TRIBHUVAN UNIVERSITY

INSTITUTE OF ENGINEERING

DEPARTMENT OF ARCHITECTURE

PULCHOWK CAMPUS

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ARCHITECTURAL MUSEUM:

"Centre for Architecture enthusiasts"

SUBMITTED BY:

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ABSTRACT

Although Architecture has a lot of impact on the daily life of people, it is not celebrated widely here in Nepal. Architecture is not only the design of a building, it's a lot more than that. There's a huge gap between the architecture fraternity and the common people. People are not aware how architecture is shaping their day to day life and how important architecture is for the humans. So,this project Architectural Museum: Center for architecture enthusiasts is envisaged to be an innotative and compelling center of architecture which aims to bridge the gap between architecture and the people by experiencing and seeing different forms of architecture and the supporting features.

This thesis presents the design and implementation of an architectural museum, which serves as a destination for architecture and design enthusiasts to learn, engage, and be inspired. The museum is organized into several galleries, each with its own unique theme and focus, including contemporary, past, and future architecture, art, product design, and more. The museum also features outdoor areas, including a public plaza, exhibition space, and a play area for children.

The thesis outlines the design process, including the conceptualization, planning, and execution of the museum, as well as the materials and technologies used in its construction. The report also details the visitor experience, including the circulation within the museum, as well as the various exhibits and galleries.The conclusion of the thesis summarizes the key findings and outcomes of the project, highlighting the strengths and weaknesses of the museum design and implementation.

Finally, the report provides several recommendations for future development of the museum, including ongoing updates and refreshing of exhibits, digital engagement opportunities, sustainability measures, and community engagement initiatives.Overall, the architectural museum represents a unique and innovative approach to showcasing the world of architecture and design, and provides a valuable resource for both professionals and enthusiasts in the field.

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1 INTRODUCTION

1.1 Background

"The museum is not only for artefacts,the museum should draw people together and activate the communication between the people" - Kengo Kuma

The International Council of Museums' current definition of a museum (adopted in 1970): "A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study, and enjoyment.

As institutions that preserve and interpret the material evidence of humankind, human activity, and the natural world, museums have a long and varied history, springing from what may be an innate human desire to collect and interpret and having discernible origins in large collections built up by individuals and groups before the modern era.

Architectural museum is a unique repository of architects and allied professionals records and a dynamic hub of research into architectural and built environment history. The architecture museum is a facility for the acquisition, preservation and management of architecture and related records. An architecture museum is a museum dedicated to educating visitors about architecture in general or with a focus on a specific architectural style.

1.2 Need identification

Architecture along with architects is not celebrated and appreciated by people here in Nepal.People are unware how important architects contribution id in the developing society like ours. There is no place in Nepal where multiple architects work is preserved, researched and exhibited on a permanent basis thus providing the need to facilitate an architectural museum where students and common people can understand ,study and analyze these works.

Such museums create a built environment which possess a quality of expression of space and architecture, where everyone, with or without qualification; can be inspired by art and architecture. Moreover, such places create a space to encourage scholarly architects and foster innovative design practices. It also creates public awareness of the role of architecture and design in everyday life and on society and to uplift architecture and architectural practices.

Architecture and design play a vital role in shaping the world we live in, and as such, there is a growing need for accessible and engaging resources to help people learn about and appreciate the field. While there are many museums and cultural institutions dedicated to art, science, and history, there are few that focus specifically on architecture and design.

This thesis seeks to fill this gap by creating an architectural museum that provides a comprehensive and interactive experience for visitors to learn about architecture and design. Through engaging exhibits and galleries, visitors

will gain a deeper understanding of the evolution of architecture and the key concepts and principles that underpin design.

Furthermore, the museum aims to foster a sense of community and connection among architecture and design enthusiasts, providing a space for people to gather, share ideas, and collaborate. By creating a hub for the architecture and design community, the museum will serve as a catalyst for innovation and creativity in the field.

Overall, the need for an architectural museum stems from a growing demand for accessible and engaging resources to learn about architecture and design, as well as a desire to foster a sense of community and collaboration among enthusiasts in the field.

1.3 Project justification

Architectural museum provides a common ground for all the professional architects, students of architecture, teachers , architecture enthusiast and the public. Such museums create a built environment which possess a quality of expression of space and architecture, where everyone, with or without qualification; can be inspired by art and architecture.Moreover, such places create a space to encourage scholarly architects and foster innovative design practices. It also creates public awareness of the role of architecture and design in everyday life and on society and to uplift architecture and architectural practices.

The creation of an architectural museum is a significant undertaking, requiring considerable resources and effort. However, the benefits that such a museum would bring to the field of architecture and design make it a project that is well worth pursuing.

First and foremost, an architectural museum would provide a much-needed resource for people to learn about architecture and design. The museum would showcase the evolution of architecture and highlight key concepts and principles that underpin design, providing visitors with a comprehensive understanding of the field. The interactive exhibits and galleries would engage visitors and foster a love and appreciation for architecture and design.

Furthermore, the museum would serve as a hub for the architecture and design community, providing a space for enthusiasts to gather, share ideas, and collaborate. By creating a community around the museum, it would act as a catalyst for innovation and creativity in the field, driving forward new ideas and approaches to architecture and design.

The museum would also contribute to the broader cultural landscape of the area, providing a new and unique attraction for locals and tourists alike. It would offer a rich educational and cultural experience, helping to put the region on the map as a center for architecture and design.

In conclusion, the creation of an architectural museum is a project that is well justified by the need for accessible and engaging resources to learn about architecture and design, as well as the desire to foster a sense of community and collaboration in the field. By providing a comprehensive and interactive experience for visitors and serving as a hub for the architecture and design community, the museum would bring significant benefits to the field and the broader cultural landscape of the area.

1.4 Project objectives

- To develop an architectural museum so that it can bridge the gap between architecture and society.
- To provide the common ground for the architects,teacher student and the public forum.
- To explore how to create a sense of community of a diverse audience and make them understand the knowledge of architecture.
- To explore the knowledge of architecture and museum in broader sense.

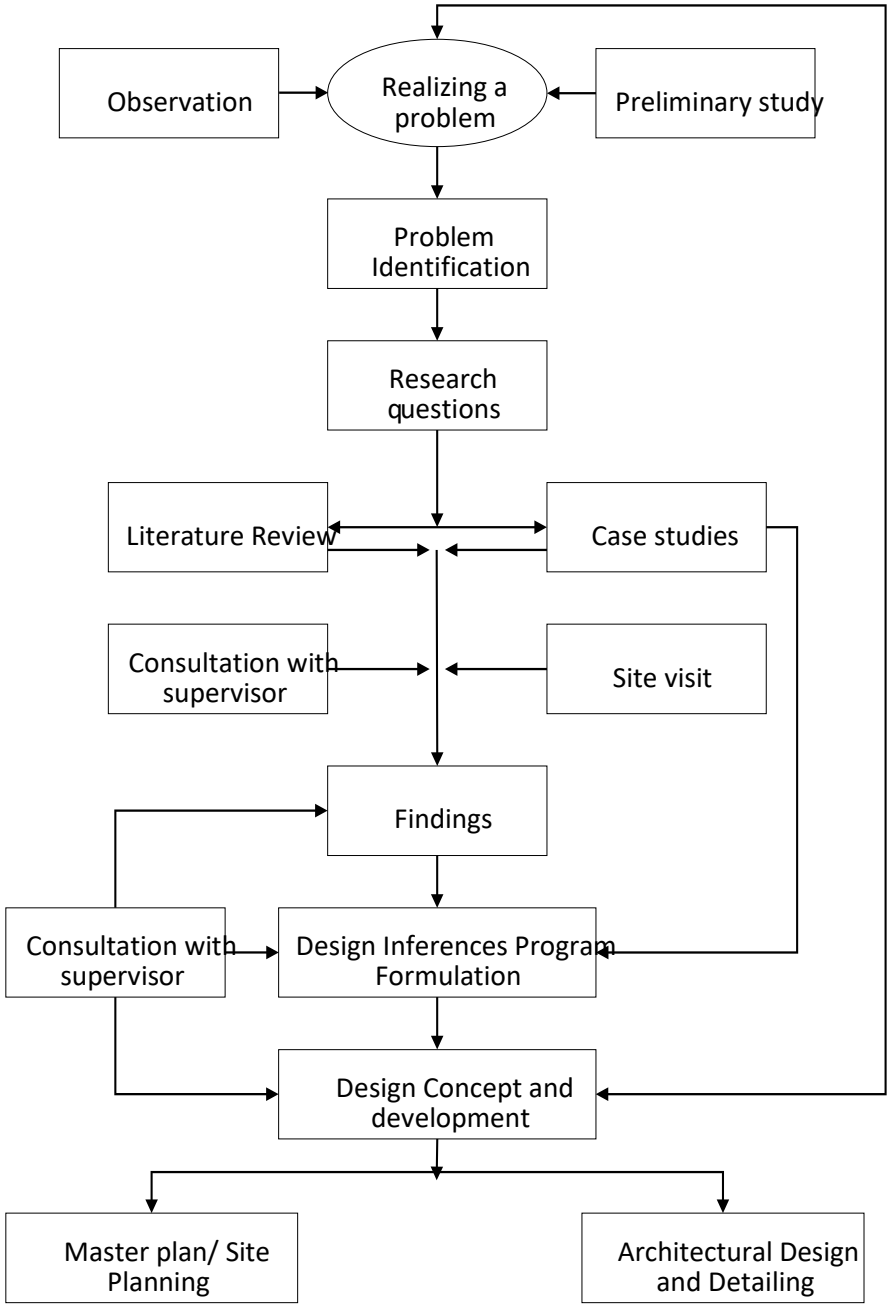
1.5 Target users

Architecture Museum has a varied use values for different categories of visitors. It is not only a museum but a centre for all the architecture enthusiasts globally. For general public, it is a place where they can know understand what architecture actually is. For the public it is also a place for educational excursion and recreation; while for the scholars, it is a place to carry out their valuable research and training programmers, whereas for a nation it is a place to house and safeguard the invaluable artifacts of national importance.

The possible visitors in a museum are:

- Researchers, intellectuals and architecture students for learning, programs, seminars and workshops .
- Tourists for learning and recreation.
- Local people for learning, recreation and leisure.

1.6 Research methodology



A series of studies will be conducted for the purpose of this thesis, in order to formulate the program and spaces required. The methodologies and procedures to be used are literature review, case study, and design idea formulation and planning. This procedure entails identifying the project location, conducting a case study of similar projects to determine the building situation, and developing a design program. A design concept will be generated based on the literature review, case study, and research.

1.7 Scope and limitations

RESEARCH

- Study on Architectural Museum
- Space Integration in museum
- Understanding peoples perspective on Architecture
- Site Analysis

- Circulation Analysis
- Literature Study
- Case studies

ANALYSIS

- Various data analysis from research
- Synthesize the analyzed data towards Concept Development
- Checking with Objectives

DESIGN DEVELOPMENT

- Concept generation
- Preliminary design approach
- Detail design development
- Landscape design
- Structural design
- Energy conscious application in services
- Universal Design Approach
- Building Services

LIMITATIONS

Technical detailing of HVAC,electrical and plumbing system is beyond the scope of thesis.The project will also not cover the detailed structural analysis and cost estimate of building elements because its an academic project.

1.8 Site selection

Site selection is one of the most important aspect of the project as it gives the understanding of climatic,geological,historical and infrastructural context. The main key factors to be considered during the site selection procedure for the architectureal museum is that the site should be located at closer proximity to the airport and the main entry point to the valley(i.e kalanki). Person from outside the valley can access the site easily after they enter the valley by air or by road as the site is located 1.7 km away from the international airport and 6 km away from Kalanki.The site lies in TINKUNE, which is a part of Kathmandu Metropolitican city. So,the site is perfect for the Architectural Museum.Moreover all the infrastructures are well developed there due to the prime location.

2.LITERATURE REVIEW

2.1 Museum

According to the **International Council of Museums (ICOM)** Statutes, adopted during the 21st General Conference in Vienna, Austria, in 2007: “A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.” The definition of a museum has evolved, in line with developments in society. Since its creation in 1946, ICOM updates this definition in accordance with the realities of the global museum community.

The word "museum" comes from the Latin word, and is pluralized as "museums" (or, rarely, "musea"). It is originally from the Greek mouseion, which denotes a place or temple dedicated to the Muses (the patron divinities in Greek mythology of the arts).
Museum, as defined by the **Oxford Dictionary**, is a building in which objects of artistic, cultural, historical or scientific interests are displayed. The objects in the museums may be antique, historically and archeologically. However, not all kinds of objects can be catered in a single museum. “A museum is an institution that cares for (conserves) a collection of artifacts and other objects of scientific, artistic, cultural, or historical importance and makes them available for public viewing through exhibits that may be permanent or temporary.” (Alexander & Alexander, 2007) “A museum is an institution, which collects documents, preserves, exhibits and interprets material evidence and association for the public benefit.” (Museum associates UK 1994)

Museum is an institution dedicated to helping people understand and appreciate the natural world, the history of civilizations, and the record of humanity's artistic, scientific, and technological achievements. Museums collect objects of scientific, aesthetic, or historical importance; care for them; and study, interpret, and exhibit them for the purposes of public education and the advancement of knowledge. There are museums in almost every major city in the world and in many smaller communities as well. Museums offer many benefits to their visitors, their communities, and society as a whole. As educational institutions, they offer unparalleled opportunities for self-directed learning and exploration by people of diverse ages, interests, backgrounds, and abilities. They are public gathering places where visitors can be entertained, inspired, and introduced to new ideas. Museums enrich local cultural life and make communities more appealing places to live and to visit. For society as a whole, museums provide valuable intangible benefits as sources of national, regional, and local identity. They have the singular capacity to reflect both continuity and change, to preserve and protect cultural and natural heritage while vividly illustrating the progression of the human imagination and the natural world. Most museums offer programs and activities for a range of audiences, including adults, children, and families, as well as those for more specific professions. Programs for the public may consist of lectures or tutorials by the museum faculty or field experts, films, musical or dance performances, and technology demonstrations. Although most museums do not allow physical contact with the associated artifacts, there are some that are

interactive and encourage a more hands-on approach. Modern trends in museology have broadened the range of subject matter and introduced many interactive exhibits, which give the public the opportunity to make choices and engage in activities that may vary the experience from person to person. With the advent of the internet, there are growing numbers of virtual exhibits, i.e. web versions of exhibits showing images and playing recorded sound. Museums are usually open to the general public, sometimes charging an admission fee. Some museums have free entrance, either permanently or on special days, e.g. once per week or year. Museums are usually not run for the purpose of making a profit, unlike galleries which engage in the sale of objects. There are governmental museums, non-governmental or non-profit museums, and privately owned or family museums.

2.2 Categorization of museum

Architecturally museums are the most significant building. The museum boom continues in the world despite the severe criticisms. It has become a culture in the architectural world. Many museums are designed with different natures. Museum can be of various types depending as per the type of collections and function on the basis of which the different types are:

- Art Museum
- History Museum
- Maritime Museum
- Science Museum
- Natural History Museum
- Open Air Museum
- Mobile Museum
- Virtual Museum
- Specialized Museum
- National Museum
- Contemporary Musuem of arts

2.3 Evolution of museum

2.3.1 International context

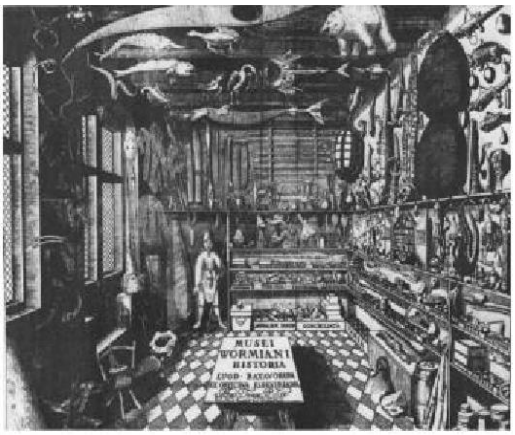


Figure 1Cabinet of curiosities

The English "museum" comes from the Latin word, and is pluralized as "museums" (or, rarely, "musea"). It is originally from the Greek mouseion, which denotes a place or temple dedicated to the Muses or seat of muses (the patron divinities in Greek mythology of the arts), and hence a building set apart for study and the arts, especially the institute for philosophy and research at the Library established at Alexandria (the great Museum at Alexandria) by Ptolemy I Soter 2nd century B.C. This was considered by many to be the first museum/library. The library of Alexandria had some objects, including statues of thinkers, astronomical and surgical instruments, elephant trunks and animal hides, and a botanical and zoological park, but it was chiefly a university or philosophical academy-a kind of institute of advanced study with many prominent scholars in residence and supported by the state. It was destroyed during various civil disturbances in the third century A.D.

Records of collection of precious items date as back as ancient Greek and Roman times. Enthusiasm for the products of classical antiquity and a sense of history first developed during the Italian renaissance. It was during this period that the collection of art started. Bramante in the old Vatican during the beginning of the 16th century was the first to provide a formal setting for the display of antiques which also displayed the rooms of wealthy individuals and royals. The term museum was first used during the renaissance. Museum was a different experience then, it was a 'Cabinet of Curiosities' in the 16th century. Natural and art objects were jumbled together on the walls and ceilings, cupboard and drawers of not more than two rooms. A square-shaped room filled with stuffed animals, botanical rarities, small works of art such as medallions or statuettes, artifacts, and curios. The purpose of the museum was to surprise and delight the visitors and they had to themselves find what attracted them and make their own interpretation about the display. With this regard, it shows that early museums began as the private collections of wealthy individuals, families or institutions of art and rare or curious natural objects and artifacts which were often displayed in so-called wonder rooms or cabinet of curiosities. Public access was made often possible for the 'respectable', especially to private art collections, at the whim of the owner and his staff.

Figure 2 ARSSETSE

The first public museums in the world opened in Europe during the 18th century's Age of Enlightenment:

Figure 3Ashmolean Museum

The Ashmolean: The first corporate body to receive a private collection, erect a building to house it, and make it publicly available was the University of Oxford. The gift was from Elias Ashmole; containing much of the Tradescant collection, it was made on the condition that a place is built to receive it. The resulting building, which eventually became known as the Ashmolean Museum, opened in 1683. (The Ashmolean **Museum** later moved to another new building nearby, and its original building is now occupied by the Museum of the History of Science.)

The first "public" museums were often accessible only by the middle and upper classes. It could be difficult to gain entrance. When the **British Museum** opened to the public in 1759, it was a concern that large crowds could damage the artifacts. Prospective visitors to the British Museum had to apply in writing for admission, and small groups were allowed into the galleries each day. The British Museum became increasingly popular during the 19th century, amongst all age groups and social classes who visited the British Museum, especially on public holidays. In Victorian times in England, it became popular for museums to be open on a Sunday afternoon (the only such facility allowed to do so) to enable the opportunity for 'self-improvement' of the other working classes. In France, the first public museum was the **Louvre Museum** in Paris, opened in 1793 during the French Revolution, which enabled for the first time free access to the former French royal collections for people of all stations and status. The fabulous art treasures collected by the French monarchy over centuries were accessible to the public three days each "décade" (the 10-day unit which had replaced the week in the French Republican Calendar). The Conservatoire du muséum national des Arts (National Museum of Arts's Conservatory) was charged with organizing the Louvre as a national public museum and the centerpiece of a planned national museum system. As Napoléon I conquered the great cities of Europe, confiscating art objects as he went, the collections grew and the organizational task became more and more complicated. After Napoleon was defeated in 1815, many of the treasures he had amassed were gradually returned to their owners (and many were not). His plan was never fully realized, but his concept of a museum as an agent of nationalistic fervor had a profound influence throughout Europe.

- The world's oldest museum was built by a Babylonian princess 2,500 years ago.
- Early museums began as private collections of wealthy individuals, families or institutions of art and rare or curious natural objects and artefacts.
- These were often displayed in so-called *wonder rooms or cabinets of curiosities.*

Figure 4 Alexendriya museum,Egypt

- Some of the oldest public museums in the world opened in Italy during the Renaissance, but the majority of them opened during the 18th century.

IN THE MIDDLE AGES

- Growth of Christianity,so does the appreciation for art.
- Thus,churches and temples became platforms for public exhibit making them public museums.
- E.g Basilica san vitale,Italy
- During the Roman Era,the world Muse was referring to "The place of meditation and philosophical discussions."

Figure 5 Basilica San Vitalae,Italy

- Ancient museums were full of antiques and precious collection.At the end of 17th century,the royal and nobles passion were kept in "Cabinet of Antiques"
- After that, all of these palaces had turned into museums as it had been contained valuable antiques and treasures.

THE MODERN MUSEUM

- European idea to make museums more public
- After French revolution(1789),museums became truly public.
- Eg:- Louvre Museum,Paris

Figure 6 Louvre Museum,Paris

- Located in Paris, the Louvre is a historical monument and the most toured art museum in the world.
- Structures of museum began to be seen as reflection of art it contained
- Organisational planning revolves around how it would complement its contents as well as how it would adapt to modern times.
- E.g:-Guggenheim museum,New York(Landmark of 20th century museums)

2.3.2 Regional context

European colonial influence was responsible for the appearance of museums elsewhere. In Jakarta, Indonesia, the collection of the Batavia Society of Arts and Science was begun in 1778, eventually to become the Central Museum of Indonesian Culture and finally part of the **Figure 1-3: Indian Museum in Calcutta**
National Museum. The origins of the Indian Museum in Calcutta were similar, based on the collections of the Asiatic Society of Bengal, which commenced in 1784.

Figure 7 Indian Museum ,Kolkata

INDIAN MUSEUM,KOLKATA

- It is one of the oldest museum in South Asia.
- When the British colonized the Indian subcontinent in the 18th century, the European idea of the museum percolated to India.

NATIONAL MUSEUM,DELHI

- The National Museum of India located in Delhi is the biggest museum in India
- Commissioned in 1946, and opened for visitors in 1949.

Figure 8 National Museum, Delhi

2.3.3 National context

Nepal, being a multi-cultural, multi-religion and multi ethnic group with vast history , the evolution of museum was too slow.History of Museum in Nepal begins with the establishment of Silkhana Museum(Arsenal Museum) in 1926 AD which is popularly known as Chhauni Silkhana. The museum building was built by Prime Minister General Bhimsen Thapa in the year 1819 A.D. for the Arsenal housing.The name of Chhauni Silkhana was converted

Figure 9 National Museum,Chhaunil

in to Nepal Museum in 1939 A.D. It is known as Nepal National Museum since 1967 A.D. The main attractions are collection of historical artworks(sculpture and paintings) and a historical display of weapons used in the wars in the 18-19th century.The museum has separate galleries dedicated to statues,paintings,murals,coins and weapons.

At present there are more than fifty museums in Nepal including community and private museums. All government museums are run under the Department of Archaeology.

National Art Gallery

National Art Gallery of Bhaktapur District is another important museum of valley which was established in 2017 B.S(1960/1961 A.D).It has only collection of paintings.This gallery is housed in the new wing of ancient Bhaktapur palace.

Figure 10 National Art Gallery,Bhaktapur

Museums related to Rulers in Nepal

- Tribhuwan Museum-ktm durbar square.
- Mahendra Muuseum
- Birendra Museum

Museums related to Natural History in Nepal

- Natural History Museum-Swoyambhu
- Annapurna Natural History Museum-Pokhara

2.4 Museums today

Museums have always been the icon of the society. It reflects how a society sees itself as well as stands as symbol of commercial and cultural achievement for the outside world. For many, the modern day temples are the shopping malls and the museum, a place for family entertainment and self- improvement. Galleries and the museum are the most popular visitor attractions in Europe. Increased mobility, more leisure time and the growth of global tourism plays an important role in the development of museum. The contemporary museum is a place with multiplicity of functions. It has to combine the traditional roles of interpreting and conserving a wide range of artifacts with requirements for large scale retail areas, complex new technologies and the circulation needs for the public. In competing with the other forms of entertainment, museums are desperately looking for architectural and techniques of theme park. It has to rejuvenate itself as place for **enjoying the past, and learning for the future.**

The Pompidou Centre in Paris designed by Piano & Rogers, opened in 1977 is an important trendsetter. It has diverted from the conventional role of a museum as a sanctuary for serene contemplation and has in turn, shaped itself as a civic institution and provided education and entertainment both to the public. Galleries and museums now have to be equipped for people wishing to relax, to shop or to have a meal. They have to be able to accommodate seminars and post graduate courses for instance. At the same time they are the monuments that identify and differentiate cities and the nations in the global scenario. Galleries are the vital part of the

museum. They act as art markets promoting artists and anticipate fashion by organizing temporary exhibitions. Art has also become theatre with its expansion to the variety of media. Galleries and the museum as a whole have to adapt to reflect the changing feelings and mood of general public. Over the years, the display technique has changed from the static posture to more interactive ones with the explanatory panels, computer screens, inviting visitors to participate. The ultimate aim, is therefore, not merely to classify and divulge the contents but to incorporate the museum into the type of place where people can readily spend their leisure time.

2.5 Museum as Public Space

A public space is a social space that is open and accessible to all, regardless of gender, race, ethnicity, age or socio- economic level. Throughout history, public spaces has formed the backdrop to public life, for commercial transaction, social exchange, entertainment, protest and contemplation. The space is filled with energy and a sense of lively enjoyment is derived. Public spaces bring people together, encourage use and interaction among a diverse section of the public.

- Uses & Activities: Activities are the basic building blocks of great places. They are the **reasons why people visit** in the first place, and why they **continue to return**. When there is nothing to do in a place, it will sit **empty and unused.**
- Comfort : Comfort includes perceptions about safety, cleanliness, and the availability of places to sit - the importance of **giving people the choice** to sit where they want.
- Access: You can judge the accessibility of a place by its connections to its surroundings, both **visual and physical**. Accessible spaces have a high parking turnover and, ideally, are convenient to **public transit.**
- Sociability: When people see friends, meet and greet their neighbors, and feel comfortable interacting with strangers, they tend to feel a stronger **sense of place** or **attachment** to their community - and to the place that fosters these types of **social activities**.

Figure 11 Qualities of public Space

2.6 Experience of a museum space

The concept of 'meaning-making' can help to bring together human experience and museological practice as well as human needs and the role of museums within society.

Narrative hermeneutics- Hermeneutics is 'the methodology of the **interpretation**'. Narrative as particular human 'expression', structured units of experience, such as **stories or dramas,** are socially constructed units of meanings. The dynamic relationship between meaning and memory may be viewed as the core mechanism of meaning-making. It is mainly guided by:

- Space, Form and Order
- Content, Context and Narrative

2.6.1 Space, Form and Medium

Spatial layout and the flowing relations among individual **exhibition spaces** provoke an **emotive response**. **Space** becomes an **interpretive agent** active in the making of meaning to memory. Display compositions and their spatial juxtapositions form another layer of a museum space, need to be filled with meaning.

The existence of **free space** which simultaneously creates a **comfortable feeling** as well as room to just digest everything and **contemplate what you think**.

Need to leave **Spatial gaps** or free space merge 'architectural and curatorial intent' create **narrative ruptures** for embodied interpretive engagements and facilitate the movement from a didactic **transmission of facts to a hermeneutic dialogue of interpretations**. (Schorch, 2013)

2.6.2 Content, Context, Narrative

A **story** generates the **linkage** between each gallery's subject matter and its respective **context** as well as the different exhibitions within the overall museum setting. Its imaginative reconstruction exposes accusation of 'historical revisionism'. **Delivery** and **message**, or form and content, are inseparable in the construction of meaning and memory. The **narrative hermeneutic approach** has delivered **ethnographic insights** into the museum experience by considering both the complexities of 'situations' and the uniqueness of 'individualising qualities'. (Schorch, 2013)

Figure 12 Factors affecting overall experience

2.7 Social learning space

2.7.1 Spirit of the place

Atmosphere contributes to the development of potentials for social learning spaces. Maintenance of integrity of the **cultural biography** of the place is important. The living **social and spiritual** nature of place need to be portrayed. Only when a **unity** emerges, when art, **building and landscape** unite and thus intensify the experience do we get this almost indefinable sensation that – here is something special. **Interaction with the surroundings** and **respect for nature** has been an important concept. **Human scale** spaces aim at establishing a democratic architecture. It constitutes the memory and significance of the place.

2.7.2 Safe place for Unsafe ideas

American museum director and museologist, Steven E. Weil's vision for museums talks about How **body and materiality** can recall memory and ideas? A shelter, refuge and a place of hiding. A safe, pleasant place to be in, a place of peace and rest. The **Concept of home** and the concept of coming home, just like the bird returns to the nest. The nest is a **place in memory** and in the dream of returning, which makes what is distant and remote exist in the present.

2.7.3 A desire for Presence

In a spatial context **tangibility** that comes from the materials. It depends upon museum's **physical settings** in interaction with the users. Users will be undergoing **mind-body cleansing** exercises before they can experience the institute performance spaces, art works, and library.

2.7.4 The Human Condition

A need for primary spaces that remind us of what it means to see, to listen, to move and to find our being in a world full of colours, sounds, shapes, currents and smells. Spaces for authentic human experiences and the **relationship** between the **individual** and the **surrounding** world are essential. Through dialogue with the surroundings, we can emphasise the values that determine human wellbeing, our behaviour patterns, our ideas and sensory possibilities. It is necessary to have **flexible and dynamic platforms** for practice that challenge the institutional framework where the self-organising consists in something performative. (Ida, Jacob, 2013)

2.8 Different learning behaviour

Explorer : Explorers are interested in learning and seek new knowledge.

Facilitator: They visit the exhibition place to create a good experience for others.

Experience seeker: They aim for individual and popular objects, buildings or environments.

Professional: They relate critically and reflectively to everything in the exhibition.

Recharger: The rechargers use the institution for mental relaxation and inspiration.

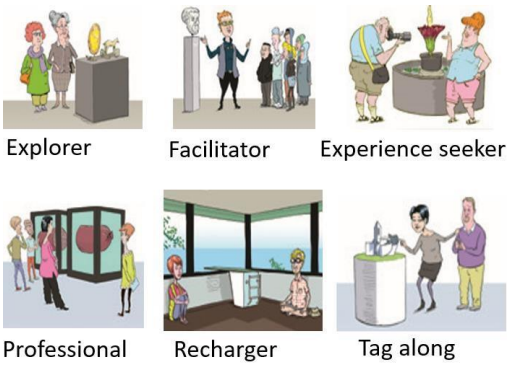


Figure 13 Learning behaviour of visitors

Tag along: They are not particularly interested in the exhibitions' content or the institution.

2.9 Social interactions in a museum

2.9.1 Connecting to each other and the exhibits

Visitors are usually assumed to be static and silent, with their experience mainly being ocular centric, shifting between passive gazing and glancing, prolonged silence and queuing in front of popular exhibits.

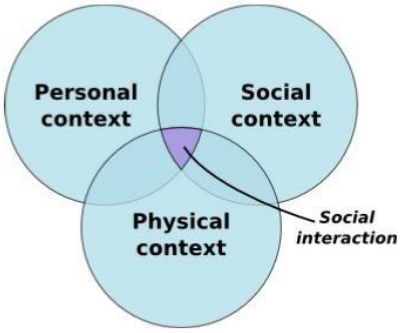


Figure 14 Social interaction space in Studio Museum

A study by B. Serrell showed that most of the time visitors spend less that **20 minutes** at an exhibition and two-third of the visitors actually **stop at less than 50%** of the exhibits. Visiting a museum and performing spectatorship cause a specific type of fatigue, the "**museum fatigue**," which is both physical fatigue and cognitive saturation.

With the **interactive exhibits** in the galleries, visitors are invited to shift from "**not touching**" to **hands-on engagement** which makes museum galleries more than ever "a locus for more than one set of expectations".

Visitors can "Read" or "redesign" the curators' script pointing towards the duality of the visitor as a **spectator** and as a **spectacle**. (Christidiu, 2016).

2.9.2 A place for sharing

Paying a visit to a museum is a **cultural activity**, and secondly, it is also a **leisure activity**, often shared with our significant others, friends and family members. Encountering an object may provoke further sharing of **memories and stories** and thus, transforming the object into a "**social object**" an "engine of socially networked experiences, the content around which conversation happens". Social sharing takes place **before, during and after** the museum experience, and invites researchers to **openly**

discuss and explore such that things and people **mutually interact**, shifting the context of the museum encounter from being "**object-centred**" to "**experience centred**". (Christidiu, 2016).

Museum Park in **Polytechnic Museum** in Moscow, an open-air foyer that will become an extension of the spaces inside the building. (Koller, 2017)

Figure 15 Interacting context in Museum

2.9.3 Interacting Contexts

Falk and Dierking define museum experience by three interacting contexts :

- **Personal context** - related to prior experience and expectations,
- **Social context** - related to other people present in the museum including unknown visitors and museum staff, and
- **Physical context** - defined by the museum space and artworks. (Peter, 2016)

2.9.4 Foyer as Transformative Space

A conceptualization of museum foyer as sites of **social and community practices** rather than as physical ramifications or functional entities. Museum foyer is seen to offer a transformative function of **resolution**. It provides an opportunity for visitors to focus on what they have experienced and what they take away in relation to substance, sociability, knowledge and reflection. . It also acts as an **ambient leisure space** of resting, waiting, playing, having informal discussions.(Laursen,Kristiansen,2016)

Figure 17 Multifunctional foyer space in Museum

Figure 16 Museum Park in Polytechnic Museum

2.10 Design philosophies

2.10.1 Museum as heterotopia - A theorization by Michel Foucault

The museum does engages in a double paradox: it contains **infinite time in a finite space**, and it is both a space of time and a 'timeless' space. What makes it a heterotopia, then, appears to be three fold: its **juxtaposition of temporarily discontinuous objects**, its attempt to present the totality of time and its **isolation**, as an entire space, from normal temporal continuity. The museum is likened to another heterotopia, in visiting, '**one abolishes time, but time is also regained, the whole history of humanity goes back to its source as if in a kind of grand immediate knowledge'** (Foucault, 1998).

Museums need not contain artifacts and need not contain texts; sometimes interpretation is implicit and hidden. But **without interpretation**, without representing a relation between things and conceptual structures, **an institution is not a museum but a storehouse**. It is the difference between things and words, or between objects and conceptual structures: what Foucault calls the '**space of representation'**. The space of representation is called heterotopia.

Foucault's museum is not a funereal storehouse of objects from different times, but an **experience of the gap between things** and the conceptual and **cultural orders in which they are interpreted**. Museum is an **Enlightment institution** not only because its essence is the problem of representation, but also because the museum partakes of the Enlightmet ethos of permanent critic: **a reflection** upon its own conceptual conditions of possibility. The modern museum functions as a sort of **narrative machine** through which the concept of a great temporal current is provided, and as a **social machine** through which specific social relationship are constructed. (Lord, 2006)

2.10.2 Bennett

A new spatial form was devised to mix a public, which used to be differentiated, then the museums were reconceptualized as a public cultural resource in the nineteenth century. There are two key themes emerged:

- **Organized walking:** Buildings are classifying devices, including the spatial layouts of modern museums, became the mapping of knowledge. Through regulating visitors movement, 'historicity' could be manifested. The single-sequence movement could be organized to illustrate historicity by applying specific spatial arrangements. By such organization, the visitors movement are controlled by the spatial organization.
- **The congregation of visitors:** The spatial layouts of museum have a function in bringing visitors together. There is an 'integration core' which serves as the locus of the exercise of power and the formation of bonds. Through maximizing visitors encounter physically or virtually, different kinds of social relationships could be possibly constructed and inscribed on bodies. (Venkat, 2012)

2.10.3 The City as a Museum

Michel Foucault (1997) argued that during the 19th century the museum was established as an "espace autres," a world outside of our own; a parallel preserved world, which we view for self-reflection, serving as a space of antagonism to propel the condition of utopia.

The internal structure of the museum supports the conception of the museum as an interior city within the city. The museum is primarily a public institution that over the past century continued to grow in size. (Pannone, 2018)

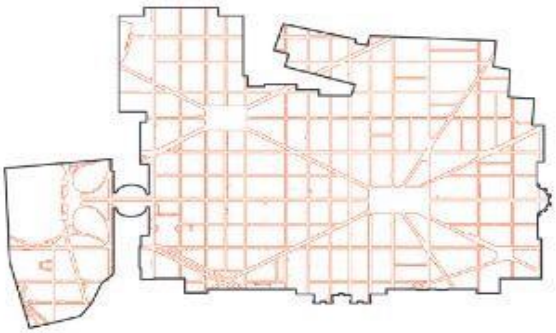


Illustration from Jonathan A. Scelsa on the possibility of the museum as a typology in architecture that is informed and driven by an urban grid.

Figure 18 Museum interior space as urban Grid

In cities of similar scale, the city center remains a stagnant historical exhibit for tourists and locals alike. Museums and monuments are the only elements that bring back those urban memories. New development and change happen on the periphery of this, consequently extending focus to different areas that surround the center.

The museum as a "**city within a city**" has a distinctive form derived from specific topography that is a result of the intersection of two urban grids. Diverse building typologies include public institutions as well as monumental gardens and detached urban squares that shape a unique site of seemingly unconnected spaces.

The idea is to imagine the **urban grid as the whole of a museum.** Thus, the blocks and **buildings** are seen **as potential rooms**, the **streets as corridors**, the **open spaces as atriums** following allegorically the structure of a typical museum.

In architectural terms, the idea of a museum starts with the distinction of its hard shell to protect the exhibit from the terrifying outside conditions and its soft interior to welcome the audience. This arche-type when transferred to the urban environment allows a **two-fold approach of exhibition space**; the "hard" one, an over-described individual **experience inside a vessel**, and the "soft" one, an **open space** characterized by the **essence of an urban and social existence** in the city. (Pannone, 2018)

2.10.4 Terry Farrell's Urban Rooms

Every town and cities should have an 'urban room'.

Terry Farrell proposes a new type of place-based venue: '**an urban room where the past, present and future of that place can be inspected**'. The suggested design is based on international city galleries and is characterized by the integration of a learning environment, a community space and an exhibition area centred on a physical or virtual city model. (Jones, 2019)

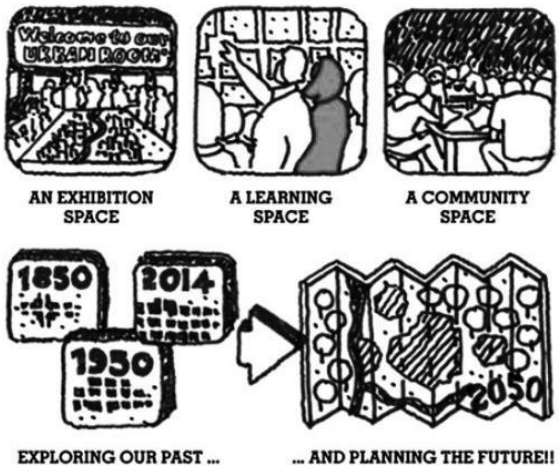


Figure 19 Museums as urban rooms

2.11 Roles of museum in society

Museums enable people to explore collections for inspiration, learning and enjoyment. They are institutions that collect, safeguard and make accessible artifacts and specimens, which they hold in trust for society. The museum of the twenty-first century is unquestionably an institution that is constantly rethinking its place in society. Museums, like cities, are repositioning themselves by altering their purpose, to become more appealing and welcoming places by being more eventful. If they were formerly solely concerned with the conservation and restoration of collections, they are now evolving into an exhibition area as well as a forum for general debate and communication. The overall context, which prioritized culture as a key component of economic and tourism growth, was critical.

2.11.1 Switching from information to provocation

In the last few years of technological advancement, a new strategy has been necessary. Consumers all around the world quickly modified their tastes when it came to cultural items, driven by a fervent desire to try new sorts of experiences. Young adults, who represent that specific sector of the public who may actively contribute to the resuscitation of the modern museum if attentively and consistently listened to, demonstrate audience sophistication. Furthermore, people must be provoked in order to pique their interest in museums. Museums need to become important social actors and for that, they need to involve not only individuals, but also groups of people who share similar beliefs and identities.

2.11.2 Permanently adapting to new realities

Despite the efforts undertaken to promote museum attendance, there are fewer individuals visiting museums now than there were previously. Museums were regarded as first-class destinations in the 1990s, with only the social elite visiting. There is a clear need for flexible teaching through museum programs. Museums have evolved into major commercial players as well as cultural hubs. They must become self-sustaining to have some autonomy in developing their strategy. In this way, museums may improve their social performance by addressing issues like poverty, migration, gender inequality, and so on. The museum of the 21st century is a living organism that seeks for resources to adapt to various circumstances rather than

following a predetermined route. In this scenario, museums should be prepared to spark debates, raise questions, and take a firm stance in the creation and preservation of heritage.

2.11.3 Using identity as a core value

If museums place a higher emphasis on heritage, the audience considers identity to be equally essential for individuals and communities. A museum will not be able to conserve anything that the community does not value. A strong experience that provides the visitor a sense of location and the value of that specific object as part of their personal identity is required to establish a link between the tourist and the object. Working with identities is extremely important for any museum, but it can also be extremely difficult.

2.11.4 Becoming sustainable

For most 21st-century organizations, sustainability has become a serious problem. When it comes to museum sustainability, new demographics, changing patterns of government, corporate, and individual funding, as well as new means of generating, conserving, and sharing knowledge, are all significant factors to consider. Whether it's a matter of financial, intellectual, or social sustainability, cultural institutions must put up a significant effort in identifying and addressing their requirements.

2.11.5 Changing Museum Priorities

The social and political upheaval along with economic pressures from the 1960s to 80s forced museums to diversify their collections, exhibitions, and outreach efforts, as well as to increase revenue through ticket sales, film and concert series, member lounges, restaurants, and shops. Conceived as a response to 1968 democratic upheaval, the 1977 Pompidou Center in Europe, brilliantly illustrated this emerging mix of high culture and entertainment, and many U.S. museums built additions or new buildings specifically designed to accommodate new trends throughout the 1980s and 1990s.

2.12 Viewing museum from Architecture point of view

2.12.1 Spatial and visual relations

It is in fact in the first autonomous and specifically designed museum building, the Altes Museum in Berlin (1823), that we find the idea of the significant location of the museum in the city and its major role ‘in shaping the nineteenth-century metropolis’ . The Altes Museum was built facing the royal residence, and was flanked by the cathedral, the arsenal and the university. The aim was to create a ‘temple of science and art’ to embellish the city. Shinkel's design enhanced the museum's relation to the city, in that the visitor, before entering the exhibition spaces, was offered a panoramic view of the open space defined by the group of buildings through the columns of the portico from the upper floor terrace, a kind of collective space that linked the museum to the city. More than a century later, the urban landscape of the metropolis as a whole was proposed as the background for the viewing of works of art by Mies van der Rohe in the New Nationalgalerie Berlin (1968), ‘an interior that appears to be outside’ while almost a decade later, in 1977, the creation of the Centre Pompidou marked a vast urban project, where ‘the building occupied half of the Beaubourg Plateau: the other half being

covered by a long plaza on a slightly lower level a meeting place, a place of assembly, a constant focus of life and movement'. Georges Pompidou's vision was converging with Le Corbusier's argument that 'a museum to be really open to all, must be built in the heart of the city .

2.12.2 Social space and urbanity

Linked to the idea of the museum being spatially and visually related to the surrounding city, is the creation of a public space in the building, or adjacent to it. An outstanding example of this is Ieoh Ming Pei's transformation of the Louvre in 1989, where the glass pyramid that now marks the entrance to the Museum is the centre of a public space, which as a result has become densely used. The space below the pyramid is then the organizing centre for visits to different parts of the museum, a radical transformation of its previously highly sequenced form. MAXXI Museum in Rome (by Zaha Hadid, 2009), aims to reflect contextual urbanity, in a more complex way. A piazza, linking a local through street to the museum, offers oblique pedestrian routes to and past the entrance, with visual links to the interior as the entrance is approached. In this way, it combines the unexpectedness of the building with everyday local spaces. At the same time, the form of the building follows the shape of the site, so assimilating itself to the specific conditions of the urban context and creating a sense of physical continuity. The sense of urbanity continues inside the building, with spaces whose sequences, choices and unforeseen dead ends bring to mind an urban grid, at the same time making 'a shared spectacle out of the flow of people through the building' (Moore, 2009), and contributing to the architects intention to create a 'semi-urban campus' .

2.12.3 Symbols and landmarks

If in the previous cases the museum aims to become in some sense integrated into the city, in cases like the new Acropolis Museum, Athens, the Jewish Museum, Berlin, and the Musee des civilisations de l' Europe et de la Mediterannee (MuCEM), Marseille, it seeks to act as a symbol for the surrounding city. The museum as symbol is proposed as a more subtle concept than the museum as urban landmark. Clear examples of the latter are the Guggenheim Bilbao and the project for a Cultural District on the Island of Saadiyat, in Abu Dhabi e all expressions of both the global expansion strategy of contemporary museums and the significance of museum architecture in the urban economy and environment, by becoming recognizable landmarks of the city.

More specifically, the architecture of the museum is shaped by the site: it is built above the exposed archaeological remains of the city, and in the immediate visual environment of its subject, the Acropolis, while its top level emulates the geometry and orientation of the Parthenon. Its spatial design shapes a sequence of spaces as a linear route which reflects chronology from prehistory to late antiquity, but at the same time it expresses the real topography of the Acropolis: a walk up the slopes of the hill on the ground floor, through statues in the open air on the first floor, and around the Parthenon, on the top floor. In these ways, the route through the museum acquires a symbolic value. This is reinforced both by the arrangement of objects in the different spaces, which creates embodied experiences of the

display, and by the increase in visual scale inside and outside the building as the visitor progresses, which generates a growing sense of the Acropolis as place.

Perhaps one of the most discussed examples of the museum which through its building form and structure aims to be an expression of the memories of the city, and so acquire a symbolic function is the Jewish Museum, Berlin (by Daniel Libeskind, 1999). The ground plan is based on the intersection of two elements: one straight but discontinuous line that can be seen as the major axis of synthesis of the building; and the other a zig-zag that intersects the former at intervals, generating voids intended to be 'metaphors for the absence and erasure of Jewish history in Berlin' . According to the architect, 'the non-visible manifests itself as emptiness, as the invisible' .In contrast to the Acropolis Museum where the symbolic effect is accompanied by a growing visual expansion of space and awareness of the real city, in the Jewish Museum, it is by the articulation of small-scale, spatially and visually isolated spaces that a symbolic relation to the city is most powerfully created. The spaces, representing the Holocaust and the Exile are dead-end spaces, linked to the main layout by long lines of sight e a classic spatial device for expressing sacredness by combining spatial depth and visibility . By their scale, internal shaping and positioning in the layout, these spaces come to stand for events which took place over years, and in this way to become, in themselves, both key objects of the display and symbols of the city's history.

2.13 Storytelling in museum architecture

2.13.1 From collecting to self-learning and interpreting

In the pre-Enlightenment period, early museum collections began as private demonstrations by wealthy individuals or families and could be regarded as particular places for the rich to present their wealth to the general public and to preserve their reputations.

As products of the Enlightenment, the first public museums as "displays of artifacts for the edification and entertainment of the public" opened in Europe during the 18th century.

According to George E. Hein, Professor at Lesley College, Cambridge, USA, the development of public museums in the 19th century can be divided into two stages. In the early stages of the 19th century, collections were focused on displays of "imperial conquests, exotic material, and treasures brought back to Europe by colonial administrations and private travellers or unearthed by increasingly popular excavations" (Hein, 1998, p.3) and were only open to those who were "fortunate enough to be allowed to enter and observe the splendo[u]r of a nation's wealth" (p.4). In the latter stages of the 19th century, museums were viewed as one of several institutions that could offer education to the general public as they helped the general public to "better themselves and appreciate the value of modern life" .

Different from schools where the general public received formal education, museum architecture was understood to be "the advanced school of self-instruction" and offered opportunities for the general public to conduct self-directed and selective learning.

In the last three decades, the educational role of museum architecture has become venerable and notably because "the very nature of education in the sense of what we mean by the term

and what we expect of educational institutions has changed" (Hein, 1998, p.6); learning is not to be achieved by means of written words in the traditional sense but should be "viewed as an active participation of the learner with the environment" .

During the time that Museum architecture as spatial storytelling of historical time: Manifesting a primary example of Jewish space 443 the educational function of museums has developed, their other role as "interpreters of cultures" has been brought to the foreground in museums. Social theorists, such as Sharon Macdonald and Gordon Fyfe, argued that museums as social and cultural sites can create interest, such as "the stories museums tell, the technologies museums employ to tell stories, and the relation these stories have to those of other sites". What is learned in the museum and how learning takes place by interpreting cultures in the museum are more significant than a matter of intellectual curiosity.

In the modern age, in addition to their original function as "cabinets of curiosities" demonstrating personal collections, the accepted meaning of architecture of museums can be regarded as an "artificial memory, a cultural archive" ,which has to be created in the pursuit of "historical memories recording by books, pictures, and other historical documents" for modern humans to define and better themselves and to appreciate the value of modern life.

Collecting and creating an archive of artifacts would ensure that tangible artifacts "would be saved from destruction through time by the technical means of conservation" not only in the practical sense but also in the ideal sense; that is, the significance of tangible artifacts would be conveyed by interpretation and inherited by building up an engaging environment for self-learning.

2.13.2From oral to spatial

Museums have inherited the custom of telling stories to perform activities on their own. Deborah Mulhearn, a freelance journalist, reported that "oral history has come a long way in museums", which could be viewed as a treasured link with the past and a prominent way of "recording lives and unexpected events that may otherwise have been lost".

In addition to oral usage, storytelling has been applied in museums by use of exhibition techniques. One of the examples selected by Bedford is an exhibition strategy called "object theater," which was developed in the 1980s. By creating a multimedia and multisensory context with computer technologies, "object theaters" are designed in museums to "bring objects to life without necessitating a hands-on experience" .

According to Andrea Witcomb, Associate Professor of Faculty of Arts and Education at Deakin University, Australia, the spatial arrangement of collections in many museums by use of linear narrative comprises three levels.

1. Level of space, in which the linear narrative is designed as "a one way flow, with exhibits lining either side of the rectangular space and a tunnel through which visitors must pass."

2. Level of collections, in which artifacts are usually set within another single linear narrative, "such as an evolutionary chronology from primitive to modern."

3. Level of individual artifact, which is "organized in a linear fashion, replicating the master narrative in the way it is classified, labeled, and displayed."

2.14 Aspects of museum

In every museum, it is very essential to be concerned of various aspects of museum in order to increase the quality of the space and convey the unforgettable impression among the visitors. Some of the important aspects to be considered for the quality of the museum are mentioned below:

i. Space organization
ii. Entrance and Access
iii. Circulation
iv. Display arrangement
v. Display techniques
vi. Lighting

2.14.1 Space organization:

Analyzing the spatial requirements for a museum, it shows that there is no such thing as an ideal space or plan as the type of space required for museum. These factors entirely depend upon the type of functional requirement of a museum and the objects on display.

The basic function and space requirements for a museum are as follows:

Table 1 Function and Space requirements for a museum

Functions	Space required
1. Curatorial Functions (Private area) a. Collection, preservation, identification, documentation, study, restoration b. Storage of collections	 a. Office-workroom, Workshop b. Reserve Collection Room
2. Display Function (Public area) a. Thematic and changing displays of selected objects and documents from the collections arranged to tell a story	a. Display Gallery
3. Display Preparation Function (Private area)	
a. The preparation of exhibits	a. Workshop, Office-workroom
4. Educational and Public Functions (Public area) This term has been expanded to include all public functions. a. Lectures, school tours, society meetings, films, and social functions b. Reception, information, sales, supervision of display gallery c. Public requirements	 a. Lecture room, Chair storage closet, Kitchenette b. Lobby, Sales and Information Counter c. Cloak room, Washrooms

5. Other Services (Private area) a. Mechanical b. Janitorial	 a. Heating-ventilation plant b. Janitor's closet

The spaces required by a museum can broadly be divided in two categories:

1. <u>Public Areas</u>: All those areas where the general public is admitted are public areas, it starts at the entrance, the entrance hall should be large so it can admit large crowds and should lead to the auditorium, library and committee rooms directly through corridors, without having to go through exhibition galleries.

a) Public circulation: Those areas where there is always public access and free circulation is to be provided come under public circulation. E.g. Reception, Gallery, Library, Café, etc.

i. Enquiry and Sales Counter: Enquiry should be located at the entrance hall to provide guidance to the public. Generally a sales counter is located in the vicinity for the purpose of selling museum publications, guidebooks, post-cards etc. But the trend of museum gift shops, which sells more than self-publications, is gaining popularity.

ii. Galleries: Galleries are the most important part of a museum as they are the main objective of a museum. Gallery planning and systematic presentation is a vital issue in the design. The design of spaces in a Gallery, sizes of rooms, ceiling heights etc. depend entirely on the type and nature of collection/ objects. Long and narrow galleries are suitable for exhibiting the paintings and the sculptures require tall halls or open courtyards.

iii. Library: Libraries require separate stacking and reading areas, and a study area. They can also house other facilities like photographic and print collections along with access to the internet. Reading and study areas require sufficient natural light.

b) Restricted circulation: Those areas where there is public access only at certain times such as at certain events or at a particular time and controlled circulation is to be provided come under restricted circulation. E.g. Auditorium, Seminar Hall, Research areas, etc.

i. Auditorium: The planning of auditoriums should be done in such a way that they accommodate multiple functions, lectures, cultural performances etc., and have an attached ante-room doubled as a green-room during performances. Sloping floors should be avoided, if possible, so it can also be used for conferences and temporary exhibits.

2. <u>Private/ Service Areas</u>: The service areas are the behind the scene areas and are important for the proper functioning of a museum. **At least 40% of the total area** should be provided for spaces like preservation laboratory, offices for administrative and technical staff, workshops, stores, working spaces etc. All these areas should be well planned and interlinked; they should be properly maintained and kept useable. Too many entrances and exits should be avoided, for security, but a separate entrance to the service areas should be provided accessible from electrical and air-conditioning plant and also

connected to the stores so that objects can be directly taken to the store without interfering with the public areas.

a. **Freight circulation**: Those areas where there is only access for the staff for service purposes come under freight circulation. E.g. Lab units, Reserve, Collection store, etc.
b. **Staff circulation**: Those areas where there is only access to the staff for official purposes come under staff circulation. E.g. Administration, Technical room, etc.

3. **<u>Other areas</u>:** In addition to the public and private spaces there must be provisions for other spaces such as toilets, separate cloak rooms and water rooms for public and staff as well as enough corridors and staircases for circulation.

i. **Toilets and Cloak Rooms**: Separate facilities should be provided for the public and the staff; which should be well equipped and well maintained. The public facilities should be directly accessible from the entrance hall.
ii. **Staircases and Corridors:** Staircases and Corridors should be wide enough to accommodate a normal crowd, and should not be crowded by displays, although area signs and notice boards should be placed in a limited number. These spaces should have a pleasant atmosphere which can be enhanced using vegetation, they should be well lighted and non-slippery.

The relation between functions and physical facilities is summarized in the following diagram.

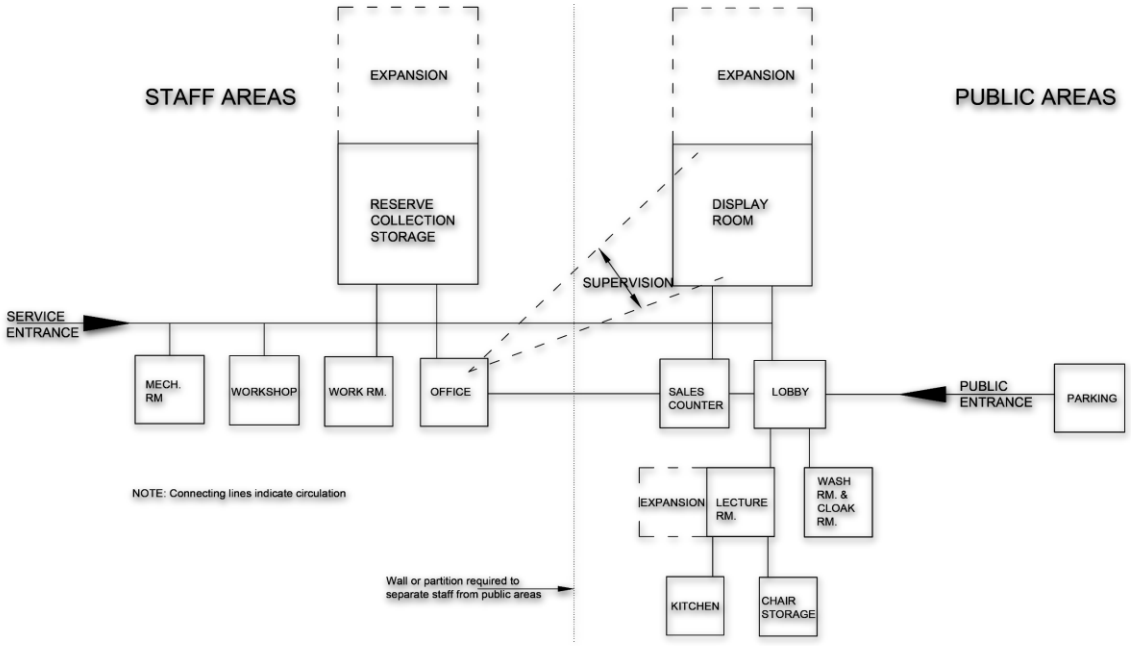


Figure 20 Space Organization Diagram

2.14.2 Entrance and Access

2.14.2.1 Entrance:

The entrance to a museum is significant as a zone of sociological contact. It plays an important part in providing a bridge between the public and the designed spaces for the

collection. It should be designed as an independent but closely integrated architectural element. A museum should be so organized as to exert the greatest possible influence on the surrounding community and at the same time afford the public the freest possible access to it. Entrance is a transition space and is crucial for mentally preparing the visitor for experiencing the upcoming space. In this context the three most important stages are:

- Enhancing the vicinity of the museum by providing appropriate additional amenities such as shopping malls, recreational facilities and places for people to meet.
- Exploiting possible amenities on behalf of the museum by using techniques to gain wide publicity for, and interest in, the services of the museum (action programs aimed at the public).
- Psychological preparation by abolishing distance and gradually changing the layout for sequence of visual surprise as in traditional planning into harmonious space.

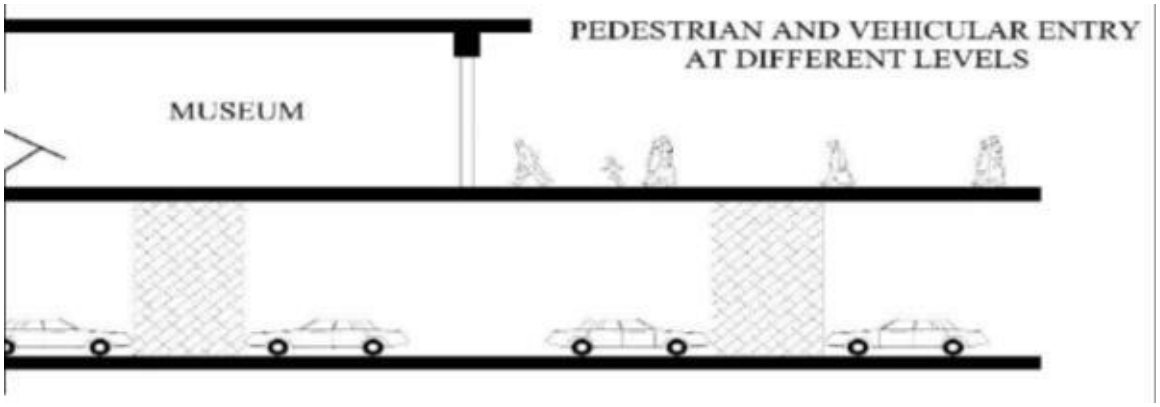


Figure 21 Different levels of entry

Apart from the above mentioned points, a museum visit can be more effective by designing an interesting entrance reflecting present context, so that the curiosity inside the museum can be displayed by the type of entrance it has. Further designing and planning of complex in the bold architectural form in monumental scale with segregated pedestrian and vehicular traffic can do magic to a functional museum. A single entrance and exit for all visitors is ideal. This will allow the museum to provide security efficiently. Museum visitors most often arrive as individuals and small groups, or as large groups such as a bus of school children or tourists. The intended sequence of entrance, welcome, and orientation are different for these two situations and must be coordinated with the external location of visitor and bus drop-off areas. The clarity of this entrance is of the utmost concern. The entrance should face the direction of approach. If visitors will arrive by multiple modes of transportation, the design should reconcile these to a single entrance. A separate museum staff may be used and is often located near the collections loading clock, if possible. This entrance should also be used for mail, courier, office supply, and similar deliveries.

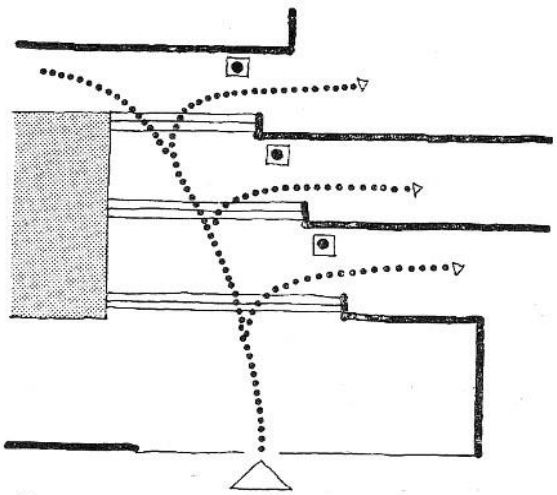


Figure 22 A series of attractive vistas at the entry

2.14.2.2 Access:

The access can be approached in terms of a general distribution along certain main directions of traffic flow and a more detailed breakdown within groups of room- although the means of locomotion in both cases is the same. The architectural space must be planned accordingly, and must offer a variety of focal points, vistas and change of mood, as is done on larger scale in town planning policy. The use of materials, the choice of proportions and the juxtaposition of configurations can convey 'messages' which are perceived subliminally and evoke associations with the contents of the museum, before one ever enters it. The same process can be used in the entrance hall, with a wider range of indications as to what is on show. Here a system of signs such as the display of typical works, which convey visual information, is preferable to the use of written panels or texts.

i. Centralized System of Access:

The main advantages of such systems are the possibilities of control and surveillance which they afford. Only in such systems can the visitor be systematically guided along a predetermined path. A certain disadvantages lie in the fact that before coming to a particular object he has always been subjected to a number of other prior impressions. A layout based on principle of arterial flow implies that visitors have to keep moving along and thus to a certain extent entails the idea of a "conducted tour". The visitor may be conducted more or less noticeably, by means of different architectonics forms, which will lead him on continuously, in what is bound to be to some extent a stereotyped manner, from start to finish, even though he may be able to cut short his visit at certain points. The arterial flow may be in more or less straight line, twisting so as to follow the line of atriums or meanders, curved in circular or spiral form, weaving freely about, and comb type.

ii. Decentralized System of Access:

Here, since there are two or more entrances and exits, the visitor is not required to follow a particular circuit. He could be allowed to move about freely, as in the areas reserved for pedestrians in town centers (of which the museum could form an integral part); and since it is not always possible to see everything in a "free range" system at a single visit, further visit will be required, enabling him to make further discoveries. Until now, sociopsychological advantage of such an approach has in practice been nullified by organizational difficulties.

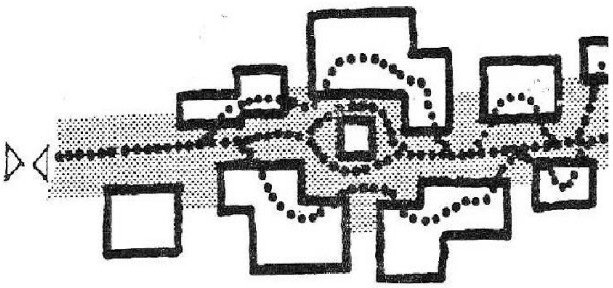


Figure 23 Decentralized system of access

2.14.3 Circulation:

Circulation in a museum is an important aspect not only for ease in conveyance but also to increase the quality of space and the presentation. Circulation in a museum can be seen in two different sectors firstly the circulation and relation of spaces in the entire museum, both

public and private areas, and secondly the circulation of visitors in the public areas especially the gallery.

2.14.3.1General considerations:

- Entry and lobby should direct the visitors to the galleries so as to avoid confusion.
- Circulation pattern should be continuous leading one gallery to another in order to maintain the continuous flow of people.
- Dead ends in the gallery should be avoided with exhibits in one side. This will prevent the visitors to pass by the same space again and also avoids the space from being crowded.
- Movement should be such that one is not forced to pass the object one has already seen.
- Enough space for the visitors to move in the different speed.

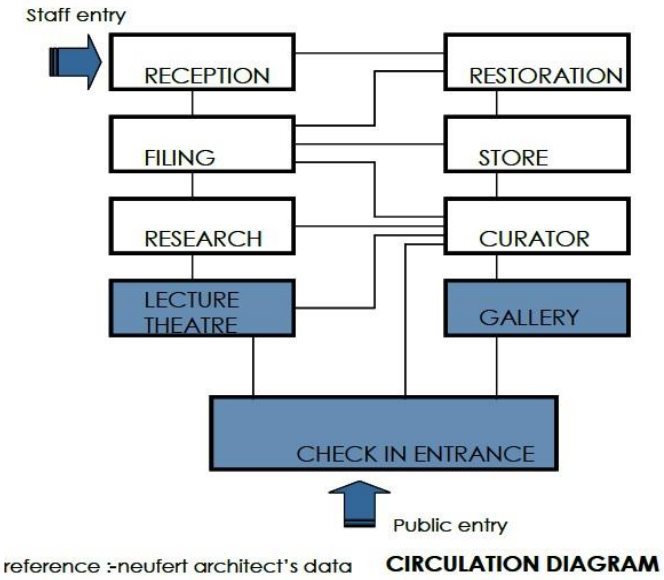


Figure 24 Circulation Diagram

2.14.3.2 Mass Circulation Pattern:

In a large public complex like a museum, a clear and efficient circulation plan is preferred. Much time should be spent in experiencing the gallery spaces than getting from one gallery to another.

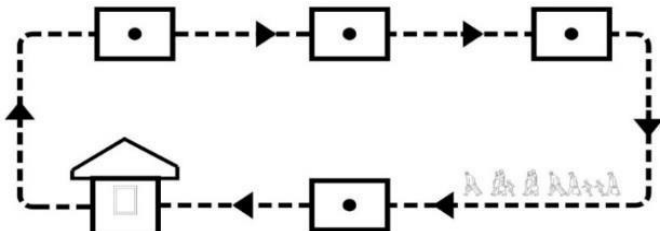


Figure 25 Mass circulation pattern

To design the circulation space the number of people to be accommodated in a year, month, and on the peak and typical day is significant. The museum should have a clear circulation and organized spaces. Public circulation should be self evident and direct. It should be reinforced by well designed signage. The designs for visitor circulation should allow flexibility and choice so that visitors can pace themselves, seek out the familiar and explore for the new.

2.14.3.3 Visitors Orientation:

Finding direction is the primary instinct of human, by this nature, museum tends to the principle of spreading out rather than towards compression. So it requires movement and choice on the part of the spectator. The exhibition and other public spaces need to be designed to help the viewer organize the experience of looking at and considering a sequence of objects on display.

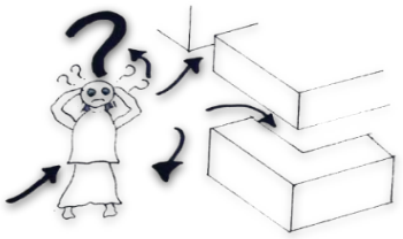


Figure 26 Confusion in visitors due to lack of proper orientation

- A visitor should get a clear idea of layout of display rooms
- A central atrium connecting all rooms enables the visitor to orient themselves.
- A symmetrical design or a clear axis leading to the prime area may create an order of orientation
- The entry position can also guide the visitor's route
- In vertically traversed spaces, the visitor should have an idea of the place they are moving to

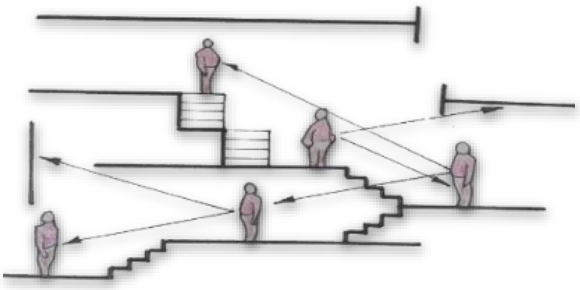


Figure 27 Visual link between different floors

(a) The visitor is drawn into the centre of the room;
(b) the visitor is drawn to the right into the centre of the room;
(c) the visitor is inhibited by the difficulty of making a decision.

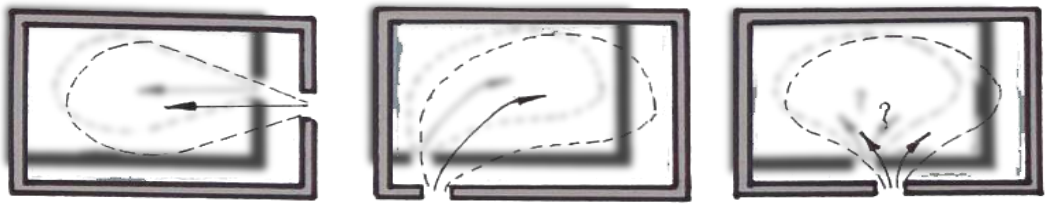


Figure 28 Orientation Patterns

2.14.3.4 Circulation Pattern:

A circulation pattern determines the extent to which a visitor would enjoy or get tired during exhibition. Better circuit directs a visitor towards all exhibits as well as provides choices. Some of the possible circulation patterns are as follows:

1. **Comb circuit:** An entrance at one end of the 'comb' leads into a central axis, off which one can wander at will into successive exhibition areas, varying in size. It has a simplified ground-plan and offers many alternatives and at the same time corresponds to the classification of museum contents.
2. **Rectilinear circuit:** It is found to be the most simple and easy of all with the same opening functioning as entrance and exit.
3. **Twisting circuit:** A layout based on the arrangement of rooms around a central atrium with a circulation core at the central. Access from a staircase may be provided in the middle which links the different levels.
4. **Fan shaped circuit:** It provides a lot of choices of going into different pockets of gallery spaces and at the same time confuses the visitor.
5. **Decentralized circuit** It provides a lot of choices to the visitors but can also result in security problems.
6. **Chain layout circuit:** It represents a sequence of displayed units in which each space can be individually designed to match their contents and lightings.
7. **Itinerary layout circuit:** An itinerary which weaves in and out, often involving use of a ramp, endeavors to counterbalance the constraints inherent in an exhibition by introducing an element of surprise.
8. **Nest of small cubicles circuit:** It gives the appearance of a maze and is deliberately aimed to make a visitor linger.
9. **Star shaped circuit:** Radiating from its central point, it provides access to sections of more or less equal significant rooms.
10. **Spirl circuit:** It is led by spiral pathways, connecting to different rooms .

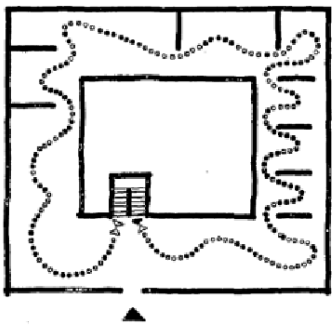


Figure 30 Twisting Circuit

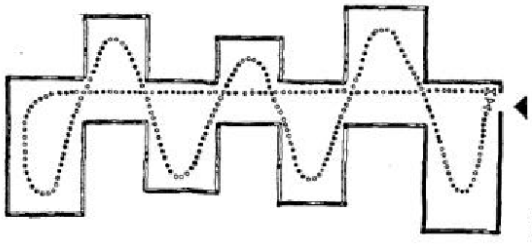


Figure 29 Entrance hallway along one side

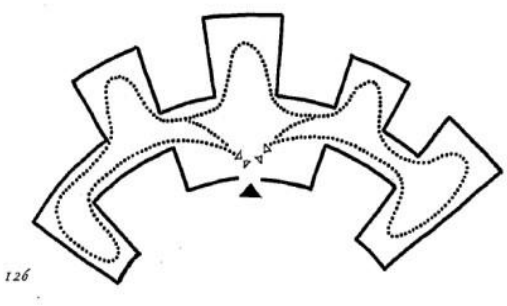


Figure 31 Comb circuit

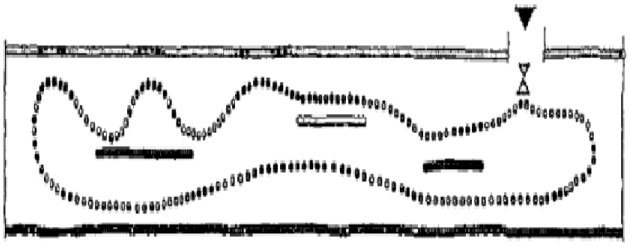


Figure 32 Rectilinear circuit

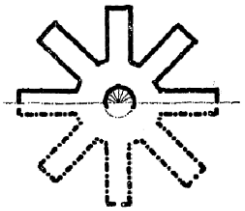


Figure 35 Star shaped circuit

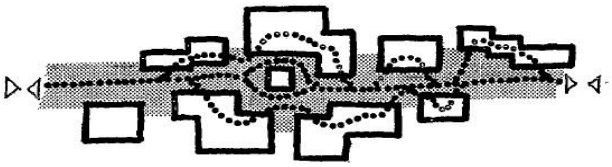


Figure 34 Decentralized Circuit

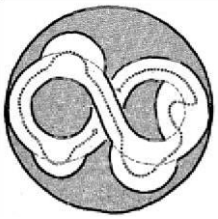


Figure 33 Itinerary Layout

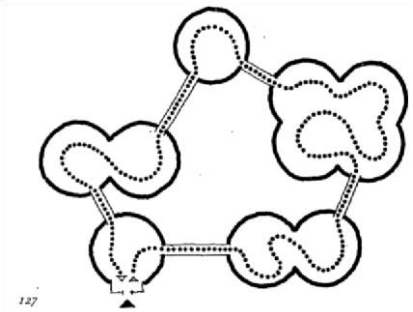


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Figure 38 Chain layout Circuit

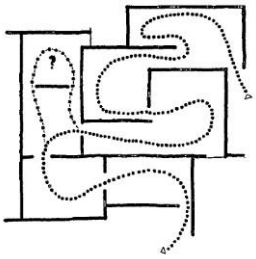

Figure 37 Nest of small cubicles circuit

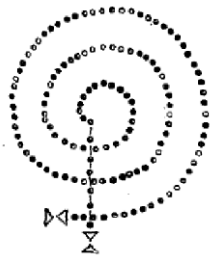

Figure 36 Spiral Circuit

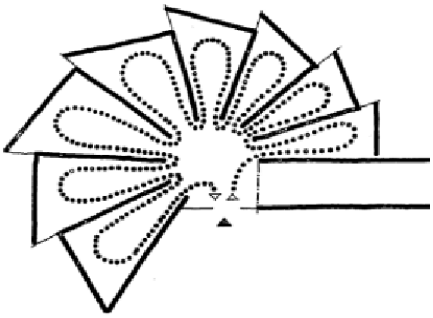

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Figure 39 Fan shaped circuit

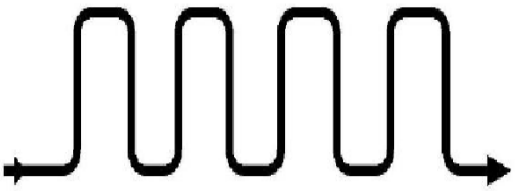


Figure 40 Tedious Flow

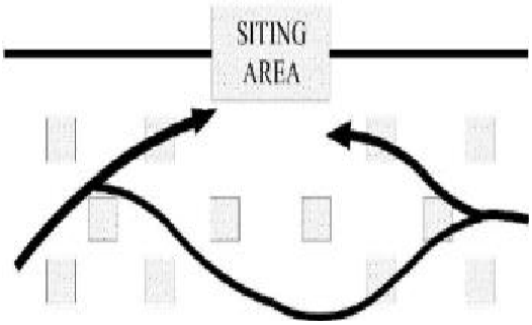


Figure 42 Relaxation area in circuits

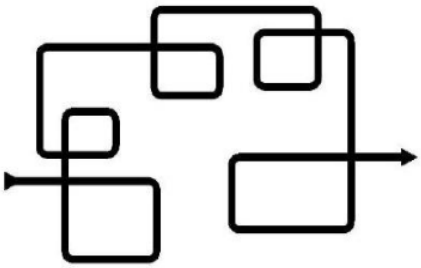


Figure 41 Circulation on various rhythms based on focal points

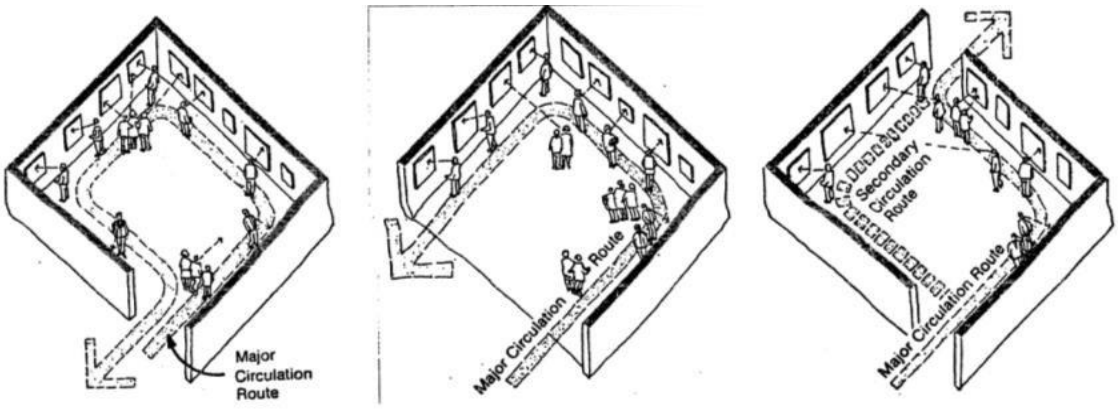


Figure 43 Right Hand Circulation

2.14.4 Exhibition Space:

It is now acknowledged in the field of museology that the exhibition medium is the best means that museums have of both displaying their collections to good effect and transmitting their knowledge. (Museum International, No 185, Vol. XLVII, no 1, 1995, page no. 4)

The design of the exhibition spaces should reinforce and promote the audience's engagement with the collection. Some museums will want vistas and visual connections between areas (vertical and horizontal) to create excitement and anticipation for the visitor. Visitor choice is essential to attract different audiences. The physical arrangement and relationship of exhibition spaces needs to offer visitors, options. The layout of exhibition spaces and the main circulation to these should be flexible and provide opportunities for the visitor to select multiple routes tailored to the duration and intensity of his or her visit. By being so configured, the exhibition experience becomes an active dimension of the whole museum experience, encouraging repeat visits. Ideally, all exhibition spaces will be located together, or as nearly together as is practical. This will facilitate maintaining security and environmental conditions. There may be exceptions to this if the design is multi-story or- an exhibition space occupies a very special role in the museum and is to be located in a particular location. It is desirable that visitor circulation patterns to and through exhibition spaces he clear and direct. It' there are major groups of exhibition spaces or focal points; these can be treated as "anchors- to dram visitors past other exhibition spaces

located in between. Vistas may be developed by aligning openings between galleries. Flexibility in changing exhibits should be provided.

Exhibition space of any museum is completely guided by the object it contains. The smaller and detail exhibits requires more concentration from the visitor's side and prefers a lesser number of visitors at a time. This will naturally require a smaller room size. On the other hand, the larger sculptures and paintings demand for a distant view and hence, a relatively larger space would be favorable besides the nature of exhibits. The space is also determined by the number of visitors and their curiosity on the exhibits. Hence, the visitor exhibit relationship is a determining factor in maintaining the size and type of exhibition space as illustrated below:

- Smaller the ratio of visitors to exhibits, greater the possibility of concentration and close contact. This will require a huge space which can be reduced to the objects' own 'living space'.
- Certain exhibits are favored for group viewing where a certain distance is to be maintained. This will require a slightly greater volume of space compared to individual viewing.
- Further, when the viewing group consists of greater mass, a larger space is essential to allow a considerable space between the exhibit and the viewer. There is restriction in movement and close contact is not encouraged.
- Sometimes, copies of original exhibits are created for the division of the larger group, hence minimizing the space required.

Depending upon layout of the display objects also the visitors can be distributed over the gallery space. Not only the display layout, but the display objects themselves have an important role to play in distributing and guiding viewers. Objects that attract large number of visitors should be placed with an ample circulation space around it, whereas, less popular objects can be placed in small clusters with a limited group viewing space.

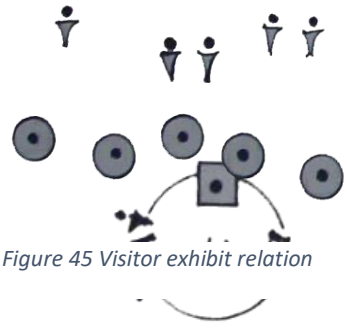


Figure 45 Visitor exhibit relation

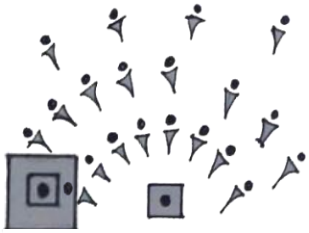


Figure 44 Group Viewing exhibit

Figure 46 Large no.of visitors

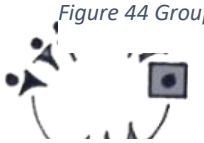
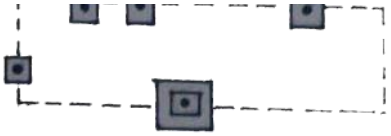


Figure 47 Division of Group

Figure 48 Dealing with large no of visitors



Source: Neufert Architect's Data

2.14.4.1 Display Arrangements:

Exhibits should be displayed in a way which allows the public to view them without effort. This calls for a variety of carefully selected, spacious arrangement, in rooms of a suitable shape and especially in museums, in an interesting and logical sequence. The display in a museum can be different as per the need and character of museum and the display technique can be different as per the character of the display. Depending upon layout of the display objects also the visitors can be distributed over the gallery space. Not only the display layout, but the display objects themselves have an important role to play in distributing and guiding viewers. Objects that attract large number of visitors should be placed with an ample circulation space around it, whereas, less popular objects can be placed in small clusters with a limited group viewing space.

Various types of exhibition schemes:

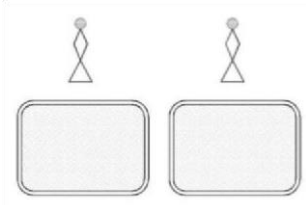


Figure 50 Isolate viewing

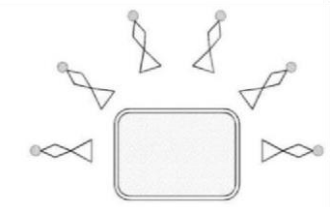


Figure 49 Group Viewing

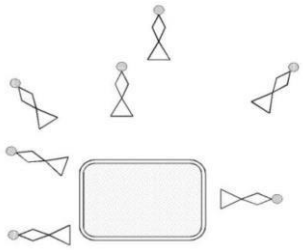


Figure 51 Haphazard viewing

i. Isolated Viewing

Less space is required for isolate viewing compared to other exhibition schemes. It is a type of viewing arrangement in which an individual is evolved for viewing the object which can be a free standing statue or wall display or free hanging display.

ii. Group Viewing

It is a type of viewing arrangement in which viewing of object is done in a group, which can be a huge object or unique and rare objects. It requires large space as a circulation space is provided around the object.

General considerations in display:

- Care should be taken while fixing devices and furniture in wall, floor and ceiling so that maximum space is left vacant.
- Viewers need places to sit down and rest, reflect on art, take a break from visual richness of gallery.
- Seats at the appropriate distance from large, important works of arts gives visitors a chance to pause and examine the art without standing for a long time.
- Lighting and color of the gallery should not be disturbing or creating fatigue.
- It is essential to control noise and vibration in the gallery.
- Air conditioning and other equipment should be selected and located accordingly

- Variation in ceiling height and color of walls to avoid fatigue.
- Enough space should be in a gallery space for easy movement.

2.14.4.2 Different types of display arrangements

Arrangement of spaces varies with design and display of objects.

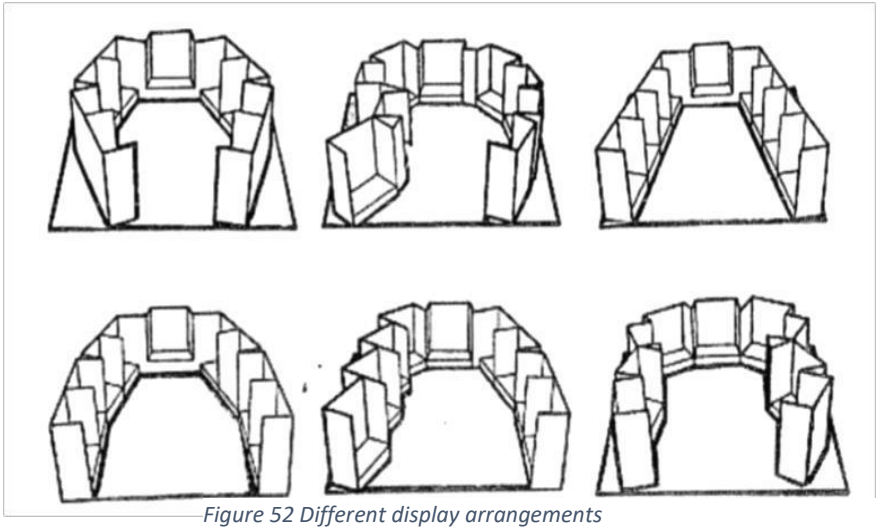


Figure 52 Different display arrangements

2.14.4.3 Space layout:

The type of space layout adopted should be congruent with the overall circuit adopted. The space layout adopted has a great influence on the form and façade articulation of the museum. Most of the time in the course of attaining standard gallery spaces, the form which has immense importance in museum architecture is lost and as a result the building looks more like a factory than a museum. In this project, the symbolic value that the form of the building encompasses cannot be compromised for any cause. Hence, more effort should be made to understand the possibilities of gallery space layout, so that an immaculate balance between form and function could be met simultaneously.

Various types of space layout and planning are as follows:

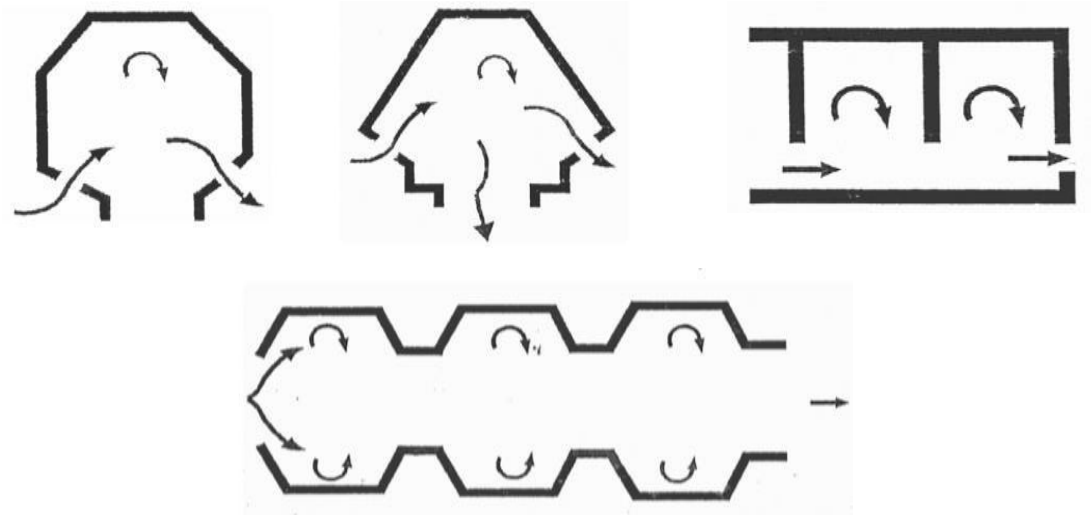


Figure 53 various space layout

The different ways of dividing up exhibition space are as follows:

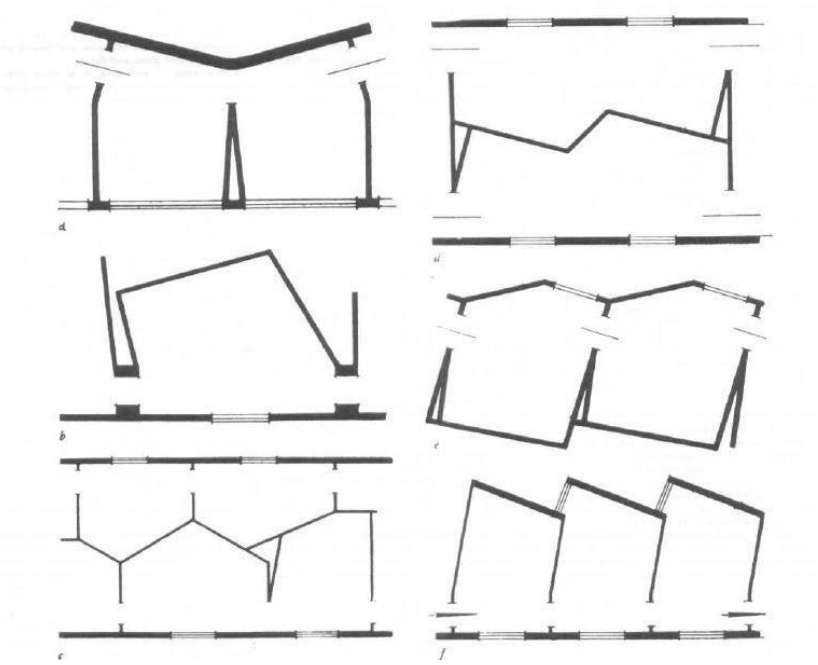


Figure 54 Division of exhibition Designs

Source: Time Savers Standards

2.14.4.4 Viewing parameter :

Viewing dimension is another important aspect while designing exhibition space in a museum. While placing exhibits one should not forget that from where and how it can be observed by visitors. Viewing dimensions includes cone of vision, viewing angle, distance of observer from the exhibit, height of the exhibit or size of it, etc. purpose of considering viewing dimensions is to make visitors feel easy while observing objects so that they do not have any difficulties and strain while viewing exhibits. While designing any exhibition space, the viewing dimension of any object should be kept in mind. There should not only be enough space for the installation but also for the visitors to observe them from a favorable distance, while at the same time free circulation space for other visitors.

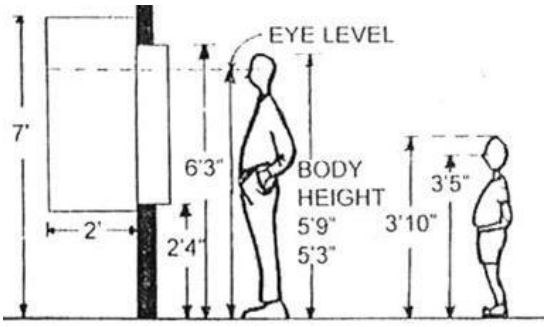


Figure 55 The eye level of an adult and child

The average height of a visitor, if a man is about 5' $9^{1/4}$" tall, his eye level is 5' $4^{3/4}$". The average women is 5' $3^{1/4}$" tall, her eye level is 4' $11^{3/4}$".Thus the mean adult eye level height is about 5' $2^{1/4}$". Whereas, in case of children average height is 3'10" and eye level is at 3'5". The normal human angle of vision of human starts 27 degree. From eye level.For a standing viewer, this means that well-lit pictures should be hung 10m away with the top not more than 4.90 m above eye level and the bottom about 70 cm below.

The best hanging position for smaller pictures is with the point of emphasis at eye level. It is necessary to allow 3-5m^2 hanging surface per picture. 6-10m^2 ground surface per sculpture, and 1m^2 cabinet spaces per 400 coins. With little eye movement, people usually see and recognize with ease thing that are within an approximately elliptical cone of vision, with the apex of the cone at the eye level height. Studies have shown that, in general, the adult visitor observes an area only a little over 1" above his own eye level to 3" below it at an average viewing distance of 24-48 inches. Generally larger objects can only be viewed comfortably from a certain distance to include it within the cone of vision.

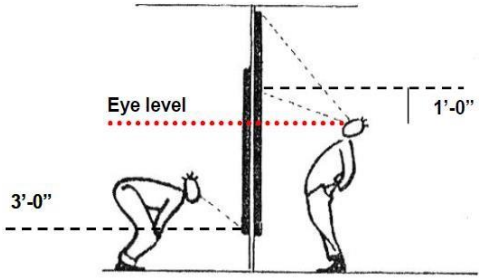


Figure 57 Difficulty iin viewing 3' above and 1' below eye lvl

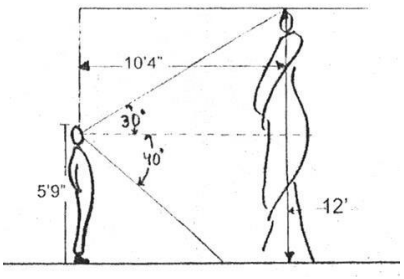


Figure 56 Field of vision:Height/size and distance

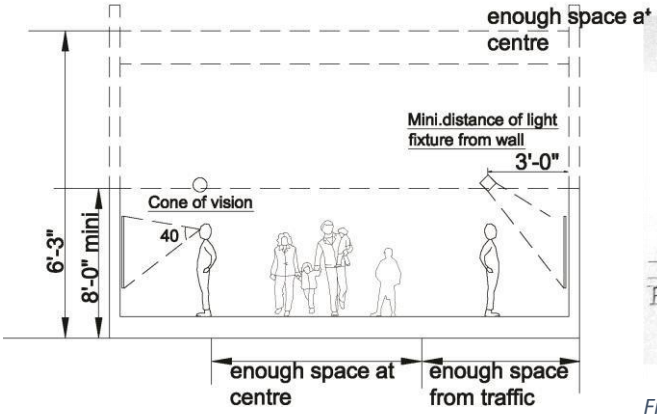


Figure 59 space arrangement for easy flow

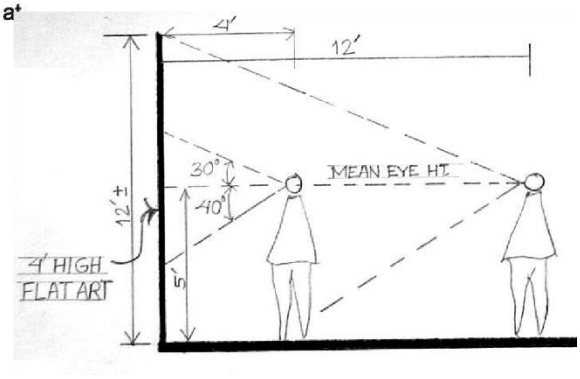


Figure 58 viewing distance increases with size of object

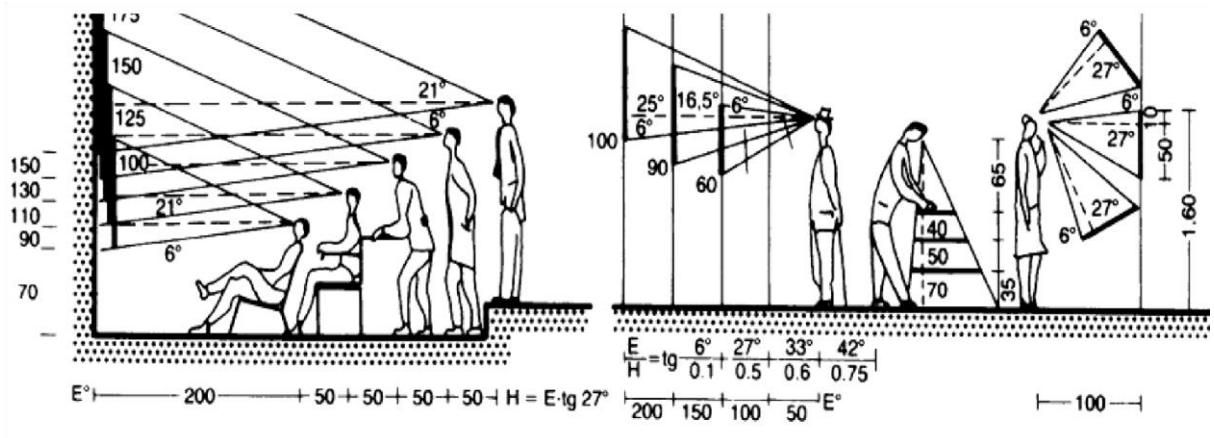


Figure 60 Appropriate viewing distance

2.14.4.5 Factors affecting the museum environment:

Various factors may come into account in order to maintain the ideal museum environment.

- **Theme of display**: Galleries are accepted by the public as a place where knowledge is presented in palatable manner. So the exhibit on splendid chronological order of selected theme is preferred to maintain good museum environment.
- **Display technique**: The arrangement of objects in space or composition in three dimensions, lighting, texture, color and scale are the main guiding principle for presentation in galleries with good museum environment that may be open or closed display.
- **Color scheme**: Often preferred monochromatic color scheme with respect to exhibit to maintain good museum environment may vary to different gallery.
- **Types of exhibits**: Various exhibits are preferred to draw interest of visitors.
- **Visitor comfort:** Achieved through air conditioning, natural ventilation and proper lighting and planning amenities space at regular interval could add plus point to enhance museum environment.
- **Recreational area**: allocating recreational area in designed environment could act as refreshing space for visitor which ultimately results in good museum environment.
- **Good ambience**: Good surrounding environment could ultimately add in good museum environment.
- **Lighting**: Proper lighting to both exhibits and surrounding space could enhance the museum environment.
- **Circulation**: Functional circulations enhance the museum environment.
- **Zoning**: Proper zoning of required space helps to create a good museum environment.

2.14.5 Display technique :

The arrangement of objects in space or composition in three dimensions, lighting, texture, colour and scale are the main guiding principles of presentation in galleries.

i. Composition:

The arrangement of layout of the objects is the strength of display. If this is not effective and fails to have visual appeal, the purpose of display is defeated. The arrangement should be able to attract and hold the attention of visitors. Every object has a size, shape, texture, colour and tone which is affected by the same of other objects as well as by the showcase in the particular display. The physical arrangement of all in relation to each other and to the environment influences the way the eye reads a showcase picture. It should accentuate, emphasize, and focus attention of viewers. But while doing this, one must remember that the objects are more important than the surroundings, therefore, these must be in full view with characteristic features prominently disposed and their nature should not be distorted nor debauched.

ii. Lighting:

The texture, shape, size and colour cannot be considered apart from the influence of light. Light brings out the character of objects if used in an effective way. It brightens the object, sculptures it form and builds an atmosphere around the object. Lighting should be sufficient so that the objects are visible but light should not be glaring. Source of light should not be visible to the visitors' eye directly as it gives glare. Indirect and reflected light gives good subdued light for general lighting. In a showcase, however the objects must be brighter than their surroundings.

iii. Texture:

Texture of the exhibit should be brought out by the texture of the background. So the interplay of following textures – rough and smooth, light and heavy, shiny and dull, clear and opaque, and lose and tight is effective. Textures of the background contribute to accentuate the characteristics of the objects by the way of contrast and this can be achieved by using various kinds of textiles. Jewellery is always shown on background of soft silks and velvets. The softness of the background accentuates the hardness of gold and matches the richness of metal. Textured textiles act as backgrounds for sculptures and woodworks as softness of textiles diverts the mind from soft textile to hard surface of wood and stone. Smooth glassware goes very well with rough textures, which brings out the smoothness of glass. Smooth background like polished wood is appropriate for delicate and soft textiles.

iv. Colour:

Colour is another eye appealing factor. The background colour should complement and enhance the colour and beauty of the objects on display by matching and contrasting the colours. The colour of utilitarian devices like pedestals, platforms, fixtures should be identical with that of the background in order to lose them against the same and thus making the object visible. If the colours of these props can be swallowed up, they don't appear important. Besides the visual effect, colours can also be used for illusions of the space and distance.

- Light colours recede and dark colours advance
- Blue and shades of blue recede in the background
- Red and shades of red and yellow advance in space
- Neutral colours like grey, buff, etc. stay in positions.
- In addition light colours reflect light and give brighter appearance, while dark colours need extra lighting as they absorb light.
- Red and yellow attract attention.
- Blue and green are soothing to eyes.

v. Scale:

Scale of the object in relation with the space in which it is shown also needs consideration. A small object in a big showcase or in a large gallery will get lost no matter how beautiful it is. It has to be encased and shown in a background matching its scale. Similarly large

sculptures in a crowded gallery lose their scale and therefore need isolation as well as space around them.

2.14.5.1 Display theme:

Galleries are accepted by the public as a place where knowledge is presented in a palatable manner. The decision of a display theme follows a systematic sequence:

i. Decision of theme:

Displays arranged in a logical sequence enliven and arouse the interest of the visitors. A thematic display becomes important in the sense; decision of a theme may depend upon: x Number and the kind of exhibits available on a theme

x The sequence of thought or experience the designer would like a visitor to go through x The final message a gallery would like to convey

ii. Decision of the display technique:

Various display technique can be used singularly or with combination with each other. Some of them are:

x Hanging and wall mounted x Freestanding and open exhibits x Exterior and interior installation x Contained exhibits and display cases x Diorama display- Specimens are presented in a simulated 3D environment. x Pictures and photographs x Audio/video aid

iii. Designing the enclosure:

- Decisions are taken regarding
- Dimension, shape of exhibits and spaces available
- The background color, texture, scenery depending upon display techniques and exhibits

2.14.6 Types of exhibitions:

i. Permanent and Temporary exhibitions:

Permanent exhibitions are primarily based on a museum's collection and are on view indefinitely. Temporary or changing exhibitions deal with other topics related to a museum's educational mission and goals. They augment the permanent exhibitions and may include materials from the core collection as well as objects borrowed from other sources. Some temporary exhibitions are traveling exhibitions assembled and circulated by a museum, a group of museums, or a nonprofit organization. These exhibitions bring museum collections to a wider audience. They are also economical, because several museums can share the considerable preparation costs. Temporary exhibitions may last from several months to a year or more, depending on the subject matter, the goals of the exhibition, and the museum's needs.

ii. Online exhibitions:

Online exhibitions extend a museum beyond its physical walls and invite virtual visitors to explore images and text at their own pace. These exhibitions range from digital images of a museum's works to three-dimensional, interactive tours of a museum's galleries with audio and video.

iii. Blockbuster Exhibitions:

Large, special exhibitions popularly known as blockbusters have been regular crowdpleasing attractions since the 1970s. A museum uses this term to refer to an exhibition that draws huge numbers of visitors and significant media attention. A blockbuster can be a traveling exhibition, or it can be on view in just one museum. Although they are complex and expensive to produce, blockbusters offer possibilities for imaginative programming, attracting new members and visitors, and generating revenue for the museum.

2.14.6.1 Exhibition designs:

Most exhibitions are developed by a team of professionals. A curator or content specialist does extensive research on the topic of the exhibition. An exhibit designer plans the physical presentation and oversees production of the exhibition components. An educator determines the best way to communicate information to the audience. An evaluation specialist may incorporate research about visitor behavior and interests. Developing an exhibition may take several years from concept to opening. Objects on exhibit are accompanied by multimedia materials that enhance the visitor's experience and the overall educational goals of the exhibition. Central to these materials is a brief, accurate, and easyto-read narrative, presented in wall text, object labels, and audiovisual media such as videos. Museums often provide different levels of information—from basic background to more complex details—to suit diverse learning styles and educational levels. When interactive media are incorporated effectively into exhibition design, they stimulate visitor involvement, elicit an active response to objects or concepts, and facilitate learning. A touch screen computer system can allow a visitor to select information according to individual interests. Interactive electronic maps, computer-based quizzes that test visitors' knowledge and programs that allow visitors to simulate a rocket launch or aircraft landing are other engaging exhibit features that make use of computer technology. Many museums offer audio tours of exhibitions using handheld listening devices.

2.14.6.2 Museum exhibit design: *"Designing a Wonderful Experience"*

When it's a great experience, going to a museum can teach us, delight us and inspire us; however, a lot of effort goes into a museum exhibit design. As architects, we can learn a lot by understanding the ingredients that make such designs so successful. Obviously, visitor accessibility and attention are paramount, but that's not all it takes to design for a great museum experience.

2.14.6.3 Problems of visitors:

A museum is constantly looking for different ways to attract visitors, but what happens once they get there? Often they suffer from three main problems-

i. They can't find a specific piece of information
ii. They must leave too soon because they are bored
iii. They stay a long time but miss key lessons from the main exhibits.

2.14.6.4 Criteria for successful exhibit design :

The following are 10 ingredients for successful exhibit design:

i. **Motivate Visitors**: Target an audience — the general public and specific communities

ii. **Focus Content**: Filter content so visitors are not bombarded with information overload

iii. **Immersion**: Engage visitors within a "story"

iv. **Modularity**: Present smaller themes instead of one larger complex topic

v. **Skimmability**: Information should be easy to take in because visitors are often standing and/or have different levels of education

vi. **Patterns**: Incorporate traffic/circulation patterns, exhibit sequence patterns and preexisting framework patterns (architectural elements)

vii. **Capture Curiosity**: Use storytelling techniques to engage visitors

viii. **Interaction**: Give visitors a "fun" experience by tapping into their emotion

ix. **Integrate Technology**: Technology should enhance visitor's experience, not detract

x. **Layer Content**: Present information in a hierarchical manner

2.14.7 Technology :

Analyzing the trend of museum architecture, it shows that technology is a property which makes it possible to modify the function of an existing space to meet a new requirement, which must be organically integrated with the overall utilization of space. Studies show that the technology for museum space is based upon two fundamental principles: Adaptability principle and Extensibility principle.

- **Adaptability principle**: Modification of function with minimum technical resources and organizational work. E.g.: Patan Museum, National Museum, Chhauni, etc.
- **Extensibility principle**: Modification as such to preserve function through structural uniformity with a building. E.g.: Guggenheim Museum, etc.

2.14.8 Lighting:

Light has substantial impact on perception of space and upon emotional response of visitors. Lighting is one of the major planning factors guiding the space quality in a museum. It is also a basic element for the expression of a space. Light can attract or distract people's attention. The change in its intensity, color source, distance, etc. can have varying effect on human behavior and psychology. Light has more conflicting character in a museum environment as stronger light is required to help the exhibit stand out and at the same time provide diffused and lesser intensity light for human comfort. Light also has a deteriorating effect on specimen if not properly planned and calculated. Gallery lighting basically consists of natural lighting or artificial lighting or combination of both which has its own merits and demerits. The amount of light and its quality for galleries has to be considered in relation to contrast, glare, color effects, color of light, brightness of object and room lighting. Good contrast of brightness is desirable for satisfactory visibility. Eyes can easily focus on a good contrast, but strong contrast is tiring and confusing. Windows

on north side give cold yet uniform light. This light named north light was preferred in old days in the Gallery galleries. Today, direct sunlight diffused by means of diffusing glasses is more favored. Artificial light can be produced by lamps and filters in great variety of colors. The colors useful for Galleries are those blended character which approximate color mixtures of natural light. This can be done in a simple way. Gallery can be lighted with indirect lighting by using fluorescent lamps giving approximate color mixtures and objects on display lighted by mixed daylight by incandescent lamps giving localized floods or spots on the individual objects.

2.14.8.1 Natural lighting:

Natural lighting is the natural sunlight entry into a building to minimize the need for artificial lighting. For human ease natural light contributes partially in room-lighting, whole for seeing things clearly. Properly controlled natural light is suitable for presentation of true colour values, yet it is constantly subject of qualitative and quantitative changes, intensity angle and colour range. Natural light if properly controlled is a very suitable medium for lighting. The level of lighting is not the same throughout the times of day and days of a year. Windows on the north side give cold but uniform light. This light named north light was preferred in old days in the Gallery galleries. Today, direct sunlight diffused by means of diffusing glasses is more favoured. Natural light, normally received through windows has a psychological value. Mere presence of a window sets our feelings are rest. It is so natural to look through windows, wherever you are. There is a sort of reassurance to have a window in the gallery, though it may not have any view and may not give any useful light. Absence of natural light in a space can be fatiguing to human eye. Also too much of light of particular wavelength can cause damage and deterioration of valuable artifacts and collections. So another concern with natural light is the UV rays which when strikes sensitive materials can discolor or damage the materials. Light is on one hand a destructive force and thus conflicts with the museums role in preserving the heritage on the other it is essential to vision. Natural lighting or day light offers a continuous spectral curve i.e. it reveals all the colors in art work. However, direct sunlight is much harmful to the exhibits and should be diffused in some way before allowing it to fall on the exhibit.

Natural light can be drawn into the room by two methods:

1. **Side lighting**

The windows in the sidewalls of the gallery provide side lighting. Its strategies rely on apertures located in building's perimeter walls and it is also dependent upon the orientation of the building. Depending upon the need and use of space these windows may be placed at a high level or normal level. Windows on one side give unilateral light whereas the windows on two sides give bilateral lighting. It is the simplest form of lighting preferable for sculptures. However there is a possibility of glare and reflection by use of this lighting which can be difficult to avoid. Normally ribbon windows at a height above human eye level are preferred for general illumination of gallery. There are various methods of side lighting scheme:

a. Ribbon windows:

Continuous windows above the eye level on one side of the gallery give a good and uniform light if placed on the north side. This band should extend to the ceiling, to avoid dark wall band above the same. If this is supplemented with artificial lighting to light the wall below the windows, it is the best method of introducing natural light.

b. Sun- breakers:

Window glare can be controlled by the use of sun-breakers outside the windows. It does not admit direct sunlight and reflects it by means of its fins. Fins are normally concrete screens constructed at an angle outside the windows.

c. Corner and end lighting:

Big window from floor to ceiling at end or corner of the long walls gives good lighting for wall mounted objects. End window on a short wall of a rectangular gallery from one end to the other end of the wall also gives good light. These lights give enough wall space for exhibition and sufficient natural light for small galleries. The glare can be cut off by simple curtains or adjustable venetian blinds.

d. Window lighting at high level

Window lights at very high level or sidewalls can also be used in the manner of clerestory light. Here windows are at a very high level. There may be a false ceiling at the level where the bottom of the window is. So the windows are not visible in the galleries. This ceiling is penetrated with metal or wooden grid panels, which reflect and allow the diffused natural light into the galleries cutting its glare. This can easily be combined with artificial lighting by providing fluorescent light above the grid panels giving diffused light.

2. <u>Top lighting</u>

In this system of lighting, the daylight access through roof top apertures. These are not dependent on the orientation of the building façade and are effective for lighting single storey or low-rise building. One of the most prominent examples of the use of skylight is the dome feature used in Islamic architecture. In this type of lighting system, the light is evenly distributed over the floor instead of the wall, where it is needed. This source of light can be effectively used by introducing the diffusing glass or louvers to reduce the impact of glare. This type of lighting is useful for improved illumination and superior light quality with better color and rendition. It gives free and steady supply of light, usually, north light being preferred. The wall space can be used for displays in case of top lighting but the vertical light is double brighter than side lights so either screening or high ceiling should be designed. Skylight provides improved illumination and superior light quality, including,

- Better distribution of light
- Better color and rendition
- Absence of flicker

There are various methods of sky lighting scheme:

a. Lantern light

Only the sides of the lantern are glazed while the top is unglazed. Height is reduced comparatively but considerable height is needed to control reflections. Lantern light is better than the previous methods.

b. Inverted lantern

It is more advantageous than other lighting schemes. Light directly falls on the walls and the objects and the spectators are in shade. The source of light cannot be seen and the heights are lower.

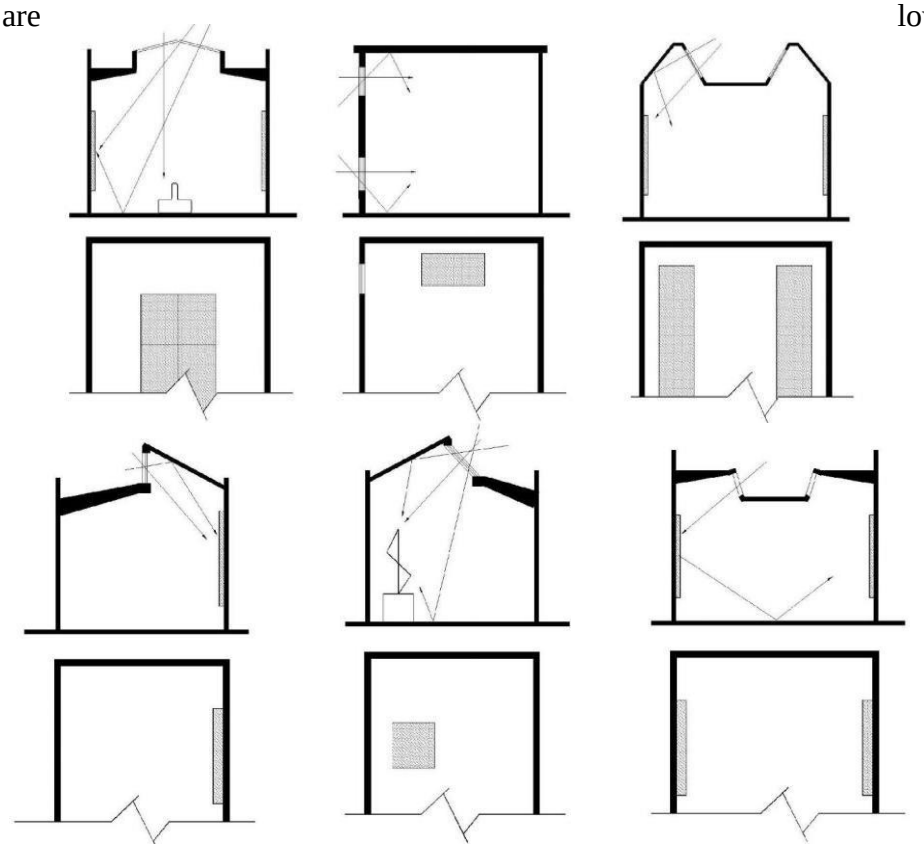


Figure 61 Various schemes of natural lighting

Wherever it is possible most museum visitors prefer to see objects which are displayed under daylight. The daylight must be highly controlled or partially controlled. The impression of daylight in a space is much more noticeable from side windows than roof lights but is more difficult to control to avoid glare and poor viewing conditions. Highly controlled roof lights, however, may cease to give an impression of daylight and it must be questioned whether they are simply worth the cost. Day lighting is presented as playing multiple roles: responding to the climate (there is a "right light" for each particular place); lowering energy consumption in buildings, both for electric lighting and its associated cooling load; providing appropriate light (both qualitatively and quantitatively) for the visual tasks, including orientation and movement; shaping the form of the building to provide the appropriate qualities of light; and providing a pleasant visual environment for the occupants.

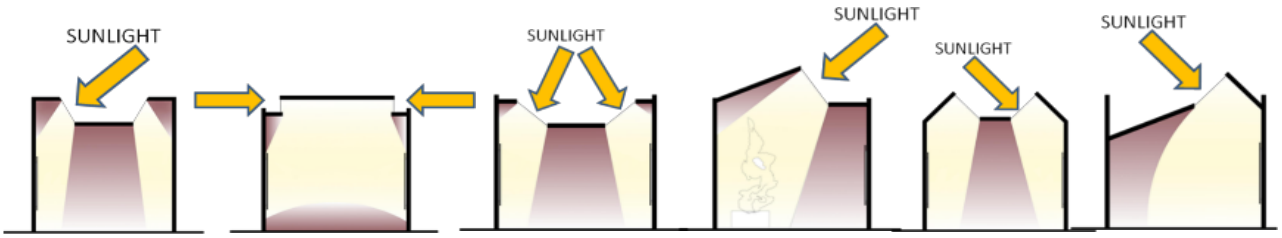


Figure 62 Top and side lighting

2.14.8.1.1 Top Lighting

There are several top lighting methods including skylights, monitors and clerestories. The following diagram illustrates the various top lighting possibilities. The saw tooth is a variation of a clerestory.

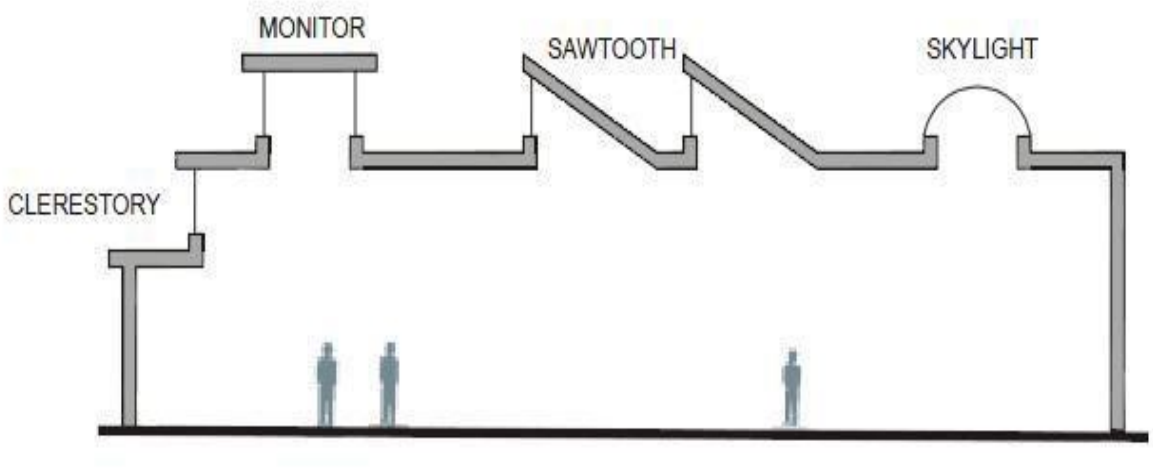


Figure 63 Example of Top Lighting Strategies

2.14.8.1.2 Horizontal and sloped skylight

- **Use skylights for high illumination levels**

Horizontal, slightly curved, sloped or pyramid skylights receive a lot of direct light, especially during the summer months. The primary disadvantage of these skylights is the high imposed cooling load during the summer.

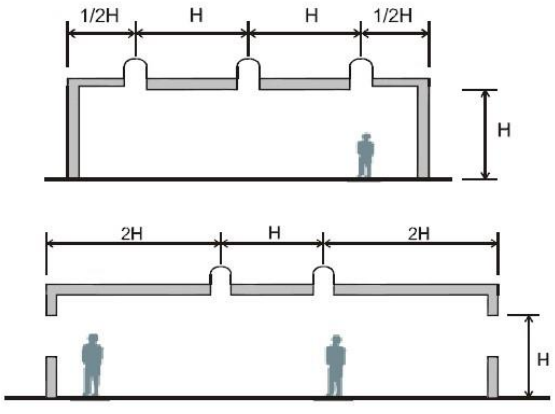


Figure 64 Skylight placement as a function of building height

- **Space skylights according to ceiling height**

The spacing between skylights should be equal to

the floor-to-ceiling height. Skylight placement will depend on the presence of windows. They can be moved further into the interior if windows are present, as shown below. The size of the room will determine how many skylights are used.

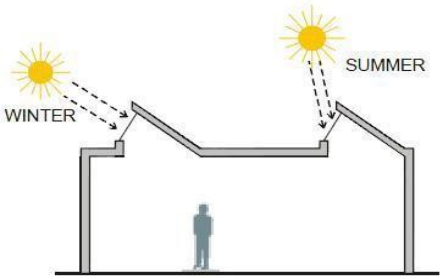


Figure 65 Skylight for seasonal light

- **Use sloped skylights**

To improve light balances between winter and summer months, slope the skylight towards the north or south. A sloped skylight will collect more winter light and less summer light. The recommended spacing for clerestories and monitors is shown below:

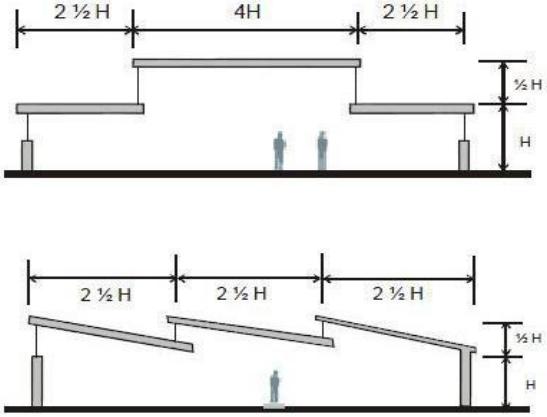


Figure 67 Clerestory spacing as a function of building height

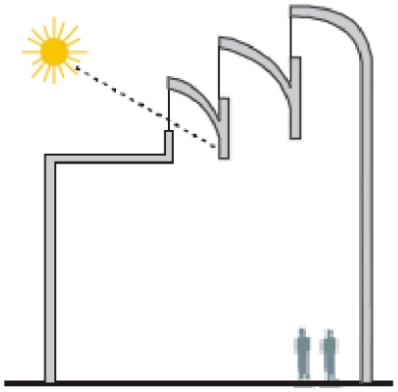


Figure 66 South facing clerestories with light scoops

2.14.8.1.3 Exposure to diffused daylight

Table 2 Required illuminance for different objects

Works on Paper	50 lux	Works on paper with colored media, Any media on a degraded support, Color photo prints and transparencies
	100 lux	Works on paper with black and white media only, Black and white photographs
Paintings	50 lux	Thinly covered paintings on unprimed canvas, Paintings in distemper media or gouache, miniatures
	150 – 200 lux	Oil and tempera paintings
Objects	50 lux	Objects with painted, dyed or polychromed surfaces, Upholstered furniture, Unstable glass
	200 lux	Objects made of material such as leather and wood
	1000-2000 lux	Objects made of inorganic material with unpainted surfaces such as stone, ceramic and metal

Source: Wilson, “Lighting in Museums”, P. 1

2.14.8.2 Artificial Lighting

Artificial lighting is preferred to illuminate and highlight gallery objects as it can be easily controlled and is less harmful to exhibits. It has many benefits over natural light like total control in light intensity, color, direction and type. It is used as a supplement to natural light to create different mood inside the gallery and focus on objects. Different provisions are necessary for lighting different type and size of object. Artificial lighting can be divided in two parts: Direct artificial lighting is mostly used for lighting objects and indirect artificial lighting is used for room lighting.

There are various methods of artificial lighting scheme:

a. Fluorescent light

Luminous efficiency of fluorescent lighting is 2 to 5 times that of incandescent lamps. In addition, fluorescent lamps provide cool light. Daylight fluorescent lamps can be used directly for sensitive materials like paintings, textiles, etc.

b. Spot light

The name spot light itself suggests its function. It is best known as projection lamp and is favored due to its adjustable character and dramatic effect. It is good sculptures yet should be avoided for paintings and other delicate objects.

c. False skylight

False skylight eliminate traditional roof openings through the effect is the same and can be employed on lower floors even in multi- storey buildings. The height of the gallery is lowered down for fixing the skylight in the ceiling. For this kind of lighting, frosted glass panels, introduced in the false ceiling, are lighted by fluorescent or incandescent lamps fixed above them. It may be in the form of one big panel or several small panels as per the requirements. This is useful for general lighting of the gallery.

d. Louvered lights

These are made in a variety of forms, employing fluorescent and incandescent lights. They throw their rays downwards diffusing them by means of louvers.

e. Louvered ceilings

These are suspended ceilings made of cross strips of metal or plastic and come in rectangular units. Fitted together these units give an entire overhead grid, through which light from lamps above passes at an angle. This panel lights the room in a semi indirect way; the objects can be lighted directly from lamps that are projected through the grid. **f. Trough light**

These are surface mounted fixtures, either covered with lenses, glass or open. It has to be tilted to direct the light. For picture galleries, the whole rectangle of trough lighting the four walls, is built in by dropping the whole central part of the ceiling to the level of lower rim of troughs. Trough light gives good indirect light.

g. Troffer lights

These are panel luminaries that are set flush in the ceilings. They are covered by special directive lenses that can place light at an angle over the wall or wherever desired. This may contain separate lamps for general lighting and for

spots. The troffers are box like units, distributed as per requirements or in long trough like units set end to end. With control light rays can be focused, projected parallel or spread and the beam may be thrown to the place where it is needed.

Indirect artificial light is for general lighting of the galleries. This can be obtained by the use of cove ceiling lighting, suspended fixtures of direct- indirect type and coffer system.

h. Cove lighting

Coves are ledges concealing light sources. These give uniform light by reflecting the light to ceilings.

i. Suspended fixtures

These fixtures have shades giving light troughs concealed in their rims and offer many possibilities. Ceiling panels may be rectangular, square or circular. It can work with incandescent and fluorescent lamps. An important feature of these reflecting coffers is their lateral distribution of light. This type of celling has relatively high brightness but has ornamental appearance.

Electric lighting is also presented in multiple roles: complementing the daylight (and therefore requiring appropriate controls); providing light for visual tasks, including orientation and movement; shaping rooms to provide appropriate focus or distribution of light; using energy-efficient sources appropriately; and providing comfort and visual clarity.

2.14.8.2.1 Objects regarding sensitivity to light

The objects that of museum exhibits are commonly divided into three categories regarding sensitivity to light, which are: insensitive, medium sensitive and sensitive. The levels of light recommended for sensitive objects prevent the use of daylight. Some highly controlled day lighting systems (normally roof lights) exist to maintain 200 lux on the objects, but the lux-hour allows a more passive approach to maintaining conservation requirements. The very sensitive objects, which may have to be lit at 10 lux or below, may be viewed at higher levels, but with a restricted viewing time. Where objects are insensitive (e.g. stone statues that are not treated with light sensitive preservative), then higher levels of light may be used.

Table 3 Illumination required for sensitive, medium sensitive and insensitive objects

Types of objects	Maximum illuminance (lux)
Sensitive objects (Water colour paintings)	50
Medium sensitive objects (Oil paintings)	200
Insensitive objects (Stone sculptures)	<200

Source: Wilson (no date), “Lighting in Museums”, P. 1

2.14.8.2.2 Lighting considerations:

Lighting is a very important aspect to be considered while designing a museum. Lighting considerations influence the entire design process and incorporate both conceptual and aesthetic issues as well as technical issues. The importance of considering lighting at all stages of the design process is stressed by

presenting lighting as part of a cohesive design approach. While designing exhibition space lighting for both displaying exhibits and movement of visitors should be designed properly. Otherwise lighting for circulation may disturb lighting for displaying exhibits or vice versa. Artificial lighting, natural lighting or mixture of both can be used for displaying exhibits and for circulation purpose in exhibition space.

2.14.8.3 General considerations for lighting:

- The lighting system used must satisfy the functional requirements of the space and type of objects displayed.
- The lighting system should provide appropriate level of illuminance at all times of day.
- An angle of incidence of 30^o to the vertical is considered as a good guideline as it handles illuminance, reflected glare and frame shadows optimally.
- Proper lighting must be selected for sensitive materials and limited exposure to light
- Exposure to ultraviolet and visible infrared light can cause fading and damage of objects.
- Potential reflected glare through windows must be considered and be eliminated
- The lighting design concept must aim to control the daylight and coordinate the natural light with the artificial lighting.
- Daylight can be controlled by the architecture to a certain extent; supplementary devices and equipment may be necessary to control luminance in accordance with specific curatorial stipulations.
- Lighting system should provide appropriate levels of luminance at all times of day and night
- Proper lighting must be selected for sensitive materials and should have limited exposure to light..
- Sculptures generally require directed light to reveal their three-dimensional quality and surface structure. They are usually illuminated by spotlights or recessed directional spotlights.
- Use of steep angle emphasizes texture, but mute color and may cause shadows from deep frames and vice versa.

2.14.8.3.1 General lighting level :

Table 4 General lighting level in various spaces

Space	**Illumination level (Lux)**
Gallery	500
Office	300
Work shop	250-700
Shop	400
Circulation	200
Toilet	150

2.14.8.3.2 Deciding light:

Light is necessary evil in any kind of galleries. Some of the important factors to be considered while deciding various kinds of lighting are:

1. **Types of light used**

Depending upon the kind of lighting system the factor of damage varies. For example: x Illumination or heat content in the light (So, recommended up to 50 lux to avoid) x Spectral distribution- Damage to specimens increase with wavelength of the incandescent radiation, decreased through the variable region of spectrum towards the blue and again increased towards ultraviolet region. Daylight should be avoided as even indirect natural light is harmful to the specimens. Maximum exposure towards the UV radiation- 70 micro watt/ lumen. Ordinary tungsten filament lamp and tubular fluorescent lamp have little UV content. This too can be filtered through a frosted glass of thickness greater than 5mm as diffuser.

2. **Various factors in choosing lighting scheme**

Psychological: Vision, Perception, Mood, and Circulation

Physiological Illumination, Reflectance, Glare, Uniformity, Color, Efficiency, Aesthetic and Fixture design

3. **Choices on light**

Table 5 Comparison between day and artificial lighting

Day lighting	**Artificial lighting**
Superior color	Light is based on a single color
Continuous spectral curve	Intermittent spectral curve
Lively natural environment	Can be manipulated to our need
UV radiation corrodes artifacts	Non corrosive
Day lighting is planning constraint	Freedom in planning

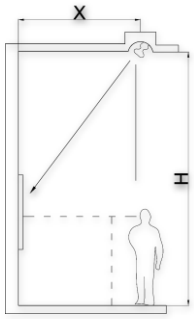
Table 6 Difference between incandescent bulb and fluorescent bulb

Incandescent bulb	**Fluorescent bulb**
Higher heat content	Lower heat content
Lower UV content	High UV content
Strong in yellow red content which is good for color rendering of organic objects	Strong in blue region which makes organic object look pale
Costlier	Cheaper

4. **Position of light**

For display lighting, it should light the desired area or exhibit without being visible itself. For general lighting- often spill over light from display is adequate, if not, the light should be placed in the ceiling so as not to cause glare to the visitor or distract attention from display.

Table 7 Guide for locating fixtures



Ceiling height (in ft) H	Approx. distance from wall (in inch) X
8	22
9	24
10	30
11	36

Figure 68 Locating fixtures

5. UV ray exposure

Care must be taken not to damage the material being deployed. Exposure to UV, visible or Infra-red can damage sensitive art. Ultra violet ray is present in most incandescent and fluorescent source as well as in unfiltered day light. Most of the ultra violet ray is filtered by clear glass while paints and filter can also virtually remove all of it. Visible lights can cause fading and damage, sensitive materials should have limited exposure to light. Infrared will raise the temperature of the object causing cracking, drying and deterioration.

6. Lighting in two dimensional objects:

The light requirement for the illumination of a two dimensional object is limited and easily controlled, such that it is strongest on the part of walls which are used for actual display and weakest where the observer stands. The source of light should be behind the observer wherever possible. Much may be achieved by the correct selection of the type of glass to be used for screens or not only to diffuse and distribute the light evenly but also to transmit light in a given direction.

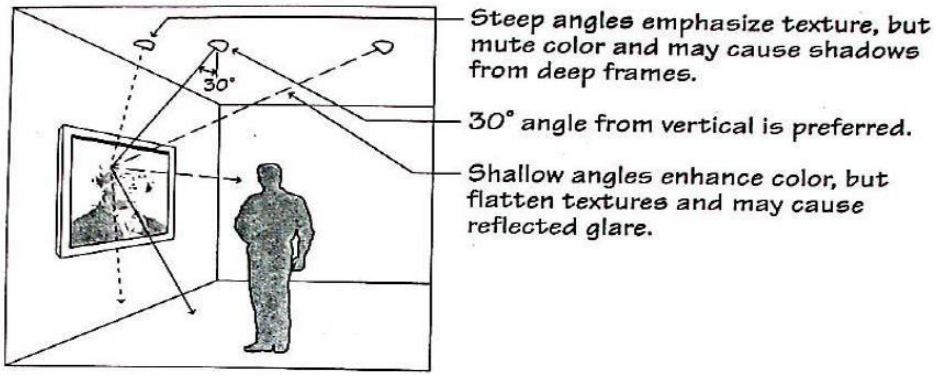


Figure 69 Artificial Lighting for 2-D objects

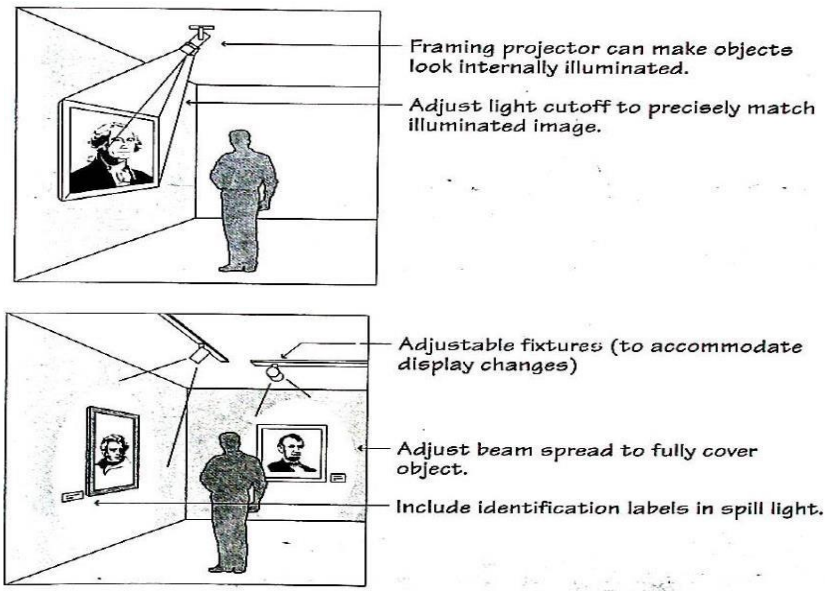


Figure 70 Artificial Lighting for 2-D objects

7. Lighting to three dimensional objects:

Three dimensional objects demand for more lighting details compared to flat objects. They have every face claiming for attention and details on every part, further require critical lighting techniques. Multidirectional lighting reveals the shape and texture while directional lights add shadows and depth to the details. Simultaneously, diffused light express clarity in the object and its intricate works. The smaller three dimensional objects require top lighting and high reflectance base. The larger object require in addition, up lights projected from the floor or the pedestal aiming at the object. The angle of incidence of light must be carefully adjusted to the relief of the exhibit.

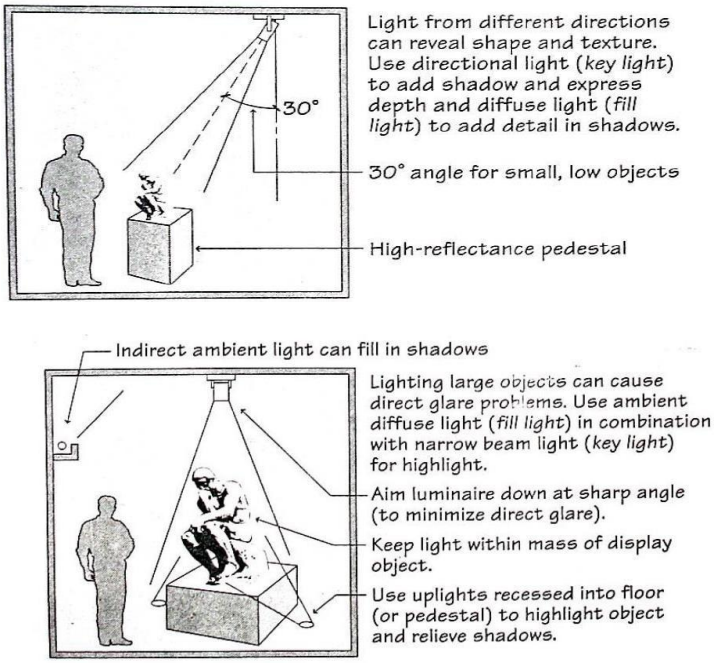


Figure 71 Artificial Light for 3d obkects

3 CASE STUDIES

3.1 NATIONAL MUSEUM, CHHAUNI:

3.1.1 Objective:

To study

- Site zoning
- Planning and function
- Gallery and internal layout in the museum
- Display techniques
- Circulation
- Lighting

Figure 72 Chhauni Museum

3.1.2 General information:

Established: 1938 as a public museum
Location: Chhauni, Kathmandu x Land Type: Flat
Main entry: North
Style: Mix of Neo-Classical and Malla Architecture

No. of blocks: 3

3.1.3 Introduction:

National Museum of Nepal is housed in the residential palace of the first Prime Minister of Nepal Bhimsen Thapa and is spread in an area of approximately 20000 sq. m. Entering the museum complex one can find a paved entry pathway with green lawns on both the sides. The complex has two more structures serving the gallery purpose besides the palace itself. The first one is **Juddha Jatiya Kalashala** established by Juddha Shumsher himself in the year 1942. It is the first building designed actually for the museum purpose. The arrangements of the display include stone sculptures, metal works, ancient paintings and wood works. The galleries are- Stone section, Terracotta section, Painting section, wooden section and Bronze section. The second structure is the **Buddhist Art Gallery**, which was originally the Mahendra Smriti Sangrahalaya dedicated to the Shah King Mahendra. Buddhist Art Gallery, envisaged with Japanese fund in 1997, is also a building designed to meet the functional requirements of a museum. The galleries are: Terai, Kathmandu and Northern Himalayan Section in ground floor and Mandala Sectionin first floor displayed in three dimensions with statue, painting and ritual art objects. And finally the main palace, **Historical Museum** has four more galleries viz; Natural Science Gallery, Historic gallery, Philatelic Gallery, and Numismatic Museum. The palace built in the neo-classical style is accessed through a gateway which leads to the main building where we are welcomed by a pair of old leather cannon. Being the oldest, largest and rich collection of National museum of Nepal, it has diversity of collections of art object and ethnographic artifact. National Museum can

be considered as the biggest museum in the country in terms of the collections. It houses different types of collections ranging from wooden sculptures, stone sculptures, decorative arts, paintings, ancient weapons, coins, stamps, etc. One striking feature about the Chhauni museum is the ample of open space it has. Especially on Fridays, these garden spaces comes into live when the various excursion teams from school, visit the museum. Museum houses the pieces of our identity, which is essential for our self-existence, and self-determination.

3.1.4 Site:

National Museum is located at Chhauni on the way to Swayambhu Mahachaitya. It is about 20 minute drive from the city center Hanumandhoka, local transport services are available to visit the museum. The Swayambhu hillock (listed in the UNESCO World Heritage Sites) overlooks the museum giving a very strong contextual flavour.

3.1.5 Architectural expression:

Figure 73 Main entry gate

The museum complex is composed of three buildings of different styles; particularly a mix of Neo-classical and Malla architecture. The main palace museum is a Post Victorian building which may have been an adaptive use and the other two, Buddhist Art gallery and Juddha Jatiya Kala Shala seems to be designed by an architect. The Juddha Jatiya Kala Shala is the first building to be designed as a museum building to house the exhibits but the outlook to be a combination of traditional Nepalese architecture, Post Victorian architecture and a touch of Indian architecture. It has a rectilinear shape with its entry resembling the Sanchi stupa. The Buddhist Art gallery is done almost in traditional Kathmandu Valley architecture with a mix of various traditional elements, such as struts of temples, windows of traditional building, doors of temples, etc. It is planned along a large central garden, thus having an introvert nature instead of dominating over surrounding. The maintained landscapes add aesthetics and direct circulation into different buildings. The centrally located Buddhist Art Gallery forms the focal point from the main entrance. With relatively smaller buildings and simple elevation treatment, the complex lacks monumentality and consequently mingles with surrounding architecture and environment.

3.1.6 Site zoning:

There are three main buildings which house the exhibits. There is no fixed parking area either for visitors or for the museum authority. The main historic building stands dominating the area and other buildings which were added later are arranged in the site in such a way that a lot of spaces fall in the negative side. The reasons could be that, earlier it may have been designed to serve as an open museum, there are certain facts which suggest so; like some exhibits are being displayed in the garden, but at this time they have been neglected and no care has been given to such exhibits.

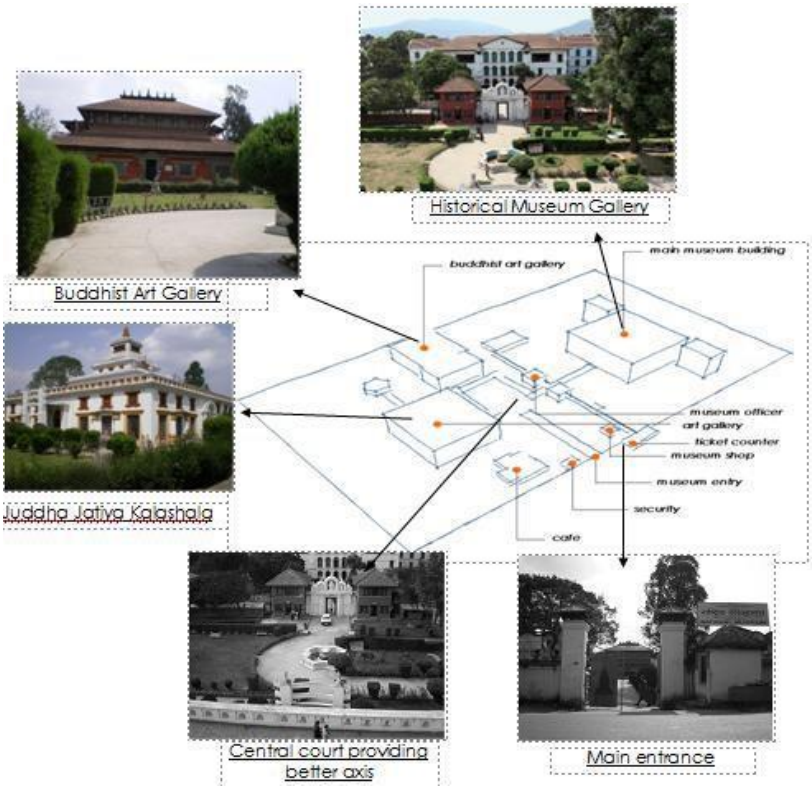


Figure 73 Zoning of Chhauni Museum

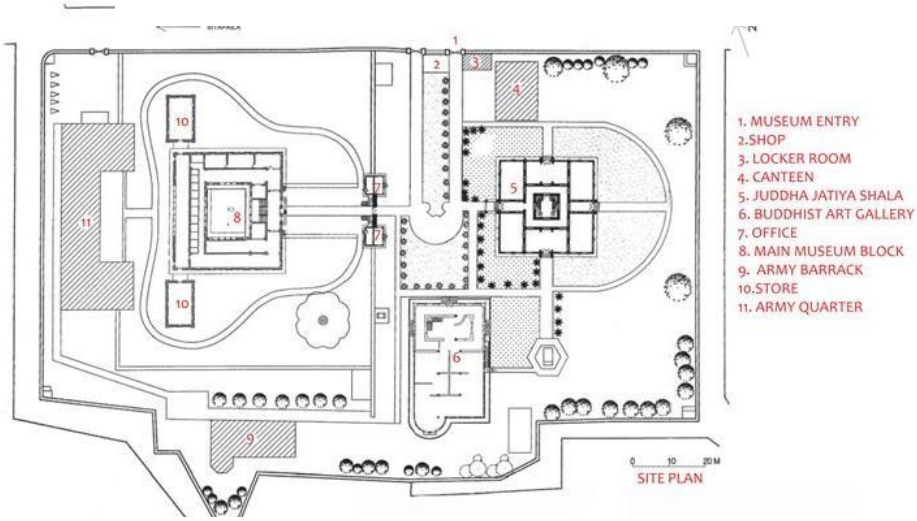


Figure 74 Master plano of Chhauni Muuseum

3.1.7 Planning and function:

The overall building complex is planned for the museum purpose and this institutional touch is felt, in its character. As for the planning of the buildings, they are arranged in two mutually perpendicular directions with respect to the main entry. This eases in the orientation of the visitors as all three block are clearly perceivable from the central court, which also directs towards the museum shop, parking and the canteen. The placement of these public zones around the court creates a clear circulation pattern and provides the visitors with choices. Functionally, the building seems effective in objective with simple planning and orientation. However, there is no segregation of visitor and service entry, creating a discomfort at the time of freight circulation. The restroom is placed at the rear end of site, which is not easily approachable. In addition, the museum often fails to provide enough parking spaces for large number of visitors.

Space allocation details:

- There is no fixed space for administration; they are situated at the main historic building and small guard post building of the main building
- Museum laboratory does not exist
- Small space has been provided near the entrance gate for museum canteen.
- Museum shop is located at the guard house, next to museum entry
- Toilets have been placed at the end of the site to the south
- At the two sides of the entry, to the left is the ticket counter with locker facilities while there is a souvenir shop which also has CCTV surveillance monitors.

3.1.8 Internal layout:

Building 1: Juddha Jatiya Kalashala

As this building has been designed for exhibition purpose, it has good linkages within the gallery. Some modern display facilities have been added in this building. It seems that there is more exhibits than the room it can hold i.e. they are tightly displayed.

Figure 74 Juddha Jatiya Kalashala

Building 2: Buddhist Art Gallery

In this building which has been designed to exhibit and has the best gallery spaces, has various modern facilities added. This building functions as a true museum as far as possible. There is one small AV area as well as a small lecture hall. Among, the three, this building is the best example of a museum catering to all requirements.

Figure 75 Buddhist Art Gallery

Building 3: Historical Museum

The main Historic Gallery, housed in the European/Rana style building, the residence of Prime Minister Bhimsen Thapa houses varieties of displays in different floors which are as follows: As we enter the building, there are two different spaces one housing the administration and other housing the gallery or the exhibit area. As most of the other Rana palaces, this palace too has a central court (but in a very poor state, littered with bird droppings and not accessible to public), grand scale halls and a bifurcated stairway.

Figure 76 Historacal Gallery

3.1.9 Display techniques:

Typical line up technique or linear arrangement can be seen for the display of the objects. The showcase is designed for a number of similar types of objects. Sometimes low height partition wall or display board are seen. Display panels and boxes are good in some areas but needs to be changed in almost all galleries. Some galleries have modern display boxes too mostly in Juddha Jatiya Kalashala and Buddhist Art Gallery. However, the arrangements fail to tell the story, or there is no theme binding the collections which make it difficult for the visitor's to learn and understand. Also each collection should have a descriptive write up describing the artifacts and why it sits there, which is lacking and even if there is any some have only names and date written while others have a temporary paper (written in ink pen) which is already fading.

3.1.10 Circulation:

Circulation is effective and easy, as defined by partition and position of exhibits. The defect in the museum is the lack of seating where the visitor can relax for a while which makes the whole journey tiresome and strenuous. Left hand circulation is provided in all the exhibition spaces which are preferable in context of Nepal.

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the whole journey tiresome and strenuous. Left hand circulation is provided in all the exhibition spaces which are preferable in context of Nepal.

1. **MAIN HISTORIC BUILDING**

Hall to hall connection and provision of a rectangular circuit is the main circulation pattern used in this building.

Ground Floor: No proper circulation route in the ground floor. This floor holds the display of various faunas and a doll section representing various cultures of countries including Nepal.

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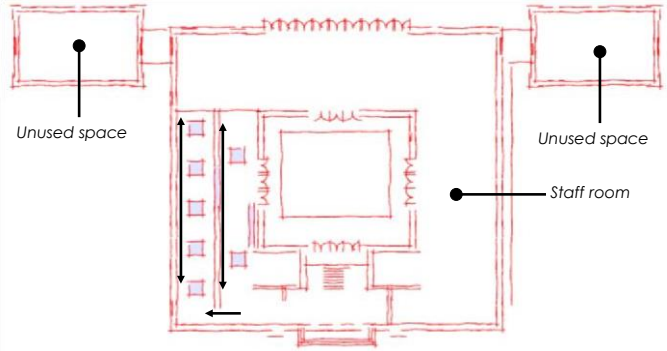

Figure 77 Ground Floor Plan

First Floor: Entry and exit is considered but no proper display arrangements according to the circulation. This gallery has circular circulation, thus one has to go through various other zones to be at the one they like.

Second Floor: Circulation is not continuous and visitor moving inside the gallery have to disperse themselves to find the way.

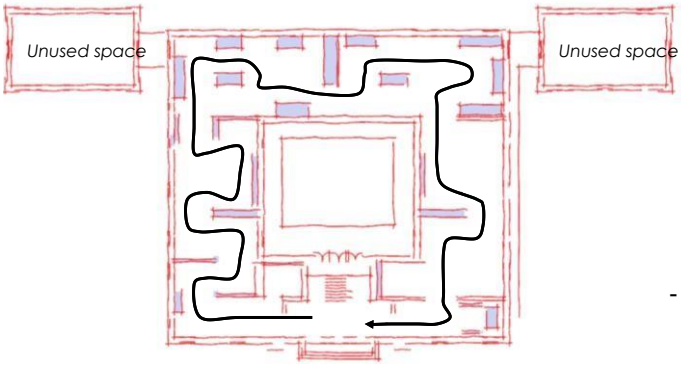

Figure 79 First Floor Plan

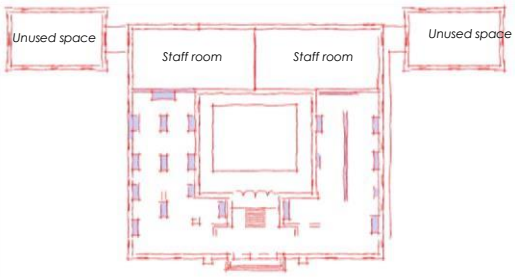

Figure 78Second FLoor Plan

2. Juddha Jatiya Kalashala:

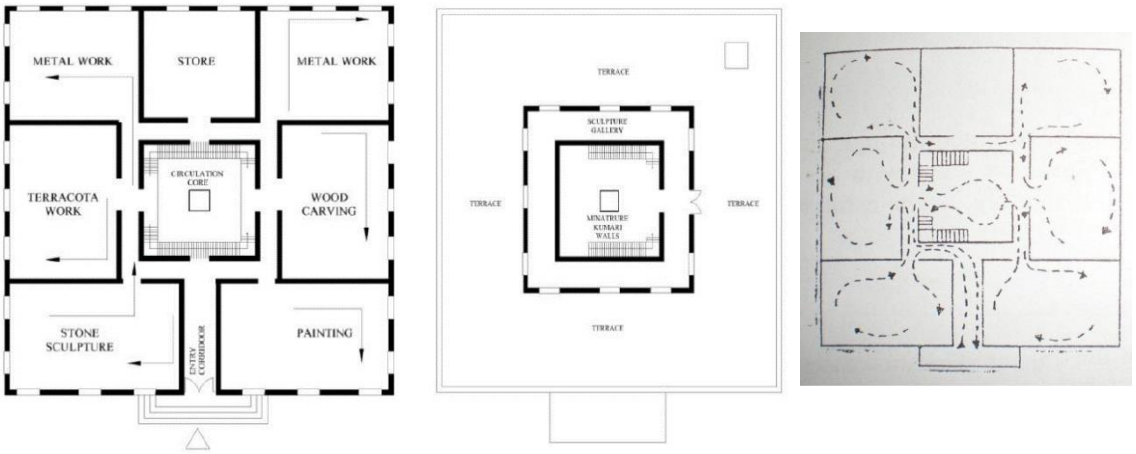

Figure 80 Floor Plans of Juddha Jatiya Kalashala

A twisting circuit around a central hall including an access stone stairway takes a visitor to all the exhibits in Juddha Jatiya Kalashala, where corridor is the main circulation core proving option to the visitor for different rooms and creating a room to room flow.

3. Buddhist Art Gallery:

It has simple linear circulation pattern and consists of large gallery space which is effectively interrupted by exhibits and partition to define circuit but allowing view at the same time. There is a central hall and itinerary circuit and decentralized circuit are provided.

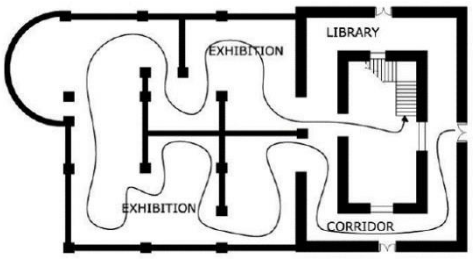

Figure 81 Circulation Diagram

3.1.11 Analysis and inferences:

Alongside the increase in the number of museum visitors, the public has also become much more diverse and demanding, expecting to see unusual objects presented in an attractive and innovative manner, to which National museum does have a good collection of unusual objects but there is no innovation in terms of presentation.

"The exhibits have not been brought together so that they can occupy a quiet little niche in the museum for the rest of the time but to begin a new life among new companions, whether these be museum visitors or the other exhibits." This excerpt from the book "Museum Architecture" by Manfred Lehmburck can be a message to the national museum here in Nepal, the exhibits are unfortunately separated of its past from the present.

"The architecture should not only offer visual diversity but suggest a rhythmic variation of movement, such as slow and fast walking, sitting down and, if possible, also lying." (Lehmburck, 1975) The large expanse and the green grounds of the museum offer strolling around, sitting and even lying. People are mostly seen sitting in the grounds after the museum tour, relaxing under the warm sun and chatting with their friends. This relaxing activity gives time to reflect on the lessons learnt and things seen inside which is really welcoming. Despite so many problems National

museum itself is a glimpse of the entire country. The museum because of lack of proper space is working as the store house for the national treasures

The inferences are as follows:

- Lack of curator and security inside museum may lead to vandalism and loss to the nation.
- Fails to provide parking for the large nos. of visitors.
- No segregation of visitor and service entry, creating discomfort at the time of circulation.
- Lighting insufficient, as the result view is greatly affected by glare.
- Absence of artificial lighting and the uncontrolled natural light is affecting the quality of the display.
- Strong axis along the central court giving sense of direction towards the three different buildings.
- Lack of seating at intervals making the visitors tiresome.
- Museum lacks the sense of welcome inside, creating lack of enthusiasm.
- The green grounds of the museum offer a space to relax

3.2 PATAN MUSEUM, PATAN DURBAR SQUARE

3.2.1 Objective: To study

- Exhibition space and planning
- Circulation and display techniques
- Lighting techniques: Natural and artificial
- Museum Environment and museum facilities

Figure 82 Patan Durbar Square

3.2.2 General information:

- Established: 1997 as a museum
- Location: Keshav Narayan Chowk, Patan Durbar Square, Lalitpur
- Land type: Flat
- Main entry: West
- Construction: Load bearing
- Style: Traditional Malla architecture
- Visitors: Tourists, students, artists

Notes: Great example of conservation in the form of rehabilitation/ adaptive reuse, "The Museum behind the Golden Door" and Nepal's first self-sustainable museum.

3.2.3 Introduction:

Patan Museum is located in the northern most part of Patan Durbar Complex known as Keshav Narayan Chowk deriving its name from a small temple of Mani Keshav Narayan, placed at heart of the chowk. The Durbar was one of the royal palaces of the former Malla kings. It is said that the complex of Keshav Narayan Chowk dating back to late seventeenth century, was earlier occupied by a Buddhist Monastery. Both monastery and palace rest on far older foundation that may go back to the Licchavi period (third to ninth century). Although, the palace square has been altered over time and again to suit various purpose, many renovation have been recorded over the past, the present shape today is believed to resemble what was built under the Malla rulers long ago. The joint collaboration of the Austrian and Nepalese Government which was directed by the architect Gotz Hagmuller, began in the year 1982 to repair the Keshav Narayan chowk making it a model of a cultural institution.

3.2.4 Site:

Patan Museum's gilded door and window face one of the most beautiful squares in the world. Enlisted in the UNESCO's World Heritage Sites, Patan Durbar Square is aligned

along North- South axis with one side composed of palace complexes and the other plaza consists of various temple structures. The palace complex has a multi- tiered temple of female deity, Taleju who take blood sacrifices while the temples in the plaza are dedicated to male gods who do not take blood sacrifices.

3.2.5 Background:

Today a larger number of modern museums are being built over the world, while the others take their dwelling in these historic monuments, which no longer fulfill the original purpose.

Patan Museum caters to this idea of halting the declination and giving space a new meaningful purpose. Architect Hagmuller in his book "Patan Museum" has specified the precise objective of the project which reads as; *"The restoration of the palace compound had three major and sometimes conflicting goals: to repair and preserve the damaged structure; to restore its historical design as far as this could be determined based on research and comparable structures; and to adapt the building to its new function as a museum."*

The Palace court which had undergone much damage during the 1934 earthquake was feebly renovated time and again. Each time introducing newer materials and construction technology, causing to alter the original design of the historical palace. Also, the palace was persistently used for multiple purposes. Once it was also used as a school, where the building was plastered with a false cement brick lining and the courtyard balcony was grilled for safety. Another form of the palace was a small collection house where it already had a wholesome gathering of artifacts, most of which were stolen and smuggled objects retrieved by Nepal police and custom department. It was essential to conserve this historical interest as well as adapt it to a new use, which shall give a new abode to wide collection of historic artifacts. There was no evidence or photographs of the palace except that of the palace front that was taken by some foreign visitor way back. The architect was faced with an intense challenge of conserving the Palace complex already enlisted as one of the World heritage sites and adapting as well as making necessary changes to introduce the functions of a museum. The main aim of conservation process was to maintain the principal elevation and court space into its ancestry historic design. After several years of educational and cultural endeavors the museum was opened to the public in 1997. It displays the traditional sacred art of Nepal in an illustrious architectural setting. There are altogether 1200 exhibits in which only 200 are displayed in the museum. The exhibits include stone art, metal art, wood work and paintings. Patan Museum is an excellent example of adaptive reuse, and architectural conservation and renovation. The museum's exhibits cover a long span of Nepal's cultural history and some rare objects are among its treasures. Their meaning and context within the living traditions of Hinduism and Buddhism area explained. Most of the objects are cast bronzes and gilt copper works, traditional crafts for which Patan is famous for.

3.2.6 Architectural expression

- Courtyard system planning
- Reflects the Malla architecture
- Use of aesthetically pleasing elements such as highly decorated door and windows, brick walls and multi-tiled roofing.
- Jhingati roofs, highly carved windows and doors, struts and torana represent Nepali style architecture
- Colonnaded open portico (falcha) in the ground floor, carved wooden latticed window in the first and the circumambulatory balcony in the third floor sheltered under the sloping jhingati roofs.
- The typical Newari style of column but constructed of iron instead of wood which was included during the palace renovation in 1982.

Figure 84 Colonnaded open portico(falcha) with rows of tham

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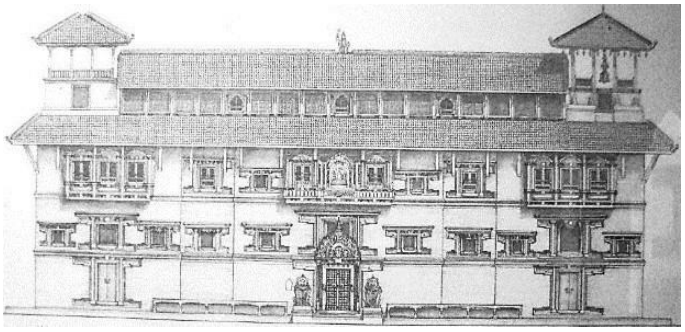


Figure 83 Front elevation of Patan Museum

3.2.7 Exhibition space

The thick walls define the long and continuous rectangular rooms giving way for the arrangement of spaces long visual axes and the space orients towards focal points at the end of long vistas. The simplicity on the wall surface with lime plaster renders a modest and sober interior, which explains the character of Malla period. The thick walls not only enclose the rooms but also add a total new aesthetics through the alcoves, niches fenestration and perforation. They support the showcases within the thickness, provide seating along the windows or just give depth to some of the voids within the display showcases. (Hagmueller, 2001)

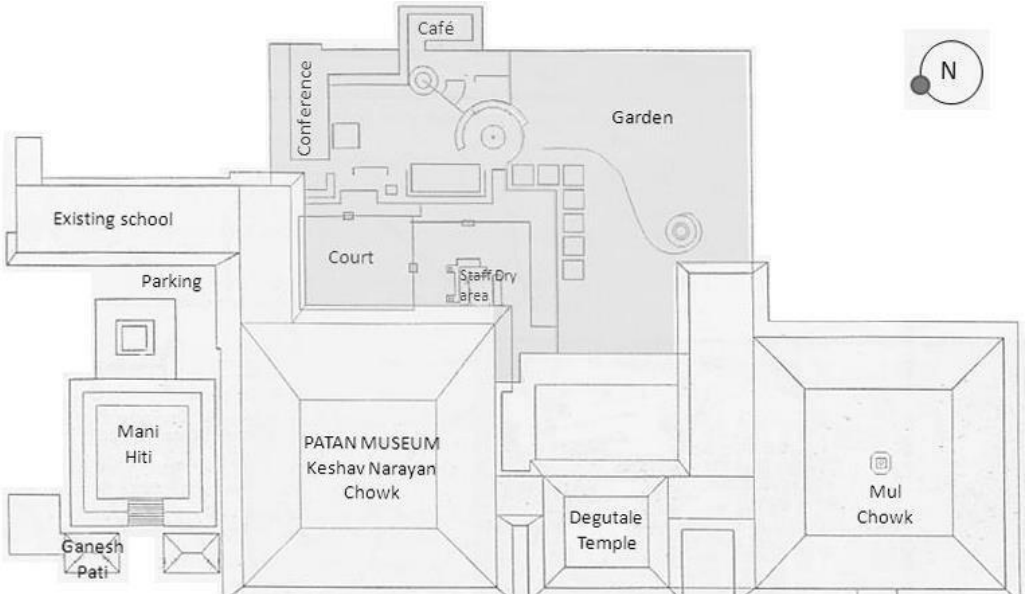


Figure 85 Masterplan of Patan Museum

3.2.8 Planning

Looking into the master plan, the golden door opens up into an entry arcade leading to the palace court which has a small reception and a souvenir shop on either side of the entry, the court is skirted with semi open arcade space for temporary exhibits. The east wing facing the court has a small door opening into the arcade creating a passage leading to a new stairwell. Behind is the rear sunken court, and restaurant area much appropriated for seminar and musical events. The whole facility of spaces is provided to bring about the idea of self-sustainability that created Patan Museum as one of the first autonomous self-sustaining body of Nepal. As any effort to restore and conserve historic edifices must include renewal of the economic and financial structure to both fund and maintain the restoration. (Hagmueller, 2001)

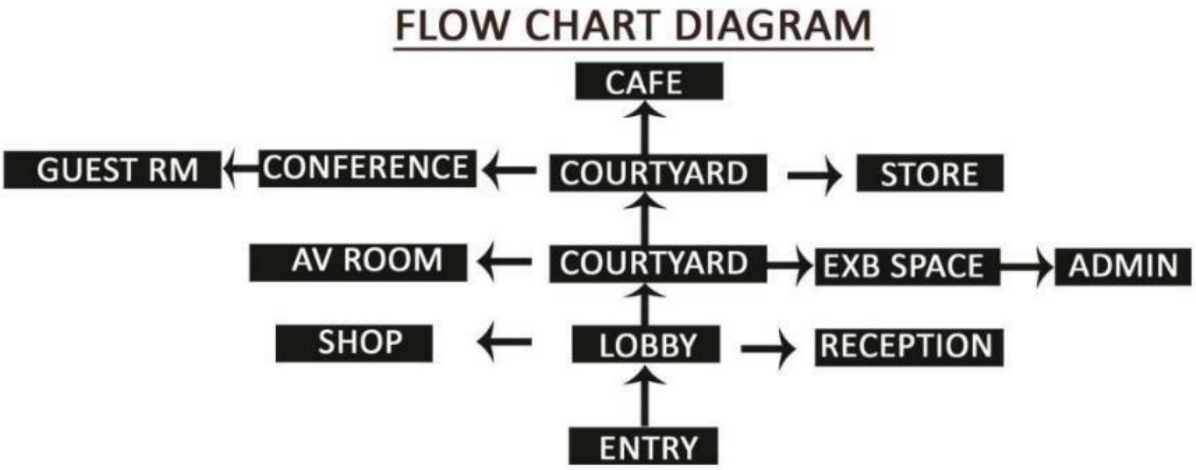


Figure 86 Flow chart Diagram of Patan Museum

3.2.9 Features of self- sustainability:

- Charges ticket fees
- Space for temporary exhibition
- Museum restaurant
- Space for musical and seminar events
- Souvenir shop
- Visitors room/ Guest studio

The three storey palace complex has five main galleries dedicated to different religions persistent in the valley. Each gallery displays various collection and iconography of Shiva, Vishnu and Buddha with scholarly identification, date and description of each object, the work cocreated by eminent historian and researcher Mary S. Slusser. Some galleries also shares rare object of history along with manuscript and technology section. (Hagmueller, 2001)

3.2.10 Circulation

Since the museum was originally a residence of a Malla king, the interiors are long narrow single bay spaces (around 10' wide). The typical palace complex renders an array of narrow and elongated rooms. A continuous flow of gallery circulation through the chain of rooms form a wellfunctioning gallery space. The elongated rooms serve for the simplest linear passage, with the exhibits on the either sides and sometimes at the center. The latter position of the exhibit is to deliberately block the further view so as to create curiosity and to break the monotony of the linear passage. (Hagmueller, 2001)

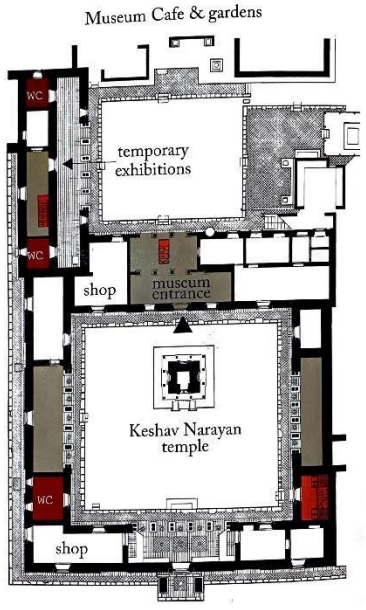


Figure 88 Ground Floor Plan

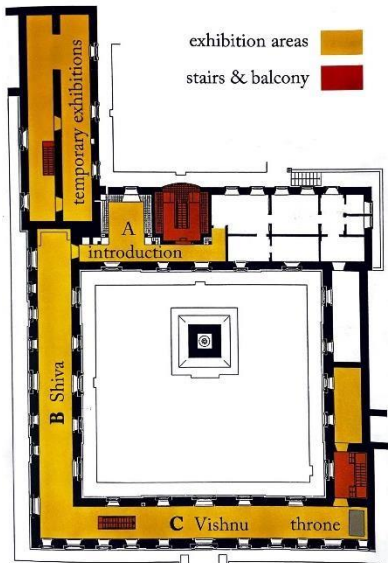


Figure 89 First Floor Plan

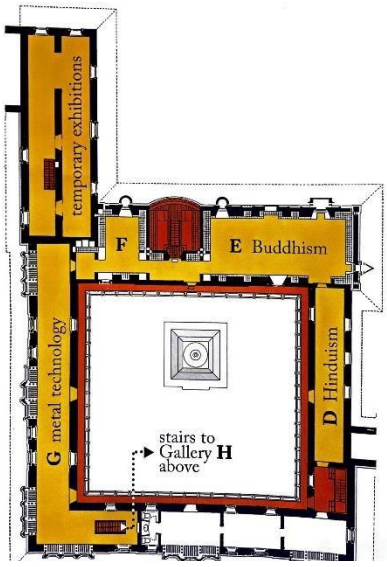


Figure 87 Second Floor Plan

- Use of wall niches and hanging display cases from the ceiling to create a clear foot area and smooth circulation pattern Non-bearing partition walls removed to add a new staircase.
- Traditional mud floors replaced with handmade terracotta floor tiles for consideration of wear and tear. Similarly, lime plaster used on the interior walls instead of original fragile mud plaster.
- Balcony is also used for the circulation. A linear pattern of movement in one direction has been maintained so that the visitors are not confused.
- Courtyards enhance the flow in museum as connectors of exterior and interior environment.
- Easy and simple type of rectangular planning
- The entry to the staff office is from the rear end which helps in maintaining privacy without creating disturbance in the public space.
- The vertical circulation is supported by single flight staircase. The staircase with its peculiar hand rail is also a new invention which was added for an efficient public flow towards the galleries. (Hagmuller, 2001)

With large curved window to light up the space and a door to end up at, this circulation pattern suffices in order to orient oneself. Once into the gallery, the exhibits itself calls for the attention such that it draws the visitor without any confusion to the stairs up to the second floor. Similar, character is repeated in the third floor, with a bit more effort seen in the reconstructed wing. Here, the repeating rectangular voids jutting through the thick walls give clear way to the visitor.

3.2.11 Display techniques

- Alcoves and niches in the thickness of the walls provided to place the objects of display. Niches are fitted with concealed lightings and glazed frames.
- The traditional windows also have partially or fully converted into a showcase for display. Glass, wooden and metal display boxes built with varying dimensions.
- Orange color is used in some display boxes and the gallery walls to give a complimenting look with the original brick walls while giving visual comfort, warm environment and pleasing effect enhancing uniformity in texture.
- Each exhibit is ensured to excellent display with necessary informative detail. Some artifacts are placed inside walls with white background for focus through contrast of colors with metal and the

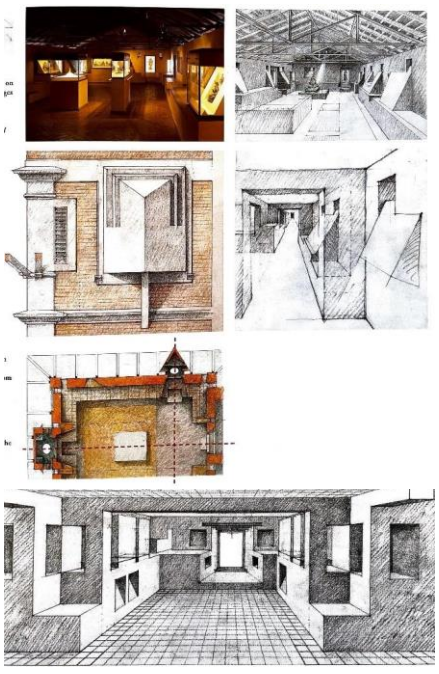


Figure 90 Various Display Techniques

walls. Two types of showcases; either resting on an elevated platform where space is sufficient or suspended from the ceiling.

- Within each cases, objects are insulated from radiant heat of light compartment above with sandwiched panels of frosted glass.
- Light compartments are well ventilated to avoid heat accumulation. Band can be easily opened for inspection.
- Also the pedestals and special designs for the leparellotype manuscripts are created. The inclined design of the showcases and handrails encourage the visitors to lean over the exhibit to study the objects closer.
- The sill space in front of the lattice windows are also used for display. The lattice windows are covered with a tight frame such that the artifacts are protected against the outdoor environment. (Hagmueller, 2001)

3.2.12 Lighting

Figure 91 Alcoves and niches in the thickness of walls provided to place the objects of display

When Hagmuller first arrived in Nepal, he found the lightscape of our traditional towns very supernatural, so in the museum, the adoption of semi darkness has been done as 'new dimensions of twilight' as the concept of the Gods dwelling in darkness, in smoky, innermost shrine of the temple, surrounded by a few butter or oil lamps. The monochrome use of color in the museum, the choice of colors did in fact arise almost naturally such that to recreate in the interior environment as well as the same sort of lighting fiesta. Also he has used various ingenious ways to get indirect light into the exhibits besides the artificial light that seems to be used quite effectively in combination with the natural lighting at places such a way that there is no problem of glare or disturbance to visitors, like the perfect combination of light and shadow which is an amazing aspect of the project.

(Hagmuller, 2001)

Natural Light

- Natural lighting is used for the purpose of display.
- Daylight provided through the low height windows lit in the corridors.
- Latticed window light characterizes in the circulation passage, whereas, niches and voids have been used to light artifacts.
- The shadows of latticed windows on interior surfaces accentuate the interior environment.
- Double storey arched bay window provides natural light in the entry staircase area.
- Daylight filtering through small windows and lattices illuminate the long dark passages, this helps orienting the visitors without subjecting them to sharp contrasts so that it seems to be the prime technique of lighting used for the artifacts.

- The upper gallery receives much light from the open able bay windows, also providing the facility of seating as well as viewing the temple complex outside. This also breaks the visitor's monotony and creates a visual interest.

Artificial light

- The method of illumination is very effective and conceptualizes the theme of lighting oil lamps in temples.
- Incandescent lights are used to provide yellow glow similar to oil lamps Niches are fitted with concealed lights and converted to showcases
- Certain display boxes are fitted with mirrors at the bottom to reflect light from above to resemble the practice of lighting at the feet of gods.
- The use of spot lights and track lights provide a pleasing atmosphere in display spaces
- Spot lights are placed at the distance of 2'8" from wall on both sides Internal case lighting is adopted.

3.2.13 Museum environment

A successful museum provides an interesting and comfortable environment. There may be various factors affecting its success.

- **Theme of museum:** The building itself is a splendid example of 18th century palace. It takes a visitor to a journey through ancient Nepal.
- **Color scheme:** It uses monochromatic scheme of soft brick red without white walls to reduce brightness in the background of the exhibit.
- **Types of exhibits:** Antique arts pieces, sculptures, thankas with supporting information under subtle lighting.
- **Visitor comfort:** It provides easy approach to information with simple circulation and calm surrounding which is psychologically pleasing. Sittings are provided at regular intervals to get a relaxing view of inner courtyard and the durbar square or to concentrate on exhibit. Juxtaposition of building and courtyard create visual diversity and hence create interest and relief.
- **Recreational areas:** Courtyard is the main spill out area not only for the museum visitors but for general public, which emphasizes on social interactions. Besides museum café and shops add excitement to the visitors.
- **Good ambience:** The building is surrounded by a world heritage site and the museum explores its beauty in every possible way through windows and corridor for providing exotic vista to the visitor.

3.2.14 Analysis and inferences

There is a pleasant landscaped garden with a semi-outdoor café, two open courts to events, a temporary exhibition space, a high story artist's workshop, and a souvenir store that functions as a catalyst for the social and economic regeneration of the entirety of the museum. It must have been a huge effort to preserve and set up the palace as a functional museum. There was a

need to modify the architecture to accommodate the museum's new purposes, which also appear to have achieved its original aim, but mostly the people find it confusing to take the pre-planned path due to its puzzling monotony. The cut-off seat from the exhibition area is very restricted, therefore the gallery doesn't have much equipment. Even the small corridor area does not offer a decent viewing distance or numerous sights while the only option is to see the front, yet such an area cannot be effectively accommodated in a historic environment. The use of lighting that occasionally shines and haze things on view is another important requirement in an exhibition, particularly if the pieces are maintained directly in the light source that operates somewhat contrary to the limited, diffuse space.

INFERENCES

- The circulation in the museum must allow the traffic flow .
- The lighting source inside the case must be hidden
- The external light entering inside the museum must be diffused
- Rest spaces should be provided at regular intervals for the visitors
- Museum must have proper disaster management system
- Courtyard shaped building helped in proper air circulation, lighting.
- Display exhibits held above 3’ and made easier to view
- Lights were kept at 45 degrees; the lighting would have been perfect if it were maintained to 30 deg.
- The lighting done inside the showcases were equally distributed by use of glass panels.
- Mirrors inserted into the bottom of the showcase to reflect the light from above and thus provide additional contour lighting Incandescent bulbs were neither sharp as halogen nor unreflective as fluorescent.
- Smart interplay of lighting, driving the visitor curiosity and attention.
- Vertical single flight staircase along with twisting circuit completing the circulation loop of exhibits.
- Seating provided in intervals for visitors comfort with good exterior view.
- Courtyard providing good social interactions not only for visitors, but for general public.
- Architecture expression providing ancient sensation to the visitors.

3.3 TARAGAON MUSEUM

3.3.1 Objective:

To study

- Exhibition space and planning
- Contemporary form of building
- Circulation and display techniques
- Functional aspects of Museum
- Elements of Contemporary Public Architecture

Figure 92 Taragaon Museum

3.3.2 General information:

- Established: Originally built in 1972 and reopened in 2014
- Context: Urban setting
- Land type: Undulating terrain with gentle slope

3.3.3 Introduction:

Located within the Hyatt Regency Hotel premises the building was originally the Taragaon Hotel until it closed in the 1990s.It was designed 45 yrs ago by Austrian architect Carl Pruscha,who was also involved in Kathmanadu;s urban planning.In a 3500 sq.metre complex the Taragaon Museum showcases these works from expatriates with "an outsider's view in". The museums collection includes maps,architectural drawings,and photographyfrom over 30 foreign contributors.

3.3.4 Features of building

Carl Pruscha's work repeats three geometrical shapes: circles,triiangles and squares. The most amazing thing is the drum roofs-the circular roofs. The focus is clearly the view of outsiders who admire and even venerate the heritage of the Kathmandu Valle.The red brickwork is also reminiscent of traditional Nepali homes relying on a brick architecture. Some of the features are very traditionally Nepali,such as the interior arches, which are low-lying, along with small roofs.Taragaon Museum builts itself more as a "garden of art."

3.3.5 Design concept

The name of the hotel village,Taragaon(tara=star),refers to the bright "stars" in the sky. The hope was ,as Angur Baba wrote in 1974,that the village will shine like a star in the sky.It was built with the intention of being "a welcoming and comfortable bungalow village devised for fascinating encounters with Nepalese people,cultural and landscape," in which , "modern architecture is combined with the traditions of Nepalese culture and way of living."

3.3.6 Functional spaces

- Art Gallery
- Information centre
- Library
- Souvenir Shop
- Studio
- Performance and exhibition hall
- Gallery
- Café

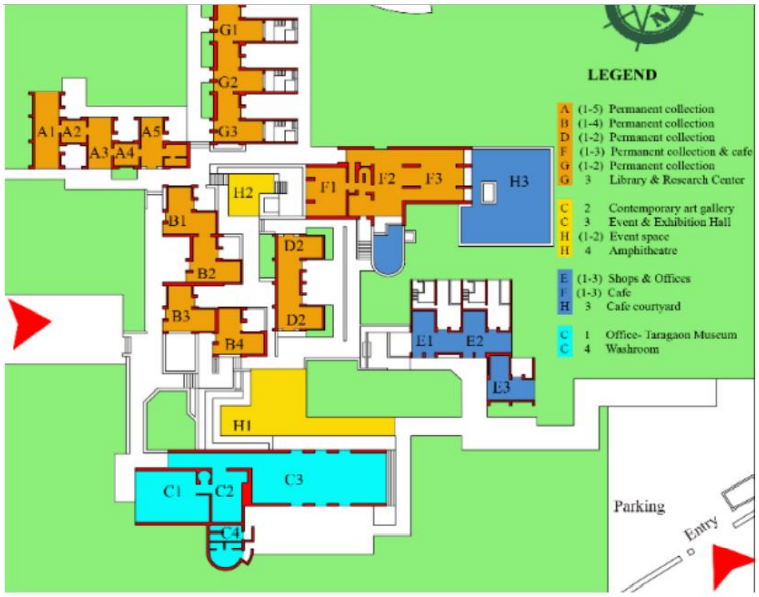


Figure 93 Masterplan of Taragaon Museum

3.3.7 Services at the museum

- Museum spans an area of 35,000 sq.ft.
- Besides its permanent collection,the Museum has a Contemporary Art Gallery,Event Hall and a Amphitheatre.
- Art and Photography exhibitions,Musical events,fashion shows,conferences and film screening are some events that happen there.
- The museum has its own Café-Bar to cater events.
- The retail space focus on artefacts,paintings,furniture and arts.

3.3.8 Site zoning

Site consists of 7 blocks connected by a paved pathways and interlinked with open courts which are either green or paved.The 4 exhibition block is placed in the first entry position after the parking.

3.3.9 Principle of organization

- Pattern of indoor and outdoor spaces of plan echoes the traditional planning of durbar squares.
- Entire exhibition center is aa fabric of intersecting cylinders and cuboids creating a textured effect of regulating lights,casting shadows and allowing glimpse of the sky.

Figure 94 Zoning of Taragaon Museum

3.3.10 Activity pattern

Mainly exhibitions and workshops are conducted in daytime.More use of interaction and transition areas like corridors,galleries and courts throughout the landscape.The evening hours are mainly focused on events.

Figure 96 Exterior activity

Figure 95 Program in Multipurpose Hall

3.3.11Circulation pattern

- Site entry from the South and West.Main entrance from South and another from the west to Hyatt Regency.
- Vehicular movement is only limited to parking.
- Domination of pedestrian movement within the entire complex.
- Free circulation achieved by adopting a network of corridors linking together by courts.

3.3.12 Inferences

- The rhythm and harmony of the elements used creates a visual effect in the landscape.
- The circular roofs represent elements of contemporary architecture.
- Orientation of building is designed with passive strategies but not feasible with regards to lighting .
- The integration between built and open spaces and their relation to their pathways defines the cooperation with environment.

3.4 GUGGENHEIM MUSEUM

3.4.1 Background

Figure 97 Guggenheim Museum

The **Museum Solomon R. Guggenheim** in New York is certainly one of the most celebrated and controversial buildings in modern architecture. It is, together with the Fallingwater House , the most famous work of American master Frank Lloyd Wright, who was commissioned to design the museum when he was already 76 years old. The curved shapes of the building contrast sharply with the rest of the urban fabric in New York, being both provocative and innovative.

- Designed by F.L Wright and dedicated to modern art.
- Design and construction ook 16 yrs,1943-59,due to changes in design and costs.
- Debate between,architect,client,art world and public opinion
- The form contrast within the grid of New York City.
- Walls and ramp were not suitable for a painting exhibition.
- Buildings overshadows the works exhibited and that it is difficult to properly hang the paintings.
- 700 sketches and 6 sets of working drawing
- 51000 sq.ft gallery space.
- Main ramp coils upwards6 floors,more than ¼ mile .

3.4.2 Zoning

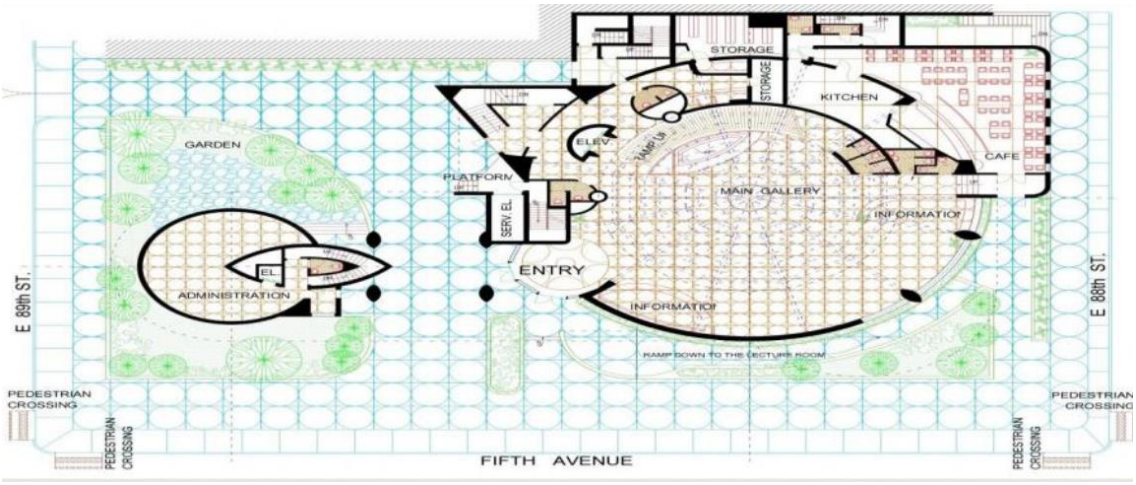


Figure 98 Ground Floor plan

Zoning of spaces in to exhibition spaces,administrative space and other amenities.Spaces were zoned vertically rather than horizontal approachFour floors of exhibition space,three of which are double heighted.Office and storage for mechanical system.

3.4.3 Concept

The building in itself has become a work of art. From the street, the building resembles a white ribbon rolled into a cylindrical shape, slightly wider at the top than at the base. Internally, the galleries form a spiral. As such, the visitor views the works while walking along an ascending, illuminated helical ramp, like a promenade.

It's design was inspired by a "ziggurat", a pyramidal, stepped and inverted Babylonian temple.

3.4.4 Conceptual plan

Concept of "Organic Architecture"-building should develop out of its natural surrounding.Organic Architecture as interpretation of natures principles manifested in buildings that were in harmony with world around them.

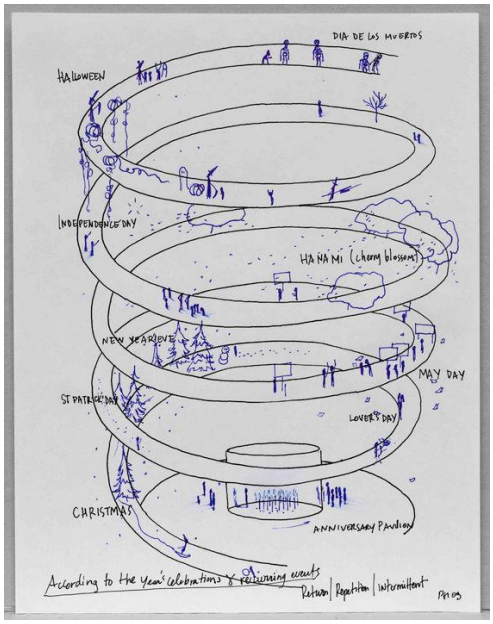


Figure 100 Conceptual illustration of ramp

Figure 99 View of ramp from interior

3.4.5 Circulation plan

- WRIGHT-Experience the collection paintings by taking an elevator to top level then view artworksby descending the central ramp
- PRESENT-design exhibits to be viewed walking up the ramp rather than walking down.

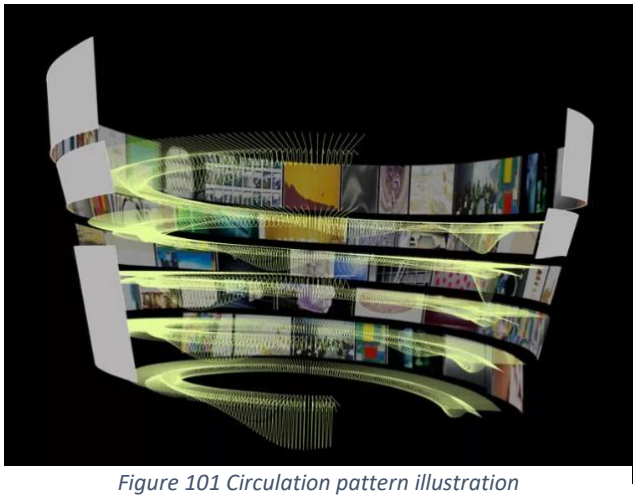
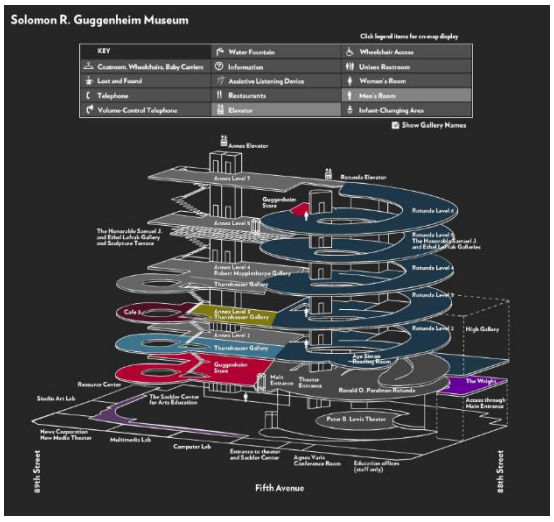


Figure 101 Circulation pattern illustration



3.4.6 Lighting features

Natural lighting was a key point in Wright's design: a large domed skylight provides a diffuse background illumination to the internal space while a continuous band of ribbon windows supplies a specific natural illumination for the artworks located along the exhibition ramp.

- Skylights originally intended to illuminate painting in natural light,but were changed to artificial.
- Glasss dome with aluminium frame.
- 12 ribs,coinciding with 12 radial "web walls"
- The web wall connects at the roof level forming hairpin beams that supports the massive central skylight.

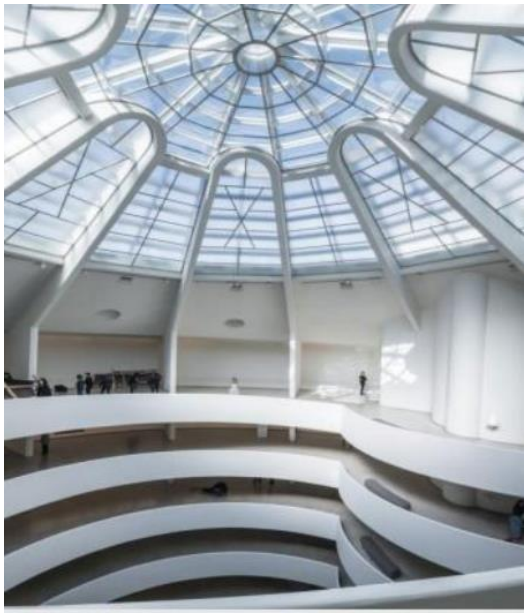


Figure 102 Lighting features

3.4.7 Floor plans

- Four floors of exhibition space.
- Three of them are double height,also have office and storage space.
- 12 radial web walls divide gallery into 70 bays for viewing artwork.
- Large glass dome covers the entire rotunda providing natural light along periphery.

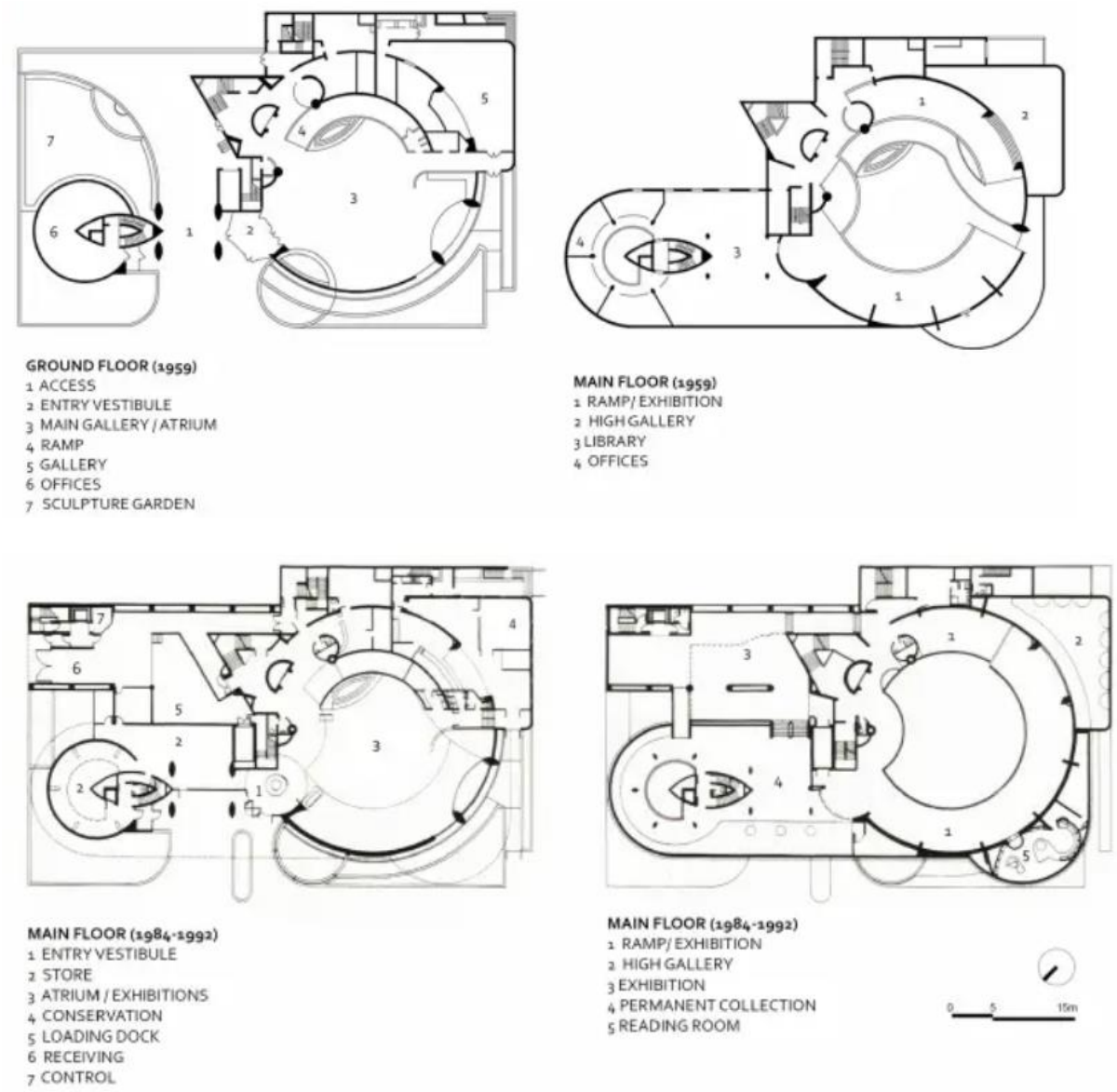


Figure 103 Floor Plans

3.4.8 Conclusion and inferences

Despite the opinion of critics, there is no doubt that Wrights design for the Guggenheim Museum provides a spatial freedom that is unique to his style. It took Wright 700 sketches and six sets of working drawings to turn his vision into an extraordinary sculpture of a building overlooking Central Park, that in the very least should be acknowledged as one of the most spatially beautiful International- style works of architecture.

Wright also embraced new materials,Machinery and technologies,Far from seeing them in opposition to nature, he saw them as allies.Depending upon each other for their integrity,nature would inform and machinery execute a totally new architecture-one where the machines capacities transformed natural principles into architectureal forms.

3.5 MUSE MUSEUM

3.5.1 Introduction

Figure 104 Muse museum

- YEAR:2013
- ARCHITECT:Renzo Piano
- LOCATION: Trento,Italy
- TYPE:Science Museum
- MATERIAL:Glass,concrete,steel and timber
- PROJECT AREA:-11,710.SQ.M

3.5.2 Context

The site is located on an 11-hectare brownfield industrial area adjacent to the Adige river.The site is bound on the north by he historic Palazzo delle Albere, on the south by Monte Baldo Road and on the east by the railway.

Despite its proximity to the city centre,the area had been cut off from the surrounding urban context due to the presence of the factory,and then completely neglected with its subsequent closing down with the presence of the railway.

3.5.3 Aim of the project

The project is mainly aimed at reintegrating the existing urban landscape and exploiting the site's relationship with the river environment by making better use of its natural resources.

The project's secondary goal is to urbanize these localities, which for social and cultural reasons have become marginalized with respect to the rest of the city, by including a range of different structures (such as residences, office buildings, shops, cultural venues, conference centers and recreational areas) and by concentrating their volumes within just one sector of the area in order to free up enough space for a large park.

3.5.4 The form

The building is made up of a sequence of spaces and volumes (solids and voids) resting (or seemingly floating) upon a large body of water, thus multiplying the effects and vibrations of light and shade. The entire structure is held together at the top by its large roof layers, which are in complete harmony with its forms, thus rendering them recognizable even from the outside.Starting from the east, the first structure houses functions which are not available to the public, such asadministrative and research offices, scientific laboratories and ancillary spaces for on-site staff.

3.5.5 The public park system

The public park represents the third major theme of the project. The connection system, which is comprised of rows of trees that make up the project's backbone on the east-west axis, serves as a unifying element for the project's three main protagonists: the existing urban landscape, the new district and the riverside park in addition to the tall trees along the roads and pathways. The greenery will also be comprised of other trees of medium height, forming denser and shadier thickets, not to mention a number of monumental exemplars, some of which are already present on site.

Figure 105 Public Park System illustration

3.5.6 Concept on layout

- Exhibition themes are reflected clearly in its form.
- Flexibility in setting up the space and the scientific content.
- Flexible layout is accompanied with moveable fixtures to meet different exhibition requirements.

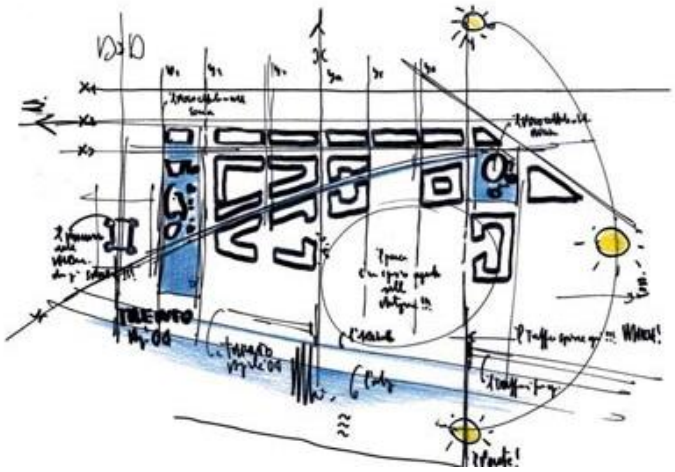


Figure 106 Layout illustration

3.5.7 Concept on section

- Striking roofing system covers a sequence of spaces and volumes of different functions, height and pitches.
- Creates harmonious rhythm with the mountains beyond.
- Under the pitched roof consists of two 'cultural poles' of the project-public science museum and admin office.

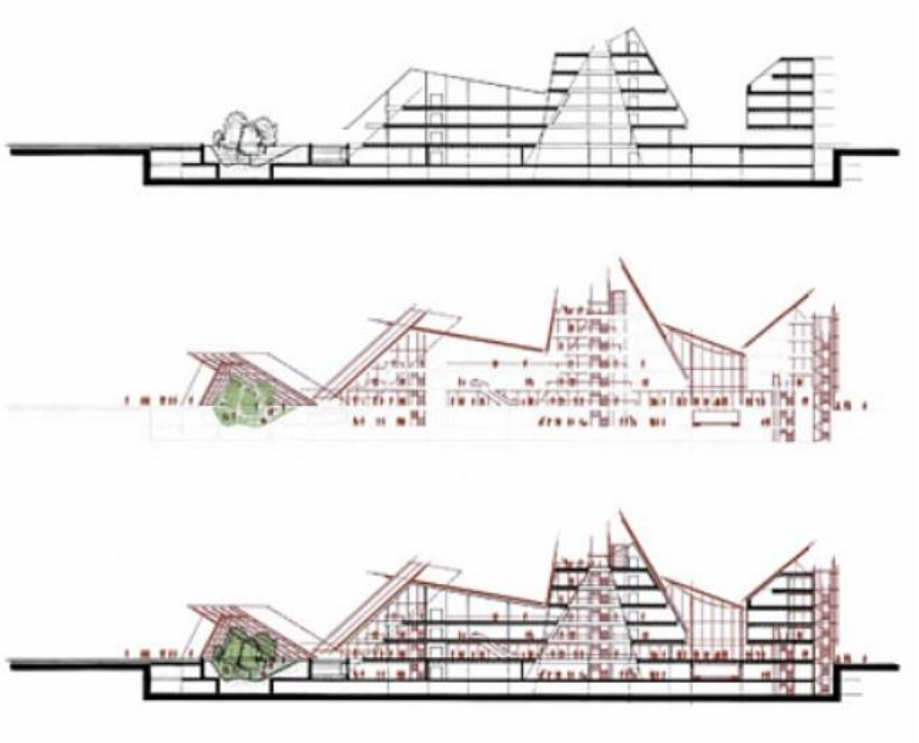


Figure 107 Illustrative sections

3.5.8 The roofing system

Figure 108 Roof uniting with background hill

The roofing system represents one of the most important and unifying features of the entire project. Despite the diversity of their various functions, heights and inclinations, these elements will work together to form a unique semantic system that covers all of the edifices, favoring the use of wood and steel structures.In this case, once again, the project's two cultural "poles", i.e. the science museum to the north and the area to the south, destined to accommodate a multi-purpose

conference centre (amongst other structures of collective interest), are characterized by maximum freedom of expression.

3.5.9 The science museum

The new Trento science museum is located in the northern portion of the new district foreseen for the Ex-Michelin area, and is housed is what is known as the A-block, situated at the end of the main pedestrian route that connects the area's higher-end activities with the functions of the greatest public interest. It is also located in close proximity to the new public park and Palazzo delle Albere, with which it will boast a respectful and productive relationship.

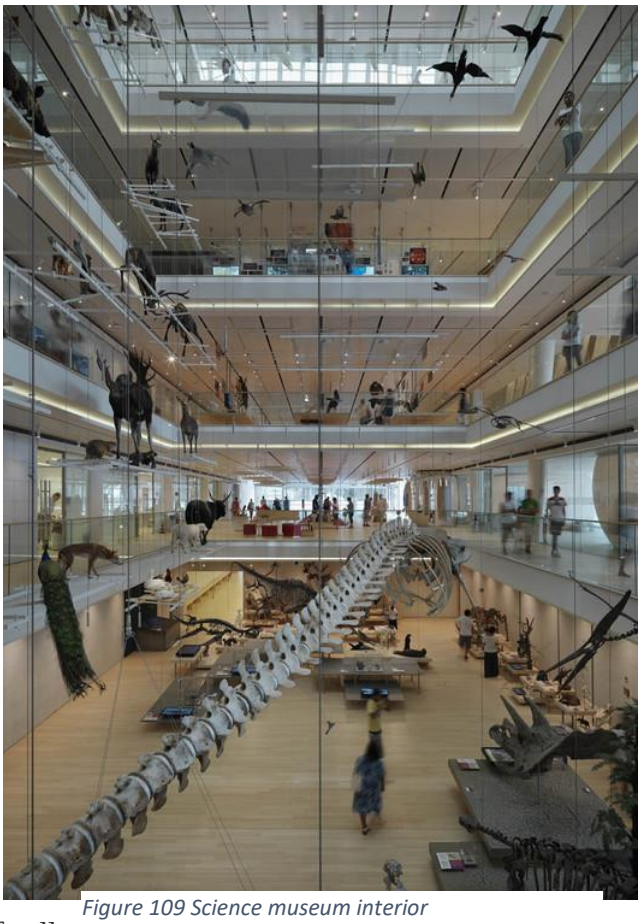


Figure 109 Science museum interior

The idea was based on establishing a perfect compromise between the need for flexibility and the desire for a precise and consistent response to the scientific content of the cultural project itself. The museum's magnificent exhibition themes can even be recognized in the form and volumes of the structure itself, all while maintaining the flexible layout typical of a more modern museum.

In addition to the volumetric interpretation of the museum's scientific contents, the architectural design has also been dictated by the museum's relationship with its surrounding environment:or rather the new district, including the park, the river and Palazzo delle Albere.Thus, all these inputs have physically taken shape thanks to the clearer definition of the specific architectural elements that make up the rest of the district itself, above all in terms of its tertiary, residential and commercial functions.

3.5.10 Sectional perspective at exhibition space

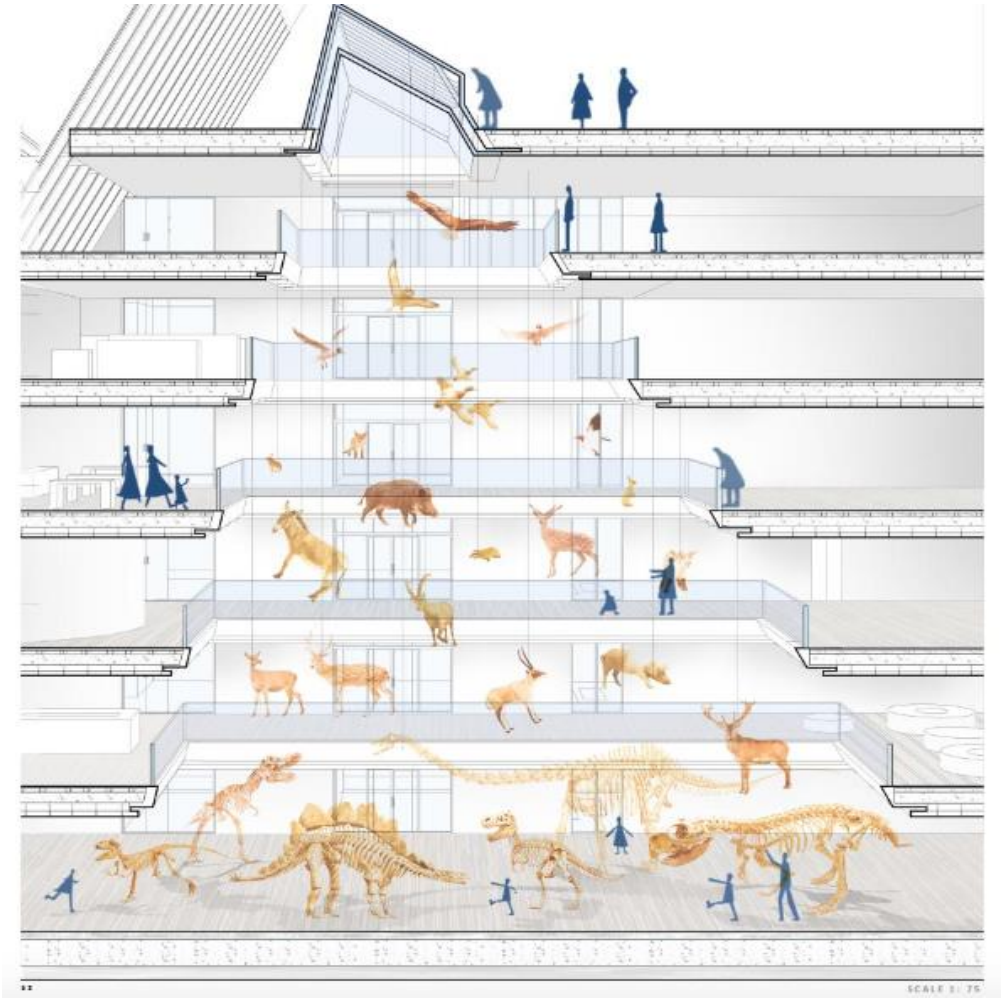


Figure 110 Illustrative section

- The large central void,conceived to allow the visitors perceive the museum as a coherent whole.
- The atrium sizes increased by each level,gradually reduced.
- This clever way of space design also makes space deeper and higher.
- Inside this full ht space,an imposing installation is housed.
- The transparent envelope is provided with openings,in the bottom and top for natural ventilation and shading system.

3.5.11 Circulation and spatial organization

- To reduce pollution from transport preferably local sourced material is used.
- Mixture of steel and glass panels,the dynamic roofline juts up and down between three and six storey heights.
- Creates a rhythm with mountains and divides the building into four sections.
- On the western side the roof functions as a greenhouse for cultivating tropical plants-irrigated using rainwater collected from roof tops.

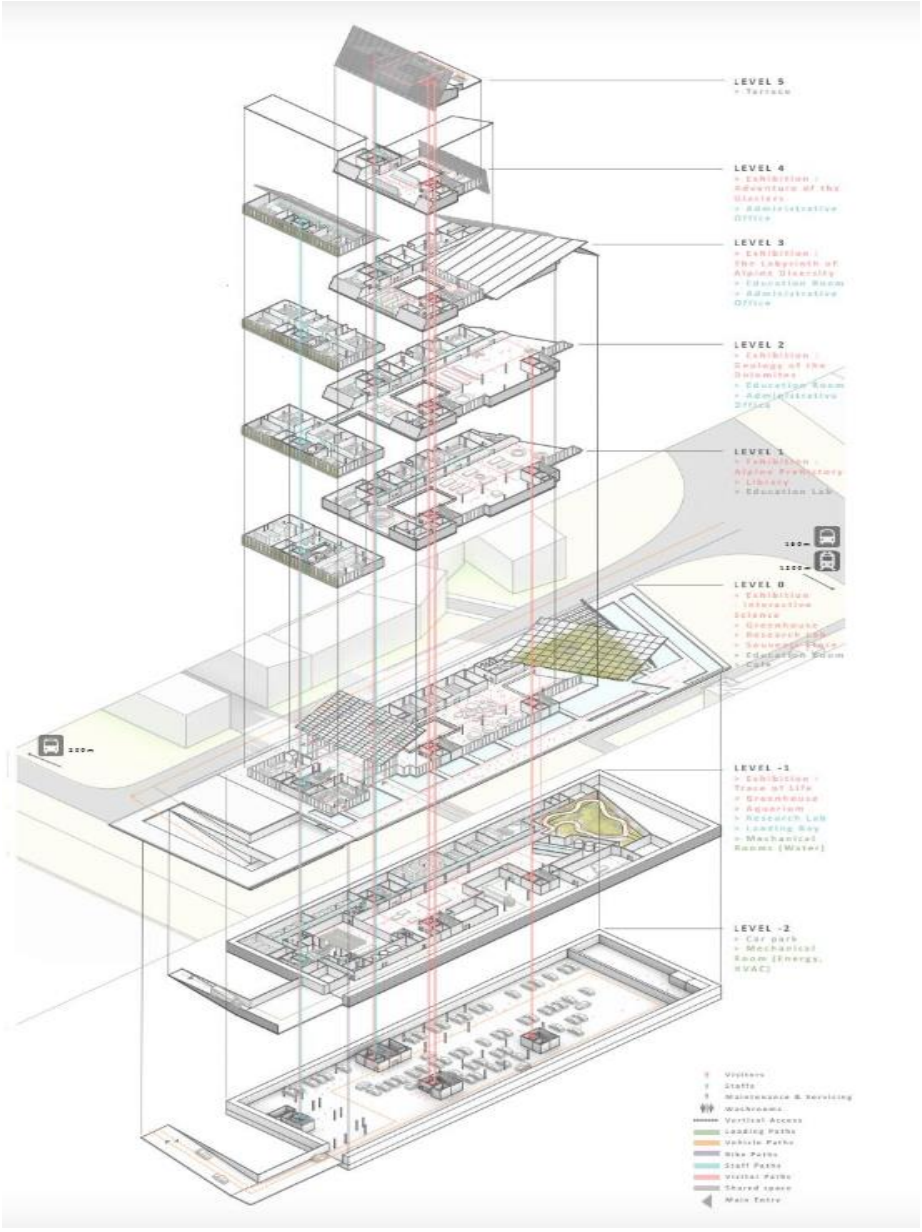


Figure 111 Axonometric diagram of circulation and spatial organization

3.6 SHANGHAI URBAN PLANNING CENTER

3.6.1 Background

- Located in Peoples square,shanghai
- Established:25th February 2000
- Type:Urban Planning museum
- Key holdings:scale model of the city
- Visitors:5 million(since 2000)
- Owner:Municipality of Shanghai

Figure 112 Shanghai Urban Planning Center exterior

- Displays the long-term development, the overall municipal layout at present, and the following urban planning of Shanghai.

The Exhibition Center is a six-story building, with two basement levels, which displays Shanghai's urban planning and development. The focus of the exhibit is a large scale model of the entirety of urban Shanghai, showing existing buildings and approved future buildings. Other exhibits relate to Shanghai's history and planned development, including smaller scaled models focussing on particular areas of interest such as the Bund. The Exhibition Center also has space for temporary exhibitions with a wide range of subject matter.

3.6.2 The display

The whole Shanghai Urban Planning Exhibition Center of 7000 square meters wide has 7 floors to show the historic change and future blueprint of Shanghai as well as many excellent international exhibitions.

The Interlayer – Historical & Cultural Change Review

The Interlayer between the first floor and the second in Shanghai Urban Planning Exhibition Center is a hall to **reflect the giant change of Shanghai during the past one hundred years**. While interacting with the multimedia devices, watching the prosperous beauty of Yu Garden for a century, seeing the pictures telling the stories of old Shanghai and the introduction of the 12 historic protection zones in Shanghai, you will know the rich past history and culture of this modern city.

3.6.3 Basement 1 – "1930 shanghai – style street"

Visiting the Floor B1 at the basement, you will **feel like being in the old Shanghai in the 1930s**. Shanghai Urban Planning Exhibition Center takes advantage of this floor to show people the typical buildings in diverse styles from France, Britain, Japan, Spain, etc., and lanes in Shikumen. It forms the so original appearance at that period that people can find the rich flavor of old Shanghai.

Old Pictures of Shanghai

Figure 113 Old pictures of Shanghai

Rich Flavor of Old Shanghai on Basement 1

3.6.4 Floor 1, 2 & 5 – international exhibitions & sightseeing

The lobby on Floor 1 shows the visitor the models of the main landmarks in Shanghai during each period, and the bright colors emphasize people with the distinct beauty of this city. Together with the second and the fifth floors, Floor 1 is abundant with visitors because of the **frequently held exhibitions from more than 10 countries in the world**. Strolling on these floors, you can find a great number of rare essences in artistic and cultural fields.

Figure 114 Model of landmarks

Besides, since Floor 5 has a circle corridor, it is very enjoyable to appreciate the full sightseeing of the People's Square through the glass window here.

3.6.5 Floor 3 & 4 – master plan & key projects vista

These two floors in Shanghai Urban Planning Exhibition Center is the highlight in your visit here for it shows the municipal progress in recent years and the **vista of the future from 1999 to 2020**. On floor 3, do not miss the **large model of the key area of Shanghai downtown**. After that, you can see the historical course of the Pudong New Area during the 1990s through the 4D animation that is the first one without the glasses domestically, and also experience the rapid pace and modern fashion of the charming Shanghai thoroughly after watching the ring-screen 3D animation presentation for near 8 minutes.

Figure 115 Model of Yu garden

Moreover, you can go up to the 4th floor to see the **professional plan in detail aspects**, like the multimedia system, air harbor, water harbor, residential environment, etc. from which you can feel the lifelike scene of the very beautiful Shanghai in the future. What's fantastic is that you can experience the vivid scenes and feelings in the deepwater port exhibiting area that is decorated with blue sea and azure sky. Also, the urban tourist exhibition area provides a special photographic technique, so you can take a photo with Shanghai city without going outside. In

the Residential planning Exhibiting Area, the models of historical buildings in various periods provide boundless imagination of the living environment of Shanghai people.

Figure 116 Large Model of key area in Shanghai

fig. 3.22. (left) Atrium of Shanghai Urban Planning Exhibition Center, with revolving model of Lujiazui, (right) physical model displays of different sectors

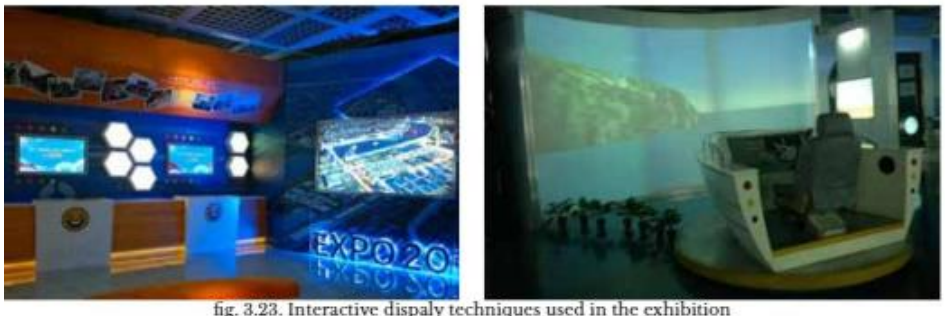


fig. 3.23. Interactive dispaly techniques used in the exhibition

Figure 117 Various Display arrangement

3.7 CHANDIGARH ARCHITECTURAL MUSEUM

3.7.1Background

Figure 118 Chandigarh Architectural Museum exterior

The Chandigarh Architecture museum also known as the City Museum is one of the three museum buildings of the museum complex in sector 10. The art museum and the Science museum are the other two in the museum complex. The structure was designed by Architect S.D. Sharma, who was trained directly under Le Corbusier and Pierre Jeanneret. This building was originally designed as the "Pavilion of Temporary Exhibitions". Later on, The Chandigarh Architecture Museum was established in the building in 1997 to mark the 50th anniversary of the independence of India.

3.7.1 Purpose of the Museum:

Figure 119 Masterplan of Chandigarh

The objective of this museum was to house the documents and information about the planning and design of the city of Chandigarh. This complex depicts the architectural advancements and planning that led to the transformation of Chandigarh as we see it now and the building holds the documentation of the development process from the beginning to the present. It also holds the future plans for the city for academic reference and to educate students, professionals and tourists. The structure is home to the original drawings and documents from the Architecture department of Chandigarh.

3.7.2 Design:

The building in accordance with the brutalist modernism style throughout the union territory is made with exposed concrete. The main cuboid block of the Chandigarh Architecture museum

is simple, elegant 14 metres by 14 metres structure derived from two squares. The double roof over the terrace of the main structure is in the form of two pyramids-one upright and the other inverted-over each square resembling the shape of a parasol. The unique roof is set at two levels and the space between the two is left open to facilitate air and light ventilation. This was in line with Chandigarh's mandate for cost-effective and climate-responsive structures. The façade and the fenestration comprise of glazing for natural lighting and ventilators for ventilation to the building along with the basement. The elevation of the minimalistic building is embellished with an external ramp used for vertical circulation.

The design of this building is adapted from Le Corbusier's earlier design of an Exhibition Pavilion at Zurich in 1965. The same concept was used for the Pavillon des Temps Nouveaux, at Porte Maillot, Paris in 1937, and later in the design of the Ahrenberg Pavilion in Stockholm in 1962. Unlike the Pavilion at Zurich which is constructed in steel and aluminium, Le Corbusier designed this museum building at Chandigarh in exposed reinforced concrete.

Figure 120 Exposed concrete exterior

3.7.3 Planning:

The Chandigarh Architecture Museum comprises four levels which are accessible utilizing the internal staircase or the external ramp. The access to the museum is a tube-like staircase which opens into the first level i.e. the basement. The floor has a reception area connected to the gallery. The displays on this level convey the trauma of the partition, the need & conception of Chandigarh, site selection, etc. with the help of rare documents, maps, drawings, and photos. The features of the site finally selected such as its topography, existing villages, vegetation, the archaeological history, and the other factors affecting the design of the city are documented. The selection and appointment of the original team of architects and other professionals are also documented. The display also consists of a framed letter written by Mathew Novicki two

weeks before his death. He along with Albert Mayer was originally commissioned for the Chandigarh project.

The second-floor exhibit shows Corbusier's team and the work undertaken by them, this consisted of drawings, models, and blueprints of the architects' built and unbuilt works. The third level has the theme of 'Chandigarh Today and Tomorrow' i.e. the future development plans of Chandigarh after its first phase of construction. This phase was overseen by Corbusier and Jeanneret before their departure. Level four comprises a snack bar and a terrace with the majestic Shivalik ranges in its background.

3.7.4 The Displays

Figure 121 Visitors watching displays

The exhibit consists of the original documents, drawings and correspondence between the Architects and the administrators who worked on Chandigarh's blueprint. The displays in Chandigarh's Architecture Museum also consisted of furniture along with a life-size replica of Pierre Jeanneret's room. Amongst other exhibits, the basement also has a giant panoramic view of the site chosen for Chandigarh along with the Shivalik ranges. The second level has a section dedicated solely to the unbuilt works of Corbusier. The Architect employed innovative lighting and arrangements for the display.

The museum's significant, innovative features include interesting display systems such as translites, models, drawings, documents or their reproductions on acrylic panels. Rare correspondence and other original documents and drawings are also available for public viewing.

The museum building encapsulates the essence of Chandigarh from the inception of its idea. It documents the historical and political backdrop of the first planned city of India. The displays narrate the story of Chandigarh which progresses as we go up the levels. The structure itself embodies the CorbusianBrutalist Modernism. It also is in line with the simple and minimalistic theme observed throughout the structure. Hence the Architecture museum is an attraction for Architects and students due to the wholesome narration of the city's history.

3.7.5 Level 1

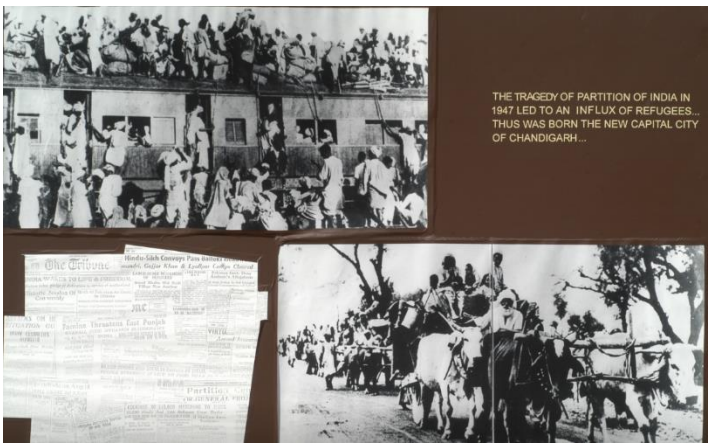


Figure 122 Photos during partition

The museum is entered through a tube-like stairway at level - 1, which is the basement. Here, the panels unfold the trauma of the Partition of the country in 1947, and the need to build the new capital city of Chandigarh. The story of the selection of site, and the accompanying controversies are displayed through rare documents, maps, and drawings. The features of the site finally selected such as its topography, existing villages, vegetation, archaeological history, and a panoramic view of the Shivalik Hills provide a fascinating picture of the land which was to be transformed into the new city.

The exhibits focus on the selection of the first team of architects which comprised American planner, Albert Mayer, and a Polish architect, Matthew Nowicki. It includes evocative sketches, studies and drawings visualizing various housing projects, shopping schemes, and other features of a neighbourhood unit. These panels also demonstrate the enormous amount of pioneering work done by Mayer and Nowicki for developing an architectural style suited to the Indian context, and to evolve the first master plan and schematic idiom for Chandigarh.

3.7.6 Level 2

An internal staircase leads to the upper floors symbolizing the gradual evolution of Chandigarh's growth. The level - 2 is earmarked for exhibits showing Le Corbusier and the selection of his team and their work. Models and blueprints of the important buildings designed by Le Corbusier for Chandigarh are on display. Also included a special section on Le Corbusier's 'unbuilt masterpieces' such as the Governor's Palace, the Museum of Knowledge, and Sports Stadium in Sector 26.

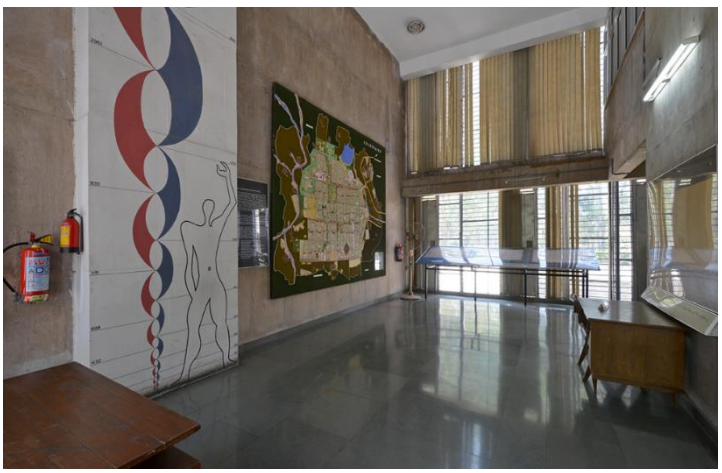
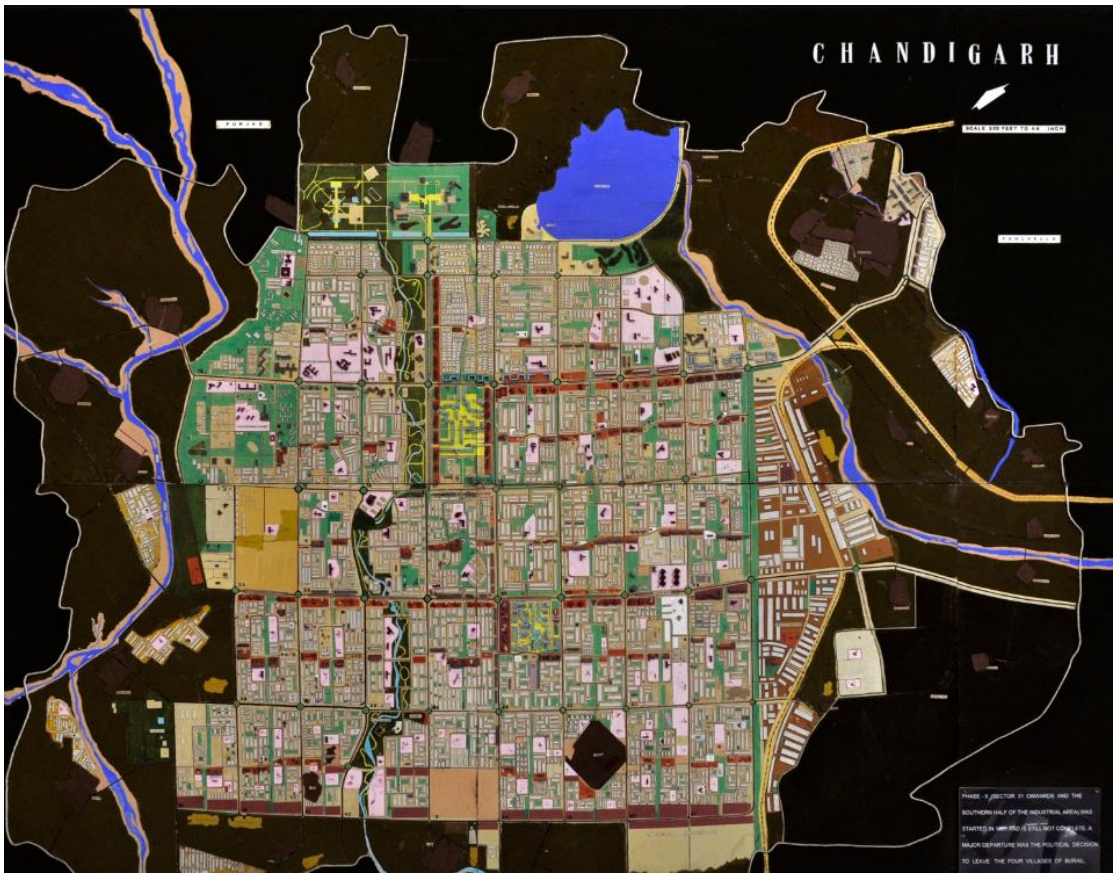


Figure 123 Display in lvl 2

3.7.7 Level 3

The level - 3 is reserved for the theme 'Chandigarh: Today and Tomorrow'. This section broadly displays the city's growth after the first phase of construction and the departure of Le Corbusier and his foreign associates - Pierre Jeanneret, Maxwell Fry and Jane Drew.



3.7.8 Level 4

Level - 4, which is the uppermost floor, serves as terrace and there is a snack bar designed to offer light refreshments against the backdrop of Shivalik Hills. The terrace is also intended to be used to display sculptures, murals, and other art works.

3.7.9 The unbuilt structures

The architecture museum has a fine collection of original pieces and recent reproductions that represent many of the designs created for Chandigarh. A recreation of Pierre Jeanneret's living room gives one an intimate sense of the person Jeanneret was.The museum also holds

Figure 124 Models of unbuilt structures

4 SITE ANALYSIS

4.1 Overview

The site is located at the heart of Kathmandu i.e at Tinkune,which is just adjacent to the Tinkune Park.It is one of the major junction of the 3 cities in the valley. Moreover,the site is located near the international airport which has various sigificannce.The site consists of major educational institutions,hospitals a wide range of market pace and most importantly the tinkune park.The site is the intersection point of the 3 cities of the valley.So,it is one of the busiest place of the valley.

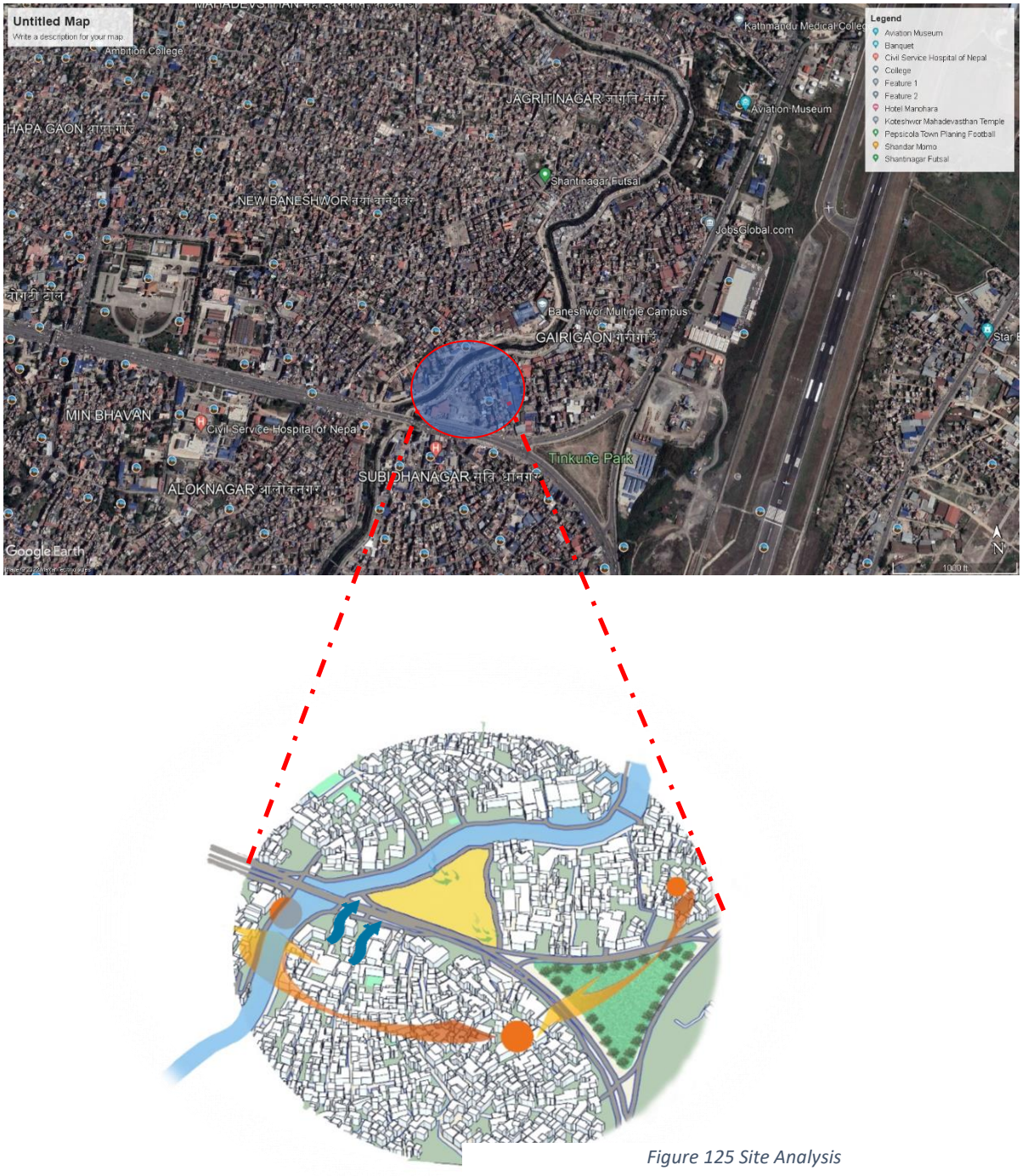


Figure 125 Site Analysis

4.2 Site introduction

LOCATION:
Tinkune,Kathmandu

COORDINATES

27°41'07.9"N

85°20'50.4"E

AREA: 19000 sq.m (approx.)

ZONE: Commercial sub-zone

Topography: Slightly sloped towards West

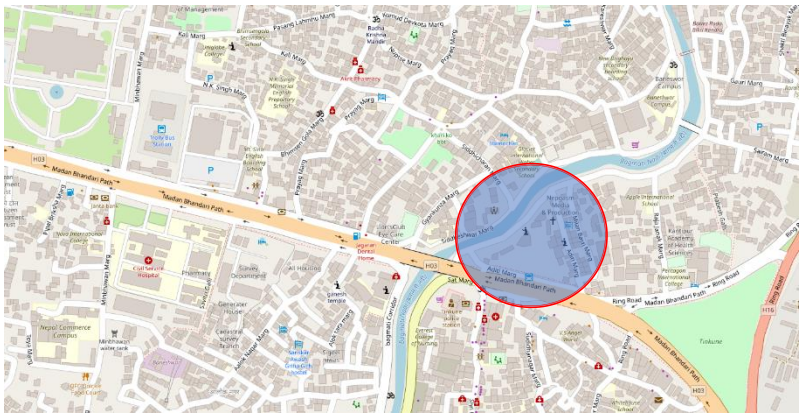


Figure 126 Site Location

4.3 Site Selection Criteria

- The main key factors to be considered during the site selection procedure for the architectureal museum is that the site should be located at closer proximity to the airport and the main entry point to the valley(i.e kalanki).
- Person from outside the valley can access the site easily after they enter the valley by air or by road as the site is located 1.7 km away from the international airport and 6 km away from Kalanki.
- The site lies in TINKUNE, which is a part of Kathmandu Metropolitican city.So,the site is perfect for the Architectural Museum.
- Moreover all the infrastructures are well developed there due to the prime location.

4.4 Site characteristics

Access and Circulation

The site is adjacent to the main road in the South but 12 ft below the main road in the South.Beside that the site can be accessed by the roads in the west and east.The road in the South is 36m,West is 12m and East is 6m.

Topography

The maximum site is flat but in some area it is slightly sloped towards West.

Visibility

The site is visible from all the sides without any obstructions

Pedestrian Access

Site is accessible via Pedestrian pathway

Public Transport

There is a Public Bus stop right outside the site thus making it easier for the users to access the site.

Infrastructure

The site is located amidst sufficient infrastructures such as Hospital, Education Institutions, Restaurants, Shopping precincts and Commercial complexes.

4.5 Immediate surrounding

NORTH: Restaurant

EAST: Bmw showroom

WEST: Bagmati river

SOUTH:kantipur hospital,siddhartha bank

Figure 127 Site photos

4.6 Climatic analysis

The climate plays a big role in how to design the building, and the amount of isolation needed to achieve thermal comfort. The mean minimum temperature in Kathmandu is 12°C and mean maximum temperature is 25.7°C whereas the average annual rainfall is 1448mm. the figure below shows the temperature, where the red curve is the maximum temperature, the green curve is the minimum temperature. The violet curve is the average precipitation on the day.

Climate analysis is crucial for the project, to understand the extreme sunlight change from winter to summer. During the winter, the low sun angle provides with little sunlight and long shadows for a very short amount of time while in summer, the high sun angle gives long hours of sunlight.

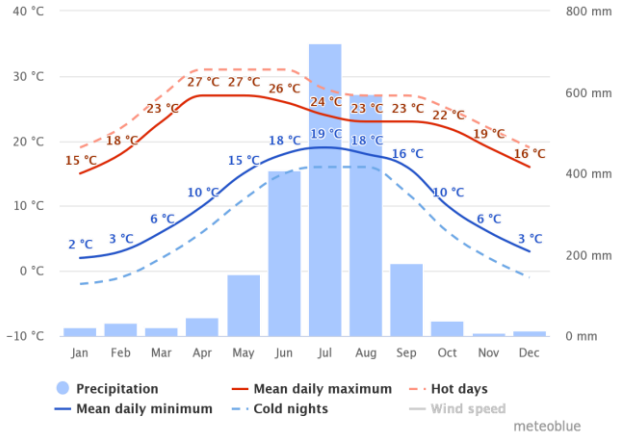


Figure 129 Temperature and rainfall chart [Meteoblue,2021]

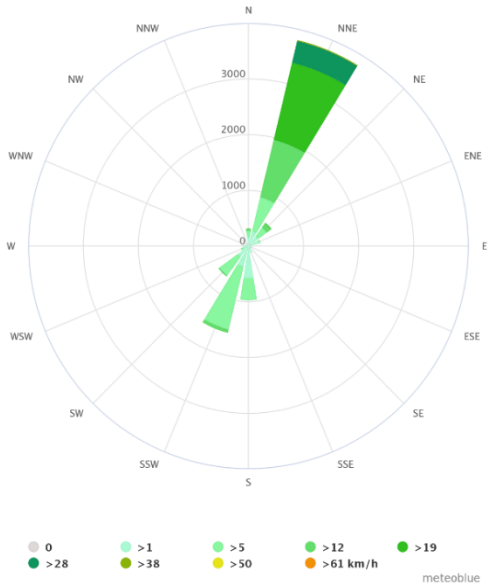


Figure 128 Windrose Diagram [Meteoblue,2021]

4.7 Swot analysis

STRENGTH:

- Located in a prome location.
- Better catchment area
- Easily accessible from major parts of the valley by local transportation.
- Better services and infrastructure available

WEAKNESS

- Site lower than main road.
- Near to main road which may cause noise and air pollution.

OPPORTUNITIES

- Possibility of making the building as a landmark.
- Almost flat terrain with gentle slope makes design and construction easy and effective.

THREATS

•High chance of water accummulation due to low level of site.

5 PROGRAM FORMULATION

S.N	DESCRIPTION	NO. OF UNITS	AREA(SQ.M)	TOTAL AREA(SQ.M)
1	**ENTRANCE**			
	Entrance court/lobby			150
	Reception+Info help desk	1	20	20
	Waiting Area		30	30
	Ticket Counter	2	20	40
	Security check in/out	1	25	25
	subtotal			265
2	**ADMINISTRATION**			
	Director General chamber	1	20	20
	Curator Office	1	25	25
	Executive staff office	1	120	120
	Staff rest room	1	12	12
	Meeting/Conference room	1	60	60
	File record room	1	15	15
	IT workroom	1	25	25
	CCTV monitoring room	1	25	25
	Toilet(M/F)	2-Jan	20	40
	Store	1	50	50
	subtotal			392
3	**EXHIBITION GALLERY**			
	Elements of Architecture Gallery	1	150	150
	Principle of Architecture Gallery	1	150	150
	Nepalese Architecture History Gallery	1	350	350
	Architectural Design Gallery	1	200	200
	Interior Design Gallery		100	100
	Architectural Model Gallery	1	200	200
	Conservation Gallery	1	150	150
	Nepalese Architects Gallery		150	150
	World Architects Gallery	1	200	200
	Vernacular Architecture Galley	1	150	150
	The grand hall	1	300	300
	Light Gallery	1	150	150
	Students Gallery	1	250	250
	Art Gallery	1	200	200

	VR Gallery	1	100	200
	subtotal			2900
4	**WORKSHOPS**			
	Art Workshop	1	200	200
	Metal/wooden Workshop	1	200	200
	Sculpture Workshop	1	200	200
	Clay workshop	1	200	200
				800
5	**Co-working space**			
	Library	1	100	100
	Co-working	1	200	200
				300
6	**AUDITORIUM**			
	Seating	200	1.5/person	300
	Stage	1	90	90
	Backstage		75	75
	Foyer		100	100
	Toilets	8	Urinals-8 for 300-600	40
		4	Male w/c -4 for 300-600	605
		6	Female w/c-8 for 300-600	
7	**AMENITIES**			
	Restaurant			
	Reception	1	10	10
	Serving Counter	1	10	10
	Kitchen	1	200	200
	Managers Office	1	50	50
	Toilet	1	30	30
	VIP lounge	1	20	20
	Dining Area	1	200	200
				520
7	**ADDITIONAL SPACES**			
	Museum shop	1	200	200

	Art.Auction Area	1	250	250
	Temporary Exhibition Space	1	400	400
				850
8	**SERVICES**			
	Maintenance room	1	20	20
	HVAc room	1	20	20
	Electrical Room	1	20	20
	Fire Protection	1	50	50
	Store	1	20	20
				130
9	**PARKING**			
	Motor Vehicle	50	12	600
	Scooter,Motorbike	60	2	300
	Bicycle	100	0.7	70
	Transportation Vehicle	10	29	290
				1260
10	**OUTDOOR SPACE**			
	Open Air Theatre	1	600	600
	Outdoor Pavillion	2	250	500
	Childrens play Area	1	100	100
				1200
	TOTAL			9222
	CIRCULATION+STRUCTURE			3688.8
	TOTAL			12910.8

6 CONCEPTUAL AND DESIGN DEVELOPMENT

6.1 Concept

The main idea to design an architectural museum is to make it a fascinating place for people to explore and learn about the history, styles, and techniques of different types of architecture. Architectural museum provides a common ground for all the professional architects, students of architecture, teachers , architecture enthusiast and the public. Such museums create a built environment which possess a quality of expression of space and architecture, where everyone, with or without qualification; can be inspired by art and architecture.It also creates public awareness of the role of architecture and design in everyday life and on society and to uplift architecture and architectural practices.

Here are some ideas which the museum includes:

1.Exhibits showcasing different styles of architecture: The museum features exhibits on various architectural styles such as Gothic, Renaissance, Art Deco, and Modern. Visitors could learn about the unique characteristics of each style and view examples of buildings that exemplify each one.

2.Interactive exhibits: Visitors could participate in hands-on exhibits to learn about the techniques used to create different types of buildings. For example, they could try their hand at designing a building using traditional drafting tools or learn about the process of creating 3D models.

3.Exhibits on famous architects: The museum would have exhibits dedicated to famous architects such as Frank Lloyd Wright, Le Corbusier, and Zaha Hadid. Visitors could learn about their lives, works, and influences on the field of architecture.

4.Historical exhibits: The museum will have exhibits showcasing the history of architecture, including how it has evolved over time and the impact it has had on society.

5.Virtual reality experiences: The museum will offer virtual reality experiences that allow visitors to explore famous buildings and landmarks from around the world. This could include historic sites like the Colosseum or modern marvels like the Burj Khalifa.

6.Workshops and lectures: The museum offers workshops and lectures on topics related to architecture, such as sustainable building practices or the use of technology in design.

7.Outdoor exhibits: The museum have outdoor exhibits featuring architectural elements such as arches, columns, and sculptures. Visitors could explore these structures and learn about their historical and cultural significance.

Overall, an architectural museum would be a fantastic way for people to learn about the fascinating world of architecture and the ways in which it has shaped our world.

Approach 1

•The conceptual approach to the design is to create a "flux" in the museum.
•Since the museum envoronment is constantly changing.So changing the experience of the people with respect to the museum environment.

Figure 131 VR in a museum

Figure 130 Interactive exhibit

Approach 2

IDEOLOGY OF PLANNING THE MUSEUM AS A CITY
"I don't think that Architecture is only about shelter,it should be able to excite you,calm you nad make you think.
-Ar.ZAHA HADID

•Proliferated corridors act as a arteries within a city.
•Varying cuboid structures that form the gallery spaces acts as buildings within a city.
•The system of corridors move around the gallery space and connect them within themselves and other programmatic spaces.
•Creating nodal junctions within a museum providing opportunities to create layers of multi-sensory stimuli that users can interact with each other.
•The corridor leads users into a landscaped courtyards,exhibition halls and landscapes.

Approach 3

ARCHITECTURAL MUSEUM AS AN ARCHITECTURAL HUB
Incorporating diffferent interactive and architecture related workshops.

•Conducting different seminars,conventions,exhibitions and other functions related to architecture.

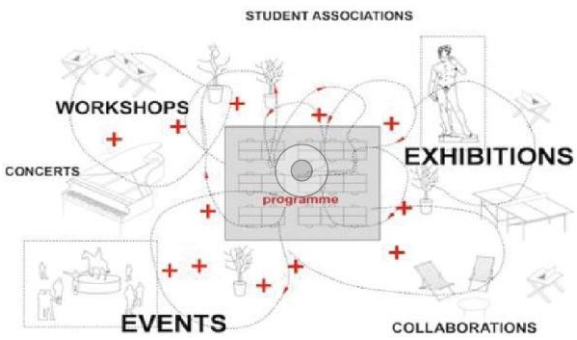


Figure 132 collaborative exhibition

Approach 4

THE EXPERIENTIAL JOURNEY

•Architecture is all about experiencing things,spaces and activiities.
•So,letting people to experience the museum as the journey.
•People can experience different aspects of architecture in this journey

6.2 Zoning Approach

Zoning is an important consideration in the design of an architectural museum, as it can help guide visitors through the exhibits and ensure that they have a coherent and engaging experience. Designing a zoning plan for an architectural museum on a triangular site surrounded by roads on three sides in a busy area like Kathmandu will require careful consideration of the site's unique challenges and opportunities.

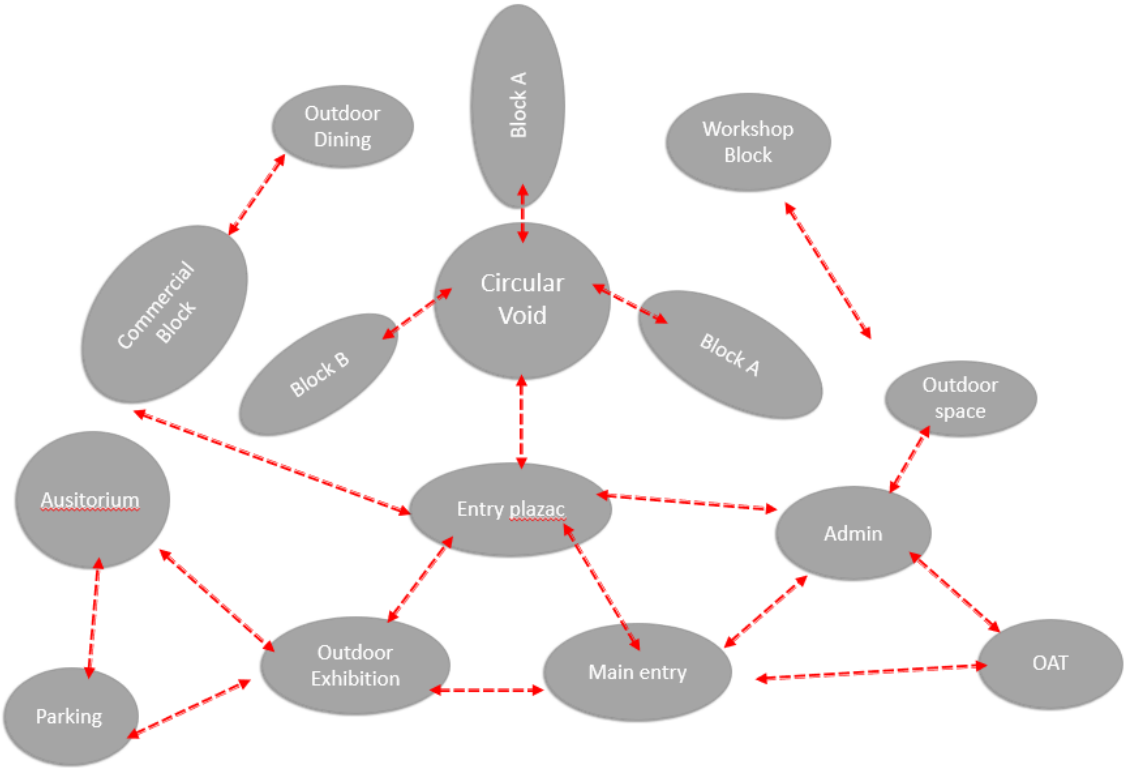


Figure 133 Basic functions of zoning

Figure 134 Master Plan zoning

6.3 Sectional Zoning

As the site is below the main road lvl. So,there is a opportunity to play with levels in different floors. A grand plaza is designed in front of the road so that the visitors get directly to the first floor as shown in the figure below. The visitors can see the contemporary architecture styles displayed in the first floor,past architecture styles below the contemporary gallery and futuristic gallery above it.

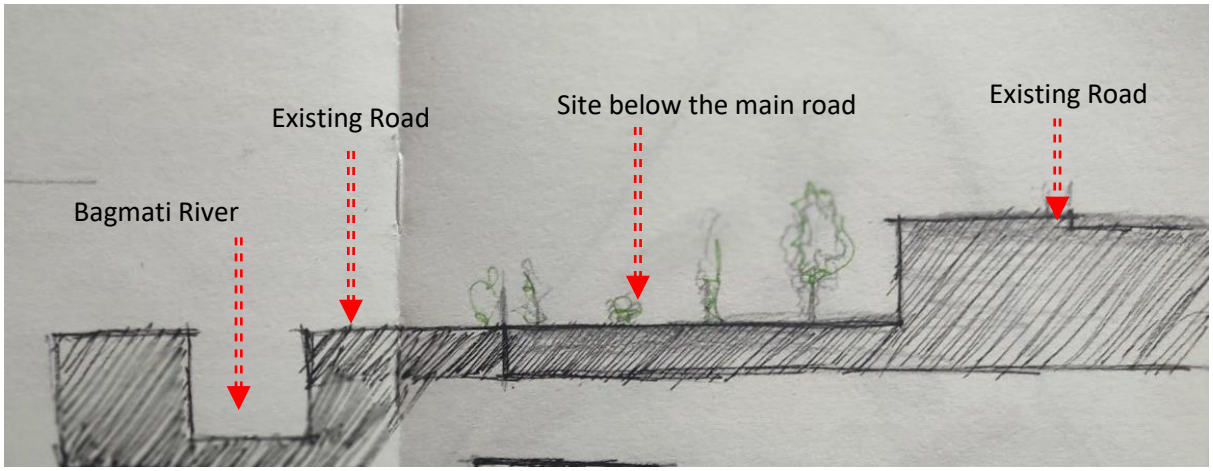


Figure 135 Existing Site section illustration

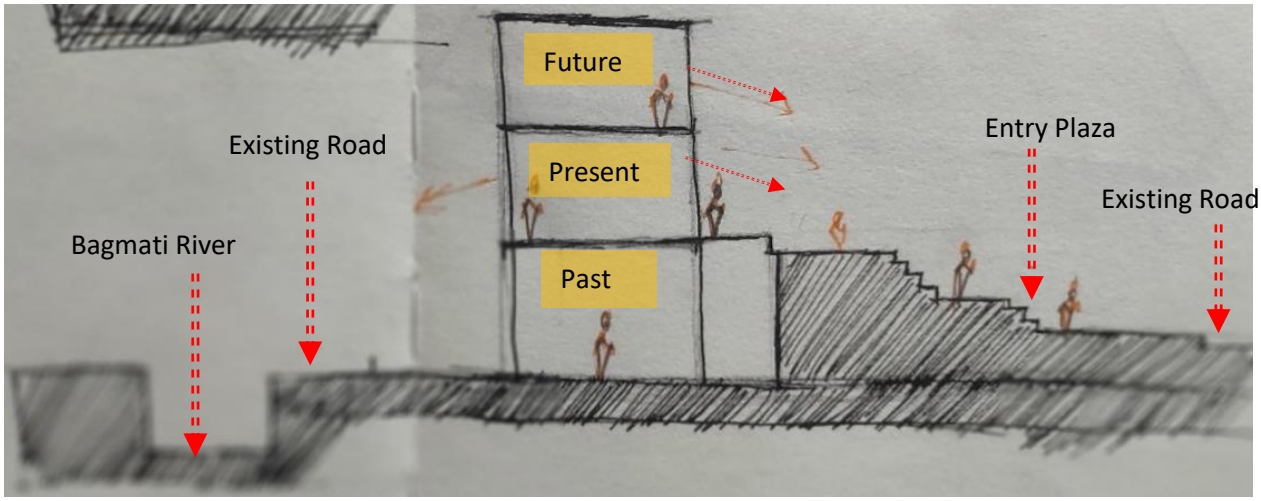


Figure 136 Site sections illustration

6.4 Design development

STEP 1

The site is challenging in terms of its location and the shape. As the site is triangular in shape So,different approach is taken here.Three major nodes were present in the side. So,initial planning was done by drawing major Axis line towards the nodes.

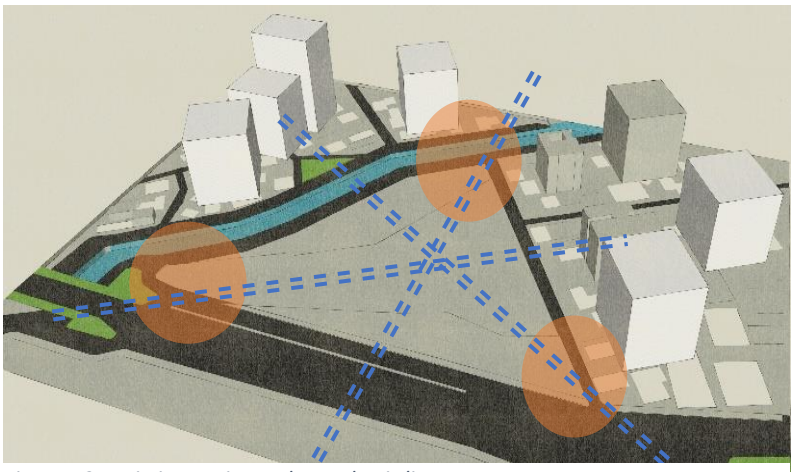


Figure 137 Existing major nodes and axis line

STEP 2

Three rectangular blocks were placed in the three axis lines,which divides the rectangular site into three outdoor open spaces.So, three outdoor space was formed and the negative portion of the triangular site was made more positive.

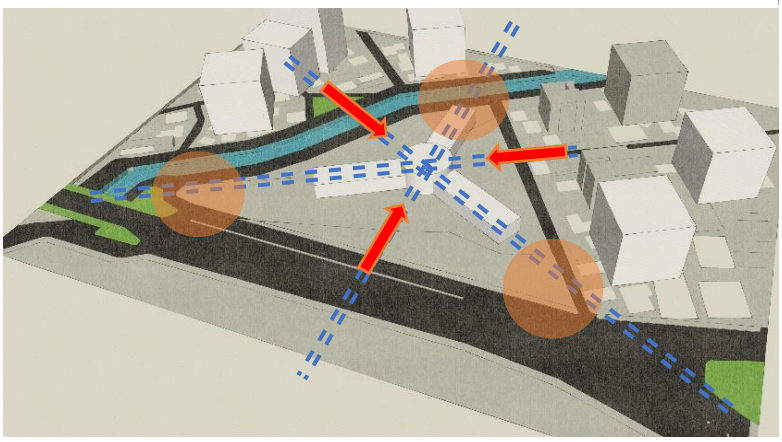


Figure 138 Museum blocks arrangement

STEP 3

A circular block was added as per the program requirement, which connects all the blocks. Pathways connects all three rectangular blocks.

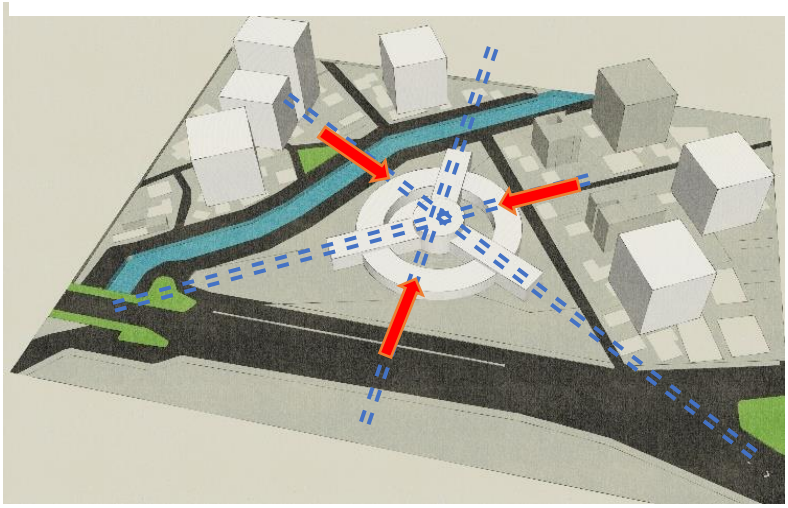


Figure 139 circular ring connecting major blocks

STEP 4

Recreational spaces and other green spaces were added in between the buildings which creates a different atmosphere in between the buildings. A large plaza was developed in the Southern Part which helps to pull the visitors in the museum.

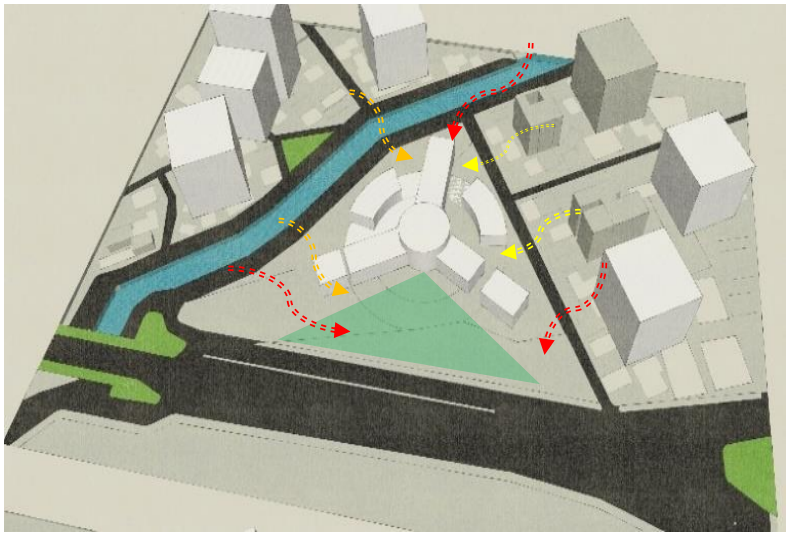


Figure 140 green spaces

STEP 5

The building blocks were transformed as per the design requirements .The volumes was broken down for undisturbed circulation and to enhance thee user experience

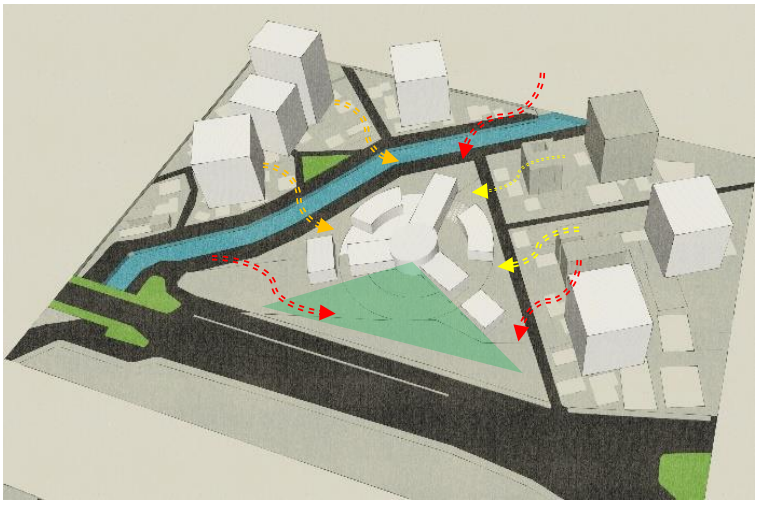


Figure 141 transformation

FINAL FORM

Figure 142 Final form

6.5 Overall form development

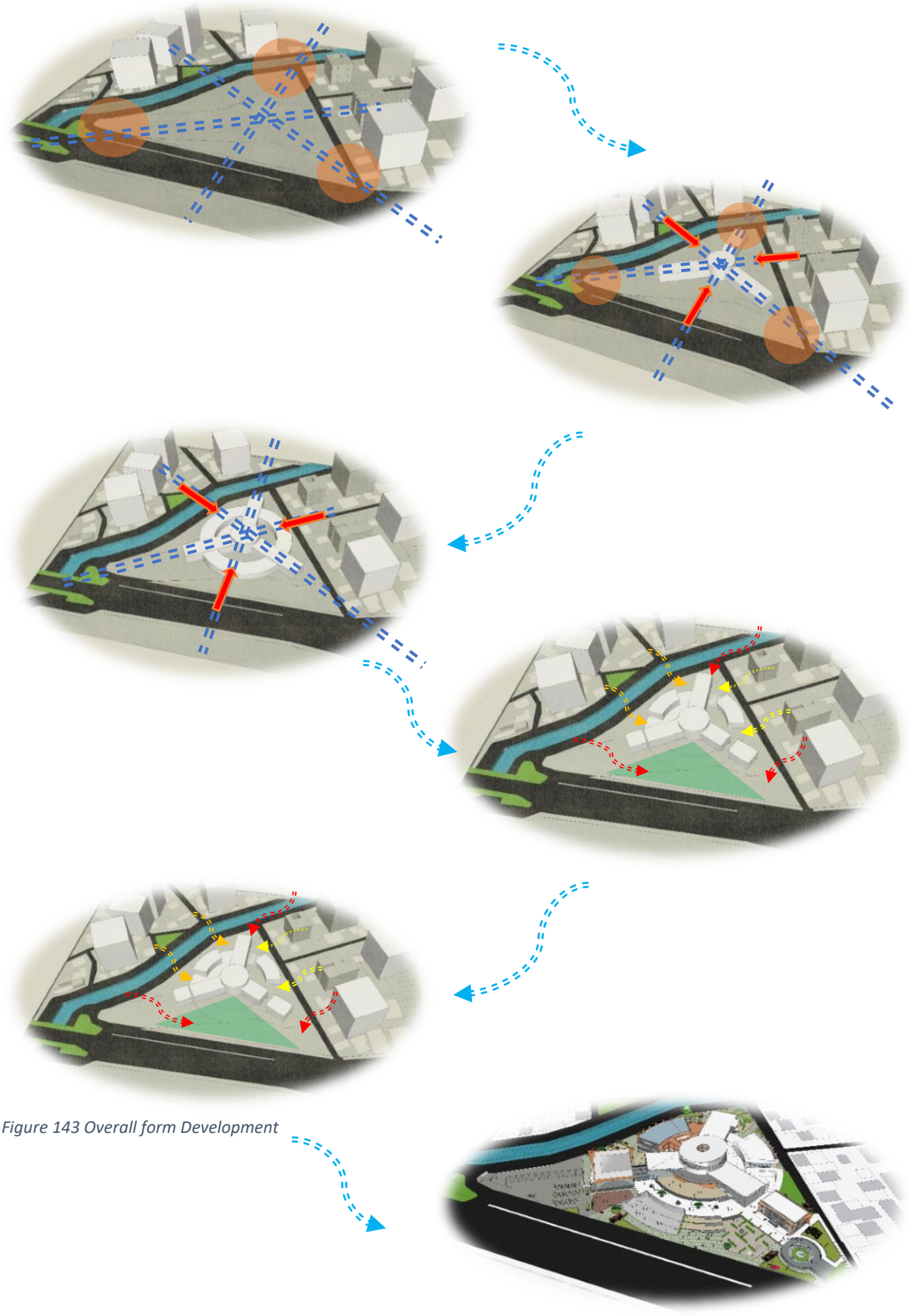


Figure 143 Overall form Development

6.6 Individual Functions

6.6.1 Entry

Entry and circulation zone: Since the site is surrounded by roads on three sides, it is important to have a clear and defined entry point. The southern side, facing the main road, is the main entrance with a public plaza leading visitors into the museum. The circulation path follows a triangular pattern with exhibit zones placed along the path.

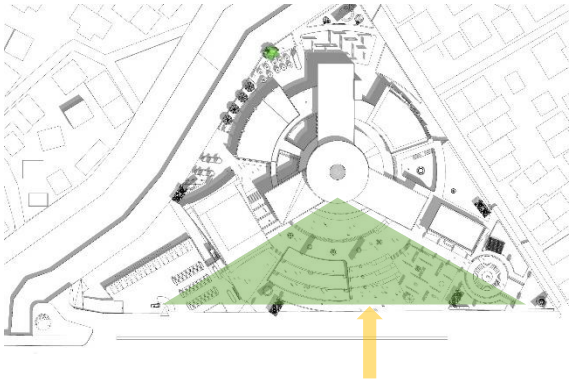


Figure 144 Entry

Figure 145 View towards entry plaza

6.6.2 Outdoor Exhibition Area

As soon as one enters the museum,he/she is welcomed by the large plaza space in the front of the museum. On the western side of the entry portion a huge open exhibition is arranged,where different temporary exhibitions can be done.There will be also different competitions among the students to design the exhibitions areas yearly.

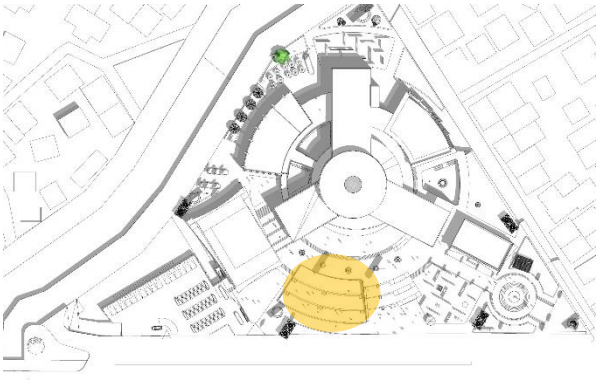


Figure 146 Outdoor exhibition area

Figure 147 View towards exhibition area

6.6.3 Museum Block

Three museum blocks are connected by a circular block. The blocks are radially distributed along the centre of circle making an angle of 120 degree with each other. The detail of the blocks is discussed in the narrative part.

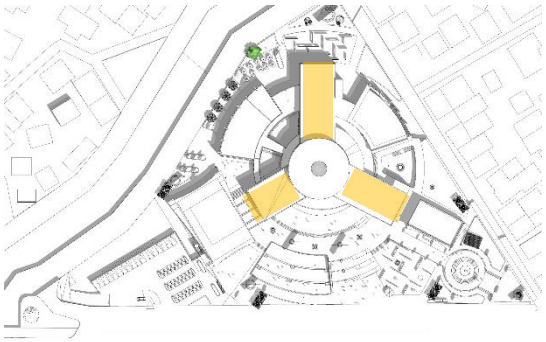


Figure 148 museum blocks

Figure 149 view towards the museum block

6.6.4 Restaurant Block/Commercial Block

The commercial block is placed on the western part of the site. The block consists of a souvenir shop which is just adjacent to the plaza. The restaurant is placed on the ground and first floor. The restaurant has the clear view of the Bagmati river which enhances the visitors experience.

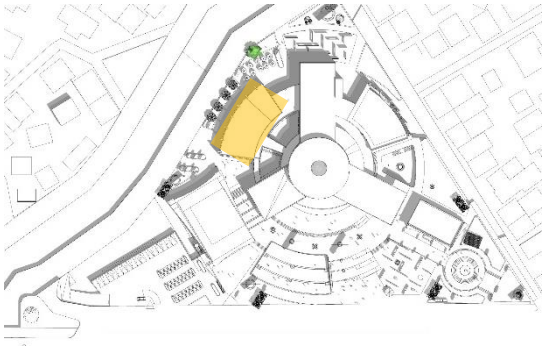


Figure 150 commercial block

Figure 151 outdoor dining

6.6.5 Workshop Block

The workshop block is placed on the eastern side of the site. It is a two storey building where wood workshop, art workshop, metal workshop and sculpture workshop are conducted. Product from the workshop can be placed for the exhibition and it can be auctioned as well.

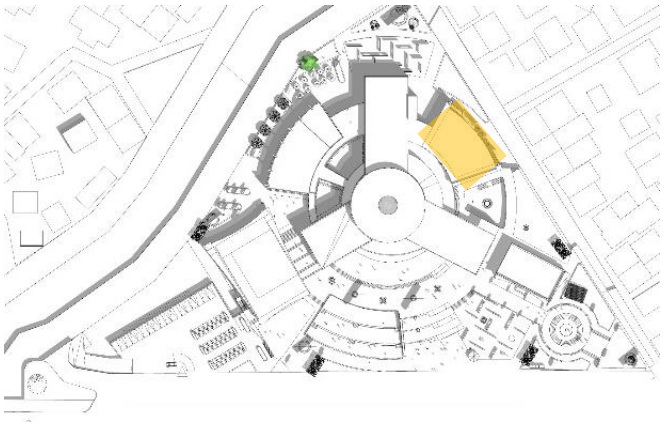


Figure 152 workshop block

6.6.6 Admin Block

The admin block is paced on the eastern part of the site and close to the entry plaza, so that people can easily see the admin areas and get the required information. The elevations of the admin block is kept as similar to the museum block to bring the unity in the design.

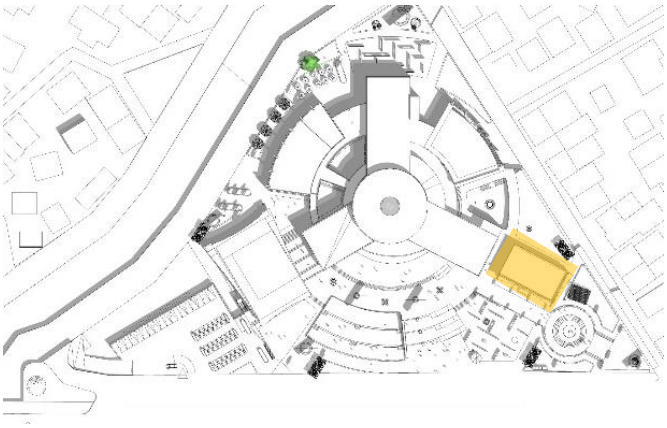


Figure 153 admin block

Figure 154 view towards admin block

6.6.7 Auditorium Block

The auditorium is placed on the close proximity of the partking in the south west side of the site.Different architectural programs and seminars can be conducted in the auditorium hall. The auditorium hall can also be rented for the commercial purpose so that the museum can be self sustained.

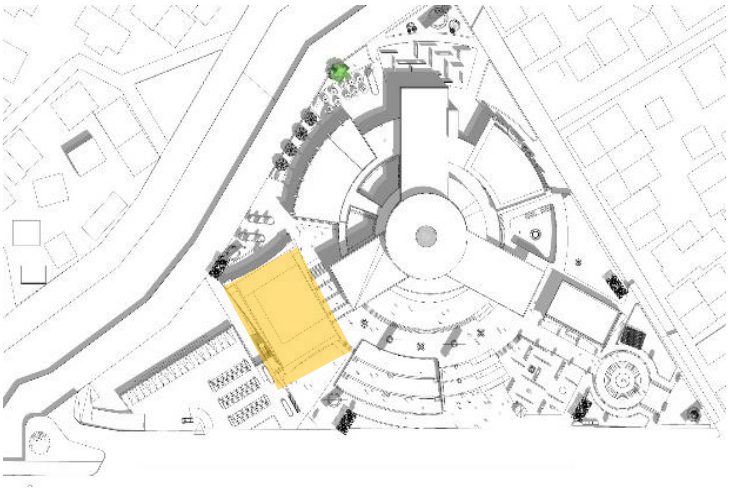


Figure 155 Auditorium

Figure 157 Auditorium block from parking

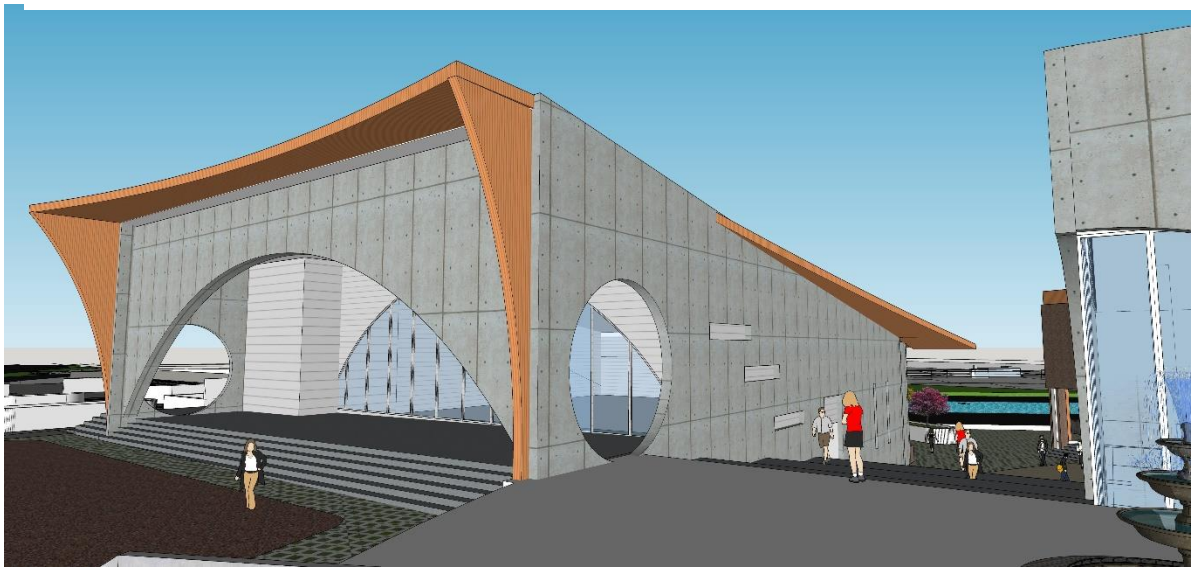


Figure 156 auditorium view from museum entrance

6.7 Museum Galleries Narrative

6.7.1 The Circular Void

As the visitor gets through the museum, their eyes are immediately drawn to the central circular void, which cuts through all three levels of the building. The void creates a sense of space and light, drawing me in and inviting me to explore the different levels of the museum. The circular design is both modern and timeless, giving the space a sense of grandeur and elegance.

Figure 158 circular void and grand staircase from ground level

The two circular staircases that wind their way around the void, connecting the different levels of the museum. The staircases are a work of art in themselves, with each step carefully designed to create a sense of flow and movement. The circular design of the staircases complements the void perfectly, creating a sense of harmony and balance within the space.

As the visitor begin to ascend the stairs, they are struck by the way that the circular void and the staircases interact with each other. From different angles, the void appears to shift and change, creating a dynamic and ever-changing visual experience. As the visitor rach the top of the stairs, they are greeted with a stunning view of the different levels of the museum, with the circular void stretching out.

6.7.2 The Past,Present and Future

As the visitor enter the museum through the main entrance on the second level, they are struck by the stunning contemporary gallery on display. The exhibits on display here showcase the latest trends and innovations in architecture, with a focus on sustainability, eco-friendliness, and modern technologies. The gallery features interactive exhibits, including virtual reality displays that allow visitors to experience different structures and designs in a hands-on way.

Figure 159 Contemporary Architecture floor in circular block

As the visitor make their way down to the first level, they enter the "Past Architecture" gallery, which takes them on a journey through the rich history of architecture from around the world. Here, they see examples of ancient structures, including temples, palaces, and castles, alongside more modern designs from the Industrial Revolution and beyond. The exhibits here are designed to be immersive, with life-sized models, multimedia displays, and interactive exhibits that bring the past to life.

Figure 160 Past Architecture hall in ground floor

The top level is the "Future Architecture" gallery, which offers a glimpse into the cutting-edge designs and technologies that will shape the world of architecture in the years to come. Here, they can see examples of futuristic structures, including high-tech buildings, eco-cities, and even designs for colonizing other planets. The exhibits here are designed to be interactive and immersive, with multimedia displays, virtual reality experiences, and hands-on exhibits that allow visitors to explore the possibilities of the future of architecture in a dynamic and engaging way.

Figure 161 view from the futuristic hall to the ground floor

6.7.3 The Grande Hall

Figure 162 triple height grand hall

As visitors enter the triple height gallery, they are immediately struck by the impressive scale of the exhibit on display below. The masterplan of a city is laid out in intricate detail, with streets, buildings, and landmarks all carefully labeled and highlighted for easy viewing.

Visitors can then move to the different floors above to gain different perspectives on the city's layout and design. From the upper floors, visitors can get a bird's-eye view of the entire city, while the lower floors provide a more immersive experience, allowing visitors to feel as though they are walking through the streets of the city itself.

The exhibit is designed to showcase the importance of masterplanning in the design of cities and urban spaces. Visitors can learn about the key considerations that go into creating a masterplan, including zoning, transportation, and infrastructure, as well as the importance of public spaces, green areas, and other amenities that make a city livable and sustainable.

6.7.4 Elements and Principle of Design Gallery

Figure 163 elements and principle gallery illustration

This gallery is dedicated to exploring the fundamental concepts and ideas that underpin all forms of design, including architecture.

The gallery features a variety of exhibits that focus on the different elements of design, such as line, shape, color, texture, and form. Each exhibit provides a detailed exploration of the different elements and how they are used in various forms of design, including architecture.

In addition to the elements of design, the gallery also features exhibits on the principles of design, such as balance, harmony, contrast, and unity. These exhibits explore how these principles are used to create visually appealing and functional designs in architecture and other fields.

6.7.5 Model Display Gallery

As the visitors make their way through the museum,they come across the model display gallery, which showcases a variety of different architectural models, from small-scale models of buildings to intricate and detailed models of entire cities.From intricate and detailed models of famous landmarks to small-scale models of futuristic cities, the gallery is a rich and diverse exploration of the art and science of architectural model-making.

The model display gallery is a must-visit destination for anyone with an interest in architecture, offering a unique and fascinating exploration of the art and science of model-making.

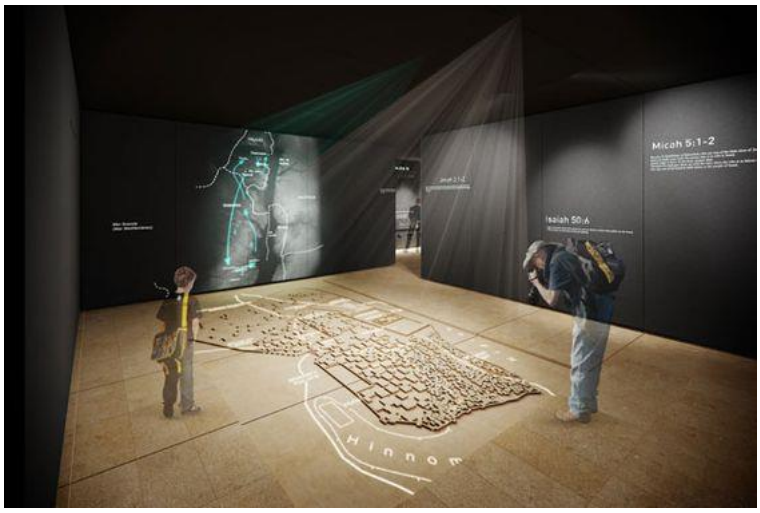


Figure 164 Model Display room illustration

6.7.6 VR Gallery

As the visitors make their way through the different levels of the museum, they come across the VR gallery, which is a unique and immersive experience that offers visitors a glimpse into the future of architecture. The gallery is designed to be fully interactive, allowing visitors to explore different designs and structures in a virtual environment.

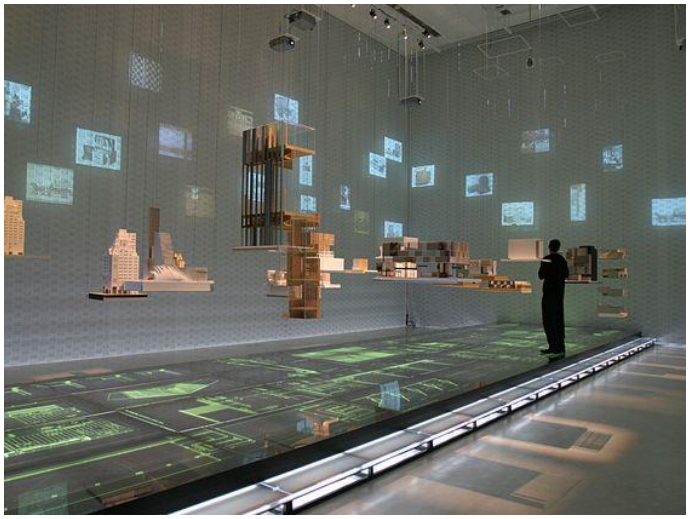


Figure 165 VR gallery illustration

The VR gallery features state-of-the-art technology, including 360-degree cameras and motion tracking sensors, which create a fully immersive experience that feels like they are actually walking through different structures and spaces.The VR gallery offers a wide range of experiences, from exploring the latest designs and innovations in architecture to taking a virtual tour of famous structures and landmarks from around the world.

6.7.7 Product Design Gallery

The product design gallery showcases a wide range of objects and products inspired by architecture and design. The gallery features works by both established and emerging designers, offering visitors a chance to experience a diverse range of styles and techniques.

Figure 166 Product Design Gallery

The product design gallery is a fascinating exploration of the relationship between architecture, design, and the objects that we use in our everyday lives. From furniture and lighting to home accessories and gadgets, the gallery offers a rich and diverse exploration of the ways in which design thinking can transform the objects around us.

6.7.8 Light Gallery

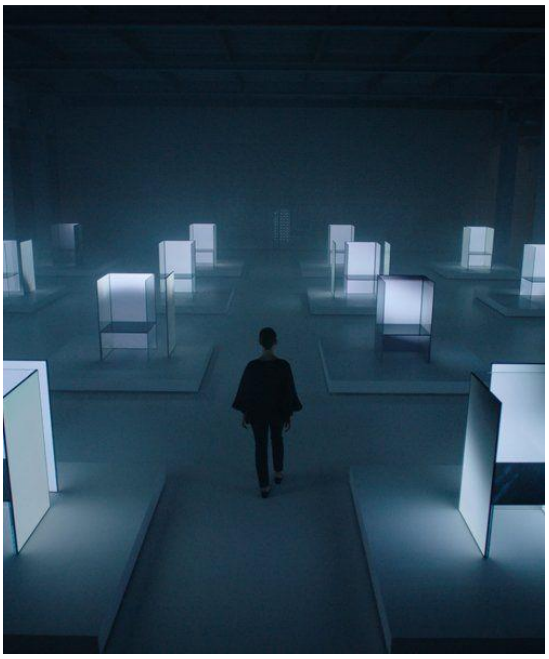


Figure 167 light gallery illustration

The light gallery showcases the important role that light plays in architectural design. The gallery features a variety of exhibits that explore the different ways in which light can be used to create a wide range of moods and atmospheres in architectural spaces.

One of the most interesting exhibits in the light gallery is a series of installations that showcase the way in which light can be used to create the illusion of movement and change. These installations use a combination of lighting techniques and special effects to create a dynamic and ever-changing environment that is both visually stunning and immersive.

It's a great opportunity to gain a deeper understanding of the way in which light can be used to create a wide range of moods and atmospheres in architectural spaces, and to appreciate the skill and creativity that goes into designing these spaces

6.7.9 Art Gallery

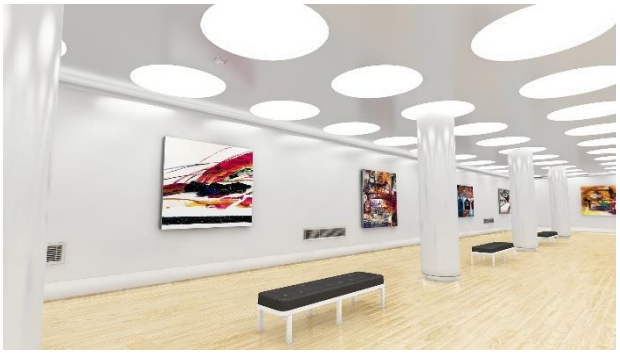


Figure 168 Art Gallery

The art Gallery allows visitors to explore the intersection of art and architecture, and to appreciate the creative vision and skill that goes into designing and constructing buildings and urban spaces.

Overall, the art gallery provides visitors with a rich and immersive experience that explores the many different ways in which art and architecture intersect and interact, and that inspires them to think creatively about the built environment around them.

6.8 Design and Materials

The architectural museum is a stunning example of contemporary design, with a sleek and minimalist exterior that emphasizes the use of clean lines and geometric shapes. The building is characterized by its circular void, which serves as the centerpiece of the museum and provides a striking visual contrast to the rectangular forms of the surrounding galleries.

Figure 169 View from the main road to the front elevation of museum

The exterior of the building is clad in a combination of materials, including glass, steel, and concrete. The interior spaces of the museum are arranged across three levels, with each level dedicated to a specific theme or era of architecture. The main entry to the museum is from the second level, which showcases the present-day contemporary gallery. The level below the second level is dedicated to the past architecture, while the level above the second level features futuristic architecture.

Overall, the architectural museum is a testament to the power of contemporary design and the creative vision of its architects. The careful selection of materials and attention to detail throughout the building create a stunning and functional space that is both visually appealing and practical for the museum's mission and purpose.

6.9 Circulation

The architectural museum is situated in a park-like setting, with expansive outdoor areas that provide visitors with a range of activities and experiences. As visitors approach the site, they are welcomed by a public plaza, which serves as a gathering space and a hub for activity.

To the left and right of the plaza, there are outdoor exhibition areas, which provide a platform for artists and designers to showcase their work in an open and inviting setting. These areas are designed to be flexible and adaptable, with a range of display options that can be customized to suit different exhibitions and events.

For younger visitors, there is a children's play area, which provides a safe and engaging space for kids to explore and play. The play area is designed to be interactive and educational, with a range of features and activities that promote creativity, imagination, and physical activity.

Throughout the outdoor areas of the museum, the use of natural materials and landscaping creates a sense of connection with the surrounding environment. Trees, shrubs, and other plantings are strategically placed throughout the site, creating a sense of natural beauty and providing shade and shelter for visitors.

The outdoor areas of the museum are designed to be accessible and inclusive, with a range of features and amenities that ensure that everyone can enjoy the space. From the public plaza to the play area and the exhibition spaces, the outdoor areas of the museum provide a range of experiences and activities that complement the indoor galleries and exhibits, creating a rich and engaging environment for visitors to explore and enjoy.

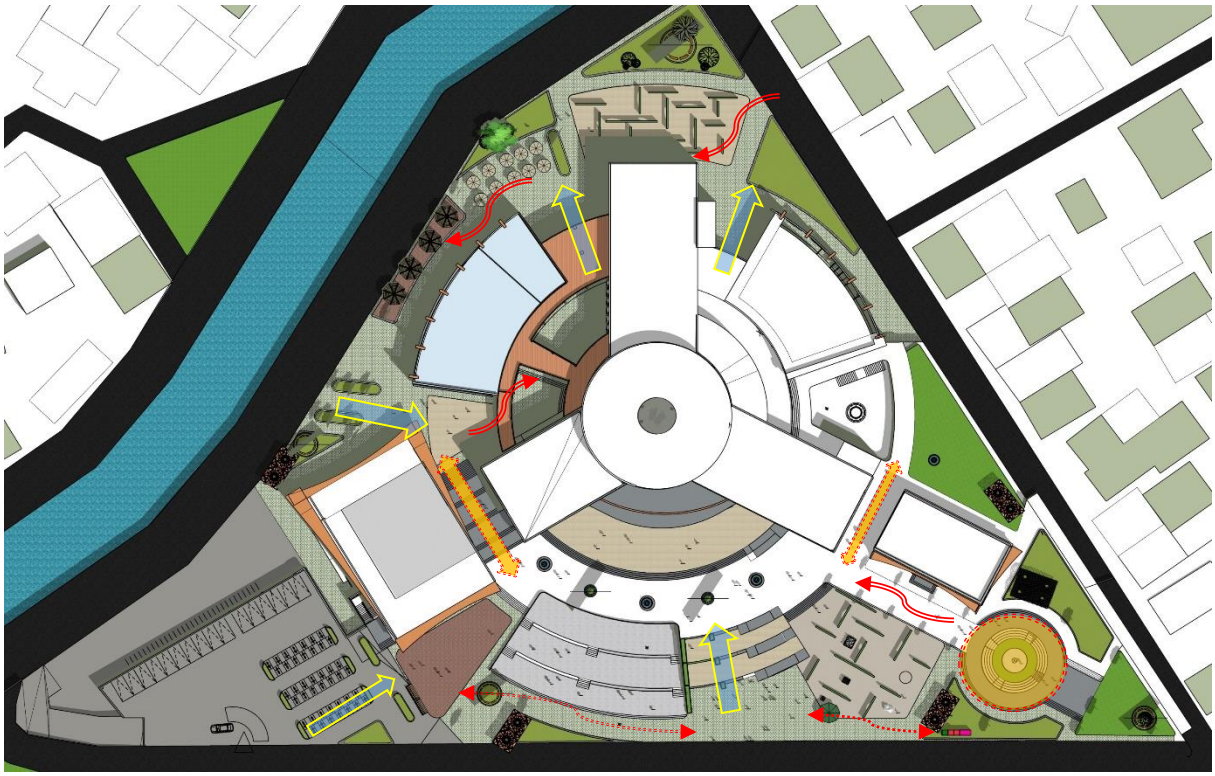


Figure 170 Outdoor circulation in the museum

7.STRUCTURE

In this project, the RCC frame is used in all building block. The sizes of structural element used are listed below:

- Column: 300x300 mm, ,600x600mm
- Beam:
  Main Beam: 300x400mm, 230x 300mm
  Secondary beam: 230x300mm
- Slab :125mm
- The remaining details are in annex attached.

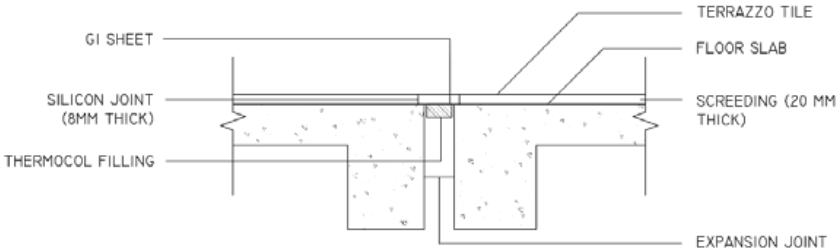


Figure 171 Expansion Joint details

The roads, pathways, parking, etc. used in the design are all paved with permeable materials.Permeable paving is a method of paving vehicle and pedestrian pathways that allows for infiltration of fluids. In pavement design the base is the top portion of the roadway that pedestrians or vehicles come into contactwith. The media used for the base of permeable paving may be porous to allow for fluids to flow through it or nonporous media that are spaced so thatfluid may flow in between the crack may be used. In addition to reducing surface runoff, permeable paving can trap suspended solids therefore filtering pollutants from stormwater

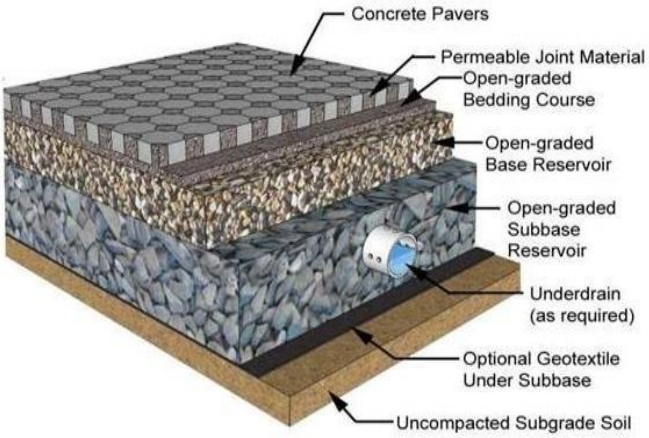


Figure 172 Floor pavement section

8.SERVICES

8.1 Water Supply

To supply water in the site, municipal water line is used as a main source and to avoid the discontinuity of supply of water, boring as the secondary source of water is used. The water obtained from boring is aerated and supplied to the underground water tank and then to overhead water tank through pump. The over head water tank will be used to distribute the water in all the building blocks. And, the separate firefighting water tank is also provided which is attached to the underground water tank.

Figure 173 water supply

Total water demand= 15 cu.m./day
Size of water tank = 15x3 =45 cu.m.(safety factor=3)
Firefighting demand=100 cu.m.(NBC)
Total underground water tank size= 145 cu.m
Height of tank = 3.5 m
Area = Volume/height
= 145/3.5
=41.2 Sq.m.(30 Sq.m)
=6.5m x6.5m

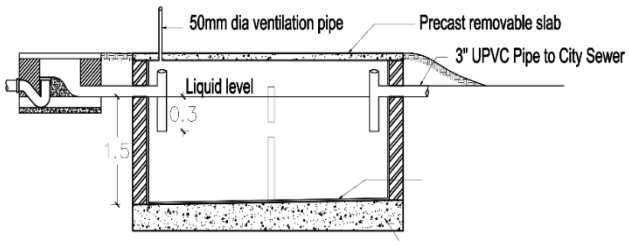
Underground storage = 6.5 m x 6.5 m x 3.5m
Overhead tank size: 15/2 =7.5 cu.m. (half of the underground tank)
Overhead water tank size: 3m x 2m x 1.5m (9 cu.m)

8.2 Sewerage management

The site has access to the municipal drainage line, the soil water and waste water will get collected at the septic tank and soak pit respectively and the overflow will have outlet to the municipal line.

Septic tank:

Quantity of waste water=75-80% of water consumed=10,500 ltrs/day
No. of septic tank=2
Quantity of waste water in each septic tank=5250 ltrs
Now,
Detention Period = 3
Total quantity of waste water in 3 days=10,500ltrs=10.5 cu.m
Volume of sludge=125x0.03x3=11.25=37.759(for 3 yrs)
Required size of septic tank = 23.53+11.25=34.78 cu.m
Let ht of septic tank be 2 metres.
Area of septic tank= 34.78/2=17.39 sq.m
Size of one septic tank=17.39/2=8.695 sq.m
Tentative size of septic tank = 2.5m x2m x2m



Soak pit:

Soil Infiltration(I)=60 l/hr/sq.m

Area=q/I = 326/60=130.73 sq.m

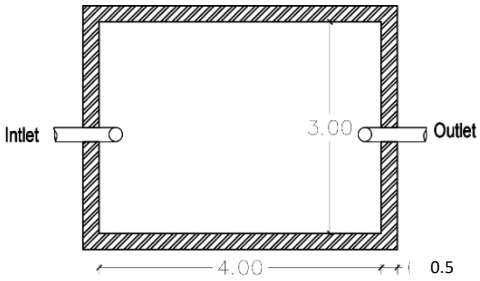
Now,

A=130.73 sq.m

Let,h=2.5m

Then,

d=15.64=16m



As 5m diameter is exceeded,the area has to be divided into 4 soak pits of diameter=16/4=4m and height =2.5m

9. Conclusions

The architectural museum is a dynamic and engaging space that celebrates the art and science of architecture. Through its innovative design, engaging exhibits, and immersive experiences, the museum invites visitors to explore the world of architecture and to engage with the built environment in new and exciting ways.

From the moment visitors enter the museum, they are greeted with a range of experiences and activities that showcase the diversity and richness of architecture. The indoor galleries, which highlight contemporary, past, and futuristic architecture, provide visitors with a comprehensive view of the field, while the VR gallery and model display gallery offer immersive and interactive experiences that engage visitors on a deeper level.

In addition to the indoor galleries, the outdoor areas of the museum provide a range of activities and experiences for visitors, including outdoor exhibition spaces, an open-air theatre, and a children's play area. The use of natural materials and landscaping throughout the site creates a sense of connection with the surrounding environment, further enhancing the visitor experience.

Overall, the architectural museum is a testament to the power of design to inspire, educate, and engage. By showcasing the art and science of architecture in all its forms, the museum encourages visitors to explore and appreciate the built environment, and to imagine new possibilities for the future.

10. Recommendations

Based on the design and implementation of the architectural museum, there are several recommendations that can be made to enhance the visitor experience and ensure the long-term sustainability of the museum.

Firstly, it is recommended that the museum continue to update and refresh its exhibits on a regular basis, in order to keep up with the latest trends and developments in the field of architecture. This can be achieved through partnerships with leading architects and designers, as well as through ongoing research and development of new exhibits.

Secondly, it is recommended that the museum explore opportunities for digital engagement, in order to reach a wider audience and enhance the visitor experience. This could include the development of online exhibits, social media campaigns, and other digital platforms that allow visitors to interact with the museum in new and innovative ways.

Thirdly, it is recommended that the museum continue to prioritize sustainability in its operations, including through the use of renewable energy sources, the implementation of green technologies, and the reduction of waste and carbon emissions. This will not only contribute to the long-term sustainability of the museum, but also serve as an example of sustainable practices for visitors and the broader community.

Finally, it is recommended that the museum continue to engage with the local community, through partnerships with schools, community organizations, and other stakeholders. By providing educational and outreach programs, the museum can help to foster a greater appreciation of architecture and design, and inspire the next generation of architects and designers.

Overall, by implementing these recommendations, the architectural museum can continue to evolve and grow, and maintain its position as a leading destination for architecture and design enthusiasts around the world.

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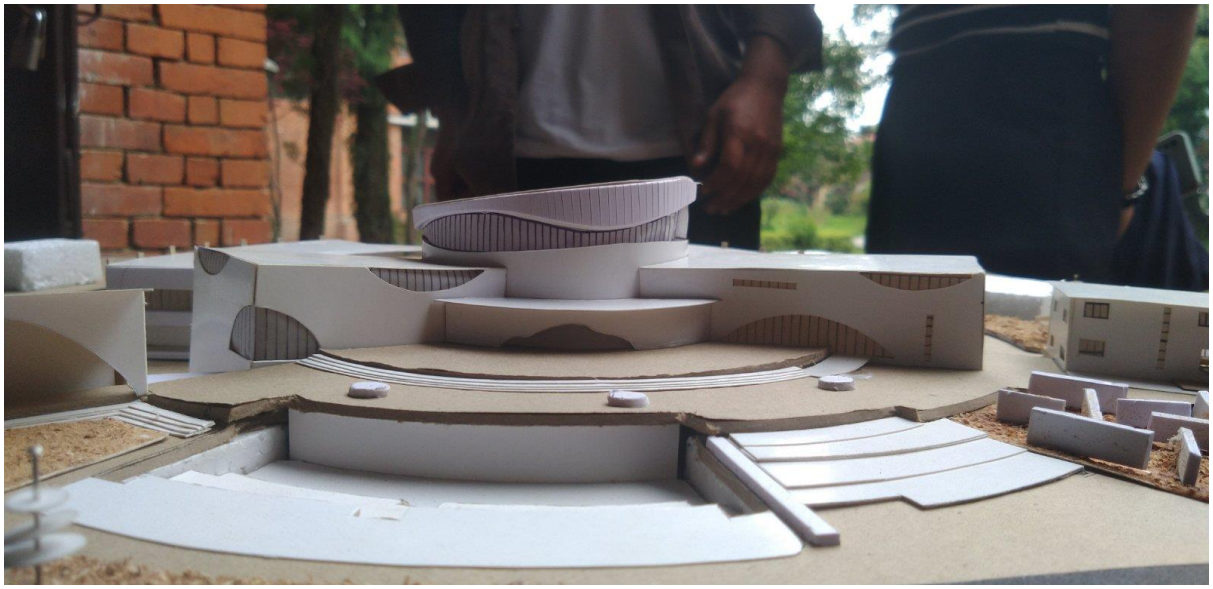
PHYSICAL MODEL


ARCHITECTURAL MUSEUM
SHIVARAM THAPALIYA
074BAE235
SCALE - 1:300



ANNEX