the mall there has been often high dependence on artificial lighting which is not stable due to poor power supply in Nigeria and necessitates the use of Generators which is often expensive in the long run.

1.5 Aim and Objectives

The aim of the design project "shopping mall for ACE Investment Limited" is making provision for the Effective use of Daylight via the adoption of a few strategies. Such objectives are;

i. Examine the regions in which daylighting may be very effective within the shopping center.

ii. Assessment of daylighting techniques that can be adopted in the layout of buying malls.

iii. Outline the benefits of daylighting as an alternate source of lighting system in a shopping Centre.

1.6 Research Methodology

As the study was designed to be comprehensive, the descriptive survey method will be employed.

The adopted procedures include the following:

i. Review of relevant literature on Day lighting in shopping malls.

ii. Carry out case studies of existing shopping malls to assess daylight strategies adopted.

1.7. Research Hypothesis

The recognition on the necessity and approaches of imparting daylight in Shopping Mall indoors areas for sustainable in lots of components consisting of improving indoor environment best, energy efficiency and its effect on human behavior and psychology.

1.8. Significance of the Study

The primary reasons for adopting daylight to enhance illumination requirements of an

Architectural space are:

1. It is expected that the study will provide ambient lighting requirements during daytime hours around the Shopping Mall through the adoption of selected daylighting strategies. It will however enhance human psychological effects.

2. The study will also emphasize the need for high consideration to be given to daylighting in shopping mall during design to create a sustainable environment.

3. It will however achieve significant energy savings by reducing energy costs and associated cooling energy costs within the Shopping Mall.

1.9. Scope of study

This study is focused on examining Day lighting strategies that can be adopted to provide Illumination within circulation spaces in a shopping mall. The location of the project is Ibadan, Oyo state, Nigeria.

1.10. Limitation of study

Limitations of the study includes:

i. Erratic power supply.

ii. And Others

1.11 Definition of terms

Aesthetic - concerned with beauty or the appreciation of beauty or pleasing appearance.

CBD- Central Business District, refers to the central district of a city, usually typified by a concentration of retail and office buildings. It is also the business as well as financial area of a state capital city.

Consumers – A person or group of people such as house hold, who are the final users of products or services.

Circulation – Movement to and fro or around a space.

Daylight - Daylight can be described because the exercise of bringing light right into a constructing interior and distributing it in a way that gives more perfect and better fine illumination than artificial mild sources

Effective - Successful or achieving the desired result.

Enhance – Intensify, increase, or further improve quality, value or extent.

Goods- Articles for sale or use, often those produced for later consumption.

Mall- A monolithic large enclosed complex accommodating stores, relaxation, restaurants, and other businesses and facilities serving the general public.

Market- A market is a public gathering for buying and selling merchandise. It could also be referred to a place where goods are offered for sale.

Retail - The selling of goods directly to customers.

Services - Work done for the Customers of a store, restaurant, Hotel, or similar establishment.

Shopping- The activity of visiting shops and stores to look at and buy things.

Space - It is a defined expanse set apart for a specific purpose with extent measured in two or three dimensions, i.e. distance, area or volume.

Strategy – Plan of action designed to achieve a long term or overall aim.

Chapter Two

2.0 Literature Review

Daylight complements the functionaly of indoor surroundings in Commercial centres and also gives good ambiance to the patrons. The concept is based on previous research performed by way of Mayhoub, M. S., & Rabboh, E. H. (2022) on "Daylighting in shopping malls: Customer's perception, preference, and satisfaction". The research Group observed that daylighting boosted sales by means of a mean of forty percent with a ninety nine percent diploma of statistical certainty. Benefits in daylighting inside a commercial centre complements productivity and safety of Patrons within the Mall.

According to Yüksek, I., & Karadayi, T. T. (2017), 35% of the power utilized in commercial buildings are mostly applied for lighting fixtures. Power intake in Shopping Malls is big due to its extent and remarkable number of users whilst it can be minimized with penetration day lighting. Considering the quantity, functionality and user quantity of the general public areas, Shopping centres have more reasons for using sunlight hours. Optimum daylight within the Shopping Mall is characterized with adequate window heights, maximum reflective ceiling and wall finishes, slender floor plans, massive facade and skylight or atrium openings with excessive transmittance glazing. There are a few examples of open shopping middle systems built in international locations Obralic, A. (2021).

The assessment of literature of this research covers the Historical history of malls, classification of shops, Types of shopping departmental stalls, components of malls, present development of shopping center in Nigeria and powerful daylighting techniques to decorate circulate in a shopping center.

2.1 Historical background of Shopping Mall

Shopping mall or center refers to one or more commercial centres together as a rows of shops representing merchandisers, with interconnecting walkways allowing traffic to stroll from unit to unit, in conjunction with parking area and can be known as a modern-day indoor model of the traditional market place locations. When Prehistoric people started out to communicate, they additionally began to trade. They bartered goods and offerings from one another. The records of long distance commerce commenced about on 150,000 years ago Nebati, E. E., & Ekmekçi, İ. (2020).The earliest trading process took place in assembly and accumulating areas Dodge, M. (2020). Shopping centre. (pp. 64-68).

After the fall of the Western Roman Empire in fifth century, Western Europe drifted into 500 years or so of dark ages, purchasing covered. The massive-scale retail surroundings of the Roman forum was no longer re-attained until many centuries later. However, buying and selling never ceased and barter have become the basis for exchange of goods rather than cash. Following the dark ages, the Middle Ages witnessed the first sustained urbanization of northern and western Europe. As an end result, cities began to prosper once more, alongside the castles and abbeys, in the end broadening and developing into trading centres Dodge, M. (2020). Shopping centre (pp. 64-68).

At the beginning of the 19th century, the market shape based totally on open courtyards with perimeter arcades lined stalls and shops where the first ground became used for garage. Later market place homes have been influenced by means of the grand exhibition homes and took advantage of advances in iron and glass creation Dodge, M. (2020). According to Koglin, T., & Glasare, L. (2020), the market place buildings have been the prototypes for early 19th century arcades. One of the 18th century truthful is Foire St Germain of 1786, which become a journeying truthful and placed at the gates

of the metropolis of Paris. The shops were prepared into network of pedestrian open streets wherein each road represents a sort of save or trade. The honest changed into famous for its luxurious items and furnished entertainment for site visitors, such as dance in the marquees, gamble in saloons, go to exhibitions, attend performances in theatres and listen to singers and musicians. So, the fairs comprise every other early form of the compatibility among enjoyment, shopping and amusement Dodge, M. (2020).

Plate 2.1: Foire St Germain, Paris, France 18th century

Source: Garrioch, D. (2019)

A new generation of specifically planned collections of shops and new types of shops started to develop in the evolution of shopping. Those buildings developed as independent buildings in priority for shopping Rao, F. (2020). According to Nebati, E. E., & Ekmekçi, İ. (2020), about 1800 the capitalist methods of organizing retail trade resulted in different forms of buildings, which were; the arcade, the magasin de nouveaute, the bazaar, and later the department store. Howard, V., & Stobart, J. (2018). Arcades are a highlight in the evolution of shopping. It was the first European building planned primarily to accommodate a collection of shops (Sozen, C., & Devrani, T. K. (2020). Arcade is a milestone in the

relationship between shopping and the city because they show that there is a demand for experience and people are willing to pay for it. Thus they also indicate that the public life reached its peak in the nineteenth century. According to Rao, F. (2020), the arcade is primarily a pedestrian thoroughfare, which is a space with a beginning and an end, but this space is bordered or covered by a building that serves its own function. Another description for the arcade is that it is a roofed in gallery, an arched or covered passageway, usually with shops on each side, like eastern bazaars, the first European arcade is Galeries de Bois in Paris constructed in 1786 throughout Europe and later round the world (Sozen, C., & Devrani, T. K. (2020). The alignment of the thoroughfare with stalls and collection of shops was an arrangement established in the Ring of Breslau, the town hall of Palazzo del Broletto and the bazaar of Istanbul, KapalÛçar Û. The arcade differed from its pioneers that it was largely naturally lit; either had top lighting from openings in the roof, or had side lit by clerestory windows above the shops Marzouk, M., ElSharkawy, M., & Mahmoud, A. (2022). The later examples had continuous vaulted glass roof, which influenced architects of multi-use shopping centres in our century (Plate 2.6)

Plate 2.2: Galleria Umberto, Naples, Italy

Source: Marzouk, M., ElSharkawy, M., & Mahmoud, A. (2022)

By the middle of the 20th century in the USA, the population was growing and urbanites were seeking to escape from the intolerable urban conditions. Luckily, it was possible to settle down in suburbs by the abundance of available and accessible land and universal spread of car ownership (Marzouk, M., ElSharkawy, M., & Mahmoud, A. (2022). Additionally, Howard, V., & Stobart, J. (2018) states that, the evolution in environmental engineering, ventilation, airconditioning systems and advanced lighting systems facilitated the development of closed malls. The suburban malls are the beginning of the shopping centres in modern sense. According to M., ElSharkawy, M., & Mahmoud, A. (2022), in 1945 there were only 45 suburban malls across America and in 1958 they grew over to 2900.

2.1.1 Open-air Suburban Shopping Mall

At the end of World War II (1945), urban America was still the inner cities and there were hardly any outer cities; the suburban movement was just starting Nebati, E. E., & Ekmekçi, İ. (2020).

On April 21, 1950, the Northgate Shopping Mall opened at NE Northgate Way at 5th Avenue in Seattle, which was planned by developers Rex Allison and Ben B. Ehrlichman and designed by John Graham. According to Nebati, E. E., & Ekmekçi, İ. (2020) evolution of retail types, it was the first open-air mall. Northgate shopping mall established the principle of shops being arranged either side of a long linear pedestrianized walkway and it became the model for the other suburban malls Sozen, C., & Devrani, T. K. (2020). Rault, Y. M., Mathew, S., & Cebeillac, A. (2018) states that, the major explosion of shopping malls came after World War II by the development of dumbbell plan which was department store anchors connected by an outdoor pedestrian mall. The earliest of this type was Shoppers‘ World (Plate 2.3), designed by Morris Ketchum, in 1951 in Massachusetts (Nebati, E. E., & Ekmekçi, İ. (2020) The Shoppers‘ World‘s safe and protected pedestrian malls and courts also housed tot lots, chapels,

community rooms, and a host of temporary activities including art exhibits, dances, and fashion shows. Additionally, it was also the first shopping centre to have a musical water fountain show. The original Shoppers' World was torn down in 1994 and rebuilt as a modern, U-shaped strip mall.

Plate 2.3: Shopper‘s World in 1974

Source: Nebati, E. E., & Ekmekçi, İ. (2020)

2.1.2 The Enclosed Suburban Shopping Mall

A half of-century ago, architect Victor Gruen brought America to the enclosed shopping center. Before Gruen, there have been sorts of fundamental buying environments in the United States: the traditional downtowns, and the improvised buying strips that coated highways of metropolitan areas. He deliberate a complex with homes, apartments, schools, a mall and a lake across the enclosed buying centre in his socialist way. Unfortunately, his prototype building has been copied uncountable times around the world best as a closed field enclosure in a capitalist manner (Aksoy 2004). Victor Gruen‘s second shopping mall South dale in Minneapolis, opened in 1956, became the first fully

enclosed and environmentally controlled shopping centre with the progressive air-conditioning gadget (Koolhaas 2001, p.34). It was the largest centre of that time with two ranges of shops served and surrounded by using decked parking, imparting direct pedestrian get admission to to each ranges of the centre (Coleman 2007, p.43). Inside, Gruen created an ecosystem of leisure, pleasure, and intimacy through placing works of art, decorative lighting fixtures, fountains, tropical plants, and flowers at some stage in the mall. Today, a great deal of the authentic South dale shape is nevertheless in use, in addition to later additions to the building.

Plate 2.4: Southdale Centre, Minneapolis, USA, 1956

Source: M Ortegon-Cortazar, L. (2019)

2.2 Classification of Shopping Malls

There are various buildings erected to serve the purpose of selling and buying in an organized setting, shopping malls cannot be restricted, due to their classification or types which can be classified based on their sizes or land cover, function performed, the facilities used, the shape and form, location and arrangement, etc. Ibrahim, I., Bon, A. T., Nawawi, A. H., & Safian, E. E. M. (2018, March)

Retails and other industrial establishments that is deliberate, advanced, owned and controlled as a single assets. On-website online parking is furnished. The centre length and orientation are normally determined through the marketplace traits of the change place served with the aid of the middle.

2.3 Types of Shopping Malls.

Shopping Malls can be classified into five sections;

1. Neighbourhood Centre
2. Community Centre
3. Regional Centre
4. Super-regional Centre
5. Outlet Centre.

2.3.1 Neighbourhood Centres

Neighbourhood centres are mini scaled department stores within the local Neighbourhood. They normally have a supermarket or a drugstore as an anchor, and are normally organized in a strip mall format. Neighbourhood centers usually have a retail region of 30,000 to a hundred and 50,000 rectangular toes (2,800 to 13,900 m2), and serve a number one region in a 3-mile (four.Eight km) radius (Micu, C. B. 2019).

Neighbourhood Centre is also known as convenience centres.

2.3.2 Community Centre

Community centres are wider range other than Neighbourhood centres, and offer a much broader range of products they generally feature two anchor stores which can be large than that of a Neighbourhood centre example: discount departmental store. They may additionally follow a strip configuration, L. or U building shape. Community centre commonly characteristic a retail place of 100,000 to 350,000 square ft (9,300 to 33,000m/sq) and serve a number one place of 3 to 6 miles (4.8 to 9.7km) (Micu, C. B. 2019).

2.3.3 Regional Centre

A regional centres or mall is a type of shopping centres, in the United States, a shopping mall which is designed to service a large area (15miles) than a conventional shopping mall. As such, it is typically large with 400,000 sqft (37,000m/sq) to 800,000 sqft (74,000m/sq) gross leasable area with a list to anchor stores and offers a wider selection of stores. Given their wider service area, these malls tend to have higher-end stores that need a large area in order for their services to be profitable but may have discount department stores. Regional malls are mostly found as tourist in vocation areas (Micu, C. B. 2019).

2.3.4 Super Regional Centre

A Super Regional Mall is rated as a Shopping Mall with over 800,000 sqft (74,000 m2) of gross leasable area, three or more anchors, mass merchant, more variety, fashion apparel, and serves as the dominant shopping venue for the region (25 miles) in which it is located, (Micu, C. B. 2019).

2.3.5 Outlet Centre

Outlet Centre is the type mostly found in the rural or tourist location. The Manufacturers' stores sell their brands at a discount. Other shops in outlet shops are operated via retailing, selling back goods and discontinued products, frequently at closely reduced fees. Outlet shops were located as early as 1936, however the first multi-store outlet mall, Vanity Fair.

2.4 Component of Shopping Mall

According to Your Article Library (2016), the components of a shopping mall can be basically divided into the following:

1. Departmental Stores

2. Food court

3. Stand Alone Stores

2.4.1 Departmental Store

A departmental shop is a retail status quo which makes a specialty of promoting a wide range of products without a single predominant products line. Department stores typically sell merchandise which includes apparel, fixtures, home equipment, electronics, and additionally choose different traces of merchandise including paint, hardware, toiletries, cosmetics, photographic system, rings, toys, and wearing items. Certain beauty stores can be similarly categorized as cut price departmental shops. Discount departmental shops typically have important consumer checkout areas, usually in the front location of the shop.

2.4.2 Food Court

Meals court docket is commonly an indoor plaza or not unusual place inside a facility that is contiguous with the counters of a couple of food companies and affords a common area for self-serve eating (Food Court). Food courts may be discovered in shopping malls, airports, and parks. In numerous regions (consisting of Asia, the Americas, and Africa), it is able to be a standalone development. In some places of learning including excessive colleges and universities, food courts have additionally come to replace or supplement traditional cafeterias EL Shaer, N. (2019). Food courts include a number of vendors at meals stalls or carrier counters. Meals are ordered at one of the carriers after which carried to a common dining vicinity. The food will also be ordered as takeout for intake at every other region, along with a home, or place of job. In this example, it could be packaged in foam meals packing containers, even though one commonplace meals tray used by all the stalls may be applied to permit the meals to be carried to the desk. Food courts may have stores which promote organized meals for customers to take domestic and reheat, making the food court docket an everyday prevent for a few people EL Shaer, N. (2019).

Plate 2.5: Plate showing the view of a food court

Source: foodcourt.com 2019

2.4.3 Stand Alone Store

Frequently, a shopping center or shopping for Centre has satellite tv for pc TV for pc buildings placed each on the same tract of land or on one abutting it, on so as to be located stand-by myself shops, which may also or won't be legally related to the essential facility via settlement or possession. These shops might also moreover have their personal parking loads, or their masses may additionally interconnect with the ones of the mall or centre. The life of the stand-on my own store might also have been planned by way of the mall's developer, or can also have come about via opportunistic moves by way of others, but visually the critical facility the mall or purchasing centre and the satellite tv for pc buildings will often be perceived as being a unmarried "unit", even in instances in which the outlying houses aren't formally or legally related to the mall in any manner. Examples of stand-alone shops may be connected eating place to the department shops, financial institution homes and so forth.

2.5 Present Development of Shopping Malls in Nigeria

Major Nigerian cities, especially Lagos and Abuja, saw these days what seems a revolution in the retail segment of the actual property market driven with the aid of the us of a's encouraging demographics, changing family buying subculture, strong shopping electricity and high patron spend coming from the higher and emerging center elegance populace. The coming of buying malls has redefined clients' life-style within the regions wherein they are hooked up, the surge inside the growth of Nigeria's retail zone might not have visible the final of investors because the kingdom has a big potential inside the region however that it's far nonetheless fantastically immature. Examples of shopping malls in Nigeria include: Ikeja city Mall Lagos, Adobayero Mall Kano, Ibadan Heritage Mall, Port Harcourt Mall, Delta city Mall, Onitsha Mall, Benin city Mall, and Jabi Lake Mall among others.

2.6 Functions of Shopping Mall

Shopping shops are home to a wide kind of forte stores catering to each possible need, from fashion, standard merchandise, and services, in addition to eating places, to food and every day goods. Malls offer extra than just a place to eat and save. There are infinite leisure options, along with cinemas, health centres, and centers presenting practice in special recreational sports. It can also maintain live shows featuring neighborhood musicians and occasions related to purchaser participation. Malls are designed to create a calming, cushty space wherein clients can spend a whole day with their family, buddies, or companions. There are four functions that shape a shopping mall, they are; business, entertainment, community and parking.

2.6.1 Business

The role of the purchasing middle as an enterprise region is to provide a better area for retailers in phrases of attractiveness of the location, its catchments of populace, accessibility, parking facilities and the quality of the buying environment as an entire Battersby, J. (2017). Shopping centres had been advanced to provide a commercial enterprise area that consists of retail areas, centers and offerings to the stores. As a commercial enterprise location, the place element may be very essential. This is due to the fact the vicinity element is typically what first attracts successful outlets. Aside from a very good location, accessibility also creates the desire to visit and keep at shopping centres. The Battersby, J. (2017) reports that most buying had been developed in town centres. This indicates that appropriate sites in town centres appear to offer the pleasant possibilities for a business.

From some other angle, the sound layout of a shopping centre is crucial in portraying its picture as an enterprise region. The beauty of the design is taken into consideration a pull component that attracts stores and purchasers. Shopping centre design is a synthesis of many demands, consisting of physical constraints, marketplace forces, management desires and nearby authority necessities, out of that is created the physical shape to help the purchasing hobby. The design embraces the mechanics of car maneuvering, the skills of image-making and an expertise of the centres creation. Above these types of, however, is the advent of a feel of region, of somewhere where humans need to be, and the transformation of the normal revel in of shopping into one in every of enjoyment and fulfilment (Olushola, A. (2018).

Almost all purchasing centres include a website that accommodates land that it occupies and a few forms of homes. These residence tenants or shops presenting goods and/or offerings. The space occupied and leased via tenants is measured in square ft. or rectangular meters, and a purchasing centres general leasable space is called its GLA. Retailers in shopping centres typically encompass more than a few tenants Department shops, supermarkets, clothing stores, and entertainment and amusement centers are considered fairly standard tenants in a buying centre Mahin, M. A., & Adeinat, I. M. (2020).

2.6.2 Entertainment

Entertainment has emerged as guiding paradigm for department shops. Entertainment is taken into consideration to be an effective motivational variable for Patrons. As such, one could assume a courting among entertainment and mall productiveness. Overview of the studies literature indicated that amusement has been associated with mall productiveness only conceptually and anecdotally and really circumspectly. Users of malls largely identified entertainment as some activities or behaviour that provided a diversion or relief from normal day-to-day activities such as movies, theatre, sporting events, consumer's hobbies and crafts, as well as shopping. Users of malls also mentioned that the architecture and the interior design of mall itself can provide entertainment value (Makgopa, S. S. (2018)). From the above stated facts, it could be seen that entertainment is one of the factors that attracts users to shopping mall and ultimately increasing productivity and economic growth of such malls. Shopping malls offer extra than just an area to devour and shop. There are endless entertainment options, which include cinemas, fitness centres and many others. Malls also can keep concerts providing local musicians and activities regarding purchaser participation. This detail of mall is designed to create a calming, comfortable space wherein clients can spend a whole day with their family and buddies or partners. Rappaport, E. (2021).

2.6 .3 Community

Shopping malls offer extra than just an area to devour and shop. There are endless entertainment options, which include cinemas, fitness centres and many others. Malls also can keep concerts providing local musicians and activities regarding purchaser participation. This detail of mall is designed to create a calming, comfortable space wherein clients can spend a whole day with their family and buddies or partners. These various facilities has made the mall a very social place where you will meet with friends, eat and shop together. Shopping mall therefore becomes a strong tool in strengthening communal life of people who uses it. A visit to the malls avails people the opportunity to meet new people, share ideas with them and have a deeper understanding of how their environment has being structured. Wongkerd, N. (2017)

Plate 2.6: Plate showing the food court in a shopping mall
Source: Wongkerd, N. (2017)

2.6.4 Parking

Parking is one of the predominant hassles for individuals who go into the town to save. Shopping at malls gets rid of this hassle, because parking is supplied both freed from fee or for a nominal fee. Shopping

department stores include widespread parking regions into their layout and construction. This makes it fantastic for human beings to choose to keep at a mall instead of a single shop. Families who select to visit a mall on the weekend or holiday for a circle of relatives' trip find it to be an extra convenient alternative particularly due to the fact parking is supplied Wongkerd, N. (2017).

Plate 2.7: Plate showing parking lot of a shopping mall
Source: Wongkerd, N. (2017)

2.7 Daylighting Consideration in Shopping Mall

Daylight can genuinely be described because the practice of bringing mild into a building indoors and dispensing it in a manner that gives extra suited and higher satisfactory illumination than synthetic light assets (Obralic, A. (2021). The time period "daylight", technically, manner best sunlight diffused by way of debris and clouds inside the sky. Daylight has been taken into consideration the maximum appropriate light form because of its particular characteristics of always changing styles, effective for dynamic play on illuminating designed areas, as well as its notable efficacy (Marzouk, M., ElSharkawy, M., & Mahmoud, A. (2022). Daylight must continually be the first preference for illuminating an area for the duration of the day, unless the feature specially excludes it. It is useful because of its 0 electricity intake, directionality, variability, depth and color. None of these factors may be absolutely reproduced through electric powered

lighting. People are tolerant of the variability of light tiers in the event that they realize that the light is daytime. However, it may turn out to be a source of annoyance and/or deliver rise to a want for compensatory heating or cooling and consequently has to be balanced in opposition to immoderate heat loss, or undesirable solar benefit or glare. Natural mild have to therefore be considered alongside the view, the layout of spaces and the sports". (Obralic, A. (2021).

According to Li, W. (2021) lighting fixtures plays a sizeable position within the human behavior. (Li, W. (2021)) stated that lighting fixtures influences the human sensory reaction, favored impressions, expectations and subjective impressions (visual clarity, spaciousness, rest, and feel of privateness).Lighting additionally has the strength to direct pastime. Wong, L. (2017) explored the impact of lighting on the selection of which passageway human beings would use. They determined that the more brightly lit passage become the one that became used by maximum humans.

Table 1: Showing Daylight characteristics

	Light Direction	Illumination fc	Brightness cd/m^2	Color Temp.	Color Description
Sun at midday	Beam	8,000 - 10,000	1,600,000,000	5500K	neutral
Sun at horizon	Beam	3,000 - 8,000	6,000,000	2000K	warm
Clear sky	Diffuse	1,000 - 2,000	8,000	10,000K	bluish
Cloudy sky	Diffuse & Beam	500 - 5,000	2,000	7,500K	cool

Source: "Mayhoub, M. S., & Rabboh, E. H. (2022)"

2.8 Effective Daylighting Strategies in Shopping Malls

According to Little fair 1990 bringing natural light further into the interior zones of shopping malls is possible with simple daylighting strategies such as

i. Windows.

ii. Skylights.

2.8.1 Windows

Windows are openings on partitions of enclosures that admits light and air into an area. They offer directional daylighting and are desirable for illumination of horizontal surface and paintings planes. Due to intense comparison among the window starting and the adjoining partitions, glare can be created resulting in visual soreness. Window length and top govern the quantity of mild entering the gap. According to Ander, 1995, the following relationships are found between the scale and top of the vertical home windows:

- Daylight obtained within the area increases with increase in window vicinity.
- Depth of light penetration depends upon the peak of the window above completed ground degree. Higher the window, deeper the vicinity illuminated.
- Point of maximum illumination movements far from the window with growth in the sill top of the window.

Spaces may be day-lit with unilateral, bilateral or multilateral direction of home windows. Unilaterally an area receives mild most effective from home windows on one wall. Bilateral method the room receives daylight from wall home windows. Multilateral method light acquired from a couple of home windows on distinctive partitions. Bilateral lights is normally desired over unilateral lighting fixtures as it also beneficial

for pass ventilation in addition to daylighting especially in the desolate tract climate.

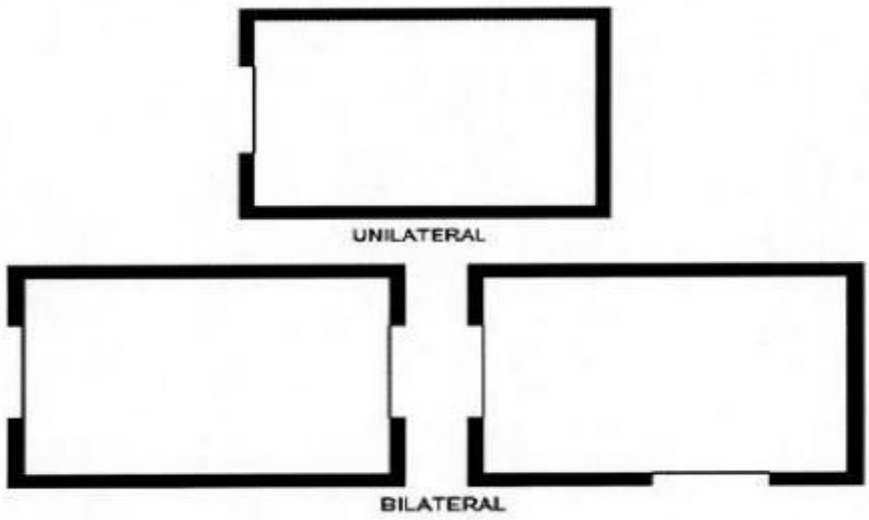


Figure 2.1: Showing different floor plan arrangement of windows
Source: Wong, L. (2017)

Day light from residential apartment windows as very own units a limit on the depth of building that can be satisfactorily day-lit. In a standard building apartment window head height of 2.5m with 3.7m room width, sunlight hours penetrates approximately from the window elevation for 6m. This sets a design constraint, producing plans that are about 12 m deep for a dual aspect building.

Height of window contributes to adequate penetration of daylighting. Attempts to boom penetration appreciably with light cabinets and required glazing have not been a hit, even though they could enhance uniformity in areas of medium depth. The use of tall windows related to tall spaces permits daytime to reach farther into the space. The human visible technique has the capacity to conform to an extensive variety of light degrees, however it calls for a minimum level to peer unique task info. Daylighting, though, is more than lighting tasks:

It's also about lighting fixtures spaces in order that they are great to be in. In preferred, people pick areas to appear brilliant; 'mild and airy' is a common description. To create this impact the window location

should offer sufficient mild and the windows be positioned in positions where they light up constructing surfaces, especially the walls which shape a main element inside the regular area of view. Window vicinity has greater than purely aesthetic repercussions. The setting of windows in the façade can greatly have an effect on view out, glare and daytime distribution. High windows are maximum green at letting in sunlight hours, specifically into the deeper part of the plan, and the aperture is less obstructed by way of other homes, bushes and the ground. The extra sky that may be visible, the better the daylight, and high home windows are satisfactory for this. The benefits of excessive stage glazing want balancing towards the better sky glare. If glare is a problem, however, this may be alleviated with inner or outside sun shades, or mild cabinets. Compared with home windows in normal positions, excessive degree home windows can allow in extra mild, or they can be made smaller, reducing electricity fees. It can even generally be vital to provide some lower home windows so that external views can be favored. The area and designated form of home windows can be arranged to supply unusual or dramatic visual effects.

Plate 2.8: Die Weiss, typical of the Baroque churches of Southern Germany
Source: Chattered institution of Building services Engineers London, 2017

In the Die Weiss, the natural source of light enters mostly from windows concealed from normal points of view, focusing light on to the altar. (The Chartered Institution of Building Services Engineers London, 2017).

2.8.1.1 The Influence of Window Size on Daylight in A Space

According to Ernst and Peter Neufert, if sunlight hours is considered to be critical to be used in a given area the use of home windows becomes vital. Simple Apertures for daylighting have evolved over time from Romanesque semi-circular arched home windows to Baroque windows surrounded by way of rich complicated decoration. Every work region needs a window leading to the out of doors international. The window area which transmit light must be at least 1/20 of the surface area of the floor in the work space. The total width of all the windows must amount to at least 1/10 of the total width of all the walls. That is 1/10 (M + N + O + P) as shown in figure 2 below.

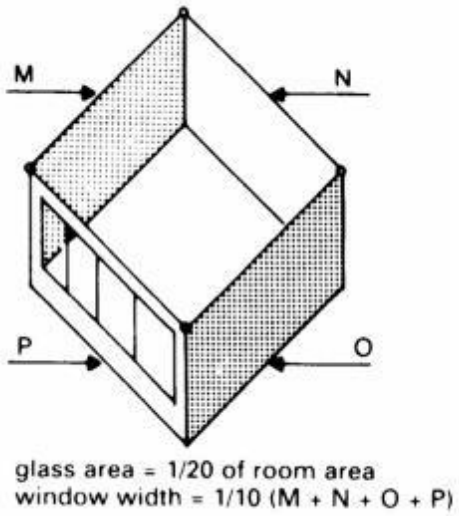


Figure 2.2: Window sizes for Industrial buildings
Source: Moscoso, C., Chamilothori, K., Wienold, J., Andersen, M., & Matusiak, B. (2021)

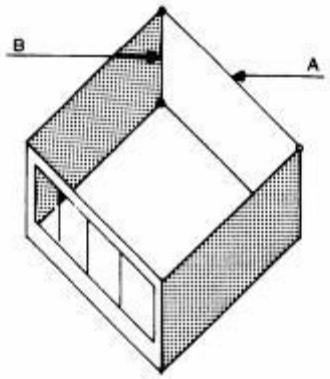


Figure 2.3: Window size ≥ 0.3 A x B
Source: Moscoso, C., Chamilothori, K., Wienold, J., Andersen, M., & Matusiak, B. (2021)

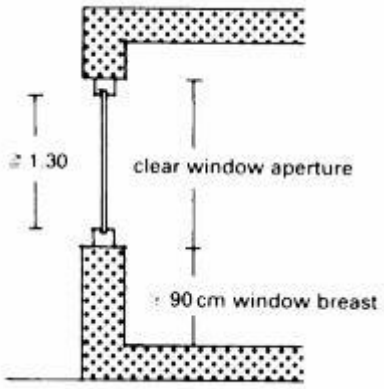


Figure 2.4: Section of a Façade
Source: Moscoso, C., Chamilothori, K., Wienold, J., Andersen, M., & Matusiak, B. (2021)

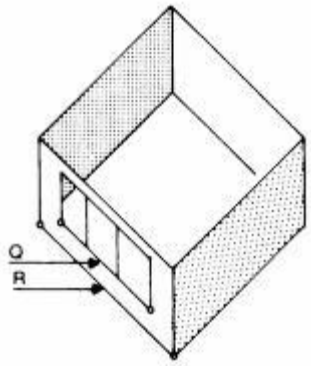


Figure 2.5: Width of the window aperture Q ≥ 0.5R
Source: Moscoso, C., Chamilothori, K., Wienold, J., Andersen, M., & Matusiak, B. (2021)

For work rooms which are 3.5m or more high, the light transmission surface of the window must be at least 30% of the outside wall surface, which is ≥ 0.3 A x B as shown in figure 3 above. For work rooms with dimensions similar to those of a living room, the following rules should be applied, minimum height of glass surface should be 1.3m as shown in figure 4 above. Height of the window breast from the ground ≥ 0.9m, the total height of all windows must be 50% of the width of the workroom, which is Q ≥ 0.5R as shown in figure 5 above. There are numerous types of windows some of which are fixed light, casement side hung, casement top hung, horizontally pivoted, vertically pivoted, vertically sliding, horizontally sliding, linked hopper, projected top hung, and Louvered. All shown in figure 6 below.

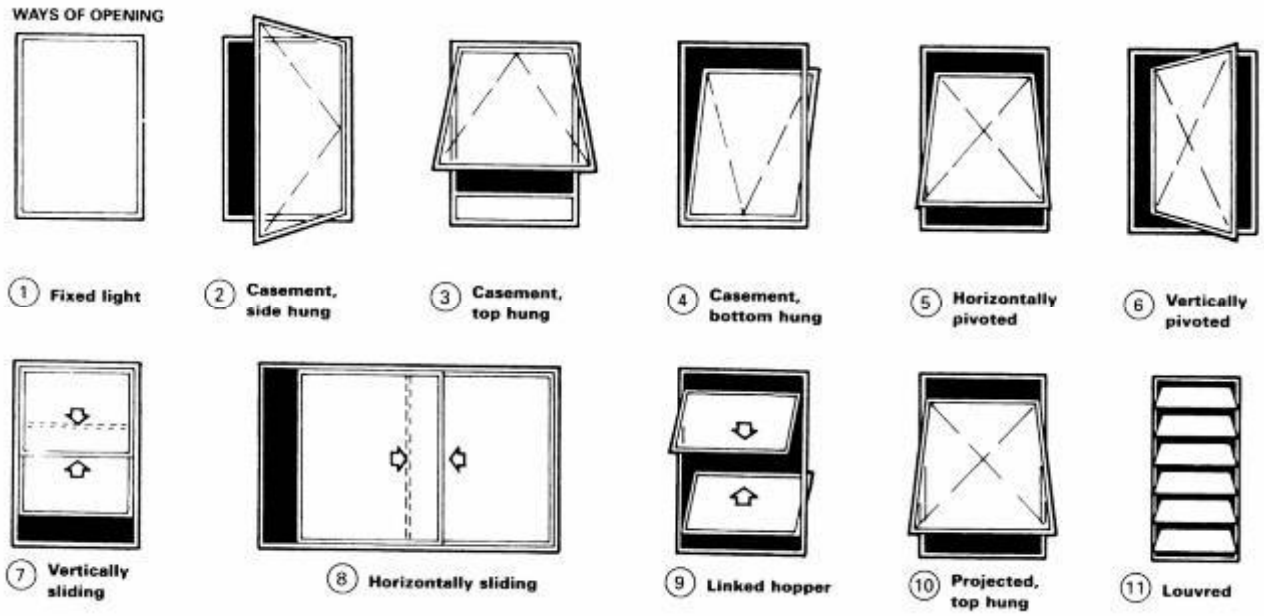


Figure 2.6: Types of windows
Source: Moscoso, C., Chamilothori, K., Wienold, J., Andersen, M., & Matusiak, B. (2021)

2.8.1.2 Window Glazings

According to Rezaei, S. D., Shannigrahi, S., & Ramakrishna, S. (2017) there are basically three main types of glazing as follows:

i. Clear glazing: This can be unmarried sheet, double or triple glazed or instead a 'thick' glass, but the extra sheets or the greater the thickness of glass the greater the daytime might be dwindled, despite the fact that the influence of the color of the outdoors will nevertheless be perceived as herbal. Clear glass while permitting an excessive transmission of sunlight hours, will at the equal time and on certain constructing facades permit an excessive transmission of solar radiation. It is that this fact that has brought about the development of the extra excessive-tech glasses designed to reduce solar advantage, with their consequent lack of daylight hours transmission. Other method which includes inter plane blinds, placed between the panes of glass, can also present a solution. These would most effective want to be hooked up on facades problem to solar benefit after which simplest activated when required.

ii. Tinted glass: This is referred to the type in which the clean glass is modified in a way as to produce radiant warmth transmission traits, consequently the denser the glass the lower the diffusion of sunlight hours, and the manager of radiant warmth from daylight. Another type of glasses are the ones coated with microscopically thin layers of steel oxides which mirror the warmth away and out of the building. These coatings are carried out to the inside layer of glass commonly in affiliation with other panes in a sealed double glazed unit as a safety, seeing that on their very own they would be susceptible to harm. These coated glasses can be designed to have high daytime transmission, due to the very thin layer of reflective fabric; in order that they nearly provide the appearance of clear glass, and do no longer be afflicted by the objections raised via tinted glasses which lessen the daylight hours significantly. Additionally they do now not impede the view; but they do have price implications, and should most effective be used in which

the specification needs it. Highly reflective glasses are available, however need to be used with care to avoid the threat of glare to different buildings or motorists.

iii. Miscellaneous glazing

A quantity of various types of glazing are positioned on this category, in large part because they cannot be lumped collectively right into a single category; they include the subsequent: Patterned glass, stressed out glass, laminated glasses and glass blocks. Patterned glass any wide variety of patterns can be rolled into semi-molten glass, to offer ornamental or diffusing sheets for numerous functions, though hardly ever for windows, considering that their capacity for light transmission might be modified.

Wired glass

A comparable manner is used for the manufacture of stressed out glass, where a wire mesh is sandwiched within the thickness of the glass. This used usually in protection conditions, and every so often as a safety to prone skylights.

Laminated glasses

Similar strategies of manufacture are used for laminating sheets of plastic among sheets of glass, again used for safety reasons as resistance to impact. These lessen the transmission of sunlight hours. In museums where reveals are exposed to daylight hours, it'll be important to manipulate the entry of UV mild. This may be executed by using laminated glasses, wherein UV absorbing filters may be laminated between the sheets of clear glass.

Glass blocks

These had been a famous form of glass wall in the Thirties, having thermal characteristics due to the hole nature of the blocks, which, because of their structural nature are nonetheless in use nowadays for the introduction of sunlight hours into new homes, but unique openings may be required to provide a view.

High tech glazing

There are a number of glazing kinds which fall into this class, the maximum superior of which are the photovoltaic, in which the glass itself is designed to generate strength from sun radiation on south dealing with exposures that could then be used inside the building to lessen the energy required for the synthetic lighting fixtures. Some buildings already use this approach, and the UK Government is now placing studies cash into it's similarly development. Two other styles of high tech glass deserve mention, but are not at present economically viable for fashionable use in buildings. The first are the photochromic glasses, which respond without delay to an environmental stimulus (temperature or mild) as a substitute just like the unique shades that are already to be had which regulate their transmission element depending upon the brightness of the ambient light; as an alternative there are the electro-chromic glasses designed to reply in a roundabout way by the utility of an electrical current which alters their visual and thermal traits. These glasses are nevertheless at the experimental degree, but are probably to be developed in addition to a degree in which they may turn out to be possible. The preference of glazing in a huge complex is one of the greatest importance, having implications both on first price, and the value in use of the challenge.

There are some critical factors to be placed into attention while preference of glass for window is to be made they include the shading coefficient, the KE component of glazing and the U issue. The ratio of the entire sun transmittance of a given glazing type to that of a single pane of clean glass defined because the

shading coefficient (SC) of that glazing. While the function of all windows is to admit daylight hours in to the building any mild inherently heats up the indoors due to the fact all the transmitted solar electricity is ultimately converted inside the building into warmth. The special ratios of mild to heat transmission characterizing exceptional kinds of glazing are performed through enhancing the amounts of various ranges of the sun spectrum which can be both reflected, absorbed or transmitted with the aid of the glass. Sweitzer et al (1986) from Lawrence Berkely Laboratory (LBL) have cautioned the use of the ratio of visible transmittance to shading coefficient which they termed the KE component, as one of the criteria for comparing window performance. The term U thing refers to the quantity of heat switch via a window because of the temperature difference among the indoor space and exterior. The thermal resistance (R fee) of the glazing is the reciprocal of its U cost. These homes depend on four unbiased elements of the home windows systems:

- The life and wide variety of air spaces among the glazing layers.
- The homes or remedies of the glazing fabric and surfaces.
- The gas which fills the air areas.
- The substances and detailing of the home windows frame.

Table 5: 42

WINDOW	R	SC	Tv	K_E
Reflective-bronze	0.44	0.22	0.10	0.5
Tinted-bronze	0.35	0.57	0.47	0.8
Clear	0.35	0.82	0.80	1.0
Low-E-bronze	0.53	0.42	0.41	1.0
Low-E-clear	0.53	0.66	0.72	1.1
Tinted-green	0.35	0.56	0.67	1.2
Low-E-green	0.53	0.41	0.61	1.5

Source: Moscoso, C., Chamilothori, K., Wienold, J., Andersen, M., & Matusiak, B. (2021)

2.8.2 Skylight

The time period "skylight" includes the light from each clean blue and cloudy skies. People are often amazed to analyze that cloudy skies can be much brighter than clear blue skies. The brightness of cloudy skies relies upon largely on how thick the clouds are. A light ocean mist may be extremely shiny, at 8,000 foot candles, even as clouds on a stormy day can almost blacken the sky. The daytime on a day with whole cloud cover tends to create a totally uniform lighting circumstance.

Skylight from clean blue skies, however, is extraordinarily non-uniform. It is darkest at 90° contrary the solar's place, and brightest around the sun. It additionally has a "blue" cast to it, and is characterized as a "cool" shade temperature of up to 10,000°K. Skylight from cloudy skies is warmer in coloration, a mix somewhere between daylight and clear blue skies, at about 7,500°K.

The proportion of cloudy days to clean blue days, and of direct beam sunlight to scattered skylight, in your nearby climate will determine how much illumination is available for sky lighting. The mix of climate conditions need to additionally affect your desire of glazing substances, mild properly design, and daylighting control strategies. For example, an obvious skylight material can be desirable in a slight cloudy climate, while a diffusing skylight is vital in areas with a substantial wide variety of sunny days. Similarly, dimming controls can be more appropriate for areas with low daytime availability, even as on-off controls can be proper in regions with predictably sunny climate

A skylight is a sloped roof cannot see the whole sky hemisphere, however handiest a partial view decided through the slope of the roof. Furthermore, relying upon the attitude and orientation of the sloped roof, the sun won't attain the skylight at some point of certain instances of the day or yr. For instance, a skylight on an east-dealing with roof with a forty five° slope will simplest get hold of direct solar during the morning and noon hours. In the afternoon it will receive skylight, however most effective from three fourths of the sky. As an end result, inside the afternoon it's going to supply notably less light to the gap beneath than an identical skylight located on a flat roof. The shape of a skylight also affects how a good deal daytime it may offer at one of a kind instances of the day, although these consequences tend to be a good deal extra subtle than constructing geometry. For example, a flat-glazed skylight on a flat roof will intercept very little daylight whilst the solar could be very low inside the early morning and at the cease of the day. However, a skylight with angled aspects, whether a bubble, pyramid, or different raised shape, can intercept notably greater sunlight at those essential low angles, growing the illumination added below by way of five to 10 percent at the begin and quit of the day (Marzouk, M., ElSharkawy, M., & Mahmoud, A. (2022).

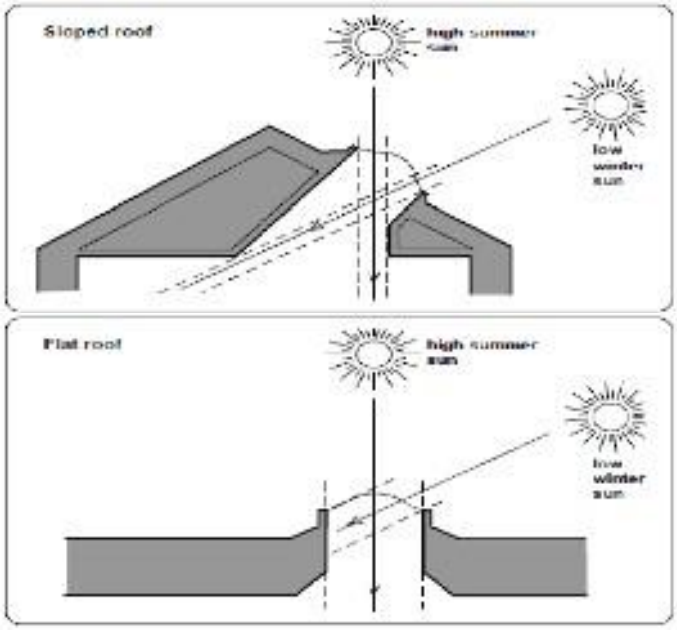


Figure 2.7: Showing sun penetration on sloped and flat roof

Source: "Marzouk, M., ElSharkawy, M., & Mahmoud, A. (2022)"

2.8.2.1 Shapes and Sizes

Skylights are offered in varieties of shapes and sizes to compliments building requirements. The shapes and sizes range from rectangles to complex polygons. They either come in smaller sizes, to fit between rafters, or large enough to run the length of a building. They are used to cover big spaces and skylights can be used as long barrel vaults or smaller units combined on a space frame.

The required glazing comes in numerous configurations. Flat glazing can be used to achieve a single plane or a faceted framing system that assumes various pyramid shapes. Plastic glazing is made available in molded dome or pyramid shapes for larger stiffness.

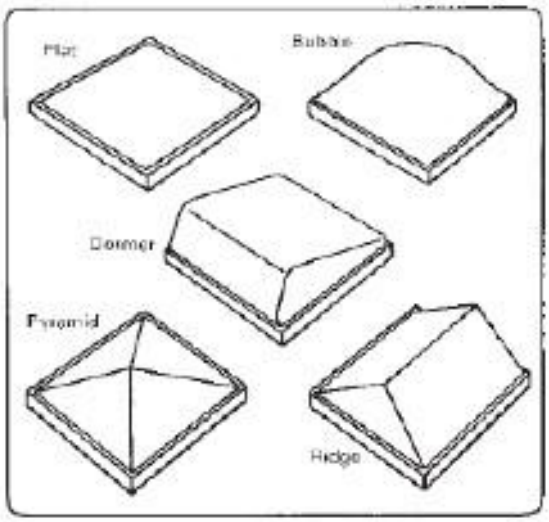


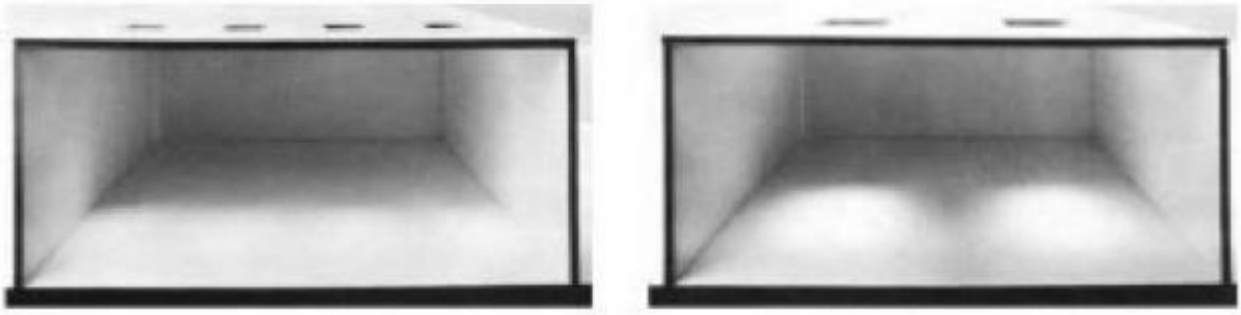
Figure 2.8: showing a variety of standard skylight shapes.

Source: "Marzouk, M., ElSharkawy, M., & Mahmoud, A. (2022)"

2.8.2.2 Layout and Spacing of Skylights

The arrangements and laying process of skylights in a roof are vital determinants for the distribution light traits of the sky lighting fixtures machine. Given a fixed percent of the roof vicinity devoted to skylights, a clothier could pick out whatever from an unmarried massive skylight to many small skylights allotted uniformly throughout the roof. For special packages, which includes entry lobbies or small rooms, the skylight format will likely be dictated frequently via the layout idea for the distance. However, whilst skylights are furnished a good way to create uniform lighting fixtures in huge open areas, cautious interest

to spacing is



vital.

Figure 2.9: Showing effects of skylight spacing

Source: "Marzouk, M., ElSharkawy, M., & Mahmoud, A. (2022)"

The differences in luminance stage among places immediately underneath the skylight, compared to places between skylights, might be greater as skylight spacing becomes wider. The left photograph above suggests near skylight spacing, with exceptionally even luminance on the work plane; the proper photo suggests a wider range of mild and dark regions. The overall skylight area is the equal for both.

The standard rule of thumb is used to area skylights at 1.0 to one.5 times ceiling top (center- to-middle in each instructions). This assumes a rather diffusing glazing and a modest depth for mild wells. Actual designs can range substantially from this rule of thumb. For instance, if the light nicely is broadly splayed, the vertical dimension to the lowest of the skylight can be used instead of the ceiling peak. Skylight placement have to additionally be coordinated with the structural, mechanical and lighting fixtures structures.

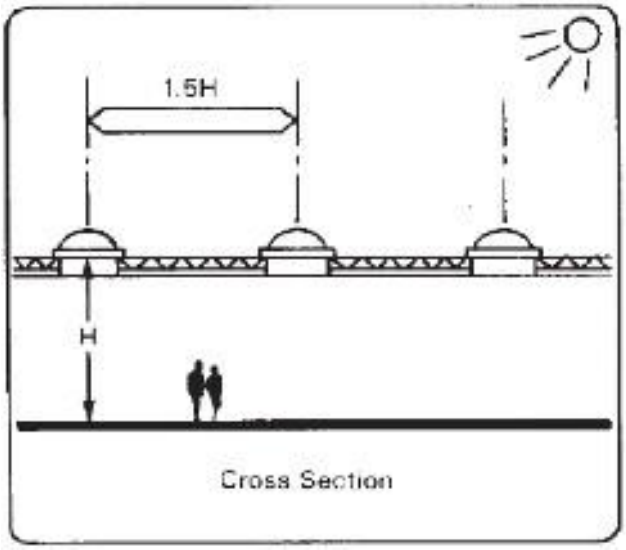


Figure 2.10: Showing Rule of Thumb spacing skylights at a distance between 1.0 and 1.5 times the ceiling height.

Source: "Marzouk, M., ElSharkawy, M., & Mahmoud, A. (2022)"

2.8.2.3 Sky Light Glazing

Common glazing substances for skylights encompass a lot of plastics and glass. The common plastic substances consist of acrylics, polycarbonates, and fiberglass. These substances come in a number of shades from clean and translucent white, to bronze and grey colorations. They additionally are available a lot of thicknesses and number of layers. All those variables have an effect on the overall performance of the skylight Lou, S., Huang, Y., Xia, D., Lun, I. Y., & Li, D. H. (2021). The choice of the glazing material for a skylight may have a vast effect on the satisfactory of the light provided and the electricity performance of the layout. Factors to bear in mind include:

- How a lot mild is transmitted via the glazing measured by means of the seen transmittance (Tv's)
- How a lot of the direct beam daylight is subtle measured by the transparency of the cloth?
- How plenty of the solar's radiant heat is transmitted thru the glazing measured by means of the solar warmness advantage coefficient (SHGC) or the much less precise shading coefficient (SC)
- How much warmth from the air will pass through the glazing measured through the R-fee of the fabric or the U-cost of the skylight unit meeting?

Other homes of glazing also are important in selection, together with the electricity of the fabric, the resistance to breaking or cracking, and how the cloth will age over the years possibly dropping a number of the properties described above.

2.8.2.4 Transmission of Light

In phrases of the lights performance of a skylight, the 2 most vital residences are how much light it permits to bypass through (transmittance) and how much it diffuses the sunlight that strikes it (transparency). Most human beings assume that the more transparent a chunk of glazing is, whether or not glass or plastic, the extra mild will skip thru it. However, the 2 houses aren't at once associated. For example, its miles viable to have a cloth which scatters all of the mild that strikes it, at the same time as nevertheless allowing a very high percent of mild to skip thru. A common example is frosted or patterned glass. Although you cannot see a clear photograph through the glass, simply as plenty mild passes thru the glass as thru clean window glass. Another example is the plastic lenses generally used for fluorescent lighting fixtures. The prismatic sample within the plastic prevents a clean view of the fluorescent lamp within the fixture, however allows nearly all of the mild to skip through, scattering it inside the technique. The communication is likewise viable, with an obvious material obstructing maximum of the visible light that moves it. All tinted glasses try this to a degree, with one excessive example (dark grey) transmitting only 14 percent of the visible light Lou, S., Huang, Y., Xia, D., Lun, I. Y., & Li, D. H. (2021).

In preferred, the better the seen transmittance of the cloth, the greater effectively the skylight can offer light to the gap underneath. Diffusion of beam sunlight is essential to avoid “hot spots”, in which sunlight is greater concentrated and creates regions which can be each too vibrant and much less cushy because of the radiant warmness of the sun. Highly diffusing skylights are needed to attain uniform illumination, allowing the overall lighting fixtures machine and controls to be greener.

2.8.2.5 Day Light Distribution in Skylght

Once sunlight hours has surpassed via the skylight glazing, it could be managed and diffused by way of the form and reflective homes of mild wells, shading devices, and the surfaces of the room itself. Well-balanced lighting fixtures situations are critical to the visible consolation of the building occupants.

Light Wells

Light wells are a number one aspect of sky lighting systems. They carry the light via the roof and ceiling shape, and that they concurrently offer a method for controlling the incoming daylight hours before it enters the principle area. A light properly is much like the housing of an electric mild fixture. It is designed to distribute the mild and to guard the viewer from a very brilliant mild source. Light wells can be designed in a wide variety of shapes. The only are vertical-sided shafts, the identical length because the skylight starting. More tricky wells have splayed or sloping facets that unfold the mild more extensively through the distance. The shape and size of the light properly is regularly decided via the roof and ceiling shape.

Wells can be made from wooden, gypsum board, ceiling tiles, different construction substances, or proprietary mild nicely merchandise.

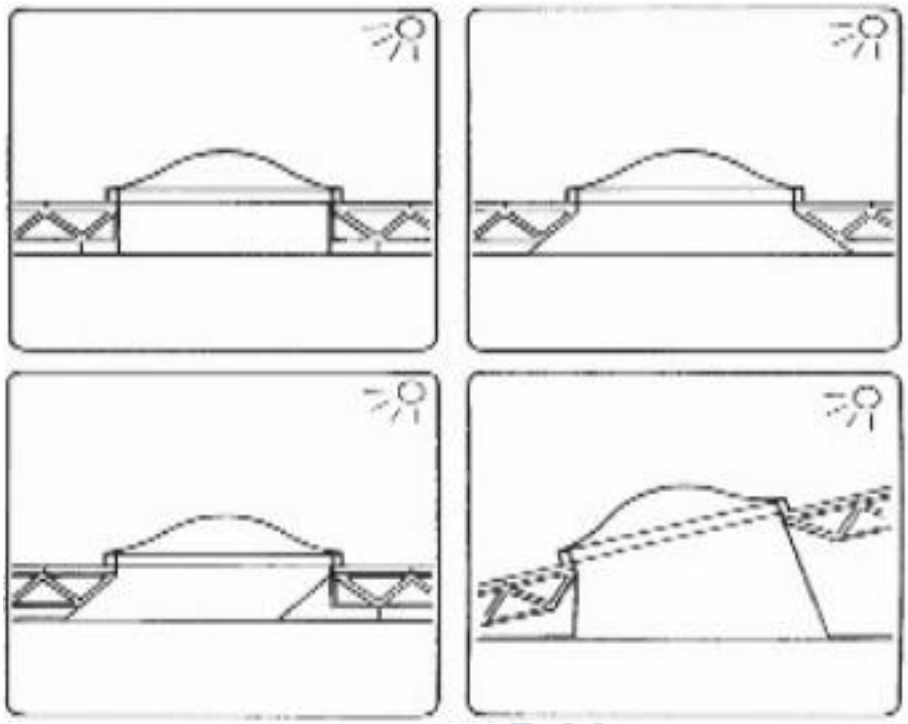


Figure 2.11: Showing types of light well

Source: "Lou, S., Huang, Y., Xia, D., Lun, I. Y., & Li, D. H. (2021)"

In a few buildings, mild wells consist only of the intensity of the scale back and the thickness of the roof structure, however in buildings with hung or dropped ceilings, the skylight properly can grow to be several ft. deep. Deep wells are a possibility for greater manipulate of the distribution of the daylight from skylights. In designing wells for skylights, several of factors should be taken into consideration:

•Solar geometry. The peak and orientation of the solar trade both daily and seasonally. The direct sunlight that enters an obvious skylight can be prevented from penetrating right down to the challenge floor through mild wells; conversely, the wells can reflect the daylight to a particular vacation spot. To block high solar angles, the mild properly should be deeper than for low sun angles.

Sun course studies are used to design for direct solar manipulate. With diffusing skylights, the attitude of the solar is less of a challenge, however the amount of light and heat getting into the gap will nonetheless be laid low with solar geometry.

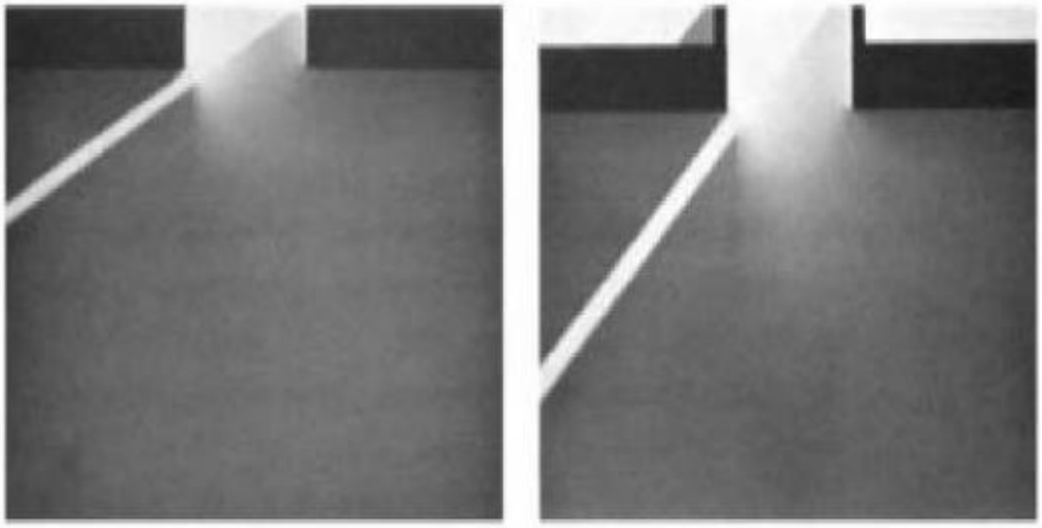


Figure 2.12: Showing shading of direct sun by light well.

Source: "Lou, S., Huang, Y., Xia, D., Lun, I. Y., & Li, D. H. (2021)"

• Surface reflectance. Light wells reflect and diffuse daylight because it bounces from the skylight to the challenge surface. A noticeably reflective, diffusing floor (inclusive of flat white paint) will help to offer a diffuse, widely disbursed mild pattern below the skylight. On the opposite hand, a specular reflective floor, including reflective foil, will not diffuse the mild, but will reflect an photograph of the solar and sky onto a restricted region underneath the skylight. Colored surfaces will distribute the mild lightly, but will lessen its intensity and can dramatically shift the advent of colours within the room below. For applications where uniform light distribution is favored, a matte white floor is first-rate.

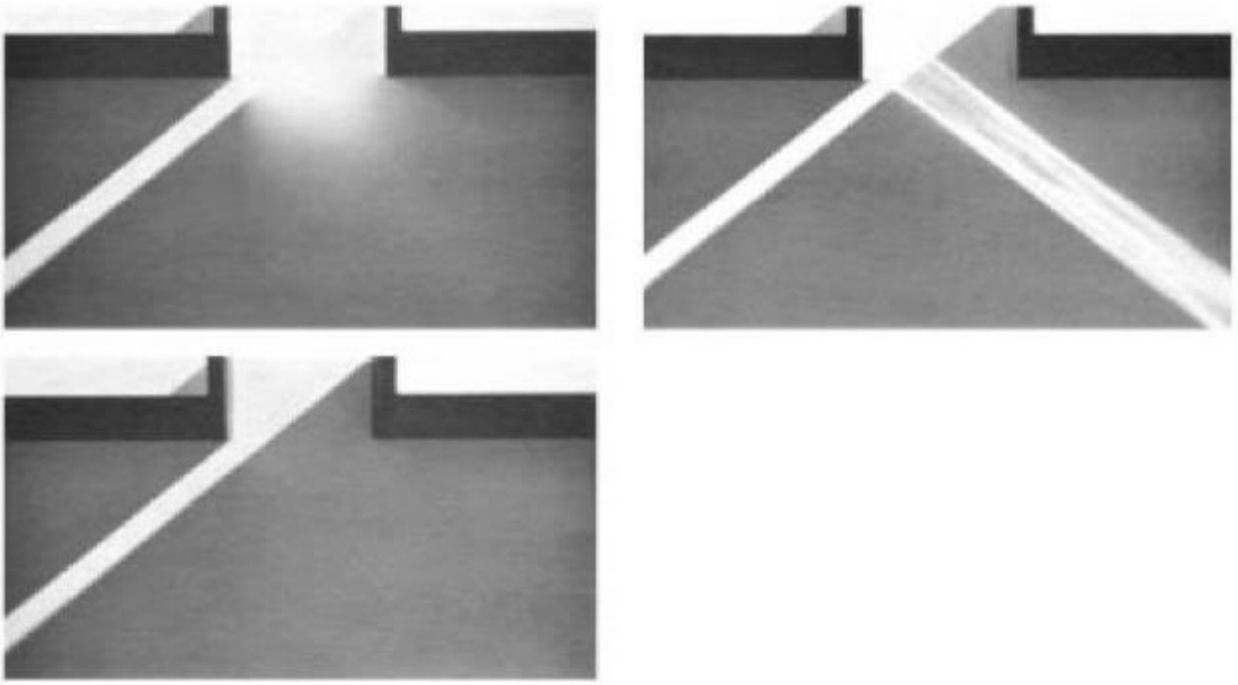


Figure 2.13: Showing reflective properties of well surfaces.

Source: "Lou, S., Huang, Y., Xia, D., Lun, I. Y., & Li, D. H. (2021)"

From the above example, diffuse partitions (e.g. Flat or matte paints) mirror incident mild in all directions, spreading the brightness (top-left). Specular walls (e.g. Reflect surfaces) mirror a right away image of the solar or skylight to the space below (top-right). Semi specular walls (e.g. Gloss paints) exhibit traits of each diffuse and specular reflection (not proven). Deeply colored properly surfaces reduce almost all mild scattering, and generally tend to admit best direct sunlight (backside-left).

- Wall slope. The slope of light properly walls facilitates to determine the distribution of light inside the area. The broader the base of the well, the larger the assignment vicinity within the space having a right away view of the skylight. This is an advantage underneath overcast sky situations or with a diffusing skylight, but it can be a serious drawback with a transparent skylight whilst direct daylight is gift. Deep

wells with vertical partitions prevent direct view of the skylight and block low angle beam sunlight, however have a tendency to maintain the mild focused in a smaller place and offer much less uniform light distribution.

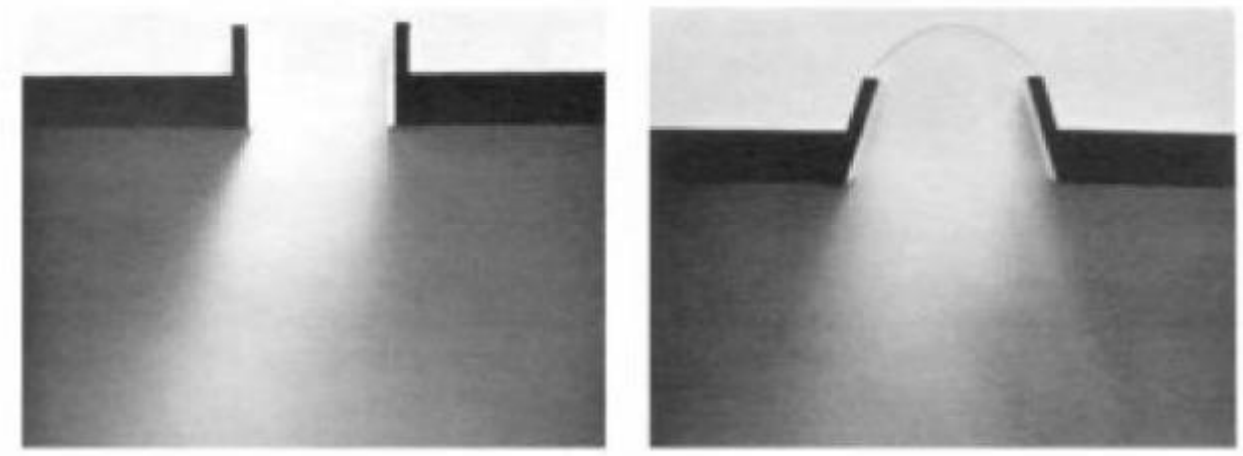


Figure 2.14: Showing splayed wall effect.

Source: "Lou, S., Huang, Y., Xia, D., Lun, I. Y., & Li, D. H. (2021)"

From the example above splayed mild nicely partitions (right) allow a larger region of the distance to view the skylight surface. With diffusing glazing, this enables offer uniform illumination. With transparent glazing's, splayed partitions permit more penetration of beam daylight. In addition to the surfaces of the light properly, daylight also can be managed and diffused with the usage of extra vertical surfaces like banners, structural factors, or horizontal shading gadgets placed under the skylight within the light properly. Operable shading devices, whether manual or computerized, also can allow the quantity of light achieving the room to be managed from complete brightness to very dim.

Room Surfaces

After the daylight has infiltrated beyond the glazing, the light well and the shading devices, it interacts with the indoors of the constructing. There it is able to be absorbed and contained, or bounced and mixed, relying on the building design and the supposed use of daylight. With skylights, ceiling height strongly impacts daylight distribution within the space. Depending on skylight size, spacing, and light properly layout, varying the ceiling peak may boom or decrease the uniformity of the daylight distribution. Keeping all the different parameters regular, as ceiling top is expanded, the light transmitted by means of skylights is shipped over a bigger floor vicinity and running aircraft. This generally results in extra uniform sky lighting fixtures.

Lower ceiling heights bring about much less uniformity, with brighter areas below the skylights and darker areas in between. As a rule of thumb, keep skylight spacing 1.0 to 1.Five instances ceiling top. The floor reflectance of walls, floors, ceilings, and furnishings additionally have an effect on light distribution. Light-coloured surfaces, which have excessive reflectance, will assist to distribute brightness around the space, and this, in turn, will lessen the brightness contrasts that reason visible pain. It is particularly crucial for ceilings to be light-colored, in order that they're as bright as viable. This reduces the glare capability from having bright skylights next to darker ceiling areas. High reflectance floors and furniture will also help in this regard, due to the fact they help to embellish the ceiling.

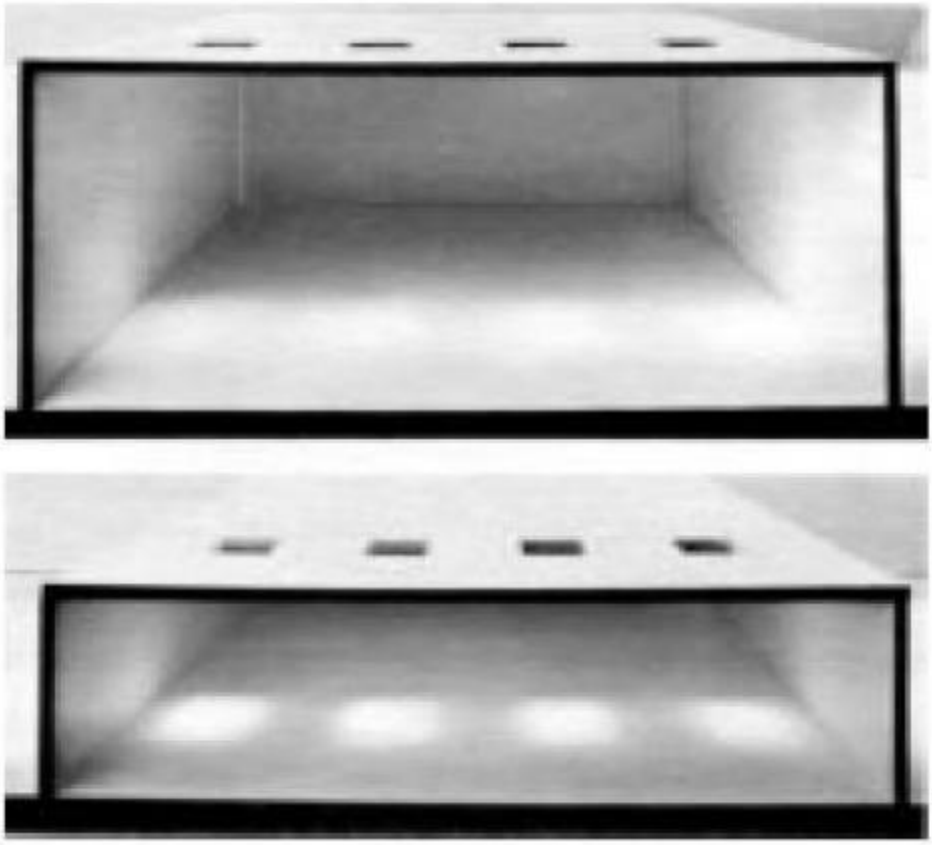


Figure 2.15: Showing effect of ceiling height on light distribution.

Source: "Lou, S., Huang, Y., Xia, D., Lun, I. Y., & Li, D. H. (2021)"

For the identical skylight spacing, a better ceiling top will bring about more uniform illuminance tiers on the work aircraft (top). Lower ceiling heights show off darker regions among and brighter regions below the skylights (bottom).

Visual Comfort

A number one goal inside the design of any lighting fixtures gadget (daylight or electric light) is to offer the illuminance levels required for visual overall performance at the assignment, using a system that enhances visual comfort inside the work surroundings. Both ceiling-set up electric powered lighting and

skylights have the ability to cause visual pain, and the strategies for heading off this are the identical. There are basic regions of difficulty:

- Avoid excessively vibrant sources inside the occupants' field of view
- Avoid reflections from shiny assets at the paintings floor

The floor of diffusing skylights can grow to be very bright in sunlight, and is an ability source of glare to humans running within the space. If the skylight is immediately of their line of imaginative and prescient, it is able to reason visible soreness, as their eyes try to alter among the extremely shiny skylight and much less shiny room surfaces. The top of the ceiling on the subject of the proportions of the room have an effect on the chance that the skylight may also cause glare. If a room has a totally low or very massive ceiling, it's far much more likely that the skylights could be inside the occupants' area of view. The higher the ceiling, the much less probably this is to be a hassle. Using a segment drawing of the building to recognize the angles of sight within the room is the quality way to decide if there may be a potential problem.

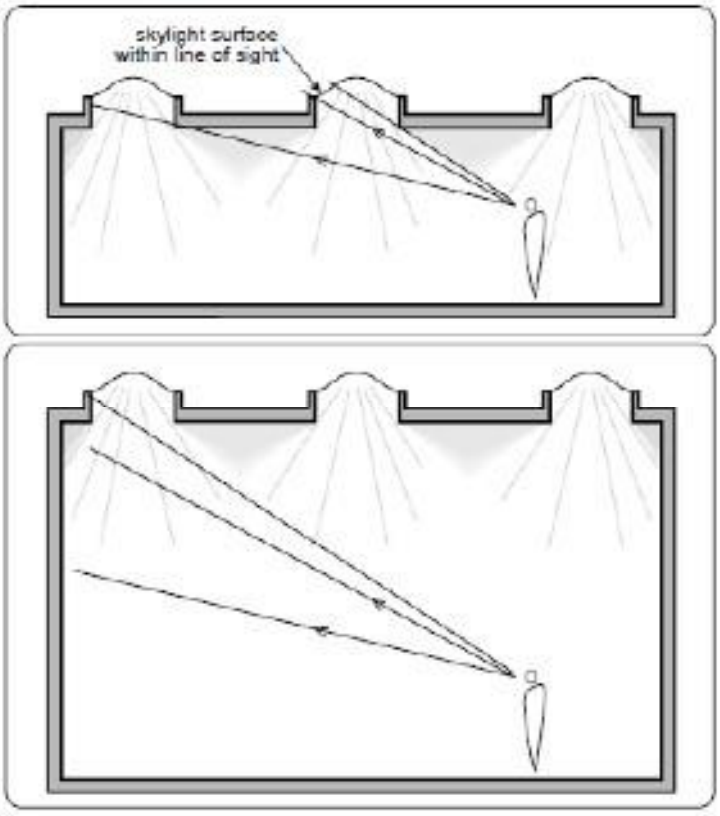


Figure 2.16: Showing visual comfort effect of high versus low ceiling.

Source: "Lou, S., Huang, Y., Xia, D., Lun, I. Y., & Li, D. H. (2021)"

Excessive raised ceiling makes skylights out of the road of view, reducing the want for other glare manage efforts.

2.8.2.6 Use of Skylight to Enhance Circulation in Shopping Mall

In the field of Architecture, flow refers to the manner people move via and interact with a building. In public buildings Circulation spaces should be as exciting as another a part of a constructing. There are always specific possibilities to make move exciting. Obvious pathways consist of hallways (horizontal circulate) and stairs (vertical movement). But each space we are able to occupy is part of the move system of a constructing. Halls can be elevated to end up spacious areas like vestibules, foyers, galleries, arcades,

and colonnades. Vertical move can encompass elevators and escalators. Less obvious pathways are the spaces among and round furnishings: the areas in rooms where humans are probable to walk. All of those versions on flow are critical elements of architecture as it is through motion that we revel in architecture as a three-dimensional revel in. Without movement, structure is simply a degree set: enjoyable to have a look at, possibly, however with no direct dating to the user. Good circulate is important to a success structure. Like the glide of blood in a body, move works best whilst the direction is clear and unobstructed. After all, how can you recognize beautiful spaces if you don't understand wherein to move otherwise you're continuously bumping into limitations? When we confront people with an impediment route, their eyes are on the obstacles, no longer the architecture (El-Abd, W., Kamel, B., Afify, M., & Dorra, M. (2018).

As part of an architectural quick, flow is commonly distinct as a percent price of overall floor location. Such a price is usually a preferred fee, defined via building kind. General architectural concepts be aware attention of path configuration, route-space members of the family and the shape of circulation space; a constructing's stream device as high quality elements that affect our notion of the constructing's forms and area. Such interest even though is generally distracted from the beginning with the aid of the importance indicated in the architectural brief and its illustration of movement as servicing; being an area provision to hyperlink the components. This promotes optimization and the practice of seeking to prepare rooms in a plan inside the maximum efficient association so one can limit movement area, which hinders the capacity articulation of circulation space. Perceiving movement as little extra than optimization inherently defines space this is linear, juxtaposed and normally taken into consideration as little greater than a connector among destinations, which equates to the manifestation of the hall.

Traffic styles are most effective while clear, logical, and unambiguous. However, that doesn't mean they want be dull. Walking through a piece of architecture is a series of occasions, and each event can be exciting. In a properly-designed ground plan, every occasion reinforces the topic, variations, and development of the overriding functional necessities and aesthetic motive. Circulation areas must be designed as significant parts of the complete. When movement have to exist unbiased from the main spaces because of privacy or safety, the architect nevertheless has many design equipment available to hold things exciting. When the price range lets in, foyers may be generous, halls can be designed as galleries, and stairs may be compelling focal factors. Circulation want in no way intrude with furnishings or characteristic. The challenge is to locate exciting and energetic transitions from one space to another. Space flows certainly and effortlessly while circulation is a necessary part of architectural design. Good circulation does not necessarily suggest that the shortest route between two factors is quality. It method that the maximum architecturally profitable route between factors is preferred (El-Abd, W., Kamel, B., Afify, M., & Dorra, M. (2018).

Top lighting (from skylights) is a superb approach to gain exact sunlight hours distribution stages in a space, so long as the ceiling apertures are nicely designed and do no longer allow in direct daylight. Illumination from skylights frequently reaches most effective the top ground of a constructing. For multistory homes with deep plans, atriums and light wells were used to deliver herbal mild deep into the constructing. Having an open area in the center of the constructing, not most effective creates greater facade however also diminishes the intensity of the plan (El-Abd, W., Kamel, B., Afify, M., & Dorra, M. (2018).

Plate 2.9: Daylighting from Skylights Anka mall, in Ankara Turkey

Source: El-Abd, W., Kamel, B., Afify, M., & Dorra, M. (2018)

Plate 2.10: Daylighting from Skylights Cepa mall Ankara Turkey

Source: El-Abd, W., Kamel, B., Afify, M., & Dorra, M. (2018)

Plate 2.11: Daylighting from Skylights in Gordion AVM Ankara

Source: El-Abd, W., Kamel, B., Afify, M., & Dorra, M. (2018)

Shopping mall types can be easily divided into two groups according to their circulation areas as:

Circulation around Single Gallery

Single important gallery, circulation paths round it, stores that may be accessed from, and meals-courtroom at the basement or upper a part of the gallery are the principle capabilities of such department shops. The use of dome, vault, flat roof and distinctive geometries in the roof of these homes to permit herbal mild are available. Galleria Ankara, Ankuva and Gordion AVM may be given as examples belonging to this group.

Plate 2.12: Interior View of Gordion AVM, Ankara Turkey

Source: Al-jubouri, 2012

In this organization, the performance of herbal light that comes immediately from the ceiling by using the use of skylight appears good because it has a terrific presence of daylight hours of their circulate regions . However the trouble of sunlight hours presence in circulate regions are in the second organization which is: in a galleria building, movement vertically and horizontally is non-negotiable. In this design, provisions had been made for motion of people and equipment's between the flooring. Circulation is a vital factor to take into account in galleria design, therefore massive movement areas are supplied for in the galleria for smooth and loose flow movement of consumers and goods. The stores have wide corridors in the front of them that may accommodate pretty a massive wide variety of shoppers at identical time without congestion. Above the Galleria's circulate regions is atrium which affords herbal lights for the galleria interior and lightens the corridor. Escalators are furnished to offer upward and downward motion form floor to first floor placed in the circulation region. Also 5 elevators are located in the galleria for smooth navigation among the flooring on the one-of-a-kind elements of the galleria.

Circulation round Multiple Galleries

Shopping department stores having stream areas connected with gallery spaces in preference to their significant galleries define this form of purchasing department stores. Circulation schemes designed which will offer get entry to many shops, have distinct galleries, geometries and dimensions. Cepa, Anka mall and Armada Shopping Centres are a few examples belonging to this institution.

Plate 2.13: Circulation Gallery of Cepa AVM, Ankara

Source: El-Abd, W., Kamel, B., Afify, M., & Dorra, M. (2018)

2.9 Principles guiding Shopping Mall Design

Some of the key principles necessary for a good and functional shopping mall design include:

1. Anchor and Retailers

2. Configuration

3. Mall interior

4. Shopping mall control

2.8.1 Anchor and Retailers

The purchasing centre is a self-contained shopping hub where the co-region of both complementary and substitutable stores occur (Vitorino, 2011). A sort of tenants may be considered for his or her suitability to the individual, quality, and drawing power of the vicinity. Tenants might also have sturdy and every now and then seemingly arbitrary perspectives approximately in which they'll or will not move within a middle. A vicinity that is good for one kind of commercial enterprise may be completely incorrect for some other. Placement in the tenant composition is important and complicated.

Grouping of tenants within the center may also follow either the ‘mix’ or ‘suit’ precept as long as client hobby is maintained throughout. Stores can be placed in affinity groupings, however blending is applicable (ULI, 1978,). Another precept of shop location is that comfort proper shops should be placed for prepared get admission to from the parking place. In reality, builders of local mall facilities often discover it optimal to locate supermarkets and positive pickup personal provider shops, along with dry cleaners, laundries, and carryout, in a separate building at the brink of a parking area, allowing on the spot get right of entry to for short, in-and-out parking. A long stroll into a mall to attain a comfort save might be neither comfortable for the purchaser nor appropriate for such a tenant (ULI, 1978,). The suitability of the tenant for the location, the pulling strength or consumer popularity by way of cause of neighborhood choice for the

service provider, compatibility and complementary repute with adjacent stores and parking wishes generated by the tenant are all well-known considerations for tenant area (ULI, 1978).

Retail call for, or purchaser site visitors generators, are created whilst customers are attracted to a particular purchasing centre by means of an outside pressure, usually an excessive-order, anchor tenant retailer (Sozen, C., & Devrani, T. K. (2020). The entry selections of anchor shops (traffic generating shops) normally decide to a mall earlier than smaller outlets who usually have a couple of anchor shops which might be notably-substitutable competition who normally compete in opposition to each other (Sozen, C., & Devrani, T. K. (2020). There are many exclusive categories of purchasing centres ranging from the smaller Neighbourhood centres to the a great deal larger local centre. There are exceptional anchor tenants which are maximum desirable to the exceptional categories, but inside the web site of the internal-town, a uniqueness center has the maximum accurate portrayal, whether or not located in a brand new structure or in a landmark structure or different constructing newly converted for retail use, it ought to have at least one prime anchor tenant.

2.9.2 Configuration

Configuration is an essential layout precept of the achievement of Shopping centre and was perfected via the manipulate over the configuration of the centre. Shopping Centre consists of huge more than one retail stores near geographic proximity to 1-any other (Sozen, C., & Devrani, T. K. (2020). The Aged shopping middle configuration idea pattern began as a roll with parking within the rear side, and in the front. They were majorly designed as L, U, and T to suit defined sites and unique places with recognize to opposite streets. Then the stores courageously turned away from the general public road with two facing strips separated by parking among the storefronts. Later this intervening parking space was shriveled and

transformed into an open, landscaped mall. The mall shape, with its keep frontages became an island surrounded by means of parking area (ULI, 1978). There are 5 conventional configurations usually utilized in mall layout. These consist of:

1. The Strip: A row of stores covered collectively linked with sidewalk, and runs along the fronts of the stores. Basically for the small centers, but should be saved with an affordable duration to keep away from immoderate walking distances and hard vending.

2. The L: it is basically a form of rows, with one end turned as corner locations.

3. The U: It is a row of stalls with two ends turned within equal route.

4. The Mall: It is usually a pedestrian way facing other rows of stalls. The Shopping centre may additionally designed in different shapes, an L for instance.

5. The Cluster: An organization of retail buildings separated by way of small pedestrian department shops or courts.

(ULI, 1978, p. 87).

2.93 Mall Interiors

Research has observed that a client of a present day shopping middle is not best worried about tenant blend and facilities supplied within the shopping middle however also the constructing pleasant which gives snug environment for the inhabitant. The constructing best consists of the facilities as well as outside and

indoors design of the constructing. Each element has a exclusive significance stage for the tenants and occupants (Susilawati, Rahardjo, &Yudiyanty, 2003). Yudiyanti, 2002, recognized crucial criteria in designing a shopping mall with the aid of pointing out that the primary building, indoors and exterior layout, format of shopping middle, get entry to, signage, heating, ventilating and air conditioning machine (HVAC) as well as electric and lights systems are taken into consideration by way of architects in the layout process (Hall P., 1988; Arismunandar& Saito, 1995). Parking centers, security machine and other extra centers also are essential factors inside the buying center design (Scott N., 1989; Redstone, 1973).

2.94 Shopping Mall Control

The mall currently controls more than the indoor environment, investigations and research into the manager of the inhabitance, whether or not aware to the general public or no longer, is a totally importance component of fulfillment within the mall. Lynn, I., Chen, L., Scott, N., & Benckendorff, P. (2017) describes 3 examples that are finished via the usage of shopping center manipulate which are the drama of motion, retaining the shoppers' fascinated, and the use of planting, water and huge scale factors. The manipulate of external look can be important specifically as an instance in environmentally sensitive areas including country wide parks, areas of extremely good herbal beauty, conservation areas and areas in which the fine of environment is of specifically high preferred. Designers should manipulate design information best if the touchy man or woman of the place or the unique constructing justifies it (Lynn, I., Chen, L., Scott, N., & Benckendorff, P. (2017).

2.10 Conclusion

From the literature, it's far glaring that daylight hour's usage in shopping center has terrific significance because it reduces dependence on energy there by saving fee in the long run. Top lights (from skylights) is an excellent option to achieving properly daytime equal levels in an area, as long as the ceiling openings are properly positioned and do not allow in direct ray of sunlight. Illumination from skylights frequently reaches simplest the pinnacle floor level. For a high-rise buildings with centralized circulation area plan, atriums and mild wells were used to convey natural slight deep into homes. Having an open area within the center of the building, now not most effective creates more facade however also diminishes the depth of the plan.

Chapter 3

3.0 Case Studies

The case research chosen for the purpose of this study have been nicely appraised to serve as equipment for the belief of the set intention and goals and permit the researcher to examine their performance as a means of making design solutions and making an evaluation of their standard impact and built paperwork. A critical analysis of the merits and demerits also helped to see such projects in retrospect and serve as a guide in the formation of new design solutions from which attempts will be made to eliminate such demerits as identified as well improving on the merits of such projects so as to conform with what is obtainable in other parts of the world.

3.1 Case Study 1: The Ikeja City Mall, Alausa Ikeja, Lagos State

3.1.1 Description

The Mall at Ikeja is a modern and simple and accommodates about 64 shops, fully air-conditioned, and has ample external parking spaces. The Mall opened on December 14, 2011.

The complex is finished externally with aluminium and glass, natural stone and paint. There are two entrances for access and exit to the complex. It was built on 28,500 square meter of land close to Lagos State secretariat Alausa, Ikeja, Lagos. The shops are

arranged along the corridor for the shoppers to have a good view of the merchandise and for easy access to the shops. It was built to serve the Mainland axis of Lagos.

Mall hopes to return the suburb to its former standing as the conventional retail stalls of Lagos.

3.1.2 Features

The shopping centre accommodates 94 commercial stalls with part of the big brands like Shoprite, Mr. Price and KFC. It facilities includes the following:

i. Departmental stores
ii. Commercial Banks
iii. cafes
iv. Snacks and drink bars
v. Food and drink restaurants
vi. Beauty salon
vii. food court
viii. cinema halls
ix. display area for car sales

It has a waste treatment plant to the rear of the facility.

Escalators and elevators were located at the centre of the Mall for easy upward and downward movement of the shopper in the Mall.

3.1.3 Appraisal

Merits

i. Ample vehicular parking space

ii. Apart from the cinema Halls, the other mall facilities are located on the ground floor making it convenient for visitors to move around

iii. Simplicity of design resulting in ease of circulation within the building

Demerits

i. The absence of an events and meeting halls to cater for meeting, conference and civic activities of the community

ii. Inadequate provision of shops

iii. Absence of green areas for soft landscape

iv. Building uses more energy for ventilation and lighting.

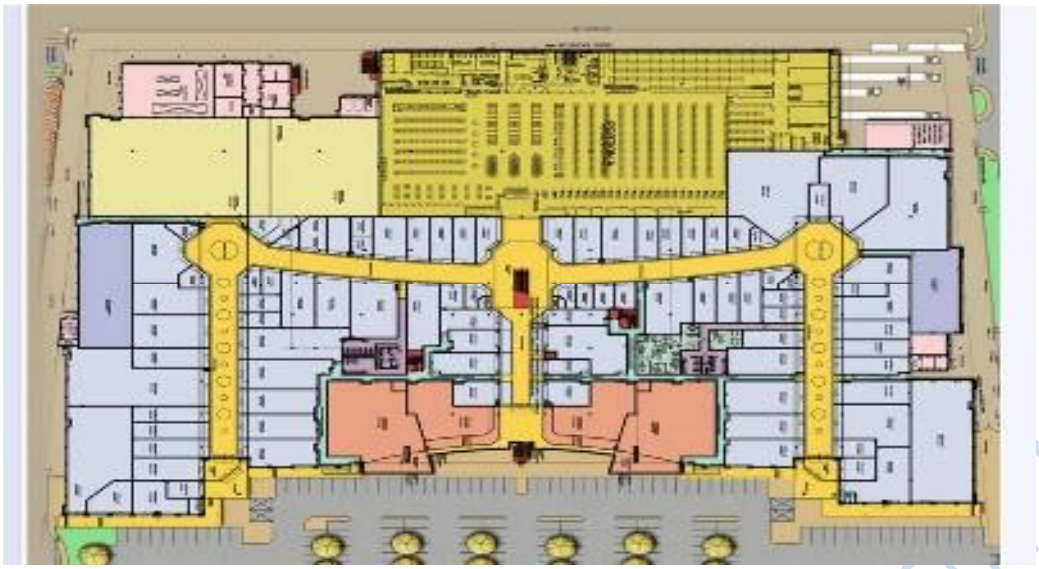


Figure 3.1: Ground floor plan of Ikeja City Mall

Source: Méndez-Vogel, G., Marianov, V., Lüer-Villagra, A., & Eiselt, H. A. (2022)

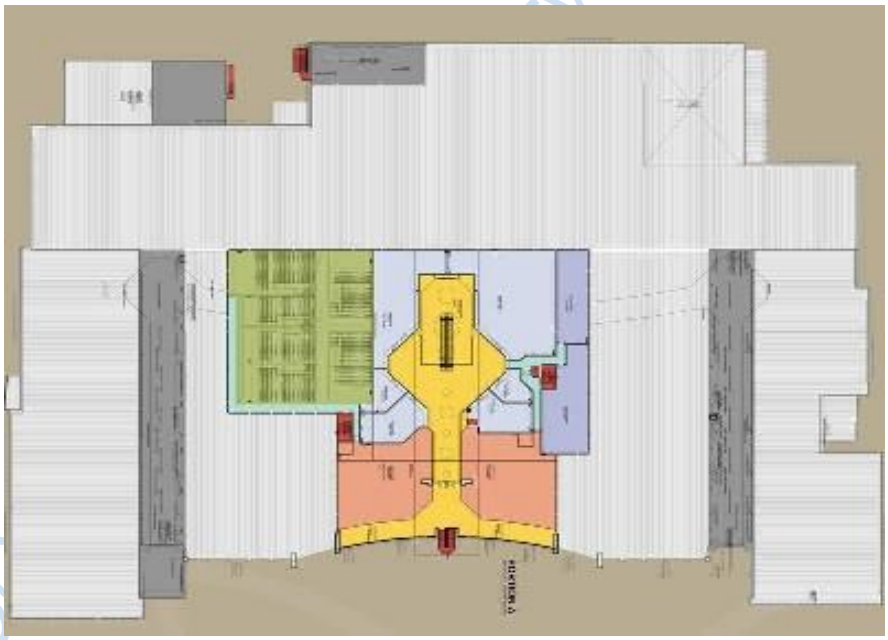


Figure 3.2: First floor plan of Ikeja City Mall

Source: Méndez-Vogel, G., Marianov, V., Lüer-Villagra, A., & Eiselt, H. A. (2022)

Plate 3.3: External view of the Ikeja Shopping mall, Alausa, Ikeja, Lagos

Source: Méndez-Vogel, G., Marianov, V., Lüer-Villagra, A., & Eiselt, H. A. (2022)

Plate 3.4: Approach view of the Ikeja Shopping mall, Alausa, Ikeja, Lagos *Source: Source:* Méndez-Vogel, G., Marianov, V., Lüer-Villagra, A., & Eiselt, H. A. (2022)

Plate 3.5: Corridor within the Ikeja Shopping mall, Alausa, Ikeja, Lagos

Source: Méndez-Vogel, G., Marianov, V., Lüer-Villagra, A., & Eiselt, H. A. (2022)

Plate 3.6: Circulation area of the Ikeja Shopping mall, Alausa, Ikeja, Lagos

Source: Méndez-Vogel, G., Marianov, V., Lüer-Villagra, A., & Eiselt, H. A. (2022)

3.2 The Heritage Mall, Dugbe, Ibadan

3.2.1 Description

The Heritage Mall is an ultra-modern shopping mall that is being modelled to meet international standard. Heritage mall consists of a total leasable space 6820sqm. The Heritage Mall has in it Banks, Restaurants; children arena, stalls and two modern cinemas. Also, provision for food court, retail shops, fitness centres and parking space to accommodate over 200 cars. Leading retail chain in Europe are amongst the tenants that have already signed for the building. The mall has 48 shops on three floors with 3 main cinemas. The mall covers a total of

14,000$m^{2.}$

The development of the mall was bore out of the need and demand on the high net-worth of patrons in the south-west region for those make journeys within and to Lagos on weekends for shopping. This mall is located at the centre of Dugbe area in Ibadan which has helped to improve the economic activities within the vicinity.

3.2.2 Features

Basement car park: The mall has a basement car park which parks 200 cars with access into the main areas of the mall from the basement car park through connecting staircases and elevators.

Ground Floor: this is accessed through a grand entrance which overlooks the access road. It has a large entrance foyer with an ATM gallery. The furniture showroom, an electronic gadget show room and a clothing retail shop, the Shoprite and several other retail outlets. The ground floor is connected to the first floor via escalators, staircases and elevators.

First floor: These accommodates retail outlets, wine shops, restaurants and eateries like Mr. Charms, KFC etc. The three cinemas are located on this floor inclusive of a box office and photo studios. Conveniences are located on this floor with large gangways for sitting and relaxing of customers.

3.2.3 **Appraisal**

Merits

1. Purpose built structure.
2. Adequate spaces to accommodate circulation and adequate recreation users.
3. Good waste management systems available.

4. Adequate circulation and space management.

5. Service facilities adequately provided.

6. User friendly to disabled people.

7. Aesthetically fit and ease of access for users.

Demerits

1. Inadequate parking for customers.

2. Use of slippery tiles in circulation areas which leaves users at a risk of accidents

3. Inadequate natural ventilation and lighting.

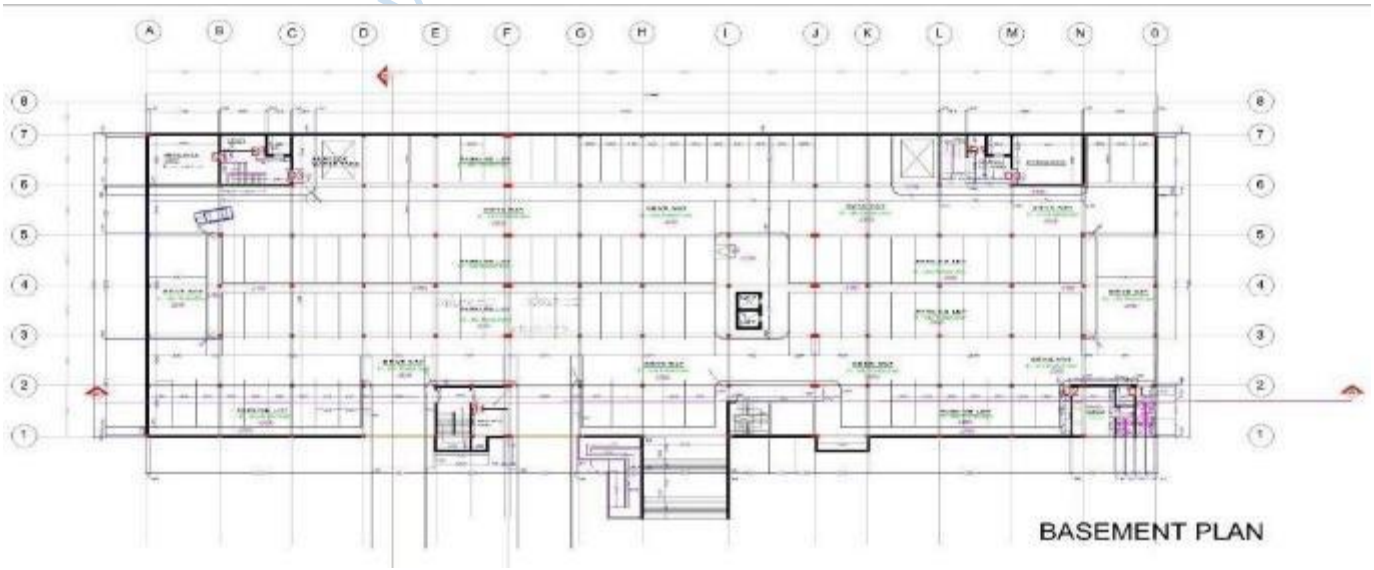


Figure 3.3: Basement plan, Heritage mall, Ibadan

Source: Ikudayisi, A. E., & Taiwo, A. A. (2021).

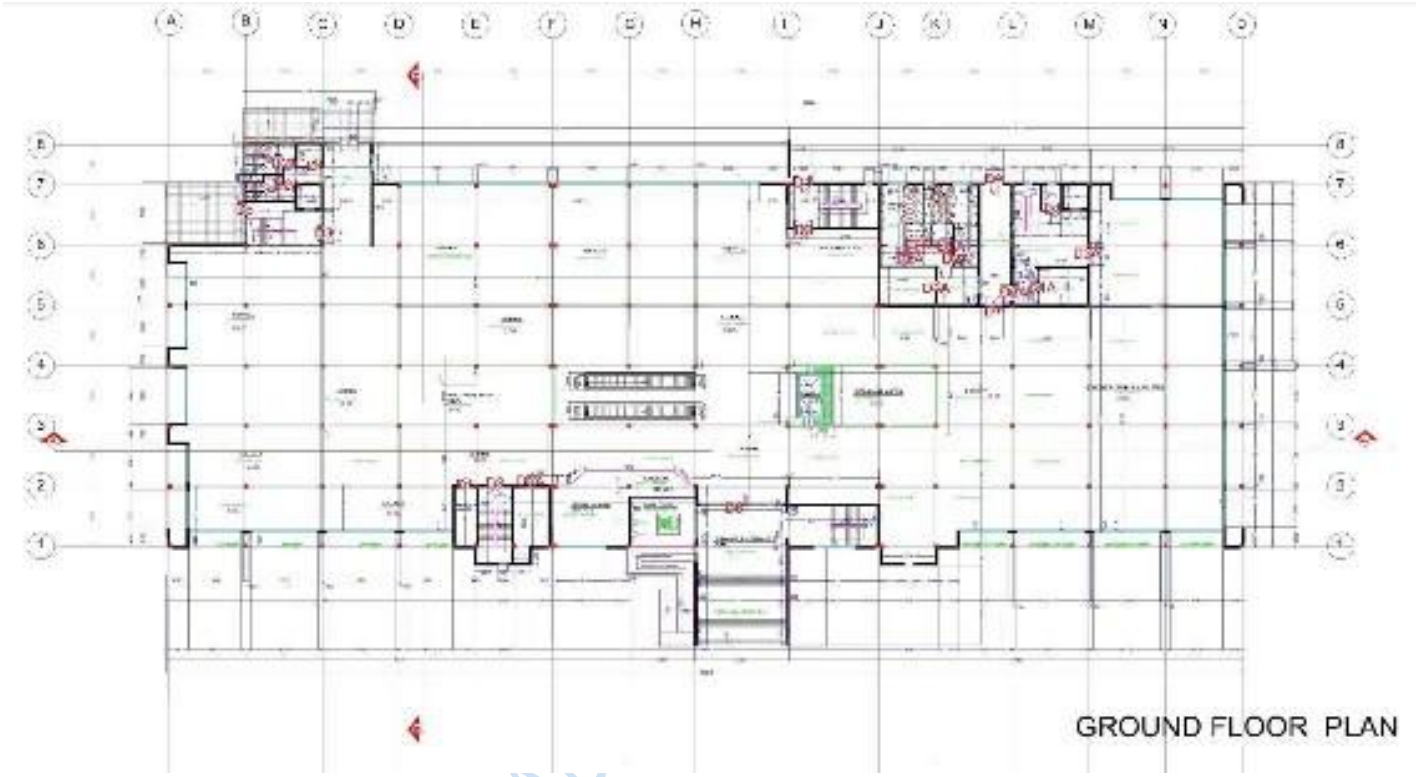


Figure 3.4: Ground floor plan, Heritage mall, Ibadan

Source: Ikudayisi, A. E., & Taiwo, A. A. (2021).

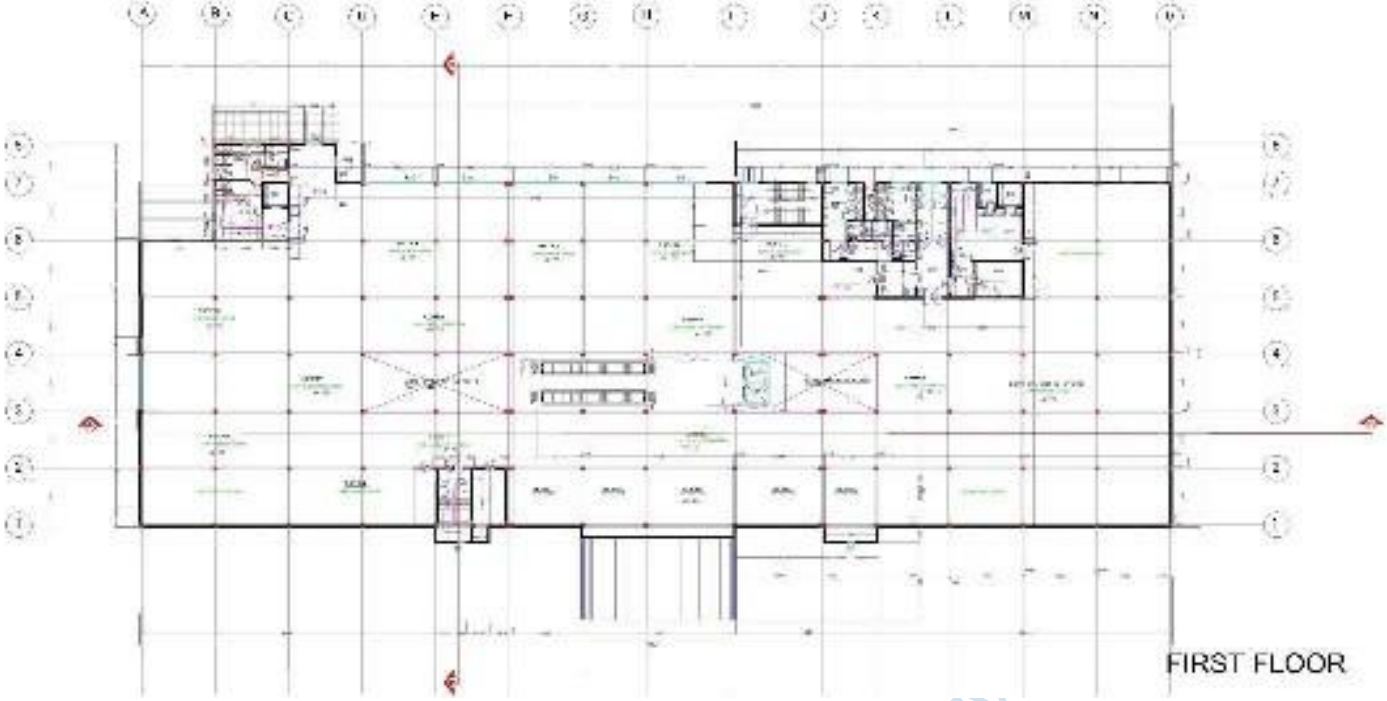


Figure 3.5: First floor plan, Heritage mall, Ibadan

Source: Ikudayisi, A. E., & Taiwo, A. A. (2021).

Plate 3.7: Grand entrance, Heritage mall, Ibadan

Source: Ikudayisi, A. E., & Taiwo, A. A. (2021).

Plate 3.8: Basement car park, Heritage mall, Ibadan

Source; Ikudayisi, A. E., & Taiwo, A. A. (2021).

3.3 CASE STUDY 3: THE PALMS SHOPPING MALL, LEKKI, LAGOS

3.3.1 Description

The Palms Shopping Mall, Lekki, Lagos was commissioned around February 2006. This is the first of Mall compare to other large shopping centres in the entirety. It is conveniently and centrally located few kilometers from the business district of Victoria Island, and the residential zone of the Lekki peninsula. The commercial site is directly

linked with the Lekki - Epe expressway providing access for visitors from Lekki, Victoria Island, Ikoyi and Lagos Island. It offers the concept of shopping, entertainment and relaxation facilities covered with one roof. The commercial zone is located on a 45,000 m2 (5 acres) site while the total built up area is 23,600 m2. The Palms Mall accommodates 69 shops ranging in size between 28- 500 m2 with a parking space for about 1000 cars.

3.3.2 Features

i. Food court

ii. Restaurants

iv. 5 screen cinema

iv. 2 large departmental stores.

3.3.3 APPRAISAL

Merits

i. Ample vehicular parking space

ii. Excellent building orientation

iii. Good placement of various access

iv. Simplicity of design resulting in ease of circulation within the building

Demerits

i. Conflict between vehicular and pedestrian traffic

ii. Poor Space management

iii. Absence of green areas externally

iv. Inadequate natural Lighting

v. Use of hazardous floor finish (slippery tiles)

Figure 3.6: Ground Floor level of the Palms mall

Source: Ikadeh, M. S., & Cloete, C. E. (2020)

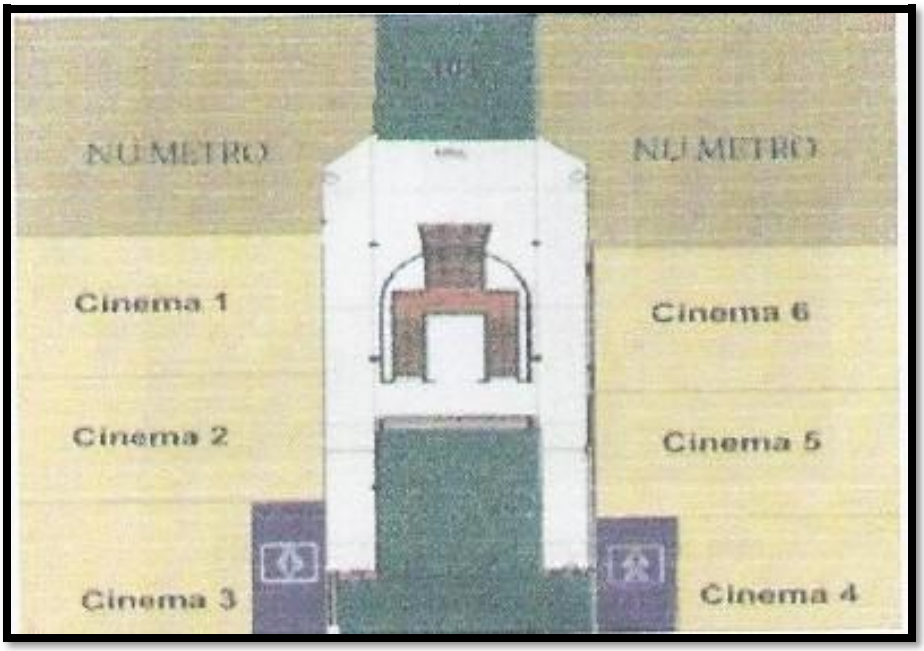


Figure 3.7: First floor level of the Palms mall

Source: Ikadeh, M. S., & Cloete, C. E. (2020)

Plate 3.7: Parking Spaces at the Palms Shopping Mall

Source: Ikadeh, M. S., & Cloete, C. E. (2020)

Plate 3.8: Interior of the Palms Shopping Mall showing the corridor

Source: *Ikadeh, M. S., & Cloete, C. E. (2020)*

3.4 Case Study 4: The Dubai Mall

3.4.1 **Description**

The Shopping Centre presently is the largest world's shopping Centre and 14th larges of a Land mass, located in the city Dubai, United Arab Emirates.

United Arab Emirate is situated in Downtown of Dubai. This is majorly part of 20-billion-dollar Downtown Dubai complex which includes 1,200 stalls. According to Google (2018), the Dubai Mall records 60, 000 tickets sold for the Dubai

It was discovered that Dubai Mall hosted over 37 million site visitors in 2009, and attracts more than 75 0,000 Patrons weekly. Far back to 2010, the Mall hosted forty seven million, and noticed excessive growth by 27% from 2009.Nevertheless, the Mall boosted the economic system of Dubai. In 2012, Dubai Mall was identified with a global's maximum-visited shopping and amusement centre and attracted more than sixty five million patrons, which is an increase more of 20% compared to 54,000,000 recorded in 2011. The increase in its attraction was more than that of New York City with over 52 million vacationers in 2012, and Los Angeles with 41 million. The figure recorded surpass visitor arrivals to all notable entertaining centres and recreational parks in the globally including Times Square (39.2 million), Central Park (38 million), and Niagara Falls (22.Five million). It is now layout DP Architects PTE Ltd recorded.

3.4.2 **Features**

Accessibility to the Centre is through Doha Street, it was reconstructed as a storey building along the street in April, year 2009. It has two anchor tenants and it covers 5,400,000 sq. ft., with 14,000 plus car park, on four floors.

3.4.3 Appraisal

Merits

i. Good aesthetical use of materials even when they serve functional usage.

ii. Provision of separate entrances for visitors and goods and services.

iii. Simplicity of design resulting in ease of circulation within the building.

iv. Good pedestrian control.

v. Disable friendly building i.e. presence of ramps and slopping floors.

vi. Adequate spaces to accommodate circulation and adequate recreation users.

vii. Adequate circulation and space management.

viii. viii. Ample vehicular parking space.

Demerits

i. No sitting area for users.

ii. No natural lighting available.

iii. Building depends solely on artificial power generation.

iv. Inadequate sitting areas provided for shoppers.

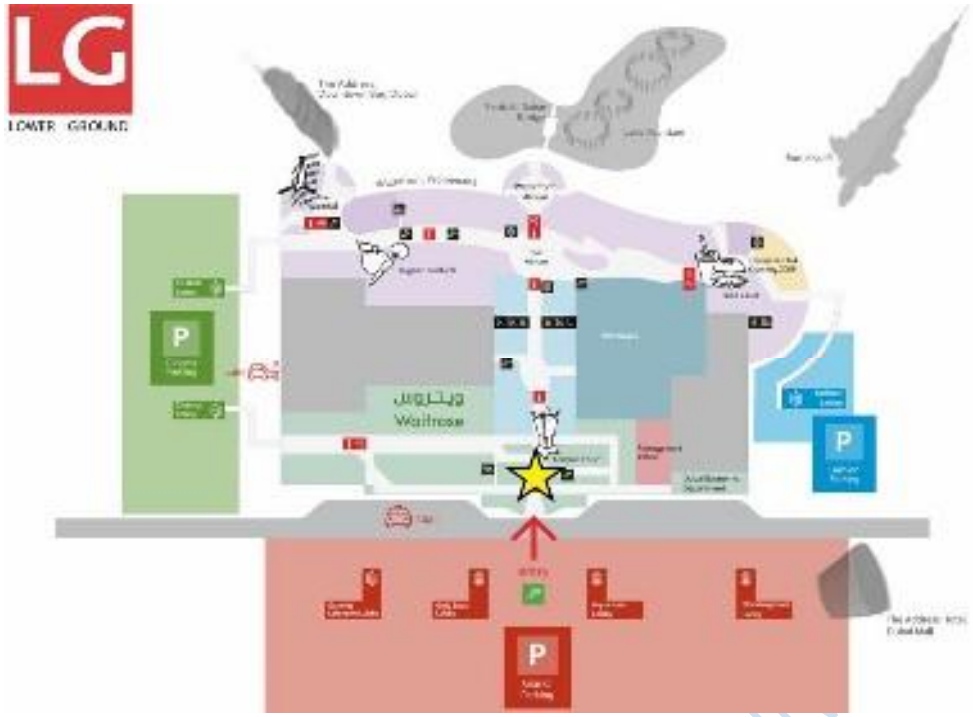


Figure 3.8: Basement plan of Dubai mall of The Dubai mall

Source: Al-Saad, S. A., & Ababneh, A. (2017)

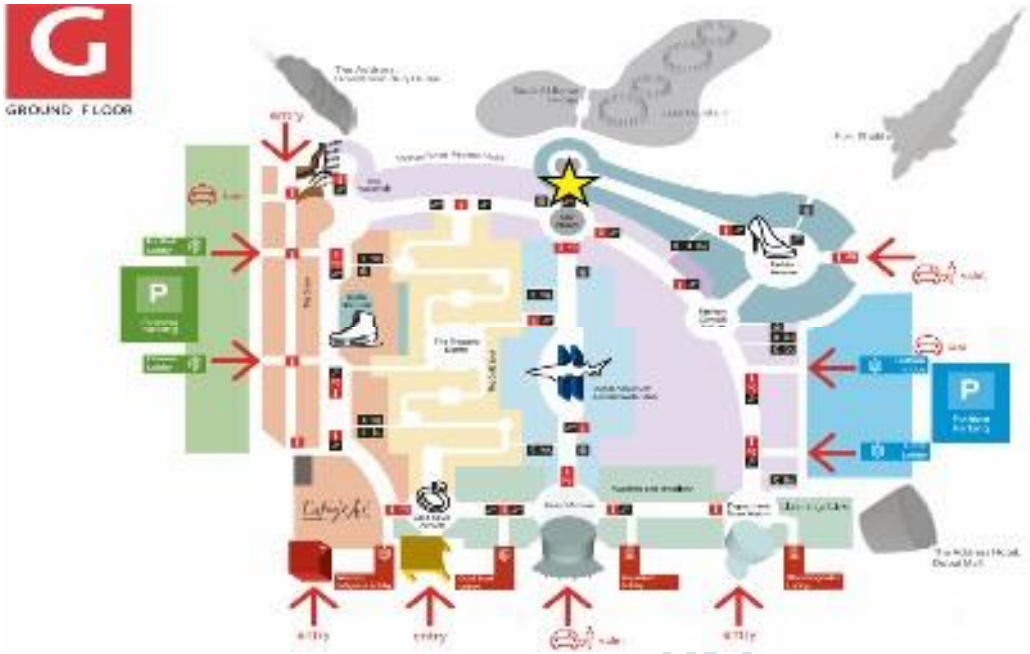


Figure 3.9: Ground floor plan of The Dubai mall

Source: Al-Saad, S. A., & Ababneh, A. (2017)

Figure 3.10: First floor plan of The Dubai mall

Source: Al-Saad, S. A., & Ababneh, A. (2017)

Figure 3.11: Second floor plan of The Dubai mall

Source: Al-Saad, S. A., & Ababneh, A. (2017)

Plate 3.9: Cinema lobby within The Dubai mall

Source: Al-Saad, S. A., & Ababneh, A. (2017)

Plate 3.10: Grand Entrance of the Dubai mall

Source: Al-Saad, S. A., & Ababneh, A. (2017)

Plate 3.11: Aerial View of the Dubai mall *Source:* Al-Saad, S. A., & Ababneh, A. (2017)

3.5 Case Study 5: Teras Park Shopping Mall, Denizli Turkey

3.5.1 **Description**

The Teras Park Shopping Mall, Denizli, Turkey is an enclosed shopping mall located in Denizli, a growing industrial city in the South western part of Turkey. It has a total indoor space of 95,310 m2, has a 46,500 m2 of leasable floor space, and limited parking for 1500 vehicles. Teras Park Shopping mall occupies a land area of 52,614 m2; it hosts about 12,000 visitors daily. The city is notable for Textile manufacturing and exports, and attracts many visitors all year round.

3.5.2 **Features**

The Teras Shopping mall has:

1. 150 shops
2. 15 fast food restaurants
3. 3 coffee houses
4. Spa and fitness centre
5. Office accommodation

3.5.3 **Appraisal**

Merits

i. Large expanse of leasable floor space

ii. Purpose-built structure

iii. Adequate circulation

iv. Provision of green interior environment

v. The use of water pools and fountains to cool the building interior

vi. Ease of transit between floors due to adequate Lifts, Escalators and Stairs.

Demerits

i. Limited parking space availability

ii. Absence of green areas externally

iii. Artificial interior lighting sources

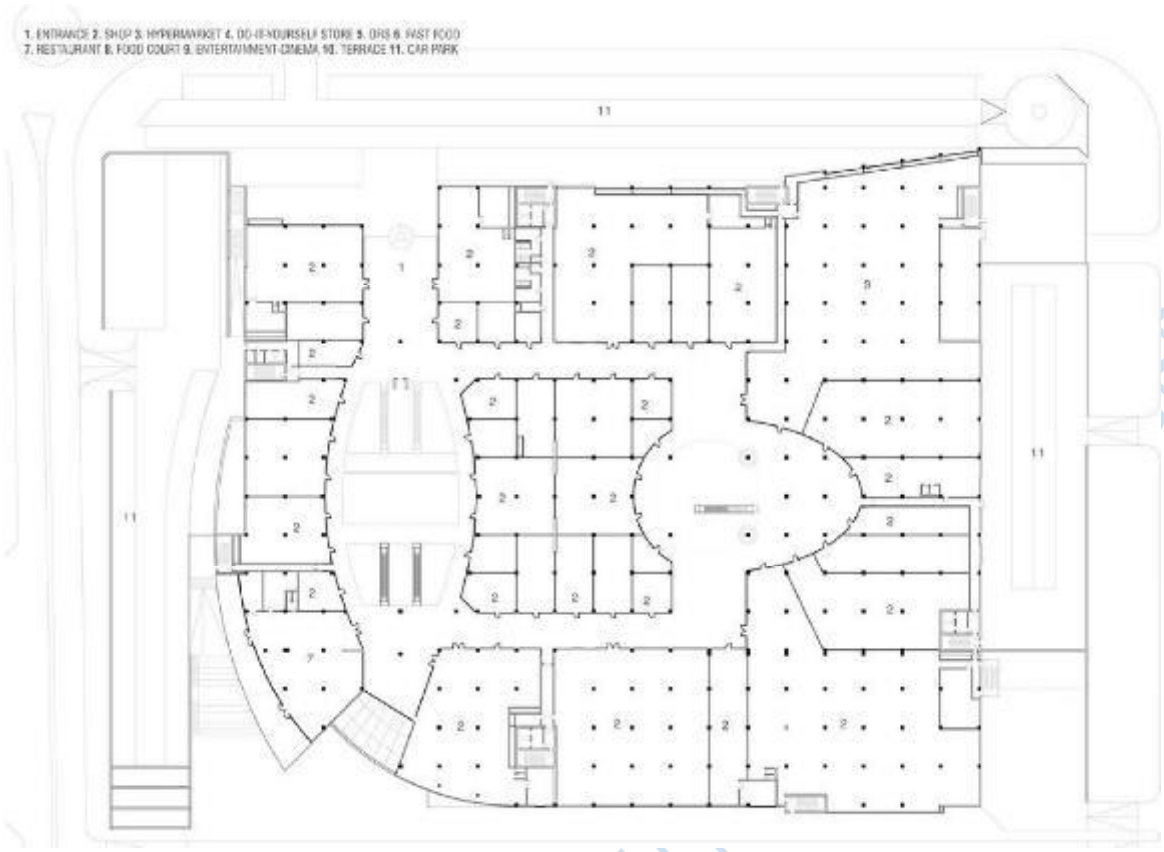
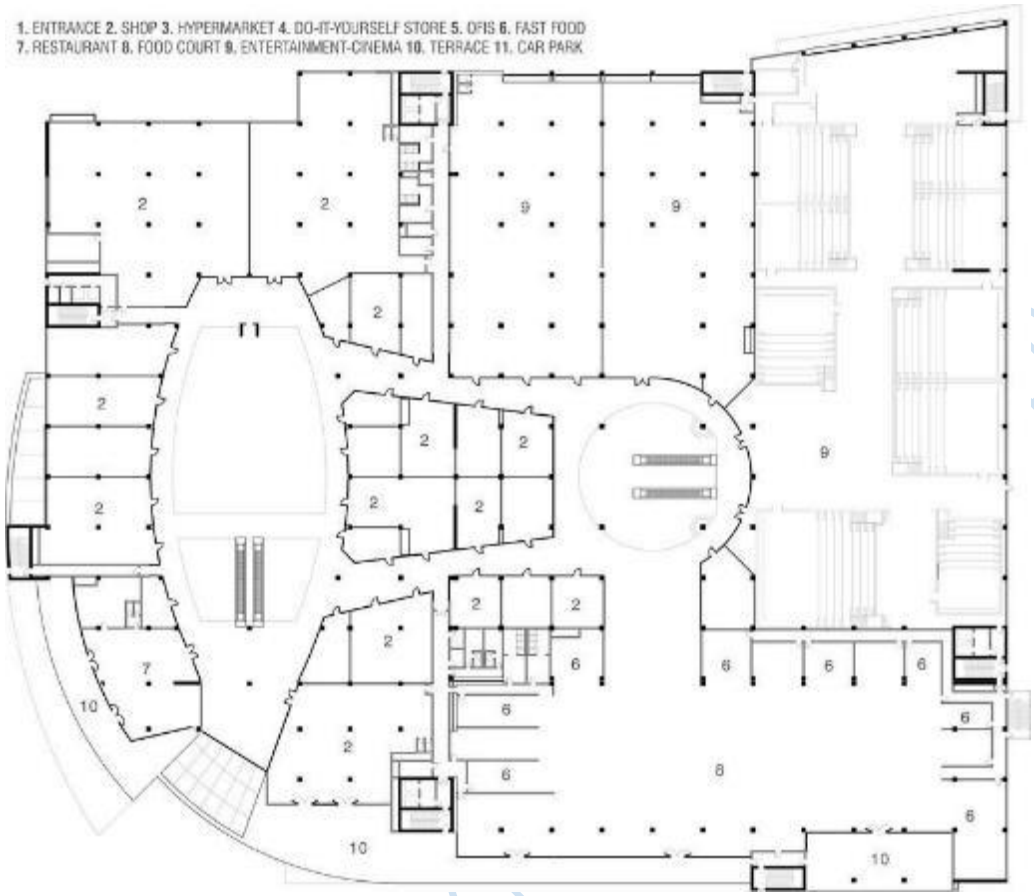


Figure 3.12: Ground floor plan of The Teras Park Shopping Mall

Source: Open buildings (2017a)



igure 3.13: First floor plan of The Teras Park Shopping Mall *Source: Open buildings (2017b)*

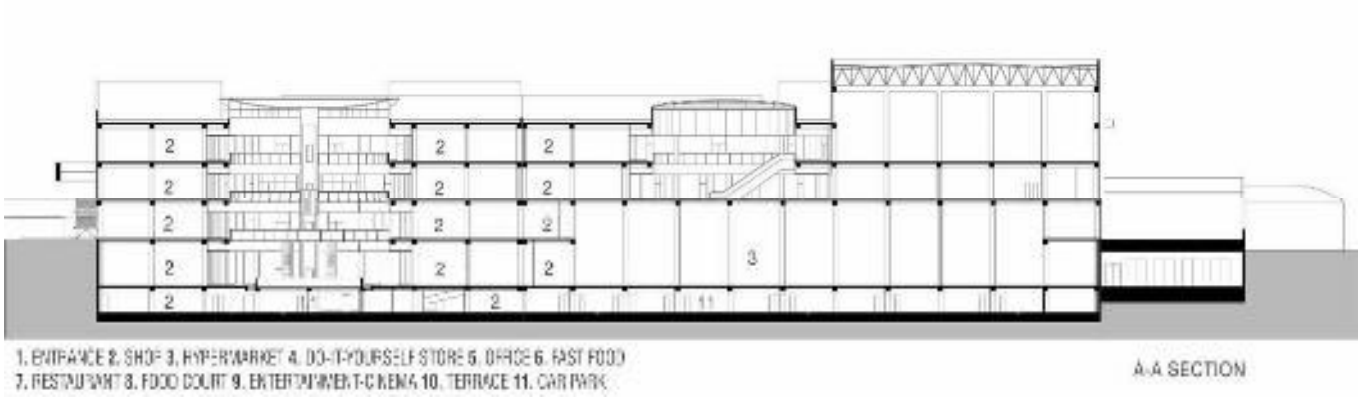


Figure 3.14: Section through the Teras Park Shopping Mall

Source: Open buildings (2017c)

Plate 3.12: Exterior view of The Teras Park Shopping Mall, Denizil, Turkey

Source: Yukselmuhendislik (2017a)

Plate 3.13: Interior view of the Teras Park Mall, Denizli, Turkey showing circulation systems.

Source: Yukselmuhendislik (2017b)

Plate 3.14: Food court within the Teras park mall

Source: Open buildings (2017d)

3.6 Case Study 6

Mall of America (Moa)

3.6.1 Description

The mall of America is positioned in Bloomington, Minnesota (a suburb of the Twin Cities), southeast of the junction of Interstate 494and Minnesota State

It was commissioned in the year 1992, it's regarded as an important shopping centre within the United States of America in phrases of wide variety of stalls and ordinary floor location. The city Mall of America has a gross area of four 870,000 sq.ft. equivalent to (452,000 m2) or 96.4 acres equivalent to (390,000 m2) with 2,500,000 sq.ft. equivalent to (230,000 m2) available as retail space. The city mall is has a similar shape with a more or less rectangular floor area designed. The stores sited within the building will be more than 530 stalls and were arranged along three rows of pedestrian walkways, in rectangle form. Four anchor stalls were also cited located at the end corners. The city mall is arranged into four unique segments, each of these segments had its private ornamental fashion till a sequence of renovations from 2010 to 2015 introduced about a unified and extra high-priced fashion, in addition to the most important development.

3.6.2 Features

i. Amusement park
ii. Anchor shops
iii. Retail shops

iv. Food courts

v. Restaurants

vi. Cinemas

vii. Miniature Golf course

viii. Aquarium

3.6.3 Appraisal

Merits

i. The mall is aesthetically good.

ii. Provision is made for heating and cooling systems within the mall to enhance comfort of the users.

iii. Sufficient parking spaces were provided

iv. Skylights were used to bring in daylight in Atriums within the building.

Demerits

i. There has been reports of indecent exposure and alcohol related offences in the mall.

Plate 3.15: Showing Amusement park inside the mall

Source: www.mallof america.com 2017

Plate 3.16: Showing circulation inside the mall

Source: www.mallofamerica.com 2017

Plate 3.17: Showing some retail outlet inside the mall

Source: www.mallofamerica.com 2017

Plate 3.18: Showing a Restaurant inside the mall

Source: www.mallofamerica.com 2017

3.7 Deductions from Case Study

Deductions made from the various case studies carried out on the subject topic include;

1. The malls have all of their facilities under one roof making it easy users to move from one end to the other.
2. Need to provide natural lighting in lobbies and large circulation areas due to the unreliable power supply in Nigeria.
3. Provision of generous entrance halls to allow for ease of flow of users.
4. Importance was attached to ease of access and movement for visitors and service requirements.
5. Spaces are polyvalent in nature which allows for flexible use of shops.
6. Provision of loading docks with direct access to storage and display areas to facilitate ease of delivery of wares.
7. The malls are located within close proximity to available market.
8. Provision of mixed-use (commercial) spaces within the mall such as cinemas, restaurants, shops, business and financial services, among others which makes them a one stop recreational location.
9. Provision of separate access for visitors and services (such as deliveries) in the various
10. Facilities.
11. Provision of sitting areas for shopper such that they can relax if they get tired from shopping.
12. They are usually a beehive of activities so security and comfort of user is necessitated.
13. Ample parking is necessary.
14. Pedestrian traffic control needs to be efficient to reduce vehicular and pedestrian interference.
15. Headroom in large malls needs to be large to allow for conducive ventilation and spaces to hide AC condensers and vents.

16. Need to create transparent spaces for display and easy relation between lobbies and shops.
17. Large lobbies need to be created to allow for easy circulation.
18. Need to avoid dark corners and alleys to avoid in appropriate loitering.
19. Aesthetically sound designs to increase interest of users.
20. Need to provide ample conveniences to enable comfort of users.
21. Disable friendly designs as ramps were provided for disabled people.

Chapter 4

4. Site, Project Analysis and Proposal

4.1 Study Area Location

The city of Ibadan (Yoruba language: Ìbàdàn or absolutely Ìlú bá- dàn, is a town at junction of the savannah and wooded area) capital town of Oyo State, also the third largest metropolitan area in Nigeria, then Lagos city and Kano city, with the population of about 1,338,659 according to the census carried out in year 2006. The city of Ibadan is regarded as most important metropolitan geographical region. During the independence, the city of Ibadan becomes the largest and most populous metropolis in United State of America. And the 1/3 in the continent of Africa, then Cairo and Johannesburg. Ibadan city is located within south-western part of Nigeria, a Land mass of 128 km inland northeast of Lagos city and 530 km southwest of Abuja, the federal capital, and is a prominent transit point between the coastal place and the regions to the north. Ibadan have been the centre of management of the antique Western Region since the days of the British colonial rule, and parts of the metropolis's historic protecting walls still stand to these days. The city of Ibadan is populated with Yoruba people, with mostly Christian worshippers. City of Ibadan is positioned in south western Nigeria about 120km to the east of the border with the Republic of Benin within woodland zone near the boundary among the woodland and the Savanna. The city ranges in elevation from a hundred and fifty m within the valley vicinity, to 275m above sea degree at the primary north-south ridge which crosses the vital part of the city. The metropolis has a coordinates of longitude 7º 23' 47" N and latitude 3º 45'0" E. (www.oyo.com/htm).

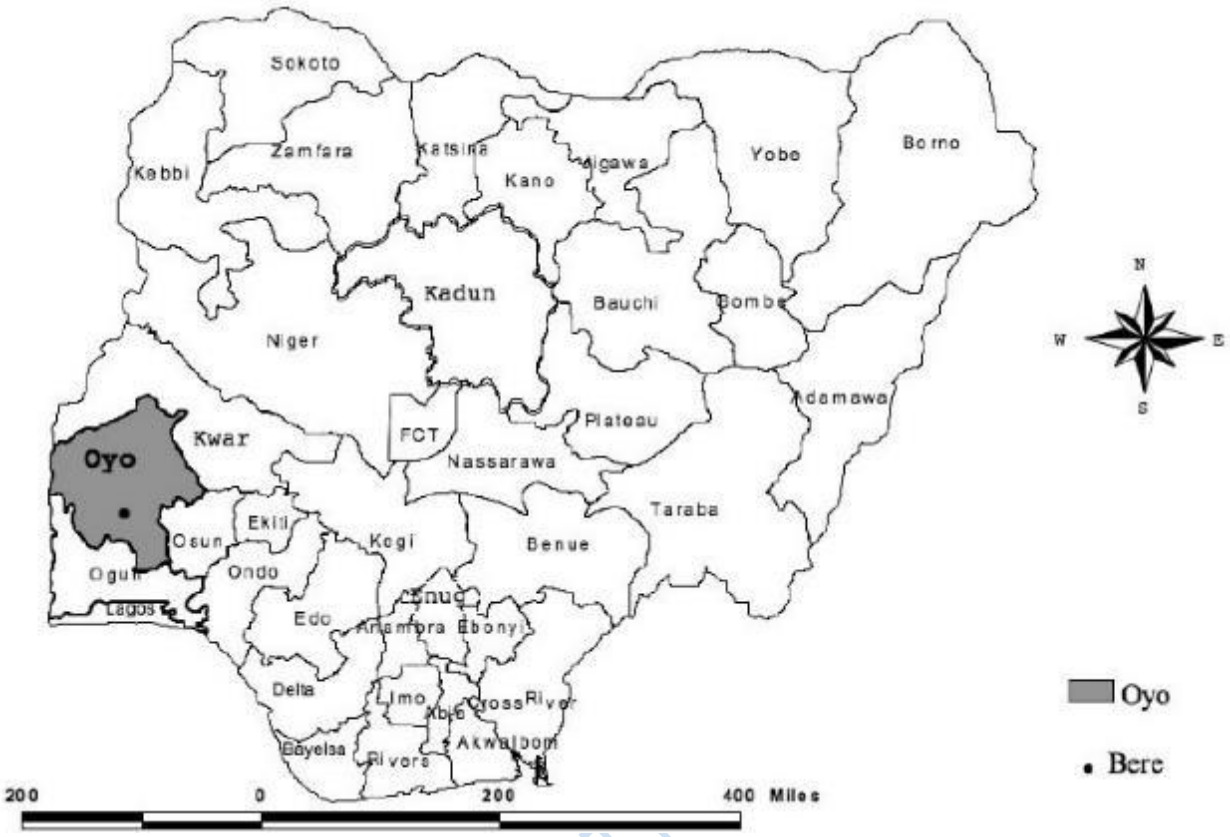


Figure 4.1: Nigeria Map showing Oyo State.

Source: Oyo state Government official website 2017

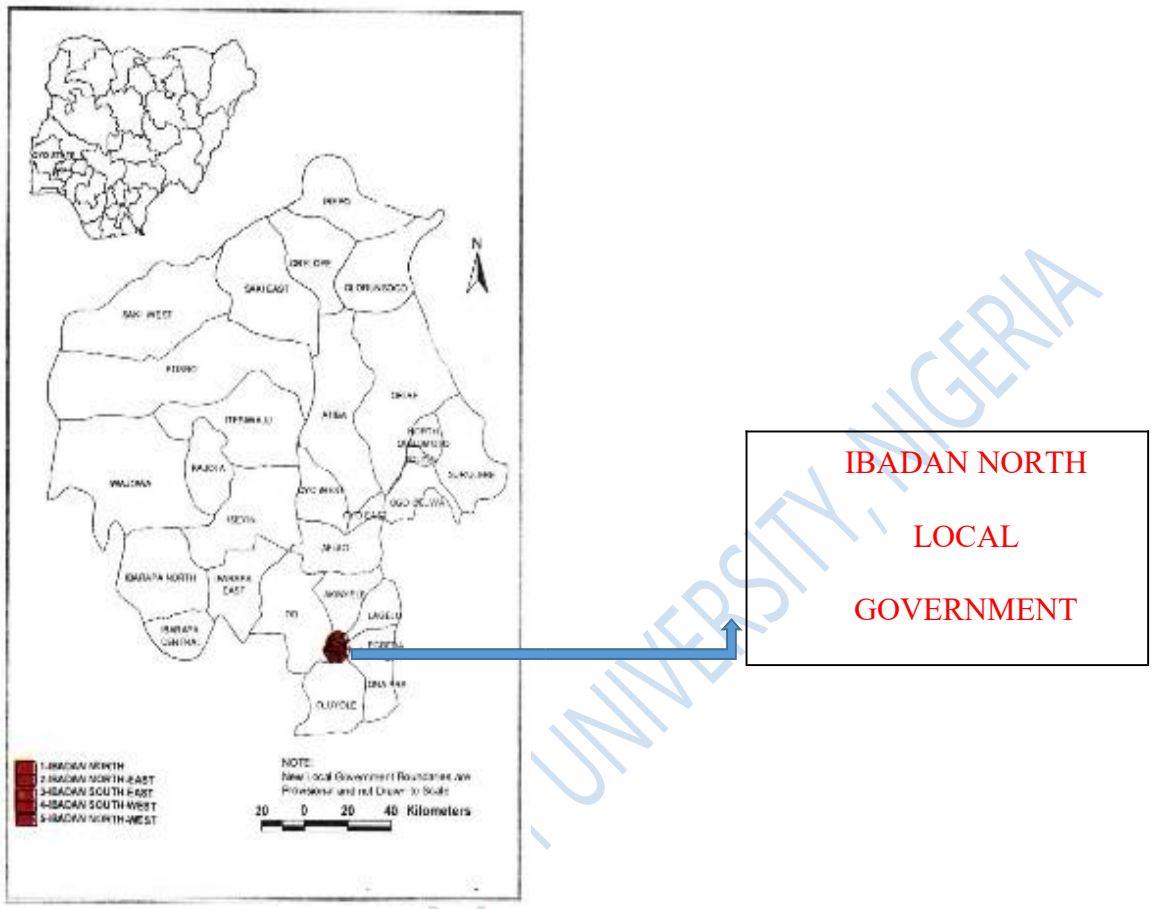


Figure 4.2: Map of Oyo State showing the Local Governments

Source: Oyo state Government official website 2017

4.2 Site Selection Criteria

Numerous elements go into site location criteria and analysis. The factors that determine successful delivery of a Shopping mall project depends specially are fulfillments of zoning requirements, circulation within the centre, site for its location, Neighbourhood context, and legal, natural and physical elements, public amenities, human and cultural factors, as well as climate.

Availability of Land:

After careful survey of the city of Ibadan it was observed that there is insufficient Land for the proposed project to be sited in within the center of the town, for this reason the choice land selected for the proposed project is located on a portion of land on the side directly opposite Union Bank, Gate – Iwo road bye pass road.

Site Location:

The site is strategically located where it will have good patronage possible and also helps to create a serene environment due to the direct link of the road to the Central business District of the town.

Site Accessibility:

The location of the site gives direct and convenient access for both vehicular and pedestrian. Proposed ACE Shopping mall has the Gate – Iwo road dual carriage road in front and it also allow for the creation of a service road which would help to divert traffic off the road and also serve as the service road for the delivery of goods into the Shopping mall.

Possibility of Expansion:

The site is suitable to conveniently accommodate the shopping mall facilities. This is as a result of the size of the site which will allow for the creation of adequate vehicular parking spaces and other facilities needed for the smooth running of the shopping mall. Possible expansion and extension of the proposed Shopping mall is made possible by the availability of ample area of land around the site which can serve as spaces for future expansion.

Topography:

The site location is relatively flat but slopes from centre to the eastward and westward.

Vegetation:

The site location has green vegetation, shrubs, and good sandy soil. The land terrain enhance planting of the desired flora which will reduce solar radiation, reduce the erosion and as well as wind forces. The vegetation also enhance outdoor recreational spaces and good landscaping.

Nearness to Public Utilities:

The site has adequate access to basic infrastructures e.g. Good Roads, Electricity, Telecommunications, Security and inter-state facilities etc.

4.3 Site Location/Description

The selected site for the proposed ACE Shopping mall, Iwo Road is a massive expanse of land which of about 26,191 square meters in length. It is located within vicinity of Ibadan North Local Government Area. The location provides good access from different parts of the City to the site. Due to in availability of large expanse of land within the locality, the site is a combination of partial virgin land and removal of existing structures. It shares boundary with residential buildings and Ibadan North Local Government.

Plate 4.1: Google Earth view of the proposed site location of the Shopping mall

Source: Google Earth, 2017

4.4 Site Analysis/Inventories

Site analysis is a complex interaction of many factors which include physical analysis i.e. vegetation, soil nature, topography, geographical analysis i.e. direction of winds, temperature, humidity, precipitations and infrastructural analysis among others.

Figure 4.3: Analysis of the Site

Sources: Researcher's Field work (2022)

4.4.1 Topography

The site location slopes gently from the centre to the Eastward and Westard. The dense vegetation on the site helps in controlling erosion. The site drainage follows the site topography; hence the site drains to the Eastern part of the site.

4.4.2 Vegetation

Ibadan is as a large commercial zone, most street within the conventional center and the inner suburbs of the metropolis has traces of a market centre or store. The city of Ibadan is characterized by several market zones. The biggest daily marketplace in the city stretches from the railway station inside westward to the centre of the town and is Ibadan's industrial area. The Site has relatively good and firm grounds with good load bearing capacity suitable for the construction of the proposed shopping mall. The site is well served by roads.

4.4.3 Climatic Data

Ibadan is warm in temperatures throughout the year and its between 27°C (80°F) and 34°C (93°F). The exceptional time of visiting the City is the drier months namely: January, February, November and December. Other historical weather facts are: Average day and night temperature

The range in temperatures throughout the year is shown below in Fahrenheit

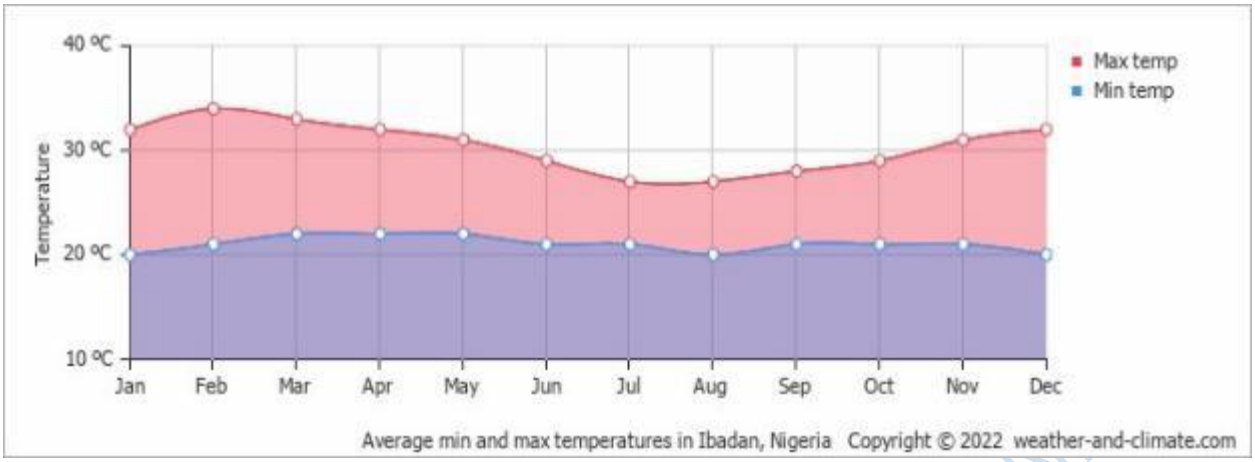


Plate 4.2: Showing the mean temperatures throughout the year

climate.com/uploads/average-temperature-Nigeria-Ibadan.

Solar Radiation:

The foremost source of power at the Earth is the solar. This power is available in form of electromagnetic radiation. Some parts of the earth receive more energy than they emit or radiates which is known as net heat gain while the other parts that receive less energy than they radiates is called net heat loss area. The net heat gain and loss could have been too hot and cold respectively for human comfort but it is being balanced through the ocean currents and winds which blow the excess heat to the area with net heat loss.

The project site is characterized with net heat gain and high intensity of solar radiation.

Daily percent of sunshine

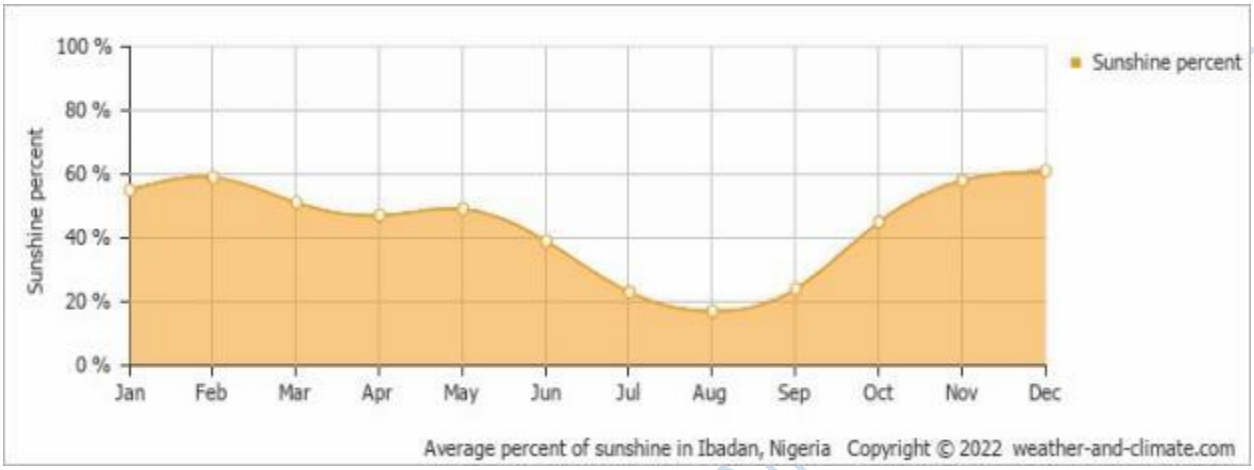


Plate 4.3: Showing the mean percent of sun hours during the day over the year https://weather-and-climate.com/average-monthly-percent-Sunshine,Ibadan,Nigeria

Wind:

For the purpose of design, it's far essential to understand the direction of winds in addition to most and imply wind velocities. Wind strain that's proportional to wind velocity is used in air flow. The period of high-pace gusts is also wanted for structural format. The willpower of wind hundreds for roof layout must mirror maximum values to keep away from blowing off of such roofs. Shopping mall site experiences both the North East Trade Wind which brings dryness and dust along with it from the desert and the South West Trade Wind which brings rain and humidity from the Atlantic Ocean.

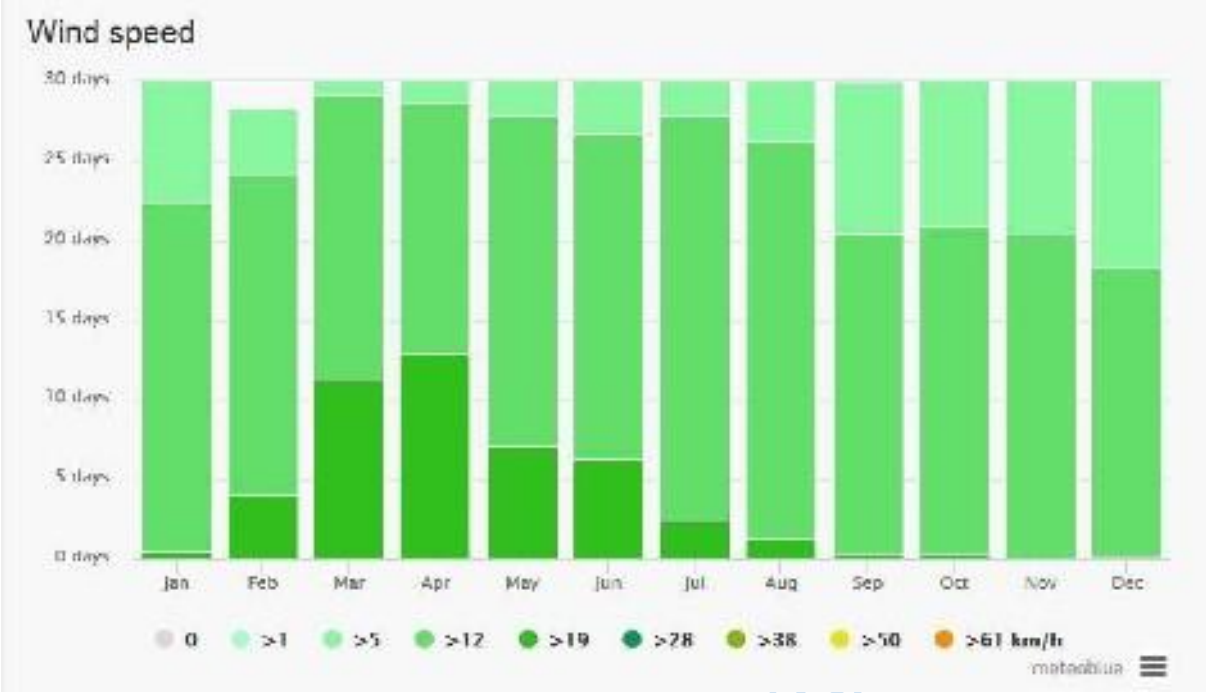


Figure 4.4: Shows wind speeds in Ibadan

Source: www.meteoblue.com

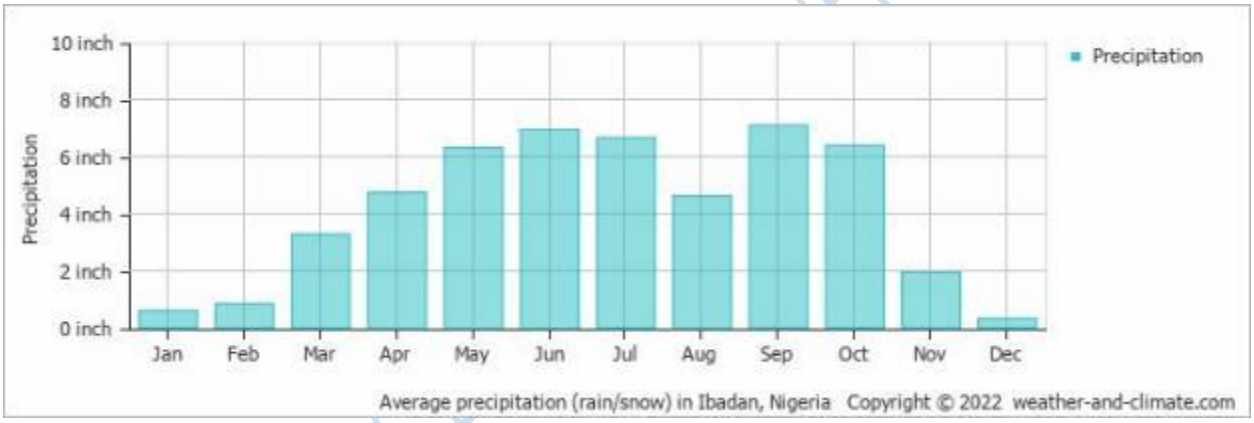
Relative Humidity:

This is the actual ratio of the quantity of moisture content present inside the air to quantity of moisture the air could preserve on the given temperature expressed as a percent. For example, the ratio of the absolute humidity to the saturation-point humidity expressed as a percentage. The Vapour content of atmospheric air in Ibadan is high which ranges between 25mmHg to 30mmHg and frequent relative humidity of 90% and above. Reflected radiation from the ground is usually low because of the dense vegetation of the site which result into damp soil and encourages insect breeding and fungal growth.

Rainfall:

Oyo State is characterized by the following:

- Oyo state like the tropical experiences rains between the months of April and October yearly.
- Whilst the dry season comes between December and February.
- Averagely, month of September is the wettest with 7.1 inch or 1800 of precipitation.
- While on averagely, month of December is the driest month with 0.3inch or 8mm of precipitation.



ving the precipitation diagram for Ibadan, Oyo State shows on how many days per month.

Source: www.meteoblue.com

Temperature:

Temperature in Ibadan is relatively normal throughout the year. The annual mean temperature is about 27 ^{0}C. When the intensity of sun is high, the maximum temperatures is between 34 C^{0} and 38^{0}C.

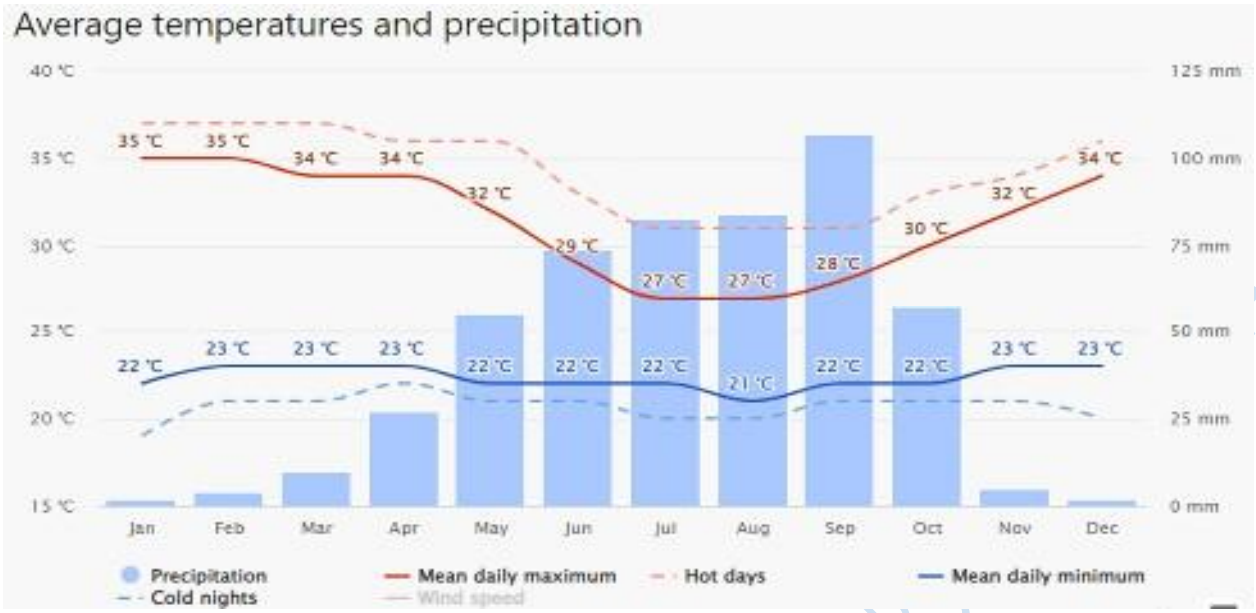


Figure 4.6: Showing Average Temperature and precipitation in Ibadan

Source: www.meteoblue.com

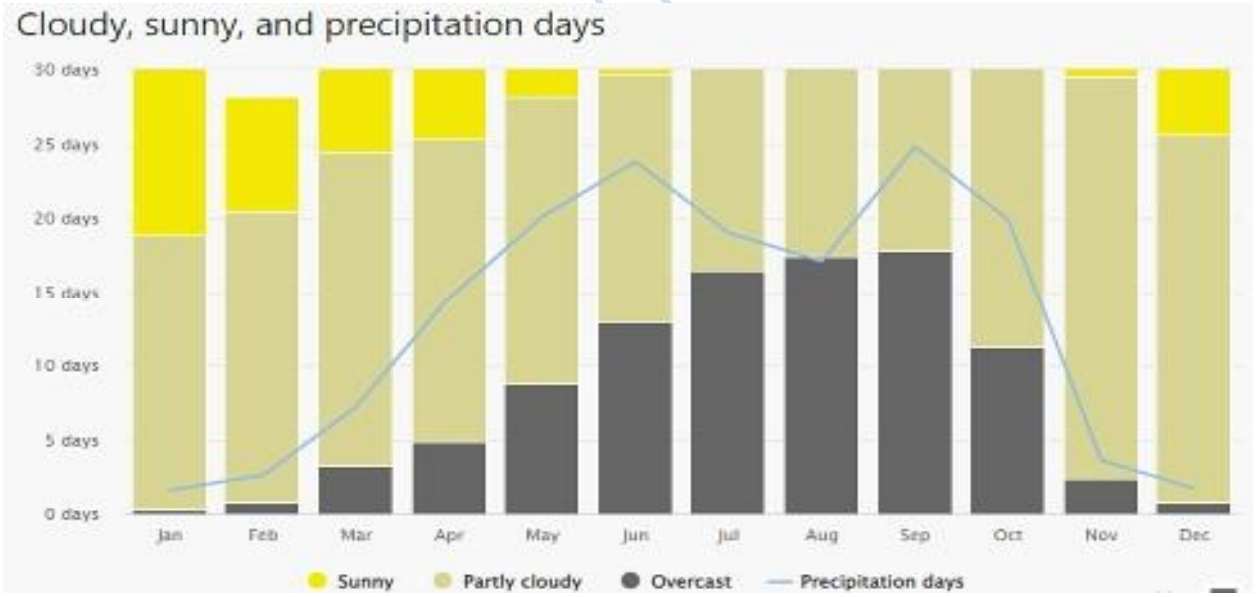


Figure 4.7: Showing cloudy, sunny and precipitation in Ibadan

Source: www.meteoblue.com

4.4.5 **Infrastructural Analysis:**

Gate – Iwo road which runs along the southern part of the site provides the major ingress and egress access to the site. High Tension Electric power distribution supplying power from the city center will make it easy to supply power to site. Independent power borehole will be provided on site for water supply. The site is thin the field coverage of most telecommunication services in Ibadan.

4.5 Project Analysis and Design Synthesis

The proposed mall design synthesis is an enclosed shopping center concept chosen by a conscious desire to balance functionality and aesthetics with the aim of producing a simple but eye catching exterior for the proposed shopping mall, with an equally comfortable interior environment. Simple straight form has been adopted and combined with treatment of its external facade and surface parking around it. Two forms of circulation; external and internal readily come to mind. External circulation has been planned such as to avoid conflicts between vehicular and pedestrian traffic. Properly defined driveways with kerbs define vehicular routes and effective parking areas. Linked road from the major entrances also well detailed. Circulation internally is major and was been achieved by horizontal means through the use of corridors, aisles, also via vertical movement with stairs and escalators in a manner as to lead to every part of the building with ease.

4.6 Design Criteria

This refers to the accepted standards used in making decisions or judgments about the design.
It entails important issues to be considered in achieving a functional and effective mall design.

Some of such issues include:

4.6.1 Column Spacing

Column spacing is a significant part of Shopping mall designs as it involves the widths and sizes of the various shops and spaces available. Often used spaces are 3.6m, 5m, 6m, 9m and 12m spans. This is very essential to achieve the most economical structural and loading system to be deployed in mall designs. A column spacing of 5.4m was used in the design of the proposed mall. (Neufert, E. (2019). *Architects' data*. John Wiley & Sons.).

4.6.2 Clear Heights

The clear heights varies from the height of 3.6m to 8m and could be headroom from floor to ceiling level for mall interior spaces. For the proposed mall a clear height of 4.2m was used out of which 600mm minimum would be used for Air Conditioning ducts, to accommodate Acoustic items, recessed lights and so on. (Neufert, E. (2019). *Architects' data*. John Wiley & Sons.)

4.6.3 Expansion Joints

These are importance in the construction large buildings with larger spans. Expansion joints are located at a mid-point separating sections of the building to relieve strain on structure substances. This is resulting from construction movement. Moreover, expansion joints were introduced to the proposed design guide against such catastrophe.

4.6.4 **Climate Control**

Most Commercial areas like shopping centres, places of work, shops, and resorts are maintained 12 months- round inner fantastic limits as to temperature and relative humidity. This approach heating and humidification in the wintry weather (where relevant), cooling, dehumidification and ventilation within the summer season or tropical climatic zones. The hassle of cooling is proportionately more critical than heating because of the want to compensate for the frame heat and moisture emitted through crowds of human beings and warmth from electric lighting, particularly the incandescent type.

In the beyond, cooling device including compressors, fanatics, and condensers have been installed in basements, mezzanines and on roofs. Roof installations, for decrease fees and engineering requirements are pretty large and unsightly. It is always critical at the planning and design tiers for provision to be made for plant rooms for all mechanical and electric installations, with allowances for floor area, for weight, for ceiling clearances, and for appropriate visual consequences of deliver and exhaust grilles where required.

4.6.5 Ducts and Shafts

The external wall of shopping mall structures should be bendy to house reasonable tenant desires. The importance is a schedule of vicinity and sizes of ducts and shafts runs to keep away from area issues and design failure. This requirement ought to consist of unique aeration via ceilings, roof, and all different mechanical objects that may be expected.

4.6.6 Exterior Walls

The trend is to reduce the wide variety of show home windows and public entrances at the outside façade of enclosed purchasing department shops. Experience has shown that the general public do not like to enter a mall via something but the regular mall entrances or through primary departmental stores located inside the mall shape. Furthermore, the whole idea of cutting-edge day shopping center is to get the Customers as fast as viable into the shopping mall, from which the buying method originates. Department shops insist on having direct entrances to the parking masses and the mall right.

4.7 Brief Analysis

4.7.1 Design Brief

Ibadan as a fast growing city in reference to infrastructure and commercial growth in Nigeria and should have a well-designed shopping facility especially from inter-state interception to take shopping to an international standard in the State and to provide an enabling environment for investors to ply their trades in the City. The scheme is a proposed design of a high performance city shopping mall for Ibadan city that would take a full advantage of its location thereby becoming increasingly important to the city's economy. The mall will serve as a facility where people of different status and caliber come together on

common ground to relax and shop which in turn gives them a sense of belonging in the community where they reside.

4.7.2 Brief Development

Series of case studies were carried out at various shopping malls, both local and foreign malls. Appraisal of these case studies is improved on for the proposed design. The proposed shopping mall will be a hub of activities for the people around Iwo road, Basorun, Egbeda, Iyana Church and Ibadan at large. The proposed design is set to world-class standards and effectively reflect an approach to achieve sustainability, flexibility and originality. The design shall make provision for fully functional facilities for a world-class malls. It shall provide sufficient activity spaces and good zoning for common functions. To satisfy this need, the following spaces are required.

1. Retail facilities

i. Departmental stores
ii. Retail shops
iii. Bank
iv. Let-table offices
v. Warehouse

2***. Entertainment facilities***

i. 3- screen cinemas,
ii. Games arcade
iii. Events hall

3. Recreation facilities

i. Food courts,
ii. Outdoor recreation
iii. Children play area
iv. Bar
v. Outdoor games area
vi. Gymnasium

4. Administrative section

i. Reception
ii. Mall manager's office
iii. Secretary's office
iv. Board room
v. Maintenance offices
vi. Electrical maintenance office
vii. Mechanical maintenance office

5. Ancillary facilities

i. Conveniences
ii. Atrium
iii. Car parks
iv. Gate house
v. Water treatment
vi. Generator house
vii. Kitchens

viii. Fire service

4.8 Space Allocation/ Schedule of Accommodation.

The schedule of accommodation is used to calculate the approximate areas and reviewed in relationship to existing conditions and the manner of occupation by users, furniture and functional activities in the building. Usually, space allocation in the design of shopping mall is done by considering minimum area or number of spaces per person required for a particular activity which is optimally comfortable. Below is the schedule of accommodation for the proposed Shopping mall to be situated in Ibadan.

(1) RETAIL FACILITIES

S/N	SPACES NAME	NO REQUIRED	SIZES (M^2)
1.	Departmental store	13	2549.97
2.	Retail shops	90	54.72
3.	Bank	2	204

4.	Lettable offices	13	365
5.	Collection point	2	54.7

(2) Entertainment Facilities

S/N	SPACES NAME	NO REQUIRED	SIZES (M^2)
1.	Cinemas	3	418.87
2.	Games Arcade	2	337.10
3.	Banking Hall	2	311.4

(3) Recreation Facilities

S/N	SPACES NAME	NO REQUIRED	SIZES (M^2)
1.	Food courts	4	350.25
2.	Bar	2	293.14
3.	Outdoor games	1	175
4.	Gymnasium	1	346.29
5.	Outdoor recreation space	4	180
6.	Children play area	1	180

(4)

Adminis Trative Section

S/N	SPACES NAME	NO REQUIRED	SIZES (m^2)
1	Mall manager's office	1	25.35
2	Secretary office	1	26.77
3	Electrical maintenance office	1	54.72
4	Mechanical maintenance office	1	54.72

5	Board room	1	108.92

(5) Ancillary Facilities

S/N	SPACES NAME	NO REQUIRED	SIZES (M²)
1	Conveniences	36	1.74
2	Atrium	1	
3	Staircase	4	24.72
4	Car parks	500	18 – 25
5	Gate house	2	100 – 144
6	Water treatment	1	550
8	Generator house	1	750
9	Fire service	1	450
10	Electrical workshop	1	46.9
11	Mechanical workshop	1	46.9
12	Store	12	8.23-26.78

4.9 Functional Relationship

The functional relationship chart shows the degree of relationships among the various spaces in the facility. It helps the designer to see at a glance which spaces are or not related to one another. This helps the designer to locate related spaces within easy proximity of each other and isolate those which are not

related. It also aids zoning of spaces and functionality of the design. General functional relationship principles taken into consideration include;

1. Separation of the various traffics from one another i.e. vehicular, pedestrian, Customers, staff, etc.
2. Orientation of buildings to create maximum thermal comfort and convenience for shoppers and visitors.
3. Orderliness, functionality, aesthetics and unity.
4. Green areas with soft and hard landscaping.
5. Ample parking spaces (Parking requirement ratio of 1 car parking space/15 sqm of leasable floor space.

However, the allocation of spaces in the proposed mall is guided through sure planning concepts so that it will obtain the best viable productivity of the web site location over a period of time;

- Expose retail centers to maximum foot site visitors
- Separate diverse mechanized visitors' types from each other and from foot traffic
- Create a most of comfort and comfort for consumers and merchants

Exposure of all character shops in a shopping center to the most amount of foot visitors is the exceptional warranty of high income quantity. Therefore for the shopping center to prosper, dense foot visitors must be created thru aisles and course methods. Shopping site visitors, the act of on foot from shop to keep, creates the lifeblood of a mall; and proper circulate of this traffic ensures business success.

The separation of pedestrian areas from driveways is one of the cornerstones of top shopping mall web page making plans. The consistent motion of motors inside transport regions unavoidably creates a certain amount of hazard, noise, fumes, and confusion, which distract the client and diminish buying leisure. Service regions on the merchandising or Ground floors need to be nicely shielded by display or dwarf

partitions or landscaping, and that service motors are able to input or depart without interference from different vehicles or pedestrians.

Planning for enlargement need to be taken into consideration if the shopping mall is placed in a gradually growing location. In such situations, the departmental shops will often express the preference to make bigger whilst their sales extent reaches a stated figure. The float chart is a diagram that suggests the connection between areas the use of packing containers to designate areas, whilst the bubble diagram uses circles of various size, relying on the scale of the distance represented.

4.10 Conceptual Development

This refers to the ideas derived from specific instances, in architecture, five (5) main types of concept have been identified they are;

i. Analogous i.e. looking at other things
ii. Metaphor i.e. looking at abstraction
iii. Essence; looking beyond the function
iv. Pragmatic; looking at the function
v. Ideal; solving architectural problems

4.10.1 Site Concept

The site concept deals with the idea behind the initial and overall planning of site activities in relation to the site's existing physical situation. This is influenced by; existing buildings and the way they have been organized; physical features such as rock outcrops, roads, views to be taken advantage of, among others. The site for the proposed Mall has been planned and designed to take advantage of the nature of the surrounding environment as it relates to the winds, the sun, topography and existing services.

4.10.2 Building Concept

A pragmatic approach was taken towards the generation of the building form and arrangement of spaces. Technical requirements such as area of space per person, circulation space requirements for different activities, among others, were considered for the spaces so as to achieve the desired user capacity. Flexibility in the layout of spaces was also an important consideration since the shops had to be multi-functional in use. This led to the rectangular configuration of most of the spaces. Generous lounge areas and circulation space was provided around and before the shops, putting into consideration the minimum area ($0.7m^2$) per person requirement for such spaces and also the likely overcrowding which may occur at peak periods such as Christmas and special holidays. Recreational spaces and lounge areas were located within easy reach from the commercial spaces via the mall area without the potential to cause disturbances to on-going functions. Support services were located beside and away from the shopping area, yet positioned strategically to perform their required functions.

Chapter Five

Project Appraisal

5.1 Architectural Appraisal of the Proposed Scheme

The proposed ACE Shopping mall at Iwo road, Ibadan is expected to fulfil all requirements for a modern day shopping system for the teeming populace and also to provide a well-organized shopping facility for the fast growing City, its suburbs and fringes. Functionality and aesthetics are very important requirements to be met coupled with the provision of adequate effective illumination, circulation, security, flexibility and ventilation among others which will form the basis of the design consideration. The proposed scheme is to provide an enabling environment in which shopping activities can take place without any constraints for shoppers and retailers and provision of necessary facilities to facilitate business and transactions. The scheme will also serve as an avenue for household retailers and other multinational business enterprise that have the major challenge of befitting business environments for business to expand their businesses to the City. Therefore the riddles of getting a suitable space or location for their businesses are hereby solved by the proposed scheme. The proposed design will achieve scenery of well-designed shopping mall, outdoor spaces with the implementation of landscape which will serve as a masterpiece of how a shopping environment should be.

5.2 Construction Techniques and Materials

The location of the site also influences the material choice and construction methodology of building structures. The city of Ibadan being a commercial nerve of the country, it is expected that modern-day construction building materials need to be used. Designs/supervision of columns, beams, and reinforcements which are structural elements in a building need to be handled by licensed

structural/construction engineer registered by COREN. In the course of this, numerous analysis and test such as soil test to determine bearing capacity of the soil, in other to avert the pull from wind effect will be necessary. Appropriate reinforcements and concrete mix shall be an essential factors by the certified person while preference of finishes will take into cognizance the acoustic designs, the thermal insulation and other elements in finishes. Therefore, functionality of the spaces internally shall also decide the selection of finishes.

5.2.1 Pre-Construction Operations

The stage of operations are executed out by the Contractor and other relevant Subcontractors. The operations are assessment of health and protection components of the assignment, provision of on-site documentation, provision of facility get right of entry to and security. A preconstruction conference have to be organized to permit all of the parties concerned to get easy knowledge of the tactics concerned in contractor submittals, sampling and attempting out, production surveys, inspections by using means of outside corporations, fee requests, claims and disputes, unexpected task situations and change order requests.

5.2.2 Substructure

The building substructure comprise of solemnly foundation section. The soil within the site is firm, well compacted, with good load bearing capacity and has the presence of rock boulders running underneath the soil layer. Both strip and pad foundation would be employed in this case because of the favourite characteristics of the soil. The quality of the foundation materials will offer resistance to chemical and

pose adequate compressive strength; this will aid in conveying the weight of the building without any form of differential settlement. The substructure stage of operations that are involved are:

i. Site clearing: all obstruction on the distance to be occupied by using the buildings is to be eliminated to permit for other operations to follow. Removal of Trees and different flora that are found on the construction site.

ii. Site hoarding: This is the erection of barrier around the perimeter of the construction site to improve security and protection of device and materials. Corrugated galvanized zinc sheets nailed on wood frames is being used as hoarding.

iii. Removal of topsoil: Topsoil over the gap on the land blanketed need to be removed. The top soil on the other areas must be retained to be used for landscape planting. The common intensity for pinnacle soil elimination is 150mm.

iv. Setting out: This is refer to as transfer of dimensions on the constructing drawings to the ground or site. The structure is to be set out in relation to the layout as reference point for all buildings. The taking off is also performed with theodolite for better and accuracy in comparison to different methods.

v. Excavation to trenches: After the starting up has been completed and authorized through the certified personnel, the trenches/foundation footing are to be done with excavators to the specified depth by way of the structural engineer. The structural Engineer need to check the dug trenches and signed off before the blinding is been done.

vi. Casting of blinding, foundation wall footing and column bases: 225mm Mass concreting may be casted in the footing. The foundation footing is to be laid to correct and stabilized the slope of the site. The column bases are to be reinforced to structural engineer's specification.

vii. Laying of foundation wall: The foundation block walls are to be 225mm sandcrete block wall laid in stretcher bond. The foundation block partitions are to be packed with concrete. The concrete will improve the energy of the inspiration block wall.

viii. Hard-core filling: Hard-core need to be 300mm thick weathered rock. It must be adequately levelled and compacted.

ix. Damp proofing: Thee layers of bituminous felt as membrane material is laid over the place of the foundation. It is to disallow rising of water to the ground slab.

x. Casting of in-situ floor ground slab: The thickness of ground floor slab is to be distinct and specified accordingly by the Structural Engineer. The floor slab must be reinforced, checked and signed off by way of the structural engineer before commencement of work.

5.2.3 **Superstructure**

The building will be concrete framed structure, the superstructure encompasses of the basic components namely; floors, walls, doors & windows, ceiling and roof structure.

i. Floors: The floor is a plate as a structural member and should meet the requirements of the structural specifications. This should withstand the imposed loads and prevent damp penetration into the building. It ought to have the capability to take in warmth and sound, and hearth resistance; ease of preservation; allow for right appearance, comfort, protection, cleanliness and so forth. Reinforced concrete floor slab are used for the flooring and they may be completed with PVC tiles, marble tiles, vitrified tiles, ceramic tiles, cement screed, rug.

ii. Walls: Walls are elements that make a contribution majority to the photo and the advent of the building. It should be designed to guard towards wind, dirt, animals and to have good aesthetics. Strength and balance are maximum significance as well as resistance to dampness, thermal and sound insulation along with fire resistance. Both inner and outside partitions might be of 225mm sandcrete hollow blocks. Some of the walls for the conveniences can be of 150mm sandcrete hole blocks. Lift partitions as well as stair walls should be fabricated from large concrete to behave as defenses towards fire thereby facilitate the clean and safe evacuation of humans from the constructing while there may be a fireplace outbreak. The external wall surface will be covered with metal composite wall panels. Glazed curtain wall systems are used internally and externally. No internal wall is a load bearing wall, as all loads are transmitted through reinforced concrete columns. Acoustically treated walls are used to divide spaces for separate uses. Glazed partitions are also used to separate commercial spaces from circulation areas.

iii. Doors and Windows: Internal and external doors will be 2100mm or 2400mm in height with varying width of 750mm, 900mm, 1800mm and 2400mm. Window openings are fixed and sliding windows with varying width and height ranging from 1200mm to 3600mm width.

iv. Ceiling: Suspended ceiling will be used in most spaces in the shopping mall to help in housing major light fittings and for acoustic considerations, the ceiling materials used is 600x600mm cellulose ceiling boards. The boards are to be installed according to the pattern specified by the architect.

v. Roof: For a functional roof, the requirements are; strength and stability, durability, fire resistance and occasionally, sound insulation, lighting, ventilation. The span of the roof and nature that will determine the construction method used in the various unit. Flat concrete roof will also be used. The roof is a space frame structure, supported by steel and reinforced concrete columns, with 60mm thick aluminium insulated roof panel covering. The dominant roof design is a mono slope shed-type while a curvy butterfly transparent roof sits on the central circulation.

5.3 Building Services, Circulation, Ventilation and Lighting

5.3.1 Building Services

It is important that utility services be provided with a view to put the constructing into most powerful use. Very vital amongst this are, water deliver, strength deliver, sewage disposal and hearth safety.

i. Water Supply: Direct water supply device shall be used by linking via the available water mains from the devoted water reservoirs built to serve the customers of the residences. Provision will be made for borehole and additionally energy operated pump to supply water constantly to the building. Storage cisterns will be made to be had at required locations for one of a kind distribution.

ii. Electrical Systems: The Power Distribution Company strains in lifestyles across the website shall serve the building. Distribution community will be supplied on web page to deliver every floor and area with the desired strength. The wiring system will be conduit, nicely designed and stressed following all specifications of the electric engineer and services engineer. Type of twine cable will be of high conductivity and good resistance. Also there can be an alternative strength supply (generator) to cater for the strength needs in instances of energy failure. The generator routinely switches over each time the PHCN strength is out.

iii. Fire Protection: Fire poses a serious threat on shopping mall because of the large number of people it accommodates. The objective of fire protection is to prevent the start and unfold of a fire, stem the unfold of smoke and facilitate the break out or rescue of persons. Active and passive precautions will be taken to effectively put out fires in the event of an outbreak. Active precautions are structures which might be mechanically deployed in the event of hearth and they include the set-up of warmth-activated sprinklers which manipulate a fireplace at its source via the release of discrete volumes of water enough to extinguish a blaze. Other critical fireplace safety measures encompass convenient and well-marked exist, smoke and heat detectors, smoke and hearth alarm systems, water spray extinguishers, CO2 extinguishers, and many others. Passive precautions are creation answers in the building and its components a good way to help in lowering the unfold of hearth. These encompass minimal structural sections, casings and coatings, layout of growing mains, set up of hearth doors and windows, creation of helping floors, and many others.

iv. Sewage Disposal: Facilities for the managing, garage and collection of refuse are supplied with get admission to for frequent collection. The centers are effortlessly located, properly ventilated and comply

with all hearth safety and public health necessities. The waste are to be disposed appropriately and the users are to be sensitized on the way to dispose waste. Incinerators are also provided on the site.

v. **Acoustic:** Good acoustic is one the maximum crucial consideration for shopping mall design. Room acoustic begins with organizing the basic length, shape and finish materials of a given space to reap a certain rom sound and the place, shape of sound reflecting and absorbing surfaces. These standards are primarily based at the supposed characteristic and occupancy of the room. Acoustic consideration at the cinema of the proposed shopping mall will be controlled by the use of absorptive materials like fibrous materials, volume resonators, foam, carpet and acoustic tile on wall and ceiling. While acoustics at the alternative places in the shopping center would be performed via the use of formed aircraft of tough constructing materials consisting of gypsum board, wooden, glass, masonry and concrete.

5.3.2 **Circulation**

This is the movement of people from one point to another on the site. In the proposed project, vehicular and pedestrian circulation accesses are provided.

In a shopping mall building, movement vertically and horizontally is irresistible. In this design, provisions were made for movement of people and equipment between the floors. Circulation is an important factor to consider in shopping mall design, therefore large circulation spaces are provided for in the shopping mall for easy and free flow movement of shoppers and goods. The shops have wide corridors in front of them that can accommodate quite a large number of shoppers at same time without congestion. Above the Shopping mall's circulation areas is atrium which provides natural lighting for the shopping mall interior

and lightens the corridor. Escalators were provided for upward and downward movement form ground to last floor located in the circulation area. Ramps are provided to aid circulation of Disabled people.

5.3.3 Ventilation

Ventilation generally may be natural or artificial/mechanical. Natural air flow requires effective temperature distinction or wind movement to result in air movement, at the same time as synthetic air flow thru air-conditioning is the technique of treating air in an internal environment to establish and keep required necessities of temperature, humidity and air motion. The shopping mall will be ventilated and cooled by both natural and artificial means of ventilation. Artificial ventilation is through a combination of central air-conditioning system and extractor fans.

5.3.4 Lighting

In the layout of a shopping center, lighting fixtures is an important aspect to recall because of its physiological and mental effect on people. The feel of wellbeing associated with day lighting and the orientation that comes with being related with the exterior. The design of a Shopping facility requires a well incorporated artificial lighting to complement day lighting. Artificial lighting constitutes an essential feature of good shopping mall interior design. They enable the display of goods as clearly and attractively as possible in a manner to attract patronage from customers. They also assist in eliminating glare, and accentuate interior colours in a manner that suit and compliment goods displayed. The shopping mall is designed to have get entry to the herbal sunlight hours from atrium blanketed with laminated glass and

wide windows on the outdoors partitions to diffuse mild rays from the sky uniformly into the shopping mall indoors.

5.4 Summary of Findings

The proposed shopping mall design was arrived at with the expertise of the quantities of merchandising theories which affect the designs. The psychology includes arousing interest and its satisfaction. The Eagle shaped design has been employed which makes the proposed shopping mall the focal point, while the ancillary buildings and parking spaces are clustered around it.

The shopping mall is designed to be flexible such that spaces, fixtures, departments and merchandise can be moved or modified whichever would be desirable and make future expansion possible without affecting the building fabrics. The concept adopted also allowed for the efficient use of all the spaces in the complex, as well not sacrificing function for aesthetics. The shopping mall will be economical and its attracting potential Customers, will also induce them to enter the shopping mall. The internal spaces have also been designed in such a manner as to allow Customers find shops and activities with ease.

A successful shopping mall design is an efficient selling machine or sales factory. Moreover, in servicing the Patrons, the organizing factors have also been taken into consideration in the proposed design so that excellent service can be given to Customers visiting the shopping mall. The merchandise and the space have been so planned to enhance Customers' selections process and help shop owners to sell. The circulation within the structure is easy thereby exposing the Customers to maximum amounts of merchandise.

Landscaping and green areas have been introduced consciously in the proposed Mall design. Well kept, neatly defined lawns, right varieties of trees, properly positioned artificial lake, internal fountain and

driveways make favourable impressions on Customers as well as a practical and logical car parking arrangements.

Chapter Six

6 Recommendations and Conclusion

6.1 Recommendations

Shopping mall development is a totally essential concept in selling current day retailing, enjoyment and endeavor in modern societies. While embarking on this sort of initiatives, greater attention need to take delivery of sustainability of the ability. To obtain a design that will beautify productivity, customers, environment and destiny wishes need to be placed into consideration.

Effective Day lighting and aesthetics as considered for the layout of the proposed Shopping centre to explore beyond the provision of spaces wished for retailing and recreational activities by myself however to encompass evaluation of the long term effect of the facility at the customers.

The recommendations are as follows;

The adoption of the mentioned daylighting strategies in above.

The adoption of notable internal partitions material as wired glass and High stress laminated board to be advocated in city spaces. This will permit clean transformation and conversion of areas without breaking of walls and at the equal time decrease wastage. Architects have to usually foresee possible growth of city areas inner a shortest viable time.

Crime is a crucial barrier and a sensitive venture to Mall. Shopping Centre exhibit wonderful successful tenant mixes that aren't common with specific retail markets and should be referred with upmost safety to the middle.

iv. Good shading must be provided to prevent glare

v. Inadequate parking can create obstacles to a hit Shopping mall developments. Specific financing and rules should be created to resolve parking problems in Shopping mall particularly and concrete regions in preferred

vi. The improvement of Shopping mall should be explicitly focused on performance of the spaces supplied in different to fulfill up with city commercial revitalization coverage and approach.

Vii. Good indoors finishes need to be furnished for effective patronage and pride of window customers to be able to be part of recreational reason of a Shopping mall.

6.2 Conclusion

The key to the improvement of an effective and purposeful shopping center design is to have a clear knowledge of what's to be executed and being capable of define concisely the important problems that facilitate/affect shopping mall designs. The case studies examined on this research show that shopping mall create a medium for retail, amusement and entertainment with extraordinary potentials for business growth. The supporting studies gathered are all a success initiatives that illustrate that Shopping mall can be a success in smaller environments, and that those styles of initiatives can lead to notable advantages for the communities.

This study has clarified the Importance of sunlight hour's consideration within the design of shopping malls. Buildings structures and its environment occupied are not static artefacts throughout the most stable instances, and at some stage in instances of social and technical upheaval, they want adjustment in some measure to stay pleasing, secure and useful. It is likewise vital to be aware that the quality shopping mall buildings are the ones able to provide potential to changing functions, standards of use and life-style.

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Appendix: Architectural Drawings

Design Brief

Introduction

According to the Economist Journal (2017) shopping mall or simply mall is one or more buildings forming a complex of shops representing merchandisers, with interconnecting walkways enabling visitors to walk from unit to unit. Other establishments including movie theatres and restaurants. Shopping as an activity, process and system has improved considerably in recent times with new forms, styles and formats responding to demands for convenience and easy access physically and online. There has been rise and dominance of the major multi-national retailers due to their strength and power in the marketplace that many independent and local retailers often find that they cannot compete in terms of price or availability of goods (Watson P. 2005).
According to Aljouburi (2012) 35% of the energy used in buildings are utilized for lighting. Energy consumption in Shopping Centre buildings which have huge volumes and great number of users can be decreased by using day lighting. Considering the volume, function and user amount of the public spaces of shopping centers are the more reasons for the use of daylight. Daylight is generally associated with high window head heights, high reflective ceiling and wall finishes, narrow floor plans, large facade and skylight openings with high transmittance glazing(Aljobouri, 2012)

Project definition

- A shopping mall (or simply mall) is a North American term for a large indoor shopping center, usually anchored by department stores. The term "mall" originally meant a pedestrian promenade with shops along it (that is, the term was used to refer to the walkway itself which was merely bordered by such shops), but in the late 1960s, it began to be used as a generic term for the large enclosed shopping centers that were becoming commonplace at the time

Aim and objectives

The aim of this project is to design a shopping mall for the ACE making provision for the effective use of Daylight through the adoption of some strategies.

objectives

- Examine some areas where daylighting will be very effective in the shopping mall.
  explore and examine approaches that are used in spatial organization and planning of such stadia designs, construction and operations.
- Assessment of daylighting strategies that can be adopted in the design of shopping malls.
- Outline the benefits of use of daylighting as an alternative source of light in a shopping mall

Statement of Problem

Over the years there has been a high dependence on artificial lighting in Nigeria which has not been reliable due to poor power supply and large expenses incured on generator sets in the long run. Admitting daylight into areas of shopping malls help to reduce possible occurrence of accidents as a result of power outages especially areas of circulation and savings are made on a project when daylight is admitted into critical areas of the shopping mall.

Scope of Work

The scope of work is to design a shopping mall of not more than three floors on a 26,191 sqm land along Bashorun road.

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Studio Critics: Dr. Adedire I.M, Dr. Ayanleke O.D, Arc. Ajijola K.S, Arc. Adeola A.

proposed SHOPPING MALL
OYO STATE

LEVEL:	SCALE: NTS	ARC 731	SHEET NO:
DEPT: ARCHITECTURE		ADVANCED ARCHITECTURAL DESIGN IV	1

Brief Analysis

From the series of case studies that were carried out at various shopping malls, both locally and foreign malls, appraisal of these case studies is improved upon for the proposed design. The proposed shopping mall will be a hub of activities for the people of Ibadan and Nigerians at large. The proposed design is set to world-class standards and effectively reflect an approach to achieve sustainability, flexibility and originality. The design shall make provision for fully functional facilities for a world-class mall. It shall provide sufficient activity spaces and good zoning for common functions. A suitable location has being selected for the project along Bashorun road, Ibadan. The parcel of land selected is approximately 26,191 square meters and has been adjudged suitable due to the direct link the adjoining roads around the site. Below is a description of the different parts that makes up the design.

RETAIL

1. Departmental Stores
2. Retail Outlets
3. Specialized Retail Outlet
4. Warehouses
5. Delivery Bay

ENTERTAINMENT AND HOSPITALITY

1. 3-screen cinema
2. Food courts
3. Bar
4. Sitting areas
5. Event hall
6. Outdoor recreation area
7. Children play area
8. Game arcades

CIVIC/ADMINISTRATIVE ACTIVITIES

1. Bank
2. ATM gallery
3. offices

ANCILIARY FACILITIES

1. Atrium
2. Parking lots
3. Elevators
4. Generator house
5. Gate house
6. Refuse dump
7. Water treatment

Design Philosophy

The philosophy of this design was hinged on five major criterion which are:

- FUNCTIONALITY: the building should be such that it can fully provide optimum utility to its users above anything else. The reason for this is that the building is oriented to be activity based as it primary aim. Hence, failure to optimize the function of such expected activity is a failure of the design itself. Adequate utilization of daylight in circulation areas will be given utmost priority in the design.
- STABILITY: The building being an activity based structure is expected to be rigid enough to withstand, support and accommodate the expected load or pressure it is to receive due to the activities taking place within it.

  Hence, to achieve this, the M concept was adopted, though bearing in mind a great priority for good aesthetics.
- COMFORT: the mall should be as conducive and comfortable as much as possible to its anticipated users. Thereby, encouraging them to come again for another visit.
- SECURITY: in the case of eventuality of an attack (robbery or terrorist attack), the building should be able to create safe zones for shoppers, and easy escape routes to shield them from the attack.
- SAFETY: The building is expected to be able to respond effectively whenever there is a situation (fire, smoke etc) emergency ay hand. The users of the mall are expected to be easily evacuated from the mall with minimal or no harm caused on them.

Design Principles

PURPOSE

PURPOSE
National Development
Employment
Centre city revitalization
Income Generation

FUNCTION
Exhibition
Security
Business Transactions
Convenience
Entertainment
Community Enhancement

FUNCTION

CONTRIBUTIONS TO SOCIETY

CONTRIBUTIONS TO SOCIETY
Awareness and appreciation of cultural heritage
Employment
Serves as leisure/relaxation activities
Generate revenue for the state

GUIDING PRINCIPLES
Convey a sense of welcome to all visitors/shoppers.
Easy acess to resources
Strengthen communities
Respect history and culture
Evolve with needs and change

GUIDING PRINCIPLES

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ADVANCED ARCHITECTURAL DESIGN IV

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Design Consideration

Functionality

The design proposal should meet the demands and requirements of the prospective users accommodating all exhibition activities satisfactorily

Lighting and acoustics

Lighting is to be given much thought in order to give visitors/observers ample perception of artwork, sound waves are to be properly managed to keep the sound wave within the comfortable limits.

Landscape

Providing landscape that enhances the building and character of the zone and sub-area.

Security

The building should enhance personal safety of life and property by the application of crime prevention through design

Parking

The spaces should flow and not make parking hard to find, parking must be made adequate and convenient.

Aesthetics

The complex should give users a vibrant and lively experience as they come in contact with it, in order for this to happen the design must appear pleasing to the users sense of beauty.

Circulation and connectivity

All activities, space whether within or out provided should be interconnected with a good and efficient circulatory system.

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CASE STUDY I : IKEJA CITY MALL LAGOS

LOCATION

The Ikeja City Mall is located at Alausa Ikeja, Lagos. It is the first of its kind on the Mainland in Lagos. The mall was opened December 14, 2011.

SITE LAYOUT

The world class shopping mall, with its Grade 'A' office complex, is a destination of choice for shoppers and companies alike. It is occupied by the South Africa-owned Shoprite, Stanbic IBTC bank, Silverbird Cinemas, Kentucky Fried Chickens (KFC) and other entrepreneurs. The mall, built on a land covering 26,500m2 within Alausa, the seat of power, by Grappo Nigeria Investment Ltd.

DESIGN DISCRIPTION

The shopping center, which features the first and only cinema theatre in Ikeja, also has a 5-screen Silverbird Cinemas and Shoprite Supermarket. It also include specialist facilities for department stores, banks, cafés, bars, restaurants, hairdressing / beauty salon, ice-skating arena, etc. is co-financed by Actis, owners of The Palms, Lekki. The mall has 90+ stores with three anchor stores and total retail store floor area of 23,000m2.

MERITS

- Ample vehicular parking space
- Provision of various food courts
- Apart from the cinema halls, the other mall facilities are located on the ground floor making it convenient for visitors to move around
- Provision of various entry and exit points
- Simplicity of design resulting in ease of circulation within the building
- Provision of goods warehouses

DEMERITS

- The absence of an events and meeting halls to cater for meeting, conference and civic activities of the community
- Inadequate provision of shops
- Food court area relatively small and inadequate

Ground floor plan

First floor plan

Approach view

Parking Lot

Sky Light

Entrance to Shoprite

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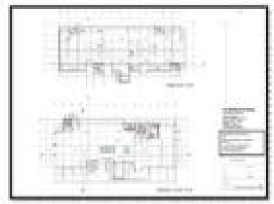
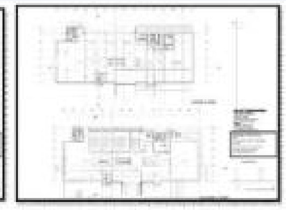
CASE STUDY 2: HERITAGE MALL IBADAN



Basement and Ground floor plan



First and Second floor plan

LOCATION

The heritage mall Ibadan is located at old sketch building, beside cocoa house Dugbe, Ibadan. The location makes it easily assessable from almost all parts of the town.

SITE LAYOUT

The mall has 40 store spaces made available within it with 3 additional anchor Tenants. The total retail floor area is 14,000m2. The parking in the mall is designed to accommodate a total of 200 cars.

DESIGN DESCRIPTION

Heritage mall Dugbe Ibadan, was opened on September 2013 for full operation. It's one of the development properties of Odua Investment Limited and designed by AB.DT Partnership. The mall has four floors. Located on the basement floor is an underground car park, while on the ground floor is the children play area and a departmental store to your right when entering the building with some retail shops. Also, on the second floor is the continuation of the retail shops and the departmental store. On the second floor are, an event Centre, a cinema, and some retail shops.

MERITS

1) There is adequate spaces to accommodate users
2) There is a good waste management system in the mall
3) Spaces are wide thereby making circulation very easy.
4) Sittings are provided on the lobbies for mall users.
5) The use of skylight in the Atriums enhanced daylighting in the mall.

DEMERITS

1) Slippery tiles are used for circulation areas
2) Inadequate parking space.

Approach View of the Mall

Parking Lot of the Mall

Picture Showing the Atrium of the Mall

Under Ground Parking Lot of the mall

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proposed SHOPPING MALL
OYO STATE

LEVEL:	SCALE:	ARC 731	7
DEPT: ARCHITECTURE		ADVANCED ARCHITECTURAL DESIGN IV	

CASE STUDY 3: THE PALMS MALL, LEKKI LAGOS

LOCATION

The mall is located in Lekki Penneula, in Lagos, Nigeria. It is conveniently and ideally located just a few kilometers away from the Victoria Island Business District and the rapidly developing affluent residential area of the Lekki Penneular in Lagos. It was established in the year 2005.

SITE LAYOUT

The Mall is located on a 45,000 square-meter (11-acre) plot of land. It has 21,000 square-meters (5 acres) of lettable retail space. It was built on swampland. In front of the mall is a well designed parking space that can accommodate about 1,000 cars conveniently. The Mall has two main entrances - to decongest the heavy traffic flow emanating from the Lekki Expressway and and an alternative entrance through Lugbi Ayorinde Street.

DESIGN DESCRIPTION

The Palms accommodates 62 shops ranging in size between 25 - 550m2, a food court and a five-screen NuMetro cinema complex. The shops are arranged along corridors for shoppers to have a good view of the merchandise. The design provided for a food court on the upper floor with the cinemas. The corridors are well daylit during the day as a result of the Atria located above the corridors.

MERITS

- The Mall has large parking space of about 1,000 cars conveniently.
- The retail shops are well arranged along the corridors, with the anchor stores located at each end of the Mall.
- The Mall is self sufficient in the area of power generation and waste treatment and recycling.
- The Mall has two major entrances to distribute shoppers traffic evenly.

DEMERITS

- No adequate priority for natural lighting, therefore, illumination is primarily via artificial means.
- The Mall corridors are often congested during festive periods due to the inflow of shoppers; therefore, the corridors are not wide enough to accommodate the shoppers.
- The toilet facilities are not well positioned in a way that it could be easily accessed by all.

Ground floor plan

first floor plan

Parking spaces at the Mall

Internal view at the Mall

CASE STUDY 4: THE DUBAI MALL

LOCATION

The Dubai Mall is the worlds largest shopping mall based on total area and fourteenth largest by gross leasable area. Located in Dubai, United Arab Emirates (U.A.E), it is part of the 20-billion-dollar Downtown Dubai complex, and includes 1,200 shops. Access to the mall is provided via Doha Street, rebuilt as a double-decker road in April 2009

SITE LAYOUT

Over 18 million square foot (equivalent in size to more than 50 football fields), the Dubai Mall has a total internal floor area of 8.9 million square feet (55 ha) and leaseable space of 5.77 million square feet (35 ha), about the same as the West Edmonton Mall.

DESIGN DISCRIPTION

It has a 250-room luxury hotel, 22 cinema screens plus 120 restaurants and cafes. The Mall has over 14,000 parking spaces across 5 car parks, with valet services and a car locator ticketing system. The mall has won five awards - two awards at the Retail Future Project Awards at Mapic, Cannes, in 2004, for Best Retail Development Scheme (Large) and Best Use of Lighting in a Retail Environment and the Dubai Mall brochure collected three awards at the Summit Creative Awards 2005 in Portland, Oregon - the Gold award for Best Art Direction / Graphic Design, Silver award for Best 4-colour B2B Brochure, and a Judges Special Recognition award.

MERITS

- Good aesthetical use of materials even when they serve functional usage.
- Good pedestrian control.
- Purpose built structure.
- Disable friendly building i.e. presence of ramps and slopping floors.
- Adequate spaces to accommodate circulation and adequate recreation users.

DEMERITS

- No natural lighting available
- Building depends solely on artificial power.
- Inadequate sitting areas provided for shoppers

Basement floor plan

Ground floor plan

Approach view

Interior view of Mall

Mall Aquarium

Water fall

CASE STUDY 5: THE TERAS PARK MALL TURKEY

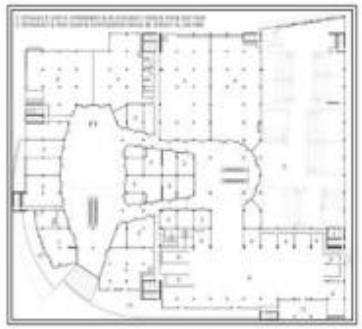
LOCATION

The Terase Park Shopping Mall, Denizli, Turkey is an enclosed shopping mall located in Denizli, a growing industrial city in the South western part of Turkey.

SITE LAYOUT

It has a total indoor space of 95,310 m2, has a 46,500 m2 of leasable floor space, and limited parking for 1500 vehicles. Teras Park Shopping mall occupies a land area of 52,614 m2; it hosts about 12,000 visitors daily. The city is notable for Textile manufacturing and exports, and attracts many visitors all year round.

Ground floor plan



First floor plan

DESIGN DESCRIPTION

150 shops, 15 fast food restaurants, coffee houses, Spa and fitness centre, Office accommodation among others.

MERITS

- Large expanse of leasable floor space
- Purpose-built structure
- Adequate circulation
- Provision of green interior environment
- The use of water pools and fountains to cool the building interior
- Ease of transit between floors due to adequate Lifts, Escalators and Stairs.

Exterior view of Mall

Interior view of Mall

Demerits

- Limited parking space availability
- Absence of green areas externally
- Artificial interior lighting sources

CASE STUDY 6: MALL OF AMERICA

LOCATION

The mall of America is a shopping mall located in Bloomington, Minnesota State Highway 77, north of the Minnesota River and across the interstate from the Minneapolis-St. Paul International Airport. It was opened in 1992.

SITE LAYOUT

The Mall of America has a gross area of 4,870,000 sq ft (452,000 m2) or 96.4 acres (390,000 m2) with 2,500,000 sq ft (230,000 m2) available as retail space.The mall is organized into four different zones, each of those zones had its own decorative style until a series of renovations from 2010 to 2015 led to a unified and more luxurious style, as well as to coincide with the mall's first major expansion.

Circulation inside the Mall

Amusement park inside the Mall

DESIGN DESCRIPTION

The mall is nearly symmetric, with a roughly rectangular floor plan. More than 530 stores are arranged along three levels of pedestrian walkways on the sides of the rectangle, with a fourth level on the east side. Four anchor department stores are located at the corners. Aquarium, Food court Amusement parks, Cinemas among others.

MERITS

i. The mall is aesthetically good.

ii. Provision is made for heating and cooling systems within the mall to enhance comfort of the users.

iii. Sufficient parking spaces were provided

iv. Skylights were used to bring in daylight in Atriums within the building.

Demerits

- Limited parking space availability
- Inadequate green areas externally
- There has been reports of indecent exposure and alcohol related offences in the mall.

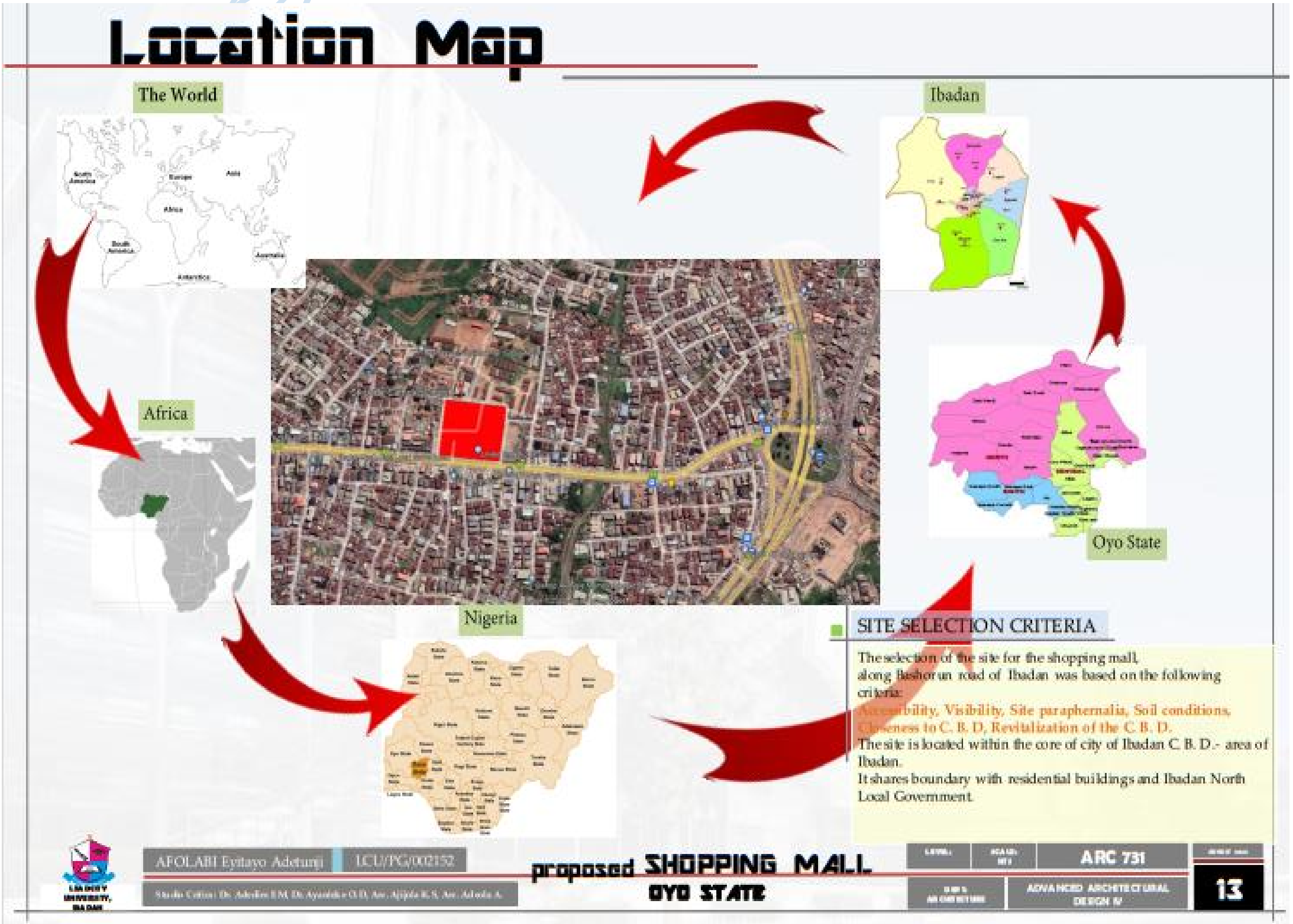
Restaurant inside the Mall

Retail outlet inside the Mall

Case Studies Deductions

Deductions made from the various cases studies carried out on the subject topic include:

1. The malls have all their facilities under one roof making it easy for users to move from one to the other.
2. The use of indoor landscaping elements can be seen in the international case studies.
3. Provision of generous and well celebrated entrance halls to allow for ease of flow of users.
4. Importance was attached to ease of access and movement for visitors and services requirements.
5. The use of vertical form of lighting can be seen in the Maryland mall and can be incorporated into the design to aid the lifespan of the interior landscaping elements.
6. Provision of loading docks with direct access to storage and display areas to facilitate ease of delivery of wares.
7. The malls are located within close proximity to available market.
8. Provision of sitting areas for shoppers such that they can relax if they get tired from shopping.
9. There's actually a large amount of activities, hence security and comfort is of the essence.
10. Ample parking with adequate natural/ artificial cover is needed.
11. Pedestrian traffic control needs to be efficient to reduce vehicular and pedestrian interference.
12. There is need for natural lighting in lobbies and large circulation areas due to the unreliable nature of power supply in Nigeria.
13. Headroom in large malls need to be large enough to allow conducive ventilation and spaces to hide AC condensers and vents.
14. Large lobbies need to be created to allow for easy circulation.
15. Transparency and good lighting needs to be in place for display and easy relation between lobbies and shops.
16. The design has to be aesthetically sound to attract users, in this case, through the use of landscaping elements.
17. The need to provide ample conveniences to enable comfort for users.


Location Map
The World
Africa
Nigeria
Ibadan
Oyo State
SITE SELECTION CRITERIA
The selection of the site for the shopping mall, along Bashorun road of Ibadan was based on the following criteria:
Accessibility, Visibility, Site paraphernalia, Soil conditions, Closeness to C. B. D, Revitalization of the C. B. D.
The site is located within the core of city of Ibadan C. B. D.- area of Ibadan.
It shares boundary with residential buildings and Ibadan North Local Government.
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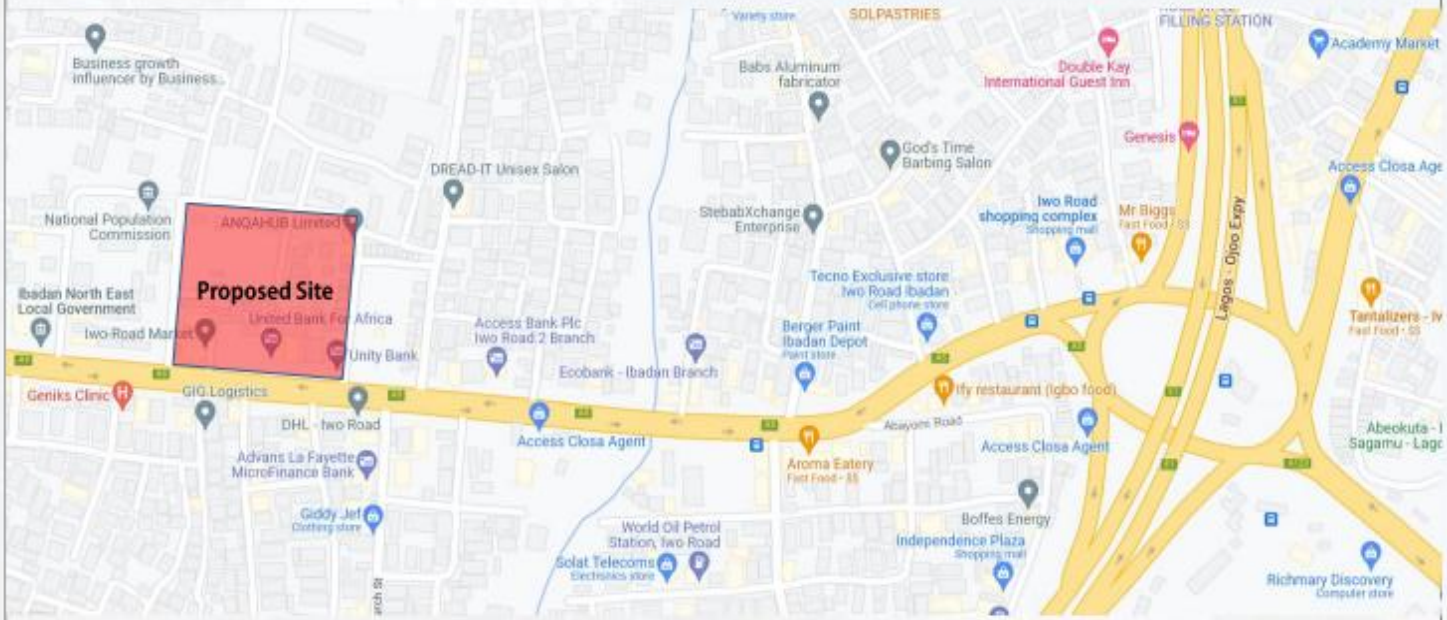
Location plan



Site Selection Criteria

- **Availability of Land-**

  The choice land selected for the proposed project is located on a portion of land along Bashorun road of Ibadan, Oyo State, though some buildings will be demolished to accommodate more space for the proposed building.

- **Site Location-**

  The site is located along Bashorun road in Ibadan city which will make good patronage possible and also helps to create a serene environment due to the direct link of the road to the Central business district of the city.

- **Site Accessibility-**

  The site has easy and convenient access for both vehicular and pedestrian. The proposed site for Ibadan shopping mall has four roads around it.

- **Possibility of Expansion-**

  The site is suitable to conveniently accommodate the shopping mall facilities. This is as a result of the size of the site which will allow for the creation of adequate vehicular parking spaces and other facilities needed for the smooth running of the shopping mall. Possible expansion and extension of the proposed shopping mall is made possible by the availability of ample area of land at the back of the site which can serve as spaces for future expansion.

- **Topography-**

  The site is relatively flat but slopes gently from the centre to east west.

- **Vegetation-**

  The site is characterized by few green vegetation and shrubs. The site favours planting of desired vegetation to control the effect of solar radiation, reduce the effect of erosion and wind forces. The site also favours outdoor recreational spaces and good landscaping.

- **Nearness to public utilities-**

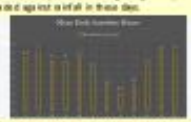
  The site has adequate access to basic infrastructure e.g. good roads, electricity, telecommunications, security, etc.

Site Analysis

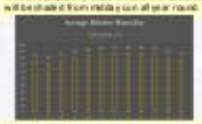
Climatic analysis

For months like June, September and October, there will be need to protect building against heavy rainfall. This will influence the type of roof and shading devices.

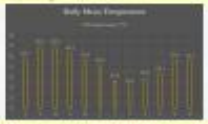
Months such as June, September and October (as noted above) are those that has the highest days of rainfall in the year. The building will generally be shaded against rainfall in these days.



The building will be oriented to expose every little of the free side of it to western sun. Furthermore, windows (especially those around the residential zone) will be shaded from midday sun all year round.



A building with such magnitude would be designed to avoid capillary movement. Permanent ventilation (with stone slab) would also be provided to ensure adequate body cooling



Hollow sandcrete block wall will be used to partition interior spaces to trap heat. West facing walls will be minimized to reduce heat gain. Finally building depth will be maximized to increase thermal capacity.

VEGETATION

There is no dense foliage on site. Most part of the site are built-up area. Plants and trees will be planted to reduce sun's effect, remove carbondioxide and also help improve air quality

DRAINAGE

Careful thought must be put into planning of the drainage system on site. This is to prevent erosion due to the action of run-off water especially during the peak period of the rainy season.

MID-DAY SUN

This is when sun is directly overhead. It occurs around 12noon. This is usually when sun is hottest. There is need for shading of fenestration and openings *quiet*.

NORTH-EAST TRADE WIND

It is also called Tropical continental air mass
It develops over the sahara desert
It is warm, dry & hazy
It blows at 30 degrees latitude in the NE to SW direction.
It brings about harmattan and it is associated with dry season
Trees and other shading devices will be plated along this axis to serve as screen against dust
This wind will also be taken into consideration while designing the roof.

SUN SETS in the west.

It occurs between 4 pm to 6 pm.
It could be really hot depending on season.
Projections to form shields would be
considered to shade windows.
Openings will be designed to reduce direct eye contact with this sun.

SUN RISES in the east.

It occurs between 4 pm to 6 pm.
It could be really hot depending on season.
Projections to form shields would be
considered to shade windows.
Openings will be designed to reduce direct eye contact with this sun.

SOUTH-WEST TRADE WIND

It is also called Tropical maritime air mass
It develops over the Atlantic ocean
It is cool, moist and windy
It blows at 30 degrees long in the SW to NE direction
It brings about rain and it is associated with wet season
Areas towards this wind is suitable for the location relaxation centres
More of the residential area fenestrations will be positioned to enjoy this wind.

Picture showing St. Jude Catholic Church not too far from the site

NOISE

The major noise belt identified is from the adjoining roads, one of which is major road which is usually busy therefore the site is noisy.

TOPOGRAPHY

The site has a slight slope and proper planning must be put into the site layout to ensure that the inherent potentials are tapped. drainage, effluent piping, siting of reservoirs, etc.

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Studio Critics: Dr. Adedire S.M, Dr. Ayorinde O.O, Arc. Ajijola K.S, Arc. Adeola A.

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LEVEL: | SCALE: NTS | ARC 731

DRP'S ARCHITECTURE | ADVANCED ARCHITECTURAL DESIGN IV

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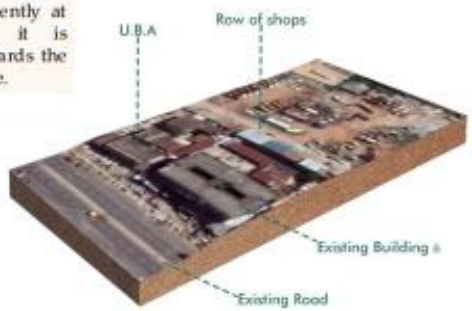
Site Section

The site slopes gently at the front and it is relatively flat towards the rear part of the site.

3D Site Section



A-A

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Spatial Requirement

Retail Outlet

1. RETAIL STORE
2. ANCHOR STORE
3. ATM GALLERY
4. LEASABLE OPEN OFFICE

Mall Admin

1. RECEPTION/WAITING AREA
2. ELECTRICAL AND MECHANICAL MAINTENANCE
3. BANK
4. ATM GALLERY
5. OPEN OFFICE
6. BOARD ROOM
7. CONFERENCE ROOM
8. RECEIVING OFFICE
9. INSPECTION OFFICE
10. MANAGERS OFFICE

Entertainment

1. GYMNASIUM
2. RESTAURANT
3. FOOD COURT
4. INTERACTION SPACE
5. NEWSPAPER LOUNGE
6. COFFEE SHOP
7. ICE CREAM PARLOR
8. CHILDREN'S SOFT PLAYSCAPE
9. BEAUTY SPA
10. UNISEX SALOON
11. GAME ARCADE
12. OPEN GALLERY
13. SIT OUT
14. GREEN/ RELAXATION AREA

Auxilliary

1. LOADING BAY
2. CONVENIENCES
3. ESCALATOR
4. SERVICE LIFT
5. COFFEE SHOP
6. ATRIUM
7. WAREHOUSE
8. COLLECTION POINT
9. SERVICE ROOM
10. CONTROL ROOM
11. CHANGING ROOM
12. CLOAK ROOM
13. GENERATOR/ POWER HOUSE
14. REFUSE DUMP
15. WATER TREATMENT

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Space Schedule Requirement

S/N	FLOOR	RETAIL STORE	DEP. STORE	RELAXATION	AUXILLIARY FACILITY	ADMIN	AREA STATEMENT
1	GROUND FLOOR	12	7	3	7	5	10,573.45sqm
2	FIRST FLOOR	40	4	6	10	4	10,573.45sqm
3	SECOND FLOOR	38	2	5	7	4	5,868.65sqm
	TOTAL	90	13	14	24	13	27,015.55sqm

Schedule of Accomodation

GROUND FLOOR

Entrance/Exit Porch	142.91sqm
Small Retail Store	272.69sqm
Medium Retail Store	95.18sqm
Big Retail Store	567.84sqm
Banking Hall	107.6sqm
ATM Gallery	48.1sqm
Warehouse	102.7sqm
Food Court	908.57sqm
Children Playarea	138.9sqm
Gymnasium	280.96sqm
Convenience	146.14sqm
Green Area	284.34sqm

FIRST FLOOR

Small Retail Store	821.89sqm
Medium Retail Store	95.18sqm
Big Retail Store	144.04sqm
Banking Hall	148.16sqm
Cinema	418.87sqm
Restaurant	121.20sqm
Bulk Storage	1,716.16sqm
Departmental store	349.18sqm
Elect/Mech. Area	92.16sqm
Game Arcade	280.96sqm
Convenience	243.96sqm
Green Area	185.33sqm

SECOND FLOOR

Small Retail Store	593.84sqm
Medium Retail Store	418.42sqm
Big Retail Store	418.42sqm
Cinema	418.87sqm
Cinema Lounge	114.41sqm
Leasable Office	464.84sqm
Elect/Mech. Area	92.16sqm
Sit-Out	348.19sqm
Convenience	110.1sqm
Projector Room	134.34sqm

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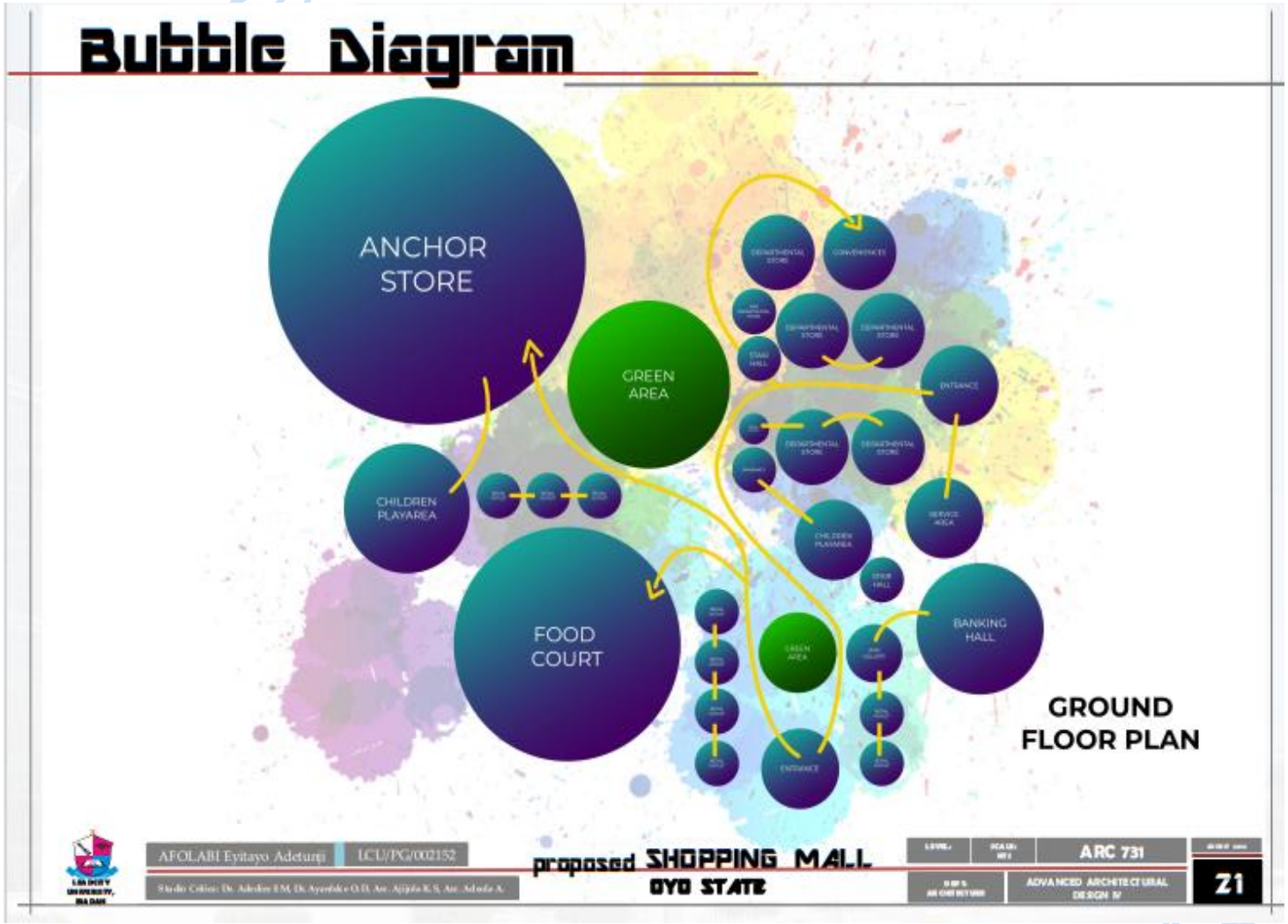
Bubble Diagram
ANCHOR STORE
GREEN AREA
CHILDREN PLAYAREA
FOOD COURT
ENTRANCE
BANKING HALL
GROUND FLOOR PLAN
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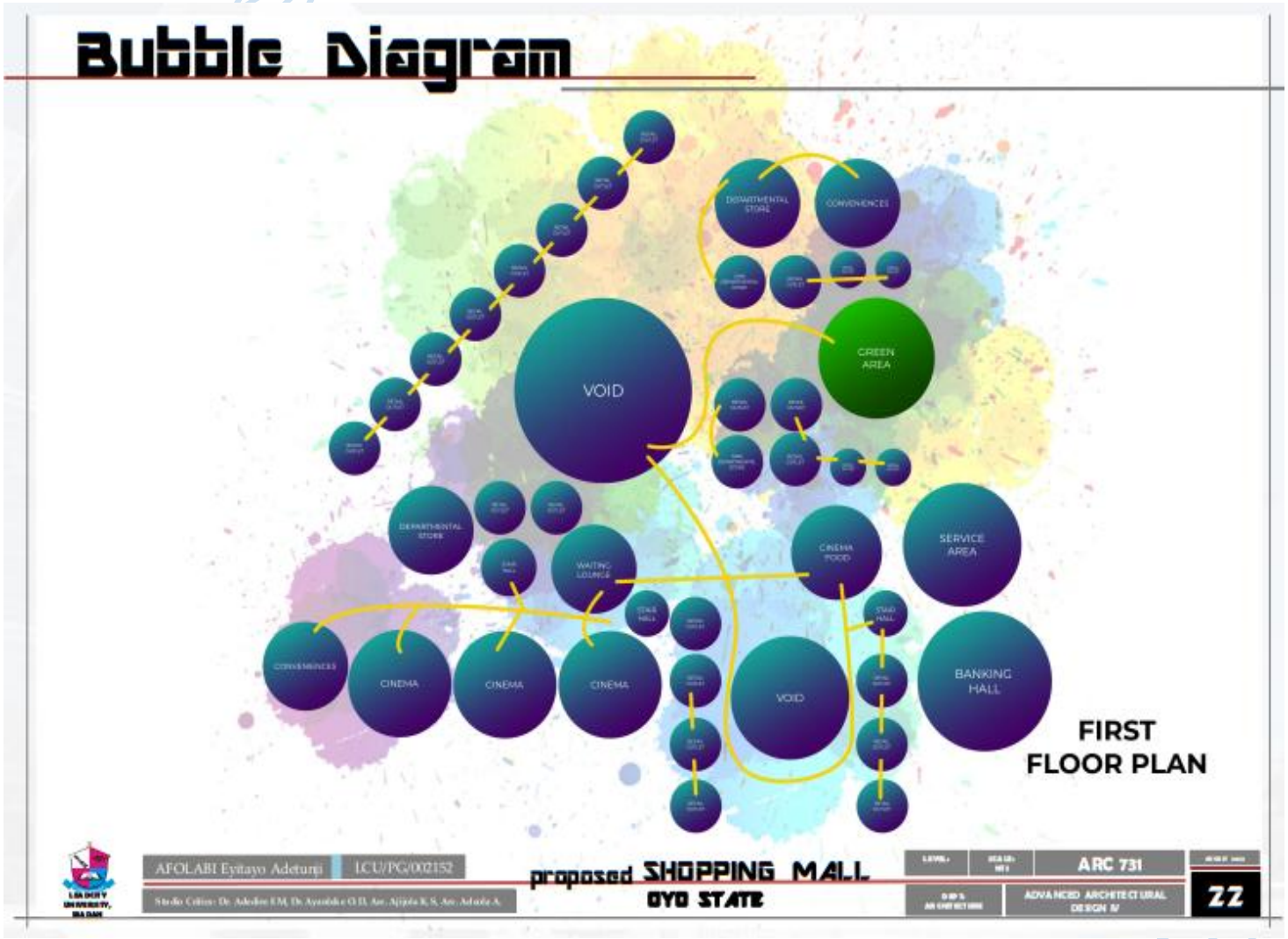
Z1


Bubble Diagram
DEPARTMENTAL STORE
CONVENIENCES
VOID
GREEN AREA
DEPARTMENTAL STORE
WAITING LOUNGE
CINEMA FOOD
SERVICE AREA
CONVENIENCES
CINEMA
CINEMA
CINEMA
VOID
BANKING HALL
FIRST FLOOR PLAN
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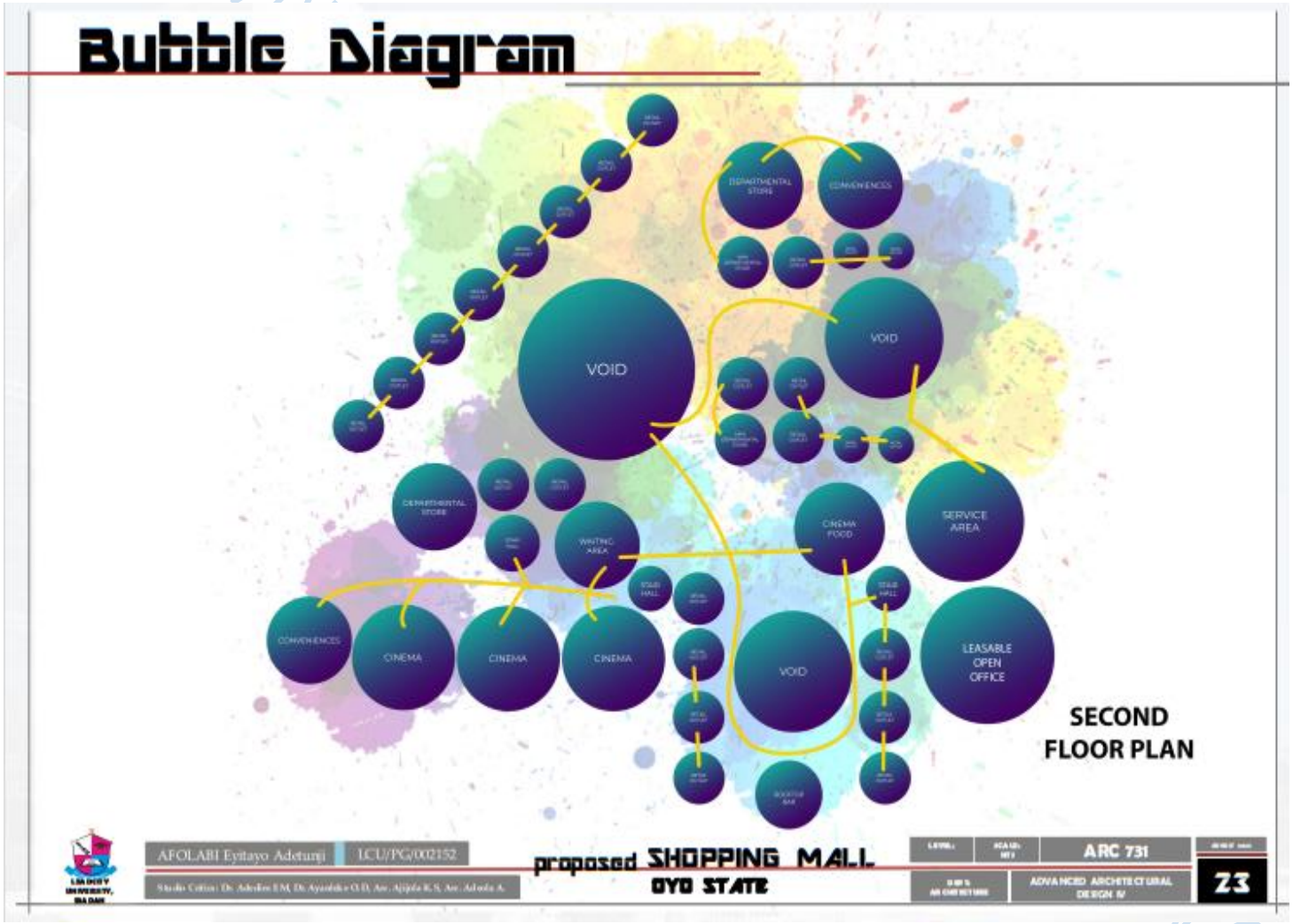
Bubble Diagram
VOID
VOID
VOID
DEPARTMENTAL STORE
CONVENIENCES
DEPARTMENTAL STORE
WAITING AREA
CINEMA FOOD
SERVICE AREA
CONVENIENCES
CINEMA
CINEMA
CINEMA
LEASABLE OPEN OFFICE
SECOND FLOOR PLAN
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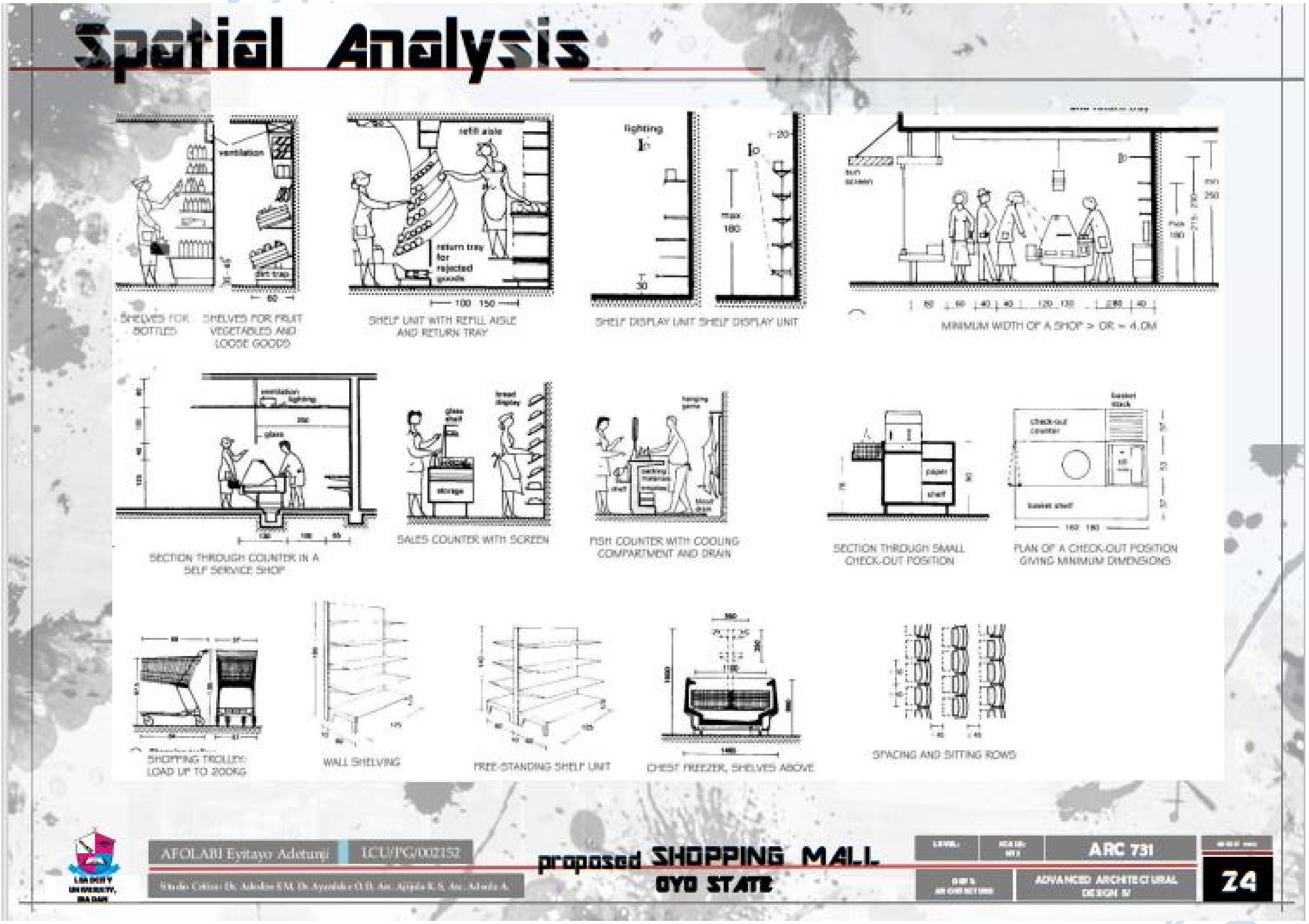
Spatial Analysis
SHELVES FOR BOTTLES
SHELVES FOR FRUIT VEGETABLES AND LOOSE GOODS
SHELF UNIT WITH REFILL AISLE AND RETURN TRAY
SHELF DISPLAY UNIT SHELF DISPLAY UNIT
MINIMUM WIDTH OF A SHOP > OR = 4.0M
SECTION THROUGH COUNTER IN A SELF SERVICE SHOP
SALES COUNTER WITH SCREEN
FISH COUNTER WITH COOLING COMPARTMENT AND DRAIN
SECTION THROUGH SMALL CHECK-OUT POSITION
PLAN OF A CHECK-OUT POSITION GIVING MINIMUM DIMENSIONS
SHOPPING TROLLEY: LOAD UP TO 200KG
WALL SHELVING
FREE-STANDING SHELF UNIT
CHEST FREEZER, SHELVES ABOVE
SPACING AND SITTING ROWS
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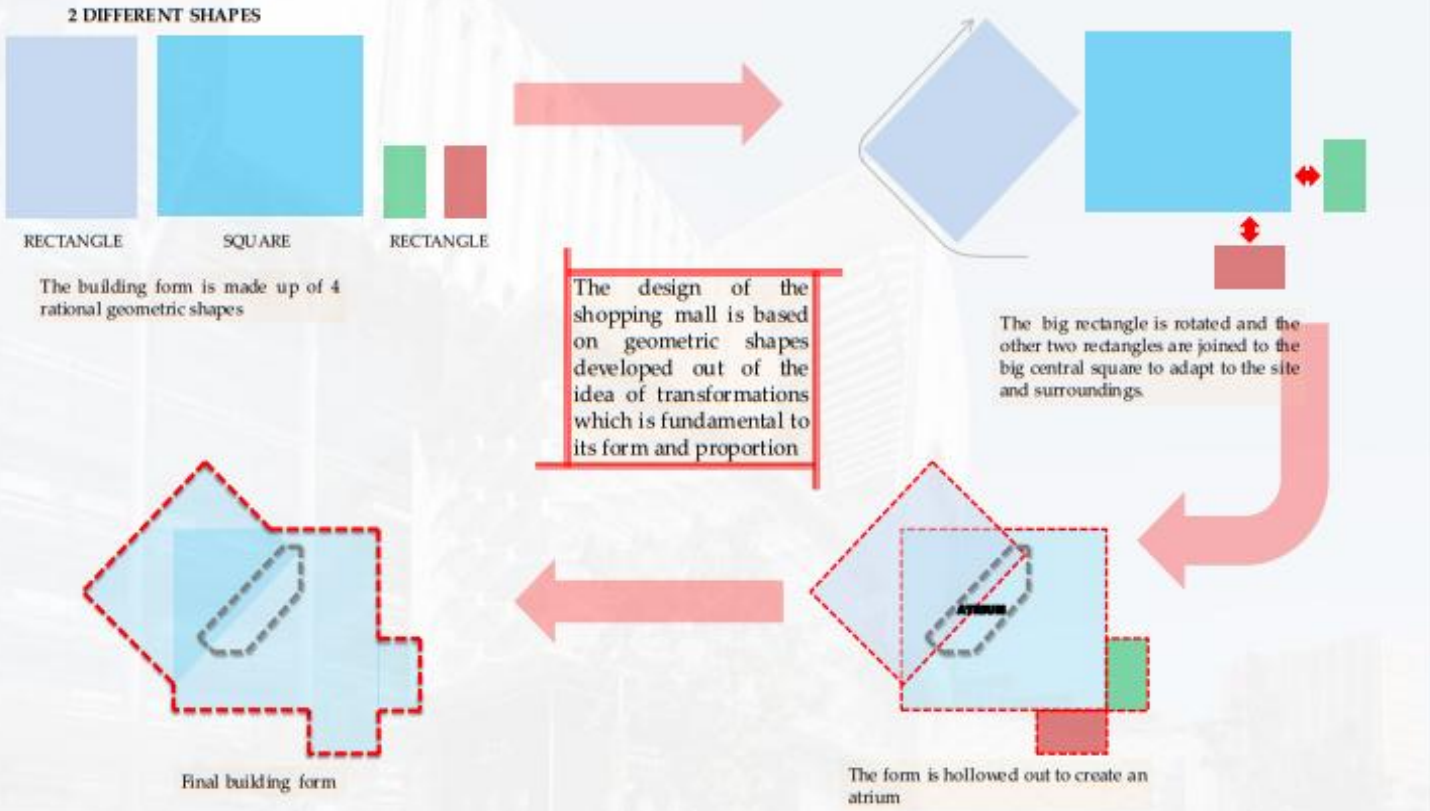
Concept Development



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Concept Development

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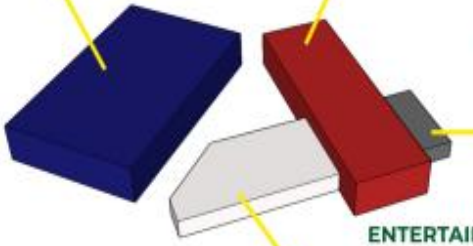
ANCHOR STORE

An anchor store is the big department store at the mall. Depending on the size of the shopping center, there's often more than one and at least two, with one at either end of the property.Their large advertising budgets and wide range of desirable merchandise help anchor stores attract shoppers to the mall. Those shoppers often spend money at the anchors as well as at surrounding

RETAIL OUTLETS

A retail outlet or store is a retail sales establishment which has a genuine retail activity and which therefore has a sales area. This therefore excludes ancillary establishments such as warehouses or the offices of commercial enterprises without their own turnover

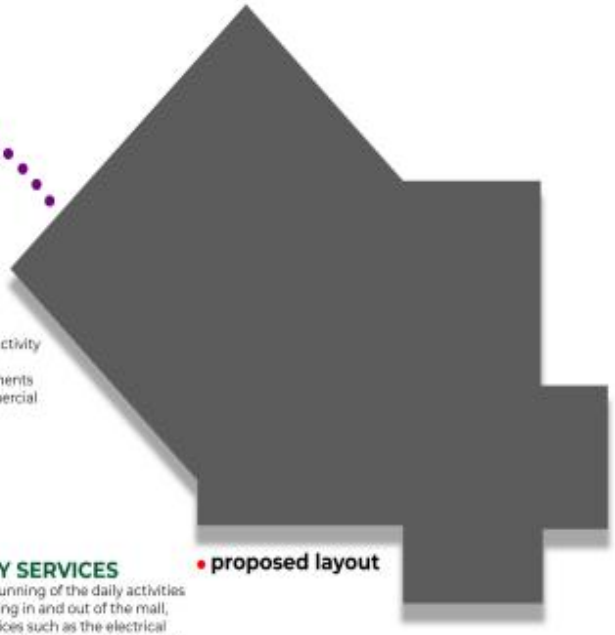


AUXILLIARY SERVICES

For the smooth running of the daily activities of shoppers coming in and out of the mall, the need for services such as the electrical and mechanical, cannot be overemphasized, also banks and other administrative spaces will be needed

ENTERTAINMENT

Entertainment facilities such as Children playarea,gymnasiums,food court, cinema, outdoor bar, soa etc can be found in this zone of the building with emphasis laid on shopping enjoyment and improving the mall's futre re-patronage



• proposed layout

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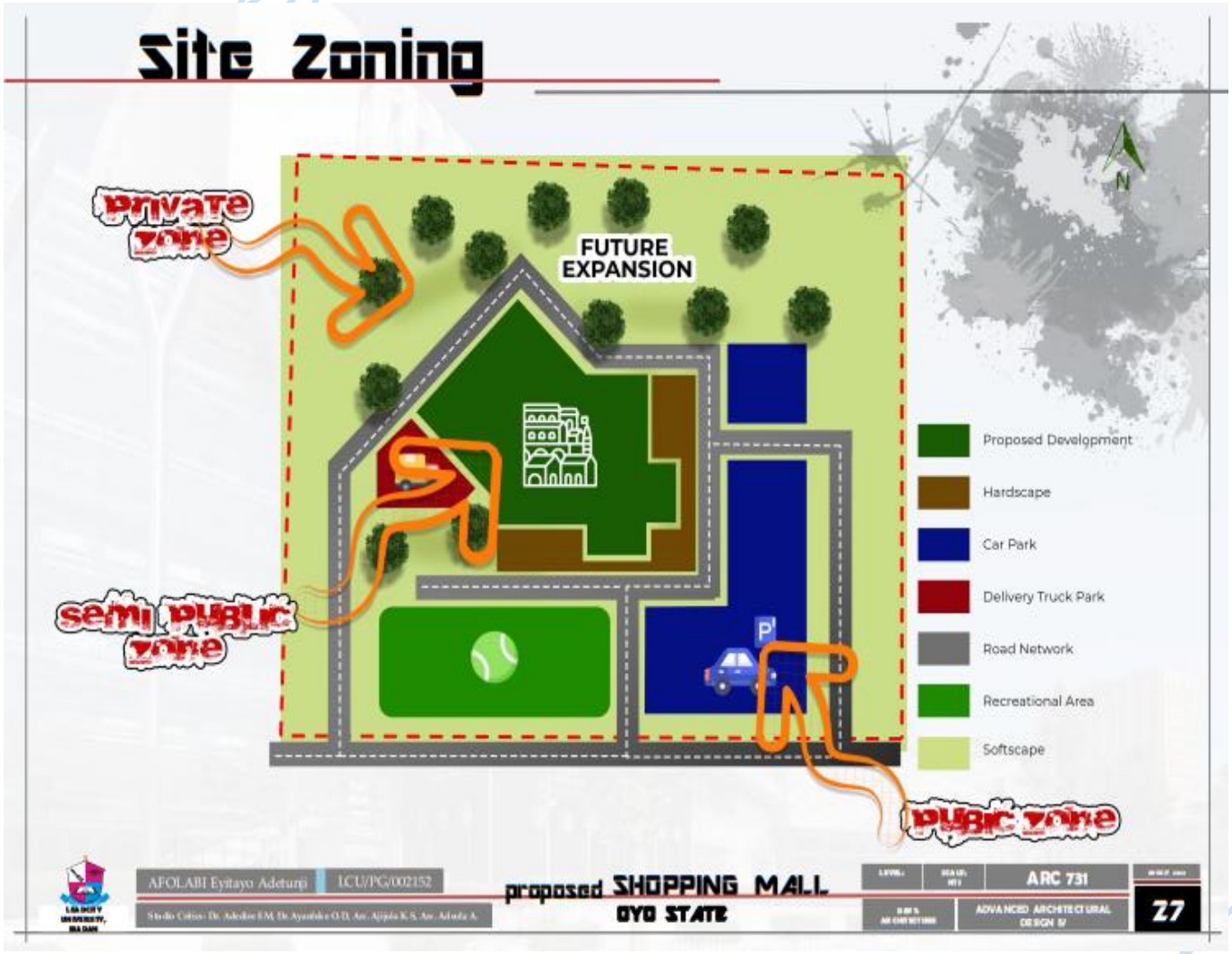
Site Zoning
private zone
FUTURE EXPANSION
semi public zone
public zone
N
Proposed Development
Hardscape
Car Park
Delivery Truck Park
Road Network
Recreational Area
Softscape
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Z7

Site Plan
SERVICE ACCESS ROAD
ACCESS ROAD
N
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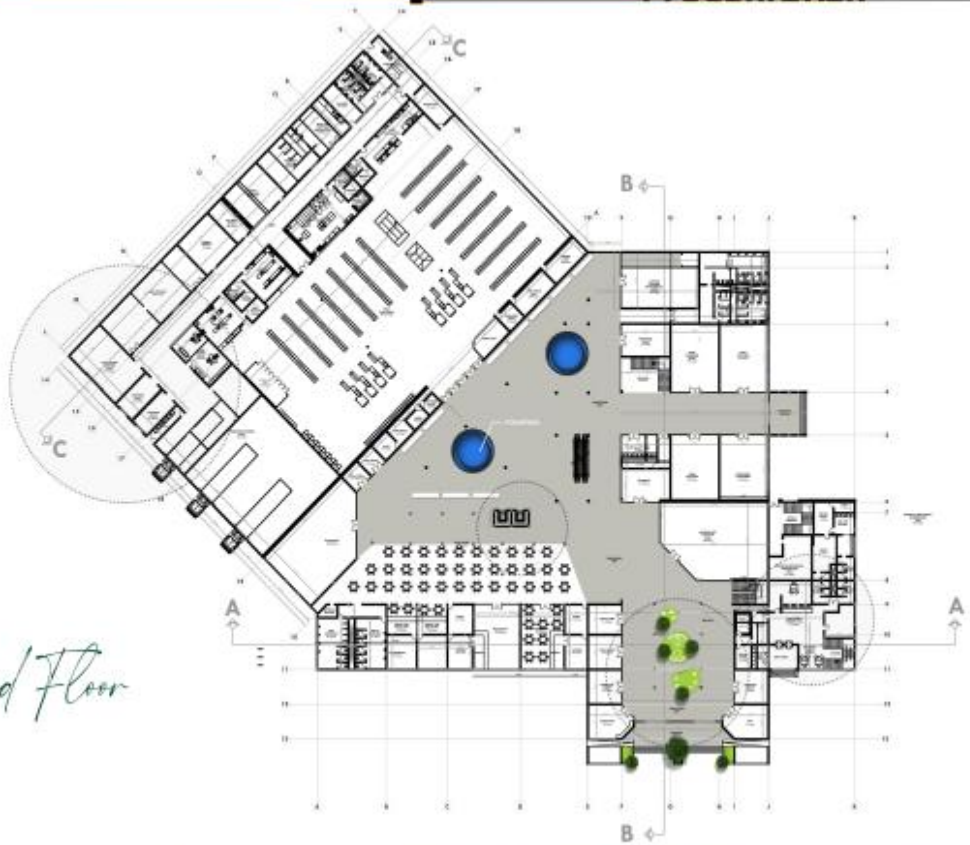
Z8

Ground floor plan

Presentation



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First floor plan

Presentation

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Second floor plan

Presentation

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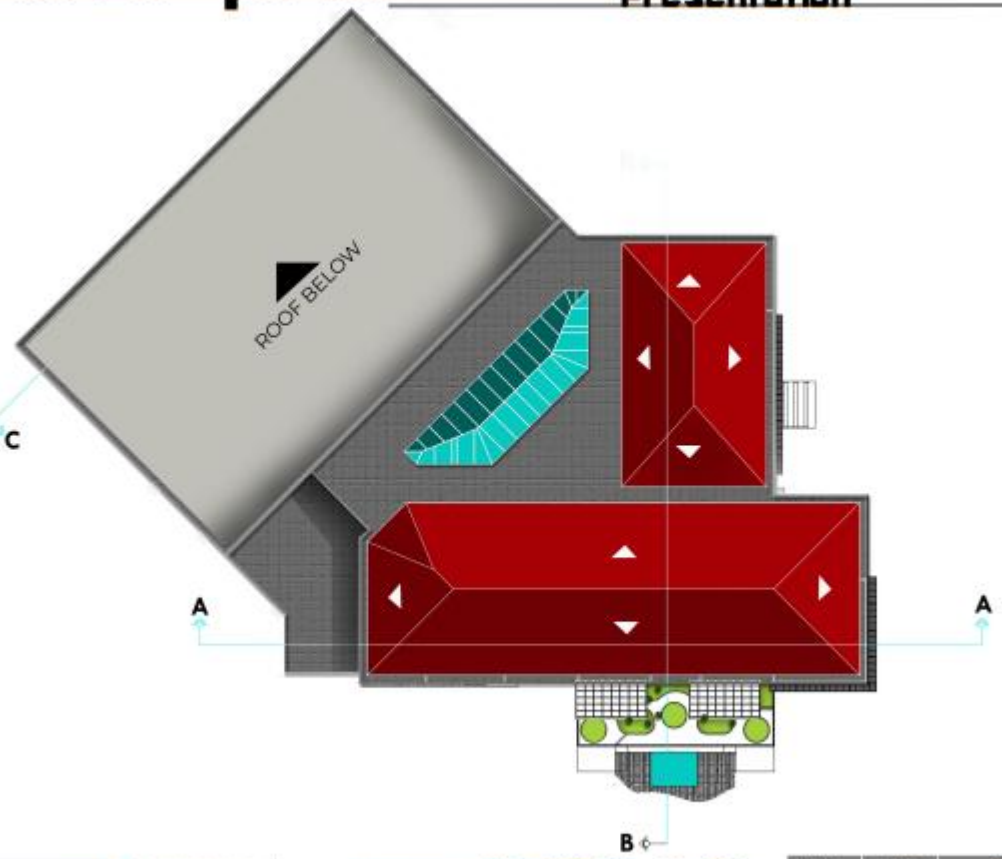
Roof plan

Presentation



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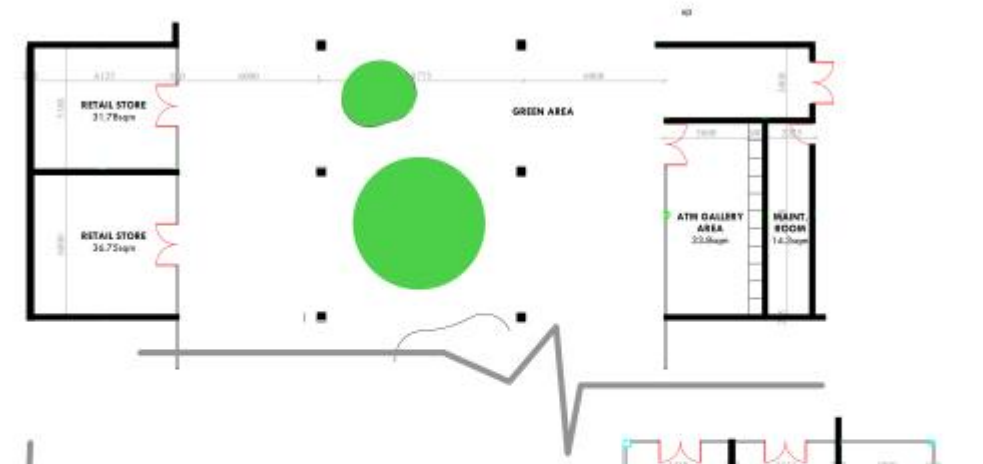
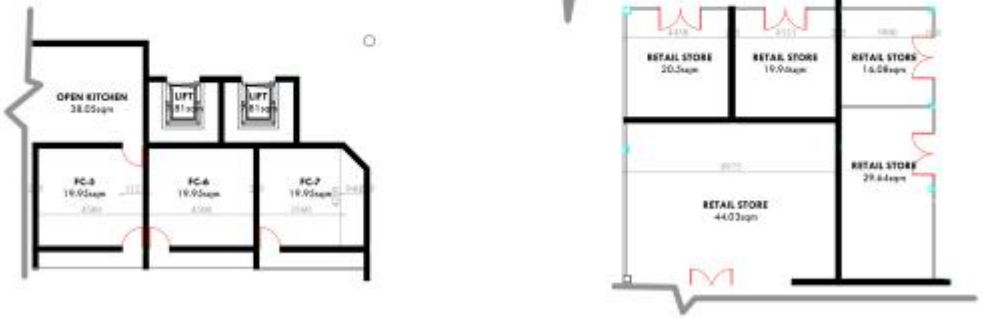
Blow Out





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Blow Out

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Sections

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Section

Section C-C

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Elevations

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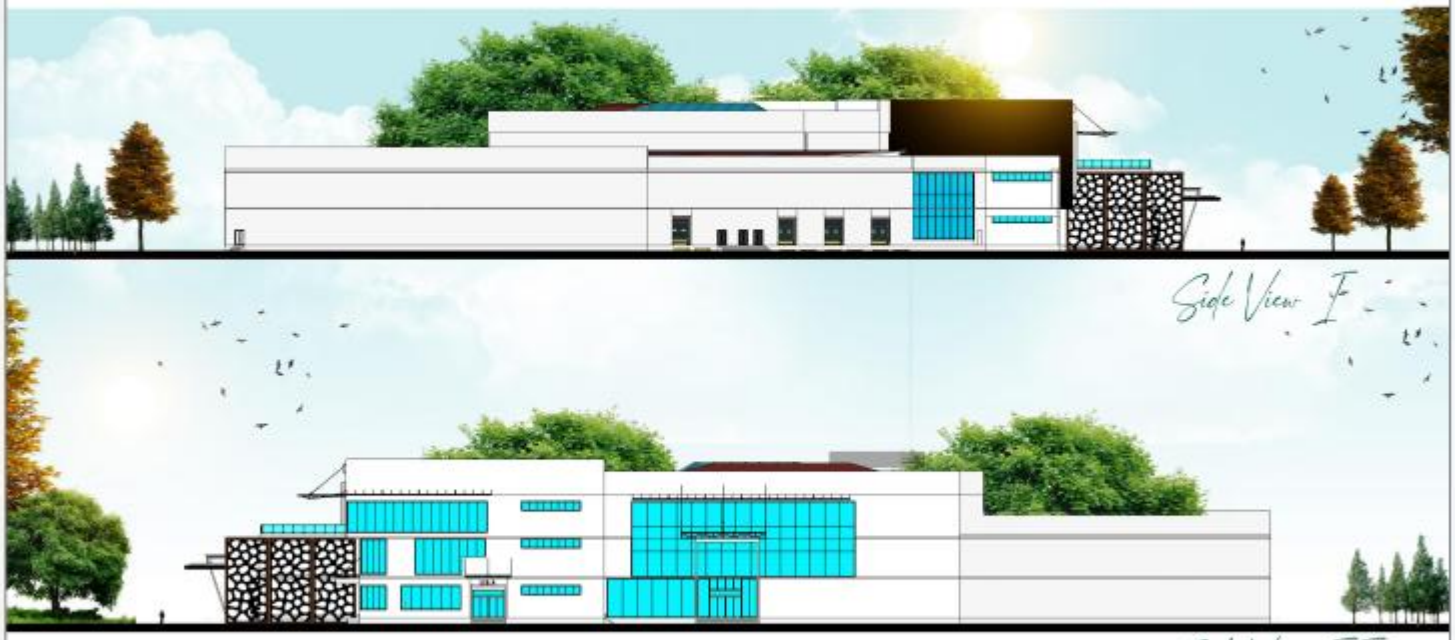
37

Elevations



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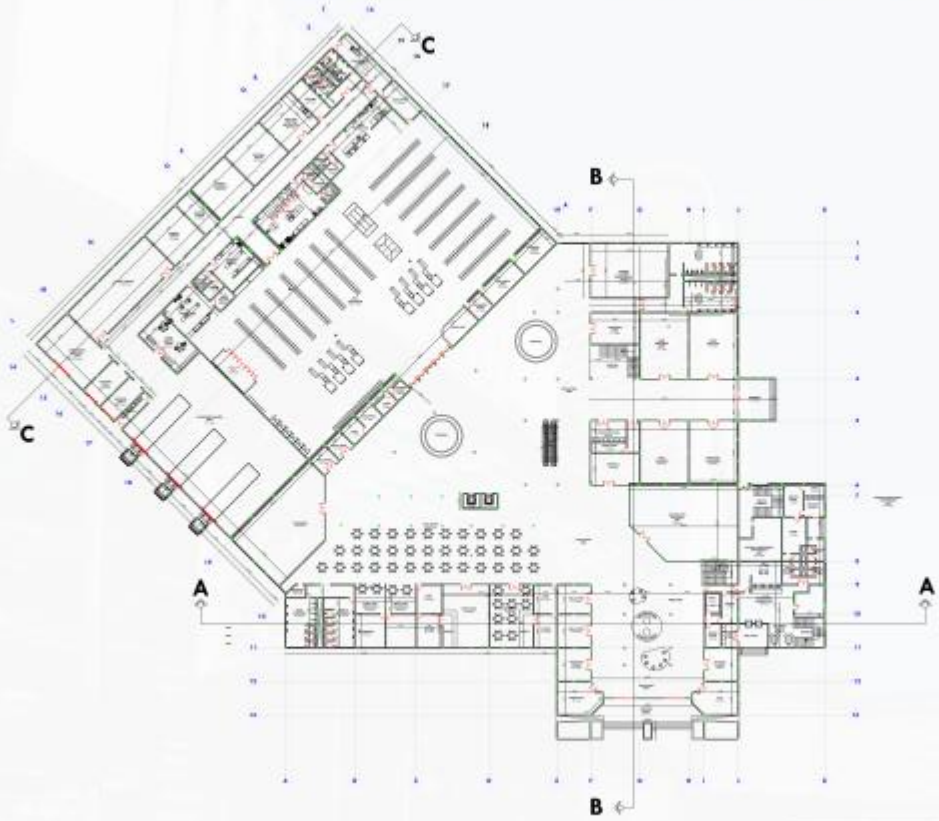
Ground floor plan

Working drawing



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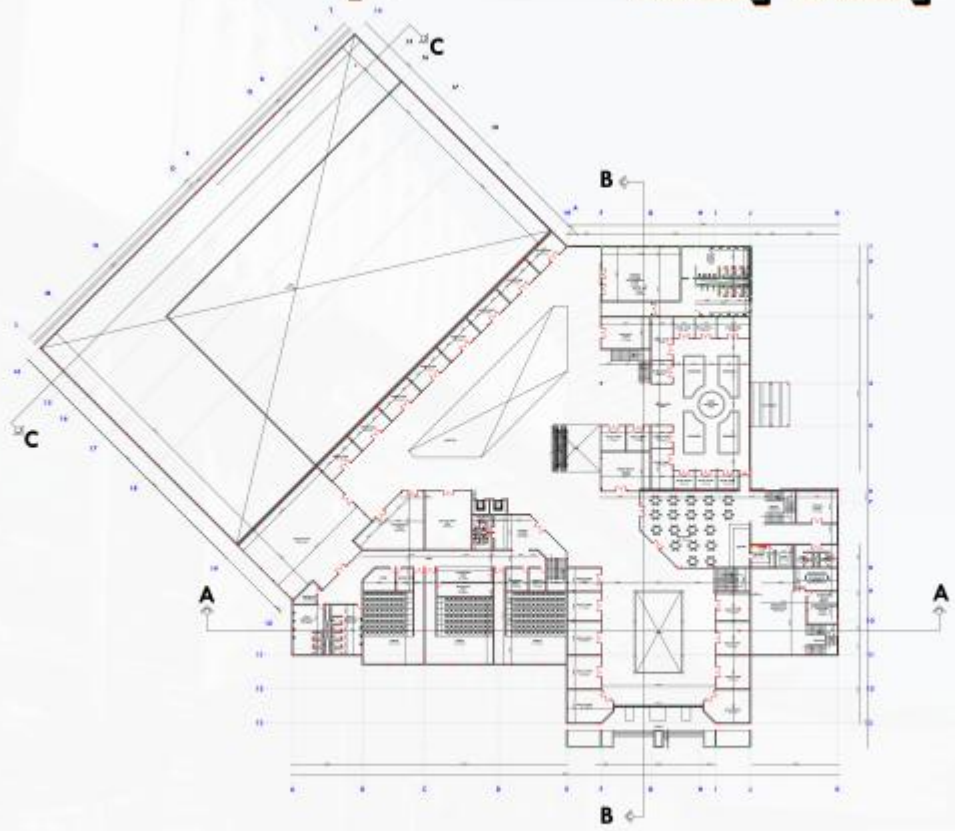
39

First floor plan

Working drawing



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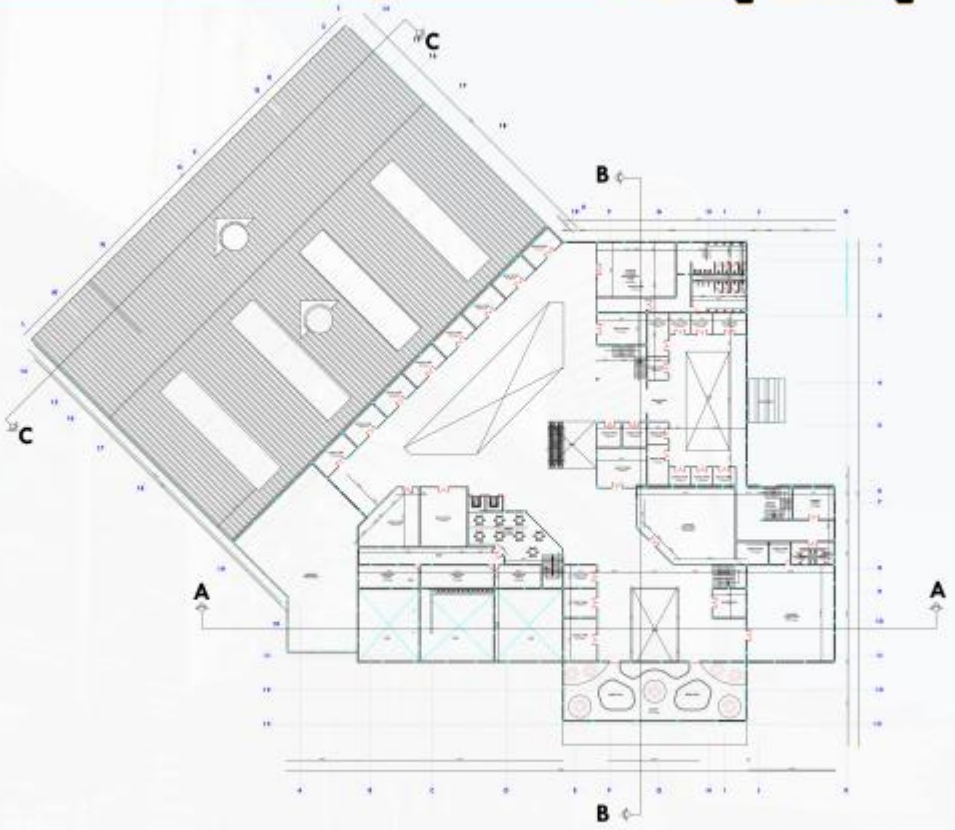
Second floor plan

Working drawing



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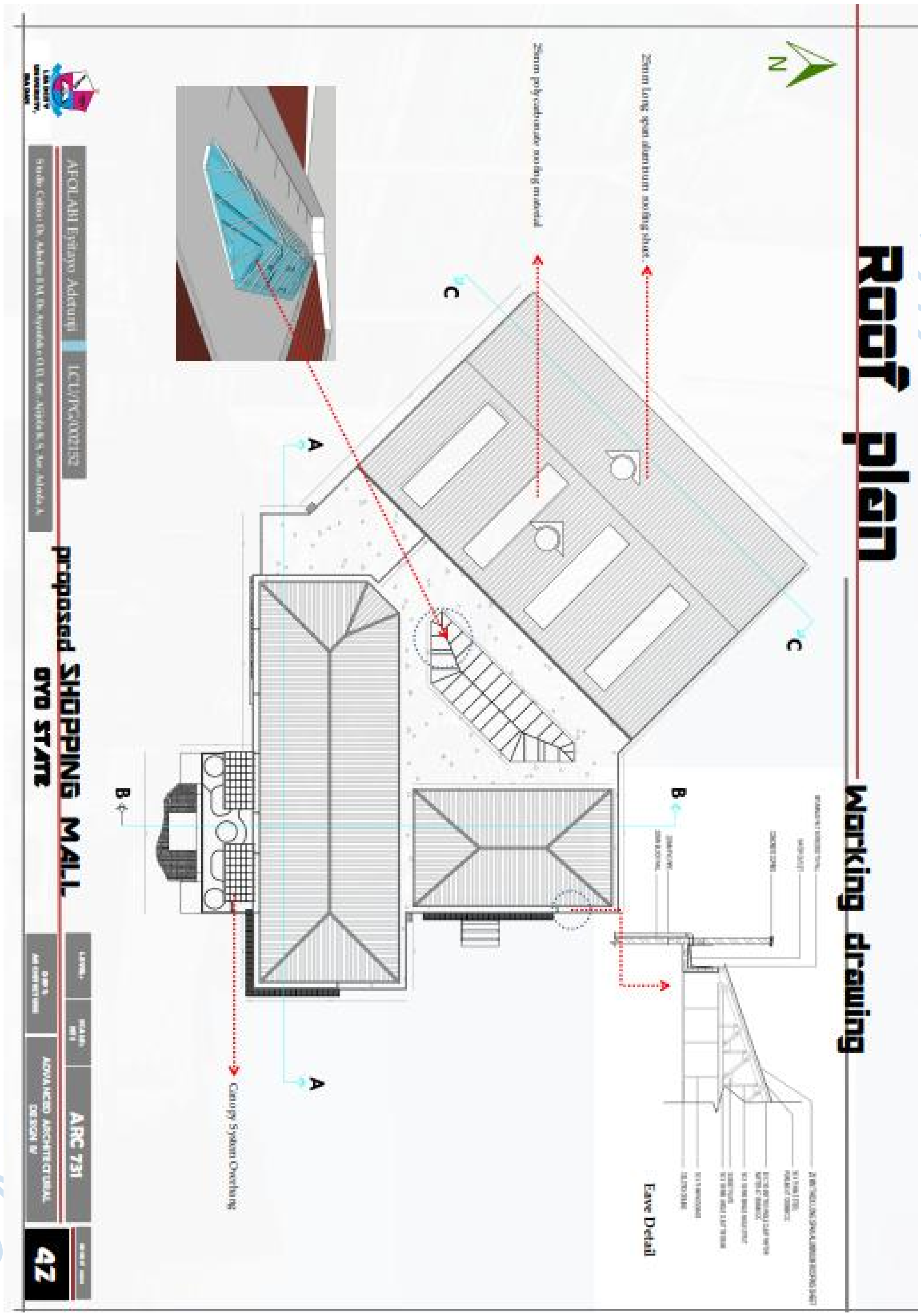
41


Roof plan
working drawing
25mm long span aluminium roofing sheet.
25mm polycarbonate roofing material
Eave Detail
Canopy System Overhang
A
B
C
N
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Elevations

Working drawing

FRONT ELEVATION

REAR ELEVATION

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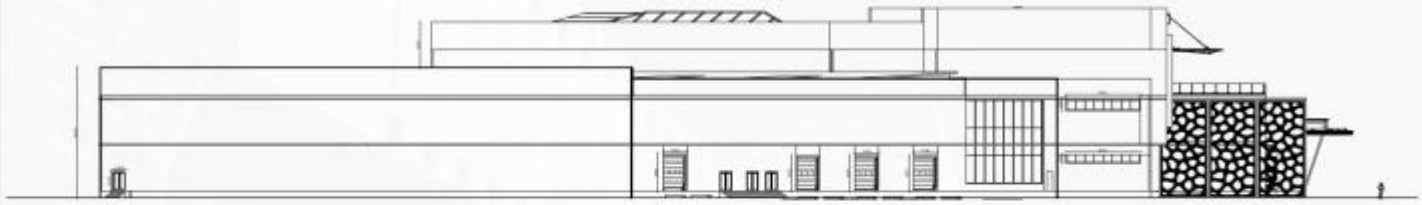
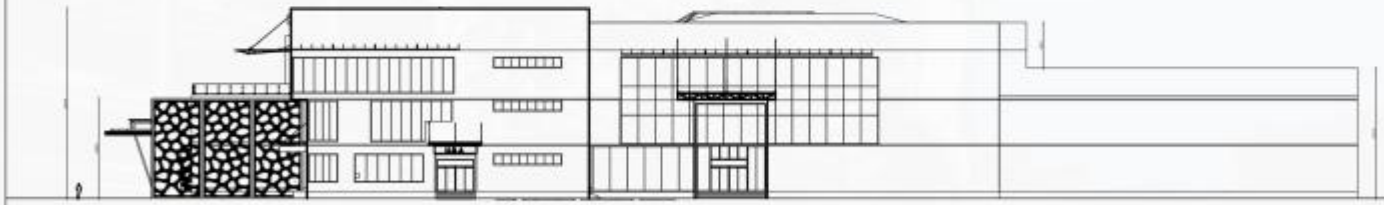
Elevations

Working drawing



LEFT SIDE ELEVATION



RIGHT SIDE ELEVATION

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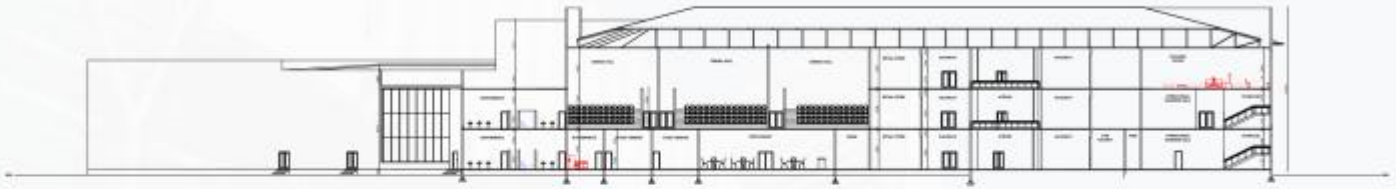
Sections

Working drawing



SECTION A-A

SECTION B-B

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ADVANCED ARCHITECTURAL DESIGN 5?

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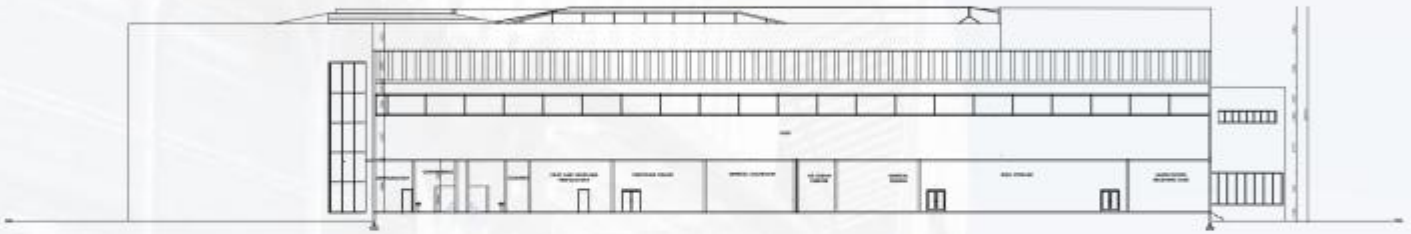
Section

Working drawing



SECTION C-C

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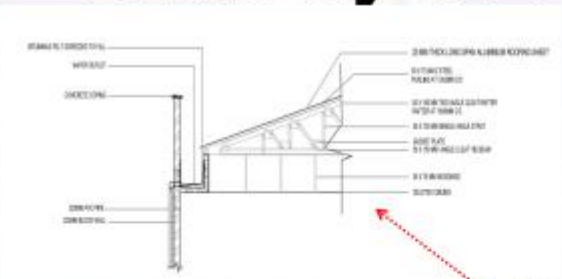
Section[Blow out]

Working drawing



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SectionBlow out1

Working drawing

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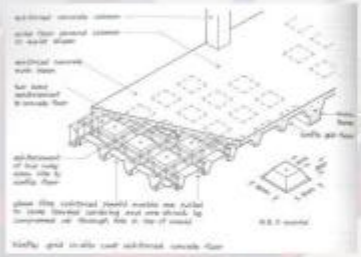
Details

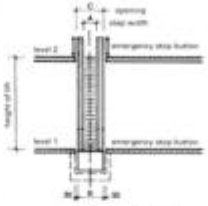
WAFFLE FLOOR DETAILS

Waffle slab or ribbed slab is a structural component which is plain on its top and contains grid like system on its bottom surface. The top of ribbed slab is normally thin and the bottom grid lines are generally ribs which are laid perpendicular to each other with equal depth. Waffle slab has two directional reinforcement.



Advantages of Waffle Slab Construction

- Waffle slabs are used for larger span slabs or floors
- Used when there is limited requirement for number of columns.
- The load carrying capacity of waffle slab is greater than the other types of slabs.
- They provide good structural stability along with aesthetic appearance.

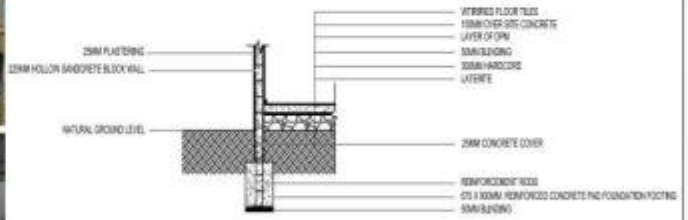


Escalator width

Step width	400	800	1000
A	605-620	805-820	1005-1020
B	1170-1220	1320-1420	1570-1620
C	1290	1460	1660
Transportation capacity/h	3000-6000 persons	7000-8000 persons	8000-10000 persons

Dimensions and performance for escalators with either 30 degree or 35 degree angle of ascent.

Escalator Details



Pad foundation Details

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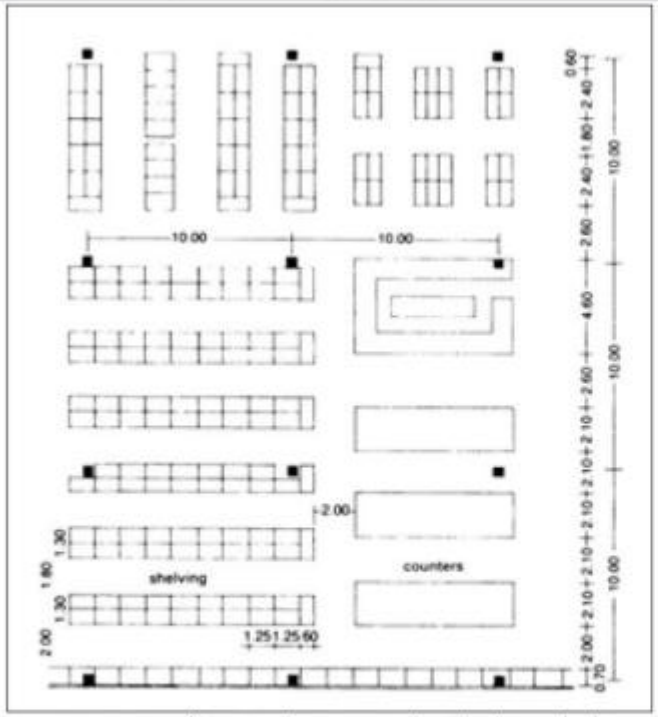
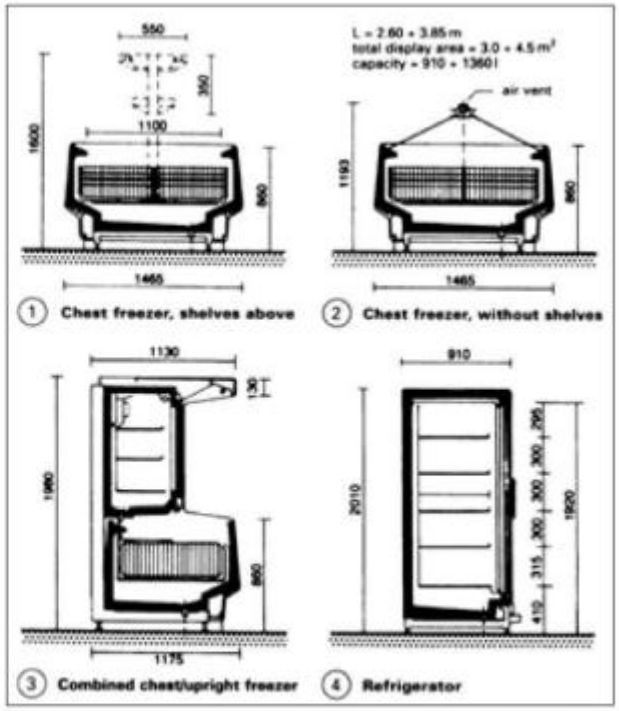
Details



Dimensions of counters and shelves(m)



Dimensions of freezers and refrigerators

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Bio-data

A. Personal Data:

1.	Name:	Eyitayo Adetunji AFOLABI
	Permanent Home Address:	No 25, Ifesowapo Street, Kinji estate, Mabolaji, Oyo, Oyo State
	Contact Address:	No 9, Olorombo Street, Orita Basorun, Ibadan, Oyo State
	Email:	aeyitayo@gmail.com
	Phone Number:	08035752978
2.	Date of Birth:	3rd December. 1982
	Place of Birth:	Oyo, Oyo State
	Marital Status:	Married
3.	Nationality:	Nigeria
4.	Next of Kin	Abimbola Elizabeth AFOLABI
		No 9, Olorombo Street, Orita Basorun, Ibadan, Oyo State

B. Education Background with Date

1. Institution Attended with Dates

i.	Lead City University Ibadan, Till gate, Oyo State	2020 – 2022
ii.	Lead City University Ibadan, Till gate, Oyo State	2018 – 2020
iii.	The Federal University of Technology, Akure, Ondo State	2012 – 2014
iv.	The Polytechnic Ibadan, Oyo State	2006 – 2008
v.	Federal Polytechnic Ede, Osun State	2002 – 2004
vi.	Olivet Baptist High School, Oyo, Oyo State	1994 – 2000
vii.	St. Francis Nursery and Primary School, Oyo	1986 - 1993

2. Qualifications with Dates

i.	MSc Architecture	2022
ii.	BSc Architecture	2020
iii.	Post Graduate Diploma Architecture	2014
iv.	Higher National Diploma Architecture	2008
v.	Lower National Diploma Architecture	2004
vi.	NECO	2000
vii.	First School Leaving Certificate	1993

C. Working Experience with Date

Project Architect: Turning Point Network, Onikoko Close, Agodi GRA, Ibadan, Oyo State.	2008 – Till Date
Project Architect: Homas Finese Concept. Akobo, Ibadan	2017 – Till Date
I.T./Site Architect: AhMAK Engineering Limited, Behind School of Survey, GRA, Oyo, Oyo State	2004 – 2006

D. Membership of Professional Bodies

Graduate Member of Nigeria Institute of Architect (NIA)

E. Publication

Assessment on the Quality of Public Housing in Oyo State	(Unpublished)
Effective Daylighting Strategies to Enhance Circulation in Shopping Mall	(Unpublished)

F. Referees

1. Arc.(Dr.) Funmilayo Adedire
   Principal Lecturer
   Lead City University Ibadan

Architecture Department
Toll gate Ibadan Oyo State.
08080997437

2. Arc. Ayodeji Olorunda FNIA
   CEO
   Turning Point Network
   Agodi GRA
   Ibadan Oyo State.
   08062209440

3. Arc. Oyenekan 'Lola
   Arkibest En-Konsult Ltd
   13 M Fadahunsi Onilegogoro, Premier Hill
   Mokola
   Ibadan Oyo State.
   08063630345

University Compliance Form

This is to certify that this thesis by Eyitayo Adetunji AFOLABI with Matriculation Number LCU/PG/002152 in the Department of Architecture, Faculty of Environment Design and Management, Lead City University, Ibadan is in full compliance with the approval of the University's format and style.

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Signature Date