
SANTOS



Final Graduation Booklet by Inés Hemmings

TU Delft
Faculty of Architecture & the Built Environment

Heritage & Architecture
Harbour Heritage Graduation Studio 2017/18

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This Graduation Project has been a very special year for me in many ways.
I would like to thank several people that have accompanied me on this journey.

Starting with sincere appreciation to my supervisors for their critical assistance and guidance. Thank you, Lidy Meijers, for your empathy, encouragement and capability to point me in the right direction. Thank you to Bas Gremmen for constantly pushing me towards my limits and encouraging me never to stop learning. And thank you to Nicholas Clarke for being such an enthusiastic teacher and making Cultural Values so enjoyable.

A big Thank You goes to Wieger Bronstring for your assistance and know-how in the Acoustics of the project.

Furthermore I would like to thank my parents, Bill Hemmings and Krista Trattnig, and my brother, Jérôme Hemmings, for your love and support.

Thank you to Gerardo Duarte for all your support and guidance and for constantly encouraging me to think critically and believe in myself.

A huge Thank You goes to my flatmates Johanna Pieritz and Haji Akhundov for your support and for sharing the highs and the lows with me.

Thank you also to my close friends Noortje Weenink, Xie Hai and Bernadett Csenteri for your friendship and meaningful conversations.

And last, but not least, I would like to thank my overseas friend Luke Bird for our never-ending conversations on nostalgia and a nostalgia for the future.

Santos House of Jazz

A proposal to re-design the abandoned
Santos warehouse in Rotterdam and
turn it into a House of Jazz

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All images and contents are made by the author, unless stated otherwise.

I have always felt romantically inclined to historic buildings and their architectural re-interpretation on both conceptual and material level. Most heritage buildings and old places carry a deep sense of nostalgia and always manage to move me and communicate on a deep psychological level. Their transitory character requires a receptiveness for the intangible and a shift in vision, welcoming apprehension by all senses and empathy towards our environment. This fascination is my driver and encourages me to do the same; to create places and spaces that touch people, reinforce an understanding of the past in the future and - perhaps - elicit a little sense of wonder.

The MSc3 Harbour Heritage Graduation Studio in Rotterdam provides a good framework for me to do, allows me to explore my personal interests and to connect it with my greatest passion: music.

Vision

The aim of this *Final Graduation Booklet* is to lay out the research and design process of my graduation year in the Harbour Heritage Graduation Studio 2017/18.
It is impossible to grasp the entire nature of it, but I would like to illustrate the most important steps in order to gain a better understanding of how I came to the final results. This report is divided into three parts; *Fascination, Story* and *Exploration*.

Fascination illustrates my first impressions of Santos without having gained any background knowledge about it yet. The aim was to grasp the spirit and the feeling, without being influenced, and to try and sense what message the place conveys. This is done through sketches and atmospheric studies. In the course of the design process, it is fascinating to see that all of these intuitive drawings come back into the picture.

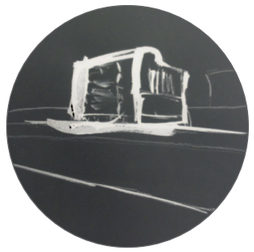
Story provides a brief cultural historical and urban analysis, the problem definition and the indication of cultural values to frame the starting points for the transformation and the overall design assignment.

Exploration is a continuation of the Story and captures the final result which is subdivided into several points. It concludes with a final reflection.

Note,

this booklet also expresses my personal thought process which is distinguished from the general research process with italic font.

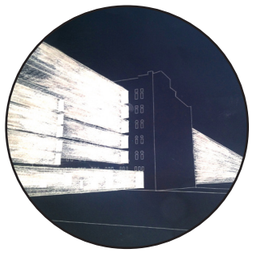
Methodology



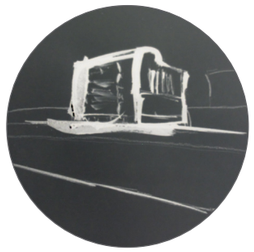
FASCINATION



STORY



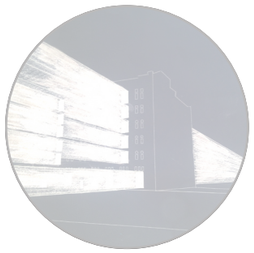
EXPLORATION



FASCINATION

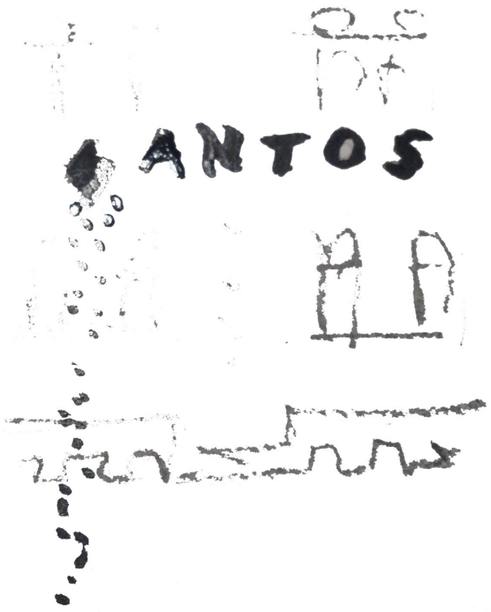


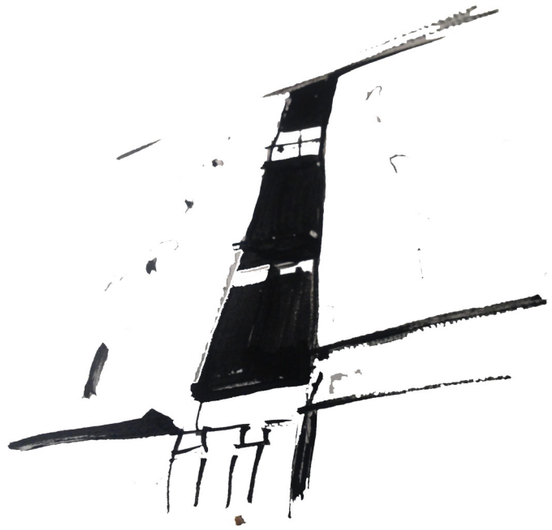
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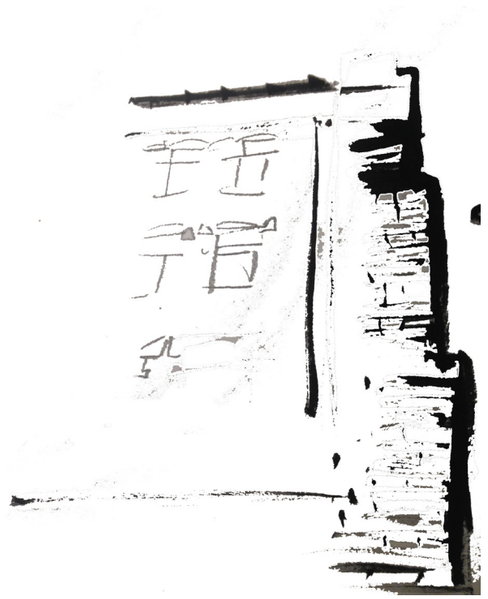


EXPLORATION

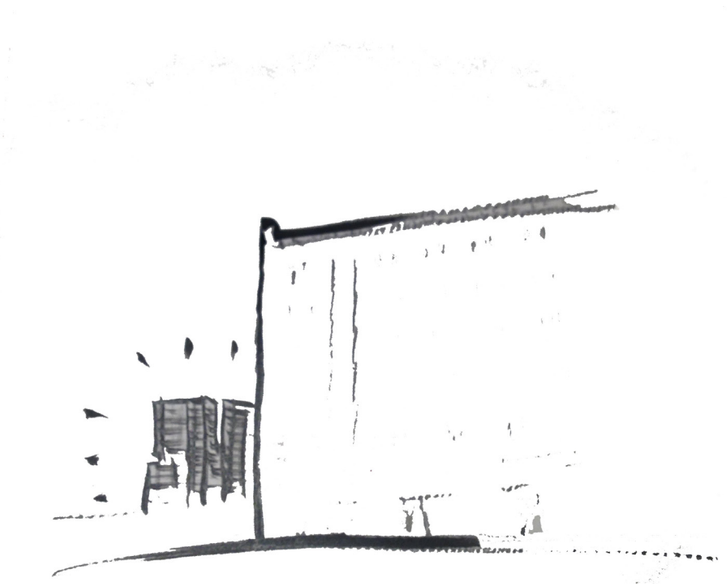



ANTOS









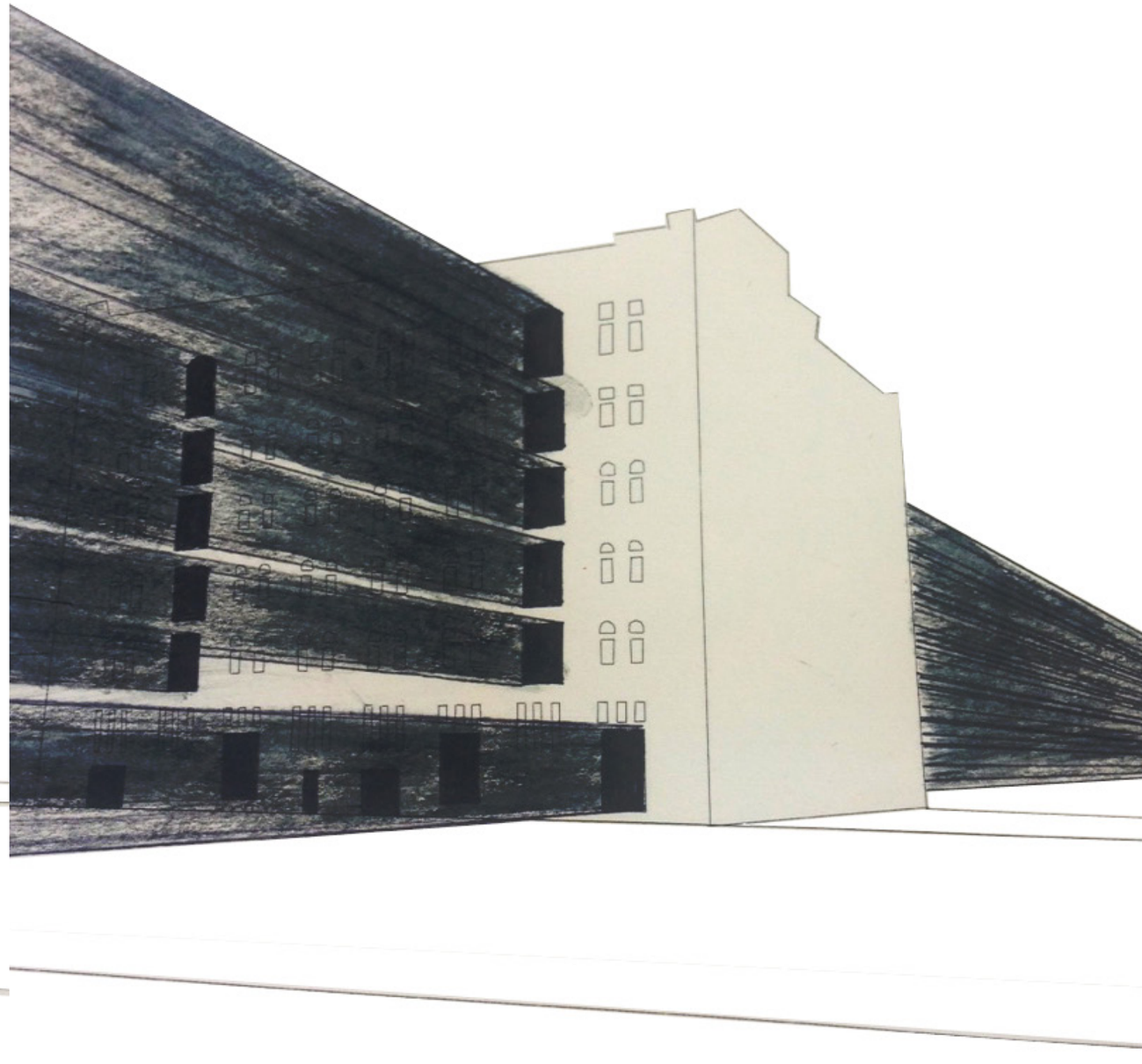
Light filtering through trees on the Brede Hilledijk Straat

Vastness, Openness, Lightness on the Rijnhaven Zuidzijde

FASCINATION



Monumentality, Rigidness
Closed off despite many openings



How can Santos open up to its surroundings?
FASCINATION



How can Santos become part of its surroundings?

Realization: Santos is more than the building itself but part of a larger story.

What is the story?

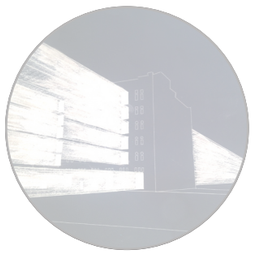
STORY



FASCINATION



STORY



EXPLORATION

Themes



Name:	Santos Warehouse
Address:	Brede Hilledijk 95 / Rijnhaven Z.z. 6, Rotterdam
Status:	National monument nr. 513940
Year of construction:	1901 -1902
Client:	N.V. Blaauwhoedenveem
Architect:	J.P. Stok Wzn. i.s.m. J.J. Kanters
Original function:	Warehouse for the storage of coffee from Santos, Brazil
Owner:	Onwikkelings Bedrijf Rotterdam, Municipality of Rotterdam
Building condition:	Good
Total m2 surface area:	6420 m2

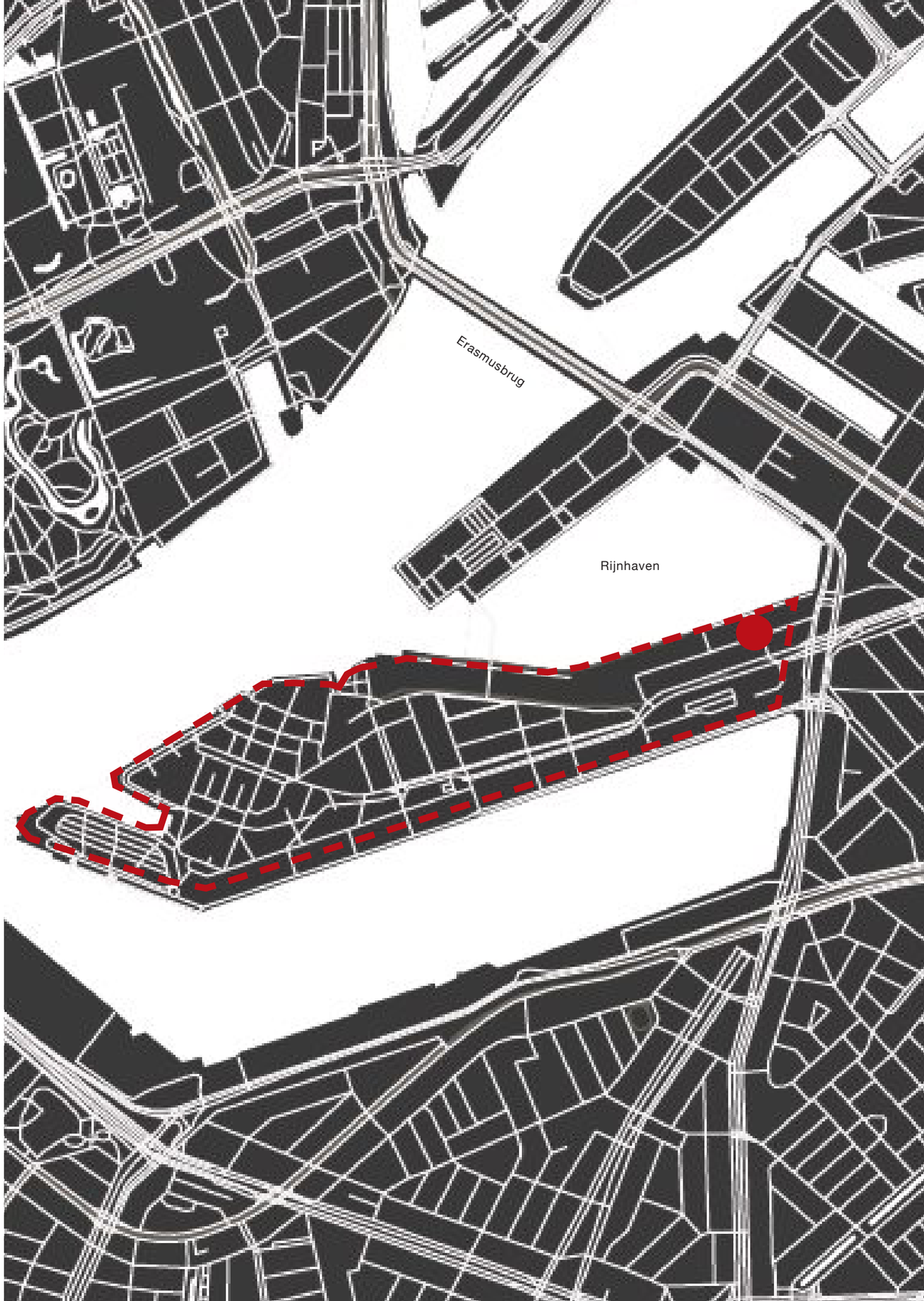
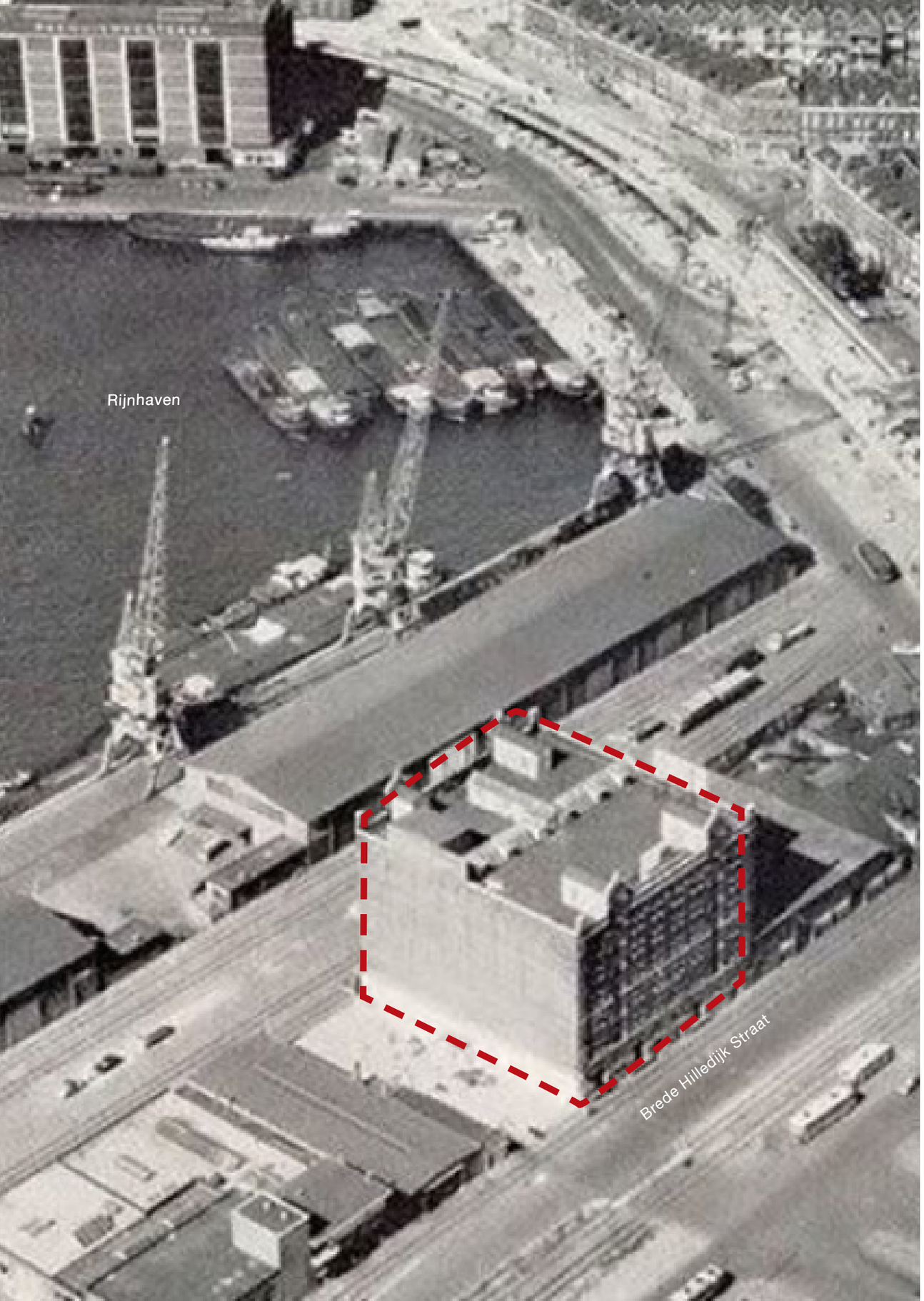
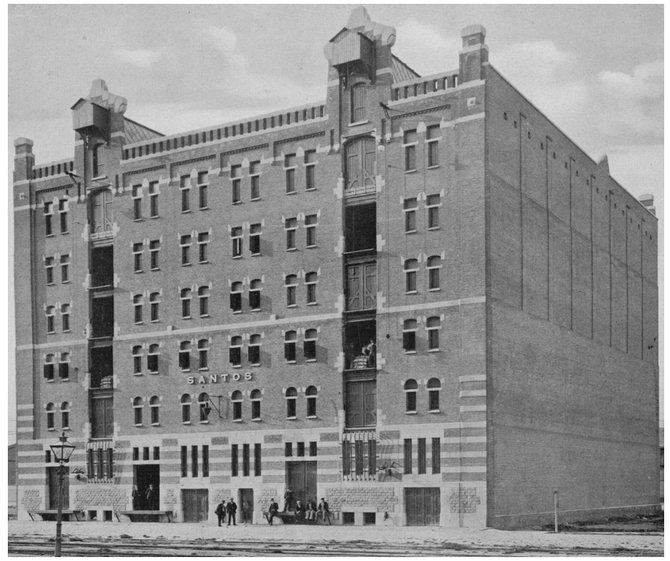
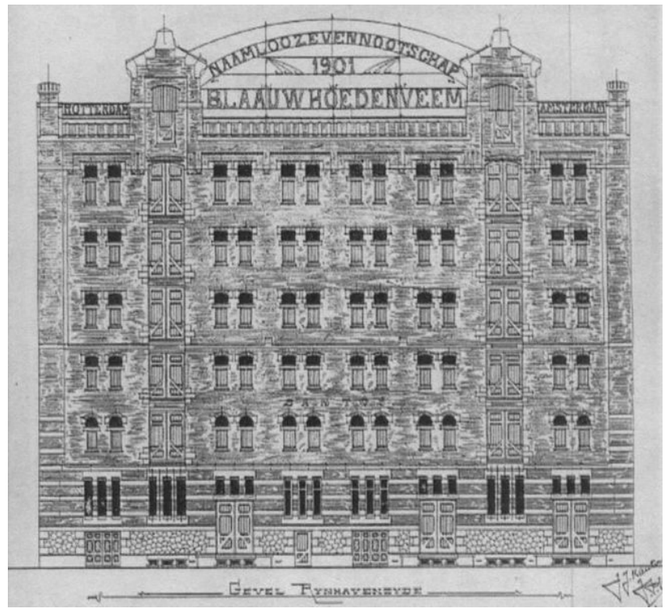


Fig 1: Above
Fig 2: Right







After the formation of the Nieuwe Waterweg in1872, the Rijnhaven was built and became the biggest dok of the larger harbor in Transitopolis Rotterdam. Around the turn of the century, the real estate company N.V. Blaauhoedenveem, today known as Vopac, rapidly spread their power and commissioned the architects J.P. Stok and J.J Kanters to design Santos. Located at the Rijnhaven in Katendrecht, it was opened in 1903 as the tallest building in its surrounding context, and the tallest warehouse of Rotterdam. It functioned as a warehouse and entrepot for brazilian coffee from the port of Santos in Brazil. At that time, 80% of the world's coffee production derived from Brazil and was viewed as a sign of bourgeois distinction and a luxury business, which stagnated during WWI up to the late 1920s.

Fig 3: Left
Fig 4: Above
Fig 5: Below



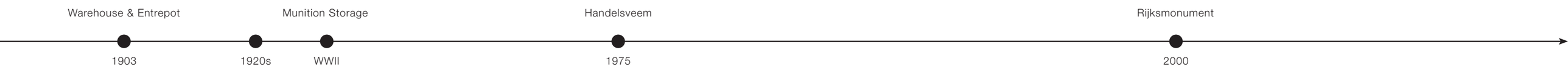






Santos was opened in 1903 and functioned as a warehouse and entrepot for brazilian Santos coffee until the late 1920. During WWII, Santos was used as a munition storage and then rented out to the koninklijke landmacht before the N.V. Blaauhoedenveem unsuccessfully rented it out for commercial use and sold it to Handelsveem in1975. In the year 2000, Santos was listed as a Rijksmonument due to its cultural-historical, typological and architectural value. Besides some office activities up until today, Santos is mainly empty and awaits to house a new function in order to preserve its historical value and become part of Katendrecht's cultural future.

In the year 2000, Santos was listed as a Rijksmonument due to its cultural-historical, typological and architectural value. Besides some office activities up until today, Santos is mainly empty and awaits to house a new function in order to preserve its historical value and become part of Katendrecht's cultural future.



Left: Fig 6
Middle: Fig 7
Right: Fig 8

Fig 9

STORY

Over this period of time, Katendrecht has gone through several social transformations.



Originally Katendrecht was a small settlement in the outskirts of Rotterdam where mainly wealthy citizens had their country house.

Fig 10



When the Maashaven and the Rijnhaven were created, this settlement was almost completely destroyed and replaced with harbour activities and housing for the workers. Because of this change in occupants and the inflow of sailors which came to the shore in this area, the functions that this district housed, changed.

Fig 11



First in 1911 the local sailors created a strike which resulted in a large import of chinese workers that where housed in the district. Asian people and shops were characteristic for Katendrecht and at some point it even became the largest China-town of Europe. They were later forced out by the municipality when they became obsolete.

Fig 12



In the following period, the area developed into a recreational area for the sailors that had only a short amount of time ashore to enjoy themselves. Because Katendrecht was situated on the edge of Rotterdam, away form the city's residential areas, it was regarded as an outcast and gained an atmosphere of lawlessness and disobedience. Local bars and clubs thrived and accomodated the famous prostitution scene of that time.

Fig 13



During WWII, the district remained lawless and so soldiers where not allowed to visit this area due to the fear of them gaining infectional diseases. The germans imposed laws against playing Jazz music which was considered to belong to the people of racial stereotypes. With this area being restricted to the occupying force, it became a safe haven for the local jazz-scene and a sign of resistance.
The only Jazz Club in Katendrecht was the Belvedere Verhalenhuis which was closed off from the outside. Today the Belvedere does not function as a Jazz Club any more but houses space for music events, exhibitions and a restaurant.

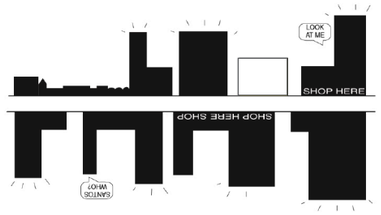
Fig 14

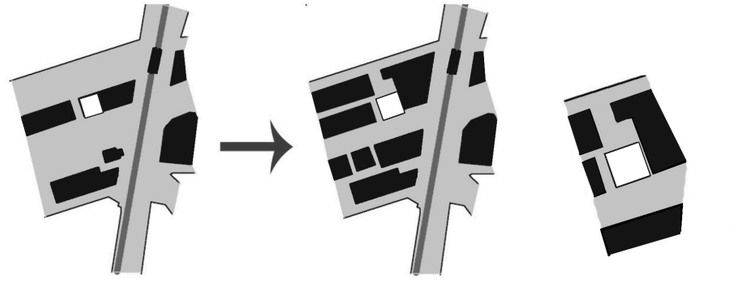


After the war ended, the harbour activities slowly pulled out of the area which resulted in a lot of vacancy, lesser employement opportunties and a diminishing flow of visitors. In recent years the area is changing again. New bars and restaurents are opening which like to benefit from the atmosphere left behind by this rugged history.

Fig 15







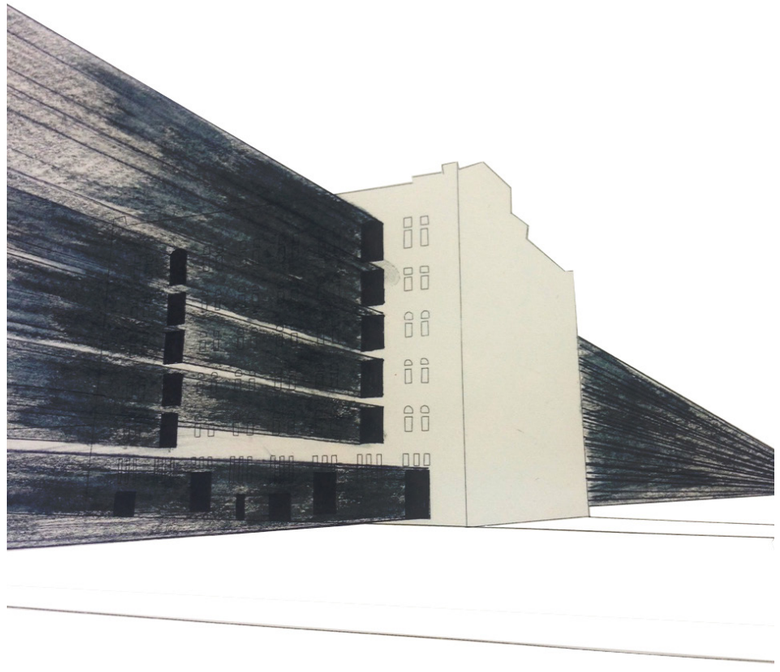
From 2020, the municipality plans to turn Katendrecht into one of Rotterdam's most trendy and creative districts, which means that Santos will not be the tallest building in its surroundings any more - but instead the lowest.

Fig 16: Upper left
Fig 17: Upper right and lower

When I visited the site for the first time, I had a nostalgic revelation.



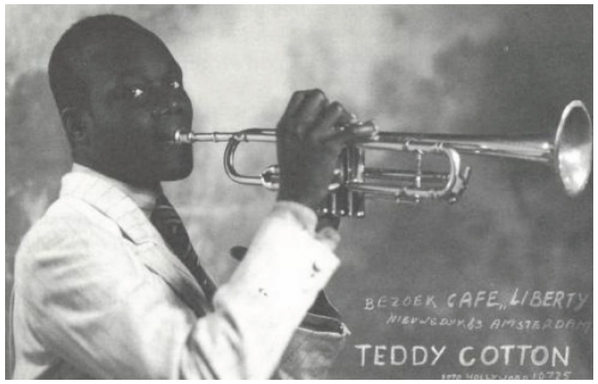
Firstly, Santos seemed very closed off despite its many openings.



Secondly, the vertical door openings instantly conjured up harbour activities all across the ocean towards Santos.

Verticality | Water

STORY







All of a sudden I realized; Jazz also came to Katendrecht all across the ocean and back in WWII, it was also very closed from the outside. Furthermore, the Belvedere Verhalenhuis does not function as a jazz club any more these days.

Threshhold | Water

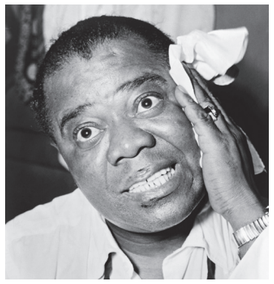
STORY

Fig 18: Upper
Fig 19: Middle
Fig 20: Lower



Nostalgia

SANTOS WILL BRING BACK THE JAZZ TO KATENDRECHT. THIS POSES A GREAT OPPORTUNITY TO BRING BACK SOMETHING TO THE COMMUNITY THAT WAS TAKEN AWAY FROM IT - A PLACE OF TOGETHERNESS AND IDENTITY AS THE BELVEDERE VERHALENUIS EMBODIED EXACTLY THAT DURING WWII.



Louis Armstrong



Ella Fitzgerald



Charles Mingus

Fig 21: Farthest left
Fig 22: Left
Fig 23: Middle
Fig 24: Right

CONNECTIONS OF DOMAINS

Belvedere
Verhalenhuis

During WWII, the world inside Belvedere was crazy and cheerful - totally the opposite of the outside world. So there was a clear threshold between outside-inside. Two different world clashing with each other.

Intimate character and gloomy atmopshere

Jazz

Main elements are Swing (rhythmic momentum) and Syncopation (2 different counter rhyhms)

Jazz came to Europe via the ocean

Intimate character and gloomy atmopshere

Santos

With Santos, there is also a threshhold between outside and inside. The 2 worlds are totally different. When you stand at the dok in front of Santos - there is a very open and light atmosphere - while when you enter, you unexpectedly come into gloom.

Santos coffee came to Europe via the ocean

Intimate character and gloomy atmopshere

EXPLORATION

MONUMENT STATUS

In March 2000, Santos was designated a national monument due to its cultural-historical, architecture-historical and typological value. From October 2003 it was added to the Monuments Register of National Office for Cultural Heritage.

It is important to note that the indication of cultural values are a combination of personal highly valued aspects of the building and its context (so the monument remains strong) tailored to the needs of the Jazz domain.



Fig 25

STORY

Coffee as a very lucrative business in the 20th century and came to Rotterdam via the Atlantic Ocean. This journey from Brazil to Katendrecht and from the dok into the warehouse itself should be revived and become a driver for the design. When visiting Santos, the visitor puts himself into the place of a coffee bean and gets to experience the former routing towards the warehouse.

Historic Value - Nostalgic Value - Use Value



Separation of
Consignments



Bags were lifted with winch drums
and stored in designated areas



goods are lowered
down with winches



Coffee beans are shipped
from the port of Santos
to wharfs in Europe

Rijnhaven dok

covered pier

cart and human traffic

SANTOS

street rail line

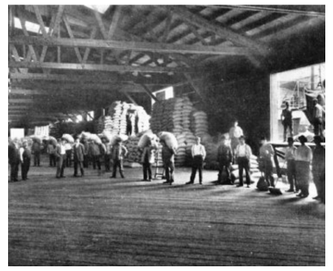
Coffee beans are unloaded
off streamer in Katendrecht



Dock labourers carry bags
to the Santos warehouse



Storage, sampling and
separation of goods



Goods are loaded onto carts
and flow in hand of supplies



Clear one-directional flow

STORY

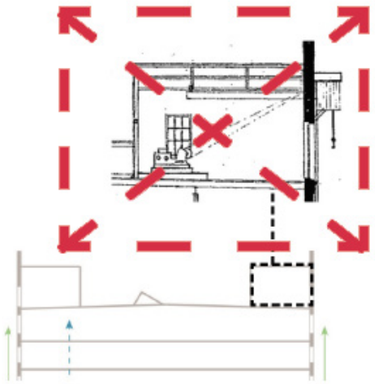
Left: Fig 26
Below: Fig 27
Upper left: Fig 28
Upper left: Fig 29

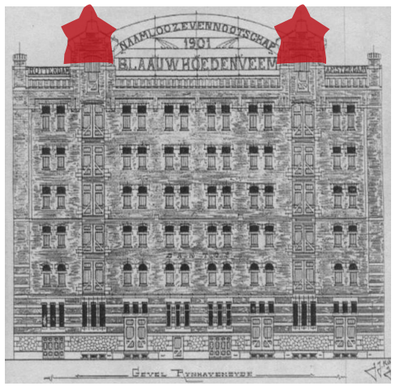
Fig 30: Lower left
Fig 31 Lower middle
Fig 32: Lower right
Fig 33: Upper right

STORY

There are two main important physical proofs to identify this specific warehouse typology, namely the winch houses on top and the verticality of door openings. Unfortunately, the winch houses were demolished in the 1950s and should not be rebuilt as that would be inauthentic. This means that the verticality of door openings needs to be cherished even more. Externally, as well as internally.

Historic Value - Nostalgic Value - Use Value





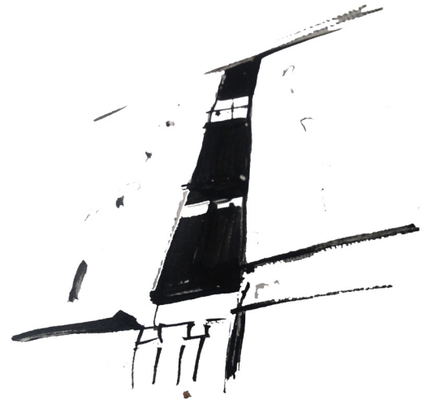


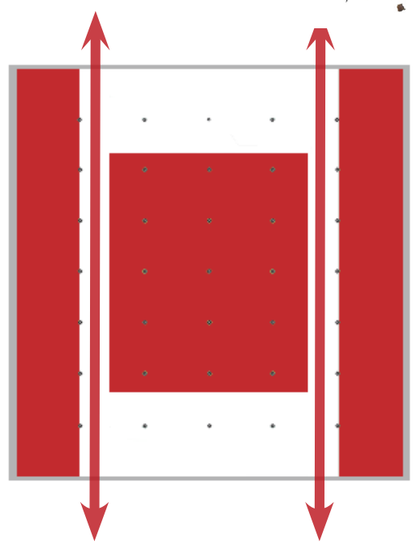
STORY

Upper: Fig 34
Middle: Fig 35
Lower: Fig 36

Externally, the door openings should be accentuated with red light at night.
Internally, the route of the coffee bean continues and winds itself through the building.
In this way, the external verticality of door openings are also accentuated on the inside as the former routing is reused for this new function of a House of Jazz.

Historic Value - Nostalgic Value - Use Value





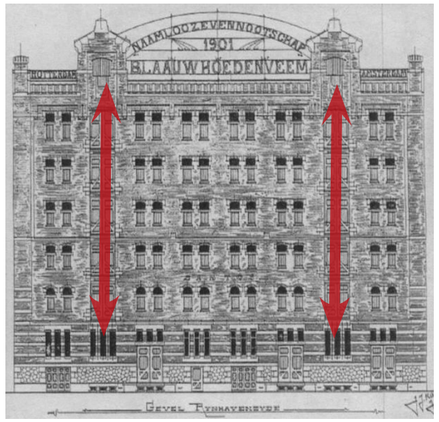




Fig 37: Upper
Fig 38: Left
Fig 39: Right

STORY

The historic supervisor house on level 0 should remain and be part of experiencing the building. Its minor structural issues will be repaired as well as repainted. For Santos House of Jazz it provides a space outside of the Red Velvet Club, where the visitor does not have direct visual contact towards the stage but is a bit more segregated and can still listen to the music.

Art Value - Use Value - Historic Value - Nostalgic Value

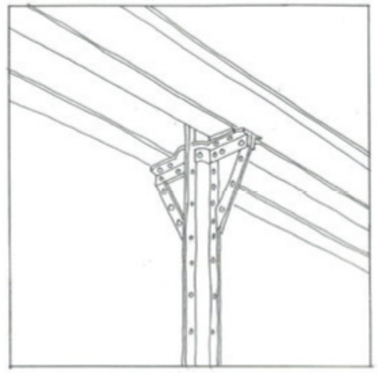




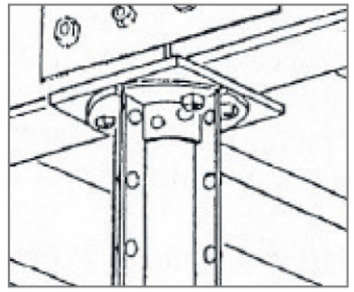
Above: Fig 40
Below: Fig 41

Especially Santos' beautiful craftmanship with its Phoenix Column System should be commemorated, so within the new design it should be retained whereever possible and added spaces should be offset from the existing.

Art Value - Use Value - Historic Value - Nostalgic Value







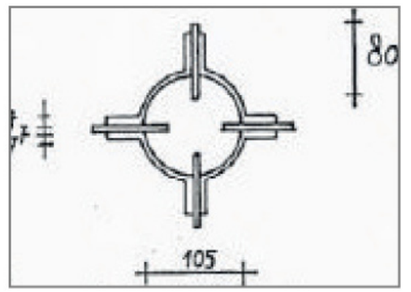
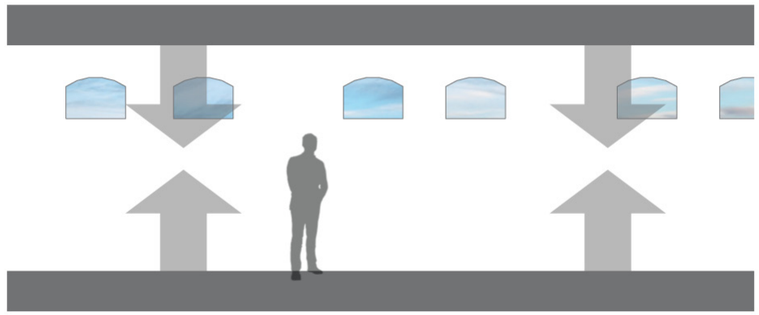


Fig 42: Above
Fig 43: Below

The small windows and low ceilings create an introvert feel. The light is gloomy. Furthermore this quality creates a counterpart to the exterior. (threshhold) When you approach the building from the dok side, there is a lot of light and openness and as soon as you enter it, you get the total opposite - a gloomy and introvert feel. Jazz thrives in introversion and gloom.

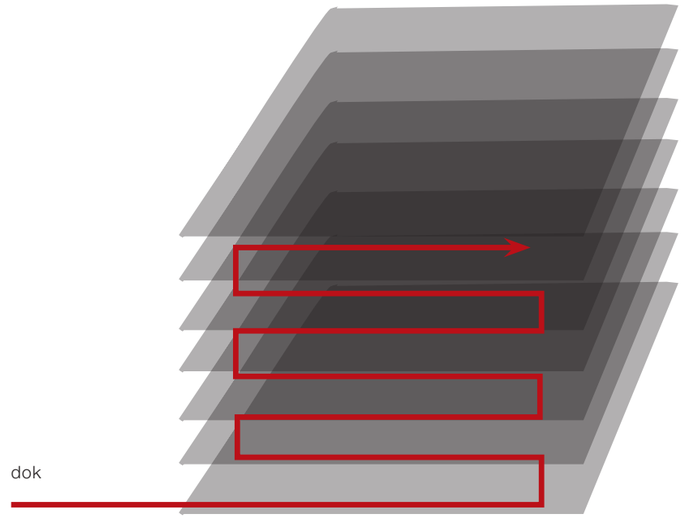
Use Value - Art Value - Nostalgic Value





Before starting with the design, it was very important to find the core essence of Santos itself. The design should reflect this core essence and make sure that it could not be applied anywhere else. In this case, it was very apparent that the repitition of equal levels create a very monotone rhythm and that each level can be seen as one world in itself. Therefore, this revived route from the dok towards Santos winds itself through the building and dives into these different worlds.

Use Value - Art Value - Nostalgic Value

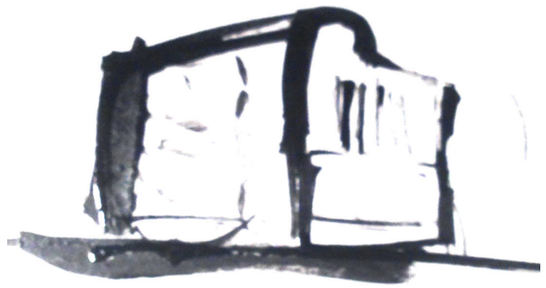


Above: Fig 44
Below: Fig 45

Santos with its prominent and visible location. It was built to have a special position within Rotterdam. There are only a couple of warehouses with these dimensions left from the 19/20th century. In the new design it should retain its original dimensions. Additionally, the Belvedere Verhalenuis was very closed off from the outside, which meant that there was a threshhold between the exterior and interior - two different worlds.
This threshhold becomes apparent within Santos again.

Rarity Value





STORY

Fig 46

Santos has a strong intangible connection to the water and with it comes the potential use of the space in front of it towards the dok. At its current state and within the future masterplan 2020, Santos seems to be a loose entity while its surroundings form a new layer within the urban fabric and do not stand in any connection to the existing. The aim is to wave a stepped landscape between Santos and the waterfront and to integrate it into the new developements, in order to create a place of togetherness. This open space should symbolize the heart of the district, strengthen a new sense of place and commemorate the past by revealing the intangible connection to the water.

Use Value - Nostalgic Value

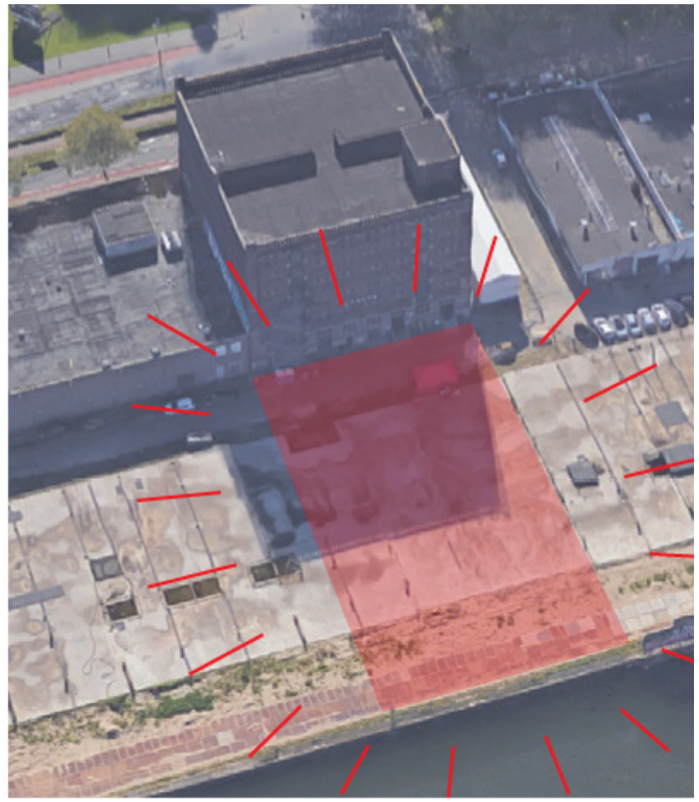


Fig 47

STORY

Santos' South and North facade seem like a carefully planned artwork with an eclectic style and different (window) and (door) elements. Important are the overall rhythm and the monotony of openings, so in the new design changes to the facade can be done as long as the overall rhythmic picture is still identifiable.

Art Value

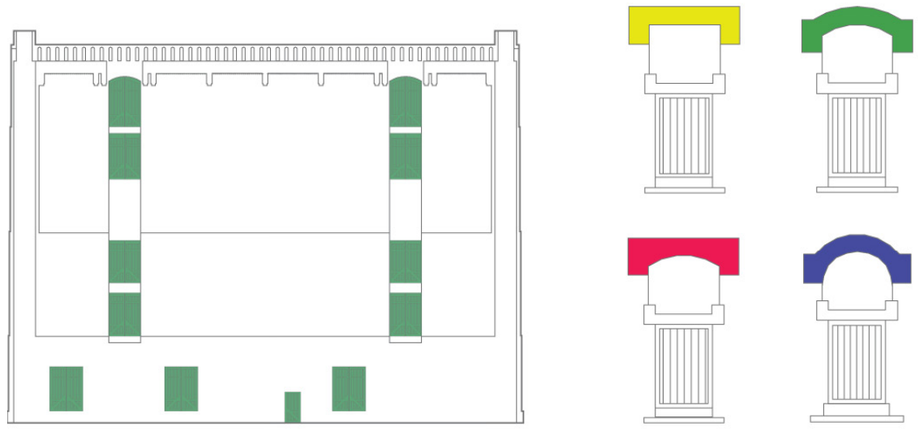
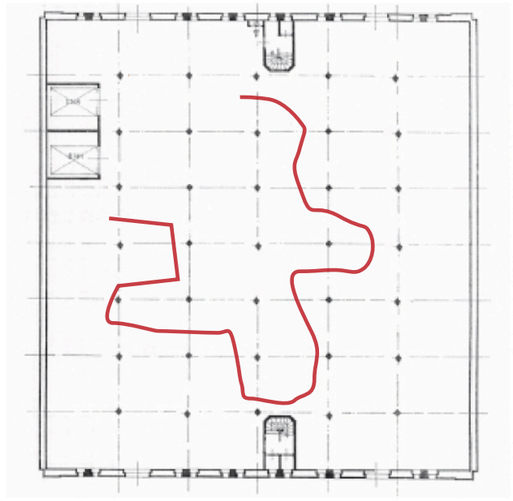


Fig 48

The open space plan gives a lot of freedom in terms of functional distribution, vertical interventions and partitions. It is important to note that the existing open space plan with the rhythm of columns has a very special aura in itself, so whenever possible the aim is to retain this openness and limit the interventions as far as possible.

Use Value - Nostalgic Value



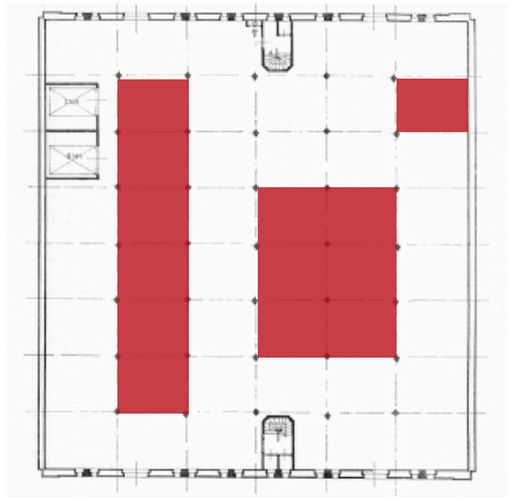


Fig 49

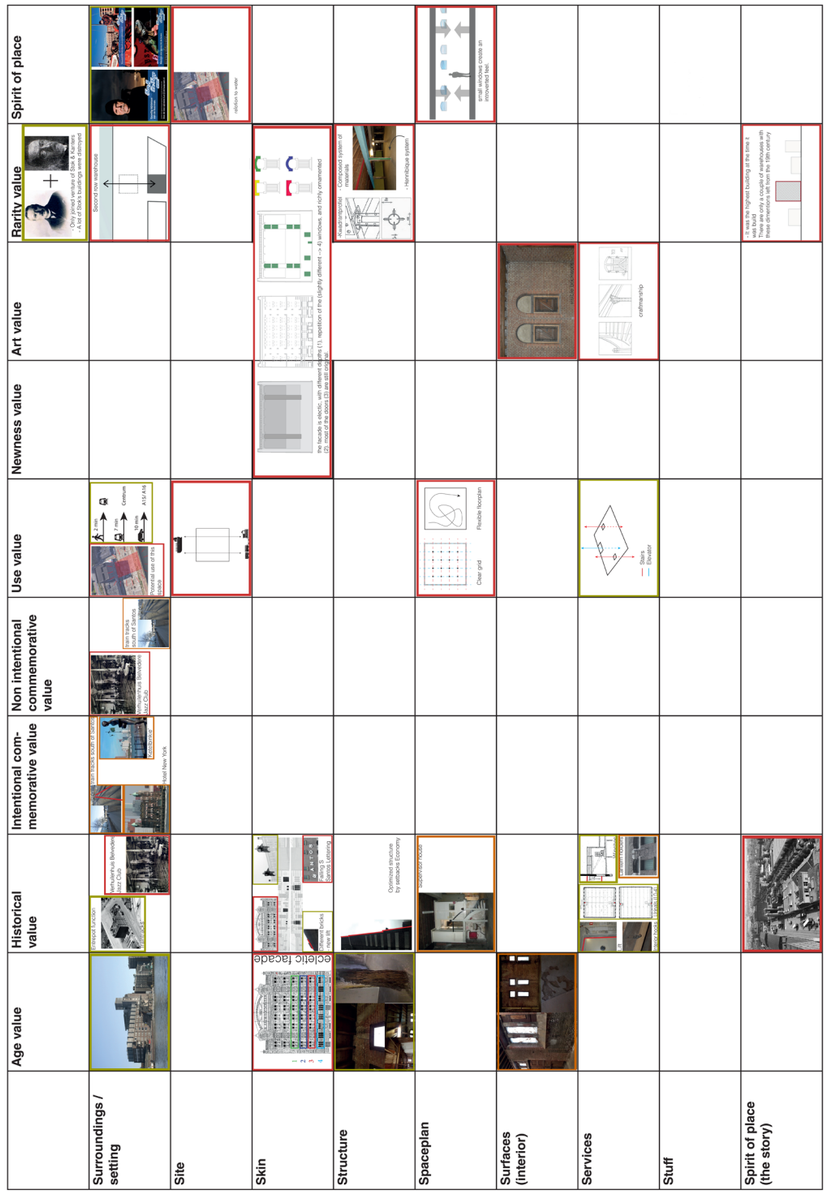
At its current state, there is a water problem in the basement which means that it can not be used.
In the new design, the it will be in use again which means that the water will be gone - but commemorated by the choice of flooring material.

Use Value - Nostalgic Value



Fig 50

The Riegl Brand Matrix offered the opportunity to classify relevant heritage values at various scales. This allowed to create my personal framework of transformation based on a specific combination of highly valued aspects.



THE PROBLEM WITH NOSTALGIA

Jazz in Rotterdam, abandoned in WWII after they've built the biggest theatres in town. All closed down on Dolle Dinsdag, the only place for Jazz during WWII was the Belvedere Verhalenhuis in Katendrecht. Looking back, it was an escape. The only one in Rotterdam during that time. But people were terrified. It was a bitter sweet escape. We romantisize the Jazz in the Belvedere because our brain filters all the bad feelings and memories. That's nostalgia at its best. What we forget is that the people who visited the club were afraid for their lives. Everytime a german soldier came wondering by to check, they needed to change the Jazz to Schlager music. So maybe back then, noone from the outside even knew what was going on inside there. It is sad if you think about it; that Jazz emerged on the verge of the 20th century and Rotterdam was a genuine pioneering city at that time. It thrived with world-class musicians and the number of Jazz records reached record highs. The city built the greatest theatres and dance halls in the 20s. Like the Pschorr, which didn't survive the war. And then all of a sudden, on Dolle Dinsdag, Jazz was banned in the entire city. Except for the Belvedere. The only sense of hope during WWII. But then in the 50s, local Jazz clubs blossomed again. That was the time when clubs opened, such as Dizzy, the Sunshine Jazzbunker and B14. These formed the rich palette of styles for contemporary Jazz. Jazz grew and grew to become a prominent source of inspiration for the Visual Arts, Graphic Design, Fashion, Literature, Dance and even Classical Music. That was when Rotterdam was slowly placed on the international Jazz card again. In retrospection, it can be said that Jazz only barely survived the WWII. It is not something to be taken for granted. It was strong enough to get on its feet and continue. And transform. The history of Jazz has basically always expressed a rebellious strength. Emerging from Black Africans in America who faced racism, discrimination and segregation, they formed a sense of strength in this struggle and found peace in their music. It was their means to communicate and express their anger, grief, compassion and desire for change. Jazz has strived out of pain and crisis, and that is the reason why it still exists. But the 21st century has changed a lot. Jazz as we traditionally know it, is slowly ceasing to exist. That is due to new technologies and pop culture. It is basically not really what young people want to hear any more. So how can Jazz continue in order to survive? Well, Jazz is constantly transforming and so in order to survive the future, it needs to evolve with it. We could be nostalgic about this, and many people are. They are in grief for the times back then. But it is really not about back then any more. It is about what is to come. A nostalgia in anticipation. If you think about it; Jazz has always arisen from pain and anger - and has always succeeded.
This is enough reassurance that it has all it needs to survive, and transform into something even stronger, despite of technology and new arising forms of art, music and expression.
So what is the future of Jazz? Instead of holding onto to the past, it should connect and go with the flow of technology, cross-pollinate with other kinds of music and most importantly - always allow for creativity, spontaneity, experimentation and togetherness.
How could all these things happen in Santos? Santos should facilitate spaces that encourage exactly that. Spaces of encounter, appropriation and expression in form of art, dance, music, gastronomy, etc. Jazz is more than just the music, the food and the expression. It is an experience, and so Santos itself should be an experience as well. And while this nostalgia for the future gives hope and strength, there is also the unknown that comes with it. In the end, the future can never be foreseen, so what we should do is fully embrace Jazz with all these new opportunities and connections, but also accept the fact that things might go in other unforseen directions. And that is cool. One thing is for sure; it is a journey of discovery and making more powerful memories. And so this experience within Santos is also a journey of the unexpected. While you experience it, you stumble across things that are unexpected or that surprise you, which also in a way serves as your motor or your fuel to continue your journey in Santos.

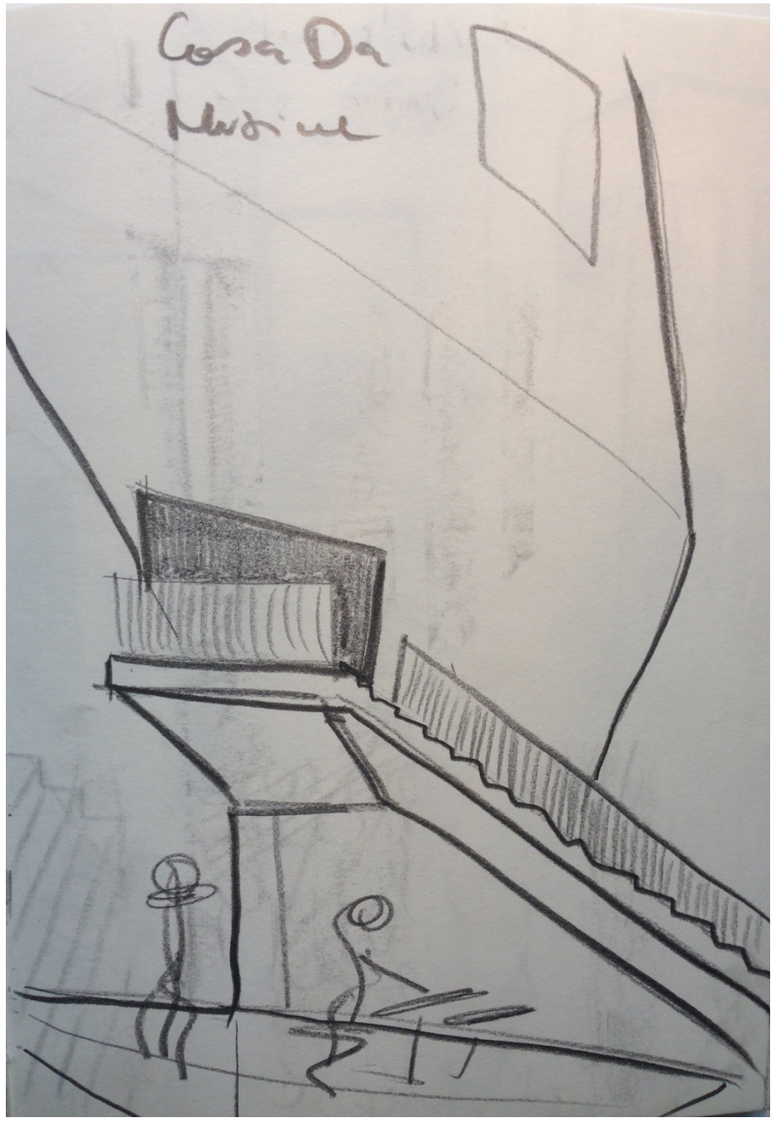
Coimbra, Portugal, Summer 2017
Jazz Techno Festival on the streets



HOW CAN THIS NOSTALGIA FOR KATENDRECHT'S PAST BE TRANSLATED INTO A NOSTALGIA FOR THE FUTURE AND TURN SANTOS INTO A PLACE THAT OPENS NEW PERSPECTIVES AND INSPIRES WITH NEW THOUGHTS?

STORY

Porto, Portugal, Summer 2017
Jazz concert under the entrance of Casa Da Musica, OMA

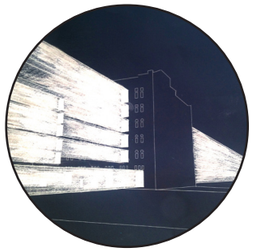




FASCINATION



STORY



EXPLORATION

Themes

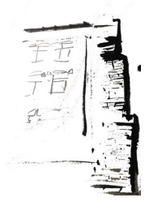
TRANSFORMATION

The framework of transformation is based on three aspects:

1. My first on-site impression: *How can Santos become part of its surroundings?*

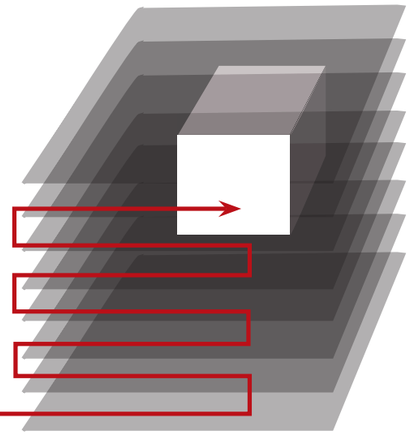
2. Indication of Cultural Values: Santos was built with very unique dimensions and should retain its shape.

3. The building's essence: The repitition of equal levels provides a certain rhythm that invites to be interrupted by a counterpoint, in order to cherish this repitition and the counterpoint even more.
This intervention breaks up the tight dark atmosphere and makes the internal experience lighter.





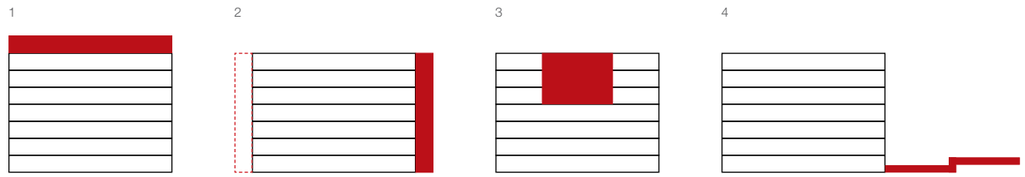
'When a musical piece is too simple we tend not to like it, finding it trivial. When it is too complex, we tend not to like it, finding it unpredictable – we don't perceive it to be grounded in anything familiar. Music, or any art form for that matter, has to strike the right balance between simplicity and complexity for us to like it.' [Levitin, 2006]



Building Intervention:
Counterpoint from Level3-5

Urban Intervention:
Open plaza connecting Santos with the dok

Framework of Transformation



Initital ideas of transformation

EMOTION IN ARCHITECTURE

I feel an emotional distance in contemporary architecture due to the fact that many buildings seem to base only on aesthetic and functional criteria, rather than stories and resonant backgrounds. Just like a piece of music or a book, I think that architecture should still strive to move us and touch our heart and soul. Architecture is about emotion and about telling a story that deeply resonates within us and provokes our imagination. Architecture, specifically heritage architecture should strive to move us in such a visceral way that we experience and keep strong memories about it.

Nostalgia Santos
Reviving past elements and stories

Nostalgia Jazz
Reviving past elements and stories

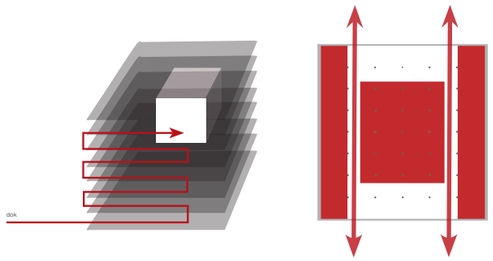
Transformation

Reinterpretation

STORY

ROUTE

Revival of the journey of a coffee bean, where the visitor gets to experience a route from the dok towards Santos and winds through the building.



LIGHT

Light as the primary sensorial stimulus and metaphysical spatial driver to create spaces and desired atmospheres.

Natural Light

Artificial Light

SANTOS House of Jazz

This 'nostalgia for the future' runs through all scale levels, from program choice, program definition to technology and materiality, meaning that architecture, building technology and the cultural value should be interwined in such a way that they complement each other and form one coherent whole. It is always about taking what exists, transforming it and pushing innovation - in order to 'survive' the future and not getting caught up in the past.

EXPLORATION

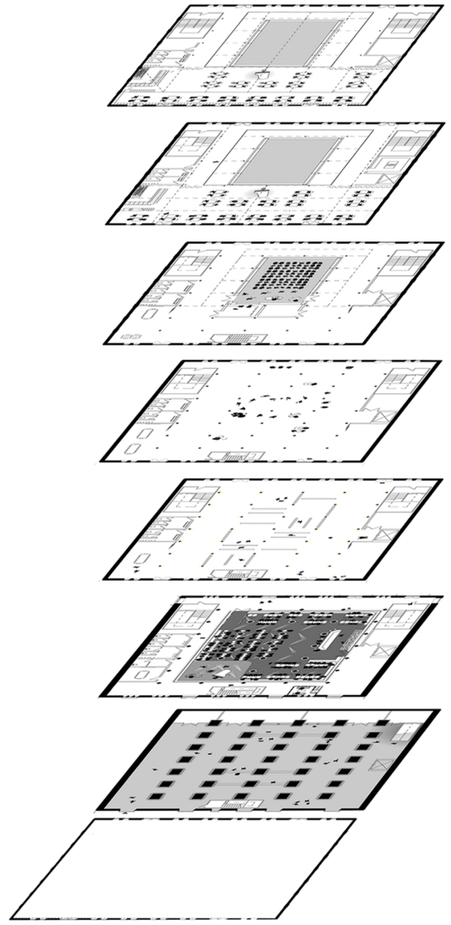
SANTOS HOUSE OF JAZZ

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EXPLORATION

PROGRAM

Santos offers serveral places of encounter that encourage people to communicate with each other, may that be through music, dance, food, art etc. Nobody knows what Jazz will and can become in the future, but to offer informal and formal spaces that encourage appropriation, experimentation and a wide range of activities makes sure that Jazz can unfold and evolve.



Food
Music

Piano Restaurant

Flexibility

Dance
Music

Explore Lab

Flexibility

Music

Improv Level

Flexibility

Art

Expo Level

Music

Red Velvet Club

Sound

Prelude

Flexibility

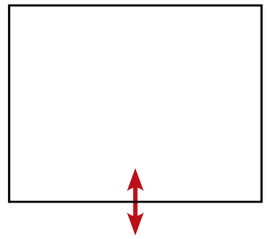
Open Air Stage

EXPLORATION

THEORETICAL FRAMEWORK

In your journey through Santos, you stumble upon things that are unexpected or even surprise you. The core strategy here is to play with the visitor's expectation in order to spark his/her curiosity, which serves as a motor to continue. It is also important to note that Santos House of Jazz is multifaceted, in a way that you experience it differently evertime you go there. Your experience depends on the time of the day, with ever-changing light & shadow plays, different activities and therefore a changing internal ambience, and the routing that you decide to choose.

Threshhold



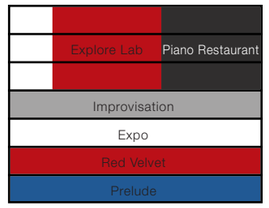
Threshhold inside-outside
Light-Gloom



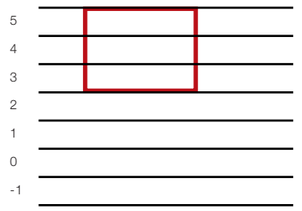


Our experience of an architectural space is strongly influenced by how we arrive in it. In most of cases, it is assumed that the main entrance is in the middle of the facade, wheras in this case it is the smaller portal on the furthest left.

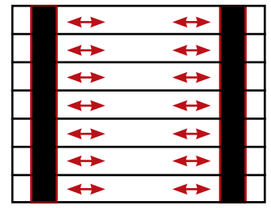
Space



Each Level represents a different story.

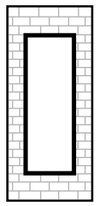


Any aesthetic quality is enhanced by a counterpoint. The regularity of low gloomy levels is interrupted by the high bright Explore Lab.

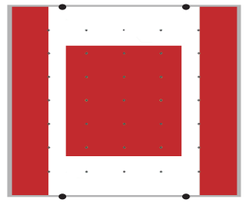


Enclosed staircases without windows make the visitor anticipate what awaits him in the next level.

Detail



Closing off the historic brick walls with insulation but leaving fragments of it exposed increases the visitor's appreciation for the existing.



The existing brickwall with a historic window are exposed four times per levels, in a way that they form the main focal points in the axis of how the goods were stored.

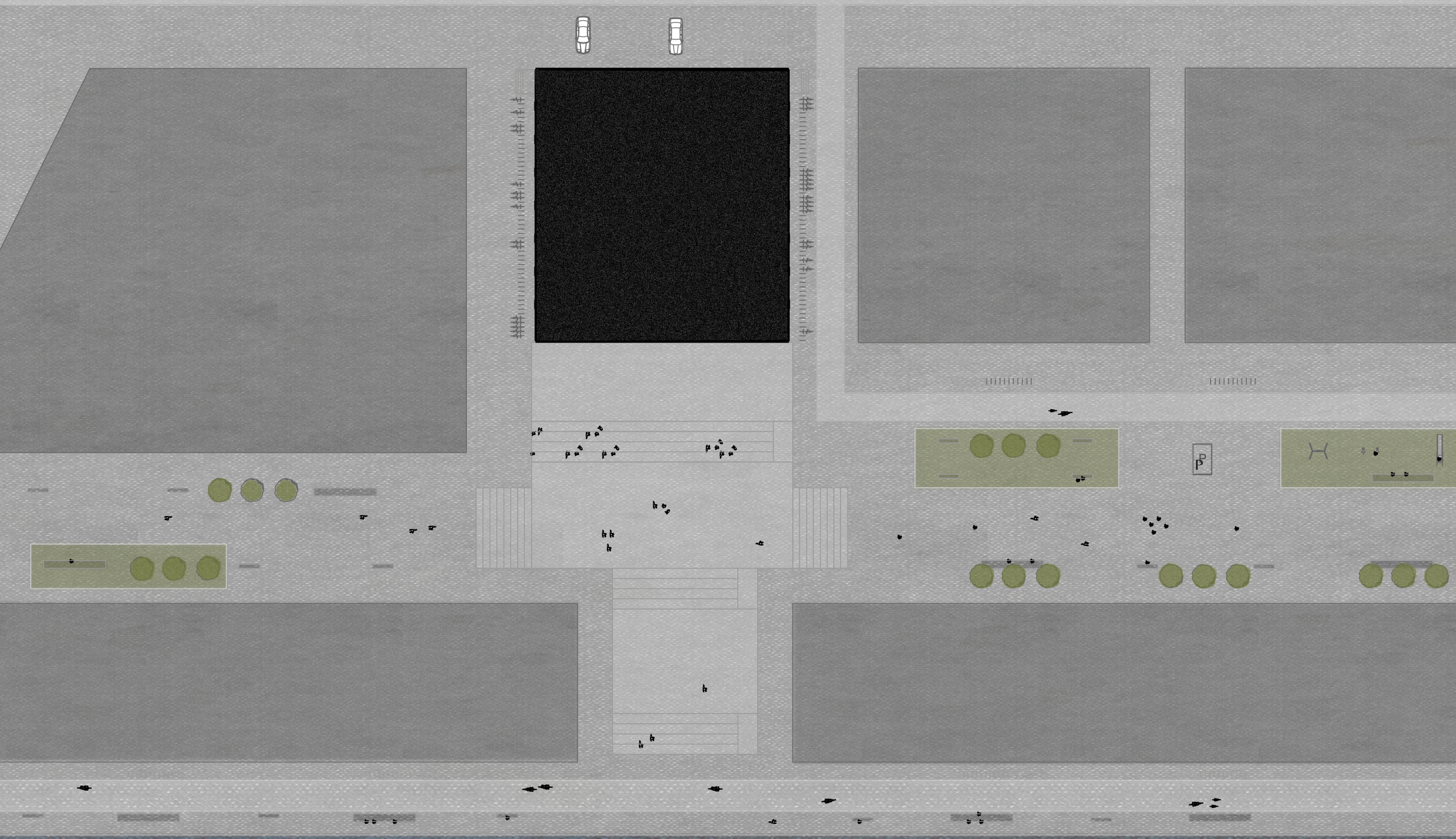
Light/ing
Activity

Due to the many different performances during the day and night, flexible floorplans and the everchanging incoming sunlight, the spaces itself are experienced differently throughout the day. So visiting Santos during the day may feel completely different than during the evening/night.

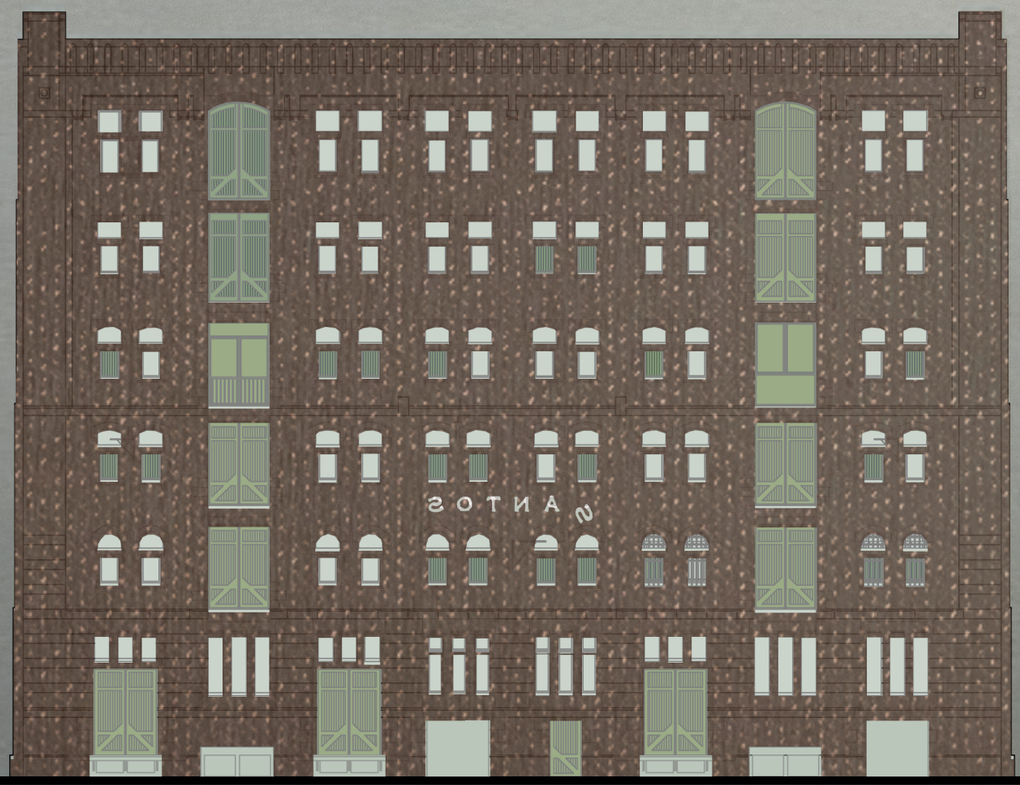
EXPLORATION

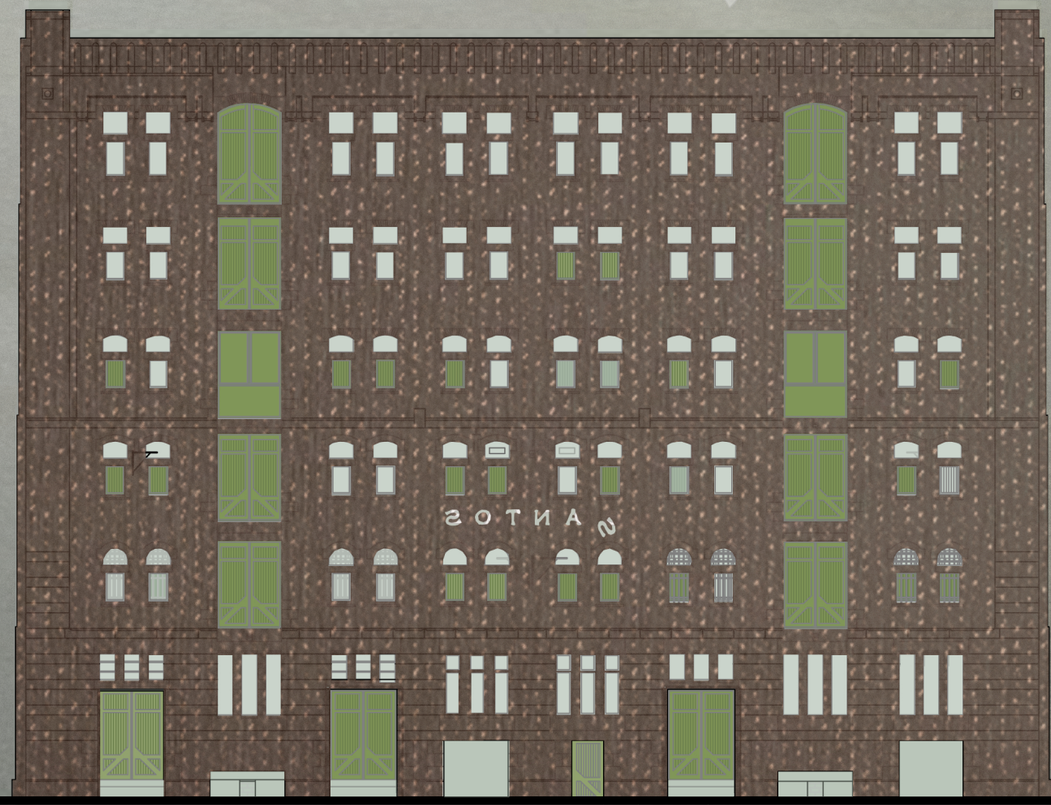
Level	m2/Function		m2 new	m2 old
Level -1 (Prelude)	Lift 10m2 Storage 80 m2 Machine Room 50 m2	Wardrobe 46 m2 Tickets 58 m2	1070 m2	1070 m2
Level 0 (Red Velvet Club)	Lift 10m2 Toilets 40 m2 Staff Toilet 13 m2	Storage 30 m2 Backstage 40 m2 Red Velvet Club 480 m2	Staff Area 30 m2	1070 m2
Level 1 (Expo Level)	Lift 10m2 Toilets 40 m2 Management 60 m2	Storage 30 m2 Multi Flex Room 60 m2 Expo Space 740 m2	1070 m2	1070 m2
Level 2 (Improv Level)	Lift 10m2 Toilets 40 m2 Management 60 m2	Storage 30 m2 Multi Flex 60 m2 Improv Space 740 m2	1070 m2	1070 m2
Level 3 (Explore Lab)	Lift 10m2 Toilets 40 m2 Management 60 m2	Storage 30m2 Practice 60 m2 Explore Lab 150 m2	Recording 20m2 Backstage 20 m2	1070 m2	1070 m2
Level 4 (Piano Restaurant)	Lift 10m2 Toilets 40 m2 Storage 30 m2	Kitchen 27 m2 Piano Restaurant 420 m2	920 m2	1070 m2
Level 5 (Piano Restaurant)	Management 30 m2 Toilets 40 m2 Piano Restaurant 115 m2	Management 50 m2	920 m2	1070 m2
			Σ= 7190 m2	Σ= 7490 m2

m2	Function	Est.People Max
Stage 465 + Visitors 3200	Open Plaza	14400
480	Red Velvet Club	140
740	Expo Level	200
740	Improv Level	200
150	Explore Lab	90
535	Piano Restaurant	100
		Σ= 15130

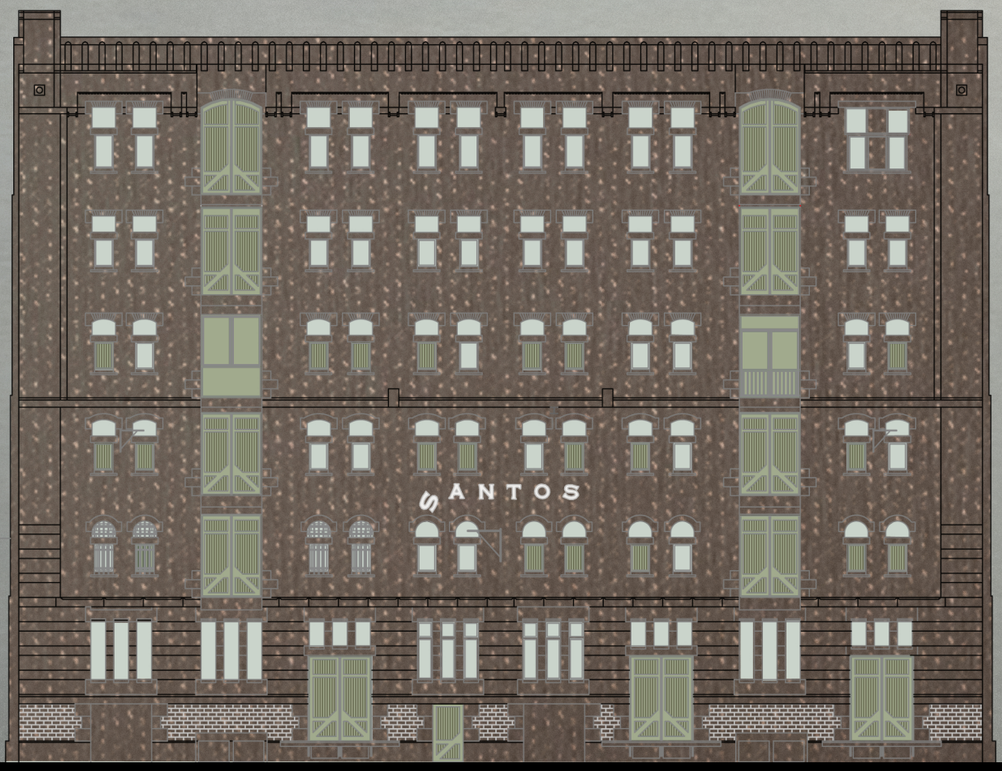


Masterplan





Back Elevation Old-New





Front Elevation Old-New

HOW DOES SANTOS ATTRACT PEOPLE?

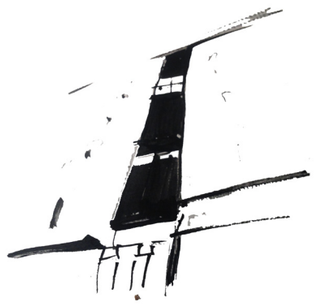
1 - Crown: Commemoration of the former crown
The former crown is commemorated with a new ‘crown’, the Santos lettering with the typical hanging S.

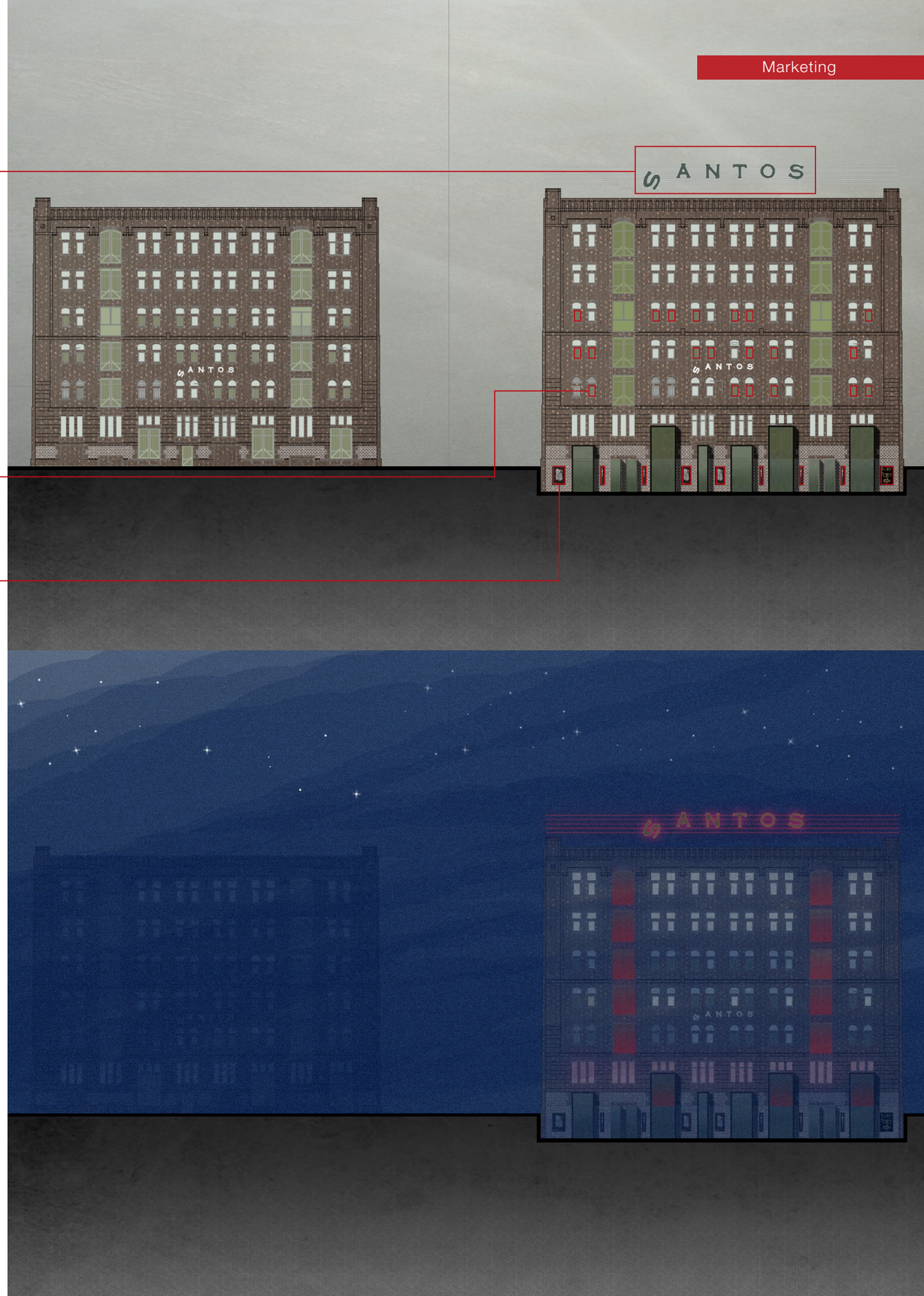


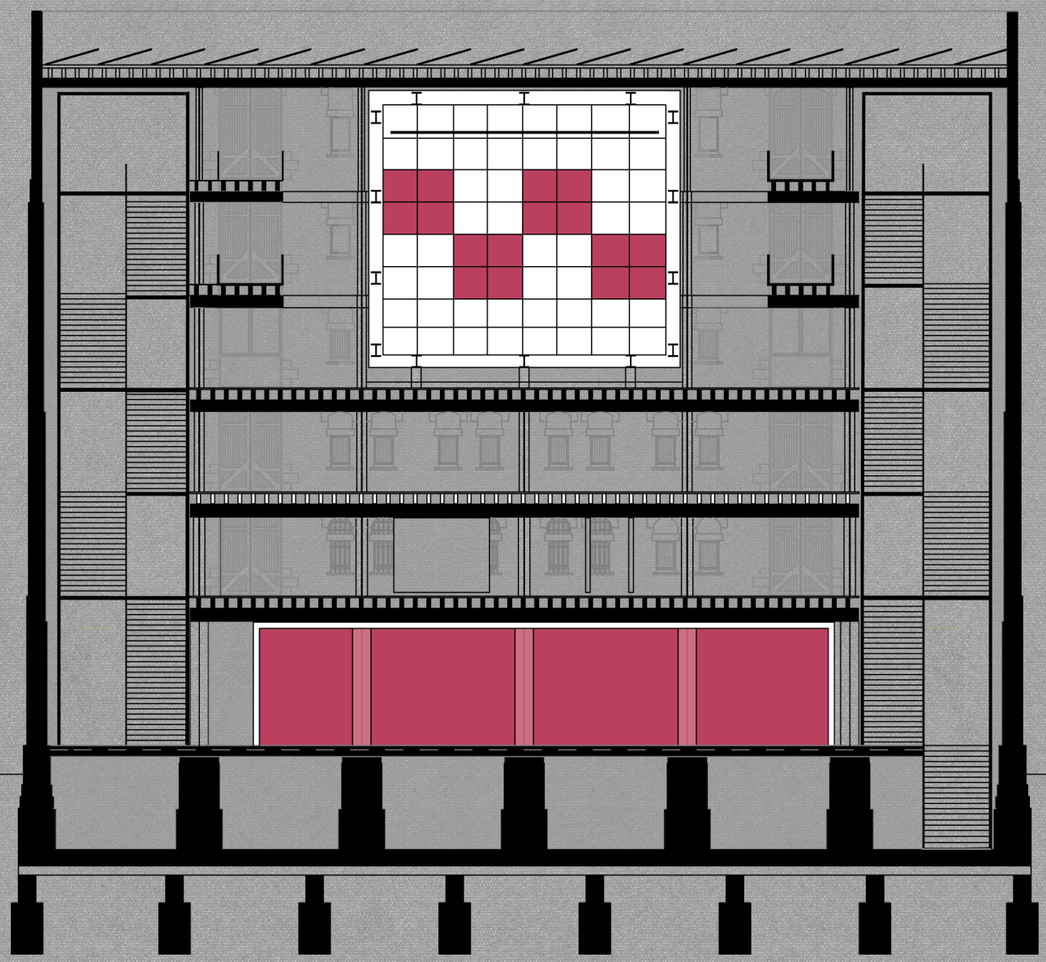
2- Repair measures on existing door and window frames, meaning a repair, repaint and consolidation on the existing green frames that ultimatley create friendly and cheerful play in the facade.

3 - Plinth: The ‘new’ old plinth provides advertisement panels made of black brushed steel, like the portals, where Santos’ latest news and events can be displayed and where people can advertise any music related topic.

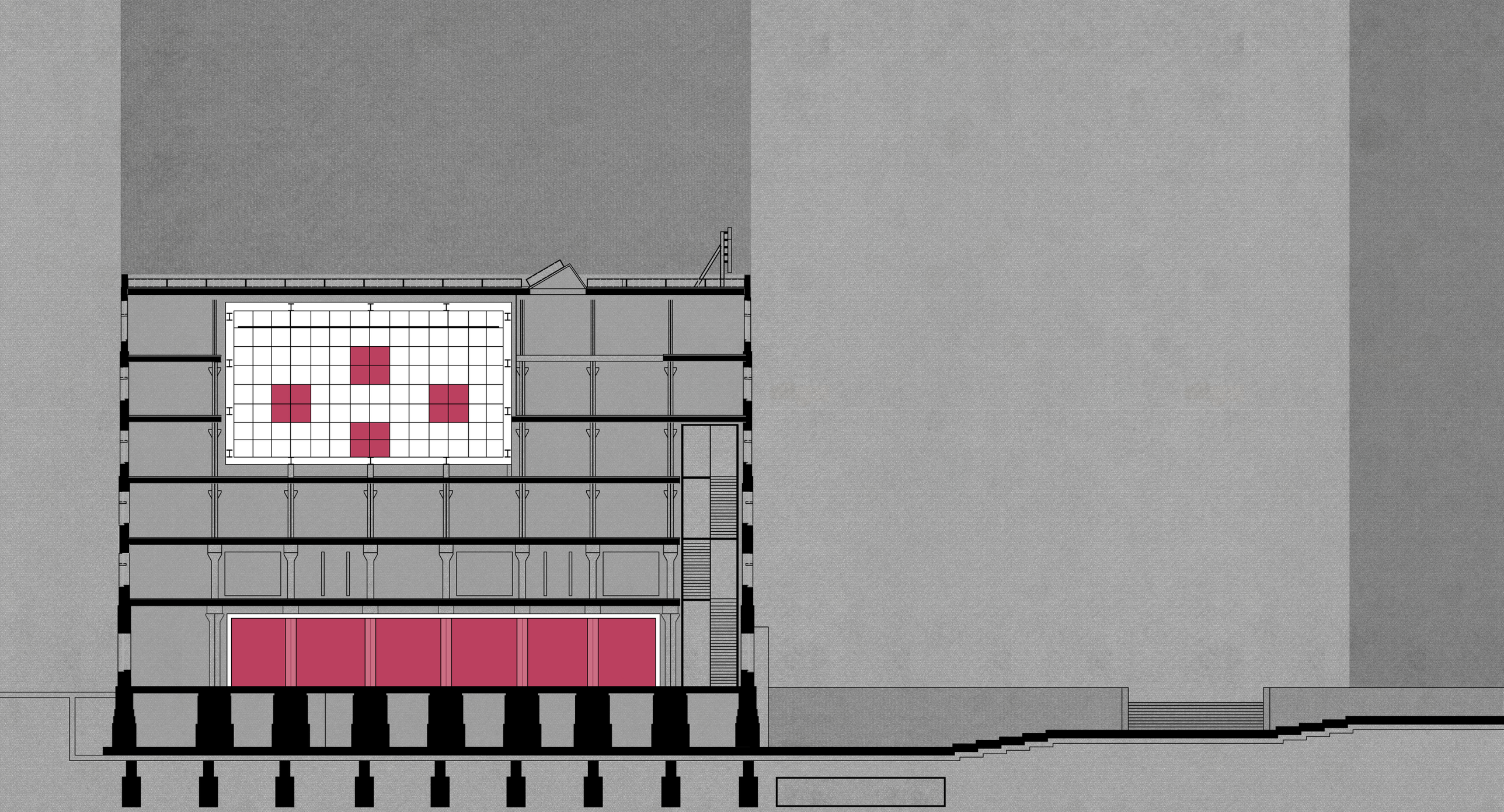
4 -During the nightime the verticality of door openings is accentuated with red lights.



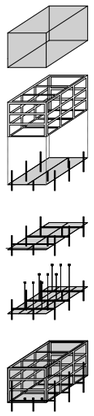


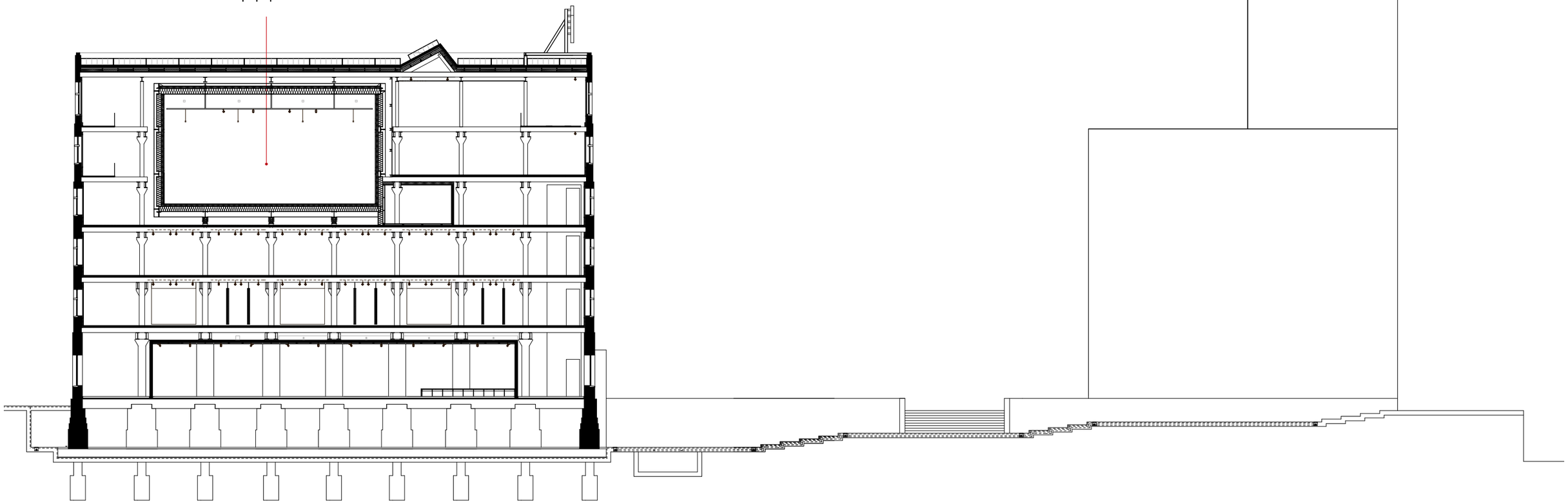


ObjEducationalVersion



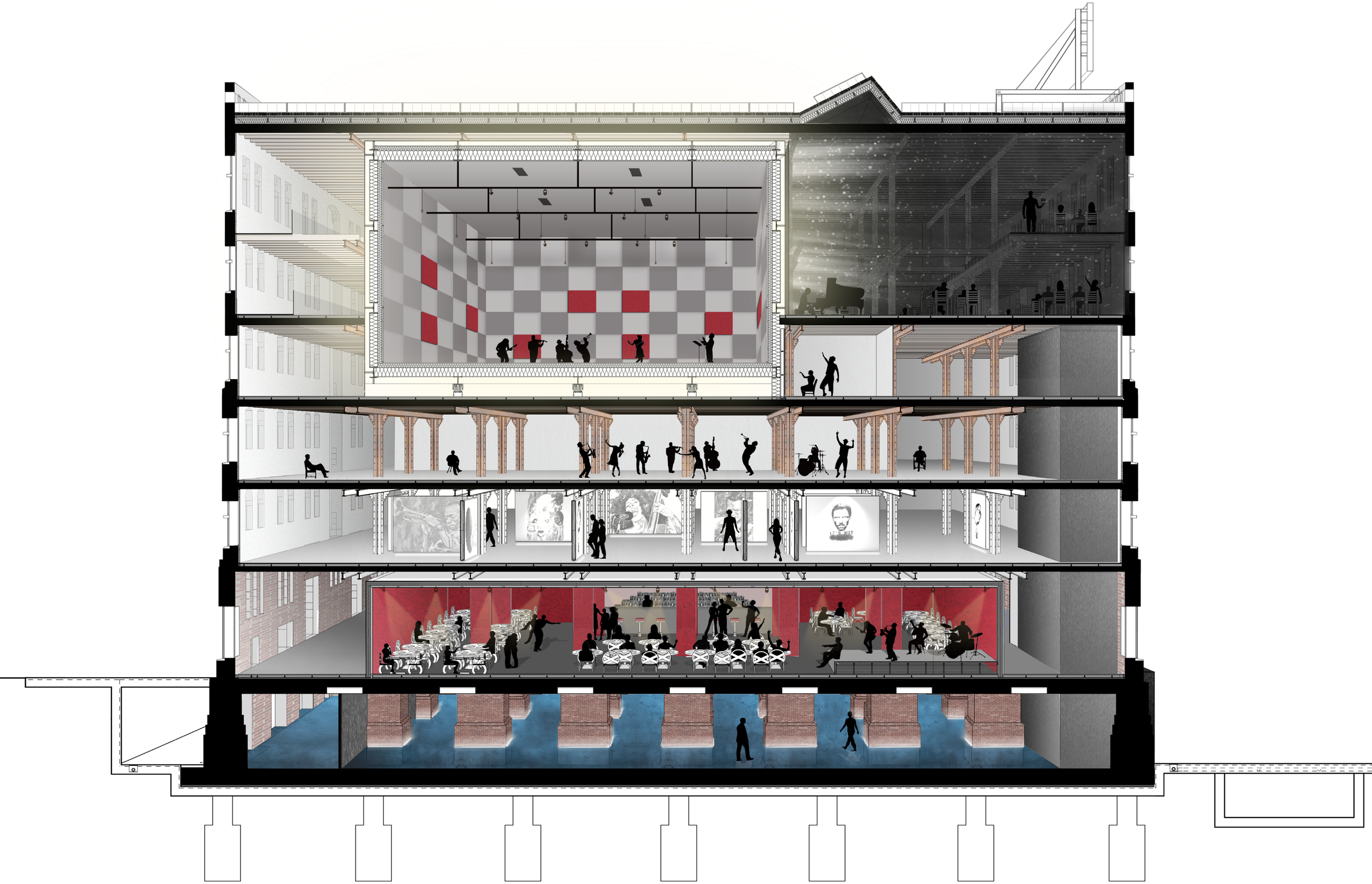
Longitudinal Section





ARCHICAD EDUCATION VERSION

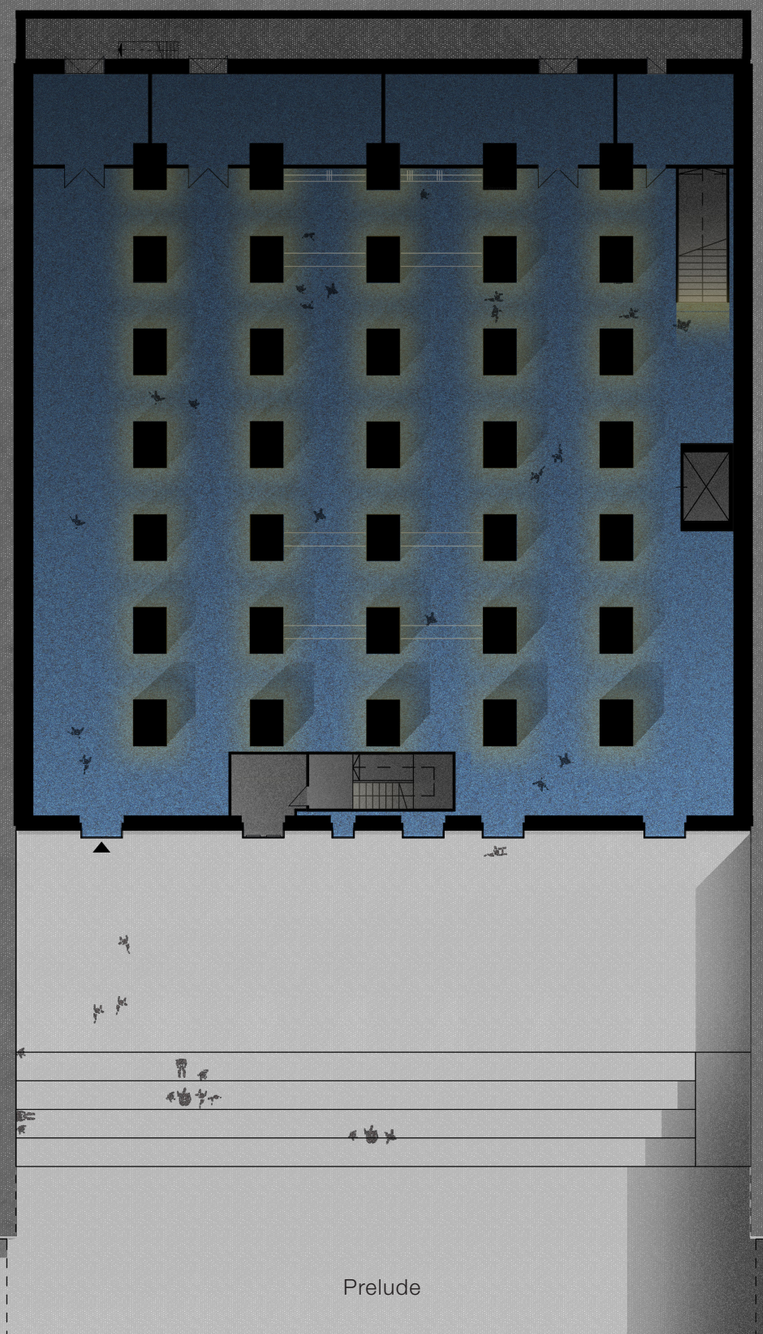
Longitudinal Section 1:50



ARCHITAB EDUCATIONAL VERSION

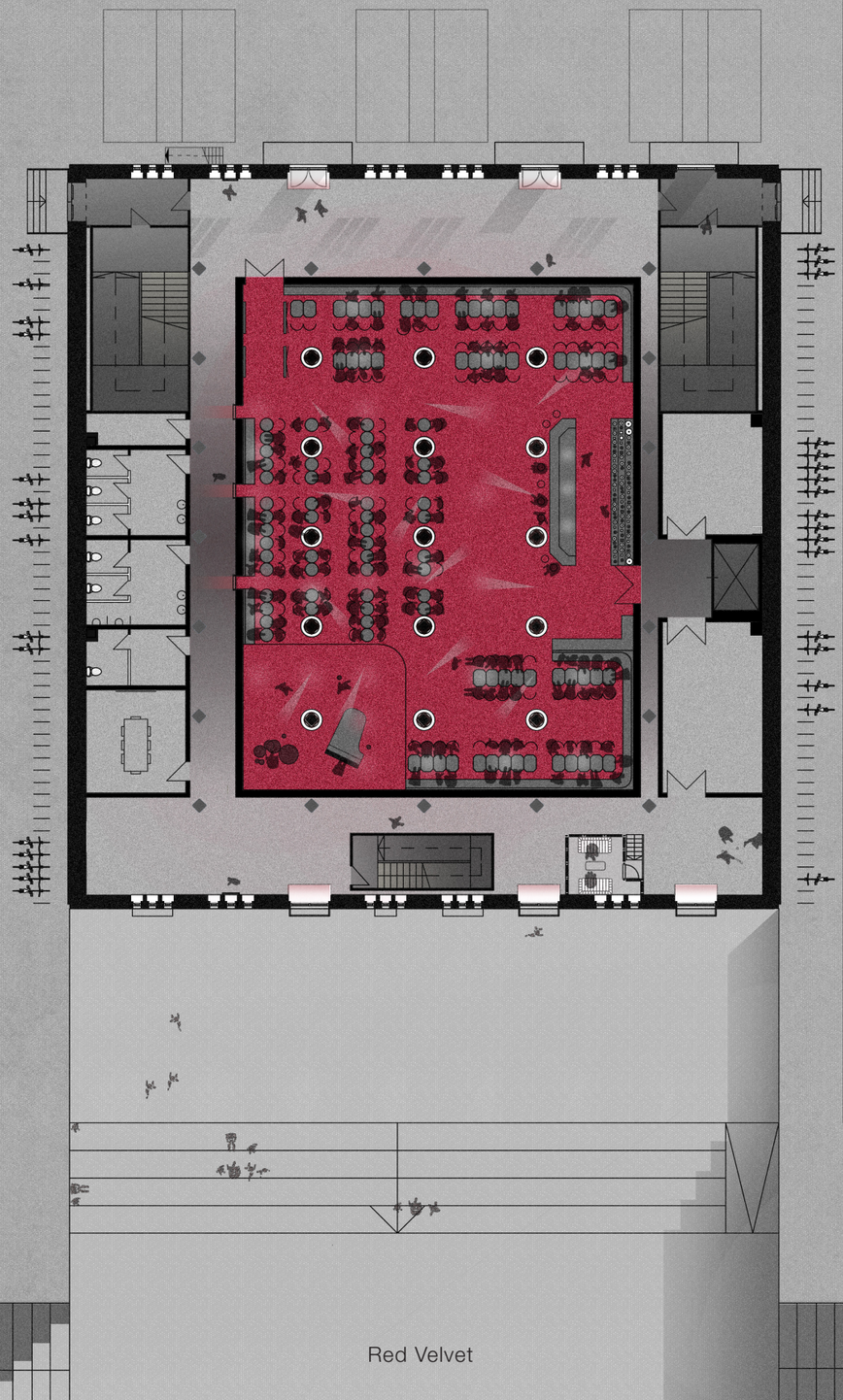
Level -1

1:200



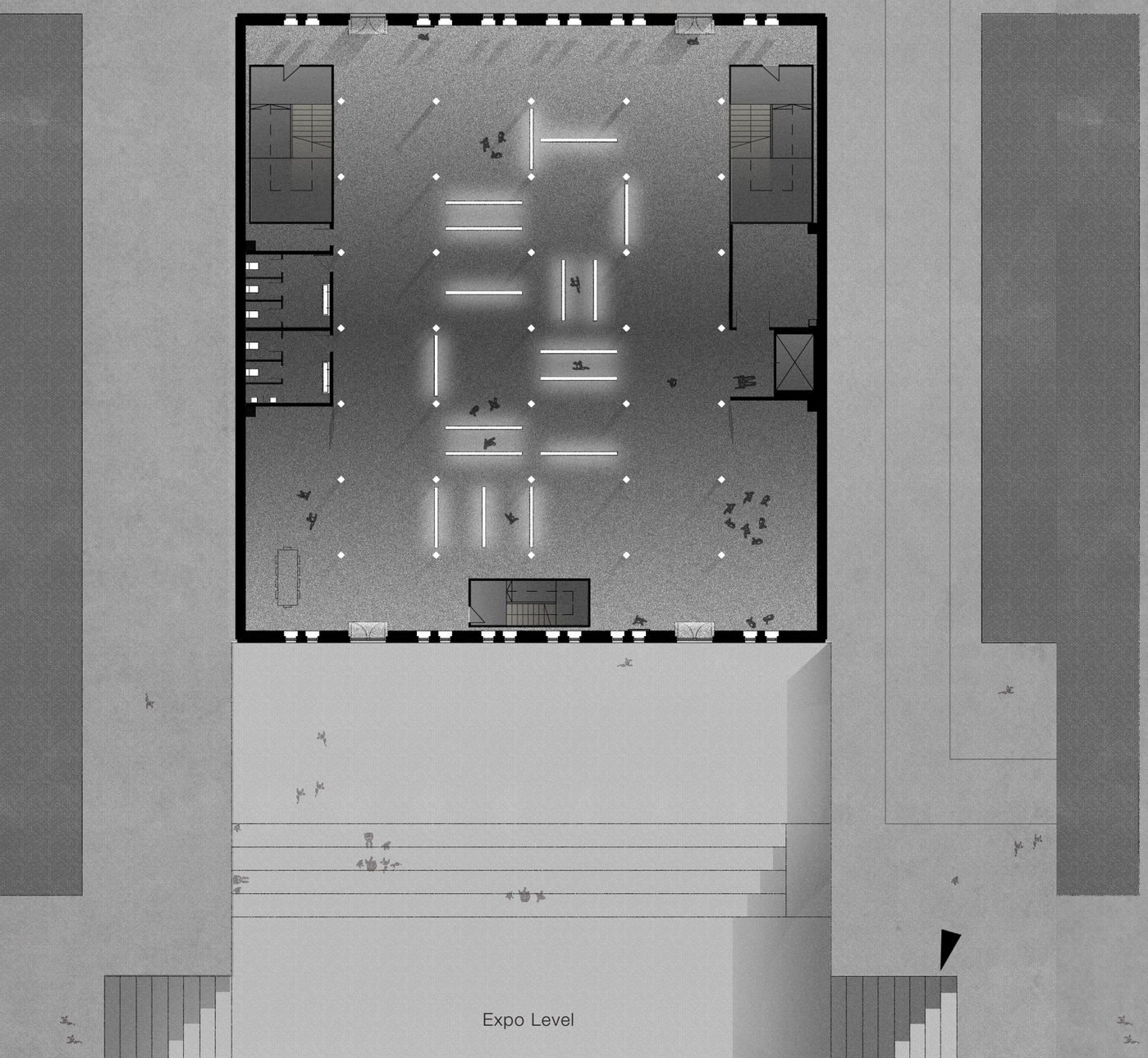
Level 0

1:200



Level 1

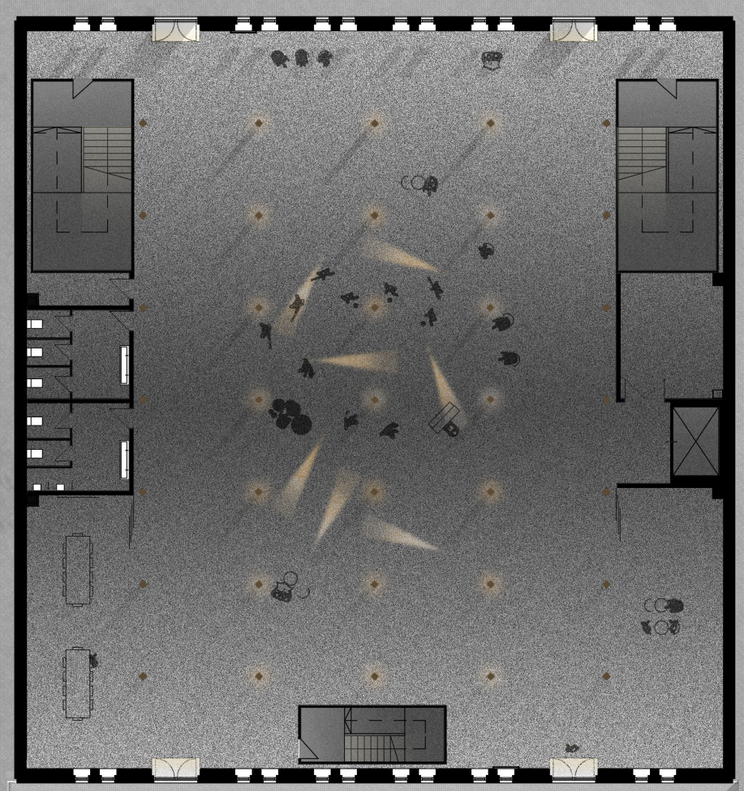
1:200



Expo Level

Level 2

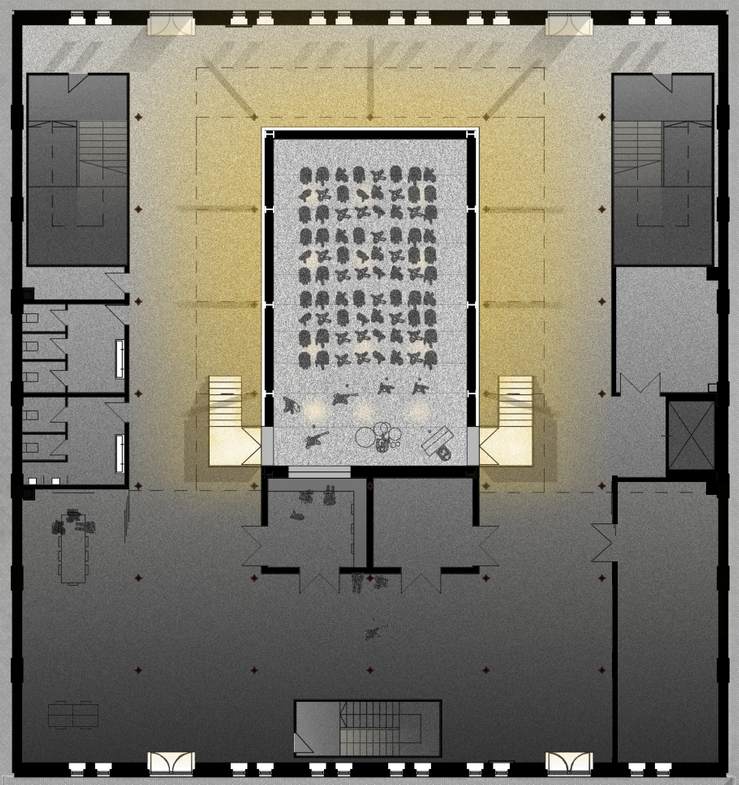
1:200



Improv Level

Level 3

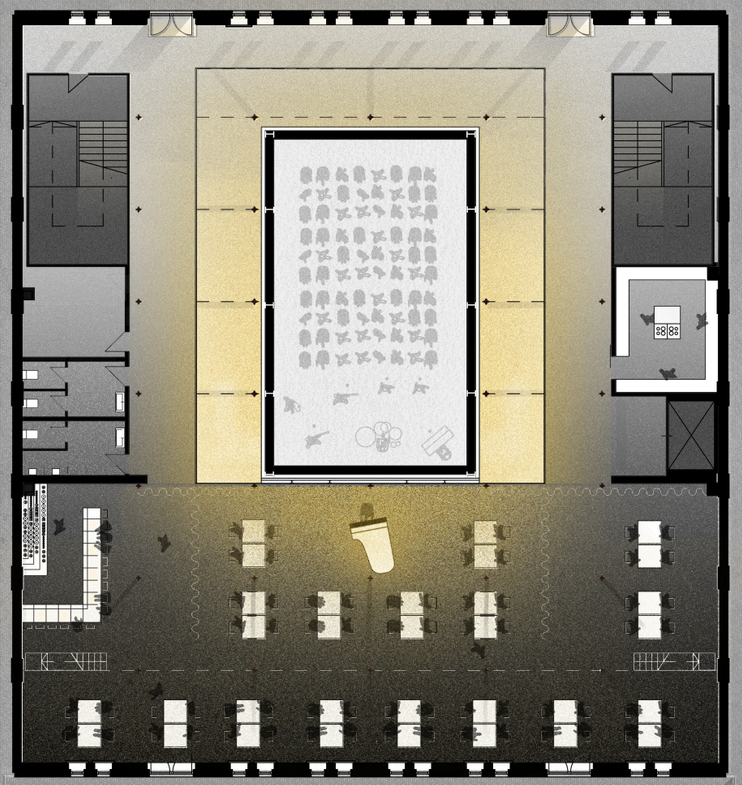
1:200



Explore Lab

Level 4

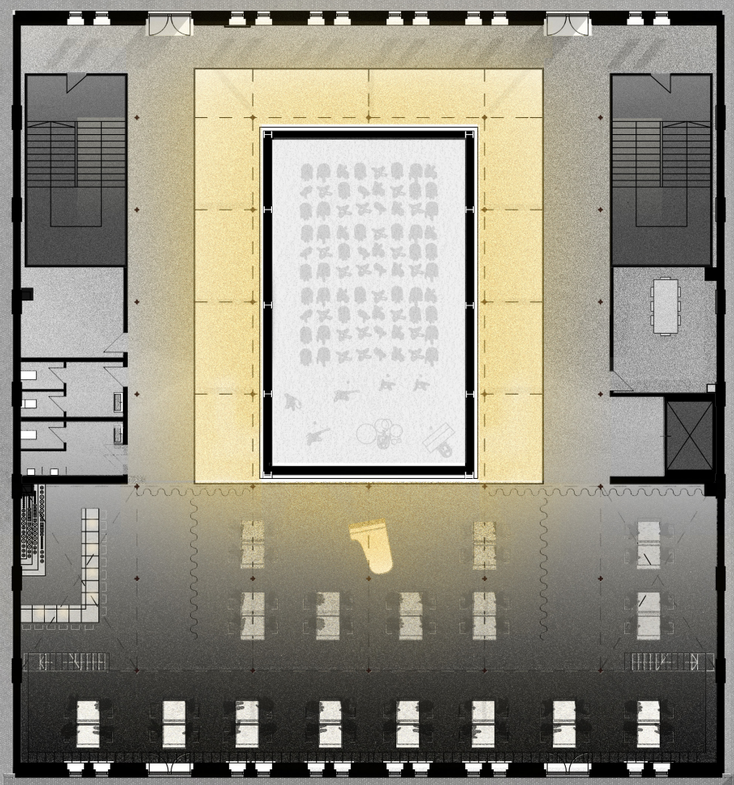
1:200



Piano Restaurant

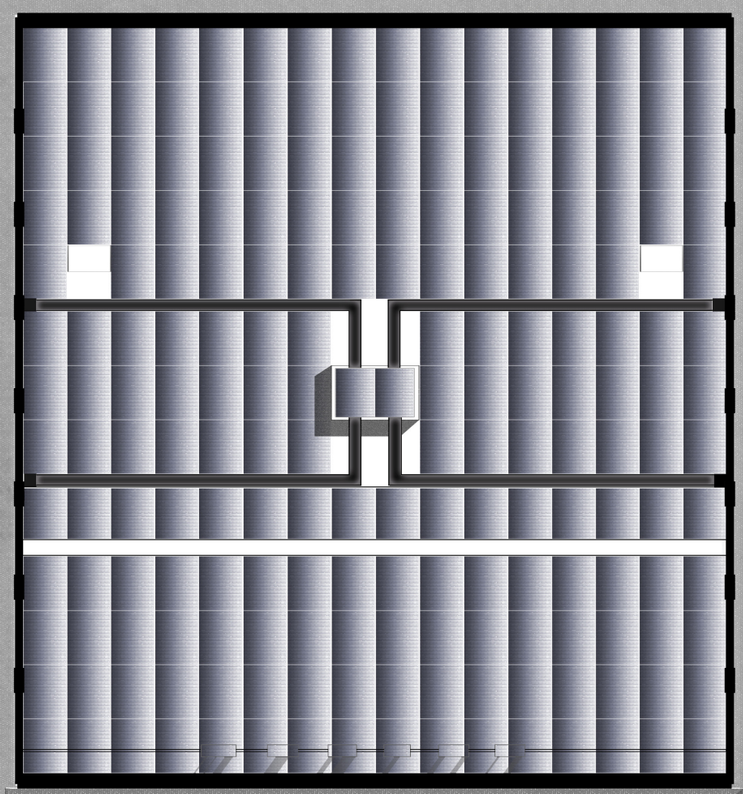
Level 5

1:200



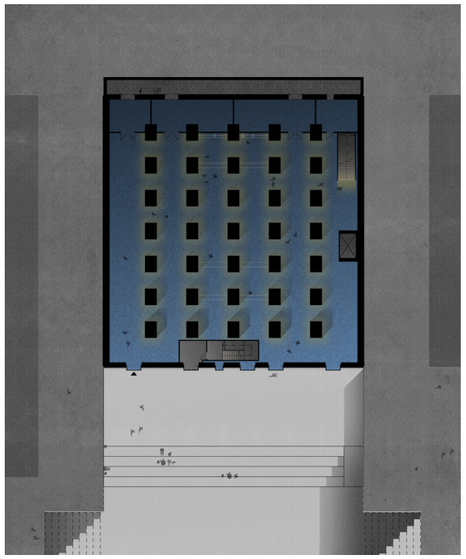
Roof Level

1:200

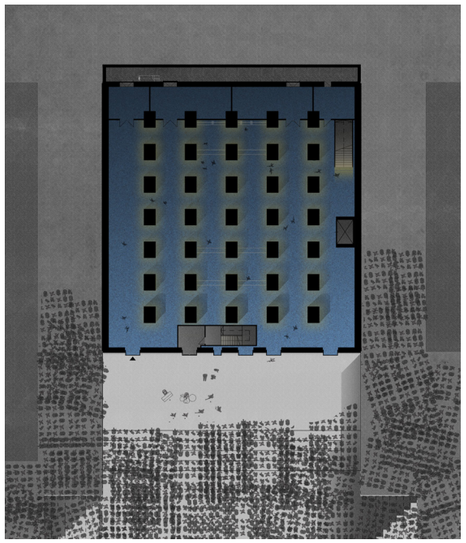


SANTOS AS A PLACE OF APPROPRIATION

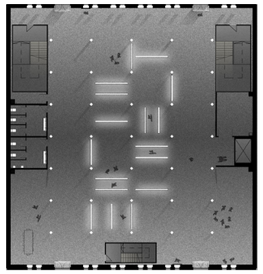
Mostly all given floorplans offer space for flexibility and appropriation and can therefore be used and transformed for several different activities.



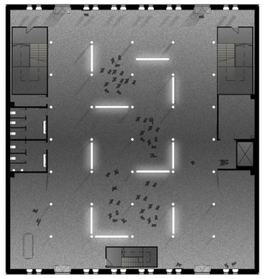
Level -1: Regular Mode



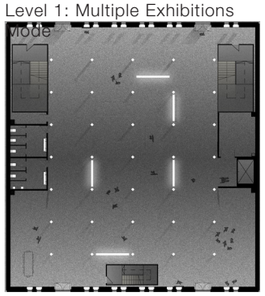
Level -1: Festival Mode



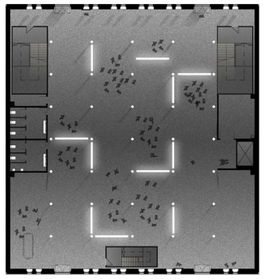
Level 1: Regular Exhibition Mode



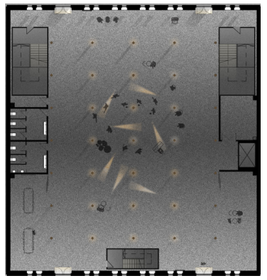
Level 1: Multiple Exhibitions



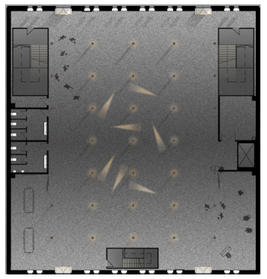
Level 1: Workshop Mode



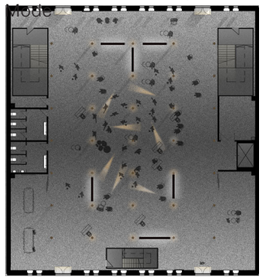
Level 1: Rebel Mode



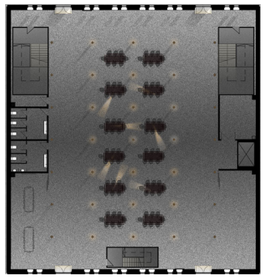
Level 2: Open Improv Mode



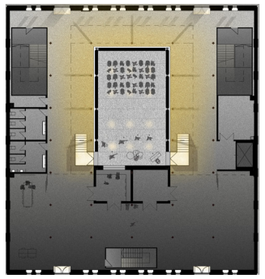
Level 2: Separated Improv



Level 2: Event Mode



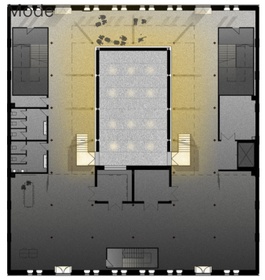
Level 2: Workshop Mode



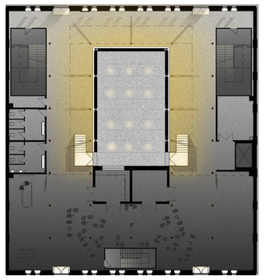
Level 3: Open Improv Mode



Level 3: Regular Recording



Level 3: Appropriation Mode

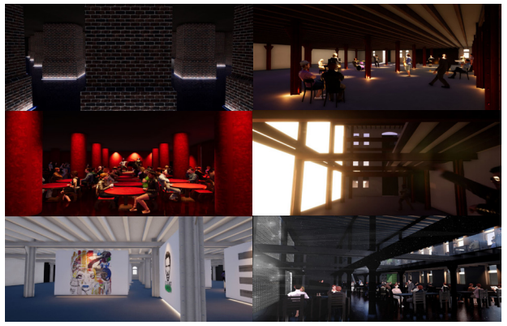


Level 3: Appropriation Mode

MULTISENSORY MATERIALITY

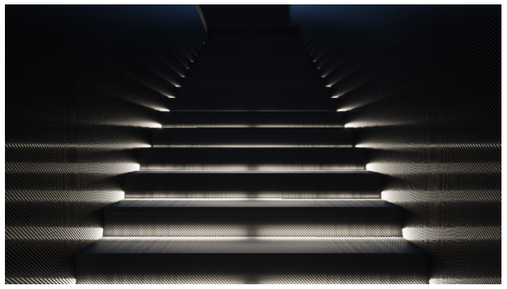
The materials for the redesign of Santos are specifically chosen to awaken the visitor's senses, guide him/her through the building and enhance the nature of light at its best.

Stories



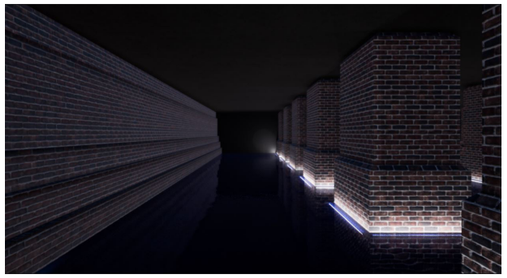
Each Level represents a different story which means that the colors of materials also differ from floor to floor.

The Unexpected



In order to make the visitor anticipate less what level comes next, the black enclosed aluminium staircases form a transition between each level and neutralize the experience.

History



In the Prelude, the entrance level, the visitor steps into the building and has the feeling of walking on water.
The dark blue polished concrete reminds of the former water that was there before.

Acoustics



The perforated metals in the Piano Restaurant serve as separation, light emitter and acoustic reflector.

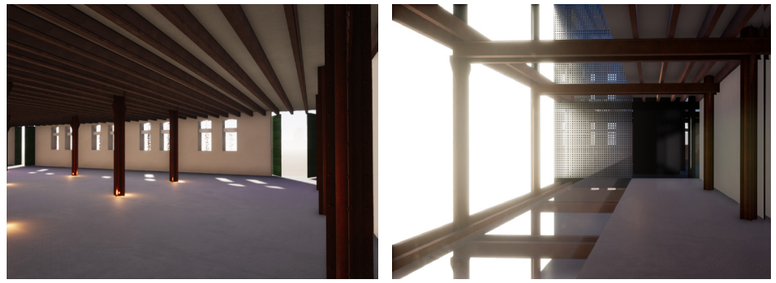
The enclosed staircases serve to keep out any sound in order to let the visitor just be with himself and his footsteps.

Sound



The flooring material differs from level to level in order to let the sound of footsteps indicate the activity. In Level -1 & 2 the polished concrete acts as a formal experience whereas from Level 1-4 the cement boards create a more informal one. In the Piano Restaurant, the attic, the black tiles break the pattern again & turn it into a formal space.

Light



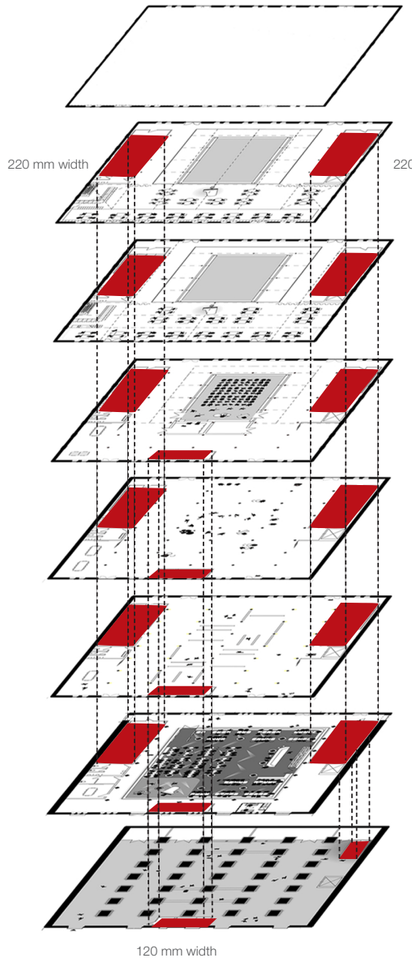
The grey cement board flooring and the rough white interior walls are chosen in grey and white to reflect as much light as possible. The translucent polycarbonate sheeting of the Explore Lab serves to enhance the Led Lighting behind it and create the glowy atmosphere.

HOW DOES SANTOS KEEP ITS PEOPLE SAFE?

1- Appropriate amount and width of emergency staircases → 1000 ppl. max.
750 mm/60 ppl.
> 220 ppl → 5mm/ppl
1000 ppl → 5000 mm min.

2- Location and exits → 3 exits in total, located in an 45 degree angle to each other and easily accessible from all ends of the building.

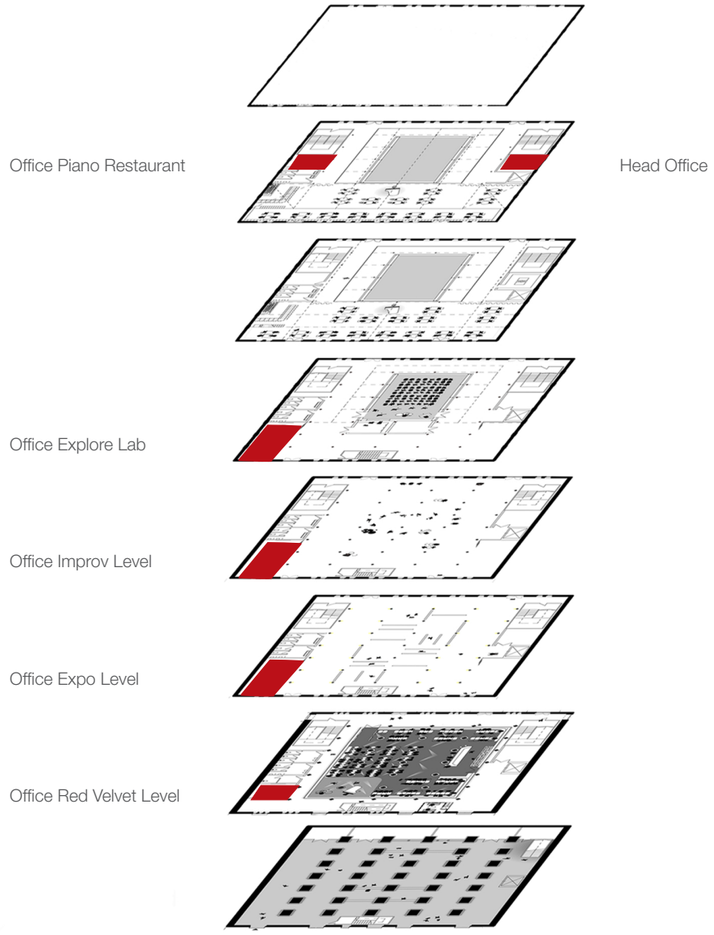
3- Fire-proofing of existing columns and beams → Fire-retardent spray VS. sprinklers
Yearly inspections



EXPLORATION

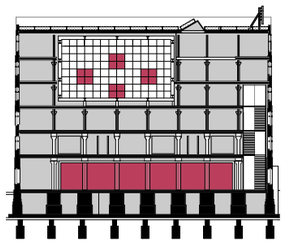
HOW DOES SANTOS STAY ORGANIZED?

Each Level (except for the Prelude) is its own management in itself, meaning each level has its own office whereas on Level 5 there is an additional office that takes care of the building's overall management and acts as the head of all sub managements.

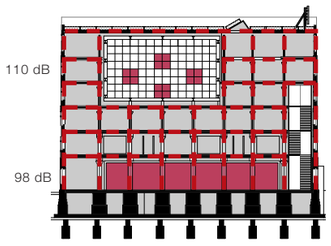


EXPLORATION

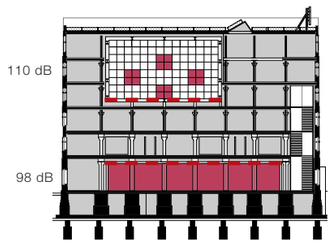
ACOUSTIC CONCEPT



Regress in structure upwards
Steel columns are all connected



Air-borne causes structure-borne and vice versa. Consequence: Flanking Sound



Solution: Disconnect Explore Lab and Red Velvet Club from existing

Conclusion: Flanking Sound can not be avoided, regardless of size and quantity of insulation.
Instead of to fight the flanking sound → to go with it.

→ Flanking Sound becomes a part of Santos, as Jazz counts among the most vibrant forms of music. Santos will feel alive, full of movement and vibrancy.

→ Although certain measures need to be taken in order to diminish the air-borne sound as much as possible.

→
1. Disconnection from the existing
2. Use of special acoustic materials

Roum Acoustics can make or break the sound of a performance. Many Jazz venues are overamplified, which means in the case: Less is more. The goal is to provide acoustically reinforced spaces that use just enough amplification for natural sound and create a good musical balance. In this case that means:

- Specific room geometries (ratio and symmetry)
- Placement of stage and piano
- Sound absorbing and reflecting materials

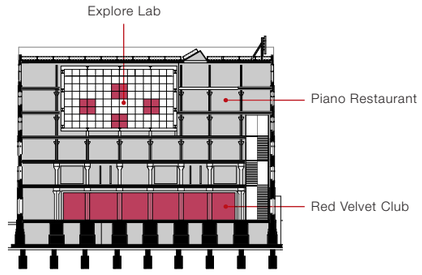
RT60= (0,16 s/m) x V/Se

aavg= 0,3
awalls=0,3
afloor=0,3
aceiling=0,3

Typical Reverberation Time (RT60) for Jazz: 0,5

Typical reverberation times (sec):
3,5 sec: Fuller richer musical sound
1,5-2,5 sec: Auditorium for speech and music
1 sec: Clear articulation, desirable for lecture halls
0,5 sec: Jazz
0,3 sec: Dead sound

Psycho Acoustics:
10 dB reduction in sound is about a 90% acoustic energy loss or about 50 % reduction in perceived sound.



Three main sound experiences within Santos:

→ The difference between them is that the Red Velvet Club and the Piano Restaurant are placed within the existing, whereas the Explore is a new artifical structure in itself.

↓ Ideal ratio

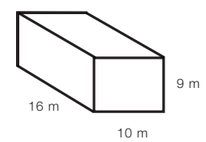
Explore Lab

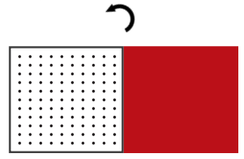
↓ Symmetry of space and placement of stage and piano

Red Velvet Club
Piano Restaurant

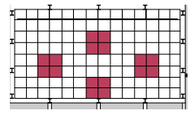
Explore Lab

h x w x d (1 x 1,04 x 1,8)
RT60current=0,95 → Goal: 0,5 sec

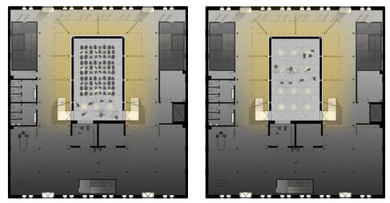




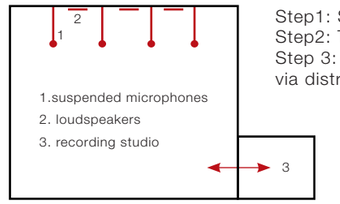
Two-sided absorbing panel (wood-felt)



Creates wall pattern



Flexibility



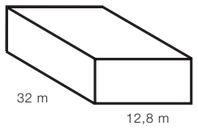
Step1: Sound/Acoustic is captured in microphones
Step2: That is applied to a platform in the Studio
Step 3: Adjusted sound is returned into the hall via distributed loudspeaker

Meyer Sound System:
Breakthrough in acoustical science

Piano Restaurant

RT60current= 0,99 sec (aavg=0,3)
→ Goal: 0,7 sec

→ Curtains Cushioned Seats



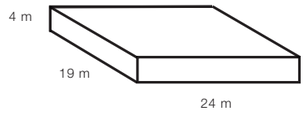




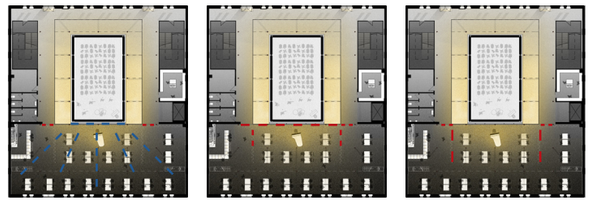
Red Velvet Club

RT60current= 1,1 sec (aavg=0,3)
→ Goal: 0,5 sec

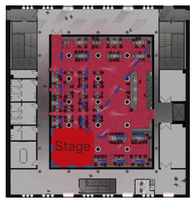
→ Cushioned Seats







Flexibility Curtain Layout (Increase and decrease RT 60)
Sound reflector behind piano



Symmetry Space-Stage
Equal distribution of sound through sound reflector at back of stage

Acoustic Ceiling
Fiberglass core & fabric coating



SUSTAINABILITY

Within Santos, 4 out of 5 levels of ambitions can be reached, in order to make it a sustainable and efficient building.

0

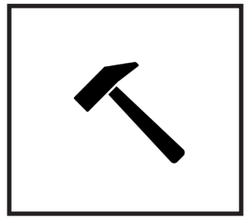
Major maintenance so that the building remains usable.

Renovation



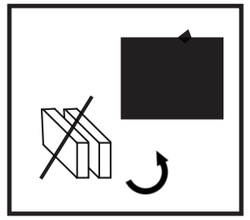
Carried out renovation instead of demolition.

Demolition



Renovation is reduced to a minimum.

Material Reuse

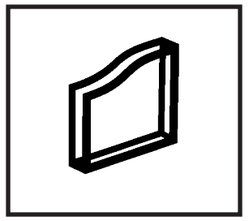


All materials demolished are resused in and for the building. Wooden beams are reused for wooden planks in the Red Velvet Club.

1

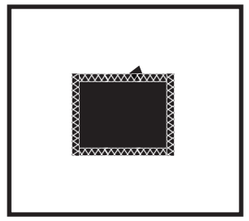
Compliance with provisions of the Dutch Energy Agreement, meaning adding energy-saving measures.

Double Glazing



All new windows are equipped with double glazing to provide a comfortable indoor climate.

Wall-Roof-Floor-Insulation

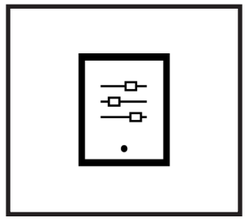


Internal Wall-Roof-Floor-Insulation prevent heat and cooling loss and provides a comfortable indoor climate.

2

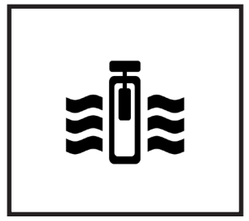
Greatest possible reduction in energy consumption.

Automation System



Complete integrated control of all indoor electrical systems, such as lighting, sound and mechanical fixtures via touch screens and sensors.

Heat Pump to River

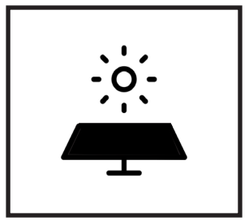


The building takes advantage of the Rijnhaven and uses a main heat pump connected to its waters and heat recovery for efficient heating and cooling.

3

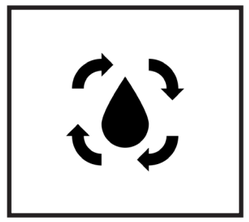
Highest possible reduction in energy consumption.

Solar Energy



A maximum of 213 PV panels on the roof provide for a total solar output of 110000 KW.

Water Reuse

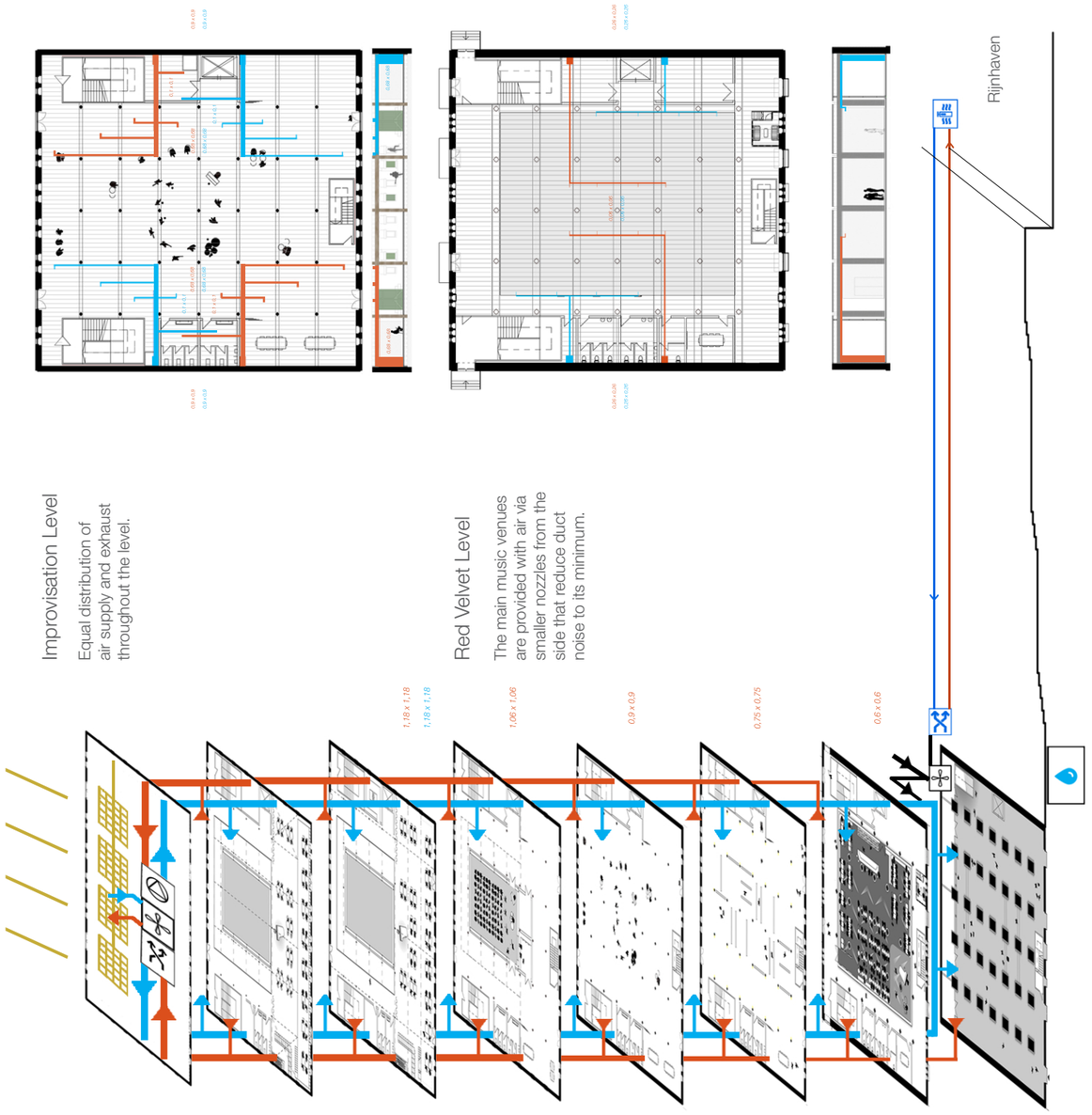


The storage of a water gallon underneath the concrete plaza allows for collection and water reuse for flush water.

EXPLORATION

Heating and Cooling within Santos is provided by a main heat pump connected to the waters of the Rijnhaven and an additional heat recovery unit on the roof. This system runs via a Double-Duct-System to avoid disturbing duct noise and friction and is illustrated in the climate scheme below. Two floorplans were chosen to display two different scenarios that are applied to the other levels as well.

	Ventilation Rate (m3/h)	Amount of People	People x Ventilation Rate (m3/h)	m3/s (divided by 3600)	vertical ducts m/s	m2	m x m	horizontal ducts m/s	m2	m x m (0,7 x X)	Double-Duct-System (2x)	vertical	horizontal
Piano Restaurant	54	100	5400	1,5	12	0,12	0,34 x 0,34	10	0,15	0,38 x 0,38		0,17 x 0,17	0,19 x 0,19
Explore Lab	75	90	6750	1,87	12	0,15	0,38 x 0,38	10	0,19	0,43 x 0,43		0,19 x 0,19	0,21 x 0,21
Improv Level	65	200	14625	4,06	12	0,33	0,57 x 0,57	10	0,47	0,68 x 0,68		0,28 x 0,28	0,34 x 0,34
Expo Level	54	200	10800	3,0	12	0,25	0,5 x 0,5	10	0,3	0,54 x 0,54		0,25 x 0,25	0,27 x 0,27
Red Velvet Club	72	140	10080	2,8	12	0,23	0,47 x 0,47	10	0,28	0,52 x 0,52		0,23 x 0,23	0,26 x 0,26
Prelude	45	200	9000	2,5	12	0,20	0,44 x 0,44	10	0,25	0,5 x 0,5		0,22 x 0,22	0,25 x 0,25
Bathrooms (12)	35	10	350	0,09	12	< 0,01	0,1 x 0,1	10	< 0,01	0,1 x 0,1		0,05 x 0,05	0,05 x 0,05
Kitchen (1)	20	8	160	0,03	12	< 0,01	0,1 x 0,1	10	< 0,01	0,1 x 0,1		0,05 x 0,05	0,05 x 0,05
Other Rooms (6)	20	8	160	0,03	12	< 0,01	0,1 x 0,1	10	< 0,01	0,1 x 0,1		0,05 x 0,05	0,05 x 0,05
		1000				1,4	1,18 x 1,18						



CONSERVATION AND RESTAURATION

Overall, Santos is in a good condition, although it needs some maintenance on a more detailed level.

1 - Water 109
2 - Cracks 111
3 - Windows/Doors 112
4 - Efflorescence 113
5 - Facade 114

1 - Water





Problem Statement

Clear water problem in basement, could not be used at the moment.

Hypothesis

1. Leveled water fluctuates throughout the year and penetrates into the inside.
2. The connections between walls and floors are not well maintained and so ground water enters the building throughout the years.

Consequences

1. High water levels
2. Mold growth
3. Rising damp and structural damages
4. (Crypto)-efflorescence

Approach

1. Assessment of the presence of intruding water and rising damp →
   - Take sample and measure moisture (MC) and hygroscopic moisture content (HMC)
   - Compare interior and exterior wall
   - Consider height of ground water with respect to foundation and type of soil, eventually measure MC profile in ground.



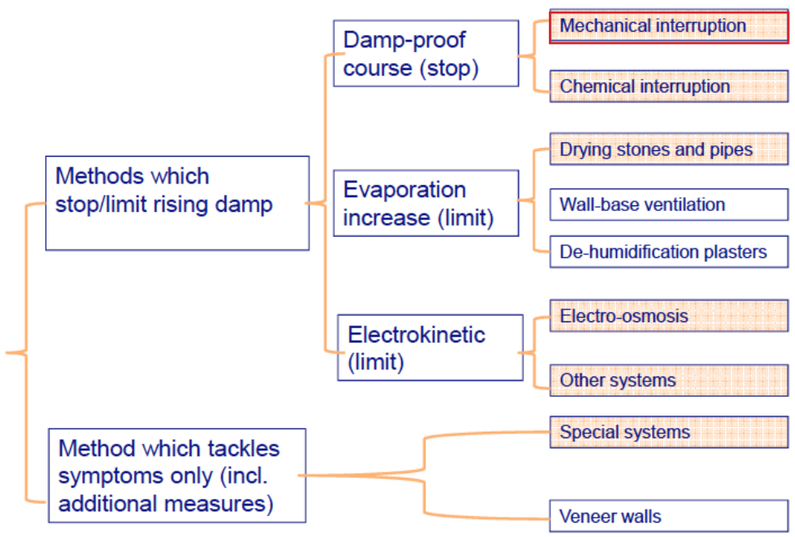
2. Sampling →
   - Powder (or core) drilling
   - At different heights and depths
   - Along vertical profiles



Measures

1. Stop water intrusion
2. Cut and replace damaged bricks
3. Remove mold growth
4. Brush off salt
5. Renew and prevent structure loss
6. Install a permanent water pump thats extract the water regularly

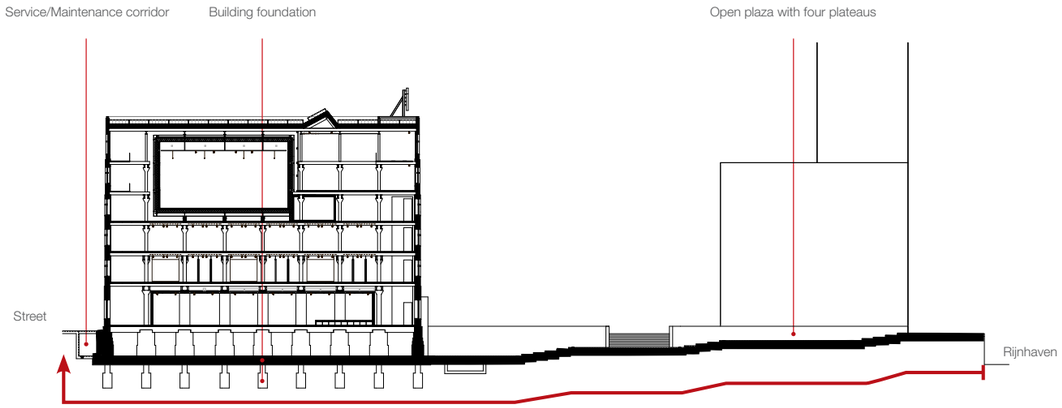
Fig 51: Above
Fig 52: Middle Above
Fig 53: Upper Lower
Fig 54: Lowest



Approach

Water intrusion and structural loss should be stopped with a mechanical interruption

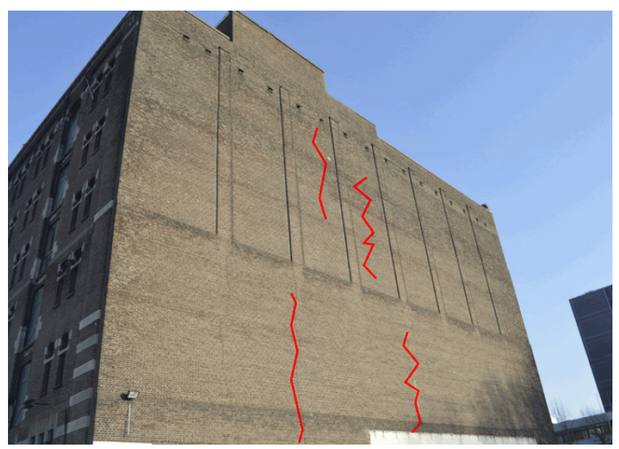
Due to the new open concrete plaza towards the dok, the best approach is to continue it underneath Santos, meaning that the original pile foundation will be replaced. The new foundation now serves as the main plaza and as the actual building foundation and additionally provides a service/maintenance corridor.



Concrete plaza and foundation for Santos

Above: Fig 55

2 - Cracks



Problem Statement	Hypothesis	Consequences
Cracks on west facade.	1. Addition of lift in 1954 and its vibration. 2. Vibration from removing winch houses. 3. Overloading 4. Expansion of walls due to climate/sun 5. Big difference of load distribution in walls	1. More structural damage 2. Rain intrusion 3. (Crypto-) Efflorescence

Approach

1. Determine main cause of structural damage (based on an analysis of the cracks' size, width and location)

2. Determine whether the cracks are
- active (increasing),
- passive (not increasing), or
- cyclic (seasonal)

Measures

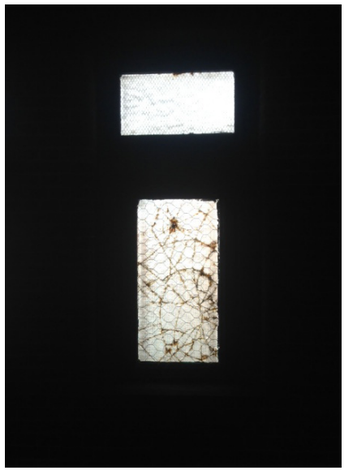
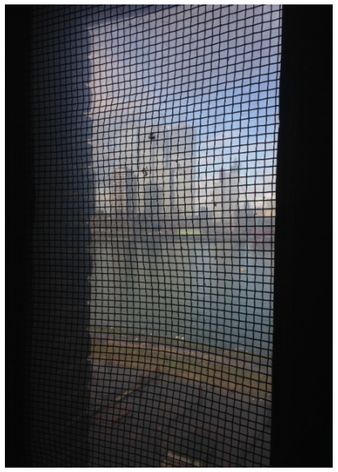
1. Construct new wall
2. Insert corrosion resistant metal reinforcement (usually stainless steel) into bed joints to redistribute strain and therefore stress over a wider area, thus reducing the risk of failure.
3. Cut out cracks and substitute a former joint, although this is major work and may not be acceptable visually and in terms of cost.

Measure nr.2
Regular control for any changes and (crypto-) efflorescence

Fig 56: Above

3 - Windows/Doors

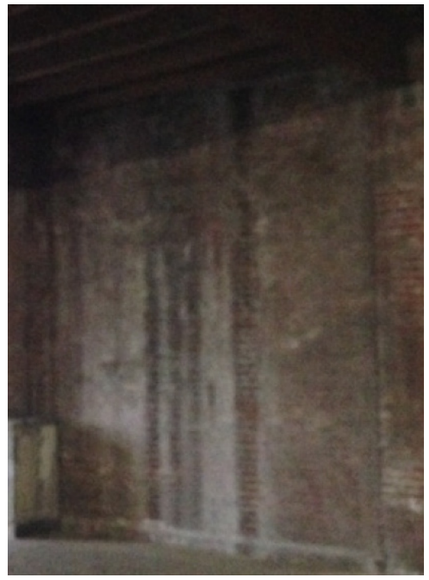


Problem Statement	Hypothesis	Consequences	Approach
1. Damages window and door frames on all levels 2. Peeling green paint 3. Mold, Funghi	Mainly water penetration and age	• Rotten wood • Original paint not visible any more • Bad indoor climate	1. Replace damaged wood 2. Repair damaged wood 3. Repaint 4. Consolidate

Upper left: Fig 57
Upper right: Fig 58
Lower left: Fig 59
Lower right: Fig 60

4 - Efflorescence




Problem Statement	Hypothesis	Consequences	Approach
Efflorescence on inner west facade	Over time, the wind caused sea spray to be transported to the inside (salt and water).	• Crypto-efflorescence • More efflorescence • Visual changes	It is difficult to come up with a quick-fix solution, so the best approach is to brush off the salts whenever they occur again and observe this phenonema over a certain period of time, to then determine whether it causes structural problems. In Santos case, insulation on the inner walls will be placed from Level 1 upwards. This means that the plaster applied on top should be an *Accumulating Plaster* which allows the salts to accumulate in a layer behind it to avoid damage. Additionally, an exterior impermeable layer can be applied.

Fig 61: Upper
Fig 62: Lower

5 - Facade







	Problem Statement	Hypothesis	Consequences	Approach
Sandstone	No acid reaction, but blackening	Acid rain, without transformation	Traces of time: Increase in blackening	
Limestone	Acid reaction, (black) crust	Acid rain, so transformation into gypsum	Increase in black crust	
Brick	Pollution soiling and structural damage	Damages underneath windows on North and South facade, probably due to soiling because there the rain can not clear the bricks.	• Rain penetration • More damage • Biological growth	Test on fragment with a Karstentube. Over time, did the damage increase? If not, leave as it is. Soiling also serves as protection. If yes, see options below:

How to choose a suitable cleaning method in relation to the nature of the soiling:

+ good cleaning effect
- limited cleaning effect

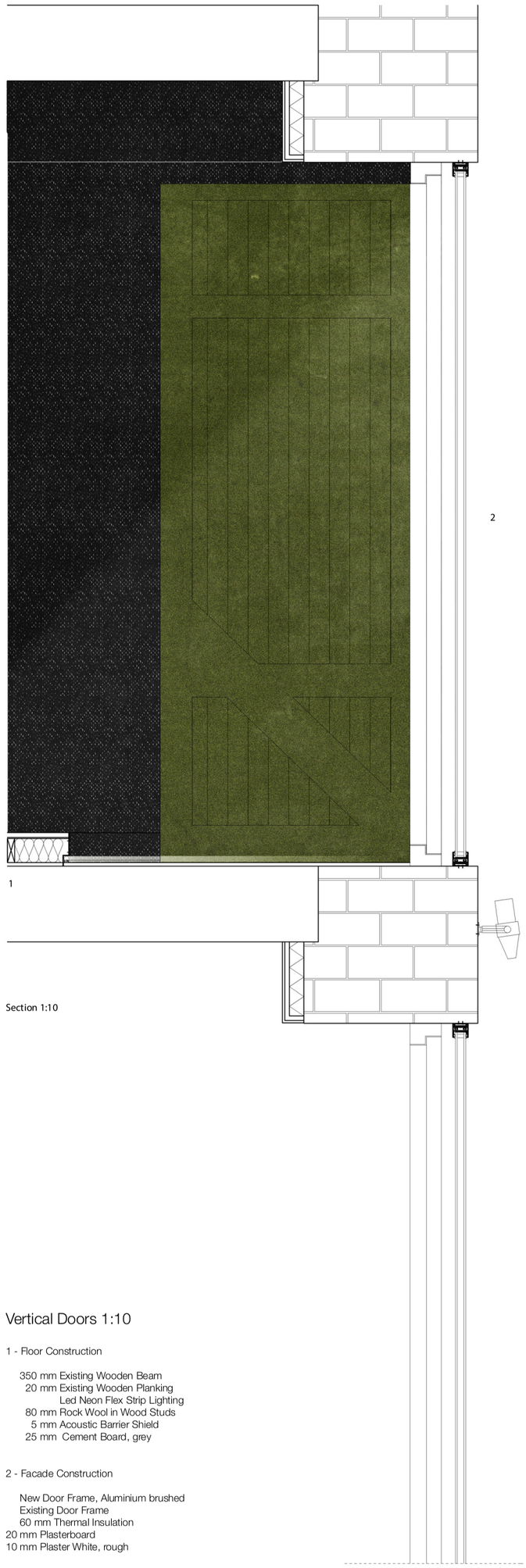
	brush	washing	steam	abrasive	organic acids	Inorganic acids	alkali	sequesterin g agents	Soaps/ detergents	laser
dust	+	+	+	+	-	-	-	-	-	-
dry dep.	+	+	+	+	+ -	+-	+-	-	+ -	+
gypsum crust	-	+	-	+	-	-	-	+	-	+
biological	+	+	+	+	-	-	+	-	-	+ -
oil, fat	-	-	+	-	-	-	+	-	+	-
encrustation	-	-	-	+	+	+	-	+	-	-
rust	-	-	-	-	+	-	-	+	-	-
soluble salts	+	+	+	+	-	-	-	-	-	-

Above: Fig 63
Above: Fig 64
Above: Fig 65
Above: Fig 66
Above: Fig 67
Below: Fig 68

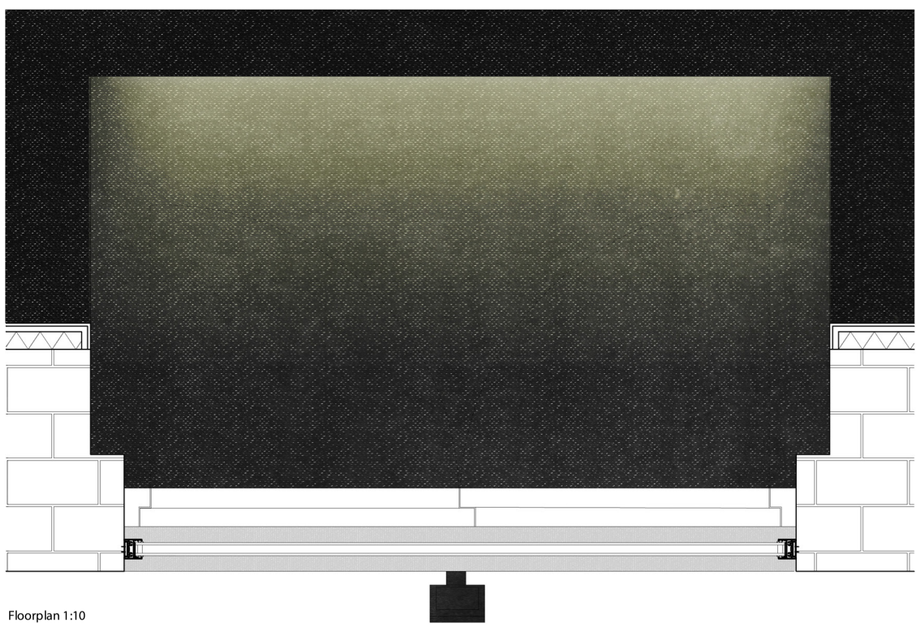




Elevation1:10



Section 1:10



Floorplan 1:10

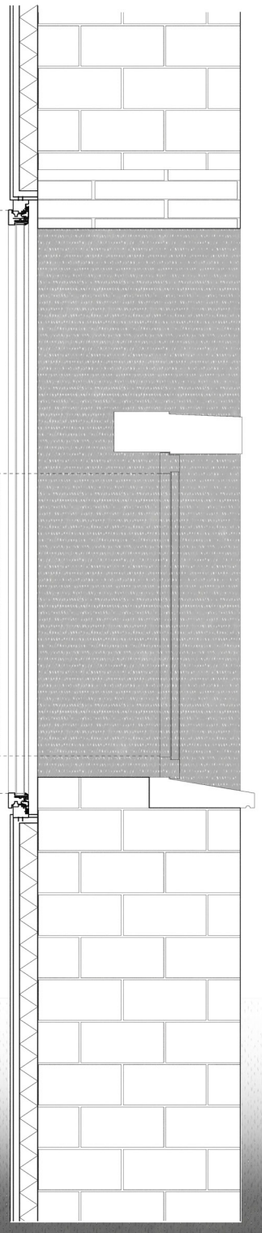
Vertical Doors 1:10

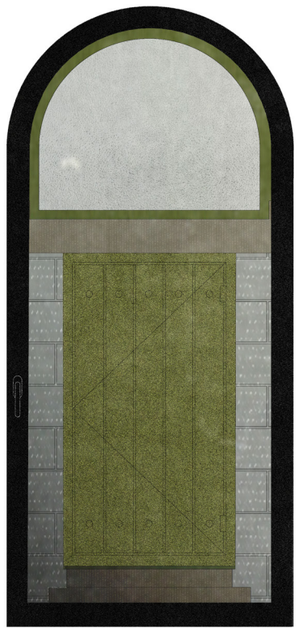
1 - Floor Construction

350 mm Existing Wooden Beam
20 mm Existing Wooden Planking
Led Neon Flex Strip Lighting
80 mm Rock Wool in Wood Studs
5 mm Acoustic Barrier Shield
25 mm Cement Board, grey

2 - Facade Construction

New Door Frame, Aluminium brushed
Existing Door Frame
60 mm Thermal Insulation
20 mm Plasterboard
10 mm Plaster White, rough





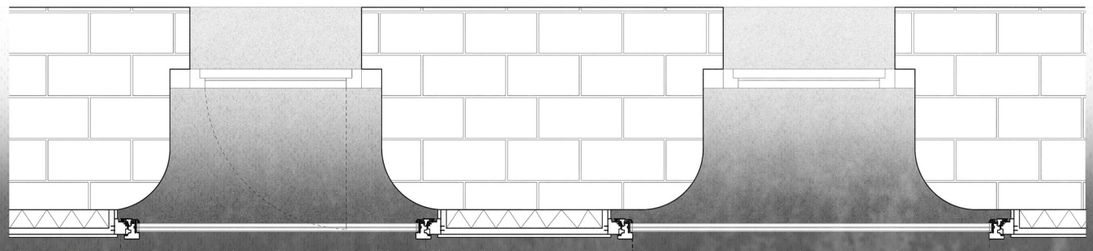
Elevation 1:10

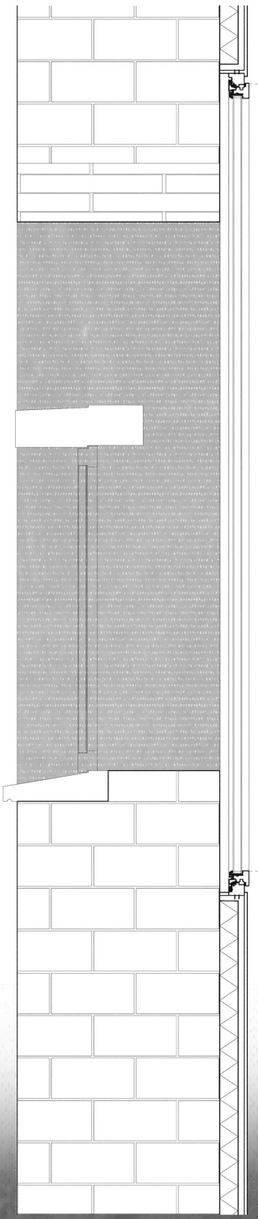
1



Elevation 1:10

2





Section 1:10

Floorplan 1:10

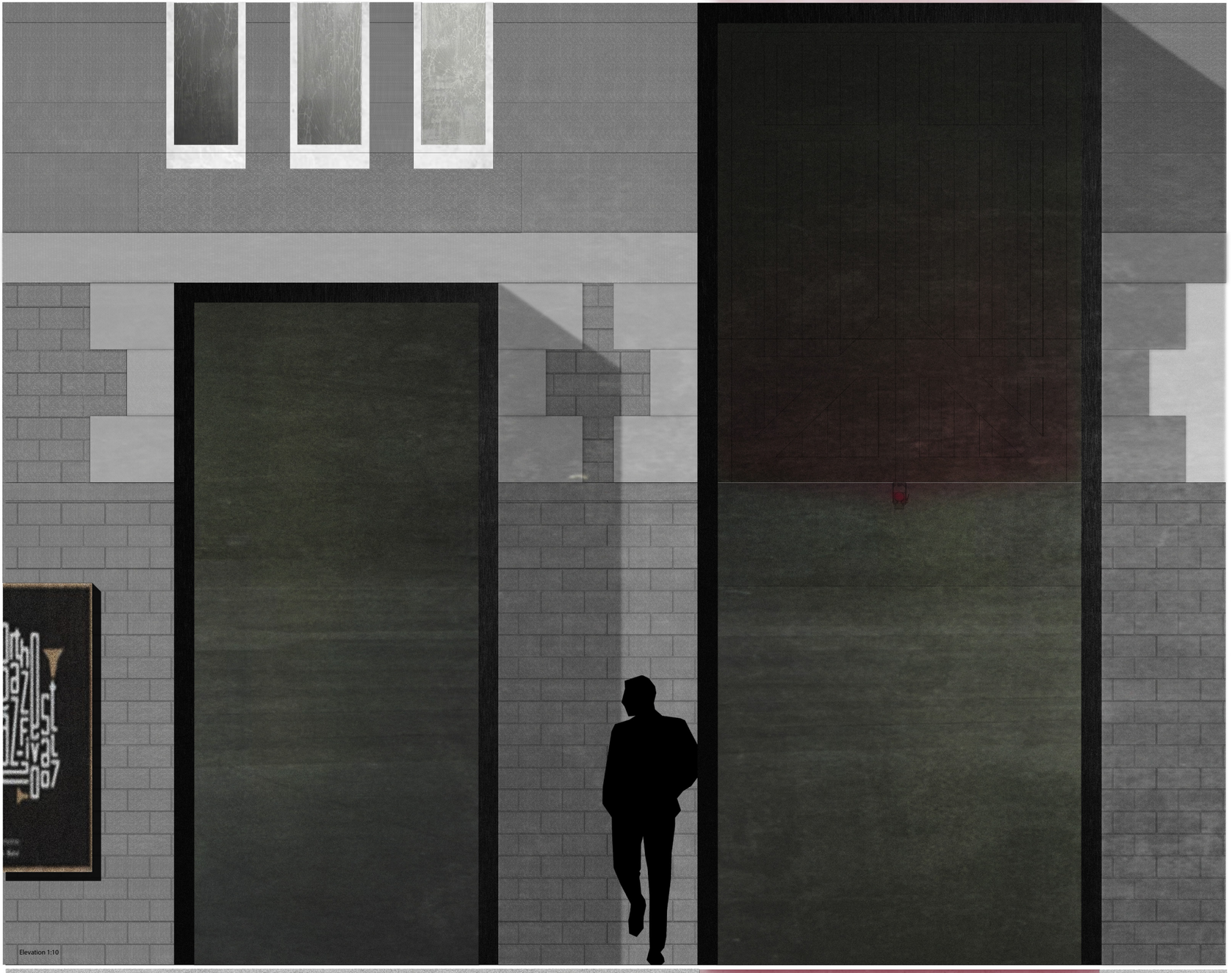
Section 1:10

1 - Small Window Fragment 1:10
2 - Big Window Fragment 1:10

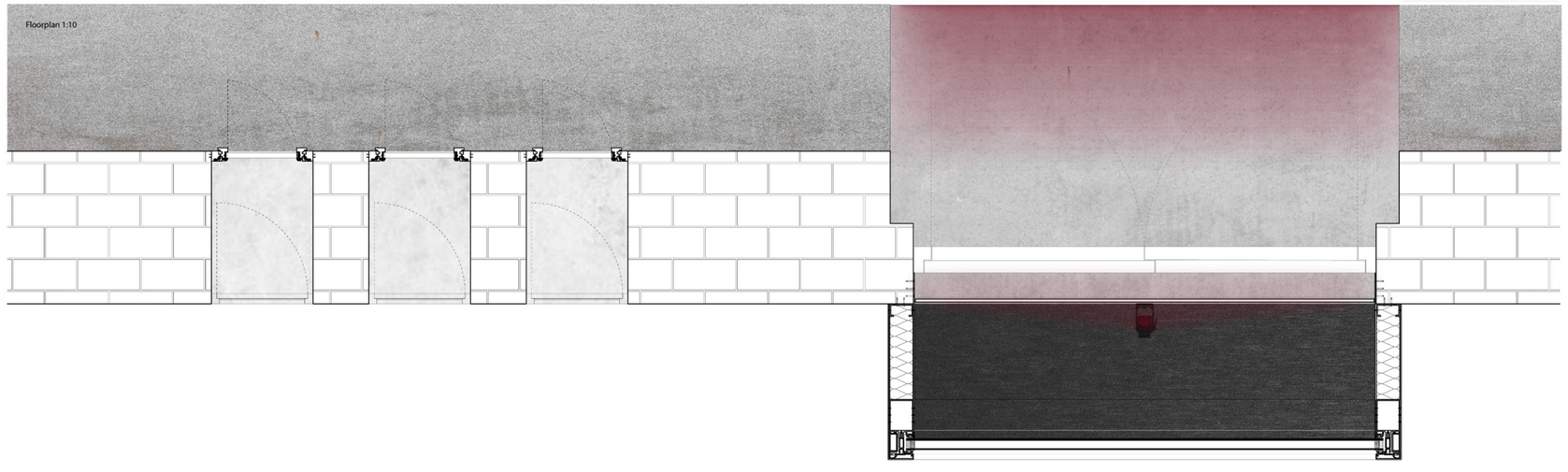
550 mm Existing Brick Wall
60 mm Thermal Insulation (Kingspan Products)
(R-Value= 3, Bouwbesluit 2,5)
20 mm Plasterboard
10 mm Plaster White Rough

Existing Window Frame
with existing frosted glass above
New Window Frame
Brushed Aluminium
Triple Glazing with acoustic layer


1 - Expo Panel 1:10
1
20 mm Perforated Metal
100 mm Rockwool in Aluminium Framework
20 mm Perforated Metal
Led Neon Flex Strip Lighting, 24v
Thread on Hook to Existing



Elevation 1:10



Floorplan 1:10

Facade Fragment 1:10, Portals

2 - Facade Construction

5 mm External Aluminium Sheeting, Brushed
120 mm Aluminium Window Frame Construction
Low-Translucency, Double-Glazed
Tempered Glass
U-profiles attached to Existing Brick Wall
Strengthened Glass Railing on Brushed
Aluminium Angle
Existing Door
Internal Exposed Brick Wall

2

1,2

Facade Fragment 1:10, Portals

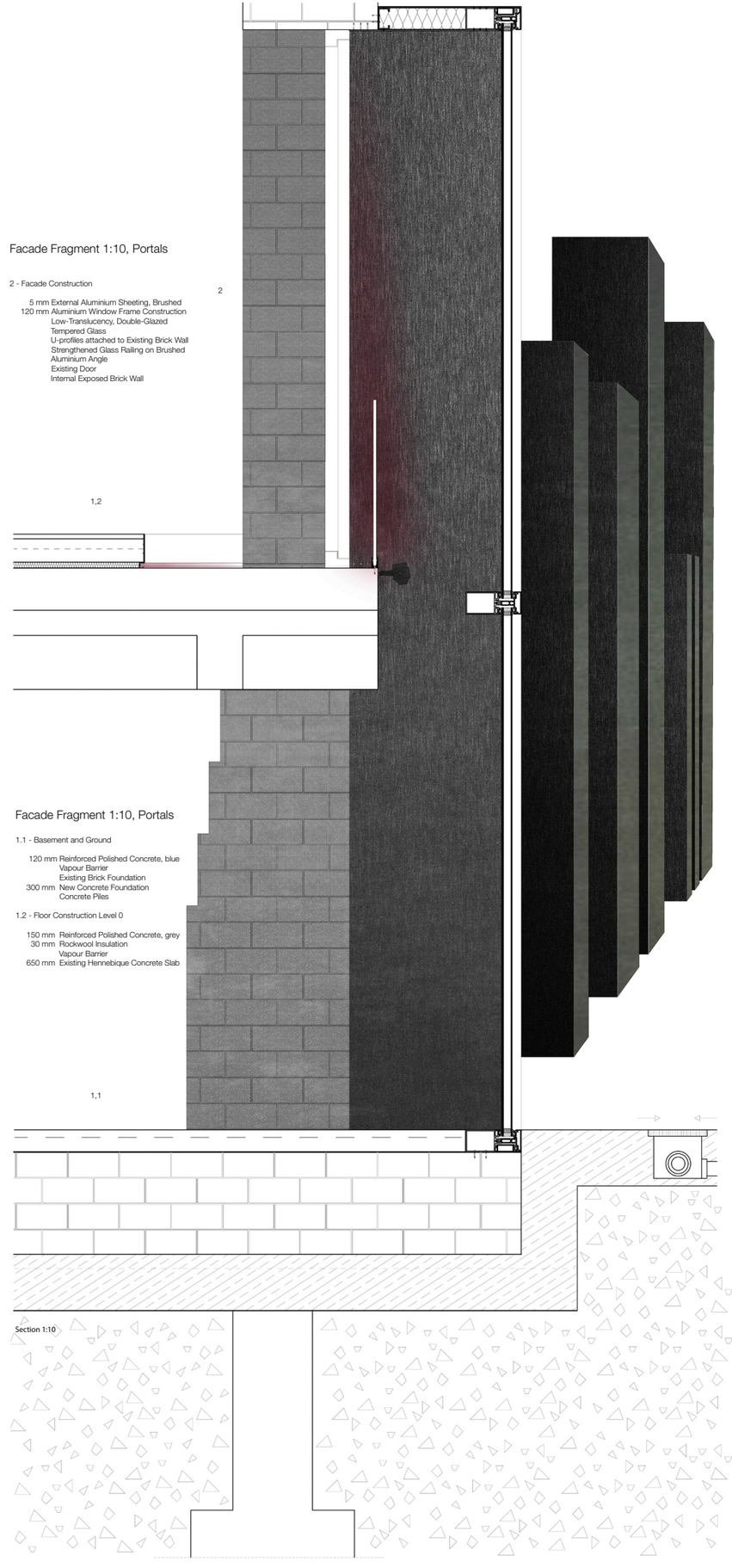
1.1 - Basement and Ground

120 mm Reinforced Polished Concrete, blue
Vapour Barrier
Existing Brick Foundation
300 mm New Concrete Foundation
Concrete Piles

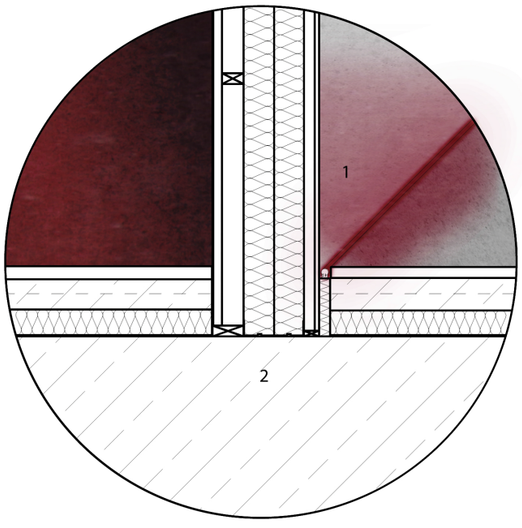
1.2 - Floor Construction Level 0

150 mm Reinforced Polished Concrete, grey
30 mm Rockwool Insulation
Vapour Barrier
650 mm Existing Hennebique Concrete Slab

1,1



Section 1:10



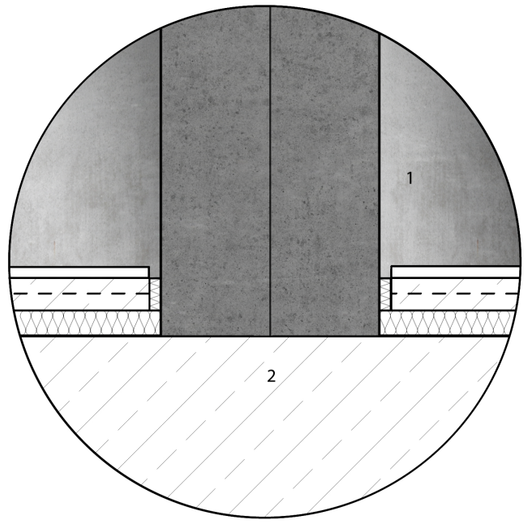
Inner Red Velvet Club 1:10, Level 0

1 - Wall Construction

2 mm Red Velvet Felt
20 mm Plaster Board
50 mm Wooden Crosswise Cavity
55 dB Weighted Sound Reduction
20x65 mm Acoustic Slab Rockwool frames
25 mm Plasterboard (12kg/m20
10 mm Plaster/Led Neon Flex Strip

2 - Floor Construction

100 mm Polished Concrete (Screed plus upper layer)
60 mm Rockwool Insulation
Vapour Barrier
650 mm Existing Hennebique Concrete Slab



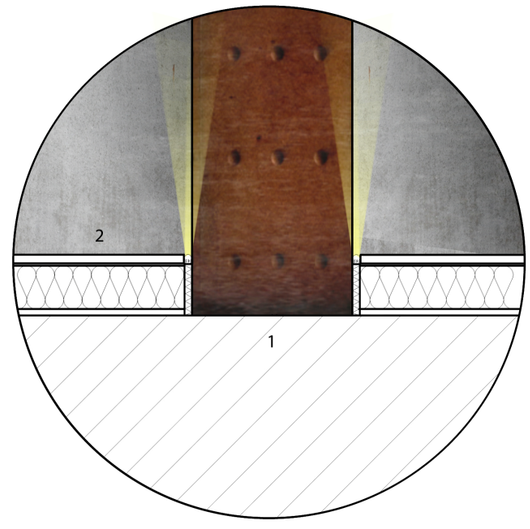
Outer Red Velvet Club 1:10, Level 0

1 - Wall Construction

30 mm Outer Plaster Layer
2 mm Reed Layer
Reinforcements
450 mm Existing IPE 450

2 - Floor Construction

100 mm Polished Concrete (Screed plus upper layer)
60 mm Rockwool Insulation
Vapour Barrier
650 mm Hennebique Concrete Slab



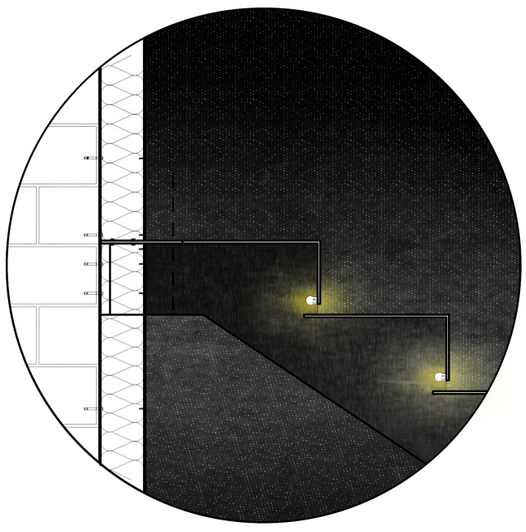
Improv Level 1:10, Level 1

1 - Wall Construction

Fire Retardent Spray
360 mm Existing IPE 360

2 - Floor Construction

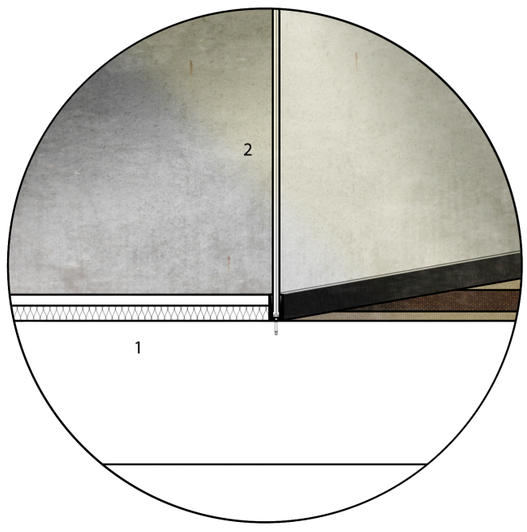
25 mm Cement Board grey
5 mm Acoustic Barrier Shield
60 mm Rockwool in Wood Studs
30 mm Wooden Planking
330 mm Esisting Wooden Beam



Staircases 1:10, Level 1-5

Floor & Wall Construction

20 mm Aluminium mounted to Wall
10 mm Kingspan Insulation
20 mm Aluminium brushed
2x Stainless Steel Slabs
25 mm Aluminium Sheet Covering
Led Neon Flex Lighting Strip



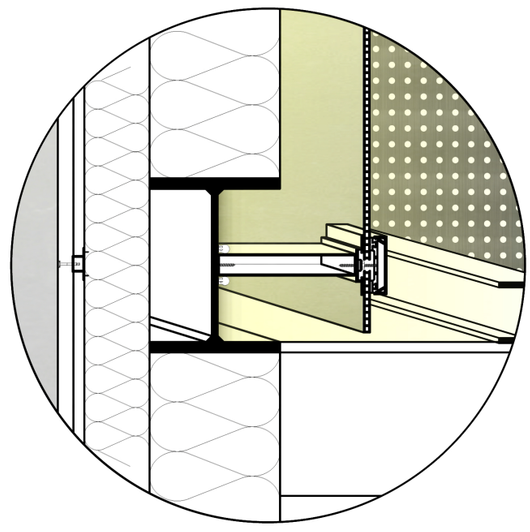
Passarells 1:10, Level 4-5

1 - Wall Construction

25 mm Cement Board grey
30 mm Impact Insulation
33 mm Existing Wooden Beam

2 - Railing Construction

Toughened Glass
Brushed Aluminium Angle

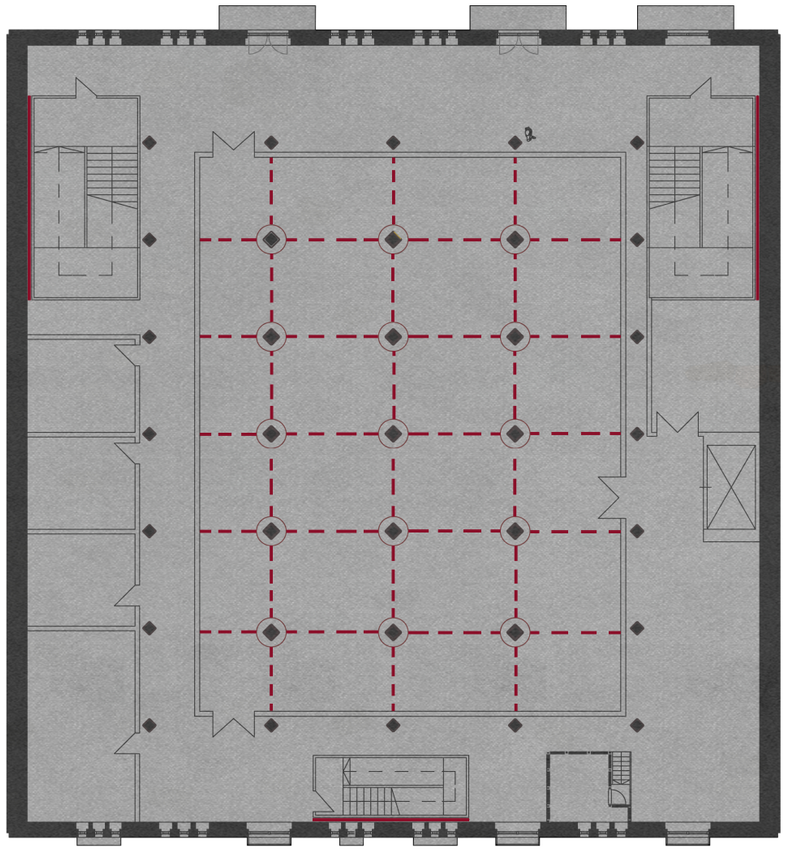


Explore Lab 1:10, Level 4

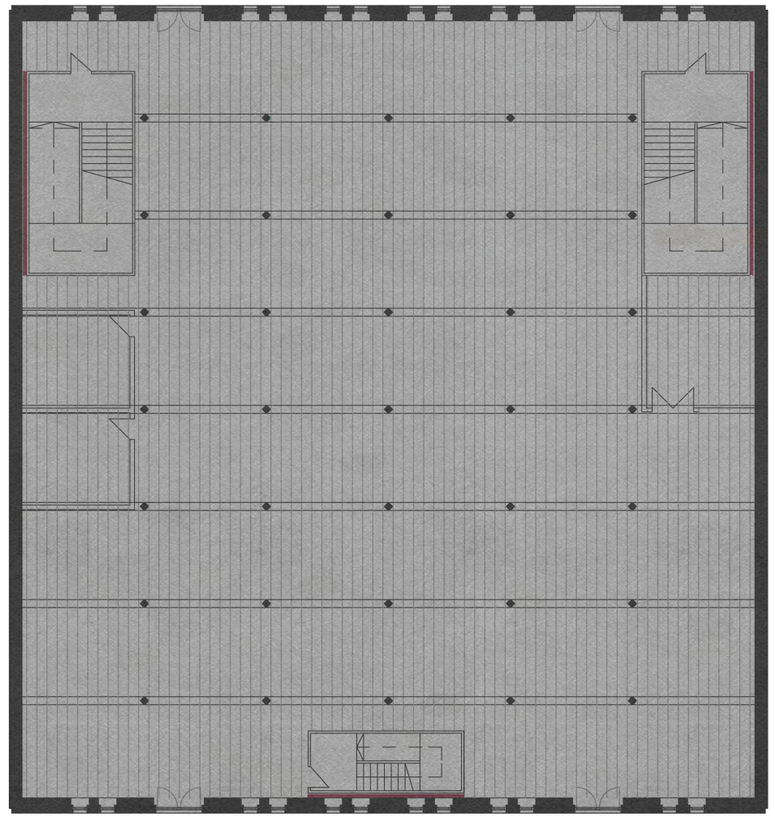
1 - Wall Construction

36 mm Acoustic Panel
20 mm Cavity with Panel Screw
150 mm Acoustic Insulation
400 mm HEB 400 in 300 mm Acoustic Insulation
Polycarbonate Mullions
25 mm Translucent Polycarbonate Sheets

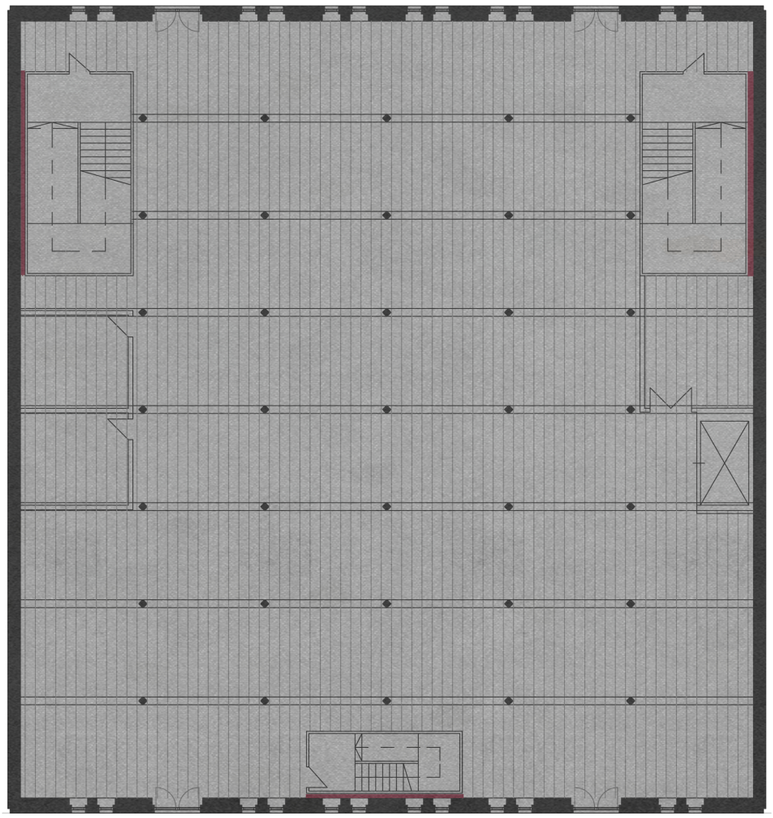
CONSTRUCTION



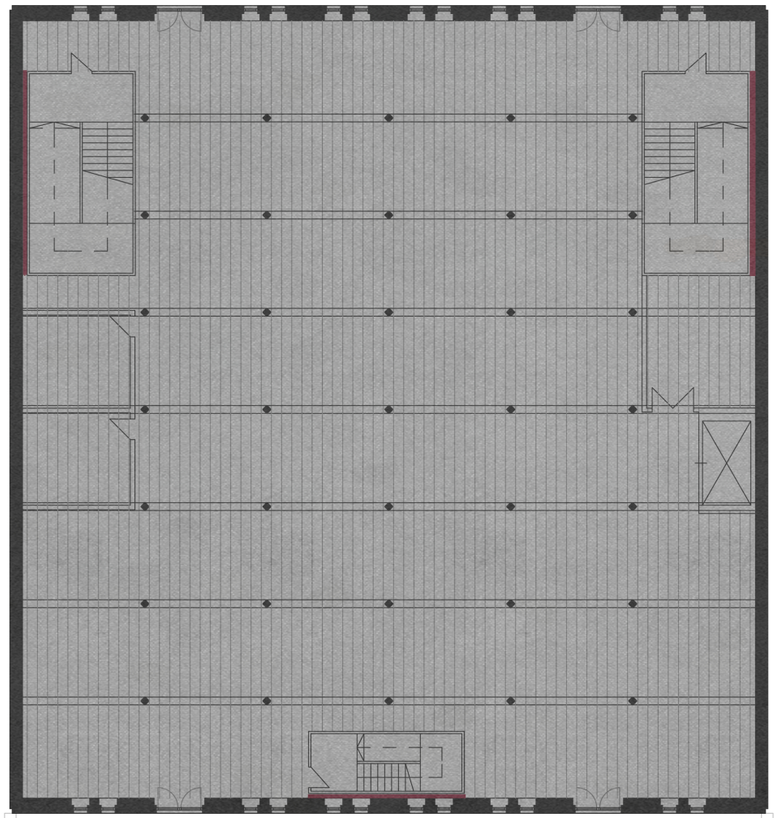
Level -1



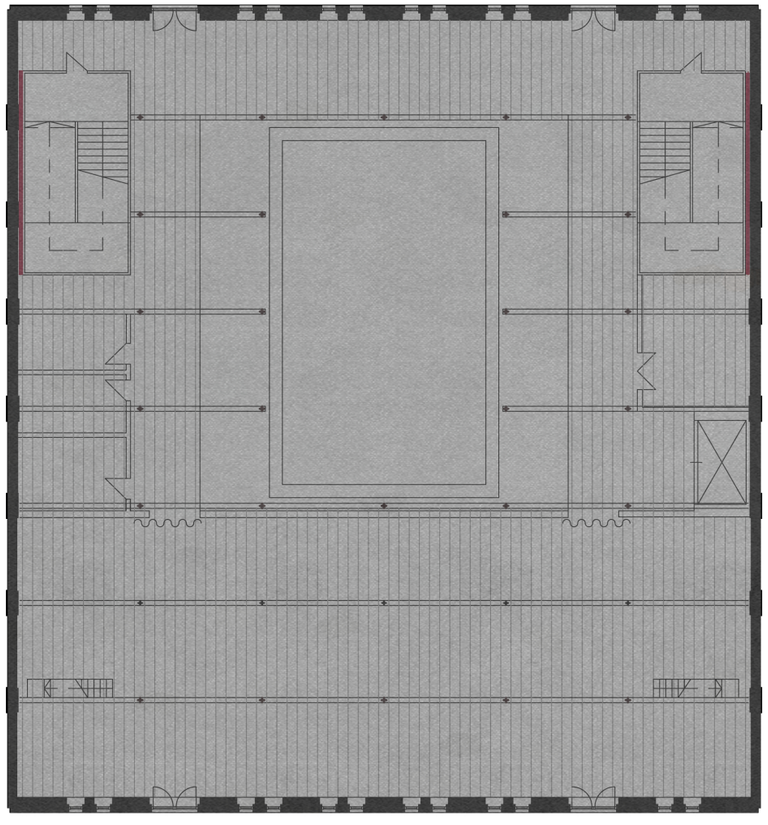
Level 0



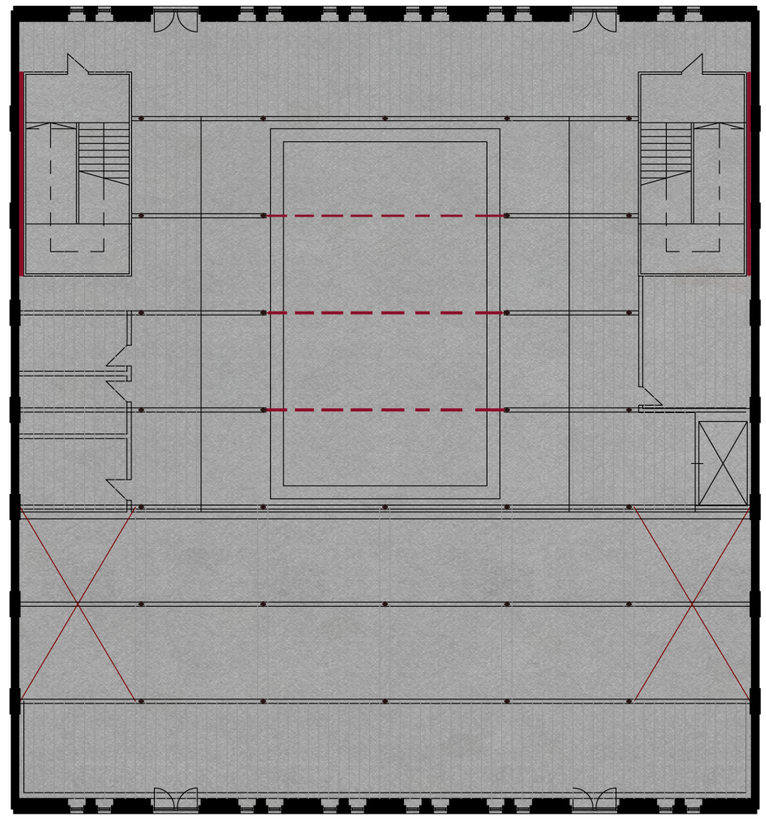
Level 1



Level 2



Level 3



Level 4

LIGHTING CONCEPT

Kaplan and Kaplan, psychologists from the University of Michigan, sought to comprehend the components that drive human's experience in environments. One component came up in their research, namely 'the desire to make sense of one's surroundings', based on two primary properties: complexity and coherence; as we enter a new environment, we automatically and subconsciously seek to find a cognitive match in our memory, as a way to understand and interpret it. Many times we enter a new space and the high familiarity generates a sense of coziness and comfort because we can actually make sense of this setting. In such a coherent scene, the boundaries of walls/ceilings/intersections are easily defined and clear to human brain. On the other hand, if crucial surfaces or objects are not well lit or unclear, this diminishes the coherence. At other times, we may enter a space that poses an entirely new experience, and we struggle to orientate ourselves and can not make sense of it within the first few seconds. That is because we can not make sense of the lighting and we find it rather unsettling not to know our way in this complex surrounding. While we humans search for coherence in a space in order to make sense of it, there is also this strong desire for involvement with the environment. If a space is too coherent, we miss out on the involvement and stimulation that we so much desire because we seek for spaces that are interesting and invite us to explore and engage. While we crave for certain coherence, there is also the strong desire for complexity and mystery that elicits a sense of wonder. [Davis, 2013]

The following lighting plans illustrate how each level is illuminated with coherent and complex lighting. This setting operates during day and evening/night time, although the experiences differ again due to the shadow play during the day and the absence of incoming light in the evening.

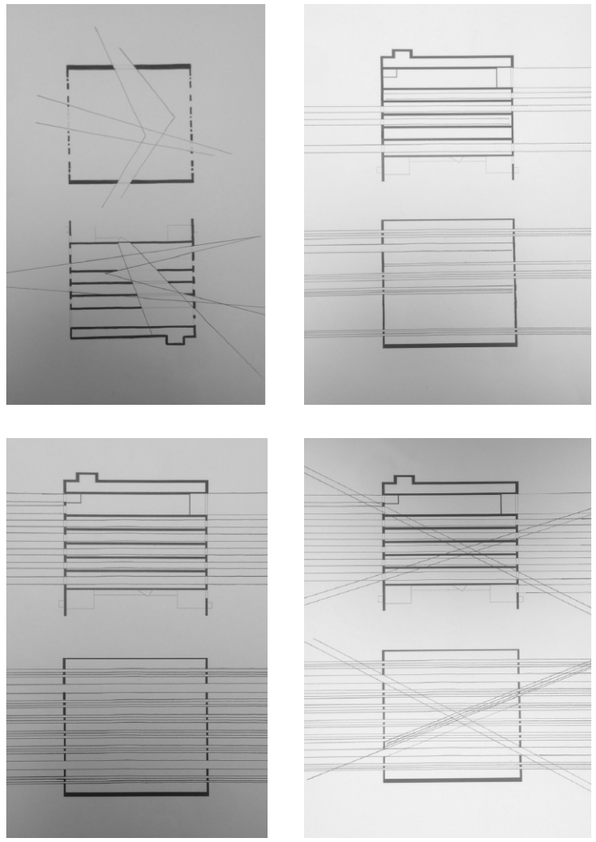
coherence

complexity

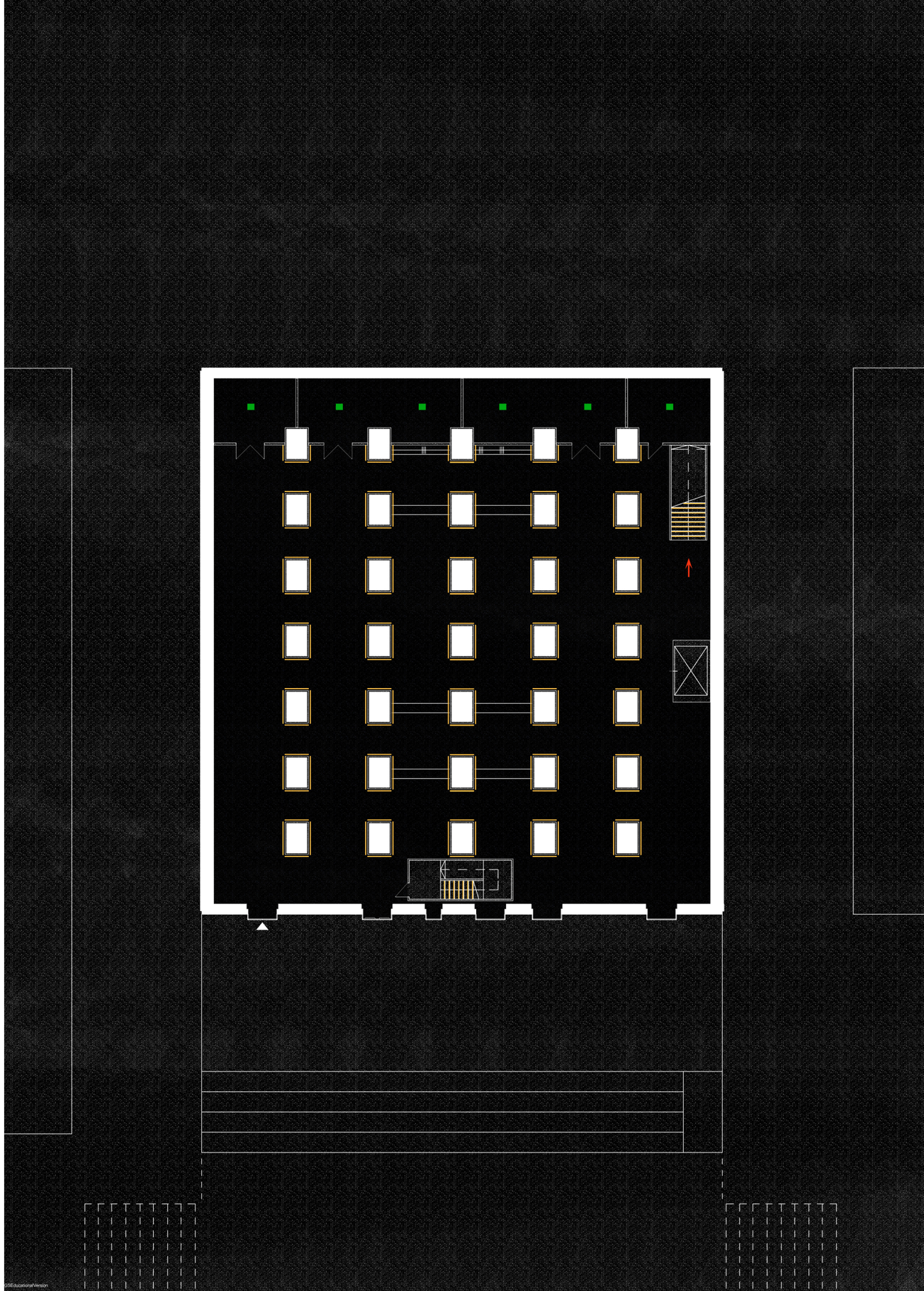
services

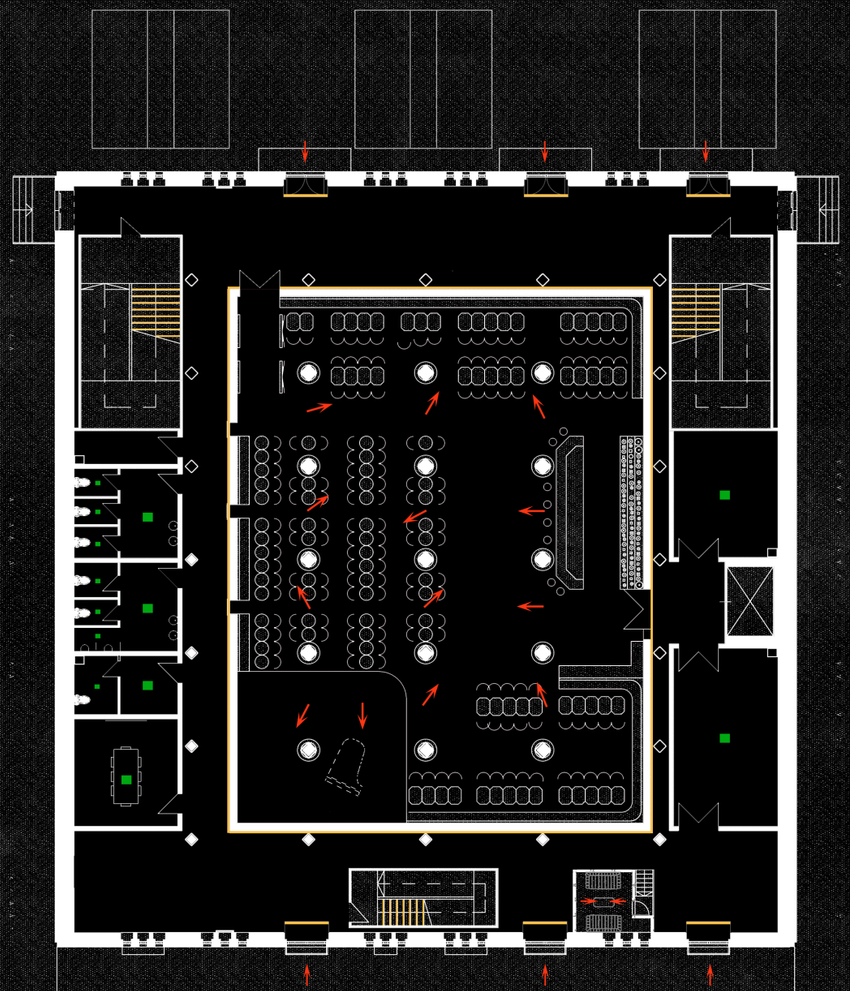
'When a musical piece is too simple we tend not to like it, finding it trivial. When it is too complex, we tend not to like it, finding it unpredictable – we don't perceive it to be grounded in anything familiar. Music, or any art form for that matter, has to strike the right balance between simplicity and complexity for us to like it.' [Levitin, 2006]

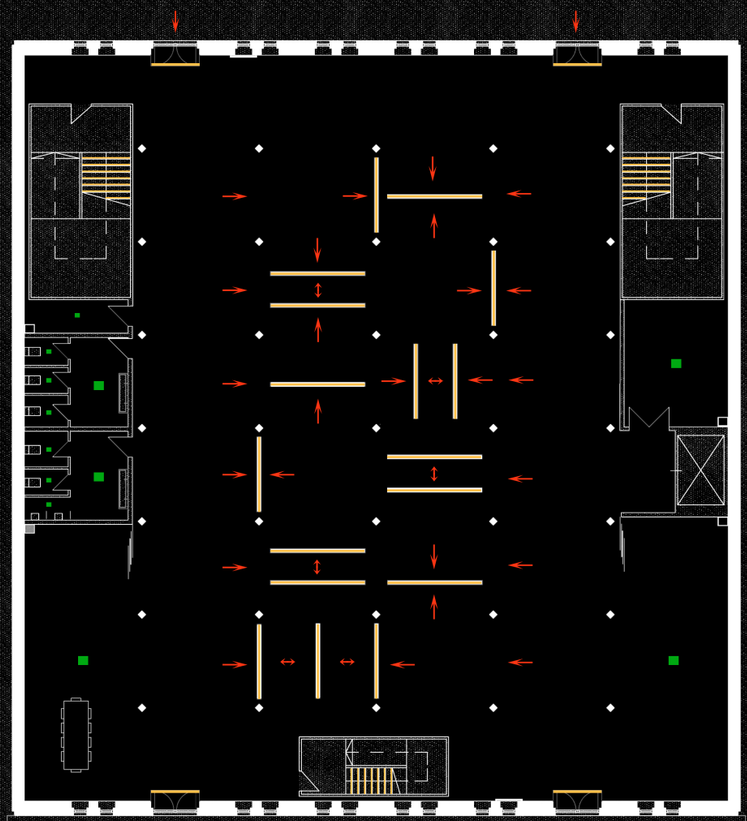
Coherence - Complexity

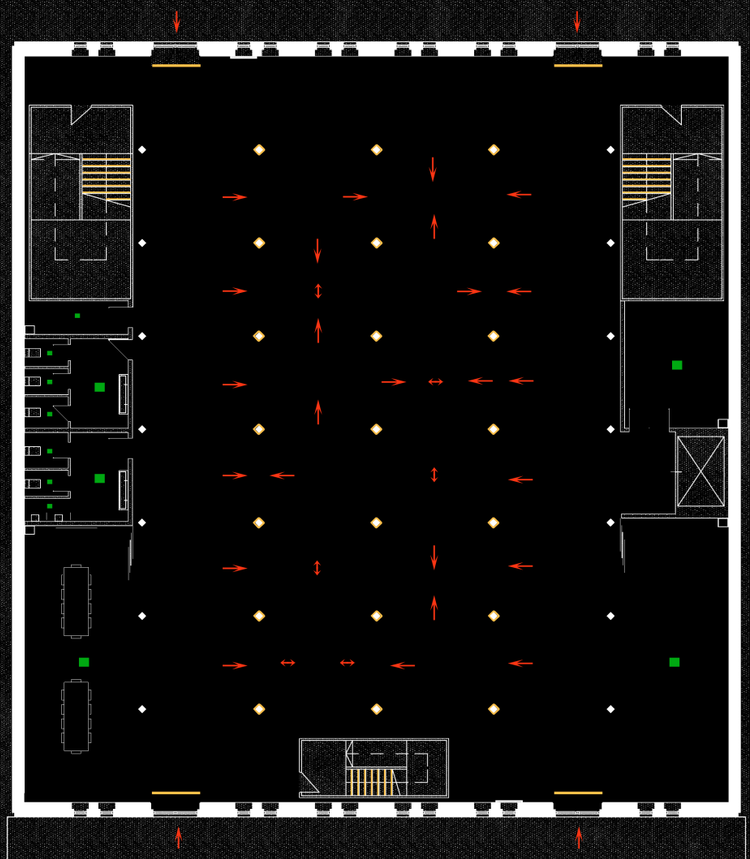


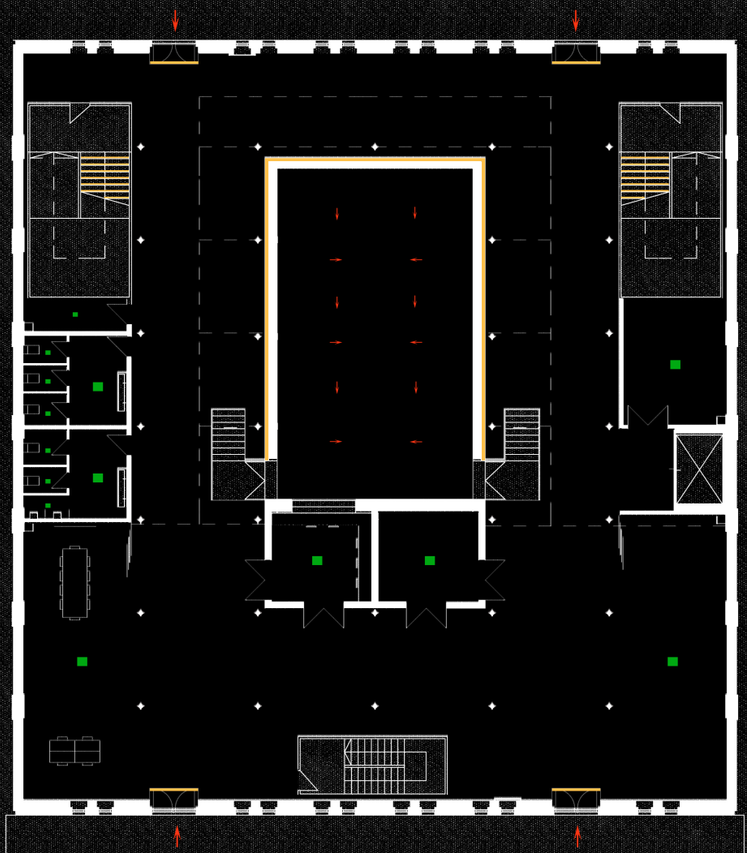
EXPLORATION

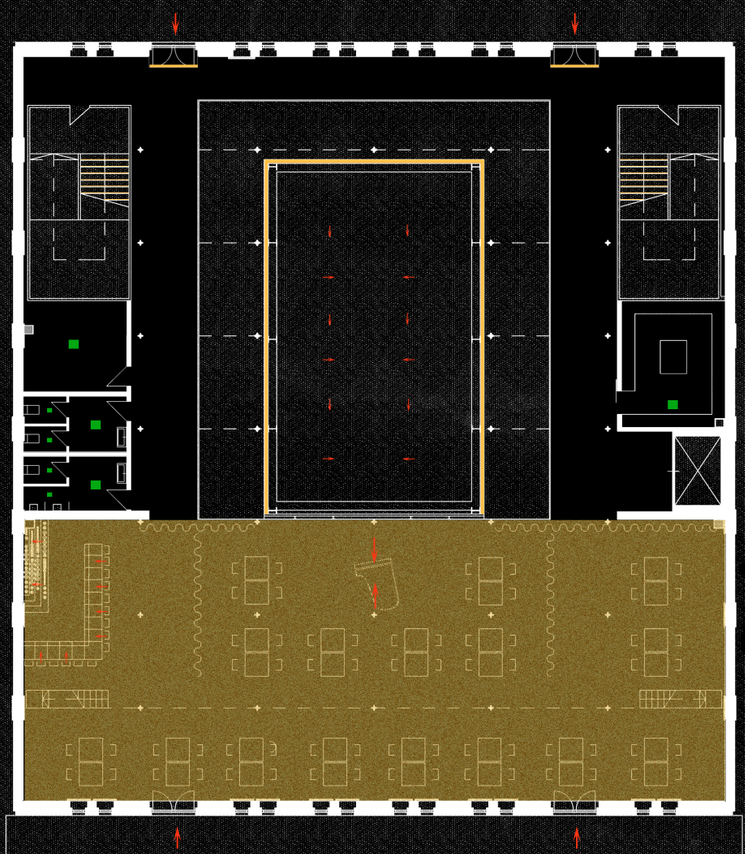


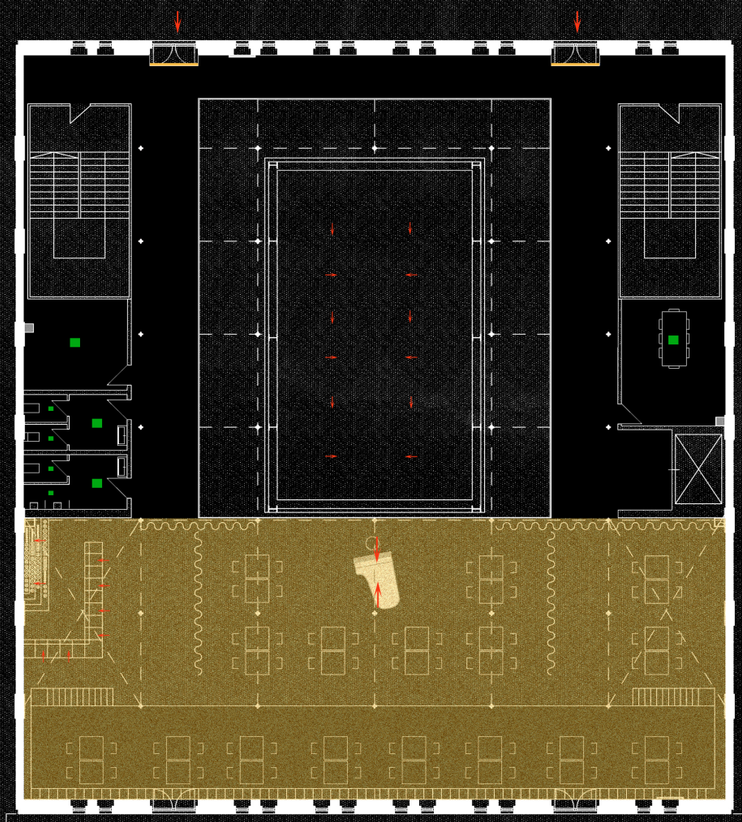














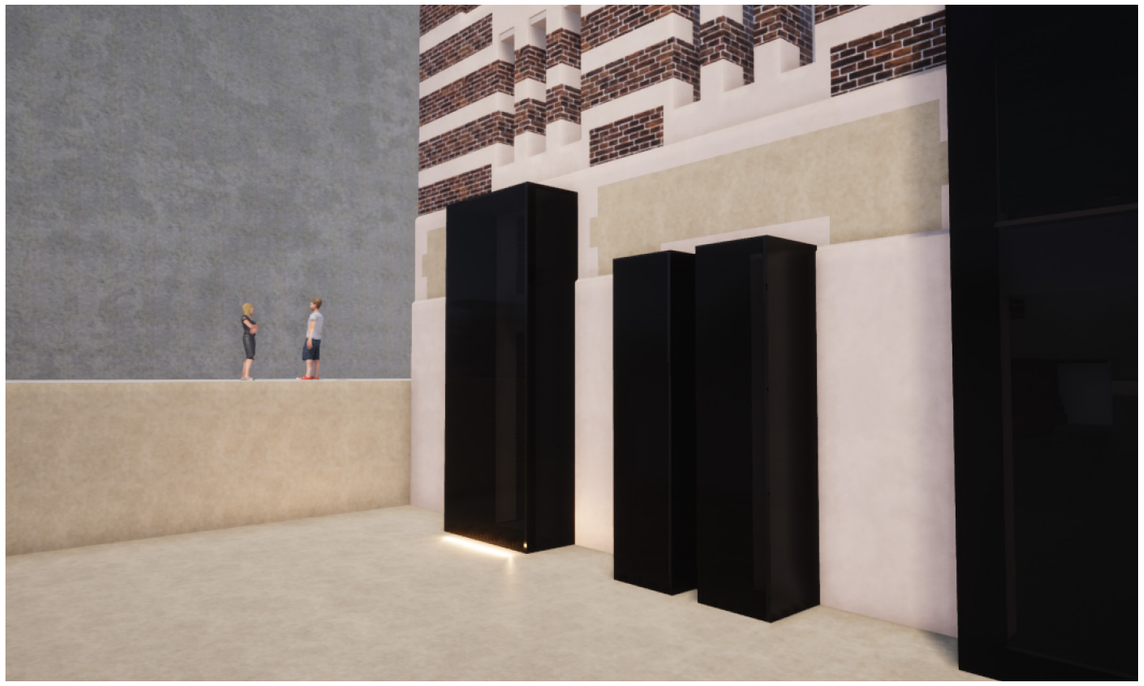
You approach Santos. Now surrounded by tall buildings.



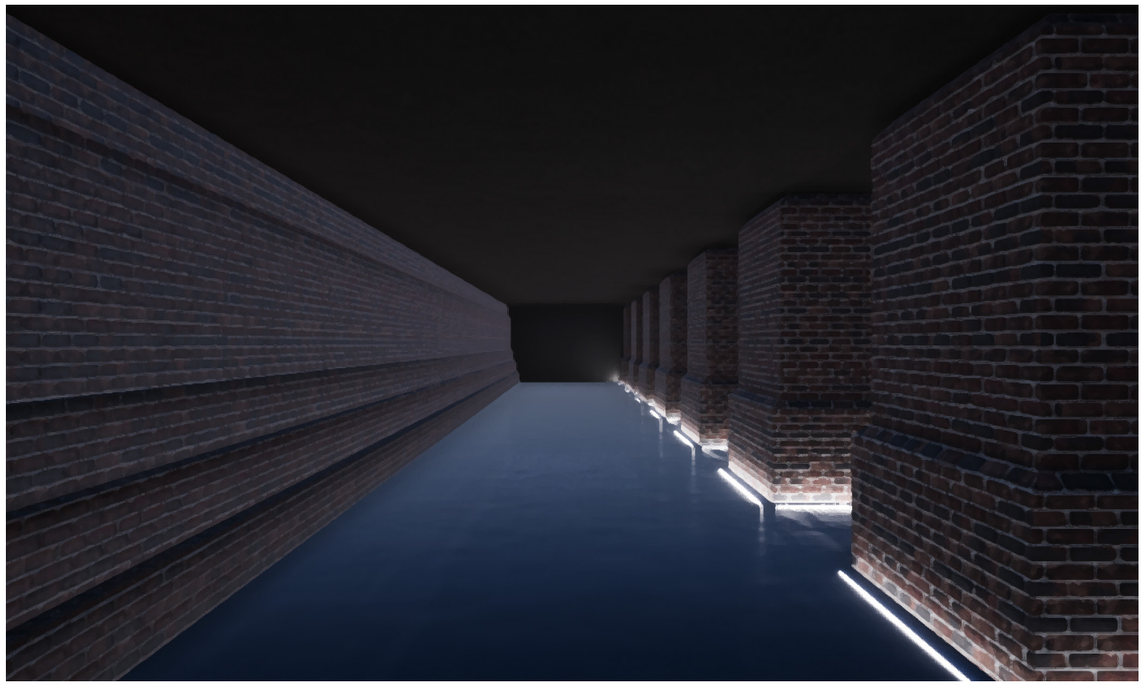
Forming a stepped landscape between Santos and the dok
that can be appropriated throughout day and night.



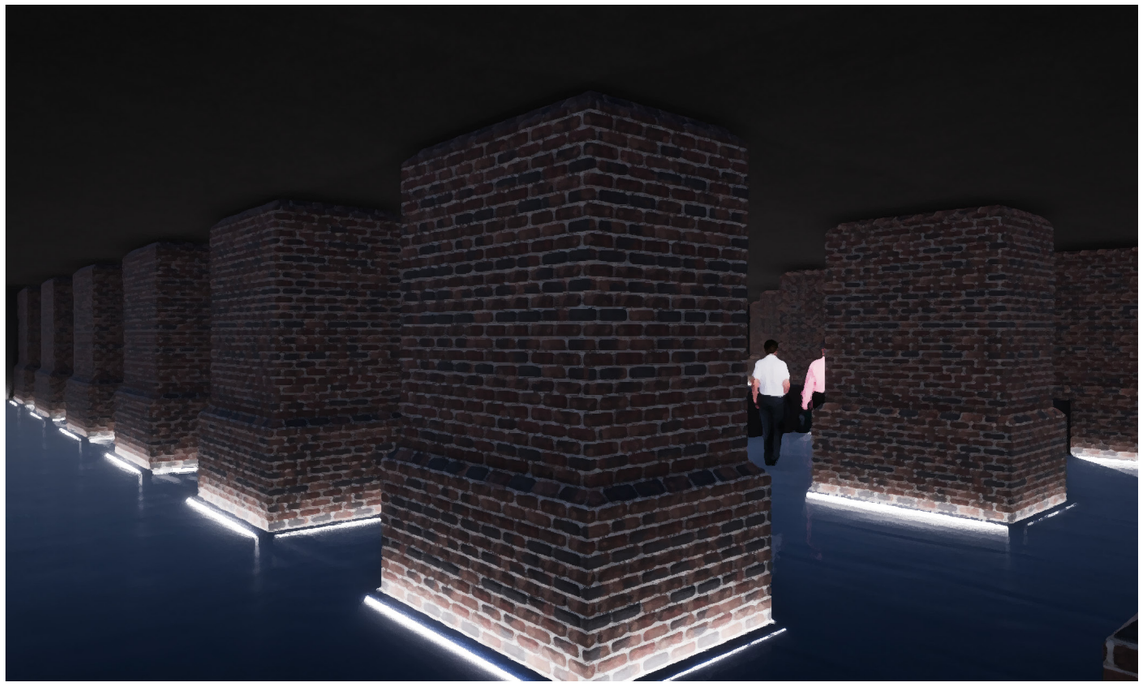
Down to the high portals, you try to find your way inside.
One by one you walk along the facade.



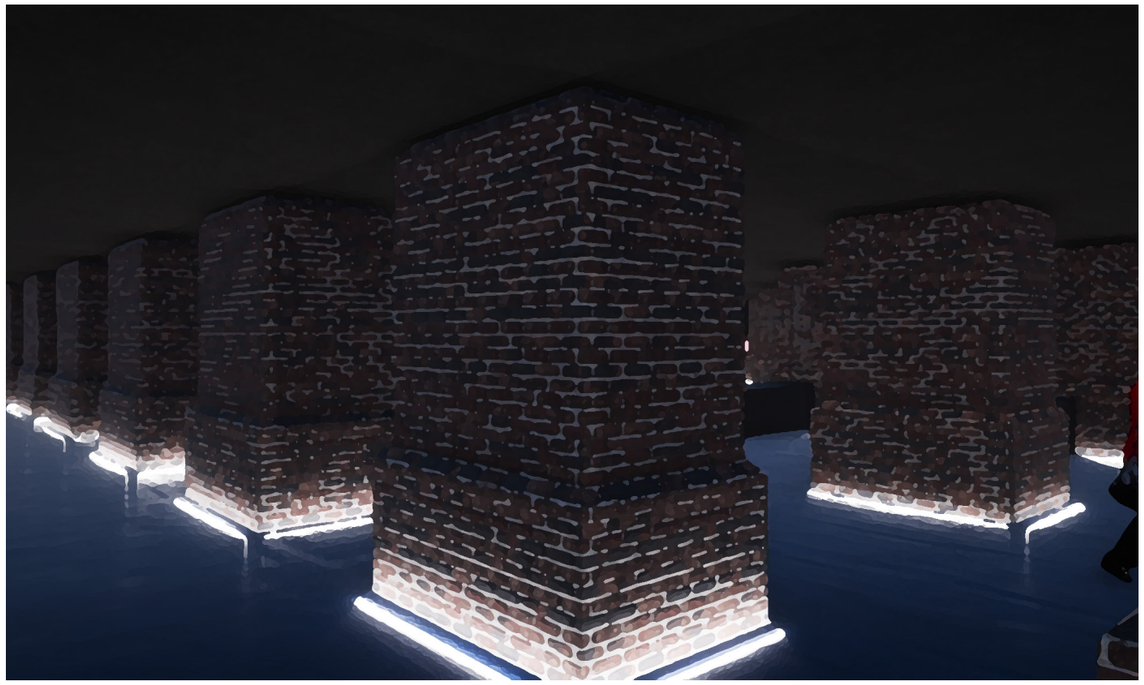
Only to find out that the last portal is the actual entrance.



You enter Santos. And feel its heavy weight. You are led by strips of light, and the dark blue polished concrete that reminds of the former water in the basement.



You move on. People appearing.



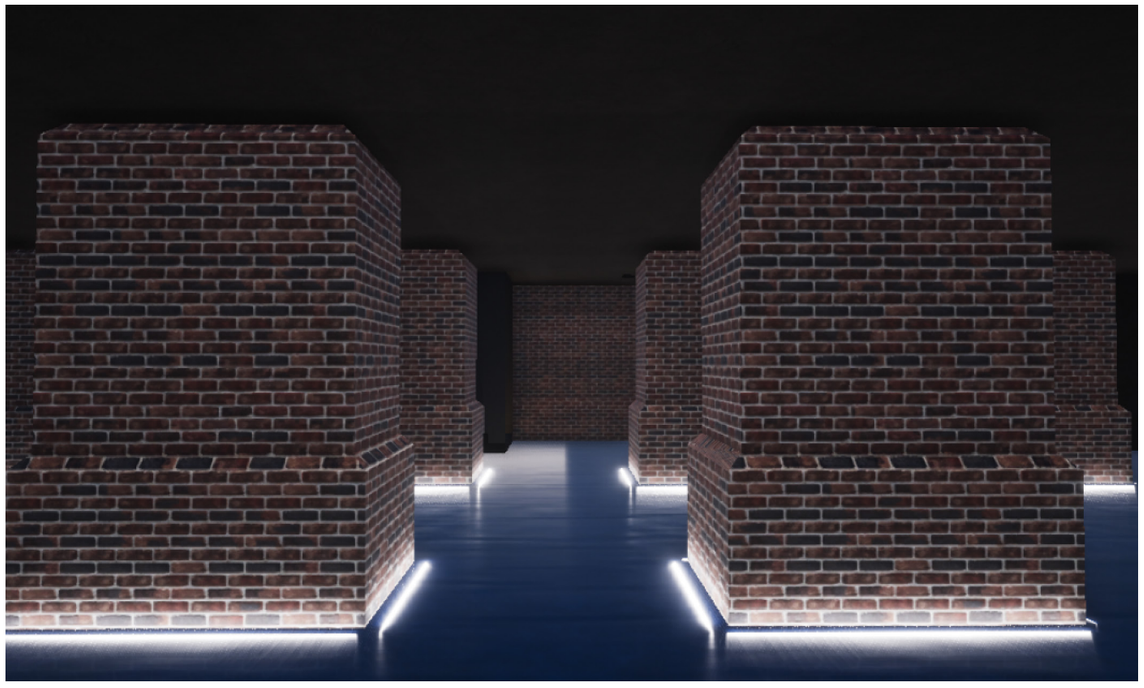
And disappearing behind and between columns. Suspense.



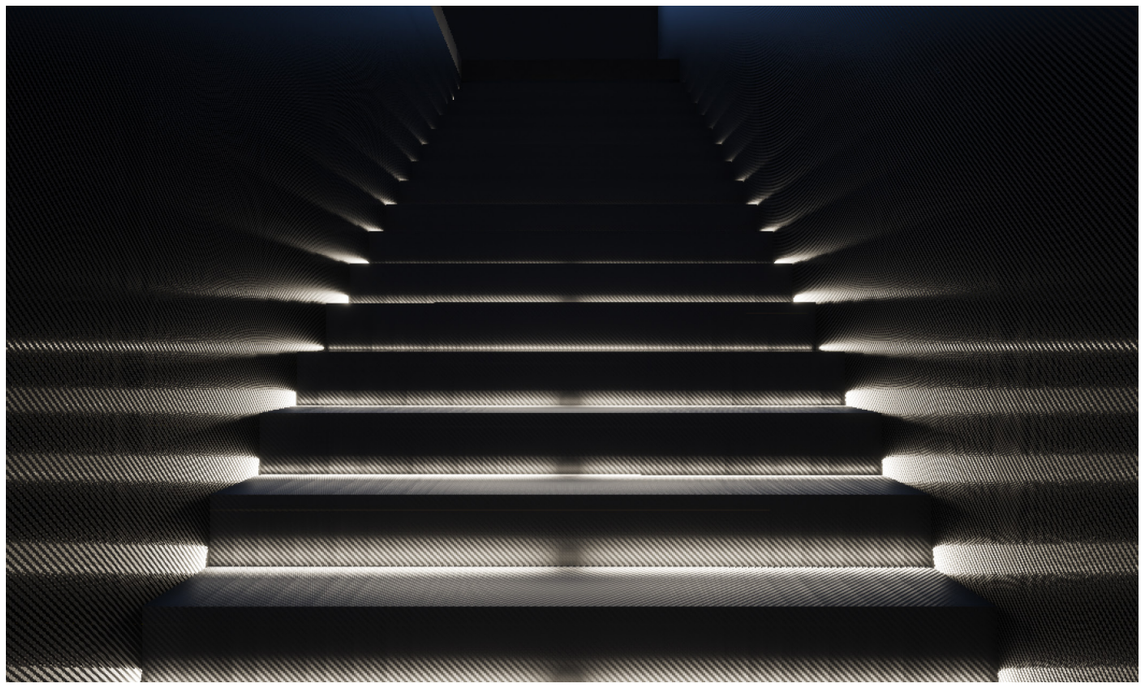
You leave your jacket at the counter.



People coming towards you.



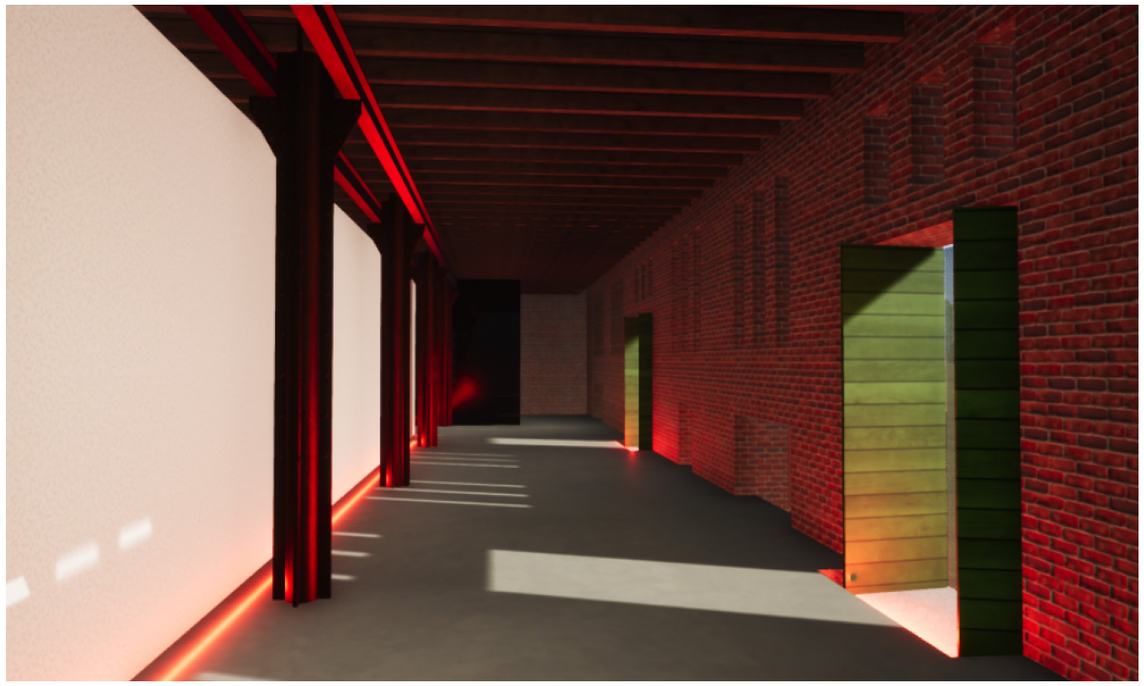
At the end - a staircase with light.



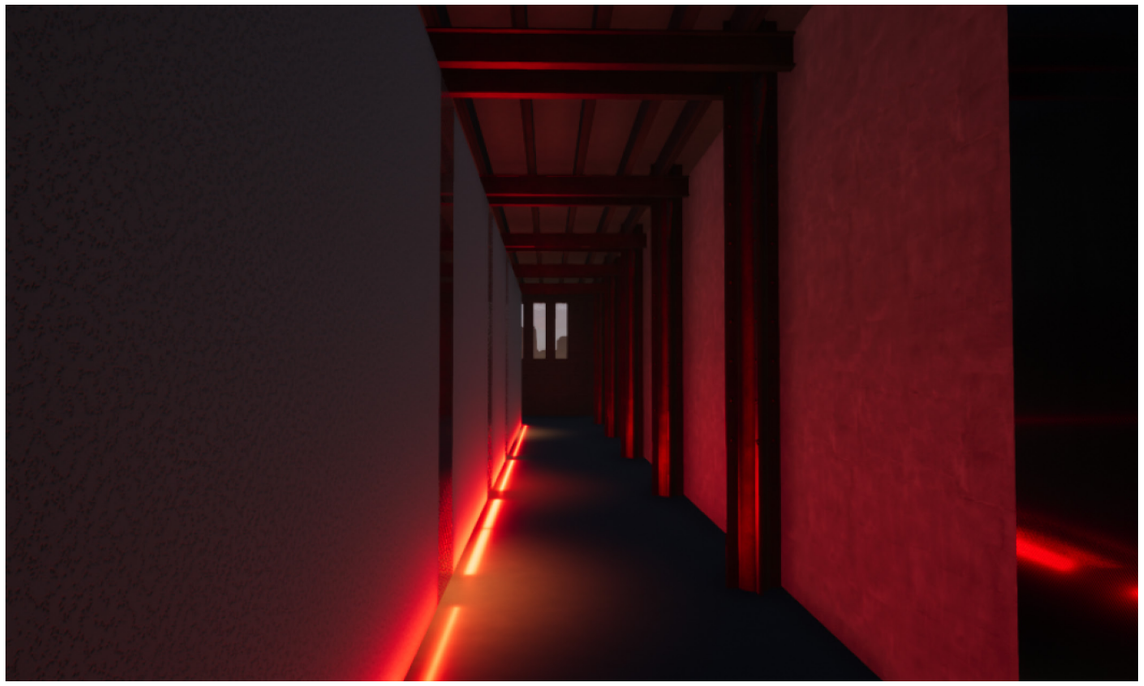
You move up.



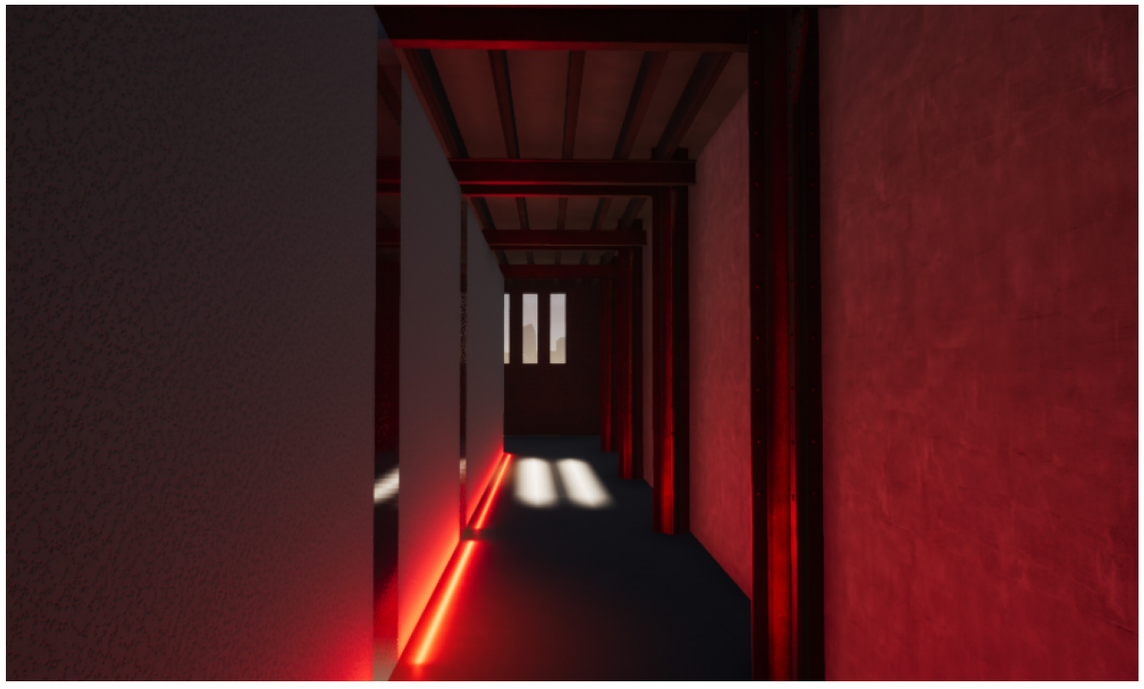
Transition.



You've reached the other end of the building. With incoming light creating dramatic shadows. A strip of light leading the way.



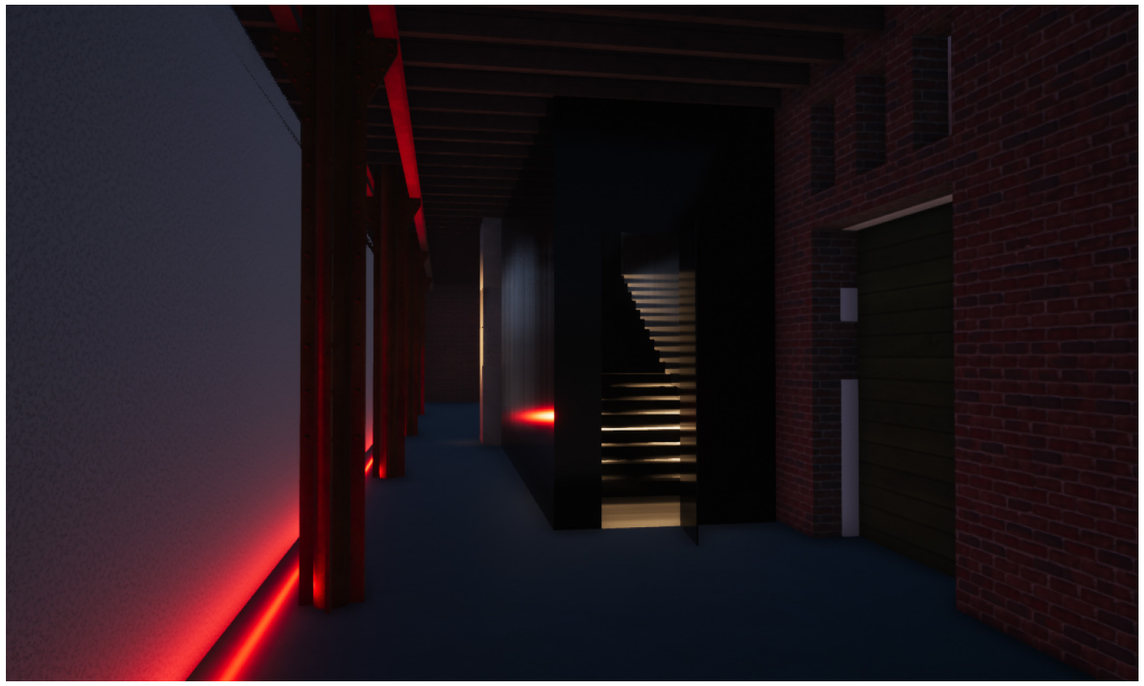
A glance around the corner, leads you along a narrow path. Red shadows flowing out of the Red Velvet Club. Oh - it seems like someone's practicing right now.



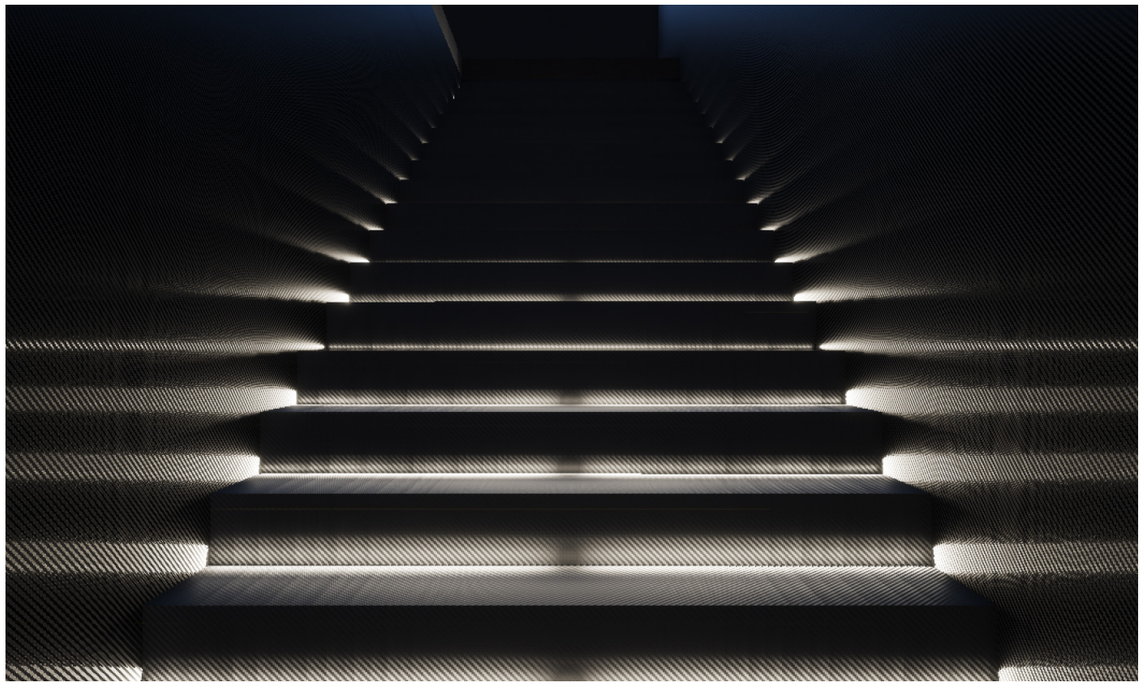
There, a window at the end of the path, casting long shadows into the space.



Upon arrival, you have the possibility to take the stairs up.



Or go and explore the old supervisor house that is hiding right behind it.



You move up.



Transition.



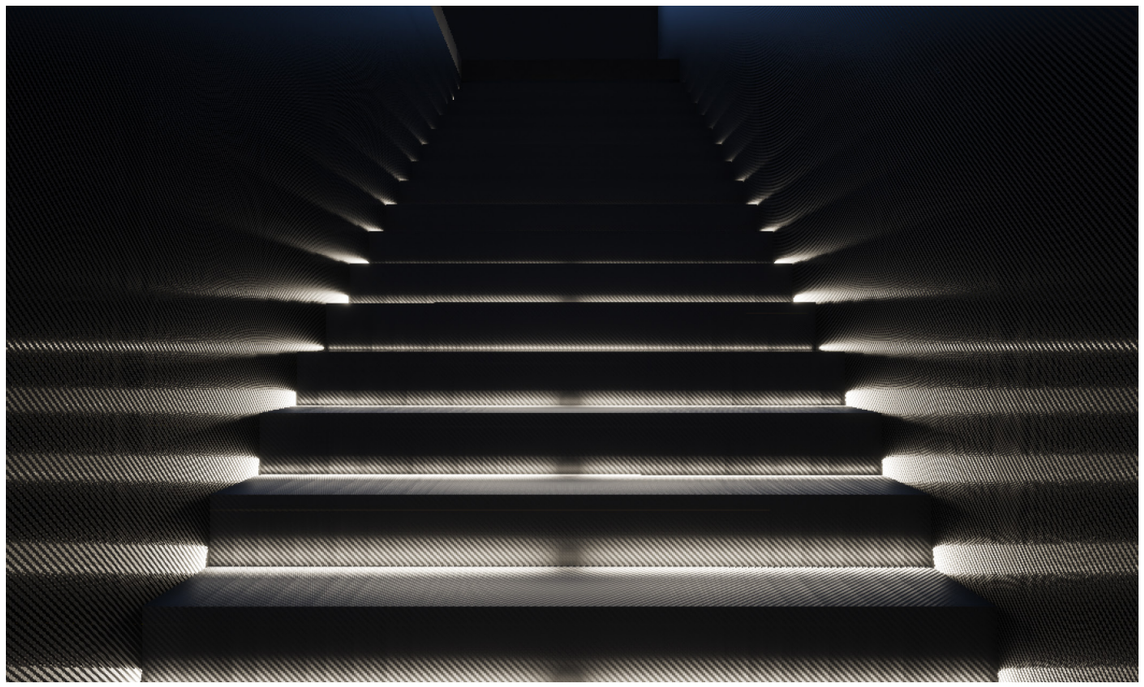
This is the white level. The Expo Level. Exhibiting contemporary Jazz art.
Spotlight and a strip of light accentuating the panels.



A labyrinth of panels. Creating a sea of light.



You move through narrow pathways, as if you were moving through the tiny alleys of the former stored coffee beans.



You move up.



Transition.



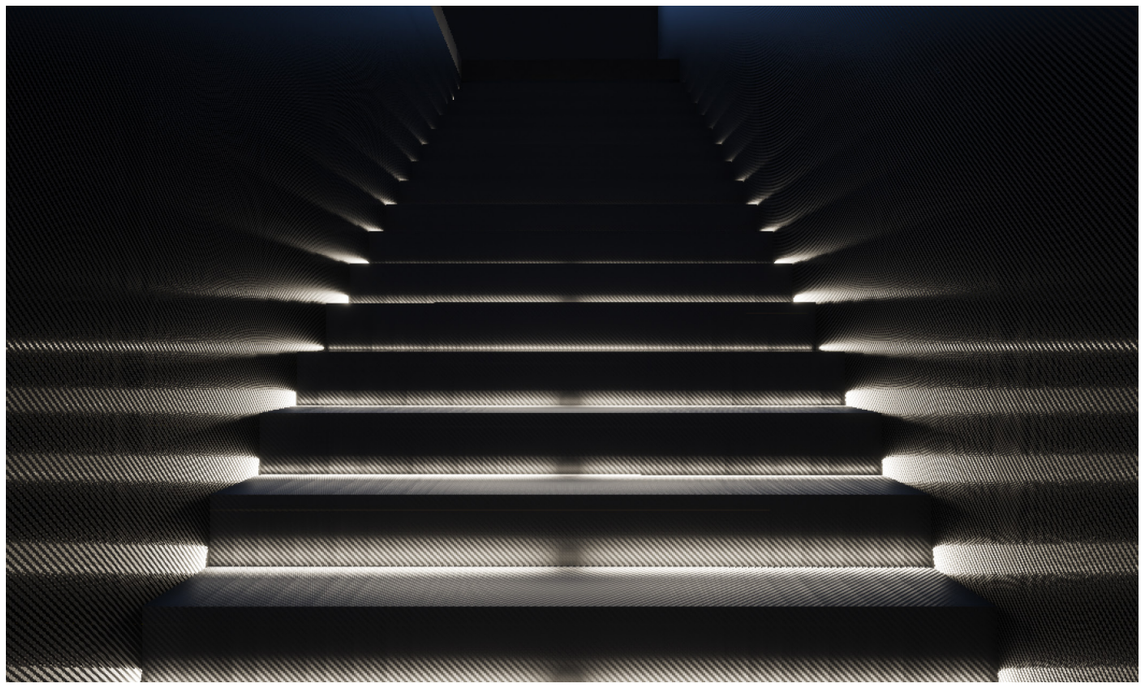
Welcome to the Improv Level!
With dramatic incoming shadows. Light accentuating each column and spotlights on.

EXPLORATION



People can come any time & make music together, as a means of communication and the true origins of Jazz. Everyone here becomes stage and audience in one.

EXPLORATION



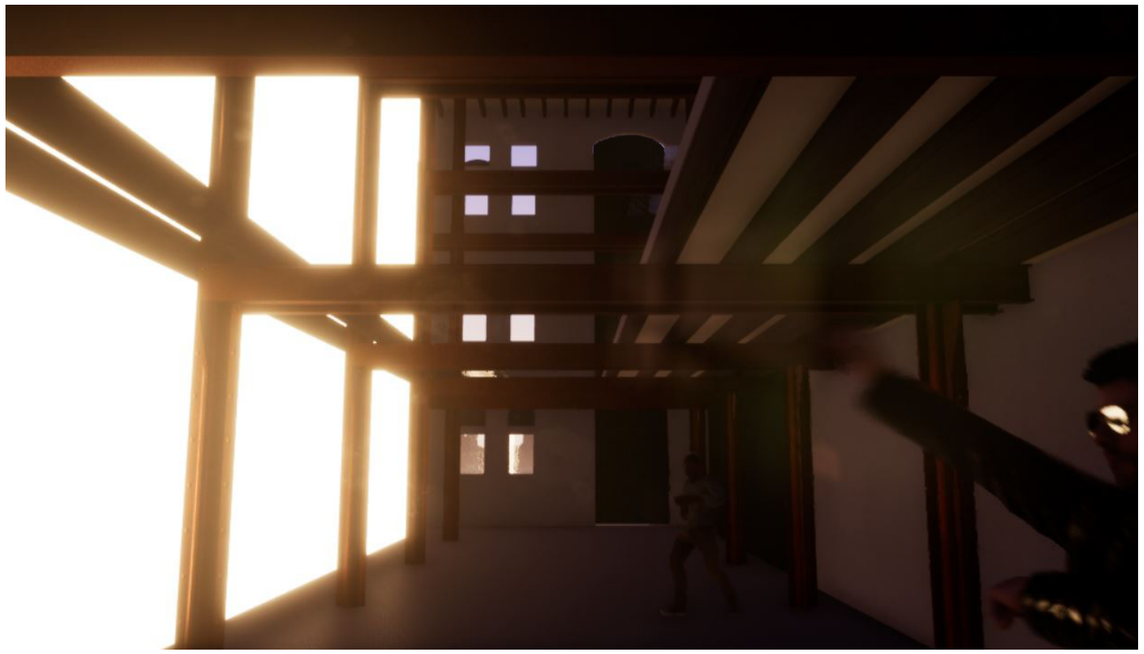
You move up.



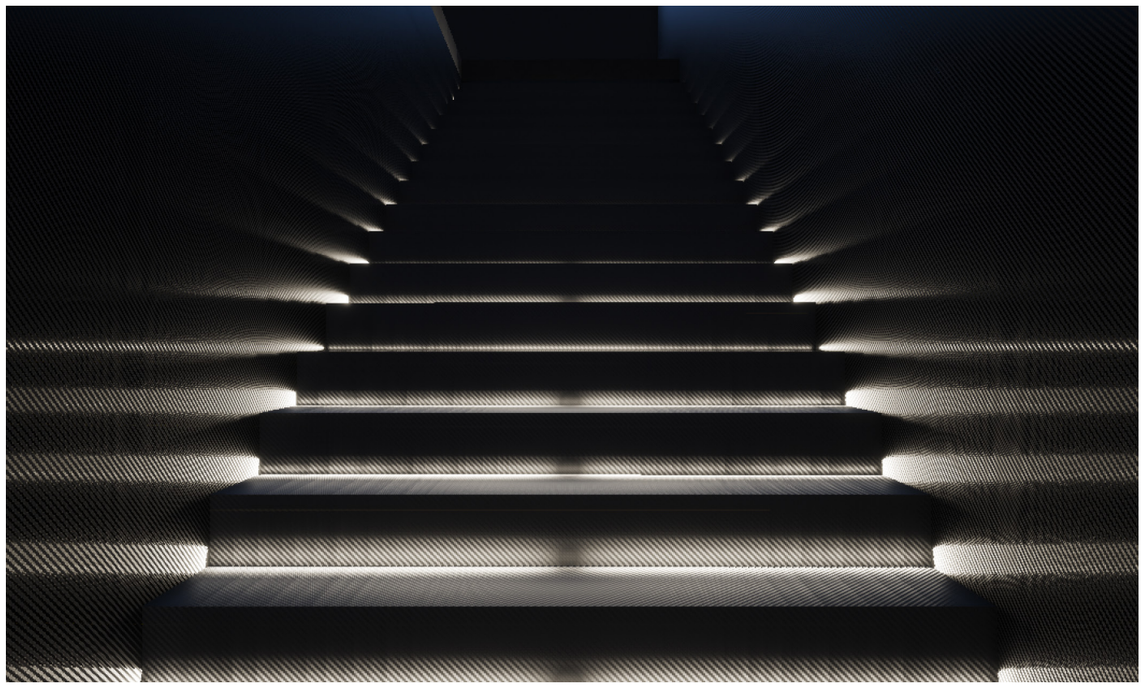
Transition.



All of a sudden-you experience an unexpected lightness. And find the Explore Lab, a glowing box. The actual heart of the building where musicians from all across the world can gather, practice and record new types of Jazz music together.



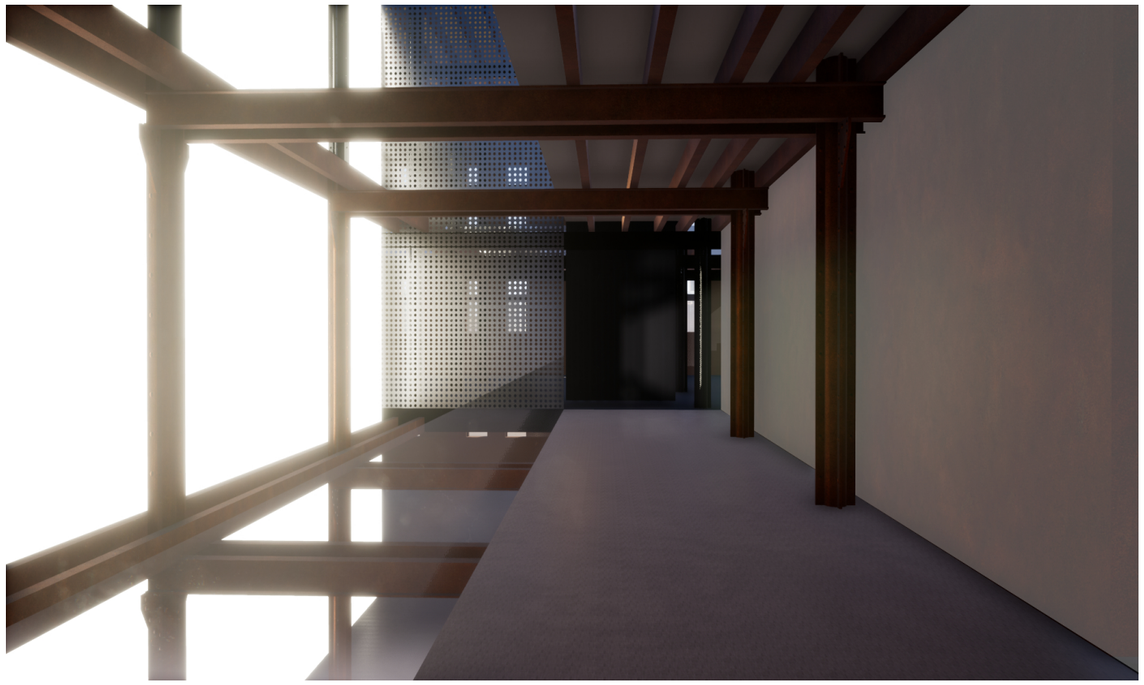
The existing wooden ceiling is opened up to create a lighter feeling. Passarells above you.



You move up.



Transition.



Walking along the passarells, across the glowing box, you approach the Piano Restaurant.
Closed off by sheets of perforated metal.



Only to realize, that upon entering, this perforated metal transforms
the space into a sea of light grains.



Candle lights…At the end of the day, you can finally enjoy the best view onto the skyline of Rotterdam.

Time passes. And you realize that it’s time to go down now - in order to do what you initially came here for.



Transition.



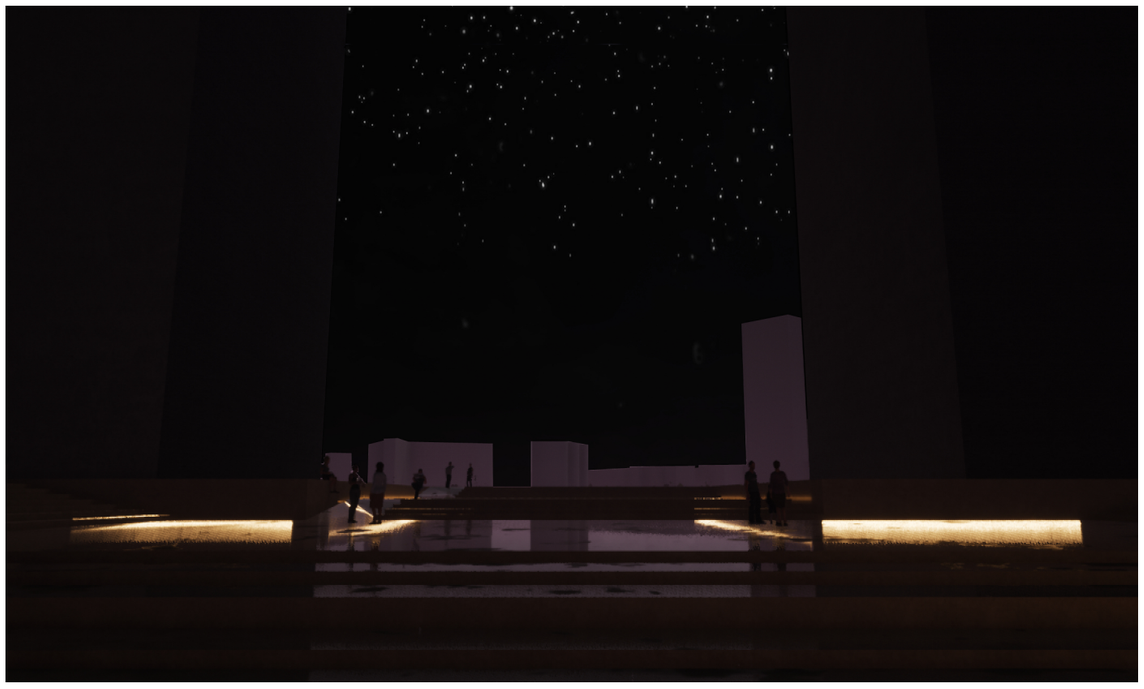
Doooors open! ‘Welcome to the Red Velvet Club! On stage with Eva Fernandes’



Transition.



You get your jacket and make your way out of Santos House of Jazz.



And slowly come to understand what Jazz is ‘really ‘about.



In fifty to hundred years time, Katendrecht may transform further. Even though buildings might become higher and the streets even busier, SANTOS House of Jazz with the open connection to the water will remain like a pearl within its confines. The future can not be foreseen, but as long as SANTOS remains a place of music, appropriation and togetherness, Jazz can evolve and transform into something even more multi-faceted and colourful.

Images:

Fig 1: Velzen, van J.Hugo; ‘Bouwhistorische Verkenning Pakhuis Santos Brede Hilledijk 95/Rijnhaven Z.Z. 6 Rotterdam’, in: Flexus AWC; Rotterdam, Netherlands, 2011
Fig 2: Museum Rotterdam, Stadsarchief Rotterdam & BOOR. (n.d.). Collectie Rotterdam: Stad in Kaart.
Retrieved on March 2017, from: www.rotterdaminkaart.nl
Fig 3: Santos Warehouse, SERC. Retrieved on March 2017, from: www.serc.nl
Fig 4: Velzen, van J.Hugo; ‘Bouwhistorische Verkenning Pakhuis Santos Brede Hilledijk 95/Rijnhaven Z.Z. 6 Rotterdam’, in: Flexus AWC; Rotterdam, Netherlands, 2011
Fig 5: Velzen, van J.Hugo; ‘Bouwhistorische Verkenning Pakhuis Santos Brede Hilledijk 95/Rijnhaven Z.Z. 6 Rotterdam’, in: Flexus AWC; Rotterdam, Netherlands, 2011
Fig 6: Dok Photo, Port of Los Angeles, Virtual History Tour, Retrieved on March 2017, from: http://laporthistory.org/level4/warehouse1/warehouse_people.html
Fig 7-20: Hemmings, Inés et al. (March 2017). SANTOS an analytical report of a historical warehouse on architecture, building technology and cultural values. Harbour Heritage Graduation Studio 2017/18. TU Delft
Fig 21: Club Photo, Brittany Bartley Photography, Retrieved on December 2017, from: http://brittanybartley.blogspot.nl
Fig 22: Louis Armstrong, FANART, Retrieved on December 2017, from: https://fanart.tv/artist/eea8a864-fcda-4602-9569-38ab446d-ecd6/armstrong-louis/
Fig 23: Ella Fitzgerald, Bohemian, Retrieved on December 2017, from: https://www.bohemian.com/BohoBeat/archives/2016/08/17/aug-20-tribute-to-lady-ella-in-napa
Fig 24: Charles Mingus, WYCE, Retrieved on December 2017, from: https://grcmc.org/wyce/node/7737/artist-of-the-day-charles-mingus
Fig 25: Pakhuis Santos, ZOOM, Ontwikkel jezelf als fotograaf, Retrieved on September 2017, from: http://zoom.nl/foto/architectuur/pakhuis-santos.2631745.html
Fig 26: World Map, World Map Clip Art Black And White, Retrieved on May 2017, from: https://clipartfest.com/categories/view/8cf224c6e-82f2a1a283f0302d163ef44cc4f557e/world-map-clip-art-black-and-white.html
Fig 27-39: Hemmings, Inés et al. (March 2017). SANTOS an analytical report of a historical warehouse on architecture, building technology and cultural values. Harbour Heritage Graduation Studio 2017/18. TU Delft
Fig 40: Supervisor House, Photo by L. Jespers. Harbour Heritage Graduation Studio 2017/18. TU Delft
Fig 41: Supervisor House, Photo by L. Jespers. Harbour Heritage Graduation Studio 2017/18. TU Delft
Fig 42-49: Hemmings, Inés et al. (March 2017). SANTOS an analytical report of a historical warehouse on architecture, building technology and cultural values. Harbour Heritage Graduation Studio 2017/18. TU Delft
Fig 50-68: Lubelli, Barbara (March 2017). Conditions, Damage Presentation Msc1 heritage studio & technology of Technology of Conservation Lectures. Harbour Heritage Graduation Studio 2017/18. TU Delft

Books:

1: Levitin D.; ’My Favorite Things - Why Do We Like the Music We Like?’; in: Atlantic Books, This is your Brain on Music (235); Dutton, USA, 2006

2: Davis R.; ‘Lighting Psychology - Cognitive and Emotional Responses to Lighting’, on website: http://www.ledinside.com/knowledge/2013/12/lighting_psychology_cognitive_and_emotional_responses_to_lighting, 2013