

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
DEPARTMENT OF ARCHITECTURE
PULCHOWK CAMPUS

THESIS REPORT ON DESIGNING
MUSEUM OF CONTEMPORARY ARTS



SUBMITTED TO:

DEPARTMENT OF ARCHITECTURE
PULCHOWK CAMPUS
INSTITUTE OF ENGINEERING

SUBMITTED BY:

MANISH DHOJU
2074/BAE/217

DATE: April 2023

COPYRIGHT

The author has agreed that the library, Department of Architecture, Pulchowk Campus, Institute of Engineering may make this thesis freely available for inspection. Moreover, the author has agreed that permission for extensive copying of this thesis for scholarly purpose may be granted by the professor who supervised the work recorded herein or, in their absence, by the Head of the Department wherein the thesis was done. It is understood that the recognition will be given to the author of this report and to the Department of Architecture, Pulchowk Campus, Institute of Engineering in any use of the material of this project report. Copying or publication or the other use of this thesis for financial gain without approval of the Department of Architecture, Pulchowk Campus, Institute of Engineering, and author's written permission is prohibited. Request for permission to copy or to make any other use of the material in this thesis in whole or in part should be addressed to:

Department of Architecture

Pulchowk Campus,

Institute of Engineering,

Pulchowk, Lalitpur

Nepal

CERTIFICATE

This is to certify that this thesis entitled “Museum of Contemporary Arts” at Maitighar, Kathmandu submitted by Mr. Manish Dhoju has been examined and declared successful for the partial fulfillment of the academic requirement for the completion of the Degree of Bachelor of Architecture.

.....

Asst. Prof. Dr. Dipa Shakya

(Thesis Supervisor)

Date: April 25, 2023,

Department of Architecture,

Institute of Engineering,

Pulchowk Campus,

Tribhuvan University

DECLARATION

I hereby declare that this dissertation has not been previously accepted in substance for any degree and is not being replicated in any manner. I state that this dissertation is the result of my own independent research/ work, except where otherwise stated. I hereby give consent for my dissertation, if accepted to be available for copying and understand that any reference to or quotation from my thesis will receive an acknowledgement.

.....

Manish Dhoju

074-BAE-217

Date: April 25, 2023

ACKNOWLEDGEMENT

First and foremost, I must acknowledge my deep sense of gratitude to my thesis supervisor **Asst. Prof. Dipa Shakya** for her valuable guidance and advice. It would have been a hard task to move forward with my ideas without his suggestion and I am pleased to have her as my supervisor. I would also like to thank The Department of Architecture, Pulchowk Campus and for the kind help in the preparation of this report.

I would also like to acknowledge with much appreciation the crucial role of **Ar. Karishma Manandhar, Ar. Prajal Pradhan, Ar. Mahesh Maharjan,, Ar .Prashant Desai** and **Asst, Prof. Bijay Singh** for assisting me throughout the project answering to my queries about museum and arts.

I would also like to thank the entire Department of Architecture at Pulchowk Campus, both faculty and staff, for all the resources and support they have offered thus far. I would also like to thank my seniors and everyone else who have directly and indirectly offered a critical and helpful perspective on the project. I am grateful to fellow friends at the college who have offered their moral support and understanding throughout these stressful and trying moments.

Manish Dhoju
074 BAE 217

ABSTRACT

The contemporary art of Nepal is becoming more visible on the international stage. Western-influenced Nepali artists have been addressing a variety of current themes with modern styles. A medium for communication or a way to shape an experience, art is more than that. Due to the increasing globalization, there are relatively few opportunities for Nepali artists to explore and show their work to the local community. The Museum of Contemporary Arts is envisioned as a captivating hub for contemporary art where the public may engage with the works and concepts of active artists and comprehend the cultural, social, and historical context of contemporary art.

Table of Contents

CHAPTER 1: INTRODUCTION	14
1.1 CONTEMPORARY ART	14
1.2 CONTEMPORARY ART IN NEPALESE CONTEXT	14
1.3 MUSEUM	14
1.4 PROBLEM STATEMENT	15
1.5 NEED IDENTIFICATION	15
1.6 IMPORTANCE OF THESIS RESEARCH	15
1.7 RESEARCH OBJECTIVES	16
1.8 RESEARCH METHODOLOGY	16
1. LITERATURE REVIEW	16
1.8 RESEARCH METHODOLOGY	17
CHAPTER 2: LITERATURE REVIEW	18
2.1 CONTEMPORARY ART	18
2.2. HISTORY OF CONTEMPORARY ART	19
2.3. STYLE OF CONTEMPORARY ART	19
2.4. CONTEMPORARY ART SCENE OF NEPAL	19
2.5. RELATIONSHIP BETWEEN ART AND ARCHITECTURE	20
2.6. CONTEMPORARY ART, ARCHITECTURE AND THE MUSEUM	21
2.7. MUSEUM	22
2.8. FUNCTIONS OF A MUSEUM	24
2.9. ASPECTS OF MUSEUM	25
2.9.1. SPACE ORGANIZATION	25
2.9.2. ENTRANCE AND ACCESS:	28
2.9.3. CIRCULATION	30
2.9.4. DISPLAY ARRANGEMENTS	34
2.9.5. DISPLAY TECHNIQUES	39
2.9.6. LIGHTING	40
2.9.7. ARTIFICIAL LIGHTING	45
2.10. EXHIBIT MAINTENANCE	50
2.11. MUSEUM SECURITY	50
2.12. UNIVERSAL DESIGN PRINCIPLE	51
3. CHAPTER 3 – CASE STUDIES	53
3.1. NATIONAL MUSEUM, CHHAUNI	53
3.1.1. OBJECTIVE:	53
3.1.2. GENERAL INFORMATION	53
3.1.3. INTRODUCTION	53
3.1.4. ARCHITECTURAL EXPRESSION:	54
3.1.5. SITE ZONING:	54
3.1.6. PLANNING AND FUNCTION:	55
3.1.7. CIRCULATION:	55
3.1.8. LIGHTING	57
3.1.9. INFERENCES:	58
3.2. PATAN MUSEUM, PATAN DURBAR SQUARE	59
3.2.1. OBJECTIVE	59
3.2.2. GENERAL INFORMATION:	59
3.2.6. MUSEUM ENVIRONMENT	63
3.3. MAXXI MUSEUM / ZAHA HADID ARCHITECTS	64
3.3.1. Objectives of study	64
3.3.2. GENERAL INFORMATION	64
3.3.3. GENERAL INFORMATION	64

3.3.4. MUSEUM CONTEXT	64
3.3.5. SPATIAL EFFECTS	67
3.3.6. INFERENCES.....	68
3.4. LOS ANGELES COUNTY MUSEUM OF ART (LACMA), USA	69
3.4.1. DESCRIPTION	69
3.4.2. INTRODUCTION.....	69
3.5. ZEITZ MOCAA, CAPE TOWN, SOUTH AFRICA.....	73
3.5.1. PROJECT INFO	73
3.5.2. INTRODUCTION.....	73
3.5.3. INCEPTION AND DEVELOPMENT	73
3.5.4. SPECIFICATION.....	75
3.5.5. INFERENCES	75
3.6. KIMBELL ART MUSEUM, TEXAS:.....	76
3.6.1. OBJECTIVE: <i>To study</i>	76
GENERAL INFORMATION:.....	76
Location: <i>Fort Worth, Texas, USA</i>	76
3.6.2. INTRODUCTION.....	76
CHAPTER 4- SITE ANALYSIS	82
4.1. SITE LOCATION.....	82
4.2. . SHAPE AND SIZE.....	82
4.3. PHYSICAL CONDITION	82
4.4. ACCESS AND APPROACH.....	82
4.5. SITE SURROUNDING	82
4.6. BYELAWS.....	83
4.7.. CLIMATIC DATA	84
4.8. SITE CHARACTER	85
CHAPTER 5 - PROGRAM FORMULATION	87
CHAPTER 5 – CONCEPT AND DESIGN DEVELOPMENT	89
5.1 CONCEPT	89
5.1.1 DESIGN PHILOSOPHY.....	90
5.2 SITE CONSIDERATION	91
5.2.1 Access and accessibility.....	91
5.2.2 Segregation of noisy space.....	91
5.2.3 Segregation of vehicles and pedestrian	91
5.3 FUNCTIONAL ZONING	92
5.4 DESIGN.....	92
5.4.1 The Entrance	92
5.4.2 The Amphitheatre	93
.....	97
5.4.3 The Museum Entrance	97
5.4.4 The Grand Foyer	98
5.4.5 Gallery 3 (G3)	98
5.4.6 Gallery 1 (G1)	100
5.4.7 Gallery 5 (G5)	102
5.4.8 Gallery 2 (G2)	103
5.4.9 Gallery 4	104
5.4.10 Gallery 6	105
5.5 FORM DEVELOPMENT.....	107
5.5.1 EXPRESSION OF CIRCLE AND SQUARE	107
5.6 CONTEXT OF KATHMANDU	109
5.7 USE OF NATURAL LIGHTING	109
5.8 STRUCTURE	110
5.8.1 Space Truss.....	110

5.8.2 Reinforced Concrete Frame Structure	110
5.8.3. Pre-Stressed Concrete Slab.....	111
5.9 BUILDING SERVICES.....	111
5.9.1. Water Consumption Calculation	111
5.9.2 CALCULATION FOR SEPTIC TANK.....	112
5.10 BUILDING MANAGEMENT SYSTEM	112
5.11 SECURITY.....	113
5.12 CONCLUSION	116
WORKS CITED.....	122

LIST OF FIGURES

FIGURE 1 ROSE, BY ISA GENZKEN	18
FIGURE 2 DONA I OCELL, BY JOAN MIRÓ	18
FIGURE 3 CHARLES THOMSON. SIR NICHOLAS SEROTA MAKES AN ACQUISITIONS DECISION, 2000, STUCKISM	18
FIGURE 4 BARCELONA PAVILLION AND SCULPTURE	21
FIGURE 5 SALÃO NEGRO (BLACK ROOM) AT THE NATIONAL CONGRESS.....	21
FIGURE 6 THE BROOKLYN MUSEUM, C. 1905, DRY PLATE NEGATIVE, 8 X 10 INCHES (THE LIBRARY OF CONGRESS(OPENS IN A NEW WINDOW)). FOUNDED IN 1895, BUILDING DESIGNED BY MCKIM, MEAD, & WHITE	24
FIGURE 7 INSTALLATION VIEW OF MODERN WORKS OF ART: 5TH ANNIVERSARY EXHIBITION, MOMA, NOVEMBER 19, 1934–JANUARY 20, 1935 (THE MUSEUM OF MODERN ART).....	24
FIGURE 8: FUNCTION OF A MUSEUM.....	25
FIGURE 9 SPACE ORGANIZATION DIAGRAM.....	26
FIGURE 10: A SERIES OF ATTRACTIVE VISTAS AT THE ENTRY.....	28
FIGURE 11: DIFFERENT LEVEL OF ENTRY	28
FIGURE 12: DECENTRALIZED SYSTEM OF ACCESS	29
FIGURE 13 CIRCULATION DIAGRAM.....	30
FIGURE 14 MASS CIRCULATION PATTERN.....	30
FIGURE 15 THE VISUAL LINK BETWEEN DIFFERENT FLOORS.....	31
FIGURE 16 CONFUSION IN VISITOR DUE TO LACK OF PROPER ORIENTATION	31
FIGURE 17 RECTILINEAR CIRCUIT.....	32
FIGURE 18: COMB CIRCUIT	32
FIGURE 19: TWISTING CIRCUIT	32
FIGURE 20 : DECENTRALIZED CIRCUIT	33
FIGURE 21: FAN CIRCUIT.....	33
FIGURE 22 CHAIN LAYOUT CIRCUIT.....	33
FIGURE 23: ITNERARY LAYOUT.....	33
FIGURE 24: STAR SHAPED CIRCUIT.....	33
FIGURE 25 NEST OF SMALL CUBICLE CIRCUIT	33
FIGURE 26: SPIRAL CIRCUIT	33
FIGURE 27 HAPHAZARD VIEWING	34
FIGURE 28 GROUP VIEWING	34
FIGURE 29 ISOLATE VIEWING	34
FIGURE 30 : DISPLAY ARRANGEMENT (NEUFERTS ARCHITECT DATA)	35
FIGURE 31: SPACE LAYOUT(TIME SAVER STANDARDS)	35
FIGURE 32 DIVISION OF EXHIBITION SPACE (TIME SAVER STANDARDS).....	36
FIGURE 33 DIFFICULTY IN VIEWING 3 FT ABOVE AND 1FT BELOW	37
FIGURE 34 THE EYE LEVEL OF ADULT AND CHILD	37
FIGURE 35 : SPACE ARRANGEMENT FOR EASY FLOW.....	37
FIGURE 36 FIELD OF VISION (HWEIGHT / SIZE AND DISTANCE)	37
FIGURE 37: APPROPRIATE VIEWING DISTANCE	37
FIGURE 38 OPTIMUM DISTANCE OF VIEWER FROM OBJECT IN RELATION TO OBJECT SIZE.....	38
FIGURE 39: ACTIVE COMMUNICATION.....	39
FIGURE 40: PASSIVE COMMUNICATION	39
FIGURE 41: INTERACTIVE COMMUNICATION	40
FIGURE 42: REACTIVE COMMUNICATION	40
FIGURE 43: VARIOUS SCHEMES OF NATURAL LIGHTING.....	43
FIGURE 44: SKYLIGHT PLACEMENT AS A FUNCTION OF	44
FIGURE 45: EXAMPLE OF TOP LIGHTING STRATEGIES.....	44
FIGURE 46: SLOPED SKYLIGHT FOR SEASONAL LIGHT	44
FIGURE 47:CLERESTORY SPACING AS A FUNCTION OF BUILDING HEIGHT	44
FIGURE 48: LOCATING FIXTURES	46
FIGURE 49: ARTIFICIAL LIGHTING FOR 2-D OBJECTS	47
FIGURE 50: ARTIFICIAL LIGHTING FOR 3D OBJECTS.....	47
FIGURE 51: : ARTIFICIAL LIGHTING FOR 3-D OBJECT, PLAN AND ELEVATION	48

FIGURE 52:SHADOW FORMATION BY IMPROPER LIGHTING	48
FIGURE 53:SHADOWS AND SILHOUETTING	49
FIGURE 54: : LIGHT ATTIC DETAILS.....	49
FIGURE 55: CHHAUNI MUSEUM	53
FIGURE 56: SITE PLAN	55
FIGURE 57: : FLOOR PLANS OF JUDDHA JATIYA KALASHALA	56
FIGURE 58: : FLOOR PLANS OF BUDDHIST ART GALLERY,	56
FIGURE 59: IMPROPER LIGHTING THROUGHOUT THE GALLERY	57
FIGURE 60: PATAN MUSEUM	59
FIGURE 61:SHRINE OF KESHAV NARAYAN.....	60
FIGURE 62: FRONT ELEVATION OF PATAN MUSEUM.....	60
FIGURE 63:SHOWCASE HUNG AT A HEIGHT OF 3'-5"	61
FIGURE 64:ARTIFICIAL LIGHTING TECHNIQUES	62
FIGURE 65:LIGHTING FIXTURE KEPT AT 45 DEGREE	62
FIGURE 66:LIGHTING OBJECTS INSIDE THE SHOWCASE	62
FIGURE 67:ARTIFICIAL LIGHTING	62
FIGURE 68: DAY LIGHTING THROUGHOUT THE MUSEUM.....	62
FIGURE 69 : MAXXI MUSEUM FRONT ELEVATION	64
FIGURE 70:MAXXI MUSEUM	64
FIGURE 71: FIRST FLOOR PLAN OF MAXXI MUSEUM.....	65
FIGURE 72: THE FOYER STAIRCASE.....	66
FIGURE 73: GALLERY 1	66
FIGURE 74: A SECTION OF GALLERY 3	66
FIGURE 76:GALLERY 5 VIEW	67
FIGURE 75: GALLERY 2	67
FIGURE 77 : GALLERY SPACE	67
FIGURE 78: URBAN LIGHT EXHIBITS AT LACMA	69
FIGURE 79 : LEVITATED MASS MICHEAL HEIZER LACMA	70
FIGURE 80 : SMOKE BY TONY SMITH ESTATE (ARTIST RIGHTS SOCIETY)	70
FIGURE 81: RESNICK PAVILLION BY NIC LEHOUX	70
FIGURE 82 :BOARD CONTEMPORARY ART MUSEUM	71
FIGURE 83 :BROAD CONTEMPORARY ART MUSEUM : CROSS- SECTION	71
FIGURE 84: WALTER DE MARIA'S INSTALLATION, THE 2000 SCULPTURE AT RESNICK PAVILLION (LACMA)	72
FIGURE 85: EXHIBITION SPACES IN THE BROAD CONTEMPORARY ART MUSEUM	72
FIGURE 86 : VIEW OF MOCCA IN SILO SQUARE	73
FIGURE 87: RENDERS SECTION OF ZEITZ MOCCA	73
FIGURE 88 :INTERIOR VIEW OF GALLERIES AT ZEITZ MOCCA	74
FIGURE 89: : EXTERIOR OF THE BUILDING	76
FIGURE 90: LOWER FLOOR PLAN.....	77
FIGURE 91:UPPER-LEVEL PLAN.....	77
FIGURE 92 :SECTION OF THE MUSEUM	77
FIGURE 93:THIS PHOTO BY UNKNOWN AUTHOR IS LICENSED UNDER CC BY-NC-ND	78
FIGURE 94: KIMBELL ART GALLERY INTERIOR.....	78
FIGURE 95:THIS PHOTO BY UNKNOWN AUTHOR IS LICENSED UNDER CC BY-SA	78
FIGURE 96 :DIFFUSE LIGHT INSIDE THE GALLERY	79
FIGURE 97:LIGHTING DETAIL.....	80
FIGURE 98: SITE LOCATION	82
FIGURE 99: LOCATION OF THE SITE.....	82
FIGURE 100: CLIMATIC AND DATA CHART	84
FIGURE 101: SITE PHOTOS	86
FIGURE 102: SITE PANAROMIC PHOTO.....	86
FIGURE 103 : SPACES VISUALIZATION	90
FIGURE 104 : ZONING	91
FIGURE 105:ACCESS TO THE SITE	91
FIGURE 106 : NOISE DAIGRAM.....	91
FIGURE 107 : SCENARIO OF ENTRANCE	92

FIGURE 108 : ENTRANCE OF THE MUSEUM.....	93
FIGURE 109 : SECTION OF AMPHITHEATRE.....	93
FIGURE 110 : AMPHITHEATRE PLAN	94
FIGURE 111 : ACTIVITIES THROUGHOUT THE AMPHITHEATRE.....	95
FIGURE 112 : AMPHITHEATRE USING FOR SHOWING ART	96
FIGURE 113 : AMPITHEATRE AS PEDESTAL FOR MUSEUM	96
FIGURE 114 : GRAND RAMP TO MUSEUM	97
FIGURE 115 : MUSEUM ENTRANCE PLAN	97
FIGURE 116 : FOYER	98
FIGURE 117 : G4 SHOWING ART SCULPTURE	99
FIGURE 118 : GALLERY 4 (G3).....	99
FIGURE 119 : SECTION OF G1.....	100
FIGURE 120 : PLAN OF G1	100
FIGURE 121 : NATURAL LIGHT DITRIBUTION ON THE GALLERY 1	100
FIGURE 122 : G1 SHOWCASING A SPECIFIC SCULPTURE.....	101
FIGURE 123 : G1 SHOWCASING DIFFERENT GENRE OF ARTWORKS.....	101
FIGURE 124 : GALLERY 5 SECTION	102
FIGURE 125 : GALLERY 5 (G5).....	102
FIGURE 126 : LIGHT DISTRIBUTION ON G2.....	103
FIGURE 127 : G2 PLAN.....	103
FIGURE 128 : GALLEY 2 (G2) VISUALIZATION.....	103
FIGURE 129 : GALLERY 4 (G4) WITH NAKED SPACE	104
FIGURE 130 : GALLERY 4 (G4) SHOWCASING SPECIFIC ARTWORKS	104
FIGURE 131 : G6 SHOWCASING ARTWORKS AND ONE OF ARTWORKS PAINTED ON FLOOR.....	105
FIGURE 132 : GALLERY 6 SHOWCASING CONTEMPORARY ARTWORKS ON SPECIFIC SETTING.....	105
FIGURE 133 : THE VESSEL.....	106
FIGURE 134 : RECTANGULAR WALL	107
FIGURE 135 : CIRCULAR WALL	107
FIGURE 136 : FORM DEVELOPMENT OF VESSEL	108
FIGURE 137 : LIGHTING IN THE ATRIUM	108
FIGURE 138 : ARCHES	108
FIGURE 139 : SOUVENIR SHOP PLAN.....	108
FIGURE 140 : NATURAL LIGHTING THROUGHOUT MUSEUM.....	109
FIGURE 141 : AXONOMETRIC VIEW OF SPACE TRUSS	110
FIGURE 142 : RCC FRAME STRUCTURE.....	110
FIGURE 143 : PRESTRESSED CONCRETE SLAB BEAM TO DEPTH RATIO	111
FIGURE 144 : BUILDING AUTOMATION	112
FIGURE 145 :BMS ((WWW.UNITYAUTOMATION.COM/IBMS/))	113
FIGURE 146 : SECURITY	113
FIGURE 147 : EAST ELEVATION	114
FIGURE 148 : SOUTH ELEVATION.....	114
FIGURE 149 : WEST ELEVATION	115
FIGURE 150 :NORTH ELEVATION	115

Chapter 1: INTRODUCTION

1.1 CONTEMPORARY ART

Contemporary art is art made today by living artists. As such, it reflects the complex issues that shape our diverse, global, and rapidly changing world. Through their work, many contemporary artists explore personal or cultural identity, offer critiques of social and institutional structures, or even attempt to redefine art itself. In the process, they often raise difficult or thought-provoking questions without providing easy answers. Curiosity, an open mind, and a commitment to dialogue and debate are the best tools with which to approach a work of contemporary art. (Walker, 2014).

Art21 defines contemporary art as the work of artists who are living in the twenty-first century. Contemporary art mirrors contemporary culture and society, offering teachers, students, and general audiences a rich resource through which to consider current ideas and rethink the familiar. The work of contemporary artists is a dynamic combination of materials, methods, concepts, and subjects that challenge traditional boundaries and defy easy definition. Diverse and eclectic, contemporary art is distinguished by the very lack of a uniform organizing principle, ideology, or -ism. In a globally influenced, culturally diverse, and technologically advancing world, contemporary artists give voice to the varied and changing cultural landscape of identities, values, and beliefs. (Art21, n.d.)

1.2 CONTEMPORARY ART IN NEPALESE CONTEXT

The earliest documented artist in the 19th century is Rajaman Chitrakar, in the mid-19th century who was trained by Brian Hodson, the Orientalist British Resident to Nepal. Two influential artists, Chandra Man Singh Maskey and Tej Bahadur Chitrakar in the mid-20th century art scene ushered the definitive beginnings of modernism. Their modernist tendencies are most evident in their introduction of a new genre of subject: the urban life of the Nepali community as a self-conscious articulation of their lived experiences that was separate from the ruling elite. (bangdel, n.d.)

An independent arts institution, Nepal Arts Council was established 1961 with the specific aim of creating public gallery spaces for exhibitions. Lain Bangdel was asked to serve as a representative of the Royal Nepal Academy heading the faculty of Fine Arts. 1964, NAFA (Nepal Association of Fine Arts) under the auspices of the Royal Nepal Academy was formally established to create a platform for annual exhibitions of contemporary art, and the first contemporary art museum was also instituted. Several art schools were also established, among them Lalit Kala Academy and Sirjana Fine Arts School are the most prominent. (bangdel, n.d.)

1.3 MUSEUM

The English "museum" comes from the Latin word and is pluralized as "museums" (or rarely, "musea"). It is originally from the Ancient Greek Μουσείον (Mouseion), which denotes a place or temple dedicated to the muses (the patron divinities in Greek mythology of the arts), and hence was a building set apart for study and the arts. (Paula, 1989)

According to the ICOM Statutes, adopted by the 22nd General Assembly in Vienna, Austria, on 24 August 2007, the current definition of museum is as follows:

“A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, research, communicates, and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment” (ICOM, 2007)

1.4 PROBLEM STATEMENT

Nepalese art is making its space in the global context. The artists with the influence of the west have been using modern forms to address numerous contemporary issues. An account of an international exhibition of contemporary Nepali arts at Vienna in 2019 reflects how Nepali artists redefine the influence of the west and how the local, national, and global permeate each other. (Dixit, 2019)

Most of the art museums in Nepal are either ancient historic monuments or the Rana Palaces. Galleries are almost completely dependent on artificial lights and have spaces allocated for only indoor installations.

There are galleries and museums dedicated to Nepalese art, yet the manner the artworks and creations are displayed does not do the artist and their artwork credit. Each form of artwork is distinct, with its own set of characters. For example, some artwork requires natural illumination, while others require a concentrated spotlight and still others require utter darkness. It should be curated based on the artist's viewpoint rather than a regulated atmosphere.

General public shows less interest on artwork, some blame can be also given to the fact that there are very limited galleries and not significant architectural structure grabbing the attention of public.

1.5 NEED IDENTIFICATION

In Nepal's history, a museum of modern arts has never been created solely for that purpose. Traditional arts in Nepal are documented in old palaces (now museums) from the Malla and Licchavi eras. Art shows at traditional art galleries are only attended by art aficionados, artists, and art students. Due to a lack of public interest in such traditional art shows, many modern artists have shifted to more public forms of art. Through temporary and permanent art exhibition galleries, a new method to human involvement with the freedom of learning and seeing must be developed.

Art exhibitions are, as Ferguson emphasizes, “narratives which use art objects as elements in institutionalized stories that are promoted to an audience.” (Sitzia, 2016).

Arrangement of spaces, social relationships and cultural context is fundamental to how buildings are shaped, used, and perceived. (Psarra, 2009). The object and the environment should be interwoven such that the museum is more than just a container for the object. The object's experience and information should be inextricably linked to the environment.

1.6 IMPORTANCE OF THESIS RESEARCH

- To learn what development has occurred in museum design in terms of new requirements, planning, materials and technologies, sustainability, etc.
- This thesis will be a reference for future generation for creating a museum architecture
- To learn and incorporate narratives related to architecture and museum making.
- To provide platform for the nepalese artist for presenting their work in suitable environment

1.7 RESEARCH OBJECTIVES

- To incorporate different stylistic expressions on one major building.
- To create a sense of community with diverse audience to contemplate and discuss contemporary art and cultural issues of today.
- To understand and identify a building can create a sense of individuality or a landmark and acquire an artistic environment.
- .
- To provide opportunities for the locals by integrating spaces for training, workshops, craft exhibition and interactive spaces for networking with a larger audience.

1.8 RESEARCH METHODOLOGY

A series of studies was conducted for the purpose of this thesis, in order to formulate the program and spaces required. The methodologies and procedures 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. LITERATURE REVIEW

General study of museums and contemporary arts

History of museums and contemporary arts

Worldwide

In the context of Nepal

Museum design and planning

Developments in museum architecture and planning

Narratives in museum architecture

Interviews

2. CASE STUDIES

Primary case studies

Secondary case studies

1.8 RESEARCH METHODOLOGY

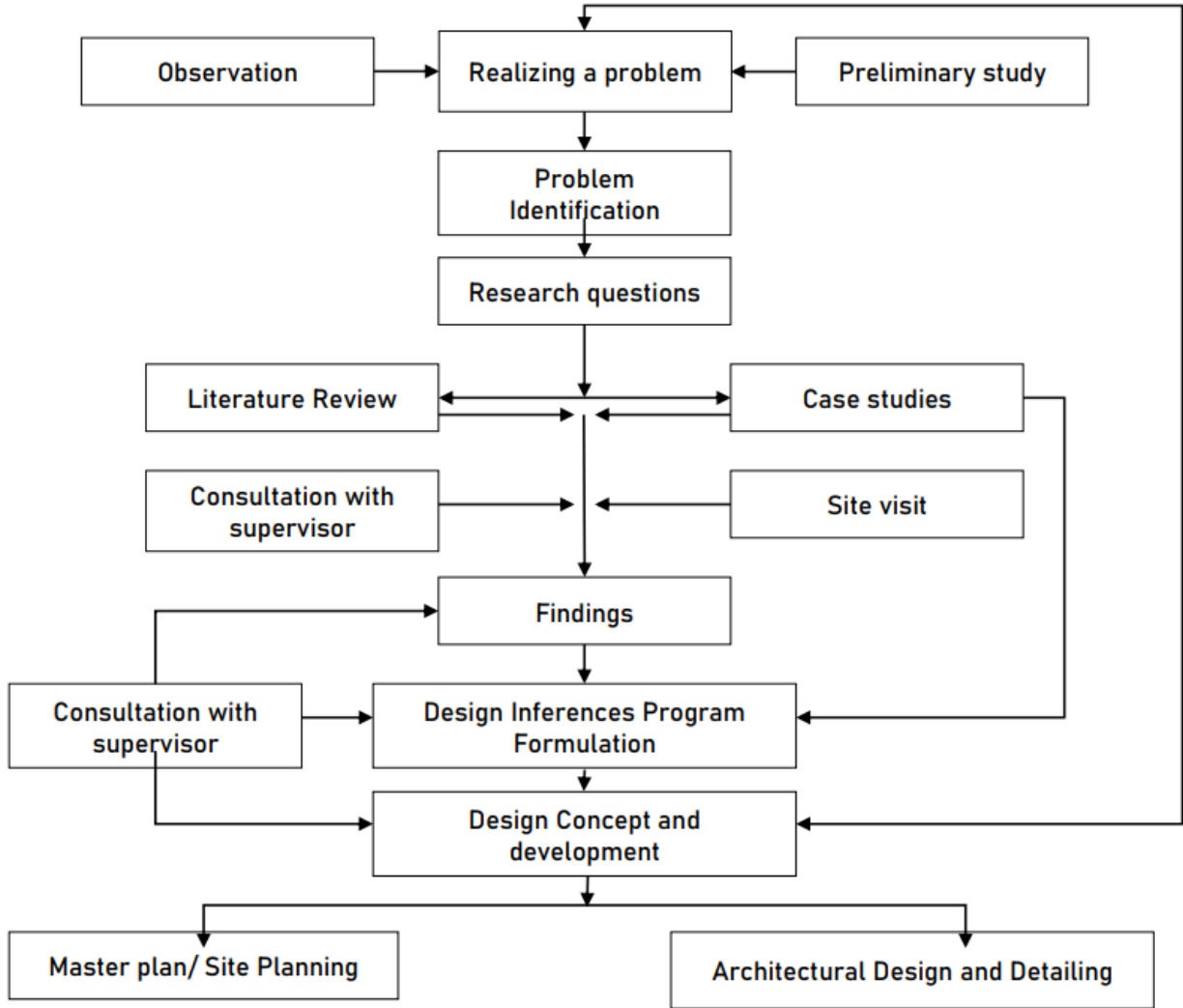


Figure 1 Research method flowchart

Chapter 2: LITERATURE REVIEW

2.1 Contemporary art

Contemporary art is the art of today, produced in the second half of the 20th century or in the 21st century. Contemporary artists work in a globally influenced, culturally diverse, and technologically advancing world. Their art is a dynamic combination of materials, methods, concepts, and subjects that continue the challenging of boundaries that was already well underway in the 20th century. Diverse and eclectic, contemporary art is distinguished by the very lack of a uniform, organizing principle, ideology, or "-ism". Contemporary art is part of a cultural dialogue that concerns larger contextual frameworks such as personal and cultural identity, family, community, and nationality.

This style of art is difficult to define because it includes such variety. Some argue that the basic approach and goal of modern Art is to challenge the nature of artwork itself. It can also make the viewer question what it is that defines art. Therefore, this style of art is not particularly uniform, and it may be more challenging to precisely describe than any other genre of art. Additionally, there are several major reasons to why contemporary art is important to society, for instance it is a mean to express oneself as it is way to provide social and cultural commentary. (IESA, n.d.)

Contemporary artwork is characterized by diversity: diversity of material, of form, of subject matter, and even time periods. It is "distinguished by the very lack of a uniform organizing principle, ideology, or -ism" (Art21, 2016) that is seen in many other art periods and movements. The focus of Modernism is self-referential. Impressionism looks at our perception of a moment through light and color, as opposed to the attempt to reflect stark reality in Realism. Contemporary art, on the other hand, does not have one, single objective or point of view, so it can be contradictory and open-ended. There are nonetheless several common themes that have appeared in contemporary works, such as identity politics, the body, globalization and migration, technology, contemporary society and culture, time and memory, and institutional and political critique. (Robertson, 2012)



Figure 2 *Dona i Ocell*,
by Joan Miró



Figure 1 *Rose*, by Isa
Genzken



Figure 3 Charles Thomson. *Sir Nicholas Serota Makes an Acquisitions Decision, 2000, Stuckism*

2.2. History of Contemporary art

Contemporary Art initially grew along with Modernism; however, it is now viewed as divergent from that school. In 1910, Roger Fry and his colleagues founded the Contemporary Art Society. At the time, this was simply a private society where artwork could be purchased for public museums. Through the 1930's more institutions were founded with the same terminology. (IESA, n.d.)

The phrase "contemporary" was first used in history in 1947 when the Institute of Contemporary Art in London was founded. Although it is the 1990s, most institutions consider this to be the start of contemporary art. It is a movement that was sparked by 'Globalization,' which fizzled at a period of complicated social and political situations in the twentieth century. (Sainani, 2021)

In contrast, the contemporary style continues to progress as over time, which adds to the wide variety of approaches and outcomes. (IESA, n.d.)

2.3. Style of Contemporary art

When considering Contemporary Art, it can be difficult to define or describe any one common style. Artists approach their work in a multitude of ways. A wide array of media and materials may be used to convey a wide array of concepts, themes, and subject matter. While artists of the past were often influenced by religion, mythology, and the demands of their paying patrons; today's artists can be inspired by much more and the work often grows out of their own interests or expressions of self. Often the work may reflect their own culture, including current political climates and popular trends. However, with the ability to travel broadly and integrate much more than what is seen in their immediate world, art is increasingly global and diverse in its themes. (IESA, n.d.)

Unlike other schools of art, this school of art has no single point of view of objective. Instead, it is multi-faceted. The pieces are often reflective of the artist and so reflect a great diversity of perspectives. This makes Contemporary Art a complex examination of present-day life. Common themes that might be examined include identity, the body, technology, globalization, migration, society, culture, memory, the passage of time, and artistic critique of sociopolitical institutions. (IESA, n.d.)

2.4. Contemporary art scene of Nepal

Art was segregated from society, kept on a pedestal and was considered strictly from an aesthetic standpoint. "Even until the mid-1990s, only paintings and sculptures were considered to be art," reflects Ashmina Ranjit, an art activist who has been relentlessly addressing socio-political issues through her artwork and performances. After the autocratic Panchayat rule ended in 1990 and a People's Movement ushered a multi-party democratic political system in Nepal, there was an influx of new voices in literature, she explains, but art took its time. For example, when she was a newcomer in the field, Ranjit received explicit messages from many sources to keep issues of women's rights out of art. But she continued her pursuit and eventually met like-minded artists. (Kunwar, 2017)

Sangeeta Thapa (founding director of Siddhartha Art Gallery) believes that the contemporary art scene in Nepal has never been as exciting as it is today. But the post-2000 surge should be viewed as part of a gradual movement that had its roots even during the Rana regime, she emphasises. It was the Ranas who imported the first cameras to Nepal and commissioned the first European-style portraits. Meanwhile, during the first decades of the twentieth century, Ananda Muni Shakya was attempting to reform Newari paubha paintings.[4] In 1940, Chandra Man Maskey, another graduate of an arts school in India, was imprisoned for drawing satirical cartoons of the Rana rulers (Thapa, "An Essential Quest"). The 104-year-old Rana regime, which collapsed in 1951, was highly oppressive. It was extremely risky for artists to express themselves, and the current arts and education landscape in Nepal still suffers from the dark shadow of the period. (Kunwar, 2017)

Nevertheless, after the end of Rana rule, under King Mahendra's patronage, artists like Lain Singh Bangdel flourished. Later, R. N. Joshi and his contemporaries inspired another generation. Birendra Pratap Singh, Kiran Manandhar and Ragini Upadhyay Grela are noteworthy names from this group. Due to emerging opportunities, a lot of these artists travelled to neighbouring countries and participated in cultural exchange. They held several local and international exhibitions and are widely known for their prolific body of work. "The influx of artists (in the eighties) created new dynamics in the contemporary art scene," writes Sangeeta Thapa, "and their contributions created a definite impact on the psyche of the public" (Thapa, "An Essential Quest"). Grela produced some of the most hard-hitting political satires in print; Singh's pen-and-ink etchings demonstrate experimentation with form and style; and Manandhar contributed profusely to Nepal's growing body of abstract paintings. (Kunwar, 2017)

"The global-digital world we inhabit is constantly in flux and moving at startling speed. We are groomed to be socio-political in our living rooms," Sangeeta Thapa.

2.5. Relationship between art and architecture

The idea of integration between art and architecture dates to the very origin of the discipline, however, it took on a new meaning and social purpose during the Avant-Garde movement of the early twentieth century, becoming one of the most defining characteristics of Modernism. This close relationship is evident in the works of some of the greatest modern architects, such as Mies van der Rohe, Le Corbusier, and Oscar Niemeyer, to name a few (Ghisleni, 2021)

The integration between disciplines was also, and most notably, brought up by Le Corbusier through the combination of elements from painting and sculpture with the formal concepts of architecture. In this sense, Le Corbusier - despite being a "one-man show" who preached the synthesis of the arts in his designs, but always worked as a solo artist - argued that the roles of architects, painters, and sculptors were of equal importance contributing to productive collaborations in the real world, that is, on the building site, by creating and designing in complete harmony.

The ideal goal is to integrate all disciplines from the beginning of the project but inviting artists to participate later in the design process does not necessarily compromise the result. A good example is the Salão Negro (Black Room) at the National Congress in Brasília, where artist Athos Bulcão, invited by Niemeyer after the project was finished, created an abstract and simple language using black granite on the floor and white marble on the walls, which resulted in a mural fully integrated with the architecture and building materials. This mural with abstract patterns is often cited by academics, including Paul Damaz when he states that non-figurative language is the best match for modern architecture. In this regard, the author also mentions Maria Martins' semi-figurative bronze sculpture in the gardens of the Palácio da Alvorada, highlighting the "formal affinity between the curves" of the sculpture and the "graceful pillars of the building," as a perfect example of integration.

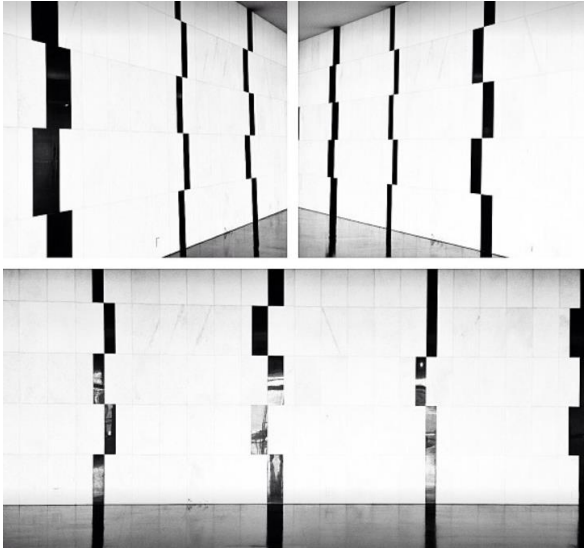


Figure 5 Salão Negro (Black Room) at the National Congress

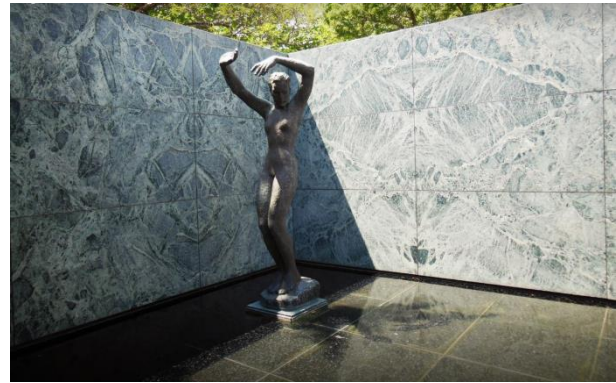


Figure 4 Barcelona Pavillion and sculpture

The integration between art and architecture through the inclusion of occasional individual elements such as the iconic Barcelona Pavilion by Mies van der Rohe. Indeed, the sculpture *Der Morgen*, also known as *Alba*, by German sculptor Georg Kolbe (1877-1947) is not essential to the pavilion. But what else is essential in this new architectural concept, if not only the arrangement of planes and vertical supports? The pavilion is completely independent of the sculpture, as well as of the materials however, one cannot picture it today without this human figure with arms outstretched precisely positioned and framed for the user's experience. As Claudia Cabral beautifully explains, "In Mies' delicate balance, guided by partial asymmetries, and by a system of compensations, the sculpture is the only element that has no counterpart Mies decided to place only one sculpture, a single figurative element in his abstract plane. Within the pavillions play with reflections, transparency, and parallels, we are the only possible partners for the bronze figure, we humans of flesh and blood, the visitors." (Ghisleni, 2021)

2.6. CONTEMPORARY ART, ARCHITECTURE AND THE MUSEUM

Upon closer scrutiny of the kaleidoscopic collection of new museums and museum extensions of the last three decades, we must admit that, despite the euphoric, exhilarated tone of the discourse on museum architecture, very few genuinely innovative museum projects with the same kind of combined architectural and institutional vigour as the Centre Pompidou, the eminent start of the so-called museum boom – have been completed. Few actual building projects, if none, have succeeded in setting the traditional museum typology architectural as well as institutional – “in motion”. Yoshio Taniguchi’s rebuilding of the Museum of Modern Art in New York may be the largest and most expensive museum building enterprise of the last decades, but it certainly does not convey a substantial breakthrough in our thinking about contemporary museum space, let alone the fundamental spatial alteration that was envisioned and promised unless in terms of surface and scale, of course.

The rather thin crop is due to the paradoxical position architecture is forced to occupy within a museum commission on the one hand, and to the rather elliptical discourse on museum architecture on the other. Despite all the rhetoric, architecture has rarely been permitted to intervene in the actual spatial

development of the museum programme. All too often, the ambition to use architecture to rethink the museum's programme and, by consequence, to develop a novel spatial framework to house that programme, is paradoxically shattered in the name of flexibility or programmatic freedom. Museums, with the museum of contemporary art as the absolute champion, simply do not allow architecture to get in the way of their ambitions.

The museum of contemporary art wants to be at the absolute service of art and artists, so it is troubled by an almost paranoid desire for an architecture that is receptive, adaptable, and adjustable, or, in other words, flexible. But here we face the first paradox. Although architecture is compelled to apply the strategy of self-effacement, it must simultaneously address itself to helping the museum overcome its problems with art. Because after all as it was defined as the core problem of the Museum in *¿Motion?* Book of 1979 art causes the museum a lot of trouble. Since the 1960's, art has drastically altered its nature and strategies: it has become ever more agile, critical toward the institutional framework of the museum, and eager to operate on more specific sites.

The museum of contemporary art wants to keep up pace, but is confronted with spatial, institutional, and socio-political problems and limitations. It suffers from the unhappy conscience that it is never able to occupy a true place in the artistic present, as it always "frames" art. This identity crisis incites the museum to indulge in ongoing self-critique, institutional introspection, and ultimately, self-denial. In recent decades, we have been confronted with dozens of museums that, following the artists, contest their own space and develop an anti-museum policy, some even going so far as to pretend to stop being a museum. The nature of this crisis, however, is fundamentally spatial. A quick glance at the metaphors used by museums to question their status, reveals the architectural bias of the crisis; if the museum of contemporary art wants to transform itself from a static repository for the art of the past into a dynamic workshop for the art of the present, it must tear down its walls, open up its space, leave the premises, push back its frontiers, etc. Both the words "repository" and "workshop" imply a different spatial, and hence, architectural connotation. So it seems that architecture ended up in a quite ambiguous position; while it is obliged to refrain from intervention or mediation in the museum program and is expected to produce so called flexible and neutral spaces, it is nevertheless always put at stake within the critical questioning of that program

2.7. MUSEUM

According to the ICOM Statutes, adopted by the 22nd General Assembly in Vienna, Austria, on 24 August 2007, the current definition of museum is as follows:

"A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, research, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment."

Word "museum" comes from Ancient Greek "mouseion" which meant "seat of Muses" and was used for philosophical institution or a place for contemplation. In Rome, the Latin word "museum" was used for places for philosophical discussions. The first time the word "museum" was used to describe something like a modern museum was in the 15th century for the collection of Lorenzo de Medici in Florence. Until the 17th century, it was a name for collections of curiosities such were Ole Worm's collection in Copenhagen and John Tradescant's collection in Lambeth. John Tradescant's collection later owned by Elias Ashmole was moved to the University of Oxford, specially built for it in 1677. The building was named Ashmolean Museum and opened to the public in 1683. It is the first museum open to the public that held the name "museum". That marks the moment when the "museum" starts being an institution and not just a collection of items and it remained like that during the 19th and 20th centuries. (Museum, 2021)

2.7.1. A brief history of Art Museum

The modern museum, as a secular space for public engagement and instruction through the presentation of objects, is tightly bound to several institutions that arose simultaneously in 18th and 19th-century Europe: nationalism fused with colonial expansion; democracy; and the Enlightenment. Thus, this historical essay and several others in this series on museums focus largely on Europe and North America. The influence of the museum model, as a tool of colonialism but also as a site for local adaptation and self-definition in places other than the West, are two sides of an important coin that is just beginning to receive attention from art historians. (Dr. Elizabeth Rodini., 2017)

2.7.1.1. Wunderkammern

The nearest thing to a museum in early modern Europe were the Wunderkammern, or cabinets of wonders, assembled by curious nobles, wealthy merchants, and scholars. Emerging just as Europe was extending its reach into “new” continents and cultures, Wunderkammern were places to gather, interpret, and show off the riches of the world. Some were literal cabinets, fitted with cupboards and drawers; others were rooms stuffed with animal, mineral, vegetal, and artistic treasures. Much like our museums—and differently from church treasuries and displays of war booty—Wunderkammern were intended to deepen people’s knowledge through the presentation of things. (Dr. Elizabeth Rodini., 2017)

In most other ways, however, Wunderkammern differed from modern museums. They were the domains of the wealthy elite, typically located in a private palace and open only to the collector, his immediate circle, and the occasional visitor who was properly furnished with a letter of introduction. This intimacy meant that objects could be taken from shelves, handled, juxtaposed, and discussed before being returned to storage, often out of sight. Wunderkammern were more like private study collections than the art museums most of us know today. (Dr. Elizabeth Rodini., 2017)

2.7.1.2. The British Museum and the Enlightenment

Toward the middle of the eighteenth century a different structure emerged, one associated with several important trends. One of these was the rise of the Enlightenment. This intellectual movement aimed to make sense of a world that from the perspective of Europeans who were colonizing other places around the globe was revealing new things that demanded new explanations. Enlightenment thinkers relied on the emerging tools of secular empiricism, or sense-based evidence, and proof through repetition that is, the guiding concepts that lie at the root of modern science. (Dr. Elizabeth Rodini., 2017)

The British Museum embodies the ideals of the Enlightenment. Founded in 1750 as a gift to the British nation by Sir Hans Sloane, its core collection consists of specimens he acquired as a medical doctor in the West Indian colonies (plants, birds, and seashells, for example) and objects he purchased from other explorers (including ethnographic and archaeological objects and manuscripts (Dr. Elizabeth Rodini., 2017)

2.7.1.3. The rise of museums

Museums reflected and helped shape that outlook. The Enlightenment is when we begin to see specialized collections, including museums devoted only to art—the Capitoline (Rome, 1734), the Louvre (Paris, 1793), and the Alte Pinakothek (Munich, 1836). Similarly, dedicated collections of plants (botanical gardens), animals (zoological gardens), and eventually natural history and ethnographic objects emerged. One key thing these collections shared was a scheme of linear, didactic layouts dedicated to narratives of development or progress. (Dr. Elizabeth Rodini., 2017)

2.7.1.4. The White Cube

In the United States that some of the most influential trends in modern art museums also emerged. One of these is the “white cube” approach which, despite precedents in Europe, was most fully exploited at The Museum of Modern Art in New York City in the 1930s under the direction of Alfred H. Barr. By minimizing visual distractions, Barr hoped to direct viewers toward a pure experience of the artwork. The “white cube” was rooted in a philosophy that aimed to liberate art and artists from the conservative forces of history. Ironically, this model has taken over, and art museums from Rio to Abu Dhabi to Shanghai draw on similar exhibition tactics. This has led some museum critics to wonder if the “white cube” has itself become a vehicle of cultural control. (Dr. Elizabeth Rodini., 2017)



Figure 7 Installation view of *Modern Works of Art: 5th Anniversary Exhibition*, MoMA, November 19, 1934–January 20, 1935 (*The Museum of Modern Art*)



Figure 6 *The Brooklyn Museum*, c. 1905, dry plate negative, 8 x 10 inches (*The Library of Congress (Opens in a new window)*). Founded in 1895, building designed by McKim, Mead, & White.

reflects the world that produced it, and it tells us as much about the history of its and our times as it does about the things it contains

An art museum dedicated to serving the intellectual, spiritual, and social demands of a diverse community is worlds away from the elite microcosm of the early modern Wunderkammer. Yet, like its ancestors, it

2.8. FUNCTIONS OF A MUSEUM

A museum is defined as a space which has five functions:

- **Collect/ acquire:** Required objects can be purchased, hired or loaned from different sources; the types of objects required depends upon the objective and type of museum. It is necessary that a museum has an active not passive collecting program. Active collecting is determined by what the collection ought to contain, to do the best possible job of presenting.
- **Store:** All collected objects need to be stored properly.
- **Conserve:** Conserving an object is also an important function; especially the conservation of very sensitive objects is important in both storage and display
- **Research:** The acquired objects are researched, and the necessary information is documented so that all the information about these objects is readily available when required. Most museums also employ their own scientist and scholars who conduct research both in the field and the museum. Most museum collection offers cultural and scientific treasures for research, scholars, and specialist. Some museum has on site resource centers and libraries that are available to variety of users, including academic teachers, researchers, student and public.
- **Present/ exhibit:** The final and most important function of a museum is to present its

collection, by displaying the objects and providing necessary information.

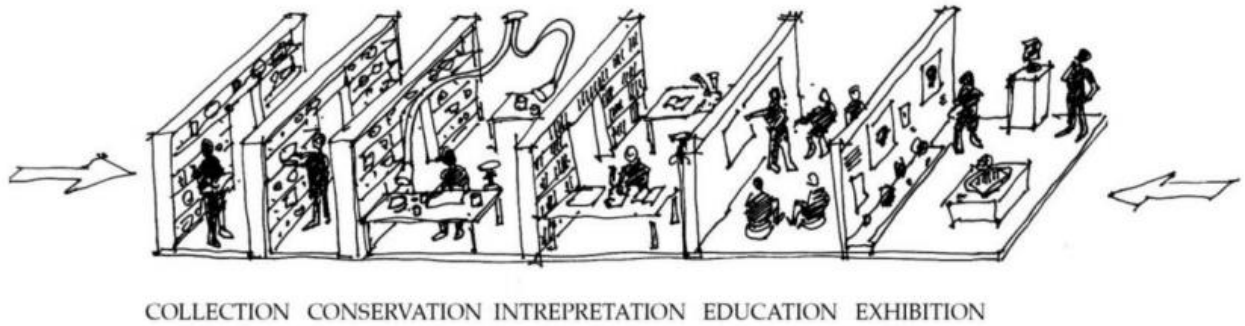


Figure 8: Function of a museum

2.9. 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

- Space organization
- Entrance and Access
- Circulation
- Display arrangement
- Display techniques
- Lighting

2.9.1. 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. Every collection has its own conditions, requirements, purpose and problems. Specific requirements of the collection influence the structure of the building the form of the exhibition room and its related services, so it is easier to design for an existing collection rather than for future collections. For this reason, a museum should be planned keeping in view that the prospects of acquiring artifacts in the future and be flexible and allow future expansion. In order to realize the objectives and function, certain facilities and spaces are essential. There must be sufficient diversification of spaces to allow each function to be undertaken separately while at the same time combining certain activities in a single area as required for economy in a museum. Because of the many and varied kinds of tasks which a museum has to perform, it is absolutely impossible to maintain good housekeeping and curatorial procedures without separation of functions into separate rooms.

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	a. Lecture room, Chair storage closet, Kitchenette
b. Reception, information, sales, supervision of display gallery	b. Lobby, Sales and Information Counter
c. Public requirements	c. Cloak room, Washrooms
5. Other Services (Private area)	
a. Mechanical	a. Heating-ventilation plant
b. Janitorial	b. Janitor's closet

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

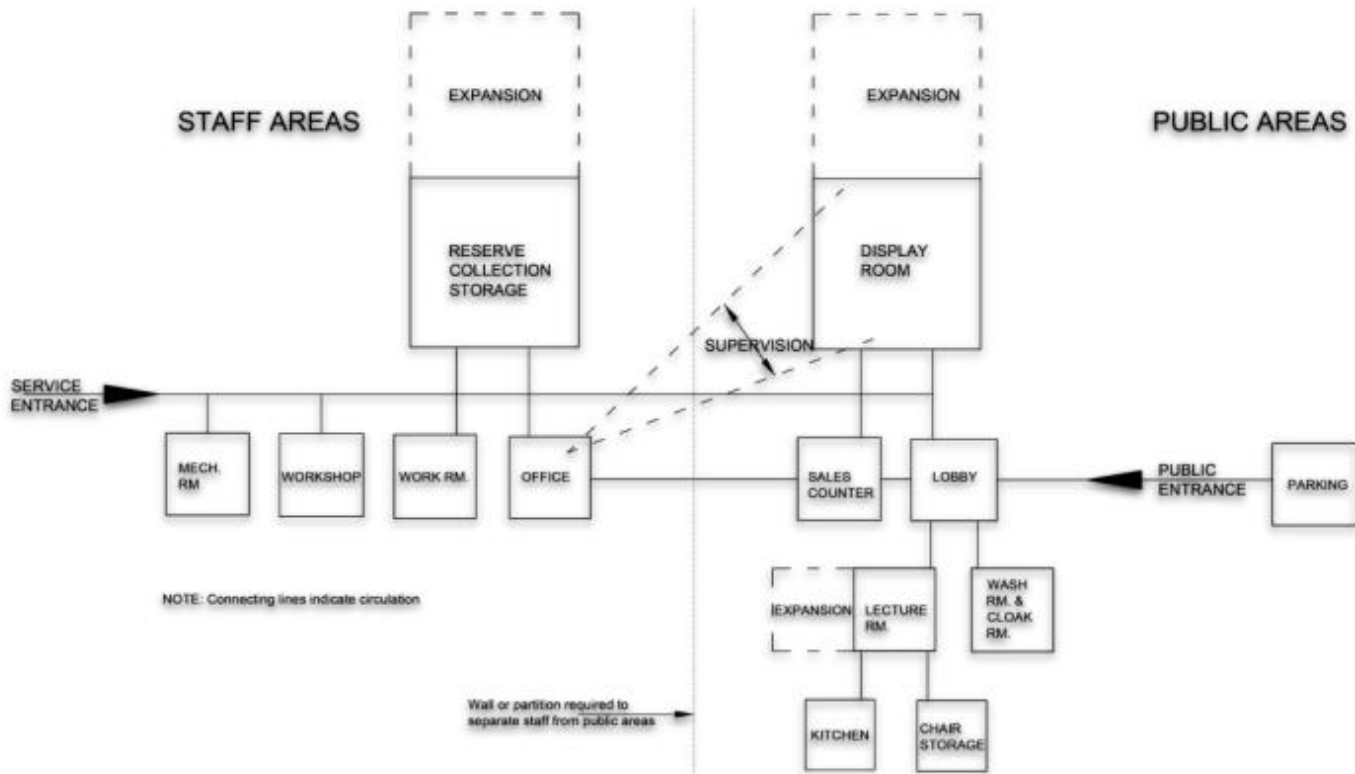


Figure 9 Space Organization Diagram

STANDARD AREA FOR MUSEUM ARCHITECTURE:

- Gallery: 40- 50 % of total built- up area
- Educational and promotional activities: 4-8 % of total built- up area
- Space for storage and collection: 10- 15 % of total built- up area
- Space for research and study: 3- 8 % of total built- up area
- Space for administration/ management: 7- 8 % of total built- up area
- Space for circulation: 20- 30 % of total area
- Ratio of gallery to non- gallery space $\leq 45\%$
- Ratio of permanent display gallery to non- gallery space $\leq 40\%$
- Provision of future expansion: 20- 25 % of total site area

STANDARD DESIGN DATA FOR MUSEUM ARCHITECTURE:

- Gallery height: Not less than 3m i.e., 3.6- 5.4 m
- Gallery length: 18.2- 24.4 m
- Gallery width: 5- 10 m
- Picture/ painting/ 2D display: 3- 5 m² hanging surface to each with artificial lighting in darker space
- Sculpture/ 3D display: 6- 10 m² areas with natural lighting

SUPPORTING FACILITIES IN A MUSEUM:

Educational, cultural and entertainment activities should be hosted at the museum throughout the day and evening to ensure that the museum is in continuous use.

- **Cultural:**
 - Siting the museum in a traditional settlement
 - Overall planning of institution complex with auditorium, seminar halls, etc. enhances cultural environment
- **Economical:**
 - From visitors' data, survey of various museums, it shows that majority of them are tourists. Hence, siting the museum in a tourist area to encourage the tourists to visit.
 - School and college organize museum visits regularly, so proximity to the same will ensure large no. of visitors.
 - Providing facilities such as restaurants, souvenir shops, temporary exhibition spaces will help make the museum economically sustainable.
- **Physical:**
 - Museums have their own Research department. Hence, it can interact with other large research houses in libraries, archive centers, institutions and universities.
 - Educational facilities or academic component in the museum such as seminar halls, library and other features can ensure active participation.
- **Social:**
 - Recreational facilities for the local people and tourists who come to museums for leisure.
 - Promoting social environment by providing open spaces functioning as interaction spaces.

2.9.2. ENTRANCE AND ACCESS:

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.

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 dock, if possible. This entrance should also be used for mail, courier, office supply, and similar deliveries (Lehmbruck, 1974)

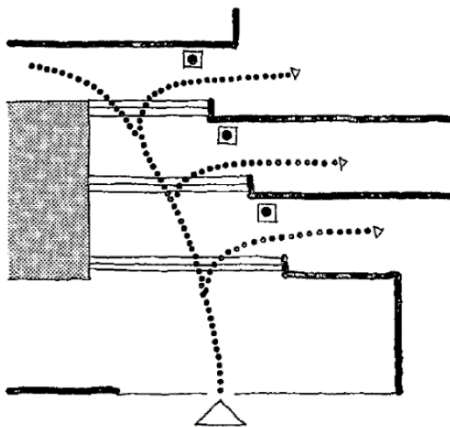


Figure 10: A series of attractive vistas at the entry

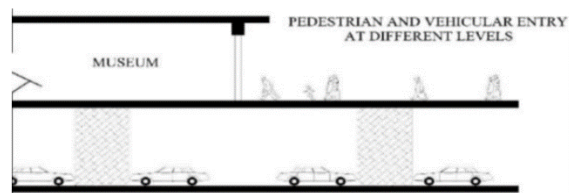


Figure 11: Different level of entry

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. A basic distinction can be made between systems affording centralized and decentralized access, according to whether there is just one entrance (and exit) or, alternatively, the collection can be approached from several sides (Lehmbruck, 1974)

- **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. 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 architectonic 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. (Lehmbruck, 1974)

- **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. (Lehmbruck, 1974)



Figure 12: Decentralized system of Access

2.9.3. 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.

General 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.

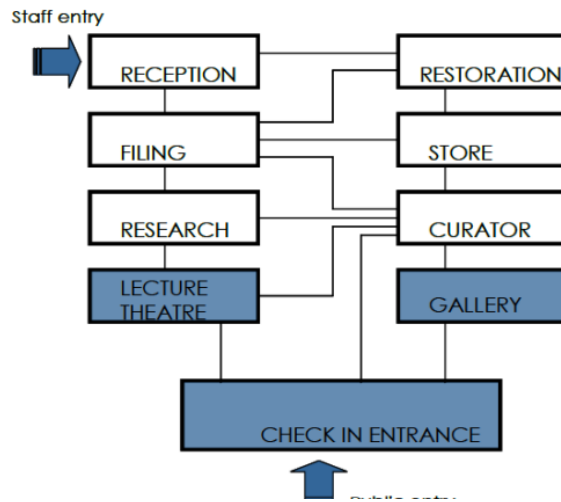


Figure 13 Circulation Diagram

2.9.3.1. MASS CIRCULATION PATTERN

Clear and economical circulation pattern is preferable in an extensively public complex like museum. Much time should be spent in experiencing the gallery spaces than getting from one gallery to another. To design the circulation space the number of people to be accommodated in a year, month, and

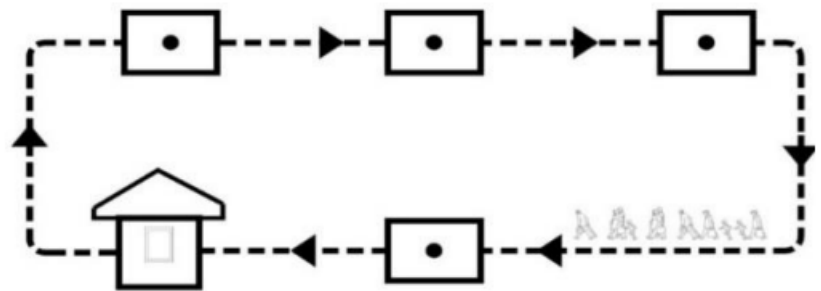


Figure 14 Mass circulation pattern

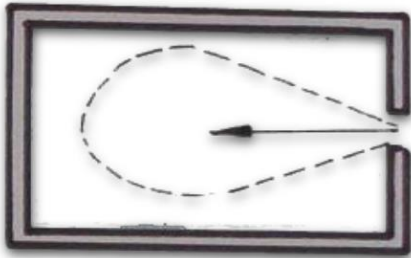
on the peak and typical day is significant. The museum should

have a clear circulation and organized spaces. Public circulation should be self-evident and direct.

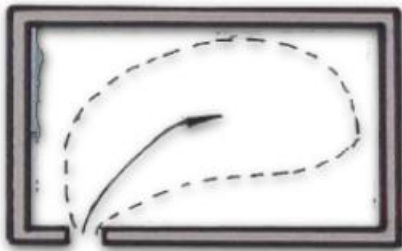
2.9.3.2. VISITORS ORIENTATION

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.

- 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



The visitor is drawn into the centre of the room.



The visitor is drawn to the right into the centre of the room



The visitor is inhibited by the difficulty of making a decision.

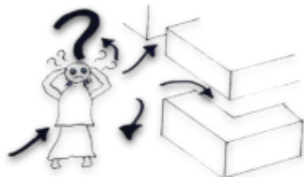


Figure 15 The visual link between different floors

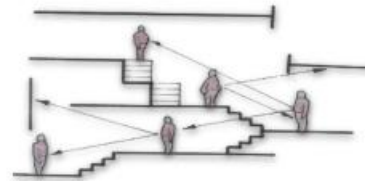


Figure 16 Confusion in visitor due to lack of proper orientation

2.9.3.3. 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. **Spiral circuit:** It is led by spiral pathways, connecting to different rooms.

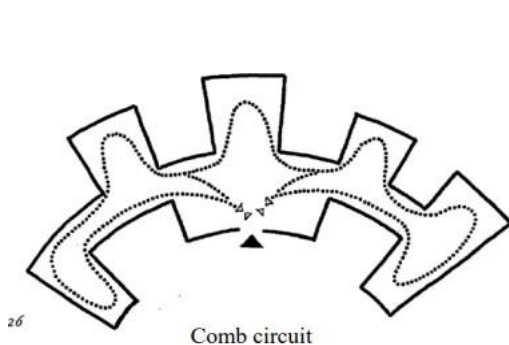


Figure 18: Comb circuit



Figure 17 Rectilinear circuit

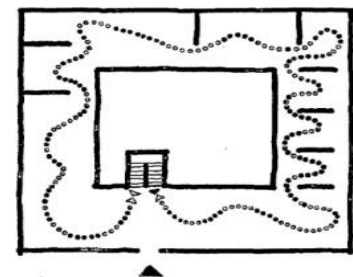


Figure 19: Twisting circuit

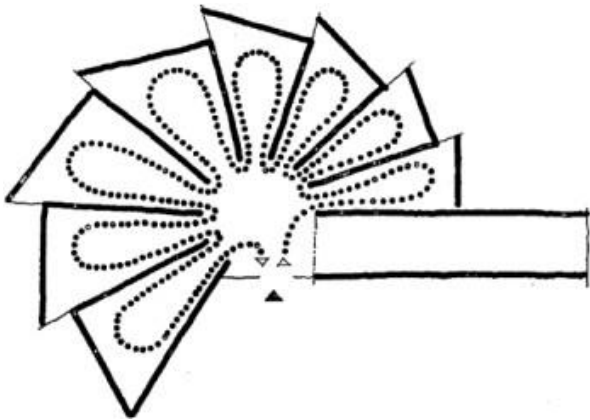


Figure 21: Fan Circuit

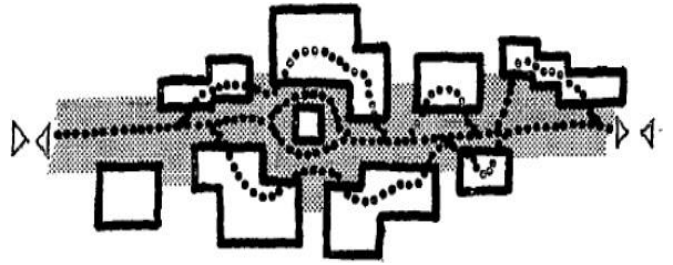
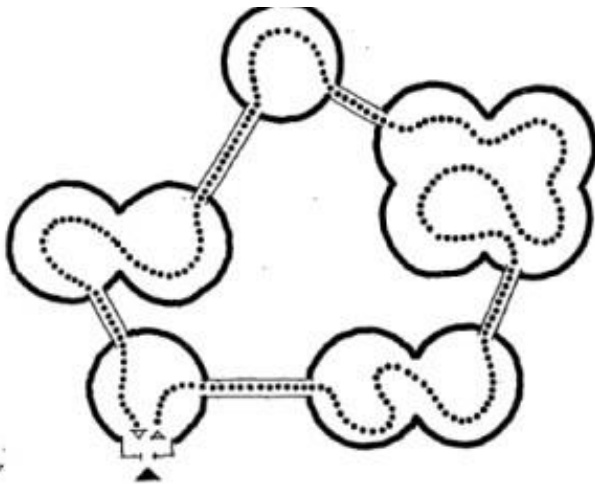


Figure 20 : Decentralized circuit



127

Figure 22 Chain layout circuit



Figure 23: Itinerary layout

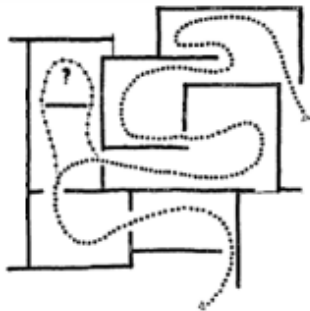


Figure 25 Nest of small cubicle circuit

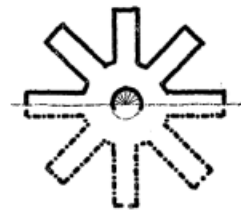


Figure 24: Star shaped circuit

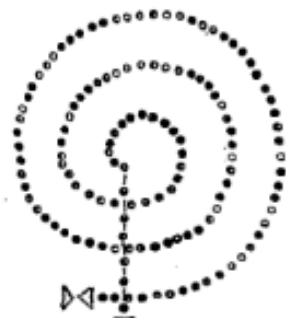


Figure 26: Spiral Circuit

2.9.4. 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:

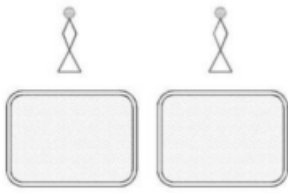


Figure 29 Isolate viewing

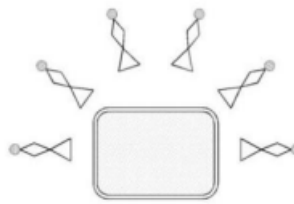


Figure 28 Group Viewing

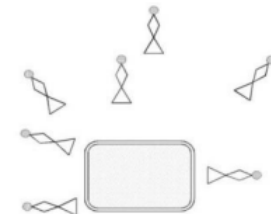


Figure 27 Haphazard viewing

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.

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. x It is essential to control noise and vibration in the gallery.
- Air conditioning and other equipment should be selected and located accordingly x Variation in ceiling height and color of walls to avoid fatigue.
- Enough space should be in a gallery space for easy movement

DIFFERENT TYPES OF DISPLAY ARRANGEMENT

Arrangement of spaces varies with design and display of objects.

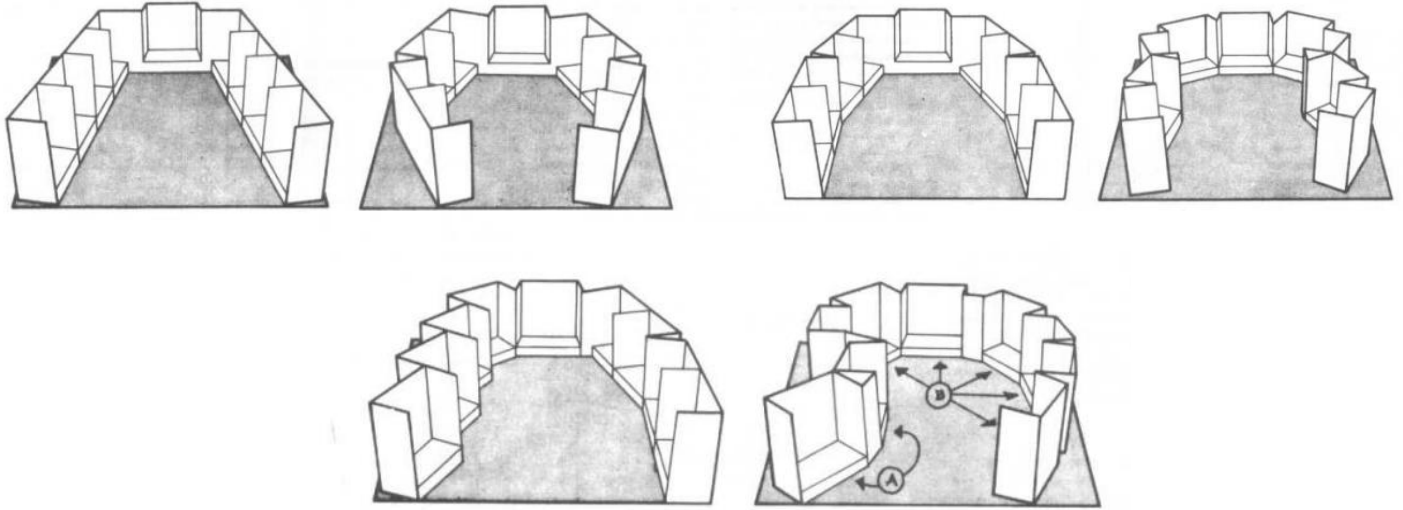


Figure 30 : Display Arrangement (Neuferts Architect Data)

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:

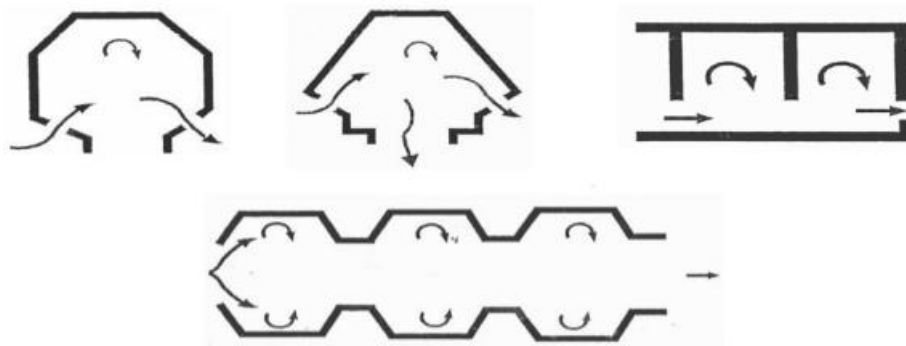


Figure 31: Space Layout(Time Saver Standards)

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

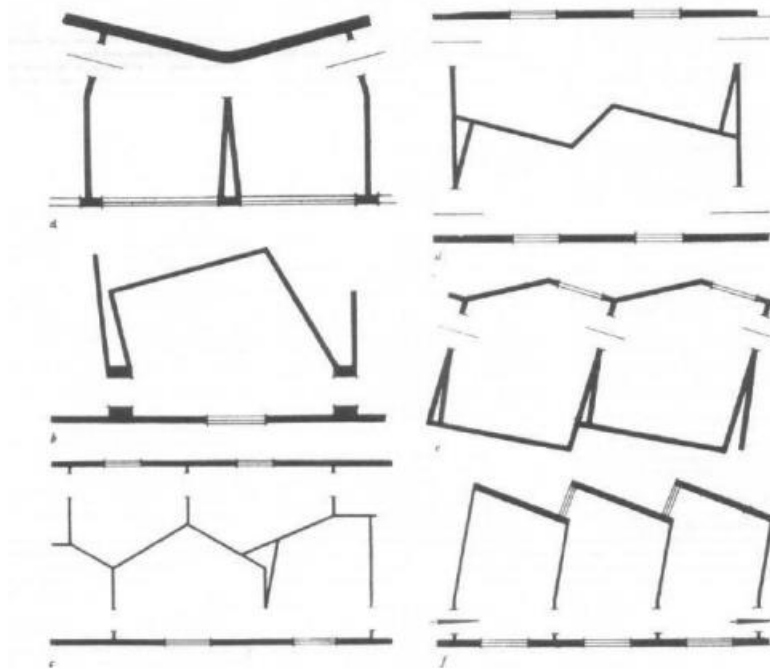


Figure 32 Division of Exhibition space (Time Saver Standards)

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. 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 270 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 3-5m² hanging surface per picture. 6-10m² ground surface per sculpture, and 1m² 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

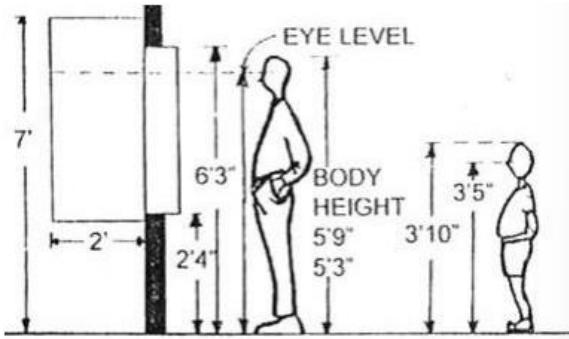


Figure 34 The eye level of adult and child

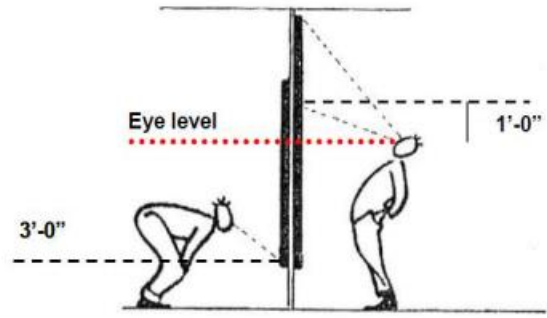


Figure 33 Difficulty in viewing 3 ft above and 1ft below

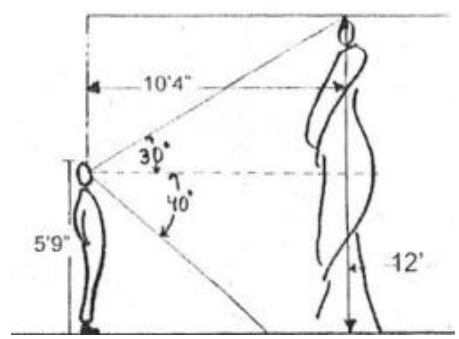


Figure 36 Field of vision (height / size and distance)

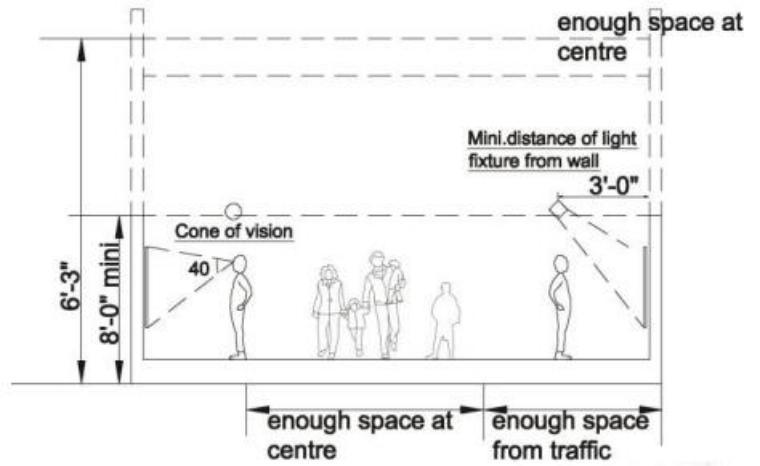


Figure 35 : Space arrangement for easy flow

Source: (Callender, 1983)

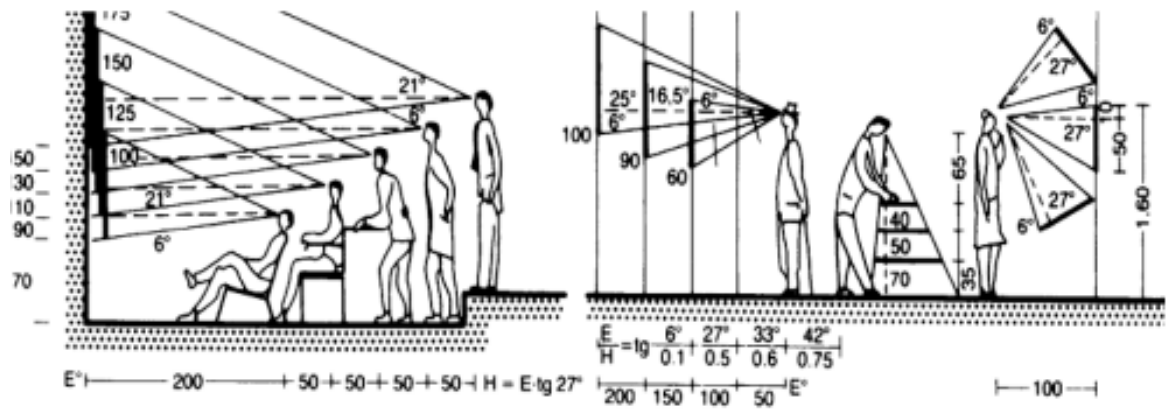


Figure 37: Appropriate viewing distance

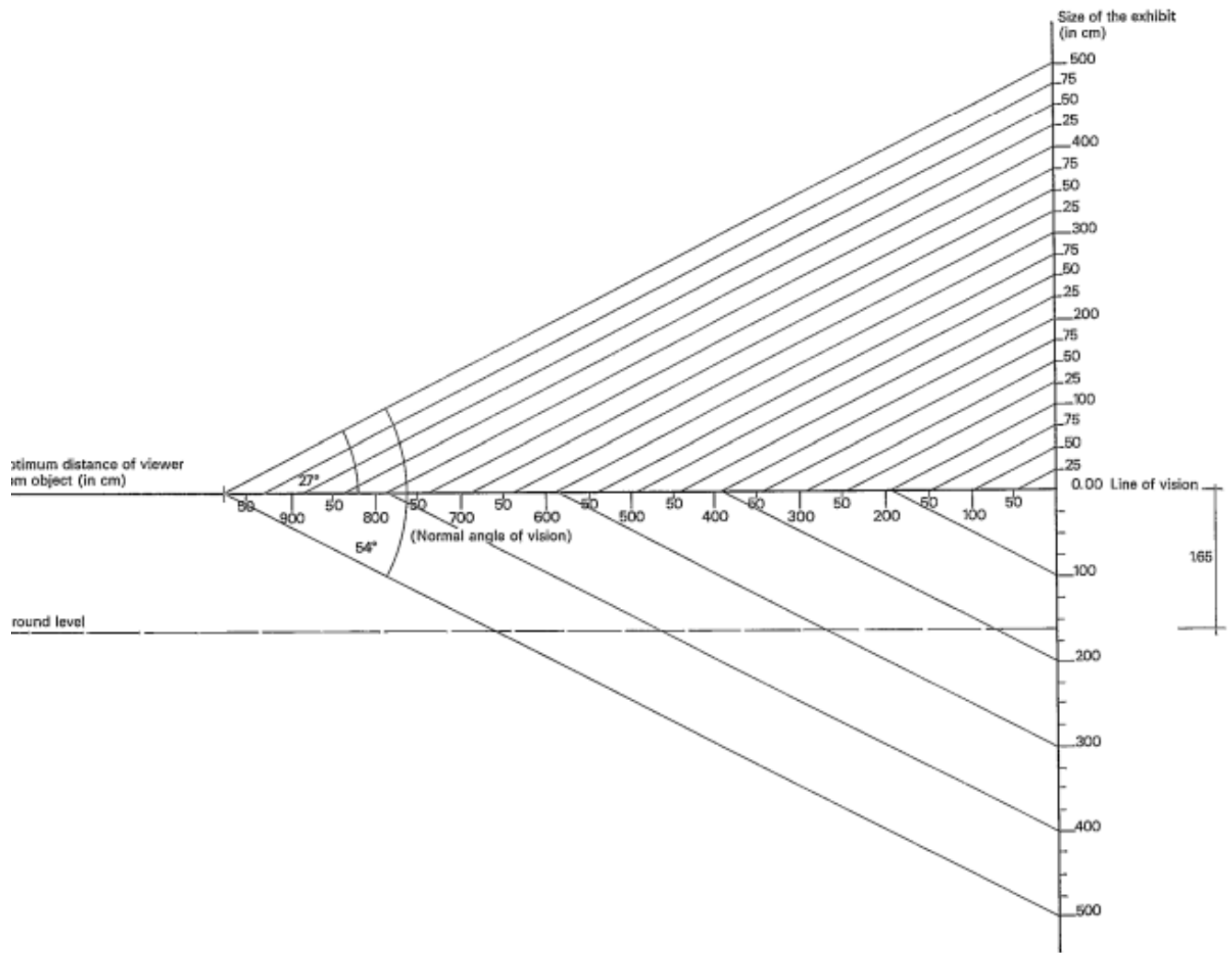


Figure 38 Optimum distance of viewer from object in relation to object size

source (Lehmbruck, 1974)

2.9.5. DISPLAY TECHNIQUES

The idea of exhibits considerably changed during years rather than clear remarkable display of exhibit “do not touch” restriction, the display has formed a team of inactive, active and interactive types.

A. MODE OF DISPLAY

The museum can display interpretive information in the following forms.

Passive Communication

- Graphic Panels – Incorporate text and images
- Object Labels – For individual objects
- E- Labels -Incorporate text, images, video, audio and interactivity
- Images and illustration – Photographs, maps, drawings and diagrams
- Model -Scale models. Dioramas, props, reconstructuons

Active Communication

- Audio – Spoken word, oral testimony, music, foreign languages
- Video – Film, interviews, archive film, moving images effects.

Reactive Communication

- User Activated (Push button, pressure pad, proximity switch)
- Lighting Effects – Sequenced presentations
- Immersive Effects – Sequenced presentation with audio
- Films – Movies, Documentaries and videos

Interactive Communication

- Educational Technology, Microprocessor Contolled devices, online databases
- Low Tech Interactives – Incorporate text, Film Flipbooks, Audio
- Live Interpretation – Staff or actor in role play
- High Tech Interactives – Programmed and computerized



Figure 40: Passive Communication



Figure 39: Active Communication



Figure 42: Reactive Communication



Figure 41: Interactive Communication

B. INTERPRETATIVE/COMMUNICATION METHOD

Graphic panels	Incorporate text and images
Object Labels	For individual objects
E- Labels	Incorporate text, images, video, audio and interactivity
Images and illustration	Photographs, maps, drawings and diagram
Audio	Spoken word, oral testimony music foreign languages
Video	Film, interviews, archive films, moving images effects
Immersive Effects	Sequenced presentation with audio film and lighting
Lighting Effects	sequenced presentation
Low Tech Interactives	Incorporate text fil flipbooks, audio
High Tech Interactives	Programmed and computerized
Hand Boards	Incorporate text and images
Models	Scale Models, Dioramas, Props and Reconstruction
Live interpretation	Staff or actors in role play
Printed text	Leaflets, trials and education packs
Events	Workshops

2.9.6. 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. Light coming from one direction gives a sharp contrast. It is better to have light from

both directions which predominance of light from one. The object to be seen should be brightest but not glaring. Light, properly controlled at source, can give diffused light avoiding glare. Color tends to change under the influence of light. Blues and greens look brighter in daylight and duller in incandescent light. Sunlight contains a high proportion of these colors. Color of light is most important whatever the source may be. 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.

The light to which museum collections are exposed is made up of three parts:

- i. Ultraviolet (UV) radiation at one end of the spectrum,
- ii. Visible light in the middle and
- iii. Infrared radiation at the other

2.9.6.1. 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. TOP LIGHTING

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.

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.

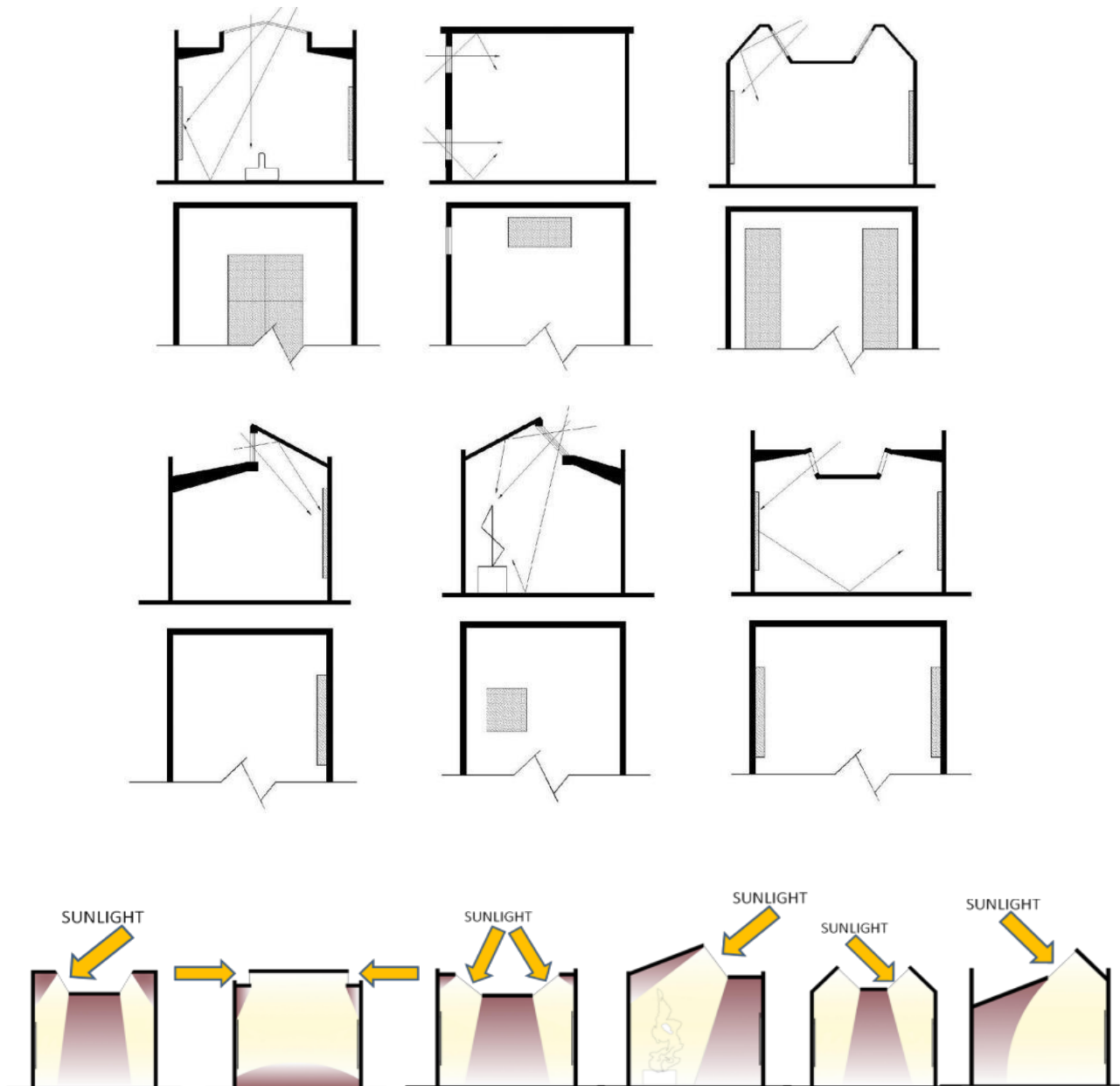


Figure 43: Various schemes of natural lighting

2.9.6.2. 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.

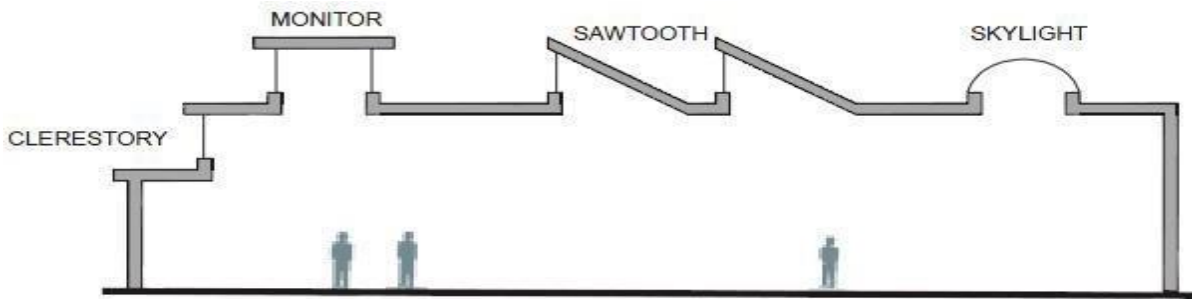


Figure 45: Example of Top lighting Strategies

- **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.

- **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.

- **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:

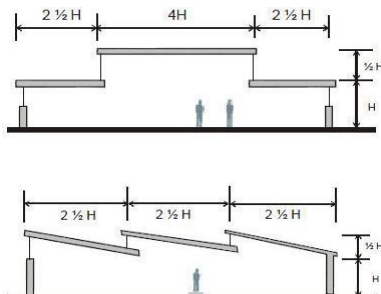


Figure 47: Clerestory spacing as a function of building height

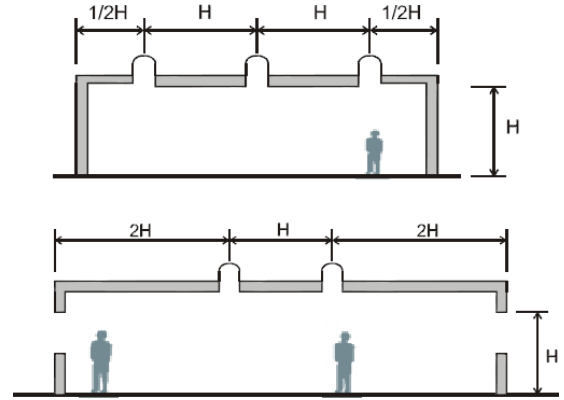


Figure 44: Skylight placement as a function of

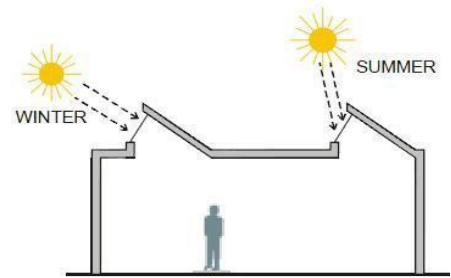
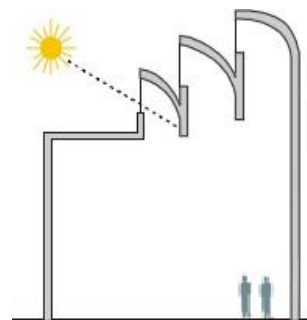


Figure 46: Sloped skylight for seasonal light



2.9.6.3. EXPOSURE TO DIFFUSED DAYLIGHT

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

2.9.7. 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.

2.9.7.1. 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. Designer must have a keen knowledge of lighting and its effect on exhibits. Light is such a factor due to which we can see all objects or in absence of it we cannot see anything. So degree or intensity and quality of light obviously affect the appearance of any object. By appropriate play of light and shadow, exhibits can be displayed in very attractive and dramatic way. However, poor design of lighting may damage the aesthetic of exhibits. Lighting should be provided in a balanced manner, since due to insufficient light exhibits cannot be seen properly while over lighting may cause glare. 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.

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° 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.

2.9.7.2. 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.

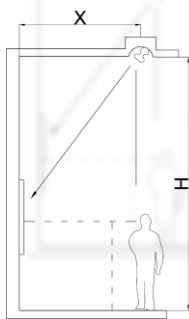


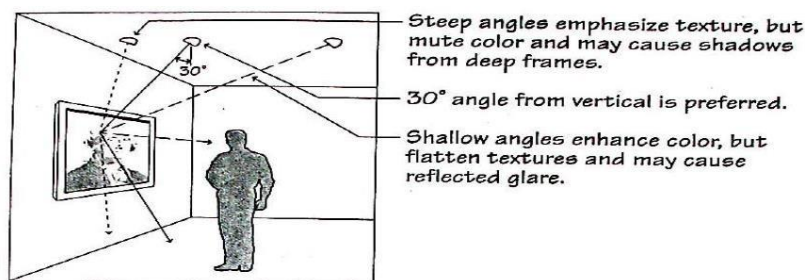
Table 3-7: Guide for locating fixtures

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

Figure 48: Locating fixtures

2.9.7.3. 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 each direction.



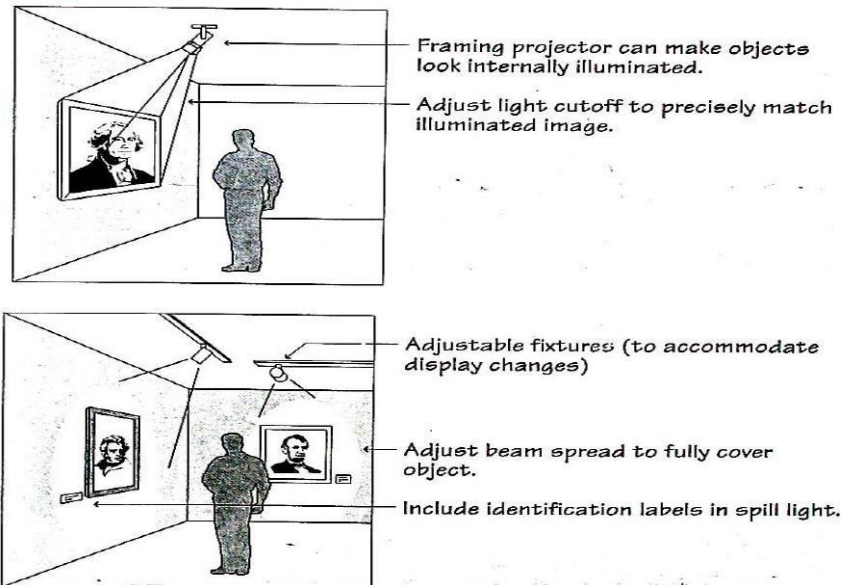


Figure 49: Artificial lighting for 2-D objects

2.9.7.4. 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 requires 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.

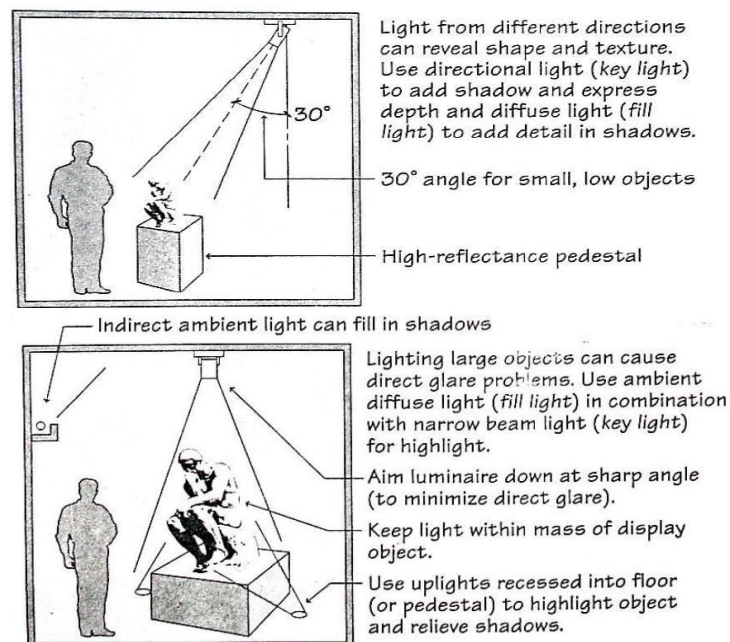


Figure 50: Artificial lighting for 3d objects

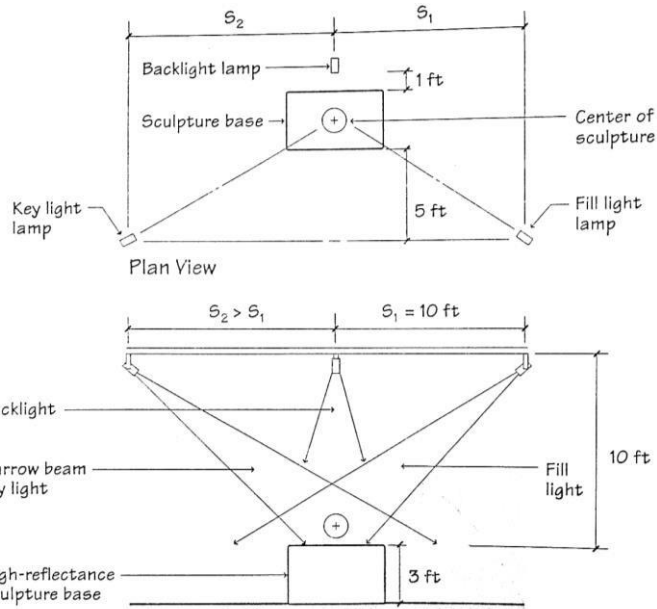


Figure 51: : Artificial lighting for 3-D object, plan and elevation

The angle of incidence of light must be carefully adjusted to the relief of the exhibit to prevent shadow formation by improper lighting.

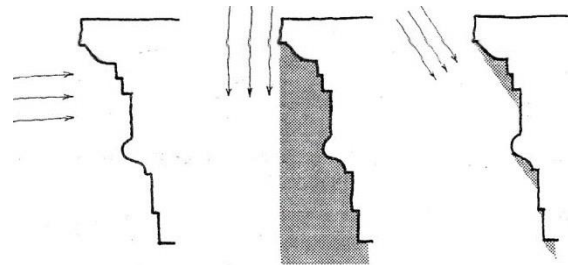


Figure 52: Shadow formation by improper lighting

Lighting detail for internal and external illumination

Internal illumination avoids glare and

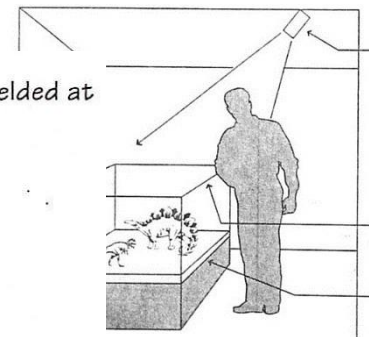
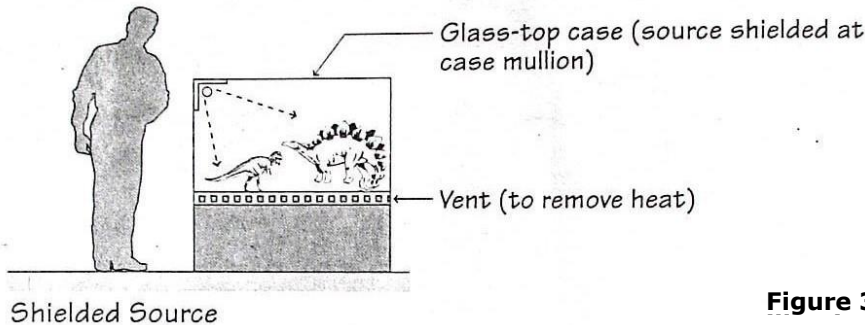


Figure 3-60: External

Shadows and silhouetting

A single point source can create strong shadow to emphasize the form of objects. Shadows should be cast on plain background free of visual noise. Silhouetting backlight objects, makes the object dark and the background bright. Silhouetting can frustrate a viewer attempting to distinguish details in the object and the bright background can be a source of glare.

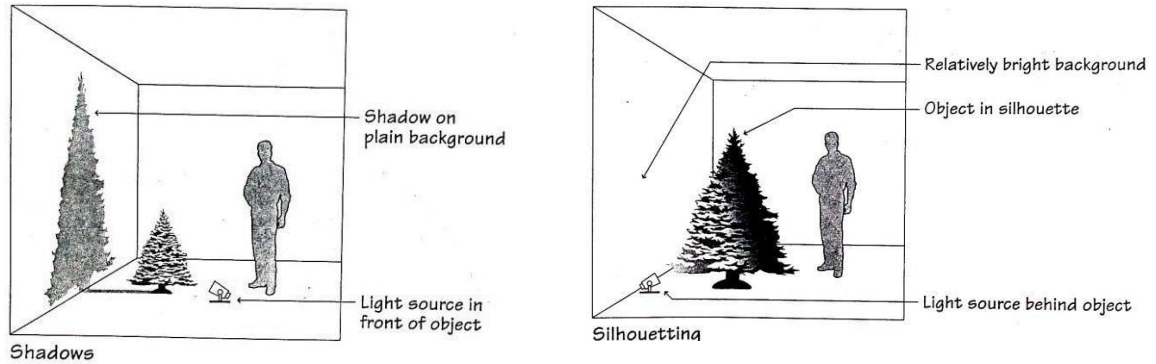


Figure 53: Shadows and silhouetting

Background

Background plays a very important part in presentation of art objects. Color scheme and texture of the background should be selected keeping in mind the richness, texture and form of objects. Backgrounds should be able to bring out the characteristics of the objects shown against them. Object should be prominent against the background and not the background itself.

Light attic

Guidelines for case lighting:

- Use light filters and glazing to reduce UV light on displays
- Use cool light sources, such as fibre optics or fluorescent lamps to reduce heat. Incandescent lamps can cause to become too hot.
- Design light attic to control light, vent heat and increase energy efficiency. Use point sources if sparkle is desired.

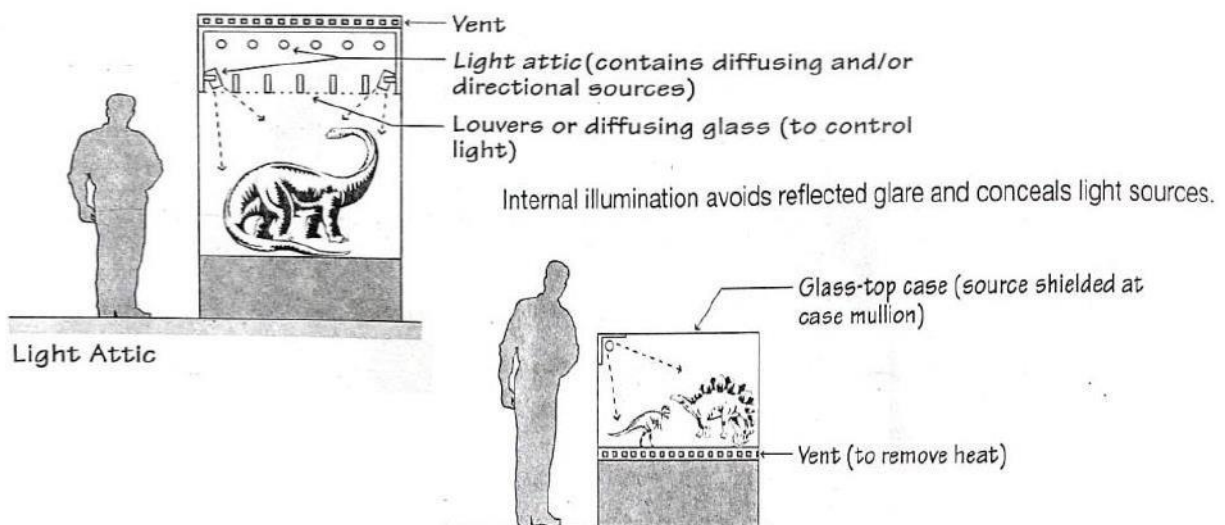


Figure 54: : Light attic details

2.10. EXHIBIT MAINTENANCE

The primary goal of exhibit maintenance it's to prevent decay of displayed exhibit by ensuring proper storage and upkeep including performing regular housekeeping of the spaces an object end monitoring and controlling storage environments.

There are four environmental agents of deterioration which should be monitored on a regular basis as a part of maintenance. These are temperatures, relative humidity, light and dust. It is important to recognize the type of damage each agent may present as well as to mitigate any harm.

a. Temperature

- Agents of deterioration act primarily in conjunction with relative humidity but can trigger damage.
- At the extreme, the temperature can cause several damage to some materials; paint may be brittle in excessive heat, and some plastic may soften or melt in the heat.
- high temperature also accelerates chemical and biological processes

b. Relative humidity

- Collecting institution aim to keep the RH constant in exhibition and storage areas because many organic object expand and contract as both temperature and RH changes.
- High humidity can accelerate the mold growth some chemical changes like metal corrosion if not properly maintained.
- It is important to measure the RH of space regularly using several tools including humidity strip, Thermo hydrograph, hygrometers and data loggers.
- Once the percentage humidity is identified, there are a number of ways to adjust its by using humidifier dehumidifier or improving the heating and air conditioning system of the space.

c. Light

- Light as it relates to collection maintenance consist of visual and ultraviolet lights
- Both types of light can cause damage as real light radiation falling on the surface provides energy to induce the chemical changes in molecule of material.
- Damage from light including loss of color and strained is cumulative and irreversible.

d. Dust and dirt

- Dust can contain several materials including skin mold and inorganic fragment like silica or sulfur.
- it is important to keep collection free from dust whenever possible because it Ken bound to a surface overtime making it significantly more difficult to remove.

2.11. MUSEUM SECURITY

City is an essential part of life today whether we like it or not. most organisations see the need To allocate resources to security to protect their assets customer and employees. Museum galleries libraries and archives have added duty and responsibility of protecting nation's cultural and artistic history.

Types of Risk:

Burglary

Vandalism

Robbery holdup

Natural Hazards

Fire and fire smoke

Mechanical Measures

Walls : Sufficiently Robust

Doors: Tested and approved burglar- resistant doors and additional lock and braces

Windows: Test and approved

Display Case Measures

Glass should be resistant to breaking

Surfaces without glazing to have an attack resistant design

Weak points need to be secured against bending apart so that it is not possible to fish out small exhibits.

Electronic Surveillance

Intruder alarm systems should be designed in such way that intrusions are detected and notified as early as possible.

Perimeter Surveillance is intended to protect a buildings perimeter from penetration.

2.12. UNIVERSAL DESIGN PRINCIPLE

Seven principles of Universal design.

Principle 1: Equitable Use

The design is useful and marketable to people with diverse abilities.

Guidelines:

- 1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
- 1b. Avoid segregating or stigmatizing any users.
- 1c. Provisions for privacy, security, and safety should be equally available to all users.
- 1d. Make the design appealing to all users.

Principle 2: Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.

Guidelines:

- 2a. Provide choice in methods of use.
- 2b. Accommodate right- or left-handed access and use.
- 2c. Facilitate the user's accuracy and precision.
- 2d. Provide adaptability to the user's pace.

Principle 3: Simple and Intuitive Use

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

Guidelines:

- 3a. Eliminate unnecessary complexity.
- 3b. Be consistent with user expectations and intuition.
- 3c. Accommodate a wide range of literacy and language skills.
- 3d. Arrange information consistent with its importance.
- 3e. Provide effective prompting and feedback during and after task completion.

Principle 4: Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Guidelines:

- 4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- 4b. Provide adequate contrast between essential information and its surroundings.
- 4c. Maximize "legibility" of essential information.
- 4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- 4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

Principle 5: Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Guidelines:

- 5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- 5b. Provide warnings of hazards and errors.
- 5c. Provide fail safe features.
- 5d. Discourage unconscious action in tasks that require vigilance.

Principle 6: Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue.

Guidelines:

- 6a. Allow user to maintain a neutral body position.
- 6b. Use reasonable operating forces.
- 6c. Minimize repetitive actions.
- 6d. Minimize sustained physical effort.

Principle 7: Size and Space for Approach and Use

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines:

- 7a. Provide a clear line of sight to important elements for any seated or standing user.
- 7b. Make reach to all components comfortable for any seated or standing user.
- 7c. Accommodate variations in hand and grip size.
- 7d. Provide adequate space for the use of assistive devices or personal assistance.

3. CHAPTER 3 – CASE STUDIES

3.1. NATIONAL MUSEUM, CHHAUNI

3.1.1. OBJECTIVE: To know about

- Site Zoning
- Planning and function
- Gallery and internal layout in Museum
- Circulation
- Lighting
- Display technique

3.1.2. GENERAL INFORMATION

- Established: 1938 as a public museum
- Location: Chhauni , Kathmandu
- Land Type: Flat
- Main Entry: North
- Style: Hybrid of Neo-classical and Malla architecture
- No. of blocks : 3
-



Figure 55: Chhauni Museum

3.1.3. INTRODUCTION

The National Museum of Nepal occupies a space of around 20,000 square meters and is located in the residence of Bhimsen Thapa, the country's first prime minister. One finds a paved approach walk with lush gardens on both sides as they enter the museum complex. In addition to the palace itself, the complex also includes two other buildings that serve as the gallery. The first was started by Juddha Shumsher himself and is called Juddha Jatiya Kalashala. It is the first structure specifically constructed for museum usage. The display's arrangements include wooden creations, metal creations, old paintings, and stone sculptures. The galleries are divided into five categories: stone, terracotta, painting, wood, and bronze. The Buddhist Art is the second building gallery, which was formerly the Shah King Mahendra's Mahendra Smriti Sangrahalaya. The Buddhist Art Gallery, which was planned with Japanese funding in 1997, is another structure made to comply with museum functional standards. The first floor's Mandala Section features three-dimensional displays of statues, paintings, and ceremonial artifacts, while the ground floor's Terai, Kathmandu, and Northern Himalayan Section features similar displays. The Natural Science Gallery, Historic Gallery, Philatelic Gallery, and Numismatic Museum are the final four galleries of the Historical Museum's main palace. We enter the neo-classical palace through a gateway that leads to the main structure, where two antique leather cannons greet us. It features a variety of collections of artwork and ethnographic artifacts due to it being the National Museum of Nepal's oldest, largest, and richest collection. In terms of collections, the National Museum might be regarded as the largest museum in the nation. 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.

3.1.3.1. 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.

3.1.3.2. BRIEF HISTORY

The Arsenal Museum in the ancient building, which has been constructed in 1819 during the term of General Bhimsen Thapa as prime minister, became the National Museum of Nepal, also known as the "Nepal Rastriya Sangrahalaya," in 1928 AD (1806- 1837). This museum was formerly known as "Chhauni Silkhana," which means "the warehouse of weaponry" in Lao. It was initially solely accessible to guests of the Rana family. In 1938, Rana Prime Minister Juddha Shumsher inaugurates it as a public museum. The oldest, largest, and only multifunctional museum in the nation, this one contains exhibits on Nepalese history, natural history, personalities, ethnology, and a variety of disciplines of Nepalese art artifacts. It should play a significant and pioneering role in the growth of Nepal's museums. Of course, it serves as the first step in providing the public with non-formal education.

3.1.4. ARCHITECTURAL EXPRESSION:

Three structures that combine elements of malla and neo-classical architecture make up the museum complex. The Buddhist Art Gallery and Juddha Jatiya Kala Shala appear to have been created by an architect, whereas the main palace museum is housed in a Post Victorian structure that may have undergone adaptive usage. The first structure created specifically as a museum building to display exhibits is called the Juddha Jatiya Kala Shala, and it combines traditional Nepalese architecture with post-Victorian architecture and a dash of Indian architecture. Its entrance resembles the Sanchi stupa and has a rectilinear design. 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.

3.1.5. SITE ZONING:

There are three main buildings that house the exhibits. There are no fixed parking spaces for visitors or museum personnel. The historic main building dominates the area, and other buildings added later are arranged on the site so that many rooms fall on the negative side. The reason may be that it was previously designed as an open museum. Some exhibits are displayed in the garden, but at the time they were neglected, and such exhibits were not maintained.

3.1.6. PLANNING AND FUNCTION:

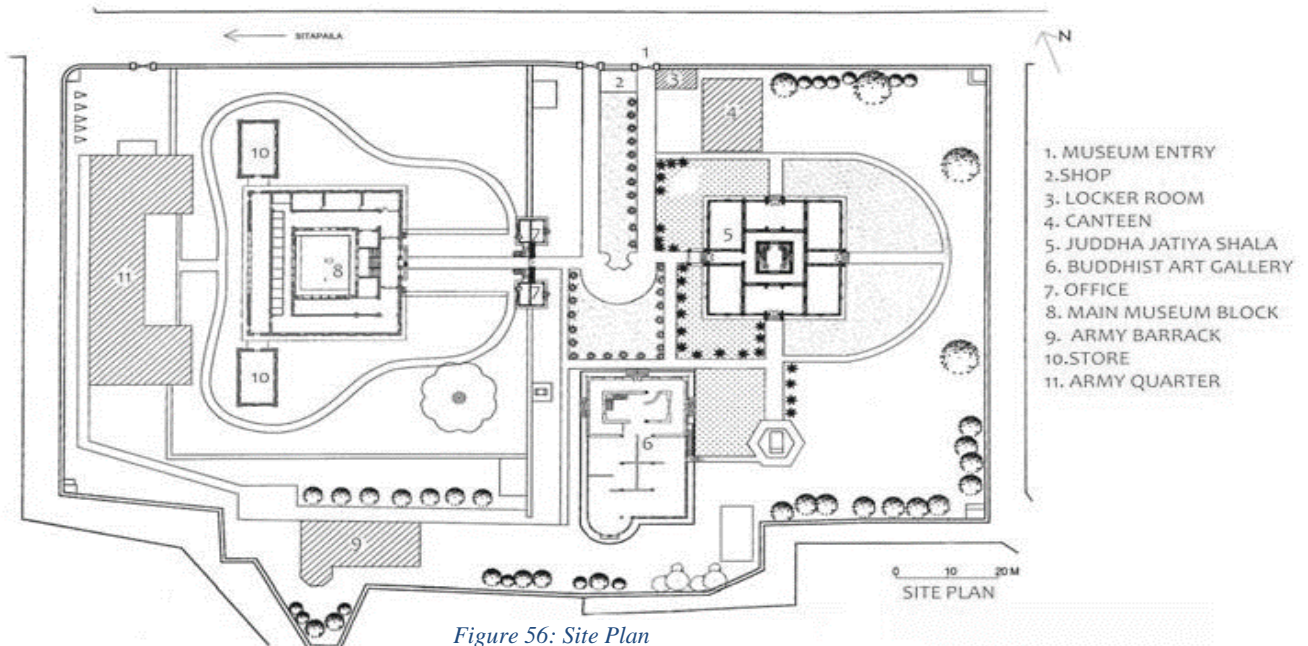


Figure 56: Site Plan

The entire building was planned for museum purposes and this institutional touch is felt in its character. According to the plan, the building is laid out in two directions perpendicular to each other towards the main entrance. This facilitates visitor orientation, as he has a clear view of all three blocks from the central courtyard facing the museum shop, car park and dining room. The placement of these public zones around the plaza creates a clear circular pattern and offers visitors choice. Functionally, the building appears to be effectively effective with simple planning and orientation. However, there is no separation between visitors and service entrances, and I feel a sense of incongruity when goods are distributed. Restrooms are at the back of the site and not easily accessible. In addition, museums often do not provide enough parking spaces for large numbers of visitors.

Space allocation details::

- There is no fixed place for management. It is located in the historic main building and the small watchtower building of the main building.
- Museum Lab does not exist
- Small space for the museum cafeteria near the entrance gate.
- The museum shop is located in the guard house next to the museum entrance.
- Toilets were placed at the south end of the site.
- There is a ticket office with lockers on either side and left of the entrance, as well as a souvenir shop with video surveillance monitors.

3.1.7. CIRCULATION:

As per display placement and division, circulation is efficient and simple. The absence of seating areas where visitors may take a break makes the entire experience difficult and exhausting. All of the exhibition halls have left hand circulation, which is ideal in the setting of Nepal.

a. 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.

b. JUDDHA JATIYA KALASHALA:

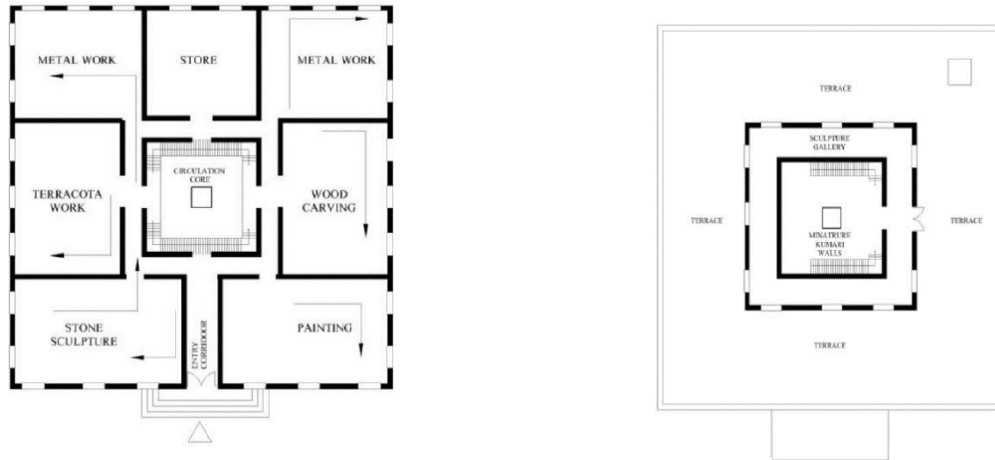


Figure 57: : Floor plans of Juddha Jatiya Kalashala

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.

c. 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.

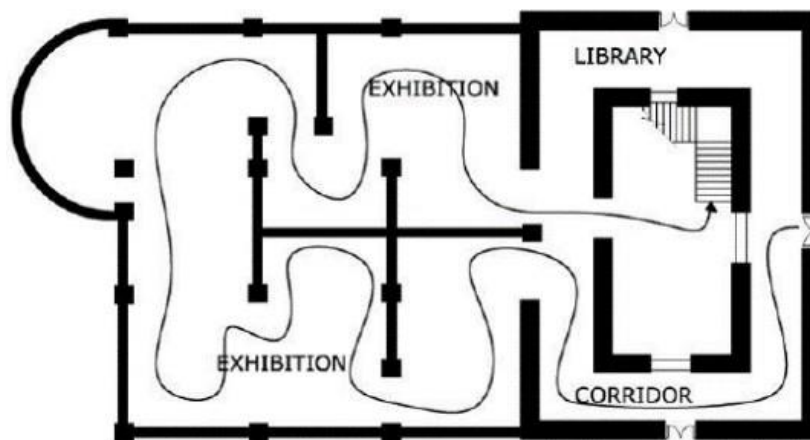


Figure 58: : Floor plans of Buddhist art gallery,

3.1.8. LIGHTING

Primarily, natural light and then artificial light are used to light the gallery. Direct sun radiation hits the exhibits in numerous places, suggesting that the natural illumination provided by the huge side or ribbon windows is not being utilised correctly. The quality of artificial illumination is not as fantastic as it might be. For the purpose of object illumination, fluorescent tubes and CFLs, with or without diffusers, are utilized. Spotlights have been utilized in certain places, but the illumination is too dim practically everywhere. The main mistake appears to be using the same lighting for both room and object illumination, however new display boxes feature a superb artificial lighting system. In the Buddhist Art Gallery, artificial lighting is shielded by a screen.

No attempt has been made to design the lighting in connection to exhibitions and the interior space structure, even when artificial lighting is present. Fluorescent lighting may make displays more apparent, but when situated such that the light bulbs themselves are visible, it can be distracting and tiresome for visitors. Additionally, presentation entails adequate lighting in the galleries. The National Museum has a beautiful architectural ensemble that allows good illumination into the interiors, and daylight is preferred for psychological reasons. However, the lighting intensity must be such that overwhelming contrasts are avoided.

Figure 4-13: Natural light creating glare

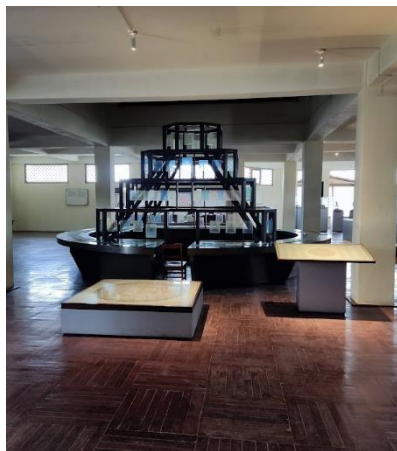


Figure 59: Improper Lighting throughout the gallery

3.1.9. INFERENCES:

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.
- 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

- Display techniques
- Lighting techniques: Natural and artificial
- Museum Environment and museum facilities.

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



Figure 60: Patan Museum

3.2.3. INTRODUCTION:

A modest temple dedicated to Mani Keshav Narayan is located in the center of the Keshav Narayan Chowk, which is the northernmost section of the Patan Durbar Complex and home to the Patan Museum. One of the royal residences of the old Malla monarchs was the Durbar. It is believed that a Buddhist Monastery once called the Keshav Narayan Chowk complex, which dates to the late seventeenth century. Both the monastery and the palace are built upon much older foundations, possibly dating to the Licchavi era (third to ninth century). Although there have been several renovations to the palace square throughout the years to suit various purposes, the current design is said to reflect that of the past. Beginning in 1982, the Austrian and Nepalese governments worked together under the direction of architect Gotz Hagsmuller to restore the Keshav Narayan chowk and turn it into a model of a cultural institution.

3.2.3.1. SITE:

The golden door and window of the Patan Museum look out over one of the most stunning squares in the world. With one side made up of palace complexes and the other plaza made up of diverse religious buildings, Patan Durbar Square is one of the UNESCO's World Heritage Sites. It is positioned along a North-South axis. On contrast to the temples in the plaza, which are devoted to male gods who do not require blood sacrifices, the palace complex has a multi-tiered temple of the female deity Taleju.

3.2.3.2. BACKGROUND:

More contemporary museums are being established nowadays all around the world, while others are moving into old buildings that are no longer serving their original function as museums.

The Patan Museum supports the notion of stopping the decline and giving space a new, purposeful use. The project's specific goal is described by architect Hagsmuller in his book "Patan Museum," 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 sustained significant damage as a result of the earthquake in 1934, was repeatedly and feebly repaired. Every time modern building materials and techniques are used, the ancient palace's original design is altered. The palace continued to serve a variety of functions. It was formerly also a school, with the courtyard balcony being screened for safety and the structure being coated with an imitation cement brick coating. Another version of the palace was a tiny collection house, where it already had a well-rounded collection of antiques, the majority of which were recovered by Nepal's customs and police departments from stolen and smuggled items. It was crucial to maintain its historical significance while also putting it to new uses that would provide a large collection of historical items a new home. Except for a snapshot of the palace's facade taken decades ago by a foreign visitor, there was no documentation or any images of the palace. The architect was given the difficult task of maintaining the Palace complex, which was already recognized as one of the World Heritage Sites, while also adapting and making the required alterations to incorporate museum-like features. Mainly preserving the primary elevation and court area in accordance with its original historic design was the goal of the conservation procedure. After several years of cultural and educational initiatives, the museum first welcomed visitors in 1997. It exhibits Nepalese traditional holy art in a magnificent architectural environment. Only 200 of the total 1200 items are on show in the museum. The works on display include paintings, sculptures made of stone, metal, and wood. An excellent illustration of adaptive reuse, architectural conservation, and renovation is the Patan Museum. The museum's collections include some priceless relics and span a significant portion of Nepal's cultural history. They are explained in terms of their significance and setting within the current Hindu and Buddhist traditions. The majority of the items are cast bronze and gilt copper creations, two traditional crafts that Patan is renowned for

3.2.4. ARCHITECTURAL EXPRESSION:

The mud, wood and brick structure has a symmetrical principle façade and can be accessed from a central main door with a decorated torana. The highly decorated door and windows, brick walls and multi tiled roofing is the typical of Malla period architecture. It expresses the glorious period in the history of architecture in Nepal. The main court has a small shrine of Keshav Narayan at the centre, from which the name of the palace has been



derived. The palace has 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 double rows of wooden posts (Than) from the falcha on the ground floor, is highly decorated with each layer of decoration having religious meanings. These porticos are usually introduced where an opening is required for design reasons or because of the usage of space behind. The typical Newari style of column but constructed of iron instead of wood which was included during the palace renovation in 1980s

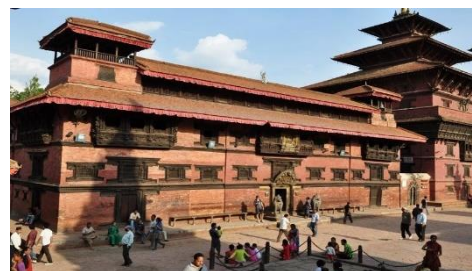
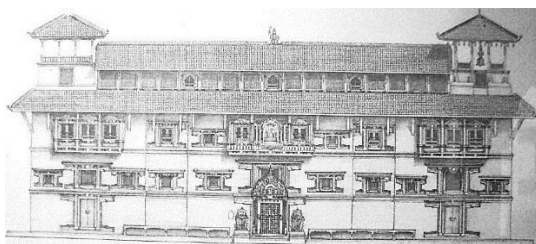


Figure 62: Front elevation of Patan Museum

3.2.5. LIGHTING:

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. When Hagmuller first arrived in Nepal, he found the lightscape of our traditional towns to be very supernatural. The usage of color in the museum was monochromatic, and the choice of hues came fairly effortlessly in order to replicate the inside ambiance and the same kind of festival lighting.. Additionally, in addition to the artificial light that appears to be used fairly effectively in combination with the natural lighting at certain places such that there is no problem with glare or disturbance to visitors, he has used a variety of inventive methods to get indirect light into the exhibits, such as the perfect combination of light and shadow, which is an amazing aspect of the project.

a. Natural light:

The Patan Museum's hallways were lighted by natural light coming in via the low-height windows. Indirect illumination has been achieved using a variety of methods. The circulation route is illuminated by latticed windows, while artifacts have been lit via gaps and recesses. The indoor environment is enhanced by the shadows cast by latticed windows on internal surfaces. An arched bay window with two stories provides natural lighting for the area near the entrance stairway. Long, gloomy hallways are illuminated by daylight passing through tiny openings and latticework; this aids in orienting visitors without exposing them to stark contrasts, giving the impression that this is the primary method of illuminating the objects. The top gallery is well-lit thanks to the operable bay windows and offers sitting as well as a view of the surrounding temple complex. Additionally, this provides a visual appeal and breaks up the visitor's boredom.

b. Artificial light:

In certain locations, it appears that artificial light is combined with natural illumination rather successfully. Artificial illumination is provided to the bottom gallery, which receives less natural light via the latticed window, to highlight the artifacts. The exhibitions were lit using incandescent lights that were easily accessible locally. These screened lights helped the displays stand out in the dark, cramped spaces. The same lights were hidden inside the alcoves and recesses, giving the empty walls a beautiful appearance and providing room for displays. Focus lights are employed in areas where brightness is required. The height of the display rooms are 7' 6" and the distance of the lights are at 2' 6" from the wall which provided appropriate lighting for the museum exhibits. The height of the display case is maintained from 3' 6" to 3' 8" in which lighting is done from inside the display case with the use of glass panels distributing the light equally in every part of the display case.



Figure 63: Showcase hung at a height of 3'-5"

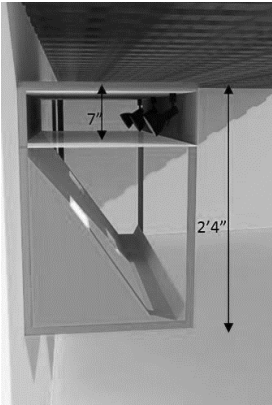


Figure 66: Lighting objects inside the showcase



Figure 64: Artificial lighting techniques

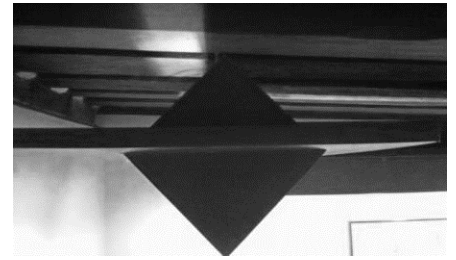


Figure 65: Lighting fixture kept at 45 degree



Figure 67: Artificial lighting

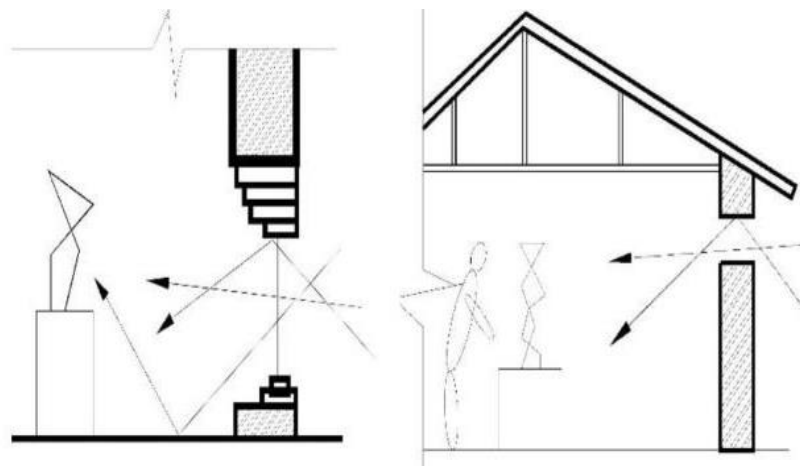


Figure 68: Day lighting throughout the museum

3.2.6. MUSEUM ENVIRONMENT

A good museum offers a welcoming and engaging atmosphere. Its success may be influenced by several things.

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. Seatings 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 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.

INFERENCES:

The inferences are as follows:

- 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
- 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.
- Seating provided in intervals for visitor's 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. MAXXI Museum / Zaha Hadid Architects

3.3.1. Objectives of study

- Planning and function
- Internal spatial layout and form
- Architectural expression
- Circulation
- Lighting
- Site context

3.3.2. GENERAL INFORMATION

- Location: Rome, Italy
- Architects: Zaha Hadid Architects
- Area: 27000 m²
- Year: 2009



Figure 69 : Maxxi Museum front elevation

3.3.3. GENERAL INFORMATION

The museum was created by British-Iraqi architect Zaha Hadid, and it debuted in 2010. Like many other art museums with cutting-edge designs, Maxxi's architecture evokes a feeling of purpose and significance. The architecture of MAXXI, which is characterized by spatial layering and fluidity as well as coexisting interior/exterior design situated within the context of its surroundings, reflects both the art and Hadid's distinctive style. 2014 Simonsson According to the architect, "the museum is not an item container, but rather a campus for art," where flows and paths connect and join to create a vibrant and interactive space. Even though the program is clearly laid out and well-organized, the project's main goal is to make it as adaptable as feasible.

Every section is connected without any obtrusive wall separations or breaks, making it the ideal setting for any form of mobile and transient display. As soon as one enters the atrium, they can see the project's main characteristics: the curving concrete walls, the hanging black stairs, and the open ceilings that let in natural light. In order to capture the chaotic flow of modern life, Zaha Hadid intended these elements to depict "a new fluid form of spatiality with many viewpoint points and fractured geometry." 2012 Giannotti.

3.3.4. MUSEUM CONTEXT

The Flaminio neighborhood, where the museum is situated, has undergone a significant change in layout and use during the past century. It was home to various factories as early as the 20th century. Rome held the World's Fair in 1942, which contributed to the area's development as a destination for recreation and fun. Several sports stadiums, concert venues, and other venues may now be found in the Flaminio area. venues, as well as MAXXI and Galleria Nazionale d'Arte, two significant art museums.

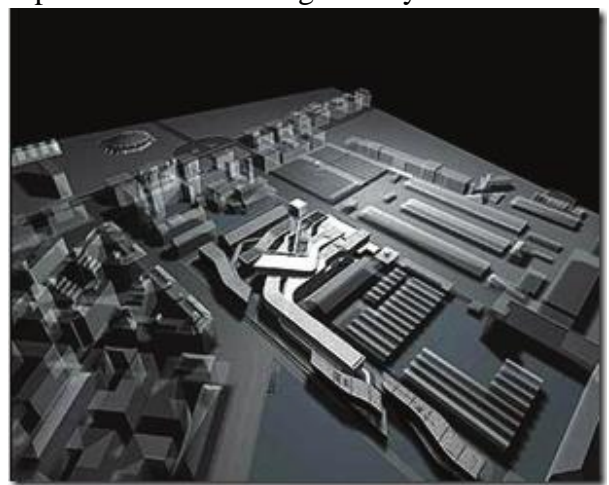


Figure 70:MAXXI MUSEUM

As she does with all of her projects, Hadid considered the environment when planning and creating MAXXI. The location was challenging to build on since there wasn't much area for a new construction because of the former army barracks on Via Guido Reni. As a result, some were destroyed, one was added to the museum, and others were renovated to use as additional exhibition spaces. The Maxxi's floor layout was bent as a result of the site's and the city's unusual shape. Concrete was chosen as the main building material for the museum since it complemented the surroundings. A courtyard was built first to make room for outdoor displays before the façade. The building's avant-garde design makes it one of the most noticeable examples even though it was created to blend into the Flaminio neighborhood. A lobby, five galleries, and five more rooms for exhibits and instruction may be found in (MAXXI. 2014 Simonson.)

3.3.4.1. THE FOYER

Arriving at MAXXI, a visitor's eyes are immediately drawn to the building's imposing entrance. The walls are curved and the angles are twisted, rising around twenty meters into the neighboring rooms. The unsupported ramps and steps give the sense that they are floating in midair, giving enough room for the entryway to look large and roomy. Despite the rounded, delicate contours of the entryway, a frigid mood is produced. Some of the concrete is unpainted and still retains its original shade of grey, aside from the white walls and flooring. They provide a hint of coolness to the atmosphere and make a tiny place feel larger. Floating ramps and steps contrast with strong, stable walls. At the same

time, the room seems both weighty and light.

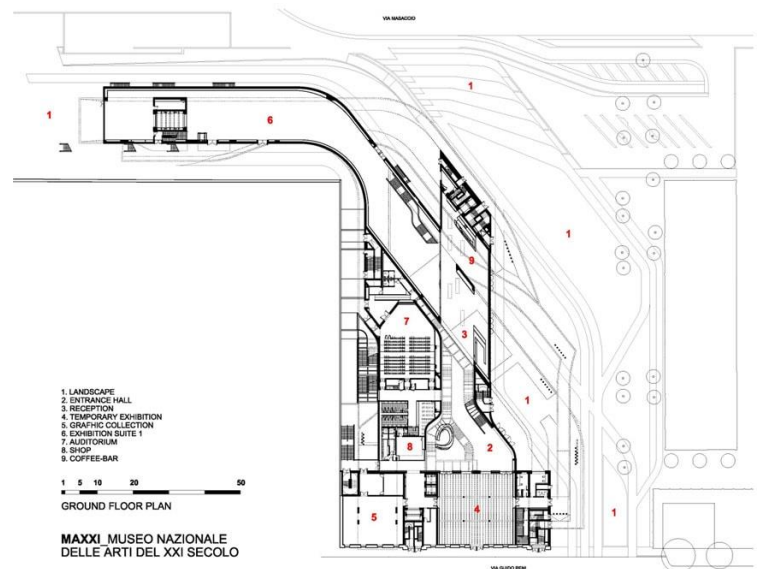


Figure 71: First floor plan of MAXXI Museum

Even though the stairs and ramps are largely built of metal, they give the impression of fluidity and lightness. Steel grates cover the stair treads and stairs, while sturdy black metal planks serve as the banisters. In order to create the appearance that one is walking on light, grates are used on top of screens that have white light shining through them and serve the same effect as they do on ramps. In contrast to those on the ramps, the gratings on the steps don't rely on screens. Instead, they serve as steps without any assistance from below, allowing one to see all the way to the floor of the entryway. Walking on the unsupported stairs and ramps gives an impression of instability and a kind of insecurity. Bridges and staircases, on the other hand, can contribute to the feeling of movement and fluidity. Indeed, one is moving at a high altitude. Walking up and down on the topmost bridge, you can see a pattern emerging. There is an asymmetrical S-shaped structure that spirals upwards from the floor to the galleries

Hadid drew inspiration from geology, landscapes, and terrain while designing her buildings, and she intended for their lines and shapes to follow the streets around them. Continuously running through the rooms and following their flowing patterns, rows of concrete rails with flat bars as ceilings mimic components seen on a city's streets. They all have something to do with urban structures and traffic flow. That is to say that it is reminiscent of urban modern Rome, which is in keeping with MAXXI's mission as a museum of contemporary art and architecture

3.3.4.2. EXHIBITION ROOMS AND GALLERIES

The architect's desire to create an unlimited flow in ill-defined regions is hinted at in MAXXI's design. The arrangement of the areas and exhibits does not provide a clear course or direction. Visitors are free to stroll around at their leisure without being constrained in any manner, even though the galleries are numbered. While browsing the galleries, there is a sense of confusion, as well as a sense of joy and surprise. The ground-level Sala Claudia Gian Ferrari and Sala Carlo Scarpa are to the right of the entrance. Two exhibits are on display, one of which features the museum's photographic collection and the other of which features video and audio art. To the right is the entrance to the first gallery, a curved space that then extends into a rectangular hall, Gallery 1.



Figure 72: The Foyer Staircase

The first floor contains Galleries 2, 3, and 4. The second floor consists of the exhibition room Sala Guido Reni and the third-floor houses Gallery 5. The different levels can be reached by the stairs and ramps in the foyer or by elevators. Gallery 2 is the largest of the galleries, stretching from one end of the structure to the other. First, a lengthy corridor, then a rectangular space that follows the shape of Gallery 1 downstairs on the ground floor may be found. These two galleries are joined by some steps. A further, smaller area may be found adjacent to these steps in a separate building. Alternatively, Gallery 2 can be used to present one exhibition or a mix of many exhibits.

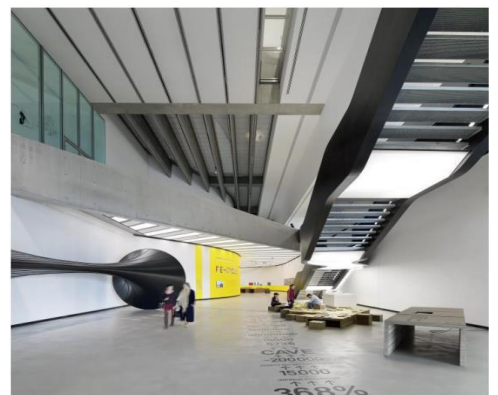


Figure 73: Gallery 1

Somewhat similar to gallery 2, gallery 3 provides the biggest shocks in terms of floor levels. Space is divided into smaller portions by glass screens or high concrete barriers, such as those at the top of the slope and near the back wall. As a result, the artworks can be the center of attention in some places. In Gallery 3, the softer forms are mixed with more chaotic lines. These lines appear to be asymmetrical to the eyes, which can lead to feelings of uneasiness in certain people. One might feel relaxed and in charge when looking at a straight and regular line or a symmetrical space.

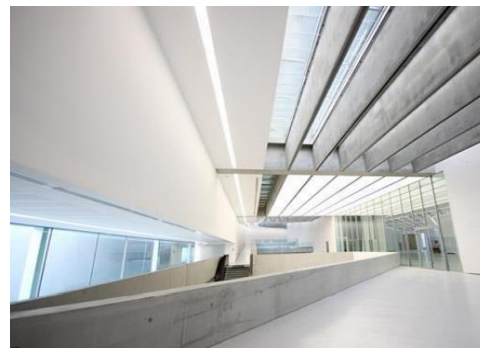


Figure 74: A section of Gallery 3

Although irregularities might be viewed as unpleasant, they can also generate a spirited and provocative environment. There are visual obstacles in Gallery 3 that prevent the eyes from fully comprehending the entire area at once, creating a sense of surprise and wonder. Therefore, it is a space that can cause contradicting reactions.

Unlike other galleries with their open surfaces and more understandable layouts such as Gallery 4, Gallery 3 is extremely dynamic. Despite the gallery's modest curvature, visitors can have a good view of the whole room. No matter what form of art is displayed in Gallery 4, the artworks are all displayed the same way. Sculptures and other artwork are on the floor, while others are hanging on the walls at eye-level, such as paintings and screens exhibiting video art. Although it's not as white cube-like as the other galleries, Gallery 4 has the most conventional spatial design. As a final exhibition area, Gallery 5 is on the third floor. With a sloping floor and backless sofas for seating, it resembles a movie theatre. The video art section, which is very gloomy, is easily bypassed in favor of a more open, brighter exhibition room, where a variety

of sculptures are displayed. A projecting portion of the museum, opposite the curving wing holding Galleries 1 and 2, houses this component of the museum.



Figure 76: Gallery 5 view



Figure 75: Gallery 2

3.3.5. SPATIAL EFFECTS

The entrance receives a lot of natural light due to its several large windows. After sunset, darkness descends, diminishing weightlessness because it gives the impression of a denser, more confined place. The darkness is more intense at the top of the area. Because of the brilliant white light that is cascading down the stairs and ramps, it seems as though the stair construction is heavier. The light has a significant effect on the darkness by enhancing it rather than lessening it.

The natural light in the galleries is white or white-yellow, while the artificial light is of a softer and darker yellow, close to the hue of copper. A strong spotlight isn't needed to draw attention to an artwork since the light from the sun and artificial light is so varied that they cast distinct shades on different locations. Consequently, the rooms and artworks are uniformly lit, yet with different shades of illumination. Not by emphasizing, but rather by color coding the artworks in their surroundings.

The Gallery 2 corridor area has uneven widths throughout. On the one hand, Gallery 2's larger portions look to be roomy, while those in its smaller portion seem to cram people within. The demand for the observer to take up the pace and move on to another more open and expansive space does not appear as urgent because the gallery does not resemble a solid concrete tube. The windows provide the hallway a sense of room, light, and freshness as opposed to a narrow hallway that drives one to move forward. Levels and floors are intertwined with pathways, creating a flow of spatiality that isn't always clear-cut. Narrow hallways are distributed throughout the areas. Due to this fluctuation, the pace of a visitor is constantly being re-adjusted.

One is constantly on the alert, wondering what will happen next and how to adapt to the changing surroundings because of the pace shift. It's never dull from that perspective, plain and simple. On the other hand, it could get boring to constantly find new spaces, especially when fresh artworks are shown in unexpected locations within the oddly shaped rooms. Consequently, the MAXXI's design might result in a range of reactions with different outcomes.

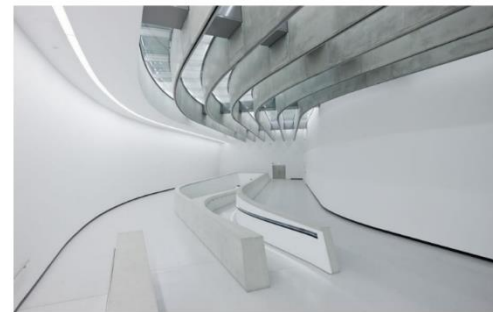


Figure 77 : Gallery space

Conclusion

- Modern art institutions may nevertheless have white cubical chambers despite their avant-garde exteriors. This is not the case with MAXXI. Despite largely being white and light grey, it stands out because to a variety of inventive display techniques in unusually shaped and open areas. The worth of art does not just depend on whether it is exhibited against a white-grey background; it also depends on how people perceive the art, whether it is displayed against white-grey walls or other colored walls.
- Even while modern art institutions may have avant-garde exteriors, the inside may still be white cubical rooms. With MAXXI, this is not the case. It pops out despite being mostly white and light grey due to a range of creative display tactics in oddly shaped and open spaces. The value of art is not just determined by whether it is placed against a white-grey backdrop; it also depends on how viewers react to the artwork, regardless of whether it is exhibited on white-grey or another color of wall.
- Only when the audience is seated within the precise space where the artwork is shown can they see the multiple artworks since they are obscured by walls and parts. A few architectural elements, such as stairs, slopes, and walls that divide the rooms into hallways and portions, may detract from the art to some extent, but they also compliment it and provide an intriguing contrast rather than acting as a distraction.
- Due to Hadid's attention to detail, MAXXI is both unique in the Flaminio neighborhood and seamlessly integrated into it. While Hadid's ideas are similar to many others in the field of contemporary museum architecture, they seem to represent innovation and dramatic development. More than that, their futuristic design implies a future when they will be viewed as contemporary

3.3.6. INFERENCES

- Response to the urban grid in context.
- Curvilinear geometry for exhibition spaces which is different from gallery spaces which are conventionally cube in structure.
- Bringing in controlled daylight via an innovative roofing which adds to experiential quality.

3.4. LOS ANGELES COUNTY MUSEUM OF ART (LACMA), USA

3.4.1. DESCRIPTION

Building	Los Angeles County Museum of Art (LACMA)
Location	Los Angeles, California (USA)
Major Area	Exhibition area, Research Library, Conservation Center
Area	60,000 sqft (5600m2)

3.4.2. INTRODUCTION

Located in Pacific Rim, LACMA is the largest art museum in the western United States, with a collection of more than 142000 objects that illuminate the globe. Committed to showcasing a multitude of art histories, LACMA exhibits and interprets works of art from new and unexpected points of view that are informed by the regions rich cultural heritage and diverse population.

LACMA's spirit of experimentation is reflected in its work with artists, technologists and thought leaders as well as in its regional, national, and global partnerships to share collections and programs, create pioneering initiatives and engage new audiences.



Figure 78: Urban light Exhibits at LACMA

Urban Light, an exhibit by Chris Burden is a stand out piece at LACMA composed of 202 old lampposts, many of them from the 1920s and 30s collected from around Los Angeles.

PUBLIC ART

An important aspect of LACMA's success in increasing attendance and raising the museum's profile was a strategic investment in public art, accessible outside the museum walls. Dina Vesga, chief operating officer, described the public art on LACMA's grounds as an essential component of this vision: "The front of the museum is packed at all times. We have had to put guards out in the middle of the night. It's a young, diverse demographic. Our public sculptures have become a point of engagement for an audience that has been elusive to the museum. Eventually they venture into the galleries. We are the only museum that can say it tripled attendance in such a short time."

THE FUTURE

LACMA's future plan focuses on radically breaking down the barriers even more this time by rethinking what a museum can mean to a city. This plan includes a redesign of LACMA's physical location, making the museum a more transparent and open space. It also includes a radical plan to start hosting more exhibits in communities around Los Angeles. Turning LACMA into a repository for a decentralized city-wide art museum.



Figure 79 : Levitated mass Micheal heizer
LACMA



Figure 80 : Smoke by Tony Smith Estate (Artist rights Society)

KEY FINDINGS

Establishing a Civic Sense

By increasing its profile and reflecting its environment, LACMA has become an integrated cultural space in a city that is both highly diverse and highly segregated. Staff see this as a civic responsibility for a country museum.

Audience Engagement:

LACMA staff think critically about how to be good hosts to the public, and they often use contemporary art as access points for cultural conversation. To this end, education and curatorial departments achieved a high degree of collaboration founded on mutual respect for one another's expertise.

Decentralization

Urban planning and environment factors create a barriers to accessing LACMA for many Los Angeles residents. LACMA is finding spaces outside the walls of the museum for its art and working with county of Los Angeles to build satellite locations.



Figure 81: Resnick pavillion by Nic Lehoux



Figure 82 :Board Contemporary Art Museum

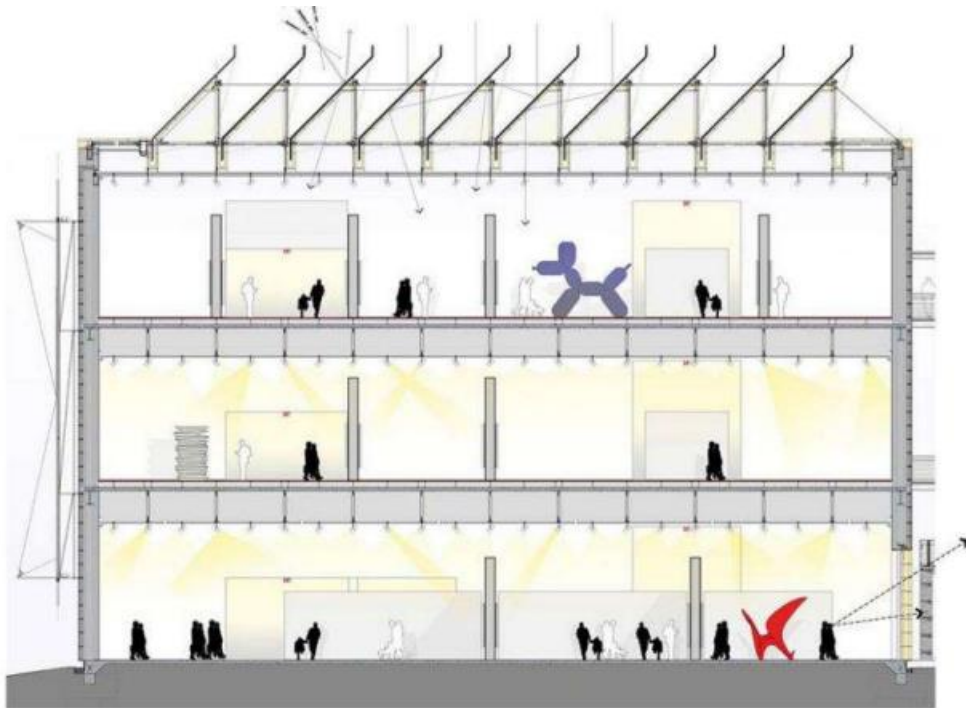


Figure 83 :Broad Contemporary Art Museum : cross- section



Figure 84: Walter De Maria's installation, The 2000 Sculpture at Resnick pavillion (LACMA)



Figure 85: Exhibition spaces in the Broad Contemporary Art Museum

INFERENCES

- Regularly rotating temporary exhibits, constantly changing film program, lectures, courses and special events mean that there is always something new and fascinating going on at this museum.
- There is the Boone Childrens Gallery at LACMA for childrens, when they can try their hand at paintings
- By bringing works like Levitated Mass and Urban Lights to the grounds of LACMA, The museum has become an iconic cultural space on the West Coast, Drivej in no small part by visitors social media engagement. LACMA is now the Fourth Most Instagrammed Museum in the world.

3.5. ZEITZ MOCAA, CAPE TOWN, SOUTH AFRICA

3.5.1. PROJECT INFO

Building	Zeitz MoCAA
Location	Cape Town, South Africa
Architects	Heatherwick Studio
Spaces	Gallery Spaces, A rooftop sculpture garden
Area	9500 sq m

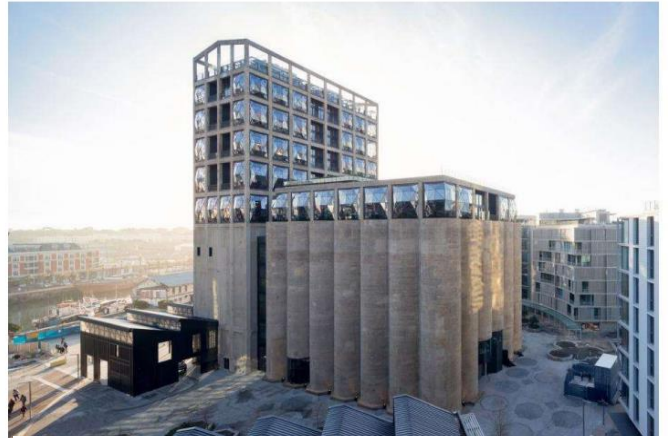


Figure 86 : View of MoCCA in Silo Square

3.5.2. INTRODUCTION

The Zeitz Museum of Contemporary Art Africa (Zeitz MOCAA) is the world's largest museum dedicated to contemporary art from Africa and its diaspora. The museum is housed in 9500 sq meters of custom designed space, spread over nine floors, carved out of the monumental structure of the historic Grain Silo Complex. The silo, disused since 1990, stands as a monument to the industrial past of Cape Town, at one time the tallest in South Africa, now given new life Through the transformation by Heatherwick Studio.

3.5.3. INCEPTION AND DEVELOPMENT

The public not for profit museum was commissioned through a public/private partnership between the V And A Waterfront and German businessman, Jochen Zeitz . The WaterFront invested over 500 million dollar towards its construction and infrastructure development.

The museum building was constructed from the conversion of 57 m tall historic Grain Silo originally built in 1921 and decommissioned in 2001. The galleries and atrium space at the centre of museum have been carved from the silos dense cellular structure of forty 2 tubes that pack the building
The development includes 6000 sqmeters of exhibition space in 80 gallery spaces.A roof top garden, state of art storage and conservation areas, a bookshop, restaurant, bar, reading rooms. The museum will also house Centrs of Costume Institute, Photography, Curatorial Excellence , Moving Images, Performative Practice and Art Education.\



Figure 87: Renders Section of Zeitz MoCCA

(EXHIBITION: ZIMBABWE)

Interiors



Figure 88 :Interior view of galleries at Zeitz MoCCA

3.5.4. SPECIFICATION

Structural System

Historic Structure: Combination of steel frame and reinforced concrete

New Structure: reinforced concrete

internal walls: lightweight drywall construction

Exterior Cladding

Metal/glass curtain wall: Glazed Facades and Pillow

Windows: Mazor Aluminum

Moisture barrier: SIKA Sikalastic 152 to protect the historic concrete

Roofing

Other: Sculpture garden: concrete flat roof with raised precast pavers by World of Decorative Concrete and g LeRoux Sculpture garden and gasket roof lights manufactured by Mazor Aluminum

Doors

Entrances: As Above Glazed Facades: Mazor Aluminum Metal doors: re-instated historic doors salvaged from original grain silo Wood doors: HG Holliday Fire-control doors, security grilles: HG Holiday

3.5.5. INFERENCES

- There are few discussion areas in between galleries as buffer spaces.
- The Central atrium with the Grain Silo Structure is awe-inspiring.
- The services run in floors near the walls, the services are well hidden away from the main public circulation routes.
- All different types of galleries provide a rich and varied user experience with different display exhibits, lighting, and color contrasts. The audio gallery and the 180° audio-visual gallery provides an immersive experience to the user.

3.6. KIMBELL ART MUSEUM, TEXAS:

3.6.1. OBJECTIVE: To study

- Planning and function and architectural expression
- Lighting design and use of natural lighting

GENERAL INFORMATION:

Location: Fort Worth, Texas, USA

- Established: 1972 AD
- Construction system: Reinforced Concrete
- Building usage: Art museum
- Architect: Louis I. Kahn
- Style: Modern
- Notes: Vaulted ceilings with integrated daylighting



Figure 89: : Exterior of the building

3.6.2. INTRODUCTION

The Louis I. Khan-designed Kimbell Art Museum is located in the 9.5 acres of Fort Worth, Texas' Amon Carter Square Park. The gallery is made up of 16 thin rectangular vaulted parts that are arranged in three sections, with six vaults on either end and four in the center. The Kimbell Art Museum is a straightforward construction of parallel concrete vaults that shows itself to the visitor before they enter the structure with porticoes that appear to be an unnecessary prolongation of the vaulting. Actually, the issue of natural lighting was the source of the museum's fundamental design. Louis Kahn has always believed that light gives creatures life. Because of this, lighting, especially natural lighting, is regarded as a powerful component in his design. The interior interiors of this museum were conceived by Louis I. Kahn using natural illumination, which is its most charming feature. He has lit his rooms with a blend of silver and green light while maintaining the interior planning hierarchy of served places and servant quarters. The 2.5' wide gap in the ceiling's silver top lighting was reflected from the curved reflector by the silver light. However, green light is the one that the structure receives after it bounces off the light courts. It gives good interior illumination but has the drawback of being very difficult to maintain an appropriate lighting level in the gallery spaces

PLANNING AND FUNCTION:

The sloping location provides for both public access on the east side at the lower level from the parking lots and access on the west side at the upper level, which is largely a pedestrian entry. The low "servant" spaces between the vaults assist to establish smaller, human-scale chambers so that the gallery spaces are not constrained by the individual vaults but flow from one to the next. This movement is made possible by the wall gap that Kahn mentions at left, which is seen in the external porticoes. But rather of using wall space, opening up the roof space allows for the development of internal space via light. At the most interior parts of the galleries, there are three open courts that let in a bit of the outside world. The gorgeous outside landscape space has improved the atmosphere of the entire facility. The gardens are on several levels, and west entrance is bordered by two rectangular pools that provide a cool approach to the gallery.

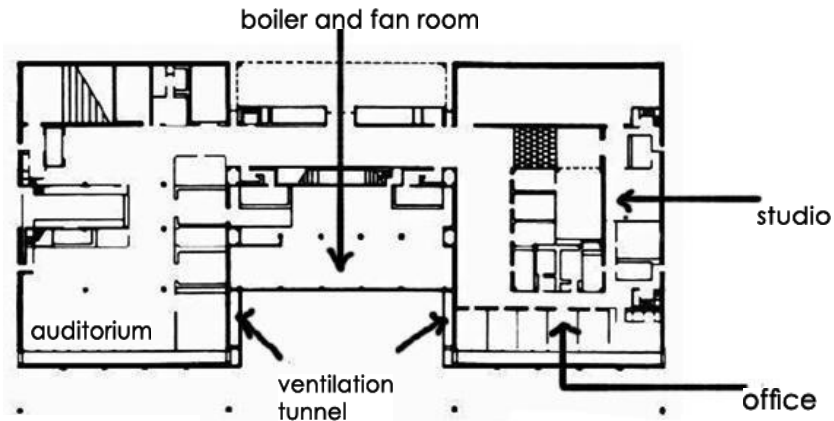


Figure 90: Lower floor plan

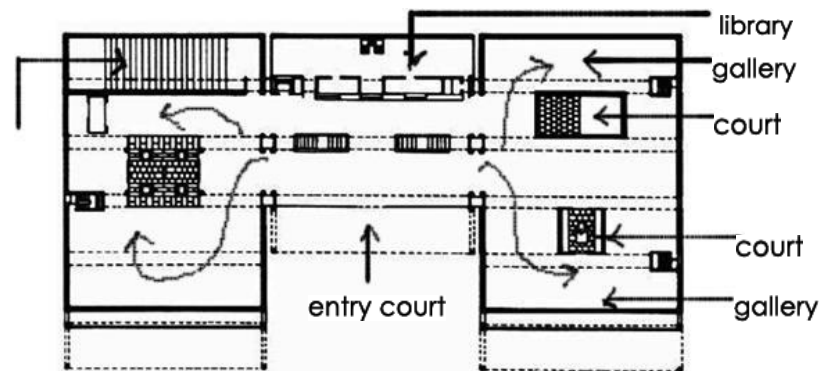


Figure 91: Upper-level plan

3.6.3. ARCHITECTURAL EXPRESSION::

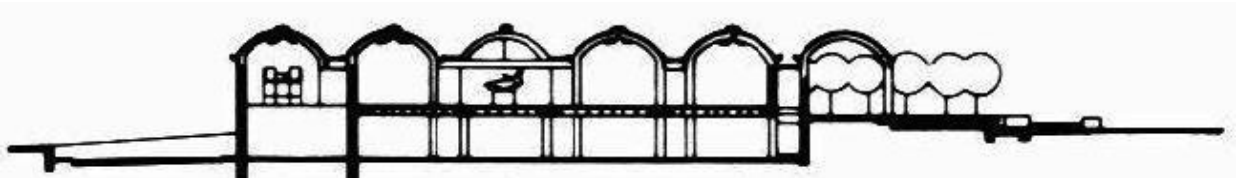


Figure 92 :Section of the museum

The porches serve as the structural lexicon for the entire museum, consisting essentially of a concrete beam (100' x 23') shaped like a cycloidal vault and supported by four square columns. As was the case in the majority of Kahn's structures, this straightforward structure is employed to provide an abstract order that serves as the basis for more sophisticated space. Materials utilized include white wood, aluminum, honey-colored travertine, stainless steel, exposed concrete, travertine, and fair-faced concrete. The museum is made up of 16 parallel vaults that are each 20 feet (6 meters) high, 20 feet (6 meters) broad, and 100 feet (30.6 meters) long (internal measurements). The vaults are divided by intervening low canals. There are three wings made up of the vaults. The western vault is open as a portico, while the north and south wings each feature six vaults. The western vault is open as an entry porch and faces a courtyard that is partially enclosed by the two exterior wings. The central area includes four vaults altogether.

In order to provide access to natural light, the museum's art galleries are situated on the upper floor. The bottom level is home to service and curatorial areas as well as a second gallery. To let natural light into the galleries, each inner vault has a slit along the top of it. The flat passageways between the vaults are home to mechanical services like air ducts. Kahn employed a number of strategies to create a welcoming atmosphere in the galleries. Travertine is used on both the interior and outside of the concrete block ends of the vaults. To provide a matte surface texture, crushed pecan shells were used to "blast" the steel railings..



Figure 94: Kimbell Art gallery interior

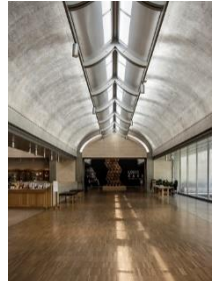


Figure 93: This Photo by Unknown Author is licensed under CC BY-NC-ND



Figure 95: This Photo by Unknown Author is licensed under CC BY-SA

In addition, Kahn created three courtyards, each of which featured a unique theme and was named for the color of light he thought its proportions, foliage, or sky reflections would produce: Green, Yellow, and Blue Courts. Green Court features a vine-roofed ceiling and flora, while Blue Court features a splashing fountain with a travertine cage that reflects sky and water. The expansive Yellow Court is located right adjacent to the conservation lab for the Kimbell. The exhibition rooms are illuminated naturally by these glass-walled courtyards. The conservation studio on the bottom level receives natural light thanks to a yellow court that seeps through the gallery floor.

3.6.4. LIGHTING

"No space, architecturally, is a space unless it has natural light."— Louis I. Kahn .A person's experience of an architectural space is shaped by many factors, including its scale, proportions, plan, and use of materials. In many buildings, and especially at the Kimbell Art Museum, light performs a crucial role—illuminating the space and creating a mood.

3.6.5. NATURAL LIGHTING

Louis Kahn always emphasized the significance of light in relation to structure in both his teachings and projects. Above all other forms of illumination, he liked natural light because it is "dynamic, ever-changing." In order to protect expensive and delicate works of art from direct sunlight damage, many museum designs predominantly rely on artificial lighting. Richard Brown, the director of the Kimbell, however, believed that the museum halls should be lit by natural light so that visitors might connect with nature and the impacts of changing weather while within the Kimbell.. Additionally, this kind of illumination makes it possible for viewers to observe works of art more accurately than they would have under natural lighting. This issue was a matter of mutual interest between Kahn and Brown, and it served as the basis for Kahn's design for the cycloid vault with "thin slits to the sky," which is an aperture or slit that spans the whole length of each vault and allows natural light to enter and change the space. The intention was to provide the galleries with soft natural light, avoiding any direct sunlight that would harm the artwork. Hence, the works of art are not illuminated entirely by natural light—lamps bolster the daylight to give a mixture of natural and artificial light that is ideal for viewing works of art.

Kahn envisioned a metal "reflector" or "shield" that would be positioned exactly beneath the skylights to reflect sunlight onto the smooth, gray, curving surface of the vault, allowing light to penetrate the area without damaging priceless artworks. A silvery radiance would appear on the surface as if by magic, filtering down to fill the area below without affecting the Museum's artifacts. Lighting expert Richard Kelly concluded that a reflecting screen constructed of perforated, anodized aluminum with a particular curvature might be utilized to uniformly disperse natural light across the ceiling's cycloid curve.. He hired a computer expert to determine the exact shape of the reflector's curve, making it one of the first architectural elements ever to be designed with computer technology. Lighting consultants worked with Kahn to devise gull-wingshaped reflectors that are now installed in the Kimbell. These "natural light fixtures," made from pierced aluminum, were curved to simultaneously reflect and filter the Texas sun. For works of art that require very low levels of light (drawings or Asian scroll paintings, for example), black felt can be used to cover the skylights to further reduce the amount of light reflected into the gallery. Kahn incorporated slender lunettes at either end of each vault for more light.

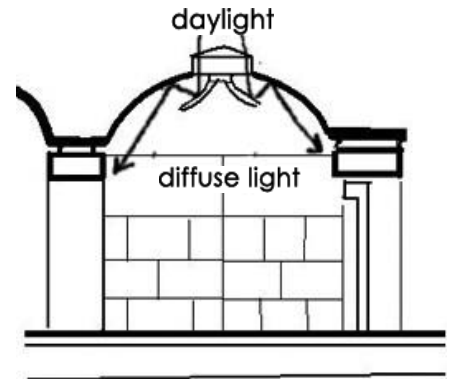
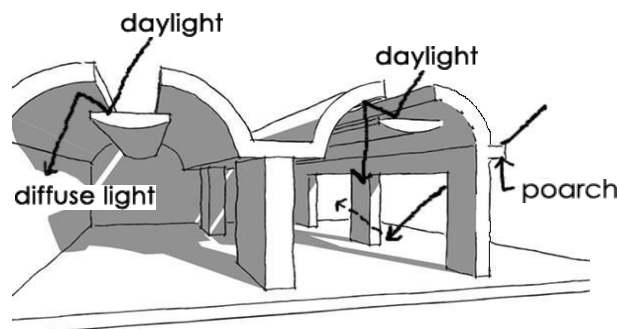


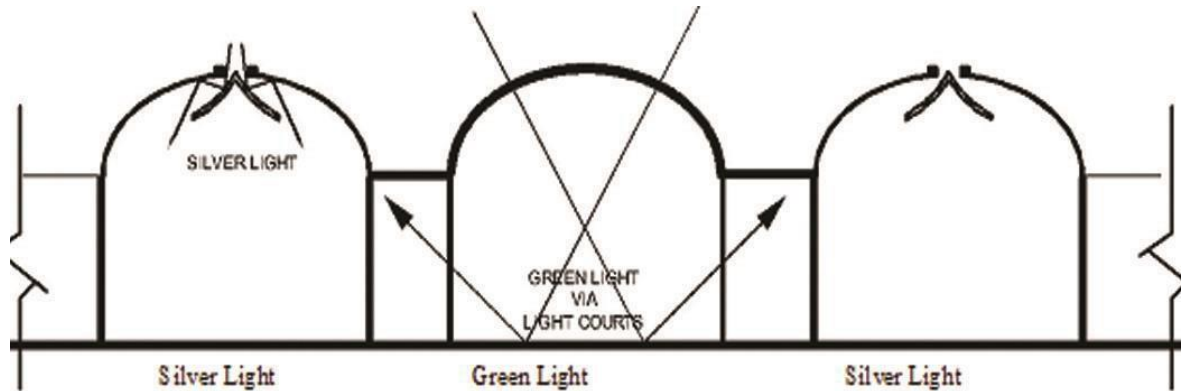
Figure 96 :Diffuse light inside the gallery

Additionally, the lunette serves as a crucial component that divides different portions of the structure and is in turn formed by those components. Its topside is sculpted by the concrete shell that thickens at its peak, while its underside repeats the cycloid. Each lunette's topside thus widens towards the bottom and narrows at the top. For letting indirect sunlight into the Museum areas, light slits run the length of the bottom of the vault. The whole reflector is perforated in sections lacking artwork, such the lobby, cafeteria, and library, allowing anyone standing underneath to catch a peek of passing clouds. The center of the reflector, which is immediately beneath the sun in the gallery spaces, is solid; the rest is perforated. To further aid in the reflection of the light, the concrete surfaces of the ceiling were given a high gloss. The ultimate effect is a stunning distribution of natural light that had never been accomplished before as the powerful Texas sun enters a small opening at the top of each vault and is equally reflected off a curved screen across the whole arc of the polished concrete ceiling.

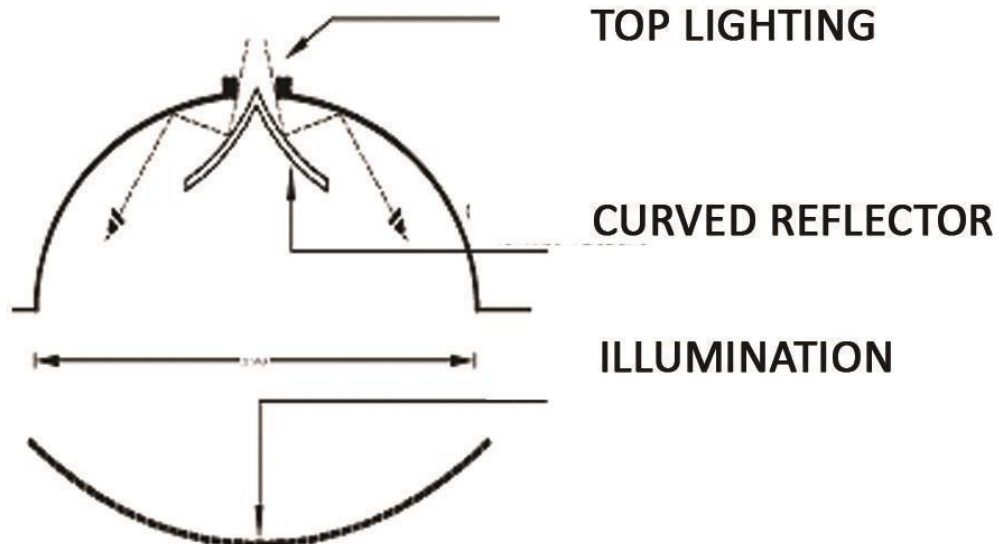


3.6.6. ARTIFICIAL LIGHTING

As with all buildings, an architect must design for day and night lighting conditions. The Kimbell's artificial lighting has been placed in the aluminum reflector assembly and between the vaults as to provide ample luminescence. The placement of the first set of lights allows that fluorescent lighting to wash the vaults at night in the same way that the natural lighting does during the day.



USE OF SILVER AND GREEN LIGHT



SKY LIGHTING DETAIL

Figure 97: Lighting detail

3.6.7. INFERENCES:

- Maximizing the use of natural light using indirect method
- Creating the internal courtyard for enhancing the internal built environment.

COMPARATIVE ANALYSIS.

Attibutes	National Museum Chaauni	Patan Museum	MAXXI Mueseum	MoCAA Museum	LACMA	Inference
Planning and layout	<ul style="list-style-type: none"> Hall to hall connection Adaptive reuse of palace of Bhimsen thapa 	<ul style="list-style-type: none"> A courtyard building create a cyclic rectangular circulation 	<ul style="list-style-type: none"> Uninterrupted free flow plan throughout the building No Clear path and direction 	<ul style="list-style-type: none"> Conventional Floor plan Hall to hall connection 	<ul style="list-style-type: none"> Uninterrupted free flow pla No Clear path and direction 	<ul style="list-style-type: none"> Open planning of display area Volumetric variation in design should be considered
lighting	<ul style="list-style-type: none"> Daylighting from Existing windows Fluorescent tubes and CFL without diffuser 	<ul style="list-style-type: none"> Artificial hidden lighting for the display Diffused light from above the lintel level for room lighting 	<ul style="list-style-type: none"> Daylighting from roof of the building, Artificial lights are hidden and displayed like natural light 	<ul style="list-style-type: none"> Artificial lights are used in galleries Natural light is being used in the central galleries. 	<ul style="list-style-type: none"> In galleries, artificial lighting is employed. The middle galleries is light by natural light. 	<ul style="list-style-type: none"> Natural diffused north light is suitable Lighting should be hidden from the sight
Open space	<ul style="list-style-type: none"> Planned around a large central garden Provides circulation in different building 	<ul style="list-style-type: none"> Large multiple open spaces enclosed within the courtyard 	<ul style="list-style-type: none"> In front of museum there is large open space The open public atrium is open space 	<ul style="list-style-type: none"> There is large atrium in the centre of museum 	<ul style="list-style-type: none"> In museum front there is open space and promenade 	<ul style="list-style-type: none"> Open spaces should be of multi use Sculpture garden are to be developed
Components	<ul style="list-style-type: none"> Gallery spaces Library Conference area Gift shop 	<ul style="list-style-type: none"> Gallery spaces Courtyard Gift Shop 	<ul style="list-style-type: none"> Galleries Conference hall Auditorium 	<ul style="list-style-type: none"> Galleries Restaurant Sculpture garden cafe 	<ul style="list-style-type: none"> Galleries Conference hall Auditorium 	<ul style="list-style-type: none"> Different component complement each other to make a complete a museum
Architectural character	<ul style="list-style-type: none"> Neo Classical Architecture 	<ul style="list-style-type: none"> Traditional Newari architecture Courtyard system 	<ul style="list-style-type: none"> Contemporary character Fluidity and Organic form 	<ul style="list-style-type: none"> Contemporary Futuristc 	<ul style="list-style-type: none"> Contemporary 	<ul style="list-style-type: none"> Contemporary form with symbolism is suitable.
Display Techniques	<ul style="list-style-type: none"> Line up display Technique Low height partition wall 	<ul style="list-style-type: none"> Line up display Technique Use of hologram display 	<ul style="list-style-type: none"> Different innovative Display is being Used Artworks and spatial relation is 	<ul style="list-style-type: none"> Line up display Technique Use of hologram display 	<ul style="list-style-type: none"> Different innovative Display is being Used 	<ul style="list-style-type: none"> Different innovative kinds of display must be used Temporary partition use
Connection between spaces	<ul style="list-style-type: none"> Spaces disconnected with each other Not usable by disabled people 	<ul style="list-style-type: none"> Each space is connected through the courtyard 	<ul style="list-style-type: none"> The uneven space of corridor connects the whole building without barrier. 	<ul style="list-style-type: none"> Each space is connected through the Atrium 	<ul style="list-style-type: none"> Each space is connected through the pathways. 	<ul style="list-style-type: none"> Visual and physical connection between different spaces is required.

CHAPTER 4- SITE ANALYSIS

4.1. Site Location

- Location: Thapathali, Kathmandu
- Shape: Irregular
- Earthquake zone: 5th zone
- Area: 16800 sq. m.
- Orientation: North-West
- Terrain: Flat
- Current Use: Nepal food Corporation
- Access: 13 m Main Road-North-West

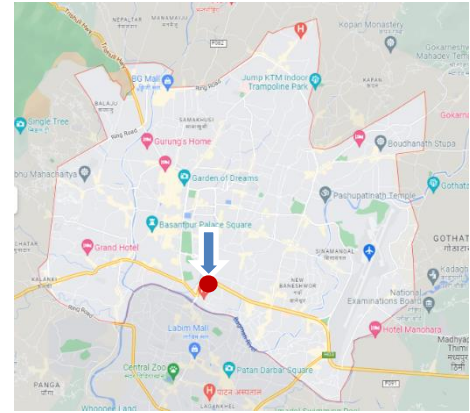


Figure 98: Site Location

4.2. . Shape and Size

The area of the site is around 16800 sq. m. The site is almost rectangular in shape.

4.3. Physical Condition

The site is flat about the road level. The site is currently used as Food Corporation. Geographical the site has latitude of 27°42' and 85°22'E; the site has altitude of approximately 1282m above the mean sea level.



Figure 99: Location of the site

4.4. Access and Approach

The site features a 13m wide, black-topped main road with a 1m wide sidewalk on the west side. The site has the benefit of being easily accessible from a variety of locations, including Kupondol, Jawalakhel, Patan Sanepa and Teku, Baneswor, and Putali Sadak. Transportation does not appear to be an issue, as public cars are accessible on the major road that connects the property to the rest of the city. There are several public transportation options available, ranging from minibuses to tempos and microbuses. It is located on the other side of Thapathali Campus.

4.5. Site Surrounding

The site is located in the city core as well as in commercial area. The site has lots of potential for landmark value and so the surrounding bears the same quality. Surrounding building have the street front shops with corporate offices in the upper floors. In very few buildings along the roadside upper floors being use as residential. The street front shops are generally the cafe, cars showroom, diamond show room, wardrobes, and handy craft showrooms. The various types of offices are banks, different trading company, corporate offices etc. The important buildings around the site are

T. I. Airport = 3 km radius
 Singha Durbar = 0.5 Km radius
 Dashrath Stadium = 0.5 Km radius
 Norvic Hospital = 0.35 Km radius
 Maternity Hospital = 0.35 Km radius
 Pulchowk Campus = 1.5 Km radius



4.6. BYELAWS

According to the bye laws of the Kathmandu metropolitan city, the site lies on the Dense Mixed Residential Sub Zone. Following are the regulation for the project as per bye-laws.

- FAR - 2 (excluding basement)
- Max. Ground Coverage Area - 50%
- Max. Height - 63.5-degree light plane
- Parking - 20%
- For Building above 6 floors, there should be lift, fire escape and fire safety

4.7. Climatic data

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	9.2 °C (48.6) °F	11.3 °C (52.4) °F	14.6 °C (58.3) °F	17.9 °C (64.2) °F	19.1 °C (66.4) °F	20.5 °C (68.8) °F	20.3 °C (68.6) °F	20.3 °C (68.6) °F	19.5 °C (67) °F	16.8 °C (62.2) °F	13.6 °C (56.4) °F	10.7 °C (51.2) °F
Min. Temperature °C (°F)	4.9 °C (40.9) °F	6.4 °C (43.5) °F	9.1 °C (48.4) °F	12.2 °C (54) °F	14.8 °C (58.6) °F	17.6 °C (63.6) °F	18.4 °C (65.2) °F	18.2 °C (64.8) °F	17 °C (62.7) °F	13.4 °C (56.2) °F	10 °C (50.1) °F	7 °C (44.6) °F
Max. Temperature °C (°F)	14.2 °C (57.5) °F	16.3 °C (61.4) °F	19.7 °C (67.5) °F	23 °C (73.4) °F	23.5 °C (74.3) °F	23.9 °C (75) °F	23.2 °C (73.7) °F	23.4 °C (74.1) °F	22.8 °C (73) °F	20.7 °C (69.3) °F	17.8 °C (64.1) °F	15.2 °C (59.4) °F
Precipitation / Rainfall mm (in)	44 (1)	56 (2)	59 (2)	79 (3)	205 (8)	460 (18)	778 (30)	643 (25)	334 (13)	98 (3)	30 (1)	26 (1)
Humidity (%)	73%	69%	57%	54%	72%	85%	92%	91%	88%	80%	75%	76%
Rainy days (d)	5	7	8	10	16	19	22	22	20	12	6	4
avg. Sun hours (hours)	7.1	7.6	9.3	10.0	8.6	6.0	4.3	4.8	5.6	7.0	6.5	6.5

Data: 1991 - 2021 Min. Temperature °C (°F), Max. Temperature °C (°F), Precipitation / Rainfall mm (in), Humidity, Rainy days. Data: 1999 - 2019: avg. Sun hours

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

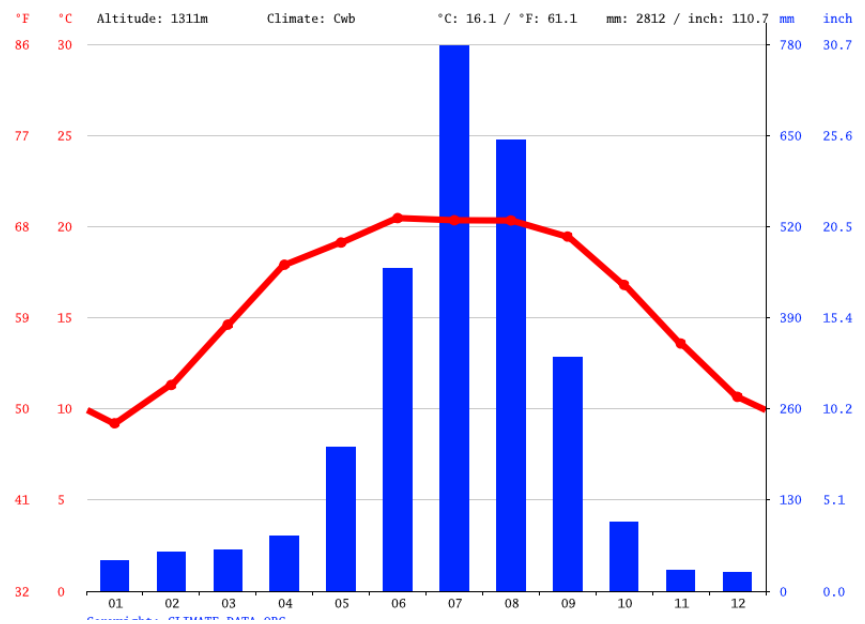


Figure 100: Climatic and Data Chart

4.8. Site character

Topography: the proposed site is plain land and above the 1282 m above the mean sea level. The orientation of the site is West-North direction.

Seismic prone zone: the site lies on the 5th zone.

Circulation: the site is accessible only from the North and West due to existing building on the remaining side.

Vegetation: there is little vegetation around the boundary wall and grasses on the whole site. There is no such dense wooded area in the site, not even in the surrounding areas.

The SWOT analysis is given below

Strength:

- Easy accessibility - better visibility
- Commercialization
- Easy availability - public transportation
- Facilitated - infrastructures
- Government and institutional buildings

Weakness:

- Air pollution from the vehicular traffic
- Noise from the North-Western Road

Opportunity:

- Good commercialization
- Landmark value
- Social interacting place

Threat:

- Loss of open space



Figure 101: Site Photos



Figure 102: Site Panoramic Photo

CHAPTER 5 - PROGRAM FORMULATION

SN.	Description	No.	Area in sqm	Total Area in sqm
1	ADMINISTRATIVE SPACES			
a.	Administrative block	1	200	200
b.	Reception	1	120	120
c.	Waiting Lobby	1	250	250
d.	Toilet	1	56	56
e.	Server Room	2	25	50
			SUBTOTAL	676
2	EXHIBITION SPACES			
a	Gallery 1	1	400	400
b	Gallery 2	1	500	500
c	Gallery 3	1	500	500
d	Gallery 4	1	400	400
e	Gallery 5	1	350	350
f	Gallery 6	1	350	350
g	Gallery 7	1	600	600
			SUBTOTAL	3100
3	SUPPORT SPACES			
a	Entrance Foyer	2	100	200
b	Cloak room	1	20	20
c	Exhibit Storage Area	1	90	90
d	Meeting room	1	100	100
e	Toilets	3	56	168
f	Souvenir Shop	1	240	240
			SUB TOTAL	818
4	RESTORATION AND ARCHIVES			
a	Restoration workshop	2	200	400
b	Store	1	55	55
c	Offices	1	40	40
d	Discussion area	1	40	40
			SUB TOTAL	535
5	RECREATIONA L SPACES			

b	Seminar hall (100 capacity)	1	400	400
d	Restaurant	1	260	260
f	Open Air Theatre	1	800	800
			SUB TOTAL	1460
6	SERVICES			
a	HVAC	1	50	50
b.	EL and Plumbing	1	50	50
c.	General Store	3	40	120
d.	Security and surveillance	1	100	100
e.	Fire pump and fire Hose cabinet	1	50	50
f.	Staff room and janitor room	1	60	60
			SUBTOTAL	430
	Total			7019
			20% CIRCULATION	1403.8
	TOTAL			8422.8
7	PARKING			
	Motor vehicle	20	12.5	250
	Scooter, Motobike	150	2	300
	Transportation Vehicle	3	28	84
			subtotal	634
			circulation	253.6
	Total			887.6
	Total			9310.4

Total Site Area = 16,800 sq m

Total Built Up area = 5,500 sq m

Total Ground Coverage percent = 33%

CHAPTER 5 – CONCEPT AND DESIGN DEVELOPMENT

Contemporary museums, also known as modern art museums, are institutions that specialize in collecting, preserving, exhibiting, and interpreting works of art created in the 20th and 21st centuries. These museums showcase a diverse range of artworks, including paintings, sculptures, installations, videos, and performances, created by artists from all over the world.

Contemporary museums often prioritize promoting innovative and experimental works of art, as well as exploring new mediums and techniques. They also frequently feature exhibitions that examine the social, political, and cultural contexts in which contemporary art is produced and consumed.

One of the key features of contemporary museums is their emphasis on engaging audiences in a variety of ways, beyond just looking at the artworks on display. They often host workshops, lectures, and events that encourage visitors to participate in the creative process or interact with the art in new ways.

Another trend in contemporary museums is a greater focus on inclusivity and diversity. Many contemporary museums have made efforts to showcase art from underrepresented communities and to create more inclusive spaces that welcome diverse audiences and visitors.

5.1 Concept

The contemporary museum of Nepal would be a dynamic institution that celebrates the vibrant and diverse artistic traditions of Nepal and the wider South Asian region. It would showcase a wide range of contemporary art forms, including painting, sculpture, installations, photography, video, and performance art.

One of the key goals of the museum would be to promote inclusivity and accessibility, creating a space that is welcoming to all visitors, regardless of their background or level of familiarity with contemporary art. To achieve this, the museum would offer educational programs, interactive exhibits, and community events that engage visitors and encourage them to explore and appreciate contemporary art in new ways.

The museum's permanent collection would focus on works by Nepali artists and artists from across the region, showcasing the diversity of styles, techniques, and themes that define contemporary art in this part of the world. The collection would be curated to highlight the social, political, and cultural contexts in which the art was created, and to promote dialogue and understanding among different communities.

In addition to the permanent collection, the museum would also feature rotating exhibitions that showcase emerging artists, as well as established figures in the Nepali and South Asian art scenes. These exhibitions would be curated to address timely and relevant themes, such as climate change, social justice, and cultural identity.

The museum would also serve as a hub for artistic collaboration and exchange, workshops, and conferences that bring together artists, curators, scholars, and community members from Nepal and around the world. Through these programs, the museum would help to foster new creative partnerships and networks, and to promote the development of contemporary art in Nepal.

5.1.1 DESIGN PHILOSOPHY

ART is made up of three important components: freedom of expression, dynamism, and perception.

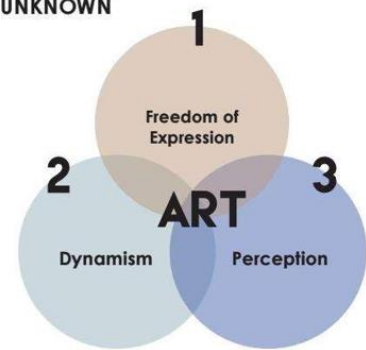
The right to free expression has been included into the circulation.

- Notion when a visitor progresses from the Known (more conventional types of art) to the Unknown (the most recent technologically advanced and culturally varied art forms).
- Dynamism is encountered as a visitor walks around the galleries. Throughout the museum, numerous areas are positioned on various levels, some on a slope, some with high ceilings, and others with low ceilings. The spherical dome at the entryway greets visitors to the structures.
- Contemporary artworks are free of fixed compositions and forms and are intended to be felt and experienced rather than just seen. For this, a new environment must be built and experienced.

1 Journey from **KNOWN** to **UNKNOWN**

2 Move **through** ART

3 Stimulate **SENSES**



SPACES VISUALIZATION ACCORDING TO PHILOSOPHY

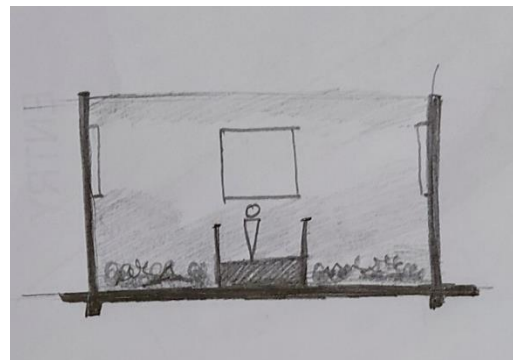
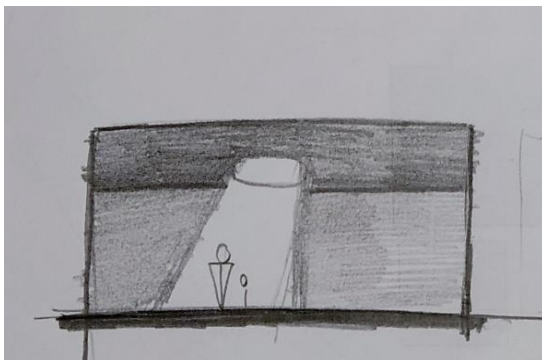
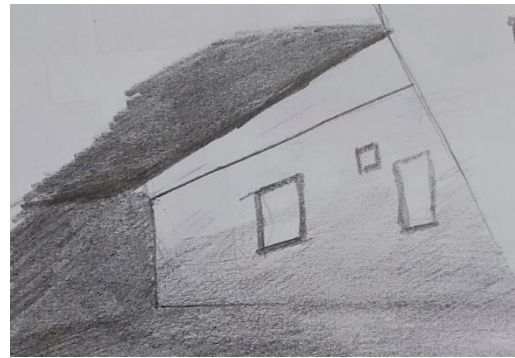
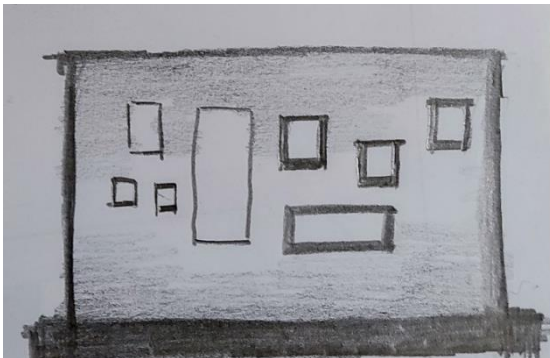


Figure 103 : Spaces visualization

Overall, the contemporary museum of Nepal would be a vibrant and inclusive institution that celebrates the rich artistic traditions of the region, and fosters dialogue, exchange, and creativity among artists and audiences alike.

5.2 Site consideration

The planning for the proposed site is done according to the surrounding context. The public is provided an open plaza, as well as a blank wall that artists may utilize to express their points of view and storylines.

5.2.1 Access and accessibility

The 10 m road in the north is a main approach road that links to the secondary road in the west. The 6m road on the east side serves as the restaurant's service entrance. The planned construction is a public building; however, the location is directly in front of the demonstration road. That is why a regulated entrance to the building is required, resulting in a single pedestrian entry on the north side of the structure.

5.2.2 Segregation of noisy space

The location is largely bordered by roadways on three sides. These roads may contribute to noise pollution. That is why the structure is nestled in the center of the site. Furthermore, the surrounding landscapes might be exploited as a buffer zone to reduce noise levels.

5.2.3 Segregation of vehicles and pedestrian

Separation of automobile and pedestrian traffic to make the museum complex more walkable, convenient, accessible, and people-friendly. It also gives an appropriate solution to the problem of road congestion while simultaneously ensuring the smooth operation of museum activities and circulation.

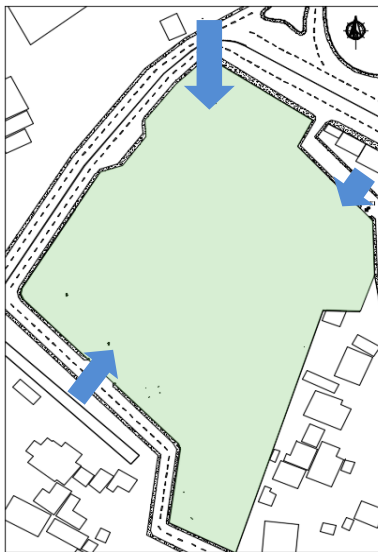


Figure 105: Access to the site

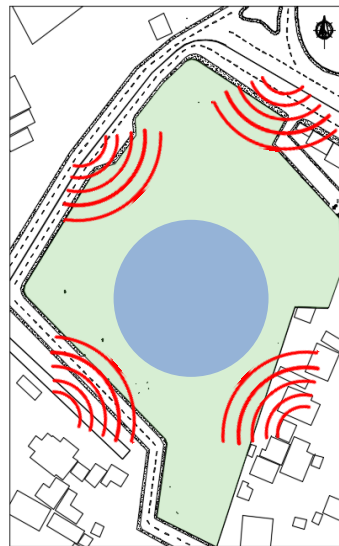


Figure 106 : Noise daigram

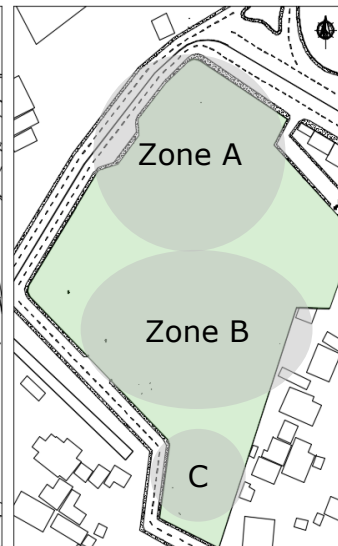


Figure 104 : Zoning

Zone A : Public
Entrance,
landscapes,
Amphitheatre

Zone B: Semi Public
Exhibition,
Restaurant, Gallery.

Zone C. Private
Archives
Restoration
Research, Store

5.3 Functional Zoning

The whole site is mainly surrounded by roads. The northern most part of the site is separated as public zone (Zone A). This zone is linked with the main pedestrian entry where public is much more available. The large Amphitheatre is also present on the site which acts as a perfect space for public interaction and different kind of activities.

Zone B a semi-public zone is the space where the main building complex is located. This zone contains all the exhibition galleries, auditorium and places where people are allowed to connect with artworks. This space needs to be sensitive to the security matters as most of the valuable artworks are here showcased.

Zone C is a private zone and is located at the south most and on the end of the whole site. This space is only accessed by the museum staffs secluded from the public entrance. This is the place where most of the artworks are stored. Some of the artworks are needed to be conserved for long duration of time. For that type of artworks certain controlled environment is needed. This Zone C facilitates all the condition required for conservation and archival.

5.4 Design

5.4.1 The Entrance

The main pedestrian entrance is placed on the northern side of the site. The vehicular entrance is placed on the western side of whole site. After parking, there is a path that takes people directly to the pedestrian entrance. The Entrance is made in such away that people at the outside of the site can only see the glance of the whole structure. After going through locker room and ticket counter they are shifted to the site environment. There is a huge transition of the space from outdoor environment to the internal museum environment which creates an immersive experience.

The sudden shift on environment not only shift people view but also create a pleasing sensation. At the entrance there is a whole blank wall which can be used as a medium for different artist to create their artworks.

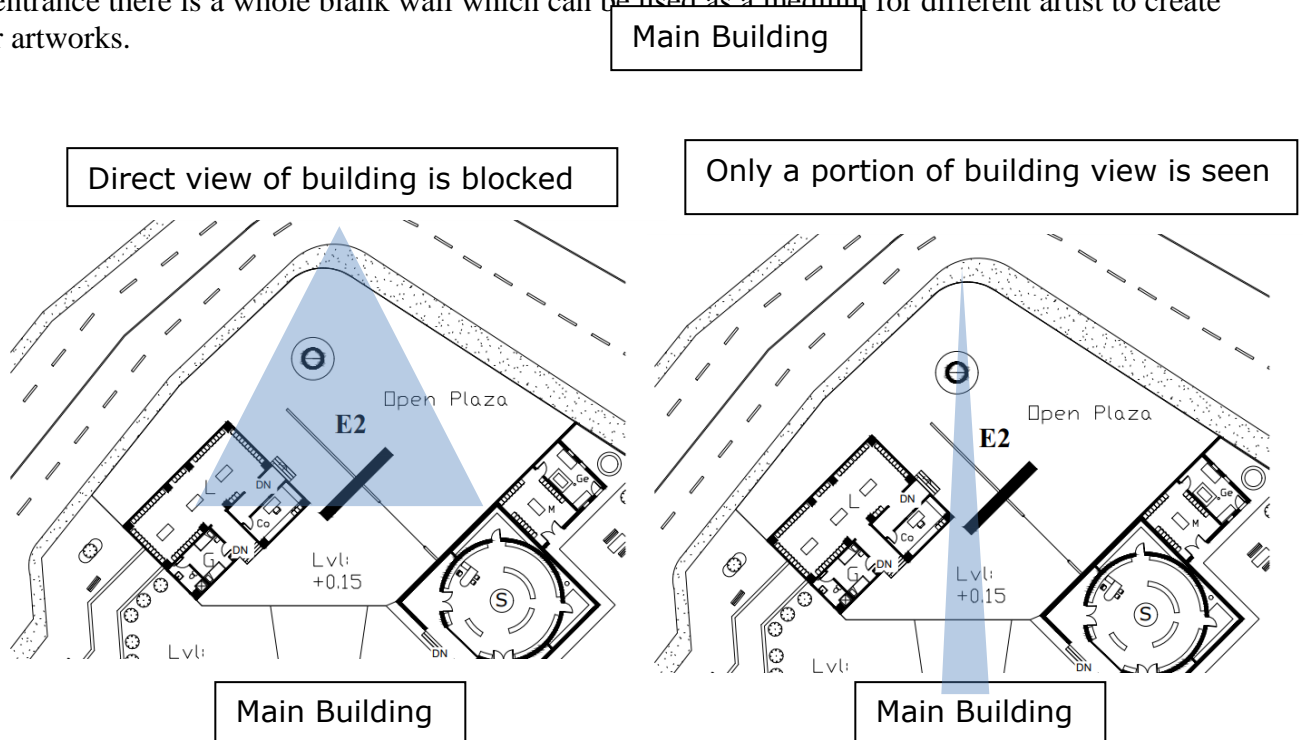


Figure 107 : Scenario of Entrance



Figure 108 : Entrance of the Museum

5.4.2 The Amphitheatre

The enormous Amphitheatre is one of the museum complex's most remarkable architectural elements. Not only is it the Amphitheatre, but it is also an important venue for human interaction. It is the space that brings people together. It serves as a transition place between the entire museum and the surrounding landscapes. The Amphitheatre staircase is structured in such a manner that a single, group of people, or even multiple sorts of events may be held without interfering with one other's activities.

The Amphitheatre stairs has also given the whole museum a pedestal. The pedestal which doesn't only rest the building but also enhance the appearance of whole museum structure.

It is designed in such a way that first you are taken to level 1 (a meter above from ground level)

Then there is a platform which connect from one to another site of the whole site. Then suddenly you are taken to level 2 (two meter down the ground level.)

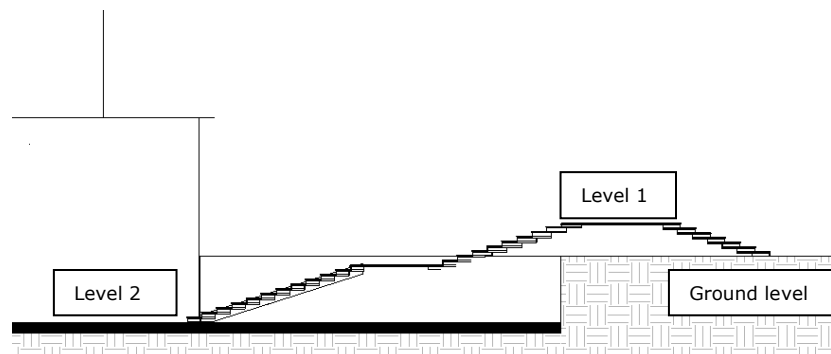


Figure 109 : Section of amphitheatre

The stairs run from one end of the museum's front side to the other. It runs from the western parking lot to the eastern restaurant.

The Amphitheatre is composed of a long ramp that welcomes the audience from the entrance of a site to the entrance of the whole museum. The ramp takes the audience to a level up from the ground level. It is a point of major interaction. All the people gather at those points where the museum is entered.

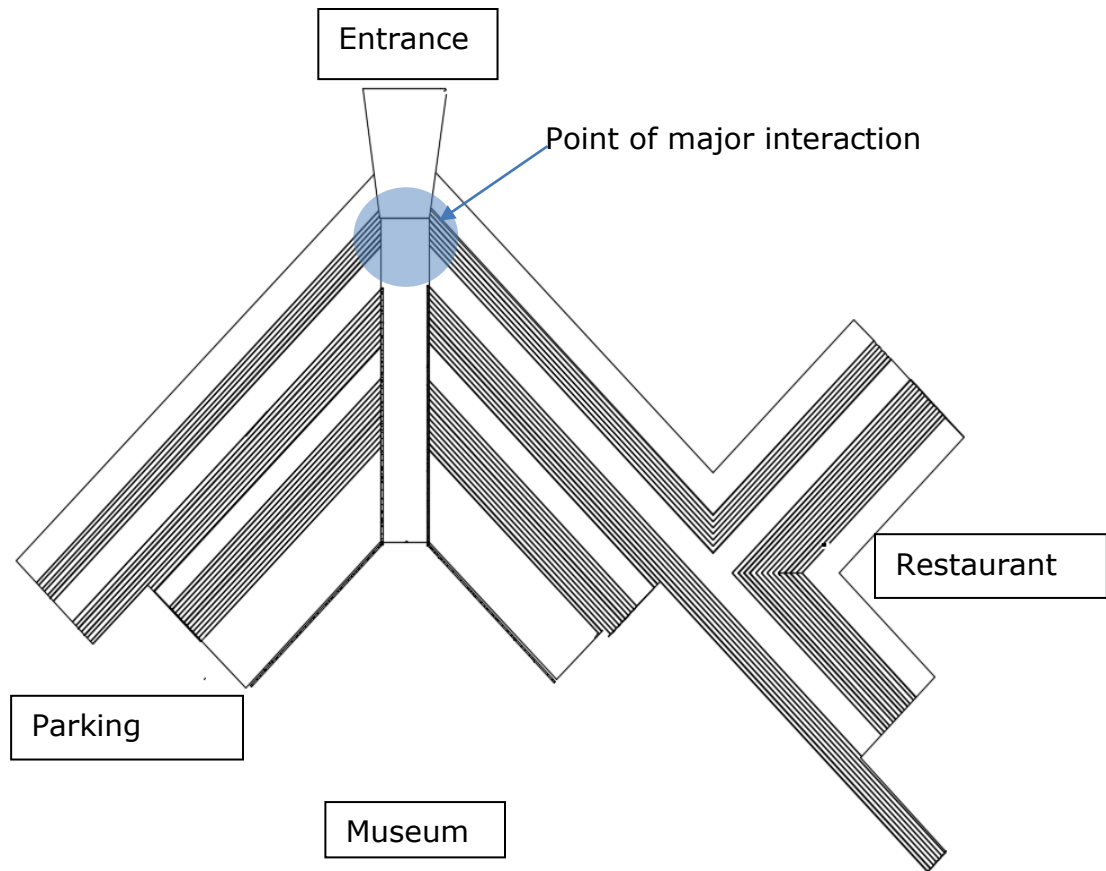


Figure 110 : Amphitheatre plan

The point of major interaction plays a crucial role to collect the audience from the whole site to it. It is the only point on the whole site from where you can enter the museum building,

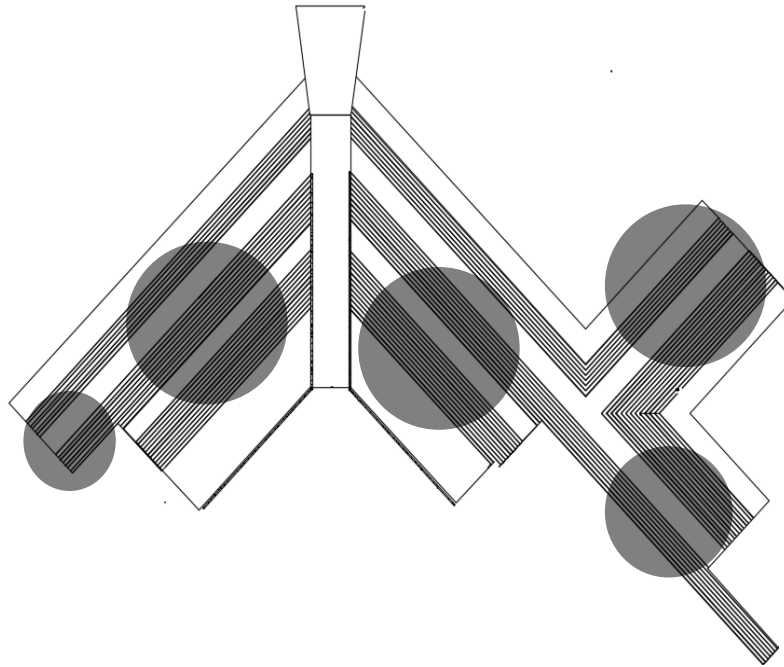
The western side of the Amphitheatre rises just one metre above ground level, but the restaurant side rises to the first floor of the restaurant complex. The large area on the restaurant might be used as an indirect dining location for the audience. While sitting on the steps, guests may also see a variety of performances taking place around the place.

The stairs also extend below two meters of ground level. While extending below up to two meters below ground, it leaves a huge seating space which can also be used as a proper amphitheatre.

ACTIVITES THROUGHOUT THE WHOLE AMPHITHEATRE

Group activities Area

- Performance art
- Cultural programs
- Exhibitions
- Projection Arts
- Discussion



Individual activities Area

- Seating and dining
- Art discussion
- Cultural exchange etc

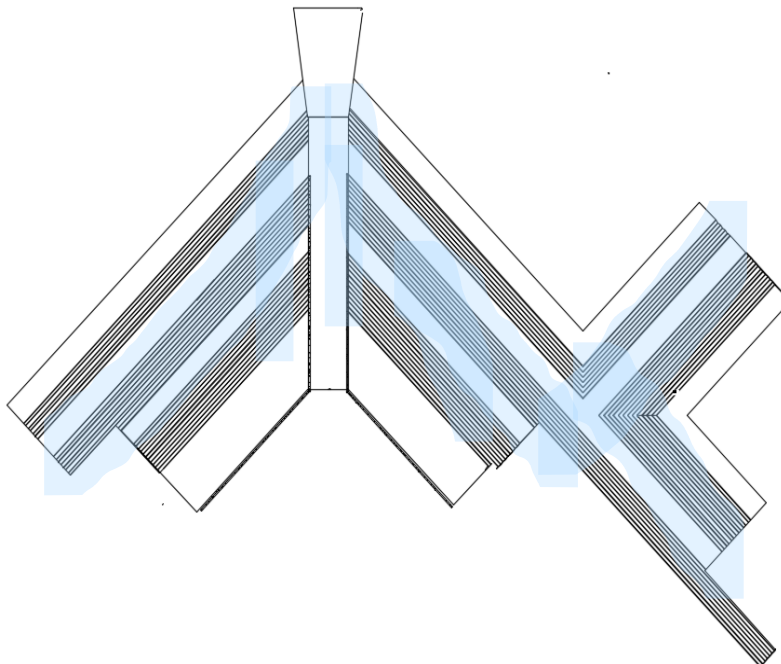


Figure 111 : Activities throughout the amphitheatre



Figure 112 : Amphitheatre using for showing art

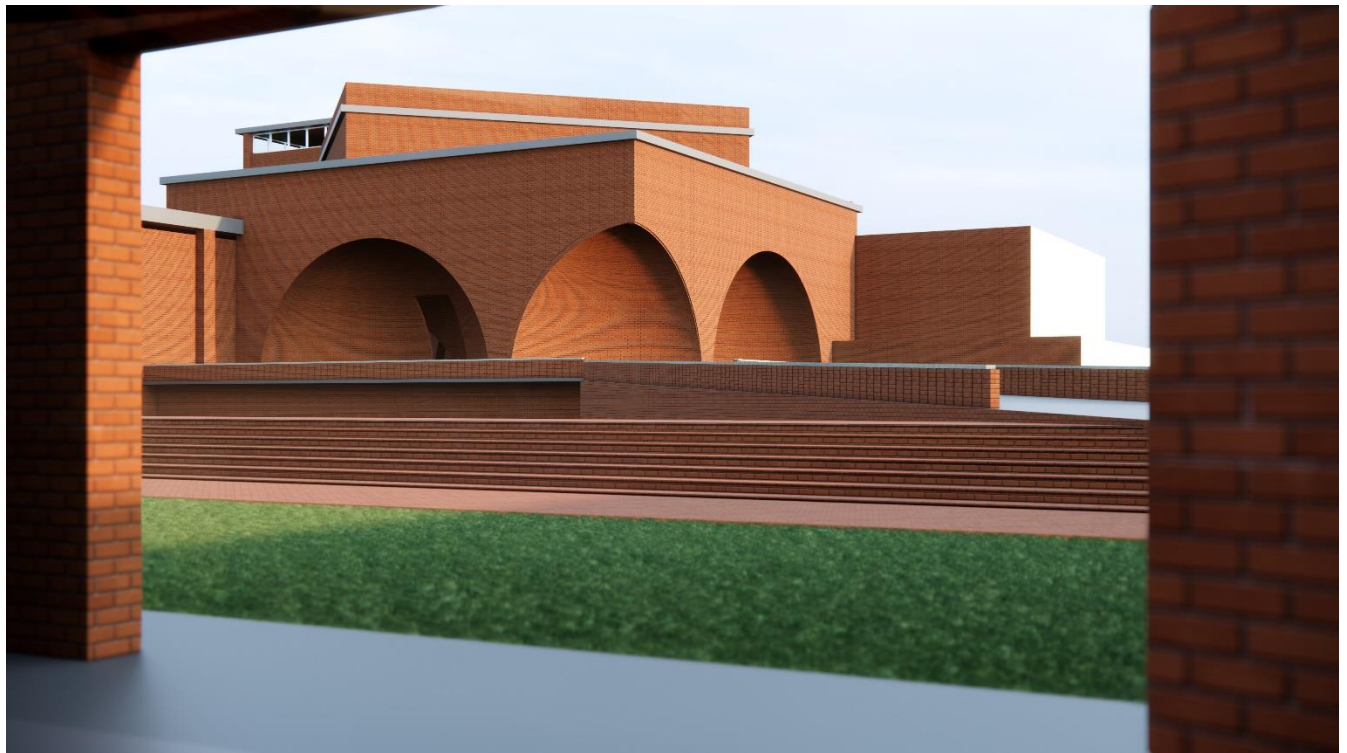


Figure 113 : Ampitheatre as pedestal for museum



Figure 114 : Grand Ramp to museum

5.4.3 The Museum Entrance

The main entrance of museum is a juxtaposition of two different types of geometrical shape i.e. Square and sphere. The two shapes are arranged in such a way that it welcomes and embrace the visitors. It consists of three spherical shape embedded on the cube surface. The engraved spherical shaped can be used to showcase the artwork as well as act entrance to museum. The two spherical entrances on placed on opposite side of the cube whereas the central space can be used to exhibit different kinds of artworks.

In contrary to basic rectangular entrance the spherical entrance give the feeling of immersion to the whole building.

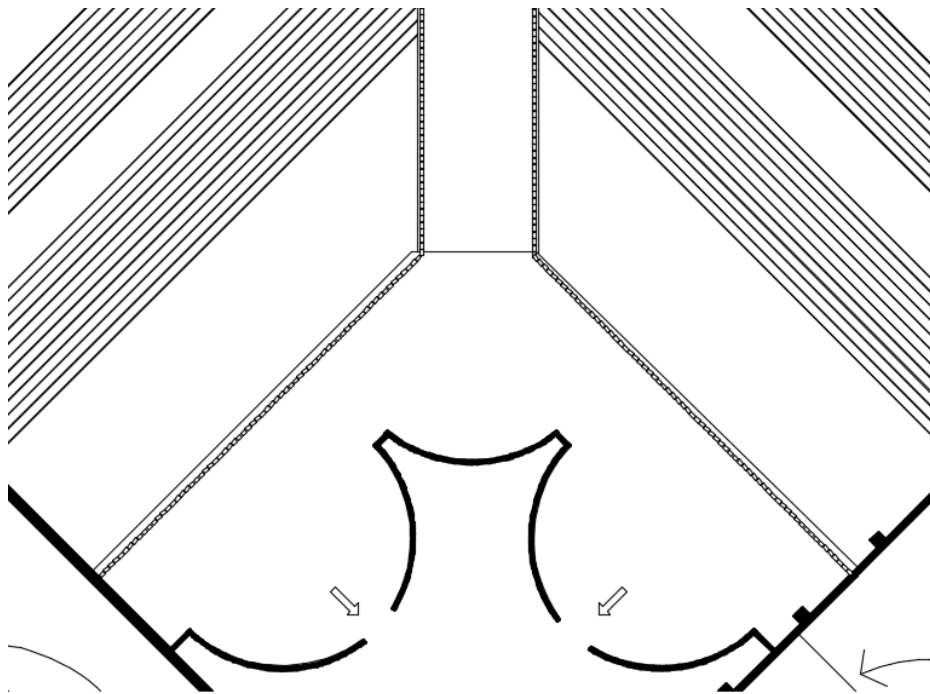


Figure 115 : Museum entrance plan

5.4.4 The Grand Foyer

For any kind of public building, the welcoming entrance should be exciting, enticing and have elegant visual appearance. It creates long lasting impact on the visitor. So keeping that on mind , The foyer is designed.

It's a poetry of shapes, light shadow, texture history, philosophy and idea. The whole foyer welcomes the audience to the building showing its beauty and also help in spreading the whole audience throughout the building.

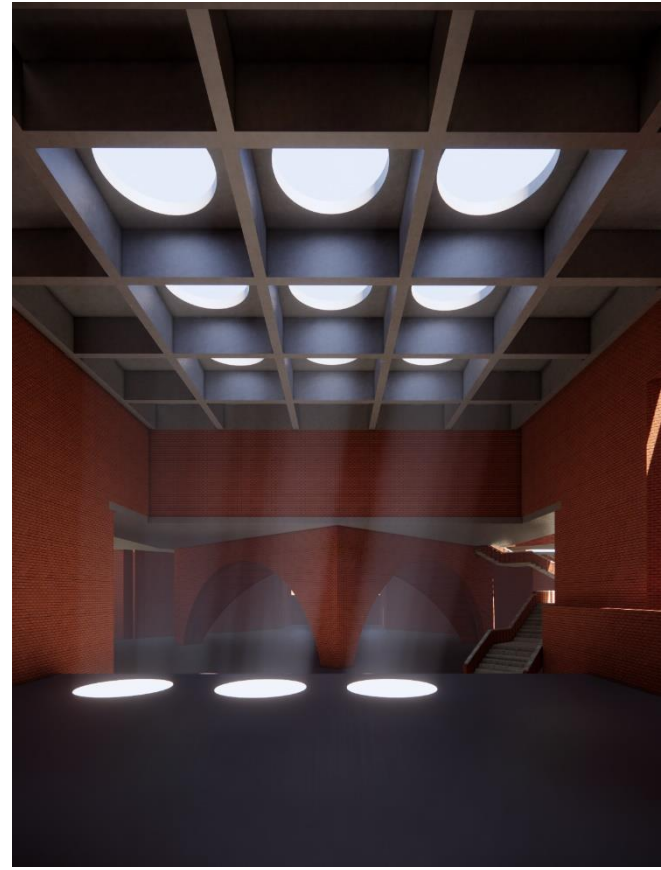


Figure 116 : Foyer

5.4.5 Gallery 3 (G3)

The Gallery 3 is the heart of whole museum complex. This space can be used for multiple purpose. After going through the atrium, audience are welcomed to the Gallery 3. It's a space which acts as a center for the whole circulation of the museum complex. Its place where audience start their journey to the museum and also ends here. The space is characterized by long span arches. There are total of 6 arches on this gallery, two of them are at center and other four are at the site of whole gallery.

It's a space that connects all the galleries within the structure. The large are on the whole gallery function as the space to conduct, organize and perform different types of events, program and performance.

The alignment of arches on the whole structure also symbolizes an interaction, connective space through the whole museum context.



Figure 118 : Gallery 4 (G3)

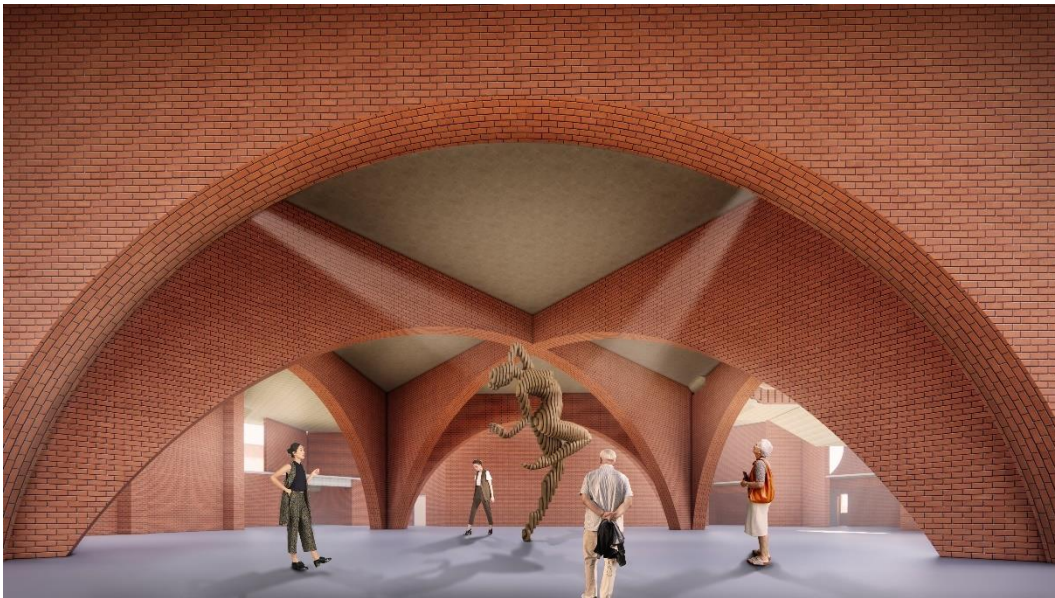


Figure 117 : G4 showing art sculpture

**Activities
that can**

happen on Gallery 3 (G3)

- Sculpture presentation
- Temporary exhibition
- Performance art
- Workshop
- Active exhibition
- Digital installation

It is basically a multipurpose hall transformed gallery

5.4.6 Gallery 1 (G1)

When guests arrive at Gallery 4 (G3), they have several alternatives concerning where to proceed. However, G1 is the gallery where most visitors begin their voyage. The distinctive feature of gallery 1 (G1) is the use of natural lighting throughout the gallery. The visitor arrives at G1 on plinth level and go down with the grand ramp up to the basement level while enjoying every artwork being placed on the building.

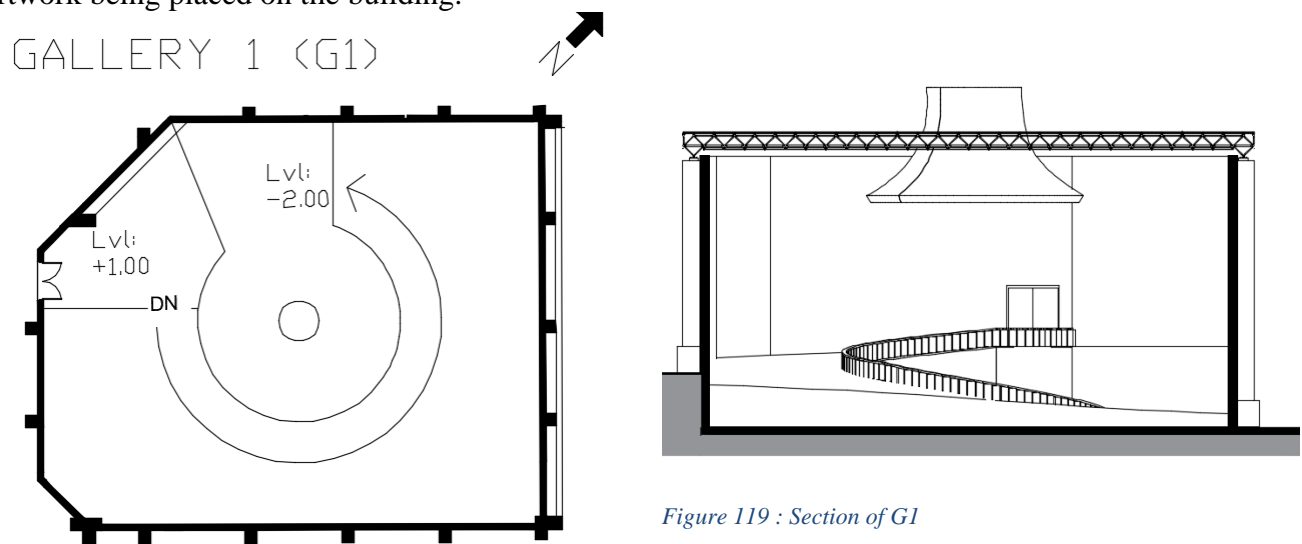


Figure 120 : Plan of G1

Figure 119 : Section of G1

NATURAL LIGHTING ON GALLERY 1 (G1)

The natural lighting on G1 is done in such way that the diffuse light get evenly spread out throughout the whole gallery and also improving the focus light on the central piece of artwork. It differs from regular hole on roof which doesn't necessarily light up the whole gallery environment

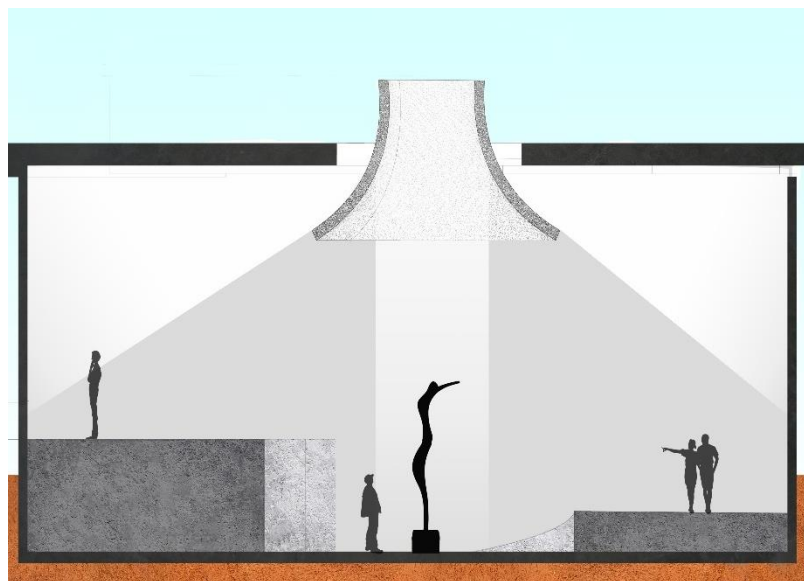


Figure 121 : natural light ditribution on the gallery 1



Figure 122 : GI showcasing a Specific Sculpture



Figure 123 : GI showcasing different Genre of artworks

5.4.7 Gallery 5 (G5)

This Gallery is on the one of the lowest levels of whole museum complex. This can be reached from Gallery 1 or Gallery 2 through the ramp. It is a typical white cube gallery unlike other galleries its totally dependent upon artificial lighting.

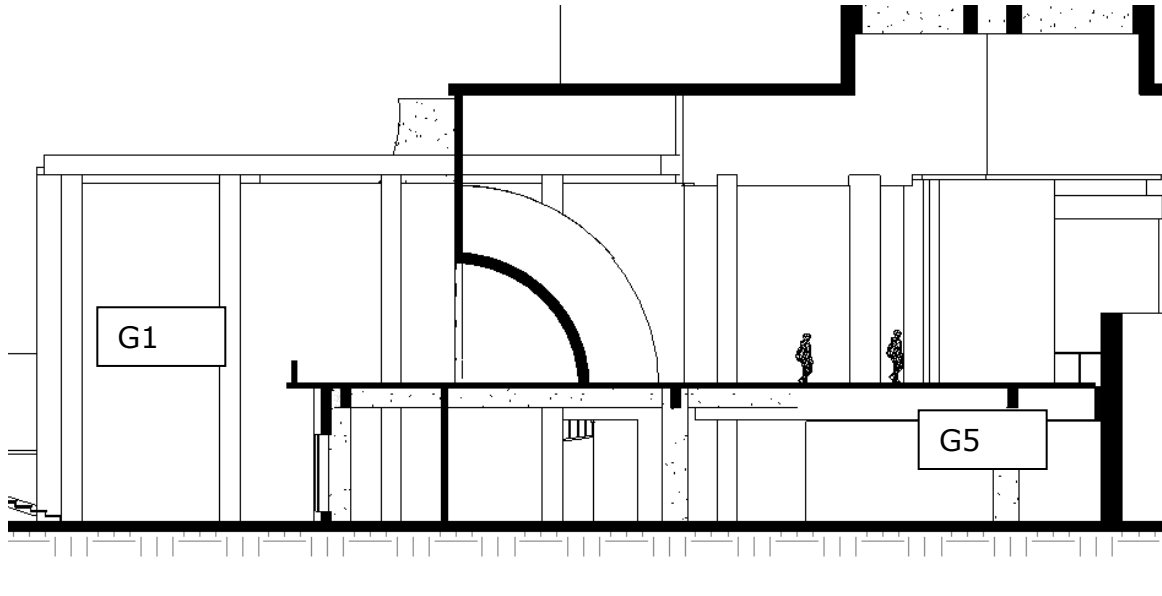


Figure 124 : Gallery 5 section



Figure 125 : Gallery 5 (G5)

5.4.8 Gallery 2 (G2)

This gallery also has similar feature as Gallery 1 (G1). The whole artworks are showcased on wall and central space. While Going from the ramp from basement level to the plinth level. The artworks here are directly light up by natural lighting from above. The light come is diffused with help of different diffusing panels.

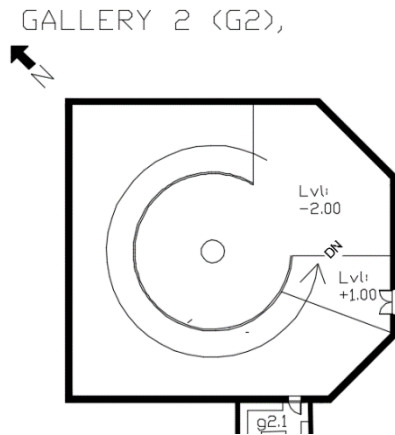


Figure 127 : G2 plan

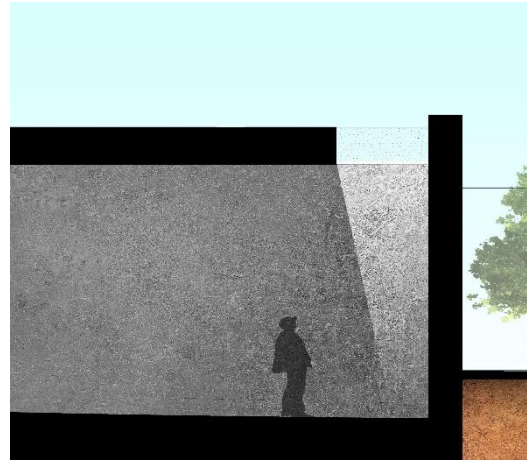


Figure 126 : Light Distribution on G2



Figure 128 : Galley 2 (G2) visualization

The ramp of G2 stretch from plinth level to basement level. After entering from G5 you can enter to G2 from basement level and go upto plinth level to Gallery 3 (G3) or vice versa.

5.4.9 Gallery 4

Gallery 4 is very much secluded from other galleries. Some works need specific type of controlled environment. Certain parameters are needed to be controlled such like humidity, temperature, light and dust particle for showcasing certain kinds of artworks. These types of controlled environment can be only obtained by secluding it from external environment. This gallery is thus separated from external environment creating a unique controlled environment inside.

The space on this gallery is itself an artwork. It's a celebration of shapes, space, light and shadows. The main motto of this gallery is to create the thought provoking, calming and evocative environment.

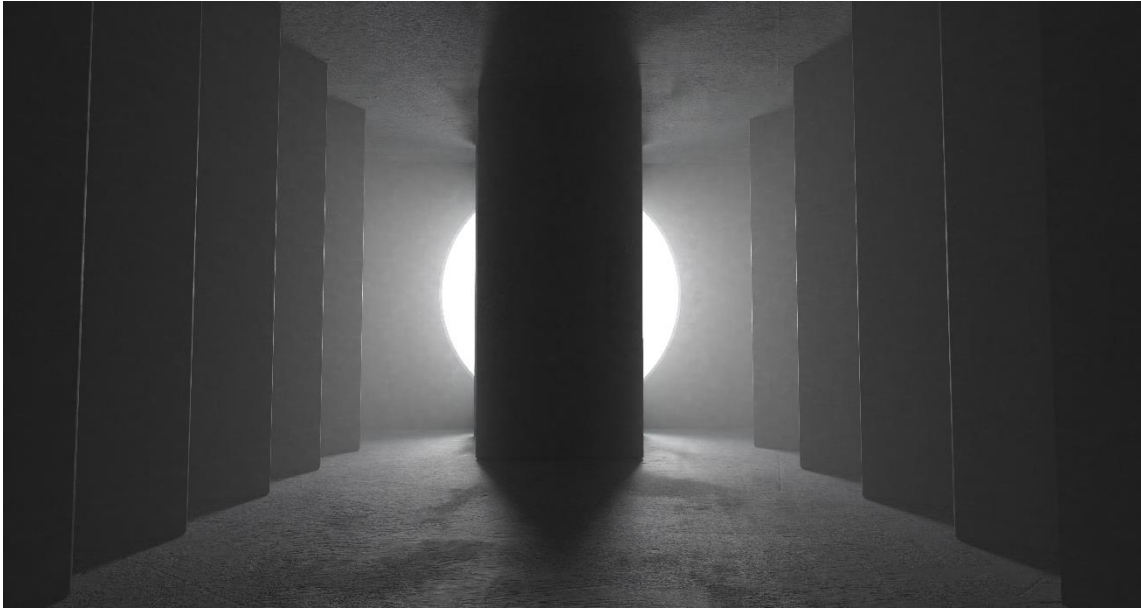


Figure 129 : Gallery 4 (g4) With naked space



Figure 130 : Gallery 4 (g4) showcasing specific artworks

5.4.10 Gallery 6

Some works of art are intended to be felt, touched, experienced, and tactile sensations. These sorts of artworks need a special location that allows the audience to immerse themselves in and swim through the artist's creations. This type of atmosphere can only be produced by rearranging the entire room. The entire gallery is built such that there are undulating continuous planes throughout where artworks may be projected painted. The activation of tactile feeling when seeing artworks offers an immersive experience to which the audience may have a strong emotional connection.

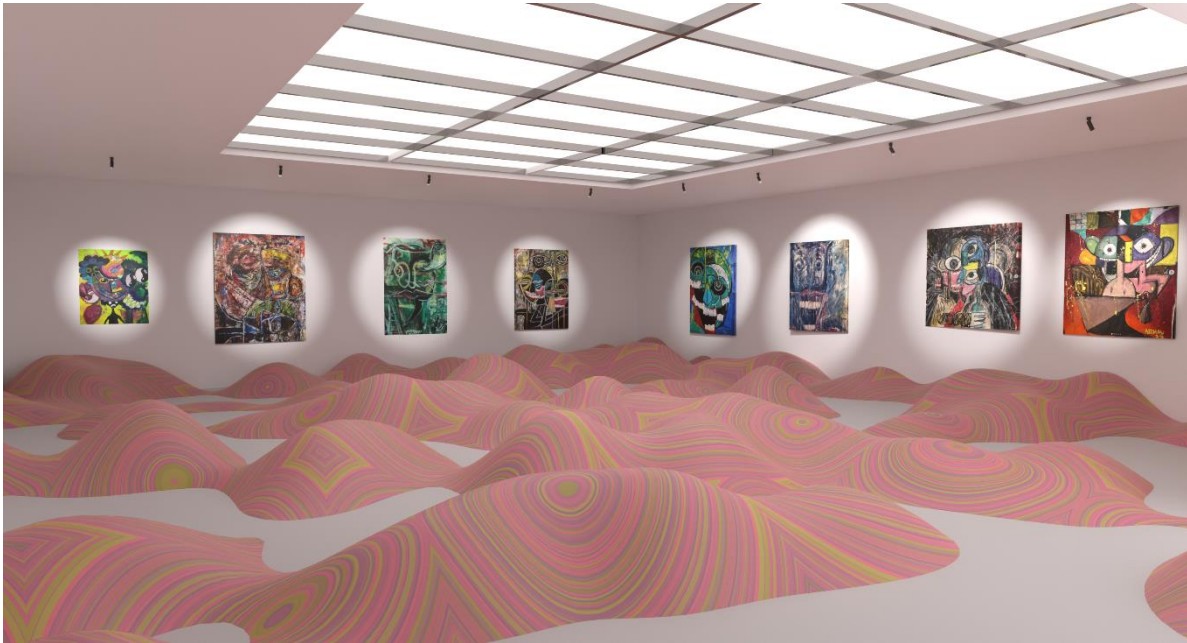


Figure 132 : Gallery 6 showcasing contemporary artworks on specific setting

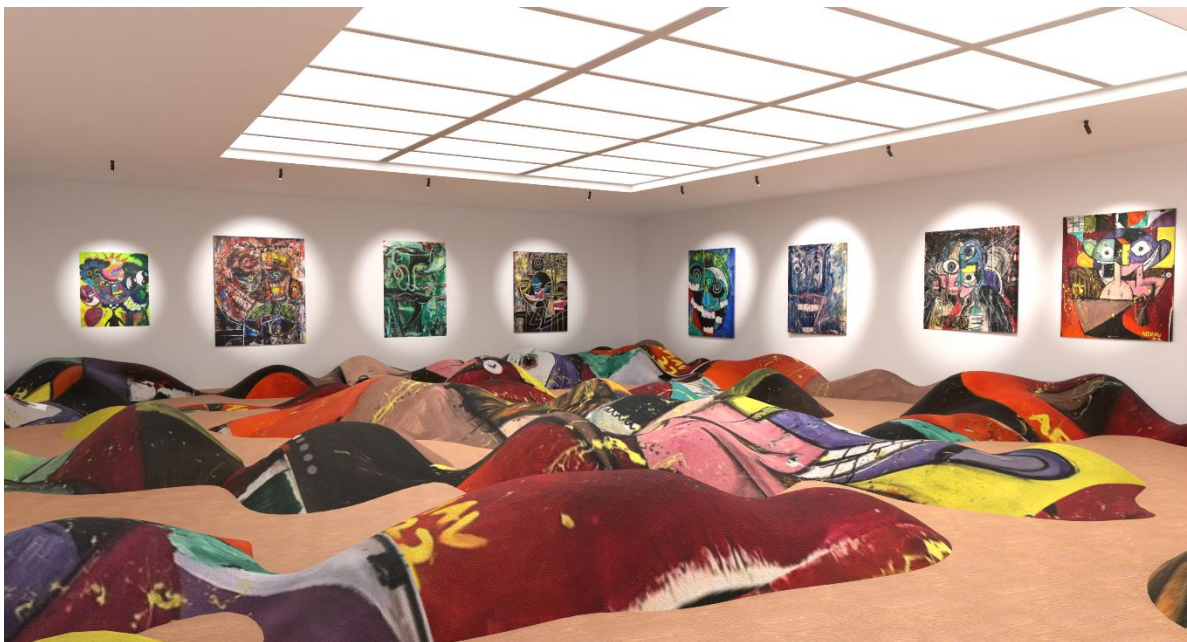


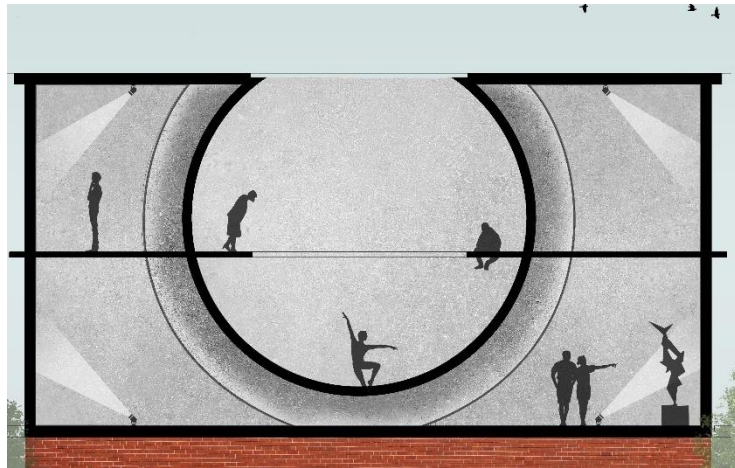
Figure 131 : G6 showcasing artworks and one of artworks painted on floor

5.4.11 Gallery 7 (G7) (The Vessel)

The entire gallery serves as a vessel. The goal of establishing such place is to immerse the audience in the performance, artworks, and theme. Conventional performances are held on a level stage with attendees scattered throughout the entire flat surface. These approaches are successful, but the vessel provides a more immersive experience.

The vessel is composed of two geometric forms. The spherical is contained within the cube's surface. The inside of the vessel may be utilized to showcase spectacular performances, while the outside of the vessel can also be used as a traditional gallery.

Performance art



Sculpture Presentation



Abstract Visualization

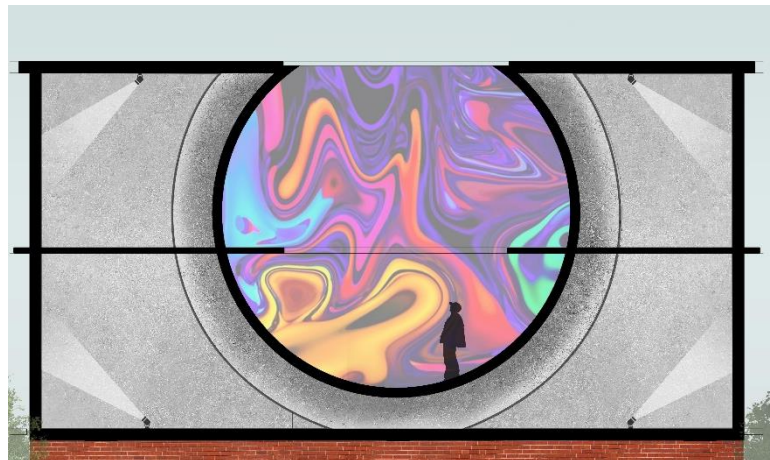
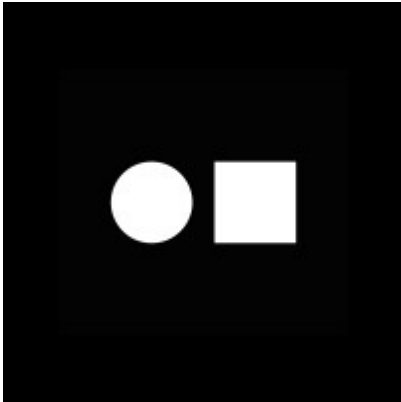


Figure 133 : The vessel

5.5 FORM DEVELOPMENT

5.5.1 EXPRESSION OF CIRCLE AND SQUARE



A square is a regular quadrilateral with four equal sides and four right angles. It has a total of four sides, four vertices (or corners), and four interior angles that each measure 90 degrees.

A circle, on the other hand, is a two-dimensional shape that is defined as the set of all points in a plane that are equidistant from a given point called the center.

The circle represents harmony, infinity, and unity, while the square symbolizes stability, order, and balance. Architects have used these shapes in various ways to create buildings that reflect these qualities. In the design of floor plans, the square is often used as the basic unit of measure to organize space. This creates a grid-like structure that can be used to divide spaces into functional areas. On the other hand, the circle can be used to create curved spaces that are more fluid and organic in form. Circles can also be used to create focal points or to emphasize important features within a building.

In the design of building facades, squares and circles can be used to create patterns and textures that add visual interest. Square patterns can create a sense of order and stability, while circular patterns can create a sense of movement and flow. Additionally, the use of circles and squares in facades can be used to control the amount of light entering the building and provide natural ventilation.

The use of circles and squares can also be seen in the design of building structures. For example, circles can be used to create domes or arches, which provide structural stability and are visually striking. Squares, on the other hand, can be used to create modular structures that are easy to construct and can be easily replicated.

Overall, the use of circles and squares in architecture is a powerful tool that can be used to create functional and visually striking buildings. By understanding the unique qualities of these shapes, a visually striking, emotionally evocative experience is created and this space can be used to exhibit different genre of art that truly helps to connect the audience with art rather than traditional boring spaces.

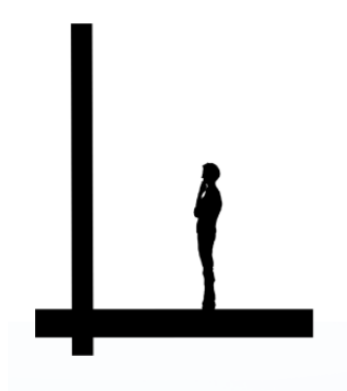


Figure 134 : Rectangular wall



Figure 135 : circular wall

ARCHITECTURAL FEATURE FROM CIRCLE AND SQUARE.

FORM DEVELOPMENT OF THE VESSEL

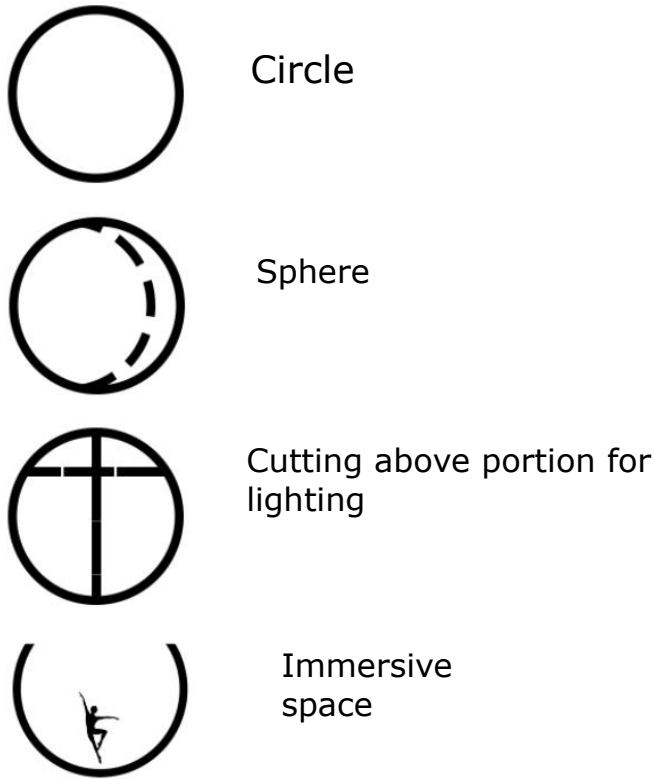


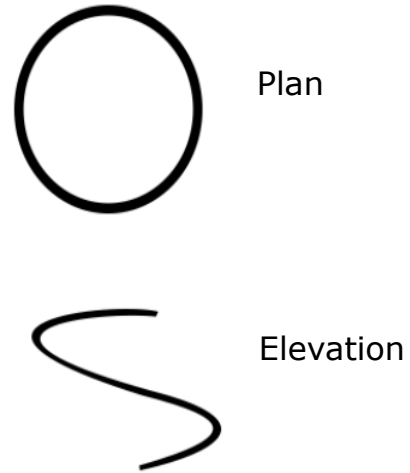
Figure 136 : Form development of vessel



Figure 139 : Souvenir shop plan

Plan of Souvenir shop

RAMP



LIGHTING

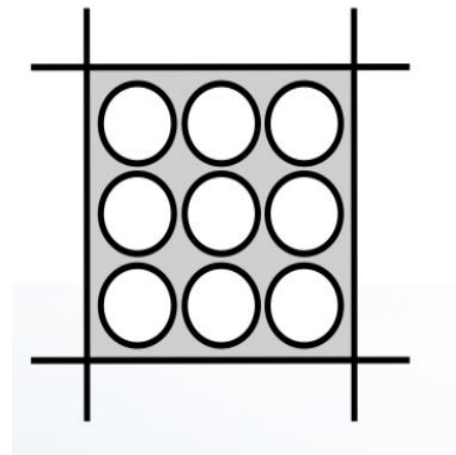


Figure 137 : Lighting in the Atrium

Arches

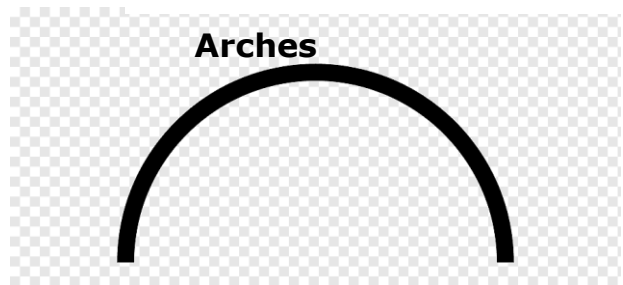
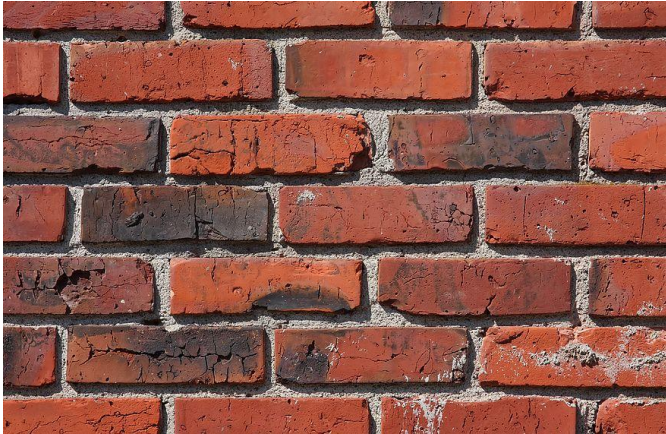


Figure 138 : Arches

5.6 CONTEXT OF KATHMANDU



Brick and mortar are two common building materials that have been used extensively in Newari architecture, which is a traditional architectural style found in the Kathmandu Valley of Nepal. Newari architecture is known for its intricate wood carvings, decorative brickwork, and ornate temple architecture.

In Newari architecture, bricks are typically made from clay and fired in kilns. These bricks are then used to create intricate patterns and designs on the exterior of

buildings. The use of brick in Newari architecture provides a natural insulation against the heat and cold, making it an ideal material for the climate in the Kathmandu Valley. Mortar, which is used to bind the bricks together, is typically made from a mixture of clay, sand, and water. The mortar is often left exposed, which provides a contrasting color and texture to the brickwork.

In summary, the use of brick and mortar is a key feature of Newari architecture. These materials are used to create intricate patterns and designs on the exterior of buildings, while providing a natural insulation against the heat and cold.

5.7 USE OF NATURAL LIGHTING

Natural lighting is an essential design consideration for museums as it can enhance the visitor experience and protect the artwork and artifacts on display. Natural light can bring out the colors, textures, and details of artwork, creating a more dynamic and engaging environment for visitors. Additionally, natural light can help reduce energy consumption and provide a more sustainable source of lighting.

However, natural lighting can also be a double-edged sword. Overexposure to sunlight can cause fading and damage to artwork and artifacts over time. Therefore, careful consideration and design are required to ensure the natural light levels are balanced, controlled, and consistent.

There are several strategies for incorporating natural light into museum design. One common approach is to use skylights or light wells to introduce natural light into the building's interior. These can provide a more even distribution of light, particularly in areas where it is difficult to access natural light through windows.

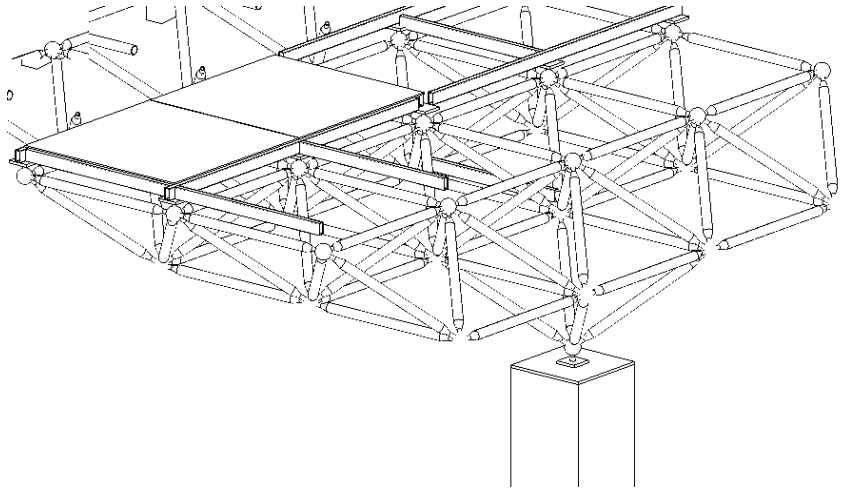


Figure 140 : Natural Lighting throughout museum

5.8 Structure

5.8.1 Space Truss

A space truss is a type of truss structure that is commonly used in engineering and architecture to support large buildings, bridges, and other structures. It is made up of a network of interconnected bars or members that form a three-dimensional lattice structure. The bars are typically made of steel or other high-strength materials and are joined together at their intersections using various types



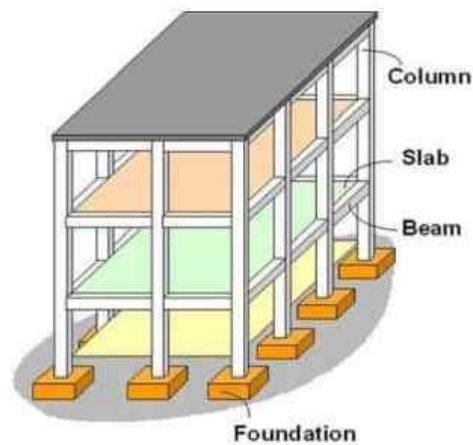
of connectors, such as bolts, welds, or rivets. *Figure 141 : Axonometric view of space truss*

Space trusses are designed to be lightweight yet strong and can span long distances without sagging or buckling under heavy loads. They are often used in applications where large open spaces need to be covered, such as in arenas, stadiums, and airports. Space trusses can also be used to support roofs, walls, and floors in multi-story buildings, or as part of the structural framework for bridges and other transportation infrastructure.

The design of a space truss involves a careful balancing of strength, weight, and stiffness. Engineers use computer simulations and mathematical models to analyze the loads that the structure will be subjected to and determine the optimal size and spacing of the truss members. They also consider factors such as wind and seismic forces, as well as the materials and manufacturing processes that will be used to construct the truss.

5.8.2 Reinforced Concrete Frame Structure

A reinforced concrete (RC) frame structure is a common type of building construction that uses a combination of concrete and steel reinforcement to provide strength and stability. In an RC frame structure, vertical and horizontal reinforced concrete members, known as columns and beams, are interconnected to form a rigid framework. The concrete provides compressive strength while the steel reinforcement, usually in the form of bars or mesh, provides tensile strength. This type of construction is widely used in buildings of all sizes and is known for its durability, fire resistance, and ability to withstand seismic forces



Typical RC Frame Building

Figure 142 : RCC frame structure

5.8.3. Pre-Stressed Concrete Slab

Prestressed concrete is a method for overcoming the concrete's natural weakness in tension. It can be used to produce beams, floors or bridges with a longer span than is practical with ordinary reinforced concrete. Prestressing tendons (generally of high tensile steel cable or rods) are used to provide a clamping load which produces compressive stress that offsets the tensile stress that the concrete compression member would otherwise experience due to a bending load. Traditional reinforced concrete is based on the use of steel reinforcement bars, rebars, inside poured concrete. Prestressing can be accomplished in three ways: pre-tensioned concrete, bonded or unbounded post-tensioned concrete.

The main inspiration behind using this structure is a need of long span structure with walkable platform above it.

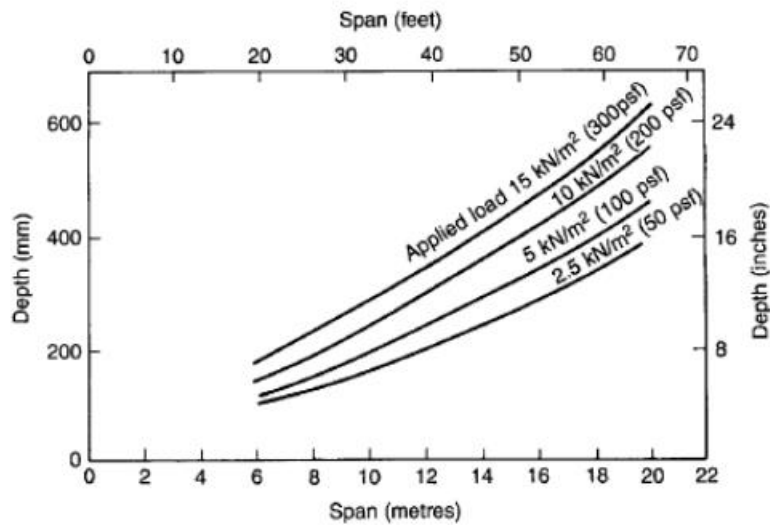


Figure 143 : Prestressed concrete slab beam to depth ratio

5.9 Building Services

5.9.1. Water Consumption Calculation

S.No	Description	No. of people	Per person	Total	Remarks
1.	Art Exhibition	120	40	4,800	15 staffs and 500 visitors a day, taking 1/5 th visitors
2.	Auditorium	160	20	3200	
3.	Administration	20	45	900	
4.	Archives	10	20	300	
5.	Café and Restaurant	250	50	12500	
6.	Waterbody			2000	
				23700	

Total = 23,700 per head per day about 24 cu.m
 Size of water tank = 24 X 3 = 72 cu.m.
 Fire Tank = 50 cu.m. a/c to NBC
 Total Underground tank = 72 +50 =122 cu.m
 Tank size = 125 = 5 X 5 X 5 cu.m

5.9.2 CALCULATION FOR SEPTIC TANK

Primary Users

Museum = 200 (40% of total visitor)

Admin = 20

Restoration and archives = 10

Subtotal = 330

Secondary Users

Auditorium = 160

Café and Restaurant = 250

Subtotal = 410

20 % of Total = 82

Total users = 402

Required volume of Septic tank = No. of user X 3 cu ft.= 402 X 3 = 1206 cu ft = 34.18 cu .m

Size of Septic Tank is L X B X H = 35 cu.m. 3B X B X H = 35

Taking H = 3 m then B = 2 m and L = 6 m, So size of Septic tank = 6 m X 2m X 3m.

Size of soak pit = 6x sp.6 (Sp.6 = Dia. 5m and depth 2.75) from standard

5.10 Building Management System

A building management system (BMS), often known as a building automation system, is a type of building management system. A building automation system (BAS) is a computer-based control system placed in buildings that manages and monitors mechanical and electrical equipment such as ventilation, lighting, power systems, fire systems, and security systems.

More specifically Building Management systems link the functionality of individual pieces of building equipment so that they operate as one complete integrated system. Current generation BMS systems are now based on open communications protocols and are WEB enabled allowing integration of systems from multiple system vendors and access from anywhere in the world. The following will be controlled under the BMS mechanism

in the museum:

- Lighting
- Electrical Power Control



Figure 144 : Building Automation

- Heating, Ventilation and cooling
- Security & Surveillance
- Access Control
- Fire Alarm System
- Elevators
- Plumbing
- PA system
- Alarm Monitor

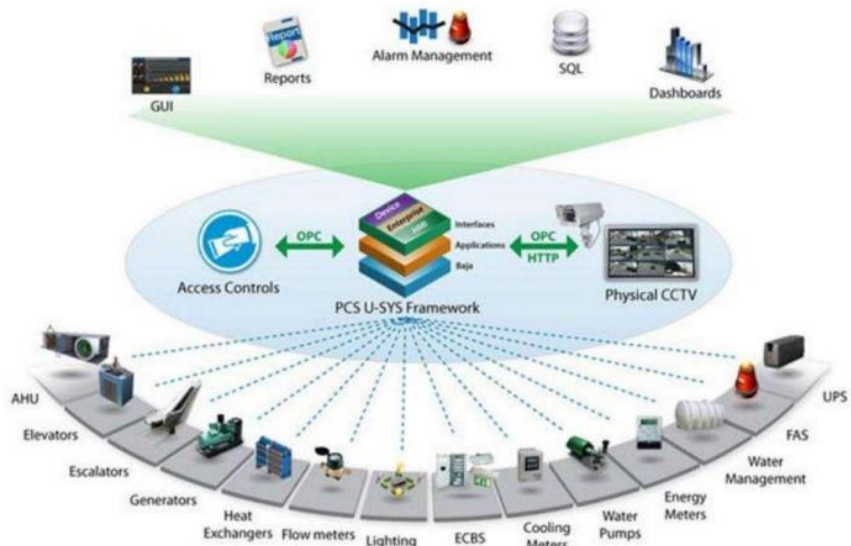


Figure 145 :BMS ((www.unityautomation.com/ibms/))

5.11 SECURITY

Security is the duty of everyone in the museum, beginning with the governing board up to and including employees and volunteers

It is necessary to balance acceptable access to collections with the risk of threats arising.

A risk management strategy enables the development of security solutions in response to risk assessment as well as specific conditions and context. A risk management approach to museum security consists of four phases.

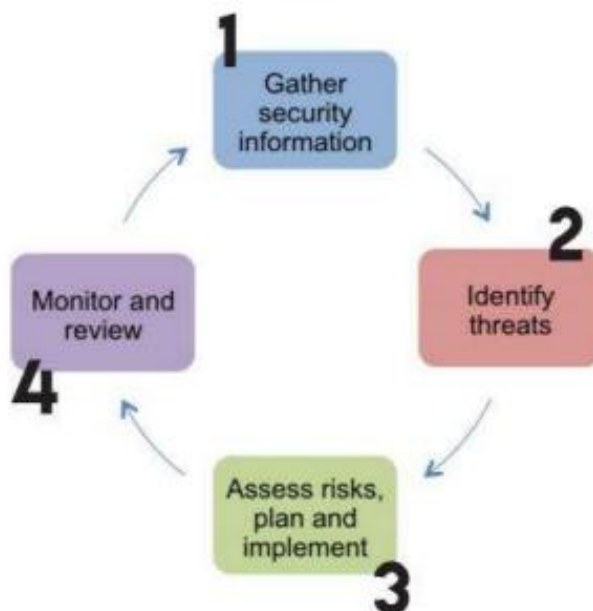


Figure 146 : Security

The museum has been advised to implement the following security measures.

Mechanical measures

- Walls must be adequately strong.
- Used burglar-resistant doors and windows that have been tested and authorized.

Security Measures for Display Cases

- Glass should be break-resistant.
- Surfaces without glazing, such as the cover, bottom, and sides, must also be attack resistant.
- Weak parts must be protected against bending apart so that little exhibits cannot be fished out.

Electronic monitoring

- Intruder alarm systems (IAS) should be constructed such that intrusions or attempted intrusions are recognized and reported as soon as practicable.
- Perimeter surveillance is designed to keep intruders out of a building's perimeter (windows, doors, and exterior walls).
- CCTV and video surveillance, as well as special detectors

Architecture model photos

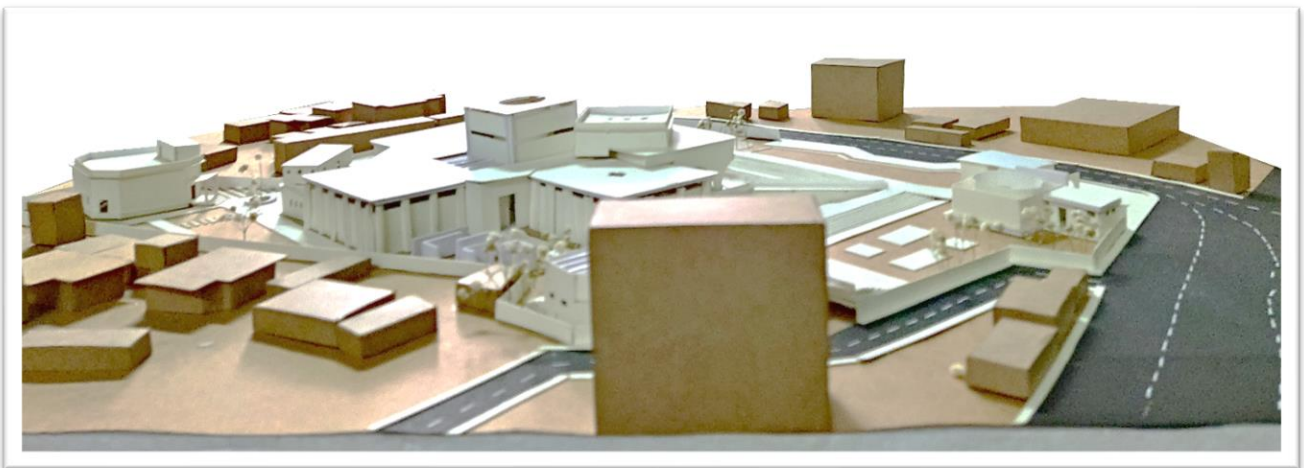


Figure 147 : East Elevation



Figure 148 : South Elevation



Figure 149 : West Elevation



Figure 150 :North Elevation

5.12 Conclusion

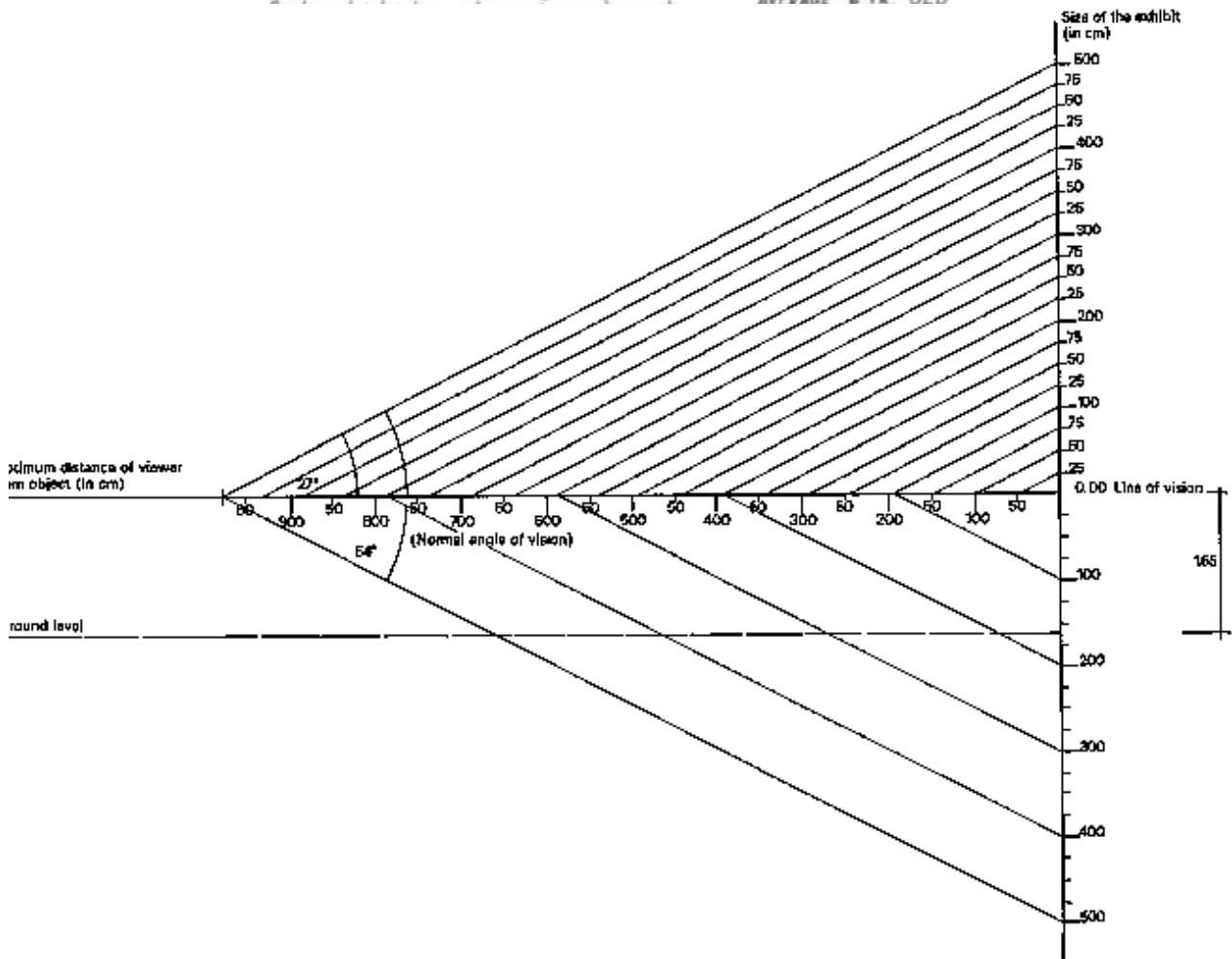
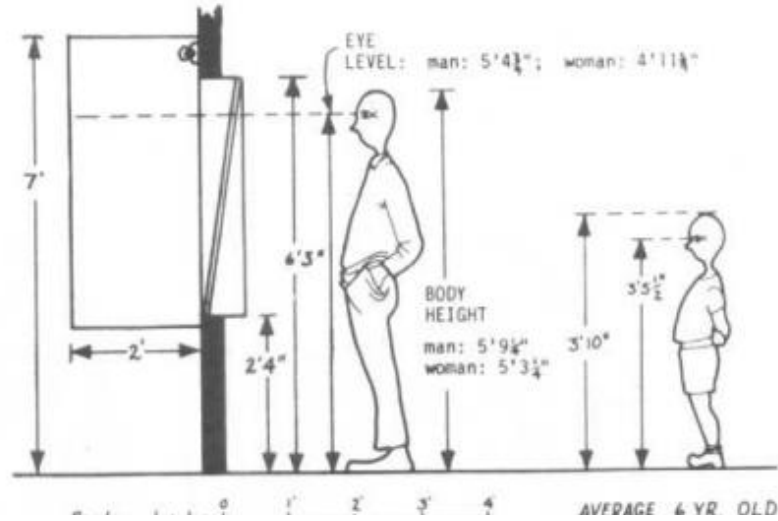
Museum architecture is a professional's genre of architecture because it has unique space requirements and aesthetic purposes to fulfill in the socio-political context, where architecture is required to be pursued in constructing structures embodying national identity. It represents the changing mood and aspirations of the people while retaining the originality of the roots with various options in addressing the nation's future.

This Thesis project helps an individual and society to have a deeper understanding of the dimension of Museum Architecture in Nepal's context. The Museum of Contemporary Arts is a cultural storehouse, a catalyst for the dissemination of new forms of art, and an invitation to a diverse audience and target groups. This museum acts as a representative of modern reality, where diverse viewpoint, narratives are shared from artist to general audience.

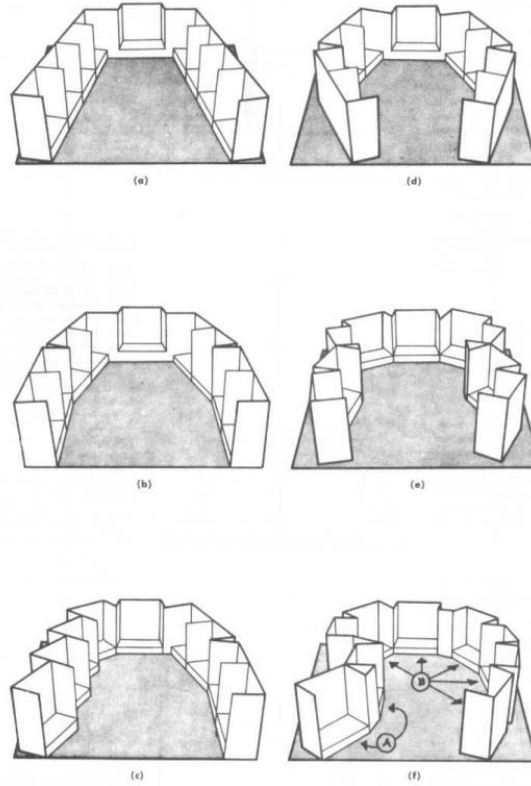
Annex A

(Design Standards)

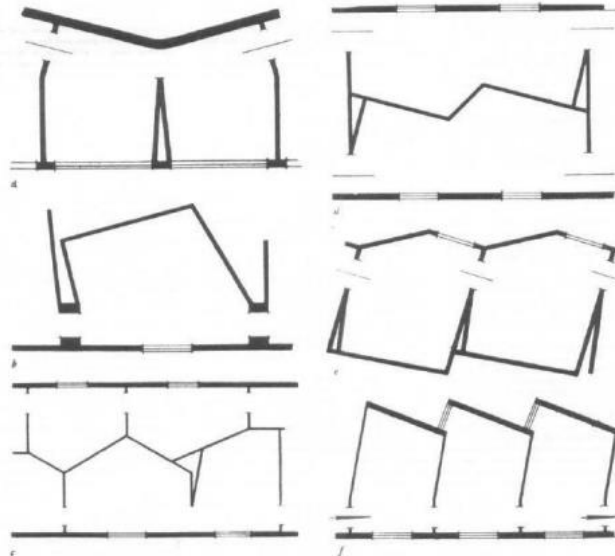
SMALL MUSEUM
Gallery Design



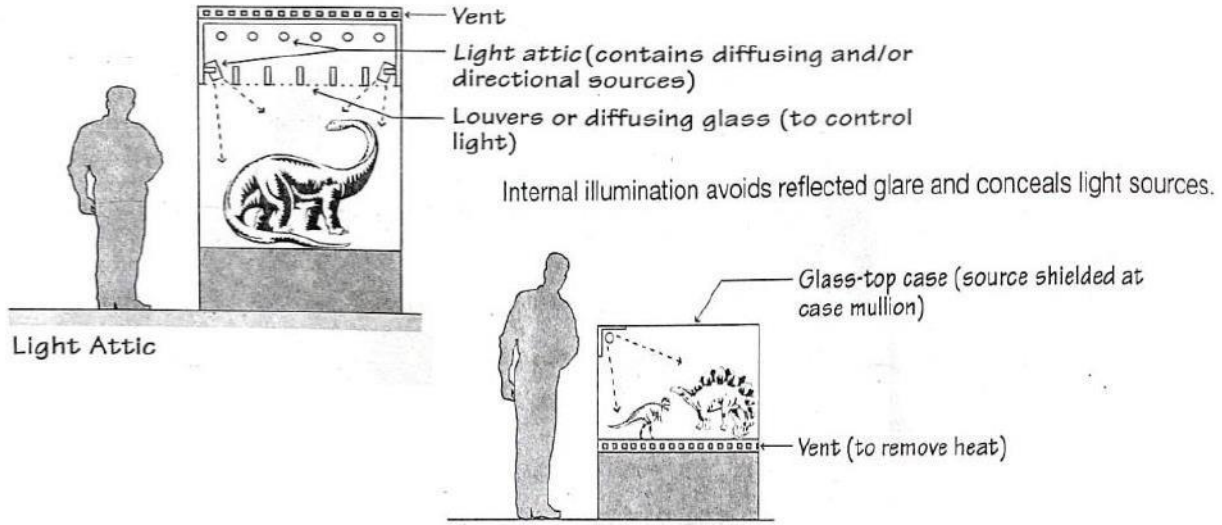
source (Lehmbruck, 1974)



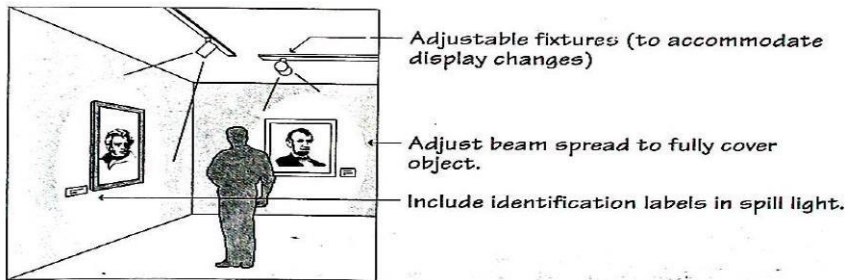
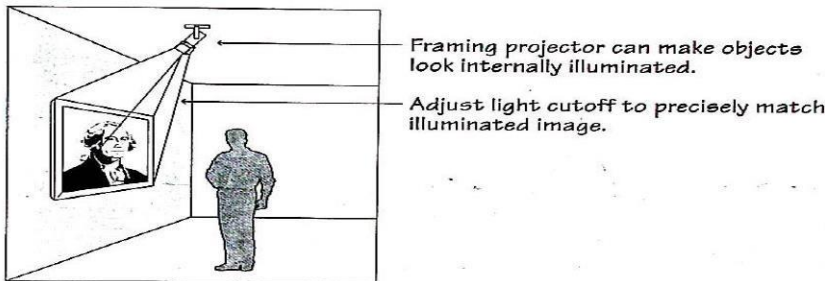
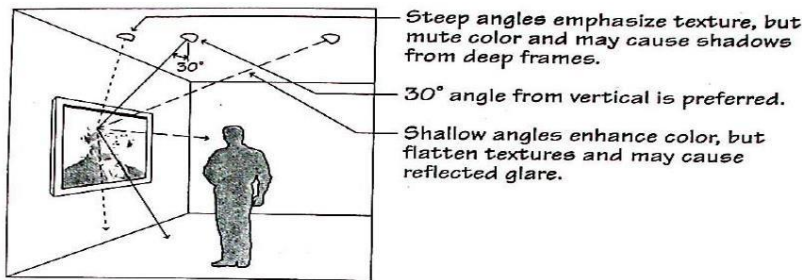
Display Arrangement (Neuferts Architect Data)



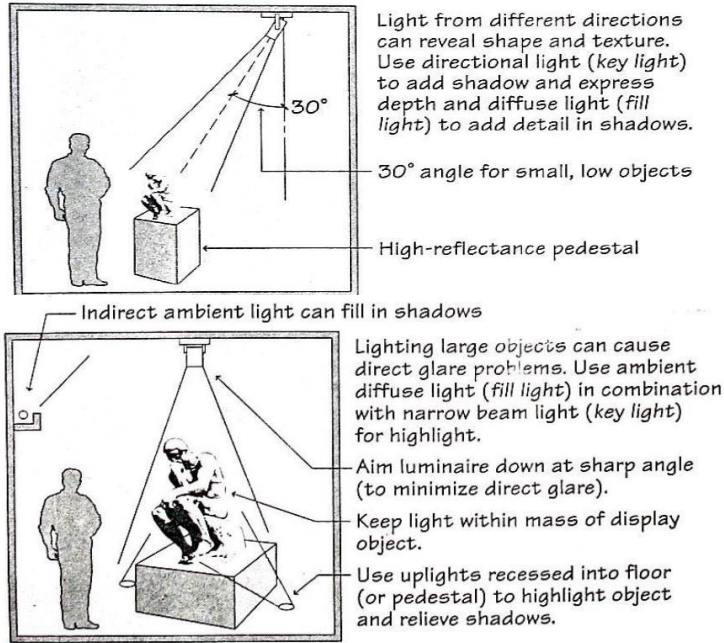
Division of Exhibition space (Time Saver Standards)



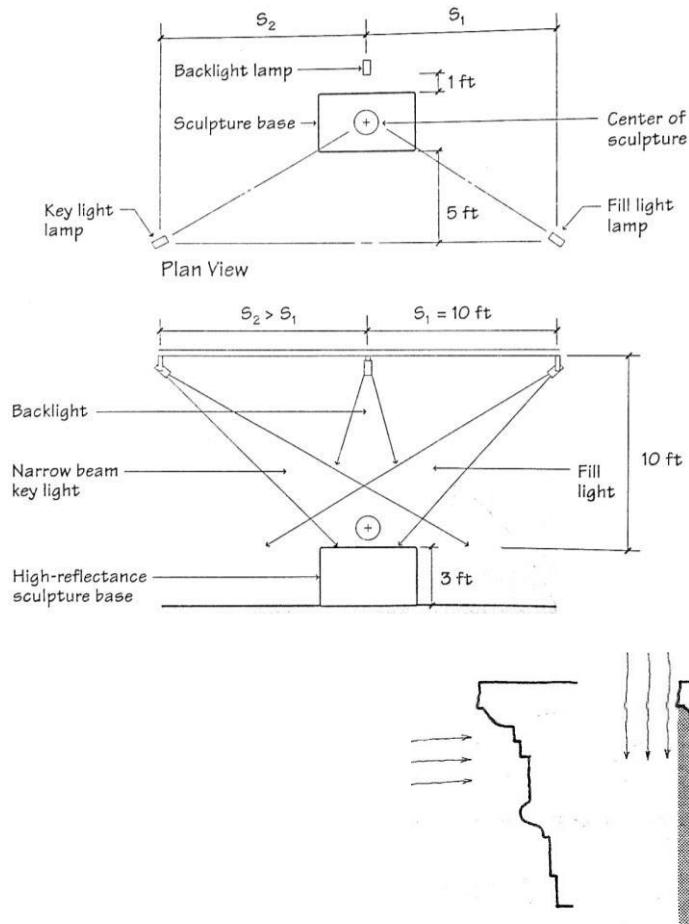
Artificial lighting for 3d objects



Artificial lighting for 2d objects



Artificial lighting for 3d objects



Lighting direction and shadows

Works Cited

- Architects, N. (n.d.).
- Art21. (n.d.). Retrieved from <https://art21.org/for-educators/tools-for-teaching/getting-started-an-introduction-to-teaching-with-contemporary-art/contemporary-art-in-context/>
- Art21. (2016). Retrieved from <http://www.art21.org/learn/tools-for-teaching/on-contemporary-art/contemporary-art-in-context>
- bangdel, D. (n.d.). Retrieved from <https://www.nepalartcouncil.org.np/modern-and-contemporary-arts-of-nepal-brief-overview/>
- Callender, J. D. (1983). *Time Saver Standards For building type*.
- Dixit. (2019). *Nepali Times*. Retrieved from <https://www.nepalitimes.com/banner/nepali-art-going-places/>
- Dr. Elizabeth Rodini. (2017). *www.khanacademy.org*. Retrieved from www.khanacademy.org/humanities/approaches-to-art-history/: <https://www.khanacademy.org/humanities/approaches-to-art-history/tools-for-understanding-museums/museums-in-history/a/a-brief-history-of-the-art-museum-edit>
- Ghisleni, C. (2021, june 1). *Archdaily.com*. Retrieved from <https://www.archdaily.com/962541/the-close-relationship-between-art-and-architecture-in-modernism>
- ICOM. (2007). Retrieved from <https://icom.museum/en/resources/standards-guidelines/museum-definition/>
- IESA. (n.d.). Retrieved from <https://www.iesa.edu/paris/news-events/contemporary-art-definition>
- Kunwar, N. (2017, march 1). Retrieved from <https://lalitmag.com/the-contemporary-art-scene-in-nepal/>
- Lehmbruck. (1974). Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000127357>
- Museum*. (2021). Retrieved from <http://www.historyofmuseums.com/>
- Paula. (1989). *Findlen, Paula (1989). "The Museum: its classical etymology and renaissance genealogy". Journal of the History of Collections.*
- Psarra, S. (2009). *Architecture and Narrative, The formation of space and cultural meaning*. London: Routledge.
- Robertson, J. &. (2012). *Themes of Contemporary Art: Visual Art after 1980. Themes of Contemporary Art: Visual Art after 1980 (3rd ed.)*. Oxford: Oxford University Press.
- Sainani, S. (2021, may). Retrieved from https://www.researchgate.net/publication/351580467_What_is_Contemporary_Art
- Sitzia, D. E. (2016). *Narrative Theories and Learning in Contemporary Art Museums: A Theoretical Exploration*. Stedelijk Studies.
- Walker. (2014). Retrieved from <https://walkerart.org/visit/what-is-contemporary-art>

Simonsson, M. (2014). *Displaying Spaces; Spatial Design, Experience, and Authenticity in Museums*. Sweden: Department of Culture and Media Studies, Print & Media, Umeå University

Giannotti, A. (2012, April 8). MAXXI Museum / Zaha Hadid Architects. Retrieved from ArchDaily: https://www.archdaily.com/43822/maxximuseum-zaha-hadid-architects?ad_medium=g

Hagmueller, G. (2001). *PATAN MUSEUM; The Transformation of a Royal Palace in Nepal*. London: Serindia (London).

LACMA, Official: <http://www.lacma.org/>

The Broad Museum, Official: <https://www.thebroad.org/>

Ching, F. D. (n.d.). *Form, Space and Order*.