



Lahore College for Women University

Jail Road, Lahore – Pakistan. Tel: 042-9203801-09 Fax: 042-9203077

SDG 11

Sustainable Development Goals

11.4.7

DEPARTMENT OF ARCHITECTURE

**LAHORE COLLEGE FOR WOMEN, UNIVERISTY,
LAHORE**





Lahore College for Women University

Jail Road, Lahore – Pakistan. Tel: 042-9203801-09 Fax: 042-9203077

Architectural Studio VIII

SEMESTER VIII

SESSION 2016- 2021

DEPARTMENT OF ARCHITECTURE

**LAHORE COLLEGE FOR WOMEN, UNIVERISTY,
LAHORE**





COURSE INTRODUCTION

COURSE CONTENTS:

The course content based on understanding knowledge of contemporary urban transformation processes and context-based design methods. It tends to analyze, comprehend, and design intricate urban environments. The insights gained are expressed through visionary and strategic thinking, concept development, and the design of urban spaces. The studio seek to provide a comprehensive package linking urban design, theory, research and practice. The main focus is given on Spatial planning system, Knowledge of contemporary ideas of shaping space in cities, Identify principles of formulating local zoning plans for advanced urban complexes using the applicable notation. Knowledge which takes into consideration the interdisciplinary character of circumstances of urban planning.

COURSE SYNOPSIS:

The well explicit application of theories in design are formulated as projects for students of Architectural Design Studio VIII to transform the literal and projected meanings of theoretical concepts into design practice. The foci of studio comprises complex, creative, exploratory and advanced design assignments in background of national as well as international practices. An integrated emphasis is built through comprehensive layout of architectural design assignments. The design projects in Studio VIII correspond to urban development, planning and design. Experimenting with different solutions using knowledge of architectural theories and contemporary concepts to a high level of practicality is taught to students. A thorough sense of urban realm, exchange of intra-city resources and sustainability is developed in students' architectural design capability; that the students learn through various instruments of applied and basic research.



COURSE INTRODUCTION

COURSE LEARNING OUTCOMES:

The projects assignments are based on contemporary urban themes such as design and densification of urban nodes and quarters, revitalization of former theories, and sustainable transformation of our city landscape. The students gain an advanced understanding on the inner logic of urban design and practical experience. This enables them to tackle complex urban challenges, and to synthesize their knowledge into a design project at the interface between planning, architecture and landscape architecture. The students are assigned to develop complex urban design and architectural projects, by critically reflecting and integrating relevant design criteria such as heritage, mobility, public space, landscape, morphology, density, building typology, materiality.

• **GRADING POLICY:**

TERM CLASS ASSESMENT 30 %				FINAL TERM EVALUATION 70%			TOTAL	
TEST 1		TEST 2		FINALS		ATTENDANCE		
Marks 15		Marks 15		Marks 65			Marks 05	100
Class Discussion	Test	Class Discussion	Test	Final Project	Jury	Viva		
Marks 05	Marks 10	Marks 05	Marks 10	40	25	-		



COURSE INSTRUCTOR

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PROJECT INTRODUCTION

REPLANNING & REDEVELOPMENT OF GOVERNMENT OFFICERS HOUSING COLONY, WAHDAT ROAD LAHORE

DEPARTMENT OF ARCHITECTURE



PROJECT INTRODUCTION

PLANNING & RE DEVELOPMENT HOUSING COLONY OF GOVERNMENT OFFICERS WAHDAT COLONY LAHORE

LOCATION:

The site is in Lahore Wahdat Town is already a Housing Colony for Government Officers Wahdat town Lahore.

PROJECT OBJECTIVES:

Following objectives should be achieved in the context of housing scheme design:

- Provision of spaces which offer scope for compatible social communal activities adjacent to living areas
- Establishment of sustainable housing community to maximize human well-being and minimize environmental load

‘Roof over the head’ –is a struggle that millions in Pakistan are still caught with. A viable housing policy is still to be established to appreciate Housing Industry as a social need as well as productive sector of economy. The productivity of design of a Housing Scheme depends on the balance between a range of factors including accessibility, security,

safety, privacy, and community interaction, availability of



PROJECT INTRODUCTION

KEY CONSIDERATIONS, REQUIRED FOR ACHIEVING QUALITY IN DESIGN OF A HOUSING SCHEME:

- **LAND USE, LANDSCAPE AND ECOLOGY**

The existing topographical environment of the site should be respected. Earthworks should be minimized, as far as possible, every effort should be made to retain existing trees and vegetation. Indigenous species should be chosen for landscape design of Housing scheme.

- **SUSTAINABILITY AND ENERGY EFFICIENCY**

a. Sustainability in context of a single house/unit/family involves:

- i. Location of a house close to shops, schools, work places, and transport nodes
- ii. Optimizing the energy performance of the residential unit/building so as to reduce CO₂ emissions. (Generalized goal of reducing energy dependency on electricity by 40%)
- iii. Maintenance of High Quality Indoors
- iv. Preferred Use of materials which are sustainable and locally available.
- v. Effectiveness of Design for Future Growth

b. Energy Efficiency

- i. Provision of shading devices in buildings in relation to solar gains, orientation
- ii. Orientation of Houses and other Buildings to significantly benefit from day lighting.
- iii. Thermal Insulation should be introduced as an integrated approach at initial stages of design so as to qualify for parameters for an energy efficient design.

ARCHITECTURAL DESIGN:

i. NEED BASED APPROACH:

- Access for people with disabilities
- Changing /Varying needs of occupants as per age groups
- Durability and Performance of a Building
- Optimal Use of Infrastructure to avoid Urban Sprawl

i. SOCIALLY RESPONSIBLE APPROACH:

- Accommodation type, Support Services and Purpose based Division of spaces determine socially responsible character of a design
- Accessibility and Adaptability as per changing needs of lifetime of users.
- Security, Health and Safety are also key concerns to meet requirements of circulation inclusive of pedestrian, vehicular and service vehicles

i. PRESERVING ENVIRONMENTAL AND CULTURAL HERITAGE

- The scheme must provide a pleasant living environment to respond appropriately to context of aesthetically pleasing and human in scale. The neighborhood and cultural heritage must also be elaborated in design solution.



STUDENT PROJECT 01

HOUSING SOCIETY WAHDAT COLONY

HOUSING

The word housing has a broad meaning. It is not only a physical structure (namely human habitation) but also a relation of a house to a house, house to neighborhood and then to the community. The broad objective of housing is to provide adequate supply of good dwellings for a variety of income groups and also providing an environment for better life.

The place of housing is next to food and clothing among the primary necessities of life. Man is basically a social creature. He loves to live in a society or community.

LITERATURE REVIEW

A review in a general sense is a report on the smallest unit from where the town planning scheme begins.

NEIGHBORHOOD

Designing great neighborhoods or subdivisions, existing residential communities begins with looking at the many components and factors that create a great neighborhood and understanding how these pieces are integrated and assembled.

TYPE OF DWELLINGS

Small terraced house, Independent terrace, Terrace house, Duplex terrace house, Row terrace house, Semi-detached house, Detached house, Bungalow, Core and shell, Accommodation, Apartment, Small apartment, Low-rise apartment, Mid-rise apartment, High-rise apartment.

TYPE OF LAYOUT FOR HOUSING SCHEMES

Rectangular or grid pattern, Radial, Ring, Spine, Stripling development, Radial-concentric, Star, Ring.

EVOLUTION OF STREET PATTERNS

Guidance	Fragmented	Winged	Linear and	Loose and
pattern	grid	grid	irregular	irregular
Grid	Fragmented	Winged	Linear and	Loose and
Fragmented	Grid	Winged	Linear and	Loose and
Winged	Grid	Fragmented	Linear and	Loose and
Linear and	Grid	Winged	Fragmented	Loose and
Loose and	Grid	Winged	Linear and	Fragmented

STREETS AS PLACE

Like few other places, streets are a special place where life unfolds. Some towns parade and 'trick-or-treat' to markets and public gatherings. They're where we celebrate and come together with our neighbors. They're where we share ideas, thoughts, and one of the joys and pleasures of our lives. We encounter people who are different from ourselves. They're where people have gathered to protest, justice for centuries. That's why projects for public spaces has advocated for the idea that streets are more than just a means of mobility.

PROJECT : HOUSING SOCIETY

LOCATION : HOUSING SOCIETY WAHDAT ROAD WITH THE SAANPORA COLONY IN THE EAST LAHORE TOWN IN WEST AND CORRAL COLONY AT ITS NORTH AND AGRA TOWN AT ITS SOUTH

AREA : 93000sqm

EXISTING SITE

SITE CONTEXT

TYPOLOGY

CONCLUSION

After visually analyzing Wahdat Colony, came to the conclusion that the community required spaces are not better than many other communities. The targeted people for whom I am going to design are more involved in social living in their neighborhoods. They spend more time in their backyards and central green spaces talking to their neighbors and they use their streets as space which makes their streets more active and the green point which plays a role in building up the character in them is that they are used to live in terrace housing that's why they adopt the environment more easily.

CASE STUDIES

HOUSING SOCIETY : JOHAR TOWN PHASE I

INTRODUCTION: Johar Town is a locality in the suburbs of Lahore. Its a wealthy neighbourhood of Lahore which ranges from Kausana Shukat Hill Road, College Road, Al-Mansoor Road, Shadwell Road, Nazania-Pakistan Ave, and Canal Road.

ANALYSIS OF BLOCK A

THEORY AND CONCEPT: Irregular and Concentric zone model

OBJECTIVE: The basic objective outlined is to design a neighbourhood enhance social capital within a community and identify factors for declining social capital. It also highlights the contribution of the physical environment that helps promote social capital.

ARCHITECTURAL STYLE AND TECHNIQUE

LARA GROUP HOUSING, NEW DELHI (1970) BY CHARLES CORREA

The LARA says drew attention to the nature actively or passively. LARA IN THE LUNATA GARDEN AND LEAVE THE INTUITION OF TRAFFIC IN NEARBY.

JAWAHAR KALA KENDRA JAIPUR, BY CHARLES CORREA

THE THEATRE WAS LOCATED AND PLACED SO WELL IN A COURT AND PLANNED HALL. THE REST OF THE SQUARE WILL BE CONNECTED TO THE CENTRAL OPEN THEATRE AND THE REST OF IT WERE THE STAGED PLATFORMS WHICH GOVERN THE USE OF SPACE.

AYESHA ZULFIKAR_31651018

REPLANNING & REDEVELOPMENT OF GOVERNMENT OFFICERS HOUSING COLONY, WAHDAT ROAD LAHORE



STUDENT PROJECT 01



REPLANNING & REDEVELOPMENT OF GOVERNMENT OFFICERS HOUSING COLONY, WAHDAT ROAD LAHORE

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STUDENT PROJECT 01



REPLANNING & REDEVELOPMENT OF GOVERNMENT OFFICERS HOUSING COLONY, WAHDAT ROAD LAHORE



STUDENT PROJECT 02

the pedestrian as protagonist
Kinnor Syed
034651036

RESIDENTIAL SOCIETY DESIGN

SITE ANALYSIS

Introduction

Wahdat Colony Lahore was created in 1970's on 2002 Kanal of Government Land. The Project provides roughly 1500 families of government employees scale T7 and benefits with the housing. The majority of the houses are single story. Wahdat Colony is a low density neighborhood that needs modern facilities which are vital for the modern lifestyle.



Why Redevelopment is main

The redevelopment of urban colony is the ultimate need. The limited land in Lahore creates numerous issues in the city. It's difficult to provide houses to professional employees, the middle class can't purchase houses in Lahore because of high property costs. The people of Lahore require affordable but the visitors in Lahore is deal with the housing shortage for both government workers and overall population.



MACRO ANALYSIS

COUNTRY PAKISTAN

CITY LAHORE

LOCATION WAHDAT COLONY (LAHORE GOVERNMENT EMPLOYEES)



PHYSIOGRAPHICAL CHARACTERISTICS

17.5 N Lat
74.2 E Lon



According to the old Lahore-metro plan colony is located on main road. If we look about present Lahore colony is located in the middle of city.

URBAN DEVELOPMENT

Wahdat Colony was developed in 1970's on 2002 Kanal of Government Land. For development of colonies housing in approximately 1500 families of Governmental employees of Scale T7 and below. However for houses in the colony, Wahdat Colony is a low density residential, suitable for modern amenities which are necessary for modern lifestyle.



NEIGHBORHOOD



ADJOINING COLONIES

MELBA LANE ON OPPOSITE SIDE
CLIFTON COLONY ON BANK
ALAMA IQBAL TOWN ON STRAIGHT RIGHT CORNER
NEW GARDEN TOWN ON STRAIGHT LEFT CORNER
PROFESSOR'S COLONY

ROADS

WAHDAT ROAD
FEROZPUR ROAD
CASAL ROAD

MAIN MARKET

KUBA BAZAR
MEHUN BAZAR

HOSPITALS

SHIBKH ZAYED HOSPITAL
HAMEED LATIF HOSPITAL
FAROOQ HOSPITAL
WAPDA HOSPITAL

BUS STOPS

HANK STOP
SCHOOL STOP
WAHDAT COLONY STOP
NAGSITA STOP

EDUCATIONAL INSTITUTES

GOVT. PILOT SECONDARY HIGH SCHOOL FOR BOYS
PUNJAB ORIENTATION SECTOR REHABILITATION PROGRAMME
COLLEGE OF PHYSICIAN AND SURGEON PAKISTAN
PUNJAB FOOD AUTHORITY OFFICE
UNICEF SCHOOL SCHOOL AND COLLEGE

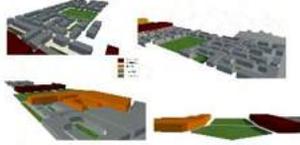
LAYOUT PLAN



CLUSTER HOUSES



Cluster housing, homes are in group and closed together.
Mostly centralized open spaces.



ROAD NETWORK



EDUCATIONAL INSTITUTES

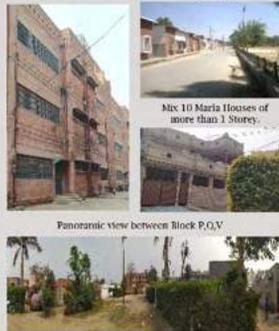


TYPES OF HOUSES

SIZE OF HOUSE

Colony consists of single storey quarters or houses.
Mixed New House
Including 3 storey flats of different sizes.

Hats Maria single storey 7 and 5 Quarters



Mix 10 Maria Houses of more than 1 Storey.

Panoramic view between Block P,Q,V

Environment of Site

-Wahdat colony is a well planned town since 1970's.
-Government's property which was designed for 1-17th grade government employees.
-After critically analyzing the environment of colony, we concluded that society is not maintained the way it was designed to be.



West side gate facing east, public school.

View of road with green belt on left and quarters on right.

Nagsita Stop Wahdat Colony

View of Boy's School from west gate of colony.

View of street stalls alongside road

School Opposite Wahdat Colony

SWOT Analysis

Strengths

- Planned roads.
- Planned Houses
- Good Society
- Open Recreational Spaces
- Pedestrian paths
- Boundary Wall

Weakness

- Colony's poor maintenance system
- Road Side Garbage
- Houses are not properly maintained.
- No Landscaping
- No Public Spaces
- Bad Security System
- Drainage Issues.

Opportunities

- To creatively find the solutions for poor maintenance.
- Improving the lifestyle of people living there.
- Facilities accessible to all.

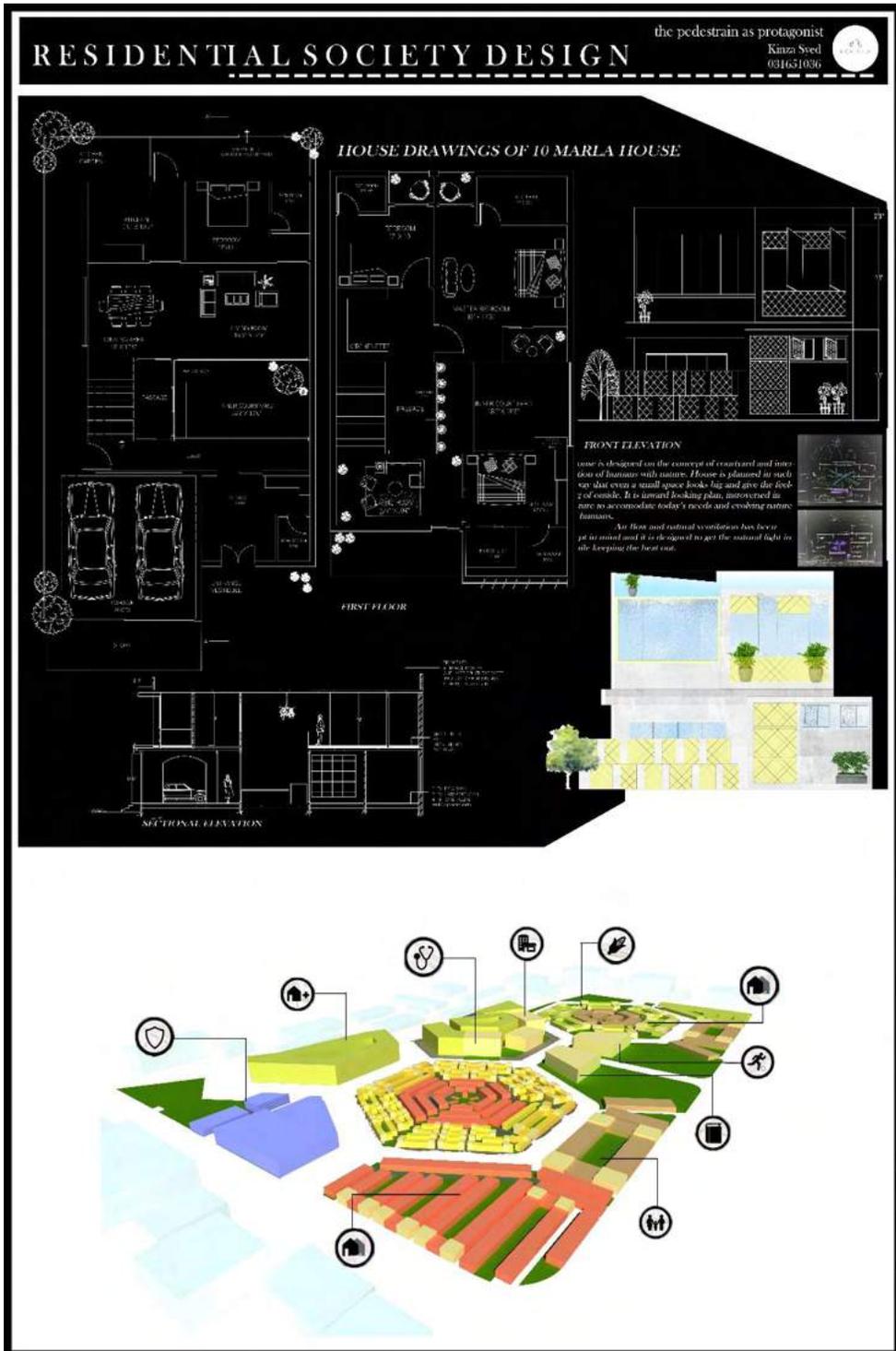
Threats

- Lack of Education.
- Poor Maintenance.
- Road Issues.
- Abstract investment on roads.

REPLANNING & REDEVELOPMENT OF GOVERNMENT OFFICERS HOUSING COLONY, WAHDAT ROAD LAHORE



STUDENT PROJECT 02



REPLANNING & REDEVELOPMENT OF GOVERNMENT OFFICERS HOUSING COLONY, WAHDAT ROAD LAHORE

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LITERATURE

WHAT IS HOUSING SCHEM?

A theory about (housing) architecture aims to say something about what(housing) architecture is

- In itself (as typologies, as spatial and aesthetic configurations etc)
- In relation to other societal fields

The role of housing in shaping society – providing social change

TARGETS TO ACHIVE AFOREDABLE HOUSING SCHEME:

FLEXIBILITY AND VARIABILITY

Flexibility and variability enable one to change the living environment according to the new requirements in the course of their existence. It can be applied to urban and architectural design related to the actual and future needs of the people living there. In the urban context it applies mainly to the structure of amenities of a city and community in order to design specific areas for shops, services, offices, leisure and culture.

GATED COMMUNITY

Gated communities comprise physical areas that are fenced or walled off from their surroundings. The entrances to these areas are usually prohibited or controlled by means of gates or similar physical obstacles.

HOUSING AMENITIES AND UTILITIES

the terms “housing amenities” and “utilities” represent a very important part of architectural and urban planning design.

In the urban context it applies mainly for the structure of amenities of a city and the community in order to design specific areas for shops, services, offices, leisure, health and education facilities and culture. It also includes the quality of design of semi-private and public spaces.

MIXED-USE HOUSING

Mixed-use development offers numerous benefits to its inhabitants. However, the most frequently stated benefits of this development pattern are sustainability and compliance with housing needs. Mixed-use may be developed at three scales, namely mixed-use buildings, mixed-use parcels/sites and mixed-use walkable/transit areas.

PATTERN

a pattern is an explicit description of the rules governing the construction of the built environment and the processes of giving

SOCIAL DIVERSITY

Social housing diversity and housing availability are significant factors in the phenomenon of city formation; they introduce a very wide scope of problems connected with the social and economic aspects of life.

- Connected
- Spacious
- Accessible
- Adaptable
- Pleasurable
- Manageable
- Sociable
- Green



PLANNING & RE DEVELOPMENT HOUSING COLONY OF GOVERNMENT OFFICERS WAHDAT COLONY LAHORE

DEPARTMENT OF ARCHITECTURE



GULBERG LAHORE ANALYSIS

PHILOSOPHY BEHIND

planning concept of gulberg has been derived from the GARDEN CITY movement as indicated by its name.
Gulberg is hybrid of the Persian "Gul" (flower) and Persian word "bagh" meaning an OPEN PARK

GARDEN CITY CONCEPT

First Garden City, CREATED in 1899 of HOWARD
"garden cities", linked by canal and transit and covered by a permanent green belt

EMERGENCE

Gulberg is a RESIDENTIAL AND COMMERCIAL area of Lahore, Punjab, Pakistan.
The town is known for its upscale BUSINESS CENTRE, URBAN SHOPPING CENTRES, MODERN RESTAURANTS and a MAJOR SPORTS COMPLEX.
It is also known as the HUB OF THE CONTENT OF FASHION and CUISINE INDUSTRY in Pakistan.
one of the most EXCLUSIVE RESIDENTIAL AREAS in Lahore

TYPOLOGICAL PLAN

Legend:
 - Residential (High Density Residential)
 - Commercial (Central Business District)
 - Institutional
 - Open Space
 - Green Belt
 - Public Amenities
 - Road Network

EVOLUTION

Phase 1: 1948-1952
Phase 2: 1953-1957
Phase 3: 1958-1962

DENSITY GROWTH PLAN

Urban Context

CASE STUDY

INFRA-STRUCTURE

BRICK AS EXTERIOR FINISHING MATERIAL
SINGLE FANE WINDOWS
CORNER FULL WINDOWS

ARCHED OPENINGS
GUTKA WORK
DOUBLE HUNG PANEL WITH HALF MOON WINDOWS

RECTANGULAR OPENINGS
LINEAR PLANNING
BRICK TEXTURE

CONCLUSION

now a days gulberg is not fulfill the Garden City concept
ENVIRONMENTAL EFFECT:
it self the layout and planning of C block is actually spread the good things in each residential part has its own central park the coverage of commercial block creates a shadows on houses which is a good point in summer.
ECONOMIC EFFECT:
its a commercial hub and have almost max facilities near to residential

SUMBAL ASGHAR
31651060

PLANNING & RE DEVELOPMENT HOUSING COLONY OF GOVERNMENT OFFICERS WAHDAT COLONY LAHORE



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RADBURN CITY, NEW JERSEY

EMERGENCE OF RADBURN PLANNING.

Inspired by the garden city idea, the city housing corporation of New York acquired a vacant site in new jersey within commuting distance of New York city for the community of Radburn.

SPECIFICATIONS

- 1929 Radburn Created
- 25000 people
- 149 acres
- 430 single houses
- 90 row houses
- 54 semi attached hous
- 93 apartment units



KEY FEATURES:

- hierarchical transportation system
- cul-de-sacs
- footpath systems
- underpasses
- shopping center
- ideal size of 30,000 ppl
- homogeneity
- large-scale development
- clustered superblock
- mixed-use
- Interior park



OBJECTIVES :

Decentralized, self-contained settlements, organized to promote environmental considerations by conserving open space, harnessing the auto, promoting community life

Factors that influenced

- Rapid Industrialisation after World War I
- Migration of Rural to Cities
- Dramatic growth of Cities
- Housing Shortage
- The need to provide housing and protect from motorised traffic

PLANNING OF RADBURN

street plan formed a pattern of rectangular block
parking is desired on each side of the street, the right of way is between 54 64 feet wide, pavement width 36 feet
Cul-de-sac and the loop street houses were oriented in reverse of the conventional placement on the lot
Pathways provided uninterrupted pedestrian access
large common open spaces within the center of the superblock
2900 residents of Radburn share 23 acres of interior parks
Plaza Building is Radburn's only neighborhood shopping center



RADBURN'S CONCEPT

- SEPARATION of pedestrian and vehicular traffic
- Super block - large block surrounded by main roads
- CUL DE SACS - each accessed from main road, Living, Bedroom faced gardens & parks, service areas to
- ACCESS ROADS
- remaining land - PARK AREAS
- WALKWAYS - designed such that pedestrians can reach social places without crossing automobile street

CONCLUSION

more safer, orderly, convenient, spacious sociologically, Radburn not only exemplifies an ideally planned place to live, but it establishes a real mode or plan of living.

FAILURE

The design of Radburn believed that people would actively use the front of the houses facing the greenways.
In reality, people come and "leave" from the back of the houses and the vehicles, not pedestrian access



Sumbal Asghar 31651060

PLANNING & RE DEVELOPMENT HOUSING COLONY OF GOVERNMENT OFFICERS WAHDAT COLONY LAHORE

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SITE ANALYSIS

WAHDAT COLONY LAHORE WAS DEVELOPED IN 1970'S ON 2403 KANAL OF GOVERNMENT LAND.

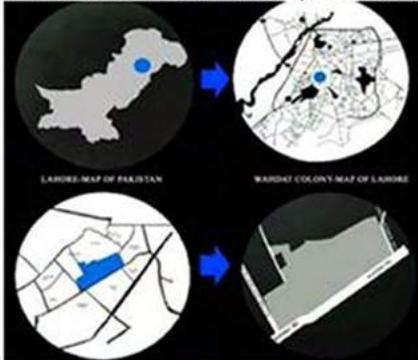
THE DEVELOPMENT PROVIDES HOUSING TO APPROXIMATELY 1800 FAMILIES OF GOVERNMENT EMPLOYEES OF SCALE 17 AND BELOW.

MOST OF THE HOUSES ARE SINGLE STORY.

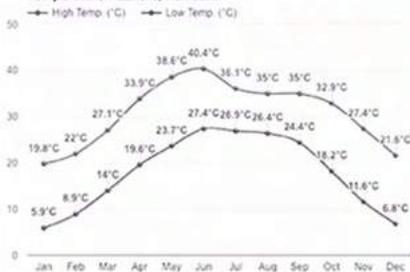
WAHDAT COLONY IS A LOW DENSITY RESIDENTIAL AREA THAT LACKS MODERN AMENITIES, WHICH ARE NECESSARY FOR MODERN LIFESTYLE.

LOCATION:

WAHDAT COLONY LAHORE, PAKISTAN



Temperature - Lahore, Pakistan



URBAN CONTEXT



- RESIDENCIAL COMMUNITIES (clifton colony, combo colony, new garden town ,rehmanpura)
- COMMERCIAL HUB
- HOSPITAL (fatima memorial , anmol)
- PUNJAB UNIVERSITY , UNIQE SCHOOL, UNIQE COLLEGE,
- GHAZALI PARK, ALI PARK



Total site area

- Site Dimension 4580' * 3215'
- Total Site Area 300 acre
- Total Site Area 2403 kanal
- Total Site Area 10,836,000 sqft

Utilities

- Infrastructure
- Electricity
- Water supply
- Gas supply



JURISDICTION

OWNER LEGAL: Govt of Pakistan Lahore development Area.

SITE ACCESSIBILITY

THE SITE IS ACCESS BY:

PADISTRIAN

PRIVATE VEHICALES

PUBLIC TRASPOT ONLY ACCESSED AT WAHADAT ROAD

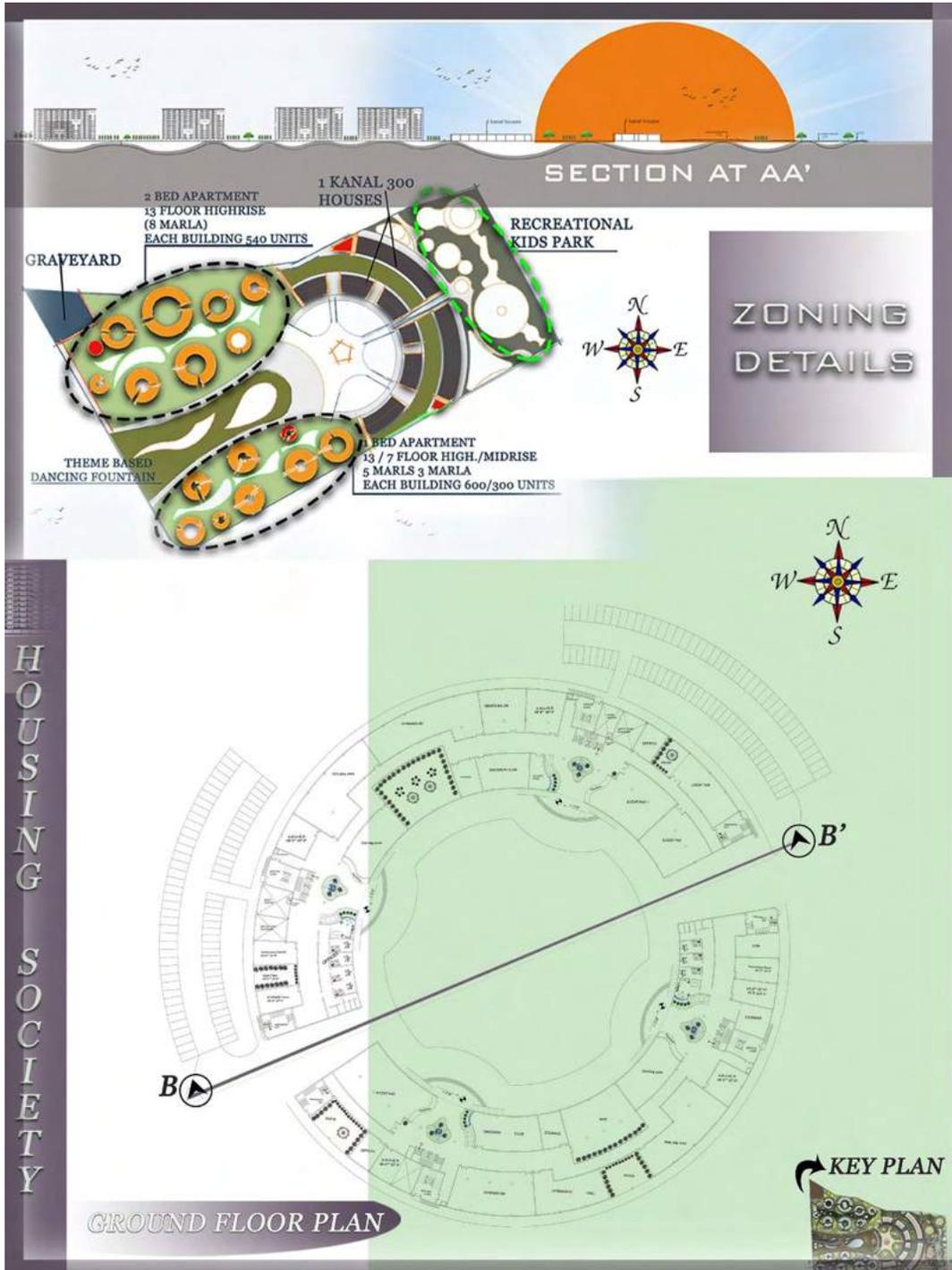
PLANNING & RE DEVELOPMENT HOUSING COLONY OF GOVERNMENT OFFICERS WAHDAT COLONY LAHORE

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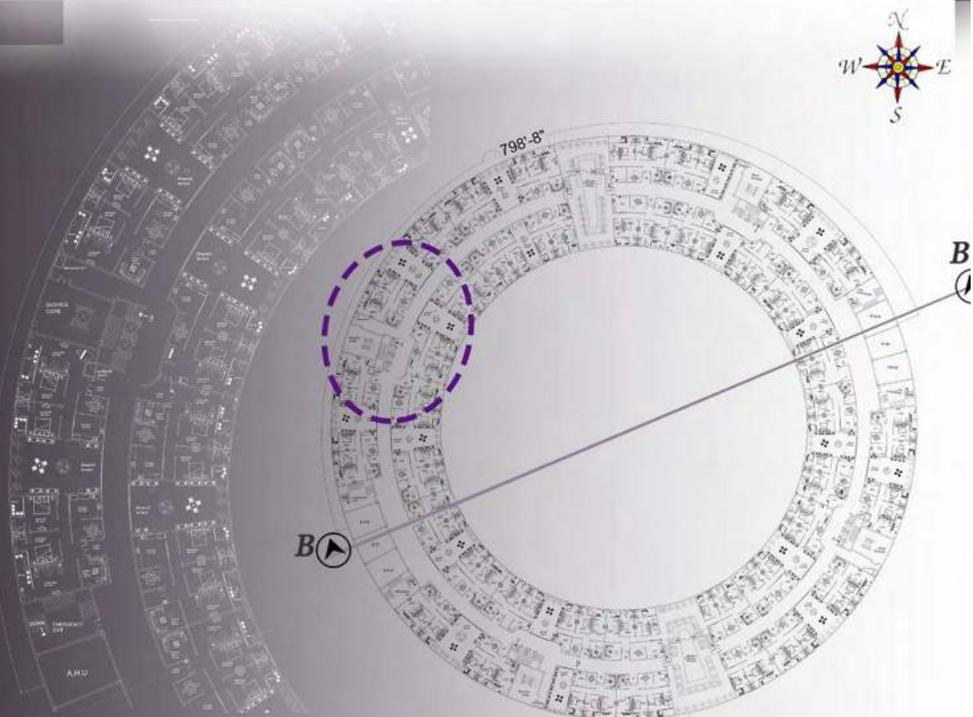


**PLANNING & RE DEVELOPMENT HOUSING
COLONY OF GOVERNMENT OFFICERS WAHDAT
COLONY LAHORE**

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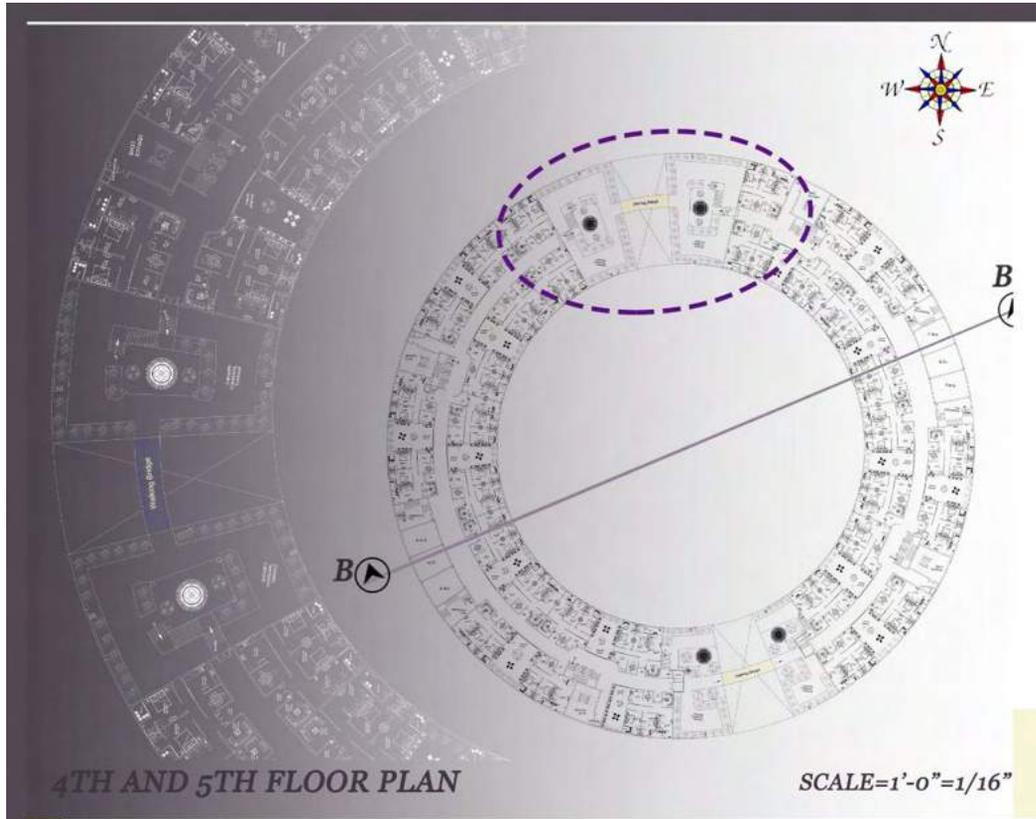


INTERNAL
PLANNING



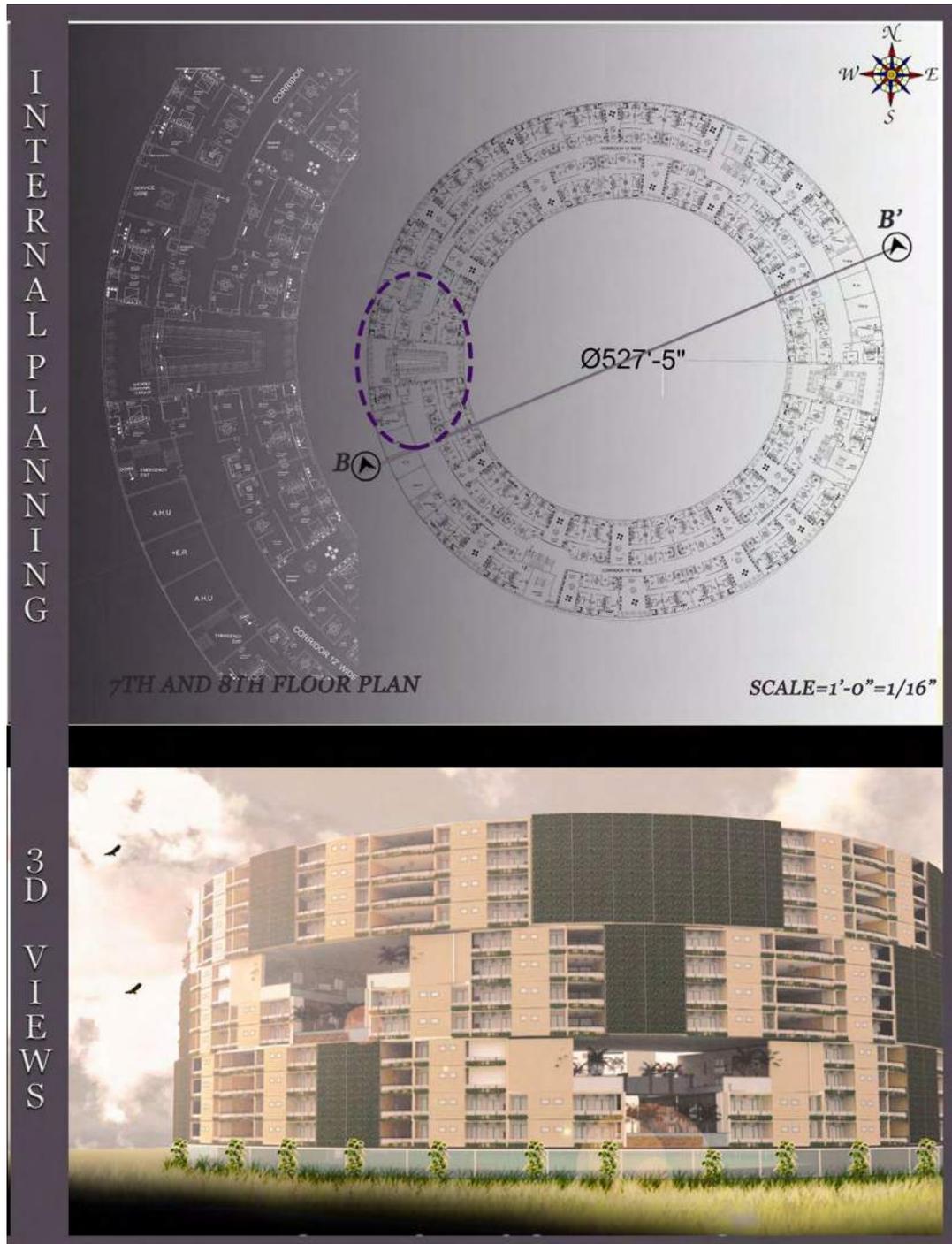
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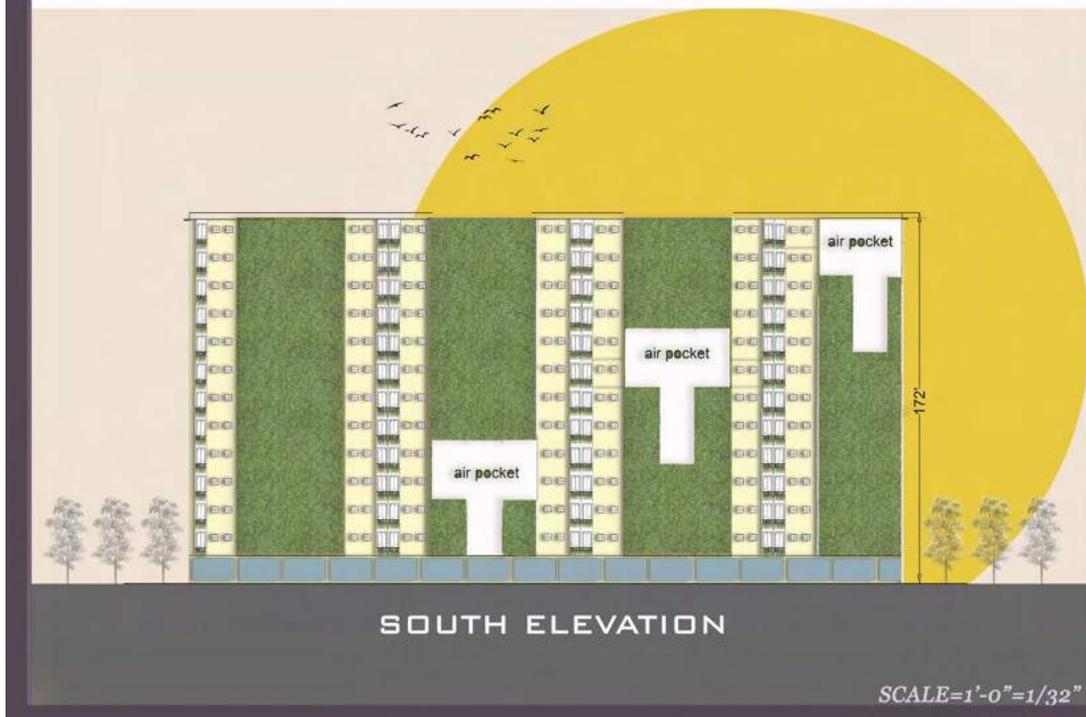
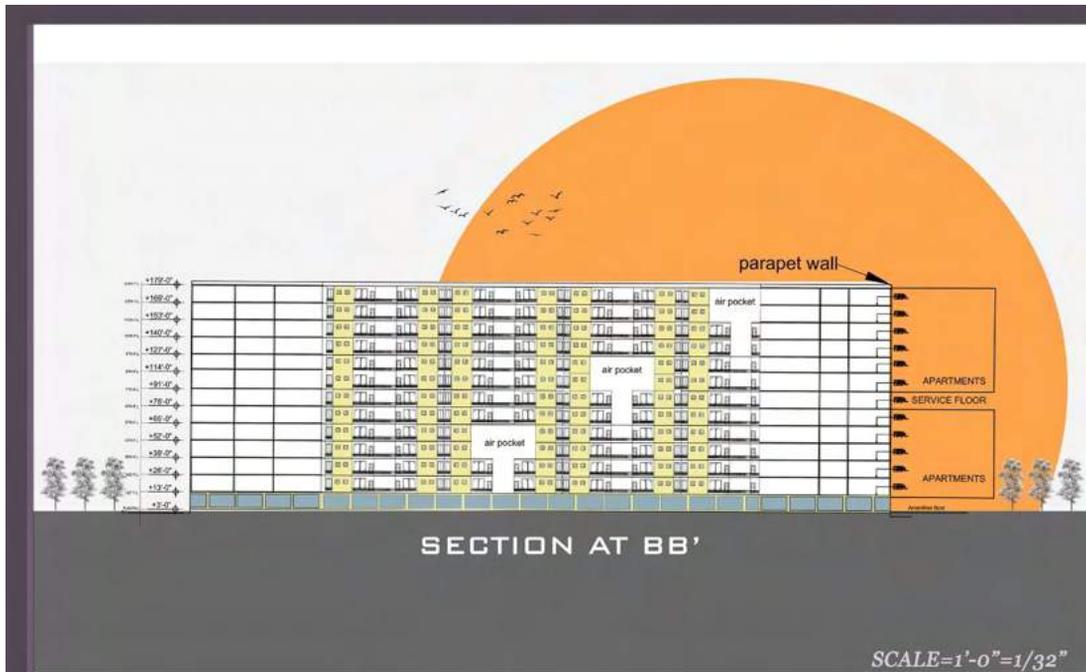
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HOUSING
SOCIETY



ISOMETRIC VIEW OF AIR POCKETS



ISOMETRIC VIEW OF AIR POCKETS

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Architectural Studio VI

SEMESTER VI

SESSION 2017- 2022

DEPARTMENT OF ARCHITECTURE

**LAHORE COLLEGE FOR WOMEN, UNIVERISTY,
LAHORE**





COURSE INTRODUCTION

COURSE CONTENTS:

The studio course is delivered through a combination of inspirational lectures and hands on individual project based discussions to refine the assigned design projects. In addition to talks on intelligent energy-efficient buildings and their services, students will be introduced to structural, electrical and public health design along with fire escapes, placement of central vertical movement core and types of lifts in public buildings, as knowledge of execution is also at par with design in any project. Significance of participatory roles in professional practice as architects for coordination in a project is also indicated in this course.

COURSE SYNOPSIS:

Architectural Design Studio –VI is furnished as a course to provide relevant learning forums for students to put theoretical concepts of the curriculum into practice. This course introduces students to complex, creative, exploratory and advanced design problems that remains their focus throughout the semester. Projects vary but often address and involve the integration of space, form, structure, function and materials. Relativity of humans as occupants in relationship to program and function are considered in detail. Such studio projects are expected to be comprehensive in their development and execution. Students are often given particular requirements to incorporate into their scenario, such as sustainability requirements or occupation restrictions.



COURSE INTRODUCTION

COURSE LEARNING OUTCOMES:

The main objective of this Studio course is to enhance the conceptual design development in the Students about mid-rise structures and their multipurpose use in the specified context. Role of weather, locality, social life of the people, available resources, orientation, noise level in the given area, horizontal and vertical cues of the site and available building materials while designing the given building. After successful completion of the projects, students would be able to; Comprehend the contextual site analysis, conceptually develop and implement the design, generate the form with respect to function of the building. They will be able to chalk out the building requirements and services, with respect to orientation of the site. Moreover the understanding of horizontal and vertical circulation systems within the high rise structure, will be heightened in manual as well as software based presentations.

GRADING POLICY:

TERM CLASS ASSESSMENT 30 %				FINAL TERM EVALUATION 70%			TOTAL	
TEST 1		TEST 2		FINALS		ATTENDANCE		
Marks 15		Marks 15		Marks 65			Marks 05	100
Class Discussion	Test	Class Discussion	Test	Final Project	Jury	Viva		
Marks 05	Marks 10	Marks 05	Marks 10	40	25	-		



Lahore College for Women University

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COURSE INSTRUCTOR

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AR. BEENISH HASSAN	darius_80@hotmail.com
AR. KHIZRA SHAHZAD	Khizra.shahzad@lcwu.edu.pk

DEPARTMENT OF ARCHITECTURE



PROJECT INTRODUCTION

Project # 1

Mixed Use Building

Mixed-use development includes a building or a substantial urban community which combine commercial, cultural and residential usage in a dense area. Creating mixed-use communities allow people to live, shop and work in the same locality offer numerous economic and social benefits.



PROJECT INTRODUCTION

Project # 2

4 Star+ Hotel

The role of the hotel industry stems from a long history and development in the field of hospitality provision. In many countries hotels have evolved as extensions of domestic hospitality; though typically they are more often larger establishments (particularly in developed countries) Industry groups in different countries may define a hotel in different ways.

A typical definition might be:

“A hotel is an establishment providing paid accommodation.”



HIGH-RISE BUILDING

INTRODUCTION:

Engineers traditionally define a "skyscraper" as a building of sufficient height from 15-18 floors. In the U.S., the National Fire Protection Association defines high-rise as being higher than 75000 sq. ft. or 10 stories or 10 floors. In the U.S., the National Fire Protection Association defines high-rise as being higher than 75000 sq. ft. or 10 stories or 10 floors. In the U.S., the National Fire Protection Association defines high-rise as being higher than 75000 sq. ft. or 10 stories or 10 floors.

DESIGN CHALLENGES:

Seismic resistant structural system, wind resistant system of high-rise buildings are reinforced concrete and steel. Material blocks are in combination of concrete curtain walls of glass or polished stone.

HISTORY:

Skyscrapers appeared in response to the need for office space, industrial space, and for more stories in apartment buildings. The first skyscraper, the Home Building in Chicago, was completed in 1889. It was 10 stories tall and 130 feet high.

MIXED-USE BUILDING:

Type: Old blocks residential, commercial, educational, or cultural. Can be used for many different purposes. Where there are different uses in one space, where there are different uses in one space, where there are different uses in one space.

SPACES CAN BE PROVIDED:

Residential apartment units, offices, shops, restaurants, hotels, schools, universities, hospitals, government buildings, etc.

NEED FOR MIXED-USE HIGH RISE BUILDINGS:

Need for increasing demand for business and residential centers, growth of technology, infrastructure development in urban areas, need for services to urban centers, need for services to urban centers, need for services to urban centers.

EVOLUTION OF STRUCTURAL SYSTEM:



STRUCTURE SYSTEM:



SAMPLES:



BENEFITS:

Higher building density, more affordable housing, better urban environment, reduced distances between housing, workplaces, retail businesses, and other services, better access to fresh, healthy foods, more compact development, stronger neighborhood character, "sense of place", community identity.

ADVANTAGES:

Save space and accommodate more residents, higher floors are relatively more airy and receive more sunlight, taller buildings are better options for the idea of a green building as they are more likely to provide more surface area to install solar panels.

DISADVANTAGES:

High wind forces and seismic forces, problems of vibrations, sometimes resulting in cracking of window panes, the foundations of very tall buildings with smaller cross-sections are under tremendous load and sinking of soil may lead to collapse of the building, difficulty in repair work, difficulty in maintenance.

LOCAL CASE STUDY: MALL OF LAHORE



PROJECT: LAHORE MALL (The Government of Punjab)
ARCHITECT: Najam Ali Dada
TOTAL HEIGHT: 140 Feet
TOTAL FLOORS: 45 (40 above ground, 5 below ground)
NO. OF BASEMENTS: 5
MATERIAL USE OF FRAME: Reinforced concrete frame with steel structure
STRUCTURAL SYSTEM: Reinforced concrete frame with steel structure
COLUMN SIZE: 2' x 2'

INTERIOR:



WHY MALL OF LAHORE:

It is a state-of-the-art, multiple-story building as per requirements. It is a state-of-the-art, multiple-story building as per requirements. It is a state-of-the-art, multiple-story building as per requirements. It is a state-of-the-art, multiple-story building as per requirements.

SECURITY SYSTEM AND FIRE SYSTEM:

Water collection at 10 feet deep the lighting unit. Fire alarm system, fire extinguishers, fire escape, fire alarm, fire alarm, fire alarm.

SOLAR SYSTEM AND HOT WATER SYSTEM:

The solar system is installed on the roof top. The solar system is installed on the roof top. The solar system is installed on the roof top. The solar system is installed on the roof top.

CONCLUSION:

It is a state-of-the-art, multiple-story building as per requirements. It is a state-of-the-art, multiple-story building as per requirements. It is a state-of-the-art, multiple-story building as per requirements. It is a state-of-the-art, multiple-story building as per requirements.

GENERATORS AND AHU UNIT:

Generators and AHU units are installed on the roof top. Generators and AHU units are installed on the roof top. Generators and AHU units are installed on the roof top. Generators and AHU units are installed on the roof top.

INTERNATIONAL CASE STUDY: SILODAM



Local name: Silodam
City: Amsterdam
ARCHITECT: HVRB
YEAR: 1999-2002
Budget: 16,000,000
Surface: 19000 m²
Client: Kohn Pedersen Fox, Director NL and Dr. Principal
T. van der Grinten, the Netherlands
Material: Concrete
Program: Mixed use, Residential
Theme: Architecture, Housing, Mixed use

CONCEPT:

It is a block of flats and offices of high density, which is situated on a central canal.

PLAN:



ELEVATION:



ANOMOMETRIC:



SECTION:



SKETCH:



BRIEF:

It is a 10-story building with 10 stories wide and 100 long. It is a 10-story building with 10 stories wide and 100 long. It is a 10-story building with 10 stories wide and 100 long. It is a 10-story building with 10 stories wide and 100 long.

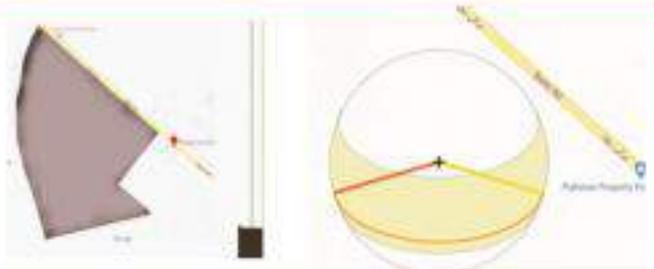
CONCLUSION:

It is a state-of-the-art, multiple-story building as per requirements. It is a state-of-the-art, multiple-story building as per requirements. It is a state-of-the-art, multiple-story building as per requirements. It is a state-of-the-art, multiple-story building as per requirements.



SITE ANALYSIS:

LOCATION: DHA PHASE SECTORS
 PROVINCE: PUNJAB
 LONGITUDE: 74.442869
 LATTITUDE: 31.528877
 LEGAL JURISDICTION: DHA
 AREA OF THE SITE: 909315 SQFT
 SITE CONDITION:
 FLAT SITE



SUN PATH:



NEAREST BUILDINGS:

INFORMATION TECHNOLOGY UNIVERSITY
 SCIL SCHOOL
 LAHORE SCHOOL OF ECONOMICS



SURROUNDING THE SITTE

ALLAMA IQBAL INTERNATIONAL ATRPOT 10 KM
 PARAGON CITY 9KM
 LUMS UNIVERSITY 14.9 KM
 LAKE VIEW CITY 36 KM



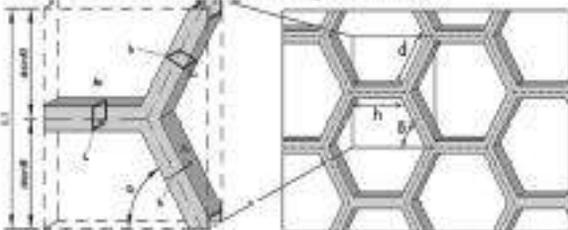
SITE VIEWS:



CONCEPT SHEET:

IN GEOMETRY:

Triangles are the strongest shape. When a force is added to a triangle it is spread evenly through all three sides.
 Triangles are effective tools for architecture and are used in the design of building and other structures as they provide strength and stability.



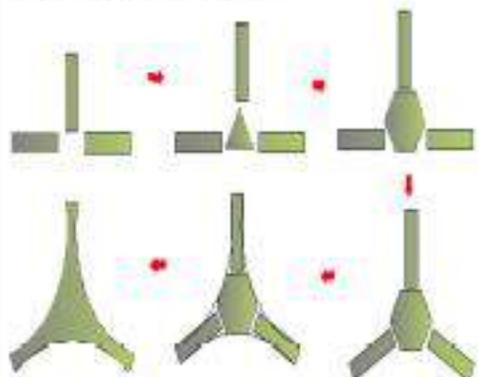
The modular, Y-shaped structure, with setbacks along each of its three wings provides an inherently stable configuration for the structure.

The Y-shaped plan is ideal for all building usage, with the wings allowing maximum outward views and inward natural light.

(a) tetra-U



CONCEPT DRAWINGS:



PROJECT: MIXED USE BUILDING HIGH RISE STRUCTURE

DEPARTMENT OF ARCHITECTURE



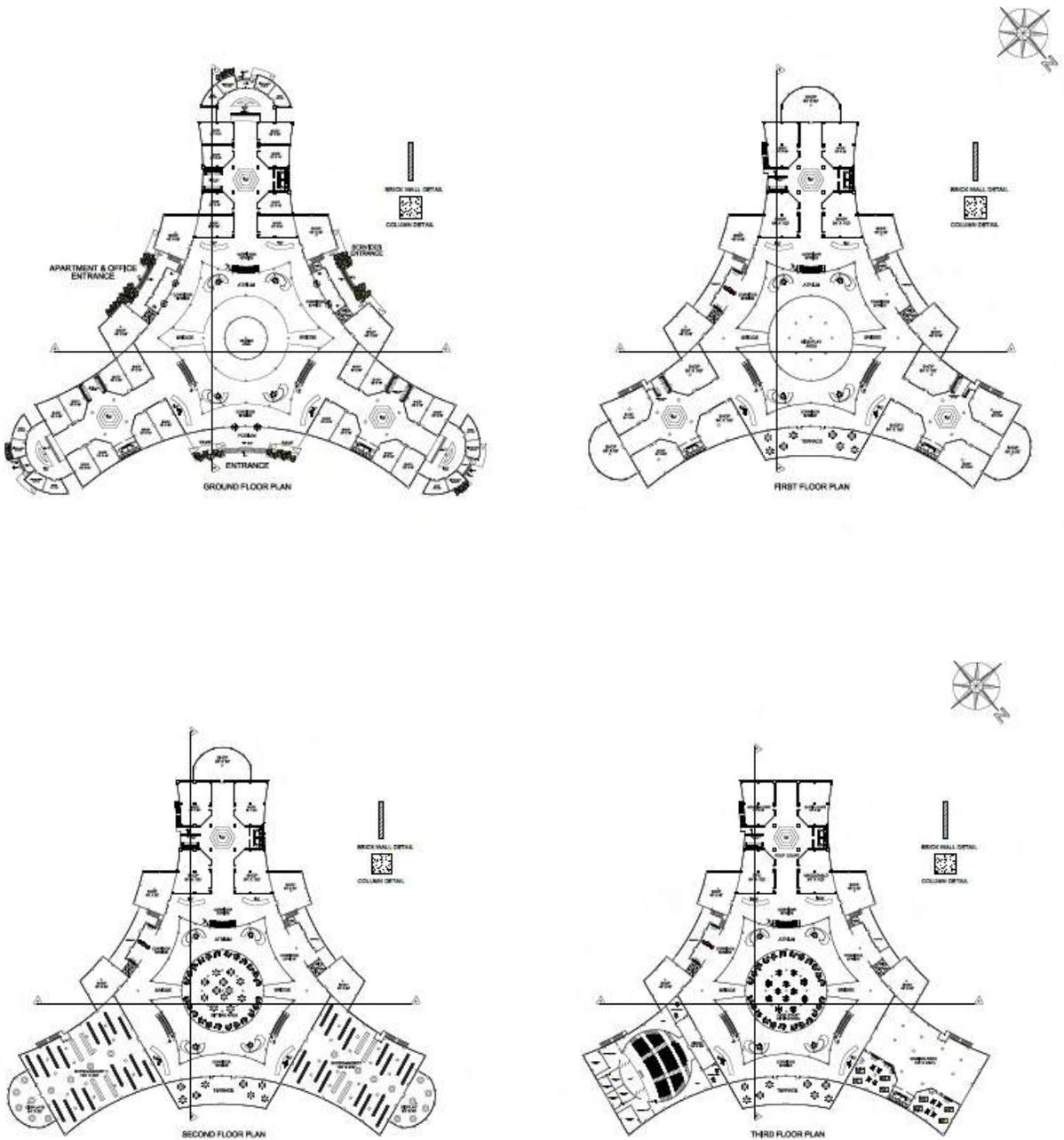
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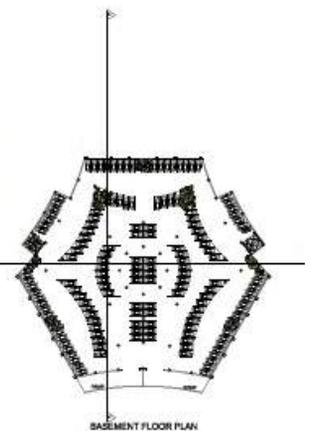
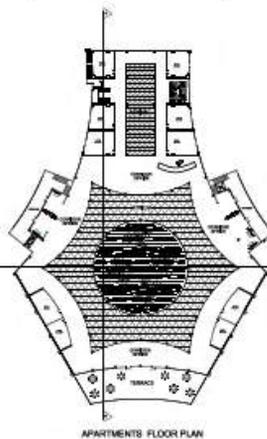
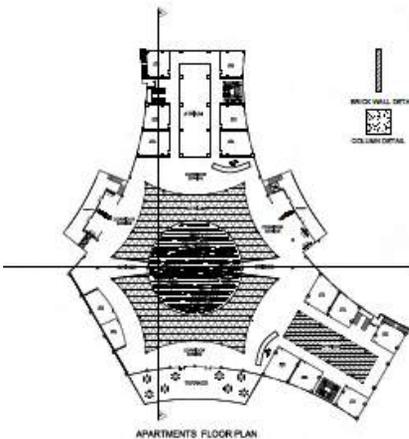
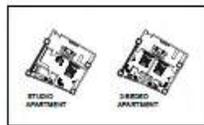
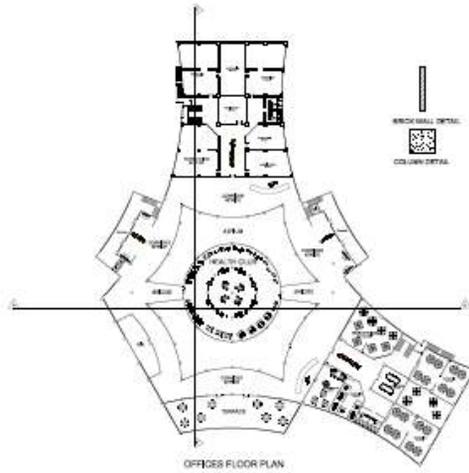
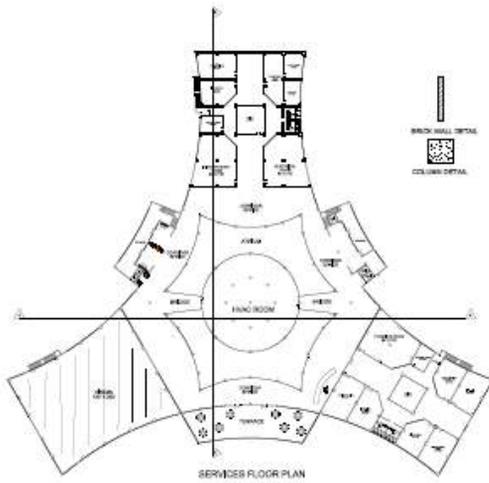
PROJECT: MIXED USE BUILDING HIGH RISE STRUCTURE

DEPARTMENT OF ARCHITECTURE



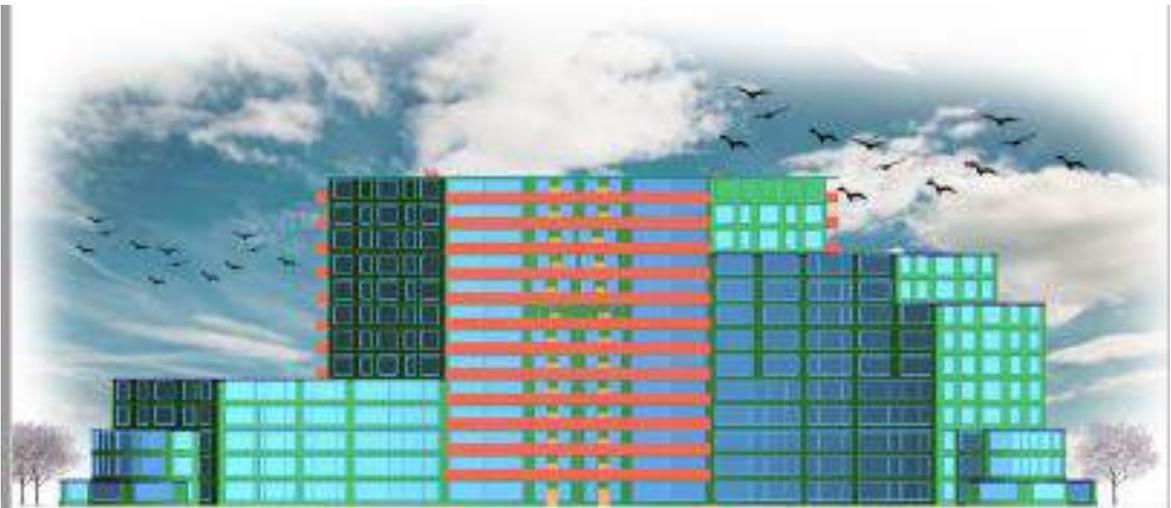
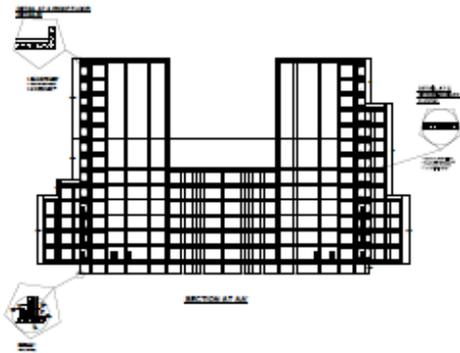
PROJECT: MIXED USE BUILDING HIGH RISE STRUCTURE

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PROJECT: MIXED USE BUILDING HIGH RISE STRUCTURE

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SOUTH WEST ELEVATION



NORTH EAST ELEVATION

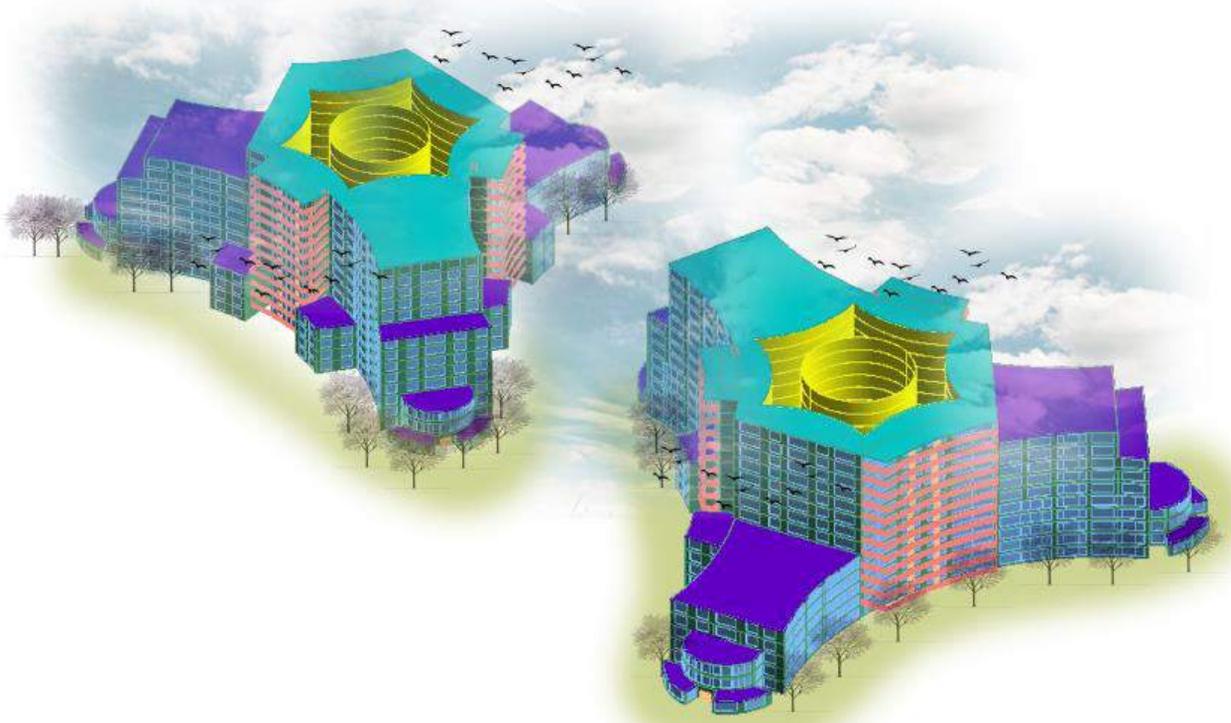
PROJECT: MIXED USE BUILDING HIGH RISE STRUCTURE

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NORTH WEST ELEVATION

BIRD EYE VIEW



PROJECT: MIXED USE BUILDING HIGH RISE STRUCTURE

DEPARTMENT OF ARCHITECTURE



PROJECT HOTEL

INTRODUCTION

A HOTEL IS AN ESTABLISHMENT THAT PROVIDES PAID LODGING ON A SHORT-TERM BASIS. HOTEL IS LARGER THAN A MOTEL

CLASSIFICATION

- 1. BY THE SIZE OF ROOM**
- : UNDER 200 ROOMS
 - : 200-399 ROOMS
 - : 400-700 ROOMS
 - : MORE THAN 700 ROOMS



2. TARGET MARKET

- : URBAN HOTEL
- : SUBURBAN HOTEL
- : MULTI-BRANDED HOTEL
- : MIXED-USE HOTEL
- : RESORT HOTEL
- : CASINO HOTEL
- : CONVENTION HOTEL
- : CONFERENCE CENTERS

3. LEVEL OF SERVICES

- : WORLD CLASS SERVICE (LUXURY 5 STAR)
- : MID-RANG SERVICE (3-4 STAR HOTEL)
- : LIMITED SERVICE (1-2 STAR)

4. OWNER SHIP / AFFILIATION

- : INDEPENDENT / SINGLE OWNER
- : CHAIN HOTEL

RANKING

1 STAR HOTEL

- : OFFER ESSENTIALS
- : HYGIENE/SECURITY
- : FUNCTIONED BATH
- : SELF-SERVICE/VENDINGS

2 STAR HOTEL

- : 2-4 STORES HIGH
- : AFFORDABLE ATTRACTION
- : CONVENIENT TRANSPORT
- : FURNISHED CLEAN/ BASIC

3 STAR HOTEL

- : AVERAGE QUALITY SERVICE
- : CLEAN DESIGN RECEPTION
- : SERVES SNACK BAR
- : NOT DINNING

4 STAR HOTEL

- : DULEX SERVICE
- : LAGER FACILITIES
- : HIGH QUALITY DESIGN
- : SERVICE TO PLEASING

5 STAR HOTEL

- : FULLY DESIGNED
- : EXPENSIVE FACILITIES
- : EXPERIENCE VIEWS
- : FOR WEALTHY PEOPLE

7 STAR HOTEL

- : MORE LUXURIOUS
- : MORE LUXURIOUS
- : MORE LUXURIOUS

REQUIREMENTS

- LOBBY
- SEATING
- RETAIL AREA
- FUNCTION SPACES
- RECREATION SPACES
- BACK OF THE HOUSE

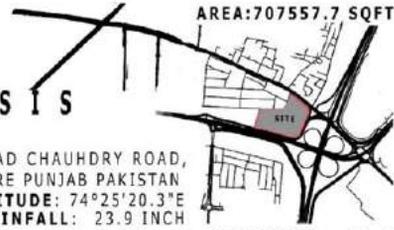
- RECEPTION
- CIRCULATION
- GUEST ROOMS

SITE ANALYSIS

MACRO LEVEL

LOCATION GULDASHT TOWN, AMJAD CHAUHDRY ROAD,
 CITY/PROVINCE/COUNTRY: LAHORE PUNJAB PAKISTAN
 LATITUDE: 31°32'27.5"N / LONGITUDE: 74°25'20.3"E
 ALTITUDE: (709 FT) ANNUAL RAINFALL: 23.9 INCH
 AVERAGE TEMP: SUMMERS: 33.9 °C / WINTERS: 12.3 °C
 MINIMUM TEMP: -1 °C MAXIMUM TEMP: 50.33 °C

AREA: 707557.7 SQFT



LAND MARKS



TRAFFIC FLOW



SURROUNDING



MESSO LEVEL

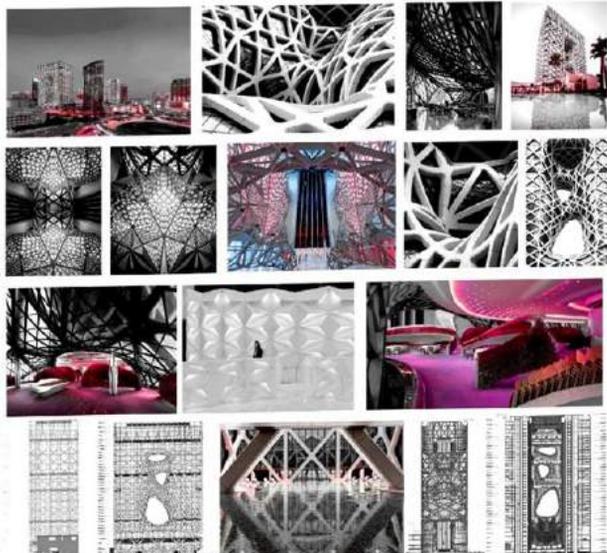
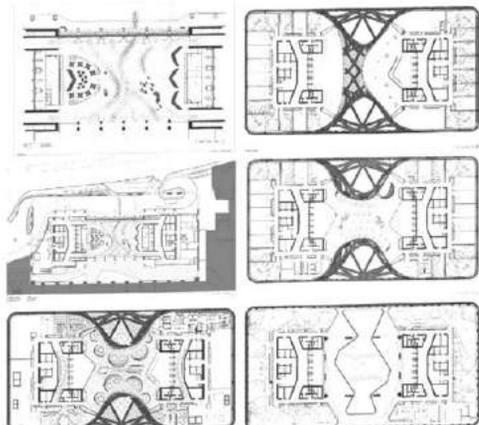
LEGAL JUNCTION: DHA LAHORE
 FEATURE: GREEN AREA AT NORTH
 TOPOGRAPHY: FLAT/NO CONTOURS
 SOIL CAPACITY: 0.5TSF TO 1.25 TSF

MICRO LEVEL

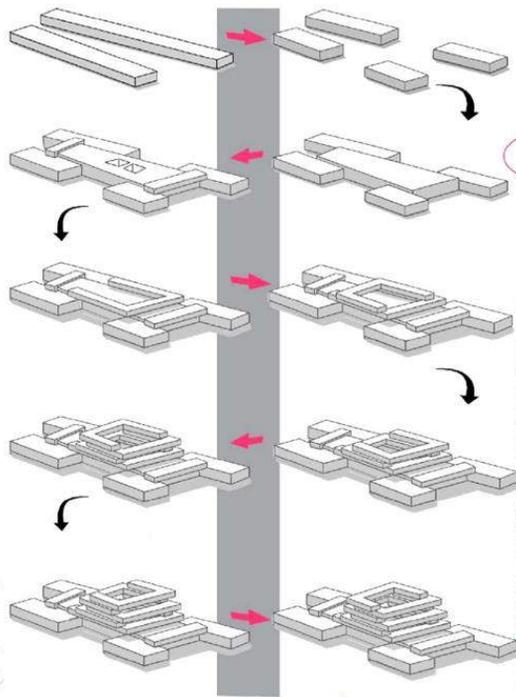
SURROUNDING: AT NORTH GULDASHT TOWN, HOUSES
 AT WEST-SOUTH ASKARI-X
 AT SOUTH MAIN RING-ROAD
 AT EAST RESIDENTIAL AREA

Morpheus Hotel (CASE STUDY)

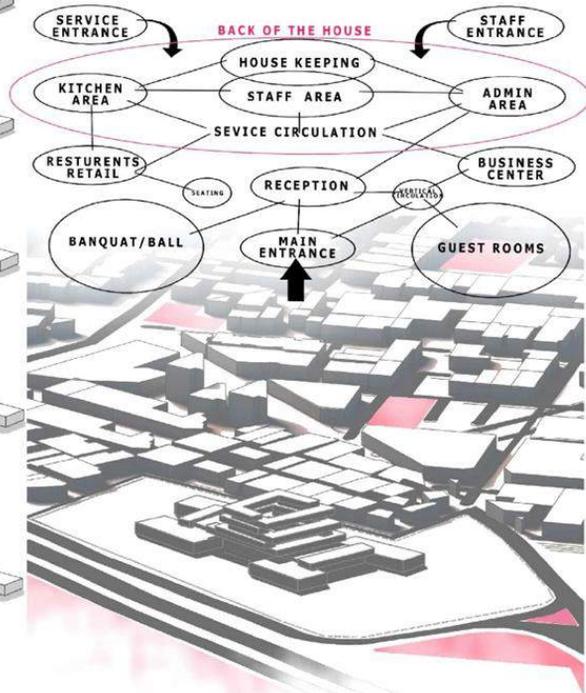
LOCATION: MACAO EST. MORPHEUS, CITY OF DREAM
 ARCHITECT: ZAHA HADID ARCHITECT
 AREA: 147860.0 M2 AREA 2018



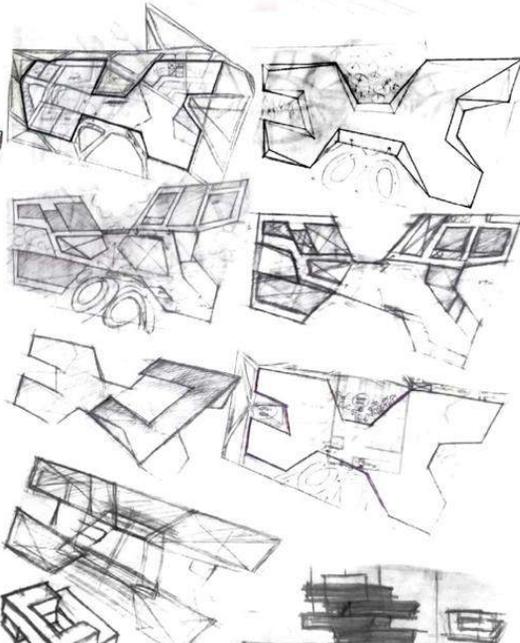
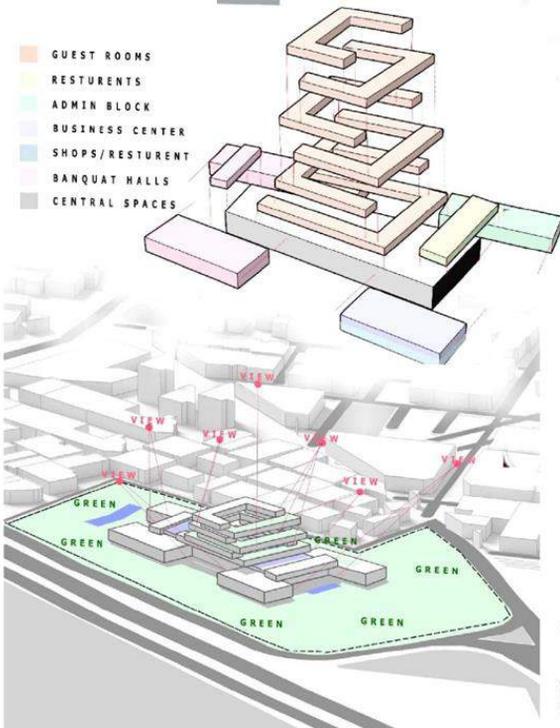
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CONCEPT DIAGRAMS



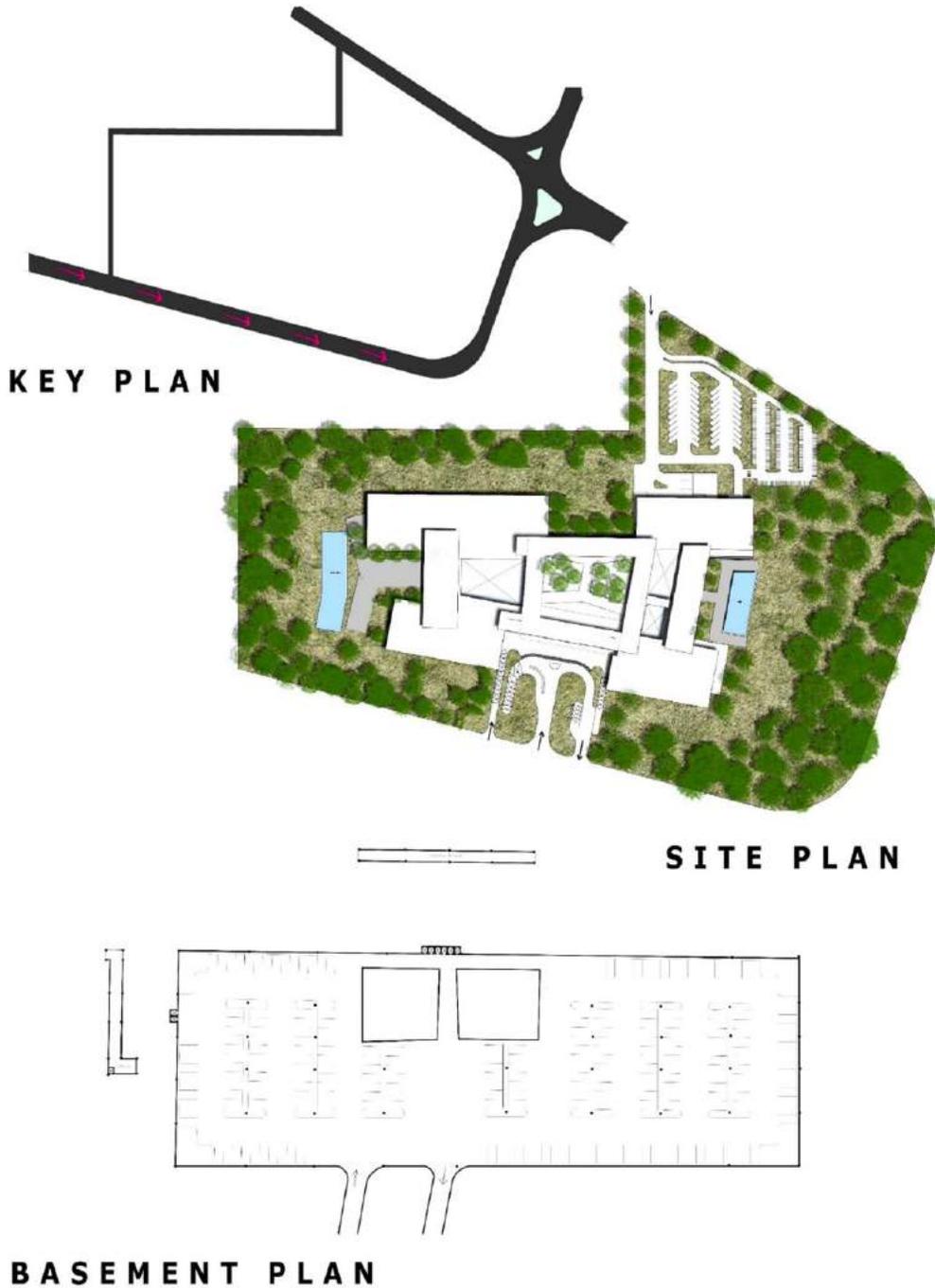
- GUEST ROOMS
- RESTURENTS
- ADMIN BLOCK
- BUSINESS CENTER
- SHOPS/RESTURENT
- BANQUAT HALLS
- CENTRAL SPACES



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PROJECT: 4 STAR + HOTEL

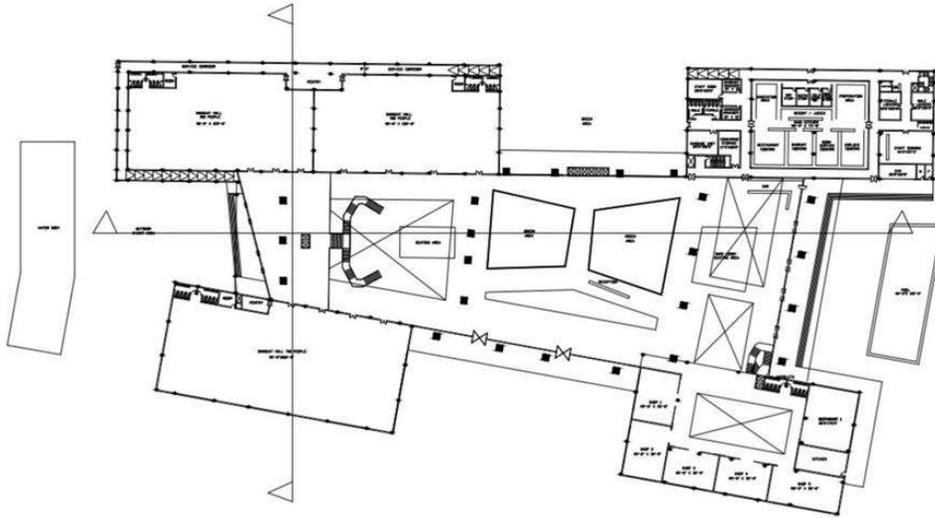
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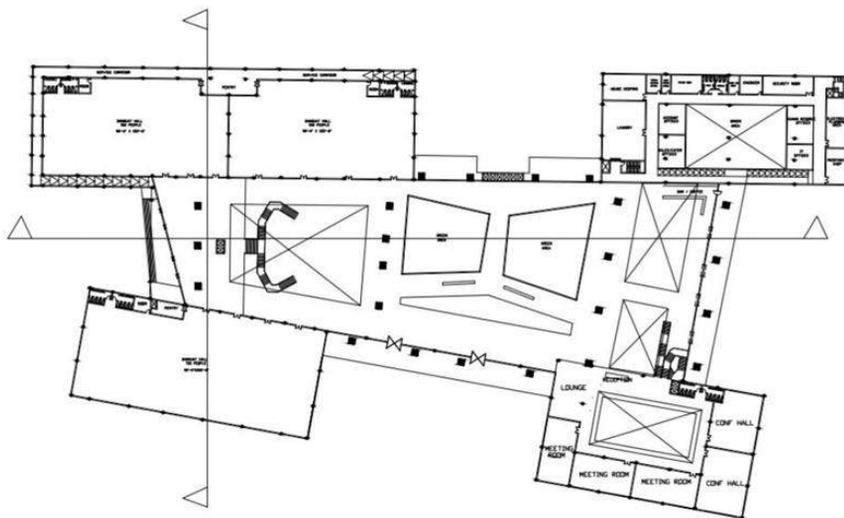
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PROJECT: 4 STAR + HOTEL

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GROUND FLOOR PLAN

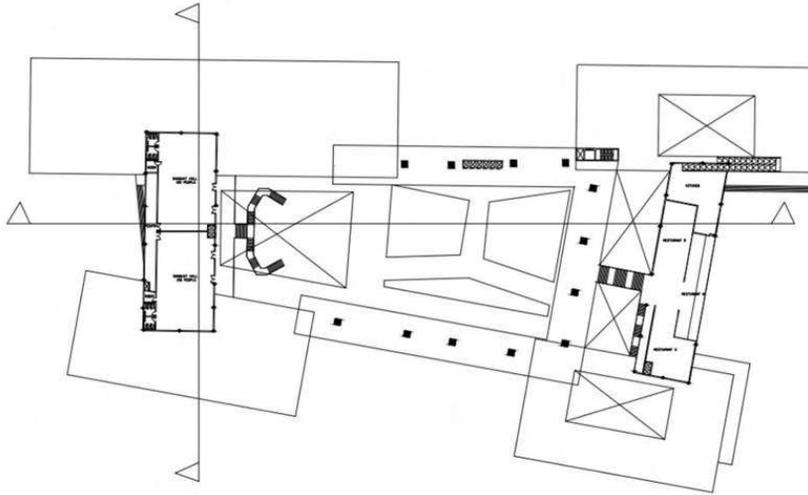


1ST FLOOR PLAN

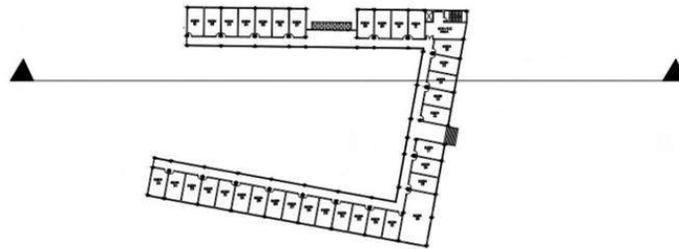
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PROJECT: 4 STAR + HOTEL

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2ND FLOOR PLAN

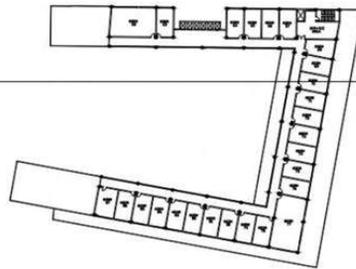


3RD FLOOR PLAN

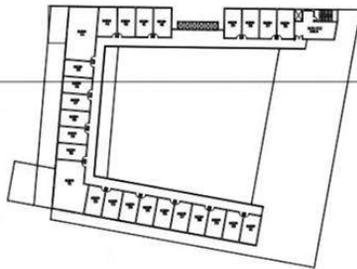
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PROJECT: 4 STAR + HOTEL

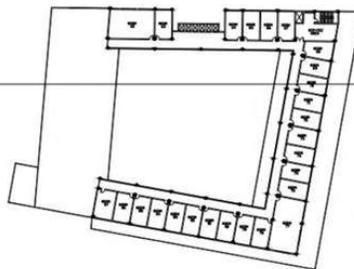
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4TH FLOOR PLAN



GUEST ROOM FLOOR PLAN



GUEST ROOM FLOOR PLAN

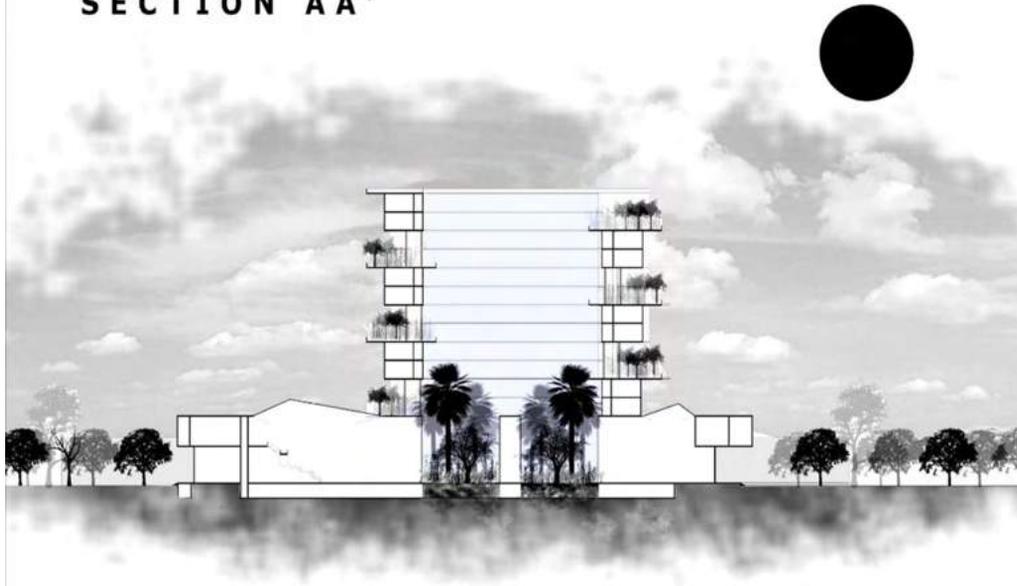
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PROJECT: 4 STAR + HOTEL

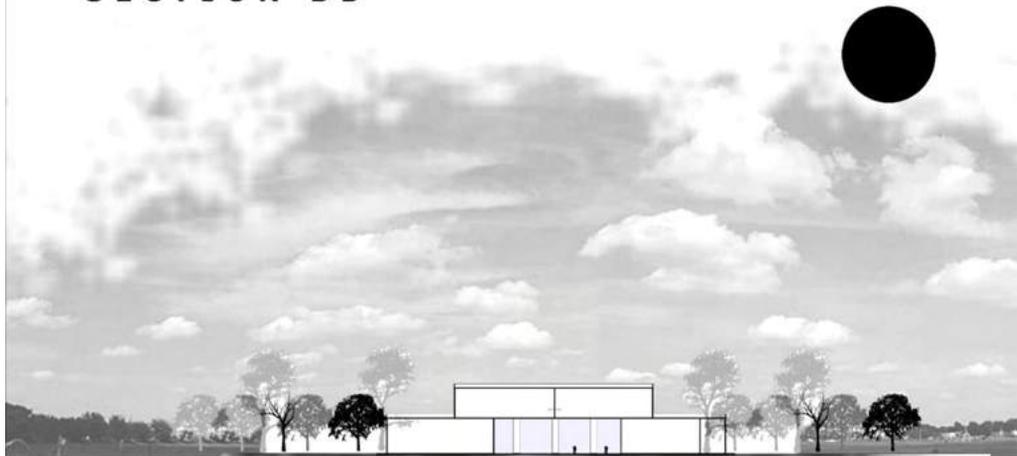
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SECTION AA'



SECTION BB'



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PROJECT: 4 STAR + HOTEL

DEPARTMENT OF ARCHITECTURE



SOUTH ELEVATION



WEST ELEVATION



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PROJECT: 4 STAR + HOTEL

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3 D VIEWS



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PROJECT: 4 STAR + HOTEL

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SDG 11

Sustainable Development Goals

11.4.8

DEPARTMENT OF ARCHITECTURE

**LAHORE COLLEGE FOR WOMEN, UNIVERISTY,
LAHORE**





Lahore College for Women University

Jail Road, Lahore – Pakistan. Tel: 042-9203801-09 Fax: 042-9203077

Arch-453 Sustainable Architecture -I

SEMESTER-VIII

SESSION 2016- 2021

DEPARTMENT OF ARCHITECTURE





COURSE INTRODUCTION

COURSE CONTENTS:

The course requires the practice to be categorized into two sections: The theoretical portion for comprehensive learning and the practical application of the studied material into projects or practical assignments. The course is designed to focus on the understanding of sustainability, its three main areas i.e. social, economic and environmental concerns , highlighting the issues in the way of sustainable design globally and with reference of Pakistan, and various passive design strategies through which the purpose of sustainable environments may be fulfilled. Thus, the course will investigate the on-going sustainable problems, climate change, behavioural change, sustainable values, and the role of passive design elements in these parameters.

COURSE SYNOPSIS:

This course is to familiarize the students with global problems emerging from the overall climate change, the steps or strategies that can at least create some resistance to the impacts of increased carbon footprints of the built spaces, the role of passive design strategies that needs to be considered while designing any building and the steps that can be taken to improve the Indoor Air Quality (IAQ) of the already built structures. The hybrid of both active and passive designs, their needs and the challenges in designing a building is a critical portion of the course. The other important systems in the course, for achieving the sustainable environment are Rain Water Harvesting and Waste management systems.



COURSE INTRODUCTION

COURSE LEARNING OUTCOMES

1. The main objective is to enable students to the realization of human beings about the impacts of lifestyle and architectural styles on the natural environments and why this subject needs urgent attention of field experts and policy makers. 2. The understanding of challenges in achieving the environmental, social and economic sustainability across the globe and within the country. 3. To develop the idea of root causes of the whole disturbance in the climate changes; the carbon emissions and the carbon footprints of the built structures in specific. 4. To make students capable to give the passive design techniques a thought while designing an academic project or infield practice. 5. The importance of building envelope in deciding the impacts of any building on environment in the next 100 years of its construction. 6. The detailed analysis of various design strategies; landscape, wall treatments, roof, openings: doors/windows, infiltration etc. and their effects on the indoor temperature and environments. 7. To create a better understanding of the dynamics of natural ventilation in the buildings, its considerations, impacts and role in maintaining an improved IAQ. 9. The hybrid technology of sustainability and the understanding its importance in comfortable indoors. 10. The analysis of various systems that can contribute in sustainability on a society level i.e. Rain Water Harvesting, Grey Water Reuse and Waste Reduction Management and its 3 R's.



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COURSE INSTRUCTOR

Name	Email Id
AR. FAREENA SHAHID	architectfareena@gmail.com
AR. MAHNOOR ASIM	mahnoorasim88@gmail.com

DEPARTMENT OF ARCHITECTURE



PROJECT INTRODUCTION

Sustainable development has been in the forefront of debates because of the far reaching effect of climate change on this earth. This is principally due to the activities of industries that pollute the atmosphere and use up non-renewable resources to fuel our growth and development. As a consequence of this, it has become necessary for all major consumers of resources including the building industry to adopt sustainable development measures as a way of prudently using our scarce resources.

The project is to propose the Design Strategies and Solutions for the existing built structures of Lahore College for Women University. The focus would be on suggesting multiple design approaches so that the Indoor Air Quality (IAQ) of the built spaces is improved and the overall negative impact of these buildings on environment is minimized.

Students are required to analyze climate on both micro and macro levels and to have a detailed survey of the blocks given to have the idea about design limitations and challenges. Study and consultation of different Sustainable Design Books, so that they can have variety of related material and case studies to analyze, brainstorm and suggest different energy efficient design techniques, is highly recommended. The strategies regarding building envelope, landscaping, shading devices, Lighting analysis, building materials and active design systems will be incorporated.



<p>SITE ANALYSIS</p> <p>laundries: sun path highrise: cool air warm air</p> <p>vehicular access pedestrian access</p>	<p>Ventilation Analysis: There is cross-ventilation through the four main entrances of building. The overall ventilation of the building is normal.</p>	<p>Temperature Analysis: There is highest temperature in the center of building. There is normal temperature at the south side of building. There is lowest temperature at the west side of building.</p>	<p>The original domes are made with concrete. We have replaced it with fiber glass to allow diffused light to enter the building. We have also made the clerestory windows in the drum of dome operable to improve ventilation.</p> <p>Stack ventilation: was temperature differences to move air. The inlets and outlets are designed so that hot air rises up and cool air stays down. This significantly improves the ventilation and indoor air quality. Bernoulli's principle says wind speed difference to move air. Stack ventilation and Bernoulli effect can be combined to improve cross-ventilation.</p> <p>SECTION OF ATRIUM</p>
<p>CONTEXT PLAN</p> <p>Neighborhood: North: Gargash Building South: Gate 2 West: Student Service Centre East: Auditorium</p>	<p>Light Analysis: There is insufficient light at the corners of building. There is normal light in the center atrium of building. There is sufficient light at entrances of building.</p>	<p>Indoor Air Quality Analysis: There is good air quality in the center of building. There is poor air quality in the corridors of building.</p>	<p>VIEW OF CENTRAL ATRIUM</p> <p>Green Roof has the following benefits: aesthetic improvement stormwater management reduces air conditioning load reduces heat island effect</p> <p>Fountain is added in the atrium so that the air quality is improved with the help of air duct.</p>

PLAN BUSHRA MATEEN BUILDING

SITE ANALYSIS

- ACTIVITY: Administration, class room, lobby
- Wall Thickness: 25 inches
- Material: Brick & Glass
- Windows: 2 types of window are used. All of them are used for different purposes.
- Structural column: Structural column has glass.
- No. of floor: 4 floor in central part, 2 floor in side blocks.
- Hotter & Colder spaces: side area cold, central part has normal temperature.
- Landscape Analysis: Landscaping is beautiful and good enough.

Implication: 100

Indoor air quality: level is maintained in classroom.

Conclusion: Best facade has sufficient depth. There is normal light in the east side building while west side building has enough light.

SCIOGRAPHY

EAST ELEVATION

NORTH

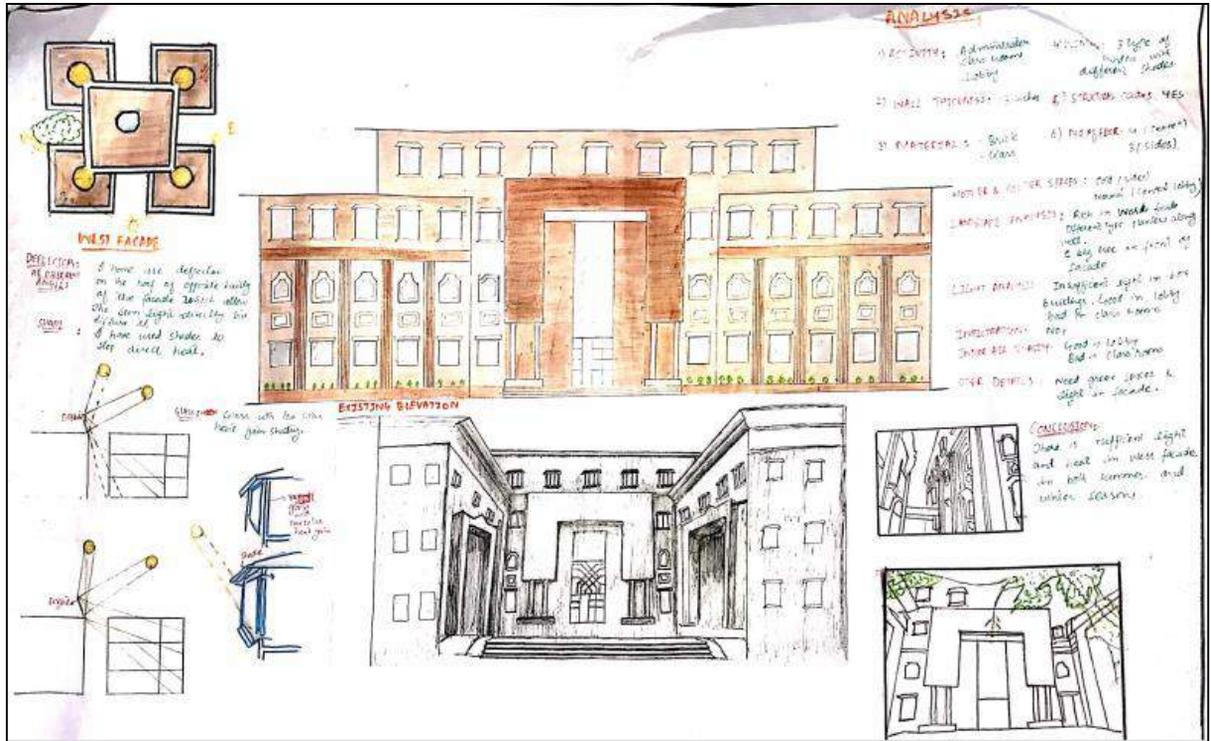
SOUTH

Plants: I have used plants outside the windows. It gives aesthetic look as well as it gives better indoor quality.

Shades: I have used shade to prevent from direct sunlight.

Thermal wall: I have used thermal wall which is passive solar building design strategies. It adopts the concept of indirect gain, where sunlight first strikes a solar energy collection surface.

CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - BUSHRA MATEEN BUILDING LCWU, JAIL ROAD, LAHORE



SUSTAINABLE DESIGN - I	NORTH FACADE EXISTING ANALYSIS	SOUTH FACADE EXISTING ANALYSIS	glazing in the facade. - Concrete is the cause of poor indoor air quality
	<p>Activity: Classrooms/Offices/Lobby</p> <p>Wall Thickness: 13 inches.</p> <p>Windows: Three types of windows.</p> <p>Structural Columns: Yes, structural columns are visible in facade.</p> <p>No. of Floors: Four floors in the centre main building. Three floors in side buildings.</p> <p>Hotter/Colder Space: - Colder in sides because of no sun penetration. - Normal in centre building because of low sun penetration.</p> <p>Landscape Analysis: - Bohr Tree - Bottle Palm - Areca Palm - Ulta Shokh</p> <p>Light Analysis: Insufficient light all over the facade because of dense landscape as sunlight can not reach the facade.</p> <p>Ventilation: Natural ventilation is insufficient due to less passive flow of air into building.</p> <p>Infiltration: Infiltration caused due to wind and air buoyancy forces known as stack effect.</p> <p>Indoor Air Quality: Poor Indoor Air Quality due to microbial contaminants caused by the dense plantation with no sunlight.</p> <p>Materials used: - Brick provides strength and durability to the structure. - Glass provides fire resistance glazing in the facade. - Concrete is the cause of poor indoor air quality.</p>	<p>Activity: Classrooms/Offices/Lobby</p> <p>Wall Thickness: 13" which minimizes the time lag of temperature differences between outside and inside the building.</p> <p>Windows: Three types of windows.</p> <p>Structural Columns: Yes, structural columns are visible in facade.</p> <p>No. of Floors: Four floors in the centre main building. Three floors in side buildings.</p> <p>Hotter/Colder Space: - Colder in sides because of no sun penetration. - Normal in centre building because of low sun penetration.</p> <p>Landscape Analysis: - Chinese Fan Palm - Ulta Shokh - Areca Palm</p> <p>Light Analysis: - South facade provides maximum light along with heat and glare. - Glass curtain wall from ground to second floor invites both problems.</p> <p>Ventilation: Natural ventilation is sufficient due to good passive flow of air into building.</p>	

CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - BUSHRA MATEEN BUILDING LCWU, JAIL ROAD, LAHORE



EAST FACADE STRATEGIES

VERTICAL LOUVERS (MOVEABLE DEVICES)

Slanted vertical louvers are Primarily useful for east and west exposures to improve the insulation value of glass in winter months by acting as a windbreak



WINDOW ELEVATION SECTION

ANGELED SLATS SET AT AN ANGLE TO GIVE WINTER SUN ACCESS AND SUMMER SHADE



Plants naturally filter the air of harmful chemicals and other toxins. Plants in building spaces additionally combat SBS (sick building syndrome), boost humidity levels which decrease dry, cough-inducing air. Rooms filled with plants were shown to have 50%-60% fewer molds and bacteria in the air than in rooms without.

WEST FACADE STRATEGIES



Vertical shading devices are essential to stop the low angled sun heating the walls and penetrating inside the building. Utilising these shading structures on west-facing aspects of the building will significantly reduce the amount of heat absorbed by building.

Sun breaker are provided on the row of windows at right and left side of the west facade which alleviates the direct heat gain and direct sunlight.






A row white reflector is provided on the roof against the west facade which reflects the light into the class room of the west facade in the morning and it gets illuminated with natural



Trees are provided to improve the ventilation and air quality as well as to give the shade from the harsh weather in the long hours of the day



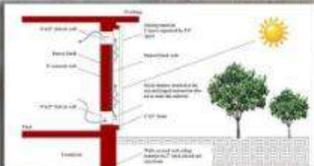
ELEVATION SECTION

NORTH FACADE STRATEGIES

Planter shall be placed on the extended sill of windows which will help in ventilating the corridors and classrooms as well as good indoor air quality.



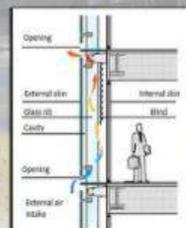
TROMBE WALL



The thermal mass of the wall is heated by the sun and warms the air in the air space, causing it to rise due to convection. Openings in the bottom and top of the trombe wall allow air to circulate and heat the room.

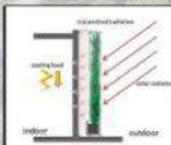


SOUTH FACADE STRATEGIES



A type of Double Façade with several punctures along the height as inlets and outlets for air

- Reduce the heating and cooling loads.
- Enable natural ventilation.
- Provide an acoustic barrier to exterior noise



Green Façade provided in South Façade where there are no windows.



Planters placed on sills of windows

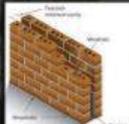
- Provide shade from sun.
- Improve indoor as well as outdoor air quality.

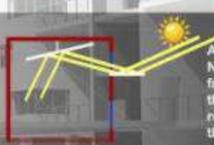


WINDOW ELEVATION WINDOW SECTION

Cavity wall is provide on south facade

- It increase the time lag of temperature differences.



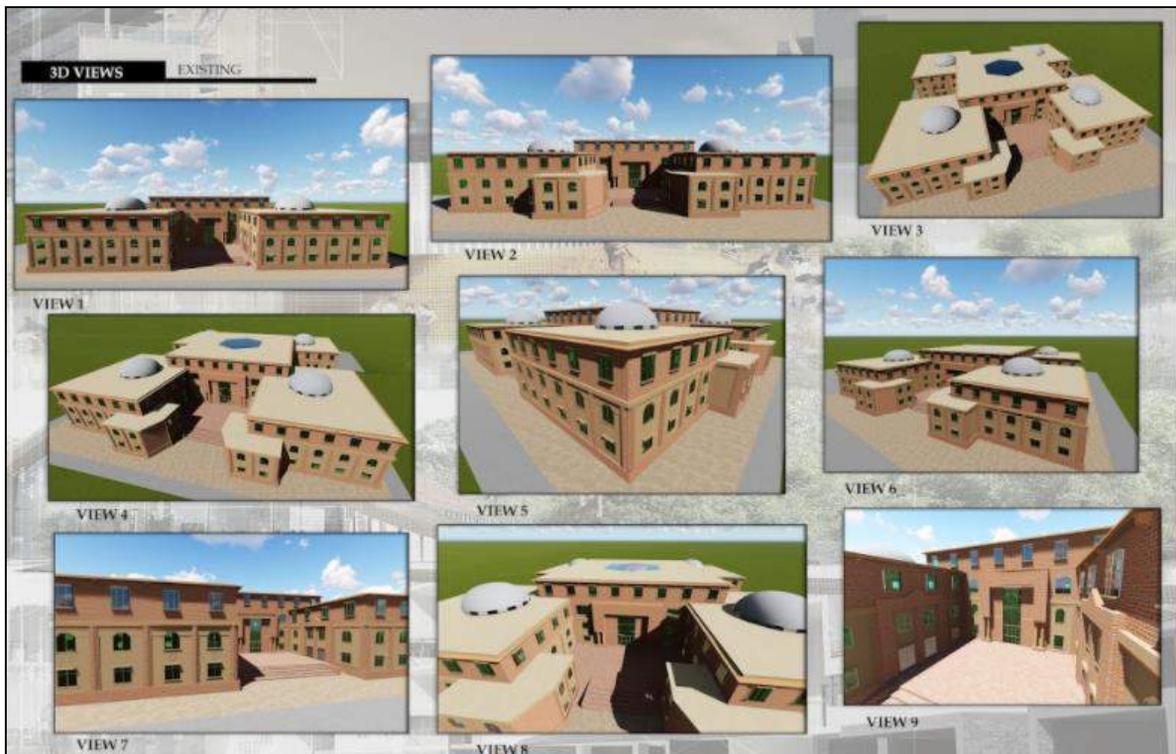



A light shelf is provided in the windows of North Façade with a white reflector hanging from the ceiling in which the sunlight falls on the light shelf, reflects and falls on the hanging reflector which in turn again reflects light into the class room and it gets illuminated with natural diffused light.

CRITICAL ANALYSIS W.R.T. SUSTAINABILITY – BUSHRA MATEEN BUILDING
LCWU, JAIL ROAD, LAHORE



TOP CATEGORY STUDENT 01

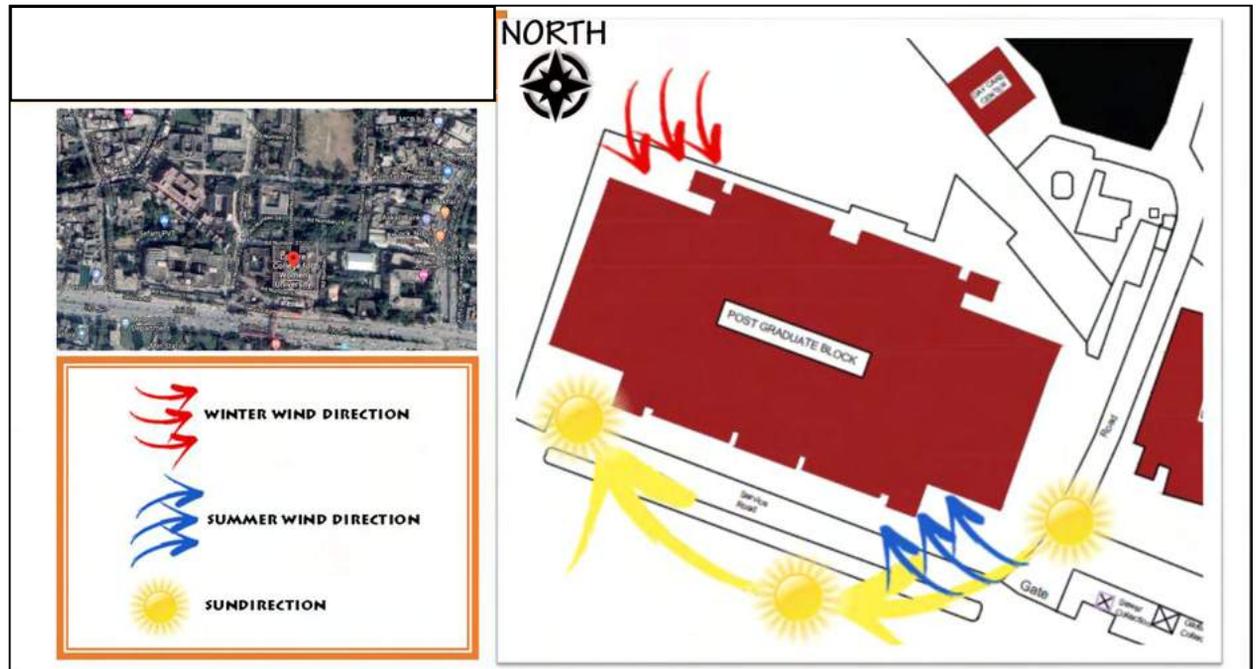


**CRITICAL ANALYSIS W.R.T. SUSTAINABILITY – BUSHRA MATEEN BUILDING
LCWU, JAIL ROAD, LAHORE**



Lahore College for Women University

Jail Road, Lahore – Pakistan. Tel: 042-9203801-09 Fax: 042-9203077



CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - BUSHRA MATEEN BUILDING
LCWU, JAIL ROAD, LAHORE

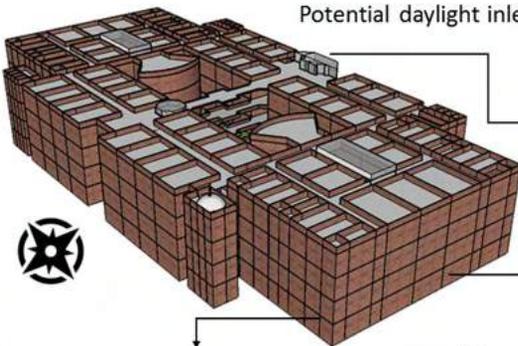


DAYLIGHTING ACCESS INSIDE THE BLOCK

No. of lights windows: 838

Potential daylight inlets: 678

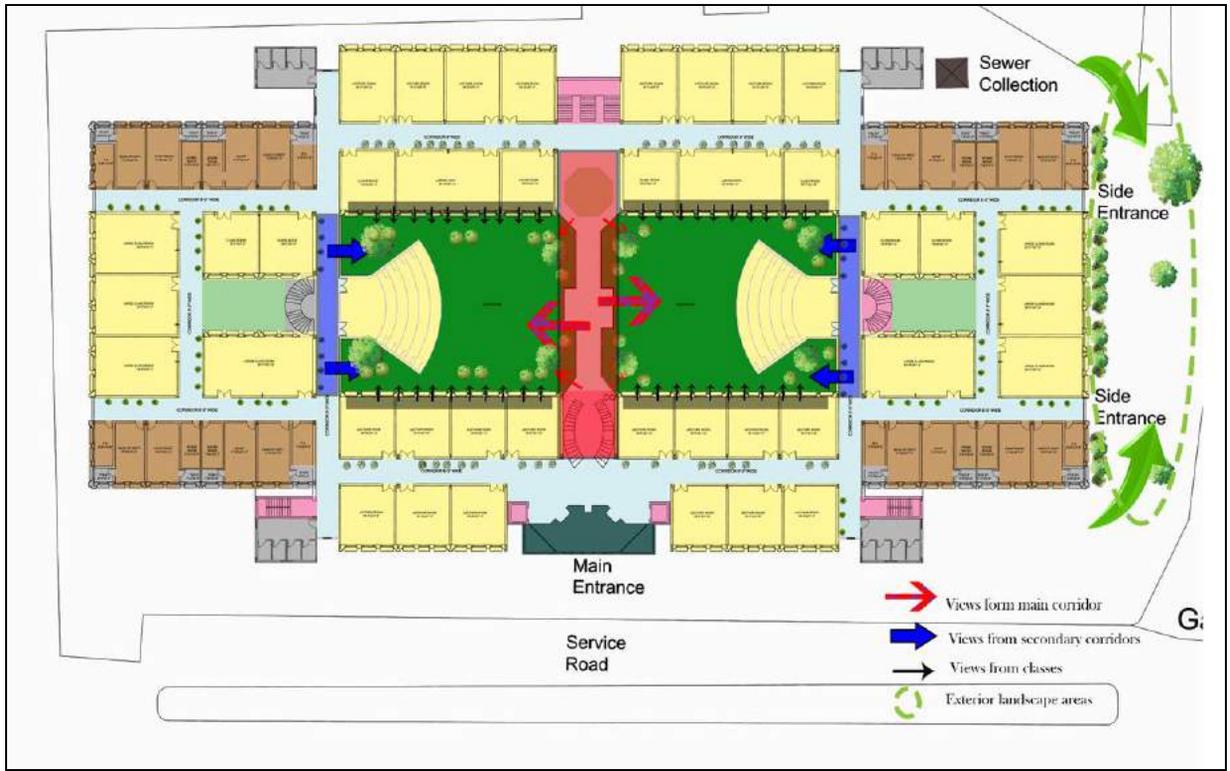
- 2 courtyards lighten up the central spine of the PG block.



**CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - POST-GRADUATE BUILDING
LCWU, JAIL ROAD, LAHORE**



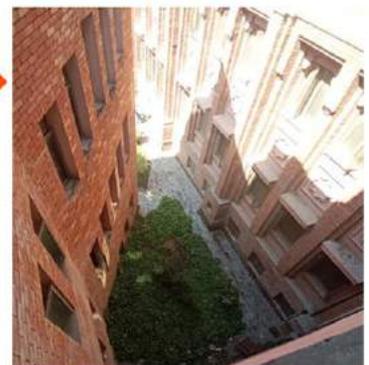
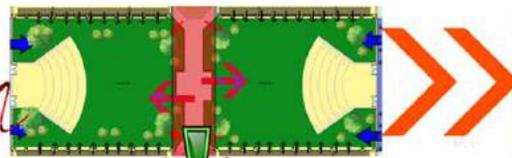
CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - POST-GRADUATE BUILDING LCWU, JAIL ROAD, LAHORE



COURTYARD

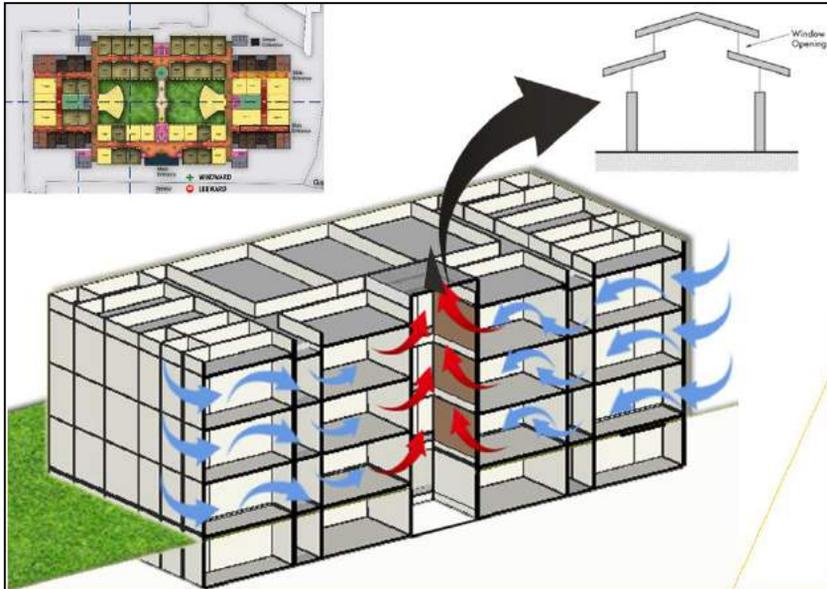
Building have two central courtyards, designed on Char-Bagh concept. These courtyard serves the air ventilation along with the views to the corridors and classes. Also act as a communal space for students. Small heighted plants and trees are planted along with pathways that is creating a harmony between hardscape and soft scape some pockets are left over as negative space in courtyard

- where poorly landscape is poorly designed



CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - POST-GRADUATE BUILDING
LCWU, JAIL ROAD, LAHORE

DEPARTMENT OF ARCHITECTURE



DRAWBACKS
Basement has poor ventilation and other floors have some leeward points due to fixed ventilators

Recommendations:
Use monitors on east and west wing instead of fiber glass. For proper air circulation use moveable ventilators.

DRAWBACKS AND RECOMMENDATION REGARDING VENTILATION

DRAWBACKS AND RECOMMENDATION REGARDING LANDSCAPE

DRAWBACKS:

- All four façade have direct sun heat due to lack of
- Corridors are way long and less airy.
- Courtyards don't have any proper shaded spaces.
- Windows facing direct heat during summers through courtyard.

RECOMMENDATIONS:

- Techniques include, for example, green roofs and walls which use vegetation on the roofs and facades of buildings to provide cooling in summer and thermal insulation in winter.

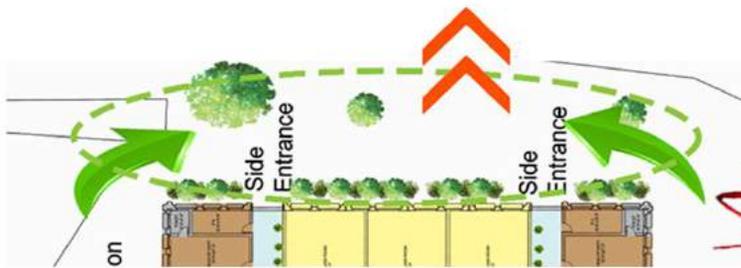


CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - POST-GRADUATE BUILDING LCWU, JAIL ROAD, LAHORE



EXTERIOR LANDSCAPE VIEWS

The major area of exterior of the building is used for .the parking
There is no landscape on .the main entrance
Some trees and plants are planted for aesthetic .purpose only
Here ,trees are not provid- ing shade to the building .and parking

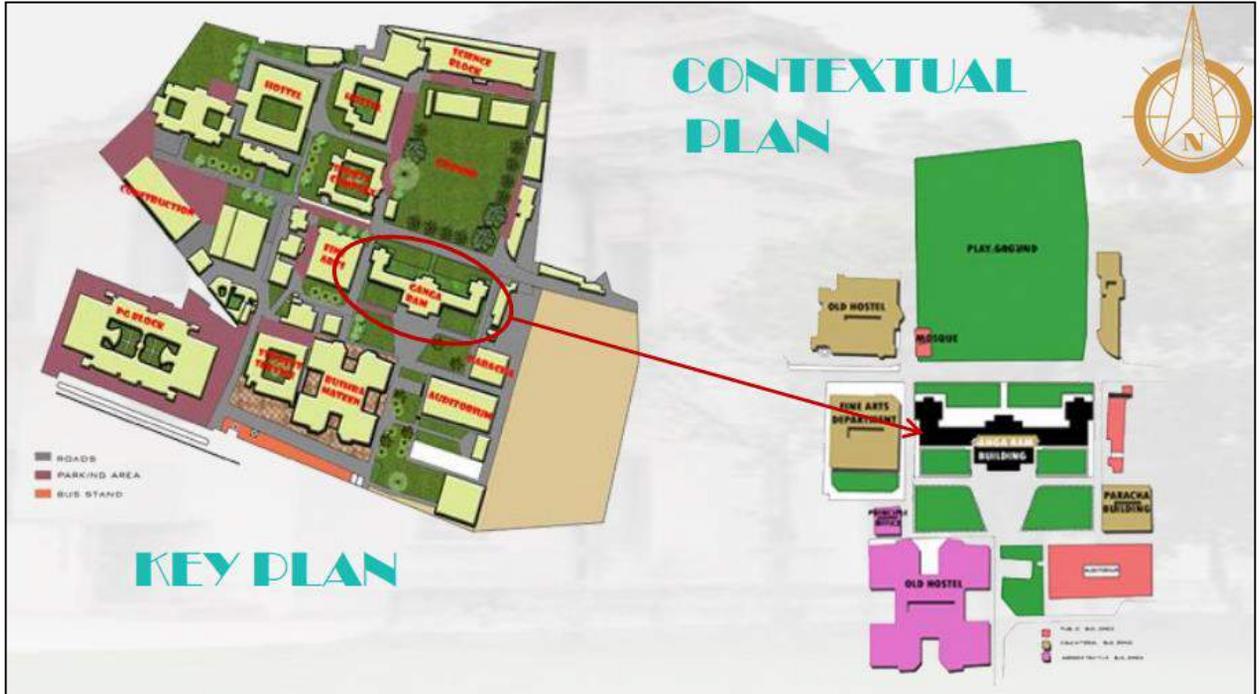


RECOMMENDATIONS:

- The creation of green areas in corridors can be applicable by indoor plants
- Green corridors can improve ventilation, allowing for cooler air from outside to penetrate into the more classrooms.
- Shade trees (deciduous) and shaded sitting spaces like pergolas can be used to provide summer shade in courtyards.



CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - POST-GRADUATE BUILDING
LCWU, JAIL ROAD, LAHORE



INTRODUCTION & HISTORY

- Construction Year: 1936
- Architect: Sir Ganga Ram
- Architectural Style: Colonial Architecture

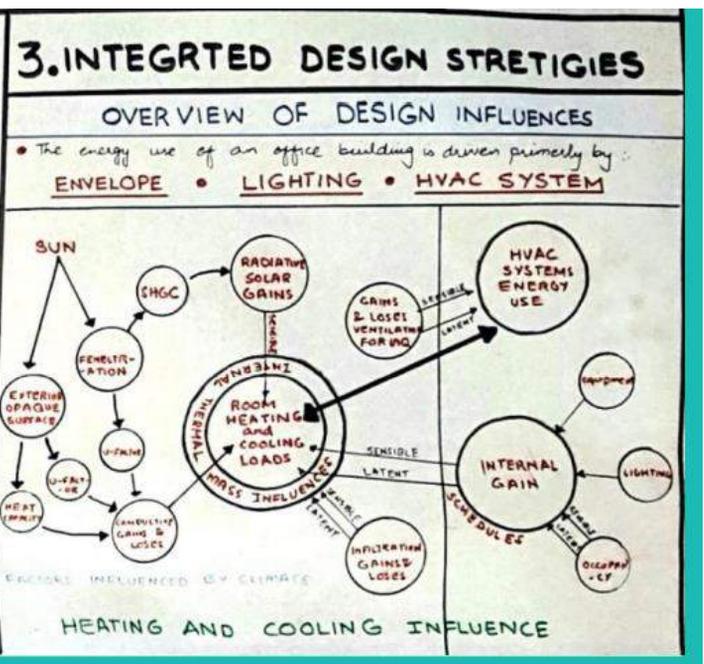
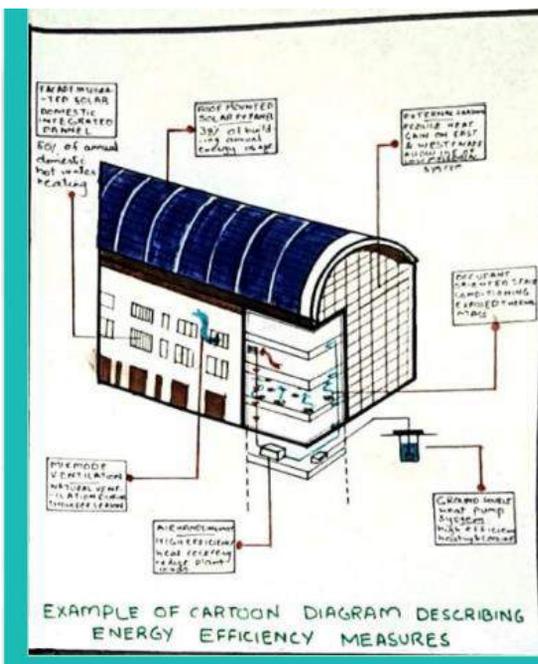
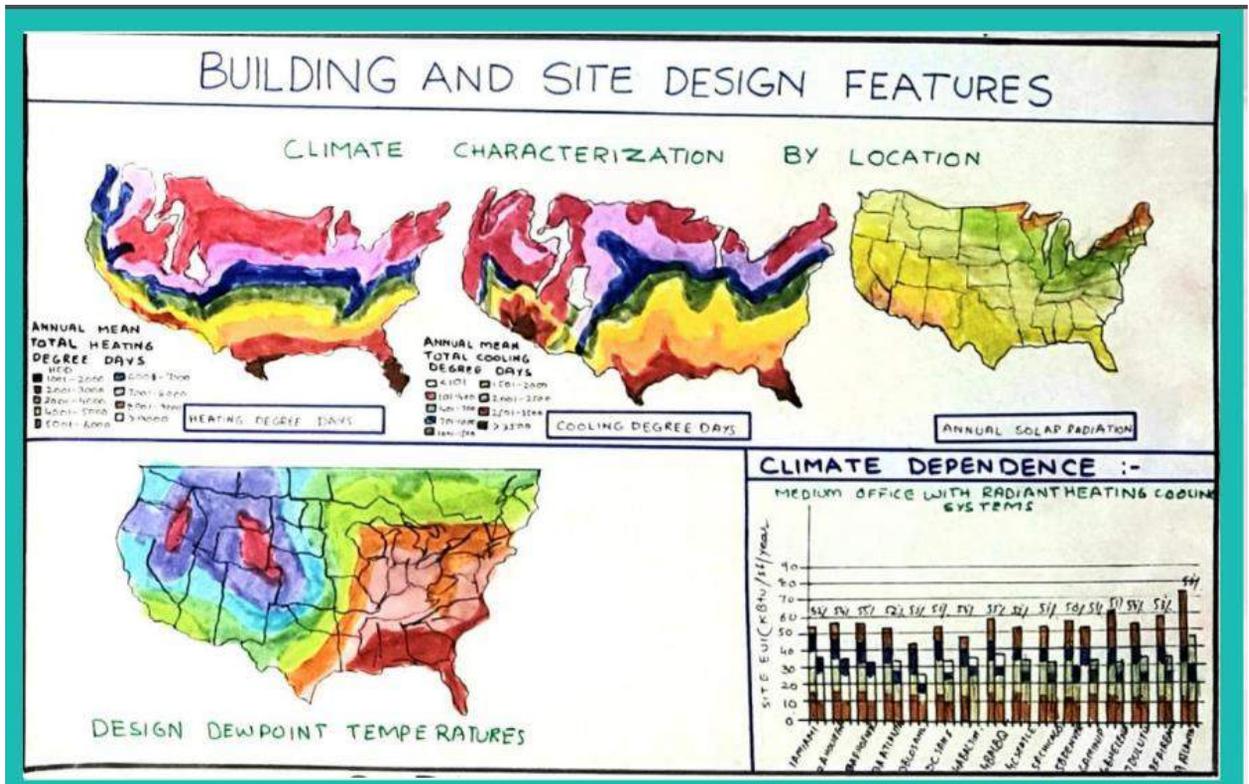


DESIGN FEATURES

○ Verandas	○ Windows
○ Arcade	• Max. Width : 5'0"
○ Clerestory	• Min. Width : 2'0"
○ (Lattice Work)	○ F.F.L - 1'6"
○ Cornices	○ Clear Height Of
○ Width Of Wall 13.6 "	○ Floor - 15'0"




CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - GANGARAM BUILDING LCWU, JAIL ROAD, LAHORE



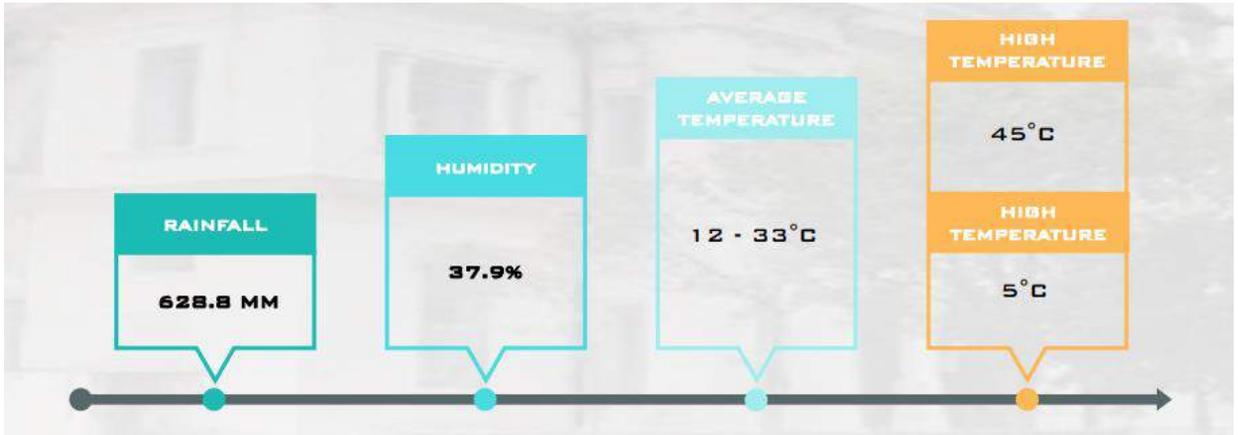
CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - GANGARAM BUILDING LCWU, JAIL ROAD, LAHORE



MATERIALS STUDY



TEMPERATURE ANALYSIS



LANDSCAPE ELEMENTS



**CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - GANGARAM BUILDING
LCWU, JAIL ROAD, LAHORE**



NORTH FACADE

- FRONT HOCKEY GROUND
- PARTIAL LANDSCAPING
- INDOOR GOOD AIR QUALITY
- NO DIRECT LIGHT
- CROSS VENTILATION AT FRONT & BACK SIDE
- AIR CIRCULATION THROUGH
 - CORRIDORS
 - WINDOW



SOUTH FACADE

- South Facing
- Extreme Landscape On The Front Facade
- Small Amount Of Sunlight Received From The Front
- Shading Devices On Windows
- Sill Level Height - 5'0"
- No Direct Light Due To Trees
- Lattice Work Above Windows On Arches



**CRITICAL ANALYSIS W.R.T. SUSTAINABILITY - GANGARAM BUILDING
LCWU, JAIL ROAD, LAHORE**



Lahore College for Women University

Jail Road, Lahore – Pakistan. Tel: 042-9203801-09 Fax: 042-9203077

Project Characteristics

Location: LCWU Jail, Road Lahore near

gate # 1 opposite to Bushra Mateen

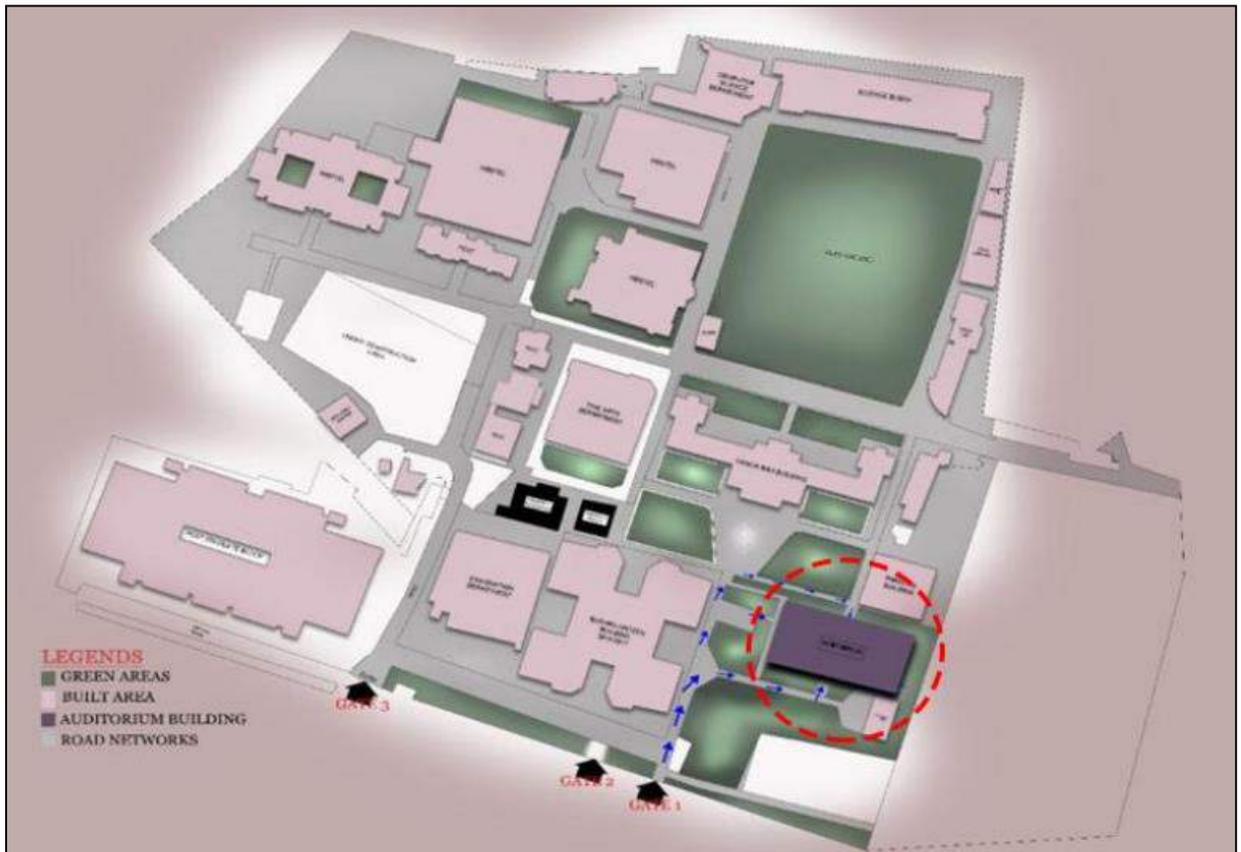
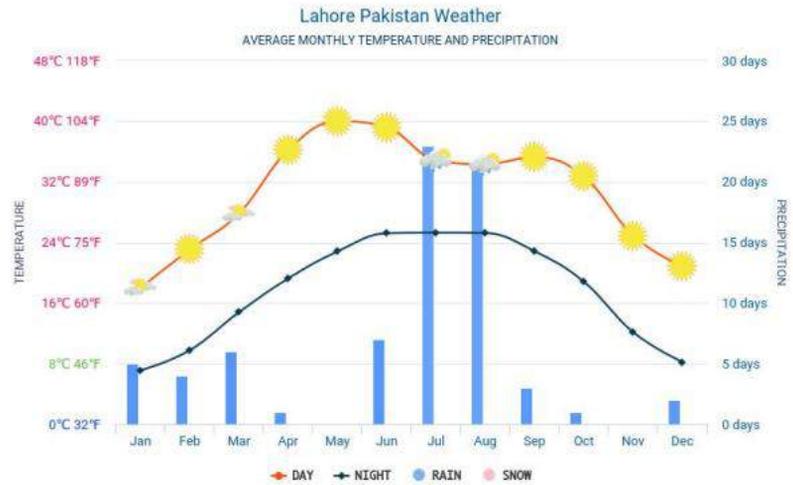
Site Area: Around 12000 sq.ft covered area

Climate:

Building : Auditorium

Building Type: Institutional (assembly building)

Architect: Ar. Fauzia Qureshi



CRITICAL ANALYSIS W.R.T. SUSTAINABILITY- AUDITORIUM BUILDING
LCWU, JAIL ROAD, LAHORE

DEPARTMENT OF ARCHITECTURE

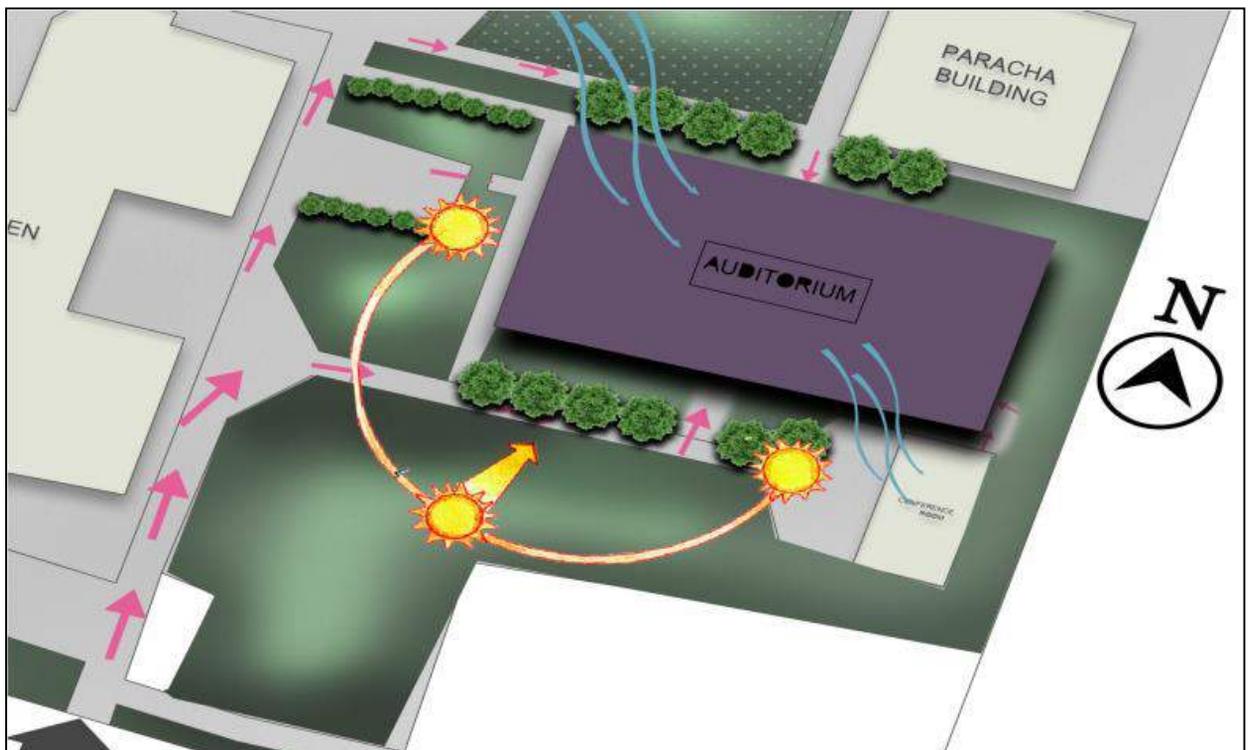


Building Analysis

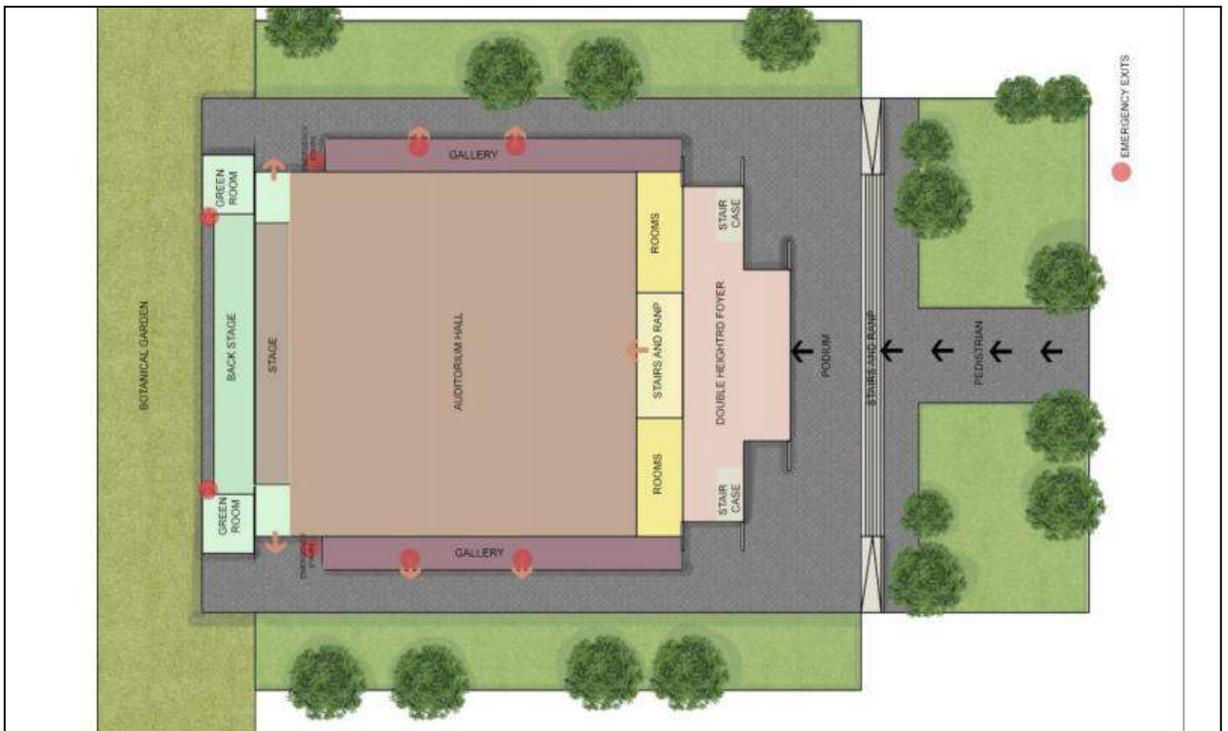
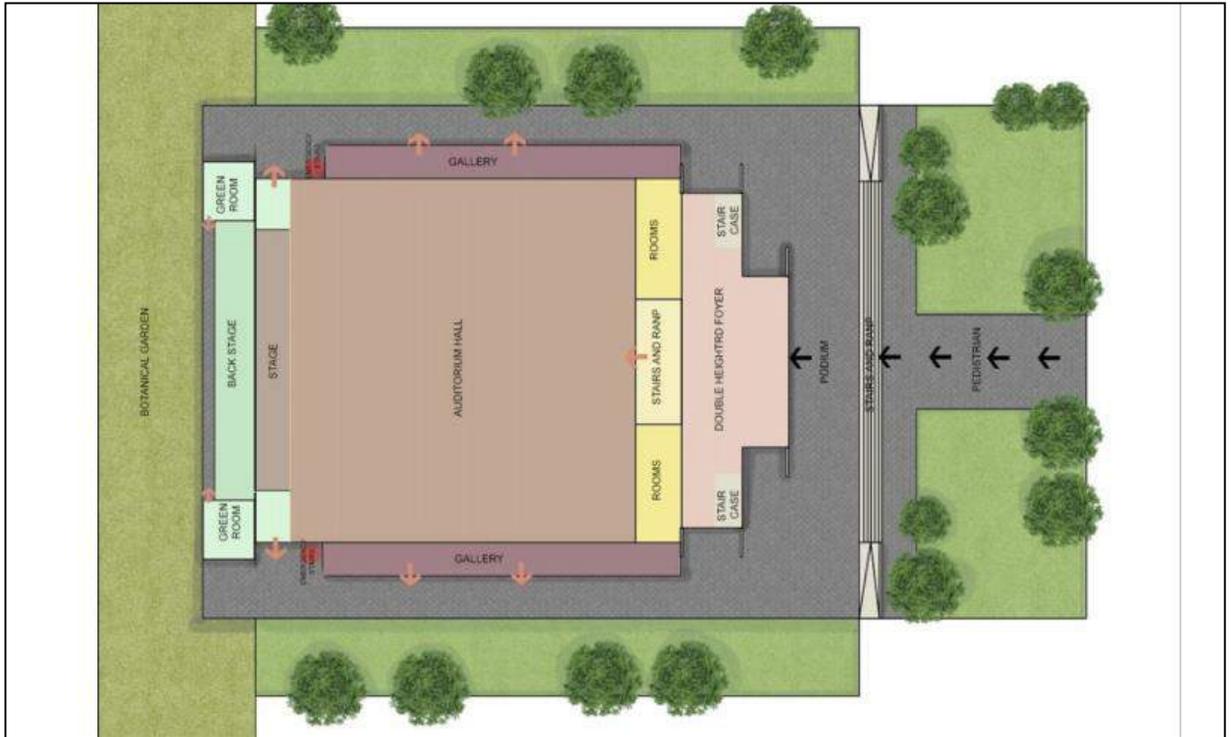
• Orientation

Facing: West Facing

- the primary wind blow from **North West** to **South East**
- the building is oriented along east west axis that's why it has maximum explore of sun rays at south and west
- the building **opens** towards **north** **south** and **west** side making advantage of passive light
- The exterior is built up of thick wall



**CRITICAL ANALYSIS W.R.T. SUSTAINABILITY- AUDITORIUM BUILDING
LCWU, JAIL ROAD, LAHORE**

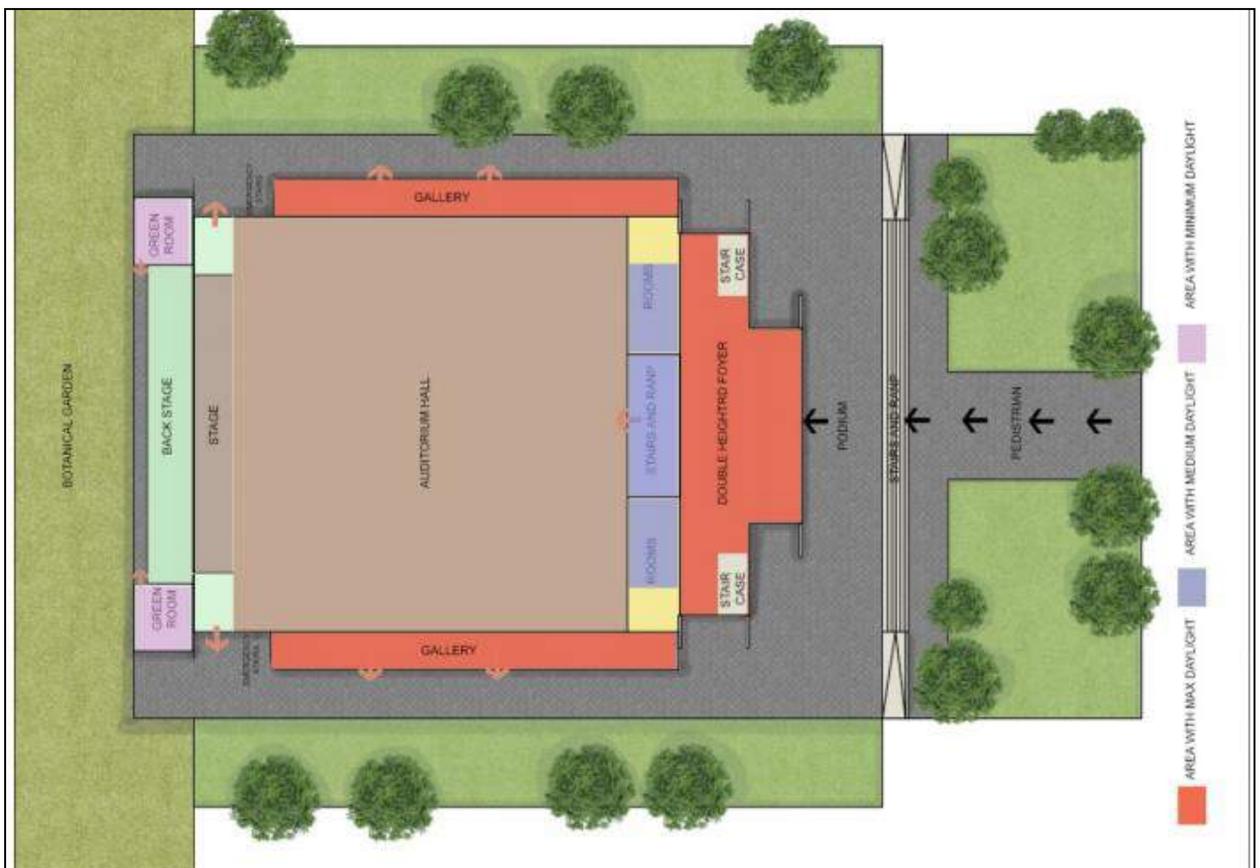
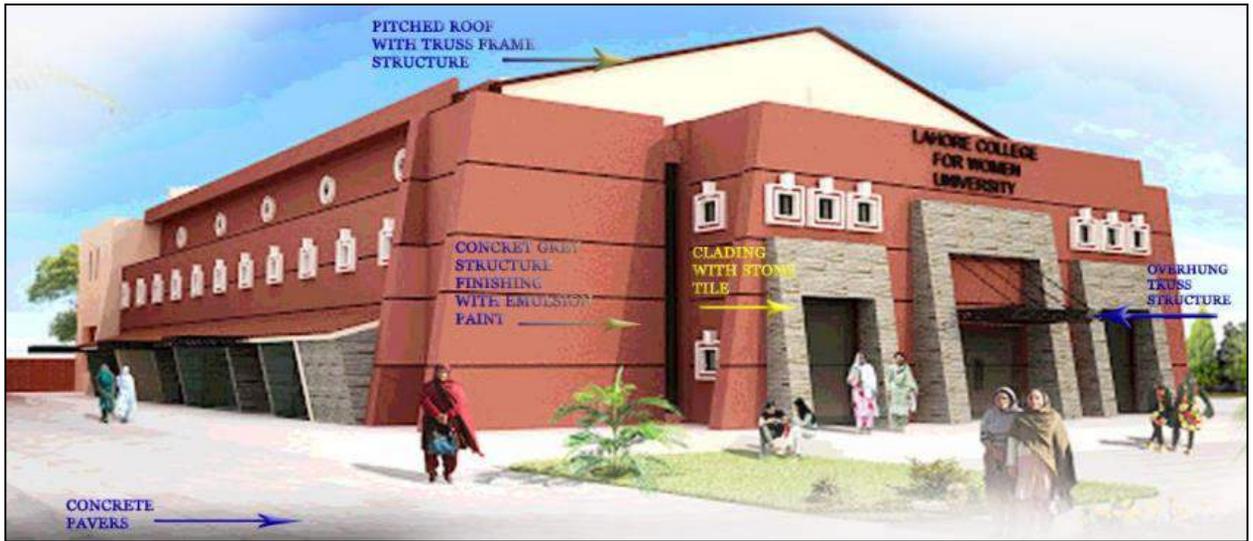


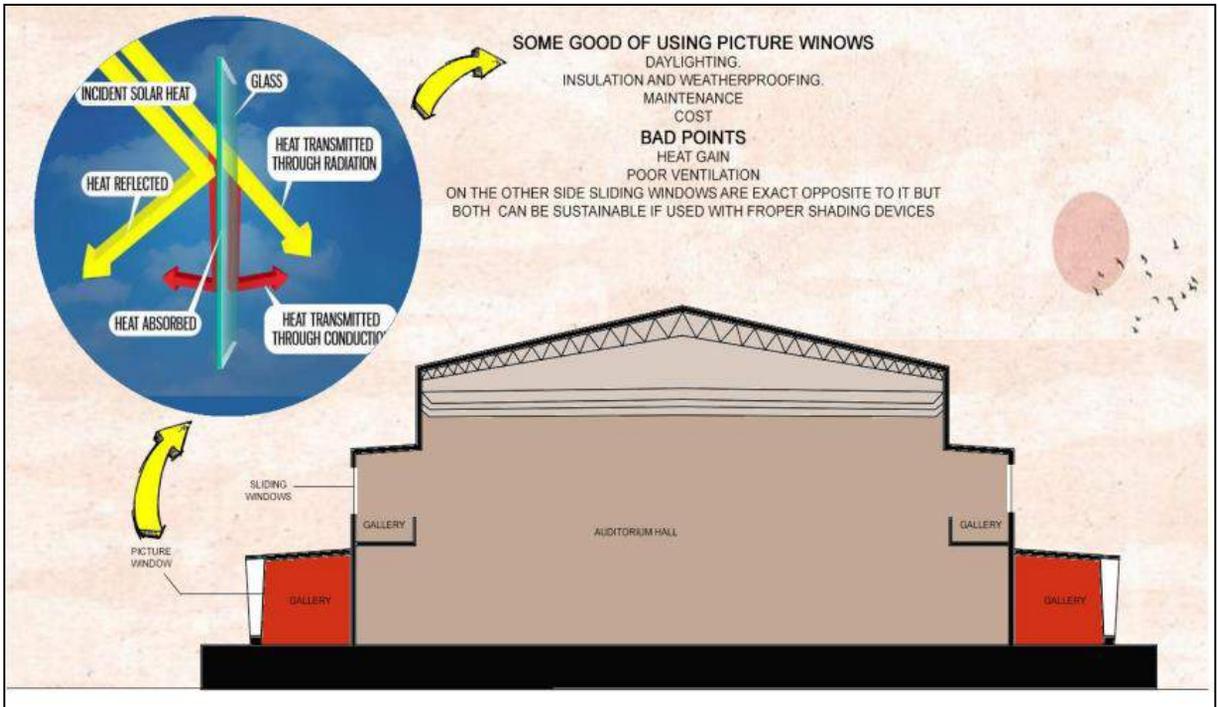
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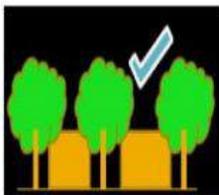
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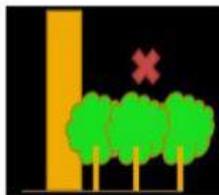




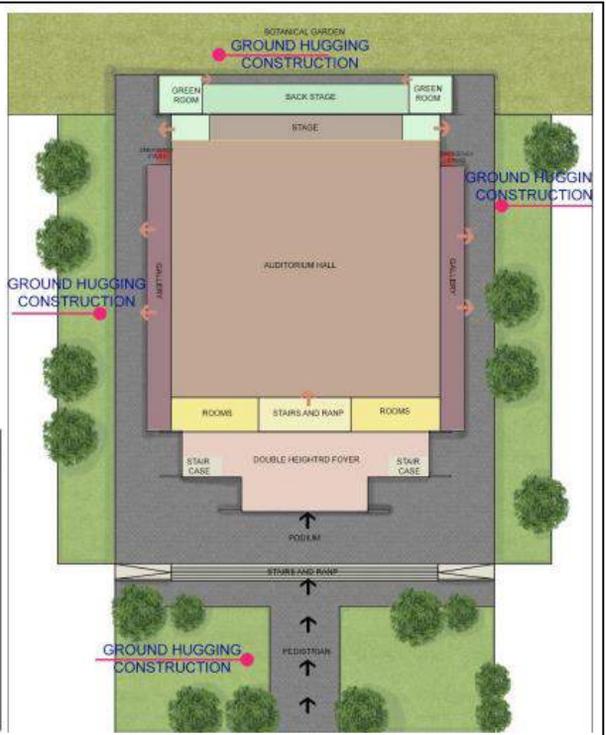
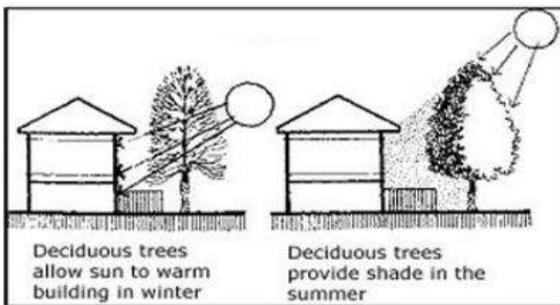
• Ground hugging construction



VS



- Like most old system of construction structure are kept ground hanging nature modulation of micro climate





- Green vegetative roof can be used to cover the area of galleries



Solar panels can be used on the roof of auditorium to make it more efficient



- Brick jali wall

Instead of using large fixed glass in galleries a mesh type ventilation of bricks can be used for fresh breeze and day light to enter





KEY PLAN

SURROUNDING

PLAY GROUND
GANGA RAM BUILDING
HOSTELS
STATIONARY SHOP
ARCHITECTURE DEPARTMENT OFFICE
SECURITY OFFICE
BUSHRA MATEEN BUILDING

WEST

IN WEST FACADE, THE MAIN PROBLEM IS THE AIR QUALITY THE AIR QUALITY IS VERY LOW AND THE HEAT GAIN IS MORE THAN IT REQUIRED. SO SOME SUSTAINABLE APPROACH SHOULD BE DONE AGAINST THE CLIMATE

SUN ORIENTATION

WIND ORIENTATION

NORTH

IN NORTH FACADE, THE MAIN PROBLEM IS THAT THERE IS NO SUNLIGHT. THE WINDOWS DOES NOT ENTER ENOUGH AIR AND LIGHT.

NORTH

WEST EAST

SOUTH

IN SOUTH FACADE, THE MAIN PROBLEM IS THE AIR QUALITY AND EXCESSIVE HEAT GAIN. EXCESSIVE SUN LIGHT IS COMING DIRECTLY TO THE ROOMS

EAST

IN EAST FACADE, THE MAIN PROBLEM IS THE AIR QUALITY AND EXCESSIVE HEAT GAIN. EXCESSIVE SUN LIGHT IS COMING DIRECTLY TO THE ROOMS.

FINAL BUILDING OUTCOMES

THE BUILDING HAS TWO MAJOR ISSUES

- BAD AIR QUALITY, DUE TO THIS BUILDING HAVE MAJOR DAMPNESS AND HUMIDITY ISSUE
- LIGHT ISSUE BECAUSE BUILDING ORIENTATION IS NOT CORRECT BUILDING IS PLACED IN SUCH A WAY THAT OTHER SURROUNDING BUILDINGS IMPOSE SHADE ON THIS BUILDING

SUSTAINABLE DESIGN

FINE ARTS BUILDING EXISTING CONDITION

GROUP MEMBERS

- HANAFAT AQBA
- AYESHA SYED
- AYESHA SAJEED
- AYESHA USMAN

GROUND FLOOR

Hotter and colder spaces	<ul style="list-style-type: none"> • Colder spaces around void and stairs • Hotter spaces around skylight and back of the building
Light analysis	<ul style="list-style-type: none"> • Sufficient light but at some class rooms light is not sufficient
ventilation	<ul style="list-style-type: none"> • Over all ventilation is good
Indoor air quality	<ul style="list-style-type: none"> • Indoor air quality is fair not ideal
Material used and impacts	<ul style="list-style-type: none"> • Brick concrete and mosaics • Brick walls are thick • Mosaics are aesthetically pleasing
Design and its impact	<ul style="list-style-type: none"> • Design would be better if the area of void would increased and sky light is designed according to wind orientation

HOTTER AND COOLER SPACES

GROUND FLOOR

Cooler Region (Blue)
Hotter Region (Red)

LANDSCAPE ANALYSIS

Names Of The Trees

Pine Tree 25 Feet	Jasmin Tree 25-30 Feet
Palm Tree 6-10 Feet	Ficus Tree 10-15 Feet

Green Facade

FIRST FLOOR

Hotter and colder spaces	<ul style="list-style-type: none"> • Colder spaces around void and stairs • Hotter spaces around skylight and back of the building
Light analysis	<ul style="list-style-type: none"> • Sufficient light but at some class rooms light is not sufficient
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Design and its impact	<ul style="list-style-type: none"> • Design would be better if the area of void would increased and sky light is designed according to wind orientation

HOTTER AND COOLER SPACES

FIRST FLOOR

Cooler Region (Blue)
Hotter Region (Red)

EXISTING SITE

CRITICAL ANALYSIS W.R.T. SUSTAINABILITY – FINE ARTS DEPARTMENT BUILDING LCWU, JAIL ROAD, LAHORE



INCREASED PUBLIC FOCUS ON SUSTAINABILITY AND ENERGY EFFICIENCY

- Quality of life is being hampered due to steady increase in traffic congestion and air pollution.
- There are significant effects on health and the environment due to the effect of greenhouse gases causing climate change.
- There was increase of 40% in the year of 1990 to 2000.
- When compared to economic damage sustained till 1990.

CO₂ EMISSION

- From 1990, there has been a sharp increase in CO₂ emissions.
- There has been a steady increase in CO₂ emissions.
- There has been a steady increase in CO₂ emissions.
- There has been a steady increase in CO₂ emissions.
- There has been a steady increase in CO₂ emissions.

CO₂ EMISSION TRADE

Distribution of CO₂ emission by United States by the year 2004

Country	Percentage
USA	41%
China	17%
India	7%
Japan	6%
Germany	5%
UK	4%
France	3%
Italy	3%
Spain	2%
South Korea	2%
Other	1%

LEED® - LEADER IN ENERGY AND ENVIRONMENTAL DESIGN

- LEED is a green building rating system.
- It is a voluntary certification system.
- It is a green building rating system.
- It is a green building rating system.
- It is a green building rating system.

PERFACE BY AUTHOR

Author: Pervaiz Malik, M.Arch, M.Sc. (Urban Planning)

Keywords: Sustainability, Green Buildings, LEED, BREEAM, DGNB, MINERGIE ECO.

SUPPLEMENTAL FRAMEWORK AND GENERAL CONSIDERATION

- No form of sustainable energy can be found in nature.
- Energy is a non-renewable resource.

BREEAM - BRE ENVIRONMENTAL ASSESSMENT METHOD

BREEAM Certification

Level	Score
Outstanding	85+
Very Good	75+
Good	65+
Pass	55+
Fail	45+

DGNB - GERMAN SUSTAINABLE BUILDING CERTIFICATE (GBC)

- DGNB is a sustainable building certification system.

AN INTEGRATED VIEW OF GREEN BUILDING - LIFE CYCLE ENGINEERING

- Green building is a holistic approach to building design.
- Green building is a holistic approach to building design.
- Green building is a holistic approach to building design.
- Green building is a holistic approach to building design.
- Green building is a holistic approach to building design.

RELATIONSHIP BMD LEVEL OF WELL-BEING & HEALTHY INDOOR CLIMATE

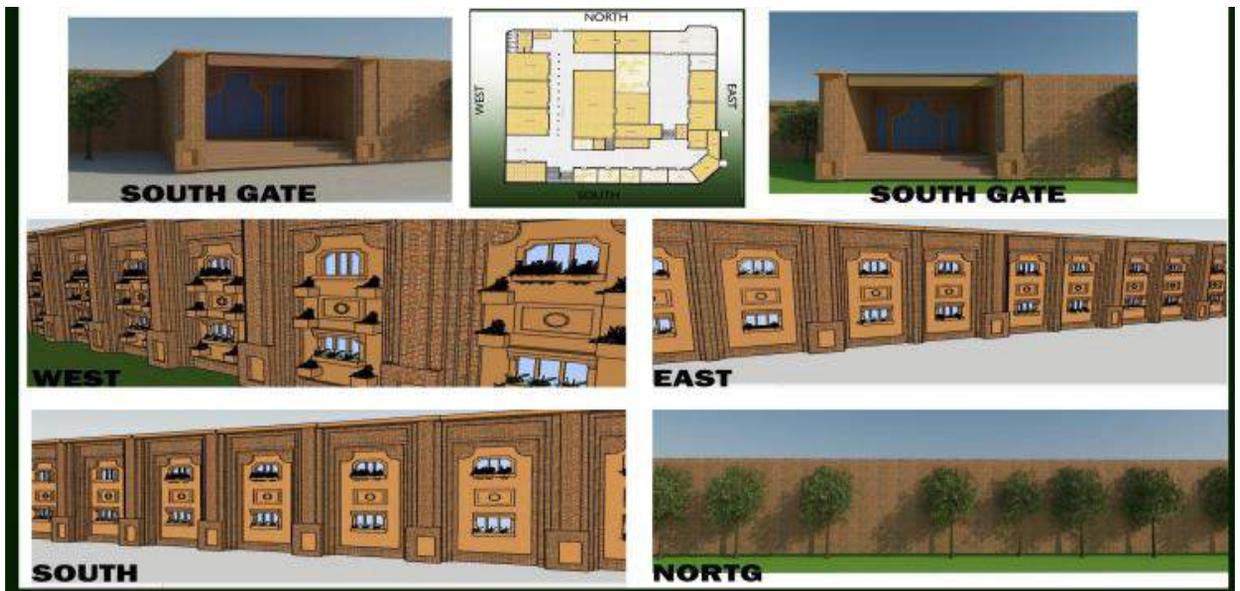
MINERGIE ECO

- Minergie ECO is a sustainable building certification system.
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OPERATIVE INDOOR TEMPERATURE IN OCCUPIED ROOMS



<h3>WEST FACADE</h3> <p>Green Facade Green "Building Facades", act as a new sustainable approach towards climate change. Overgrown Climbers on the separate leaves on the facade of the building. Proven Benefits: → Increase Air Quality → Active and healthy environment.</p>	<h3>NORTH FACADE</h3> <p>Tree Plantation "TREES AND SHADING DEVICES" reduce heat gain and increase occupants comfort level in spaces. plant shaded in positive techniques to reduce heat gain in indoor spaces as a strategy to lower cooling demand. - Reduce indoor gain by 10-15% - Trees are used for: →遮光</p>	<h3>VOID</h3> <p>Double Glazing Wall Introduced Double Skin Facade system in walls, which are attached to walls as well as by these means are not well be used and maintained. - The aim is to improve Thermal Performance. - The use of Double Facade can reduce the heating and cooling loads on a building. - Double Natural Ventilation - Provide an Acoustic Barrier to exterior noise pollution.</p>
<h3>SOUTH FACADE</h3> <p>Plants For improving air quality and temperature, we are introducing plants on this facade. They help lower surface and air temperature by providing shade through LEAFY TRANSPIRATIONS. Plants are most useful in a mitigation strategy when planted in strategic locations. Plants have many advantages: → They absorb pollutants and release oxygen through Photosynthesis. → They increase humidity by transpiring water vapor through microscopic leaf pores. → They can gradually absorb pollutants on the external surfaces of leaves and on the plant root soil system.</p>	<h3>EAST FACADE</h3> <p>Plants - Lower Surface Temperature for example may be 20°C to 25°C cooler than the peak temperature of unshaded temperature. - Evapotranspiration - Moisture in combination with shading can help in decreasing peak summer temperature by 20% to 25% C. - Improved Air Quality - Green as ground covers in absorb excess heat gain. - Enhanced Street Water Management</p>	<h3>ROOF</h3> <p>Roof Garden For absorption of excess of water and purifying water using the drainage system of a building we are using proposed "Plants on Roof Garden". This type of roof garden requires minimum layer of soil substrate and hence it is easy to maintain. - Evaporative Cooling - Light source benefits - Reduces the load of heating and energy costs. - Reduces ambient temperature. - Reduces and harvests rainwater. - Reduces storm water runoff and discharge. - It creates better environmental quality.</p>



CRITICAL ANALYSIS W.R.T. SUSTAINABILITY – FINE ARTS DEPARTMENT BUILDING
LCWU, JAIL ROAD, LAHORE



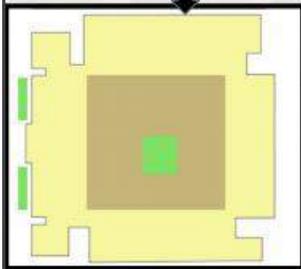
BUILDING ANALYSIS

LOCATION:

EXAM BRANCH LCWU

TOTAL AREA :

17204 SQF



EXAM BRANCH

LCWU

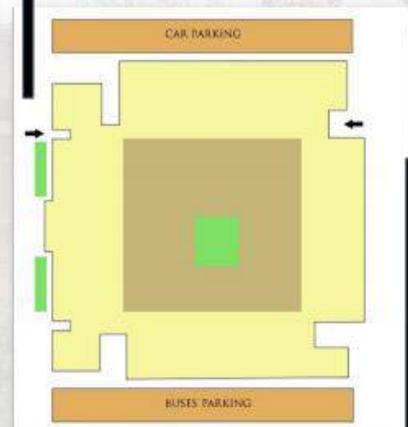
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BUILDING
LCWU, JAIL ROAD, LAHORE



ACCESS TO BUILDING



Access
routes



Access points

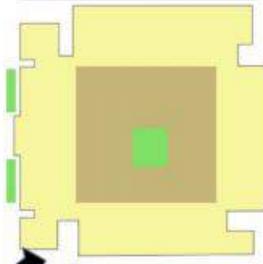


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SUN PATH AND ORIENTATION

BUILDING IS WEST FACING



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**CRITICAL ANALYSIS W.R.T. SUSTAINABILITY – FINE ARTS DEPARTMENT
BUILDING
LCWU, JAIL ROAD, LAHORE**



TREES IN COURTYARD

- Saraca asoca (Ashoka tree)
- Canocarpass shrub
- Bauhinia variegata (Kachnar plant)

Major area is hardscaped area with use of trees



- Landscape contributes in making the environment cooler.
- Tree acts as natural shade to the building
- In courtyard trees are provided at west and south direction





FOR WINDOWS:

For windows, there are two solutions:

1. **Polycarbonate plastic:** Plastic rivals traditional materials for windows and frames, providing competitive energy efficiency, aesthetics, design flexibility and cost criteria. (maximum temperature 130C, minimum temperature -40C)—the same material used in eyeglasses and known for durability and clarity—is used in windows.

It is Shatter-resistant and lightweight, the plastic product has low thermal conductivity, thus reducing heating and cooling costs though still providing protection against dangerous weather.



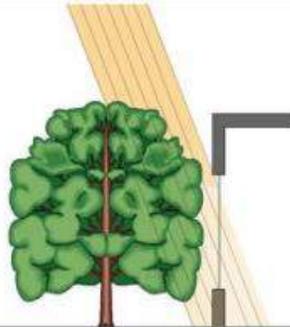
CRITICAL ANALYSIS W.R.T. SUSTAINABILITY – FINE ARTS DEPARTMENT
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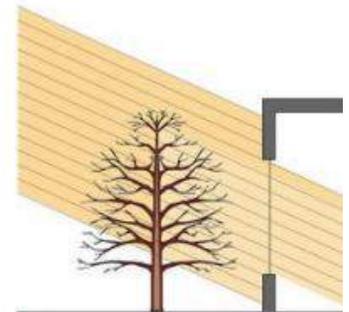
- On south side of the building, the best way to achieve shading is through **LANDSCAPING**, by using deciduous trees.
- The Environment Protection Department (EPD) Punjab has made a list of 32 '**Pollution Abating Trees**', which belong to the native species of the trees found in the Punjab a couple of decades ago. The EPD has sent the list of the environment-friendly trees to various departments including the Punjab Forest Department to promote the culture of planting tall trees in order to save environment.

- The trees approved by EPD are mostly deciduous.

SOLAR TRANSMISSION CAN BE AS LOW AS 20% FOR A MATURE TREE IN THE SUMMER



SOLAR TRANSMISSION CAN BE AS HIGH AS 70% FOR A MATURE TREE IN THE WINTER



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