IMAGINING TEXTILE HUB IN BHIWANDI

By

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A REPORT

Submitted in partial fulfillment of the requirements for the degree of

Bachelor of Architecture.

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AIKTC
SCHOOL OF ARCHITECTURE

CERTIFICATE

This is to certify that the Design Dissertation titled A TEXTILE HUB IN BHIWANDI is the bonafide work of the student MOMIN MUSHFIQUE ASIF from Final Year B. Arch of AIKTC School of Architecture and was carried out in college under my guidance.

Sign of the guide:

Name of the guide: PROF. POONAM R. MHATRE

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DECLARATION

I hereby declare that this written submission entitled “IMAGINING TEXTILE HUB IN BHIWANDI” represents my ideas in my own words and has not been taken from the work of others (as from books, articles, essays, dissertations, other media and online); and where others’ ideas or words have been included, I have adequately cited and referenced the original sources. Direct quotations from books, journal articles, internet sources, other texts, or any other source whatsoever are acknowledged and the source cited are identified in the dissertation references.

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ACKNOWLEDGEMENT

First of all I would like to thank almighty God who has blessed me & has given me the strength and guided me throughout all phases of my life.

I would like to dedicate this thesis to my parents and all people of Bhiwandi who have been over ruled by the merchant dominance in the city and who are taking part in the making of such dream to come true, the people usually suffer a lot because of lack of knowledge and awareness in the field of textile business and I hope in the future they will shine toward making better growth of this sector and thereby fulfilling the needs of the people.

The project **"IMAGINING TEXTILE HUB IN BHIWANDI"** would not have been possible without the guidance, I am thankful to all the teaching and non teaching staff of our collage for this support and guidance throughout the duration of project. I would like to convey my sincere regards & thank to **Prof. Poonam R. Mhatre** for guidance throughout the project and debate toward my success in my thesis project.

I am very thankful to other textile owners and all other people who helped me for better understanding of this textile business.

Last but not least I would like to thank my dad **ASIF AHMED MD. HUSSAIN MOMIN,** my mom **AAFREEN ASIF MOMIN,** my beloved brothers, sister and my friends.

What ever I am today by god grace because of my parents. It was not being possible without their support.

ABSTRACT

What are the basic needs of a man?
Food, Clothing and Shelter.

The Textile Sector in India ranks next to Agriculture. Textile is one of India's oldest industries and it occupies a unique place in our country. It is one of the earliest which came into existence in India. It has 14 percent of the total Industrial production, which contributes nearly 30 percent of the total exports. After agriculture, most of the individuals are engaged and employed in this sector.

Textile Industries are providing one of the most basic needs of people which hold importance in maintaining sustained growth and for improving quality of life. It has a unique position as a self-reliant industry, from the assembly of raw materials to the delivery of finished products, with substantial value-addition at every stage of processing. It's a serious contribution to the country's economy. This paper deals with structure, growth and size of the Indian textile trade, role of textile trade in economy, key blessings of the trade, textile trade export and international state of affairs and strength, weakness, opportunities and treats of the Indian textile trade.

Bhiwandi is a city, situated in the district of thane, in the western part of the Maharashtra state, in India. The city is considered a part of the greater Mumbai metropolitan agglomeration, along with Navi Mumbai, Kalyan, Thane, Dombivali, Mira-Bhayandar and the Vasai-Virar region. Bhiwandi is known for its textile industry, and it has the largest number of power looms in the country and is known as Manchester of India. Major population of Bhiwandi are engaged & employed in power loom sector for their income. There are about 11.06 lakhs power looms in Maharashtra; Out of which around 8 lakhs power looms machines are found in Bhiwandi. The city produces around 3 crores meters fabric per day and it estimates that around 60 lakhs meters of grey fabrics of special qualities is sourced from Bhiwandi on daily basis.

As there are growing scope of textile in our country as stated by Indian ministry of textile, a textile hub in necessary for a city which has this huge number of power looms and textile production, this will eventually increase the economy of the city as well as standard of living of the people.

INTRODUCTION

The Indian textile industry is one of the largest with a huge raw material and textiles manufacturing base. Our economy is largely dependent on the textile manufacturing and trade in addition to other major industries. About 27% of the foreign exchange earnings are on account of export of textiles and clothing alone. The textiles and clothing sector contributes about 14% to the industrial production and 3% to the gross domestic product of the country. Around 8% of the total excise revenue collection is contributed by the textile industry. So much so, the textile industry accounts for as large as 21% of the total employment generated in the economy. Roughly 35 million individuals are directly employed in the this activities. Indirect employment including the manpower engaged in agricultural based raw-material production like cotton and related trade and handling could be stated to be around another 60 million.

A textile is the largest single industry in India (and amongst the biggest in the world), accounting for about 20% of the total industrial production. It provides direct employment to around 20 million people. Textile and clothing exports account for one-third of the total value of exports from the country. There are about 1,226 textile mills with a spinning capacity of about 28.5 million spindles. While yarn is mostly produced in the mills, fabrics are produced in the powerloom and handloom sectors as well. The Indian textile industry continues to be predominantly based on cotton, with about 65% of raw materials consumed being cotton. The yearly output of cotton cloth was about 12.8 billion m (about 42 billion ft). Textile is one of India's oldest industries and has a formidable presence in the national economy inasmuch as it contributes to about 14 per cent of manufacturing value-addition, which includes around one-third of gross export earnings and provides gainful employment to millions of people.

India's textile business is one among the economy's largest. In 2000/01, the textile and garment industries accounted for regarding 4 % of GDP, 14 % of business output, 18 % of business employment, and 27 % of export earnings. India's textile business is additionally important in an exceedingly international context, ranking second to China within the production of each cotton yarn and cloth and fifth within the production of artificial fibers and yarns.

BACKGROUND STUDY:

- Bhiwandi is a city, situated in the district of thane, in the western part of the Maharashtra state, in India.
- Located 20 km to the north-east of Mumbai and 15 km to the north-east of thane.
- Bhiwandi comes under the administration of the Bhiwandi-Nizampur city Muncipal Corporation.
- The city is considered a part of the greater Mumbai metropolitan agglomeration, along with Navi Mumbai, Kalyan, Thane, Dombivali, Mira-Bhayandar and the Vasai-Virar region.
- Major population of Bhiwandi are engaged & employed in power loom sector for their income.
- Bhiwandi is known for its textile industry, and it has the largest number of power looms in the country and is known as Manchester of India.
- According to the reports of census 2011, population was 709,665.
- The power loom industry is the main reason for huge number of floating population.
- The power loom sector of Bhiwandi is structurally flawed and its efficiency and growth depends upon the corrective measures and their effectiveness.
- As there are growing scope of textile in our country as stated by Indian ministry of textile, a textile hub in necessary for a city which has this huge number of power looms and textile production, this will eventually increase the economy of the city as well as standard of living of the people.
- This process of improving the structural aspects of the industry was initiated in the year 1985 textile policy, which for the first time took a sectoral view of the industry.
- The government is spelling out the need for an integrated approach whereby all sectors will be modernized synchronously.
- This approach is felt to enhance the textile industry to get a level of upgraded production with new technology and make it strong enough to face the changed competitive global scenario from the year 2005.
- In order to meet the changed competitive due to liberalization of economy, and globalization and privatization, hence it is felt that the unorganized power loom
- Sector should be modernized, especially in the present segment of weaving.

- For all these to happen and to prepare a proper action plan in which all the stake holders i.e. the government, central and state, the weavers community.
- The interest groups get fully involved.
- To prepare an effective perspective plan which would boost this important sector.
- Hence this study of textile power loom sector which focuses on modernization and other aspects to convert this unorganized sector to organized sector, as the business is not being uplifted as per the present generation to meet up the globalization requirement.
- Maharashtra occupies a specific position in the textile map of the country.
- There are about 11.06 lakhs power looms in Maharashtra.
- Out of which around 8 lakhs power looms machines are found in Bhiwandi.
- Majority of the power looms in Bhiwandi produce grey materials which are used as shirting and dress material of ladies dresses.
- Cloth produced in Bhiwandi is mainly consumed by Indian market as it is not up to the mark in the international market.
- The grey cloth of Bhiwandi is transported to various parts of Gujarat and Rajasthan for finishing purpose.
- Because there are textile hubs in Gujarat.
- So, there is a need of textile hub in Bhiwandi to enhance the textile business in various aspects, which help in the increment of the city economy and increase the job opportunity in within the city and also reduce the transportation.
- From manufacturing to finishing to marketing all can be done under same complex.
- Transportation cost will be reduced.
- Thus planning different activities in a single complex would result in economic use of land and user efficiency for the city of Bhiwandi.
- A textile hub which constitute manufacturing, finishing as well as financing and marketing all in one area would work out to be the best option for both manufacturer and buyers.
- Such project would offer an excellent response to the overall development of textile business and have a futuristic vision in improving Indian economy.
- The project will include housing facilities for the migrant workers and also a primary school for their children.
- It will ultimately become a complex where textile garments will be produced from start to finish and there will be various other facilities inside the complex for workers and staff.

Economy of the city:

- The economy of Bhiwandi is largely depend on the power loom industry.
- The decline of Mumbai's textile mills increased the growth of the power loom in Bhiwandi.
- In order to reach the demand for grey fabric, power loom centers sprang up in various parts of the state.
- Textile and migrant workers especially migrant labours came in these areas to find work at these centers.
- The bloom of cloth oil and looms still attract the worker from different states to come and find a suitable jobs.
- The state government estimates that nearly 40 lakh people depends directly or indirectly on the looms of Bhiwandi.
- The power loom industry is the main reason for huge number of increasing population.
- Bhiwandi Nizampur is the "richest city in thane district".
- Bhiwandi became the "highest paid octroi". With the largest godown located in Asia.
- These godowns are owned by local politicians.
- Bhiwandi is the `mother godown' for several industries and the nodal up-country booking and transit point for several goods transporters owing to the octroi benefits that can be availed of there.
- The biggest names in the pharmacy company have their godowns in Bhiwandi.
- Industry estimates that around 60 lakhs meters of grey fabrics of special qualities is sourced from Bhiwandi on daily basis.
- The city produces around 3 crores meters fabric per day.
- Surat has 6.5 lakhs power loom. While Bhiwandi has 8 lakhs power looms.

OBJECTIVE:

To provide a textile hub which will be a model and landmark of textile commerce for the city and & industry eventually.

To provide amenities which promotes textile business through-

- Buyers-seller meets.
- Conferences.
- Exhibition of latest fabric and machinery.
- Cloth finishing units and coloring dying.
- Space for various artworks on cloth.
- An inclusive cloth market of grey fabric and finished clothes.
- Housing facilities of migrant workers.
- To increase the economy of the city.
- To reduce the transportation.

SCOPE:

- This is a realistic project, which has an opportunity to grow in future.
- This project will help in generating revenue for the city and fulfilling the needs of the people relating with such business.
- Multi-function space reduce transportation.
- It helps to save time and provide solution for the growth of textile business within the city.
- It also improves lifestyle of the people within the city.
- This project will encourage interactions with different activities to enrich functioning of the entire complex.
- It increases self sufficiency.

METHODOLOGY:

DATA COLLECTION:

- Understanding of multi functional space in a building required for textile business.
- Identifying key issues or standard aspects.
- Changes or transformation in textile business.
- history and evolution of textile business.
- Understand the process of finishing of cloth after production.

CASE-STUDY:

- Live case study.
- Study of multi functional activities of process.
- Study of various textile related activities.
- No of textile industry and their operating.
- Standard for various area requirement.
- Bye law.
- Study of Bhiwandi city and its connectivity.
- Study of various forms for the building and finalize a suitable form.
- Study of various important aspects of a building which include no of floors, no of lifts and built up area.

ANALYSIS:

- Case study analysis.
- Site analysis.
- Climatic analysis.
- Physical analysis.
- Contextual analysis.
- Conclusion.

2.6 LIMITATION:

- Initially it will not cater to whole of the textile production of the city.
- It depends up on the people who want to use this service which will be provided by the complex.
- It will work with the co-operation of the people.
- Commercial spaces to be designed and other spaces are alloted at suitable position.
- Functions should be entertain before designing.

TRANSPORTATION:

ROADWAY:

- Bhiwandi Nizampur is well connected with the rest of the country because of the Mumbai-Agra highway (national highway-3), which passes through it.
- The Bhiwandi's (state transport) depot is located on the Mumbai-Agra highway.
- Buses run every half hour to nearby depots like Mumbai-central, thane, Kalyan, Vasai, Wada and Borivali, Nasik, Shirdi, Aurangabad, Pune etc.
- The Thane municipal transport operates bus services from Bhiwandi Narpoli to Thane, and the Kalyan-Dombivli municipal transport operates bus services from Bhiwandi Gopal Nagar to Kalyan, every 20 minutes.
- T.M.T bus also started from thane to Bhiwandi after every 15 minutes.
- Auto-rickshaws too, run from Bhiwandi to thane and Kalyan.

RAILWAY:

- The Bhiwandi Nizampur road station lies on the Vasai-Diwa corridor, between the western line and central line.
- An passenger train which is run by a diesel service runs from diva to Vasai only five times in a day.
- Many mail trains make a stop here.
- Recently computerized reservation service was installed at this station and Vasai-Diva line considered as suburban rail network.
- There is a necessity for a suburban rail line for Bhiwandi Nizampur.
- The metro rail corporation plans to connect the Thane-Kalyan line through Bhiwandi Nizampur.

  This may result in more floating population.

Airway:

- The nearest airport from Bhiwandi city is the Mumbai international and domestic airport at a distance of around 50 km.
- Another international airport is proposed at Navi Mumbai.

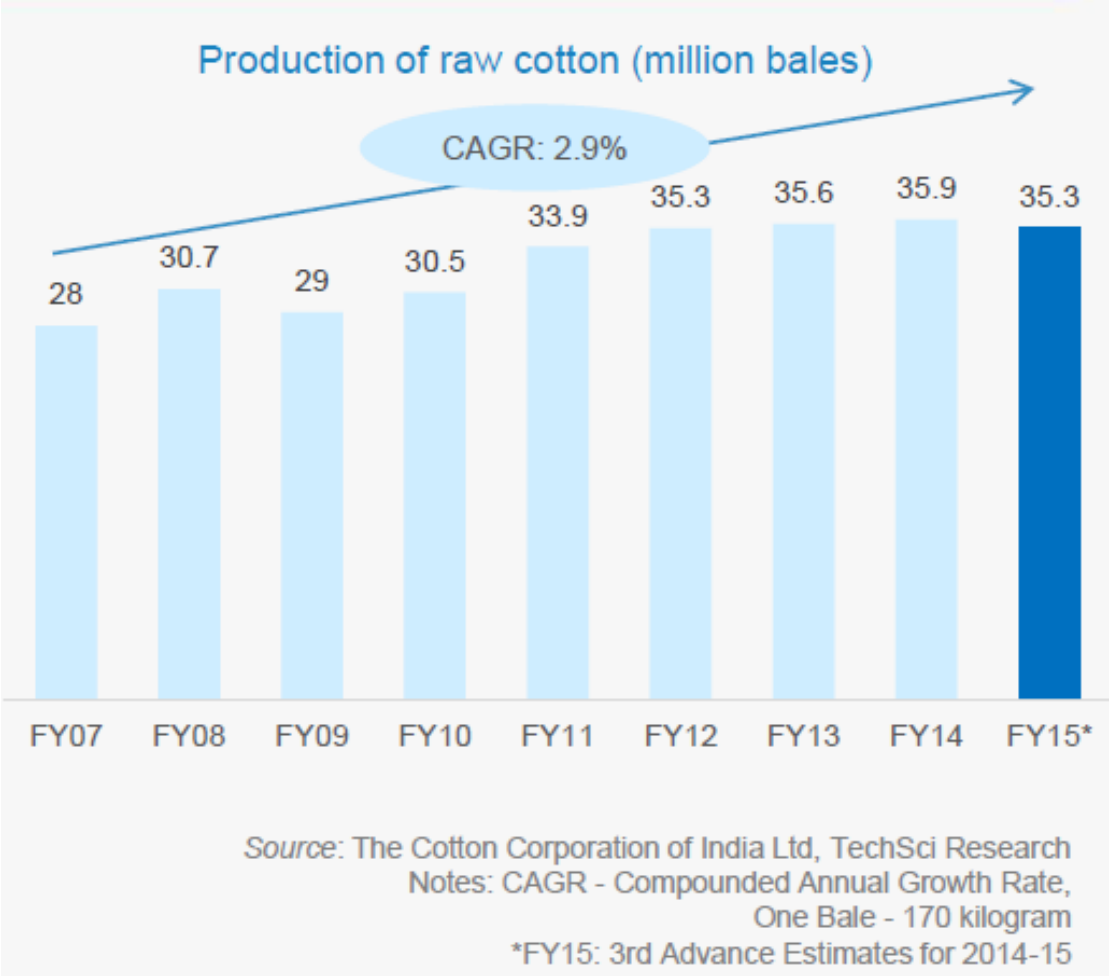
LITERATURE REVIEW:

KEY FACTS:

- The fundamental strength of the textile industry in India is its strong production base of wide range of fiber/yarns from natural fibers like cotton, jute, silk and wool to synthetic/man-made fibers like polyester, viscose, nylon and acrylic.
- According to UN com trade data released in June, 2014
- India was announced as the world's second largest exporter of textiles and clothing in the world.
- And 6th largest exporter of clothing only.
- India accounts 63 percent of the market share of textiles and garments.
- India is the 2nd biggest producer of silk and cotton.
- Indian textile industry accounts for about 24 percent of the world's spindle capacity and 8 percent of global rotor capacity.
- India has the highest loom capacity (including handlooms) with 63 percent of the world's market share.
- India accounts for about 14 percent of the world's production of textile fibers and yarns (largest producer of jute, second largest producer of silk and cotton; and third largest in cellulosic fiber).

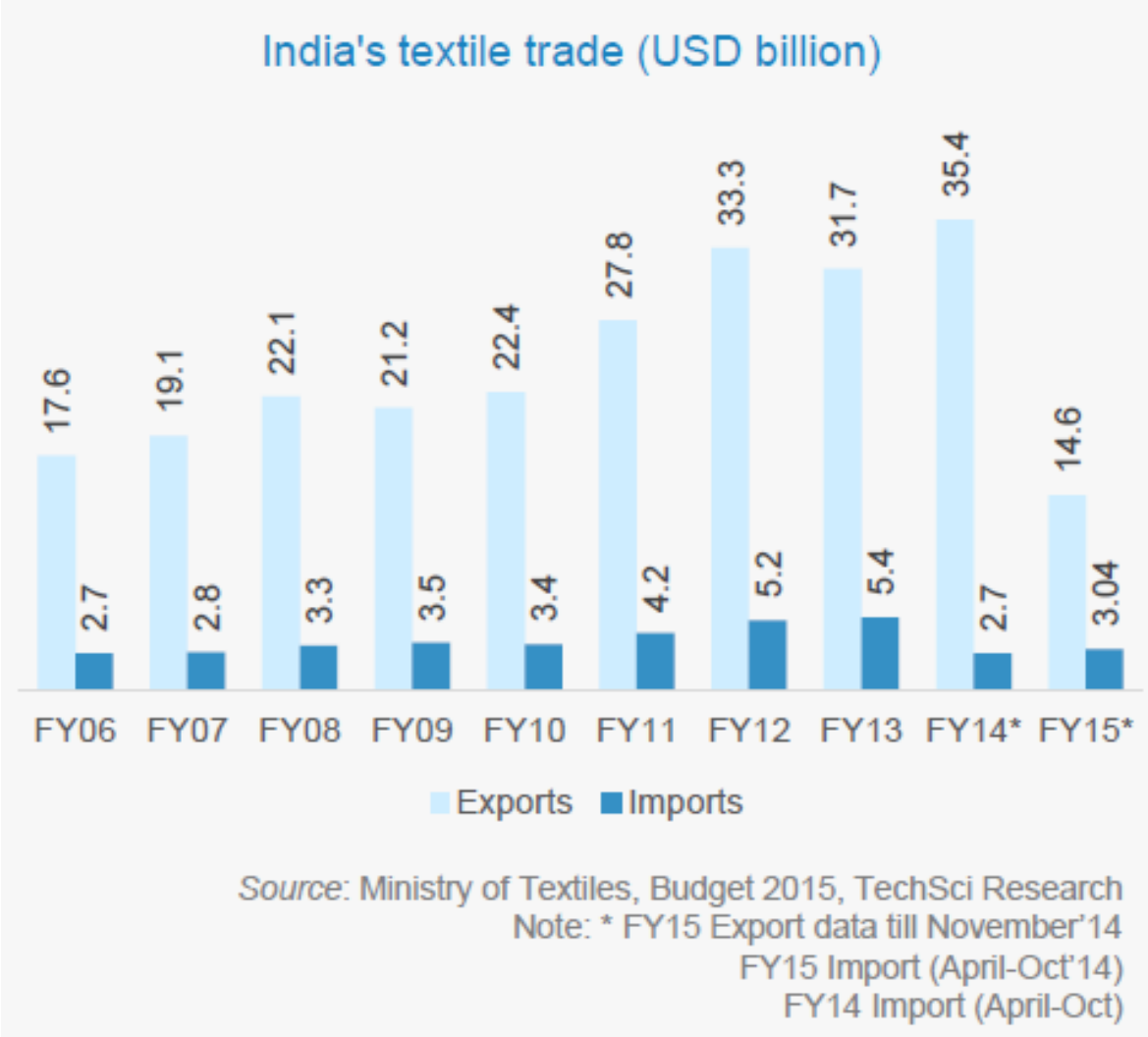
GROWTH OVER THE YEARS:

- Textile plays a major role in the Indian economy
- It contributes 14 percent to industrial production and 4 percent to GDP.
- With over 45 million people, the industry is one of the largest source of employment generation in the country
- The industry accounts for nearly 13 percent of total exports
- The size of India's textile market in 2014 was USD 99.0 billion which is expected to touch USD 226 billion market by 2023 at a CAGR of 8.7 percent between 2009-23.



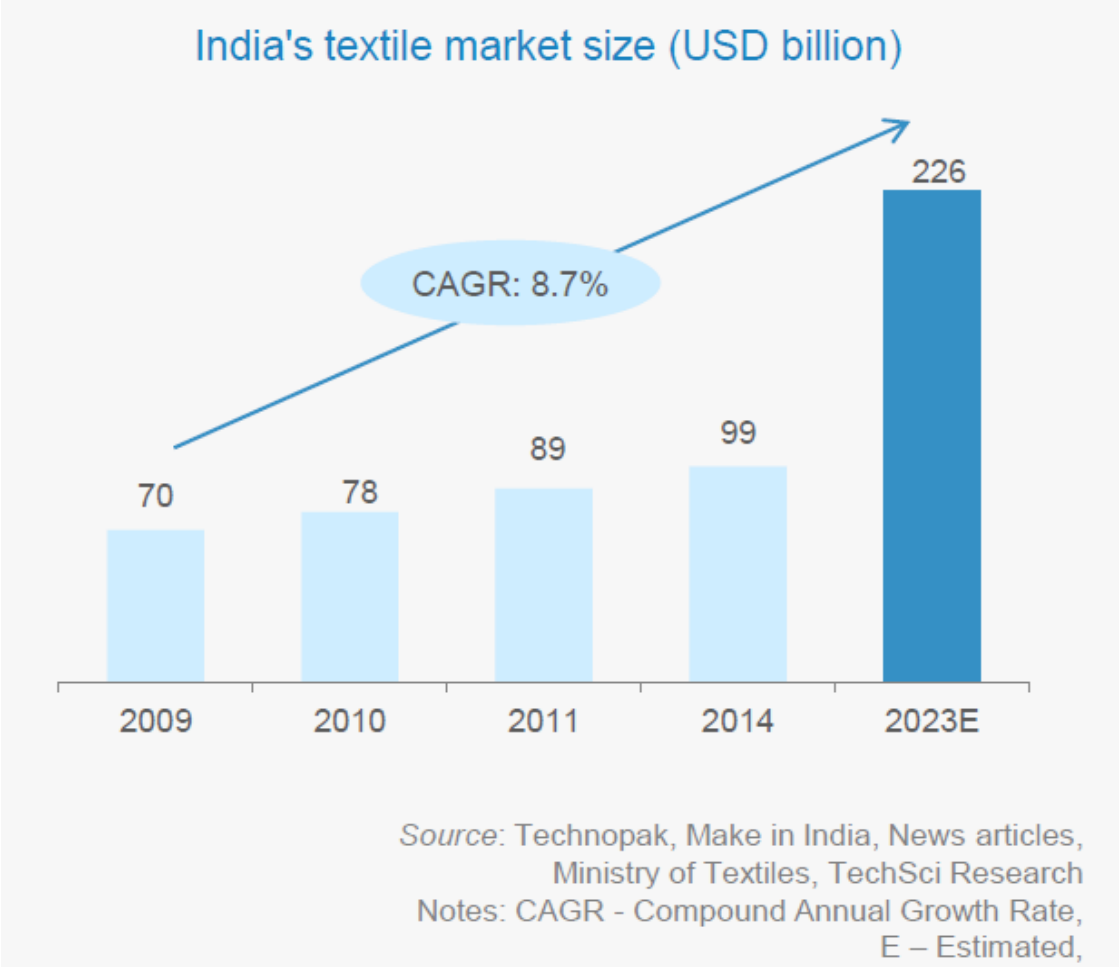
COTTON PRODUCTION OVER THE LAST FEW YEARS:

- Production of raw cotton grows to 36 million bales in year 2014, up from about 28 million bales in year 2007. Till 3rd advance estimates for year 2015, production of raw cotton in year 2015 was 35.2 million bales.
- During same time, production expanded at a CAGR of 3 percent.
- During year 2014, of the overall amount of raw cotton produced in the country, domestic consumption totaled 30 million bales, while in year 2015, 17.8 million bales was the domestic consumption between October 2014 to April 2015.



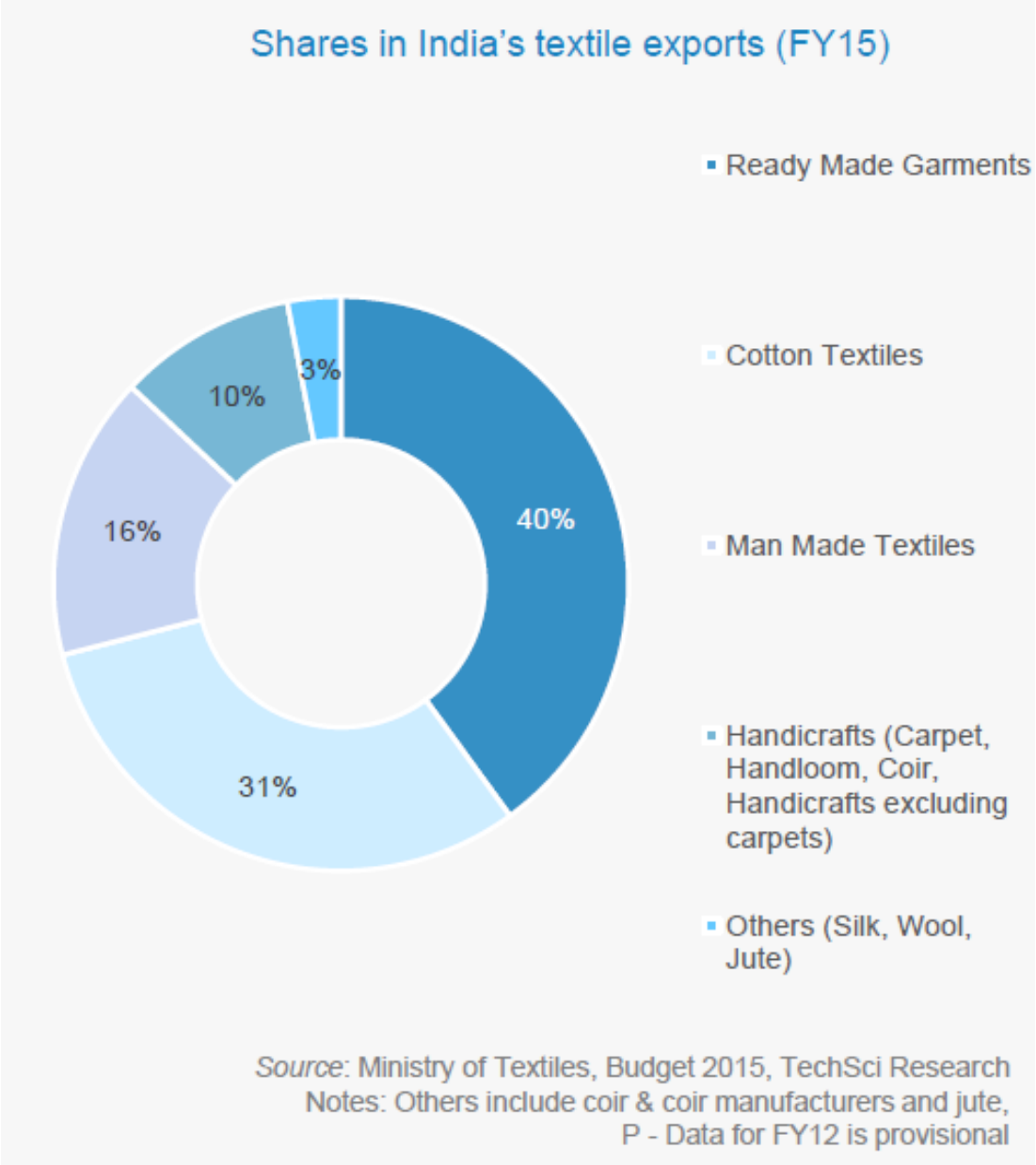
INDIA'S TEXTILE TRADE:

- Export has been a base feature of India's textile and apparel sector, a fact corroborated by trade figures.
- Exports grown to USD 35.3 billion in year 2014 from USD 17.5 billion in year 2006, implying a CAGR of 9 percent.
- Exports during year 2015 (between April - November) touched USD 14.5 billion.
- However, in year 2014 India's textile exports crossed the mark of year 2012 also and touched USD 35.5 billion.



INDIA'S TEXTILE MARKET SIZE:

- In 2009, the size of the market was 70.
- And it shows a specific amount of growth till 2014 with a size of the market was 99.
- It is estimated that till 2023, it will grow to 226.



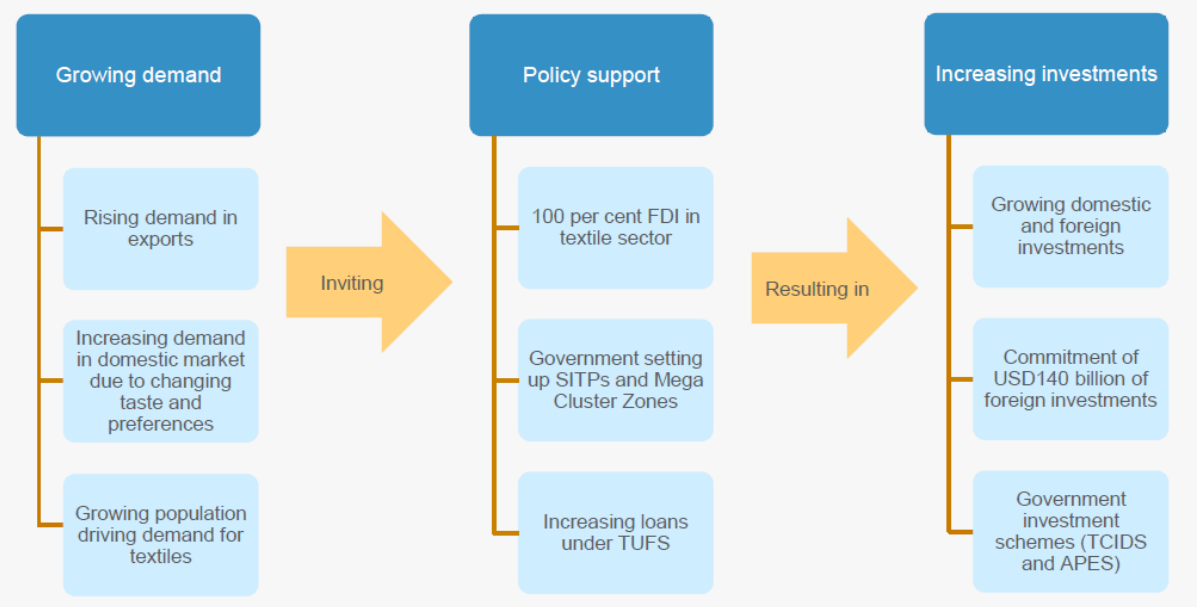
READYMADE GARMENTS AND COTTON TEXTILES DOMINATES EXPORTS:

- Readymade garments is the largest contributor to total textile and apparel exports from India in year 2015 the segment has a share of 40 percent.
- Cotton and man-made textiles are the major contributors with shares of 31 percent and 16 percent.

TRENDS IN NOTABLE TEXTILE SECTOR:

- Increasing investment in TUFS.
- Government applying investments through increasing focus on schemes such as technology upgrading finance scheme and cluster development scheme
- Multi fiber arrangement (MFA).
- Cotton prices in India are integrated with international market.
- Government cleared 13 new textile parks in different states.
- Public private partnership.
- It invites participation of private individual in textile sector.
- It is growing almost around double during past few years.
- Scheme for integrated textile park- under SITP 40 plus textile parks has been sanctioned (worth 900 USD)
- Foreign direct investment –FDI is up to 100 percent is allowed in textile sector.

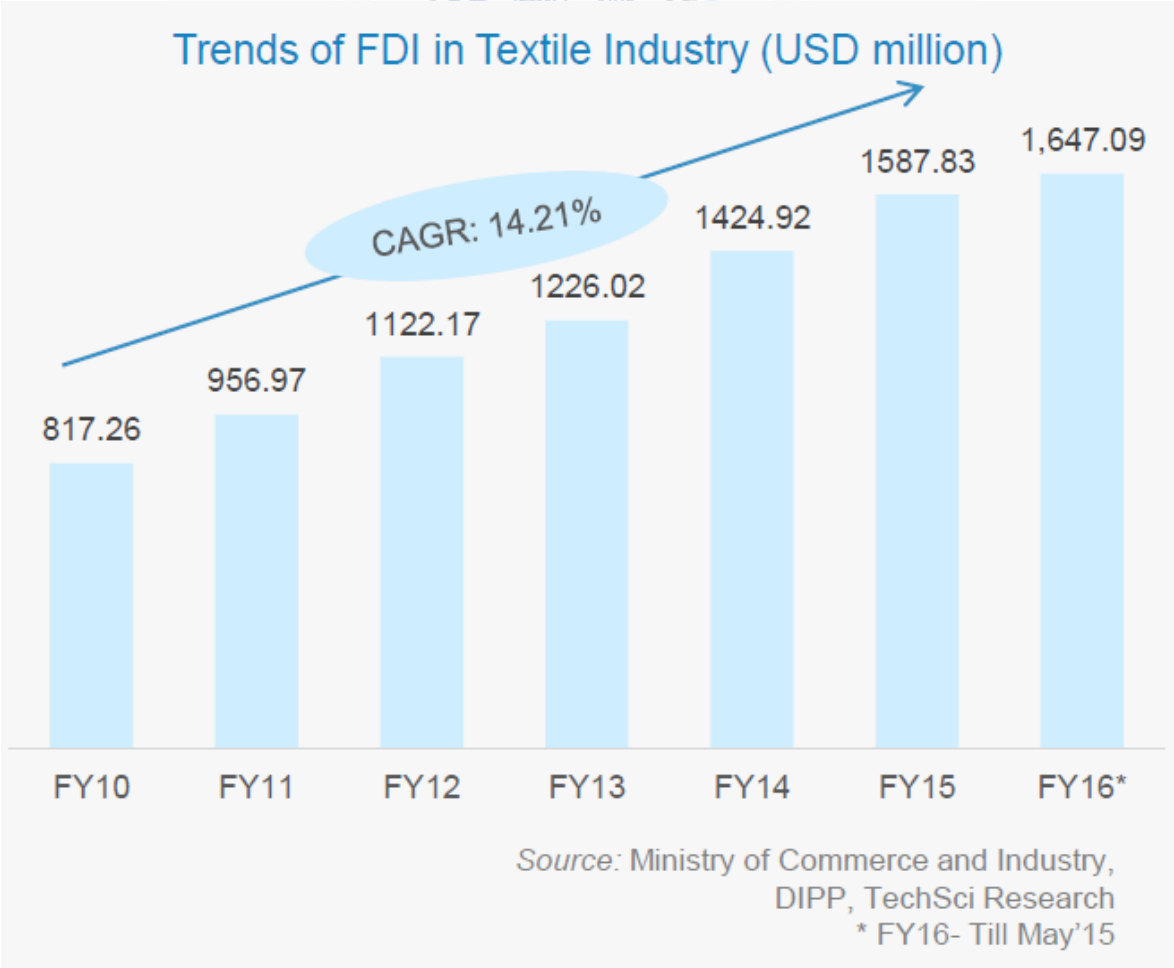
FUNDAMENTAL AND POLICY SUPPORT:



Source: Ministry of Textiles, TechSci Research
Notes: TCIDS - Textile Center Infrastructure Development Scheme, APES - Apparel Park for Exports Scheme

FOREIGN INVESTMENTS:

- 100 percent FDI is granted in sector.
- Indian textile industry experienced noticeable growth in the year 2015, as FDI increased to USD 1588 million in year 2015 from USD 1425 million in year 2014.following , till may'15 FDI in flow in textile industry stood at usd 164 million.
- In year 10-15, FDI in textile and apparel industry grew at a CAGR of 14.20 percent.
- The textile industry in India is experiencing a significant increase in collaboration between global major and domestic companies.
- International apparel giants, like Hugoboss, Lizclaiborne, Kanz and Diesel, have already started operation in India.



Case-study of printing and dyeing.

Name: Ghasletwala mill/ Balotrawala dyeing.

Location: Nawahorbazar, Chhipakuva, Danilimda, Ahmedabad -022.

Area: 2000 sq.m. approx.

Topography of land: Flat land.

Figure 1.1 Google image of the mill.

Figure1.2 Zoom out google image.

Programme:

1. Owners office- 14 sq.m
2. Cloth storage after drying- 24 sq.m
3. Workers area- 18 sq.m
4. Dyeing machine area- 56 sq.m
5. Boiler- 22 sq.m

Figure 1.3 Schematic plan of the mill.

6. Boiler and dyeing area- 56 sq.m
7. Drying machine- 18 sq.m
8. Area for separating cloth- 19 sq.m
9. Drying area—38 sq.m
10. Calender machine- 16 sq.m
11. Colour storage area- 32 sq.m
12. Printing area- 1290 sq.m
13. Screen storage- 20 sq.m
14. Storage after pronting-12 sq.m
15. Wash area after print-40 sq.m
16. Toilets- 2 blocks.

Figure1. 4 Drying machine

Figure1. 5 Storage area after washing.

Figure1. 6 Washing area after dyeing.

Figure1. 8 Drying area

Figure1. 7 Colouring machine.

Figure1. 9 Boiler and dyeing area.

Figure1. 10 Colour storage is not proper

Figure 1.11 Boiler

Figure1. 13 Boiler

Figure1. 12 Colour storage.

Figure1. 15 Final storage

Figure1. 17 Screens

Figure1. 14 Toilets are improper

Figure1. 16 Separating of clothes.

Figure1. 18 Screen storage

Figure1. 20 Printing area

Figure1. 19 Entrance

Figure1. 22 Approach road 6 meter wide

Figure1. 21 View from the entrance

ANALYSIS:

Purpose of selecting this case study that how the work is done on a small scale.

The structure is of steel frame work with brick walls.

There is no aesthetics given to it.

The working environment is not proper.

The storage of materials is not in good condition.

But the functioning of the space is good.

Entrance is enough for entering tempo & small vehicles and there is also a problem of water logging in rainy season at the entrance.

Storage room is not well maintained.

Washing area does not have roof, which makes washing difficult in rainy season.

It was a small scale factory.

Per day production 1500 - 2 piece suits and 600- 3 piece suits.

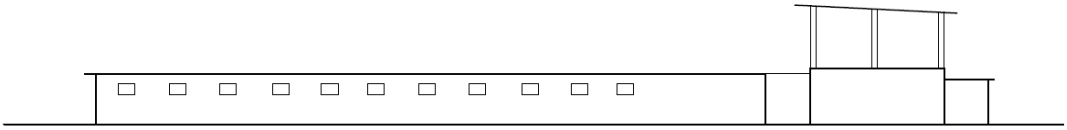


Figure1. 23 Schematic section

Case study of stitching process

Name: sapna garments.

Location: a/1, a/2, Palki maharajni khetar, Near sikander market, Danilimda, Ahmedabad -022.

Area: 150 sq.m

Structure: g+1

Topography: Flat land

Site context: Improper road with water logging.

Construction: r.c.c. frame structure.

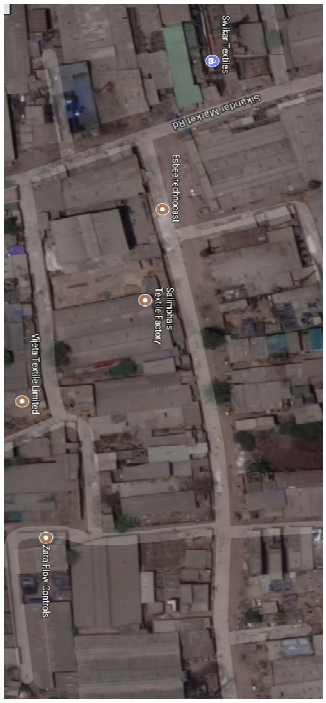


Figure2. 1 Google image

Programme:

1. Owners office – 21 sq.m
2. Cloth storage – 27 sq.m
3. Sticthing area – 90 sq.m
4. Washroom mens – 15 sq.m
5. Washroom womens – 15 sq.m
6. Stitching area – 136 sq.m

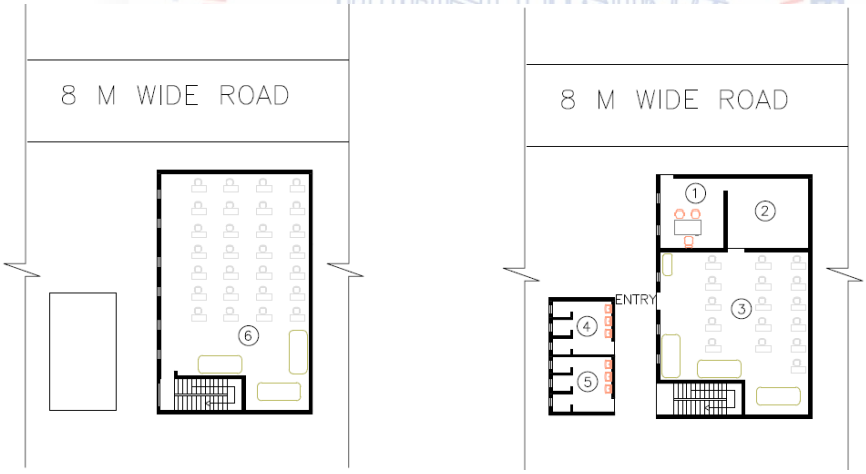


Figure 2. 2 Schematic plan of G.FLOOR and 1st FLOOR

PROCESS:

RAW MATERIAL – CUTTING – BUNDLING – FINISHING – SIDE STICTHING – POCKET STICHTING – BOTTOM – OVERLOCK – TOP – ELASTIC OVERLOCK – KANZAI MACHINE - TRIMMING – QUALITY CHECKING – STEAM IRONING – TAGGING – PACKING – FINAL PRODUCT CHECKING.

DAILY PRODUCTION:

500 – 600 pieces either of t-shirts, track pants, leggings etc.

ANALYSIS:

- There is no proper ventilation.
- The space is less according to the activity.
- No informal space in the structure.
- Flow of the function is good.
- There is no fire safety.

Figure 2. 3 View of the working area.

Case study of Beijing lingerie factory

Architects: cross boundaries

Year: 2004

Area: 14000 sq.m floor area

Figure 3. 1 View of Beijing lingerie factory

- **Programme:**
- Distribution centre
- Manufacturing area
- Research and development office
- Storage
- Showcasing of products
- 300 people dormitory
- Material storage
- Conference centre
- Event space
- Technical space
- Office
- Sewing workshop
- Shops
- Clipping workshop
- Informal space
- Terrace
- Inner landscape

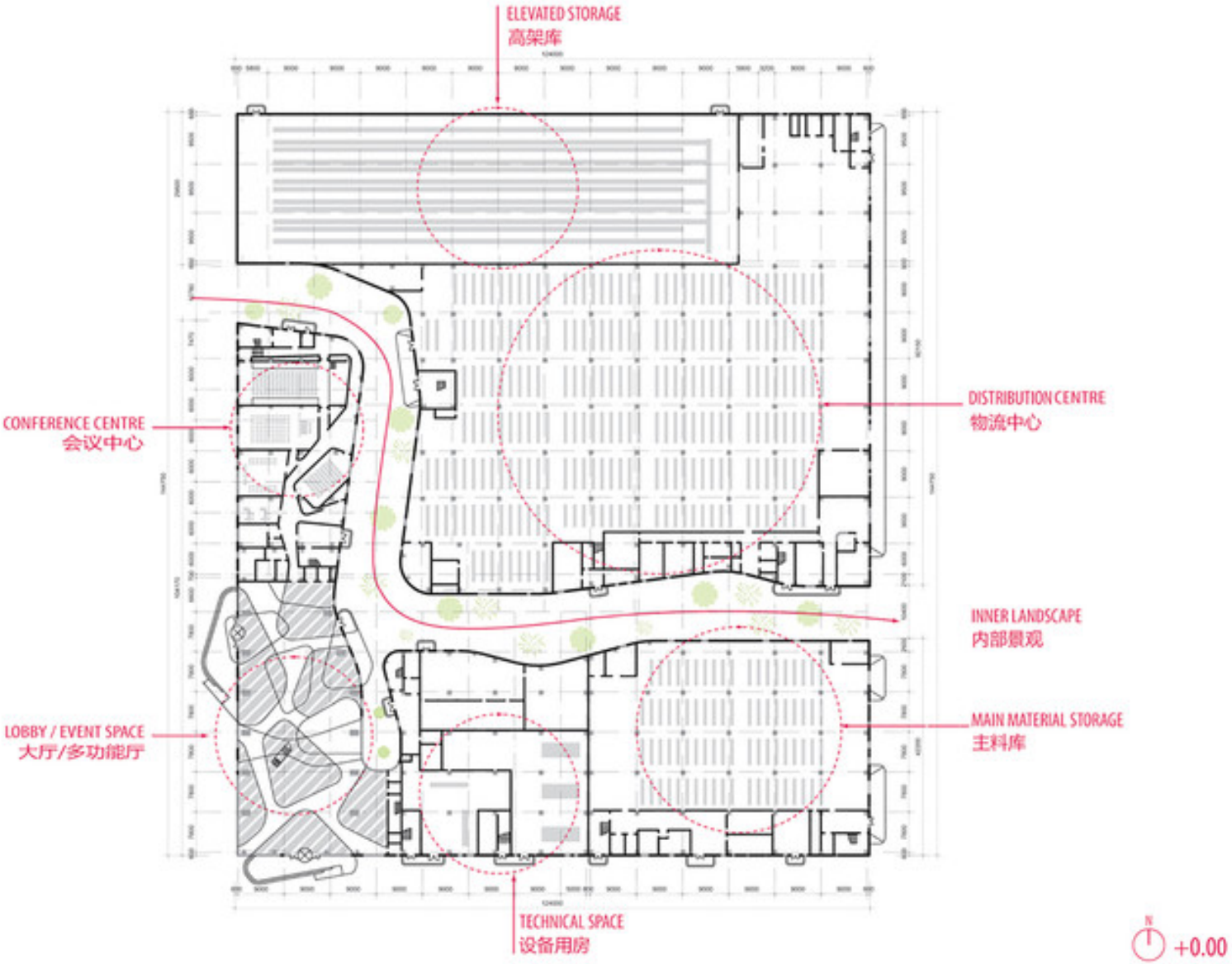
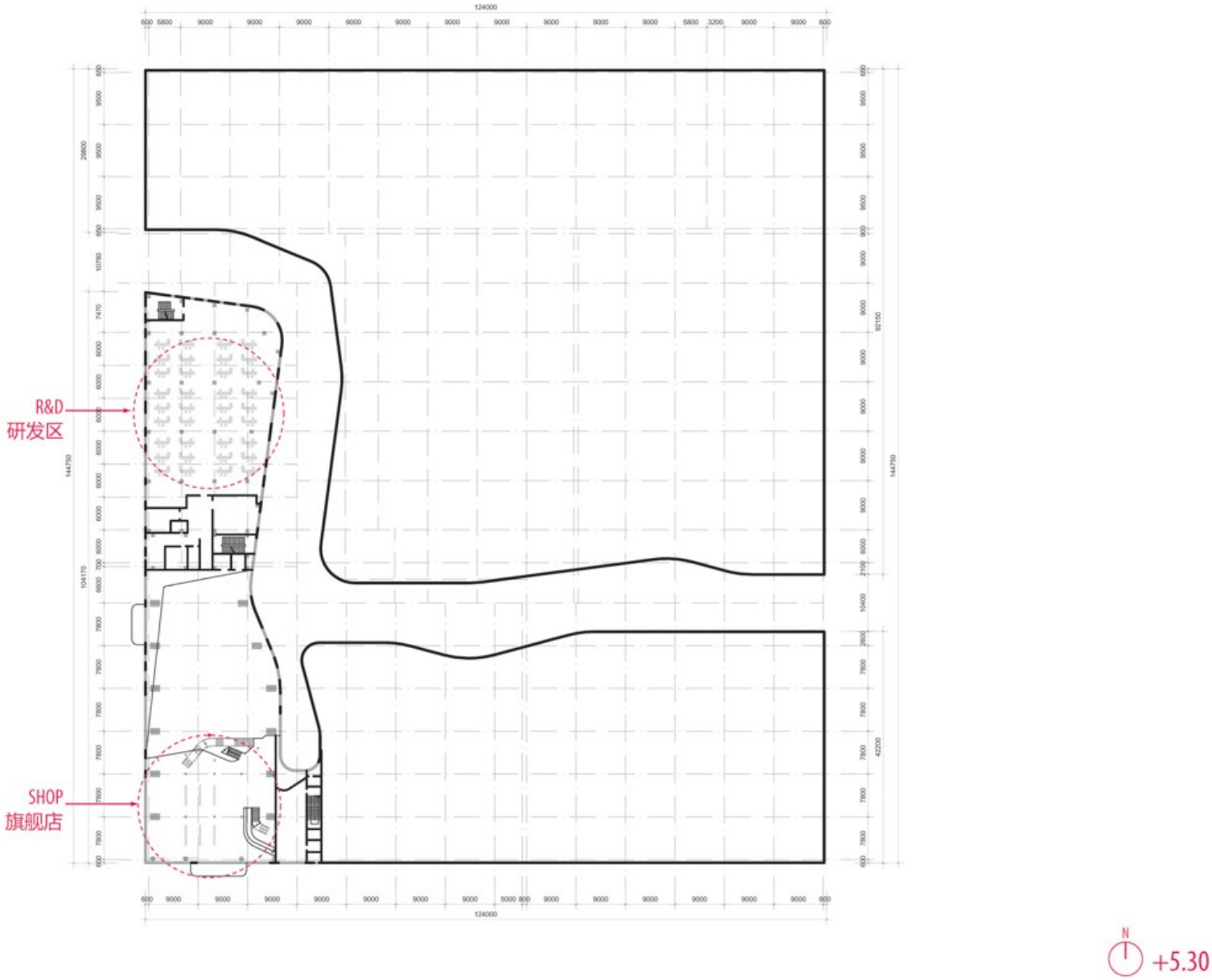


Figure3. 2 Plan of ground level showing various functions of the space and its planning.



Figur 3. 3 Plan of the 1st level of the structure

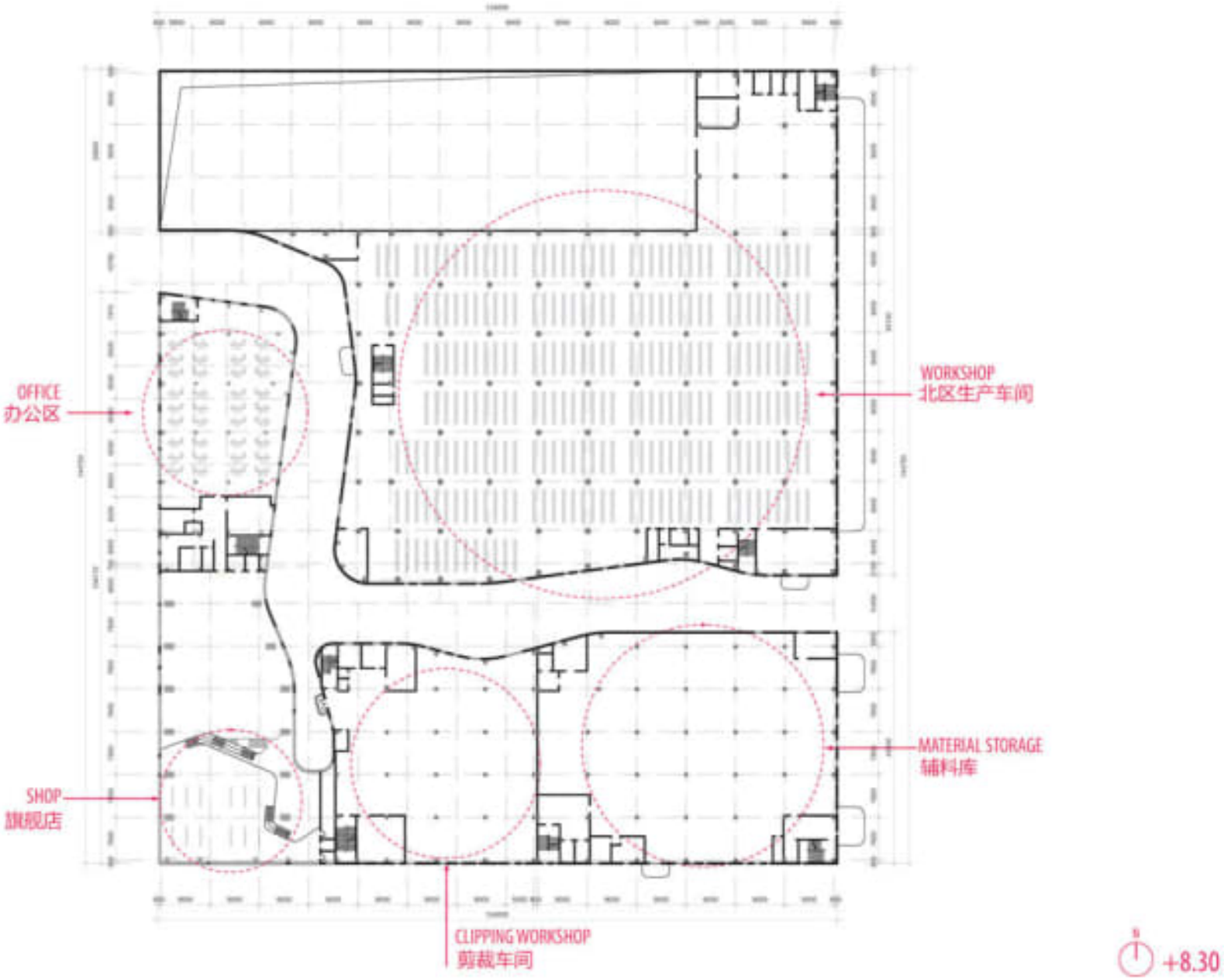


Figure3. 4 Plan of 2nd level showing various functions of the space and its planning.

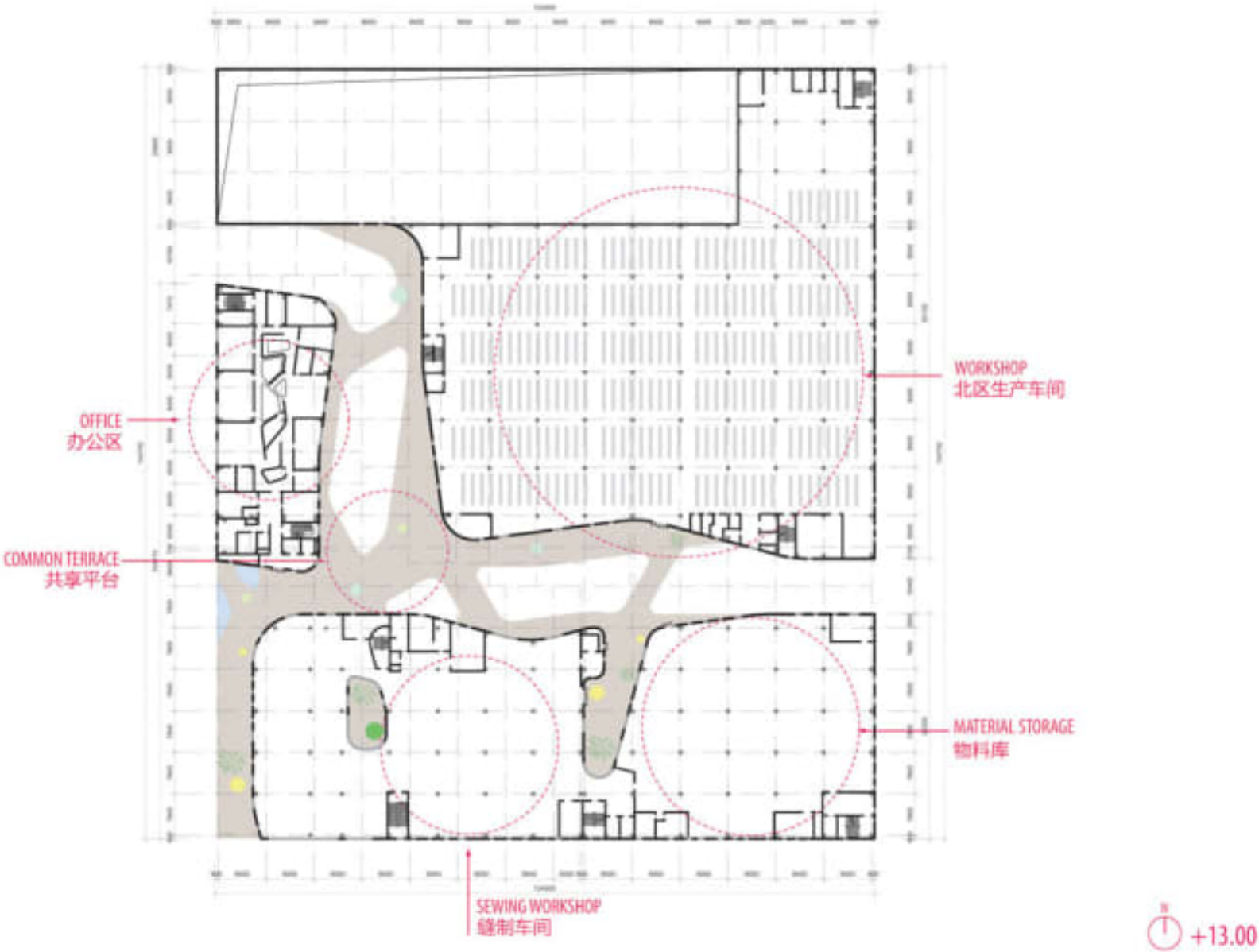


Figure3. 5 Plan of 3rd level showing various functions of the space and its planning.

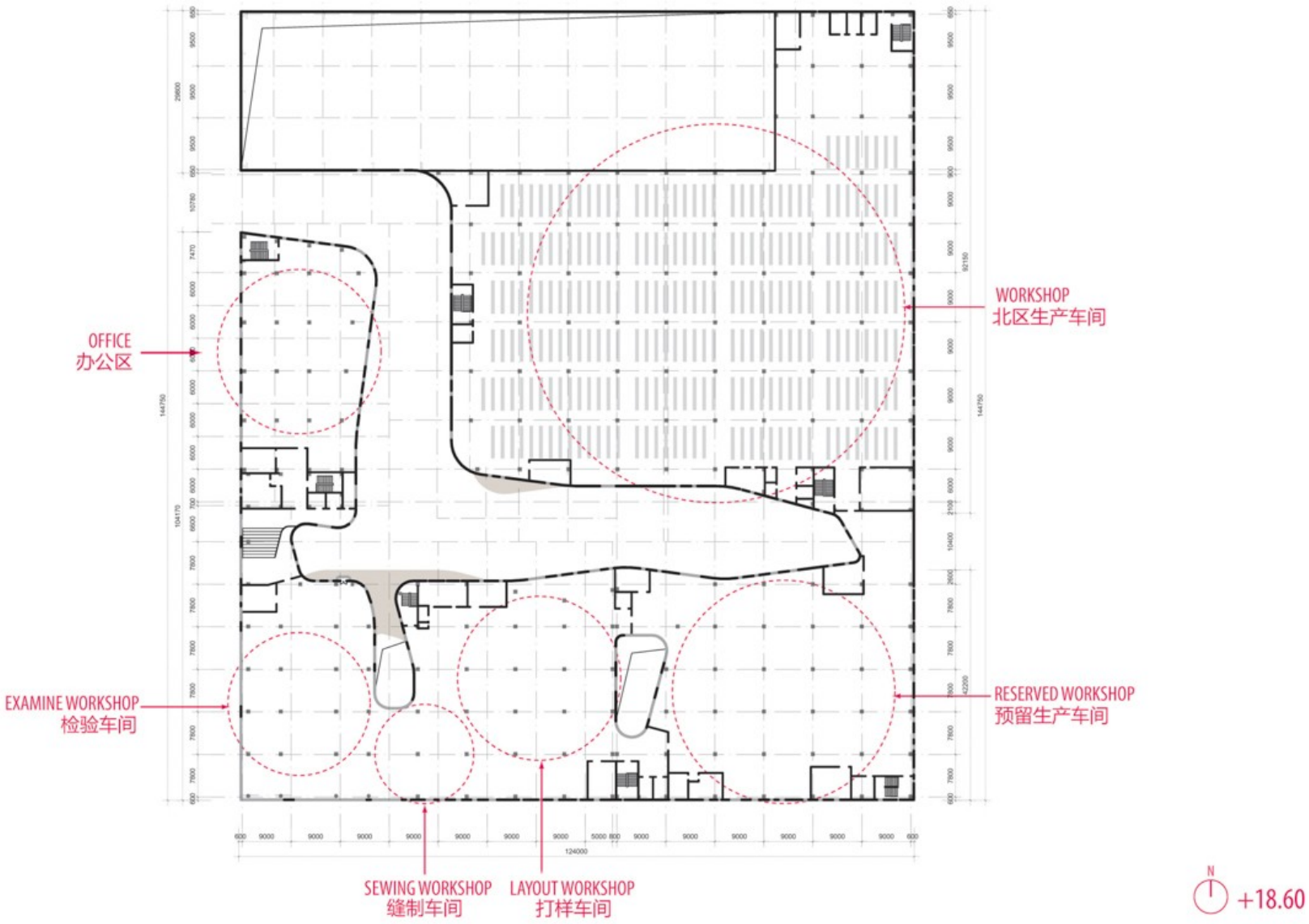


Figure3. 6 Plan of 4th level showing various functions of the space and its planning.

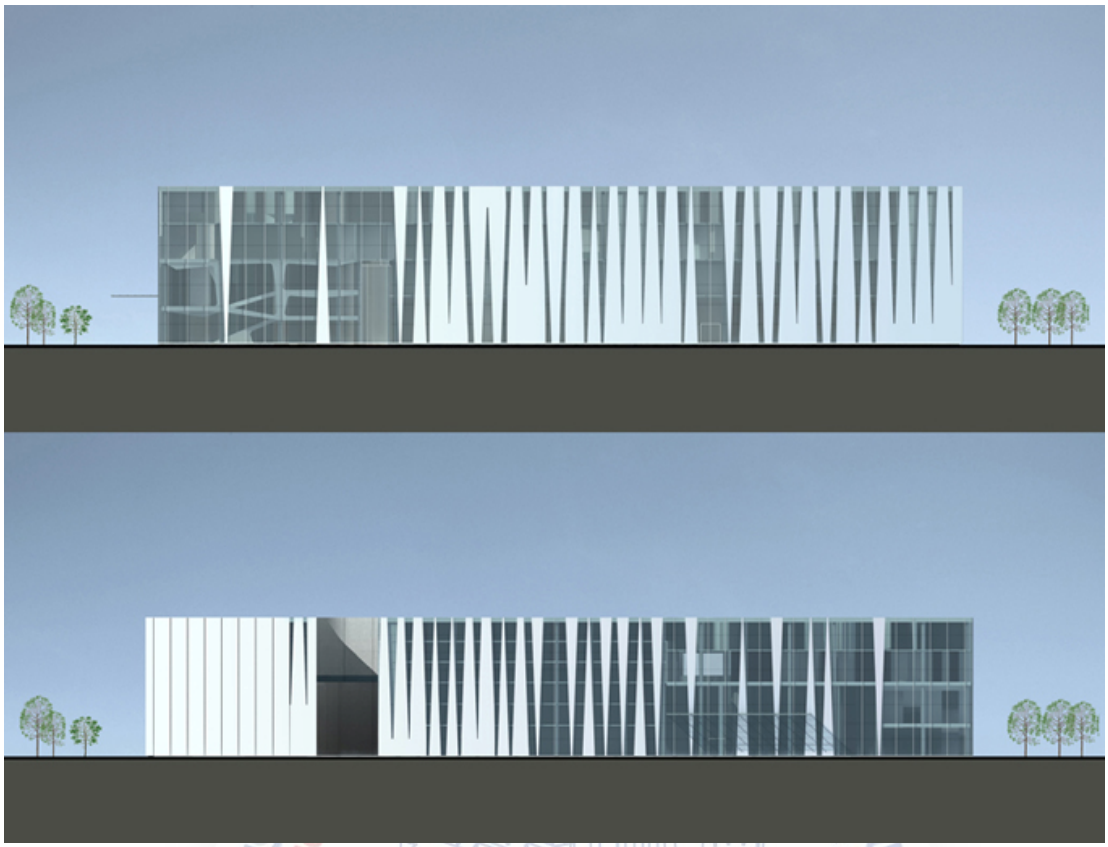


Figure3. 7 Schematic Elevation of the structure

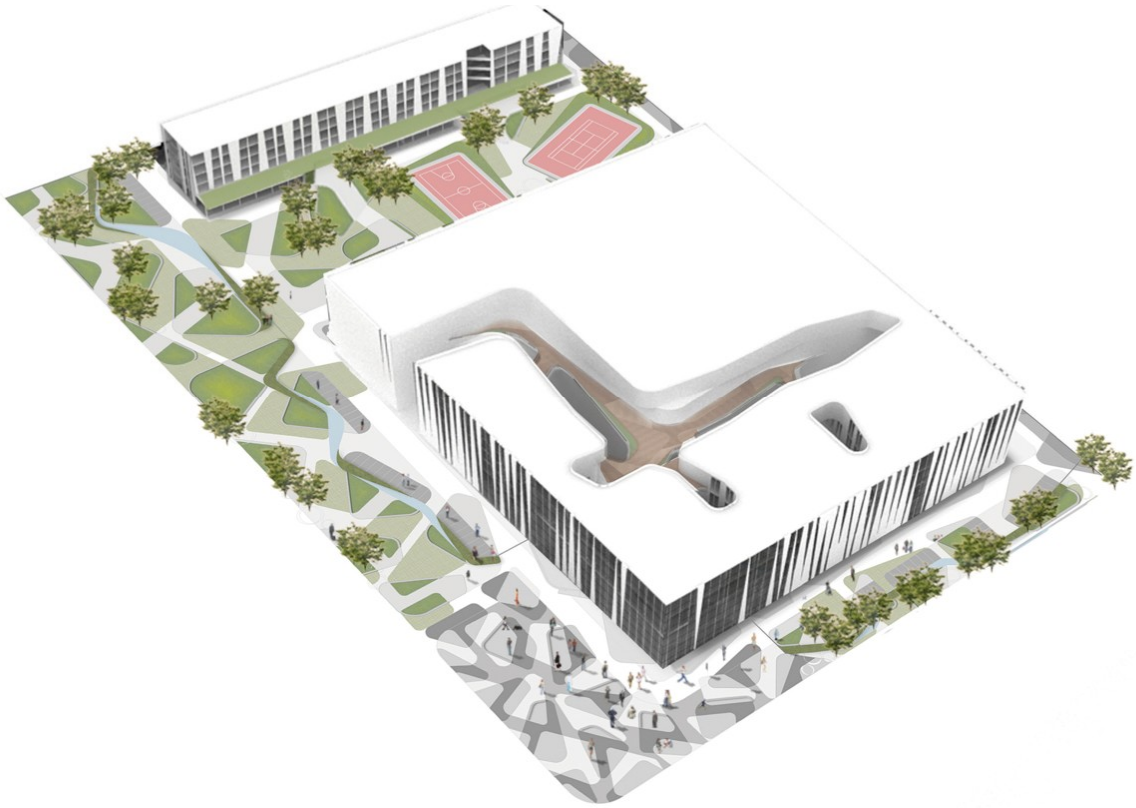


Figure3. 8 View of the structure.

KEY FACTS:

- To optimize the site, firm gather assembly, all business function under single roof, which results in a single stand alone building which represents strength and authority to the public.
- Material- the exterior is clad in a patchwork of anodized aluminium and concrete panels, broken up with slices of glazing at the centre of the complex is a courtyard like element that acts as an outdoor or informal space for the employees and the public.
- The space- splits in two level and surrounded by curved walls.
- It also designed to allow air flow in the complex.
- All in one roof.

Figure3. 9 Connectivity of spaces

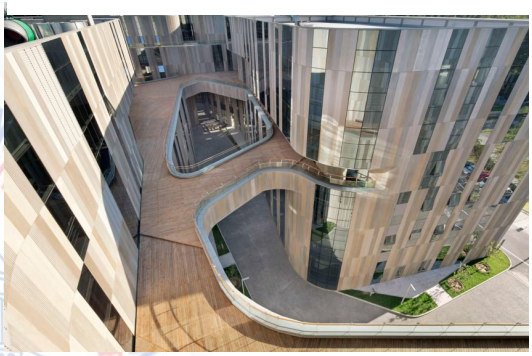


Figure3. 10 Connectivity of spaces

Figure3. 12 Internal view of levels

Figure3. 11 Natural light

Figure3. 13 Flow of design

Figure3. 14 Light effect at night

Case study of Textilmacher

Location: Munich, Germany

Architects: Tillich Architektur

Architect incharge: Kurt Tillich

Area: 1135 sq. M

Project year: 2013

Climate: Moderate

Topography: Flatland

Function: Company

Figure4. 1 View of the structure

"Textilmacher" – a company for textile print and embroidery

FEATURE AND MATERIAL:

- The iconic feature of the structure is that geometrically folded facade which shows an animated play of shadow and light.
- It is a module construction.
- The matt bright surface of pigmented concrete responds to its environment.
- Depends on season, time of day, weather and light incidence, facade continuously changes its character.

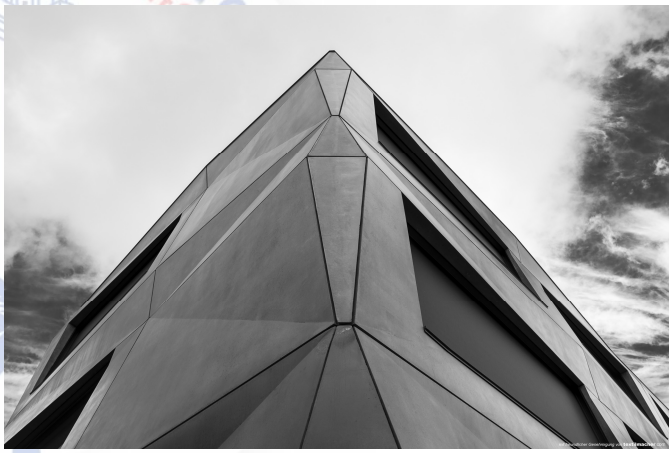


Figure4. 2 Showing facade geometry

PROGRAMME:

- PRODUCTION – GROUND FLOOR AND FIRST FLOOR
- OFFICES AND SHOWROOM – SECOND FLOOR
- STORAGE AND PLANT ROOMS ARE FOUND IN BASEMENT.

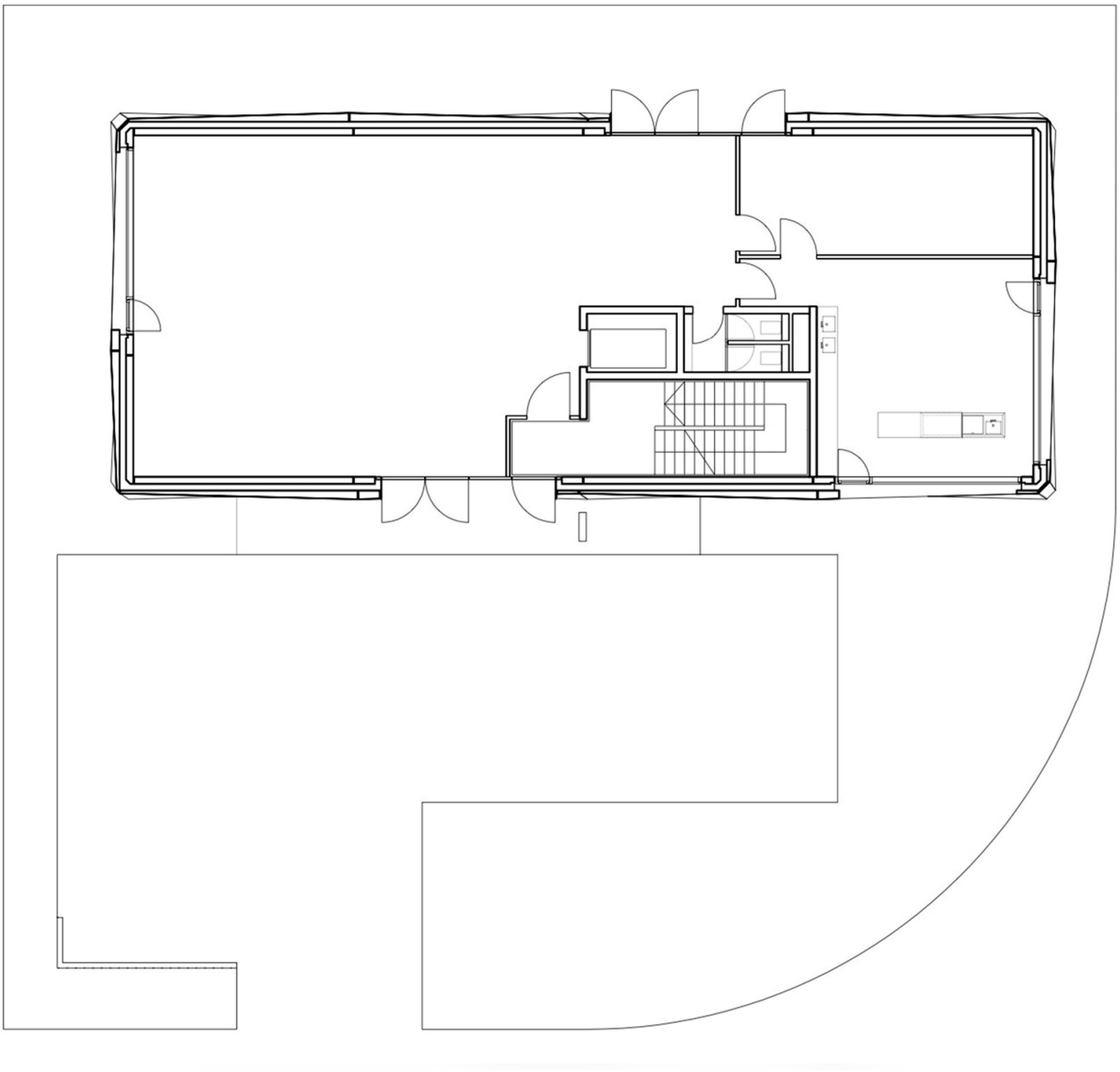


Figure4. 3 Plan of the ground level of the structure

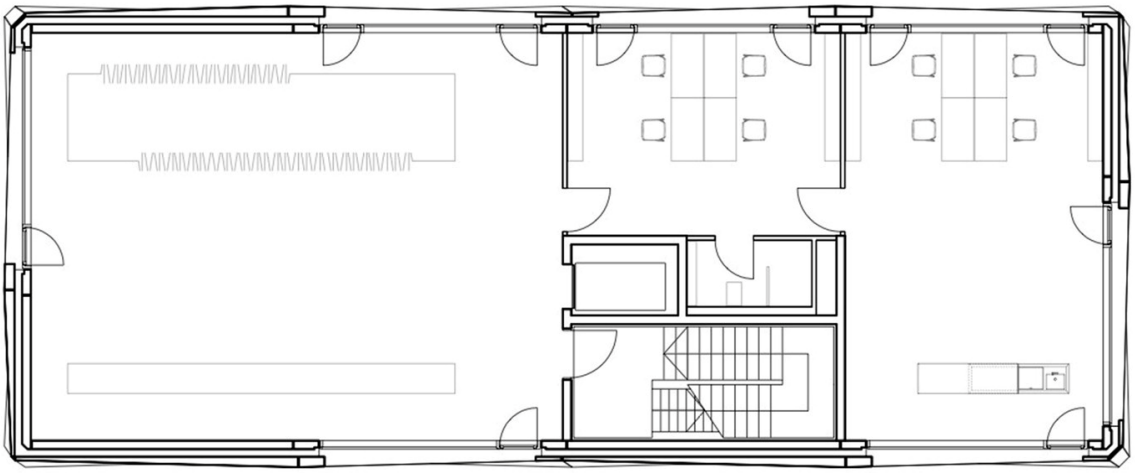


Figure4. 4 Plan of the 1st floor level of the structure

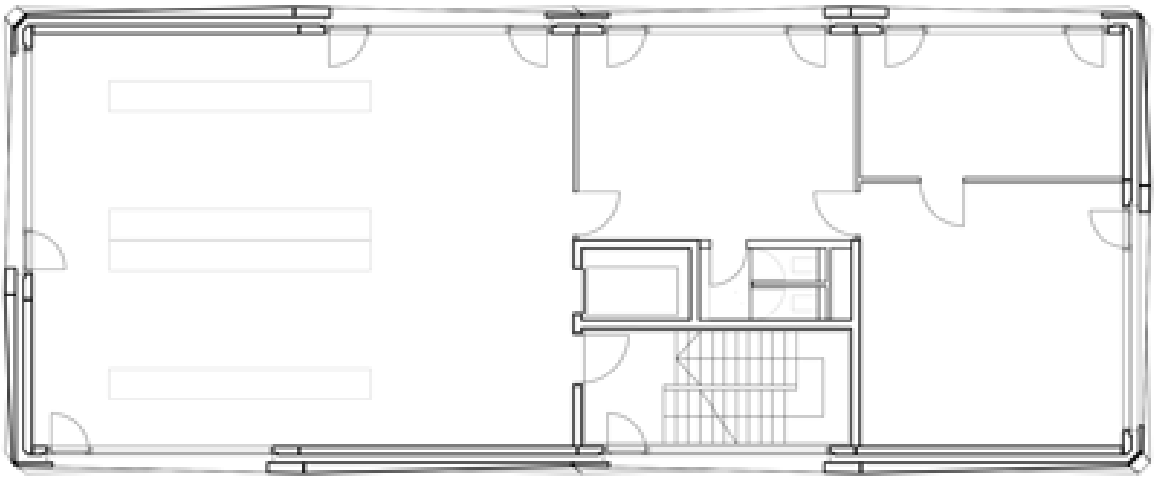


Figure4. 5 Plan of the 2nd floor level of the structure

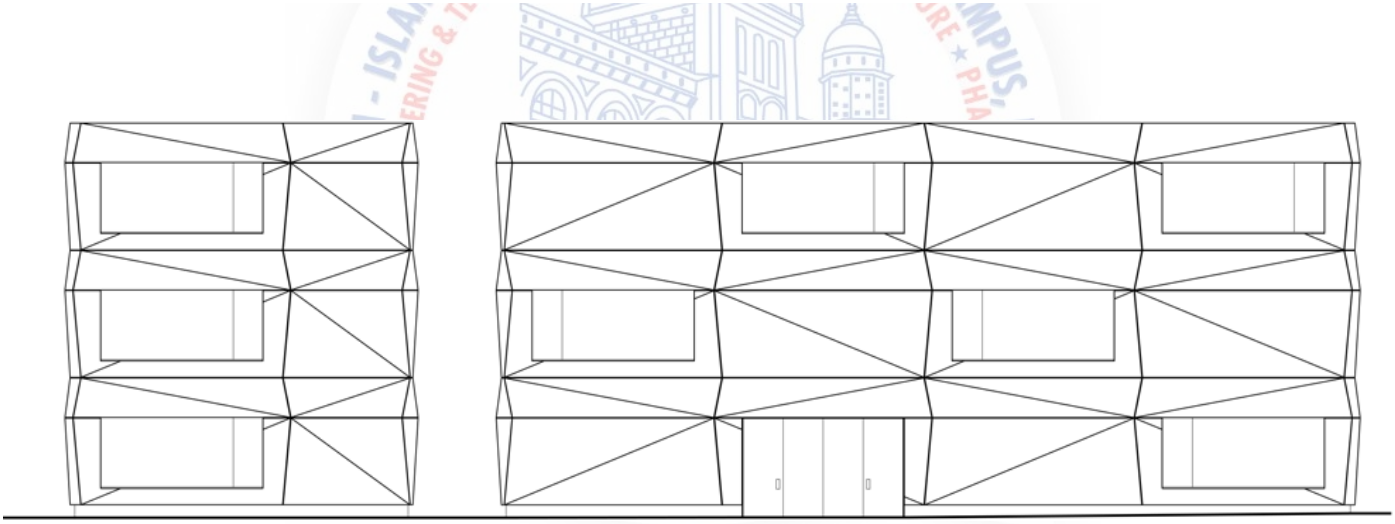


Figure4. 6 Facade simple line geometry

ANALYSIS:

- Smooth rectangular plan with proper function.
- Form follows function.
- Creative facade.

CASE STUDY OF CIDCO HOUSING

Location: Belapur, Navi Mumbai

Year: 1988- 1993

Site area- 9.5 hectors

Land type: Partially contour and flat land

Climate: Warm and humid

Type: Cluster housing

Area for shopping and school is about 2 hectors.

Figure5. 1 View of housing CIDCO

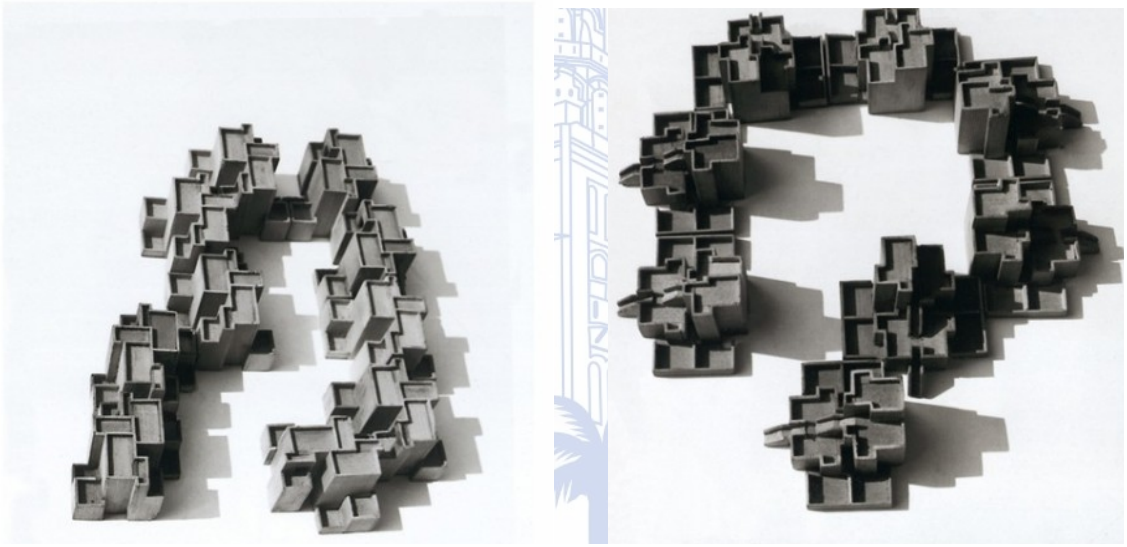


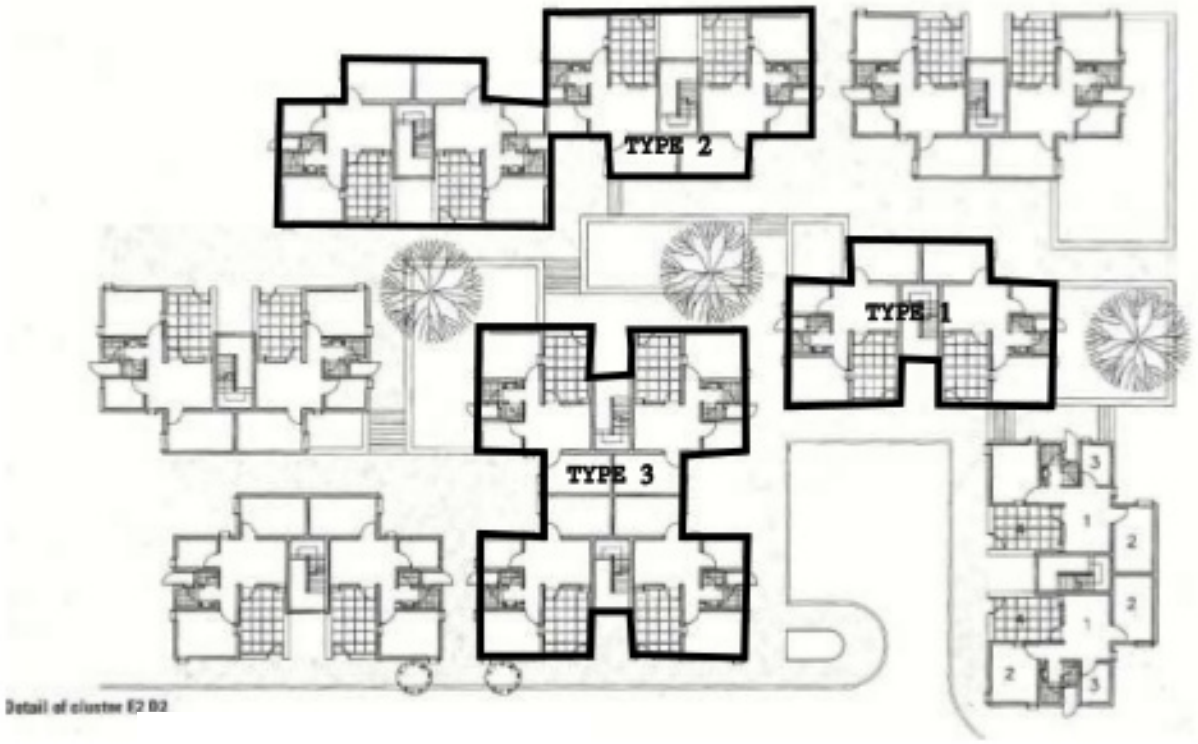
Figure5. 2 Concept of the housing

FEATURES:

- There is a requirement of 1048 apartments in a variety of one to two room units.
- It designed to create public place, semi public place and private place.
- Overall there are 55 units per acre.
- The unit size usually ranges from 20 square meters to 100 meter square meters.

CLUSTER E2 D2

GROUND FLR AND 1ST FLR-50 SQ.M (TYPE E2)
SECOND FLR-40 SQ.M (TYPE D2)
Small overhangs on the 1st flr provide for a roof terrace which also acts as a gateway.



CLUSTER B2 C2

Figure5. 3 Planning of units

- The block is composed of a
- Larger unit of 34 sq.m (type C) on the Ground floor and a smaller unit of 25 sq.m (type B) on the 1st flr.
- Private roof terrace for each unit.

- There is a sense of continuity and enclosers of movement are maintained throughout the scheme.

Figure5. 4 Planning of units

Figure5. 5 internal view

- It varies of 1 to 3 room units- 18 sq.m, 25 sq.m, 40 sq.m and 70 sq.m large.
- The design gives flexibility of contacting and meeting neighbours, friends and fellow residents throughout the day.
- Instead of building monolithic blocks , the project was developed like a dense urban settlement.
- The dwelling units are fragmented into smaller clusters creating a varied hierarchy of spaces on the sloping site which are interconnected by pedestrian pathways.
- The units are arranged such to create a network of courtyards and roof terraces fostering community interaction.
- The project was designed as a high density settlement to overcome the challenges of the limited land but also to create a high quality urban space derived from a largely naturally developed traditional village (which usually consists of squares, courtyards, terraces and balconies).
- Increased urban density was seen not as a challenge born out of necessity but a concept essential to create encounters.
- For an affordable project, one challenge was to use durable & reasonable materials.

Figure5. 6 Gathering space

Figure5. 7 Cluster of houses

- This was achieved through using a combination of concrete cavity blocks, exposed plasterwork, hand-made terracotta tiles and locally available rough granite stones for the base which can endure the hard indian monsoon.
- The creation of the traditional narrow street, linking all housing units, provides intimate encounters between people and a sense of belonging to the neighbourhood square. The interlocking courtyards accommodate different functions and create a micro climate within the site.

Figure5. 8 Cluster housing

- **Setting within the urban context:** roads needed to be moved to the periphery to allow footpath connections within the development.
- the site can be accessed from all sides from the outside, and people can easily pass through the various building groups increasing interaction.
- Thus, the planning of the housing project accommodated high level of social interaction in everyday life where the residents are in intensive contact with the other occupants throughout the day and life takes place to a large extent on the street. When planning the chain of 'molecules', great emphasis was laid on the connections implied by communally used spaces. Courtyards turn individual blocks into chains, modules are set very close together, blocks with courtyards are grouped as quarters
- Rewal explored the basic architectural elements of a village and incorporated it in his architecture on a larger scale. The result is a highly sophisticated residential unit with complex spatial diversity with varied storied buildings staggered on the sloping site

CASE STUDY OF GLEN MOR - STUDENT APARTMENTS

Location**:** Riverside, Ca, U.S., University of California

Capacity: 500 students

Area: 17,797 sq.m

Topography: Flat land

Climate: Hot and dry

Figure6. 1 View of glen mor apartments

PROGRAMME:

Parking- bike, car and cycle

Laundry rooms

study rooms

Gaming lounge

Lockers facility

Resident services area

Bbq

Pool

Computer lab

Programme activities

Convenience store

Kitchens

Cafe

Figure6. 2 View of glen mor apartments

Figure6. 4 Open space between the structures

Figure6. 3 Interior of the apartment

FEATURES:

- Single block has 4 rooms with common seating area and kitchen/dining area.
- 1 toilet block is given for 2 room residents.
- Area of room: 112 sq. Ft per bedroom.

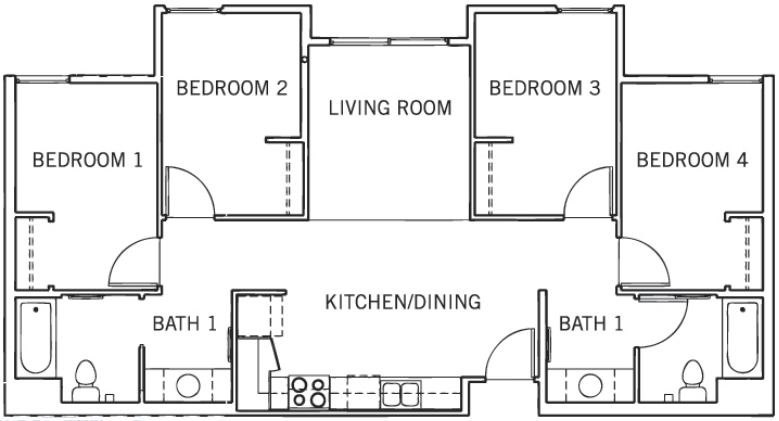


Figure6. 5 Schematic plan of unit

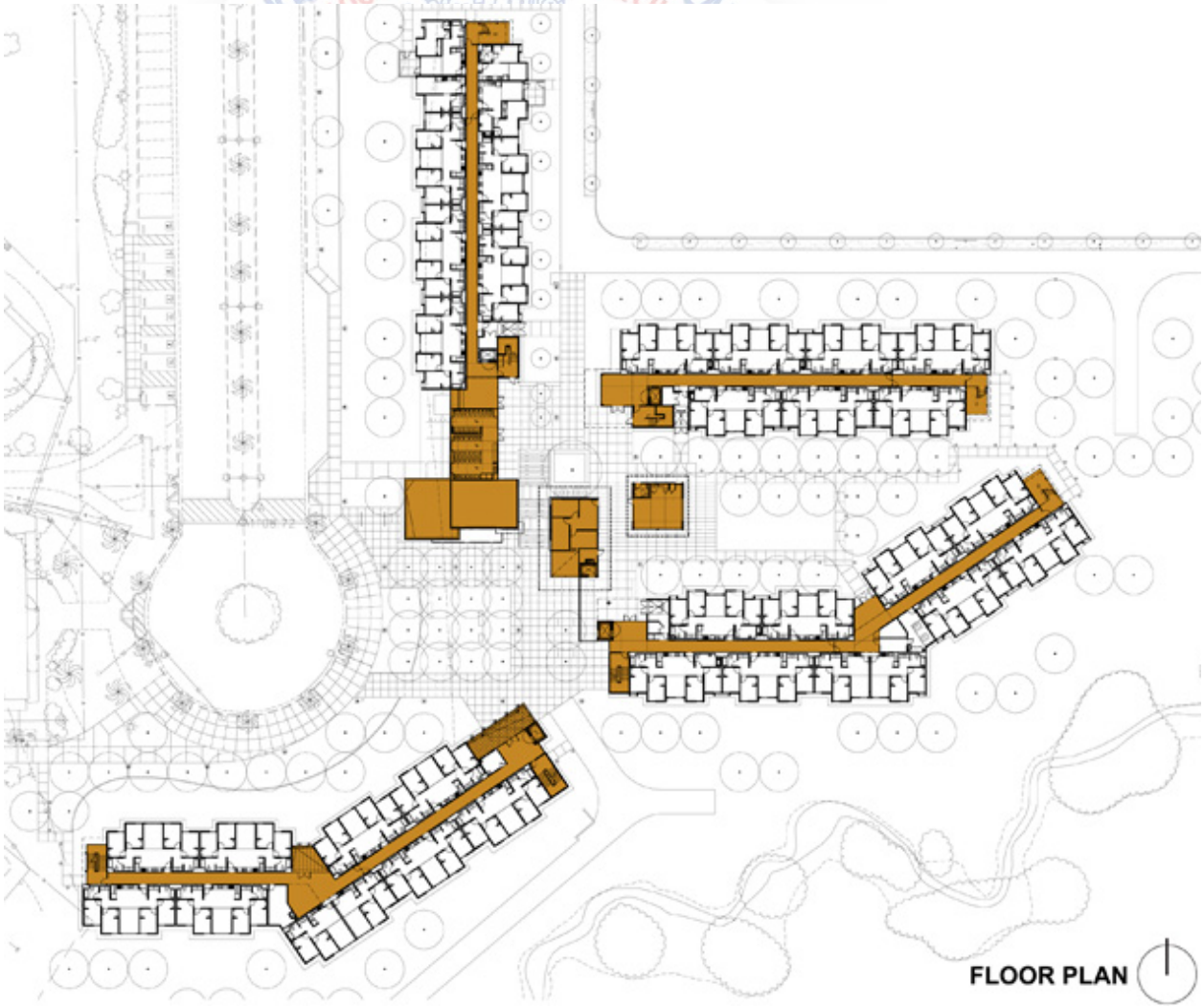


Figure6. 6 Floor plan of the structure

Figure6. 7 Site plan

ANALYSIS:

- There is proper ventilation in the structure.
- Open spaces are properly segregated within the site.
- There is a good quality of space in the surrounding as well as inside the structure.

Case study of proposed textile park in bhiwandi

- Name: Sri Rajlaxmi Textile Park.
- Location: Chavindra, Agra road, Bhiwandi, Thane
- Topography: Flat land
- Climate: Warm and humid

Figure7. 1 Proposed Textile Park plan

PRODUCTION ESTIMATED:

96 NO'S OF LOOMS SHED.	4800 NO'S OF LOOMS	1920 NO'S OF WORKERS	2,88,000 METER OF CLOTH PER DAY.
4 NO'S OF TWISTING SHEDS	17 NO'S OF TWISTER	34 NO'S OF WORKERS	17,000 OF YARN PER DAY
6 NO'S OF SIZZLERS SHED	18 NO'S OF SIZZLER MACHINE	90 NO'S OF WORKERS	3,60,000 NO'S OF ROLL PER DAY
28 NO'S OF GARMENT UNIT	1800 NO'S OF STICTHING MACHINE	2000 NO'S OF WORKERS	3,600 NO'S OF GARMENTS PER DAY
10 NO'S DEINGS UNIT	60 NO'S OF MACHINE	500 NO'S OF WORKERS	4,00,000 METER OF CLOTH PER DAY.

FEATURES:

- Plan approved by the B.N.C.M.C. under industrial zone.
- Special promotional and financial incentives like industrial promotional subsidy, interest subsidy, exemption from electric duty, waiver on stamp duty and others depending on case.
- Octroi free area- as per B.N.C.M.C. resolution no 26a.
- 100 mw electric substation within complex by M.S.E.B.
- Fire station within the complex.
- Maharashtra pollution control board approval under orange category.
- A proposed eco friendly power generation plant within complex.

Case study of Ipekyol Textile Factory

Architects: Emre Arolat Aarchitects (EAA) Istanbul, Turkey

Clients: Twist textile Edirne, Turkey

Building type: Industrial facilities

Commission: 2004

Design: 2004 - 2005

Construction: 2005 – 2006

Occupancy: 2006

Site: 38,940 m2

Ground floor: 14,480 m2

Total floor: 20,000 m2

Costs: 17,500,000 usd

PROGRAMME:

This building accommodates both the administration and production services of the factory. Co-locating these services in the same building, treating them with the same architectural style, has helped reduce hierarchy. The large building mass is broken down by linear gardens between building sections, and this has a dual benefit. Firstly, the gardens provide recreational spaces for staff during their breaks. Secondly, they allow natural light and air into the workplaces. The building is 150m x 100m on plan and 14m high containing production facilities, a training school, and administration areas and catering. A surface car park, an external play area and plant room is located on the outside. Building data ground floor area 14,480m² first floor 5,520m² canteen circa 350m² (included in ground floor) training area circa 1,000m² (included in first floor)

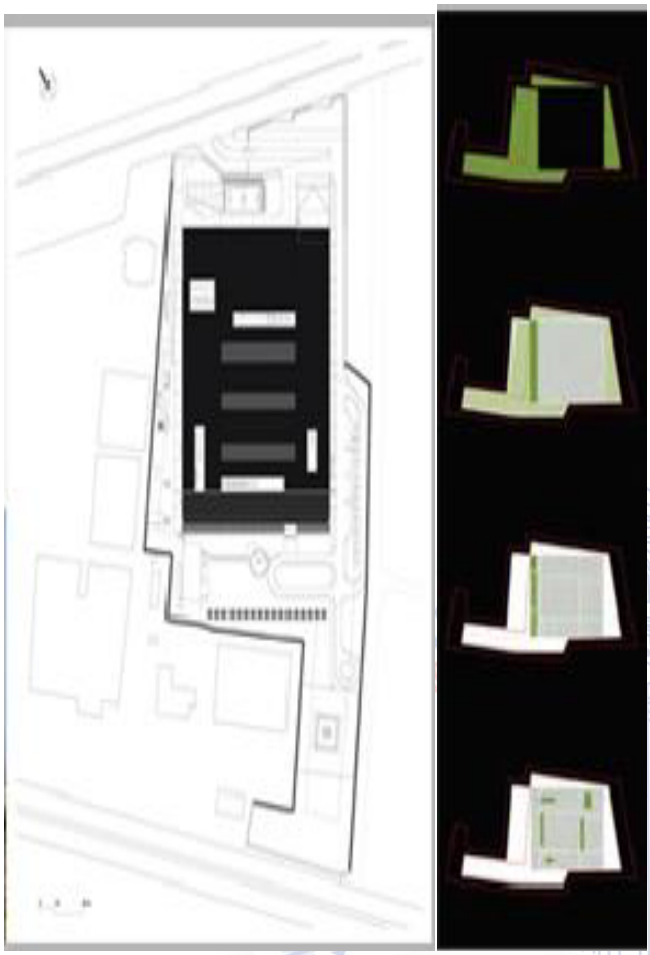


FIGURE8. 2 Site plan showing massing

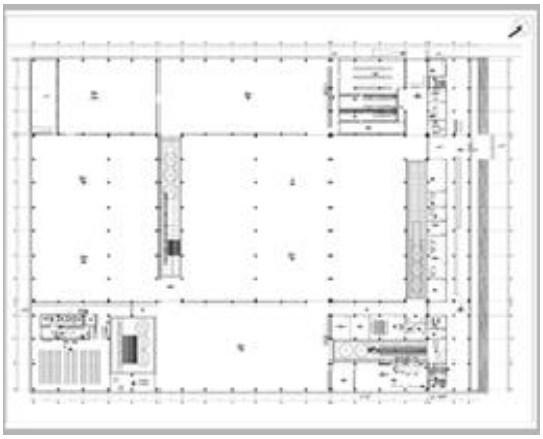


FIGURE8. 1 Ground level

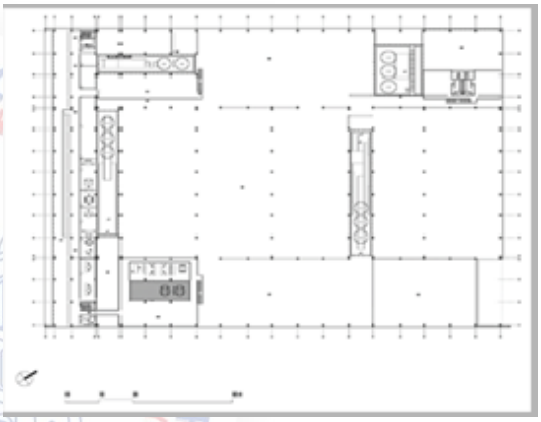


FIGURE8. 4 1st floor level

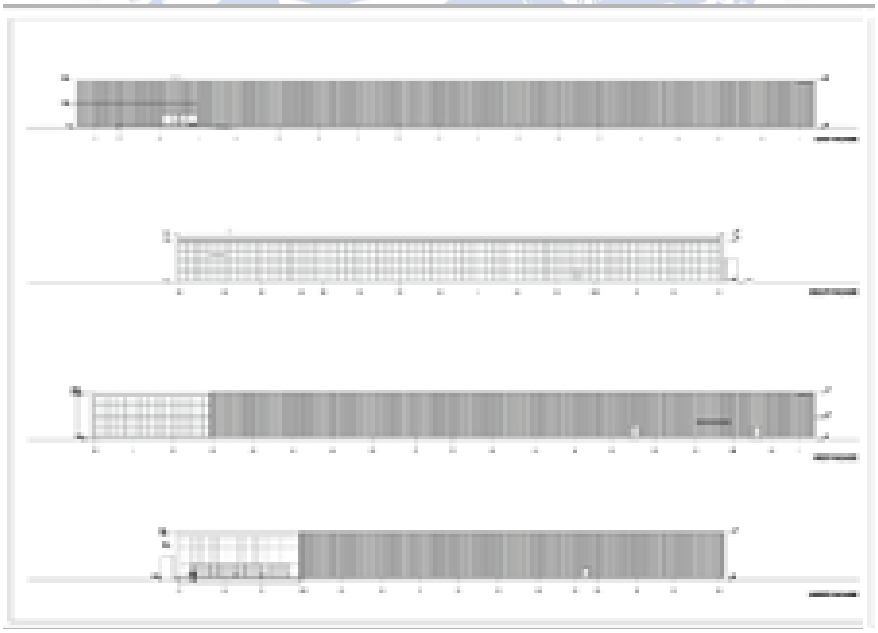


FIGURE8. 3 Elevations of the structure

PROJECT DESCRIPTION:

For the design of Ipekyol textile factory building, the service entrance leads into the building from the road to Kirklareli and pedestrian access from the busy e-5 highway on the other side. The sales unit, situated close to the road, again in the direction of the e-5, was connected to the main building by an overhang which covered and thus defined the walkway. The administrative section, which commonly is visually detached from the production building through the use of different surface languages, due to the conventional approach to such facilities, was more directly associated with production in this project and thus, instead of different buildings a large mass took shape. This mass, which reaches the outer borders of the lot, because of the constraints of the land, was implicitly loosened thanks to linear gardens located between sections. The main purpose of these gardens was that they be used by the staff during breaks and that natural light and air enter work places; it was intended that the gardens separate areas and that thanks to their transparent frames visual fluidity would be achieved.

FIGURE8. 5 Cafeteria transparent to opaque building facade

FIGURE8. 5 Administrative area

FIGURE8. 7 Football ground for staff

FIGURE8. 8 Manufacturing area

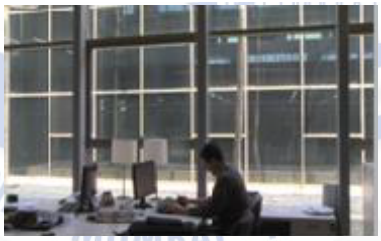


FIGURE8. 6 Office areas

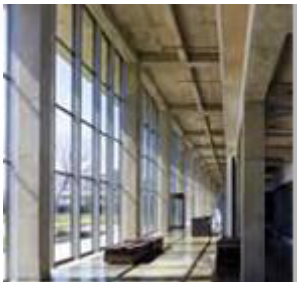


FIGURE8.10 Inner gallery

MATERIALS, STRUCTURE AND CONSTRUCTION:

Due to the limitations of local production possibilities, innovative experimentations in building materials and production methods were especially avoided. As are usually used in similar buildings, here too the main components were the vertical reinforced concrete load-bearing systems, a light weight steel structure cover placed on top of them, and the coffered system on the façades; and the exterior surface took shape through a grammar established by the clear distinction between areas open or closed to the exterior**.**

FIGURE8. 11 Exposed detailing & Production hall

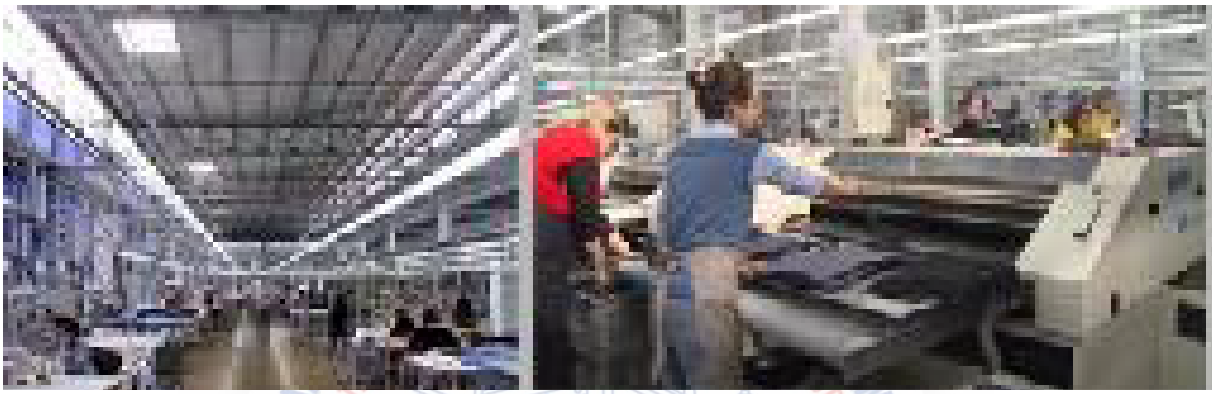


FIGURE8. 12 Production hall & manufacturing area

The interior design and finishes have been carefully considered to reflect the use of each space, provide a sense of high quality and at the same time with low maintenance needs. This is achieved by the use of exposed concrete in most areas which is sealed, and the application of highly polished polyurethane sealing lacquer to all walk able finishes with particular consideration to floors. The administration floors are also treated in the same way to avoid the need for carpets. All wall finishes are exposed and lightly colored to take advantage of the transparency of the building, whilst exposed concrete and steelwork can be seen in all ceilings.

LANDSCAPING:

The architect had also designed stand alone screen walls along this boundary as a feature of privacy, acoustic protection and as bill boards. The strongest feature is a water pool that runs along the full length of the south gable glazed wall and a tree line (not nurtured) on the southern boundary to mask the existing buildings. This feature provides some cooling effect through evaporation during the summer but was primarily designed to welcome visitors and encourage a mood of calmness while reflecting the glazed wall and overhang on this elevation. The plant room along the eastern edge is

also cleverly camouflaged as an object in the landscape. All exterior paving and tiling is robust with the local precast pavers concrete and tarmac.

FIGURE8. 13 External view of the building and north west facade

FIGURE8. 13 Inner gardens

PROJECT SIGNIFICANCE:

The administrative and production departments were solved in the same space without any hierarchy and it consists a great variety of recreational spaces for the goodness of stuff such as the inner gardens which they usually use during breaks, football field, cafeteria etc construction technology the wise choice of system and material meant that local skill and method were used throughout. The factory is very clean and tidy and in conversation with the employees, students and maintenance staff, it became very apparent that they are very pleased and happy to be working in such a wonderful environment and 'prefer to stay there rather than go home', according to one.The arrangements of all plant by the structural grids and internal gardens makes it not only a safe environment, which is easy to understand, but one that encourages communications between different parts of the production systems and instills a pride in all the workers. coffee breaks when all the personnel gather in a very light and spatial cafeteria in the north-west corner. Visibility from the design and administration mezzanine into the factory is very successful.

CASE STUDY OF MULTIPURPOSE BUILDING

LOCATION: DR ANNIE BESANT ROAD,

WORLI, MUMBAI - 400018.

NAME OF THE PROJECT: NEHRU CENTRE.

ARCHITECT: AR. I. M. KADRI.

YEAR OF CONSTRUCTION: 1977

AREA OF SITE: 6 ACRE.

THE APPROACH TO THE NEHRU CENTER IS FROM THE ROAD ON ITS WEST SIDE.

Figure9. 1 Google image bird's eye view of the structure

ABOUT NEHRU CENTRE:

TOPOGRAPHY OF LAND: FLAT LAND.

CONSTRUCTION STARTED ON 14 NOVEMBER 1973 AND FINISHED ON JANUARY 1986.

TYPES OF USES: OFFICE, EXIBITION SPACE, LIBRARY, CONFERENCE HALL, SEMINAR ROOM, RESTAURANTS AND AUDITORIUM.

AUDITORIUM HAS A SEATING CAPACITY OF 934 SEATS WITH GOOD ACOUSTICS.

THE CIRCULAR GALLERY WITH 45 RUNNING METERS FOR DISPLAYING WORKS.

THE ART GALLERY IS OF 750 SQ.M.

SURROUNDINGS:

NEHRU PLANETORIUM

APPROACH ROAD

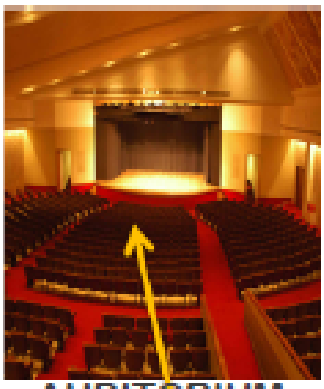
SITE

MARIAMMA NAGAR

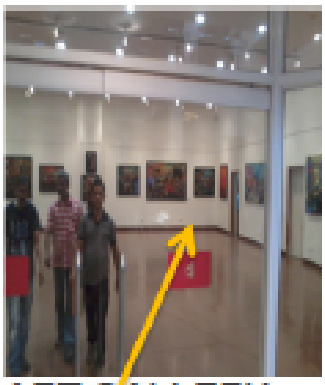
SARDAR VALLABHAI PATEL STADIUM

Figure9. 2 Exhibition space, Art gallery, Auditorium, Exhibition hall

WORKSHOP

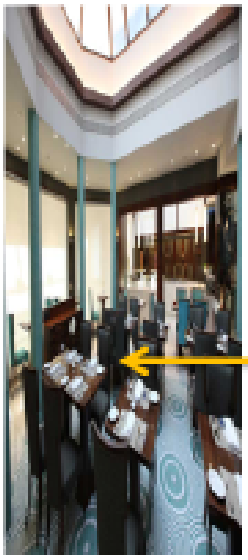


AUDITORIUM

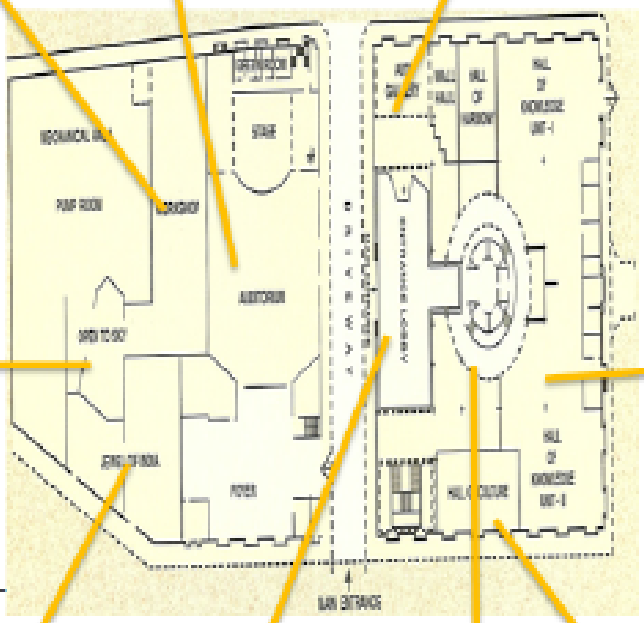


ART GALLERY

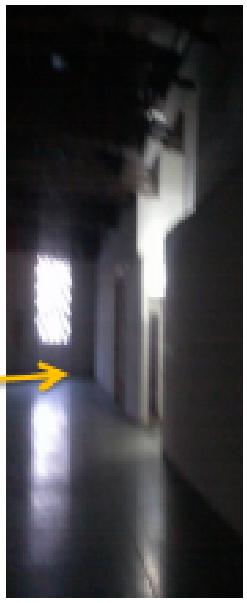
E



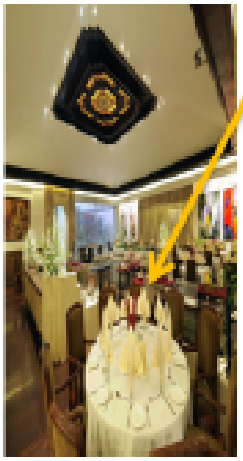
RESTAURANT



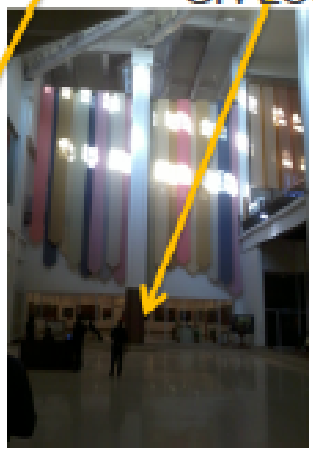
G. FLOOR PLAN



BANQUET HALL

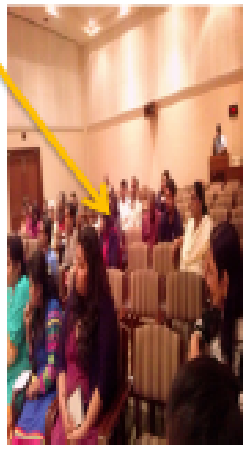


WORKSHOP

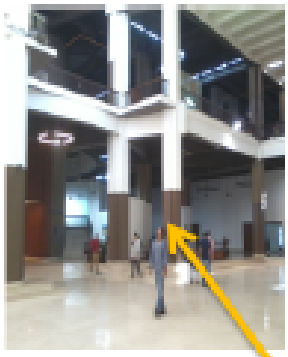


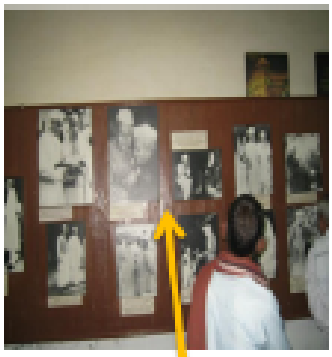
ENT LOBBY

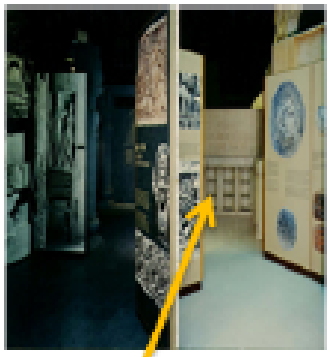
STRUCTURE CORE



HALL OF CULTURE







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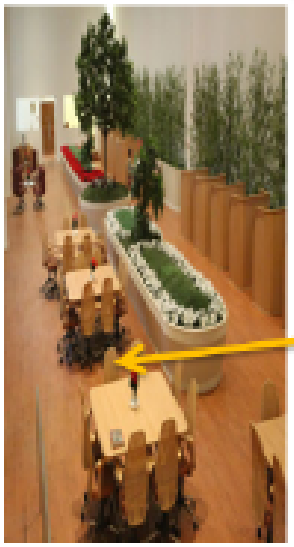
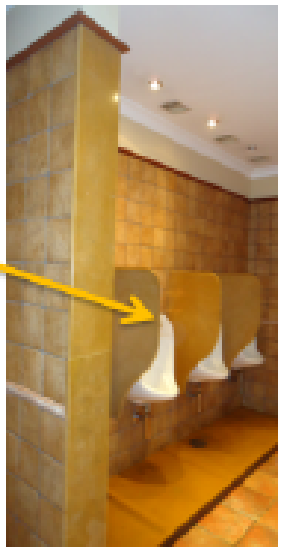
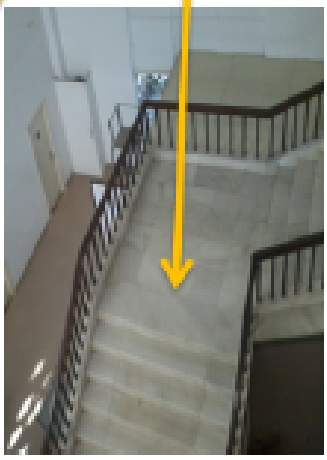
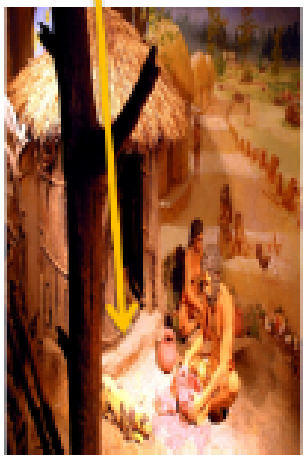
FOYER

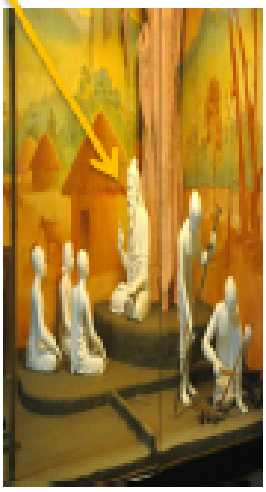


1ST FLOOR PLAN

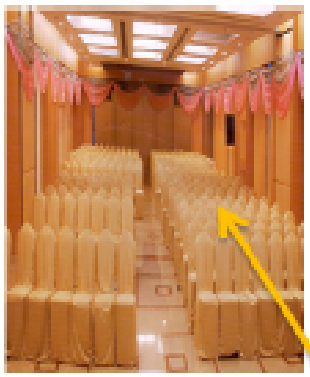




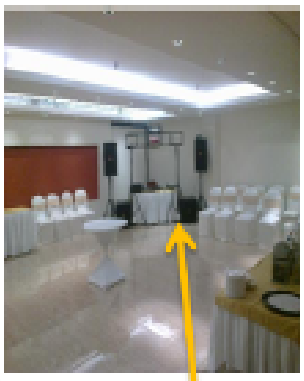




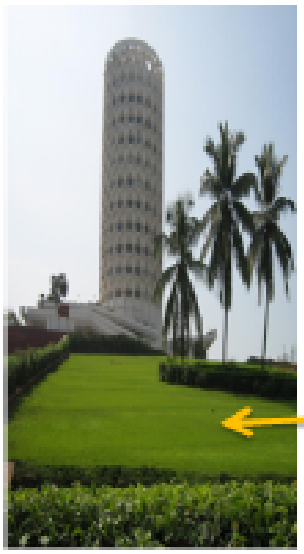
SKYLIGHT



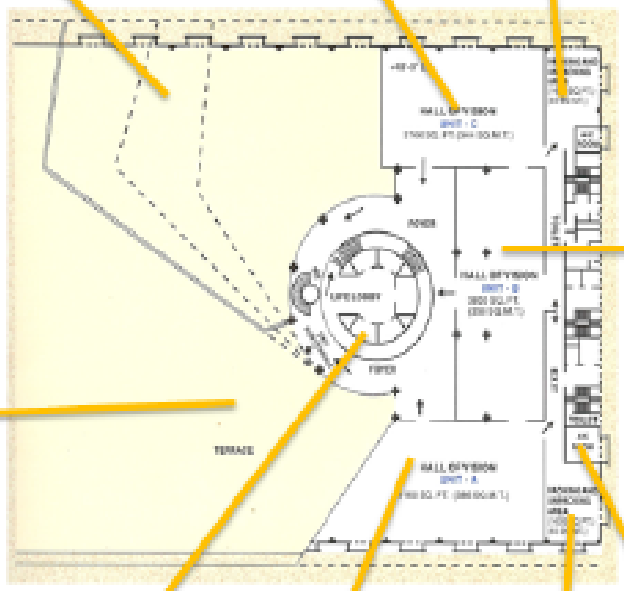
HALL OF VISION



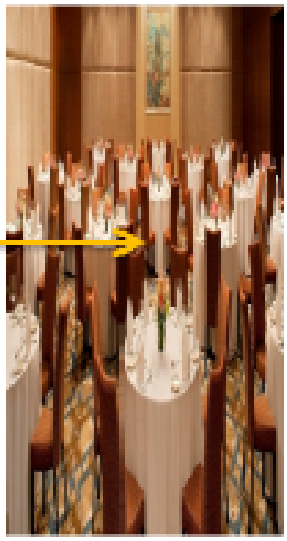
PACKING AREA



GARDEN



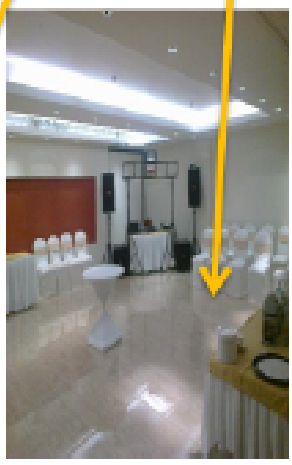
2ND FLOOR PLAN



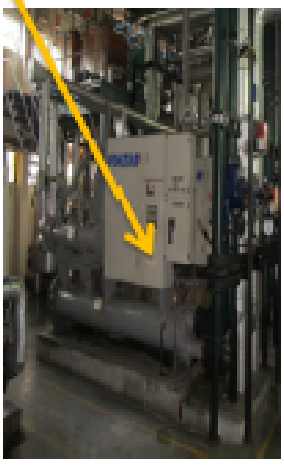
HALL OF VISION

STR. CORE

HALL OF VISION



PACKING



AC ROOM

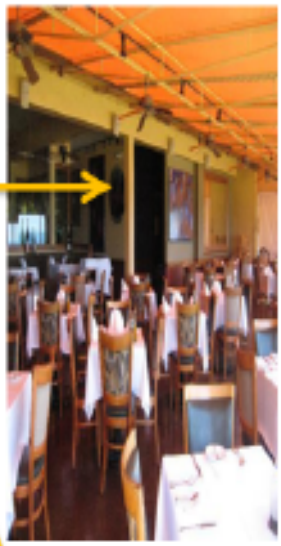
VIP LOUNGE

GARDEN EAST

KITCHEN

STAIRS

3RD FLOOR PLAN



DINING

RESTAURANT

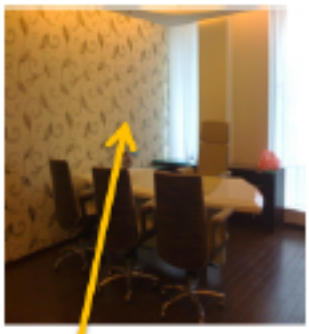
GARDEN WEST

KITCHEN

STAIRS

LIFT

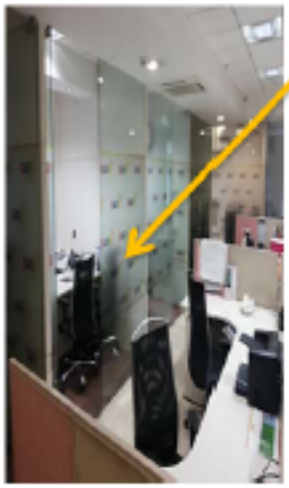
CONFERENCE



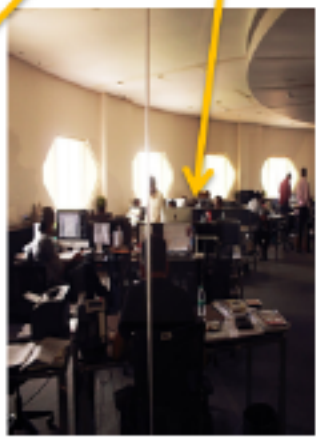
CHAIRMAN CABIN

RECEPTION

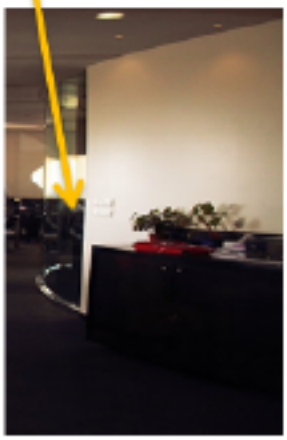
STAIRS



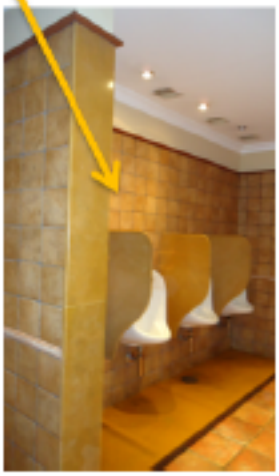
EXECUTIVE CABIN



WORK STATION

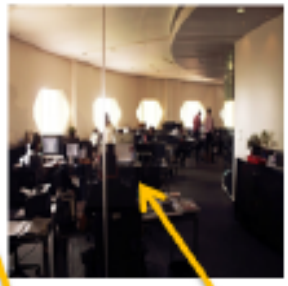


MEETING ROOM



TOILET

LIBRARY

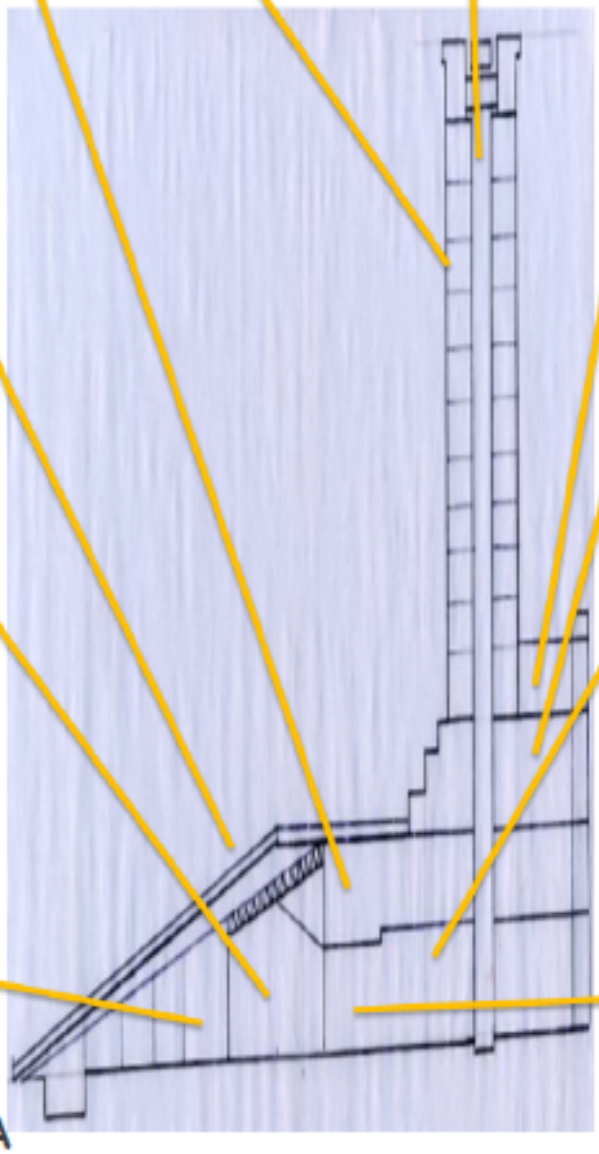


OFFICE BLK

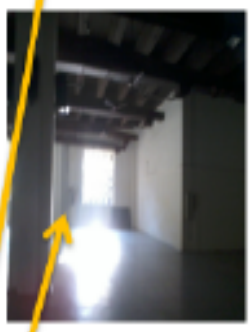
ST. CORE

GARDEN

LAWN

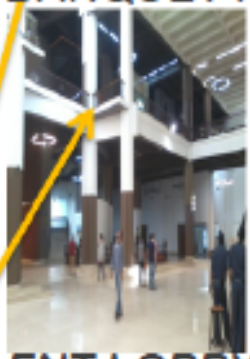


SCHEMATIC SECTION



BANQUET HALL

AUDITORIUM

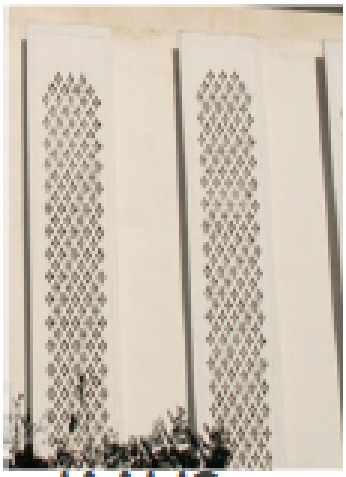


ENT LOBBY

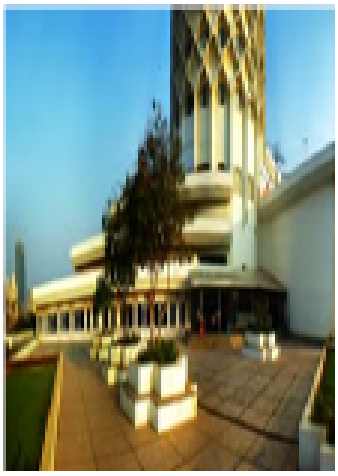
EWEL OF INDIA

ENTRANCE

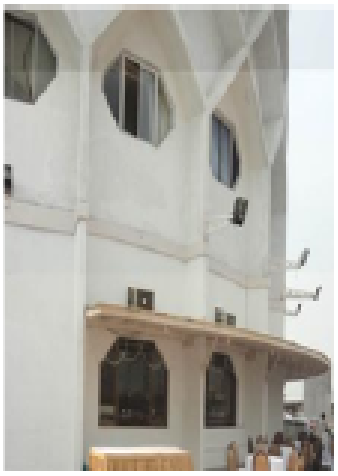
MATERIALS:



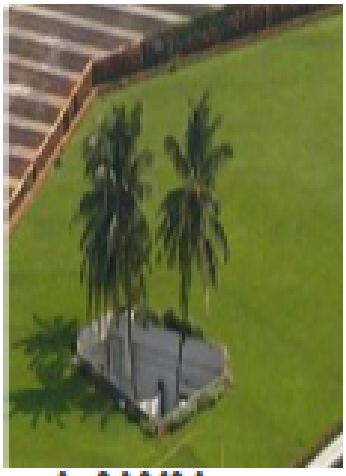
JAALIS



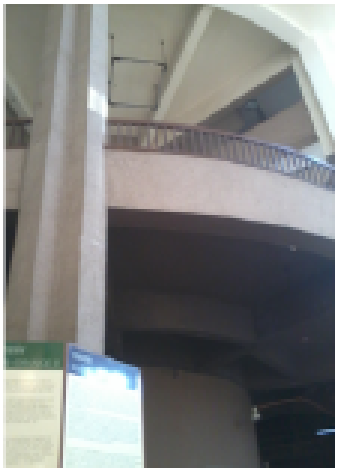
CONCRETE BLK



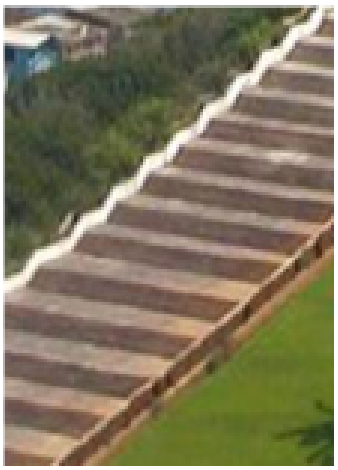
RCC GRID PATT



LAWN

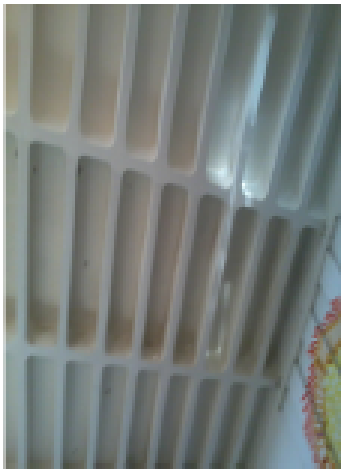


SPIRAL STAIRS

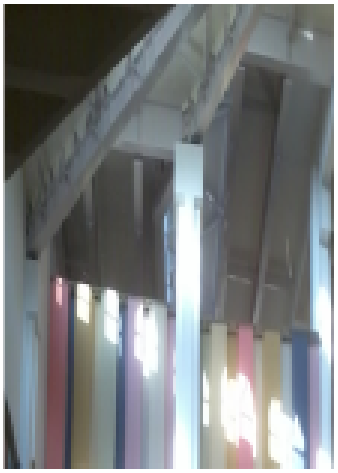


REDOXIDE PAVI

SKYLIGHT

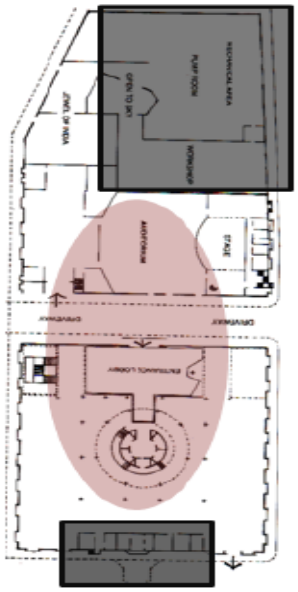


WAFFLE SLAB

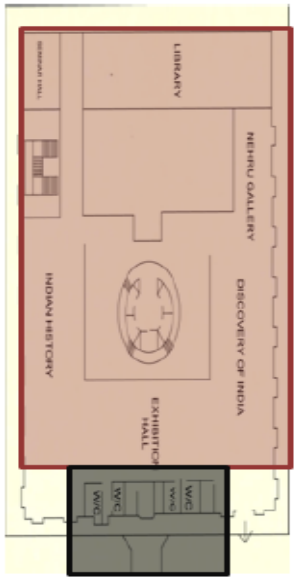


STEEL TRUSS

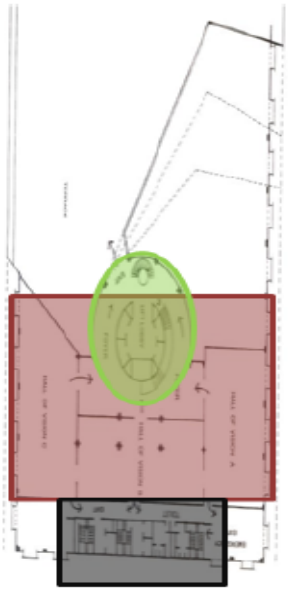
CIRCULATION:



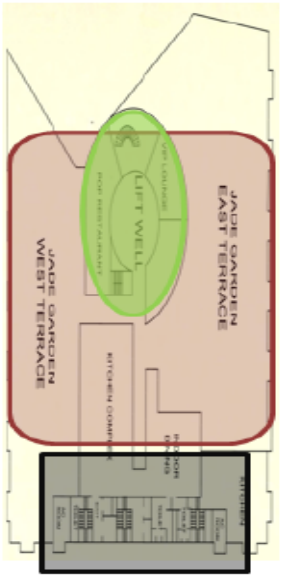
G.FLOOR PLAN



1ST.FLOOR PLAN



2ND.FLOOR PLAN

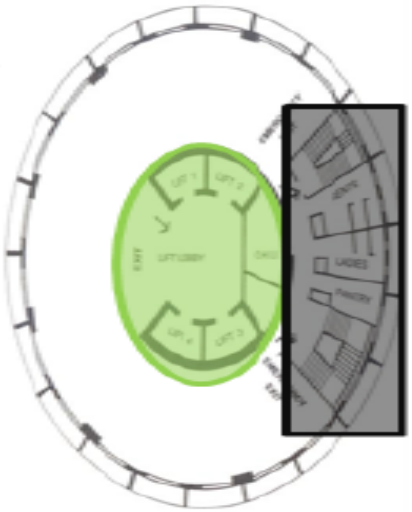


3RD.FLOOR PLAN

CIRCULATION

PUBLIC

SERVICES



TYPICAL FLOOR PLAN

- Ground floor consists of auditorium, jewel of India, restaurant, art gallery, circular gallery, banquet hall, seminar hall and cafeteria.
- First floor consist of various exhibition spaces like Nehru gallery, discovery of India, Indian history and also consist of library and seminar hall.
- Second floor consist of 3 different banquet halls.
- Service area is provided for proper flow of services.
- Third floor consist of terrace garden which is known as jade garden.
- Typical floor plan consists of only office block.
- Lawn is provided with step which gives access to the garden.
- Jalis were provided with various designs in banquet hall and various exhibition spaces.
- R.c.c grid pattern acts as an aesthetic for elevation.
- Perfect blend of nature and aesthetic.
- Skylight are provided for proper light and ventilation.

Figure9. 3 Exterior view of the structure

ANALYSIS:

- Nehru culture center is a multi- functional building.
- It consists of various exhibition spaces as well as seminar hall and banquet hall.
- Building also consists of auditorium, restaurant and cafeteria.
- Jalis are provided for proper light and ventilation.
- Skylight is also provided in the entrance foyer.
- Fire safety measures are also taken in care by providing fire escape staircase.
- Building consist of a single circular structure core
- This increases the efficience of design.
- Well segregation of function as per use of the client.
- Mechanical workshop and pump room are provided in the ground floor.
- Staff room with cafeteria and lift room are provided in the 15th floor of the building.

CASE STUDY INFERENCE:

- The most important advantage of case study is that it simplify complex concepts.
- With the help of the above case studies, one can get the idea of the spaces and areas which should be present in the structure.
- The following case studies will help in generating space programme for the selected topic.
- It helps in designing a space of good working environment.
- Proper allowance of natural light inside the structure and proper ventilation.
- It also helps in creating a space for good functioning of the space.
- To install Creative façade which will attracts the individuals.
- To provide certain amenities for the workers which will enhance their moods.
- To look after the basics of each and every aspects of designing.
- It gives the idea of using construction materials wisely.
- It also helps in understanding of construction technologies.

Basically the final product of this thesis topic will be the outcome of the understanding and appreciation, interpretation, absorption, conception and digestion of these case studies.

CLIMATIC DATA:

- This is the mean monthly wind speed (meters per second).

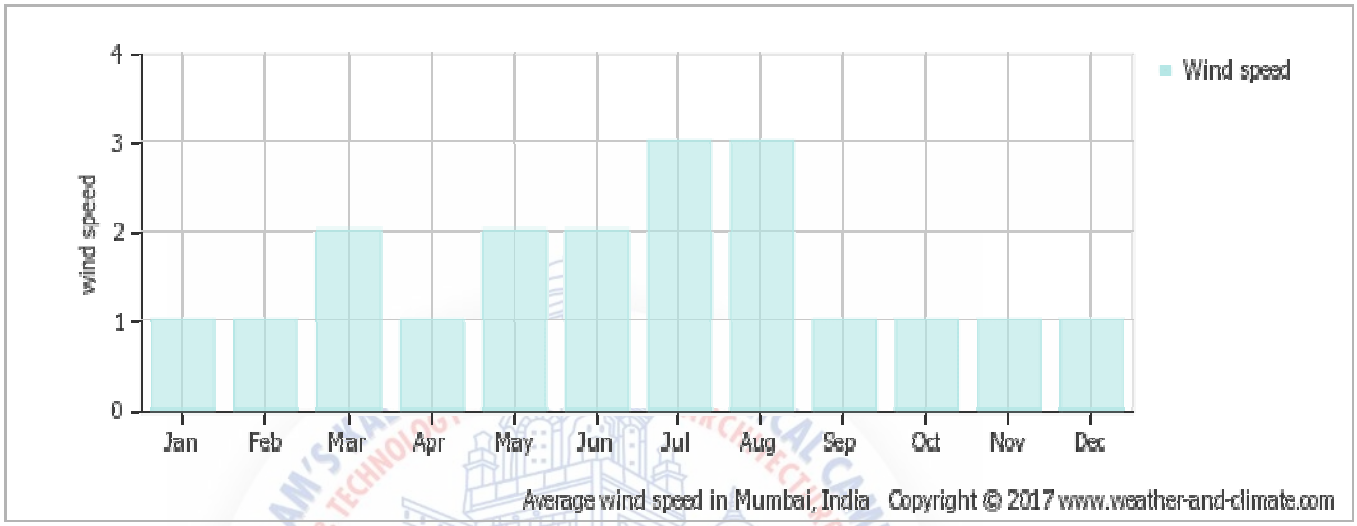


Figure10. 1 Graph showing the wind speed throughout the year.

- This is the monthly total of sun hours.

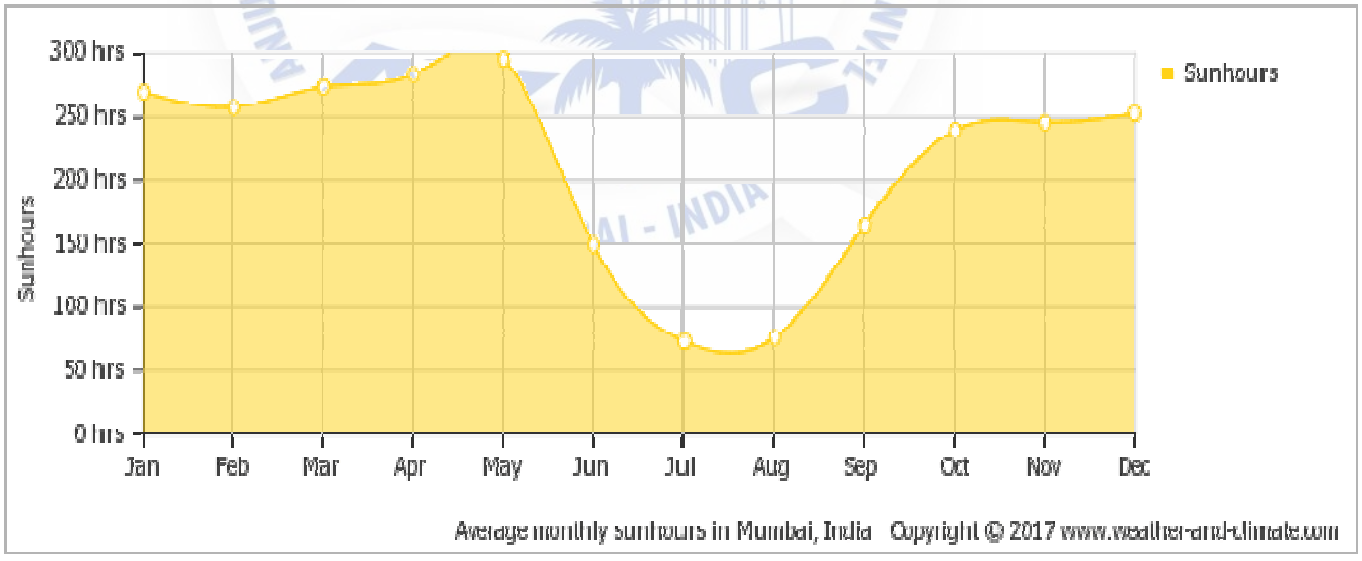


Figure10. 2 Graph showing sun hours of entire year

- The monthly mean water temperature.

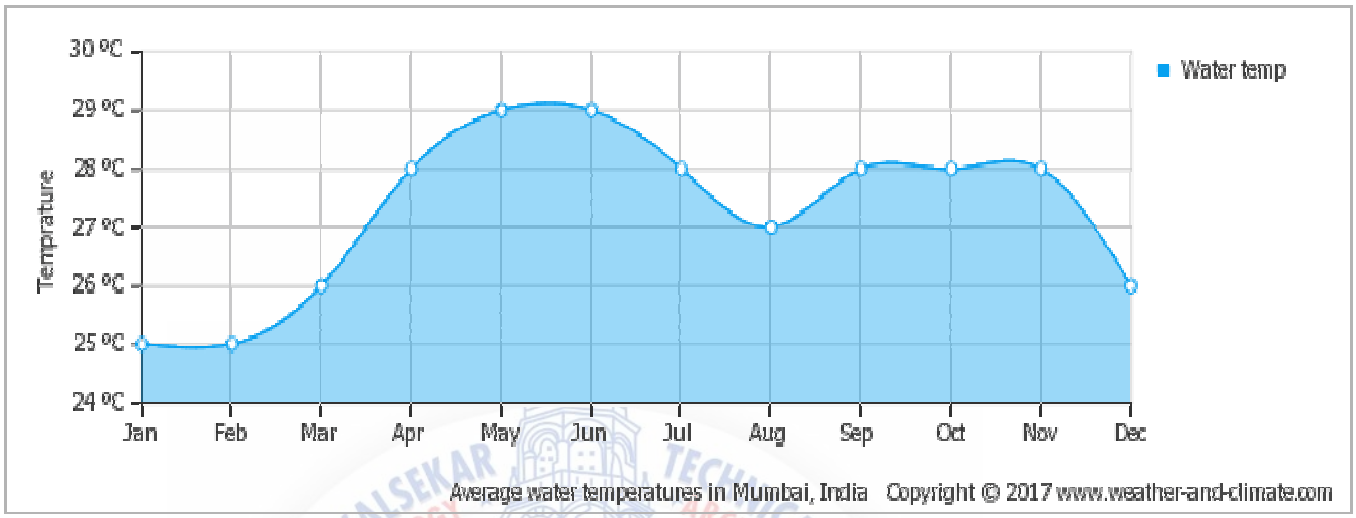


Figure10. 3 Graph showing water temperature

- With an average of 30.4 °c, may is the warmest month. At 23.3 °c on average, January is the coldest month of the year.

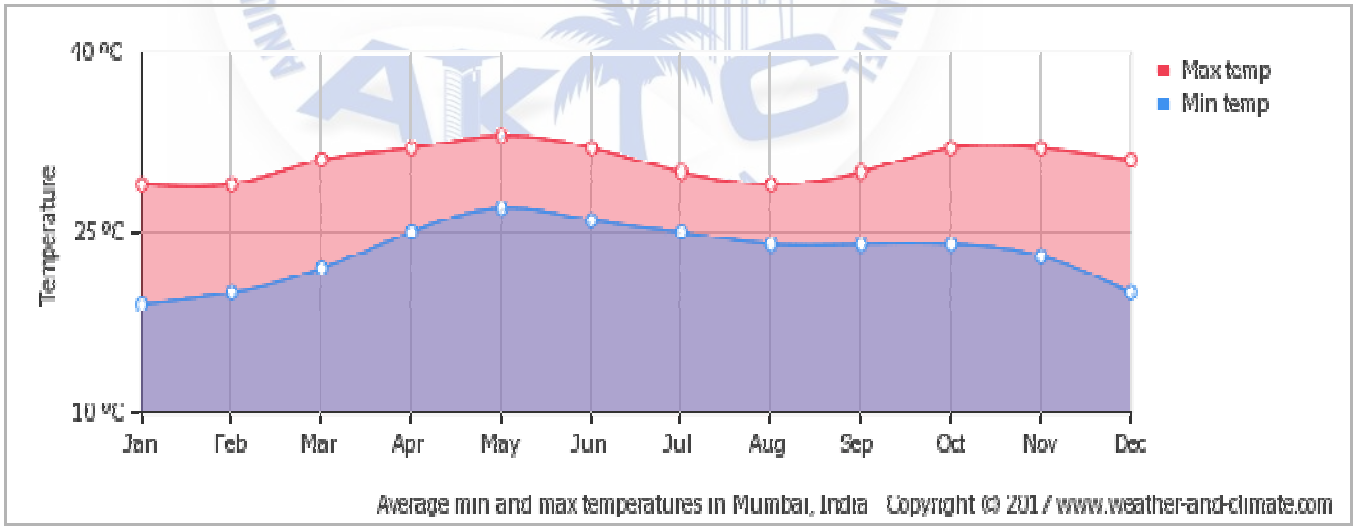


Figure10. 4 Graph showing average minimum and maximum temperature

- The precipitation varies 1060 mm between the driest month and the wettest month. The variation in annual temperature is around 7.1 °c.

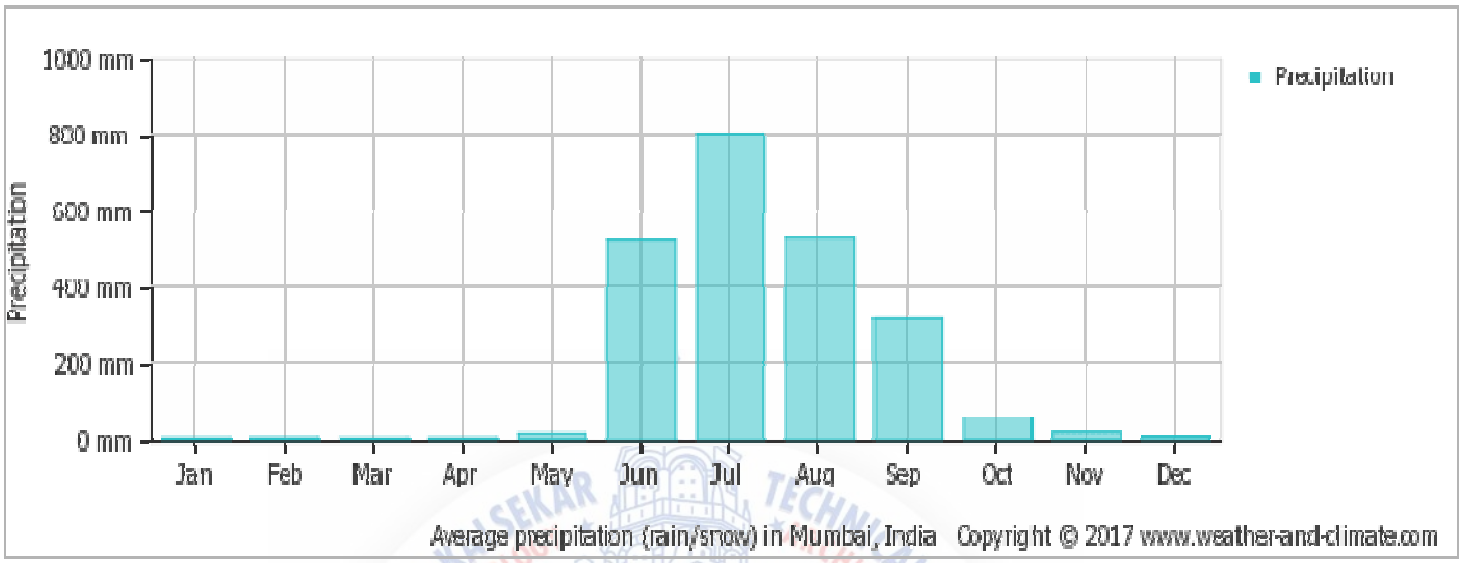


Figure10. 5 Graph showing precipitation level of the year

- On average, July is the most humid.
- On average, February is the least humid month.

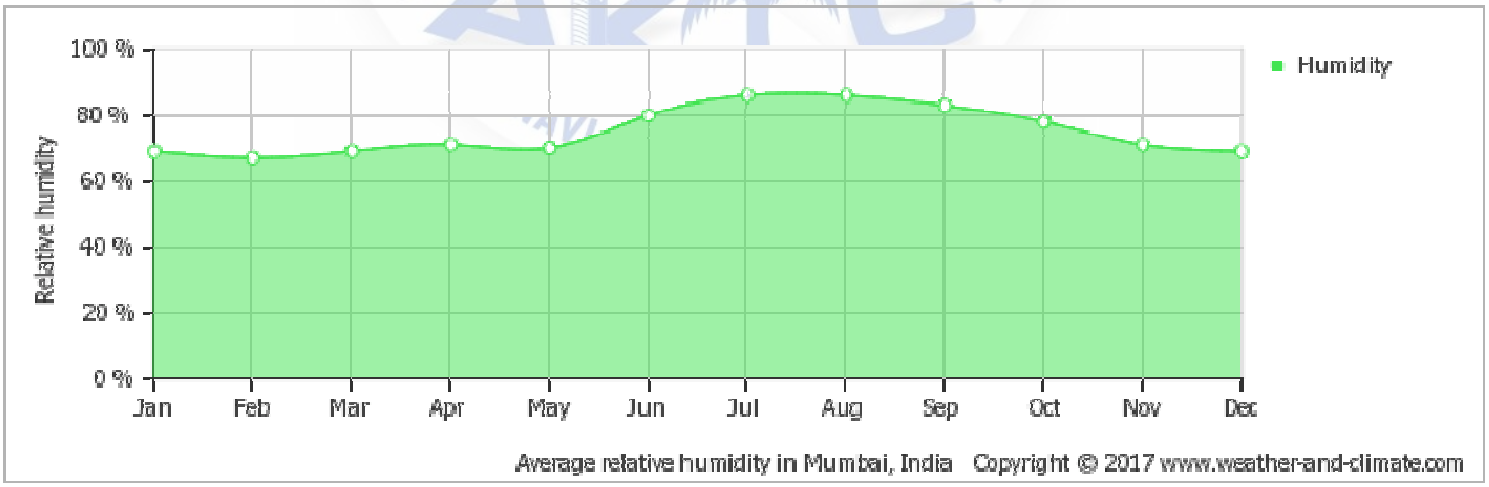
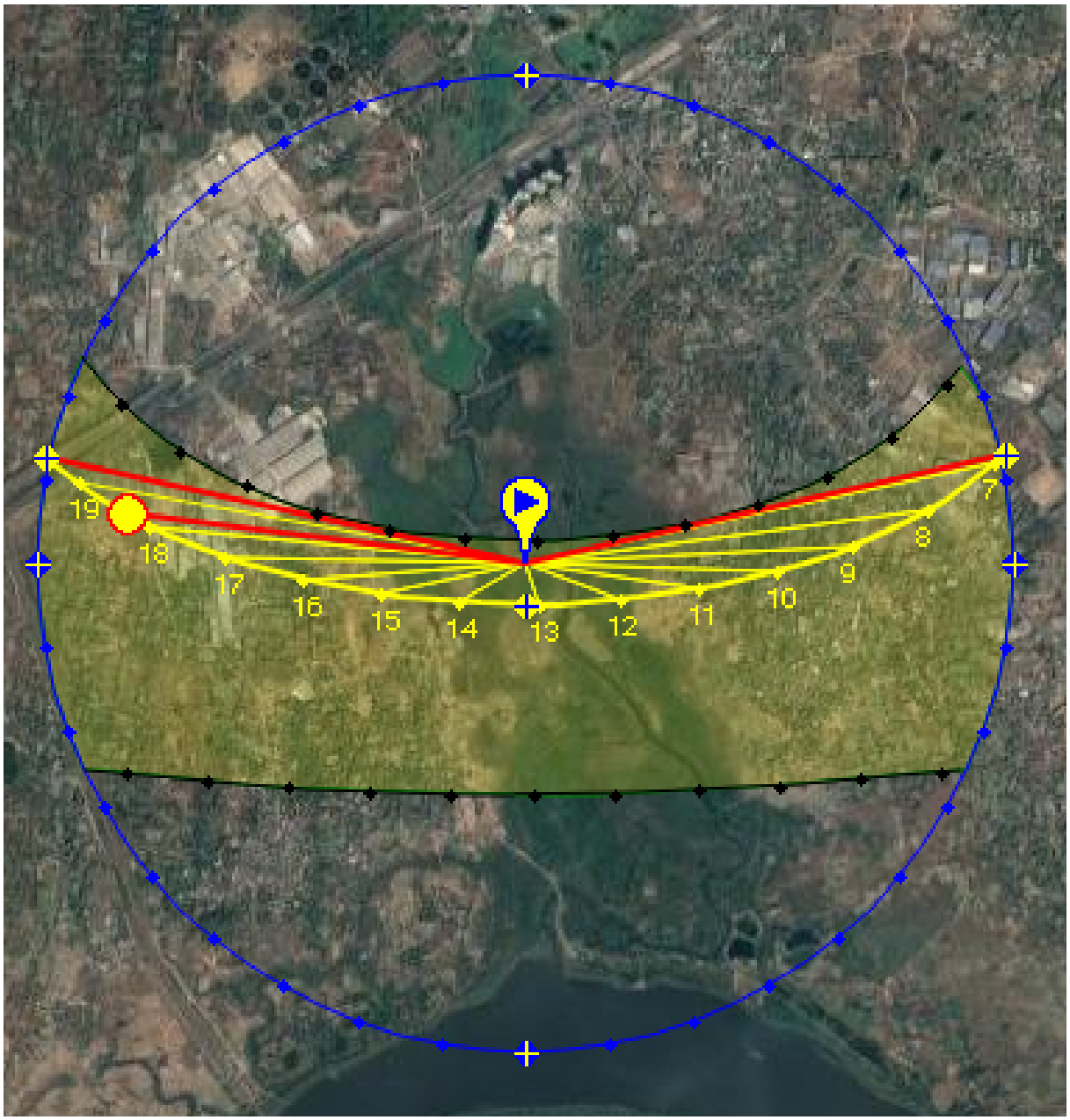


Figure10. 6 Graph showing relative humidity

SUN PATH DIAGRAM.



INFERENCE:

- The months January, February, July, August and September have nice weather with a good average temperature.
- On average, the temperatures are always high.
- A lot of rain (rainy season) falls in the months: June, July, August and September.
- Bhiwandi has dry periods in January, February, March, April, May, November and December.
- On average, the warmest month is may.
- On average, the coolest month is august.
- July is the wettest month. This month should be avoided if you don't like too much rain.
- March is the driest month.

SPACE PROGRAMS:

TEXTILE PARK:

AMENETIES:

ELECTRONIC SUBSTATION

WATER TREATMENT PLANT

FIRE FIGHTING

FIRST AID ROOMS

CANTEENS

RESTAURENTS

RETAIL SHOPS

EXIBITION SPACE

SEMINAR HALL

TYPE 1- WEAVING

Loading and unloading deck, storage of raw material, weaving area, storage of finished goods, management office, toilets.

TYPE 2- PROCESSING

Area for dyeing, area for washing, area for drying, area for printing, designing and management office, toilets

TYPE 3- FINISHING

Cutting section, stitching section, pressing section, packaging section, designing studio, storage, toilets

WEAVING UNIT:

Sr. No	Space	No's	Sub- space	Type of space	Quality of space	Capacity (no's of people)	Minimum size	Area
1	Worker block & lobby	1	1.Manager desk 2.Workers waiting area 3. Rest room	Private	Semi closed	25	40 sq.m	60 sq.m
2	Weaving area	5	English Powerlooms no's-60	Private	Closed	7	270 sq.m	300sq.m
			Airjet powerlooms no's-60	Private	Closed	4	360 sq.m	400sq.m
			Waterjet powerlooms no's-60	Private	Closed	4	360 sq.m	400sq.m
			Rapier powerlooms no's-60	Private	Closed	4	360 sq.m	400sq.m
			Automatic powerlooms no's-60	Private	Closed	4	270 sq.m	300sq.m
			2.*kaandi machine*			1	6 sq.m in each unit	10sq.m
3	Storage	2	1.Grey fabric storage. 2.Tools & equipments storage.					
4	Toilets	2		Private	Closed			

PROCESSING UNIT:

Sr. No	Space	No's	Sub- space	Type of space	Quality of space	Capacity (no's of people)	Minimum size	Area
1	Waiting area	1	1.Manager desk 2.Workers waiting area 3. Rest room	Private	Semi closed	25	40 sq.m	60 sq.m
2	Printing machines	5	Fully automatic No's 20	Private	Closed	60	800 sq.m	1000sq.m
			Rotary screen no's-20	Private	Closed	60	800 sq.m	1000sq.m
			4x4 station screen no's-20	Private	Closed	80	200 sq.m	300sq.m
			6x6 station screen no's-20	Private	Closed	120	200 sq.m	300sq.m
			Digital printing no's-20	Private	Closed	10	150 sq.m	200 sq.m
3	Storage	2	1.Grey fabric storage. 2.Tools & equipments storage. 3.Colours	Private	Closed		60 sq.m each	200 sq.m
4	Toilets	6	1.Gents 2. Ladies	Private	Closed	330	33 cubicals	30 sq.m

FINISHING UNIT:

Sr. No	Space	No's	Sub- space	Type of space	Quality of space	Capacity (no's of people)	Minimum size	Area
1	Worker block & lobby	1	1.Manager desk 2.Workers waiting area 3. Rest room	Private	Semi closed	25	40 sq.m	60 sq.m
2	Storage	1	Before stitching	Private	Closed		80 sq.m	100 sq.m
3	Workshop	6	1.Cutting 2.stitching 3.overlocking	Private	Closed	300	700 sq.m	800 sq.m
4	Steam pressing	1	1.Ironing 2. Folding	Private	Closed	20	60 sq.m	80 sq.m
5	Packaging	1	1 .Packing 2. Tagging	Private	Closed	20	60 sq.m	80 sq.m
6	Product checking	1		Private	Closed	5	20 sq.m	30 sq.m
7	Storage	1	Final product	Private	Closed		40 sq.m	60 sq.m
8	Toilets	6	1.Gents 2. Ladies	Private	Closed	370	37 cubicals	30 sq.m

DYEING UNIT:

Sr. No	Space	No's	Sub-space	Type of space	Quality of space	Capacity (no's of people)	Minimum size	Area
1	Worker block & lobby	1	1.Manager desk 2.Workers waiting area 3. Rest room	Private	Semi closed	25	40 sq.m	60 sq.m
2	Storage	1	Before dyeing	Private	Closed	1	80 sq.m	100 sq.m
3	Storage	1	After dyeing	Private	Closed	1	80 sq.m	100 sq.m
4	Drying area	2		Private	Open	4	40 sq.m	50 sq.m
5	Drying machine block	1		Private	Closed	4	20 sq.m	100 sq.m
6	Cloth separation	1	After drying	Private	Closed	3	20 sq.m	60 sq,m
7	Calendar machine	1		Private	Closed	5	16 sq.m each	80 sq.m
8	Colour storage & mixing	1		Private	Closed	3	40 sq.m	50 sq.m
9	Dyeing area	1	1.Boiler 2.Dyeing machine 3.Washing	Private	Closed	10	70 sq.m each	250 sq.m
10	Toilets	2	1.Gents 2. Ladies	Private	Closed	30	10 cubicals	30 sq.m

PUBLIC AREA:

ZONE

Sr. No	Space	No's	Sub- space	Type of space	Quality of space	Capacity (no's of people)	Minimum size	Area
1	Reception lobby	1	1.Seating 2.Help desk 3.Cloak room	Public	Semi closed	25		100sq.m
2	Manager cabin	1		Private	Closed	3	20 sq.m	25 sq.m
3	Accounts department	1		Private	Closed	10	30 sq.m	40 sq.m
4	Record room	1		Private	Closed		20 sq.m	20 sq.m
5	Staff restroom	1	1.Rest room 2.Pantry	Private	Closed	20	40 sq.m	50 sq.m
6	Cafeteria	1	1.Eating area 2.Washrooms 3.Kitchen 4.Storage	Public Private	Open	100	300 sq.m	500sq.m
7	Staff canteen	1	1.Eating area 2.Washrooms 3.Kitchen 4.Storage	Private	Closed	60	180 sq.m	250 sq.m
8	Exhibition space	3	1.Fabrics 2.Powerloom 3.Technology	Public	Semi closed	150 50-each	500 sq.m	600 sq.m
9	Conference hall	5		Public	Semi closed	250 50-each	750	1000 sq.m
10	Toilets	8	1.Gents 2. Ladies	Private	Closed	600	50 cubicals	30 sq.m

OTHER SPACE PROGRAM:

1. DISTRIBUTION CENTRE
2. RESEARCH AND DEVELOPMENT OFFICE
3. SHOWCASING OF PRODUCTS
4. 300 PEOPLE DORMITORY
5. MATERIAL STORAGE
6. CONFERENCE CENTRE
7. EVENT SPACE
8. TERRACE
9. INNER LANDSCAPE

PARKING:

Car parking: 100 user parking

100 visitors parking

Bike parking: 500 user parking

100 visitors

Truck parking: 15 trucks – 3 in each unit.

SITE STUDY: BHIWANDI DEVELOPMENT PLAN.

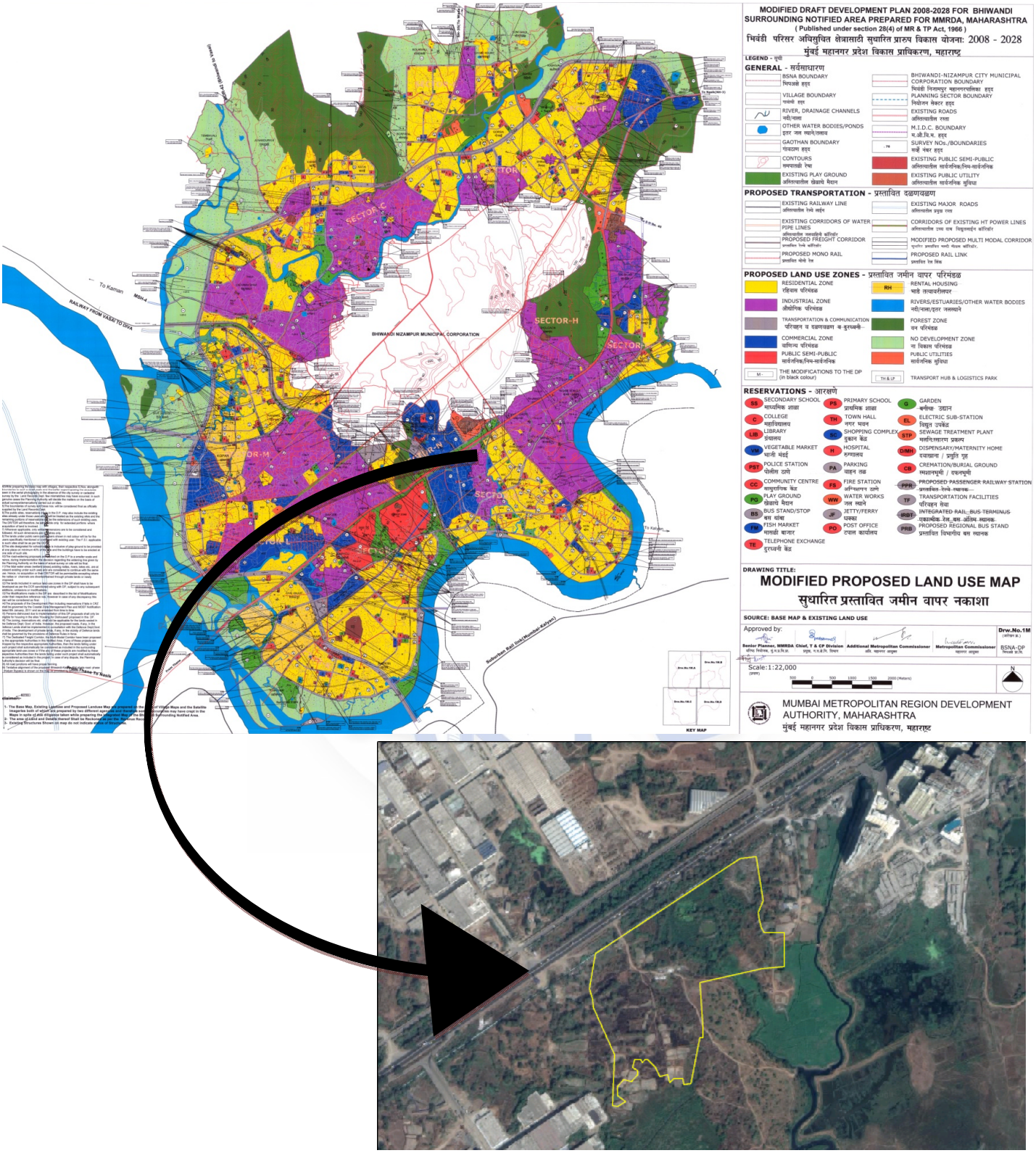


Figure11. 1 Google image showing site boundaries

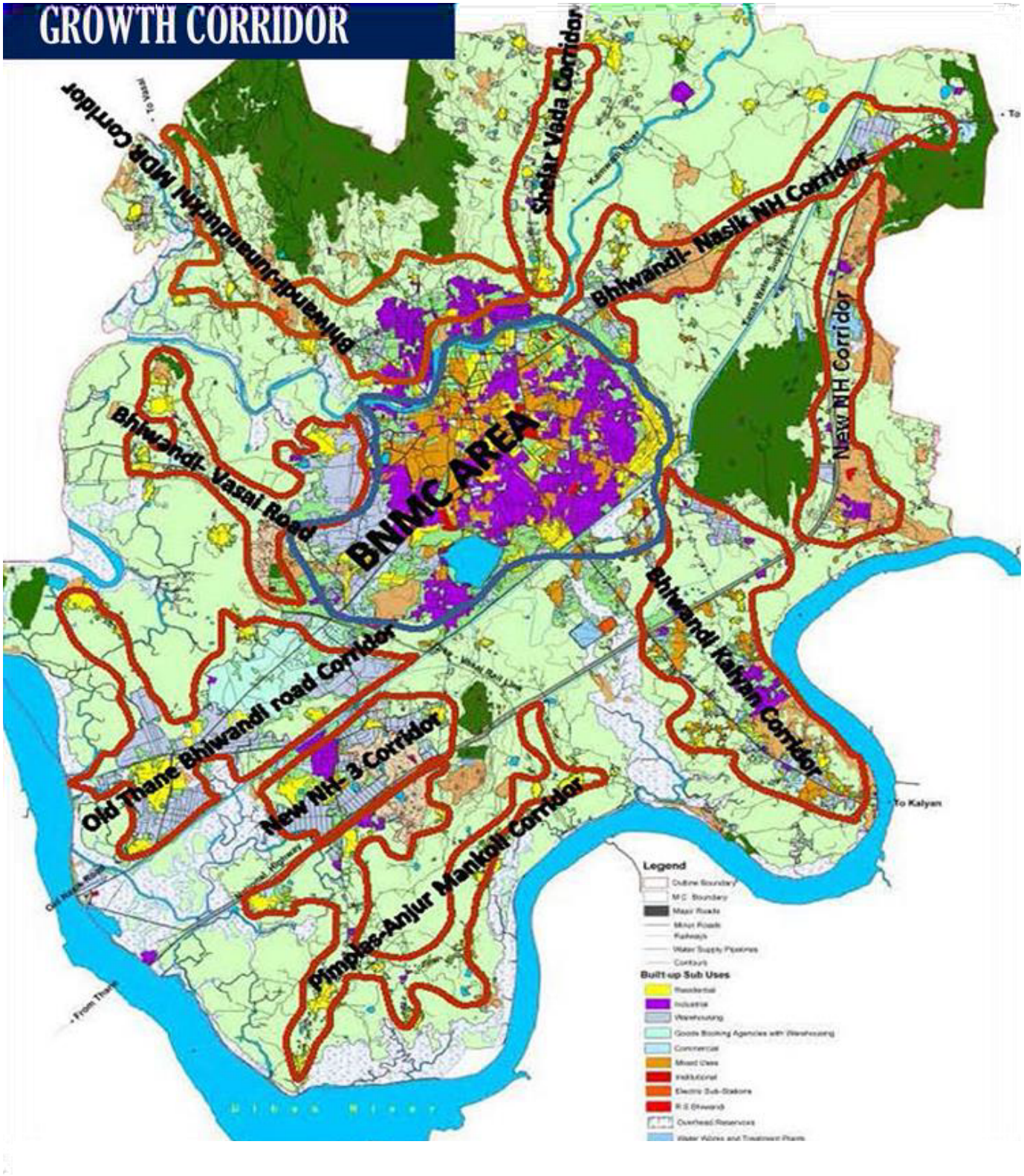


Figure11. 2 Showing growth of the city in various direction

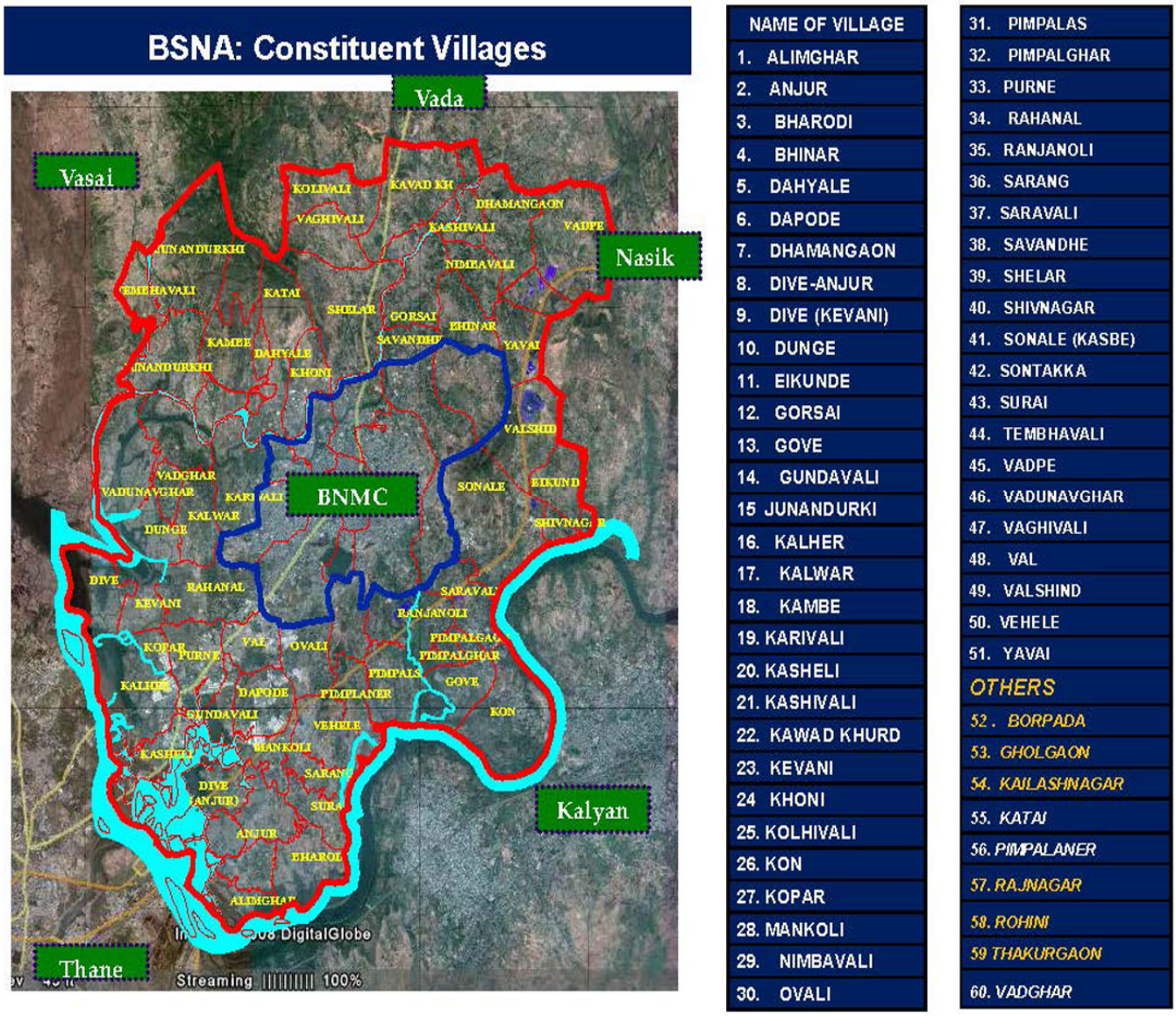


Figure11. 3 Showing surrounding notified area.

- Job opportunity will be increase in these villages and also their standard of living.
- There are 60 villages which falls under Bhiwandi notified area that is in Bhiwandi Taluka.
- There are 6 villages around a radius of 1 km to the site.

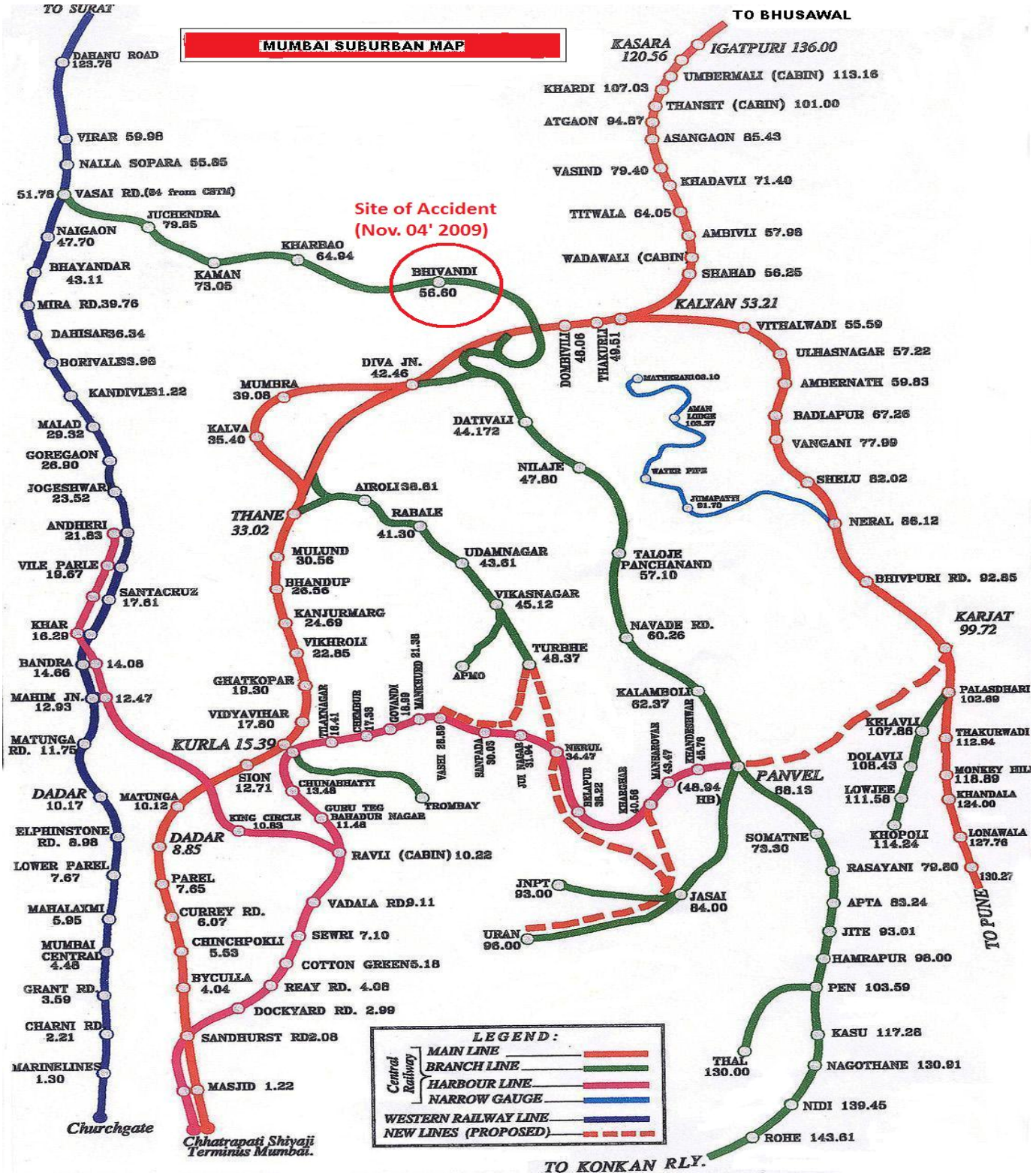


Figure11. 4 The Bhiwandi Road Railway Station lies on the Vasai-Diva corridor between western railway and central railway line.

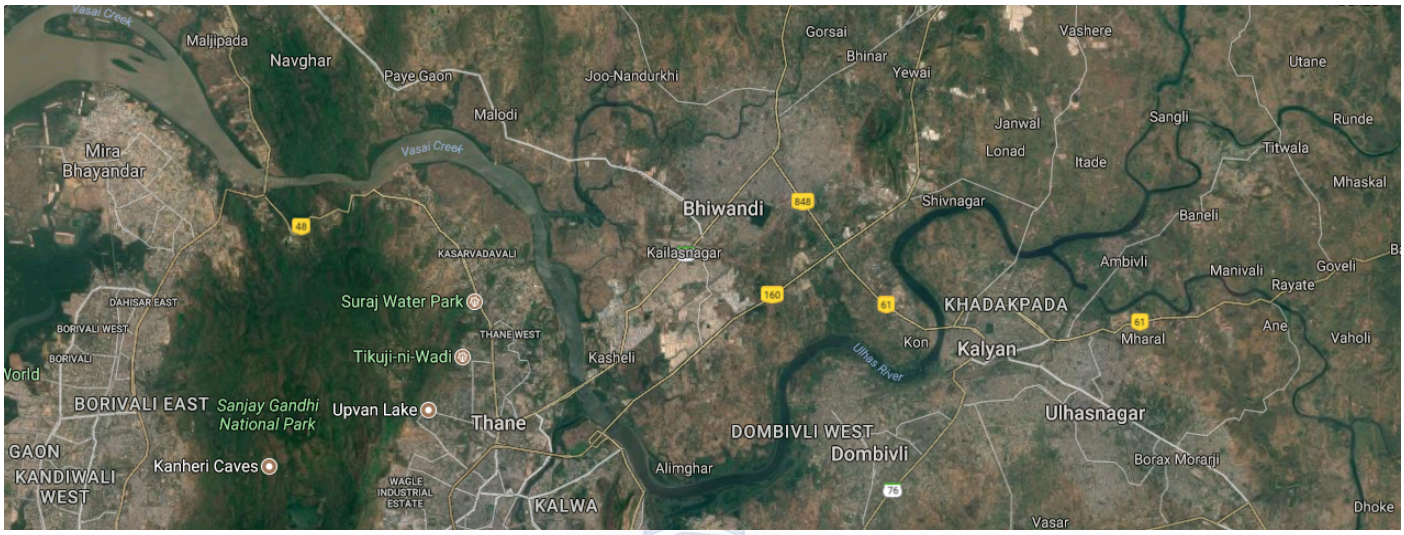


Figure11. 5 Google earth image showing nearby cities and context of the site

- Surrounding cities Bhiwandi, Kalyan, Dombivli and Thane
- The site boundary touches the NH-3 highway.
- Tata Amantra housing project is on the north side of the side.
- Bhumi industrial park is on the opposite side of the site.

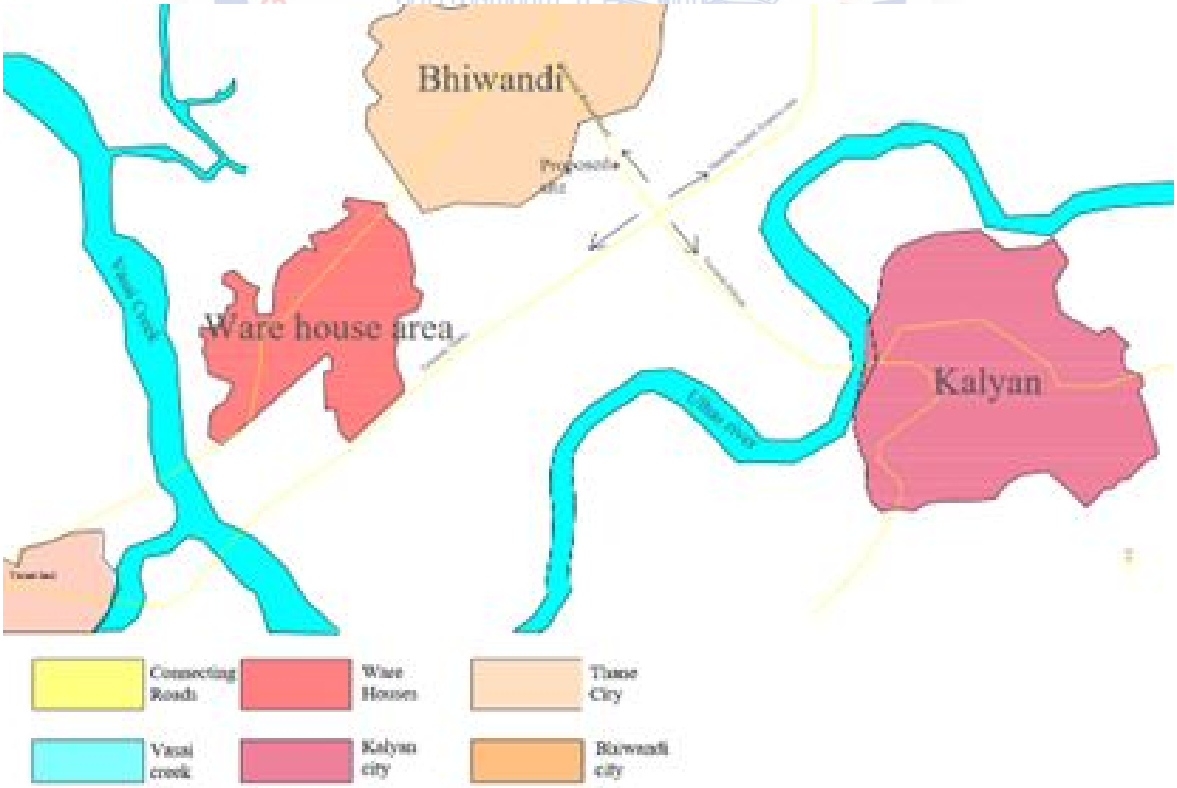


Figure11. 6 Schematic diagram showing nearby cities

SITE AREA: 69964 SQ.M (17.88 ACRE)

Figure11. 7 Site demarcation on Google maps

- The Topography of the site is flat.
- There is a small settlement beside the site.
- They have their farms behind their houses.
- There are total 5 to 6 houses in this settlement.

Figure11. 8 Settlement beside the site

SITE PHOTOGRAPHS:

Figure11. 9 Site photographs towards east and west respectively

SITE CONTEXT:

Figure11. 11 Informal road on the side

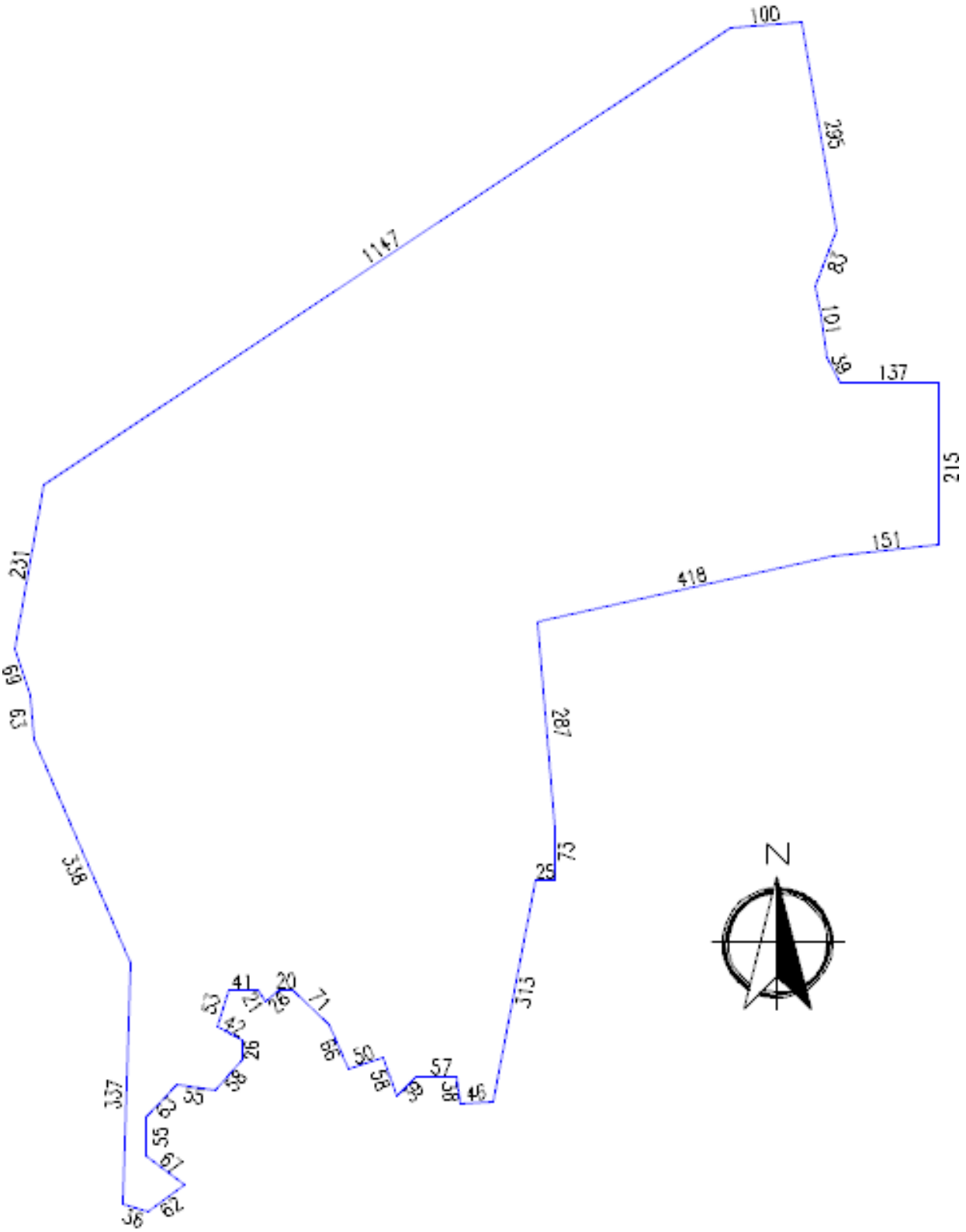
Figure11. 10 There are 2 high voltage wire touching the site

Figure11. 14 Towards Mumbai NH3

Figure11. 13 Towards Nashik NH3

Figure11. 12 Tata Amantra housing on the north east side if the site

SITE DIMENSIONS:



SITE SURVEY AND QUESTANAIRES:

In a survey to the vicinity area of the site and the villages surrounding site, following points one can get to know which helps in locating the site to this specific location.

- In a survey to the nearby villages, a set of question is asked regarding their source of income and their standard of living.
- Out of 20 houses of the nearby villages, 13 house's individuals are labours in the surrounding warehouses and that too not on a permanent job.
- There is a junction named By-pass Naka where these men used to stand daily morning till any work they get.
- They work on daily basis.
- They do not have permanent jobs.
- The women of these villages are home maker, but when asked whether they prefer doing work in industries, most of them agreed and said this will be opportunity for all of us.

In a survey to the Bhiwandi city's Power looms owner, following problems can be stated.

- There is no future development in this sector.
- After weaving the other processes facilities should be present in the city.
- The clothes are transported to Gujarat or Rajasthan for further process.
- Manufacturing of final product should be done in this city itself.
- This will increase the economy of the city as well as standard of living of the individual.
- Bhiwandi city emerge as the one of the textile hub of the country.

BHIWANDI BYELAWS:

1. Fsi in bhiwandi

- Fsi of bhiwandi city is 2 and of suburbs area is 1.5
- For commercial and mixed used buildings, fsi is 1.5.

2. Tdr: can be an additional 1 on fsi in normal areas, not in crz areas. Areas given to road setbacks and recreational grounds (15% of the plot area) should be deducted from the tdr. Therefore, if there are no setbacks, the tdr will be 0.80

3. Height of building: depends on location and proximity to airport. Height of a room should be less than 4.2m for educational building

4. Setbacks :

Front setback from roads (for residential (r) / commercial (c)bldgs)

For highway or road more : 7.5 m for both (r) and (c)

Han 52m the setback

For road wider than 21m : 3.0 m for (r) and 4.5 m for (c) in city

6.0 m for (r) and 6.0 m for (c)in suburbs

For lesser roads : 3.0 m for (r) and 4.5 m for (c)in city

4.5 m for (r) and 4.5 m for (c)in suburbs

5. Balconies: up to 10% of the fsi area per floor allowed free of fsi. Flower beds up to 1.2m in width allowed all around the building. If a flower bed is placed in front of a balcony, then its width should not exceed 0.6m.

6. Refuge areas: one every 24m in height, area not less than 4% of the occupied space.

7. Staircases: not less than two if the floor plate is more than 500m2 or the height more than 24m. Each should be 1.5m wide, enclosed by a 230mm brick wall, ventilated to the outside, and accessed via a fire door. Higher buildings will require 2m stairs.

8. Service floors: should have a minimum clear height of 1.5m.

9. Parking: in residential buildings, for tenements up to 70 m2 in area, 1 car per tenement, 2 for bigger flats (except in a ward, where 4 are required). After this, add 10% for visitors. (50% of spaces can may be 4.5 x 2.3m, the rest not less than 5.5 x 2.5m). In educational buildings, it is one car per every 35m2 of carpet area of the administrative offices and public services spaces only.

10.high rise bldg.: having height more than 70 m shall be provided with fire escape chute for every wing adjacent to staircase.

11.basement : compartization of basements up to an maximum area of 1125 sq.mts to be done with a separate staircase for each compartization.

natural ventilation up to an area of 2.5 % of each area of basement to be provided.

12. Fire escape chute :high rise bldg. Having height more than 70 m shall be provided with fire escape chute for every wing adjacent to staircase. The dimension of the shaft not less than 2.5 m x 1.50 m

13. Refuge area : in case of high-rise bldg. More than 30 m then first refuge floor shall be provided at 24 m or first habitable floor whichever is higher. Thereafter at every seventh habitable floor. If there are six floors or less above the floor where refuge area is provided the terrace floor shall be treated as refuge area. A building having height up to 30 m , terrace will be treated as refuge area.

LIST OF FIGURES:

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