GROEP 7 WEEK 1

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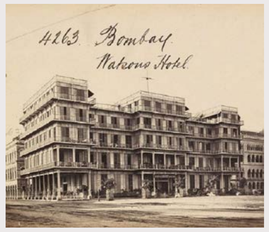
HISTORY

Located in Mumbai's Kala Ghoda Art District, Watson's Hotel may be the earliest surviving example of cast-iron architecture in India. Named for its initial owner, John Watson, the building was fabricated in England and erected onsite between 1867 and 1869.

The Watson's Hotel, known today as the Esplanade Mansion, this building, which dates to 1869, is the oldest surviving cast-iron structure in India.
With an external cast-iron frame that was typical of many 19th-century buildings in London, wide open balconies on each of its five floors and a majestic atrium, it was a much-celebrated work of architecture at its peak.
According to local legend, industrialist Jamshedji Tata built the Taj to avenge his being denied entry into Watson's, owing to its racist whites-only policy. (source link)

Long heading towards decline, the building ceased to be a hotel by 1960 and was sold and renamed the Esplanade Mansion. The building's rooms were rented out to commercial and residential tenants, as it continues to be up to this day. The building's proximity to the city's high court made it a particularly appealing choice for several law offices.
In 2005, the building's façade collapsed and killed one person, just days after it had been enlisted among the "World's 100 Most Endangered Monuments" by the World Monuments Fund. Mumbai's "Buildings Repair and Reconstruction Board" has almost regularly featured the building among its list of most dangerous buildings in the city and flagged it as uninhabitable. However, people still live there, and they are hopeful about an imminent restoration. (source link)

Mumbai's heritage conservation body has approved the historic building's restoration, but a lack of funding is among the biggest factors holding up its progress on this front.



Initial state — Image source: Wikipedia

Current state — Image source: Wikipedia

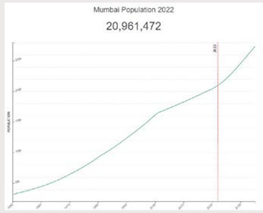
DEMOGRAPHY

Population

The percentage of people living in slums is estimated to be as high as 41.3% (source link) in Greater Mumbai, meaning that over 9 million people live in these areas. The number of people residing in slums throughout the entire country is estimated to be 104 million, or 9% of the total population of India (source link). Dharavi is the largest slum in Mumbai and the second largest in Asia.
The population density of Mumbai is approximately 73,000 per square mile (source link), which makes Mumbai one of the most densely populated cities in the world.
Cultural diversity within the city means that there are mixed religions throughout the area, although Hindu is the most practiced religion, with nearly 2 out of 3 Mumbai residents identifying as Hindu.
Mumbai has experienced rapid growth over the past twenty years, which has led to an increased number of residents living in slums and has elevated the growth of its largest slum.

Culture

The culture of Mumbai is a combination of tradition, religions, cuisines, music and fine arts. Termed as 'The city that never sleeps', it is one of the busiest cities in India. Fun is equally important to the people of Mumbai.
Mumbai is famous for its handmade fabrics, textiles and jewellery. One can also shop at the markets like Chor Bazaar for knick knacks like antique clocks, wooden furnishings and paintings. A main reason to visit Mumbai is the food. Be it street food or local favourites or the seafood dishes.



Mumbai population — Image source: World Population Review

Average Monthly Income — Image source: Salary Explorer

LOCAL CLIMATE

The Climate of Mumbai is a tropical, wet and dry climate. Mumbai's climate can be best described as moderately hot with high level of humidity. Its coastal nature and tropical location ensure temperatures do not fluctuate much throughout the year.

The mean average is 27.2 °C and average precipitation is 242.2 cm (95.35 inches). The mean maximum average temperatures is about 32 °C (90 °F) in summer and 30 °C (86 °F) in winter, while the average minimums are 25 °C (77 °F) in summer and 18 °C (64 °F) in winter. Mumbai experiences three distinct seasons: 1. Winter (October to February) winter temperature 15 to 20°C Peak Winter Months – Dec to Mid Feb with temperature range 12–19 °C; 2. Summer (March to May) Avg temperature 30 to 27 °C; Peak Summer Months (Mid March to 1 June week), temperature shoots up to 30–40 °C with humidity being approx 70–80%. 3.Monsoon: (June to September). Peak monsoon months: July & August sometimes with winds and thunderstorms. Temperatures at 24–29 °C.

As climate change and global warming is rapidly rising, the Mumbai Government launched a in-depth Mumbai Climate Action Plan (MCAP) to tackle climate change and extreme weather events.

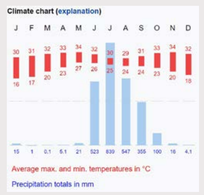


Image source: Wikipedia

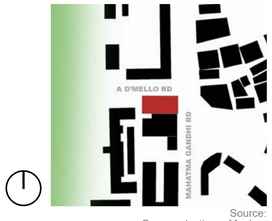
Image source: Wikipedia

LOCATION ANALYSIS

The building is located in an area called Fort. The name is derived from the defensive fort which was built on this site by the British East India Company during the colonial times.

Nowadays Fort is a business and art district in the city of Mumbai, India. The area extends from the docks in the east, to Azad Maidan in the west; Chhatrapati Shivaji Terminus in the north to Kala Ghoda in the south. This area is the heart of the financial markets of the city & multiple British era structures are located in this neighbourhood.

The Fort area was declared protected under regulations of the Maharashtra Government Urban Development Department. An advisory committee now oversees the development, repairs and renovations of structures in the precinct.



Source: Own production + Mapbox

Typologies — Source: Own production + Mapbox

- ART GALLERY
- UNIVERSITY
- GOVERNMENT
- COMMERCIAL SPACES / HOUSING

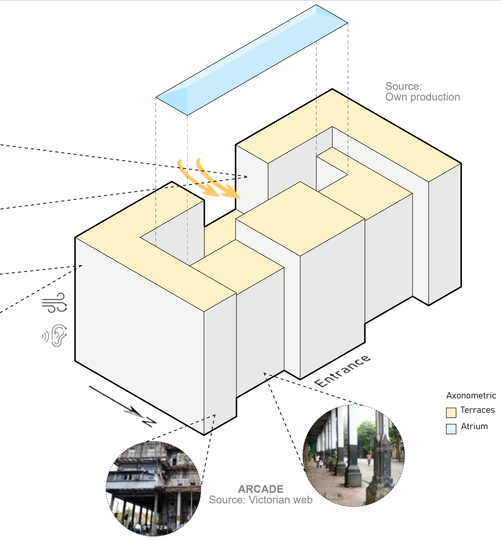
Urban morphology — Source: Own production + Mapbox

Mobility — Source: Wikipedia

BUILDING ANALYSIS

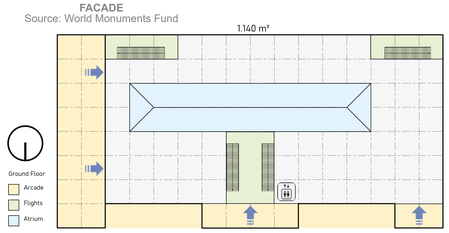
INNER TERRACE / ATRIUM
Source: India Today

FACADE
Source: World Monuments Fund



Source: Own production

ARCADE
Source: Victorian web



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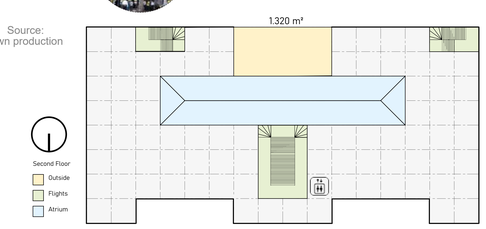


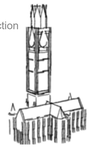
SURROUNDING BUILDINGS

Source: Own production

Bombay High Court

The High Court of Bombay was established in 1862. The building has a similar style to that of Watson's Hotel; Art Deco, Victorian.

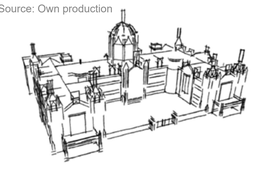
Source: Own production



Rajabai Clock Tower

The Rajabai clock tower was build in the fort area of Mumbai and is located on the campus grounds of the university of Mumbai. The 85-meter-high tower was originally built as a tribute to the mother of the client in 1878.

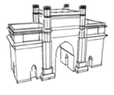
Source: Own production



Chhatrapati Shivaji Terminus

Just like the High Court this building was added to the Word Heritage Sites list in 2004 marking this building as cultural heritage. Unfortunately, the building was targeted by a terrorist organization in 2008 where 175 people lost their life.

Source: Own production



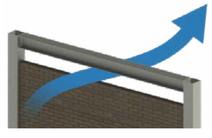
Gateway of India

The arc-monument built in 1924 was erected to commemorate the arrival of king George V, the first British king to visit India. The name came because king George used this structure to enter India.

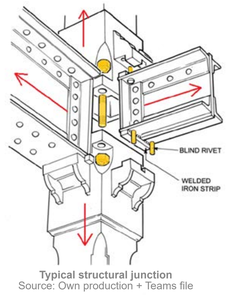
STRUCTURE & PHYSICS

The building is constructed like an iron skeleton, this iron skeleton is a modular system. That means that the beams and columns are connected in a non-permanent way. All the nodes in the building are connected with rivets and bolts. That brings advantages for a restoration project like this one, because there are more options available to choose from.

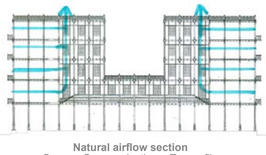
The ventilation "system" of this building was not designed very elegantly back in the day. Because this building is made up of a cellular structure, was it not possible to ventilate the inner cells of the hotel. They chose to not attach the inner walls to the ceilings, so air was allowed to flow between the separate cells or rooms.



Natural airflow 3D MODEL
Source: Own production



Typical structural junction
Source: Own production + Teams file



Natural airflow section
Source: Own production + Teams file

Natural airflow ceiling plan
Source: Own production + Teams file

RESOURCES

Image source: BW Smart Cities

Image source: Holcim Foundation

Local construction methods

The most common construction method from the area for now is concrete casting construction. Concrete casting construction can come in different ways. Usually a wooden or aluminum formwork is used. This is made on site, filled up and taken apart. Cast construction is usually used in high-rise buildings. For low-rise buildings, the use of brick stability walls is still the most common. The foundation is made of drilling piles, pile driving is not usual. Prefabrication is not common in Mumbai, it is on the rise. Building with wood has long been banned by the government but has been promoted again since the new climate agreement. (source link)

Local building materials

The natural building materials that are present in India and widely used for building are bamboo, clay, wood and (natural) stone. Nowadays, everything is replaced with steel and concrete. These products are made in India but are ultimately not indigenous building materials. (source link)

TIMELINE

1862 — Old British fort walls demolished. Freeing lots of land.

1867 — Construction of Watson Hotel: Start

1869 — Construction of Watson Hotel: Completion

1920 — Ceased to be a hotel. Used for housing.

1960 — Sold to private owner. Building partitioned into small housing and office units.

2005 — Part of the building's facade collapsed. Enlisted among 'world's 100 most endangered monuments'

2019 — Structural audit declares the building unsafe.

GROEP 7 WEEK 2

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SCENARIO 1
RESTORING HISTORY, WHILE ANSWERING FUTURE NEEDS

This scenario will answer the needs of mumbai by providing affordable housing space for students and working class people from the Fort area in an innovative manner. The building will relate to its surroundings by activating its base with public space like a restaurant. In this plan we also consider the current users and offer them an alternative instead of living in a rundown building. We will also make room for the history of Bombay and the impact the British had in modern India. India is seen al one of the most spiritual countries in the world, therefore the building will have a dedicated meditation space where people can practice their religion.

DESIGN CONSIDIRATIONS

Sound must be considered in the new design; cars honk constantly.

The original structural grid is left the same. To maintain its historic value.

The climate plays a vital part in Mumbai, Cooling and ventilation need to be considered.

The plan strives to recreate the original look of the building with modern functions.

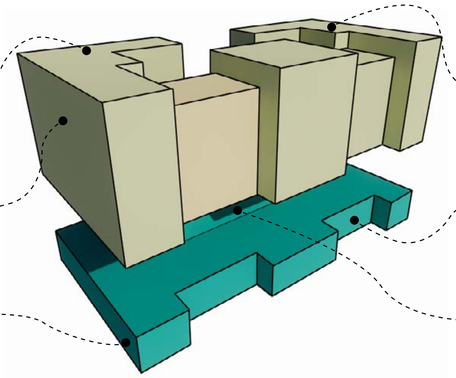
The plan houses more people than the original design. By dividing high levels for housing units.

Funding is a big part of the construction; The building must be able to sustain itself with its own generated income.

The rooftop will be used for agriculture, so that the residents can be more self-sufficient.

The studios will all have a bathroom and a bedroom, it will also be equipped with a kitchen. So is every studio self-sufficient.

At this moment there is a restaurant that will be brought back to the building after construction.



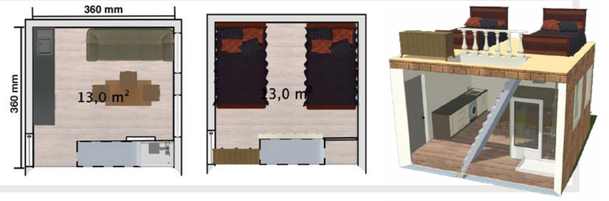
Religion is important in India. On the rooftops the residents will have a prayer booth available and a meditation area.

The new design will accommodate a large section dedicated to social services.

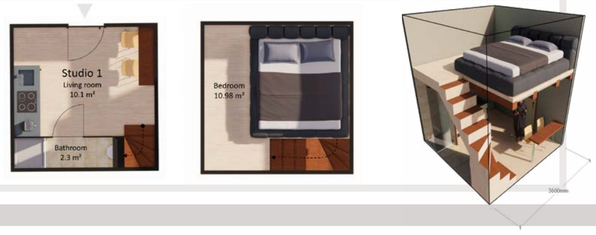
The old atrium will be an exposition place for the heritage of Mumbai and the Watson Hotel.

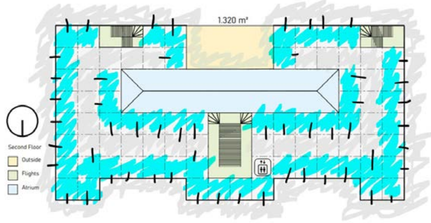
HOUSING UNIT 1

HOUSING UNIT 2



HOUSING UNIT 3





CONCEPTUAL FLOOR PLAN

STRUCTURE

The cast iron skeleton structure is restorable, We don't exactly now in what for state some structural elements find themselves. But if certain parts need to replace than is that not really an issue. Possible rust forming on cast iron elements can be treated and a new protective layer can be added.

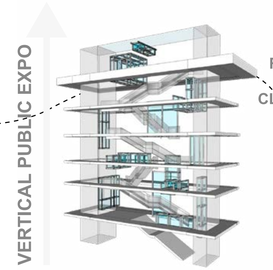
CONSTRUCTION

We are not allowed to make changes to the appearance of the building. The columns must also remain original.

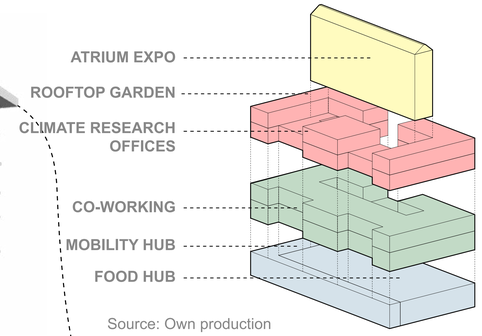
The new interior walls can be made of hollow bricks like the original. Bricks are a widely used product, have few maintenance requirements and are easy to install. they also perform well on fire resistance and compressive strength. The blocks cost around 25 cents (Rs. 21 (Mahajan, 2021)).

SCENARIO 2
A SOCIAL CATALYST FOR CLIMATE ACTION

Recently the government of India released the *Mumbai Climate Action Plan (MCAP)*, which is a framework for sustainable development in the city. Over the years Mumbai has dealt with the intense climate conditions, like cyclones and urban flooding. And now with climate change on the horizon, Mumbai needs to act to make the city prepared, or at least resilient to whats coming. This scenario acts upon this inescapable future, and uses the so-called action tracks of the MCAP. The plan is to create building where government officials and innovators, aswell as students and locals can work and meet eachother, to stimulate climate action and create familiarity with innovative solutions, by using the building as a living lab.



Source: Boijmans



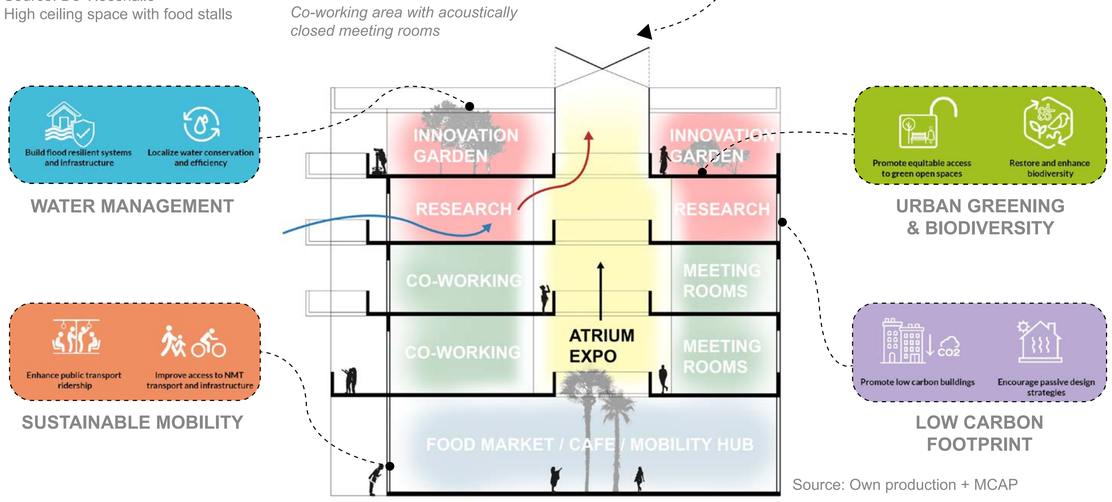
Source: Own production

Source: De Vleeshalle
High ceiling space with food stalls

Source: Leeser Architecture
Co-working area with acoustically closed meeting rooms

Source: MVRDV

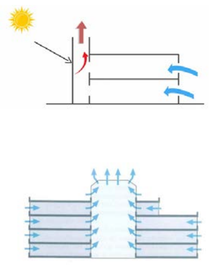
Source: Greenroofs.com



Source: Own production + MCAP

PASSIVE COOLING & VENTILATION

Construction new atrium
The best option is to demolish the existing atrium glass roof. We want the atrium raised, so there needs to come a new atrium at roof level. This atrium roof will need to be similar to the old one, with lots of ornamentation like the old style. Preferable will this roof be supported by a beam system, this beam system will probably need some additional columns to support the entire atrium structure.



Source: TU Delft

STRUCTURE (NEW ATRIUM)

Construction new atrium
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CONSTRUCTION

For these intermediate walls, the building blocks of ZerundBrick® are recommended (https://www.zerund.com/, 2019). These building blocks consist of 70% of waste material (especially plastic). This solution combats one of the biggest problems in India; pollution. Also, these building blocks offer 12% more insulation than traditional bricks, and are 10% lighter.

Source: ZerundBrick®

GROEP 7 WEEK 3

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No external source images were used.
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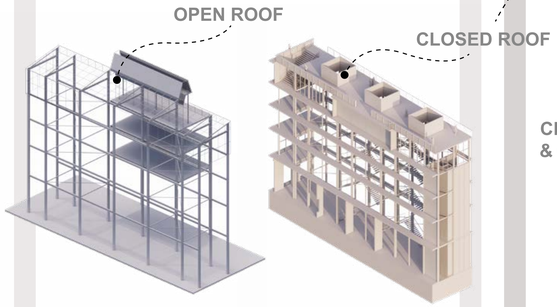
CLIMATE ACTION BUILDING

The Watson hotel will be transformed to a multifunctional building, the building will make room for multiple innovative developments where numerous people will come to collaborate. Most of the building will lean heavily on the Mumbai Climate Action Plan (MCAP), the east wing of the building will house a multitude of apartments for students and people with a lower income. Here people can choose between two different appartments The rest of the building will house functions that support the fight against climate change. The base floor frees up space for a 'Foodhal' here the local population can come to enjoy the delicious street food India has to offer. On the first and second floor is a common theme going on, here people can take part in co-working, a space where entrepreneurs can work with each other. On the third and fourth floor the space will be occupied by institutions that research ways to improve the climate in Mumbai. The roof will be the center of innovation here the atrium is in full view and multiple green roofs surround the glass structure.

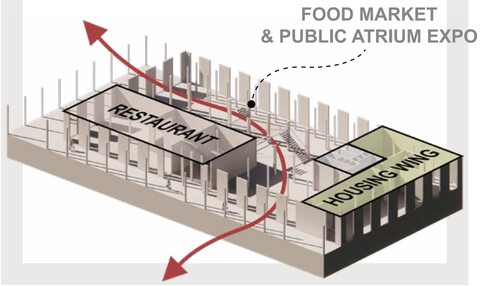
ATRIUM CONCEPT

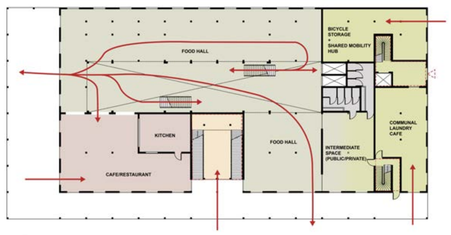


We created two concepts for the implementation of the atrium. Both options are self-supporting structures, which means that the atrium does not weigh upon the existing structure. Option one lets in more light. Option two makes the roof accessible and makes room for installations.

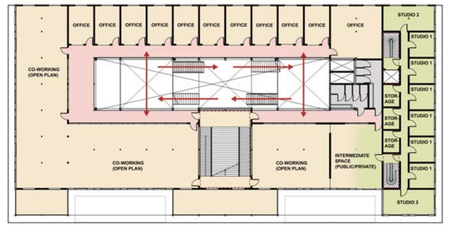
STREET LEVEL

We wanted to give this building a public character, which stimulates interaction with its surroundings and contributes to a vivid street life. About 5/6th of the building is (semi-) public, the other 1/6th is used for housing.

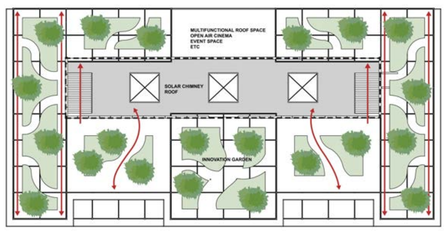




GROUND FLOOR

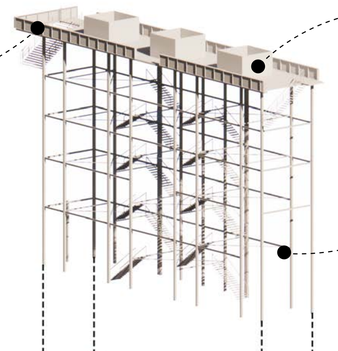


1st FLOOR (common level floor)



ROOF (innovation garden)

RESTAURANT
HOUSING & COMMUNAL AREAS
FOOD HALL
OFFICE AREA

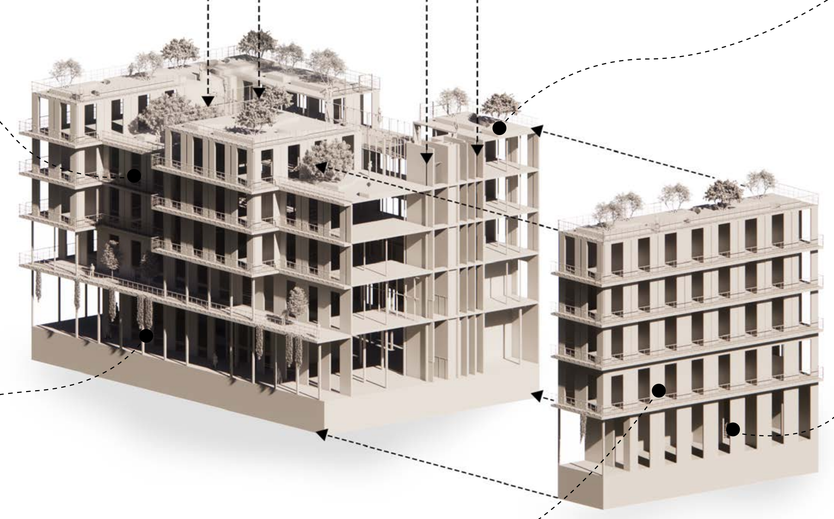


SOLAR CHIMNEY
& CLIMATE INSTALLATIONS

ATRIUM EXPO
& PASSIVE VENTILATION

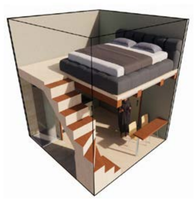
INNOVATION GARDEN
(PUBLIC ROOFTOP)

CLIMATE RESEARCH
& CO-WORK SPACES



COMMUNITY LAUNDRY
ROOM & STORAGE

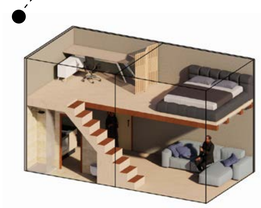
FOODHALL
& RESTAURANT



STUDIO 1 (24X)
3D MODEL

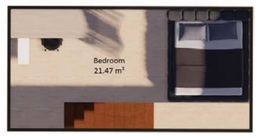
STUDIO 1
ENTRY LEVEL

STUDIO 1
SLEEP LEVEL



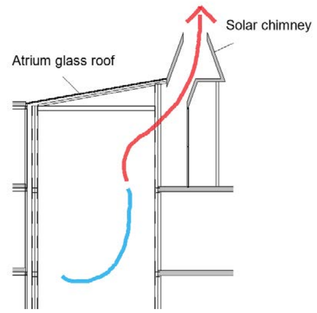
STUDIO 2 (8X)
3D MODEL

STUDIO 2
ENTRY LEVEL



STUDIO 2
SLEEP + WORK LEVEL

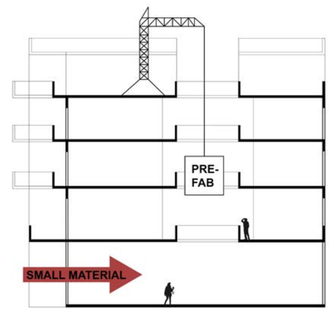
TECHNICAL



Solar chimney (Natural ventilation)
We implemented a solar chimney that ventilates the building in a passive way. We chose for this solution because it is an innovative and green way to regulate airflow in a building. When we were working on this concept we wanted to use the atrium as a symbol of the buildings history and the future to come along with its innovations.

Atrium structure (Self-supporting)
For the new addition on top of the building we decided to support it with its own structure. We chose for this option so that our concept won't affect the old renovated structure, which hold so much value.

CONSTRUCTION



The logistics on the construction site are complex. The city of Mumbai is a busy, living city that is not easy to limit. That is why we try to keep everything in the building as far as possible. The supply of material must be well attuned to the work. This means that no hub is used to store material, but that everything is delivered one by one. However, certain parts must be brought in with the help of a mobile crane. Mobile because the crane can be moved as soon as it is not needed so as not to stop the traffic. The large (prefab) parts are brought in through the open atrium. Small building materials can be brought through the main entrance. Inside, a small electric crane is used. This is used when placing the balconies in the atrium and to carry materials to floors.

Restoring the original balconies
1. Removing the existing balconies.
2. Placing the fixings of the new balconies.
3. Placing the new balconies.

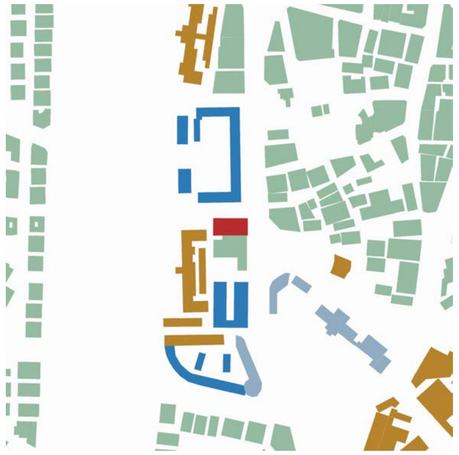
Elevator shaft
1. Preparation (strip building, leave only its skeleton)
2. Place the elevator. (mobile crane needed)
3. Finishing (electronics will be installed)

INDIVIDUELE BIJDRAGE LOGBOEK

NATHAN RICHARD PEREZ [*DESIGN*] 0970886

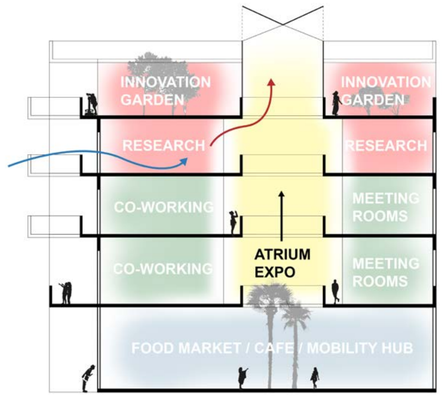
ENKELE PRODUCTIES VAN MIJ OP DE POSTERS

Stedenbouwkundige structuur/morfologie
Gemaakt met kaart geïmporteerd uit mapbox
Nabewerking in Photoshop.

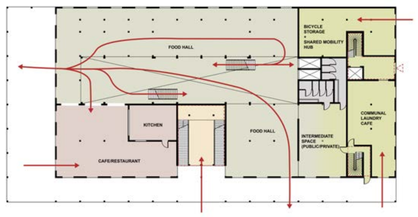


Omliggende functies (stedenbouw)
Gemaakt met kaart geïmporteerd uit mapbox
Ingekleurd met Photoshop a.d.h.v. functies te zien via Google Maps.

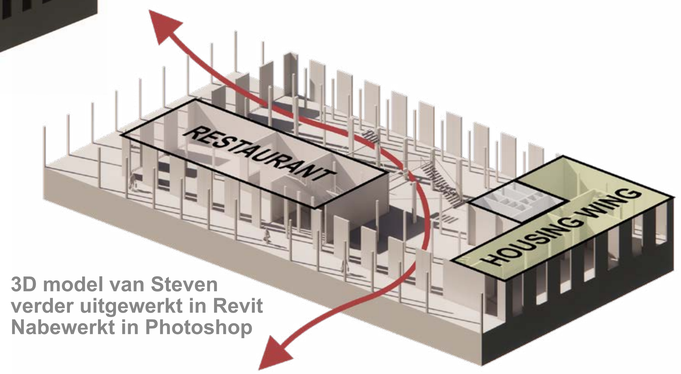
3D model van Steven
verder uitgewerkt in Revit



Massamodel gemaakt in Revit
Doorsnede nabewerkt in Illustrator
en Photoshop.



Plattegrond gemaakt in Revit
Nabewerkt in Photoshop



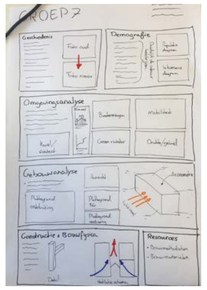
3D model van Steven
verder uitgewerkt in Revit
Nabewerkt in Photoshop

MIJN ROL IN DIT PROJECT

Voor mij begon het project niet helemaal als gepland, de ochtend van de introductie bleek ik toch niet ingedeeld te zijn bij de casus Mumbai zoals mij van te voren was verteld. Echter, sloot ik alsnog aan bij deze groep tot dat ik meer zou weten over waar ik ingedeeld was. Uiteindelijk bleek dat bij de casus Syrië te zijn, maar besloot ik toch bij deze casus te blijven aangezien dergelijk transformatie project mij erg aansprak, met de vele mogelijkheden en mijn innovatie (profiel) achtergrond. Ook kon ik het direct goed vinden met de groep, wat in de rest van het project bleef aanhouden, waardoor de samenwerking soepel en zonder onenigheden is verlopen. Wel was het van te voren was het even aftasten wie de leiding op zich zou nemen aangezien we van te voren in een voorstel rondje er achter kwamen dat bijna iedereen perfectionistisch is aangelegd, waardoor het soms lastig is om de controle uit handen te geven in groepsprojecten. Desondanks verliep de samenwerking vrij organisch. Officieel ging ik te werk vanuit de specialisatie ontwerp, maar mijn verleden met het profiel innovatie kwam bij dit project ook goed van pas, waardoor ik als een soort verbindende factor kon fungeren tussen de verschillende specialisaties, aangezien innovatie een erg breed profiel is met van alles een beetje. Gedurende dit project heb ik geprobeerd zoveel mogelijk te overleggen met wat iedereen graag wilde doen en waar ieders krachten lagen. Waardoor ik, alszijnde die verbindende factor, richting kon geven aan de groep, waarbij elke week een duidelijk perspectief werd geschetst waar we naartoe wilden en waardoor we goed gebruik konden maken van ieders individuele krachten.

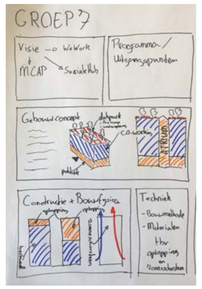
WEEK 1

De eerste dag begon uiteraard met een voorstelrondje, waarbij iedereen aangaf waar diens interesses en affiniteiten lagen. Ook had ik een de documenten die via teams waren gedeeld al uitgeprint waardoor we direct met elkaar een eerste indruk van het gebouw konden krijgen. De volgende dagen heb ik in overleg met de groep een PVA opgesteld met waarbij het duidelijk werd wat ons te doen stond en wat de bijbehorende taken waren. Deze taken hebben we in de loop van de week uitgewerkt. Waarbij ik de locatieanalyse deed en de poster maakte.



WEEK 2

We begonnen direct met sparren over mogelijke transformatie scenarios aan de hand van onze eerdere bevindingen. Ik opperde iets over de sharing economy en co-working als een soort verbindend semi-publiek element in het Fort district, ook zag ik een kans om dit te verbinden met het MCAP. Timo kwam met het idee van studios met twee lagen door gebruik te maken van de hoge plafonds. Rowan en ik werkte mijn idee uit. Ghizlaine en Timo werkte hun idee uit. Steven en Johan fungeerde hierbij voor beide als adviserende partij. Hiernaast maakte ik de poster.



WEEK 3

We begonnen met een sparsessie waarbij het publieke karakter van co-working en climate hub getoetst werd tegen het meer private karakter van woningen. We kwamen uiteindelijk op een compromis waarbij we een vleugel toewijden aan woningen. Hiervoor maakte ik samen met Timo en Ghizlaine een opzet voor de plattegrond van de woonvleugel en werkte ik samen met Rowan en Steven aan de atrium concepten. Hiernaast heb ik nog de indeling van de plattegronden gemaakt en het 3D model van Steven en Rowan verder uitgewerkt. Zoals in de voorgaande weken maakte ik ook de poster.