

# ADMINISTRATION BUILDING

IMAD PATEL  
ARCHITECTURAL DISSERTATION  
8/3/16

# Contents

<b>CERTIFICATE</b> .....	3
<b>DECLARATION</b> .....	4
<b>ABSTRACT</b> .....	6
<b>LIST OF CHAPTERS</b> .....	7
<b>LIST OF FIGURES</b> .....	9
<b>LIST OF TABLES</b> .....	10
<b>Chapter 1. BACKGROUND STUDY</b> .....	11
<b>1.1 INTRODUCTION</b> .....	12
<b>1.2 AIM, OBJECTIVE, METHODOLOGY:</b> .....	13
<b>1.3 TOPIC JUSTIFICATION</b> .....	14
<b>Chapter 2. LITERATURE REVIEW</b> .....	15
<b>2.1 MUNICIPAL GOVERNANCE IN INDIA:</b> .....	16
<b>2.2 DEPARTMENTS AND FUNCTIONS OF MUNICIPAL CORPORATION:</b> .....	18
<b>2.3 HISTORY OF PANVEL</b> .....	21
<b>2.4 GROWTH POTENTIAL OF PANVEL</b> .....	23
<b>2.5 PANVEL MUNICIPAL CORPORATION</b> .....	25
<b>2.6 MUNICIPAL CORPORATION BUILDING AS PUBLIC BUILDING</b> .....	27
<b>2.7 CLIMATOLOGY</b> .....	28
<b>2.9 DESIGN CONSIDERATION FOR WARM AND HUMID CLIMATIC ZONE</b> .....	30
<b>CHAPTER 3. CASE STUDIES</b> .....	32
<b>3.1 CITY HALL, LONDON</b> .....	33
<b>3.2 DEVENTER CITY HALL</b> .....	40
<b>3.3 HKSAR GOVERNMENT HEADQUARTER</b> .....	46
<b>3.4 PIMPRI-CHINCHWAD MUNICIPAL CORPORATION</b> .....	51
<b>CHAPTER 4. SITE SELECTION</b> .....	64



4.1 SELECTION CRITERIA.....	65
4.2 SITE OPTIONS.....	66
4.3 SITE ANALYSIS.....	75
<b>CHAPTER 5. DESIGN DEVELOPMENT.....</b>	<b>87</b>
5.1 AREA PROGRAMME.....	88
5.2 CIDCO BYLAWS.....	90
5.3 ZONING PLAN.....	100
<b>BIBLIOGRAPHY.....</b>	<b>101</b>



**University of Mumbai**



**SCHOOL OF ARCHITECTURE**

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Plot # 2 & 3, Sector-16, Near Thana Naka, Khandagaon, New Panvel, Navi Mumbai Pin 400614.

### **CERTIFICATE**

This is to certify that the Design Dissertation titled “ADMINISTRATION BUILDING FOR PANVEL CITY MUNICIPAL CORPORATION” is the bonafide work of the student Imad Manzoor Patel from Final Year B. Arch 2016 -2017 of AIKTC - School of Architecture and was carried out in college under my guidance.

\_\_\_\_\_  
(Signature of the guide)

Riyaz Shaikh

(Name of the guide)

Date: \_\_\_\_\_

Examiners: (Name and Signature)

1. \_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_  
(Signature of the Dean)

Date: \_\_\_\_\_



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### DECLARATION

I declare that this written submission entitled

**“ADMINISTRATION BUILDING FOR PANVEL CITY MUNICIPAL CORPORATION”**

represents my ideas in my own words and has not been taken from the work of others; 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. No material other than the cited and listed has been used.

I have read and know the meaning of plagiarism and I understand that plagiarism, collusion and copying are grave and serious offences in the university and accept the consequences should I engage in plagiarism, collusion or copying.

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This work, or any part of it, has not been previously submitted by me or any other person for assessment on this or any other course of study.

---

(Sign of the Student)

Imad Manzoor Patel

(Name of student)

Date and Place:

## **ACKNOWLEDGEMENT**

History of all great works is to witness that no work was ever done single-handedly without the active or passive support of people around you. Thus, it is not hard to conclude how important it was to get assistance throughout the semester consistently.

I would like to express my great appreciation to **Ar. RIYAZ SHAIKH** for guidance and supervision as well as providing necessary information regarding the project and his support in completing the dissertation. He inspired me greatly to work in this research. His willingness to motivate, contributes tremendously to my project. I would also like to thank my earlier guide **Ar. MINAL MODAK** for guiding me in the initial stage of dissertation and guiding me the right direction in the very beginning.

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And finally last but by no means least, **MY PARENTS** who always believed in me and stood by me in every phase of my life so far. They are the reason and motivation behind all my efforts all throughout the architecture course.

## **ABSTRACT**

Municipal Corporation is the main governing body of any city and its administration headquarter is probably one of the most important building. The Municipal Corporation provides all the necessary facilities and services right from the water supply and drainage to the public parks and other facilities which makes a city habitable more so a desirable one. Hence, for a city to grow and develop the administration building has to be designed with the understanding of the functioning of the Municipal Corporation, nature of work being carried out there, comfort of the employees and visitors and also the security of the building.

The purpose of the study is to establish the requirement of the Municipal Corporation's administration building by understanding the history and current world scenario, the subject in Indian context, basic and additional requirements of the same for the best possible output. This book covers all the necessary aspect for understandings the subject to help in designing the administration building. Chapter 1 is about the introduction of the topic, Chapter 2 covers all the research and literature about the subject, Chapter 3 is the compilation of the case studies of Indian and International case studies, Chapter 4 talks about the various aspect of selection of the site and Chapter 5 is the conclusion of all the previous chapters where the programme is finalized.

The Administration building of Municipal Corporation in Indian context lacks the basic connectivity of different spaces and departments. Most importantly, City's topmost important building lacks the connection to its citizen which is taken into consideration in other countries. Therefore, the reformation and a different prospect is required while designing such an important building which could change the fate of the city.

## **LIST OF CHAPTERS**

### **Chapter 1. Background Study**

- 1.1 Introduction
- 1.2 Aim, Objective, Methodology
- 1.3 Topic justification

### **Chapter 2. Literature Review**

- 2.1 Municipal Governance in India
- 2.2 Departments & Functions of Municipal Corporation
- 2.3 History of Panvel
- 2.4 Potential of Panvel city
- 2.5 Panvel Municipal Corporation
- 2.6 Municipal Corporation Building as a Public Building
- 2.7 Sustainable Building
- 2.8 Climatology

### **Chapter 3. Case Studies**

- 3.1 London City Hall
- 3.2 Deventer City Hall
- 3.3 HKSAR Government Headquarter
- 3.4 Pimpri-Chinchwad Municipal Corporation
- 3.5 Navi Mumbai Municipal Corporation

### **Chapter 4. Site Selection**

- 4.1 Selection Criteria
- 4.2 Site Options
- 4.3 Site Analysis

## **Chapter 5. Design Development**

5.1 Area Programme

5.2 CIDCO Bylaws

5.3 Zoning Plan

## LIST OF FIGURES

<b>Figure 1:</b> ADMINISTRATIVE STRUCTURE IN INDIA .....	16
<b>Figure 2:</b> PLOT NO. 30, 31, 32, 36, 37, 38.....	66
<b>Figure 3:</b> PANVEL DP PLAN .....	66



## **LIST OF TABLES**

<b>Table 1:</b> DEPARTMENTS & FUNCTION OF MUNICIPAL CORPORATION .....	20
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## **Chapter 1. BACKGROUND STUDY**

## 1.1 INTRODUCTION

Municipal Corporation is the topmost of urban local government. It is formed in urban area/centre with population above 3 lacs. It is the most powerful and respectable amongst all the local governance.

It is set up under a special statute passed by the respective state's legislature. However, in an exception, in Delhi (due to it being the National Capital Territory), the power to set up a Municipal Corporation lies with the Union Parliament.

The first Municipal Corporation formed in India was Madras Municipal Corporation in 1687 followed by the Bombay Municipal Corporation in 1726.

## **1.2 AIM, OBJECTIVE, METHODOLOGY:**

### **AIM:**

- To design a Municipal Corporation headquarter for the city of Panvel to cater all the functions of city's governing body under one roof along with forming a strong relation and co-ordination with the public keeping the sustainability and eco-friendly technologies as a major aspect.

### **OBJECTIVE:**

- To design the building with adequate functions in terms of the usability of the public, and the government employees.
- To designing a municipal corporation building by providing barrier free access for everyone.
- Designing the building and its surrounding to achieve more public involvement so as to fulfil its basic purpose which is to serve public.
- To give the city a new identity by designing it's most important building as a landmark.
- To achieve a sustainability in terms adapting passive techniques, green building technologies and use of most suitable materials.

### **METHODOLOGY:**

The methods followed to achieve the required data includes:

- Live case study: **1) Pimpri-Chinchwad Municipal Corporation Headquarter**  
**2)NMMC (Navi Mumbai Municipal Corporation) Headquarter**
- Internet case study:**1) London City Hall, England**  
**2) Deventer City Hall, Netherlands**  
**3) HKSAR Government Headquarter**

### 1.3 TOPIC JUSTIFICATION

Panvel being one of the fast growing city on the outskirts of Mumbai is declared a Municipal Corporation area. The Panvel City Municipal Corporation will include few villages and some other areas under its corporation area. Therefore, it will require a new administration building to govern and manage the different function of the city.

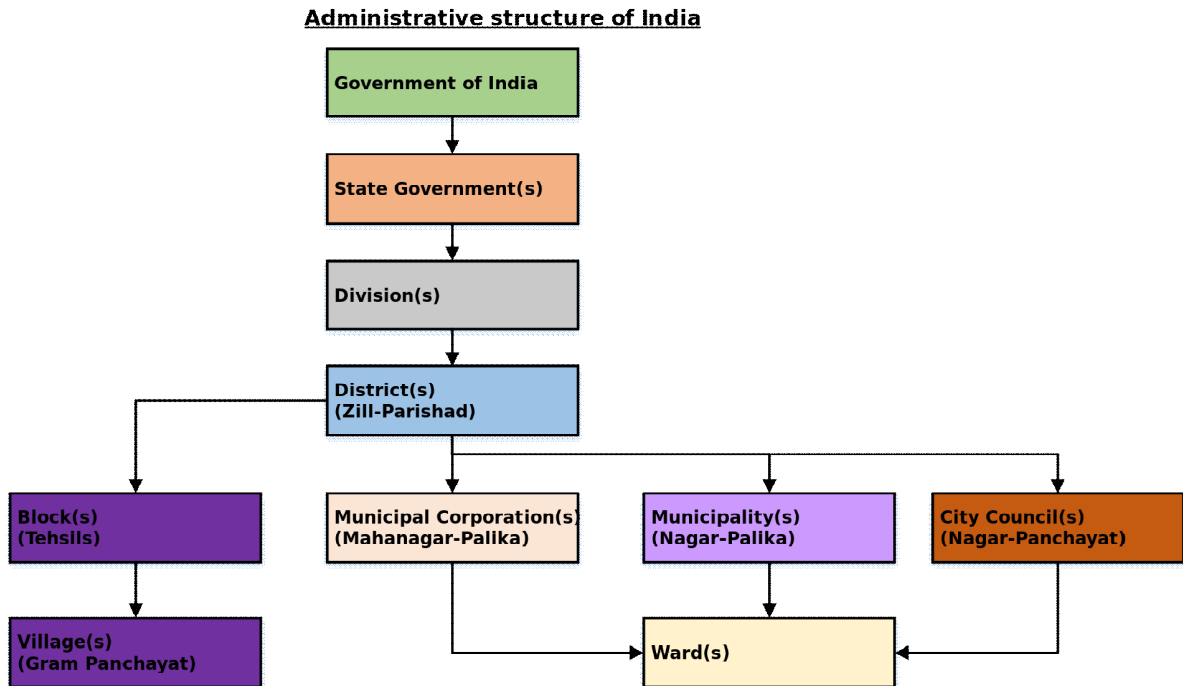
The Municipal Corporation of any city is a very busy building as most of the work related with the city and its citizen like development, health, education, tax etc. are managed in the corporation building. Also, most of the times the Corporation building becomes the identity of the city; hence it should be designed in such a way that it becomes the landmark for the city. The building is used by the government officers, corporators, other government employees and by the public. Therefore it is very important to design the structure with function and accessibility of employees and public as a major aspect.

Just like most of the other government buildings, municipal corporation of many city are not well thought of in terms of function, accessibility, public involvement, usability of spaces (restricted or public accessible) and ventilation. The design should encourage public to use for their legal purpose. The environment inside the building is very important for the employees to work which could be achieved by designing internal space adequately. The structure should be barrier free to make it accessible for physically challenged people.

The building needs to be sustainable to a certain extent and must adopt green technologies as it should be the example for the upcoming development in the city.

## **Chapter 2. LITERATURE REVIEW**

## 2.1 MUNICIPAL GOVERNANCE IN INDIA:



**Figure 1:** ADMINISTRATIVE STRUCTURE IN INDIA

### CLASSIFICATION OF MUNICIPAL CORPORATION:

CLASS A+: Cities with population above 1,00,00,000 is categorized as class A+ Municipal Corporation. BMC (Brihanmumbai Municipal Corporation) is the only Municipal Corporation in Maharashtra with A+ grade.

CLASS A: Pune and Nagpur corporation have been upgraded to class A municipal corporation.

CLASS B:

CLASS C: Cities with population above 10,00,000 is categorized as class C Municipal Corporation.

CLASS D:

EMPLOYEEES IN THE MUNICIPAL CORPORATION:

CLASS I: Commissioner, Assistant Commissioner, Joint Commissioner, City Engineer, Executive Engineer, Head Accountant, Medical Health Officer, Secretary

CLASS II: Administration Officer, Health Officer, Public Relation Officer, Social Development Officer, Deputy Engineers, Town Planner, Security Officer,

CLASS III: Head Clerk, Head Driver, Junior Engineers, Librarians, Sports Officer, Tax Inspectors, Sanitary Inspector

CLASS IV: Peons, Watchmen, Labours, SafaiKarmi, ward boy, Fireman, Liftman



## 2.2 DEPARTMENTS AND FUNCTIONS OF MUNICIPAL CORPORATION:

DEPARTMENTS	DEPARTMENT HEAD	FUNCTIONS
Accounts Department	Account Officer	<ul style="list-style-type: none"> <li>• Prepare a yearly budget</li> <li>• Payment of bills</li> <li>• Receipt and Expenditure</li> <li>• Accounts maintenance</li> </ul>
Audit Department	Chief Auditor	<ul style="list-style-type: none"> <li>• Financial Advice.</li> <li>• Audit of various department of the Municipal Corporation as per the Maharashtra Municipality Act.</li> </ul>
Education Department	Education Officer	<ul style="list-style-type: none"> <li>• To conduct Municipal Corporation election as per Maharashtra Municipal Corporation Act.</li> <li>• Provide published figure of population census.</li> </ul>
Electrical Department	Development Engineer	<ul style="list-style-type: none"> <li>• Installation and maintenance of street light, high masts etc. in Municipal Corporation area.</li> <li>• Conversion of Overhead lines to Underground cables for road widening and new road projects.</li> <li>• Installations and maintenance of substation, Generators, Lighting and Air conditioning of all Municipal Corporation Building.</li> </ul>
Election Department	Assistant Commissioner	<ul style="list-style-type: none"> <li>• Conduct corporation election as per provisions Maharashtra Municipal Corporation Act.</li> <li>• Provide published figure of census population.</li> <li>• Nodal department for Aadhar enrolment.</li> </ul>
Legal Department	Legal Advisor	<ul style="list-style-type: none"> <li>• All Legal litigations, civil suit, Writ petitions, Appeals and Criminal cases in various courts are handled by legal department.</li> </ul>

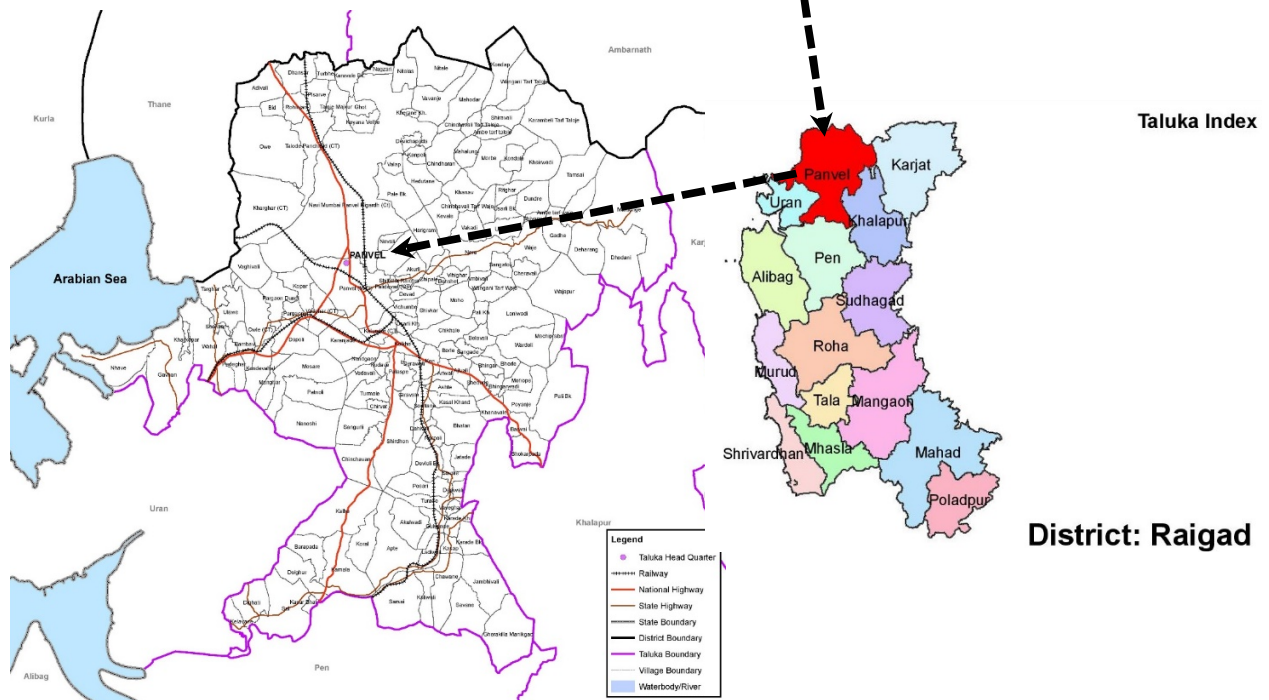
Water Supply Department	Hydraulic Engineer	<ul style="list-style-type: none"> <li>• Treatment of raw water and making it fit for drinking.</li> <li>• Supply of the treated water to the residents with adequate pressure and quantity.</li> <li>• Maintenance of distribution network and providing new supply system whenever necessary.</li> </ul>
Town Planning Department	Deputy Director	<ul style="list-style-type: none"> <li>• Preparation of Draft Development Plan for the areas included in Municipal Corporation Area.</li> <li>• Implementation of the Draft Development Plan.</li> </ul>
Public Work Department	Executive Engineer	<ul style="list-style-type: none"> <li>• Construction and development of Municipal buildings.</li> <li>• Construction and development of Community halls, SamajMandir etc.</li> <li>• Construction and maintenance of Gardens, Parks, Play grounds etc.</li> </ul>
Transportation Department	Assistant Commissioner	<ul style="list-style-type: none"> <li>• To provide a transportation system for the area under Municipal Corporation.</li> </ul>
Municipal Secretary	Municipal Secretary	<ul style="list-style-type: none"> <li>• To arrange the meetings Standing Committee, Law Committee, City Improvement committee, etc.</li> <li>• To arrange General Body Meeting.</li> <li>• To display the agenda and proceedings of the all committee meeting.</li> </ul>
Solid Waste Management Department	Chief Engineer	<ul style="list-style-type: none"> <li>• To ensure regular sweeping of the streets of the city.</li> <li>• Collection of garbage in the entire jurisdiction and disposal.</li> <li>• To process the bio-degradable waste and its disposal.</li> </ul>
Establishment Department	Assistant Commissioner	<ul style="list-style-type: none"> <li>• Appointment of various designation under Municipal Corporation.</li> <li>• Differentiating the employees in various class.</li> </ul>
Public Relation Department	Public Relation Officer	<ul style="list-style-type: none"> <li>• To publish notice of general body meeting.</li> </ul>

		<ul style="list-style-type: none"> <li>• To publish advertisement related to various departments work, circular and notifications.</li> <li>• To provide publicity of Corporations decision for the city and about future development.</li> </ul>
Information & Technology Department	Chief Information Technology Officer	<ul style="list-style-type: none"> <li>• To improve efficiency and transparency between corporation and public.</li> <li>• To provide all the information to the citizen on the website of corporation.</li> <li>• To develop software programmes for various departments to ease their work and to train them in those software.</li> </ul>
Health Department	Medical Officer of Health	<ul style="list-style-type: none"> <li>• Responsible for providing medical facilities in the Municipal Corporation jurisdiction.</li> <li>• Provide other facilities such as Blood bank, Ambulance service etc.</li> </ul>
Community Development Department	Assistant Commissioner	<ul style="list-style-type: none"> <li>• Implementing various Welfare Schemes for development of different community.</li> </ul>
Administration Department	Assistant Commissioner	<ul style="list-style-type: none"> <li>• Appointment on the vacant places by direct recruitment and promotions.</li> <li>• Conduct department enquiry and punishment on guilty.</li> <li>• Provide House loan, Vehicle loan, Computer loan etc. to the employees working in the Municipal Corporation.</li> </ul>
Drainage Department	Executive Engineer	<ul style="list-style-type: none"> <li>• Providing collection system for sewage and providing the treatment plant.</li> <li>• Maintenance of existing sewage line and to provide sewerage system for newly developed networks.</li> </ul>
Security Department	Chief Security Officer	<ul style="list-style-type: none"> <li>• To provide security in all the Government buildings.</li> </ul>

**Table 1:** DEPARTMENTS & FUNCTION OF MUNICIPAL

### 2.3 HISTORY OF PANVEL

The historic settlement of Panvel is 300 years old, developed around trade routes (both land and sea), during the time of Muslims/ Portuguese/ British dominance of the Konkan region. During this time, building activity in these townships was generated by the affluence due to trade. This can be seen in the large Wadas and the buildings that came up during the relative affluence of the Peshwahi and post - Peshwahi period. It's also said that old name of this city was Paneli (Panelim in Konkani).



In 1570, Panvel is mentioned as a European trading port paying revenue to Gujarat (Bird's Mirat-i-Ahmadi, 129). In 1779, English party under Colonel Eagerton supporting the cause of Raghoba embarked at Bombay and disembarked at Panvel on 25th November. Later the party ascended the Ghats and met the Marathas at Karle where was severely defeated, Captain Stewart being among the killed. Again about two years later in April 1781 General Goddard had sent under Lieutenant- Colonel Brown, an escort of three battalions at Panvel for bringing on a convoy of grains, but the Maratha army under Parsurambhau attacked it with great force and dispersed it thus frustrating the plans of General Goddard to march across the Ghats which he had to climb down to retreat towards Panvel. It probably raised to importance along with Bombay, as the direct route from Bombay to the Deccan lies through Panvel.

In 1804, Lord Valentia described it as a populous village, prettily situated on the banks of Sute River, in a plain surrounded by high hill. In 1810 Sir James Mackintosh found Panvel as a wooded village, well situated on small hill, distinguished by the handsome dome of a mosque. For some time after its cession, in 1818, a small English force was kept in Panvel and part of the town is still known as the camp (Mr. Cumine, C.S.). In 1820, it is described as an extensive place, well situated for business and carrying on a considerable commerce, although standing in the midst of a salt morass.

## 2.4 GROWTH POTENTIAL OF PANVEL

**STRATEGIC LOCATION:** Panvel is located about 40 Km east of Greater Mumbai. This region is gateway of the MMRDA. It is located between Mumbai and Pune near Khopoli.

### EXISTING INFRASTRUCTURE:

**1) JNPT (Jawaharlal Nehru Port Trust):** Jawaharlal Nehru Port was established in 1989 and it ranks 24<sup>th</sup> among the top 100 container port in the world and the top container port of the country. It is only 30 Km from Panvel and can create great opportunity in growing the city.

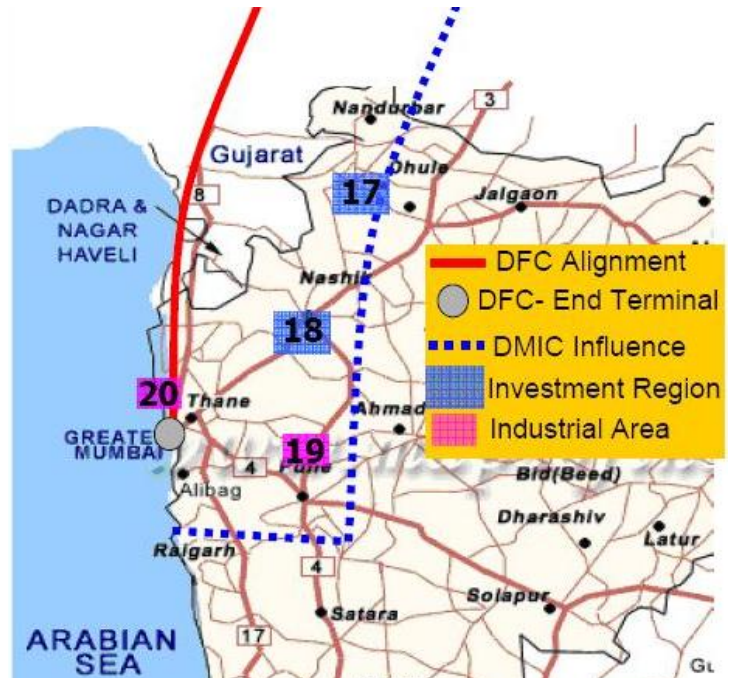


### **2) DFC (Dedicated Freight Corridor):**





**3) DMIC (Delhi Mumbai Industrial Corridor):**



**4) ONGC (Oil and Natural Gas Corporation):**

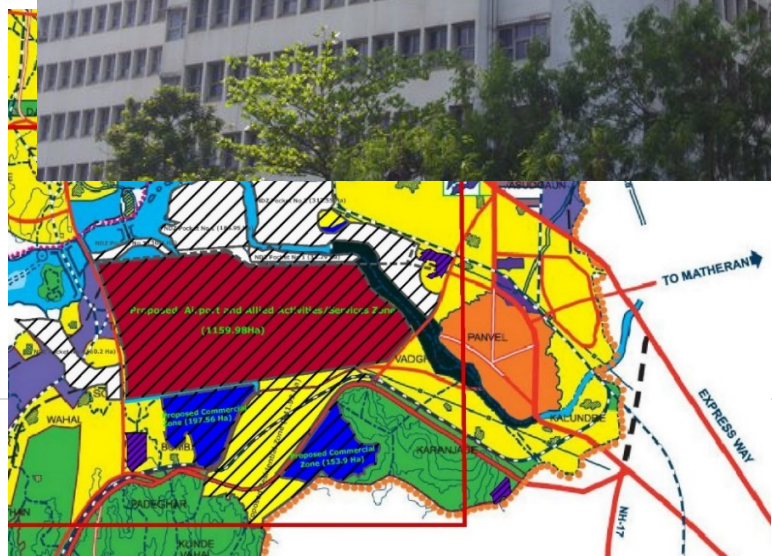
It is situated about 4 Km from Panvel. It provides great opportunity of employment for the nearby residence at present and also in the future.



UPCOMING PROJECTS:

**1) Navi Mumbai International Airport:**

It is one of the biggest project in the Navi Mumbai in recent times. It is very close to the Pnvel city and it



will bring huge development in the vicinity towns and villages.

## 2) MTHL (Mumbai Trans Harbour Link):

The 22 Km road route will connect the Mumbai and Navi Mumbai and will reduce the travel time of one hour.

As the travel time is reduced and a better connectivity option is upcoming, the development of the region is expected to get increased.



## 2.5 PANVEL MUNICIPAL CORPORATION

AREA: **110.06 sq. km.**

POPULATION: **5, 09, 901**

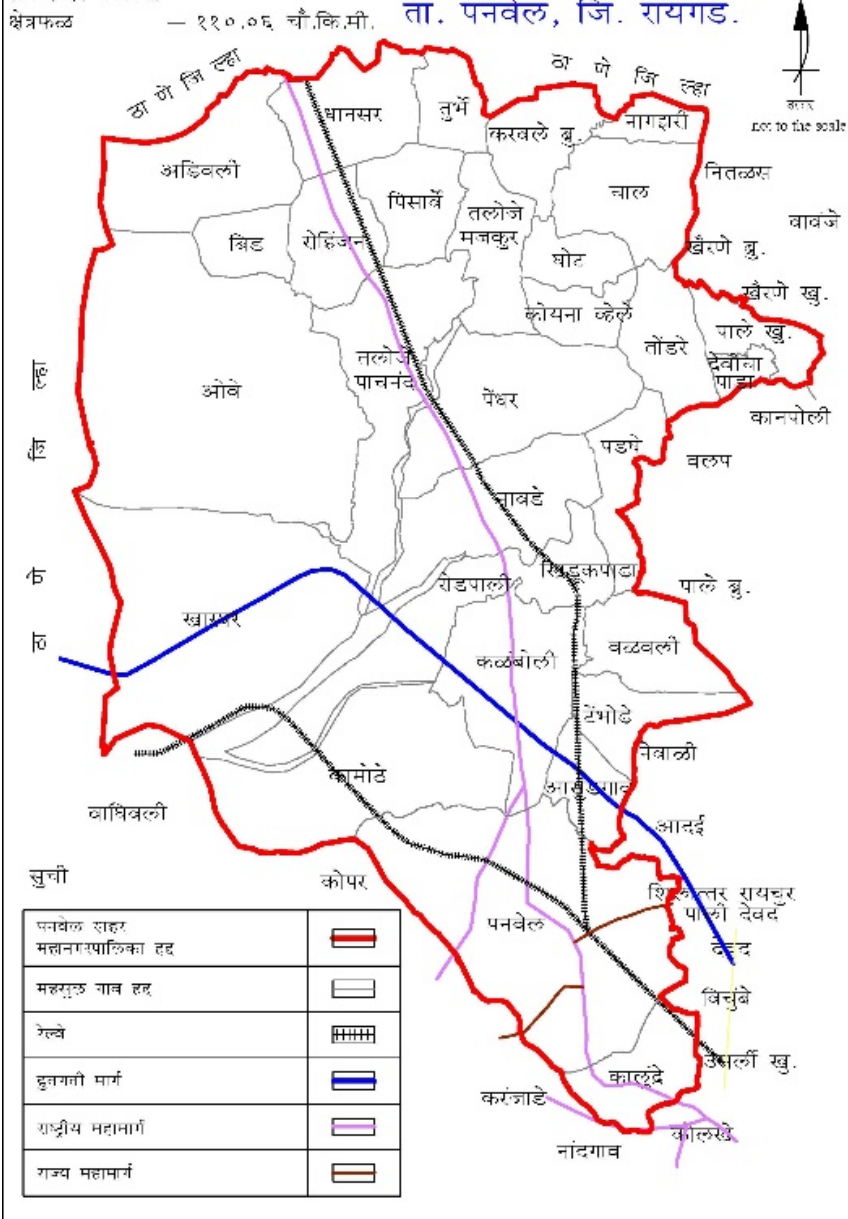


## पनवेल महानगरपालिका

लोकसंख्या — ५,०९,९०९  
(सन २०११ जनगणना)

क्षेत्रफळ — ११०.०६ चौ.कि.मी.

ता. पनवेल, जि. रायगड.



NO.	DIVISIONS	VILLAGES/TOWNS
1.	WARD 1	Dhansar, Turbhe, Karavle, TalojaMajkur, Ghot, Koynavelhe, Rohinjan
2.	WARD 2	Navde, Padhge, Devichapada, Chal, Nagzari, Tondhare, Pale
3.	WARD 3	Ove, TalojaPachanand

4.	WARD 4	Kharghar (sec 11, 13, 14, 19, 20, 21)
5.	WARD 5	Kharghar (sec 3, 4, 5, 6, 7, 12, Utsav chowk, Chafewadi)
6.	WARD 6	Kharghar (sec 1, 2, 8, 10, 15, 16, 18)
7.	WARD 7	Roadpali, sec 23-15, sec 8, sec 10-15.
8.	WARD 8	Kalamboli (sec 4E, 5E, 6E, 5 & 6)
9.	WARD 9	Khidukpada, Vadavli, Tembodhe, Asudgaon, Kalamboligaon, Kalamboli (sec 2E, 3E)
10.	WARD 10	Kalamboli (sec 1, 1E, 2, 3 & Jadhavadi)
11.	WARD 11	Kamothe (sec 1-6A, 9, 21-24)
12.	WARD 12	Kamothe (sec 21, 11), Kamotheगाon
13.	WARD 13	Juigaon, Kamothe (sec 17, 18, 19, 34, 35, 36)
14.	WARD 14	part of Old Panvel (Patel mohalla, kachchimohalla, bandar road, HOC colony, Thana naka road), Sai nagar, Khandagaon, New Panvel sec 17, Khanda colony (sec 13, 14)
15.	WARD 15	New Panvel, Khanda colony (sec 6, 7, 8, 9, 11)
16.	WARD 16	New Panvel (sec 4, 5, 9, 11)
17.	WARD 17	New Panvel (sec 12, 13, 14, 15A, 17, 18, 19), Forest colony, Panvel Railway Station area.
18.	WARD 18	part of Old Panvel (MG road, Ballaleshwar lake surroundings), New Panvel (sec 2, 3, 12, 15), Panvel industrial state,
19.	WARD 19	Part of Old Panvel (middle class society, line aali, MTNL road)
20.	WARD 20	Kalundregaoon till panvel city

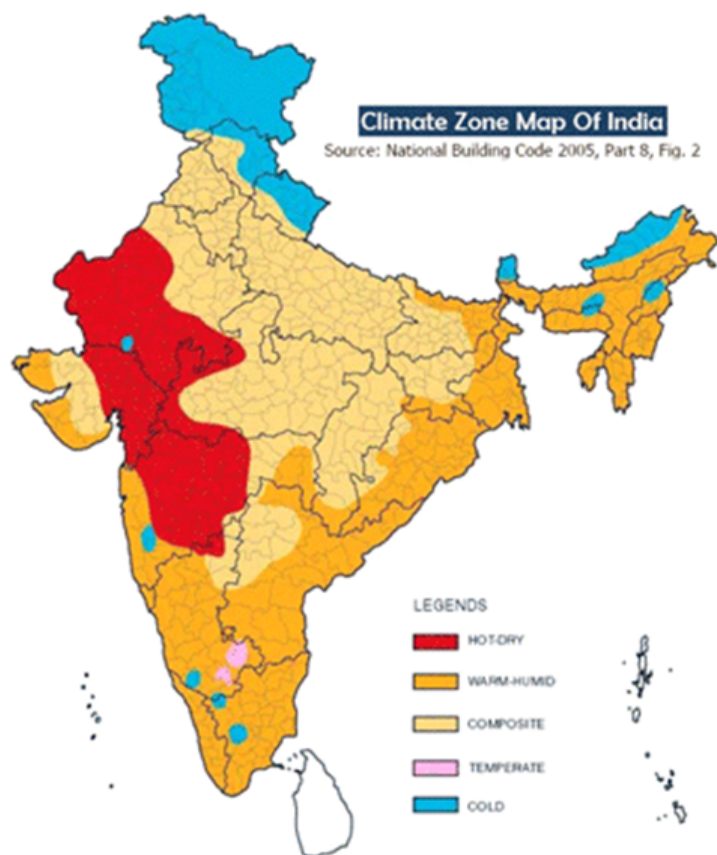
## 2.6 MUNICIPAL CORPORATION BUILDING AS PUBLIC BUILDING

## 2.7 CLIMATOLOGY

India due to its large geographical scale and varied topography possess different climatic condition in different geographical region.

There are 6 climatic zones in India.

1. Warm & Humid
2. Hot & Dry
3. Composite
4. Moderate
5. Cold & Cloudy
6. Cold & Sunny

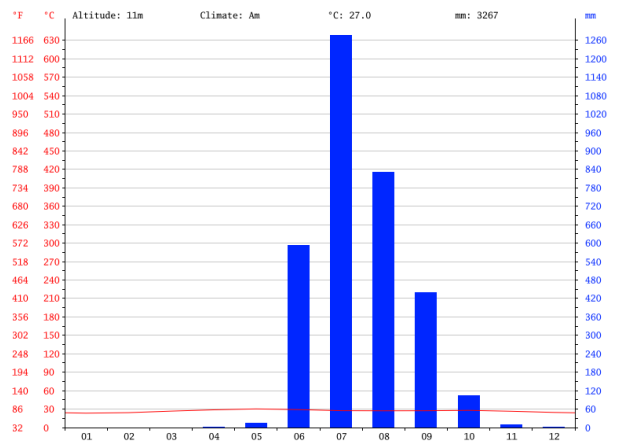
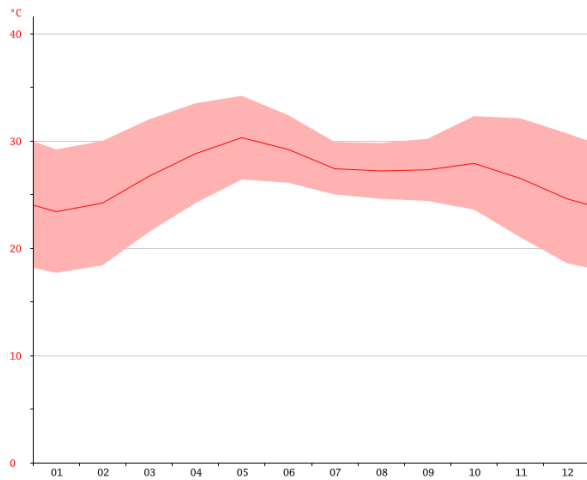


Panvel region falls under warm and humid climatic zone.

Characteristics of Warm & Humid climatic zone:

- Summer -maximum temperature: **30-35** °C

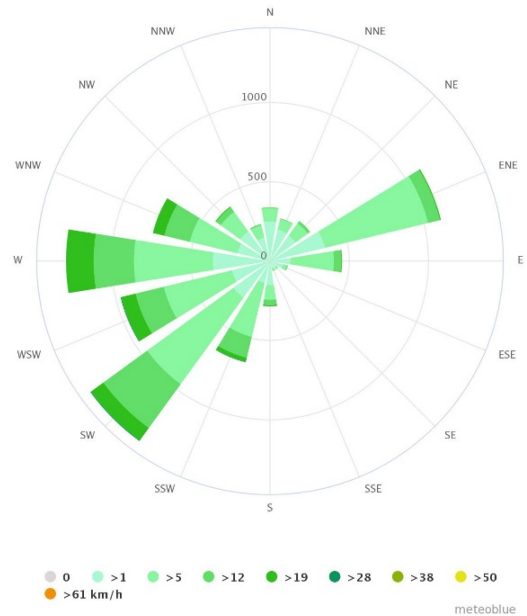
### CLIMATE OF PANVEL:



ANNUAL TEMPERATURE GRAPH

- Average annual temperature is 27°C.
- Average maximum temperature in Panvel is above 34°C in the months of March, May, and June.
- Monsoon season is from June to September and the maximum rainfall is 1166 mm in July.

- Major direction of the wind flow is from South-West and West direction.
- During winter season the wind direction is from North-East.
- Average speed of the wind is between 10 km/hr.
- Maximum wind speed is 30 km/hr during



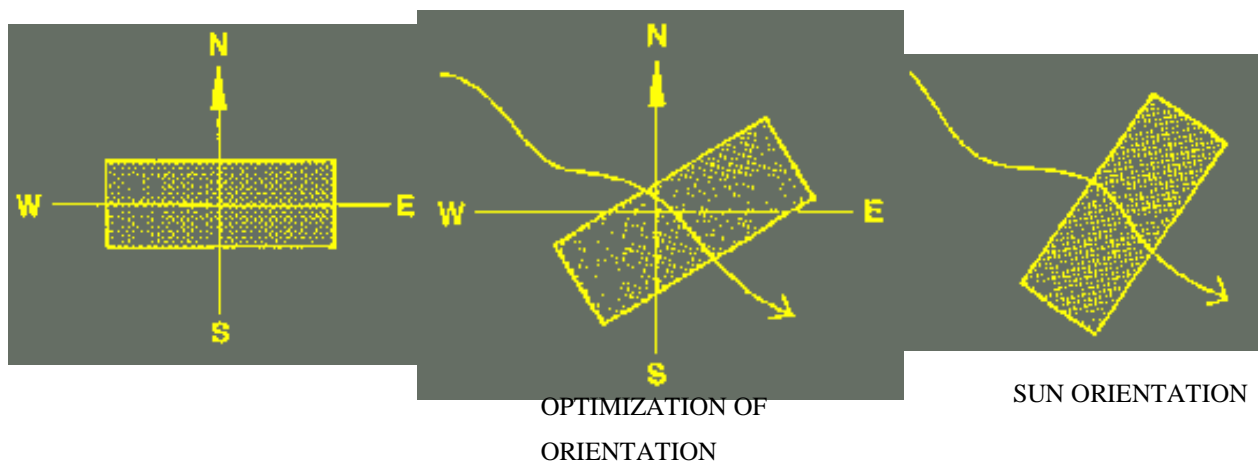
WINDROSE DIAGRAM

## 2.9 DESIGN CONSIDERATION FOR WARM AND HUMID CLIMATIC ZONE

### PASSIVE TECHNIQUES:

**Sun Orientation:** The length of the building should be oriented along the East-West direction. It will help in avoiding the low angle and harsh light from the east and west direction.

**Wind Orientation:** The length of the building should face the wind flow direction.



**Form of the Building:** The building should be kept as low as possible as the taller building receives more heat and also obstruct the wind flow of the neighbourhood building.

**Cross Ventilation:** It is very important aspect of designing; air movement in the interior spaces are very essential for human comfort.

**Wall & Roof:** Reflective surface and colours must be used in order to reduce heat gain; also the wall and should be insulated, it keeps the interior space cooler than the external space.

## **CHAPTER 3. CASE STUDIES**



### 3.1 CITY HALL, LONDON

#### INTRODUCTION:

Architect: **Foster & Partners**

Project Completion Year: **2002**

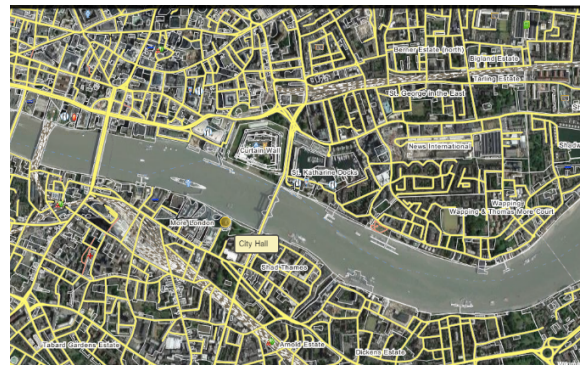
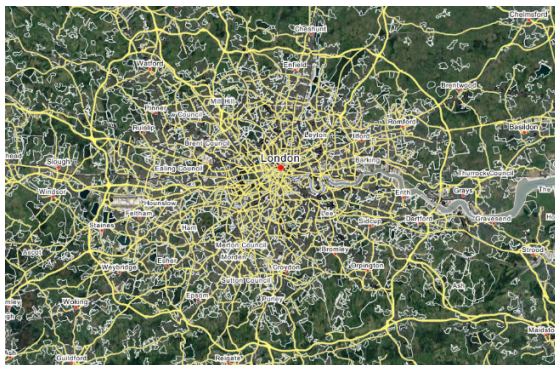
Client: **More London Development Ltd.**

Height of the Building: **45 meters (10 floors)**

Total floor space: **185000 sq.ft.**

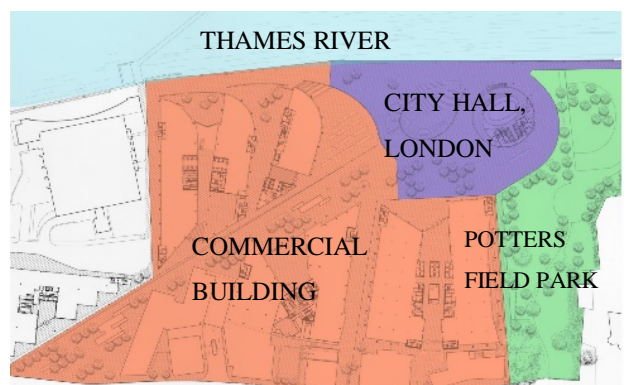
Location:

**Queens walk, London, England.**



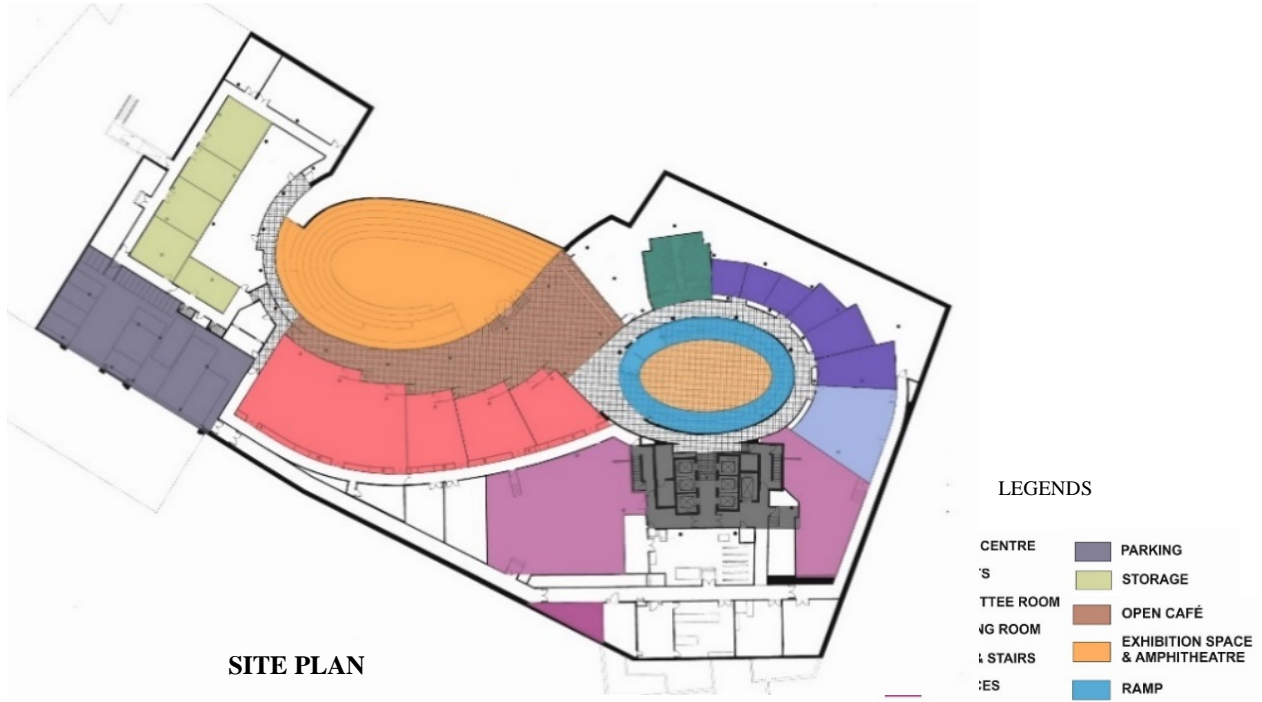
#### SITE CONTEXT:

- The London City Hall is situated in the commercial area.
- The front side has the Thames River; a park named Potter Field Park is on the other side.
- The rest of area has commercial buildings

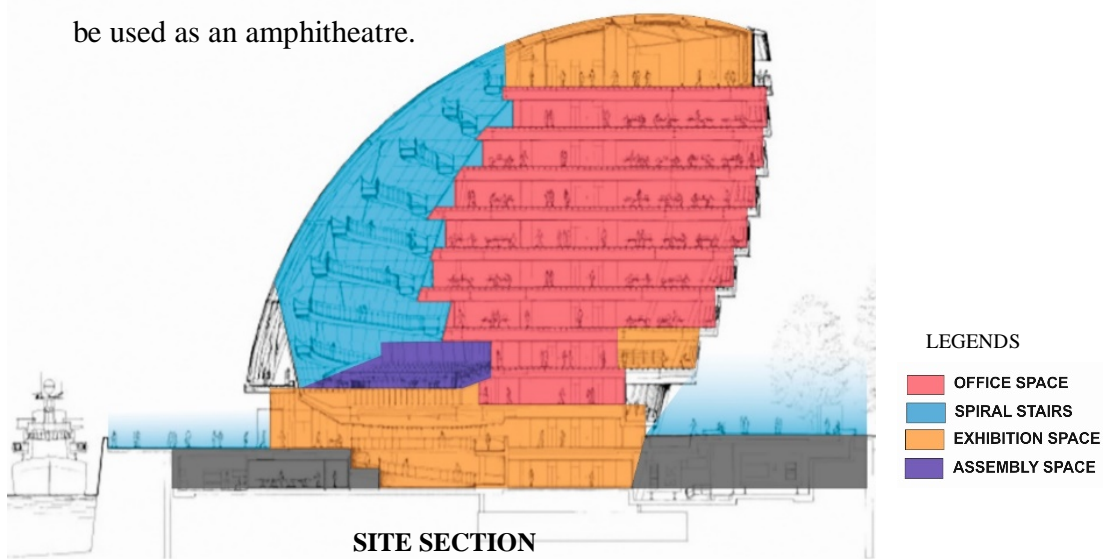




**PLANNING:**



- The basement plan along with the site design on the ground level shows how the site area and the building is designed that collectively encourage the public to visit the city’s administrative building.
- The steps which leads to the basement of the City Hall are designed in such a way that it can be used as an amphitheatre.

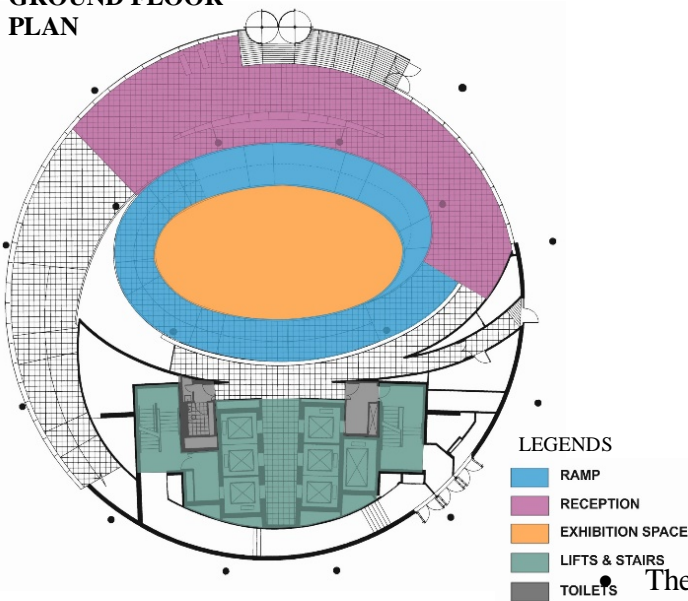


- The basement and the Ground level caters to public and it is designed for all public related activities.
- The First and Second floor caters to Council members and Assembly area.
- Office area for Administration work is provided from 3rd floor level till 8th floor.
- The 9th floor is designed for Public related activities.



TOP VIEW OF THE CITY HALL

**GROUND FLOOR PLAN**



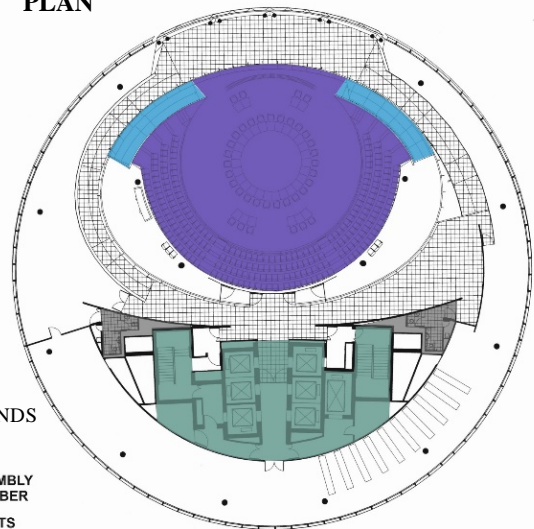
The Ground floor plan is entirely dedicated to public space.

- It has a Reception at the entrance and the Exhibition space thereon.
- Toilets and staircase is designed at a place which remains constant on every floor and act as a



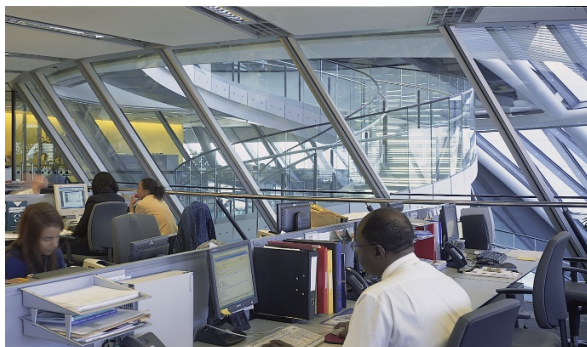
- The second floor has an assembly space. It is designed using two floor levels as the top level is at the second floor and the lowest level is at the first floor.
- The Lifts, Stairs and Utility area are same as on the below floor levels.
- 3rd floor to 8th floor are typical and consists of Open office plan, Offices, Meeting rooms, Storage area.

### SECOND FLOOR PLAN



#### LEGENDS

- RAMP
- ASSEMBLY CHAMBER
- TOILETS
- LIFTS & STAIRS

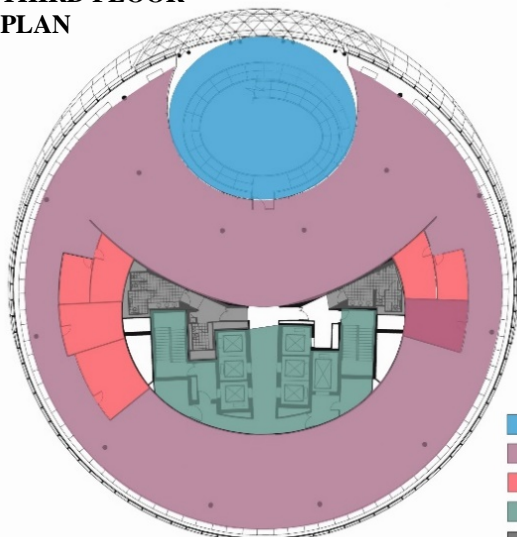


OFFICE SPACE



ASSEMBLY CHAMBER

### THIRD FLOOR PLAN



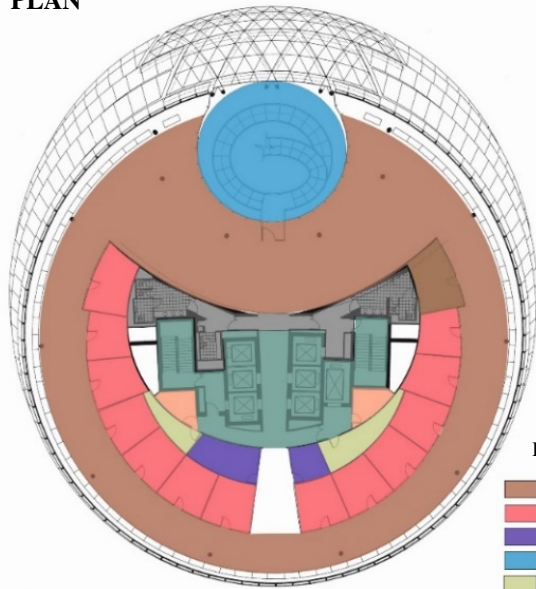
#### LEGENDS

- RAMP
- OPEN PLAN
- OFFICE
- LIFTS & STAIRS
- TOILETS

- One of the most interesting design element is the Spiral stairs that starts form the First floor level till the top floor level.
- It encourages people to use the stairs than the lifts. The tread size goes on reducing with the rise in the levels as the shaft for the stairs gets narrower with



**EIGHT FLOOR  
PLAN**



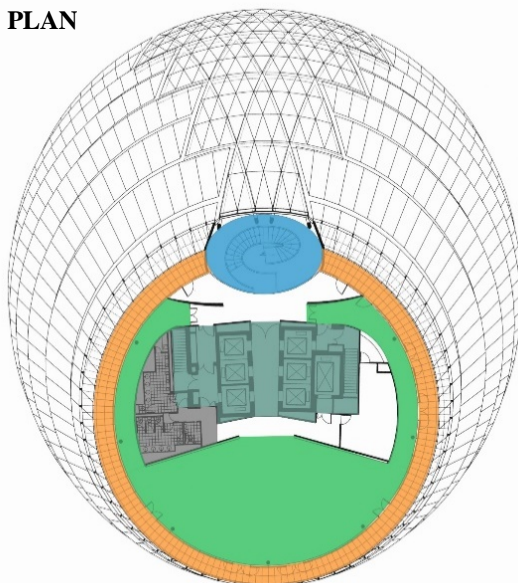
**LEGENDS**

- OPEN PLAN
- OFFICE
- MEETING ROOM
- SPIRAL STAIRS
- STORAGE
- TOILETS
- LIFTS & STAIRS



**ASSEMBLY CHAMBER**

**NINTH FLOOR  
PLAN**



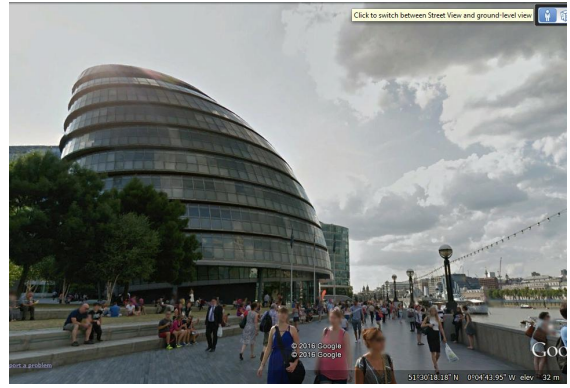
LEGENDS

TERRACE



- London city hall along with administration service also provide interactive public spaces.
- The Ground floor has an exhibition space; it is a good way to invite people to one of their own building.
- Also the top floor is entirely

EXHIBITION SPACE



- The building's design with public inviting design interventions along with River bank and Public Park provides great public spaces together.
- The steps outside the City hall which goes below ground level and opens into an exhibition space is also being used as seating.

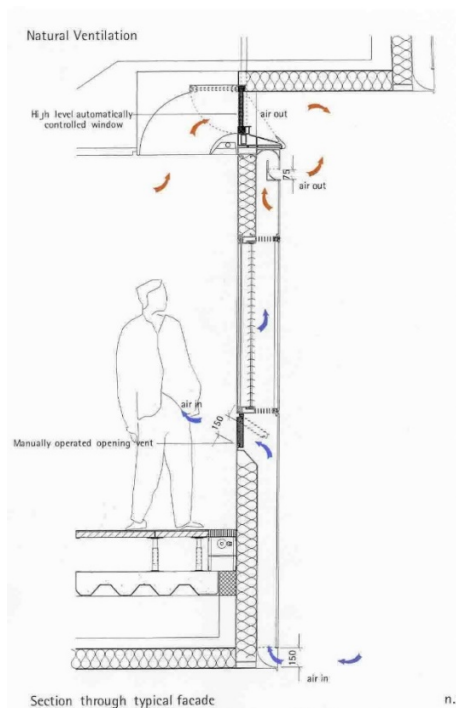
AMPHITHEATRE

CITY HALL WITH RIVER BANK

- The use of a sphere for the building gives the building 25% less surface area than a cube of the same volume. The sun will not warm the building as much as if it was a cube shape building.
- These photovoltaic panels send power to the electrical system and HVAC systems lowering the buildings carbon emissions.



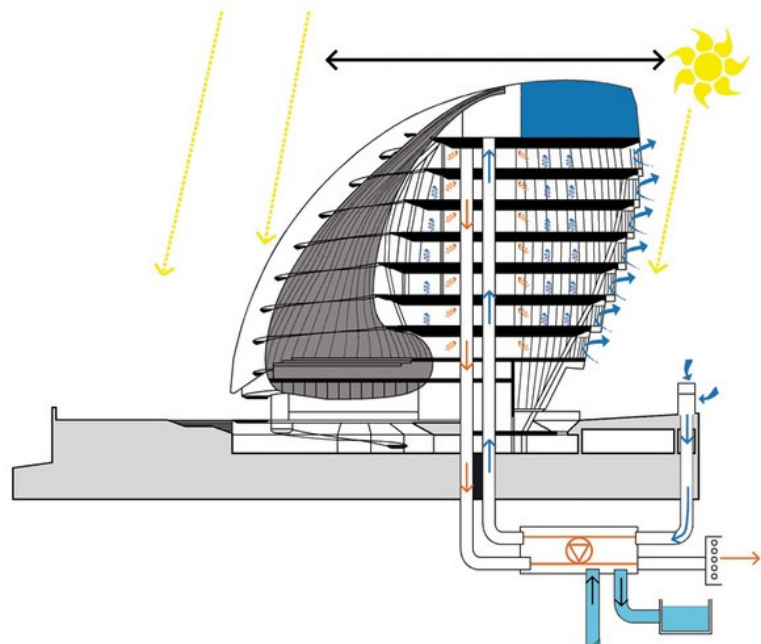
USE OF SOLAR PANEL ON THE ROOF



SECTION OF THE WINDOW

- The windows used to cover this building use insulated silver aluminum inserts to keep the building cool in the summer and warm in the

- The building uses ground water for the cooling. The ground water is brought in and dispersed throughout the building to passively cool the steel beams which cools the air in the building.



USE OF SOLAR PANEL ON THE ROOF



STRENGTH	WEAKNESS
<ul style="list-style-type: none"> <li>• Building is situated very near to the railway station.</li> <li>• Public spaces are incorporated in the design both inside the building and landscaping.</li> <li>• The design breaks the stereotypical perception of Municipal buildings.</li> <li>• The Building has adapted passive cooling and eco-friendly technologies.</li> <li>• The building is designed in such a way that it follows the fabric of the area yet became one of the landmark building.</li> </ul>	<ul style="list-style-type: none"> <li>• Parking space is less than the required considering the use of the building by the visitors and employees.</li> <li>• Shape of the building forces few negative spaces which are difficult to access and use.</li> <li>• The construction system which includes diagrid steel members adds too much for the overall construction cost.</li> <li>• The entrance of the building is not very distinct.</li> </ul>

ANALYSIS:

### 3.2 DEVENTER CITY HALL

INTRODUCTION:

Architect: **NeutelingsRiedijk**

**Architects**

40 | Page  
Project Year: 2016

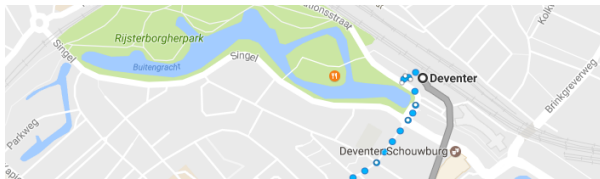
Built up Area: **24,000 sq. m.**

Old building: **4,000 sq. m.**



LOCATION:

## Deventer, Netherlands



- The City Hall is approximately at 900 meter distance from the Deventer Railway Station.
- It is built in the old inner part of the city and has narrow roads, so the access is limited (in terms of the size of the vehicle).
- There is no airport in the city; the nearest



PLANNING:



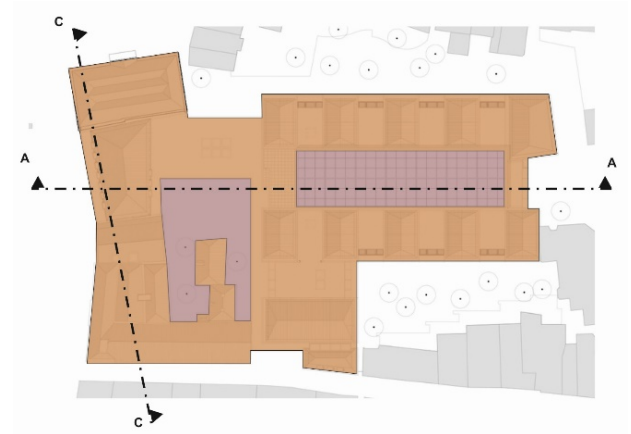
**GROUND FLOOR PLAN**



**VIEW OF HELP DESK**

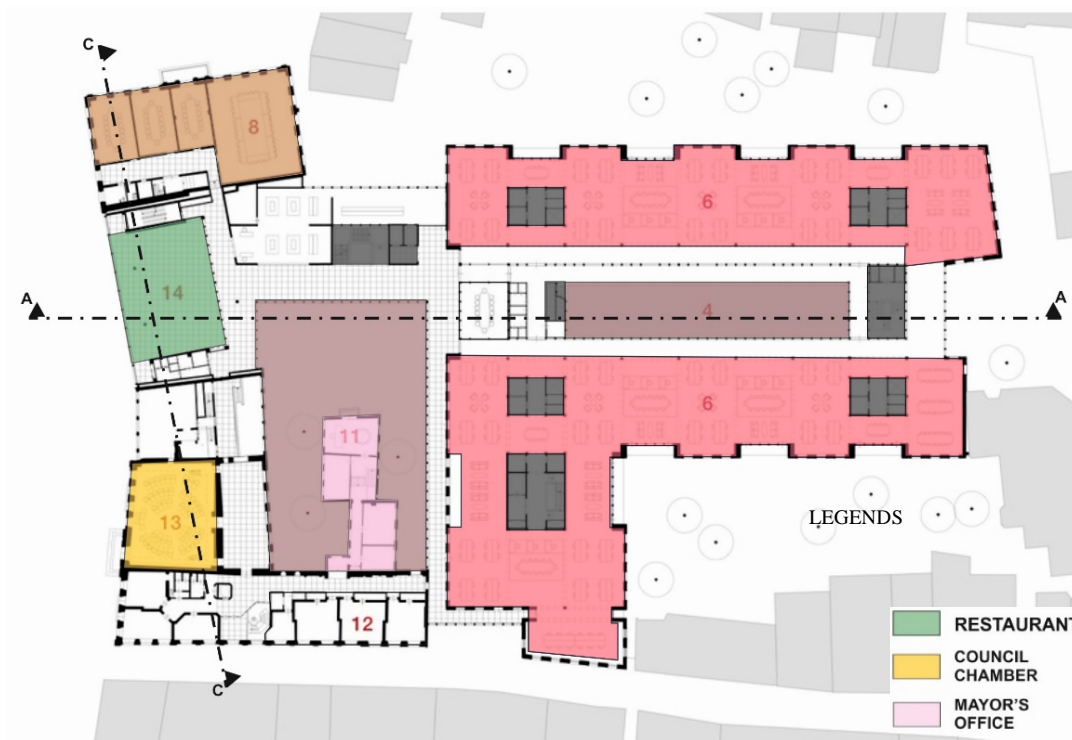


**VIEW OF PASSAGE**



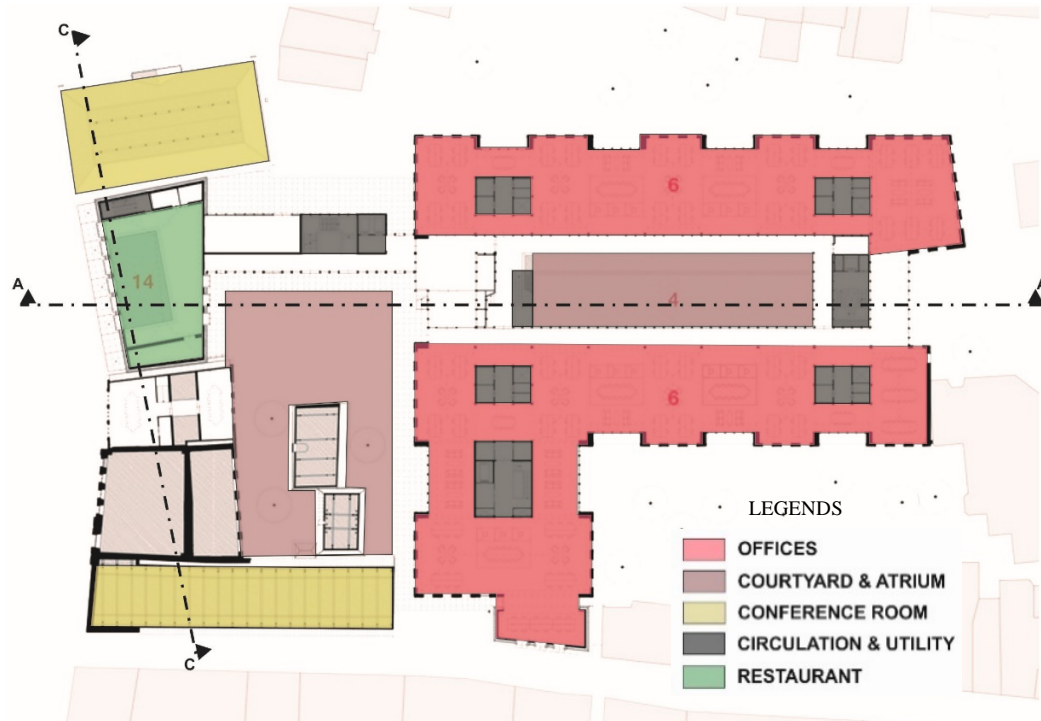
**BASEMENT PLAN**

RO



**FIRST FLOOR**

- First floor has a Council Chamber as the old buildings mayor office is also on the same floor level.
- This floor also caters to Conference rooms, Restaurant and mostly office space.

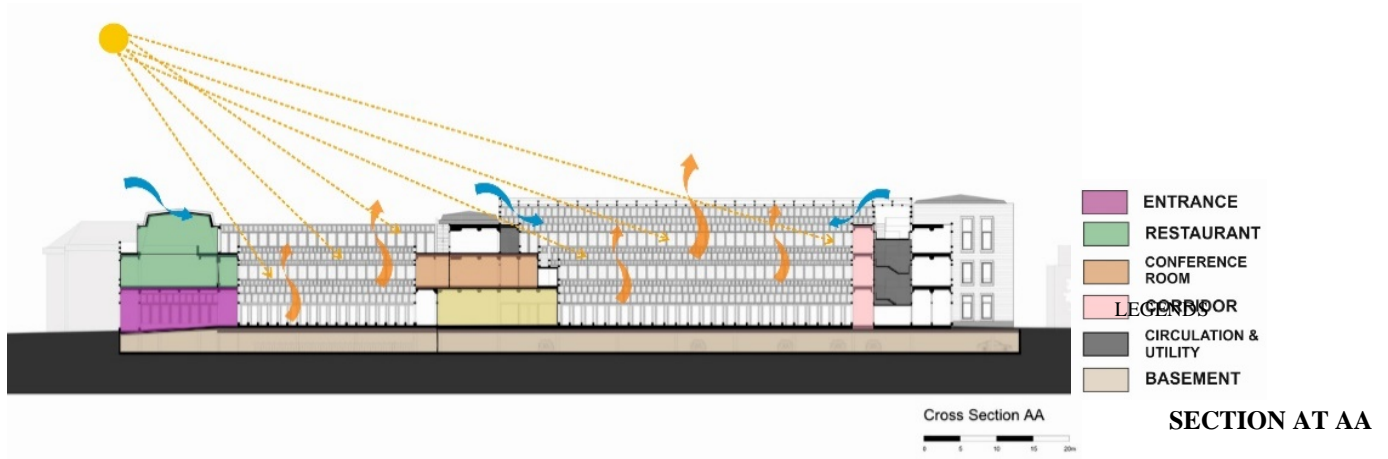


**SECOND FLOOR PLAN**

- Second floor mostly caters to the administration work requirement and its related spaces.
- The Second floor houses Open plan offices and Conference rooms.
- One restaurant is provided on this floor.







- Courtyard surrounds the mayor's residence.
- The courtyard connects the old building with new building and is being used by the citizen, employees to meet up and gather.
- It helps in cross ventilation and help in getting the light in every part of the building.



VIEW OF COURTYARD



VIEW OF ATRIUM

VIEW OF RESTAURANT

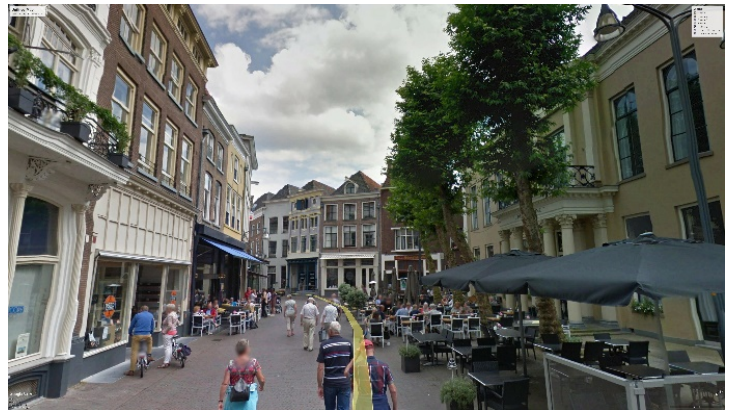


VIEW OF SERVICE DESK FROM INSIDE



VIEW OF SERVICE DESK

- The streets are mostly used by the pedestrian users and have a cafeteria and seating are arranged outside the restaurant.
- People would feel connected with the City hall because of the direct connection of the street with the building.



VIEW OF STREET WITH CAFETERIA



VIEW OF STREET PARKING

### 3.3 HKSAR GOVERNMENT HEADQUARTER

- There is no parking space within the site boundary.
- An empty space on the other side of





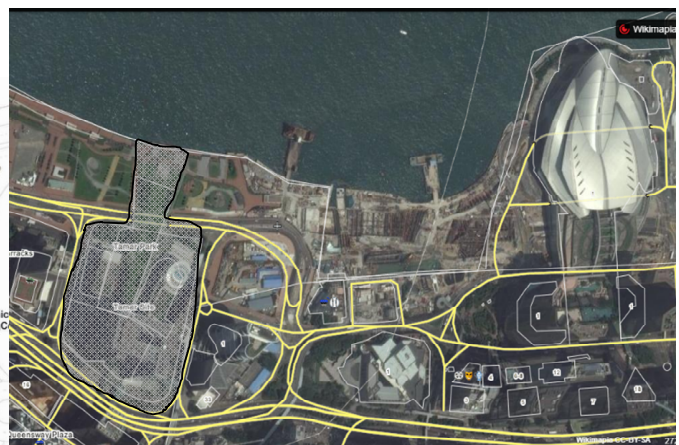
## SKYLINE OF WITH HKSAR GOVERNMENT BUILDING

### INTRODUCTION

- Site Area: **42,218 sq. m.**
- Floor Area: **131574 sq. m.**
- No. of Floor: **29**

### LOCATION:

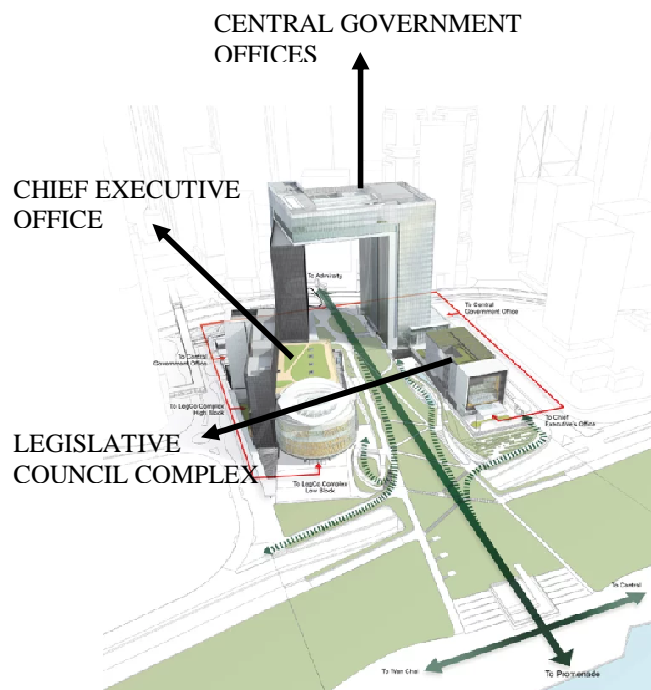
**2 Tim Mei Avenue, Tamar, Hong Kong**



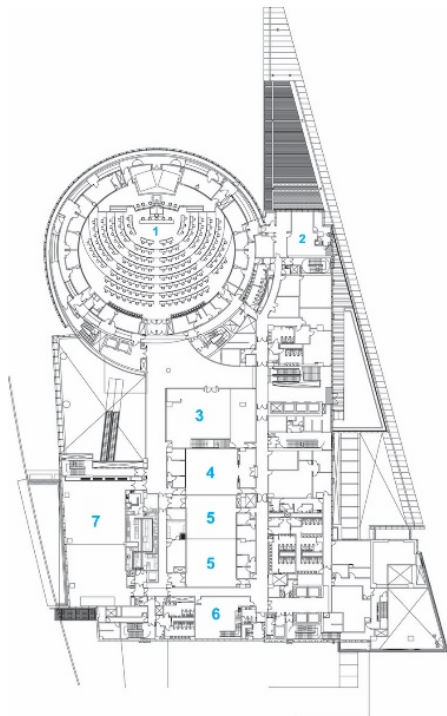
- The headquarter houses HKSAR Central Government Offices, the Chief Executive's Office and the Legislative Council Complex.
- The building is located on the

## SITE PLAN

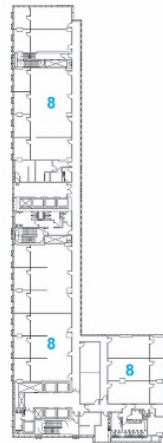
- The HKSAR government headquarter has multiple entry points from two opposite edge of the site.
- Site has River at one of the edge and it is the major pedestrian entry point, so the people feel connected with the park meant to be for them.
- One exit from the complex is towards the admiralty from the opposite edge of the river.



SITE VIEW



LegCo 1/F



LegCo 6/F

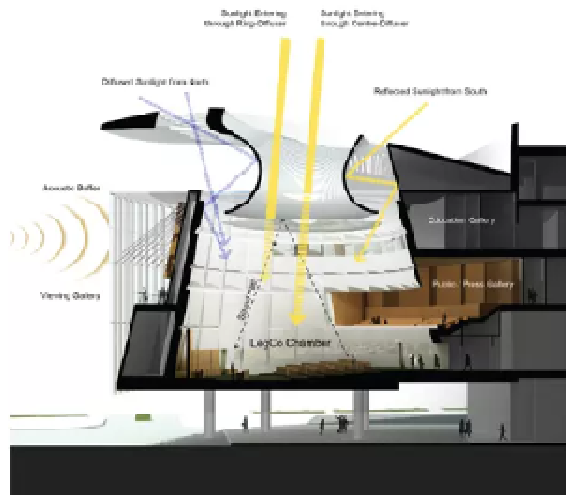
- 1 Plenary Hall
- 2 President Suite Office
- 3 Ante-Chamber
- 4 Conference Room
- 5 Press Conference Room
- 6 Press Room
- 7 Dining Hall
- 8 Member's Office

**PLANS OF COUNCIL COMPLEX**

- The ground floor of the Council Complex is designed for an auditorium to have plenary sessions of the council members, conference rooms, dining space etc.



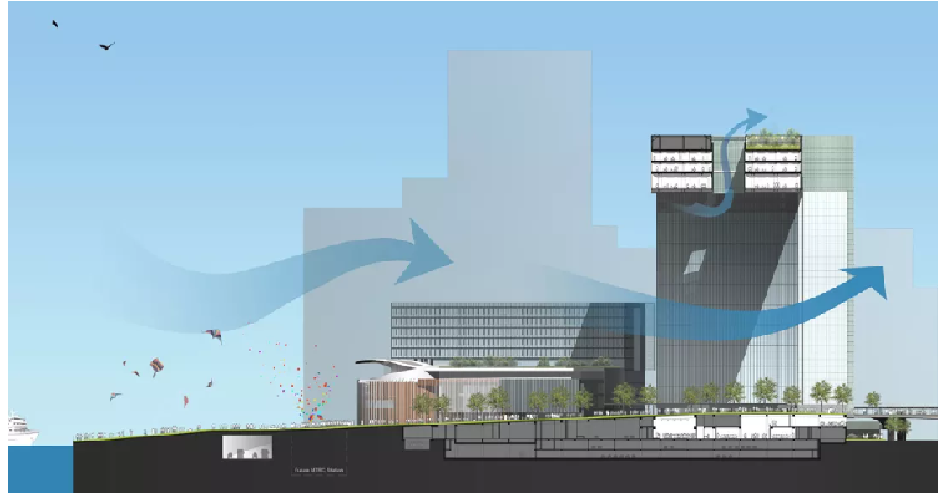
PLENARY HALL



SECTION THROUGH PLENARY HALL

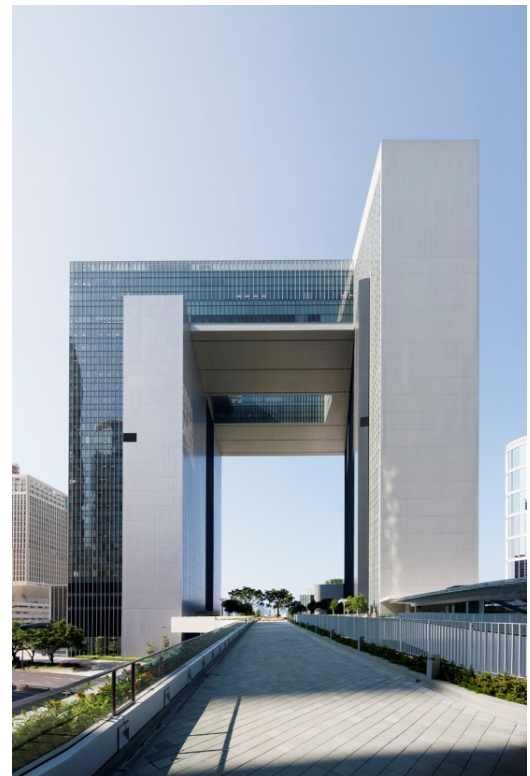
- Most part of this floor is only G+1 structure and the rest of the floor area is g+6 storey building.
- The plenary hall has an opening in the roof which lets the sunlight in the space.



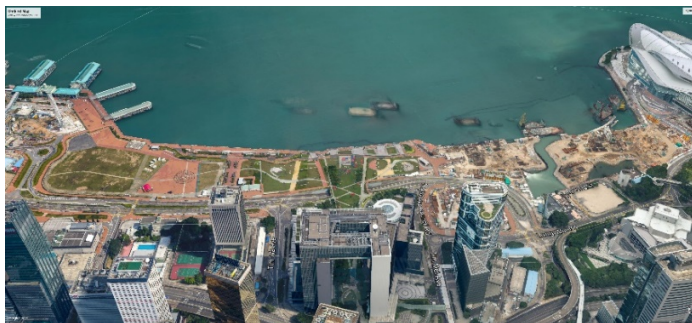


SITE SECTION EXPLAINING  
WIND MOVEMENT

- The complex is designed so that the air movement is not obstructed.
- The gap between the two building lets the air pass through it; the connecting part is also has a cut out which helps in ventilation to every space.
- The building is designed in such a way that it blends with the surrounding building yet has its own identity.



SKYLINE OF WITH HKSAR  
GOVERNMENT BUILDING



SKYLINE OF WITH HKSAR

### 3.4 PIMPRI-CHINCHWAD MUNICIPAL CORPORATION

AREA: 171.51 sq. km.

TOTAL POPULATION: 17, 27, 692

POPULATION GROWTH (2001-2011): 5.49%

SEX RATIO: 1000:833

POPULATION DENSITY: 9, 353 person/sq.km.

LITERACY RATE: 89.22%



## PIMPRI-CHINCHWAD LIMIT



## INTRODUCTION



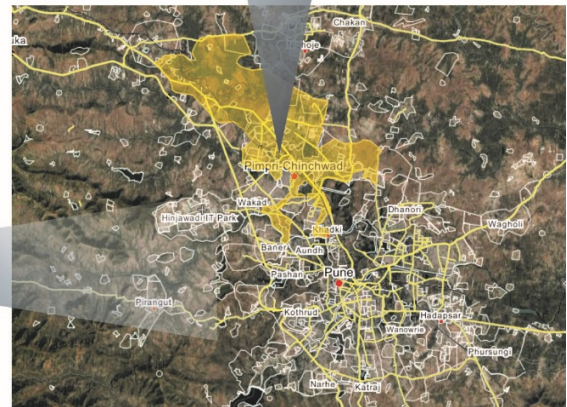
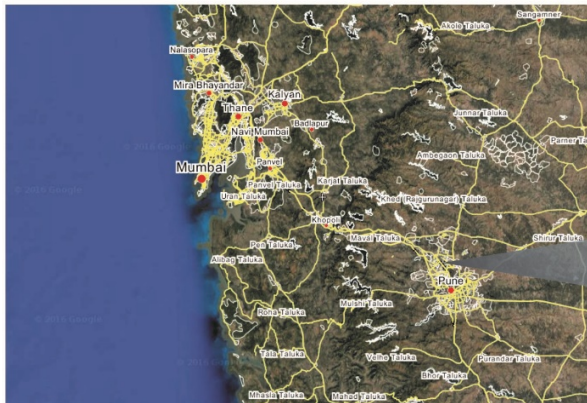
Architect: **Kirloskar Consultants Ltd.**

Site Area: **11,565.5 sq. m.**

No. of Floors: **G+4 and the Basement**

### LOCATION

**Mumbai-Pune Road, Pimpri, Pune**



The Pimpri railway station is 1.3 km away from PCMC administrative building. Pimpri station is local railway network station. It is only 15 min walking distance from the PCMC building.

Pimpri chowk bus stop is the nearest bus stop and it is only at 3 min walking distance. ST bus and PMPL bus service are active on this route and very helpful for people to access the PCMC administrative





**BASEMENT**

**PLANNING:**

PARKING ALONG THE PERIPHERY OF THE SITE

NEARSET BUS DEPOT (WALKINGDISTANCE)

ENTRANCE FOR THE PCMC



The proposed basement plan is designed

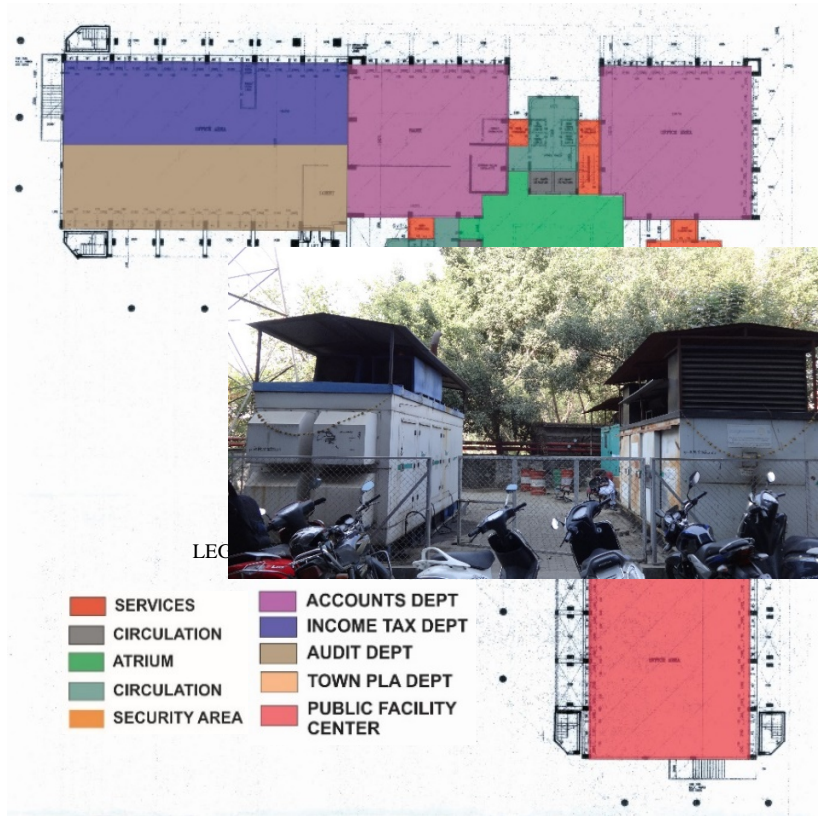
FIRE CONTROL UNIT



BANK AND CANTEEN







**GROUND FLOOR PLAN**

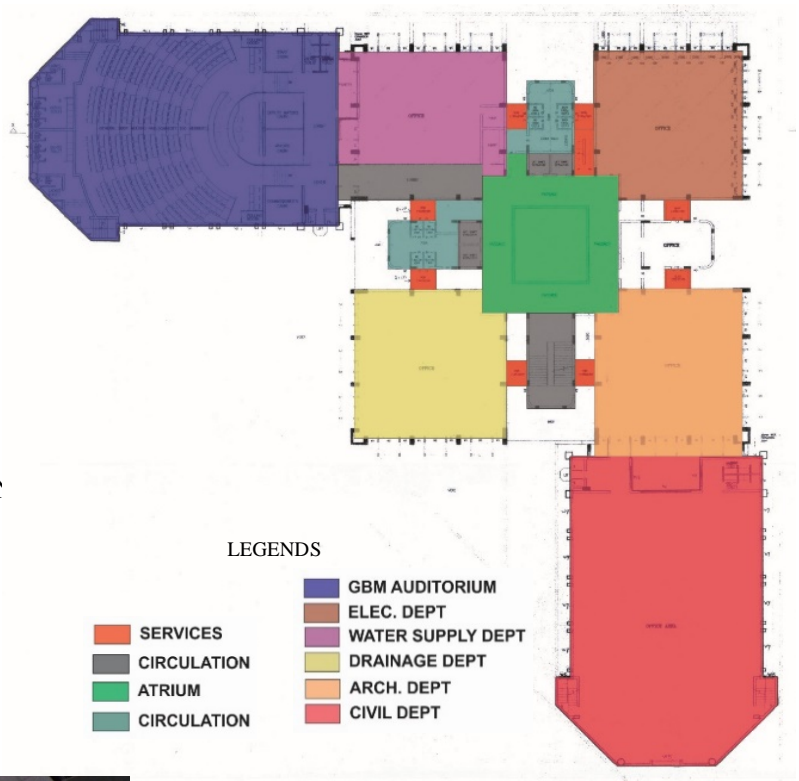
### ELECTRICITY SUPPLY CONTROL UNIT



- The building has concrete canopy at the entrance, steps & ramp to reach the plinth level.
- After security checking one enters into an atrium. There are lifts and staircase to

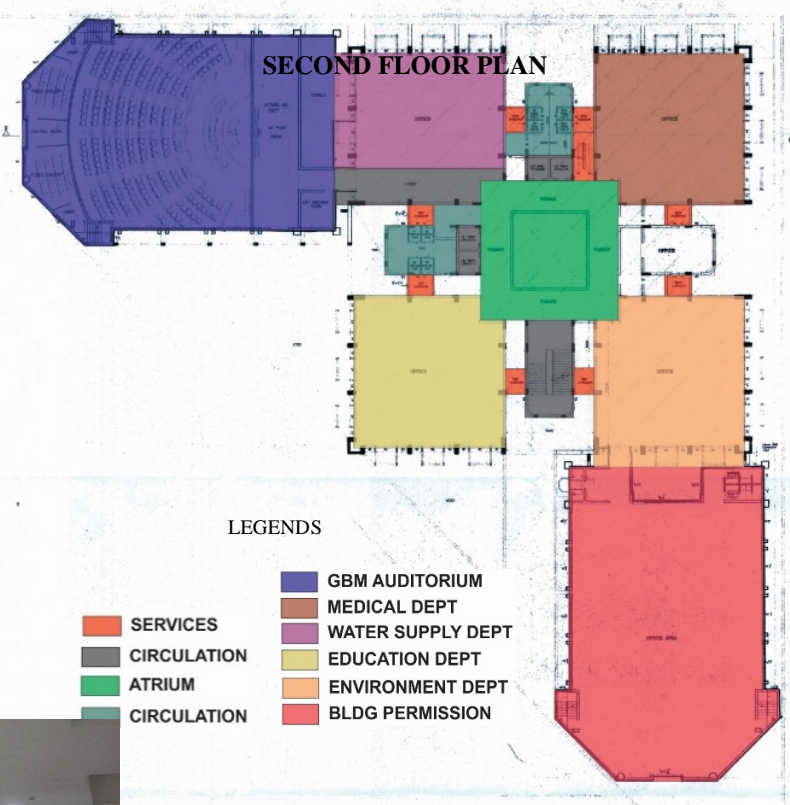


ENTRANCE TO THE BUILDING



VIEW OF AUDITORIUM



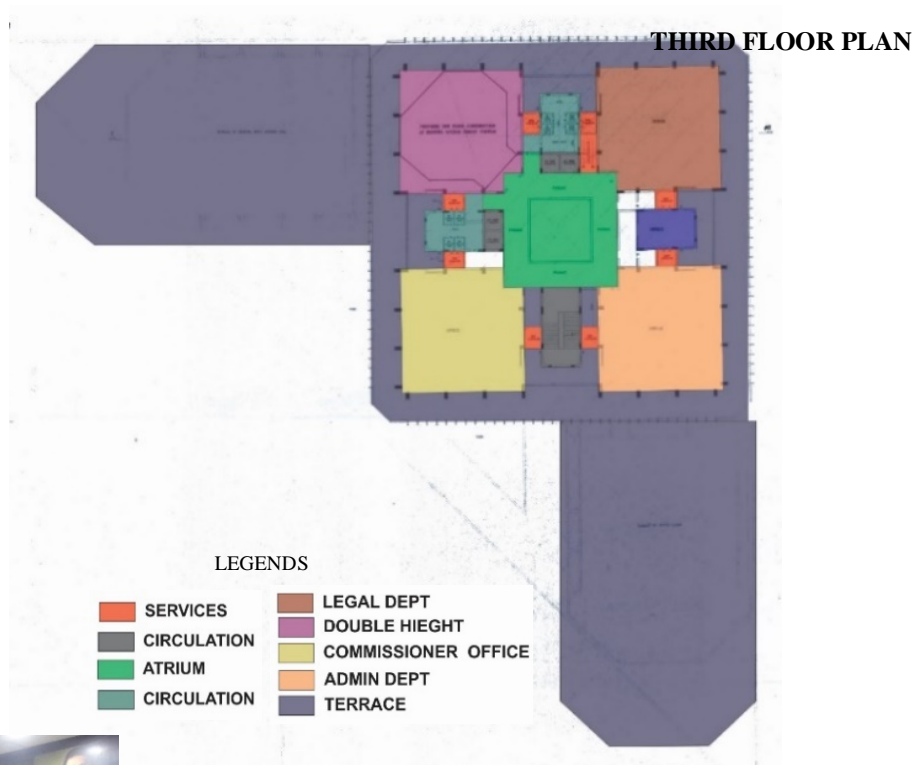


HVAC DUCT IN THE AUDITORIUM





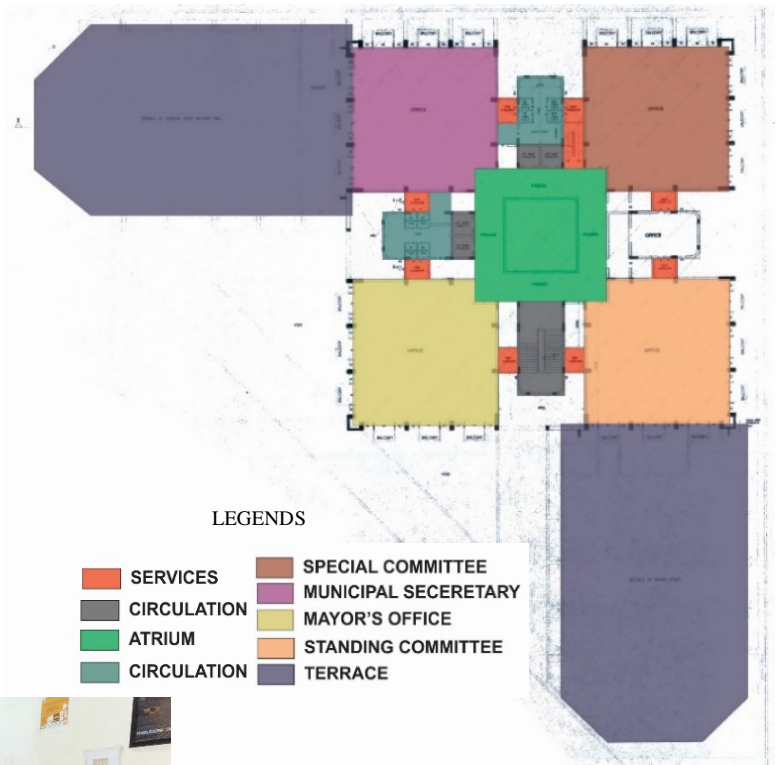
VIEW OF THE INTERIOR OF OFFICE SPACE



DRINKING WATER FACILITY AT EACH FLOOR



MAYOR'S OFFICE



INWARD-OUTWARD OUTSIDE  
EACH DEPARTMENT







RECORD ROOM

- The building has better services than most of the other government buildings.
- Firefighting system with sprinklers is designed throughout the building.
- HVAC system is designed throughout the building.

ANALYSIS:

STRENGTH	WEAKNESS
<ul style="list-style-type: none"> <li>• The building caters to all the mandatory function required by an administrative building.</li> <li>• Each department has sufficient space for the respective function to be carried out smoothly.</li> <li>• The department space is well ventilated by the natural light and does not require the artificial illumination.</li> </ul>	<ul style="list-style-type: none"> <li>• The building has no public related activity designed which could invite people.</li> <li>• Parking spaces is much less than the required space.</li> <li>• Ventilation inside the corridors is not sufficient also the roof of the atrium could have been designed better.</li> <li>• Few departments don't have direct access but have to pass form the other department</li> </ul>

<ul style="list-style-type: none"> <li>• Services like Firefighting, electricity, water supply and drainage, HVAC are better than most of the other government buildings.</li> <li>• Employees have banking facility within the site boundary.</li> </ul>	<p>which is a design flaw.</p> <ul style="list-style-type: none"> <li>• Positioning of the departments is not as per the visit of people on a daily basis.</li> <li>• The building is not barrier free, it is difficult for physically challenged people to access the desired department.</li> </ul>
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## **CHAPTER 4. SITE SELECTION**



#### 4.1 SELECTION CRITERIA

- Site should have a better connectivity from the major source of transport like railway station, bus depot etc.
- The location should be such as it is roughly in the middle of the jurisdiction area of Municipal Corporation.
- Site should have accessibility at least from 2 edges, also they must be wide enough so that there should not be any traffic issues near the Corporation.
- The site should preferably demarcated as government institution or public utility in the development plan.
- Basic services such as electricity, water supply, drainage etc. must be provided on the site by the concerned authority.
- It should be certain distance away from the industrial area and residential area to avoid disturbance.

## 4.2 SITE OPTIONS

### OPTION A:

1. Location: **Sector 03, New Panvel**
2. Land use demarcated in the Development Plan: **HFSI Zone**
3. Site Area: **17,597 sq. m.**

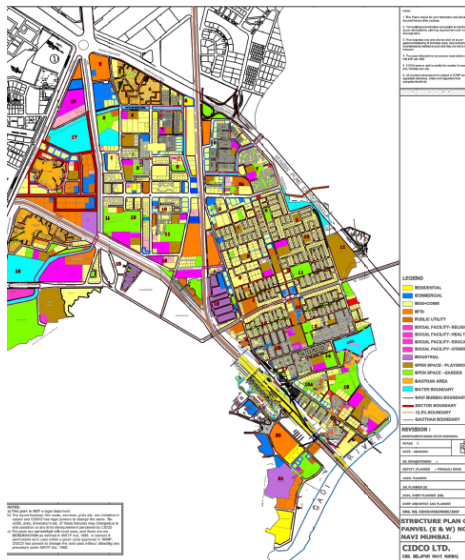
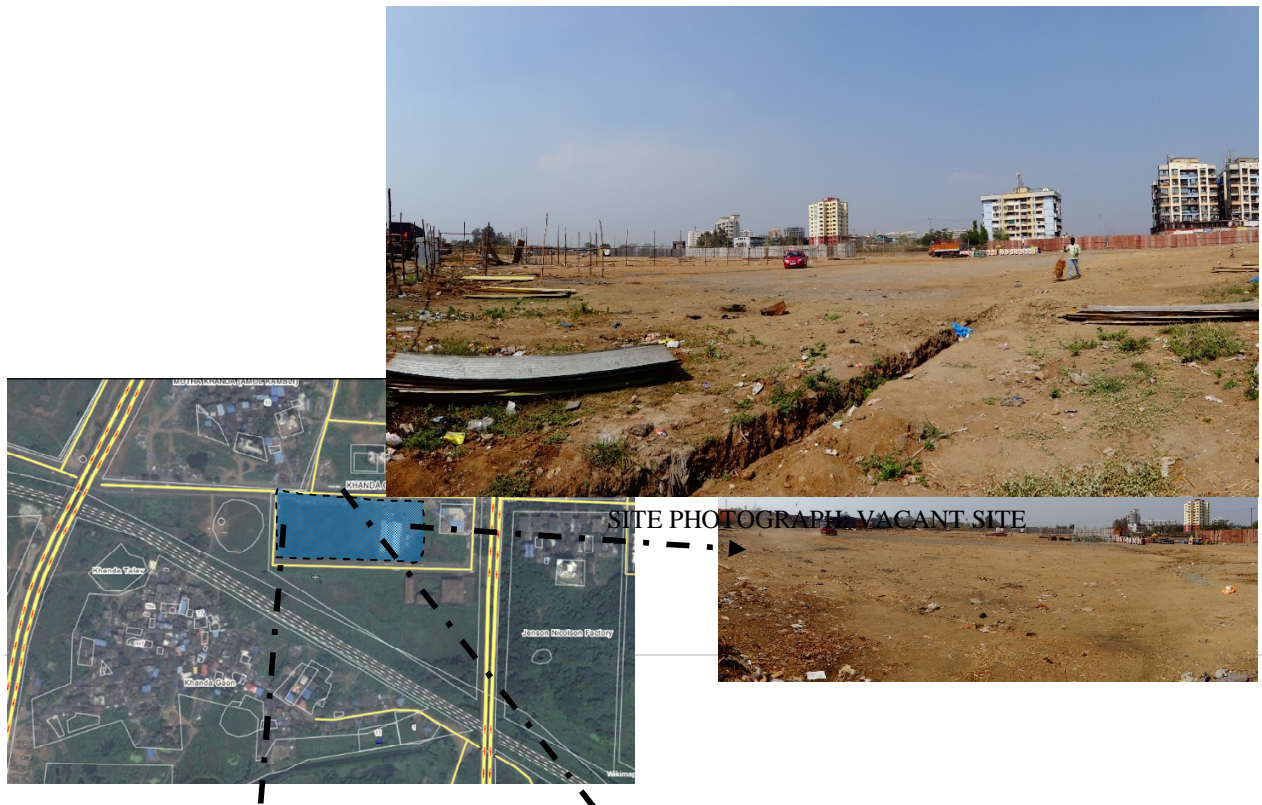


Figure 3: PANVEL DP PLAN



Figure 2: PLOT NO. 30, 31, 32, 36, 37, 38.



**SITE PHOTOGRAPH**

**SATELITE IMAGE**



**SITE PHOTOGRAPH**



**MAIN ACCESS ROAD FOR SITE**



**BHOOMI LANDMARK**



**MIDC OFFICE**

**ANALYSIS:**

<b>STRENGTH</b>	<b>WEAKNESS</b>
<ul style="list-style-type: none"><li>• Site has better access from three sides.</li></ul>	<ul style="list-style-type: none"><li>• Site is located very near to PANVEL-CST</li></ul>

<ul style="list-style-type: none"> <li>• Site does not have much buildings in the area nearby, hence cause no disturbance to the site.</li> <li>• Site is used temporarily for the fairs and circus and remain vacant for most of the time of the year.</li> <li>• Better services has been provided in the location and also the buildings like MIDC office and few commercial buildings makes it suitable site for PCMC headquarter.</li> <li>• Very near to the Khandeshwar railway station.</li> </ul>	<p>railway route which causes noise.</p> <ul style="list-style-type: none"> <li>• Site area does not fulfil the area requirement of the PCMC demand from CIDCO.</li> <li>• Site is not located on the secondary road, not on the primary road.</li> <li>• Access from the site is directly from the road and a service road is required which further reduces the area of site.</li> <li>• It is demarcated as HFSI zone which CIDCO will not provide for PCMC building.</li> </ul>
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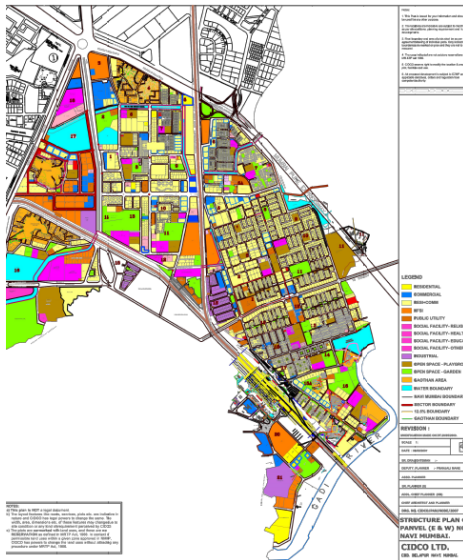
OPTION B:

1. Location: **Sector 17, New Panvel**



2. Land use demarcated in the Development Plan: **HFSI Zone**

3. Site Area: **23,902 sq. m.**



PLOT NO. 4, 5, 5A



SITE PHOTOGRAPH;  
USED FOR PARKING







HOLDING POND

SATELITE IMAGE



ROAD AT ONE OF THE EDGE



MAIN ACCESS ROAD



COMMISSIONR OF CENTRAL  
EXICE BUILDING



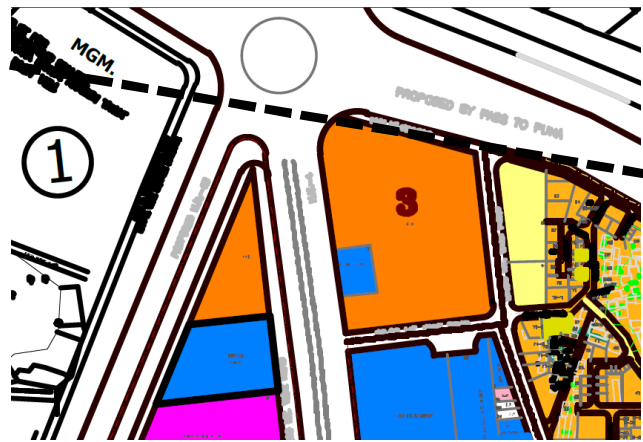
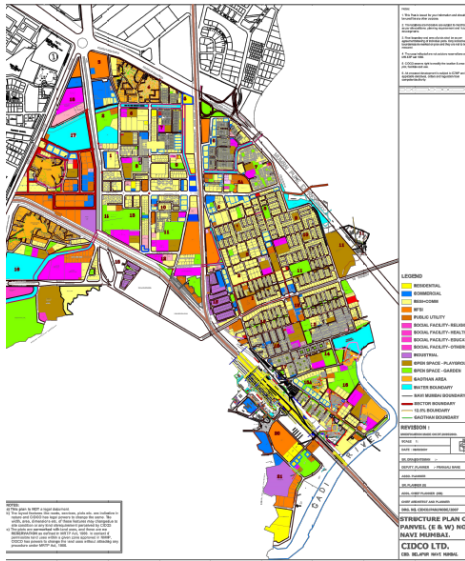
TRIFED TOWER

ANALYSIS:

STRENGTH	WEAKNESS
<ul style="list-style-type: none"> <li>• Site has wide roads on 3 edges thus provide better accessibility.</li> <li>• It is in the front layer from the National Highway 4 and already have a service road.</li> <li>• Other government institutions such as TRIFED Tower and Commissioner of Central Excise, Customs and Service Tax building are in the same row as of the site.</li> <li>• Basic services are provided in the locality by CIDCO.</li> <li>• Near to Khandeshwar railway station.</li> </ul>	<ul style="list-style-type: none"> <li>• Site area does not fulfil the area requirement of the PCMC demand from CIDCO.</li> <li>• It is demarcated as HFSI zone which CIDCO will not provide for PCMC building.</li> <li>• Municipal Corporation will cause traffic issues and Parking problems in the area, as the roads are already being used for the parking of trucks.</li> </ul>

OPTION C:

1. Location: **Sector 17, New Panvel**
2. Land use demarcated in the Development Plan: **Hospital & ISBT**
3. Site Area: **46,241.6 sq.m.**



PLOT NO.

PANVEL DP PLAN



SITE PHOTOGRAPH





**SATELITE IMAGE**



**CURRENT SITE ENTRY**



**PATROL PUMP (EXCLUDED PLOT)  
ON THE SITE**

**PART OS SITE RESERVED  
FOR HOSPITAL**



NMMC BUS DEPOT ENTRANCE

ANALYSIS:

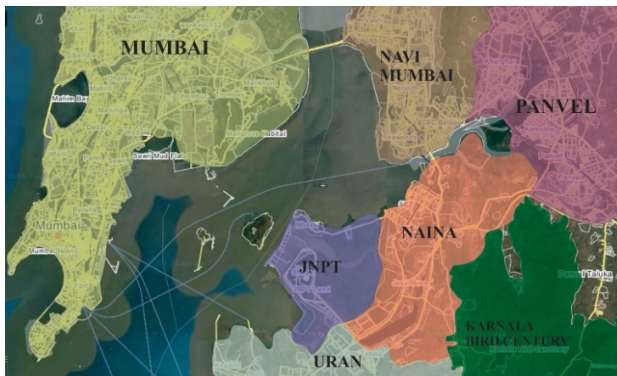
STRENGTH	WEAKNESS
<ul style="list-style-type: none"> <li>• Road network: the site is located near major road network, which are NH 4, NH 4C, Sion-Panvel highway, Mumbai-Pune expressway.</li> <li>• Strategic location: the site is located at the Kalamboli junction which is in the centre of the Panvel municipal corporation jurisdiction.</li> <li>• It is the entry point for Panvel city, thus offers the best site for the construction of the Administration building of the city which is the identity of the any city.</li> <li>• Site can be accessed easily from the Panvel &amp;Khandeshwar railway station, Panvel bus depot which are within 5 km range.</li> <li>• Better services like Electricity, Drainage &amp; Water supply.</li> <li>• Site has road on all the 4, which makes the site accessible from multiple entry point.</li> <li>• Site fulfils the required area asked by the PCMC authority from the CIDCO.</li> </ul>	<ul style="list-style-type: none"> <li>• Traffic: the site is located at the junction of 3 major road network which will affect the site during peak traffic hours.</li> <li>• Location: major road network makes the site very vulnerable and expose it to air &amp; noise pollution.</li> <li>• The Site is divided into plot 1, 2&amp;3 out of which plot 1 is reserved for Hospital and Plot 2&amp;3 are reserved for Interstate Bus Terminus.</li> <li>• Site cannot be entered from the Highway and one of the other road is one way road which can only be use to exit the site.</li> </ul>

- Site option 3 is selected as the Final Proposed Site for the construction of Administration Building fir the Panvel City Municipal Corporation.



### 4.3 SITE ANALYSIS

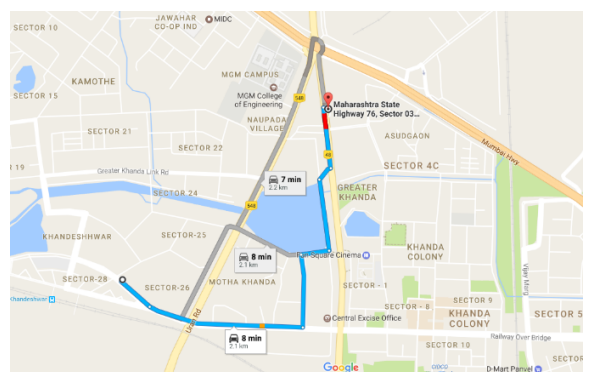
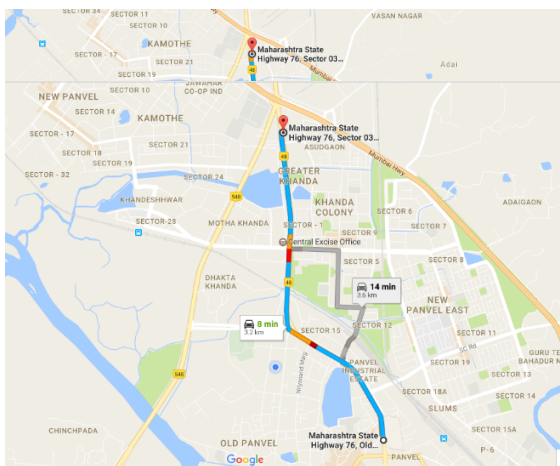
LOCATION: Plot 1, 2&3, Sector 3, New



Panvel.

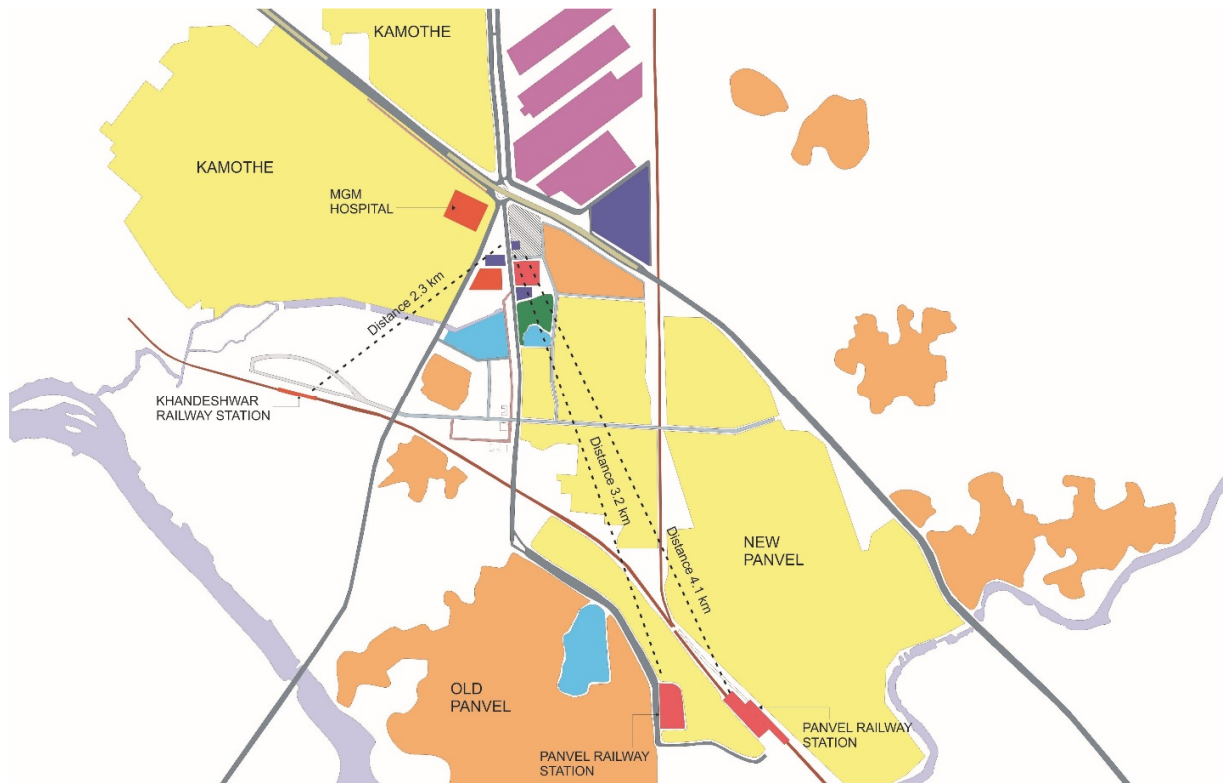


### SITE ACCESSIBILITY:

















- The nearest railway station to the proposed site is Khandeshwar Railway Station which is at 2.1 km.
- Panvel Railway station is at 6.3 km from the site.
- Panvel ST bus depot is at 3.5 km distance from the site and NMMT bus depot is adjacent to the site.
- Overall site accessibility is excellent.

LARGER CONTEXT:







LEGENDS

	PLANNED SETTLEMENT		RAILWAY TRACK
	PUBLIC PARK		PRIMARY ROAD
	UN-PLANNED SETTLEMENT		SECONDARY ROAD
	WATER CHANNEL		SERVICE ROAD
	INDUSTRIAL		TRANSPORTATION
	COMMERCIAL		INSTITUTION
	POND		SITE

- The site is located at Kalamboli junction.
- It is very near to Asudgaon village. Most of the area around the site is planned by the CIDCO.
- It is very near to Khandeshwar, Panvel railway station and Panvel bus depot.
- There is a steel market on the other side of the road and few institutional building are near to the site.

## ROAD NETWORK:



	NATIONAL HIGHWAY 4
	NH 4C, JNPT HIGHWAY
	TRUCK TERMINUS ROAD
	KALAMBOLI JUNCTION



- The site is located at the junction of NH 4, Sion-Panvel Highway, NH 4C and Mumbai-Pune Expressway.
- There are also service roads on major roads.
- A Mumbai-Pune flyover is on one of the

	PROPOSED SITE
	KALAMBOLI FLYOVER
	SION-PANVEL HIGHWAY
	ROAD ADJACENT TO SITE
	SERVICE ROAD



ONE WAY ROAD PUNE-PANVEL

SION-PANVEL HIGHWAY

- The secondary road in the picture does not have much vehicular activity.





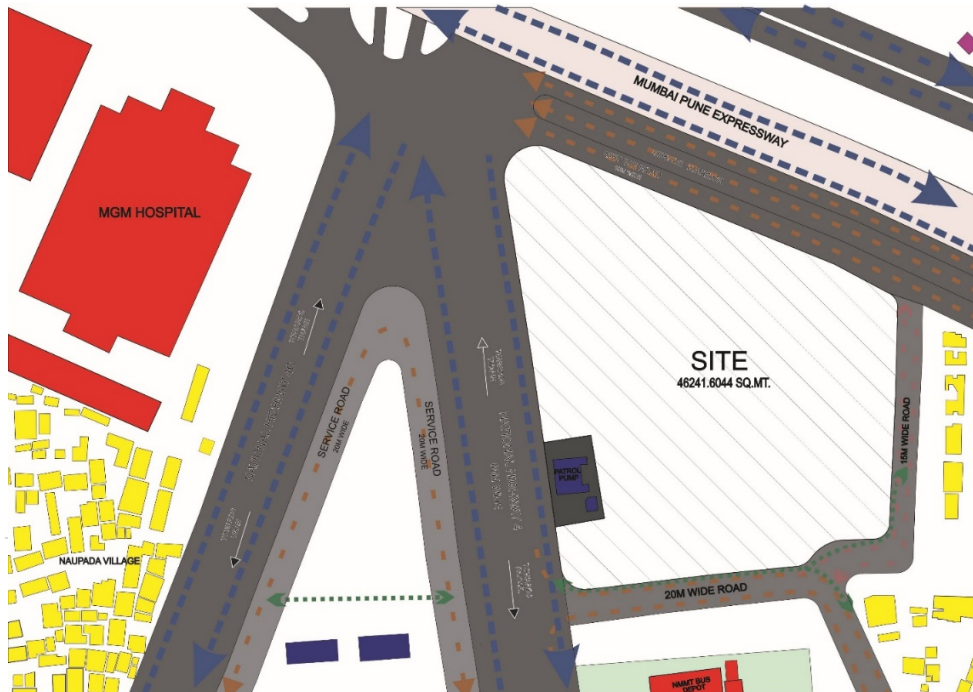


SECONDARY ROAD:  
EAST DIRECTION

NH 4



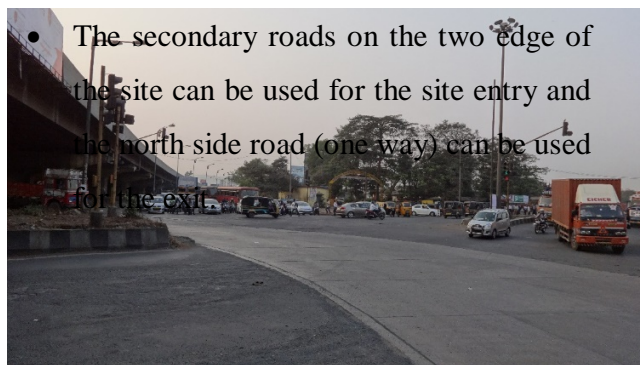
PANAROMA VIEW: NH  
4, NH 4C, SITE ENTRY



VEHICULAR &  
PEDESTRIAN  
MOVEMENT:



- Traffic as discussed earlier is a big issue as it is located at the junction of few major roads.



- The secondary roads on the two edge of the site can be used for the site entry and the north side road (one way) can be used for the exit.

LEGENDS

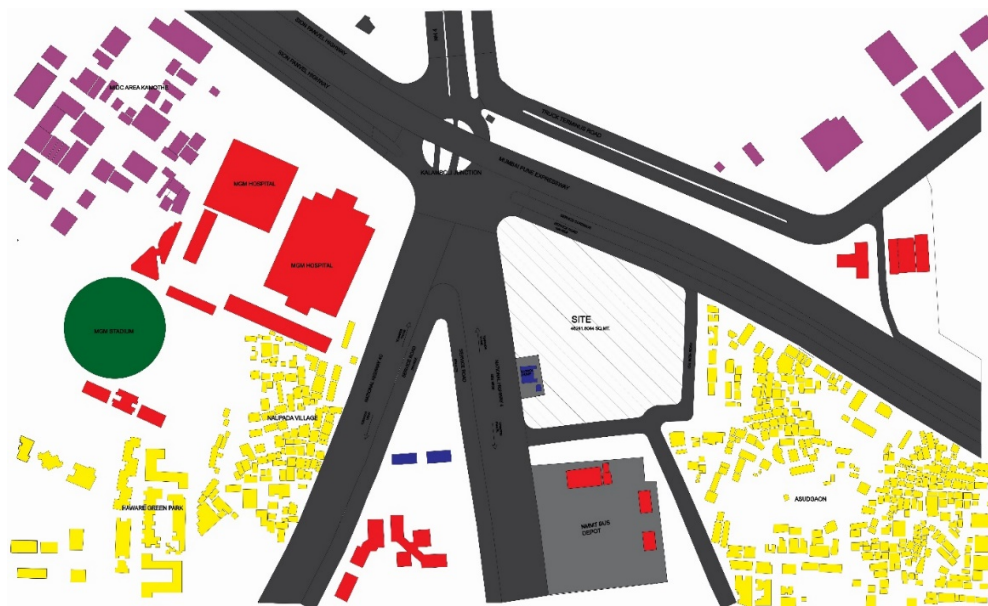
- SITE
- PEDESTRIAN MOVEMENT



SECONDARY ROAD

SION-PANVEL HIGHWAY

SITE CONTEXT:



LEGENDS

-  SITE
-  INDUSTRIAL
-  ROAD

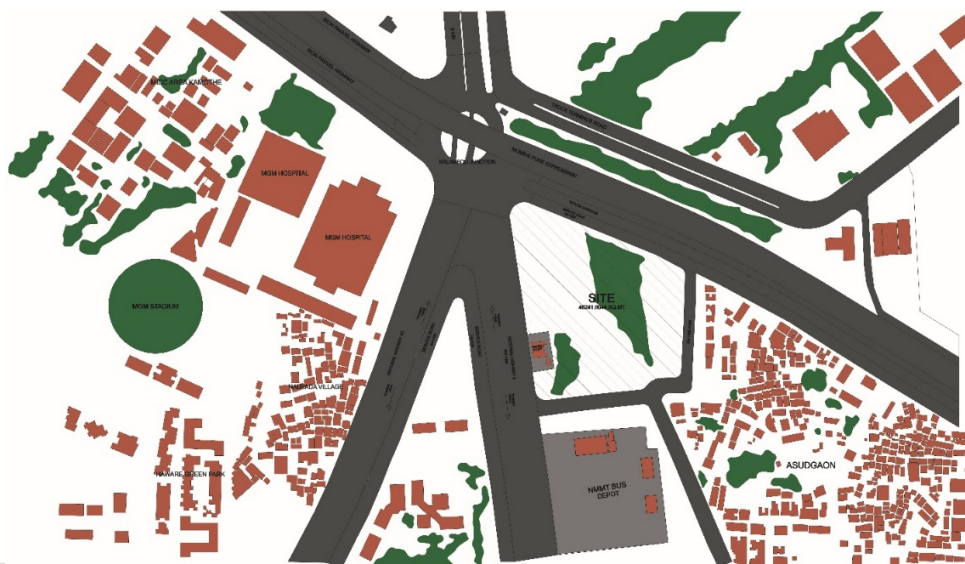


MGM HOSPITAL

- There is a village named Asudgaon adjacent to the site.
- NMMT bus depot is situated at one







RESIDENTIAL BUILDINGS  
IN ASUDGAON VILLAGE  
BUILT-UNBUILT SPACES.



LEGENDS

- There are very less green patches in the locality.
- Site does not have any tree but few vegetation.
- The village is compactly settled and other planned area have equal built-unbuilt spaces but overall it lacks natural feature.

	SITE
	BUILT SPACE
	GREEN/OPEN SPACES
	ROADS

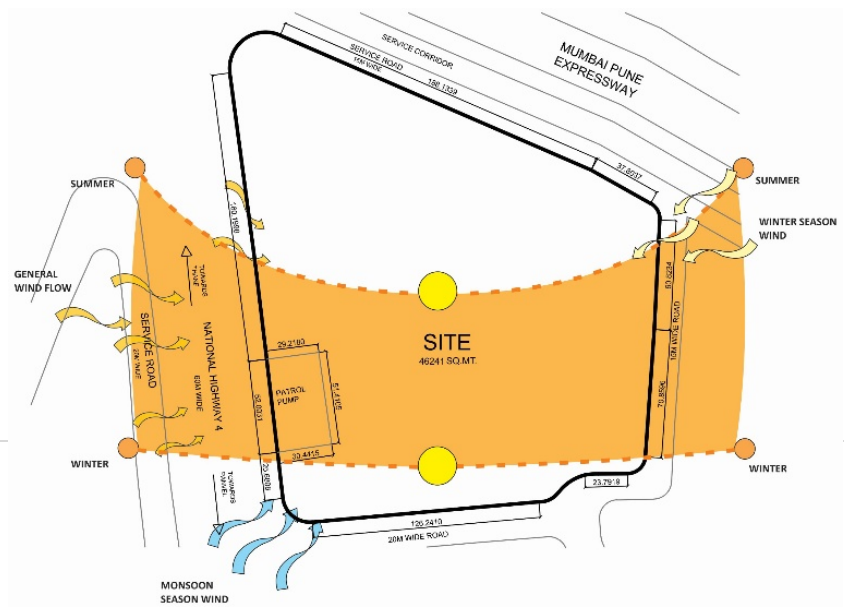
PATROL PUMP ON THE SITE



NATURAL VEGETATION



CLIMATIC



ANALYSIS:





<ul style="list-style-type: none"> <li>• Road network: the site is located near major road network, which are NH 4, NH 4C, Sion-Panvel highway, Mumbai-Pune expressway.</li> <li>• Strategic location: the site is located at the Kalamboli junction which is in the centre of the Panvel municipal corporation jurisdiction yet falls under Panvel boundary.</li> <li>• Site context: site is located near an industrial area of Kalamboli. MGM hospital is opposite to the site and NMMT bus depot is adjacent to the site.</li> <li>• Accessibility: the site can be accessed easily from the Panvel &amp; Khandeshwar railway station, Panvel bus depot which are within 5 km range.</li> </ul>	<ul style="list-style-type: none"> <li>• Traffic: the site is located at the junction of 3 major road network which will affect the site during peak traffic hours.</li> <li>• Location: major road network makes the site very vulnerable and expose it to air &amp; noise pollution.</li> <li>• Direct exposure to highway: no service road for the entry to the site on two major edges.</li> </ul>
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OPPORTUNITIES	THREAT
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<ul style="list-style-type: none"> <li>• Landmark design: the location is such that it marks the starting of the Panvel city, hence it is a great opportunity to design the main building as the landmark &amp; the identity for the city.</li> <li>• Additional function: the lack of public facility in the vicinity makes the site ideal to incorporate public function which can also generate some income for the PCMC headquarter building's maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>• No basement: the water table in the region does not allow the basement construction which can cause parking space shortage.</li> <li>• Hindrance at the entrance: the entry to the site and to the building might cause further traffic issues on the highway and the junction.</li> <li>• Security: the building has to be designed at the safe distance from the expressway flyover.</li> </ul>
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## **CHAPTER 5. DESIGN DEVELOPMENT**

## 5.1 AREA PROGRAMME

No.	PERTICULARS	AREA IN SQ.MT.
1	Entrance Lobby	150
2	Help Desk	50
3	Account Department	200
4	Administration Department	150
5	Audit Department	100
6	Building Permission Department	150
7	Town Planning Department	200
8	Water Supply & Drainage Department	250
9	Electrical Department	200
10	Election Department	50
11	Municipal Secretary	150
12	Security Department	100
13	Info & Tech Department	80
14	Public Relation Department	50
15	Health Department	200
16	Education Department	120
17	Transportation Department	120
18	Establishment Department	80
19	Waste Management Department	40
20	Community Development Department	100
21	Mayor's Office	150
22	Commissioner's Office	150
23	Mayor's Office	100
24	Tax Department	130
25	Civil Department	350
26	Zone Office (A)	100
27	Zone Office (B)	100

28	Zone Office (C)	100
29	Zone Office (D)	100
30	Environmental Department	120
31	Slum Rehabilitation	40
32	Telecom Department	50
33	Garden	30
34	Sports	25
35	Fire Brigade	50
36	Legal	80
37	License	80
38	LBT	130
39	Estate	100
40	Encroachment	80
41	General Body Meeting	350
42	Standing Committee Members Office	80
43	Standing Committee Meeting Room	40
44	Media Room	100
45	Record Room	150
46	Storage Room	100
47	Control Room	40
48	Day Care	70
49	Canteen	300
50	Stationery	80
51	Employee Union Room	80
52	Power Supply/ Generator Room	50
53	Exhibition Hall	1500
54	Community Space	300
55	Toilets	250
56	Circulation	2100
	<b>TOTAL</b>	<b>10200</b>



## 5.2 CIDCO BYLAWS

- ENTRY FROM THE HIGHWAY/IMPORTANT ROADS:
  - The width of the main street on which the building abuts shall not be less than 12 meters.
  - The approach to the building and open spaces on its all sides (see Regulation No. 15.1) and the layout for the same shall be done in consultation with the Chief Fire Officer.
  - Main entrances to the plot shall be of adequate width to allow easy access to the fire engine and
  - In no case it shall measure less than 4.5 meters.
  - The main entrance should have a minimum vertical height of 4.5 meters.
- ROADS / STREETS IN LAND SUB-DIVISION OR LAYOUT:
  - For all land uses the width of the approach from the street to building shall not be less than 3.5 m. if its length is more than 9 m. but if the area salvaged exceeds 800 sq.mt. Or the length exceeds 70 m, a regular street shall have to be provided as per requirements.
- OPEN SPACES AND HEIGHT LIMITATIONS:
  - EXTERIOR OPEN SPACES:
    - **Buildings Abutting Two or More Streets:** Where a building abuts two or more streets, the setbacks from the streets shall be such as if building was fronting each such street.
    - **Front Setback** - 12 m. from the road or 37 m. from centre line of reservation from National Highway, State Highway and Major District Road whichever is more.
    - **Side and Rear Open Space** - Side and rear marginal distance to be left open shall be 6 m. However this shall apply only to principle building.
    - **Projection into open spaces:** Every open space provided either interior or exterior shall be kept free from any erection thereon and shall be open to the sky.
    - **Canopy:** A canopy over an entrance not accessible from the upper floor and leaving a clear margin of at least 1.5 m. from nearest plot boundary.

- **HEIGHT LIMITATION:**

- a) The maximum height of building shall not exceed 1.5 times the width of road abutting plus the front open space.
- b) If a building abuts on two or more streets of different widths, the building shall be deemed to face upon the street that has the greater width.

- **PARKING SPACES:**

• Sr. No.	• Type of Mode	• Size of Parking Bay	• No. of Parking Provided
• 1.	• Car	• 2.5 m. x 5.0 m.	• Employees- 100 • Visitors- 60
• 2.	• Scooter	• 1.2 m. x 2.5 m.	• Employees- 150 • Visitors- 100
• 3.	• Bicycle	• 0.7 m. x 2.0 m.	• 50
• 4.	• Truck	• 3.75 m. x 10.0 m.	• 10

- **For Government and Private Offices** - One, space for every 70 sq.mt. Of total floor area up to 1500 sq.mt. And one space for every 150 sq.mt. Or part thereof for areas exceeding 1500 sq.mt.
- In addition to the above 10 percent of total parking spaces shall be provided for visitors parking and 10 percent for two wheelers parking.
- 50 percent of the open space around the building may be used for parking and loading, unloading provided that a minimum distance of 3.0 m. around the building shall be kept free from any parking and loading, unloading spaces.
- In the case of parking spaces provided in basements at least two ramps of adequate width & slope shall be provided, located preferably at opposite ends.

- REQUIREMENTS OF PARTS OF BUILDINGS:
  
- **Plinth:** The plinth or any part of a building shall be so located with respect to surrounding ground level that adequate drainage of the site is assured but not at a height less than 45 cm.
- **Interior Courtyards:** Every Interior courtyard shall be raised at least 15 cm. above the surrounding ground level and shall be satisfactorily drained.
  
- **Height:** The height of all rooms for human habitation shall not be less than 2.75 m. measured from the surface of the floor to the lowest point of the ceiling (bottom of slab). In case of centrally air-conditioned building, height of the habitable room shall not be less than 2.4 m. measured from the surface of the floor to the underside of the slab or to the underside of the false ceiling. The minimum clear headroom under beam shall be 2.4 m.
  
- PANTRIES - SHALL HAVE:
- A floor area of not less than 3 sq.mt. With the smaller side not less than 1.4 m.
- A sink for the cleansing of kitchen's utensils which shall drain through a grated and tapped connection to the waste water pipe where water borne sewerage system is available; in case water borne sewerage system does not exist the grated connection should be met to the pakka surface drain leading to a soak pit, or other approved system of disposal.
- An impermeable floor and an impermeable dado 0.9 m. high.
  
- ROOFS:
- The roof of a building shall be so constructed or framed as to permit effectual drainage of the rainwater there from by means of sufficient rain-water pipes of adequate size, wherever required, so arranged, jointed and fixed as to ensure that the rain-water is carried away from the building without causing dampness in any part of the walls or foundation of the buildings or those of an adjacent building.

- **BASEMENT:**

- The height of the basement shall normally not exceed 2.4 m. if constructed for service purposes.
- The minimum height of the ceiling of first basement floor below ground level shall be 0.9 m. and maximum of 1.2 m. above the average surrounding ground level.
- Adequate ventilation shall be provided for the basement. The standard of ventilation shall be the same as required by the particular occupancy according to Regulations. Any deficiency may be met by providing adequate mechanical ventilation in form of blowers, exhaust fans, air-conditioning systems etc.
- The access to the basement shall be separate from the main and alternate staircase providing access and exit from higher floors.

- **VENTILATION SHAFT:**

- For ventilating the spaces or water closets and bath room, if not opening on the front side, rear and interior open spaces, shall open on to the ventilation shaft, the size of which shall not be less than the values given below:

• <b>Height of Building in m.</b>	• <b>Size of Ventilation Shaft in square m.</b>	• <b>Minimum Size of Shaft in meter</b>
• Up to 12	• 2.8	• 1.2
• 18	• 4.0	• 1.5
• 24	• 5.4	• 1.8
• 30	• 8.0	• 2.4
• 30 and above	• 9.0	• 3.0

- \*For building above 30 m. mechanical ventilation system shall be installed besides the provisions of minimum ventilation shaft.

- **EXIT REQUIREMENTS:**

- **General:** The following general requirements shall apply to exits:
- Every, building meant for human occupancy shall be provided with exits sufficient to permit safe escape of occupants in case of fire or other emergency.
- All exits shall be free *of* obstructions.
- Exits shall be clearly visible and the routes to reach the exit shall be clearly marked and sign posted to guide the population to floor concerned.
- All exit ways shall be- properly illuminated.
- Firefighting equipment where provided along exits shall be suitably located and clearly marked but must not obstruct the exit way and yet there should be clear indication about its location form either side of the exit way;
- Alarm devices shall be installed for buildings above 15 m. in height to ensure prompt evacuation of the population concerned through the exits.
- All exits shall provide continuous means of egress to the exterior of a building or to an exterior open space leading to a street and;
- Exits shall be so arranged that they may be reached without passing through another occupied unit.
- Lifts and escalators shall not be considered as exits.
  
- **Arrangements of Exits:**
- Exits shall be so located so that the travel distance on the floor shall not exceed 22.5 m.
- Whenever more than one exit is required for a floor of a building exit shall be placed as remote from each other as possible. All the exits shall be accessible from the entire floor area at all floor levels.
- For all buildings excepting single and multi-family dwellings below 15 m. in height, there shall be a minimum of two staircases and one of them shall be an enclosed stair-way and the other shall be on external walls of buildings and shall open directly to the exterior, interior open space or to any open place of safety.



- **Doorway:**

- Every exit doorway shall open into an enclosed stairway, a horizontal exit, on a corridor or passageway providing continuous and protected means of egress.
- No exit doorway shall be less than 95 cm. in width, Doorways shall be not than 200 cm. in height. Doorways for bathrooms, water-closet, stores etc. shall be not less than 75 cm. wide;
- Exit doorways shall open outwards, that is, away from the room but shall not obstruct the travel along any exit. No door, when opened, shall reduce the required width of stairway or landing to less than 90 cm; overhead or sliding doors shall not be installed;
- Exit door shall not open immediately upon a flight or stairs; a landing equal to at least the width of the door shall be provided in the stairway at each doorway; level of landing shall be the same as that of the floor which it serves; and
- Exit doorways shall be openable from the side which they serves without the use of a key.

- **Stairways:**

- Interior stairs shall be constructed of non-combustible materials throughout.
- Interior staircase shall be constructed as a self-contained unit with at least one side adjacent to an external wall and shall be completely enclosed. For building more than 24 m. height, all staircases shall be enclosed.
- **Note:** However, above shall not apply to any structure connecting only two floors and their height separation is limited to maximum 4.2 m.
- A staircase shall not be arranged round a lift shaft unless the latter is entirely enclosed by a material of fire-resistance rating as that for type of construction itself. For building more than 15 m. in Height, the staircase location shall be to satisfaction of chief Fire Officer, CIDCO Fire
- Brigade.
- The minimum width of treads without nosing shall be 30 cm. The treads shall be constructed and maintained in a manner to prevent slipping.
- The maximum height of riser shall be 15 cm. They shall be limited to 16 per flight.
- Handrails shall be provided with a minimum height of 90 cm. from the centre of the tread.

- In case of single staircase it shall terminate at the ground floor level and the access to the basement shall be by a separate staircase. Wherever the building is served by more than one staircase, one of the staircases may lead to basement levels provided the same is separated at ground level by either a ventilated lobby or a cut-off screen wall without opening, having a fire resistance of not less than 2 hours.
  
- **Ramps:**
  - Ramps with a slope of not more than 1 in 10 may be substituted for and shall comply with all the applicable requirements of required stairways as to enclosures, capacity and limiting dimensions. Ramps shall be surfaced with approved non-slipping material.
  - The minimum width the ramps in hospitals shall be 2.25 m.
  - Handrails shall be provided on both sides of the ramp.
  - Ramps shall lead directly to outside open space at ground level or courtyards or safe place.
  
- **Refuge Area:**
  - For all buildings exceeding 15 m. in height, excepting multi-family dwellings, refuge area shall be provided as follows:
    - For floors above 15 m. - One refuge area on the floor and up to 24 m. immediately above 18 m.
    - For floor above 24 m. - One refuge area on the floor and up to 30 m. immediately above 24 m.
  - Refuge area shall be provided on the external walls as cantilever projection or in any other manner (which will not be covered in F.A.R.) with a minimum area of 15 sq.mt.
  
- **Corridors:**
  - The minimum width of a corridor shall not be less than 75 cm. in the cases of 2 storey raw housing residential building and 100 cm. in the case of other building and actual width shall be calculated based width of the staircase provided.
  - In the case of more than one main staircase of the building interconnected by a corridor or other enclosed space, there shall be at least. One smoke-stop door across the corridor or enclosed space between the doors in the enclosing walls of any two staircases

- **Lifts:**

- All the floors shall be accessible for 24 hours by the lifts. The lifts provided in the buildings shall not be considered a means of escape in case of emergency.
- Grounding switch at ground floor level to enable the fire services to ground the lift cars in an emergency shall also be provided.
- The lift machine room shall be separate and no other machinery shall be installed therein.
- In case of the existing building for construction of one additional floor the existing lift may not be raised to additional floor.

- **Sanitary Requirements:**

Sr. No.	Fitments	For Male Personnel	For Female Personnel
1.	Water Closet	One for every 25 person	One for every 15 person
2.	Ablution Taps	One in each water closet	One in each water closet
		One water tap with draining arrangements shall be provided for every 50 persons or part thereof in the vicinity of water closet and urinals.	
3.	Urinals	<ul style="list-style-type: none"> <li>• Nil upto 6 person</li> <li>• One for 7-20 person</li> <li>• Two for 21-45 person</li> <li>• Three for 46-70 person</li> <li>• Four for 71-100 person</li> <li>• From 101-200 person add at the rate of 3% and for over 200 person onwards at the rate of 2.5%</li> </ul>	
4.	Wash Basin	One for every 25 person	
5.	Drinking Water Fountains	One for every 100 person with a minimum of one for each floor	
6.	Bath	Preferably one on each floor	
7.	Cleaners Sink	One per floor minimum preferably in or adjacent to sanitary rooms	

- **BUILDING REQUIREMENTS FOR PHYSICALLY CHALLENGED:**

- The specified facilities for the buildings for physically handicapped persons shall be as follows:

- Approach to Plinth Level: Every building should have at least one entrance accessible to the handicapped and shall be indicated by proper signage. This entrance shall be approached through a ramp together with the stepped entry.
- Ramped Approach: Ramp shall be finished with no slip material to enter the building.
- Minimum width of ramp shall be 1800 mm. with maximum gradient 1: 12. Length of ramp shall not exceed 9.0 m. having 800 mm. high handrail on both sides extending 300 mm. beyond top and bottom of the ramp. Minimum gap from the adjacent wall to the handrail shall be 50 mm.
- **Stepped Approach:** For stepped approach, size of tread shall not be less than 300 mm. and maximum riser shall be 150 mm. Provision of 800 mm. high handrail on both sides of the stepped approach similar to the ramped approach.
- **Exit/Entrance Door:** Minimum clear opening of the entrance door shall be 900 mm. and it shall not be provided with a step that obstructed the passage of wheel chair user.
- **Entrance Landing:** Entrance landing shall be provided adjacent to ramp with the minimum dimension 1800 x 2000 mm. The entrance landing that adjoin the top end of a slope shall be provided with floor materials to attract the attention of visually impaired persons (hereinafter referred to as “the said guiding floor material”). Finishes shall have a non-slip surface with a texture traversable by a wheel chair. Curbs wherever provided should bend to a common level.
  
- LIFTS:
- Wherever lift is required as per Regulations, provision of at least one lift shall be made for the wheel chair user with the following cage dimensions:
  - Clear internal depth - 1100 mm.
  - Clear internal width - 2000 mm.
  - Entrance door width - 900 mm.
  
- TOILETS:
- One special W.C. in a set of toilet shall be provided for the use of handicapped with essential provision of wash basin near the entrance for the handicapped:
- The minimum size shall be 1500 x 1750 mm.

- Minimum clear opening of the door shall be 900 mm. and the door shall swing out.
- Suitable arrangement of vertical/horizontal handrails with 50 mm. Clearance from wall shall be made in the toilet.
- The W.C. seat shall be 500 mm. from the floor.
- One of the wash basins in the toilet block on each floor shall be fixed at height of 75 mm. above the finished floor level, with a tap. As similar arrangement has to be made for the drinking water facility.



## 5.3 ZONING PLAN

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