Claude Nicolas Ledoux, "The creating eye", 1804
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Italo Calvino’s novel “Le città invisibili” of 1972 or The Invisible Cities

Marco Polo tells about the cities he has seen in his travels to the Mongolian Emperor Kublai Khan.

The cities are abstract and imaginary and Marco Polo and the Emperor take very different perspectives on them.
For the individual part of the research semester, I explored 12 different cities: Almere, Antwerp, Athens, Beijing, Berlin, Delft, Londen, Maastricht, Shanghai, São Paulo, Thessaloniki, Veroia.

The research consisted of a photographic documentation of these cities, gathering over 7,000 images.

All images in chronological order
For the individual part of the research semester, I explored 12 different cities: Almere, Antwerp, Athens, Beijing, Berlin, Delft, Londen, Maastricht, Shanghai, São Paulo, Thessaloniki, Veroia.

The research consisted of a photographic documentation of these cities, gathering over 7,000 images.

Within this photographic documentation, I looked for different invisible cities.
Calvino’s Invisible Cities are dominated by a single element that is isolated.

I tried within the photographs to isolate layers of information, resulting in two types of invisible cities: those that cannot be perceived by the naked eye, and those who cannot be perceived by the mind.

For the continuation of the graduation project I focused on what cannot be perceived by the eye.
The photographs were ordered in contact sheets.

Contact sheet 023: Beijing
By juxtaposing the contact sheets from a single city, the information can be abstracted and the “average” image becomes visible.

Contact sheets 007-0037: Beijing
By juxtaposing the contact sheets from a single city, the information can be abstracted and the “average” image becomes visible.
From the photographic document I constructed virtual panoramas that on the one hand show the details of what can be seen in these cities, while at the same time giving a more abstract overview.

In this way, it becomes possible to compare the cities in terms of predominant colours and shapes of the built environment.
Within these virtual panoramas, it is possible to select layers of information, such as the different colours of the spectrum.

Almere: whole spectrum
Almere: red spectrum
Almere: whole spectrum
Almere: green spectrum
Almere: blue spectrum
São Paulo’s virtual panoramas

72 images
São Paulo’s virtual panoramas

72 images: only red spectrum
São Paulo’s virtual panoramas

72 images: only window openings

MSc3  "The Invisible Cities"
MSc3 "The Invisible Cities"
**panorama**
noun
an unbroken view of the whole region surrounding an observer

- a picture or photograph containing a wide view.
- a complete survey or presentation of a subject or sequence of events: the galleries will offer a full panorama of 20th-century art.

ORIGIN late 18th cent.: from pan-[all] + Greek horama ‘view’ (from horan ‘see’).
The panoramas were travelling tourist attractions.

It was 19th century virtual reality.

Specific building types were developed that dealt exclusively with the observation fantastic or hyperrealistic spectacles.
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The evolution of these building types resulted in very common buildings such as the cinema and the IMAX dome.

Google Earth developments

IMAX dome, San Jose [USA]
Recent developments include digital developments that deal with the visibility of the city.

Just some examples are Google maps, Google street view, panoramio, Bingmaps.
In a similar way, the urban environment was made visible by the creation of observation towers, observation decks, ferris wheels.

Example, Eiffel Tower in Paris.

Paris had grown into the great industrial metropolis. Only a tall tower could make the city visible.

The panorama can be seen on 3 viewing platforms.
The Invisible Cities

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Explorations in São Paulo

Huge Megalopolis

Explorations of the urban field: car, bus, foot

Dizzying experience, huge contrasts
Explorations in São Paulo

Huge Megalopolis

Explorations of the urban field: car, bus, foot

Dizzying experience, huge contrasts

Contact sheet 123: São Paulo’s urban field
Explorations in São Paulo

Huge Megalopolis

Explorations of the urban field: car, bus, foot

Dizzying experience, huge contrasts

Contact sheet 90: São Paulo’s cortiços
Explorations in São Paulo

Huge Megalopolis

Explorations of the urban field: car, bus, foot

Dizzying experience, huge contrasts

Contact sheet 81: Highway perspective
The Invisible Cities

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Position of the site

Urban context
Position of the site

Historic city centre

Rise of Avenida Paulista as new city centre
Position of the site

Historic city centre

Rise of Avenida Paulista as new city centre

Moving Centre
The site is located in the Luz district, at the northern edge of the historic city centre.
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Area in transformation; from Crackolandia to Nova Luz
The site is located in the Luz district, at the northern edge of the historic city centre.

Area in transformation; from Crackolandia to Nova Luz

New centrality: extension of metro network
The site is located in the Luz district, at the northern edge of the historic city centre.

Area in transformation; from Crackolandia to Nova Luz.

New centrality: extension of metro network.

Excellent site for the urban observatory of the 21st century.
Site currently undergoing works for the new metro line
Site comprising work in progress for the new metro line

Currently, the yellow line is being constructed of which Luz station will be terminus

Luz station also serves metropolitan rail network, and in the future will be directly connected to the high speed rail link with Rio de Janeiro
Historic city centre
Luz Train and Metro station
Luz Park

Pinacoteca do Estado

Sala Julio Prestes Concert Hall
From Crackolandia to Nova Luz
MSc3 "The Invisible Cities"

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Starting point for the Observatory:
The panorama surrounding the site
Starting point for the Observatory:
The panorama surrounding the site

Similar to the cylinder Mesdag painted to construct his panorama of Scheveningen and Kijkduin, I made a projection of the urban panorama around the site.
Unfolded panorama

Horizontal direction:
Polar space
Vertical direction:
Height

The design
This cylindrical panorama became the basic document for dealing with the views from the observatory.
View in 360 degrees
Starting points for the design of the observatory:

1. The Panorama
Starting points for the design of the observatory:

1. The Panorama

2. The spiral
Starting points for the design of the observatory:

1. The Panorama

2. The spiral

Gradual transition from street level towards a high vantage point.

Panorama > 360 degrees
Spirals very common in Brazilian Modernist Architecture

Museum CA, O. Niemeyer, Niteroi 1996

National congress, O. Niemeyer, Brasilia 1960

Galeria Espiral, Sao Paulo 1964

Auditório Ibirapuera, O. Niemeyer, Sao Paulo 2005
Spirals very common in Brazilian Modernist Architecture and in Paulista infrastructure.

Spiral ramps in pedestrian bridges in São Paulo.
Types of spiral

Spiral continuous curvilinear movement around a central point

Archimedean Spiral
Types of spiral

Spiral
continuous curvilinear movement around a central point

Helix
curvilinear movement around a central axis

Cylindrical helix
How to make a helix

1. Flat surface
How to make a helix

1. Flat surface

2. Continuous inclined lines that meet at the ends of the surface
How to make a helix

1. Flat surface

2. Continuous inclined lines that meet at the ends of the surface

3. Fold the surface into a cylinder
How to make a helix

1. Flat surface

2. Continuous inclined lines that meet at the ends of the surface

3. Fold the surface into a cylinder

4. The inclined lines form a helix
Design strategy:

To design spirals on top of the unfolded panorama around the site
Design process

Rhino Grasshopper

“Reading” the panorama
The layout of the observatory:

Basic principles
The layout of the observatory

Design on top of unfolded panorama

Later the design is curved around a cylinder
The layout of the observatory

Design on top of unfolded panorama

Later the design is curved around a cylinder
The layout of the observatory

Design on top of unfolded panorama

Later the design is curved around a cylinder
The layout of the observatory

Step by step

External columns
The layout of the observatory

Step by step

Internal columns
The layout of the observatory

Connection to metro
The layout of the observatory

Spiralling ramps
The layout of the observatory

Observation decks
The layout of the observatory

Observation decks
The layout of the observatory

Interior spaces
The layout of the observatory

Special programme:

Interior volumes

They bridge the central courtyard, providing vantage points from the central axis of the building towards the panorama.

Spaces for temporary events (meetings, congresses, film projections, art exhibitions) both indoors and outdoors.
The layout of the observatory

Lifts on interior
The layout of the observatory

Lifts on exterior
The layout of the observatory

Duct shafts and plant rooms: main plant rooms
The layout of the observatory

Duct shafts and plant rooms: main plant rooms
The layout of the observatory

Window openings based on the panorama

Distant view (light grey on the panorama) horizontal (wide) opening
Near view (dark grey on the panorama image), vertical (narrow) window opening
The layout of the observatory

Cobogós (Brazilian type of brise-soleil)

Patented in 1927 (Modernist invention)

Mass produced shading device
The layout of the observatory

Cobogós (Brazilian type of brise-soleil)

Provides filter for the view of the panorama along the spiralling ramps
The layout of the observatory

Cobogós (Brazilian type of brise-soleil)

Provides filter for the view of the panorama along the spiralling ramps
The cylindrical version
The layout of the observatory
Vertical section
West-East
The layout of the observatory

Vertical section: zoom on basement
The layout of the observatory

Vertical section: zoom on mid-height
The layout of the observatory

Ground floor and insertion in (cartesian) urban context
The layout of the observatory

Basement and insertion in (cartesian) urban context
The layout of the observatory

Floor plan
-8m
The layout of the observatory

Floor plan

-4 m
The layout of the observatory

Floor plan
+1.4m
The layout of the observatory

Floor plan
+7.5m
The layout of the observatory

Floor plan
+10.2m
The layout of the observatory

Floor plan
+13.1m
The layout of the observatory

Floor plan
+15.9m
The layout of the observatory

Floor plan
+114m

(Heliport)
"The Invisible Cities"

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Construction
Construction

Justification of the choice for this construction:

Hyperboloid vs Cylindrical construction
Construction

Outer columns and beams
Construction

Outer columns, beams and floors
Construction

Inner columns and beams
Construction

Inner columns, beams and floors
Construction
View from street level
Impressions

View from street level
View of the central atrium
+59m
View of Exhibition Gallery
View of Panorama Terrace
+59m
View of top observation deck
View of top observation deck
The end