

ArchitectureDesignStudioTrip: CCA Chandigarh

2nd – 4th October 2016

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Design Studio Faculty



ACKNOWLEDGEMENTS

We would like to take the opportunity in expressing the fact that this project report is the result of incredible amount of encouragement, co-operation and moral support that we have received from our teachers.

We would like to acknowledge Prof. SK Gupta for organizing the educational trip for us which helped so much in our design study.

We would also like to thank Prof. Pradeep K. Bhagat for granting us the permission to visit Chandigarh College of Architecture and conduct our study. Without his valuable support it was not possible for us to perform such a detailed study.

Also a deep sense of gratitude to our Architecture Design Studio faculties Ar. R.S. Sethi, & Ar. Honey Jalali along with our structures faculty Mr. Sumit Ghangus for organizing & accompanying us in this educational trip .

Our special thanks to Ar. Honey Jalali for her structured guidance and reviews which made this case study an organised & enlightening experience. We could not have imagined having a better advisor and mentor for the study.

DAY 1 – OCTOBER 3, 2016

Travelling from **Amity University Haryana to Chandigarh Sector 17**, we left the college at 21h00 and the journey took us 7 hours by bus. We stopped midway at Sukhdev Dhaba to have some refreshments.

We checked in at the hotel at 08h30 and left at 09h00 to Chandigarh College of Architecture for our study. Upon reaching the college at 10h00, we met the Principal of CCA, Prof. Pradeep K.Bhagat, who shared with us his in-depth knowledge of the planning of Chandigarh as a city, Le Corbusier- the principal architect and about the conception, history and construction of CCA.

We left CCA at 18h00 and from 18h30 to 20h30, we visited Chandigarh's sector 17 marketplace.

We returned to the hotel at 21h00.



*Left and Above: exterior views of CCA and CCA hostel
Far Right: Sector 17 Marketplace*

LECTURE by PROF. PRADIP BHAGAT

Chandigarh was a symbolic as well as a practical necessity. No city could house a new capital and rehabilitate the displaced persons from Pakistan. The underlying philosophy was grounded in the new industrial civilization. There were straight lines of modernism and no domes or spires. Corbusier had recognized that Hindu temples and Muslim architecture was very geometrical but what they lacked was architecture for modern civilization. Technology was invoked with admiration for emerging development of planes, cars, ships and trains. A parliamentary committee sought a site for the capital and a relatively flat area bounded by two river valleys some 5 miles apart in the foothills of the Himalayas was selected. These river valleys were dry for most of the year, but a large dam was built to form a lake to retain water from the Himalayas in July and August. Two men, P.L. Varma, the Chief Engineer of Punjab and P.N. Thapar a former member of the British Indian Civil Service directed the Chandigarh project from the very beginning. During the construction, several villages in the area were not integrated but instead were cleared and demolished, while occasional groves and peepul trees were carefully retained. All in all, the building of the city caused dislocation of about 9000 people for whom compensation was arranged and land set aside for resettlement.

DAY 2 – OCTOBER 4, 2016

On this day, we checked out of the hotel at 09h00 and went to Sukhna Lake. We reached at 10h00.

We enjoyed the refreshing and peaceful atmosphere of the lake and had lunch. At 14h00, we left Sukhna Lake to return to Gurgaon.

Our return journey took 8 hours and we reached at 22h00.



INTRODUCTION

CHANDIGARH- DREAM CITY

Chandigarh is considered as one of the perfect cities in the world in terms of architecture, cultural growth and modernisation. It was early planned in the post independence in India and internationally known for its architecture and urban design.

The master plan was prepared by the French architect Le Corbusier, he himself designed many important administration buildings including courthouse, parliament building and a university.

Serenity and a city are two diametrically opposite concepts, which however, get belied in the 'City Beautiful'. Chandigarh is a rare epitome of modernization co-existing with nature's preservation. It is here that the trees and plants are as much a part of the construction plans as the buildings and the roads i.e. landscape is well planned and considered important.



Photo taken at entrance of CCA by Student

CHANDIGARH COLLEGE OF ARCHITECTURE

- The Chandigarh College of Architecture (or CCA) is a college imparting education and research in the field of architecture. It was established on 7 August 1961 in Chandigarh, India, and was set up to impart education in architecture. The campus is housed inside the PEC University of Technology (formerly Punjab Engineering College) Campus, Sector 12 in Chandigarh. CCA is widely spread in 5-acre (20,000 m²) campus.



INTRODUCTION

- Chandigarh College of Architecture (CCA) is a college imparting education and research in the field of architecture.
- The College has an enrollment of 200 undergraduates.
- Le Corbusier got CCA established as a part of Chandigarh experiment.

LOCATION

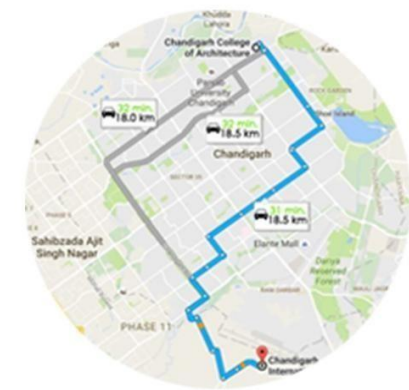
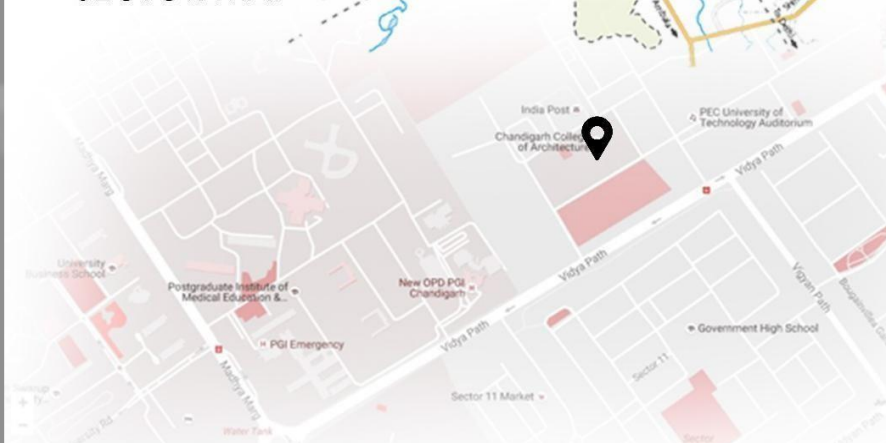
- The College is situated on Vidya Path, sector- 12D, Chandigarh.
- CCA is widely spread in 5-Acre (20,000 sq. m) campus.
- The boys hostel is located 230 m at the back and the girls hostel is located in adjacent sector- 11.



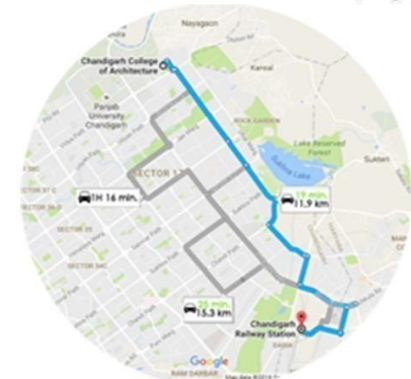
CHANDIGARH
OUTLINE MAP



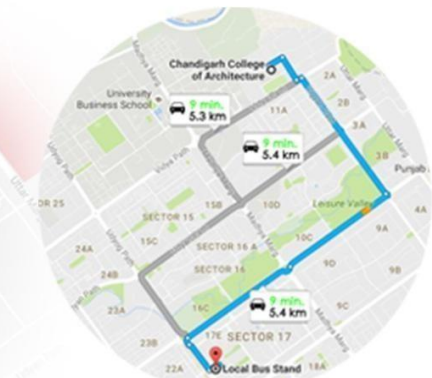
CHANDIGARH
SECTOR MAP



The distance between Airport and CCA is 18.5 km and takes 31 min. via udyog path.



The distance between railway station and CCA is 11.9 km and takes 19min. via madhya path.



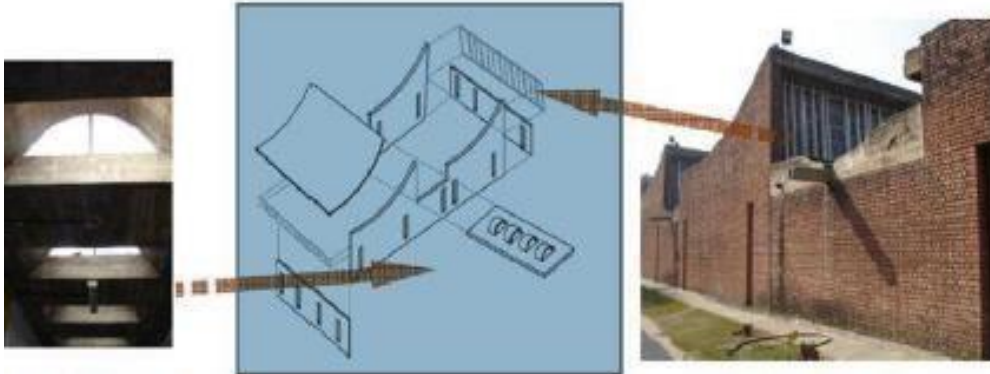
The distance between local bus stand and CCA is 5.4 km and takes 9min. via madhya path.

VICINITY MAP



CONCEPT

AMPLE NATURAL LIGHT IN ALL ROOMS DURING DAY



- CORBUSIER WANTED TO EXPERIMENT WITH NEW MATERIAL CONCRETE.
- ARCHED CONCRETE BEAMS



BRUTALISM

- **RAW** INTERIOR AS WELL AS EXTERIOR.
- **BRICK** HAS BEEN USED AS PRIMARY BUILDING MATERIAL FOR THE ENTIRE COMPLEX WALLS, COLUMNS.
- BRICK ARCHES HAVE BEEN USED FOR WIDE SPANS.
- USE OF **CONCRETE** IN FOUNDATIONS, FLOOR SLABS, AND TIES FOR ARCHED OPENINGS.

NORTH LIGHT



CONCRETE FACADE ACTING AS JALI FOR NATURAL VENTILATION ALSO PROVIDING AMPLE LIGHT INSIDE (BUT NOW GLASS HAS BEEN INSERTED)

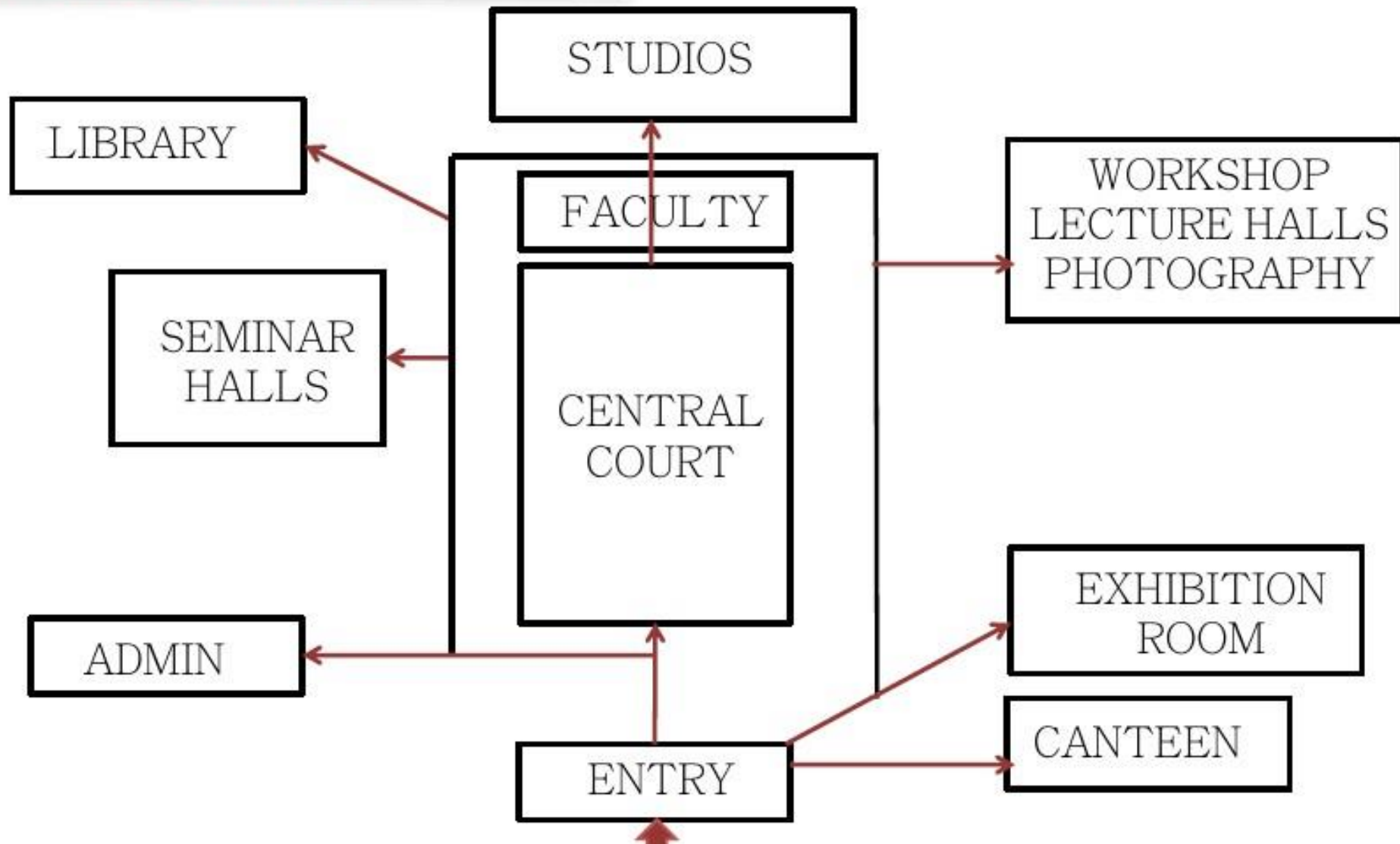
- NORTHLIGHT GLASS PLACED INCLINED TO INCREASE AREA FOR ENTERING LIGHT.
- CONVEX CONCRETE ROOF FOR SCATTERING OF LIGHT.



CAMPUS SURROUNDED BY LUSH GREENS, NO SUNLIGHT ON WALKING PATHWAYS AND A COURTYARD IN MIDDLE CONNECTING ALL THE SPACES.



CONNECTIVITY



OBSERVATIONS

Central Courtyard is one of the open interaction space in the college. It has a grassy lawn, used by students to relax during their spare time.



- The classrooms, studios are other spaces deeper on north lights for their lighting. The lighting is good during day time.
- Further **partitions** have been put in studios to divide them into subspaces.
- The **studios** are quite spacious and they are separated by low height walls.



There is good usage of open spaces whether it is internal or external open space..



- Small openings and exhaust fans are provided for ventilation.
- At the main entrance display area is provided.



• Whole campus is surrounded by lush green path way.

- Sitting space with in the corridor acts as positive area.
- White colour in whole building which reflect light and the space appears wide.



OBSERVATIONS

- There is little room for inter-faculty interaction corridors which are major circulation arteries of the building help circulation in a very uninteresting and boring manner.
- The Courtyard has not been well linked with the whole building.
- Being a concrete building it absorbs heat .
- No natural air ventilation, it becomes suffocating inside.
- Surrounding green belt is not well maintained.
- Girls hostel situated in different sector i.e. sector 11.



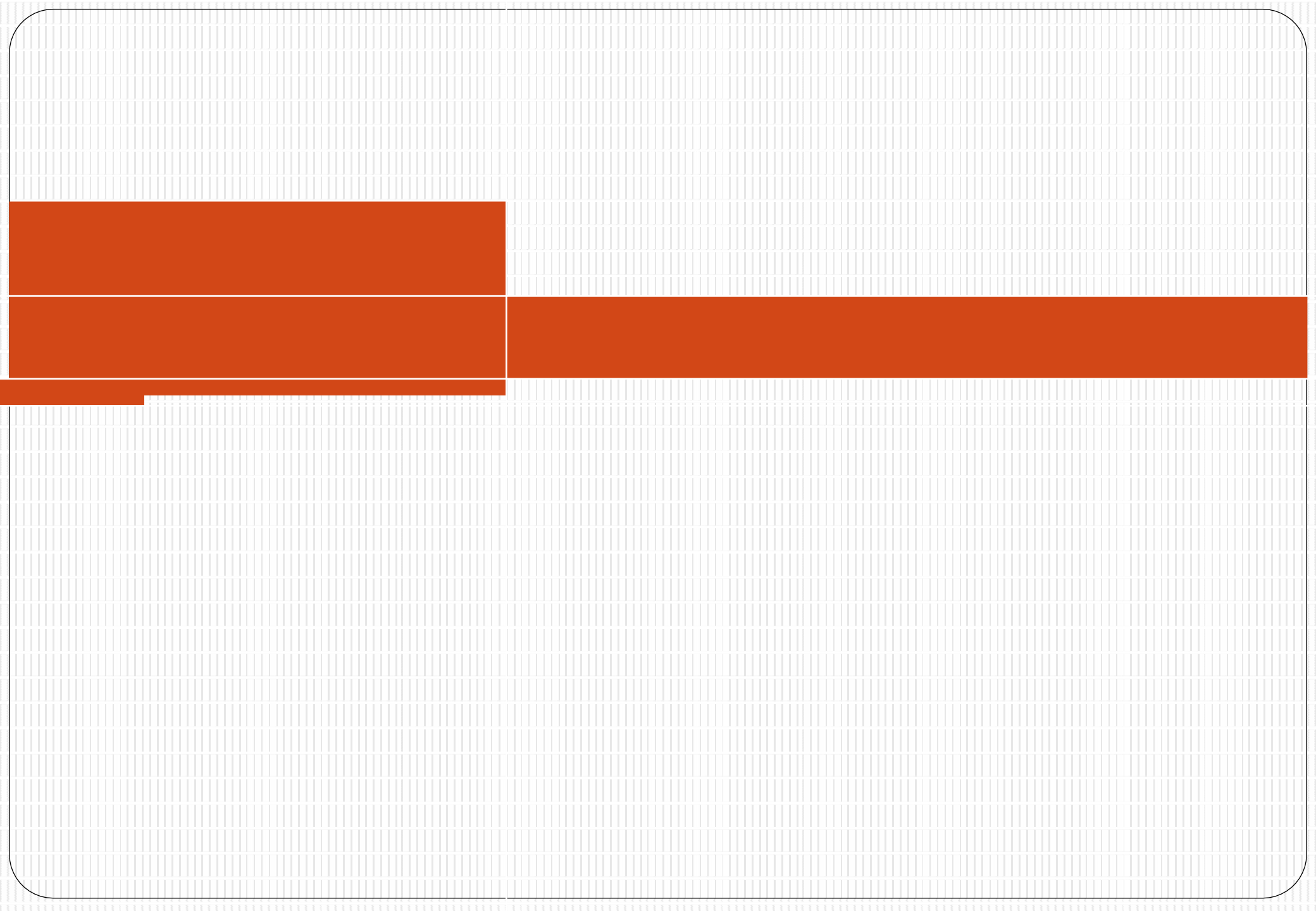
SITE PLAN

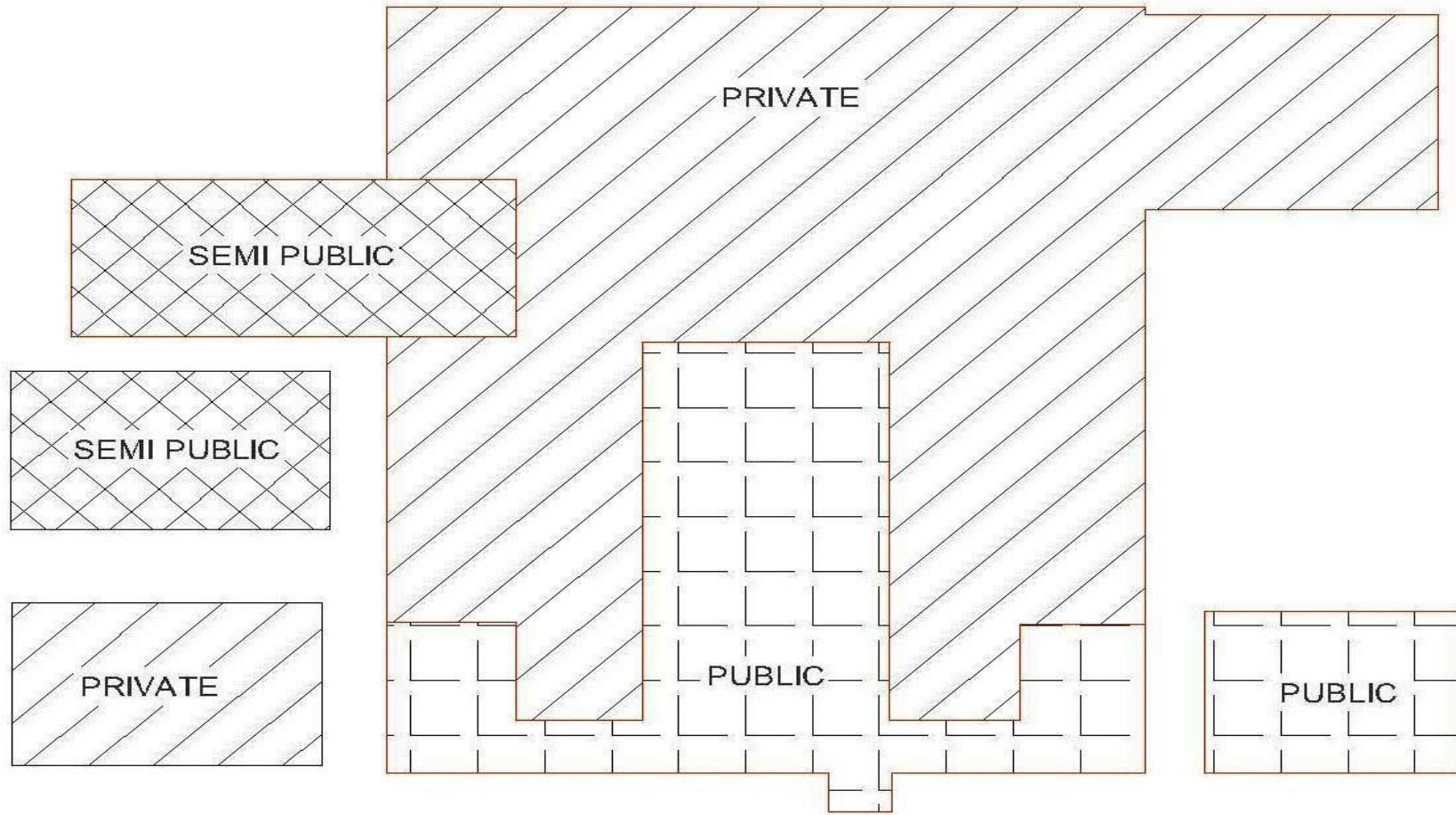


SITE AREA= 8 ACRES



S.NO	SPACE(CARPET AREA)	NO.	AREA IN SQM	TOTAL AREA IN SQM
1.	STUDIOS	5	1. 220.63 2. 258.94 3. 254.17 4. 219.05 5. 75.94	1025.73
2.	CLASS ROOMS	4	1. 42.23 2. 36.01 3. 34.75 4. 85.14	198.13
3.	CARPENTARY WORKSHOP CLIMATOLOGY LAB PHOTOGRAPHY LAB	3	1. 142.67 2. 91.13 3. 55.22	289.02
	COMPUTER CENTRE	1	94.26	94.26
5.	MATERIAL MUSEUM	1	154.77	154.77
6.	ART STUDIO	1	102.57	102.57
7.	MULTI PURPOSE HALL	1	144.97	144.97
8.	REPROGRAPHY CENTRRE	1	49.50	49.50
9.	LIBRARY	1	332.34 161.92	494.26
10.	SUBMISSION AND EXAM ROOM	1	87.60	87.60
11.	STUDENT CENTRE	1	268.51	268.51
12.	COMMON ROOM	1	154.94	154.94
13	FACULTY ROOM/CABINS	19	348.73	348.73
14.	LADIES COMMON RM COMMITTEE ROOM	2	28.32+35.80	64.12
15.	PRINCIPAL'S CABIN	3	1. 35.88 2.96.06 3. 87.26	219.20
16.	TOILETS LOBBIES		815.86	815.86





- Student population-60% girls and 40% boys
- Total students-190
- Student per class-40
- Student Teacher ratio- 1:10
- Total Faculty-48
- Total no. of studios-5

Materials Used -

- Brick Has Been Used As Primary Building Material For The Entire Complex Walls, Columns.
- Brick Arches Have Been Used For Wide Spans.
- Use Of Concrete Has Been Restricted To Foundations, Floor Slabs And Ties For Arched Openings.

Figure 1: A schematic diagram of a two-story building showing the location of the fire. The diagram is a cross-section of the building, showing two floors. The ground floor has a large open area labeled 'HALL' and a smaller area labeled 'KITCHEN'. The second floor has a large open area labeled 'HALL' and a smaller area labeled 'KITCHEN'. A fire is indicated by a small flame icon in the second-floor hall, near the kitchen. The text 'FIRE' is written above the flame icon. The text 'FIRE' is also written in the first-floor hall. The text 'FIRE' is also written in the second-floor hall. The text 'FIRE' is also written in the second-floor kitchen.

Floor plan of the first floor showing the layout of the building. The plan includes a central entrance hall (ENT. HALL) with stairs leading up and down. To the left is a large common room (COMMON ROOM, 854.34 sqm) and a terrace. To the right is a canteen (CANTEN, 154.38 sqm), a kitchen, and a courtyard. A store is located near the courtyard. A toilet and boiler room are also indicated.

GROUND FLOOR PLAN
(CANTEEN BLOCK)

BRISE
SOLEIL

ENTRANCE
CORRIDOR

STUDIO

STUDIO

STUDIO

STUDIO

STUDIO

SECTION

EXPOSED BRICK WORK

L.V. 44"

L.V. ±0'-0"

WEST SIDE ELEVATION

L.V. 44"

L.V. ±0'-0"

EXPOSED BRICK WORK

EAST SIDE ELEVATION

NORTH SIDE ELEVATION

ARCHITECTURAL FEATURES

The roofing system

The roof surface is in a convex shape since convex shapes reflect light and sound in a proper amount and thus the outer surface of the roof provides a good slope for effective drainage. The shape of the roof also allows north light to be directly projected into the spaces. All of the design studios and lecture halls have north light openings to allow for constant effective controllable light.

Lighting and Ventilation

There are arches with glazed openings strategically placed on the roof, such that there is unhindered natural light constantly. The windows in the corridor are semi-circular in shape so that light enters from a wider angle and covers a larger area.

Additionally, there are voids in the ceiling of the corridors, placed for adequate direct ventilation of the spaces. Due to tubular shape of the voids, there is effective air movement in the spaces, as a result of venturi effect.

The Drainage System

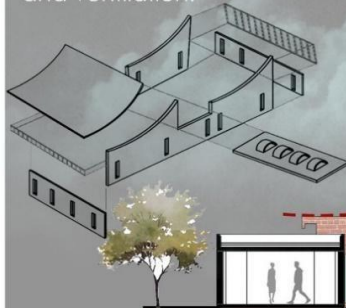
The shape of the drainage system is inspired from the shape of bull horns.

Undulatory Glazing

The panels of glass located on the exterior façade are placed in a rhythmic pattern, acting as an opening and providing adequate amount of diffused sunlight.

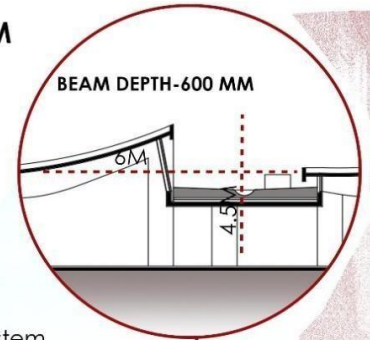
SECTION OF CCA

The Section of building expresses the concept of light and ventilation, giving all the spaces adequate amount of light and ventilation.



CONVEX ROOF

The roof surface is convex as convex surface reflects lights and sound in proper amount and the outer surface of roof provide good slope for drainage.



The drainage system is natural inspired by concept bull horns.



CONCEPT OF NORTH LIGHT

The concept of north light can be seen in the design clearly as north light is considered diffuse sun-light.

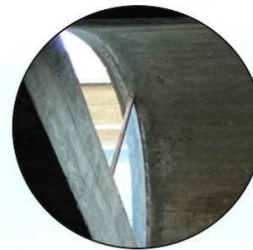
UNDULATORY GLAZING

The Panels of glass located on the exterior faces is in rhythm pattern, acting as a opening and provides adequate amount of sunlight.

RHYTHM PATTERN



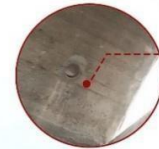
LIGHTING AND VENTILATION



Arches with glazed openings provide for Natural day lighting.

SEMI CIRCULAR windows are provided throughout the corridor

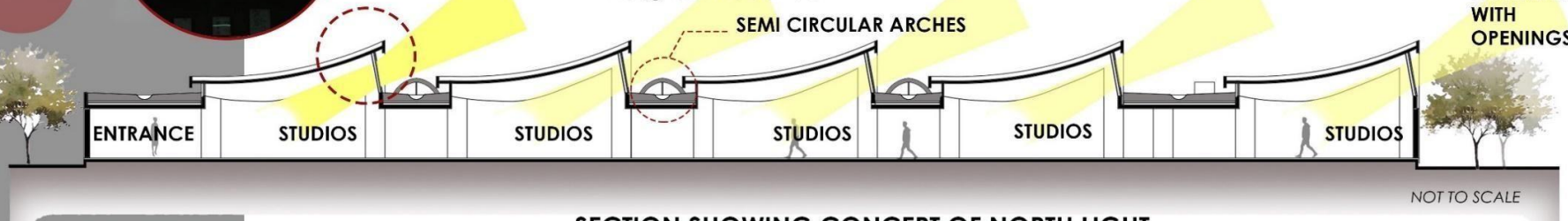
The voids in all the semi circular openings are provided for ventilation of corridors as their are no slits in corridors.



STUDIOS AND LECTURE HALLS

INTERNAL CORRIDOR WITH OPENINGS

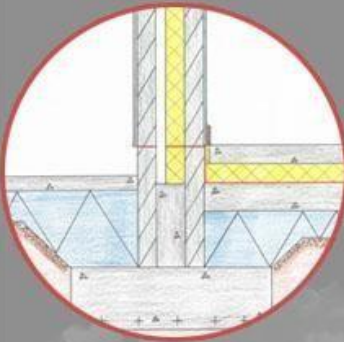
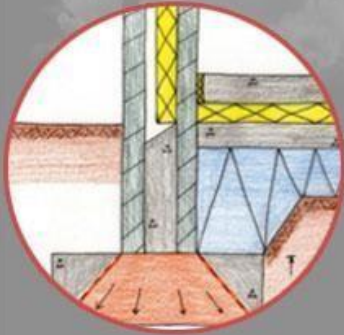
SEMI CIRCULAR ARCHES



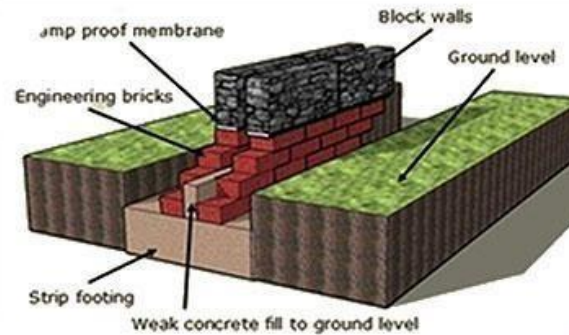
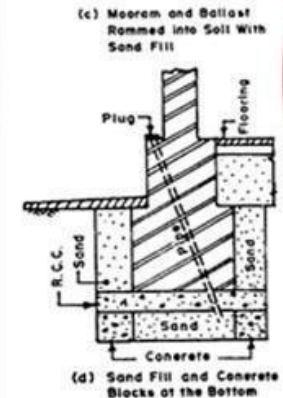
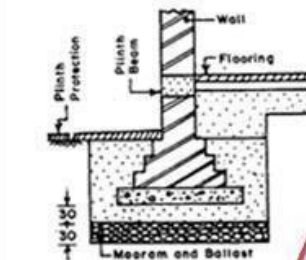
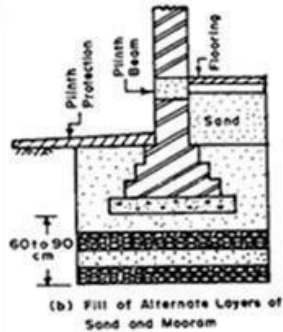
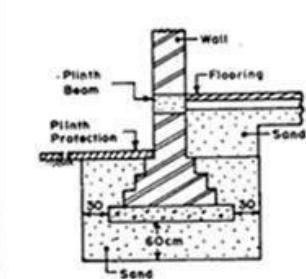
SECTION SHOWING CONCEPT OF NORTH LIGHT

STRIP FOUNDATION

Strip foundations consist of a continuous strip, usually of concrete, formed centrally under load bearing walls.



This continuous strip serves as a level base on which the wall is built and is of such a width as is necessary to spread the load on the foundations to an area of subsoil capable of supporting the load without undue compaction.



VIEW OF STRIP FOUNDATION

Strip foundations are used where the soil is of good bearing capacity.

The key sizes of a strip foundation for concrete cavity wall construction and timber frame cavity wall construction are similar.

The size and position of the strip is directly related to the overall width of the wall.

The principle design features of a strip foundation are based on the fact that the load is transmitted at 45 degrees from the base of the wall to the soil.



CAVITY WALL ON WEST FACADE

It is a wall formed from two thicknesses of brickwork or block work with a space between them. Cavity walls consist of two 'skins' separated by a hollow space. The skins are commonly masonry such as brick or concrete block. Masonry is an absorbent material, and therefore will slowly draw rainwater or even humidity into the wall, as well as from the inside of the house as from outside.



BASALITE WALL

Stonewalls are a kind of masonry construction that has been used for thousands of years. Initially they were built by piling loose stones into a dry stonewall. Later, mortar and plaster were used, especially in the construction of city walls, castles and other fortifications.

Students Attendance

- Akanksha Dewan
- Harikishan
- Shivani
- Meenakshi Phogat
- Aditya Puri
- Aditya Gahlot
- Devya Goel
- Twinkle Sharma
- Vepuri Kalyan
- Shweta
- Ujjwal Ahuja
- Bhagylakshmi
- Naman Ahuja
- Labham Sharma
- Subin Jospheh
- Meenu Varghese
- Sakshi Anoop Mittal
- Jeerin Thomas
- Palak Ranpur



THANK YOU