TOKYO FASHION MUSEUM

Thesis Project - ARCH
Alexandra Nikolova
ma4/ark11/JUNE 20010
Architecture & Design
Aalborg University

TITLE PAGE

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Supervisors:	Architectural: Peter Lind Bonderup Technical: Poul Henning Kirkegaard

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Alexandra Nikolova

SYNOPSIS

This project is a proposal for a Fashion Museum in Omotesando Street, Tokyo, Japan. The project focuses on the design and development of a 100 meter high tower harmonizing with contemporary Japanese architecture as a symbol of vanguard and daring design, and in addition it should serve as a new landmark for Tokyo city. By integrating a language according to the famous situated fashion houses brought together with the local identity, the building and its touring become a target of interest and a necessary visit to Tokyo. The project is developed where aesthetical quality and structural design are combined into an integrated design.

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INTRODUCTION

The main theme of this project is to integrate fashion and architecture in an urban Japanese context. This is done by analyzing and designing a building emphasizing the interplay between the constructive, the structural, the functional and the architectural.

The project is based on a past theoretical architectural competition brief issued by Arquitectum. The challenge of the competition is to design a 100m high-rise museum, housing clothing exhibition of the 20'th century.

The project has been conceived by integrating three main focuses points. The first focus of the project is to implement in it the language and essential and aesthetic values of the Japanese architecture. The second part is to draw a parallel between fashion and architecture, by their equalities and inspiration sources, and the third focus is to achieve techtonical aesthetics of the 100m high-rise. These focus points result in the main themes of the museums architecture by embracing the essence of light and texture, and create an icon for Tokyo city.

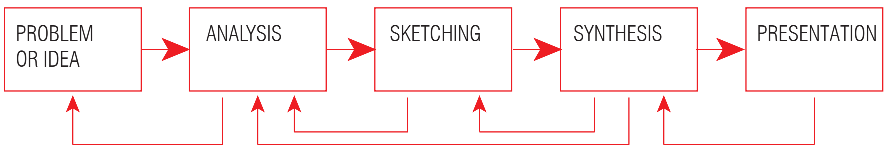
To solve this task, the Integrated Design Process (IDP) will be used during the entire project. The approach of the Integrated Design Process is an iterative process with particular emphasis on integrating the social, technical, and architectonic principles in the design.

The report is divided into four phases, reflecting the work method of the project. The four phases are analysis, sketching, synthesis and presentation phase. The references are based on the Harvard style of referencing. Additional references, specifications and calculation tables will be found in the appendix and the CD-rom, along with literature and illustration list.

METHOD

The Integrated Design Process (IDP) will be used as a method during the main project in order to achieve the design of an integrated building. The aim of the IDP is to combine architecture, design, functional aspects, indoor environment, technology and construction.
The IDP is an iterative process and will be used during all phases of the main project.
[Knudstrup, Integrated Design Process]

The Integrated Design Process consists of different phases, listed below:

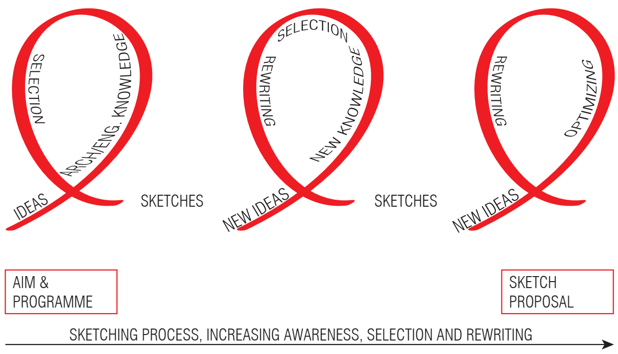


Ill. 2 Integrated Design Process

• The requirements from the competition brief

• Analysis Phase
The analysis phase includes an analysis of the site, Japanese traditional and modern architechture, the Japanese culture, the parallels between fashion and architecture, exploration of tectonic design, museum flows and case studies. The result of this phase will end up in a vision and aims of this project.

• Sketching Phase
Through the sketching process, aesthetic and tectonic ideas are linked to principles of construction, as well as the functional demands and flow organization of the new proposal for the fashion museum.



Ill. 3 Sketching process

• Synthesis Phase
Aesthetic, tectonic and functional qualities regarding the construction of the high-rise and the final facade expression are developed through calculations and iteration models.

• Presentation Phase
The final design of the fashion museum is presented by, 3D visualizations, floor plans and sections.

TOOLS

Different design and calculation tools will be applied in the different phases of the project in order to have the integrated design process function optimally.

The analysis phase is a general start where studies on basic principles are performed and overall ideas and concepts can be tested.
Tools applied in the Analysis Phase:

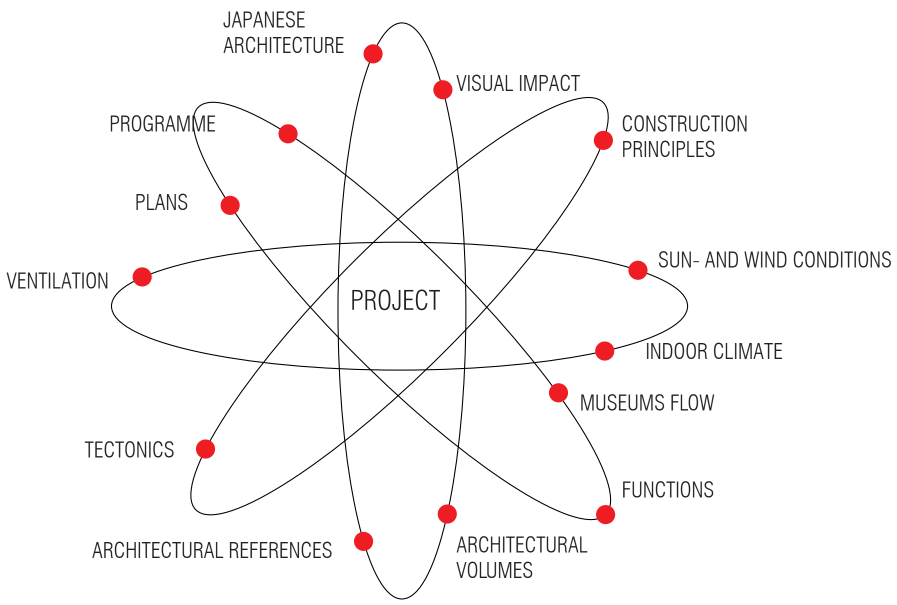
- Brainstorms
- Hand sketches
- Physical models

In the sketching phase the developed ideas are becoming more detailed, and the tools which will be applied are:

- Hand sketches
- Physical models
- Digital sketches, Rhino
- Staad Pro

In the Synthesis Phase the design is becoming even more detailed and developing into its final shape. The tools applied are:

- Hand sketches
- Digital sketching in Rhino
- Staad Pro



Ill.4 Integrated Design Process

JAPAN

Inhabitants: 127,4 mill.

Capital: Tokyo (12,8mill.)

Large cities: Yokohama (3,6mill.), Osaka (2,6mill), Nagoya (2,3 mill.),Kyoto (1,5 mill.)

Area: 377.800 km2

Religion: 51,3% Shinto's, 38,3% Buddhism, 1,2% Christianity

Politics: constitutional emperor dynasty and parliament democracy

The highest point: 3.776 m (Mount Fuji)

Ill.5

ANALYSIS PHASE

The analyzing phase will be used as a foundation to gain inspiration and a better understanding of the Japanese culture and the background for building in Tokyo, Japan. The building context and the macro climate will be mapped and investigated. Furthermore, the chapter will span in a wider perspective and give a briefly understanding of the Japanese culture and a short historical time line. This will be done to get a basis and find the essentiality of the Japanese architecture by case studies, describing the traditional architecture in parallel to the contemporary Japanese architecture. As the fashion museum will house a fashion exhibition, a cross dialogue between architecture and fashion is also done. A better understanding of the spatial requirements for the clothing exhibition and flow distribution will also be based on case studies of high-rise museums and exhibition spaces for clothing. As a final point, a structural aspect of building a high-rise and case studies of high-rises in a tectonical point of view will result in a vision for the project.

Ill. 6 Tokyo Bay

THE CHALLENGE
MOTIVATION

The Fashion museum in Tokyo is a theoretical, past academic competition provided by Arquitectum. During the period 17.11.09-02.02.10.

Over the past decades, Japan has become a leader in design and industrial production, especially in industrial development, which has successfully brought together both occidental science and technology with Asiatic philosophy and history. Japanese design assumes the service of every aspect of modern life, still being a visual way that expresses universal truths and cultural values, with unique sensibility and mixture. Japan contributes constantly to improving people's lifestyles beyond limits, from the design of objects for simple day-to-day use up to the design of sophisticated obects, becoming an example of frontline design.
Therefore, the challenge consists in designing a 100 meters high tower museum, containing exhibition areas of 20th century fashion history and becoming a landmark for Tokyo. For this purpose, the site is located at Omotesando Street since this avenue gathers the world's most important fashion houses, which buildings have been designed by world-known architects. The Fashion museum should be regarded with the urban values of Tokyo and sensitize it with Japanese culture and fashion world.

(Competition brief, fashion museum in Omotesando Street, Tokyo 2010, Arquitectum)

THE SITE

The plot is located in Omotesando Street, which is an avenue, subway station and neighbourhood in the Minato and Shibuya district in Tokyo stretching from Harajuku station, at Takeshita Street, to Aoyama-dori street and Omotesando station. The street is outlined with Zelkova trees with inspiration from the traditional European boulevards. The street is also very trafficated; around 100,000 cars drive down the main street daily.

Omotesando was originally created as the frontal (Omote) approach (Sand) to Meiji Shrine located at Northwest, when the Shrine was built in the Taish era.

The area is known as an upscale shopping area featuring several international fashion houses, ranging from Louis Vuitton and Gucci to the more affordable Gap, The Body Shop, Zara, and others. Within the building architecture, famous architects are Tadao Ando, Toyo Ito, MVRDV, Herzog & de Meuron and others. Due to the fashion museum's location, the museum building must be emblematic and relate to haute couture and design world.
The side streets of Omotesando Street feature a range of trendy cafés, bars, and restaurants, as well as specializing boutique (Wikepidia).

Ill. 7 Omotesando Street outlined by the Zelkova trees.

COMPETITION PROGRAM

ROOM PROGRAM AND USES
DESIGN CRITERIAS
BASIC ORGANISATION

Administration: A 100 m2 space destined for offices (1 office for the museum's director, 4 small offices and a conference room).
Restroom facilities for the offices: 10 m2, which include:
1 single occupancy washroom for the director.
1 single occupancy washroom for the staff.

Parking area: 200 m2 with 10 parking lots of 5.00 x 2.50 mt each for administrative staff and a 80 m2 storage room.
A parking area for a small truck (8.20 x 2.50m).
A loading area with a freight elevator able to reach every level of the building.
A security booth for vehicular control.

Runway: for fashion shows to take place at the museum, it should include:
A 40 m2 runway that should project outside the building's main structure.
A 50 m2 backstage area.
A 100 m2 seating area.
Restroom facilities for the runway: 2 restrooms of 25 m2.
Each restroom should include the following facilities:
Women: 6 toilet cubicles, 5 washbasins.
Men: 5 urinals, 3 toilet cubicles, 5 washbasins.

Terraces/urban balconies: two 100 m2 open spaces projected outside the main structure in order to watch the skyline of the city. First balcony should be located under the permanent exhibition rooms; second balcony should be located above the runway level.

Fashion exhibition rooms:
Permanent exhibition rooms of 150 m2 each, for 1920, 1930, 1940, 1950 and 1960 decades.
Permanent exhibition rooms of 300 m2 each, for 1970, 1980 and 1990 decades.
Temporary exhibition room of 300 m2 for 2000 decade where vanguard designers' current collections should be exposed.

Skybar – Japanese garden: A 130m2 bar located at the highest level of the tower, which will include a bar and tables for customers, as well as a Japanese garden.
Restroom facilities for bar's customers: 10 m2, which will include:
1 single occupancy washroom for women.
1 single occupancy washroom for men.

Circulation:
One emergency/service staircase.
One freight elevator able to reach every level of the building from the loading area.
Two elevators for visitors:
One should reach the first urban balcony.
The other should reach the highest level of the building.

The location: The first level of the building can cover 100% of the plot, respecting the context and views.

Access: A pedestrian access for visitors should be controlled at the entrance hall. Administrative and maintenance staff should have an independent access that will not interfere with visitors' flow. The vehicular access for personel and cargo truck should be controlled and not easily sighted by visitors. All the accesses must meet disabled accessibily standards.
Parking area and vehicular access: 10 parking lots must be located at the basement. The vehicular access can be developed through ramps of 15% slope or freight elevators.

Spatial organisation: The program should be organised through the vertical axis that conforms the museum in such way that it can be located at any part of the plot, as long as the building keeps the basic layout described above as well as the minimum 100 meters height.

Natural and artificial light: Every space must be naturally illuminated, except for the service and parking area.

Views: the designers should intend to obtain a 180º view as minimum from the terraces and skybar. Furthermore, the exhibition rooms and offices should seek for attractive views for the visitors.
Levels and heights: The tower-museum should reach somehow (with any of its parts) 100 meters high above the level ± 0.00 located on the street, being able to extend this altitude with 10 meters extra.

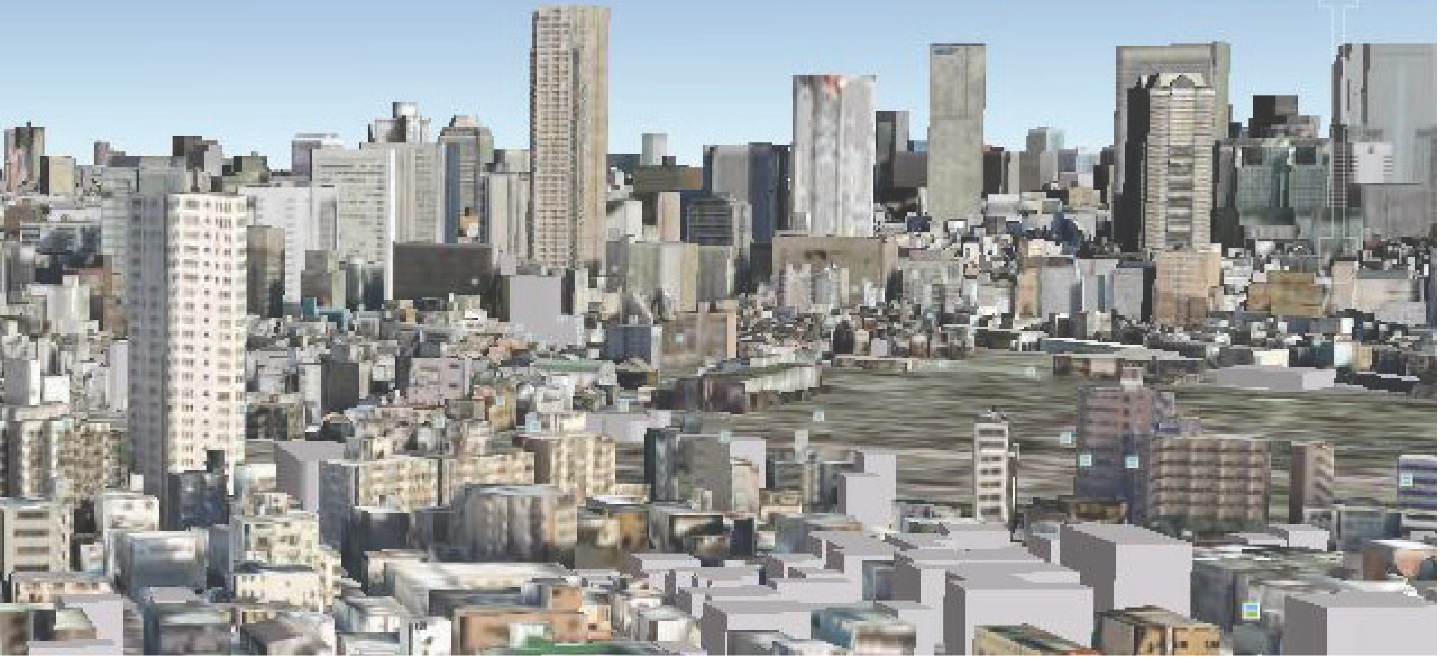
Circulation: An emergency staircase should be included. The internal circulation of the tower-museum should be designed so that a disabled person can access every Public and Semipublic Spaces of the building. This area will be calculated within the Circulation and Walls area.
Elevators: Two high speed elevators for the visitors and administrative staff should be proposed, besides a freight elevator of 2.00 x 2.00 meters. These areas will be tabulated within the Circulation and Walls area.
Setbacks: It is not necessary to leave clear any side of the plot.

Runway: It is a space where models will parade for a selected audience; it must project outside the main structure of the building (10 meters at most), allowing pedestrian and other building's users from different areas of the city to watch the fashionshows.

Rain and roofing: It is not necessary to use pitched roofs, but it is suggested the use of drainage piping for rain or waterproofing insulation.

Structure: An "architectonic" structural design is to be suggested to be later held as foundations for the building's final structural criteria.

VIEWS IN THE AREA



Ill. 8

Ill. 9

Ill. 10

OMOTESANDO STREET

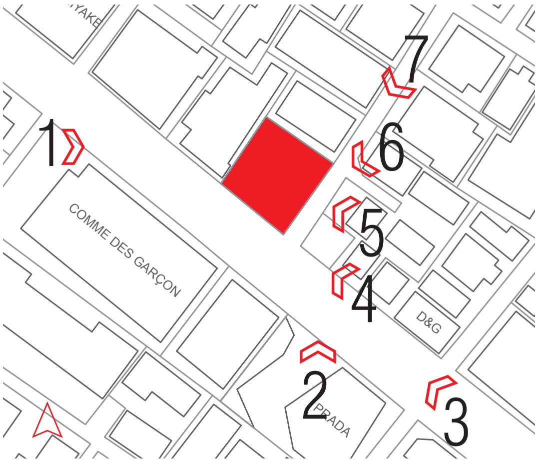
Ill.11

1.MVRDV / 2.Dior-SANAA / 3.Omotesando Hills-Tado Ando / 4.Louis Vuitton-Jun Aoki / 5.Tod´s-Toyo Ito /
6.Hanae Mori-Kenzo Tange / 7.One Omotesando-Kengo Kuma / 8.Prada-Herzog & de Meuron / 9.Cartier-Jun Mitsui / 10.Collezione-Tadao Ando

Ill.12

Ill.13

VIEWS OF THE PLOT AREA



III.14 View-points on the site


III.17 View 1


III.18 View 3


III.15 View 2


III.19 View 5


III.20 View 6


III.16 View 4


III.22 View 7

MAPPING THE AREA

Ill.23

Trafic

There are no big parking lots in the area; most of the parking is private and is usually within the building area or along the streets. The parking for the museum will only be for the employees and will be implemented as underground parking. The area has slow traffic zones. Omotesando Street has four lanes and it is most trafficated in the area.

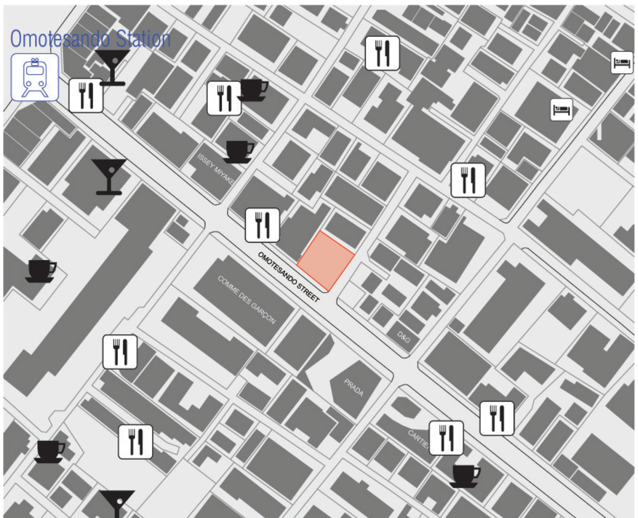
Trafic 30 km/h

Trafic 40 km/h

Ill. 24

Fashion houses and urban context

The area has a mixture of diffrent type of buildings; mostly retail stores, companies, hotels and housing. The marked buildings on the diagram are the most remarkable architecture close to the museum plot.



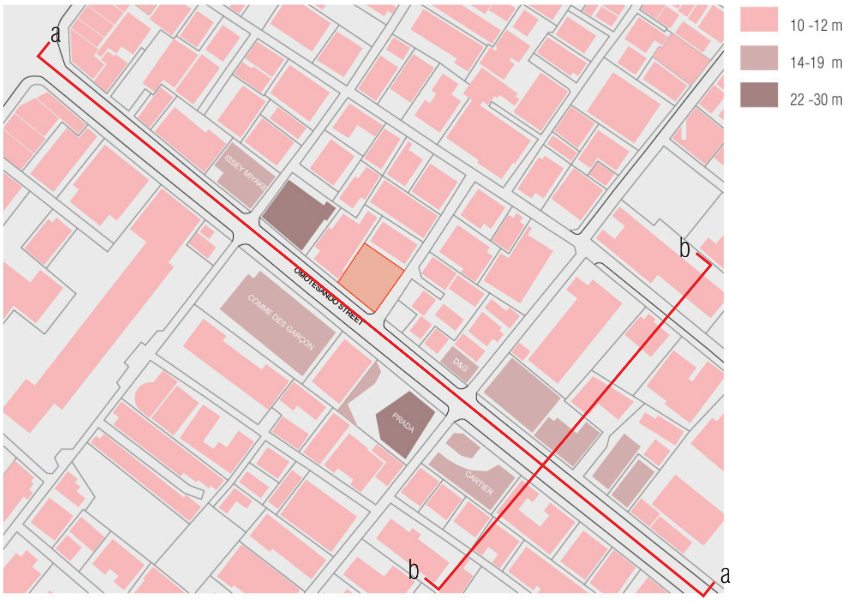
Ill. 25

Facilities

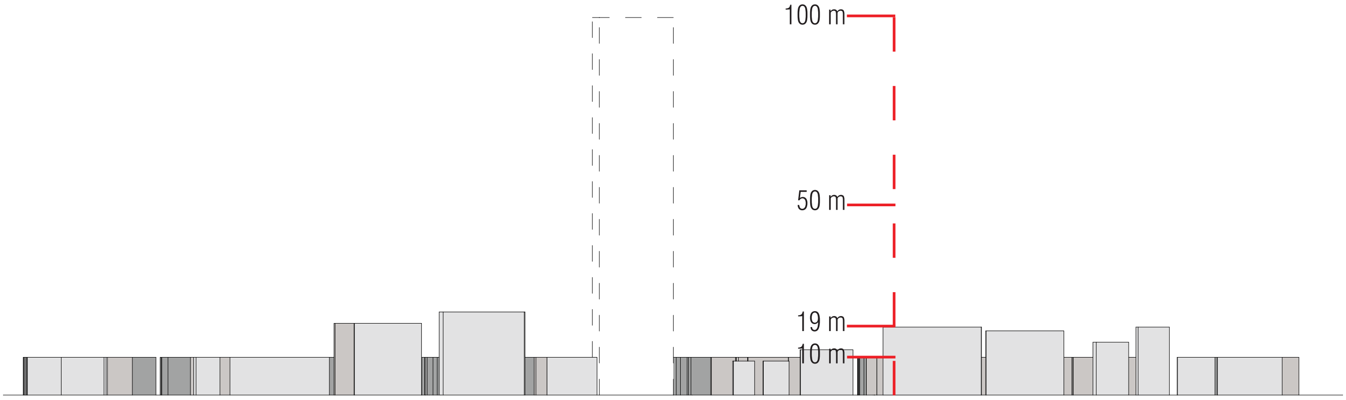
The Omotesando station is the nearest station, which has three different lines and makes it easily accessible. The next nearest station are Nogizaka 1,5 km and Meiji 1km.
The area is mainly a shopping area and is full with restaurants, cafès and cocktail places.

TYPOLOGY

The diagram marks the urban typology in the area and two sections of the plot and the neighbouring buildings. The urban typology is low; most of the buildings are not higher than 10 m. The newer fashion houses have extended up to 20 m and the iconic PRADA building is standing 30 m above the ground level. The dashed volume is the 100 m future planed fashion museum.

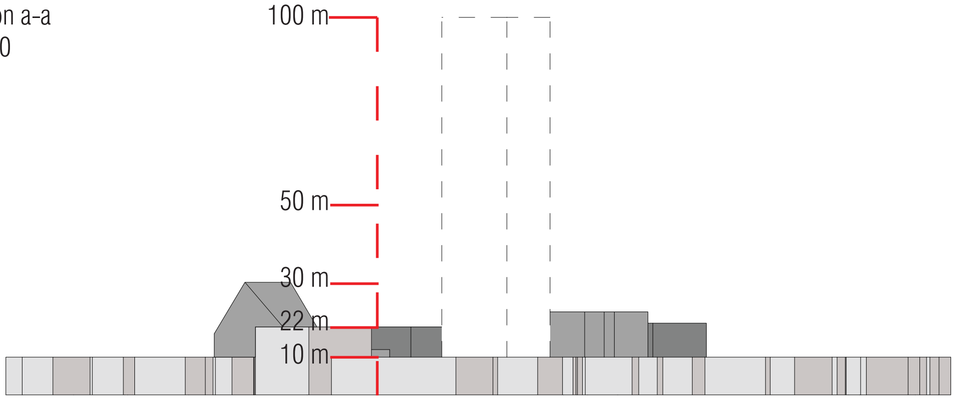


Ill. 26



Section a-a
1:5000

Ill. 27



Section b-b
1:5000

Ill. 28

MACRO CLIMATE

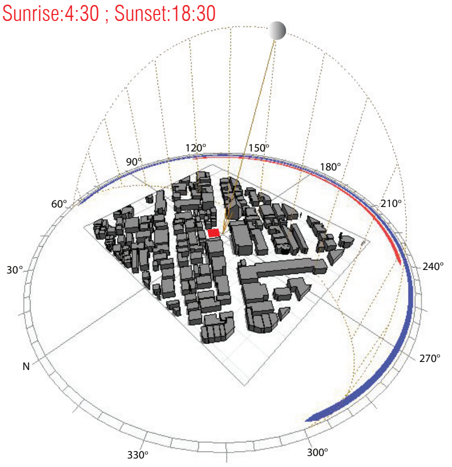
SUN PATH

Tokyo; Japan; Lattitude $36,2^0$; Longitude $140,4^0$

Tokyo has moderate climate with average temperatures, winter 10^oC and summer 29^oC. The temperature is relatively humid, with an average humidity of 71% with many hours of sunshine; January 175 h and July 137 h. The weather gives the opportunity to use the outdoor areas all year around. The hot temperatures in the summer period and the urban environment can create unbearable temperatures for most people; therefore, it is important to take considerations about shadow and cooling in the design face of the fashion museum, both for the indoor environment and the outdoor stay places.
The following diagrams show the sunpath at 12.00 pm during the four seasons in the 21st of the months; June, March, December and September.

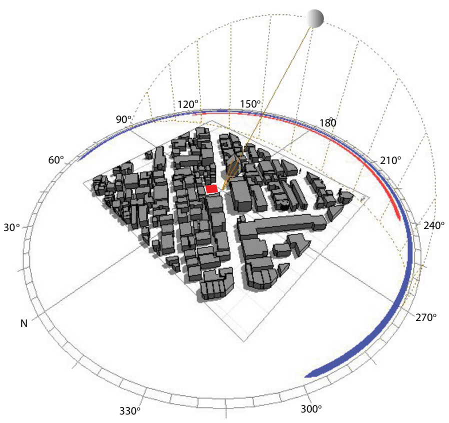
Summer Solstice, 21st June

Azimuth: ($61,1^0$ - $0,7^0$) ; Altitude:($-63,9^0$ - $4,3^0$)
Peak: 11:30 pm, Az: ($169,7^0$); Al: ($77,1^0$)
Sunrise:4:30 ; Sunset:18:30



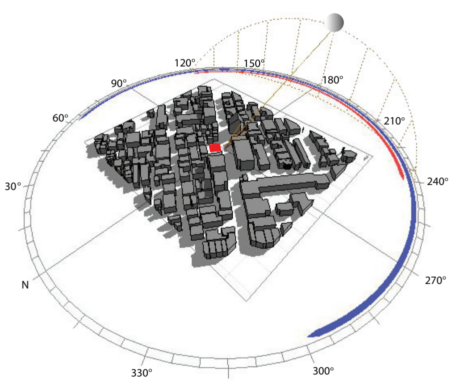
Spring Equinox, 21st March

Azimuth: ($92,3^0$ - $2,8^0$) ; Altitude:($-92,5^0$ - $3,0^0$)
Peak: 11:30 pm, Az: ($173,5^0$); Al: ($53,5^0$)
Sunrise:6:00 ; Sunset:17:30



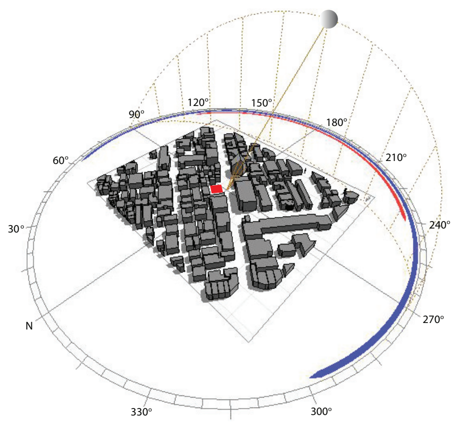
Winter Solstice, 21st December

Azimuth: ($121,0^0$ - $1,7^0$) ; Altitude:($-122,9^0$ - $3,8^0$)
Peak: 11:30 pm, Az: ($178,3^0$); Al: ($30,3^0$)
Sunrise:7:00 ; Sunset:16:00



Autumn Equinox, 21st September

Azimuth: ($89,0^0$ - $0,3^0$) ; Altitude:($-89,4^0$ - $0,9^0$)
Peak: 11:30 pm, Az: ($179,4^0$); Al: ($54,8^0$)
Sunrise:5:30 ; Sunset:17:30



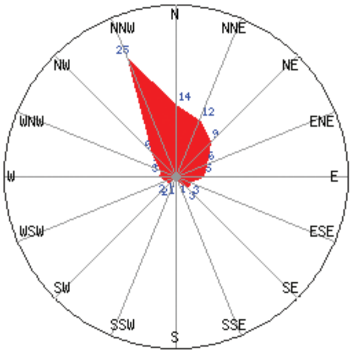
Ill. 29-32

WIND

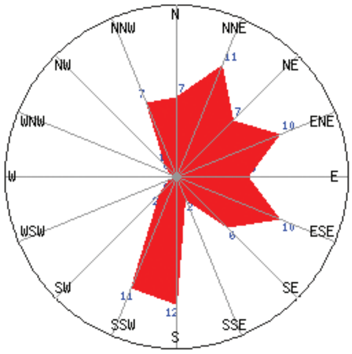
Dominating wind direction N-NW/NE & S;   Average wind speed 35 km/h

The wind rose shows the dominating wind speeds and direction for each season. The average primary and strongest winds come from south most of the year, though during the winter months the wind comes from north, north-west and north-east. The wind rose is specific for Tokyo, Japan and must, therefore, be considered in designing a tall building as the wind intensifies with the height of the building. The following diagrams show the average wind distribution and wind speeds at the given months. The blue number in the diagram show the average wind speeds in knots, scheduled in appendix().

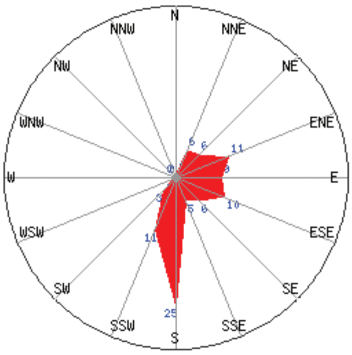
January, 44km/h



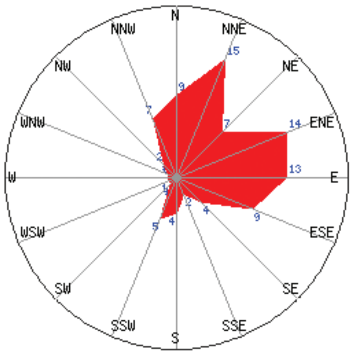
April, 24km/h



July, 44km/h



October, 24km/h



Average wind distribution

The plots coordinates: 35⁰39'51.37"N y 139⁰42'51.14"E

World time: GMT + 9

Altitude: 40 meters

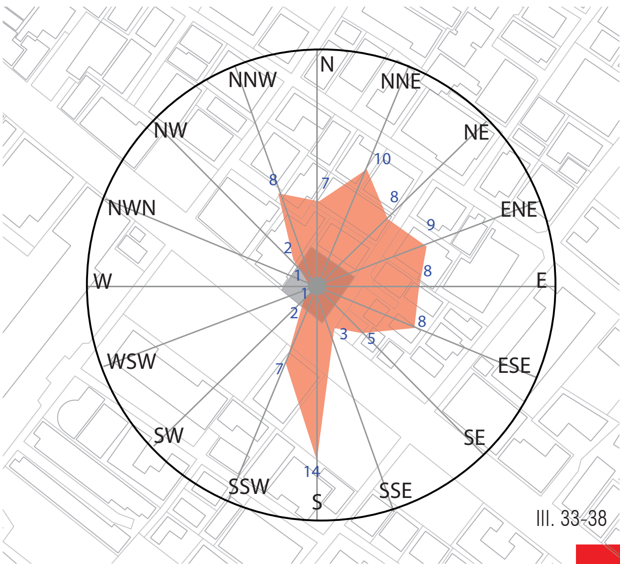
Sunrise: between 4:24 and 6:51 AM GMT + 9
Sunset: between 4:27 and 7:01 GMT + 9

Temperature: summer, day 29⁰C and night 22⁰C
winter, day 10⁰C and night 1⁰C

Average humidity: 71%

Visibility: 7.00 Km

Average precipitation: 130 mm



Ill. 33-38

III.39

JAPAN
FACTS, CULTURE, HISTORY

Ill.40 Geisha

Japan consists of 3400 islands, with Hokkaido, Handoikoku and Kyushu being the most important ones. The landscape is volcanic and dominated by mountains - the Japanese Alps. They comprise 85% of the landscape and are uninhabited. The inhabited areas are densely populated. 40% of the population inhabits 1% of the low-lying coast out to the Pacific Ocean. There are 1000 inhabitants per km^2, while in Denmark, there are on average 122 people per km2.

The long layout of Japan has different climate; tropical in the south, moderate in the middle and cold in the north. Japan is highly industrialized and has a radical external trade; it exports mainly industrial products and imports raw materials. Fishing is one of the most important and beneficial businesses. The agriculture is situated at the lowlands and is intensive and mechanized. Mostly rice, soya and vegetables are grown (Study guide - Japan 2008).

Culture

Visiting Japan (June 2008 - study trip) one gets overwhelmed with its dense and chaotic atmosphere, and at the same time tranquility. Compared to other big cities, Tokyo, Osaka and Kyoto can be characterized as orderly cities even that hundreds of people swarm into the metro cabins every day where one will always find a place to stand without feeling squeezed or frightened. The quietness and respect among people is extraordinary and has no match in the west. The only noise that captures one's attention is the exaggerated energetic, noisy and colourful commercials that are not initially to be understood. High technology equipment as robots serves the busy people and makes them aware of the possibilities for a better life with novelties and innovations.
Looking around in the metro car, the diversity among people is great, not as individuals, but as people belonging to a group - from the black and white suit salary man to the giggling girls, with their colourful and playful clothing. Going to Yoyogi park in Tokyo on Sundays another 'craziness' of the Japanese people is revealed, hearing the loud music and seeing people dressed up in different outfits ranging from music idols to stereotypes from the west, one might think it is a carnival, but it is just a Sunday routine of expressing themselves. The globalized exchange of multi diverse cuisines and products is also very significant and in perfection; it is no longer true that only natives from a given country could, for example, bake real Danish pastry. The 'Andersen's' bakery made one forget of being in Japan.

The modern Japan is a hybrid Japan where the traditions have been mixed and influenced by a globalized culture. The Japanese have created a picture of the west by cultivating the west, adopting technology, clothing, art and food. The cultivation of the ´west´ has made Japan so unique and so different from the west that Japan has been misunderstood for a long time. The view on Japan and Japanese culture has been discussed and analyzed by western anthropologists, especially after the World War 2. Japanese were defined as people with a homogenous culture and having an identical look, behavior and mentality.

This might be due to Japan having had the fastest growing economy in the world, especially after World War 2. The 'double' economy in the 80'ies has made Japan the world's leading economy and the largest country for innovative technology. All this has been achieved by a 'group', which is the basic structure of the Japanese society, and which is clearly seen in the discipline and order in the dense cities with millions. Japan has also the lowest crime rate in the world.

The Japanese social structure can be defined as horizontal and vertical collectivism. The horizontal collectivism can be seen in the Japanese mentality as having solidarity to their family, workplaces and institutions. The verticality is seen in the strong cast of the families where a family member would rather choose to be homeless than to loose ones honor. This can be dated back to the samurai's 'harakiri' – by committing suicide with their swords, rather than admitting that they have failed in combat. Combining verticality and collectivism yields a strong 'group society', in which leaders have a strong influence.

Previously, the cast society depended on one's birth, while in the modern Japan it depends on one's education. The most prestigious people are the ones, who have graduated or study in elite universities. The admission to the universities takes place in March, April, and these months have also the highest suicide rates.
(Study guide – Japan 2008)

The over-exaggerated commercials, Manga cartoons and the Japanese urge for dressing up in costumes, and violent TV-shows seen with western understanding can be explained as a reaction of one being oppressed by the 'group' and the hierarchical structure as they are expected to be devoted and loyal to it.

The 'tatemae' is a word describing the public behavior, which lies deeply in the Japanese people as they always need to be tolerant and need to restrain their emotions. Escapism from psychological restrictions is achieved through their fantasies and expressing themselves differently, where they can stand out as individuals from the social obligations and all relations to the group; away from the daily reality.

Ill. 41 Morimuras 1989, Tokyo
Interpretation of Manet 1882

The hybrid Japan can also be seen in the depiction of the culture by its contemporary art. A famous Japanese artist, Morimura, feels equally distanced from the traditional Japan as well as the modern west. He sees his heritage and his upbringing in the hybrid Japan as a third reality by making his own interpretations of the present, as seen in the painting of the interpretation of Manet (Et andet Japan, Nielsen. T.).

The Japanese culture is multi-diverse, with a strong fascination and cultivation of the west, but the Japanese do things in their own way, with their own interpretation of reality. They are not afraid of experimenting with innovative technologies and implementing them in their everyday life. The Japanese have a strong sense of maintaining their traditional culture and cultivating it in the present. The experimental hybrid interpolation of art and life style can also be seen in the architecture built in Japan - this will further be investigated in the next chapter.

EDO BEFORE TOKYO
A HISTORICAL POINT OF VIEW

The first Europeans came to Japan in the 16. century, to the fishing tow called Edo, which later became Tokyo.
Shinó was the indigenous religion in Japan between 300 B.C-300 A.C. Buddhism came to Japan in the 6.century from Kina and Korea. The Buddhism highly developed system in metaphysics, law regulations and a Chinese writing. In the 8.century the Buddhist bureaucracy became big and was a threat to the emperor of Japan. This led to the emperor moving his power and influence to Hein (today known as Kyoto).
The history of Japan after the 8.century was a battle for the power over the Daimyò.

When the Europeans came in 1543, Japan was divided in different realms. One of the most powerful daimyó was Oda Nobunaga. He saw Christianity, which was introduced by the Europeans as a weapon against the Buddhism, and in this way achieved power over Nobunaga, the central Japan. His follower was Toyotomi Hideyoshi, who continued the Christian movement. His power was taken by Tokugawa Leyasu, which after a short battle decided to make peace with Hideyoshi and resolved in that Hideyoshi gave 8 towns and Kantó region to Leyasu.

Tokugawa Leyasu was in 1603 a military administrator for the emperor; one of the most important assignments for the military was to take control over the country. The society became strictly hierarchy, which meant that nobles had an overall power unlike the daimyó, feudal and the samurai, the landsmen and craftsmen and tradesmen.

Law decided on which type of clothes the different social groups should wear, how the neighbourhoods should be divided, and who was given freedom of speech.
In the 17. century the population in Edo grew over one million which at that time was the largest city in the world. Edo was divided into social groups; the highest standing social group were the daimyós and the samurais.
The turning point for Edo and the rest of Japan was when Commander Matthew Perry came to Edo in 1853. His US ship expedition craved for that Japan should open up for trade. In 1868, the emperor moved his empire back to Edo and renamed Edo Tokyo.

In 1941 the Japanese attacked Pearl Harbor which led to the Americans bombing Tokyo in 1942. The worst bombing came in 1944 where a large part of Tokyo was destroyed and about 80.000 people died. In the 1960-70 Tokyo was the fastest growing city in Asia, and hosted the Olympic Games in 1964. This was a turning point for the Japanese history by overcoming its detriment from the World War 2. and becoming a base in the modern world economy (Study guide - Japan 2008).

500 ac. Buddhism — 1543 First Europeans — 1534-1582 Oda Nobunage — 1537-1598 Toyotomi Hideyoshi — 1542-1616 Tokugawa Ieyasu — 1853 Commander Matthew Perry — 1941 Pear Harbor — 1944 Tokyo bombed — 1964 Tokyo Olympic's

1868-1912
Meiji era

TOKYO
TODAY

Tokyo has been carefully planned since the Meiji Era in 1868 and is today Japan's financial and cultural capital, and one of the world's largest and most densely populated cities.
It lies at the southern end of the Kantó Plain, the largest stretch of lowland. It is surrounded by nearby prefectures, the mountains and Tokyo Bay. Tokyo lies at the junction of the Eurasian, Pacific and Philippine tectonic plates that makes the city an earthquake prone. To compound the problem, much of the city and many crowded residential areas are built on loosely consolidated landfills, which theoretically mix with underground water during a big tremble, causing portions of the city to collapse. (Study guide – Japan 2008)

Since the stock market crashed in 1989, the unemployment rate has hovered near 5% and the homelessness is on the rise and visible. This has resulted in that Tokyo, ones known as an impossibly expensive city, has become a much less expensive city, enabling wider range of tourism. Tokyo has a strict environmental policy - a comprehensive pollution law was introduced in 1967, leading to good public transportation and a large number of parks that are frequented year-round due to Tokyo's mild climate. An implemented law in 2002 requires all the new and reconstructed buildings to include a roof garden. If this is not abided, a large fine from the government would follow (Japan at the cutting edge, New Architecture).

Ill.42 Shibuya, Tokyo

Lifestyle
People have a consumer-mentality and are willing to spend money on brands and trends.
People in Tokyo are the busiest in the world – it is their hectic pace that continues to define their daily life. An average family of three - a mother, father and a child - usually lives in a two-bedroom apartment. 70% of all women in Tokyo live with their parents until they get married. Many young women are college-educated and earn a good salary that enables them to live on their own, but they choose to spend their income on luxury goods and European vacations. 20% of the young women in Tokyo never want to get married as traditional marriage would mean end of their freedom. In the end, it will be the daughter who ends up taking daily and financial care of her parents. (Lonely planet)

TRADITIONAL JAPANESE ARCHITECTURE
“IN PRAISE OF SHADOWS”

The following chapters will describe the parallels between the origin of the Japanese traditional and modern architecture in comprehension with the western understanding to resolve a link between historical heritage and present, and define design parameters for the future architecture of the fashion museum.

The understanding and description of the essence of inspiration from traditional Japanese architecture has been found in “Praise of shadows”, an essay by the Japanese novelist Junichiro Tanizaki in which he describes the acute sense of the use of space in the traditional Japanese houses and the collision between the shadows of the traditional Japanese interior.

An ancient Japanese philosopher, Toaist Laotse, says that the true beauty of a room lay in the vacant space enclosed by the roof and the walls, rather than in the roof and walls themselves. He aspired to an aesthetic ideal of emptiness, and true beauty could only be realized in the material world where colour, pattern and texture are imposed. The mind, the immigration of the beholder, should be allowed to complete the picture in the mood of the moment. Laotse’s philosophy was imported to Japan via Zen Buddhism and went on to become an integral aspect of the Japanese approach of living (The Japanese house).

Ill.43 Entrance of traditional Japanese house - the light is filtered by the rise papered sliding walls and casts only the shadows into the room.

When entering a Japanese house, its emptiness strikes the foreign eye. There are no art paintings on the walls, no thick carpets, chandeliers or curtains. The second state is the functionality that lies within the sliding doors, which open up and create a double sized room. At night the furniture is pulled out from sliding cupboards built within the wall, and put away in the morning to clear floor spaces for other uses. The mutability and flexibility of the house is even more noticeable during the seasons. In the summer time external walls are slide open to bring the courtyard garden in and to evoke natural ventilation.

The differences between the western and Japanese way of living is due to the historical, climatic conditions and available building materials, which constituted the frames of the local architecture. The western houses are less to keep off the sun than to keep off the wind and dew; they are built to create as few shadows as possible. The fact that Japanese houses did not use glass, concrete, and bricks, made a low roof necessary to keep off the driving wind and rain. The deep eaves in the traditional Japanese houses create a dark atmosphere in which shadows are created by the filtering light. The shadows inside the dim houses are embraced by the textures of the walls and objects in the room, interfering with each other and creating patterns of light and dark shadows.

“And so it has become to be that the beauty of a Japanese room depends on a variation of shadows, heavy shadows against light shadows.” (Tanizaki J. ‘In praise of shadows’)

It is this heritage for shadow and light that Japanese people have grown an understanding and admiration of.

“The qualities that we call beauty must always grow from the realities of life. “
Tanizaki J. ‘In praise of shadows’

The Japanese houses are built by cheap and local materials, as wood, bamboos, terracotta and different type of grass and straw creating heavy roofs with deep eaves. The few openings freely placed between the structural wood beams and the interior sliding walls and doors are shielded of with paper, framed with dark wood, filtering indirect light.

The walls are of natural colours, clay-textured with fine sand. The shade may differ from room to room, but the degree of difference is very slight as there is not so much a difference in colour as in shade, a difference that will seem to exist only in the mood of the viewer.

The floors are covered with uniformed sized Tatami mates, which constitute the size of the room. The layout can vary in different arrangements and create different patterns ,depending on the occasion.

Ill.44 Noka - a glance of the courtyard

Ill.45 Machiya-townhouse - the thatched roof creating deep eaves

One of the traditional Japanese houses is called Minka. The Minka is defined in a wide range of different styles and sizes due to different geographical relations as climate and culture. Mainly, there are two groups of minkas: the courtyard house - Noka and the townhouse – Machiya.

The traditional Machiya-townhouse was built for the noble - merchants and samurai - during the Edo period (1603-1867). This period provided a great space and prosperity and self-imposed isolation from the rest of the world. Any extravagant display of wealth was forbidden for everyone but the nobility and the samurai class. The façades are enclosed and based on the old construction system of the Tatami mat unit (90cm x 180cm). Typically the Machiya is two-storeyed dark wood structure with interior garden, providing privacy from the busy streets.
(study guide - Japan)

JAPANESE GARDENS

"The history of Japanese garden is the history of mans's search for his place whithin the nature, and thereby, ultimately, his search for himself." (Nitschke G., Japanese gardens)

The Japanese gardens have a very important part in the Japanese culture and in the architecture. The house and the garden is a homogenous and coherent phenomenon, where the relation between the inside and outside is gradual. The Japanese garden has also a different approach and philosophy compared to the Westerns ideas of a cultivated nature. This chapter will briefly look into the different types of traditional Japanese gardens as the museum competition requires a Japanese sky-garden.


Ill.46 Walking garden

There are different types of Japanese gardens; sand and stone garden (Karesansui), tea garden (Roji), walking garden (Kaiyushiki teien), and the courtyard garden (Tsubo Niwa). Nature and mountains always exist in the composition of the background of a Japanese garden.


Ill.47 Tea garden

The walking garden dates back from the noble times when the gardens were built to show their wealth to the public, and they were used for an escape and social games. The garden consists of different walking paths paved with stones, which lead one around and open up for different framed views.

The sand and stone garden is usually connected with the Zen Temples. The gravel is raked in different patterns and symbolizes water, and the edge of the green vegetation symbolizes the coast. A dry-Zen-garden has only green vegetation composition. Usually there are not many plants in a Zen-garden, and the space between the plants is as important as the plants themselves to create the perfect look and the optimum tranquility. The vegetation in the Zen-garden is usually of pine trees, maple, azalie, ilex and a green moss-ground and big stones. These gardens have always a symbolic story to tell and are only used for mediation and are only to be observed at from the temples wooden verandas.


Ill.48 Sand and stone garden

The most well-known Zen-garden is located at Konchi temple of Nanzen-ji and was built by a famous Japanese gardener Kobori Enshu in the 17th century.
The garden is formed after a crane and a turtle, facing each other and symbolize the Tsuru-jima (the Crane) and Kame-jima (Turtle) islands. The garden consists of a composition of stones, which form the head of a crane and a turtle's shield. Spruce trees decorate the crane's back. In the forefront of the garden white sand is spread out, symbolizing the water. The combination of the crane and turtle is a symbol for happiness, and the garden was made as a pray for everlasting progress and success.


Ill.49 Different types of moss

CONTEMPORARY JAPANESE ARCHITECTURE

By drawing a parallel between the historical heritages of the traditional Japanese architecture, contemporary projects by well-known Japanese architects will be analyzed in understanding the essence in the modern interpretation.

The simplicity and functionality, and the fascination with light is also an essential part in the present Japanese architecture. This can be seen in the works of Tadao Ando and Kengo Kuma.

According to Tadao Ando, there are not many that are aware of the rapid change in the modern lifestyle, not only in the natural and man-made environment but also, in our sense of values. Due to the rapid globalizing changes and obsession with economics and wealth, the human has lost sight of the truly important things in life.
If the essence and characteristics of the inherited traditions are not maintained in the contemporary architecture, the differences between the cultures will become homogeneous and destroy the sense of association to a specific region and a nation.

Tadao Ando means that architecture is about the awareness of the issues involved and the most important is what value we are to place on culture. The basis of the culture is within the moral, spiritual characteristics and the sensibility that have been inherited through the ages, and that it is the architect that needs to be aware of these pressures and reflect on where their real responsibility lies. (kilde)

Tadao Ando's architecture is characterized by the nature and light as essential parts. The buildings are usually proportioned by modular dimensions, drawing a parallel to the Tatami mats and consistent use of 'raw' cast-concrete as a primary building material. The plain use of concrete makes the building appear clear through their volumes and the penetrating light.

Kengo Kuma is an educated engineer; his work can also be characterized by contradictions in between light and shadows, modulation and the physical response of the materials by experimenting with their texture. Natural materials as glass, bamboo, stone, plastic and metal are used within spatial flexibility, blurring the boundaries between inside and outside. Kengo Kuma's main philosophy is to 'erase' architecture, and he achieves this by enclosing the facades with paper, bamboo and glass; blending the element from traditional Japanese architecture.
(Kengo Kuma, selected works, Botond Bognar)

"When we wear clothing made of materials that have the right thickness and are produced with the right weaving method, we feel that we have become one with our environment. Likewise, we must choose the right materials and select the correct size of units when designing buildings."
(kengo Kuma, selected works, Botond Bognar)

“While designing the stone museum, I learned that we can bring nature back into architecture by breaking down natural materials into smaller particles – a method that I call “particlizing”. By particlizing material, we can allow light, wind and sound to penetrate freely.” Tadao Ando

Tadao Ando, Garden of fine arts, Kyoto, Japan is located next to a botanical garden on Kitayama Boulevard and is an outdoor museum for Western and Japanese art. The museum provides a natural atmosphere with light, wind and water. The museum is an enclosed sunken area below ground level creating a space of three levels. The spaces are created by three walls, which intersect and create a circulation provided by bridges and ramps.
The water runs at each level by waterfalls and gathering pools.
The project was conceived as a contemporary, volumetric version of a traditional Japanese walking garden - ‘Kaiyushiki teien’.

Ill.50 Japanese walking-garden

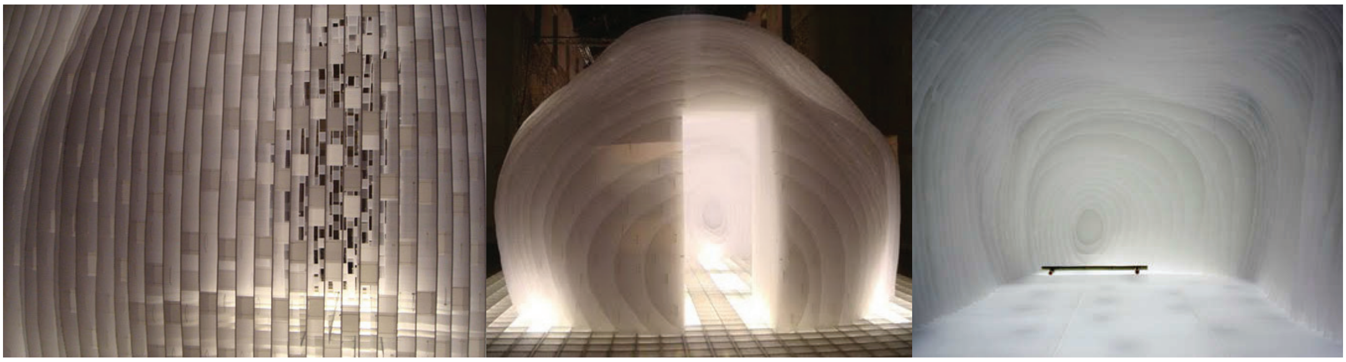
Ill.51-53 Garden of fine arts - Tadao Ando

Kengo Kuma’s project One Omotesando, Tokyo built in 2003, is an urban building containing shops, office and dwellings. The façade is made of vertical wood lamellas, which are in connection with the trees along the Omotesando Boulevard. The wood lamellas give a lightness and transparency to the façade but still maintain an enclosure of the building and provide interesting shadow displays to the interior. Diffuse light is filtered through opaque glass.

Ill.54-57 One Omotesando - Kuma

Oribe Tea House, by Kengo Kuma, does not look like the traditional tea house, but it embraces the traditional values. The inspiration of the form is based on the Japanese irregular pottery. The multi-layered structure gives lightness to the form and outlines its irregular shape.

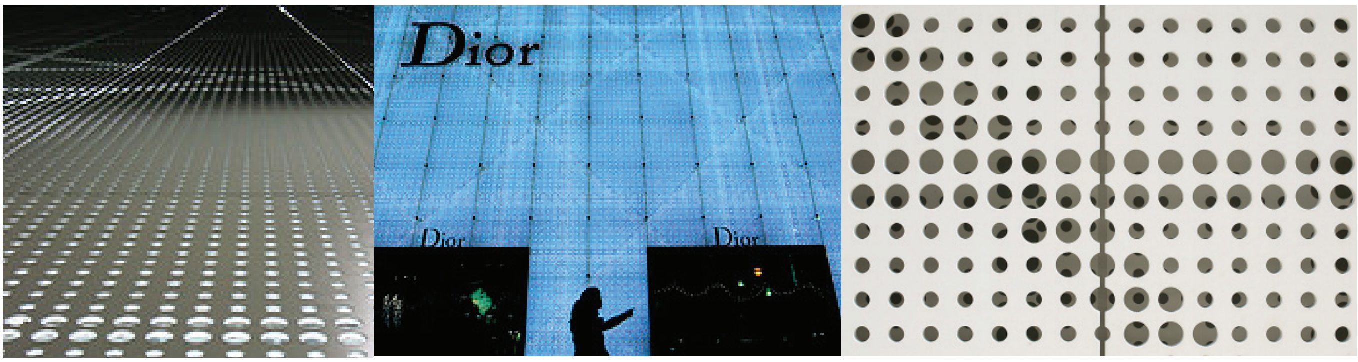
The white light and the irregular groves created by the layers provide a soft-like texture of the walls, creating tranquility and harmony to the space, which is also the most essential atmosphere in the traditional tea house.



Ill.58-61 Oribe Tea house - Kengo Kuma

The essence between shadows and light is also seen in the example of the Dior building in Tokyo made by Architectural firm office of Komiko. The building has a two-layered perforated façade, which provides a three dimensional depth to the regular building form. The outer and inner layer of the façade consist of punctured steel plates, creating the logo pattern for the fashion label Christian Dior.

The perforated façade gives the building two different expressions during the day and the evening. During the evening the inner layer is illuminated by different light settings in different colours which display and create different variation of the pattern.



Ill.62-64 Dior building in the Ginza district of Tokyo - Office of Komiko


Ill.65


Ill.66


Ill.67


Ill.68

DESIGN PARAMETERS

Maintaining the essentiality of the traditional architecture. The architecture should be a reflection of the culture. It is important to preserve the peculiar language and the aesthetical values of the Japanese architechture by embracing the essence of light and texture.

Filtering the light – playing with the contrast of light and shadow
The materials texture – patterns, texture, colour – using local and traditional materials in a new way
Bringing in the nature

Working with contradictions of:
Simple- Complex
Transparent - Opaque
Temporary – Permanent
Light- Massive
Surfaces- Depth
Unique – Diverse
Variation - Repetition
Decorative - Plain

FASHION & ARCHITECTURE

The fashion museum will house clothing and will represent the history of the world of fashion. This chapter will look at the cross dialogue between fashion and architecture in a historical perspective and visualize some examples of the parallels and inspirations between them. As environmental and cultural conditions influence fashion designers and architects alike, historically, both clothes and buildings are invaluable anthropological artifacts that create important cultural and economic conditions.

Fashion, opposite to architecture, is thought to be ephemeral and superficial, using soft, fragile, materials while architecture is thought to use rigid and highly durable materials. Even though fashion and architecture are two opposite fields, they have many common parameters. The tendencies emerge in both practices at about the same time. Their existence and development is a product of the society's social, political and economical influences, and the independent lust for beauty, colors, lines and forms. Just like art, they follow their own forms and rules and portrait humanity in a contemporary context as art painting and literature.

In both fields the point of origin is being inspired by the human body, as clothing is made to fit the human body, and architecture is made to house several human bodies. Both protect and shelter, while providing a means to express identity - whether personal, political, religious, or cultural.
Clothing, in the history of mankind, has always had a function to decorate people and tell them apart, and designate their affiliation to a specific group. Architecture has also been used to express collective identity of values and status. An example is the heavy and durable materials used for bank buildings and other important buildings.

They both inspire and complement each other and each field can be described by using a cross terminology from both fields; architectonical, constructed, sculptural and from the fashion world; draping, warping, waving, folding and pleating surfaces and materials. Both fields merge more and more together, as computer advancements in software have made it possible to generate and design more sophisticated and complex architectural forms. The collaboration between fashion designers and architects and their interpretation of the same current aesthetical tendencies, ideological and theoretical foundations, and technological innovations have influenced each, resulting in innovating materials used for both clothing and architecture.

The collaboration of architecture and fashion builds the frames of fashion and stages a setting, where both fields complement each other. Rem Koolhas and Herzog & de Meurons buildings for Prada store in Tokyo and New York are some examples of a growing collaboration between the two fields.

A HISTORICAL POINT OF VIEW

Through the history, clothing and architecture have emerged and developed through human's needs and interpretations of the time. From the Ice Age homo sapiens used animal skin as clothes and caves as shelter; in the ancient Greek temples the ionic columns were similar to the tunic worn by the Greeks which were made of single length of fabric draped over their bodies. Both classical Greek dress and architecture were conceived in harmony with the human body. This verticality can also be seen in the medieval age's Gothic dress and architecture; sharply pointed shoes relate directly to the ogival arches of the Gothic structures. In 1850, prefabrication of building materials and advancements in steel constructions resulted in light and open architectural spaces, as in Paxon's Crystal Palace. Is seen in the women's clothing at that time where metal hoops were developed as armatures to support the heavy layers of the wide dome shaped skirts.

In the beginning of the 20th century, Art Nouveau's sensuous organic and ornamented shapes can be related to the fashion designer in clothing, Paul Poiret. He liberated the woman's clothes from the corsages and gave them freedom to move with light and colourful clothing.
In the 20ies, modernism of clear lines and functionality characterized both fashion and architecture; ornament stripped away in a greater simplicity as in the work of Le Corbusier and Coco Chanel's black simple dresses. The Bauhaus school emphasized practicality and the idea, that buildings and garments alike should be expressive of their function. The simplicity with straighter lines that characterized the recession times in the 30ies when architects, as Mies van der Rohe, built houses with an abstract composition of solid, void and line, was also embraced in fashion by the women's clothing of long skirts and waist belts, outlining the body. The clean and modern simplicity in the International style of the 1950ies and 60ies, inspired designers as Calvin Klein, providing minimalist aesthetic in his clothing designs.
The 70ies grew into a fantasy world of colour and texture. In 1980, postmodernism architecture embraced the neoclassical elements with motifs from Greek fret ornaments on column capitals, and fashion designers as Gianni Versace and Hermés used them as textile prints and ornaments in their accessories. The 90ies retro and technical cult was characterized by architects as Frank Gehry and Japanese designer as Commes de Garcones.

1920-30 — 1940-50 — 1960-70 — 1980-90

IN PARALLEL PERSPECTIV

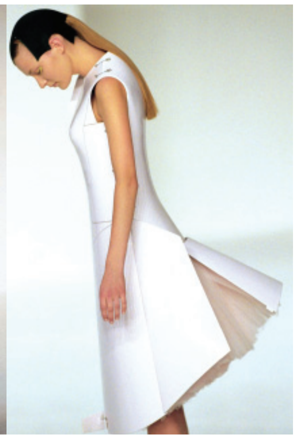
Illustrations of architecture and clothing by famous fashion houses will be discussed in their references to each other.

In fashion, the garment itself serves as skin in a metaphorical meaning, but the products of the innovative computer-programmed industrial knitting are direct parallels to the structural skins being developed for architecture.

Folding and pleating are two strategies most frequently used in both architecture and fashion. In folding, one flat piece of material becomes a volumetric form through the introduction of creases. Pleating is a subset of folding, in which regularly spaced folds or creases occur at close interval. Folding in architecture is used as a device to create greater visual expression through dramatic effects of light and shadows on a building's exterior and to manipulate the volumetric forms of the interior.

Funktion and layering


Ill. 69 Naked house, Ill. 70 Satima and Curtin wall house, Tokyo, Japan by Shigeru Ban

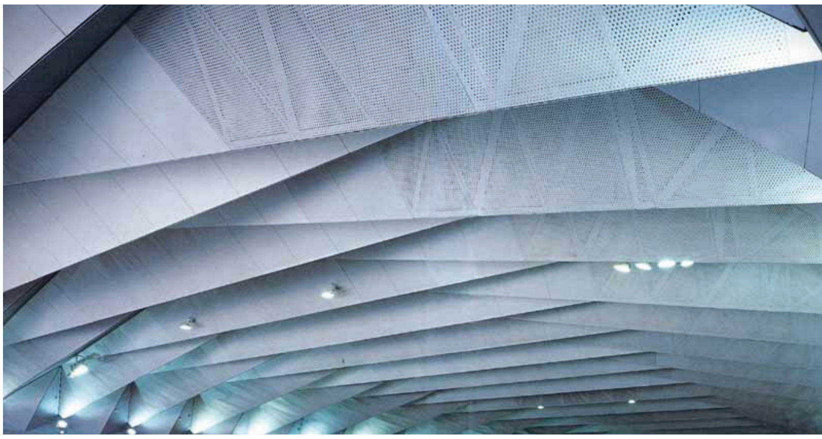
Ill.71-72 Hussein Chalyan- Before minus now, collection spring/summer 2000

Volumes and movement

Ill.73 Walt Disney Concert hall 1997- Frank Gehry


Ill.74-75 Comme de Garcons - Body Meets Dress - Dress meets body, collection, spring/summer 1997

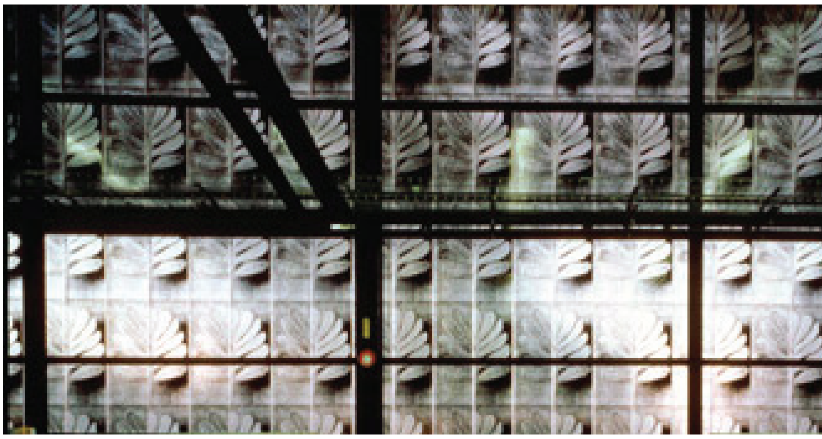
Clean lines and tectonics



Ill.76 Yokohama Internatinal Port Terminal, Yokohoma, Japan by Foreign Office

Ill.77-78 Lanvin - collection, spring/summer 2006

Patterns and depthless



Ill.79 Ricola-Europe SA Production building, Mulhouse-Brunstatt, France by Herzog & de Meuron

Ill.80-81 Dries van Noten - garments collection, spring/summer 2008

CONTEMPORARY MUSEUMS

Museums and its architecture have become a very important part in our culture. The popularity of museums has increased radically from the beginning of the century. Museum buildings have boomed, attracting even broader audience and creating an icon and identification effect of the city it is buildt in, the so called 'Bilbao effect'.

A new turning point of building museums for the public is seen in 'Pompidou' museum by Richard Rodgers and Renzo Piano, the glass façade opens up to the public inviting people not only to visit the museum but as well enjoy the architecture and take in the views it provides.

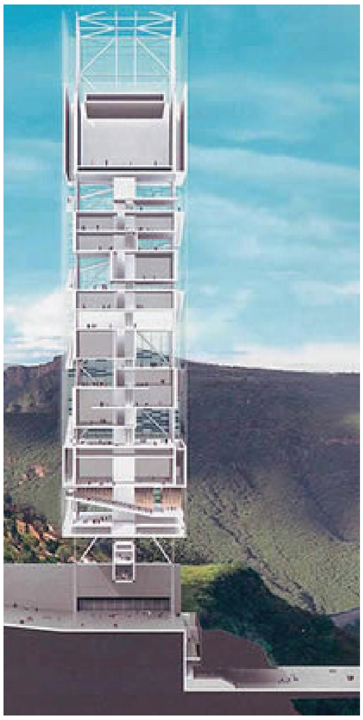
The growing popularity of museums' buildings has also grown with the societie's growing consumer and leisure mentality and the urging interest in experiencing new things. The museum buildings have become a gathering place with the same importance as the other public places (e.g. cafés and shopping areas) and leisure attractions, which are a part of the daily pulse of the city. One can say that museums today have the same importance as cathedrals had in the past. New technologies and building materials have broaden the expression of the museums' architecture.
Translucent materials used in the facades have created a new way to build museums, in which the transition between the outdoor and indoor space has blurred. Transparency of the museum becomes also visible through the museum's influence on the social aspect by opening up its institution to the public on one hand, and providing an aesthetical and visual connection to the surroundings for the visitors on the other.

As the art changes, the requirement for the museums and their form language need also to change. Some museums have created neutral exhibition spaces, where the space is defined by the art, and other museums are made for the art to fit the room. Creating unique exhibition spaces only to fit a certain art piece is a paradigm, which started in the Japanese museums. An example is the Benesse House in Naoshima built by Tadao Ando in collaboration with the artist James Turrell, where the exhibition spaces are created and defined by the interplay between light- dark and shadows (Museer I det 21. Århundrede, S. & T. Greub).

Planning the architecture of a museum is an intricate building assignment, as it should be a place serving the spatial requirements for the changeable art, and also providing an icon for the city it is placed in. The visitors should have a lasting variation of the spatial experience, both to observe and perceive.
How the museums of the future should look like is an open question with many interpretations, but one thing is in common; that the museum is a natural part of the urban context and that it should be built for attracting people and providing a new architectural language.

As the fashion museum will be a 100m high-rise and have temporary three dimensional exhibitions, case studies of high-rises of the museum will be analyzed to create an idea of the flow distribution and exhibition spaces. Furthermore, more specific exhibition spaces for clothing of retail stores, Prada traveling art exhibition pavilion and the FIT museum, will be looked at.

CASE STUDIES
MUSEUMS FLOW

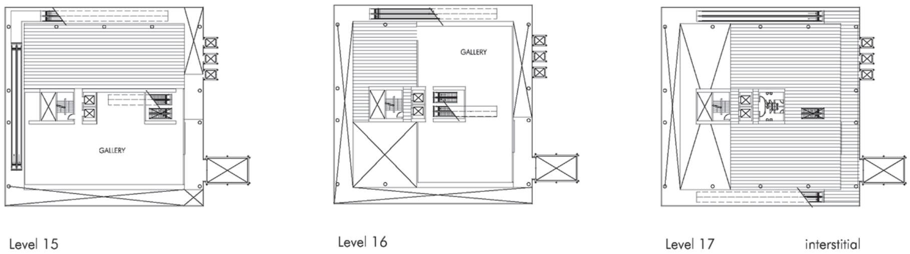


Ill.82 Section - flow

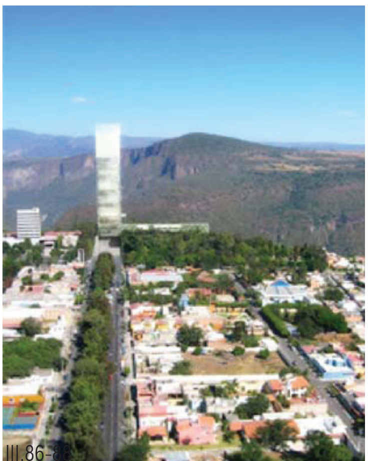
The new Guggenheim museum in Guadalajara, Mexico, is located in a park at the end of the 'Independera' Avenue and the city. The city is raised on a Plato into the Gorge (canyon) of the Rio.
The high-rise museum is lifted up from the ground supported by two volumes leaving the avenue running underneath. The placement of the museum is visible in every point within the city.
The museum features small, medium, large and extra large gallery modules, which are laid in a vertical array. The modules are suspended within the transparent double–skin volume of the high-rise as a series of free-floating solids. The spaces between them provide informal areas for special installations or other activities. The service areas are located in the core of the building. This composition provides a controlled and free vertical flow.
The controlled circulation is placed at the center of the building providing a controlled access to the temporary exhibition in the solid galleries modules that are linked through their own vertical circulation flow, making it possible to isolate certain areas according to the demands of the individual exhibitions. The free access to the void spaces is at the side of the building which is for visitors who wish only to have a view.

The free-floating solids are supported by two major truss systems. One rises through the tower, terminating in a hat truss that counteracts lateral (sideways) forces, the other acts as a lever, counterbalancing the weight of the tower and liberating the space below. The double-skin of the tower provides natural insulation. The outer skin is an 'intelligent façade' made of digital sensor partials, which provide variations in the façade's opacity. The entrance to the tower is a ramp at the side of the building.

(TENARQUITECTOS - http://www.ten-arquitectos.com/ten_main.asp?lang=en)

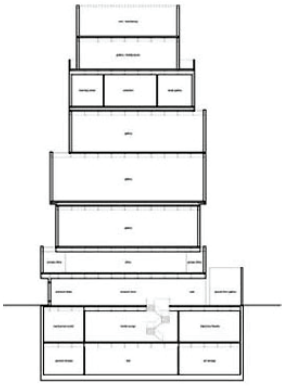


Ill.83-85 Ground plans

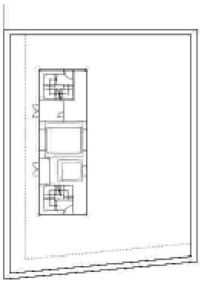


Ill.86-88

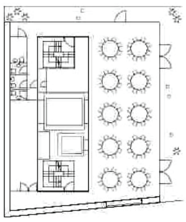
“The solution of the shifted boxes arrived quickly and intuitively. Then through trial and error we arrived at the final, ideal configuration. Now we have a building that meets the city, allows natural light inside, gives the Museum column-free galleries and programmatic flexibility, and expresses the program and people inside to the world of New York outside.”
SANAA



Ill.89 Section - flow



Ill.90 First floor - entrance - lobby



Ill.91 Seventh floor - ‘sky’ room

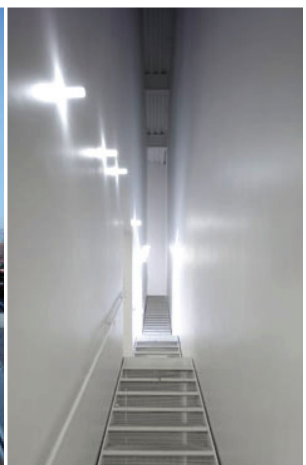
New Museum of Contemporary Art, New York

The New Museum is designed by Tokyo-based architects Sejima + Nishizawa/SANAA. The museum is seven storied and has a total area of 57.000 m^2. It has a footprint of 22 m x 34 m. It houses galleries, a theater, an education floor, Museum Store, a café, a top floor event space with roof terraces.

The museum’s form is a stack of six rectangular boxes shifted off the axis in a dynamic composition. The façade structure is double-layered; the inner façade is white concrete covered with a glimmering metal mesh-clad, made of silvery, anodized expanded aluminum meshes. The windows and skylights are behind the mesh-clad and offer the visitors a view of the city. The building’s form was conceived to express the ever-changing dynamic of the art and ideas to be presented within.

The ground floor space is the entrance with 4,5m clear plate glass stretching across the full width of the building. The lobby area, a transition from the colour and buzz of the Bowery neighborhood is a luminous, pale space with polished gray concrete floors. The museum’s store is defined by a serpentine screen of metal mesh, the Café, and a glass-walled lobby gallery lit by daylight from a setback above leading down to a basement floor with toilet facilities and theater. The exhibition spaces are on the three main gallery levels and are full floor open spaces and column-free. The service areas are in the core, consisting of two elevator shafts toilet facilities and a staircase, which provides the vertical flow in the museum. The seventh floor has a ´sky´ room for events and special programs, and outdoor terrace, which runs without interruption around the east and south side of the building. A glass façade, from floor to ceiling, provides a panoramic view over Bowery, lower east village, Manhattan.

The lights consist of fluorescent tubes placed behind a dropped ceiling, sieving the light through screen of metal mesh. The latter softens and abstracts the largely visible functions of the ceiling above it. The light in the galleries can be controlled through a system of shades beneath the glass.



Ill.93-95

SHOW ROOMS



Ill.96-98 Asymptote architects Carlos Miele Flagship store, New York City





Ill.99-103 Rem Koolhaas Prada transformer

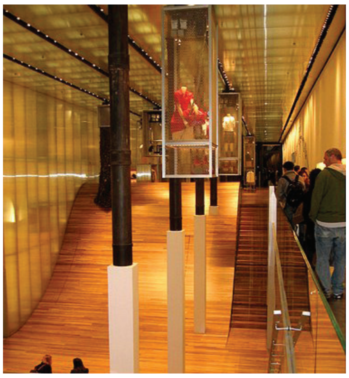

Ill.104-5 FIT Museum, New York

Carlos Miele Flagship store in Manhattan, New York, made by Asymptote architects has a total floor area of 300m^2. The store is an open space with landscaped sculptural walls, exhibiting the clothes. The pale white colours of the interior stand in contrast and highlight the colourfulness of the clothes. Mannequins are hanging down from the ceiling, providing a good view and passages for the customers. The organic shaped walls refer also to the lightness and waviness of the dresses.
The floor is made of highly gloss epoxy with embedded neon and halogen lights. The ceiling is made of glossy stretched PVS rubber, and the landscaped formed walls are made of plywood.

The Prada Transformer is a traveling pavilion that mixes fashion, architecture and art. The Prada Transformer was conceived by Rem Koolhaas as a four-in-one tent-exhibition: Art Exhibition, Cinema, Fashion Waist down Exhibition (as seen in the photographs), Special Event (Fashion Show) are all physically rolled to fit into the same architectural structure. The exhibition has a dynamic playful environment and exhibits the clothes in an untraditional way, using the whole room as an exhibition space, where cardboard models hang down from the loft and skirts as lampshades. This gives the visitor the opportunity to wander around and explore and experience new things. The pavilion’s façade membrane provides natural diffuse light.

The museum at Fashion Institute of technology in New York has permanent and shifting contemporary exhibitions. The clothes are displayed on a long platform as a runway show, where the visitors can walk down in their own tempo. The exhibition room is very dark, with black painted walls and with spotlights only set to illuminate the exhibit clothes. This setting blurs the spatiality of the exhibition room and only the clothes are in focus.

The Prada shop is in two levels; the street level connects the basement in a continuous whole so that a part of the slope creates amphitheater-style space for public events. The clothes are exhibited on steps as waves that drags one into the store. The exhibited clothes on the steps give the visitors an overview of the exhibition, and visitors can thereon freely move in their own tempo and observe the displayed clothes. Elements hanging from the loft attract the visitors’ attention and one can observe the spatiality of the room/store.


Ill.106-8 Rem Koolhaas Prada store, New York City

High-Rises
TECTONIC DESIGN

A formal high-rise construction is with more limitations than a standard low-rise construction as height and natural forces have bigger impact on the high-rise. As the pressure of the wind escalates with the building's height, it is important to take the wind load in the designing phase of the fashion museum into consideration early in the process, to create an optimal structure and provide comfort for its visitors.
Earthquake loads are also an important factor as the building site is in Tokyo, which is in the earthquake zone of the Eurasian tectonic plate. The earthquake calculations will not be included in the design process of the construction phase; they will only be theoretically explained in this chapter.

Ill.109 In 1883 The Home Insurance Building, Chicago built by engineer Willia LeBaron Jenny was the first building completely framed in steel, using all types of beam and column shapes.

The key to the high-rise stability is in its resistance to higher vertical and lateral loads; wind or earthquake forces increase dramatically in magnitude with the building's height. For example, a building about twice as tall as another building must resist wind effects four times as large as those on the lower building.

In the first skyscrapers, the facades were heavy and closed. This was due to the horizontal rigidity, obtained by the use of closely spaced columns and deep beams filled with heavy masonry or brick walls.

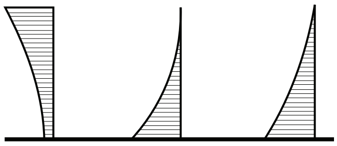
Ill.110 In 1903 the Ingalls Building in Cincinnati, was the first high-rise made of reinforced concrete. The frames of the building were not only capable of channeling the gravity loads to the ground, but of resisting the wind forces with a relatively small sway due to their masonry walls that added materially to their lateral stiffness.

Later on, a concept of lighter frames and more open facades was introduced. This was based on a separated structural system; a flexible exterior frame and an inner core, both consisting of stiff wind-bracing frames of X-ed diagonals. In addition to the beams and columns, the X-ed framed diagonals provided a greatly increased stiffness by working in tension and compression, rather than in bending.
The walls were filled with thin concrete and provided shear resistance because of the stiffness in the horizontal direction. The core may be built with reinforced concrete walls that provide even higher stability.
The hinged frame façade works as an outer core leaving the interior open providing a spatial flexibility. The horizontal wind loads are distributed between the inner and outer core and carried down to the base. This structural principle reduces the weight of high-rise and their cost of materials and manpower.

These types of constructed buildings are called 'tube buildings' since their outer walls act as the walls of a hollow tube. This structure is the most efficient construction so far, resisting the high wind loads (Why Buildings Stand Up, Salvadori M.). Later in this chapter, examples of tube structure buildings will be provided as case studies showing the process towards getting a better understanding of the structural possibilities when designing the Fashion Museum.

Ill.111 In 1962 the Columbia Broadcasting system building, New York by Eero Saarine. The wind forces are resisted by both an inner core and a shear-wall façade of columns 1,5m wide and spaced, connected by a rigid waffle floor slabs.

LOAD CASES



Behaviour of a high-rise structure under lateral loading.

Dead loads: Permanent load, the structures elements' own weight.

Live loads: Varying load, people, furniture, equipment, store goods.

Dynamic load: are defined as the pressure of the wind gust, or the action of an object dropped on the floor. Such loads may be exceedingly dangerous because they often have much greater effect than the same loads applied slowly. The fleeting effect of a dynamic load depends on how fast the load varies. (No varying load is ever static or dynamic depending on the structure itself. Its effect can be static or dynamic depending on the structure to which it is applied.)
If the wind load grows to its maximum value and vanishes in a time much shorter than the period of the building, the effect of the wind is defined as a dynamic load. The wind effect is static if the wind load grows and vanishes in a time much longer than the period of the building. The weight of snow and people is always a static load because snow takes hours to accumulate and people enter buildings singly or in small groups.

Thermal and settlement loads: is where the change of the daily or seasonal temperature or uneven settlement of the soil. The buildings construction parts can expand when heated or increase in length when cooled, depending of the material. To avoid the thermal loads, the structure of the building needs to be less rigid.

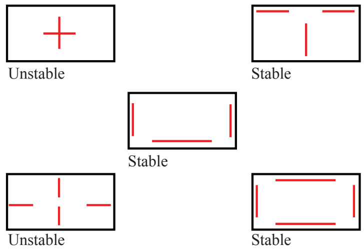
To understand the effect that the different types of structures has, fundamental principles of shear wall and core placement, and the stable arrangement of structural stiffening elements are briefly described.

The objective of placing the core and the shear walls in the optimal position is to minimize the effect of torsion. To enhance the lateral stiffening, it is better to place the core in the middle of the ground plan as seen in the diagram 113 and arranging the shear walls in a stable composition - see diagram 112.

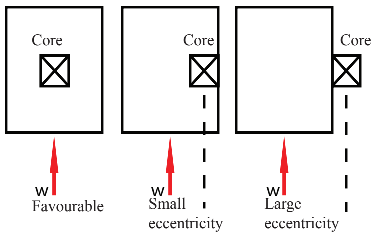
Different types of bracing systems have been developed and used in architecture, from simple planner systems to space frame hybrid systems.
Bending and shear forces are produced due to lateral loads acting on the rigid frame, and these lead to various deformations shown in the diagram 114. The lateral deformation creates tension on the side facing the load and creates compression on the other side. These forces produce a lengthening or shortening in the frame leg, which results in deformation of the horizontal member. To reduce the buildings costs, a larger dead load concentration can be planned when designing the ground plan of the building.

The relationship of both deformations will change depending on the respective stiffness of the legs and horizontal members. The largest bending moments occur in the corners of the frame, where the moments must be transferred from the horizontal members to the legs (High-rise manual, J. Eisele and E. Kloft).

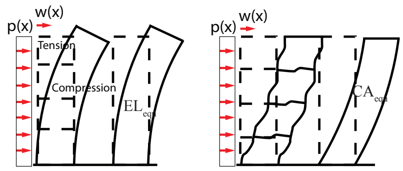
A high-rise structure stiffened only by frames is practical up to maximum of 100m (25 stories). Frame systems in connection with shear walls and/or outriggers are more appropriated for higher heights in an economical point of view.
Different types of structural bracing systems can be seen on diagram 115. They vary from the rigid rectangular frame work to combinations of various implementations of diagonal elements. The choice of an efficient bracing system takes on increasing importance for the profitability of a high-rise, this is why, this should be a central element in this project, combined with an efficient core.



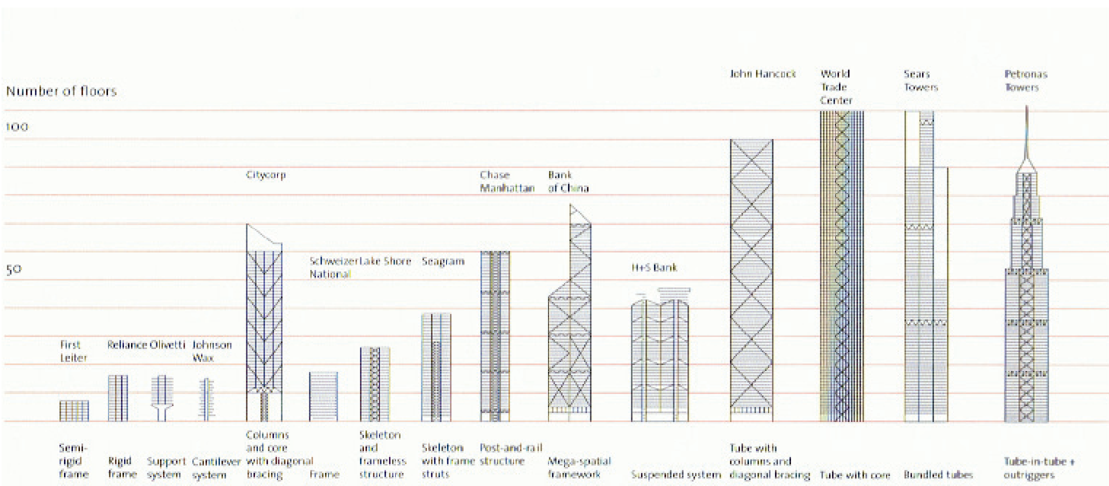
Ill.112 The diagrams show the unstable and stable arrangements of the shear wall structural stiffening elements. At least three elements are necessary in every horizontal plane to reinforce a floor plane; they should not intersect. This will prevent the deflection of the plane along the x, y axes and rotation.



Ill.113 The diagrams show the influence of the core positioning and the increasing effects of non-central cores on lateral loading.

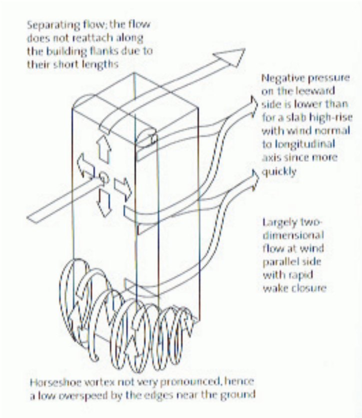


Ill.114 Bending and shear drift of walls and frames.
A breakdown of the lateral deformation into the components bending (flexion) and shear.

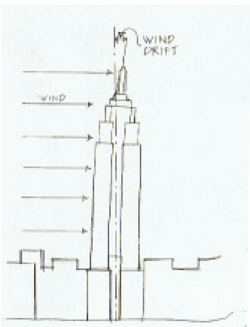


Ill.115 The diagram shows the diffrent types of frame systems of load-bearing structures.

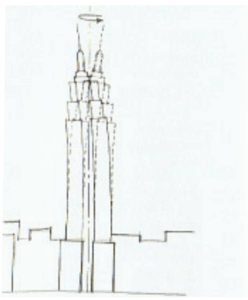
STABILITY
WIND AND EARTHQUAKE DESIGN



Ill.116 The diagam shows the wind effect and the loads on the building (tower). Wind field-wind pressure and distribution:



Ill.117 Wind sways in a tall building: when wind pressure hits the high-rise, the building beds slightly to the side and its top moves.
Period of a building oscillation: when one pusshes the building it will start oscillating – back and forth. The time it takes the building to swing through a complete oscillation is called its period.



Ill.118 Resonance is a load, which does not grow rapidly but has a dynamic effect that increases progressivly in time. When a force is rhythmically applied to structure with the same period as that of the structure, the force is said to be in resonance with it.
Aerodynamic force is a force, which drives from the interaction between the wind and the structure.

Wind design
The wind investigations should be based on comfort but also on reducing the cost of the building. Different factors need to be taken into consideration when designing a high-rise; the surrounding terrain, smoke extraction, wind-induced noise, wind fields near the ground and urban ventilation due to the changes in the emission field.

On the windward face of a rectangular building, the wind pressure exerts because of the movement of the air particles that are stopped by the building. When the wind particles go around the building and continue together again in their original flow, a negative pressure is created and suction occurs on the leeward side. The total wind force is the sum of the windward pressure and the leeward suction, but each of these local forces has its own local effect. When calculating the wind forces, the surrounding of the building is very important as the nearby buildings and land configuration have an influence on the wind pressure.
The wind-induced flow field is dependent on the size and shape of the building. The overpressure on the leeside facing the wind is the result of a dynamic air pressure. The areas on the ground near the building's corner can be an uncomfortable outdoor space, as the displacement effect of the wind can result in high local wind velocities, shown in the diagram (Ill. 116).

When applying the wind loads, the maximum wind pressure should not be taken into account as the cost of the building would become too high. Instead, the building should be structurally designed capable of resisting a maximum wind load that could occur once in 50 years.
To avoid wind drifts, the structure of the high-rise should be stiffened so that the top will never swing more than 1/500 of the building's height. This should also be done to prevent resonant oscillations, shown in the diagrams 117-118. In this regard, a stiffer structure will result in a shorter period.
When using a tuned dynamic damper, the building will oscillate with its own period, but the tuned damper will, after a short while, start oscillating with the same period but in the opposite direction, evening out or reducing the total oscillation of the building (High-rise manual, J. Eisele and E. Kloft).

Earthquake design
Earthquakes are characterized by the type of waves they emit.
The waves are differentiated into space waves and surface waves. In space waves, the ground experiences either an expansion or compression movement (P-waves) or a shear movement (S-waves). Surface waves are divided into Love-waves, which produce a shear movement similar to the S-waves, and Rayleigh-waves that give an upward downward movement combined with a horizontal distortion as water waves. The P-waves are the first to arrive causing vertical loads, and then the S-waves arrive in the horizontal direction and can severely damage buildings or cause collision.

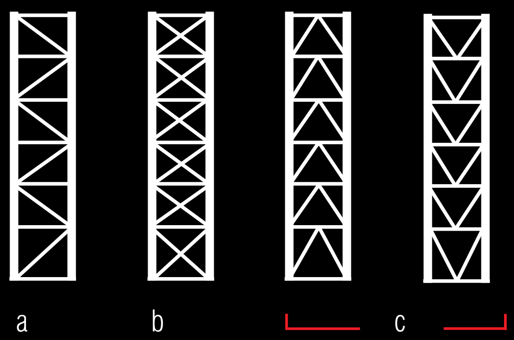
The earthquake loads are defined as a horizontal and dynamic impact force due to the jerky motion of the sudden sliding. As it is a dynamic force, it can be resisted by the same kind of bracing used against the wind loads, or by implementing dampers, to take the natural period of the oscillation provided by the earthquake waves (High-rise manual, J. Eisele and E. Kloft).

Plan and elevation:
- Depend on the building's behavior when it is subjected to dynamic forces.
- The floor slabs should be as compact as possible to allow the transfer of horizontal loads to the reinforced system and to the foundation.
- The foundation, especially of a high-rise with a small footprint, must be capable of preventing the entire structure from tilting.

Material selection
The load-bearing structure is generally designed as:
- Reinforced concrete
- Steel
- Composite steel construction

Reinforcing systems, depending on the construction method
Three different reinforcing systems are employed for high-rise:
- Load-bearing walls
- Frame systems
- Trusses

Different combinations of diagonal bracing



The simple diagonal bracing in alternative a - is a frame stiffening with simple diagonals. Depending on the direction of the lateral loads, the forces produced in the diagonals are compressive and tensile.

X-ed bracing in alternative b - is double diagonal bracing and is only effective as stiffening when both diagonals are formed as tension members. The benefit of X-ed framed diagonals is that, the least steel consumption is used compared to alternatives a and c.

The K-bracing in alternative c - this type of bracing system is good for absorbing the horizontal loads and reduces the length of the beams.

General construction principles

Simple load-bearing system
- Regular plan and elevation for building
- Compact building form
- No dramatic changes in stiffness as the building rises

Symmetry
- Symmetrical reinforcement system along two orthogonal axes
- Rectangular ground plan if possible

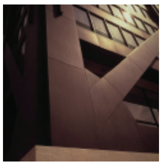
Connected foundations
- Integrated building sections constructed on common foundations

Energy dissipation capacity
- Transfer of horizontal loads
- Sufficient local and general ductility is essential

CASE STUDIES
TECTONIC ARCHITECTURE

The following case studies have all a tube-like structures but different form expressions. Each building will be briefly described by their structural aspect and their tectonical expression.

Rigid squared form
The John Hancock Center, Chicago is 344 m. Built in 1969 by Fazul Khan in SOM architects. The building's materials are steel, aluminum and glass.
The geometrical division of the façade with X-ed formed frame and columns give a dynamic expression and a visual strength. The form originated from the philosophy of 'Function follows form', where the tube structures' X-ed formed buttress-crosses continue from section to section connected to columns, so that the weight can be transferred from the buttress to the columns and back again. The building encompasses owner apartments, offices shops and a hotel.
(Dupré J. Skyskrabere)

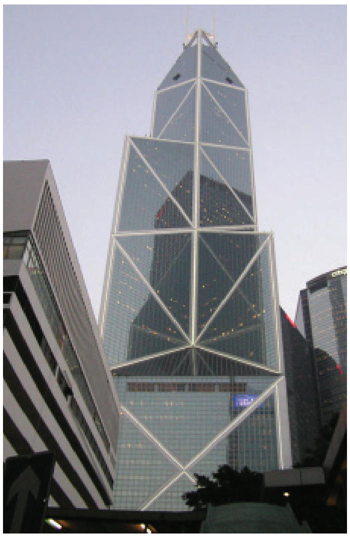


Ill.119

Oval slender and layered form
Lipstick Building, built in 1986, New York, by Philip Johnson, is 133m tall building and is built of steel, granite and aluminum. Johnson P. describes the building as an oval building on a squared building site. The nickname has been given by its curves and secluded sections. Three volumes stacked on each other as a layer cake, with the wider volume at the ground, emphasizing the horizontal lines and the increasing forces with the buildings height.
The corners of the building are drawn back as a dramatical contrast to the orthogonal and traditional neighbouring building blocks.
By breaking with the traditional building volumes, more space is created for the pedestrians at the situated corners. The construction has been very costly, mainly due to the material used; a slab on column construction, with visible marble columns on the entrance part, which are three stories high to increase the availability of light to street level and to the volume of the building. (Dupré J. Skyskrabere)

Ill.120

Diamond shape
The Bank of China, Hong Kong is made by I.M. Pei, 1990. The building is 369m and consists of four vertical column shafts, which emanate from the building granite base and get thinner further up the construction. The form assembles as a bamboo shoot that is growing higher and higher for each new growing shoot. It also comprehends with the impact that the forces have on the building form. The squared plan is divided by four triangles, which consist of eight vertical, plane frames; four of them have wind X-es. The weight of the building is transferred to four corner columns and a fifth central column. By directing the gravity load to the building’s outer edges, a bigger resistance for the wind gust is achieved. At the ground level there are gardens, which assemble to the building geometry and material selection.
(Dupré J. Skyskrabere)



Ill.121

Staggered and fragmented volumes
The Sears Tower, Chicago, is built in 1974 by Fazul Khan in SOM architects. The building is 442m tall made of steel, aluminum and glass and consists of nine square tubes hinged together in different heights, providing a light but strong construction. The dark fragmented volumes are a cross combination between the monotone rectangular buildings (which has dominated since Mies van der Rohe) and the tapered first skyscrapers.
The height and the reflected glass façade of the building have led many birds fly in to their death. The building has problems by wind gusts both inside and outside. This can be due to the fragmentation of the hinged square tubes.
(Dupré J. Skyskrabere)

Ill.122


Ill.123

Organic shape

O-14 is an office building, 31,400 sq. m by Reiser + Umemoto, 2006 in Dubai. The building has a wavy organic closed form with a star-like ground plan.

The structure consists of an outer reinforced concrete shell and an inner steel and glass facade. The concrete shell is the bearing structure of the building and has perforated openings to give a more light 'lace-like' appearance to the façade and bring light, air, and views. The office floors are carried without the barriers of conventional columns and walls. The space between the two structures is one meter deep and the main enclosure creates a so-called "chimney effect," whereby hot air has room to rise and effectively cools the surface of the glass windows. This passive solar technique essentially contributes to a natural component to the cooling system for O-14, thus reducing energy consumption and costs (www.reiser-umemoto.com).


Ill.124


Ill.125

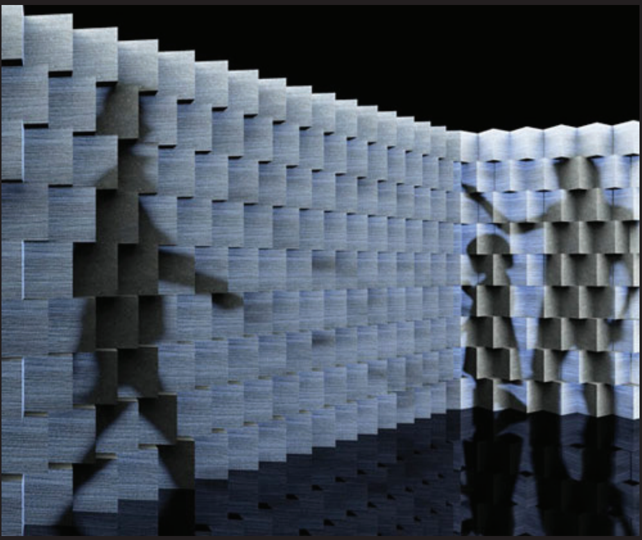
Form and expression

Hancock building's rigid form and its identical, continually X-ed frames could give the impression that its height could continue in infinity.
The construction of Bank of China creates an expression assembling a prism, with consistent use of triangles, in the facade and in the ground plan, creating different expression, seen from different directions. (Due to Feng shui different symbols are read, an ironic symbol is the masts on the top, assembling two chopsticks placed perpendicularly in a bowl of rice, symbolizing poverty.)
The Lipstick building assembles to a lipstick case by its volumes and the glossy use of materials.
The thickness of the concrete shell in O-14 gives the understanding of a bearing structure, but the perforated holes give lightness to the thick concrete and provide an expression assembling a lace.

Materials, structure and construction

The Hancock Center and Bank of China have clear structures and the used materials have capability to absorb and transfer the loads. The steel X-ed bar frames in the facades take the tension and compression from the horizontal forces, so that the glass façade is non bearing. The aluminum mullions of the window frames reduce the weight of the facade. The X-ed frames in both buildings are thicker down at the base where most forces need to be obtained.
The reinforced concrete shell in O-14 is connected to the building floor slabs, which transfer the horizontal loads from the decks down to the fundament. The perforated holes are denser at the top of the building and less at the bottom, due to the forces that need to be obtained.
The Lipstick building has columns plastered in granite and placed in the facade and in the floor plans to take the tension loads.
In Bank of China, there is a consistency between structure and construction. The triangle plan shape fits with the form of the building. The columns in the building's outer edges are constructed in a way that one part column could not be left out, which would cause the construction and design to be incomplete. This is also the case of the Hancock Center where the X-es in the steel frames will get weaker if one is removed.
The O-14 reinforced concrete shell is strengthened by the organic enclosed shape, and in the Lipstick buildings the lower volume has a larger footprint than the top one, due to the larger loads occurring at the ground level.

VISION



LIGHT AND TEXTURE

BUILDING THE FRAMES AROUND FASHION

OPTIMIZED CONSTRUCTION

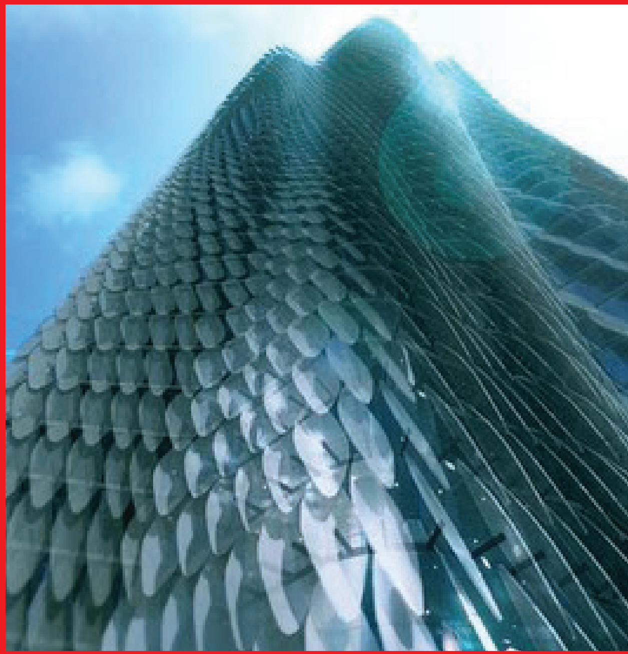
Ill.126-128

THE VISON OF THIS PROJECT IS TO DESIGN THE FRAMES AROUND FASHION AND CREATE AN ATMOSPHERE BY THE INTERPLAY BETWEEN LIGHT AND TEXTURE, DEFINED BY THE MATERIALITY AND A SPATIAL VARIETY, ENCLOSED BY A TECH-TONICAL STRUCHTURE.

SKETCHING PHASE

The sketching phase will illustrate the design process of this project. As the design process of this project is an iterative process, the sketching phase in the report is documented as a liner process in order to simplify and superficially summarize the ideas and steps behind it.

The sketching phase expands initial sketches and models of the form and concept to interior organization and functions distribution. Considering the design parameters from the analysis phase, technical issues will be considered throughout the phase and integrated as design parameters.

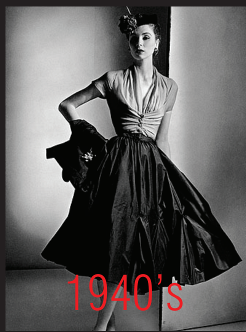


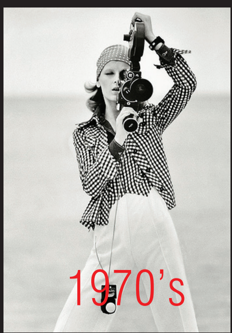
INSPIRATION

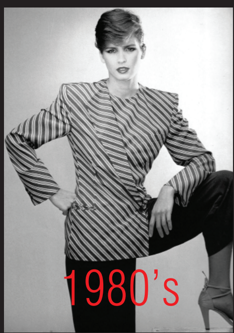
Ill.129-132

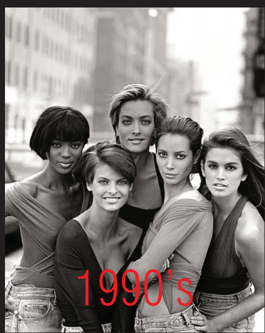
PUBLIC SPACES 14%

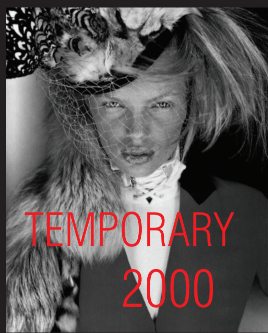
EXHIBITION 60%





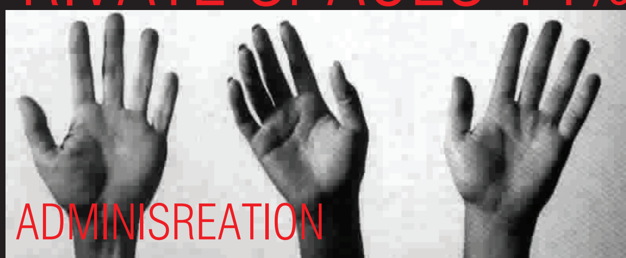






SEMIPUBLIC SPACES 12%

PRIVATE SPACES 14%



Ill.133-148

Public Spaces

Type	Area m2	Quantity	Light
Entrance hall	100	1	Artificial/Natural
Souvenir shop	50	1	Artificial/Natural
Public restrooms	50	2	Artificial
1920 ´s room	150	1	Natural-diffuse
1930's room	150	1	Natural-diffuse
1940's room	150	1	Natural-diffuse
1950's room	150	1	Natural-diffuse
1960's room	150	1	Natural-diffuse
1970's room	300	1	Natural-diffuse
1980's room	300	1	Natural-diffuse
1990's room	300	1	Natural-diffuse
Temporary 2000	300	1	Natural-diffuse
Urban balconies	100	2	Natural

Semipublic Spaces

Type	Area m^2	Quantity	Light
Skybar	100	1	Natural
Bar	30	1	Natural
Bar restrooms	20	2	Natural
Runway	40	1	Artificial
Backstage area	50	1	Natural-diffuse
Seating area	100	1	Natural-diffuse
Runway restrooms	50	2	Artificial

Private Spaces

Type	Area m^2	Quantity	Light
Administrative	100	5	Natural
Office restrooms	20	2	Natural
Parking area	200	10	Artificial
Loading area	60	1	Artificial
Storage room	80	1	Artificial

Partial area : 3200 m^2

Circulation and walls : 25% of the partial area : 800 m^2

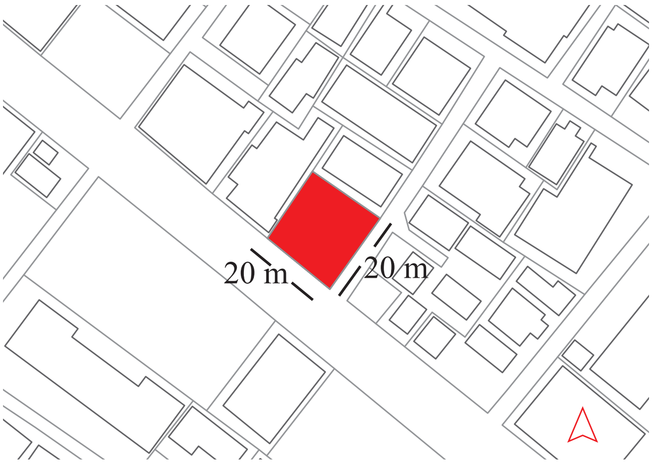
Total : 4000 m^2

BASIC ORGANISATION

The Public Spaces: entrance hall, urban terraces, exhibition rooms, restrooms will be accessed free for any visitor of the museum.

The Semipublic Spaces: skybar-Japanese garden, runway will be separately accessible.

The Private Spaces: administrative, service will be interconnected according to their compatible functions and will only be accessible by the museums' staff, therefore, a digital indentification system will be installed (ID cards, fingerprint detector, etc).



Foot print of plot: 20 x 20 m

Foot print sqm: 400 m^2

Total sqm of the building: 4000 m^2

Ill.149

VOLUME DISTRIBUTION OF THE FUNCTIONS

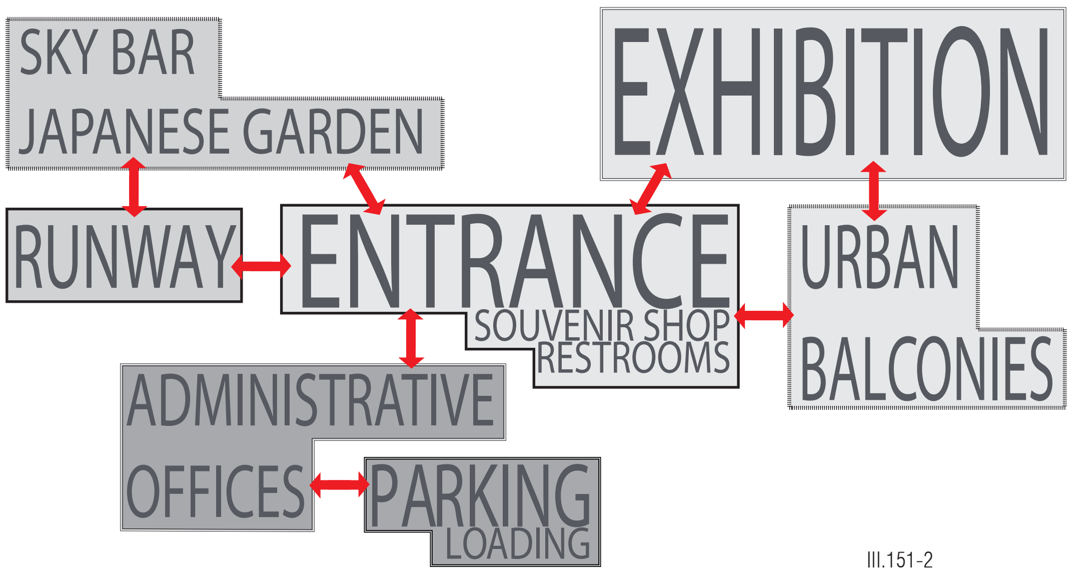
Public
Semi Public
Private

Ill.150

FLOW DIAGRAM - VERTICAL

FLOW DIAGRAM - CONNECTIONS

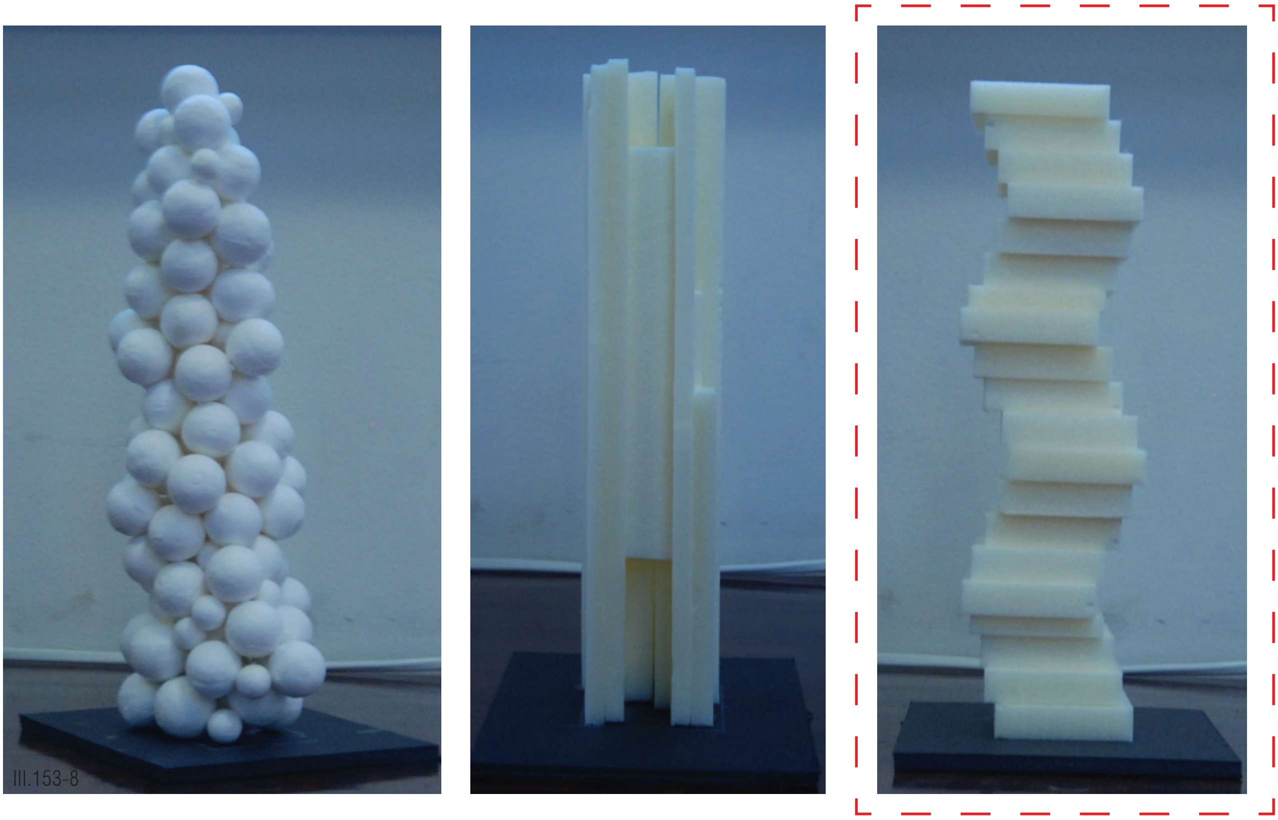
Open spaces to the surroundings
Visual connections to the surroundings
Closed visual connections to the surroundings



Ill.151-2

INITIAL MODELS

As a starting point for the sketching phase, inspiration in lightness and movement will be investigated by models and sketches.
The models are based on a volume studies. By breaking up the building volume in more parts, the volume would appear lighter and would give the opportunity of creating different floor plans.



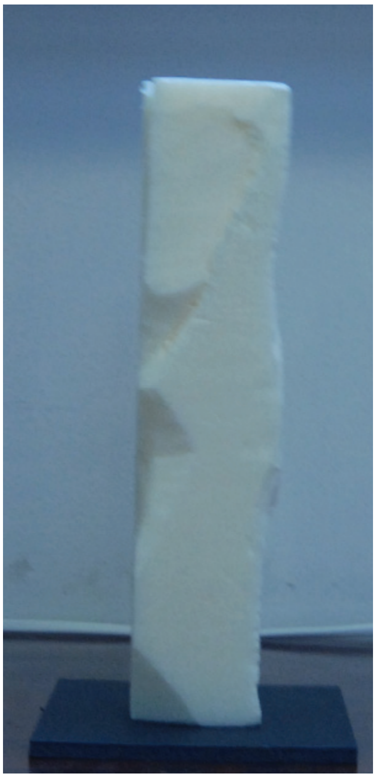
Ill.153-8

The spheres model provides intricate spaces between the spheres. By hollowing out the interior, parenthetic volumes can merge together and create an interesting flow. This model would have a challenging construction solution.

The shifted vertical elements give the building a strong verticality and lightness. The shifting vertical colums can give different floorplans and many outdoor spaces. The construction can be made by hinged square tubes.

The horizontal volumes are staggered shiftwise in four directions. As the core would be centrated, the staggered volumes will produce diffrent floor plans and there will also be an opportunity for outdoor areas. The shifted volumes also provide an intresting movement. As the volumes are shifted, the construction would need a strong core and supplementing columns, which will limit the flexibility in the exhibition floors. By implementing an outer stabilizing ‘skin’ the construction could be made as a tube structure.





The above iterations are a further development of the previous chosen model. In these iteratons the shifted volumes will be connected by an outer skin underlining the potential movement in the form.

In the first iteration the shifted elevations have been upholstered by plaster and made softer with water. This gives the model a soft and interesting reference to fabric. The movement becomes more visual.

The iteration in the middle connects the shifted elevations in a straight line. A second connection is also done over several elevations. This gives depth of the doubled layer,and the movement of the form is still preserved.

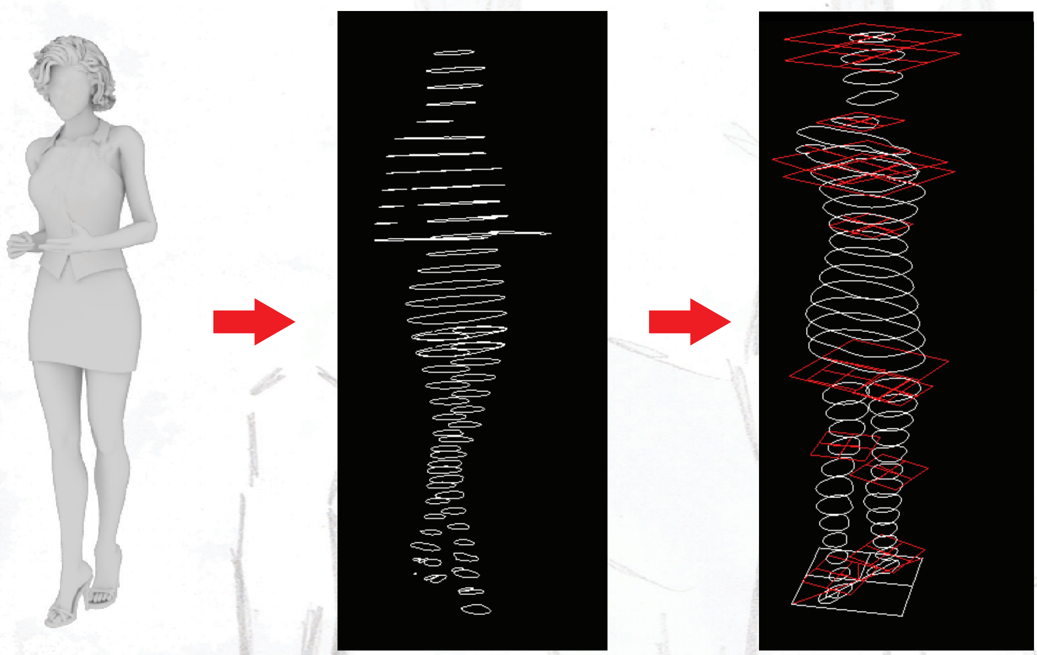
The last iteration is based on a movement created by the human body. By cutting and curving lines outlining the legs, torso and head.

FORM FINDING

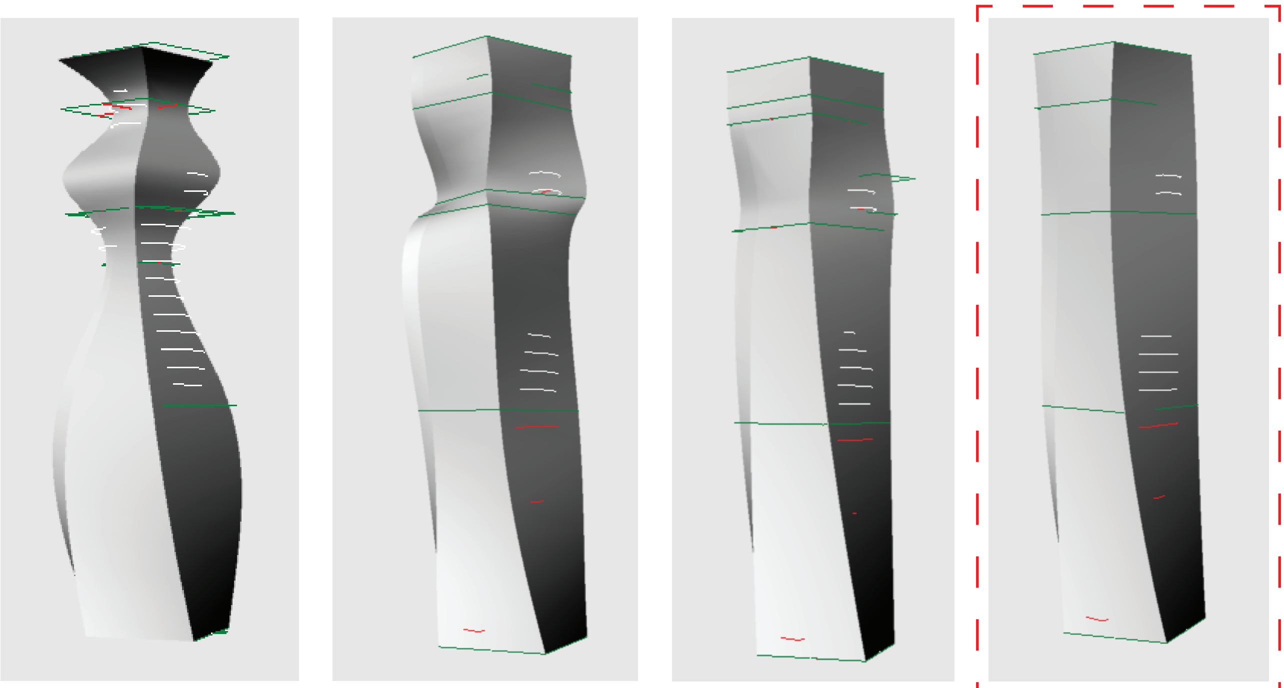

Ill.159


Ill.160

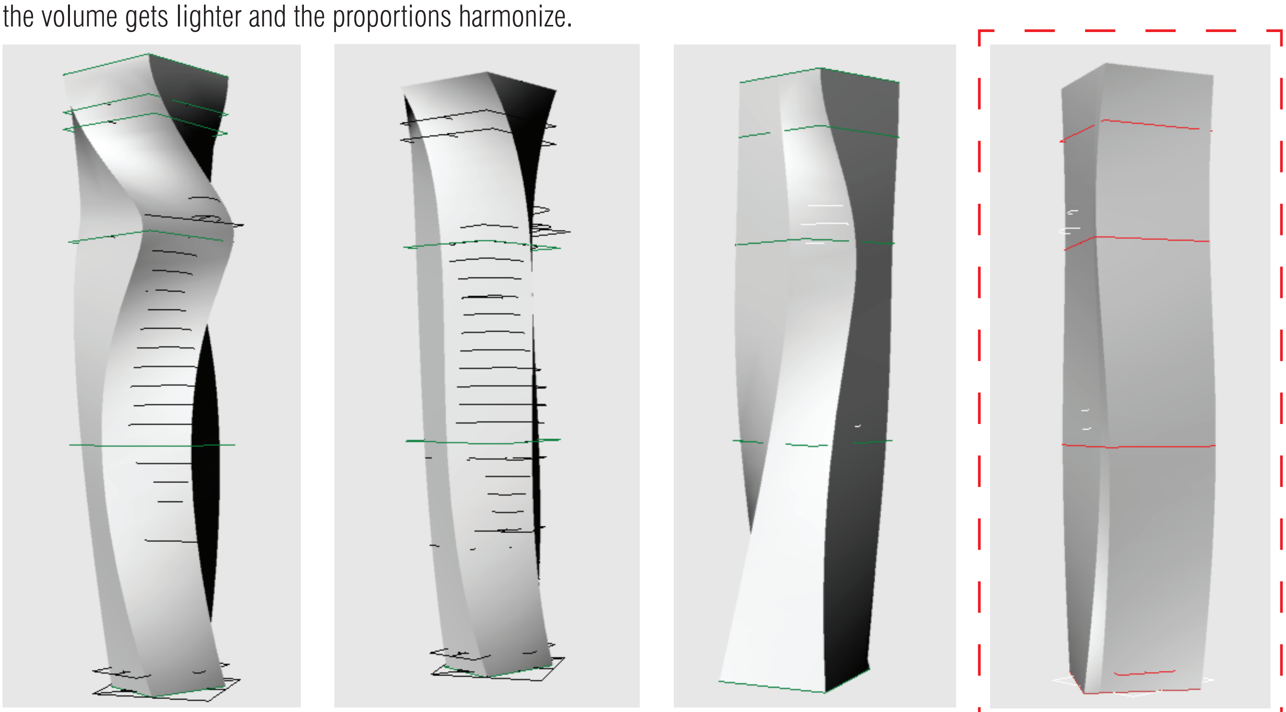
The body is the point of origin in both fashion and architecture. The catwalk provides a strong posture and a dynamic, elegant movement.
To understand the proportion and the twist of the human body, a 3D cat-modeling (Rhinoceros) is used for further sculp-turing of iterations.


Ill.161-163

The process is based on contouring the human body and scaling it in the proportions of the high-rise. To connect the movement and twist of the body the red curves as seen in the illustration are drawn up and scaled in the base plan of the high-rise (18x18m).



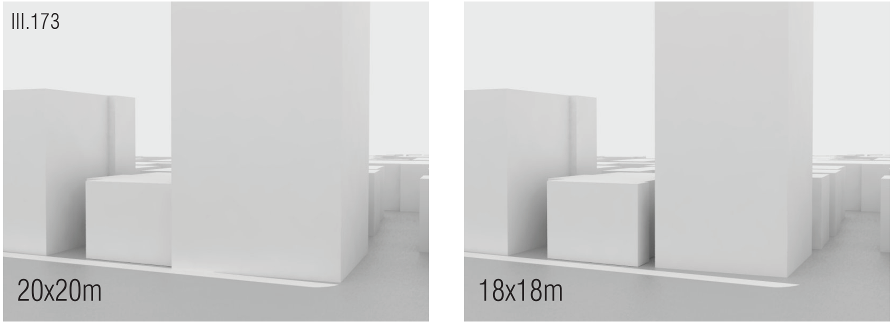
The form of the iterations derive from connecting between the different curves which outline a twist in the human body by using the loft function in 3D modeling program. In the first two iterations the curves of the hips , shoulders and neck are connected. In this case the shapes do not appear proportioned. The third iteration the curve around the hips and shoulders are the ruling curves for the form. In this case the forms get more proportioned and the movement of a walking human body comes to form. In the last iteration the same curves have been used connecting them with a loosely loft. In this case the volume gets lighter and the proportions harmonize.



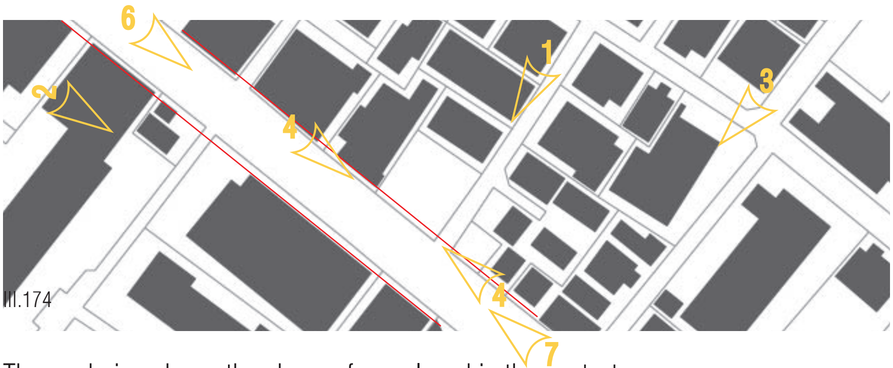
Working further with the twist of the movement in the walking body, further iterations are made by connecting the diagonal curves created by the two legs and the angled diagonal created by the shoulders. The first two iterations have a smaller footprint creating irregular forms. By increasing the footprint to the same dimensions as the other connecting curves, which is seen in the last two iterations, the proportion of the volumes become more harmonized. Using the loose loft tool in the last iteration, the movement is embraced. The diagonals created by the feet and the shoulders lock the body and provide a structural quality to the form of the high-rise. The form is compact and the construction can be done as a tube structure.

Ill.164-172

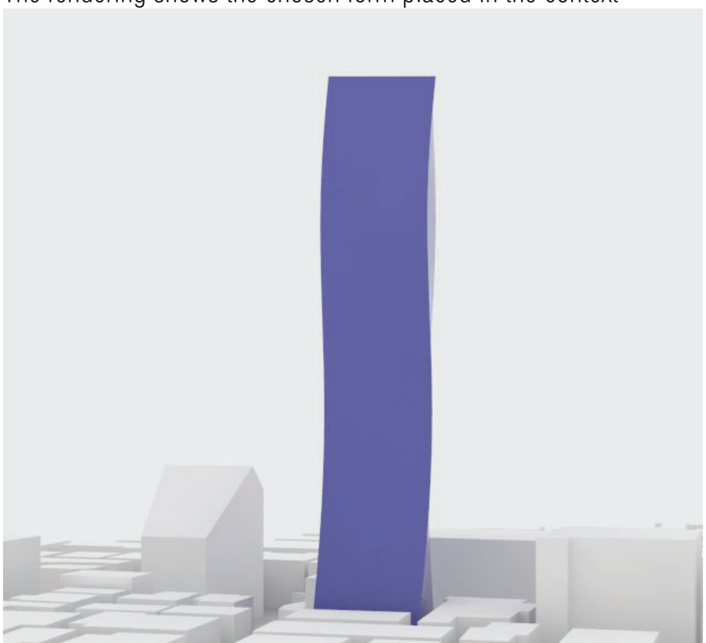
PLACEMENT



If using the whole plot area of 20x20m for the building, the building will become too dominating. As seen on the map below, the neighbourig buildings are placed 1-2m away from their surrounding plot areas. The second illustration is a volume of 18x18m. This gives air to the surrounded buildings and harmonizes with its surroundings.

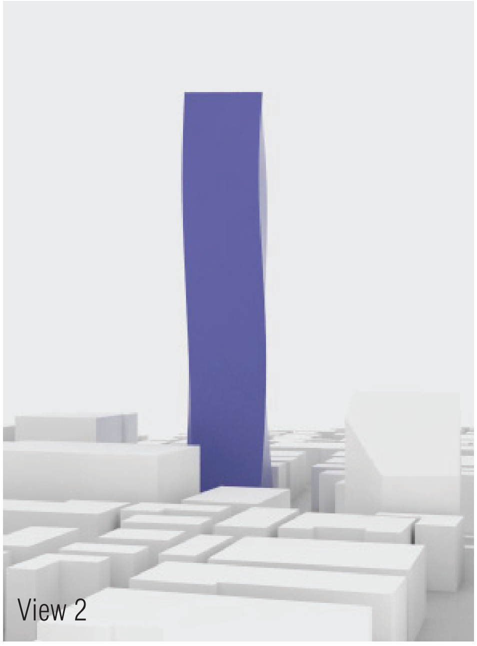


The rendering shows the chosen form placed in the context

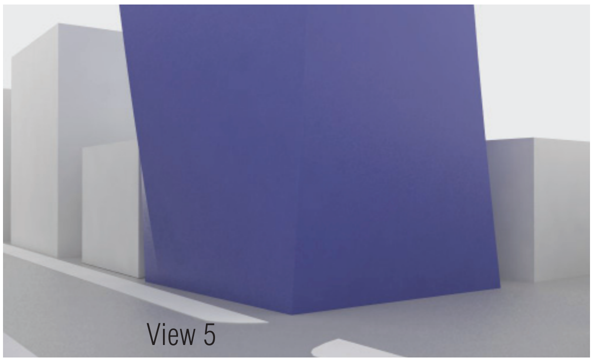


The 100m hig-rise stand provocatively in the context of low buildings, though the slender and swaying form gives the high-rise a humble apperance and blends in with the context.
View 1

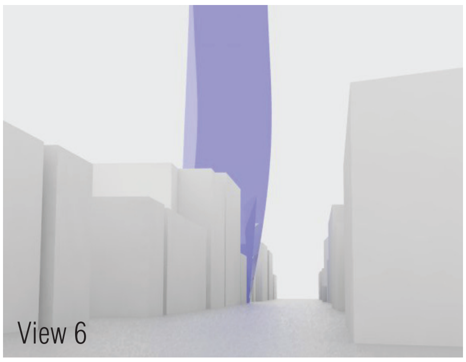
III.175-182

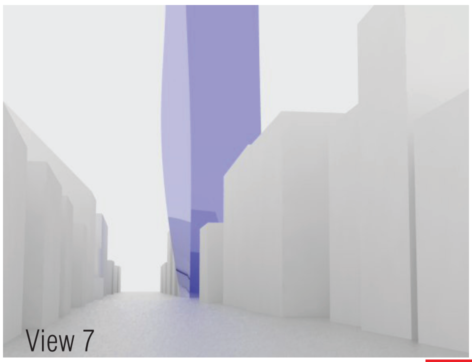


The high-rise seen from the near placed high-rise - the first ill. is seen from south-west in ill. 2 from north-east.



The twist of the form fits well in the plots corner and outlines well with the other neighbouring buildings. It draws back from the busy street but still marks its presence by swaying its front in the street picture in human scale, as seen in the pictures below that show the view of the high-rise from both directions of Omotesando street.



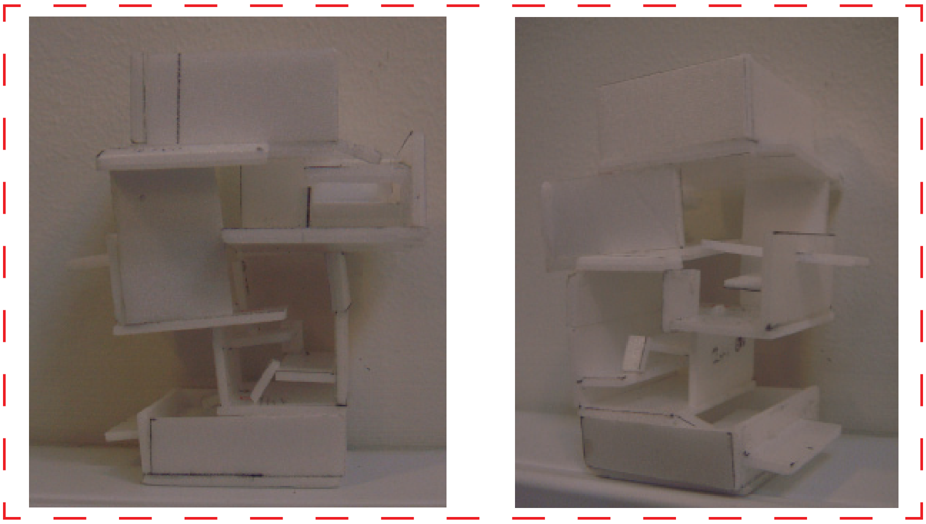


INITIAL MODELS OF THE INTERIOR SPACES

As the building needs to be 100m tall, the total area of $4000m^2$ of the museum, if spred out equally on the floors, will occupy only 1/3 of the building's height.
Placing the museum exhibition and the other functions on different levels by shifting and creating floor areas with irregular and different sizes would provide different experience for the visitors while working their way up in the building and create visual connection between the exhibition and the visitors.

Ill.183-190

The model picture displays an exhibition room of 150 m^2. The organic formed platoes create a landscape of exhibited mannequins. One can get an overview of it when standing in the base of the platoes. The platoes are 0,4m high which gives the opportunity to have rather short ramps and provide easy access for the disabled. The platoes can be used as sitting areas and admire the exhibition.
The avarage 25 m^2 area of the platoes limits the space for both the exhibited maniquiens and visitors walking arround. The platoes would also need banisters, which could interrupt the expression of the organic platoes. To provide enough space for each exhibited period and mantain its natural flow, expression and experience through the exhibition, the visitor would need to climb to exhaustion 1300 platoes.

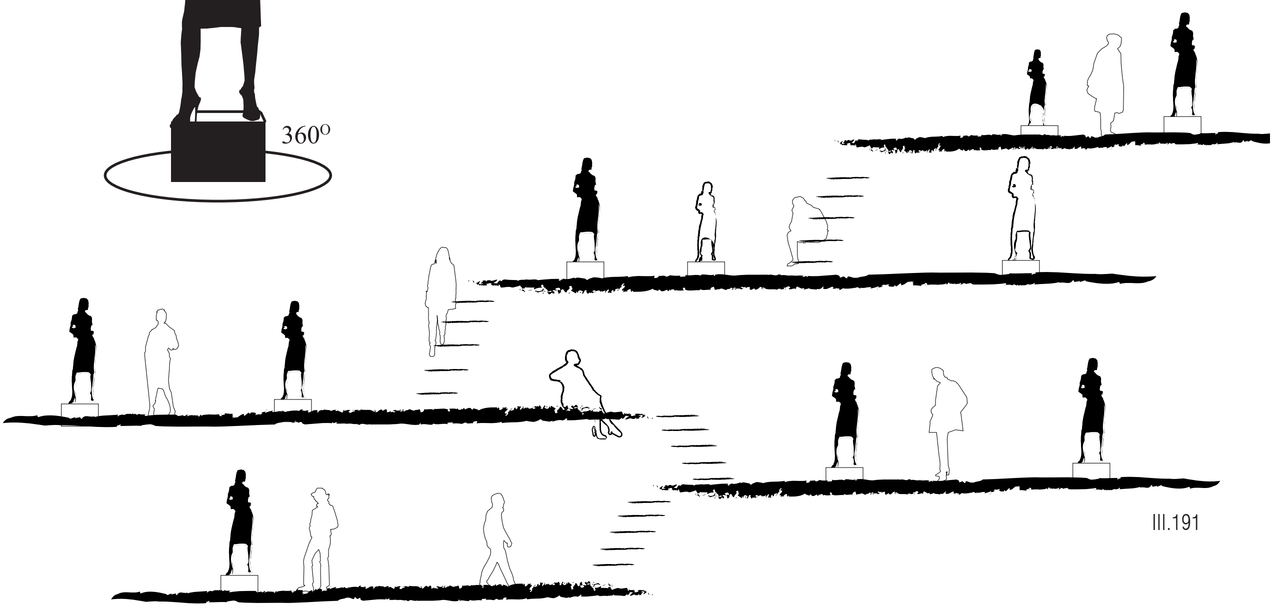


By giving the plateaus a larger area, more space would be provided for the exhibition. The plateaus are shifted in different heights and provide shifting interposing volumes between them. By walking up the plateaus the view and experience of the room and exhibition will change and provide a good visual connection between visitors and exhibition. The volumes will change from a 3m high room to a 9m high room. The larger area of the plateaus will provide less floors and the opportunity of having a continuous staircase and elevator connecting the exhibition floors.

CONCEPT

The exhibition consisting of mannequins with clothing will be three dimentional. To provide a more space for the exhibition and a different experience for the visitors, the exhibition area will be divided into several levels. Creating a landscape of complexity of spatial diversity, visitors will get different and new views of the exhibition and the architechture.

Shifting and cutting the different levels, low and high spaces will be provided, giving spatial experience for the visitors.
The staircases connecting the plateaus are wide and can also be used to exhibit the mannequins and connect and divide the exhibitions.
The dynamic interior will stand in contrast to the light and soft external expression of the high-rise.

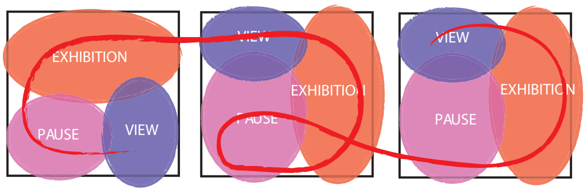


Ill.191

FLOW AND FUNCTION DISTRIBUTION

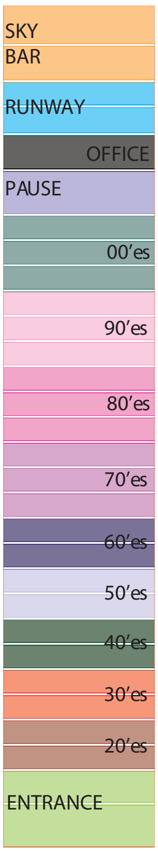
The exhibition will be chronologically told when visitors work their way up the museum. A 150m^2 is allotted to each fashion decade, from 20'es to 60'es, and 300m^2 for each decade from the 70'es to 00'es.
To provide a continuously flow through the exhibition floors and connect to the consecutive decades, a transition pause will be introduced. The transition zones for pauses will be placed shiftedly to get a various view to the outdoor surroundings.

By breaking up the spiral movement with U-turns, shiftwise on every second or third floor, the room heights and the shifting positions of the exhibition floors will give interposed volumes which are twice and thrice the heights of the exhibition rooms, as seen in the diagrams below.

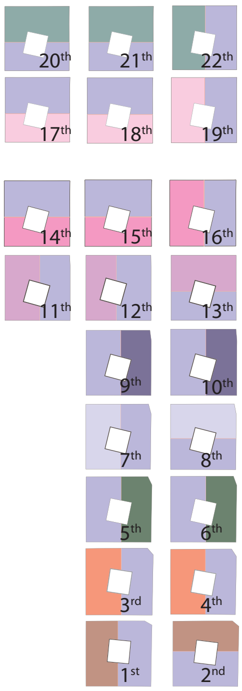


Ill.192 Flow diagram

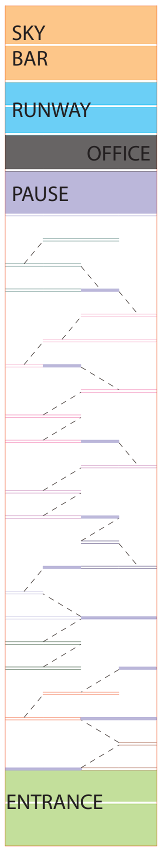
The core consisting of elevators and fire escape staircase is centered in the floor plan.
Each floor with 150m^2 area is distributed on two levels and each floor with 300m^2 area is distributed on three levels for the exibited decades, as shown in the diagram 193. below. The exhibition floor plans are shifted around the core, creating a system for the inserted volumes. As seen in the floor plan diagrams, the multicoloured spaces represent the area of the exhibition, and the light purple spaces show the transition and pause zones. These spaces will be cut away creating double and three double volumes as mentioned earlier and provide an open and visual connection between them, as illustrated on the diagram 195.
This arrangement will give too many levels of exhibition floors and only one large pause/urban terrace floor above the last exhibition floor.



Ill.193 Function distribution

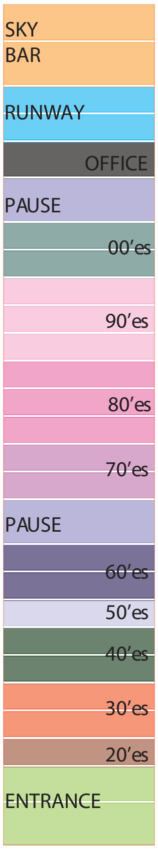


Ill.194 Exhibition floors

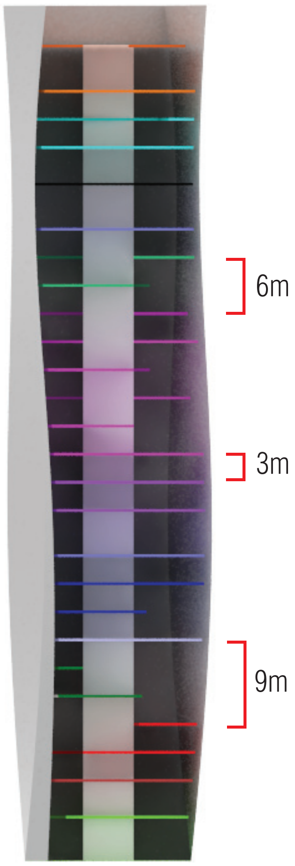


Ill.195 Shifted and cut exhibition floors

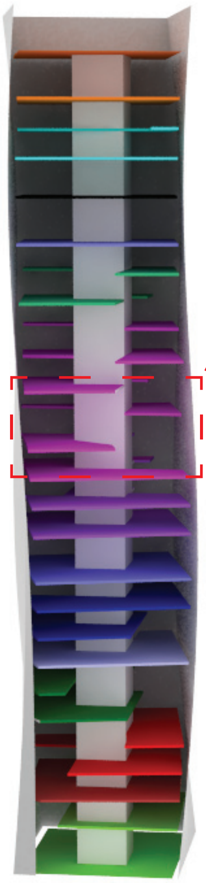
By reducing the exhibition floors as seen on the diagram 196, one more pause floor can be introduced which will provide space for restrooms facilites and full round panoramic view. In this case, space for the restrooms facilities would not be needed at the exhibition floors. As the first pause/urban terrace floor is located 36m above the ground level and the last one rises 70m high from the ground, visitors will view and experience the scenaries differently.



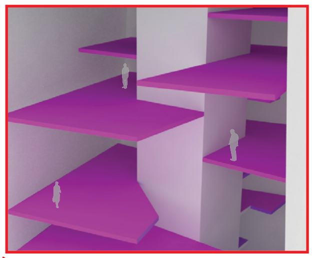
Ill.196 New floor distribution



Ill.197 The interposed volumes created between the exhibition floors

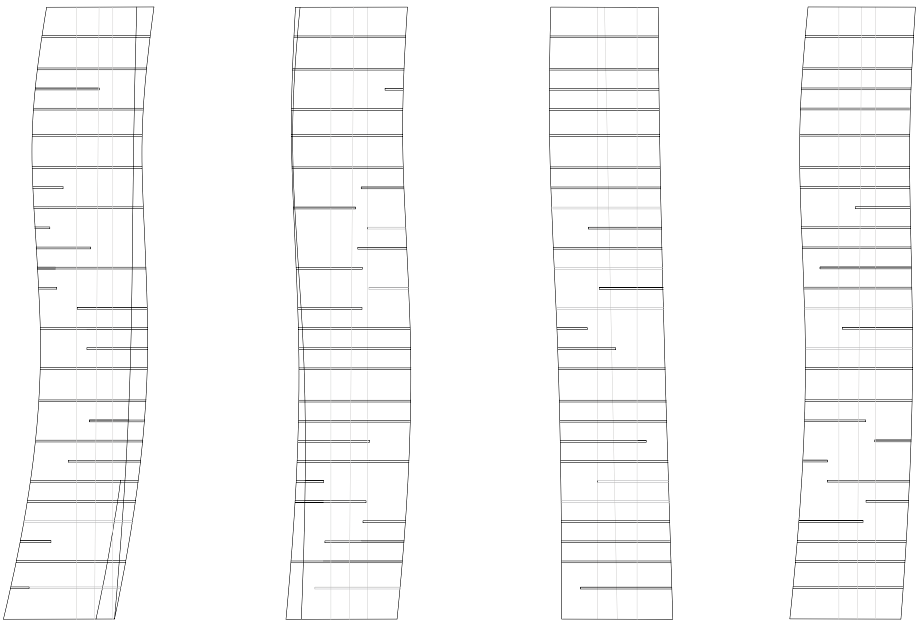


Ill.198 The shifted and cut exhibition floors



Ill.199 The visual connection between the exhibition floors

Sections of the exhibition floors and the additional functions



Ill.200 West facade South façade - entrance East facade North facade

SYNTHESIS PHASE

In the synthesis phase the construction and facade of the high-rise will be determined and developed in its final shape. Different construction principles will be explored by using StaadPro calculations. Various facade expressions and materials will also be explored and determined.

CONSTRUCTION

THE STRUCTURAL PRINCIPLE

In this chapter, the construction for the high-rise is investigated and determined, using Finite-Element program Staadpro. As the high-rise will only be 100m tall the first iterations will be made on a construction consisting only vertical beams, to prove a structure stiffened only by frames. This will be investigated by calculating the relationship between the distance placement of the beams and the dimensions of their profiles. The evaluation is based on the architectonical expression of the high-rise both inside and outside with the use of supplementing renderings.

The indoor renderings are made on a room with 18m width and 6m height and so is the panoramic views of the functions above the exhibition rooms. The render is considered in relation to the framing of the view.
To maintain and underline the movement and form of the high-rise building, the beams in the iteration are bended in the same fashion.

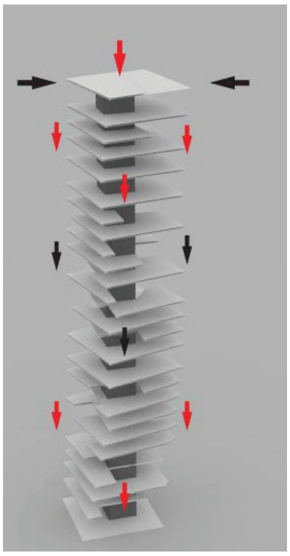
The 100m high Fashion museum has 27 stories. The floor slabs have various areas and are shifted around the core. Their maximum span is 7m from the core to the facade structure.

The Finite-Element model is built up with an approximation of the genuine distribution of the deck in the museum. The 27 stories decks are arrayed up the core with an equal height. The service load is calculated on the average area of the varying floor decks.
The wind loads and the service loads are distributed from the façade and floor decks to the core and down to the foundation.
The wind and the service loads are divided by 4 to distribute the loads on the nodes in the façade and the core. The half of the loads is distributed in the façade, and the other half is distributed by the core.

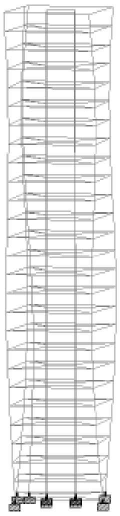
The average area pr. deck slab: 140m2

Service load: 140m2 x 2kN/m = 280kN/m
: 4 = 70kN/m
Wind load: 18m x 2 = 36m
36m x 1kN/m
: 4 = 9kN/m

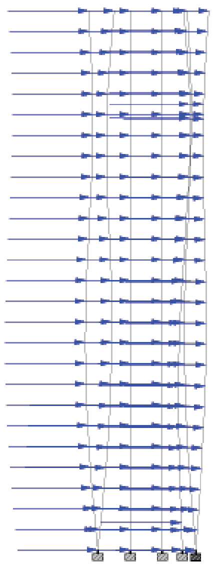
To obtain a translucent light appearance of the high-rise and its façade, the structural beams are chosen to be of steel as steel provides high strength and slender profiles. The core and the floor slabs will be made of reinforced concrete.
The beam profiles in the Staadpro calculations are squared; this is based on the wanted expression on the façade and inside the building, and their ability to resist torsion.
The results from the Staadpro iterations are compared with the service and ultimate limit state by looking at the beams with the highest deflection at the base, in the middle, and in the top of the high-rise. The service limit state is calculated as a rule of thumb - the maximum deflection should be under 1/200 of the beam length, which in this case is an average of 2000 mm: 1/200 of 2000 = 10mm.
The ultimate limit state is compared with the yield point for steel in relation to the dimensions of the steel beam profiles for 2-3m square-profile with t < 40 2,05 MPa x 314 = 643N/mm2 (Teknisk ståbi, chapter 6, steel constructions, p.209)
(Table is found in appendix X)


The model shows the distributions of the decks and the loads.

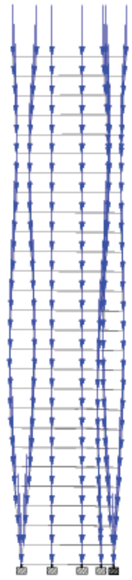
Building the model: geometry, forces, loads, profiles



StaadPro model -
the beams at the base
are fixed

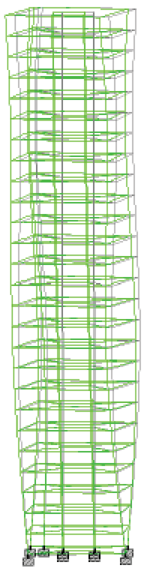


StaadPro model -
the wind forces work as
horizontal loads

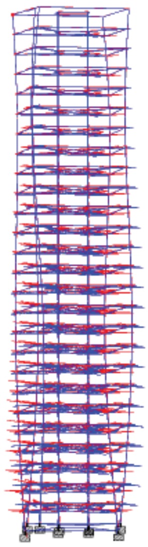


StaadPro model -
the service and self
weight forces work as
vertical loads

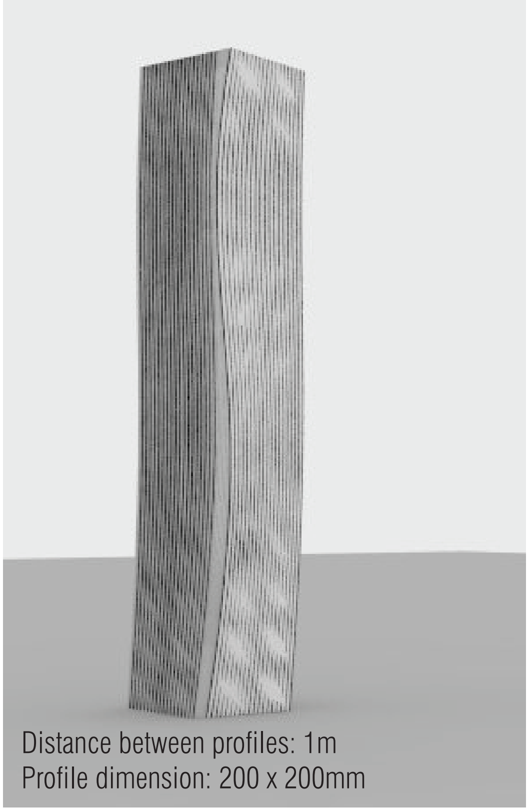
Results of the model: service and ultimate limit state

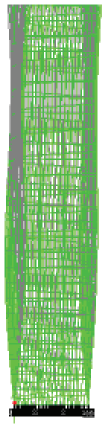


StaadPro model -
the deflection of the
node displacement

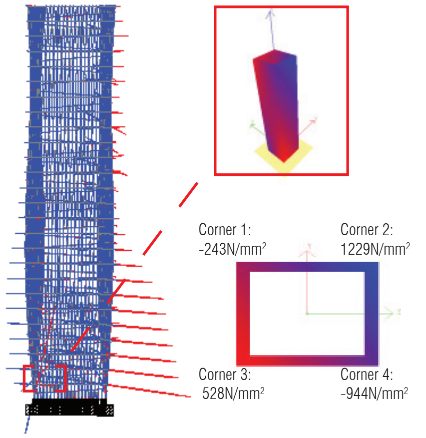


StaadPro model -
the deflection of the
beams profiles



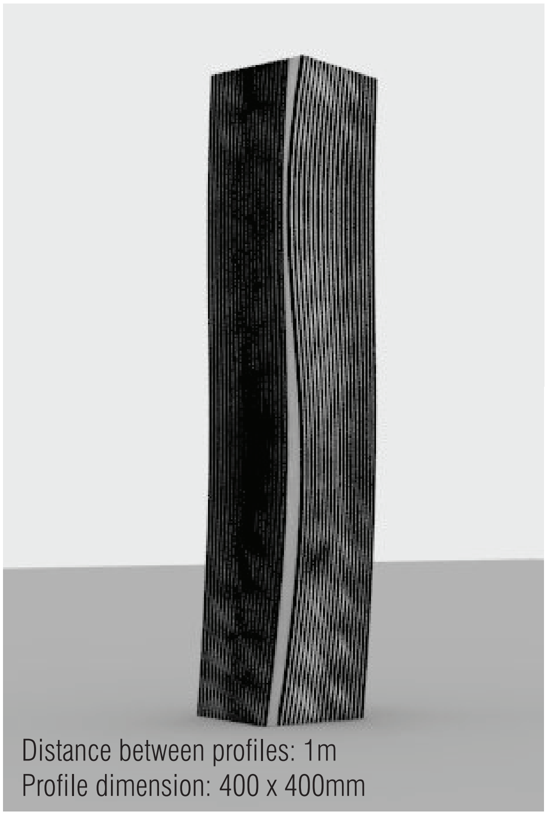


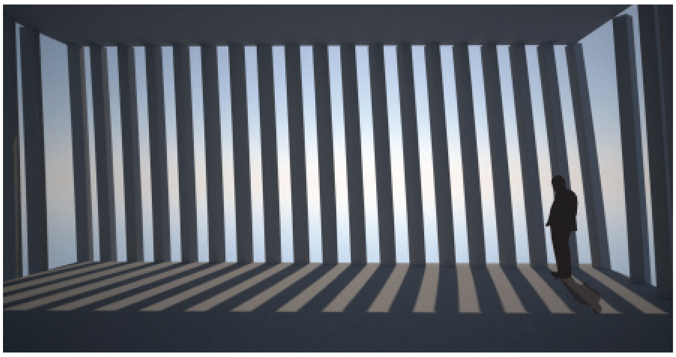
Maximum Node displacement = 983mm

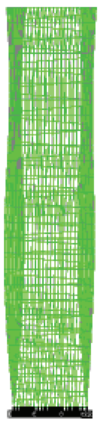


Maximum Stress Level = 1880 N/mm²

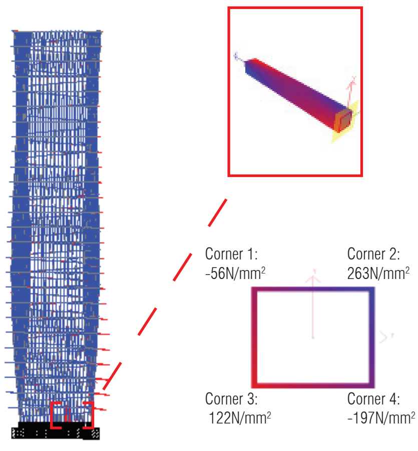
The slender and closely set beams compliment the form of the high-rise and outline the shapes movement. The beams give slender shadows into the room and the opportunity for an open view. As the deflection of the beams is very high, another constructional principle is implemented.





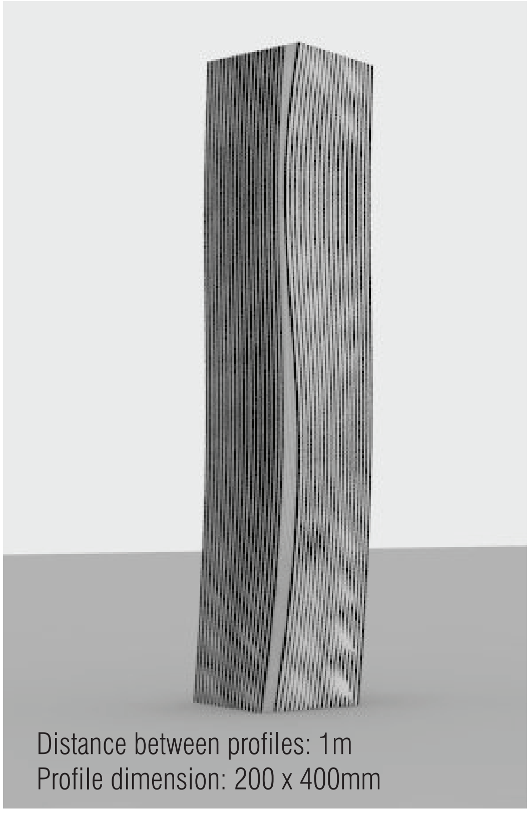


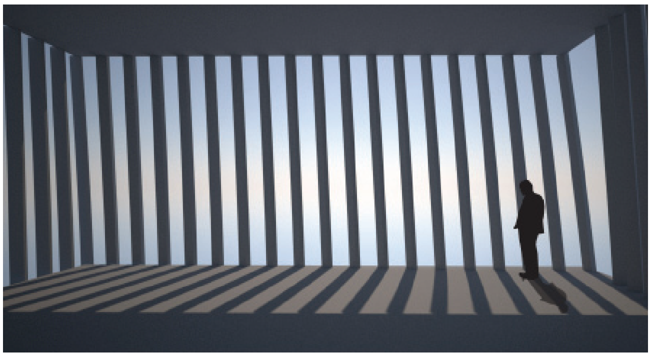
Maximum Node displacement = 0,167

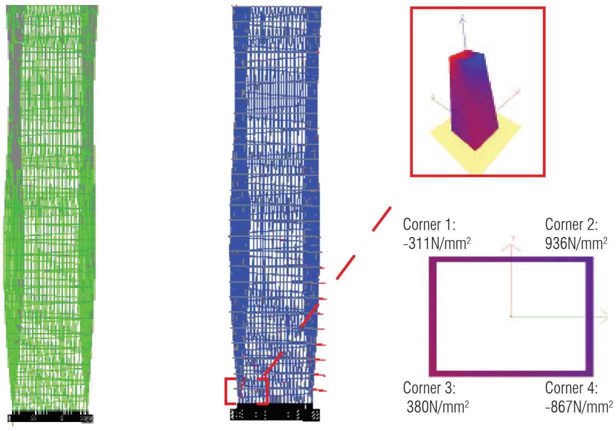


Maximum Stress Level = 415 N/mm²

The thicker squared beam profiles reduce the deflection as they better can resist torsion; the maximum strees level is under the ultimate limite state value. The thicker beams have a dominating and closed expression, and the view gets more limited.

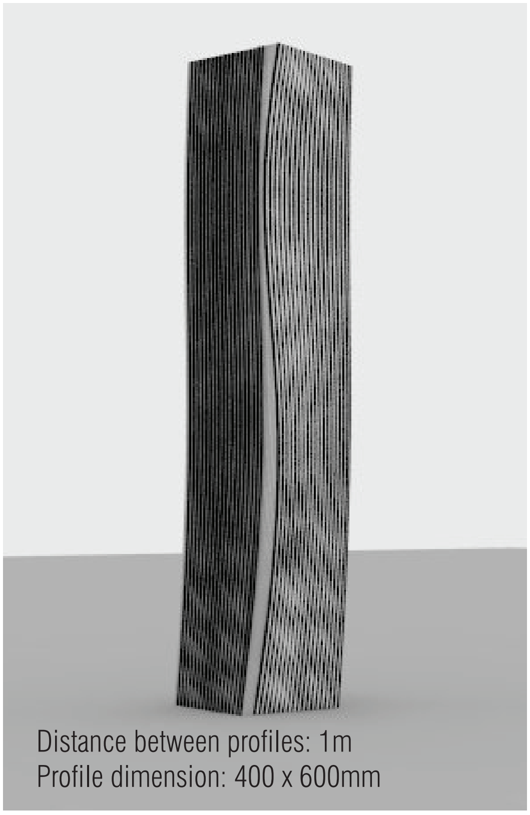


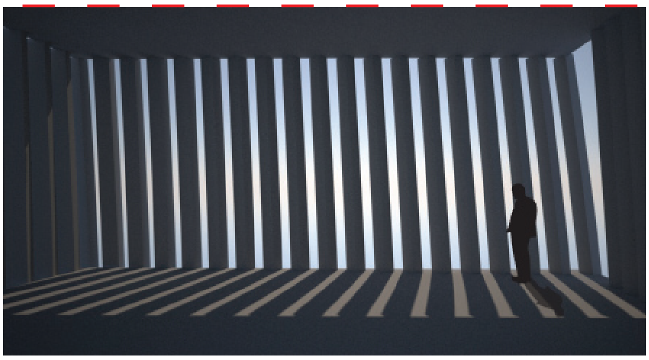


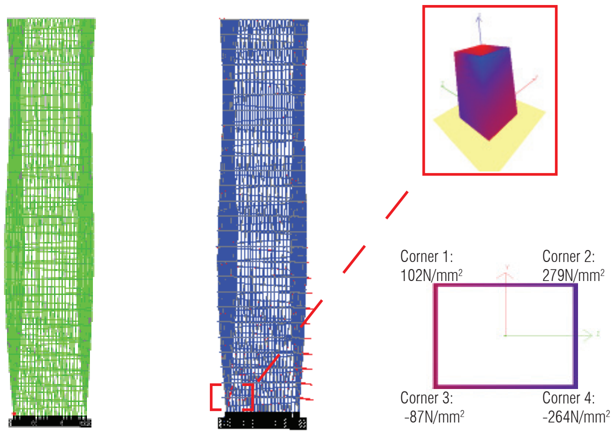


Maximum Node displacement = 0,068mm
Maximum Stress Level = 936N/mm²

Combining the two dimensions from the previous iterations, the slender and open appearance is very similar to the first iteration. As the profile of the beams is deeper, the penetrating sunlight changes the shadows and the interpretation of the beams during the day. The structural support is still not met. The deflection of the beams is over the limit as the rectangular profiles are exposed to more torsion, and a supplemented support is required.

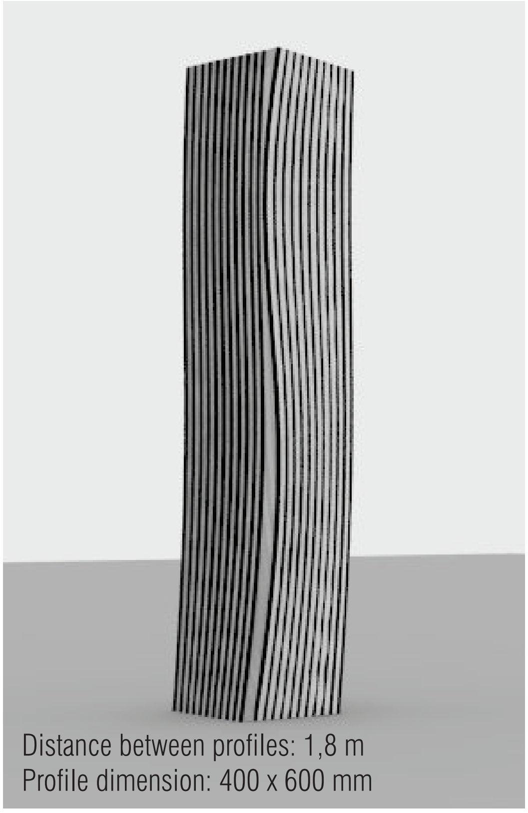


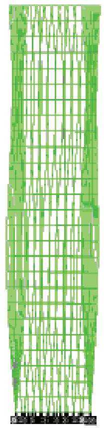


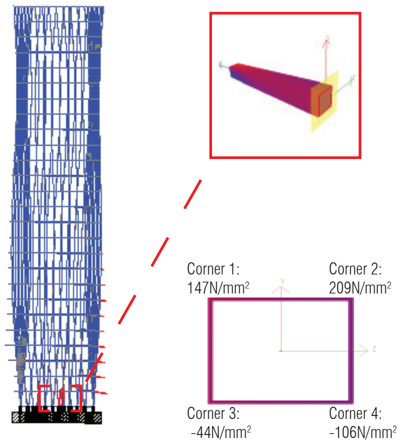


Maximum Node displacement = 0,076mm
Maximum Stress Level = 279N/mm²

The thicker beams fulfill the structural support by the ultimate limit state. They give also a more closed appearance to the building, both inside and outside. The view is very limited, and the massiveness of the beams are very dominant.







Maximum Node displacement = 0,4mm

Maximum Stress Level = 209N/mm^2

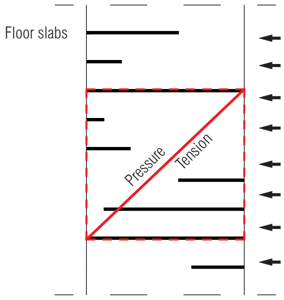
To obtain a better view and maintain the required structural support, the beams are placed in a wider distance of 1,8m. The expression of the high-rise and the view opens up, and the beams seem less massive and dominating. The structural support is also met both in the service and ultimate limit state.

The vertical beams compliment the movement of the building and outline the slender shape. To obtain the required structural support, the beams profile needs to be thicker or the distance between them needs to be shorter. Both cases would result in a massive and dominated expression and would limit the desired uninterrupted panoramic view in the office, runway, and sky bar.

The third iteration fulfills the required qualities of the high-rise expression, both inside and outside, but the ultimate limit state is not obtained.
The fifth iteration has larger profiles, but by placing the beams with 1,8m apart, the beams deflection is decreased, and the structural requirements are fulfilled.
The expression of the façade becomes lighter, but the dimensions of the beams are still dominating inside the building.

As the largest loads affect the beams at the base of the high-rise, supplementing structural principles are implemented to strengthen the exposed beams. The above chosen iteration is further optimized by implementing diagonals, and further iterations are made by variation in thickness and placement of the vertical beams in order to obtain the most possible slender construction and determine the final structural principal.

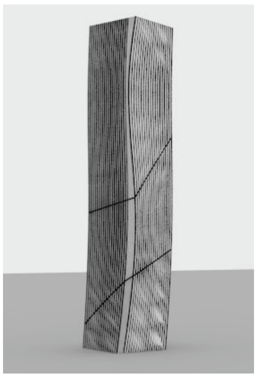
DIAGONALS

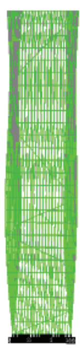


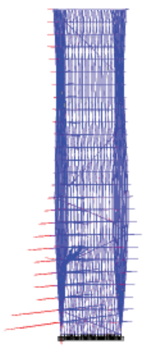
The diagonal spiral connects to the slabs, which are fixed on the core and the façade structure, providing a riged structural bracing system.

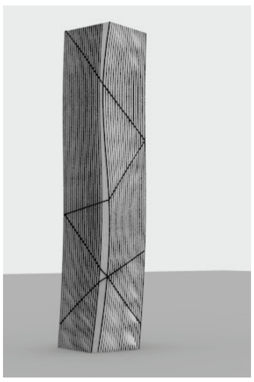
The following iteration will be based on optimization of the previous iteration.
By implementing diagonals, the slender expression from the vertical beams is maintained and structure strengthened. As the slabs are variably fixed on the façade structure, the diagonals will have variating inclinations and lengths (see diagram).
The first diagonal iterations are based on a spiral, with a start facing north-east direction (the "back" of the building) and connecting the slabs, fixed to the four sides of the facade. The second iterations are two spirals going opposite directions. Both iterations are calculated in Staadpro to evaluate and understand the relationship of the optimization of the structure. Further iterations with different diagonal solutions will be done and evaluated through their aesthetical point of view.

Profile distance: 1m
Profile dimension: 200 x 400 mm

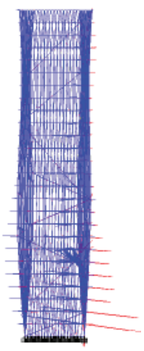

Single diagonal


Maximum Node displacement = 0,163mm

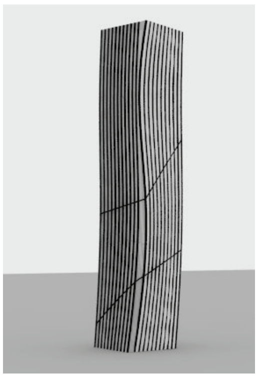

Maximum Stress Level = 437N/mm^2

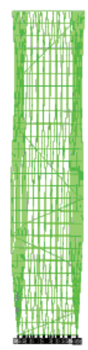

Double diagonals

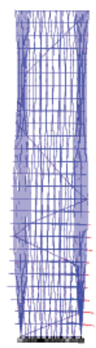

Maximum Node displacement = 0,025mm

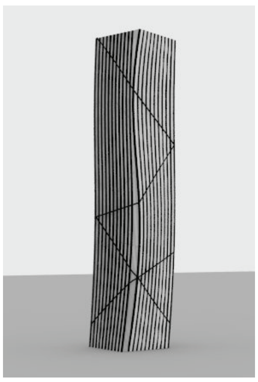

Maximum Stress Level = 335N/mm^2

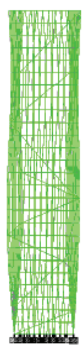
Profile distance: 1,8m
Profile dimension: 400 x 600 mm

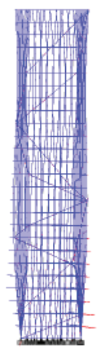

Single diagonal


Maximum Node displacement = 0,45mm


Maximum Stress Level = 187N/mm^2


Double diagonals


Maximum Node displacement = 0,45mm

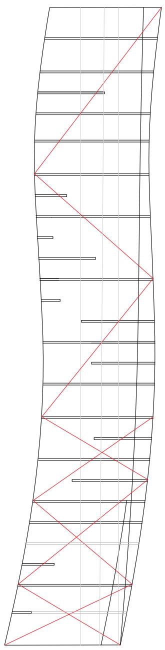

Maximum Stress Level = 48N/mm^2

The diagonals provide a higher strength to the structure and reduce the deflection of the beams, but the expression of the spiral diagonal does not harmonize. By adding more diagonals at the base of the building and fewer at the top, thinner beam profiles and wider placement between them is achieved.

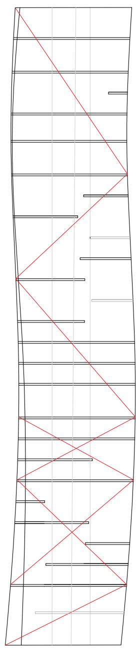
The diagonal bracing system is based on a combination of x-ed braced diagonals at the lower level of the building, where the highest amount of forces needs to be obtained and a simple diagonal bracing system at the top of the building, where less strength is needed.

The diagrams below show the placement of the diagonals, which are placed on the decks that have two sides connected to the façade. As the decks are shifted, the diagonals get shifted as well which provides a dynamic expression to the building. The diagonals at the entrance façade and the east façade facing the way do not cross to provide an inviting triangular. The north and west façade are facing the neighboring buildings and have crossed diagonals. As the diagonals get less and span over several decks, the views at the top of the building do not get interrupted.

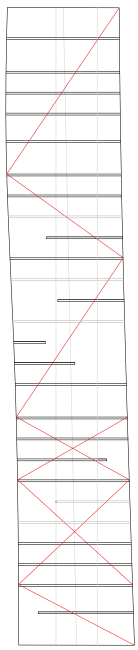
Further Staadpro calculations have been done of 1,8m distance between the beams with different beam profiles to achieve a most possible slender construction.



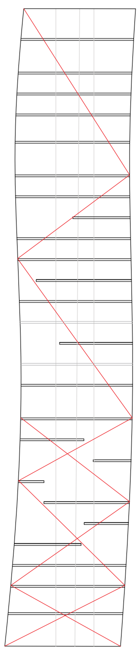
West façade



South façade - entrance

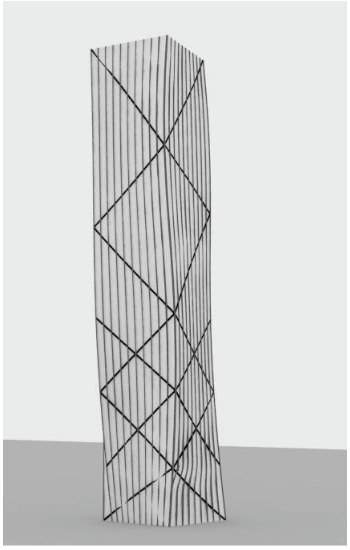


East façade



North façade

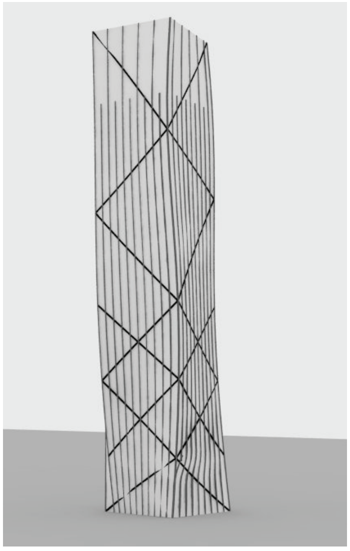
1,8m beam distance



Profile dimension	200x200mm	200x400mm
Maximum Node displacement	0,663mm	0,653mm
Maximum Stress Level	415N/mm^2	366N/mm^2

Both dimensions of the beam profiles fulfill the structural recruitment. To obtain most slender expression of the construction, beam profile of 200 x 200mm is chosen. As the beams at the top are less exposed to deflection, a further investigation is made by removing every second beam at the four top levels in order to provide more openness of the views and the experience of being inside.

1,8m beam distance and 3,6m at the top



Profile dimension	200 x 200mm
Maximum Node displacement	0,132mm
Maximum Stress Level	333N/mm^2

The 200x200mm beam profiles fulfill the structural requirements and the desired expression of a slender construction and an open view to the outside. To absorb the earthquake loads, dampers would be implemented to decrees the energy created by the earthquake waves and prevent structural deformations.

FACADE

THE THIRD LAYER

The third layer of the high-rise will be the building's envelope, giving the high-rise two different expressions during the day and evening hours.
In the evening the fashion museum will change character and reveal the internal complexity of shifting volumes and the three-dimensional exhibition. To achieve this expression, a graduation of translucency needs to be obtained in the façade.
As shown in the model photographs below, when the sunlight flanks the façade, the expression of the façade seems to be closed. As the light moves behind the building the façade opens up, revealing a graduation of displayed shadows by the exhibition objects and present visitors.
The exhibition rooms need to have controlled and diffuse light. The office, runway and sky bar facilities will have open panoramic views.

The perforated patterns produced by the plaster are the preferred expression of the facade, but as the patterns are randomly produced, a more controlled and systematic approach for coding of the facade pattern must be found.

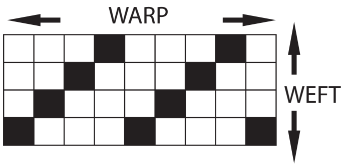
Top - view of the construction and facade

The model photograph shows the detail of the plaster used as facade, where the light flanks the plaster.

The model photograph shows how the interior gets revealed as the light moves behind the plaster.

The model photograph shows the interior effect of the plaster. The model is 1:200, the segregation of the plaster responds to 0,5 x 0,5m.

WEAVE PATTERNS

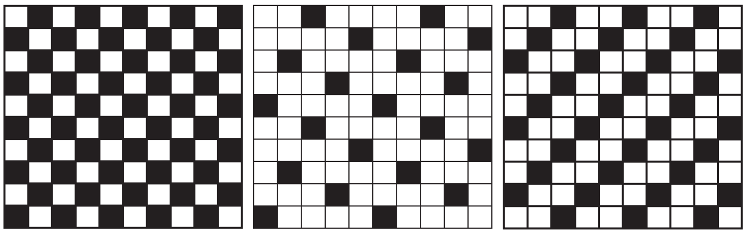


Denim weave - the back side of the textile. The inverse of the white areas is the coloured and fashion side of the denim.

A controlled but still a haphazard appearance can be found in the code bars for weaving textiles. Woven textiles have many different weaving techniques and patterns. The three basic ways of weaving are; plain, silk and twill, as shown in the diagram (). The weave has code bars, which show how the thread or yarn should be woven by the warp and the weft. The plain weave has the warp and the weft going over and under each other in each direction.

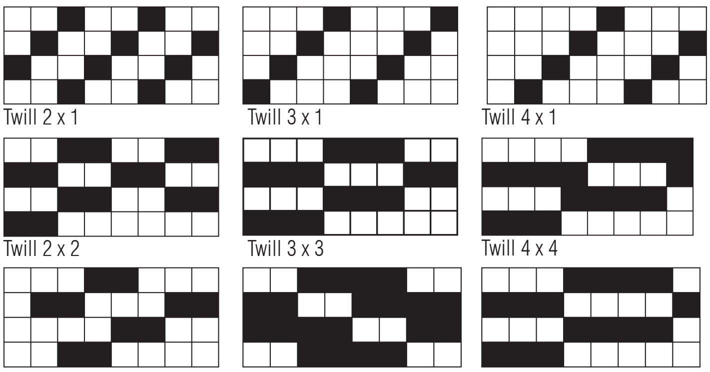
The silk weave is similar to the plain weave. In the silk weave, the weft goes over several warps before going under the warp and repeats itself in different set of warps (see diagram).

The twill wave is characterized by the warp and weft creating a diagonal lines running either right or left. Opposite the plain and silk wave, the twill wave has many different variations of weaving and is the most used weaving technique used in clothing. As it has different weaving variations, it can create different patterns and gives higher strength to the textile. Examples of twill fabric in clothing are chino, denim, gabardine, tweed, etc (http://www.favonius.com/soaring/materials/material.htm).



Plain weave 1/1 Silk weave 4/1 Twill weave 2/1

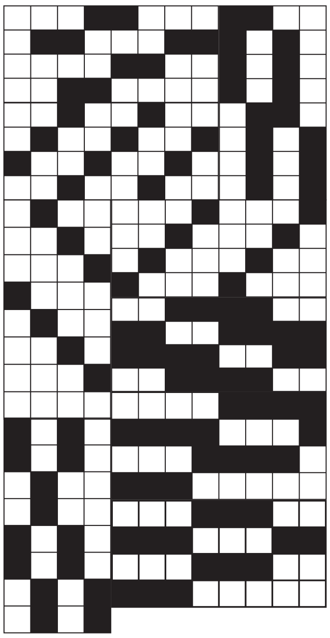
The following diagrams show the basic combinations of twill code bars. The basic code bars will be combined by shearing and rotating in order to create expressions, which could be implemented as the façade pattern. The black areas are closed and the white are open.



Twill 2 x 1 Twill 3 x 1 Twill 4 x 1

Twill 2 x 2 Twill 3 x 3 Twill 4 x 4

Twill 3 x 2 Twill 2 x 4 Twill 3 x 4

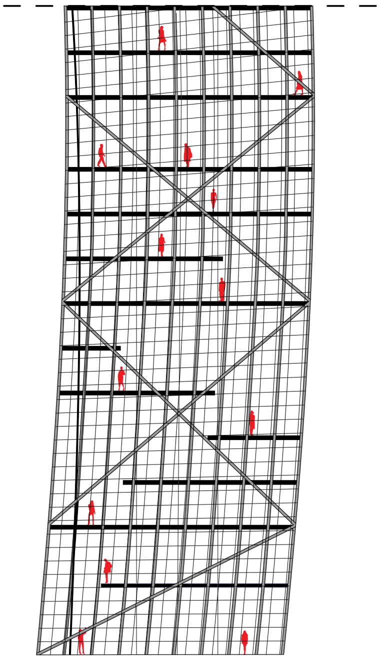


A pattern created by combining the different basic twill combinations.

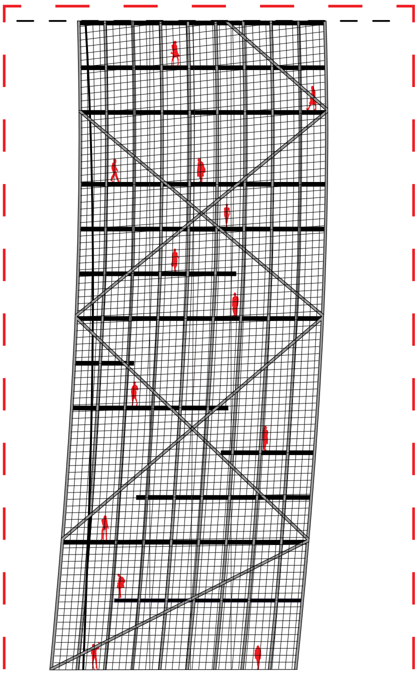
The combined pattern from the basic twill code bars seen in the diagram to the left, provide an interesting pattern but the expression seems to divided, and the coincidental expression does not harmonize. The squares which defined the basic code bars create too large areas, by dividing them into smaller square areas the expression of the facade will get more refined and harmonizing.

FACADE SEGREGATION

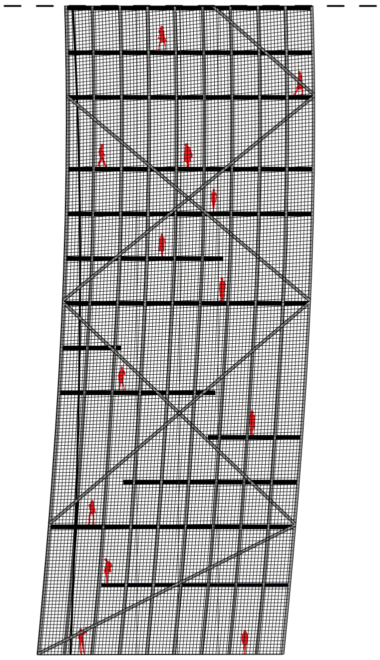
To determine the area of the open and closed spaces, segregation of 1 x 1m, 0,5 x 0,5m and 0,25 x 0,25m have been done to evaluate the expression and the open views provided among them. The mullions of the segregated areas follow the swaying form of the high-rise.



1 x 1m segregation



0,5 x 0,5m segregation



0,25 x 0,25m segregation

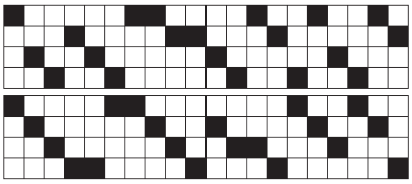
The 1 x 1m segregation gives the opportunity to have large openings.
The 0,5 x 0,5m segregation gives a more refined expression of the overall facade expression.
The 0,25 x 0,25m gives also a more refined expression, but the areas will be too closed and will reduce the openess of the views.

PATTERN COMBINATIONS

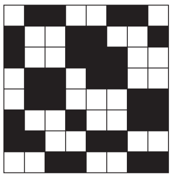
The twill weave pattern for creating different patterned motives in the woven fabric originates from the basic twill combinations. The numbers of squares, which define the twill weave pattern, must always be divided in equal numbers, but the combination of the code bars is just limited by one's fantasy.
As the plaster pattern assembles to the twill code bars, an area of 8 x 8 squares is used as a code bar to create a pattern. The following two patterns for twill patterns are chosen as they can create different expressions when combined. The code bars will be shifted and rotated to create a random overall expression. The final expressions will be evaluated by their patterned expressions and through the use of open and closed areas.

The squares segregation in the diagrams are divided by the number of squares corresponding to the facade segregation of 0,5 x 0,5m squares.

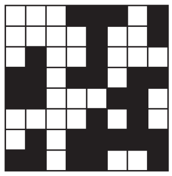
Fancy Twill - recipe

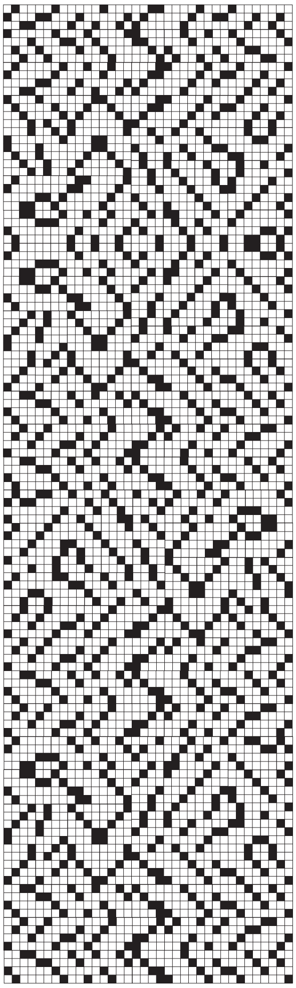


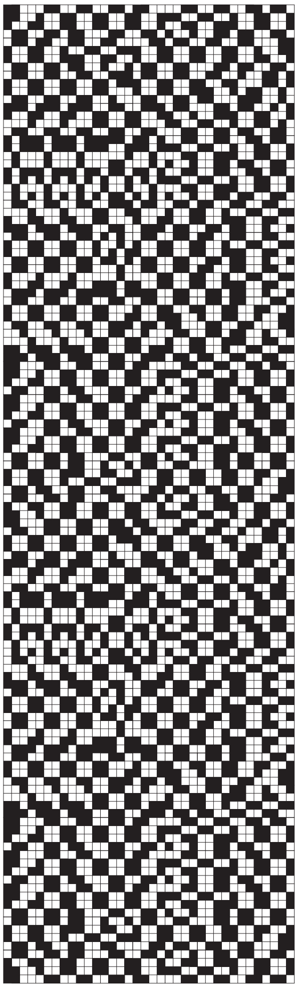
Hanne Twill - recipe

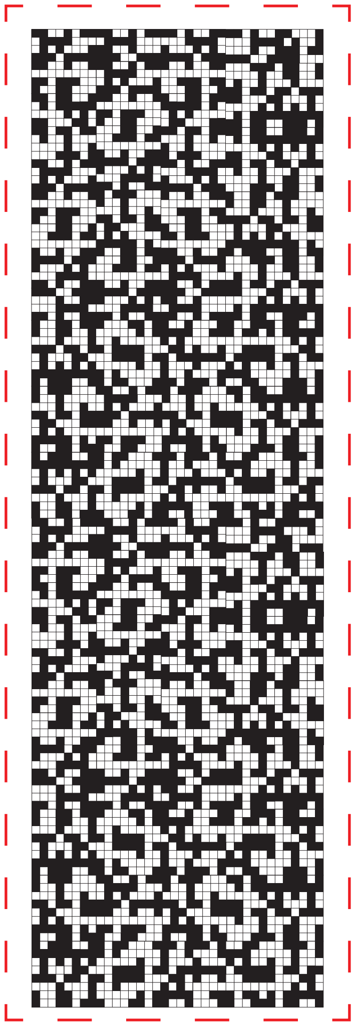


Plaster Twill - recipe







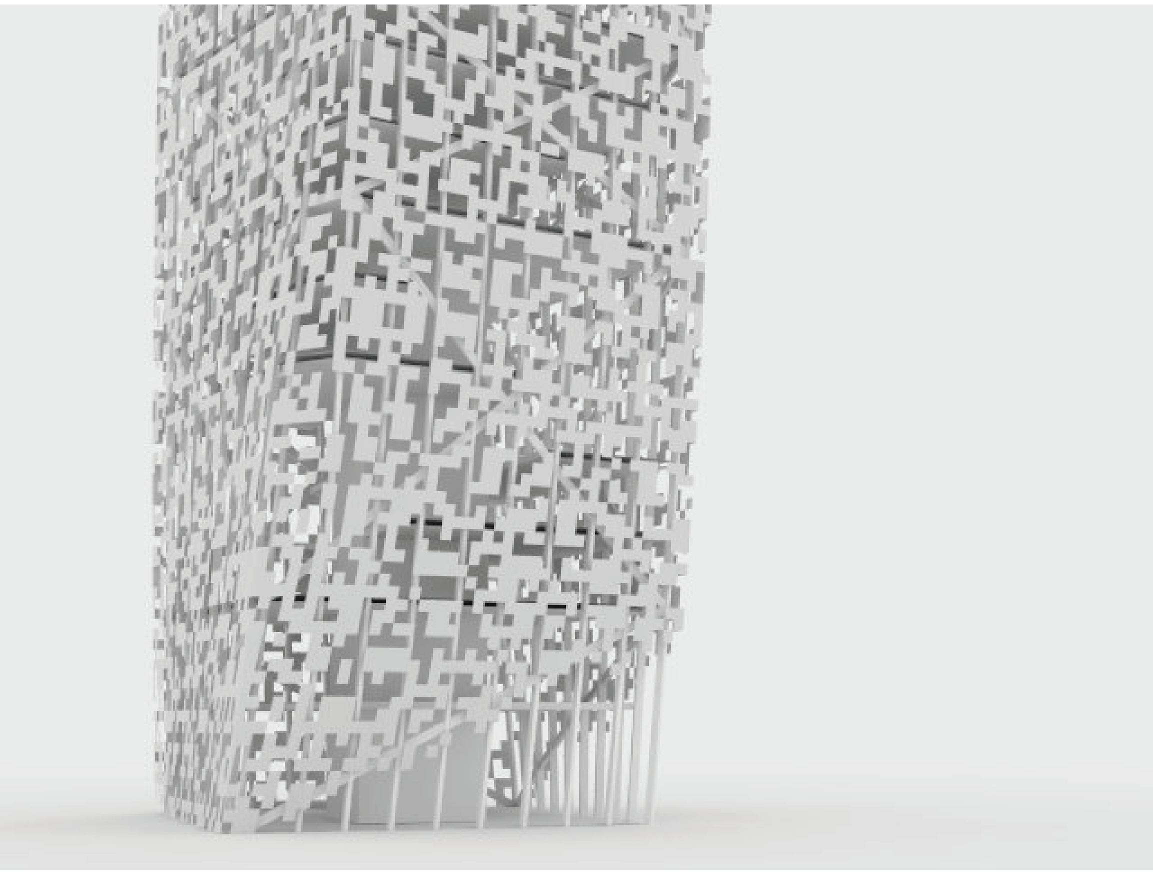


The first created pattern provides too many open areas. The pattern in the middle creates too many closed areas. The last pattern made by the plaster gives the same random expression as seen in the plaster. The pattern provides also a good balance between the open and closed areas.

FACADE DETAILING

The final facade expression provides an interesting fragmentation between the open and the closed spaces. The segregation of 0,5 x0,5m areas which were used to create the pattern in the facade is not defined, as the areas merge together and create larger patterns.
Seen by the indoor render, the open spaces for clear views are limited.

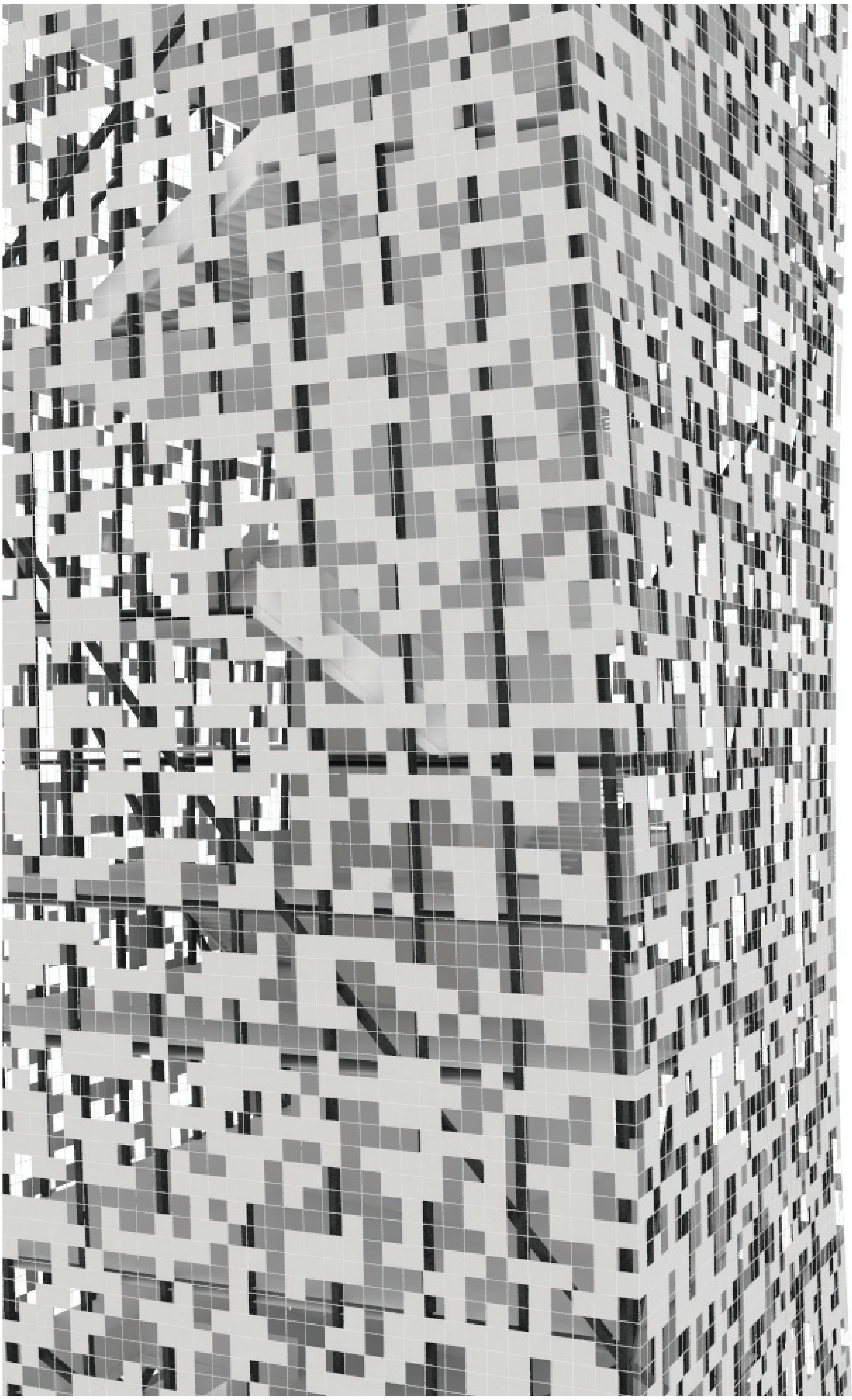
In the rendering below, the closed spaces have been removed by the inclination of the diagonals in bracing construction. The created triangle relates to the intersection point. The transition between the open area and the irregular removed closed spaces create a natural opening inviting the city in to the building.



Removing the closed spaces at the last floors; office floor, runway and sky bar and sky deck, wider views are provided. The closed spaces are removed frequently but still maintaining the natural transition between the open and closed area as in the entrance. This final result does not harmonize and the overall expression looks fractured.

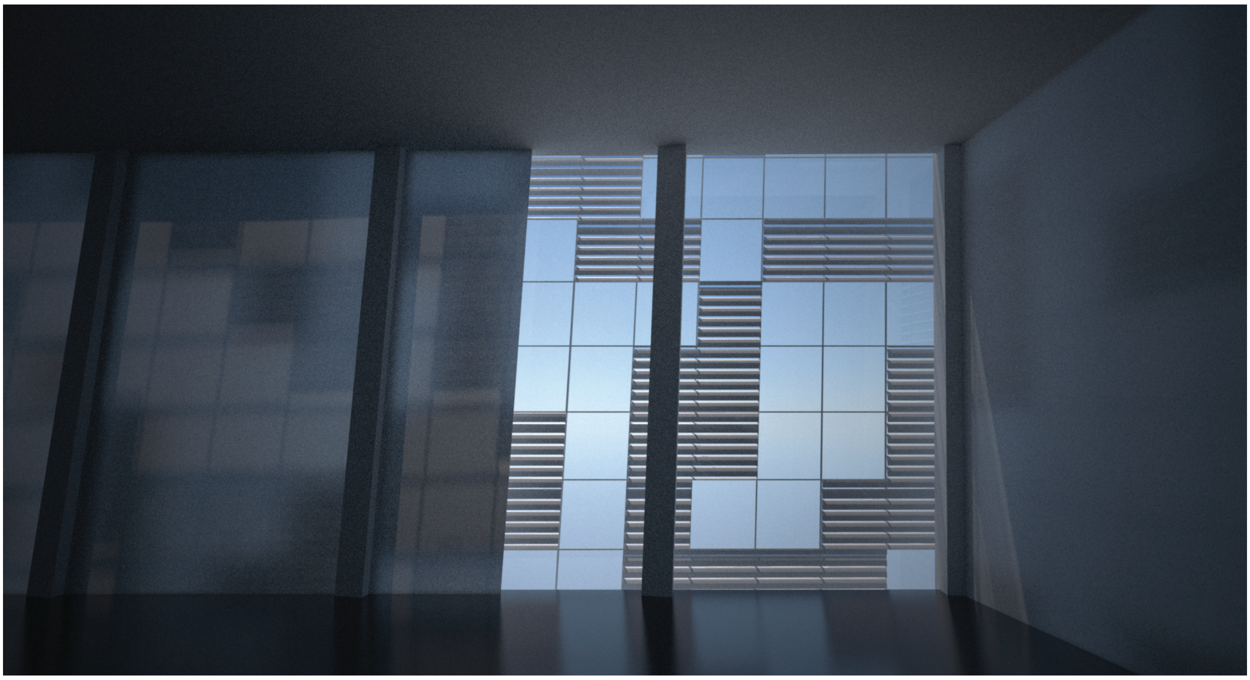
To get a more harmonizing and integrated transition between the open and closed spaces, but still open enough spaces to provide open views.
By removing gradually the closed spaces starting from half way up the building and ending up by removing every second closed area at the top (Illustrated by the red painted areas), the transition of the open spaces is not immediately seen.

Making the mullions framing the glass and the closed areas visible, the segregation of the original areas emerge and creates a further interpretation of weaved pattern, resembling thin thread and creating a more refined expression as seen in the plaster. The facade provides a composition of sporadically closed areas and transparency, casting different types of shadow into the spaces of the building.

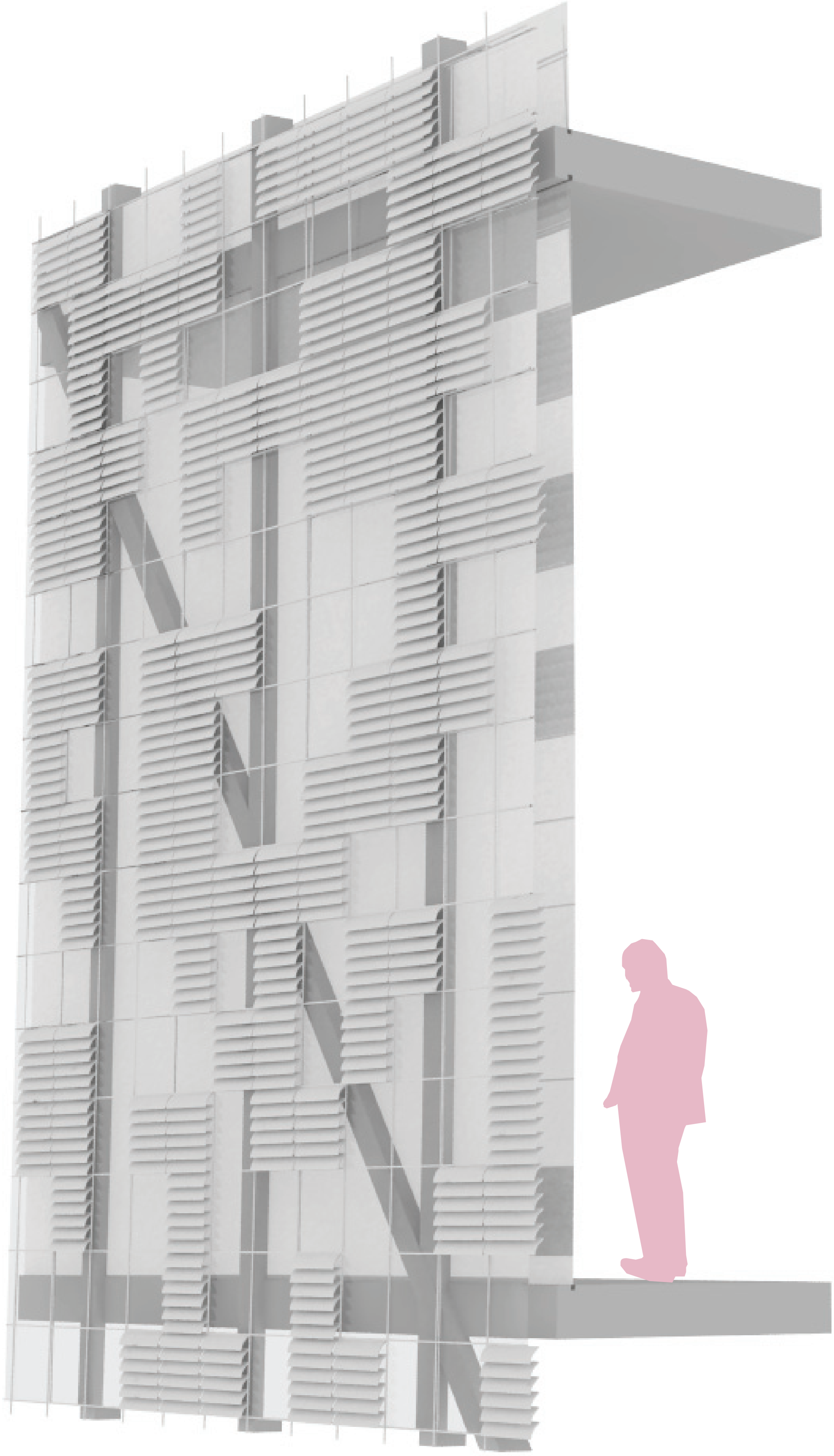


THE FIRST LAYER

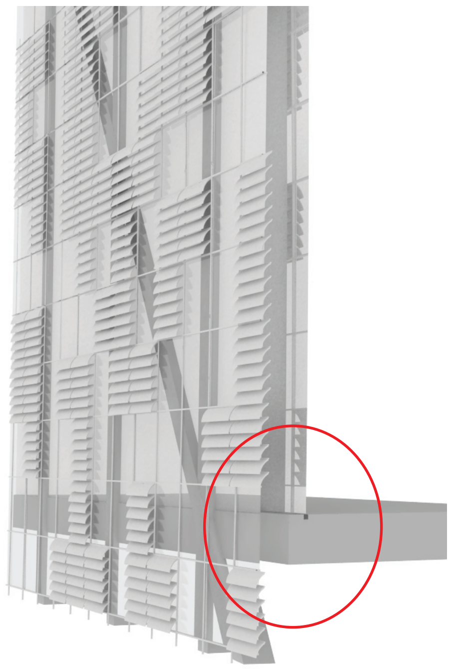
To provide diffuse natural light in the exhibition rooms, a layer of white fabric is set from floor to ceiling filtering the light and providing a better acoustic to the room. It works as a sound absorber and reduces the reverberation time. The fabric is only set at the exhibition areas.
The fabric is divided by 3m x 3m to provide open views for the visitors as they work their way up the exhibition. One or two areas of the fabric are removed shift wise the exhibition floors, opening up for various views. The segregation of the façade; the outer layer, the structure and the inner layer of the fabric all add depth and filter the intensity of the light, providing shadows that merge together from the different elements in the façade.

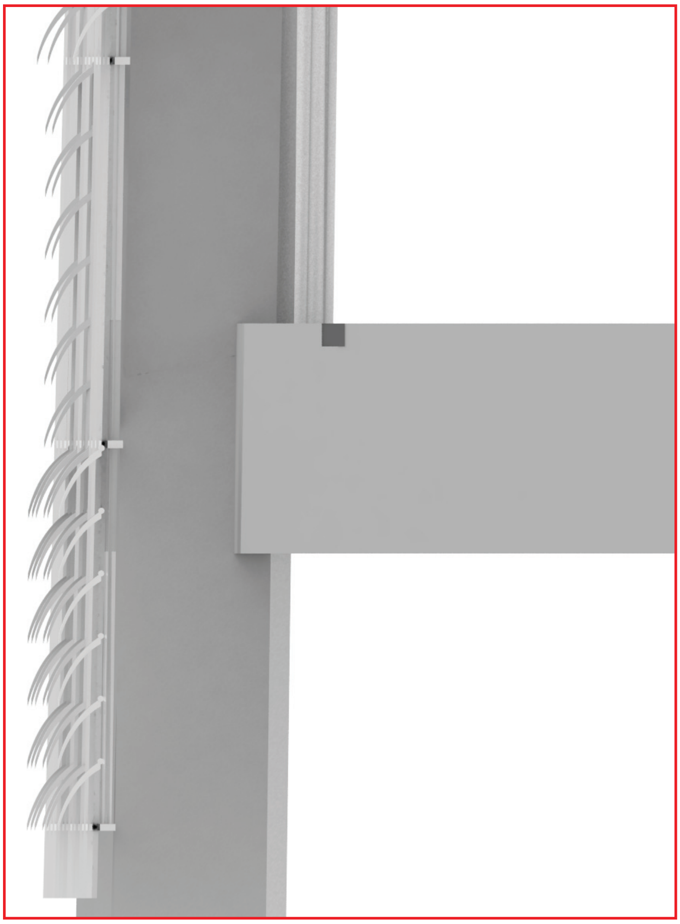


FACADE DETAIL

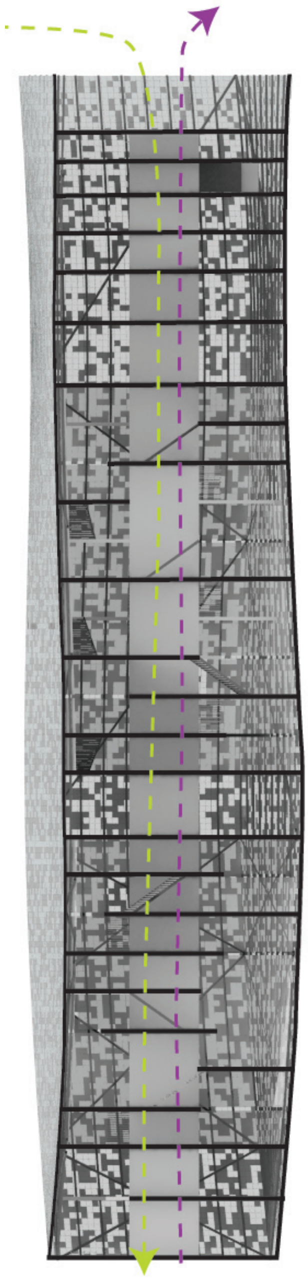


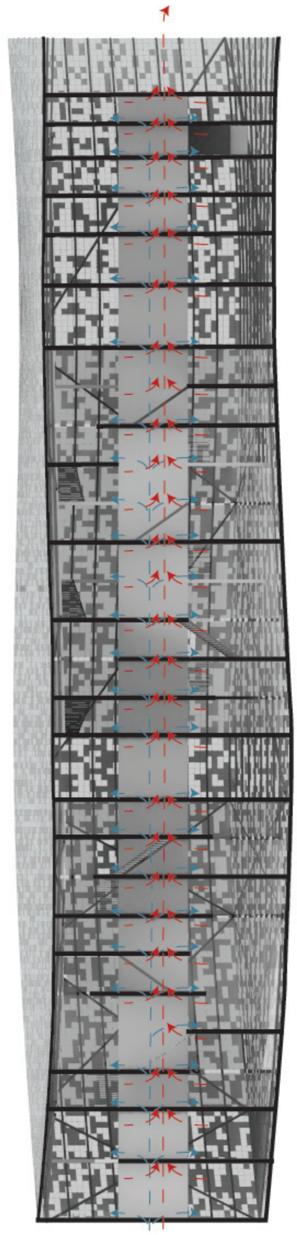
The diagrams show a detail of the final layering of the façade. To break up the wind, the closed areas are made of lamellas, which provide shading but still let indirect light to the building. They are fixed on the outer frame of the mullions and the glass is placed between the mullions. The lamellas are made of aluminium to provide least amount of weight.
The glass and the mullions are aligned with the columns. The columns intersect the deck with 10 cm. The fabric is also aligned with the columns and fixed by a metal rail integrated in the deck.
The expression of the lamellas will change as the building is observed from a distance and when standing close to it, the texture of the lamellas will be revealed.





VENTILATION



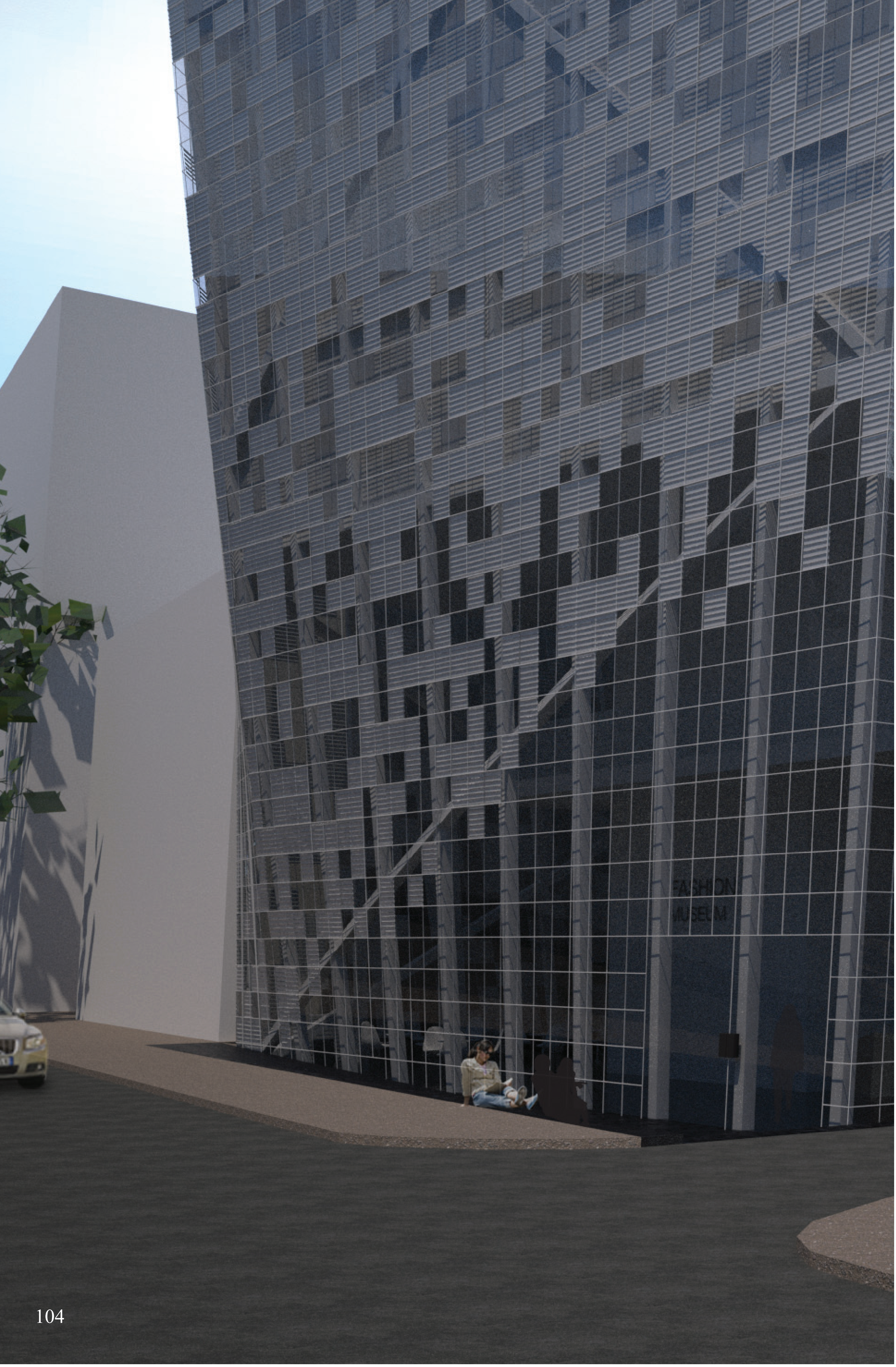


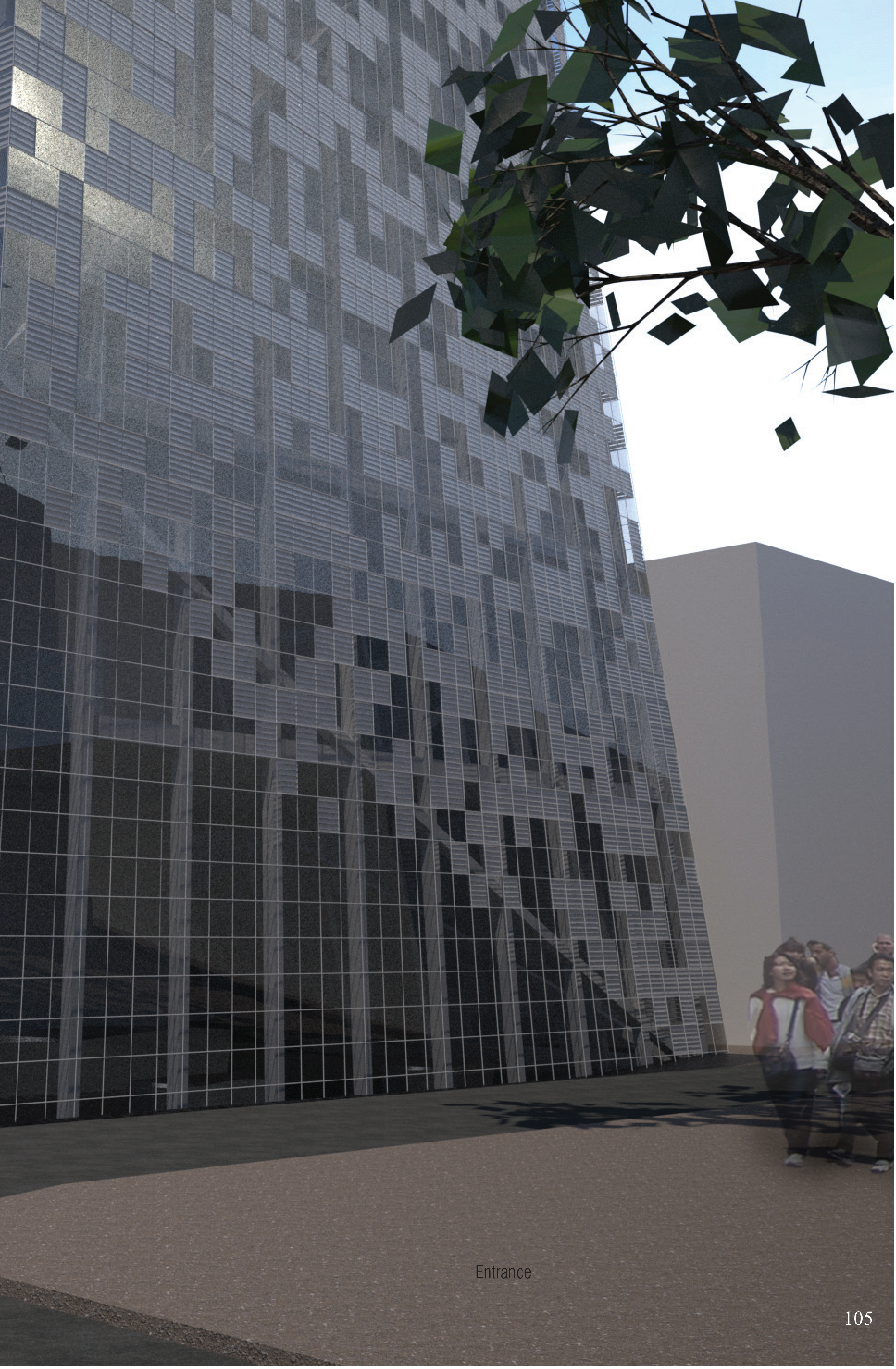
The diagram to the left shows how the Fashion museum gets it fresh air from intakes at the top of the building. The air is then sucked to the basement ventilation plant, from where it is further distributed to the building, and the exhaust polluted air is then again released at the top of the building.

The diagram to the right shows how the ventilation is intended to work in the fashion museum. The chosen ventilation is displacement air flow, where cooler air is blown in at the bottom of each floor, and heated by the visitors and the sun. This results in the polluted air to rise to the ceiling where it is removed by the exhaustion ventilation.

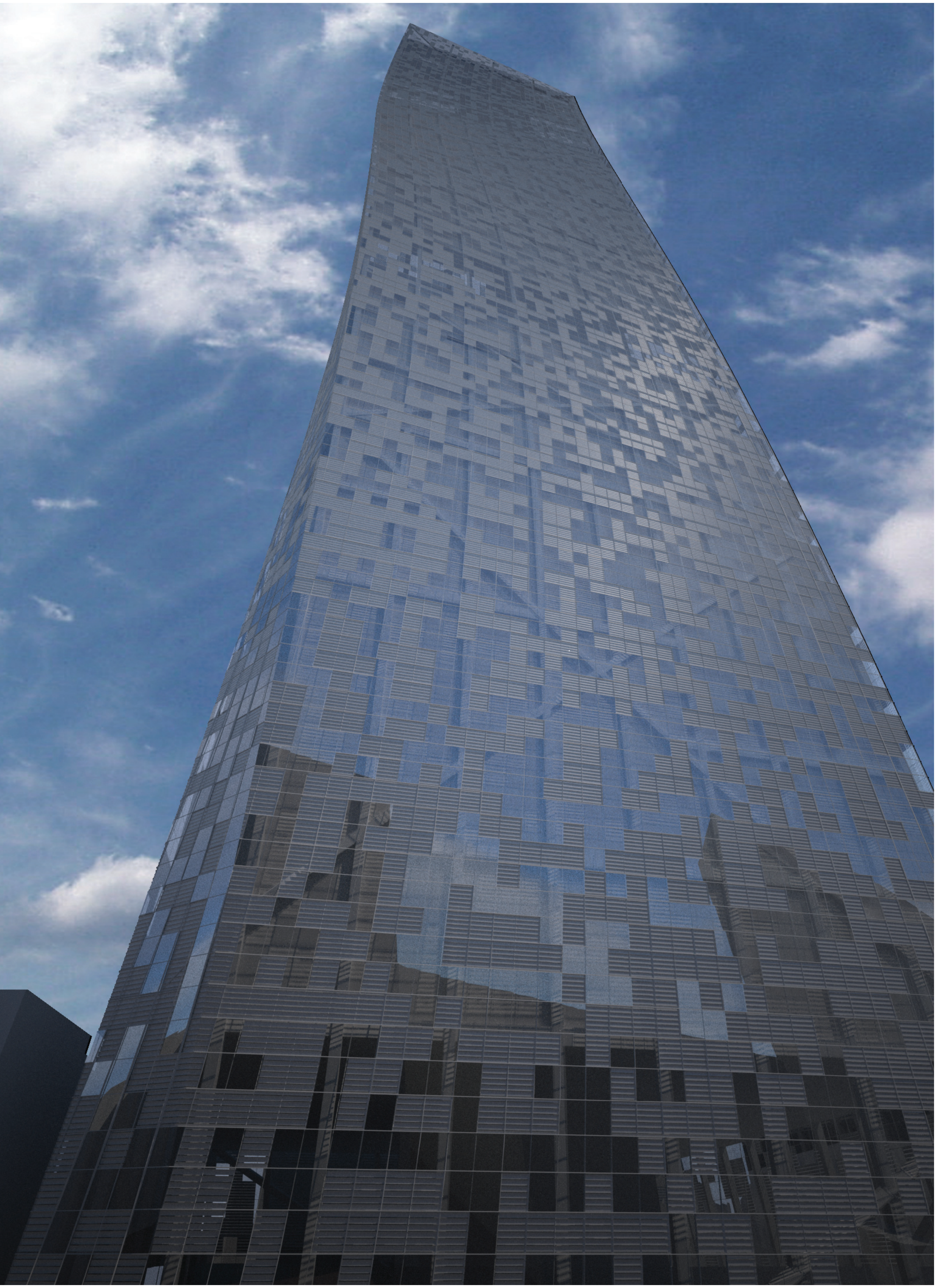
PRESENTATION

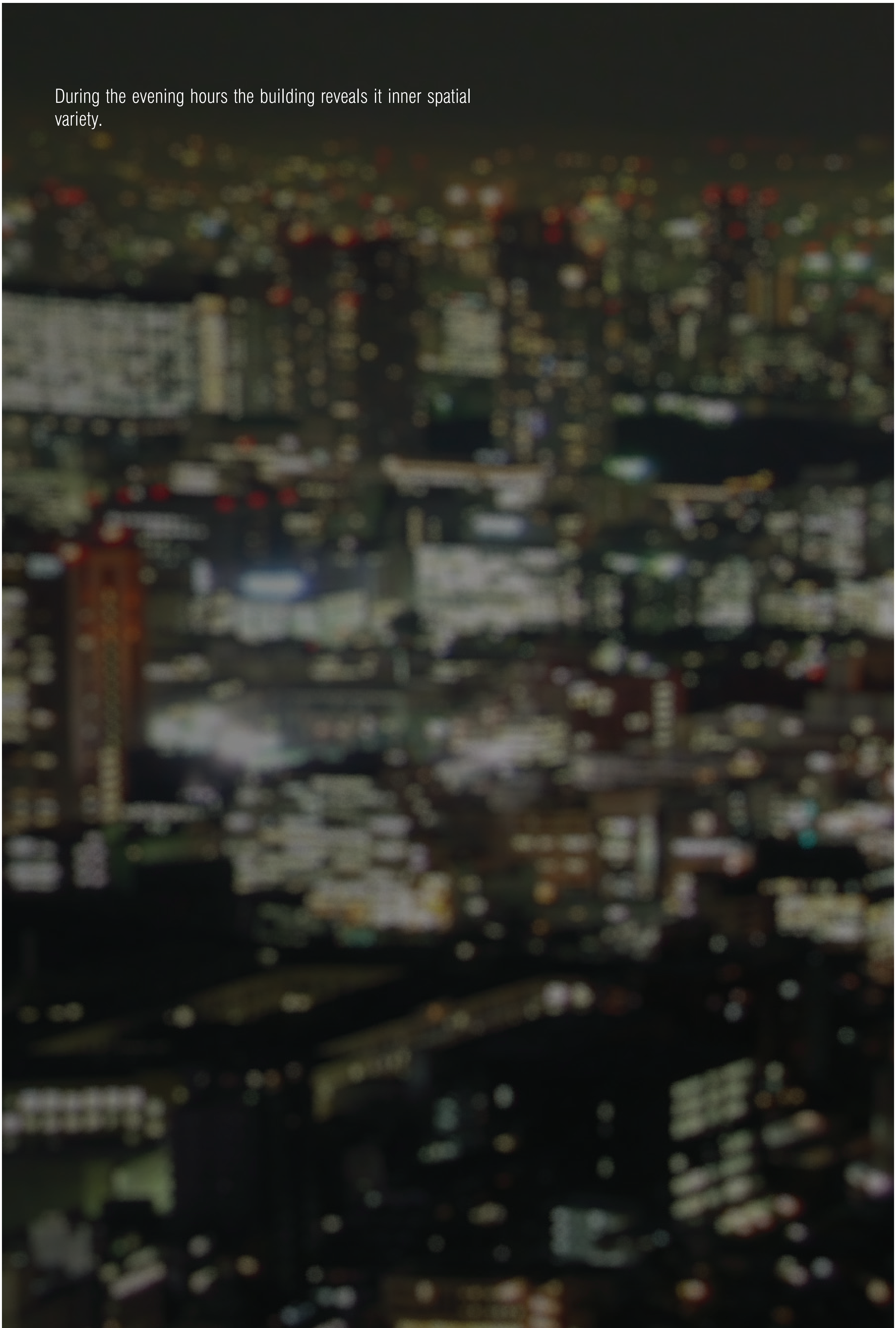
In the presentation phase the final design of the Tokyo fashion museum is presented through 3d renderings, plans, sections, facade elevations and master plan.


FASHION
MUSEUM

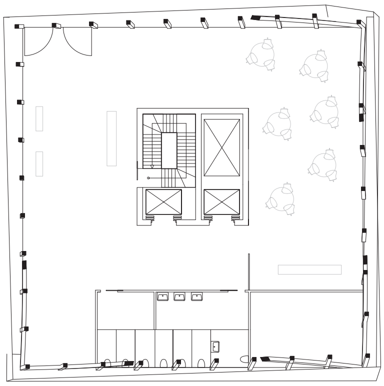


Entrance

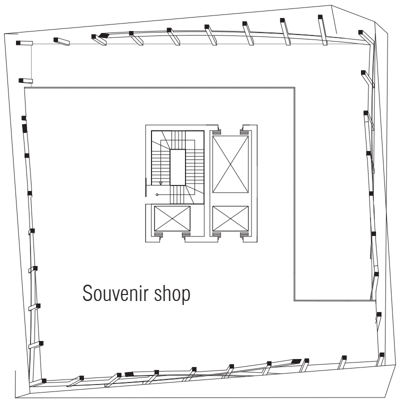




During the evening hours the building reveals it inner spatial variety.

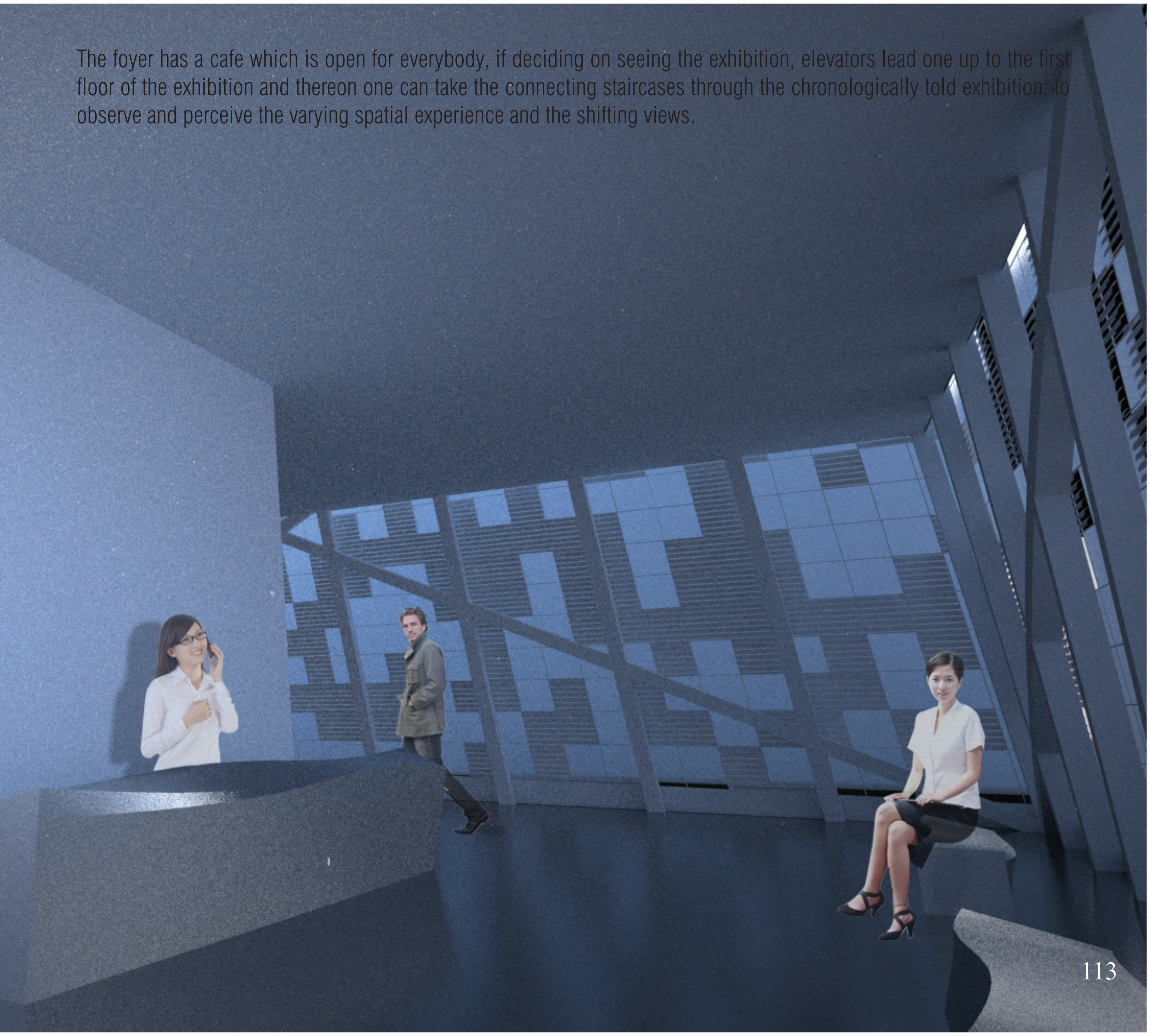


Ground floor 1:200

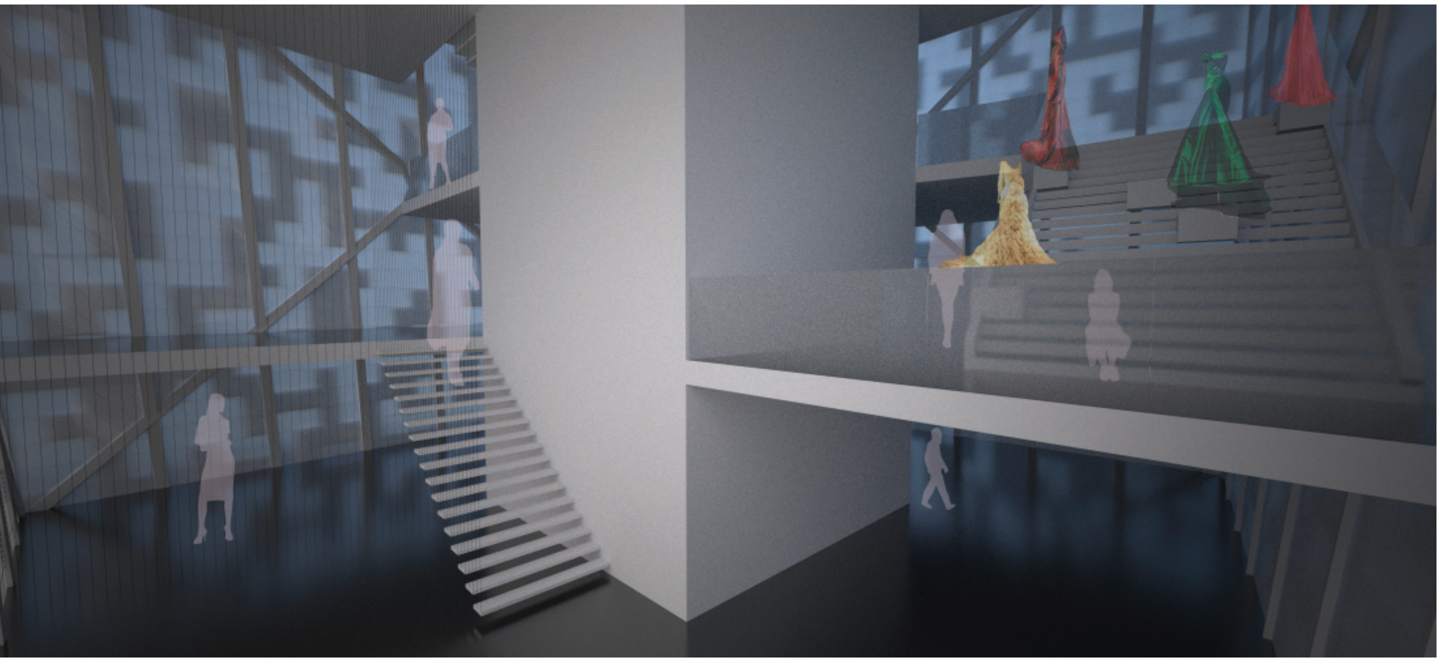


2nd level - ground floor 1:200

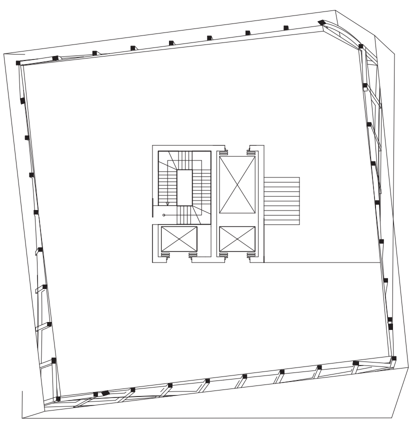
The foyer has a cafe which is open for everybody, if deciding on seeing the exhibition, elevators lead one up to the first floor of the exhibition and thereon one can take the connecting staircases through the chronologically told exhibition; to observe and perceive the varying spatial experience and the shifting views.



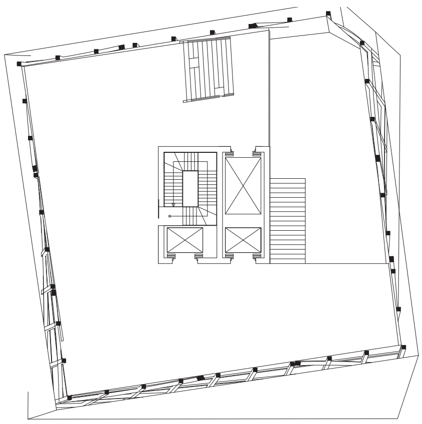
The stair cases dividing the exhibition decades - divide the rooms in two ways; One is by cables, which span form floor to ceiling as seen in the rendering. They also serve as structural part by holding the staircase in one end and the other end is fixed in the core. The cables give horizontality to the room and divide the room, but still provide visual connection between the exhibition floors.
The other staircases are set where the room heights are 3 m. They close of the room as boxes, to give the visitor different experience while working their way up. The 'walls' of the staircases are dim colored Plexiglas revealing only the shadows of the visitors.



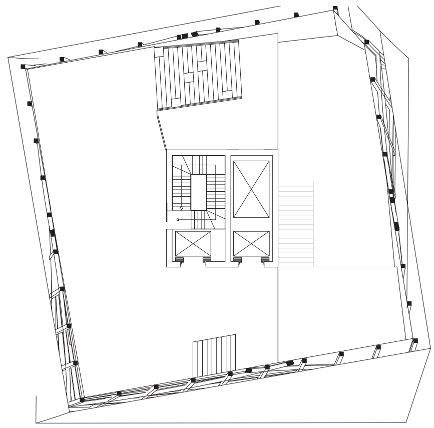
The exhibition stair cases connect the exhibition floors with the same decade, are integrated with the decks, having the same thickness and materials. They are 4m wide and used as a part of the exhibition. The mannequins are placed on plateaus as seen in the render.



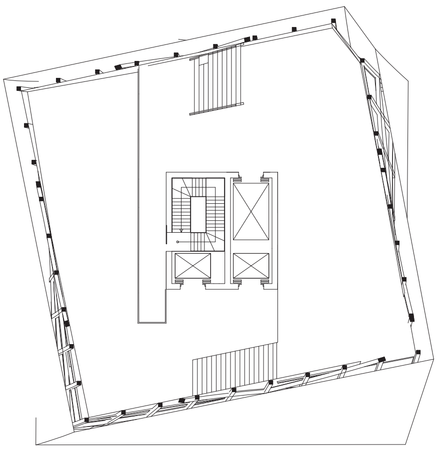
3rd floor - 20'es 1:400



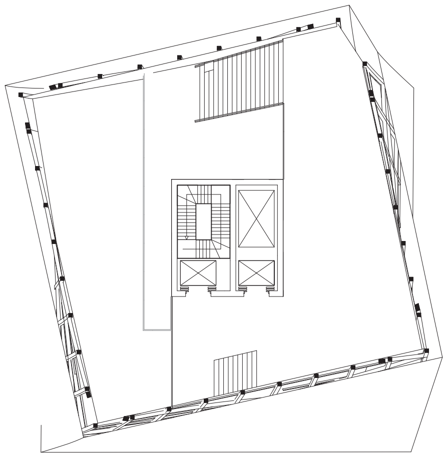
4th floor - 30'es 1:400



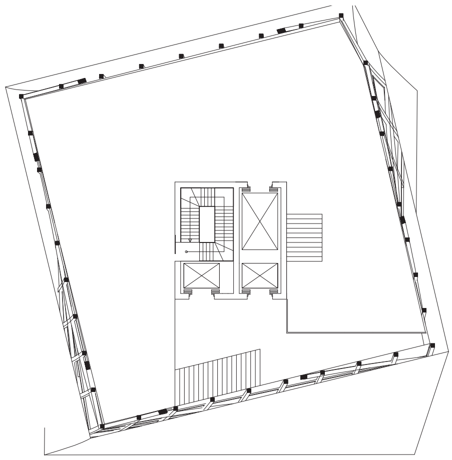
5th floor - 30'es 1:400



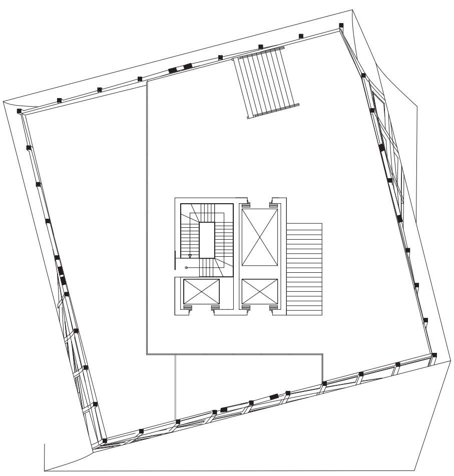
6th floor - 40'es 1:400



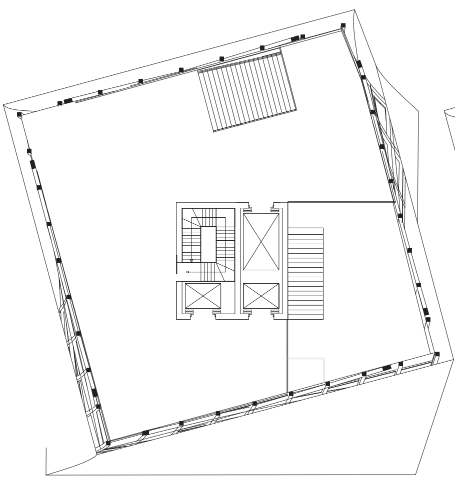
7th floor - 40'es 1:400



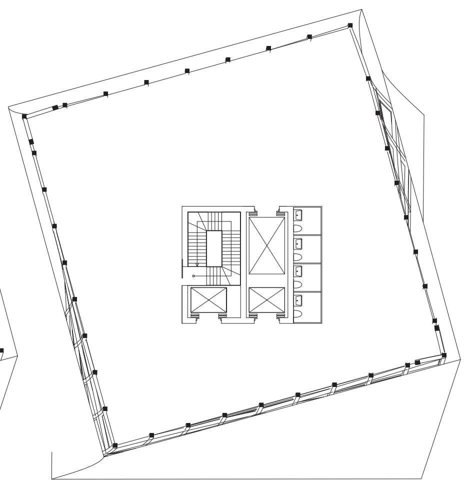
8th Pause 1:400



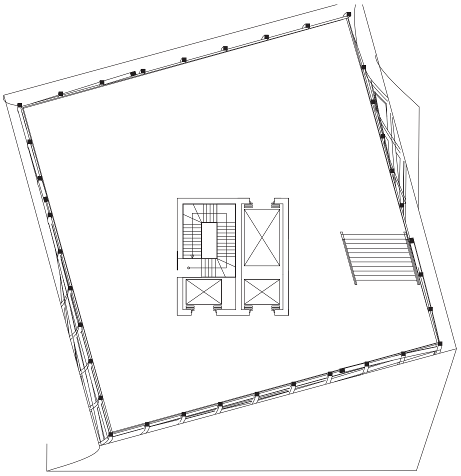
9thfloor - 50'es 1:400



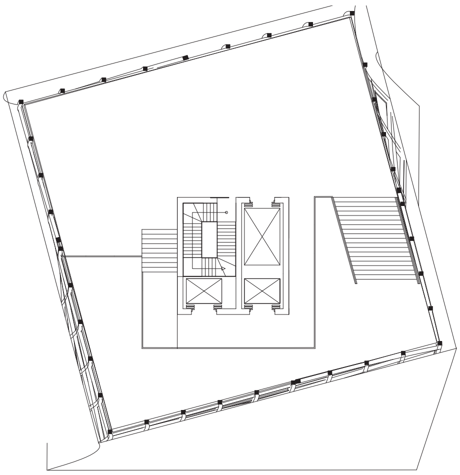
10th floor - 60'es 1:400



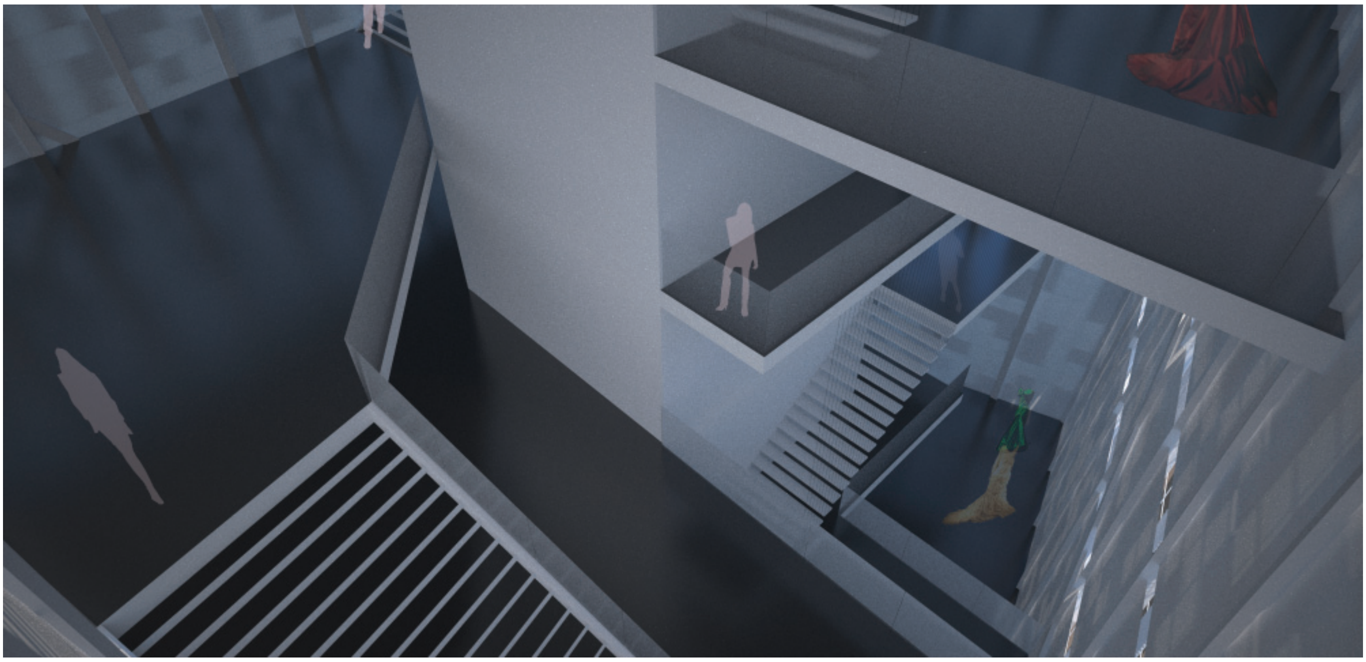
11th floor - 60'es 1:400

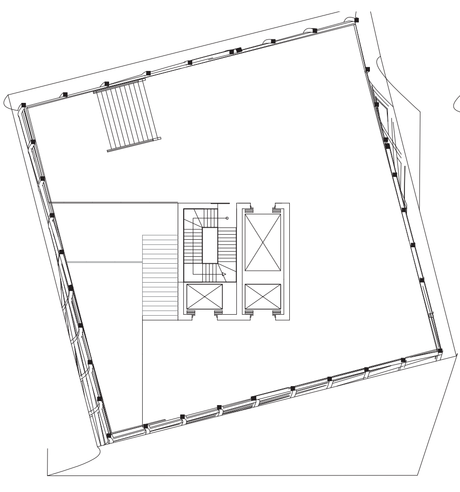


12th floor - 70’es 1:400

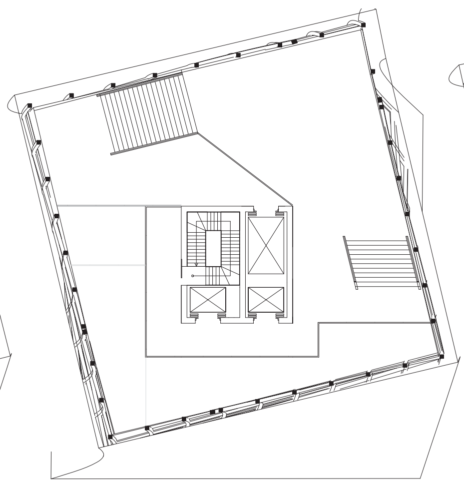


13th floor - 70’es 1:400

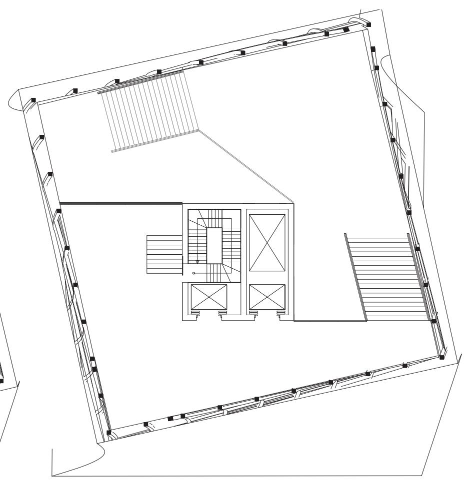




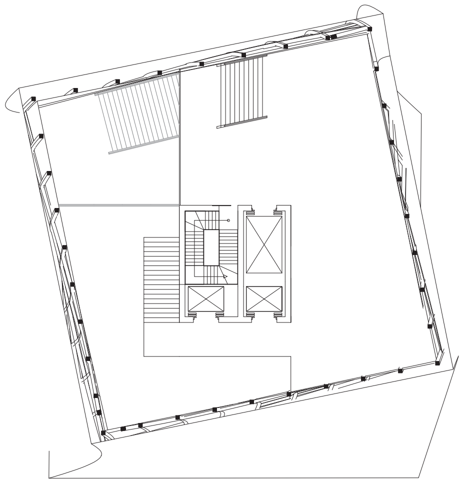
14th floor - 80’es 1:400



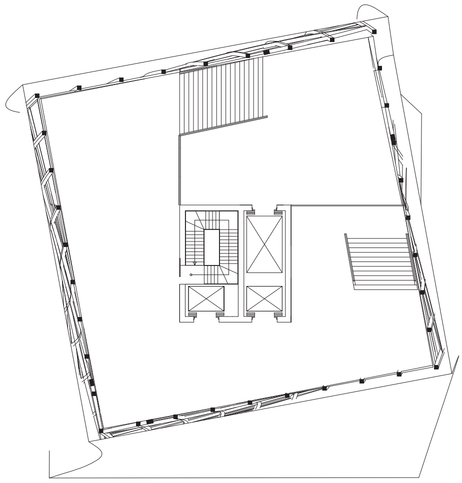
15th floor - 80’es 1:400



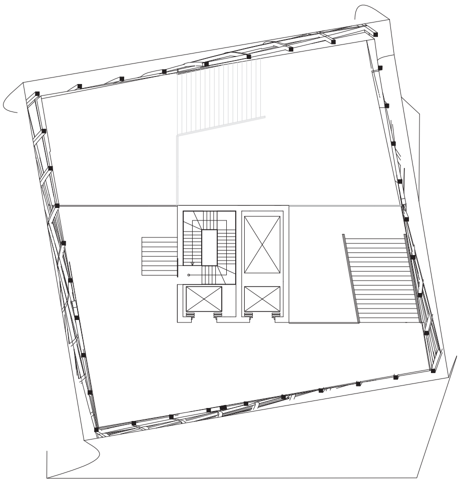
16th floor - 80’es 1:400



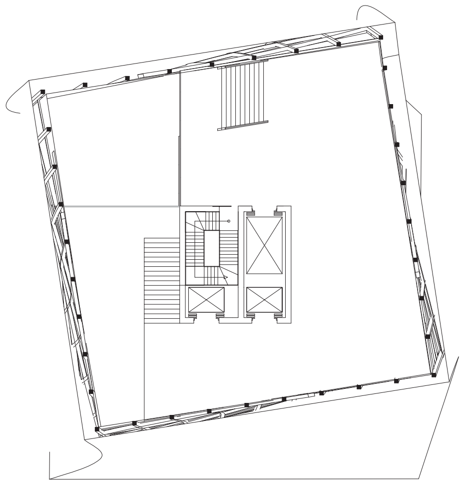
17th floor - 90’es 1:400



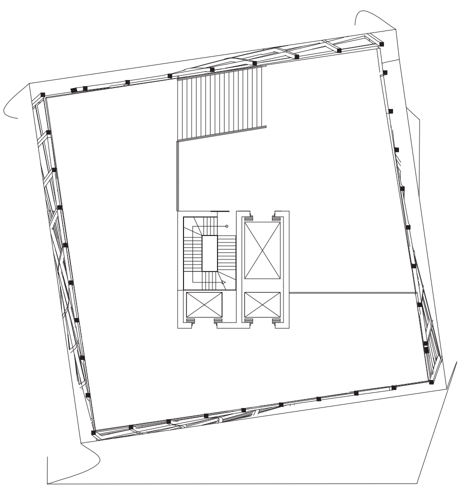
18th floor - 90’es 1:400



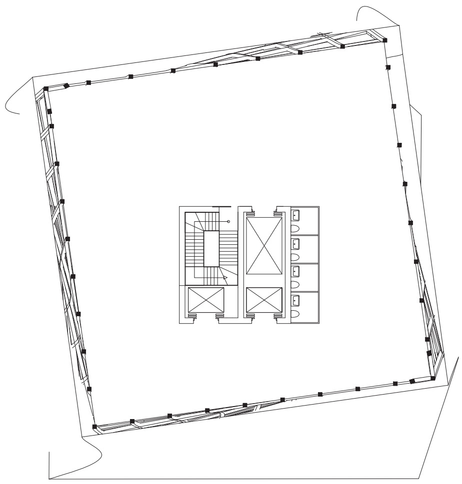
19th floor - 90’es 1:400



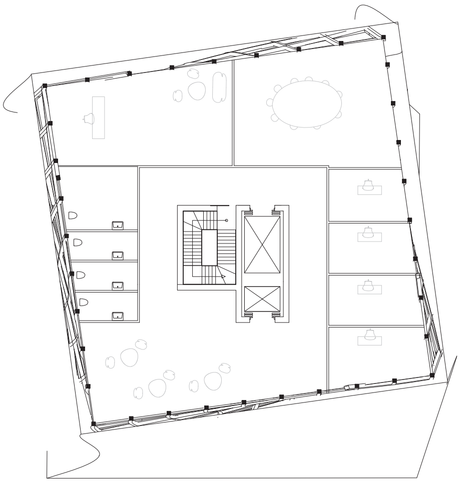
20th floor - 00’es 1:400



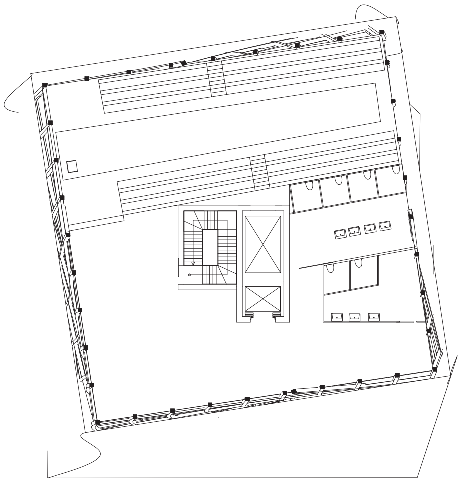
21th floor - 00’es 1:400



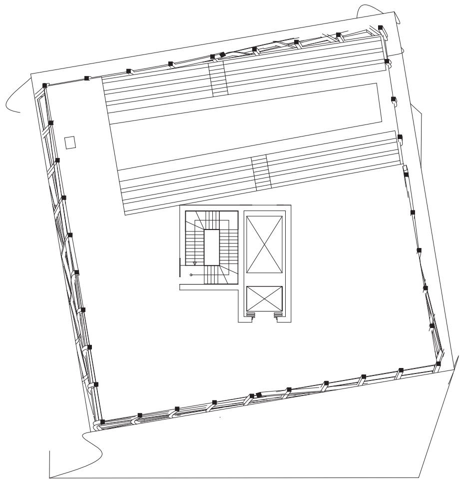
22th Pause 1:400



23th Office 1:400

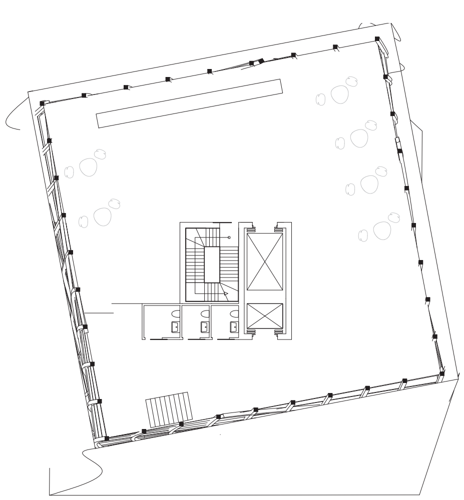


24th Runway 1:400

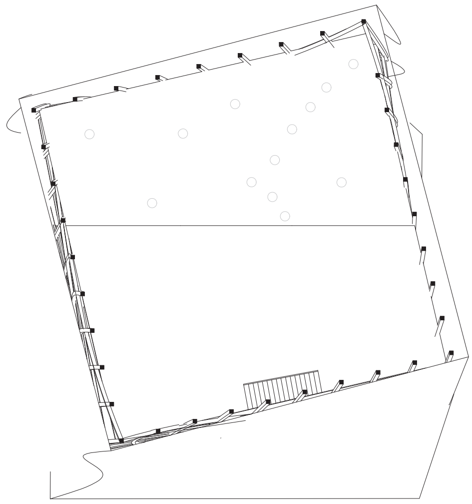


25th Backstage 1:400

The runway room provides intimacy. The catwalk is sunken into the floor before the show starts, and rose when people have taken their places. The backstage area is set on the second level. The volume seen in the rendering above the runway is a part of the backstage area - the translucent wall reveals the shadows of the hectic and chaotic atmosphere before the runway show. When the show starts the models appear from the small elevators going down to the runway and back again. The end of the catwalk is looking out on the west side of Omotesando street, by light sources behind the catwalk model a shadow of the silhouette will be projected on the facade and seen from a long distance in the street.

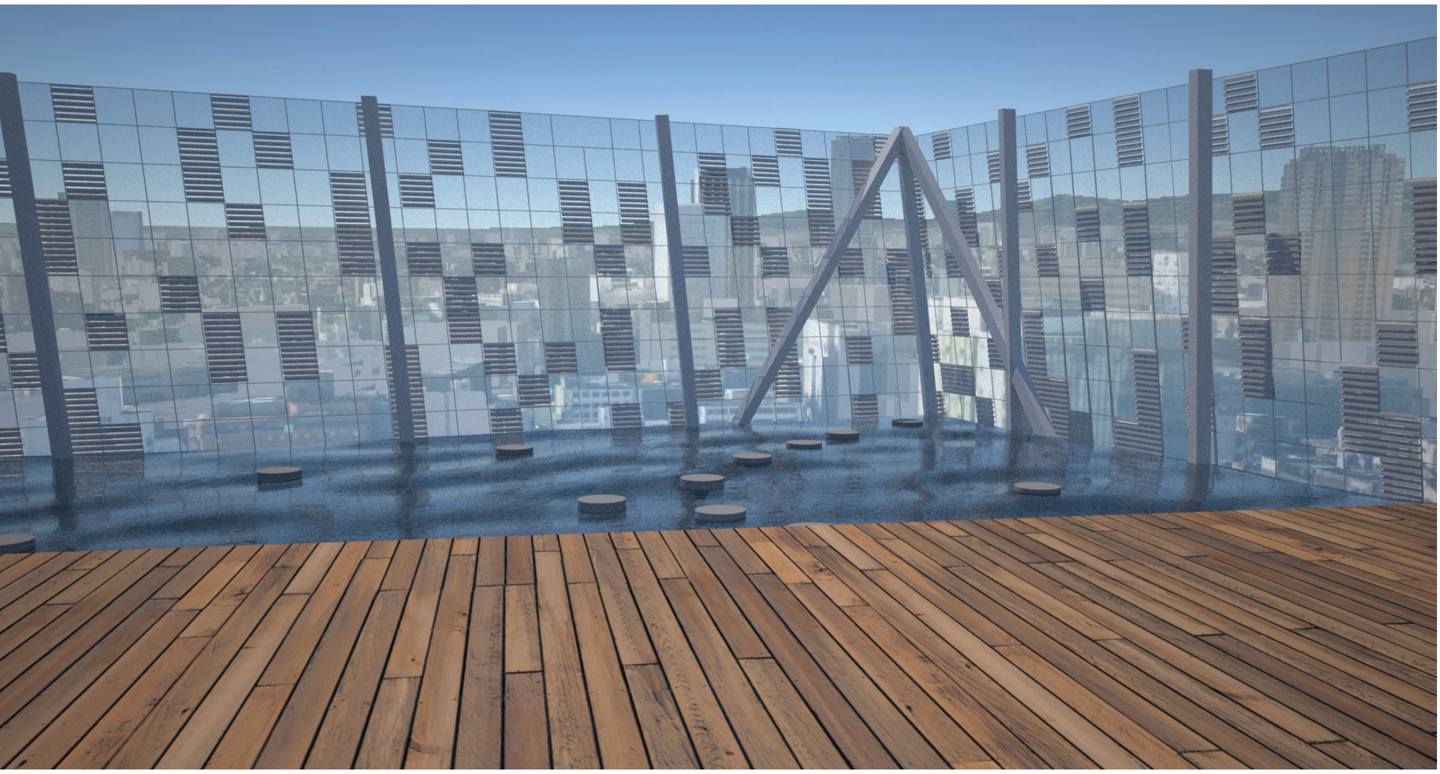


26th Sky bar 1:400

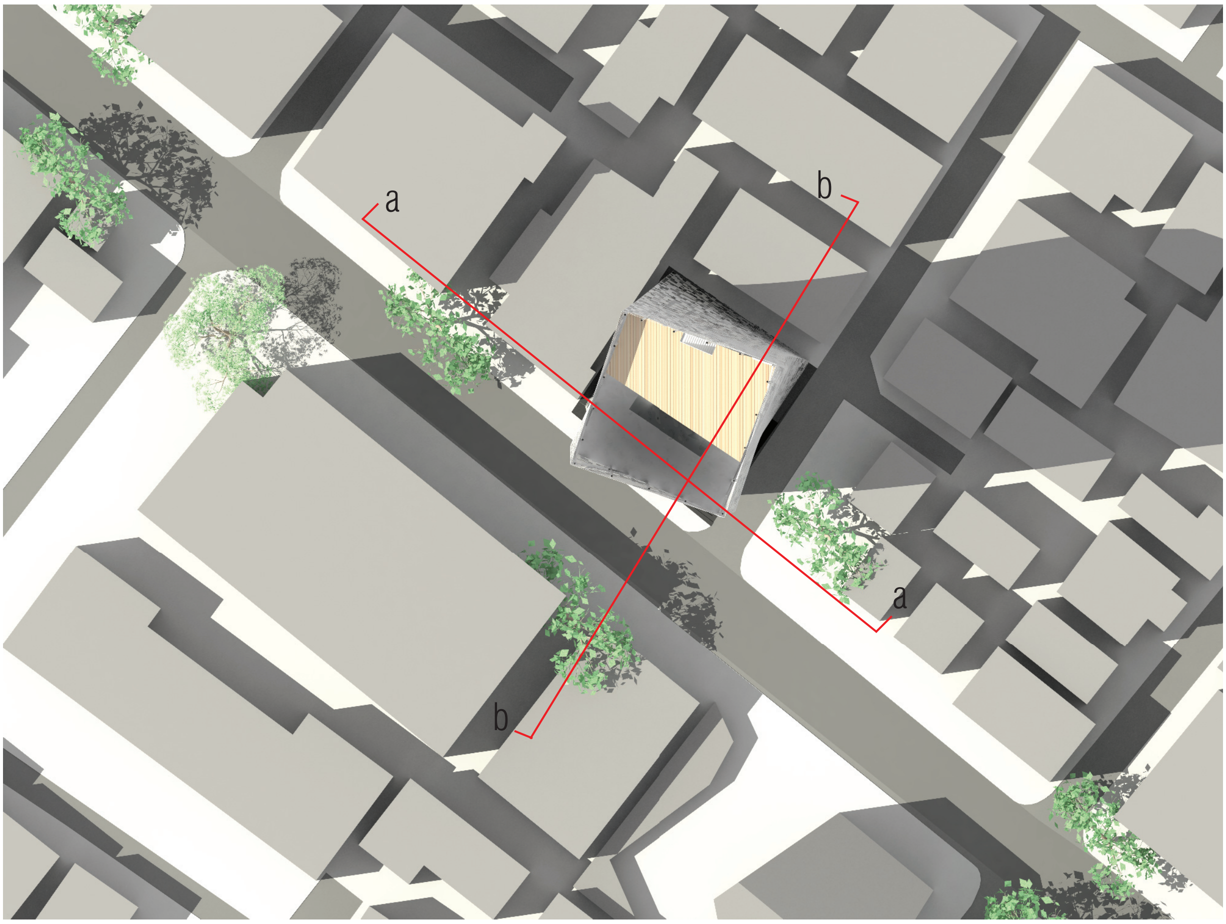


27th Japanese garden 1:400

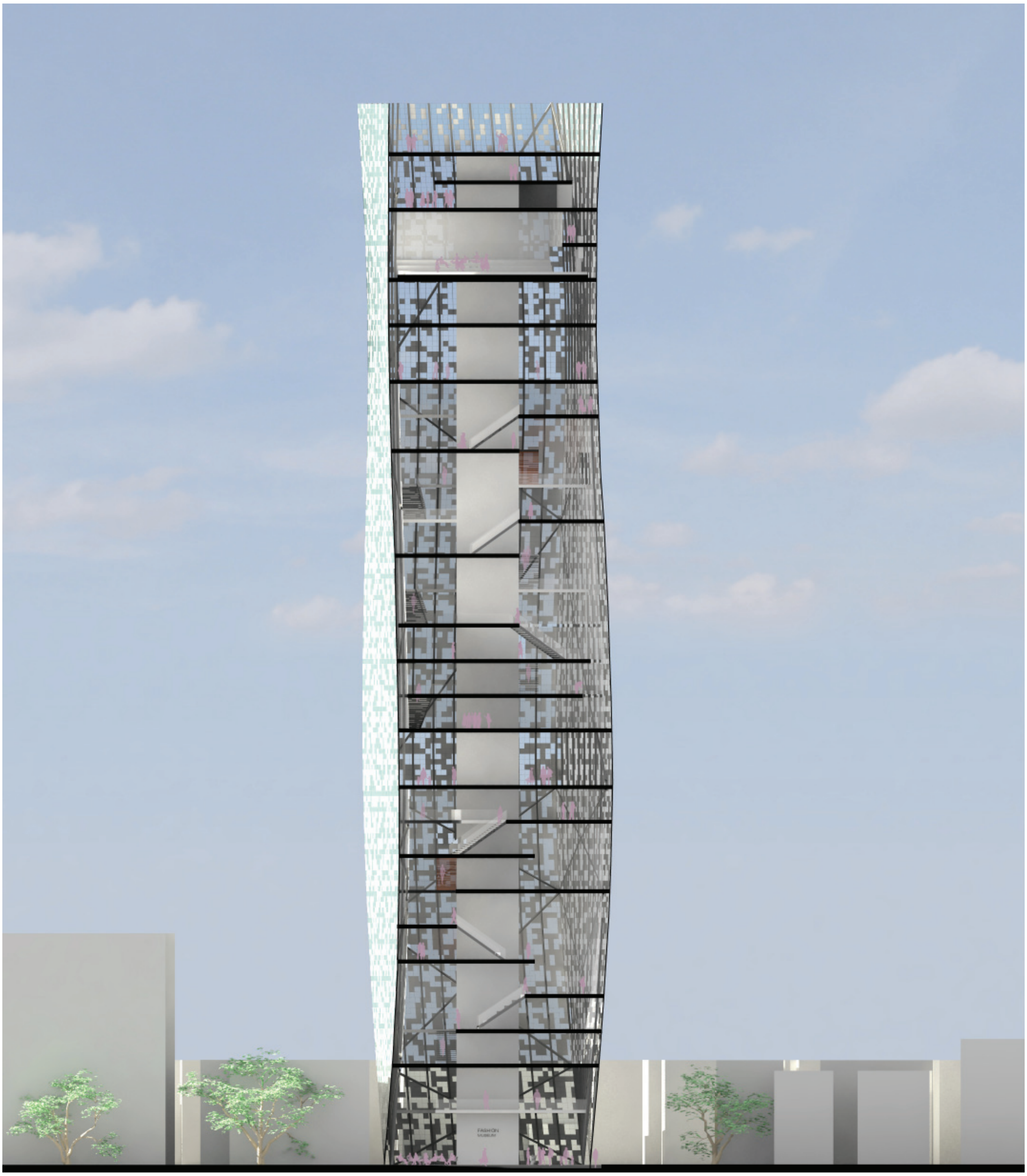
The sky bar is oriented towards Tokyo bay - providing a panoramic view of Tokyo by night during the evening hours.



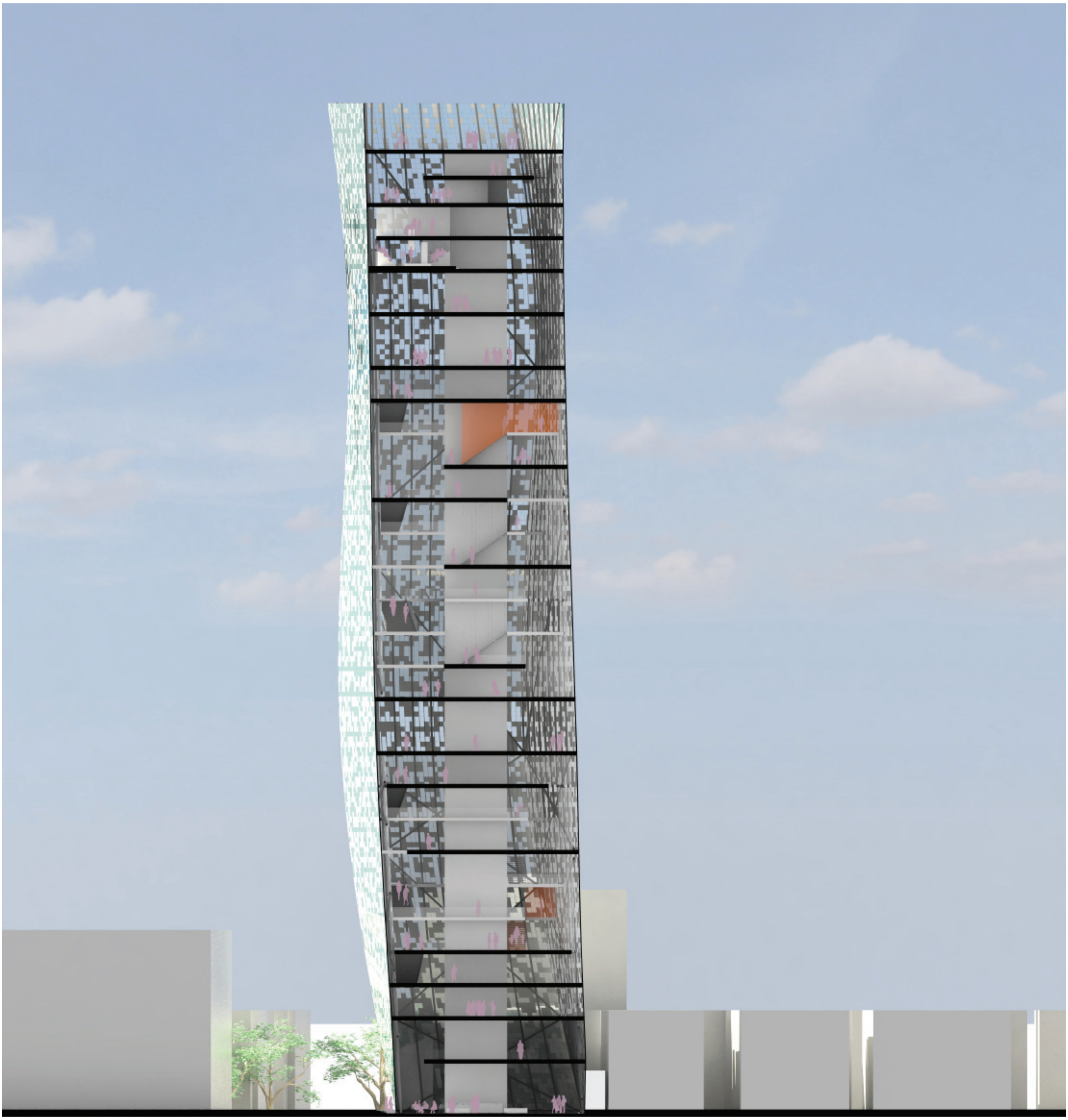
The Japanese sky garden is interpretation of a japans walking garden. The symbols red in the traditional Japanese gardens are a literally interoperated. The patio is covered with wood boards, in the foreground the water is set with stepping stones and in the middle the city represents the nature with the mountains in the background. The water gives also a filtering light to the sky bar beneath.



Site plan 1:1000



Section a-a



Section b-b

TOKYO FASHION MUSEUM
IN PERSPECTIVE

The perspective upon the project is based on whether the design criteria for the museum are met and integrated. This is achieved through conclusion and evaluation of the architecture and tectonic integration of a fashion museum in an urban context.

The required main criteria for museum building is to attract visitors, provide a lasting spatial variability, and provide new architectural experience. This has been done by using light and texture, defining the frames around the experience and the sensation of the architecture. This also draws a strong link between the essentiality of Japanese architecture by creating interplay between light and shadow, provided by the different layering of the façade. The filtered shadows are cast inside the building and out on its surroundings with two different expressions during the day and evening.

The displaced and cut floor plans that provide diffuse interposed volumes give the visitor changing scenery and a lasting variation of the spatial experience, both to observe and perceive.

The cross dialogue between fashion and architecture has also provided a strong connection to the fashion field. The reference to the human body is not literally seen but has given the form a balance between the strong and dynamic posture of the catwalk, as well as the proportions of the twist in the rectangular plan and the movement.

As architecture and fashion have a point of origin in the human body, the reference to a walking body gives the form a dynamic and elegant movement, swaying over the other low buildings in the context. The compact form, despite its height, provides a humbleness to the surroundings since it does not interfere with the busy Omotesando Street. The 'closed' expression during the day makes the building disappear as the glass façade reflects in the sky and provides diffuse light into the exhibition.
During the evening hours, the expression of the high-rise changes by opening up and revealing its landscaped interior and becomes a part of the city's hectic pulse, also elevated and divided in several levels of the near surrounding high-rises.

Working with a high-rise with a small foot print, it has been important to provide a spatial variety in the limited floor area. This had to be done in order to avoid a monotonic and repetitive experience. Breaking up and displacing the exhibition floors results in the connection between them being an open and indefinable volume. This can be seen as a contradiction to the general high-rise buildings. The unlimited open area of light and space, gives the opportunity to have changing view and the awareness of being in a high-rise, where the senses are stimulated by the scale and astonishments of the everlasting view of Tokyo city.

Flow
The staircase connecting the exhibition is an integrated part of the exhibition, and one might not think of the many stairs connecting the exhibition. The transition staircases give a different type of spatial organization and division; the cables are used as a structural integration of the staircase but also to provide a filtering between the exhibition floors giving the visitor awareness that something new will be told. The closed with dim Plexiglas transition staircases provide a new experience by closing of spaces and are a contradiction to the ever shifting openness in the exhibition's levels.

Both staircases provide materiality to the spatial experience, and cast and filter different type of shadows.
The elevators, stopping on each floor, provide a possibility for the disabled people and others who are physically weak to go to see the exhibition in a chronological order.

Flexibility
The exhibition is intended to be chronologically told, and the area of the floor slabs is divided by the required square meters and the same materials are used. The defined exhibition areas in an 'equality' and 'neutral' manner provide the possibility to set different types of settings, e.g. colour setting or different shaped plates or partition walls that characterize the given decade. The floor slabs are cut from the core with the same inclination. This provides a flexibility to have sliding walls hidden in the core and pushed out when a given exhibition space needs to be closed off, e.g. during film installations or special exhibitions. The space between the inner fabric layer and the glass façade can be used to set coloured lighting and create a certain atmosphere that would change the expression of the building from the inside and out.
Integration of tectonics

The visible construction complements the movement of the high-rise by underlining it with the slender beams. The shifted diagonals provide also a dynamic expression to the structure. The changing direction of the diagonals seen from inside on each floor changes the interpretation of the room. They become a part of the interior as they also contribute to creating depth and cast different type of shadows into the room.
The segregated 'third' layer of the façade can give different association seen from a distance. The difference between the open and closed spaces of the lamellas can give an association to a sequence dress – sparkling when eliminated by the light. The visible mullions between them gives also a sense of fabric weaved by thin threads.
The inner layer – used as filter of the sunlight, seen from the outside in connection with the rest of the layers - provides deepness of the overall expression of the high-rise as it creates differences of the intensity of the light penetrating and reflecting through the building, both during the day and evening hours.

The calculations of the earthquake loads are not included in the project. By further calculations, a further development would be made on the structural bracing system in order to provide a better optimized and rigid structure that would resist the dynamic forces from the earthquake loads.
Calculations of the amount of intake and outtake of the air change could be further calculated to ensure good indoor environment. A mechanism in the façade could be implemented to provide natural ventilation. A further investigation of the acoustics in the exhibition rooms could define a further detailing of the materials used on the ceilings.

The new proposal for Tokyo fashion museum has created an iconic museum building with two different expressions during the night and the day, where visitors and architecture are in dialogue with each other.

APPENDIX
ILLUSTRATION CREDITS

Ill. Own rendering
Ill. 2-4 ArCid, 8th semester (Integrated Design Process, Architecture & Design)
Ill. 5 Google earth

Analysis phase

Ill. 6 http://www.crymod.com/thread.php?postid=525655
Ill. 7 http://en.wikipedia.org/wiki/Omotesand%C5%8D,_Tokyo
Ill. 8 -10 Google Earth
Ill. 11-13 Competition brief
Ill. 14-22 Own production
Ill. 23-39 Own production
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