THE ARNO ARCHIVE :

MUSEUM AND INSTITUTE FOR FLOODED ART RESTORATION, FLORENCE

Oscar Lakatos - UG3 - YR3



The Arno Archive is a Museum and Institute for Flooded Art Restoration located on the Arno Weir in Florence. Inspired by the devastating 1966 flood, the project explores how architecture can preserve cultural heritage while reimagining the relationship between the city and the river that once threatened it.

The design is derived directly from Florence's flood-damaged artworks. Paintings, sculptures and artefacts were analysed and translated into architectural geometries, allowing the building to emerge from the cultural objects it exists to protect. Conservation is made visible throughout the project, transforming restoration from a hidden process into a public experience.

Water acts as both subject and design generator. Hydrodynamic research informed the building's organisation and form, while Leonardo da Vinci's studies of the Arno inspired a flowing roofscape that contrasts with the building's more permanent structural frame. The project also explores the idea of the river as an artist, using hydraulic processes to create new artworks that connect destruction, restoration and creation.

OSCAR LAKATOS - UG3 - YR3

SITE INTRODUCTION

Situated in the center of Florence this site offers a unique opportunity to reconnect the population with the river Arno. With limited river side accessibility, the weir feels very separated from the surrounding city. I saw this as a great opportunity to re-imagine an iconic Florentine viewpoint and more importantly to research Florence's historical relationship with the Arno.



A.



B.



C.



D.



E.



F.



G.



KEY FEATURES:

1. RIVER WEIR
2. BRIDGE CONNECTIONS
3. RAISED RIVER PROMENADES
4. RIVERSIDE ACCESS
5. RIVERSIDE PROMENADES
6. RIVERSIDE BIODIVERSITY
7. CAR PARK
8. PUBLIC SQUARE
9. CHURCH

KEY:

Features.

Site.

Bus stops.

View points.

SITE EXPLORATION











The most important thing for me was to capture the river's movement in and around the site, looking carefully at how the water moves over the weir. I also wanted to display my sites disconnect from the surrounding city.

There is limited acess to the site, having to walk 100 metres downstream before finding an opening to walk down beside the river, this is something I kept in mind when progressing with my design, looking to make this space immediately accessible.

OSCAR LAKATOS - UG3 - YR3

SURROUNDING ARCHITECTURAL & LOCAL MATERIAL RESEARCH



SANDSTONE WEATHERING

Sandstone plinths are common on the ground floors of these buildings and often express years of weathering between water and stone.

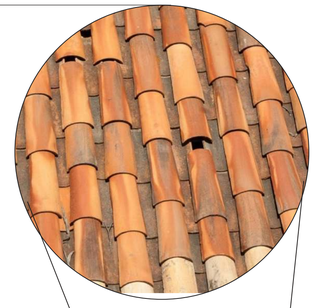


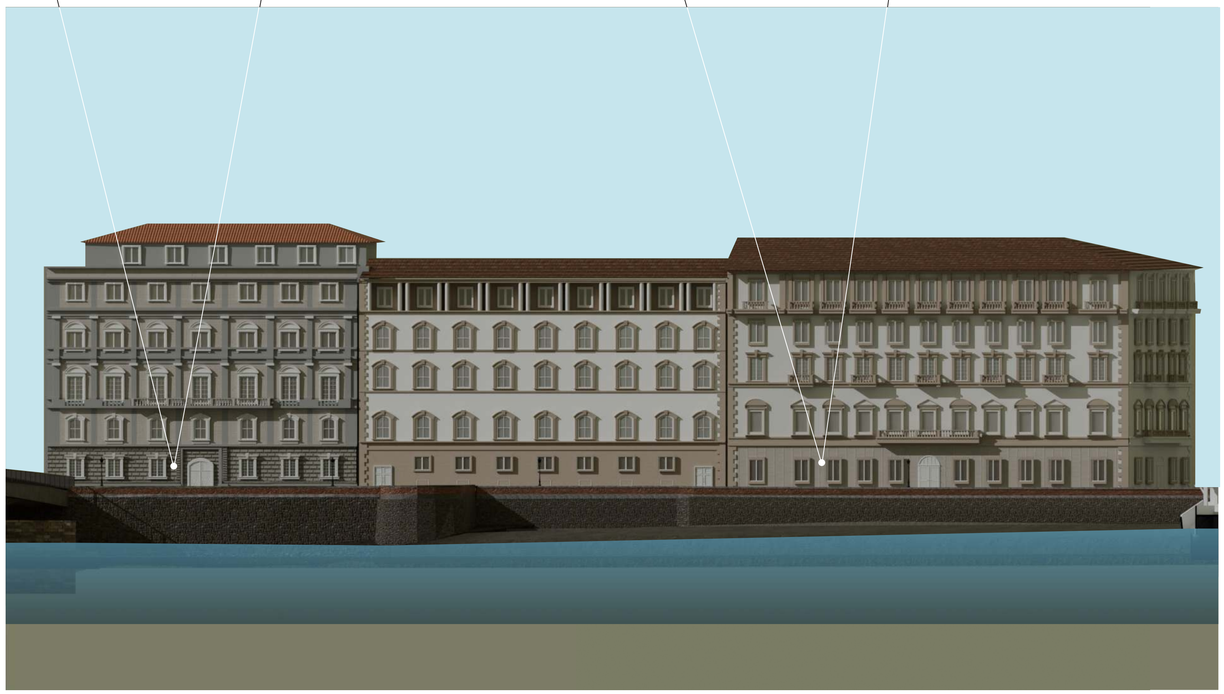
SANDSTONE BUILDING BASE

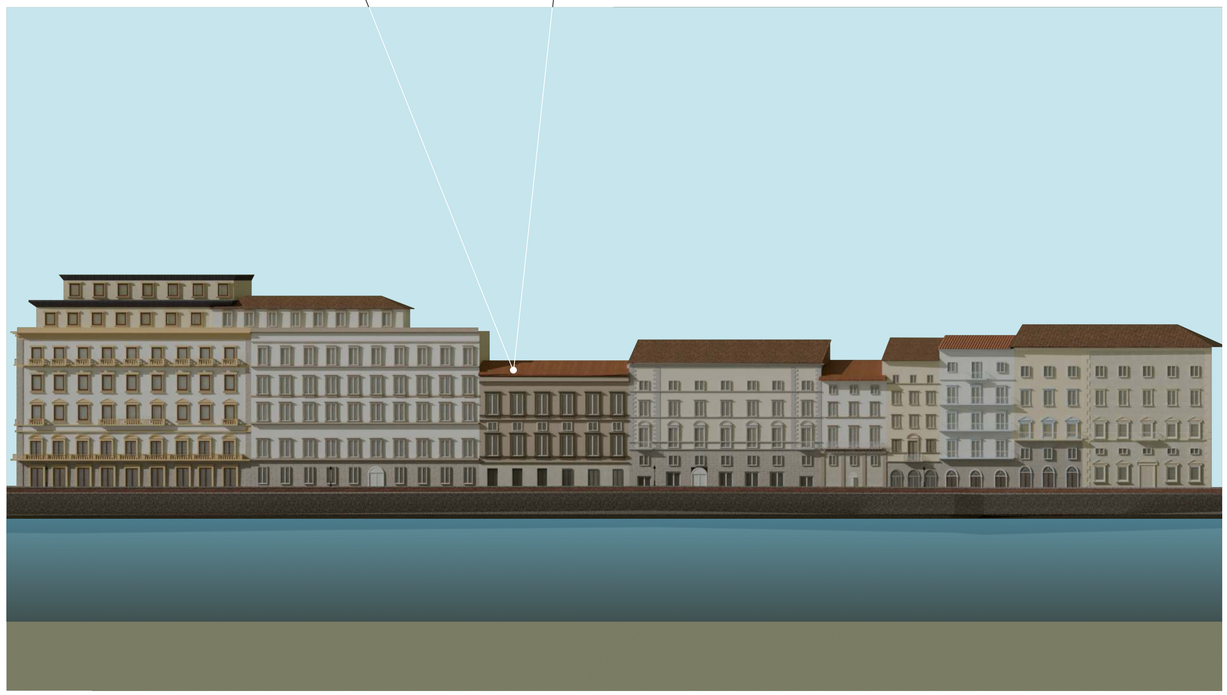
Heavily rusticated sandstone bases to buildings often extrude out at the base of a cleaner uniformed masonry facade. This transition defines a material hierarchy, expressing weight and anchoring the building to the ground.

TERRACOTTA ROOF TILES

Terracotta roof tiles define the skyline and material continuity of Florence's historic fabric, emphasizing repetition and warm tonal consistency.







DOOR DESIGN

It is common to see elaborately designed timber doors on the streets surrounding the river. These act as key elements defining the local architecture. They are often set within thick, pale masonry frames creating a nice material contrast and adding nuance to building facades.





RIVER WALL

The river wall condition shows staining, water marks, and material decay, indicating long-term hydraulic impact on vertical surfaces. The brick parapet and stone retaining wall detail demonstrate layered construction and foundation strategies, suggesting how new interventions might anchor into or sit against the existing structure.



SITE PHOTOGRAPHS







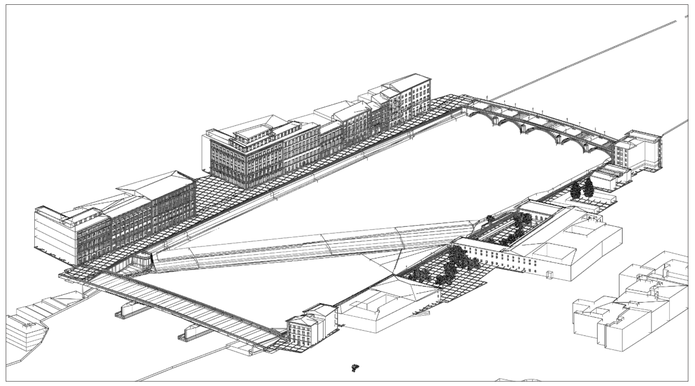




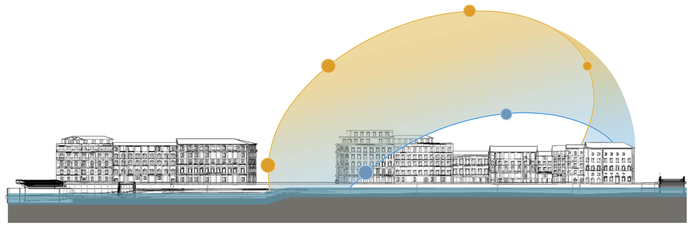


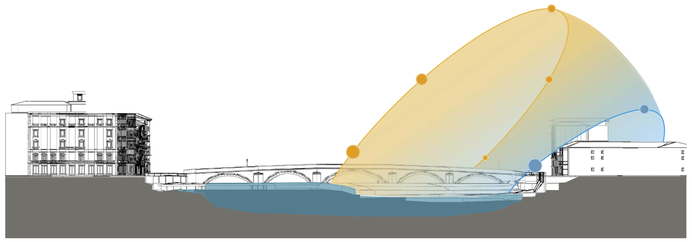
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MODELLING SITE



Site model axonometric

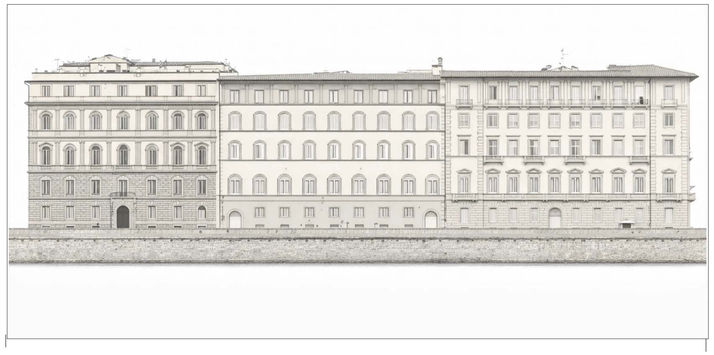


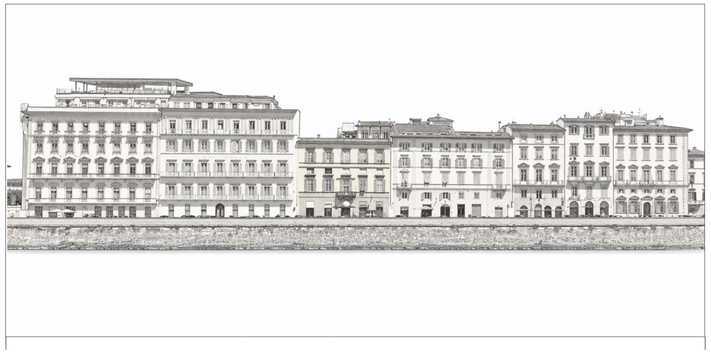


Site sections with sun behaviour

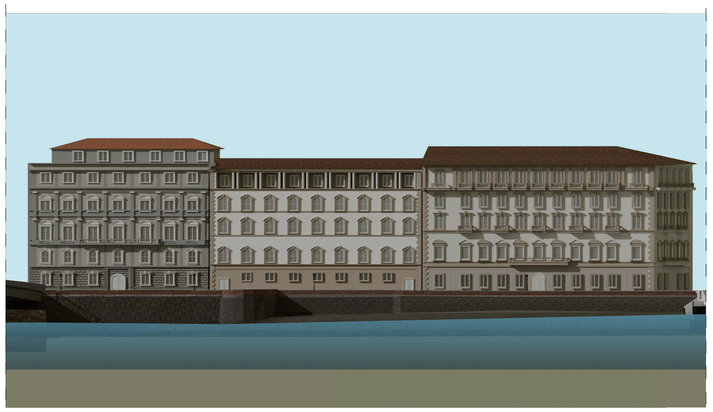
For my site model I prioritised the Florentine facade characteristics for the existing riverside architecture, as I knew these buildings were most likely to feature in the background of some of my final exterior renders.

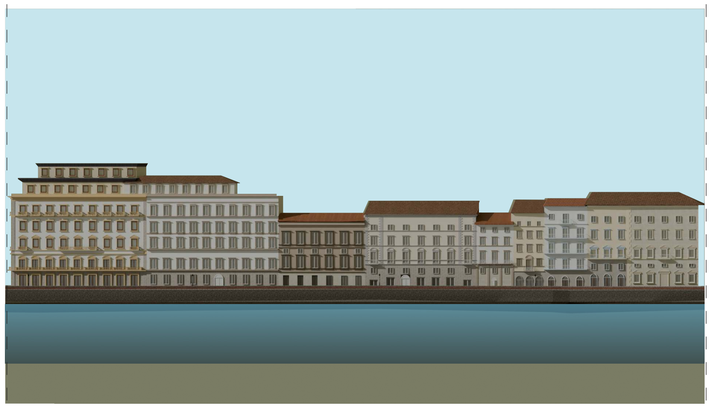
It was also very important to model the correct weir gemotry to make sure that I could accurately design my building's foundations in the future. In order to do this I carefully measured google earth imagery.





Extracted and flattened riverside facade imagery





Riverside facade model based off imagery

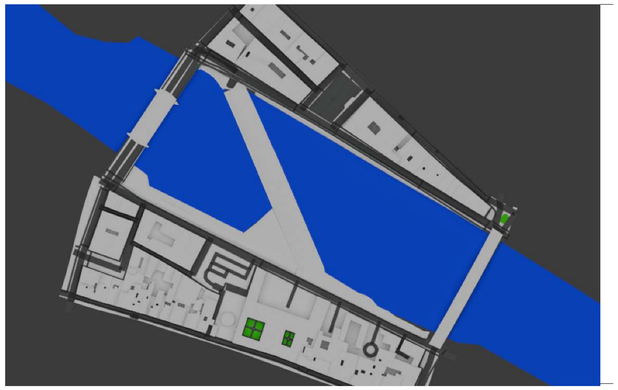


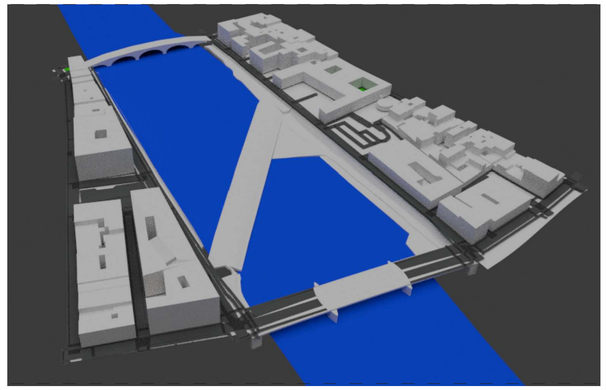


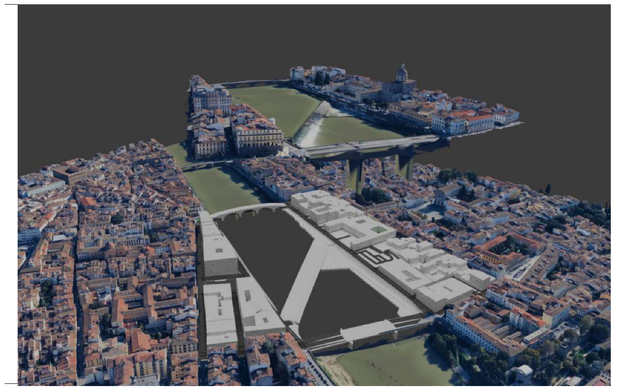
Blender site model

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MODELLING SITE



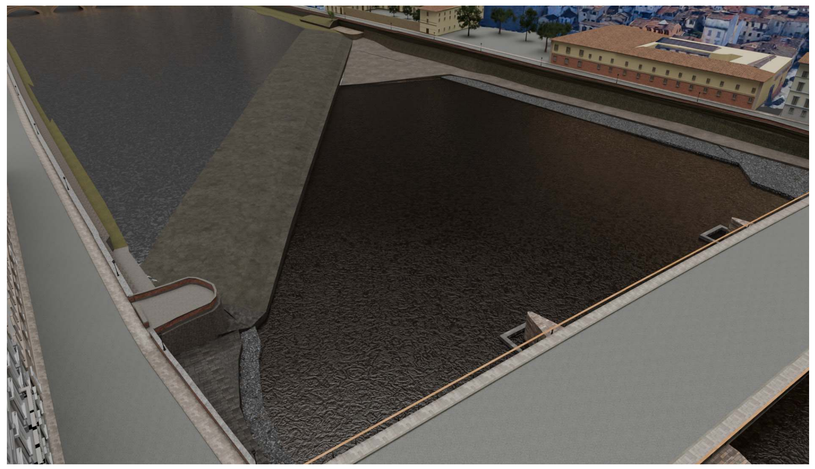


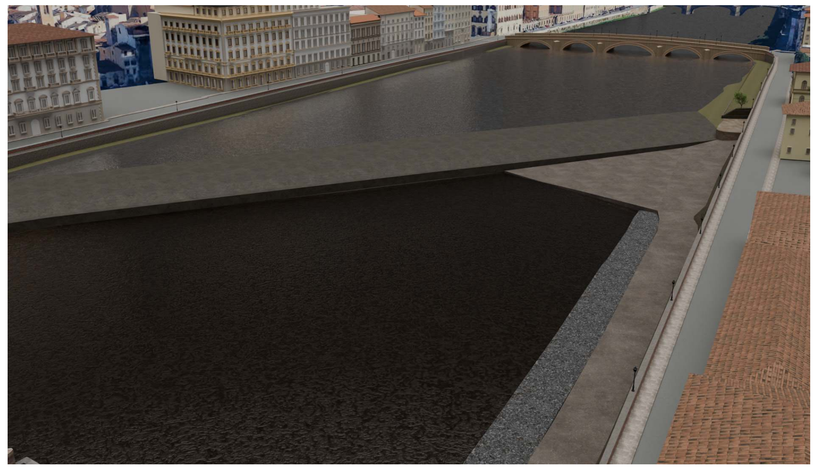


Section of Florence to focus modelling on

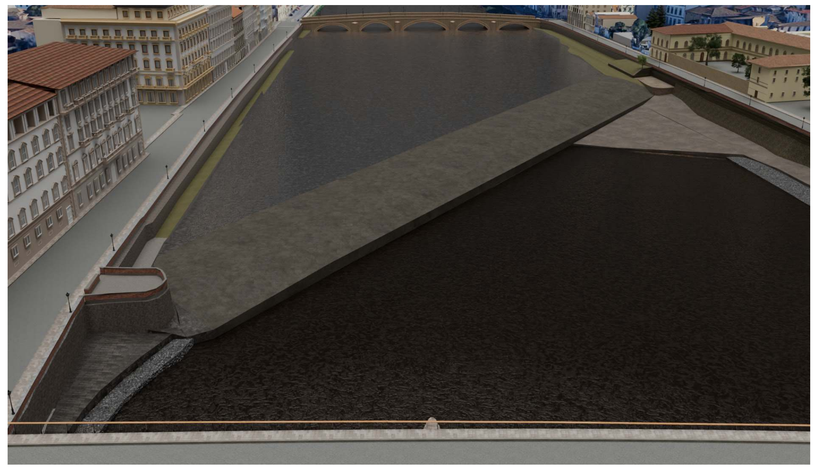
From these images you can see that I started by importing the google earth meshes into blender. I then modelled the immediate facades and river geometry around my site in more detail as these are the hotspots most likely to appear in my final renders.

I tried to use a sky HDRI that matched the lighting seen on google earth so I could fuse my modelled geometries with the surrounding imported ones.









SITE MODEL OUTCOME





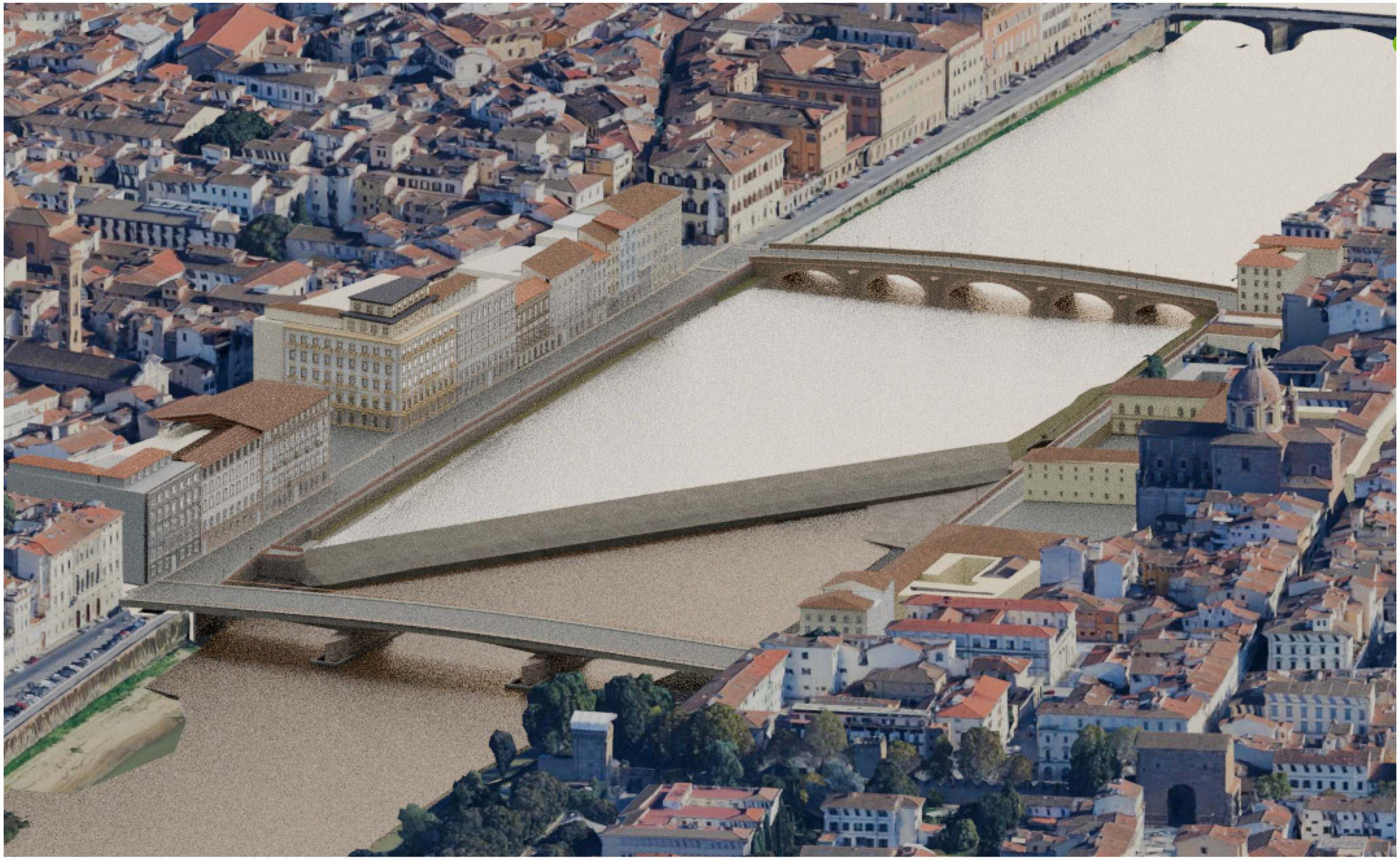












SITE CONTEXT AND HISTORY



EXTENT OF 1966 FLOODING

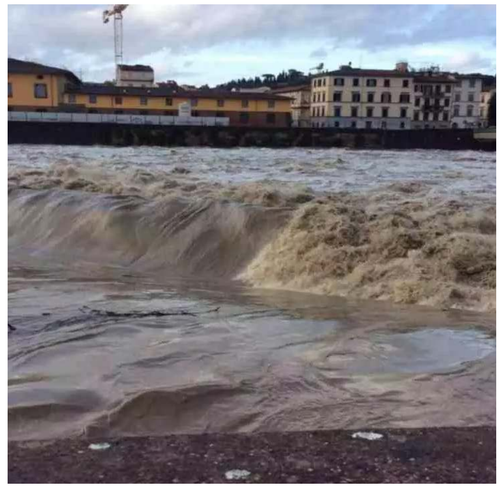


CONTAMINATION OF FLORENTINE FLOOD WATER WITH CITY POLLUTANTS

In November 1966 Florence was hit with one of the most extreme European flood events in recent history. A lack of river monitoring across the Arno systems meant that the city was unable to predict the extremity of the flooding and therefore suffered severe damage from the event. As a result of the flood, up to 14,000 cherished pieces of art were damaged including paintings, sculptures and panels. Given the rich artistic history within the city of Florence people went to great lengths in order to initially protect and later restore and repair these pieces of art. My building programme hinges on the damage caused to these specific artworks.

MORE RECENT, LESS EXTREME FLOODING





MORE RECENT FLOODING EVENTS OVER THE LAST 20 YEARS



MY PHOTOGRAPH DISPLAYING THE RIVER'S VISUAL IMPACT ON THE SURROUNDING ARCHITECTURE

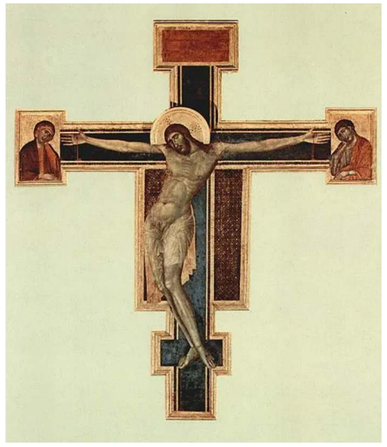
PROGRAMME : MUSEUM & INSTITUTE FOR FLOODED ART RESTORATION







PHOTOGRAPHS NEAR TO MY SITE FROM THE 1966 FLOOD

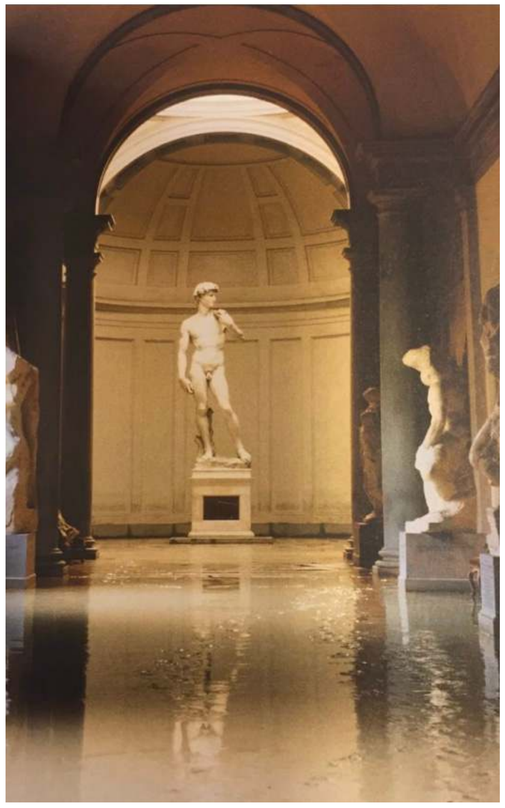






CIMABUE'S CRUCIFIX DAMAGED IN THE 1966 FLOOD





PHOTOGRAPHS DSIAPLYING THE AFTERMATH OF THE FLOOD



A lot of the immediate, makeshift response to protect these art works from water contamination came from a group of student volunteers named, 'The Mud Angels'. Most of their work included initially finding and transporting art to dry buildings, quarantining the art, drying, disinfecting, and peeling mud from nuanced surfaces. A large reason artworks such as Vasari's 'Last Supper' and Cimabue's crucifix are currently restored and displayed is due to these initial efforts made by the Mud Angels.

My building programme aims to recognise these efforts, by displaying these specific artworks in an institute of flooded art restoration. On top of this I wanted to place my museum directly above the Arno in order to reconnect the cities population with the river and overcome the city's cultural and even architectural divide with the body of water.

DESIGN DEVELOPMENT - PART 1

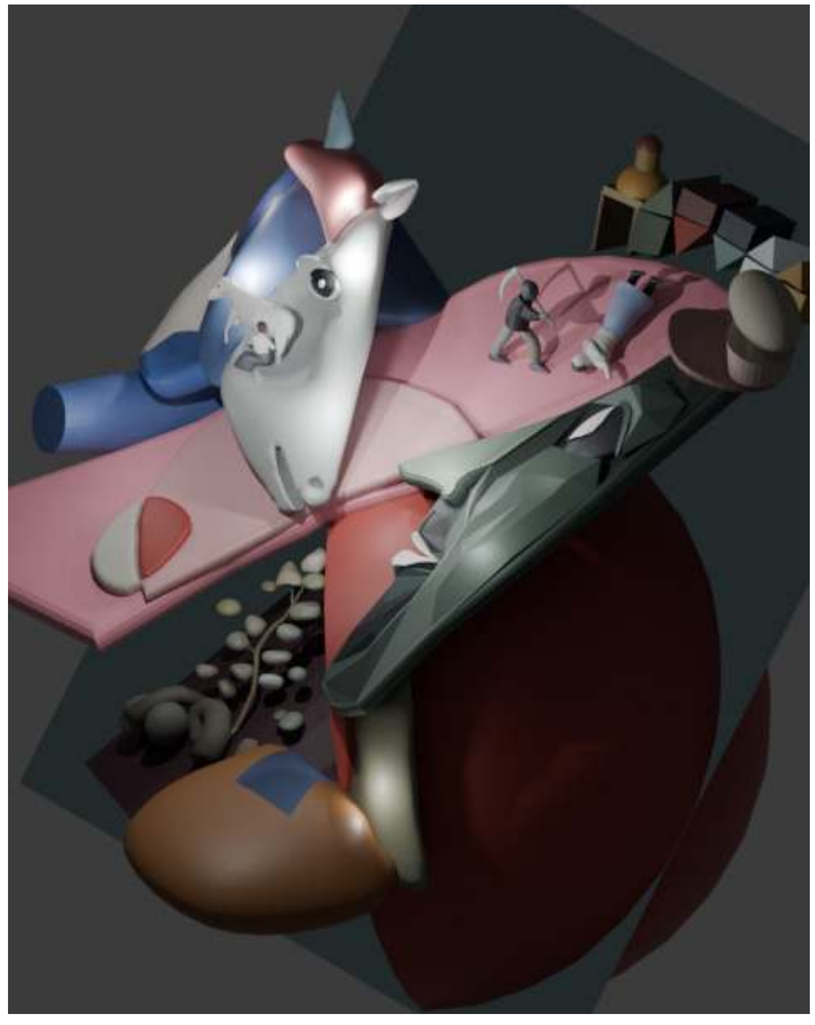
A CONTINUATION OF MY P1 PROJECT : MODELLING ARCHITECTURAL SPACES FROM 2D ARTWORKS



CHAGALL'S PAINTING



BLENDER RECREATION

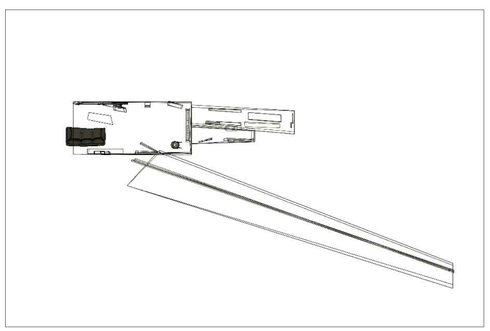


THE SPATIAL QUALITY OF THE PAINTING

CONTINUATION OF P1 METHODOLOGY

1. TAKING ORIGINAL PAINTING/ARTWORK

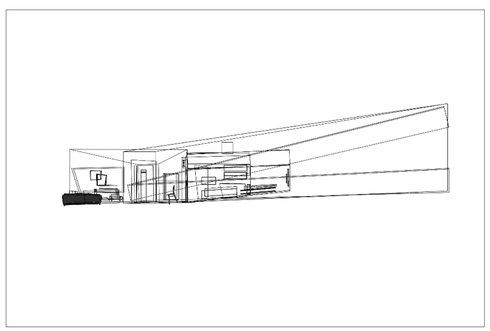




PLAN VIEW

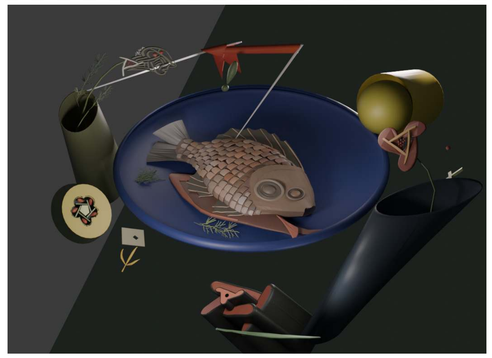
2. MODELLING FROM FIXED PERSPECTIVE

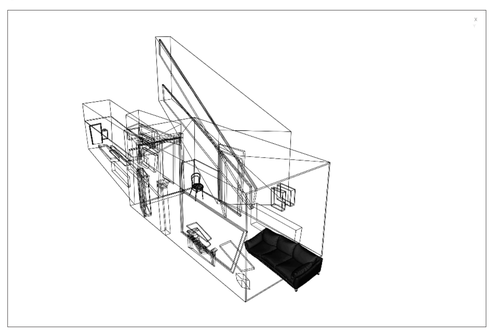




ELEVATION VIEW

3. FINAL OUTCOME





3D VIEW







From my work in P1 you can see that I discovered a methodology to create interesting nuanced spatial outcomes from a strictly 2 dimensional starting point. Using this method meant that I was able to create an immediate architectural relationship with a specific painting. Given my site's context it only made sense to utilise this method to explore some of the specific artworks damaged during the 1966 Arno flood.

I set myself the task of discovering the most important pieces of art damaged or destroyed by flood water in 1966, highlighting specific architectural geometries from these paintings and then modelling these spaces using my P1 method.

Given my building's programme, this process ensures that the impact of flood water on art becomes the core of my design. It is a key factor in reminding the Florentine citizens of both the sheer power of the Arno and importance of their historical artworks.

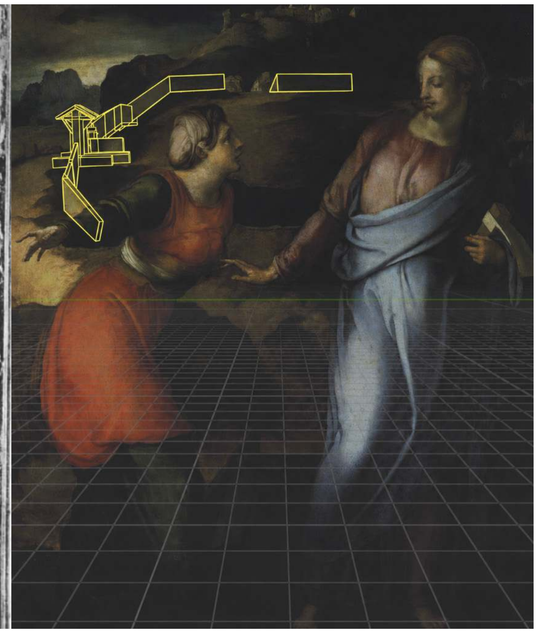
NOLI ME TANGERE , JACOPO PONTORMO



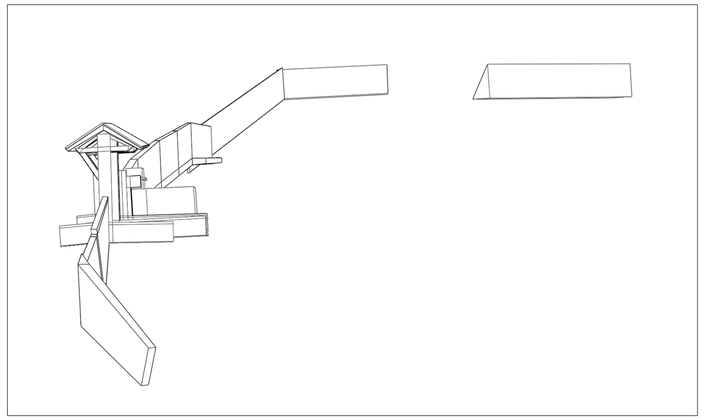
ORIGINAL PAINTING



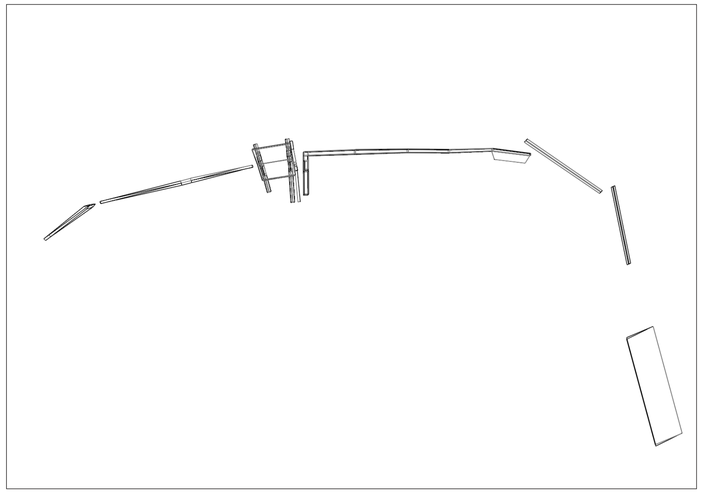
1966 PRESS PHOTOGRAPH OF FLOOD DAMAGE



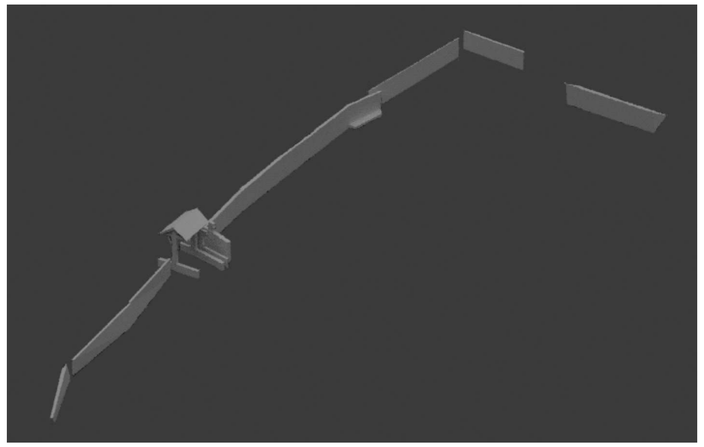
ARCHITECTURAL GEOMETRY OF INTEREST



EXTRACTED GEOMETRY



PLAN VIEW OF MODEL



MODEL OUTCOME

Pontormo’s Noli Me Tangere (c. 1531–32) depicts the risen Christ’s encounter with Mary Magdalene. During the devastating 1966 Arno flood, it was submerged in water, mud, and oil, causing serious damage to the panel and paint surface.

The work was rescued by conservation teams and Mud Angels who helped recover thousands of flood-damaged artworks and books across Florence. It was later stabilised, cleaned, and restored through Florence’s long-term conservation programme, allowing the painting to be returned to display.

I found the swooping wall in the top left of the painting to hold particular architectural interest with is elevation gain providing opportunity to allow movement between floor whilst walking through a legendary locally restored painting.

THE LAST SUPPER , GIORGIO VASARI

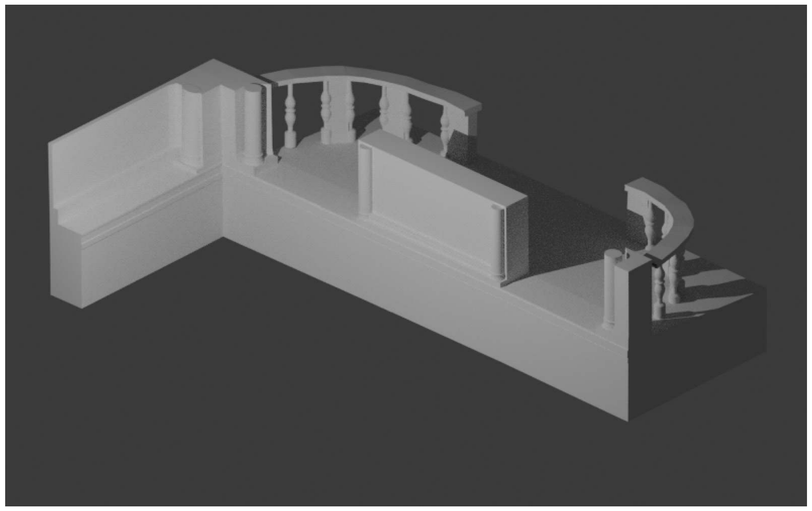


DAMAGES CAUSED BY THE 1966 FLOOD

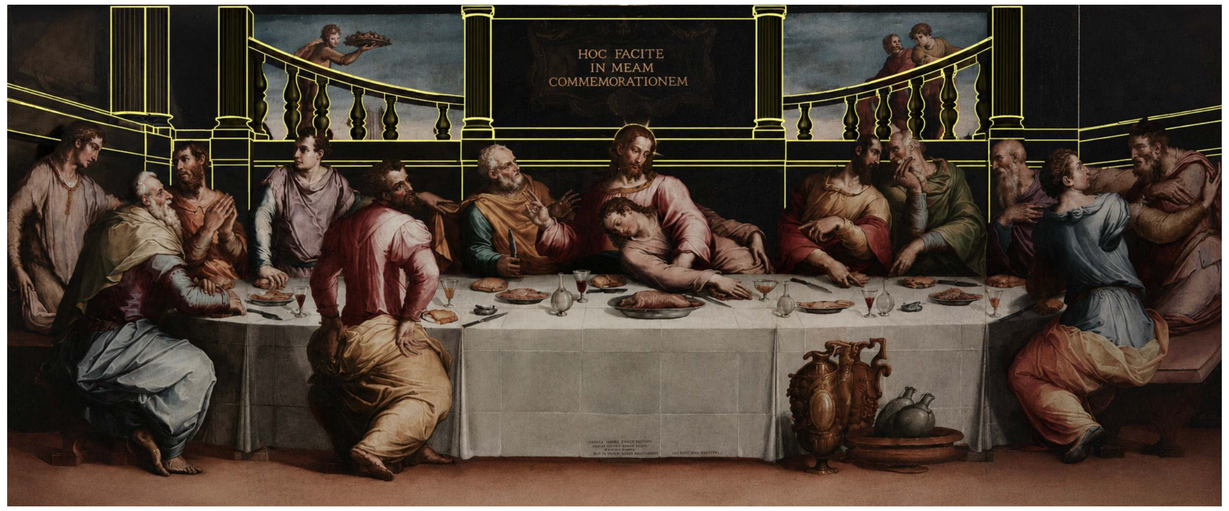




RECENTLY RESTORED PAINTING



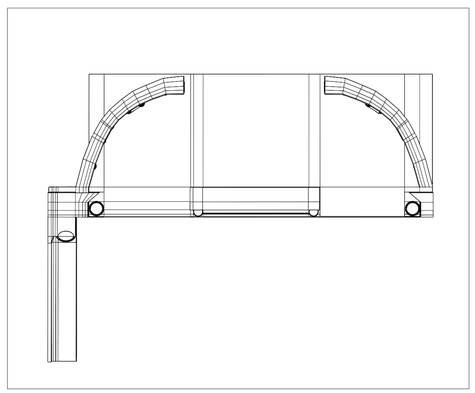
MODELLED OUTCOME

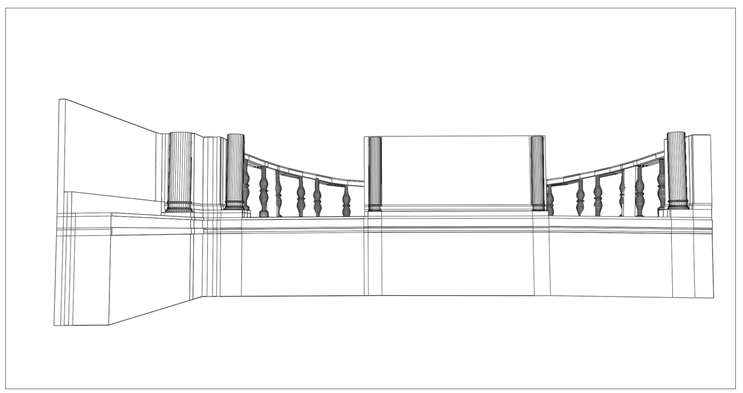


HIGHLIGHTED GEOMETRY OF INTEREST

Giorgio Vasari's The Last Supper (1546) depicts Christ's final meal with his disciples and is one of the largest Renaissance panel paintings in Florence. During the 1966 Arno flood, it was submerged for over twelve hours in water, mud, and oil, becoming one of the city's most severely damaged artworks. Rescued in the wider effort led by the Mud Angels, the painting underwent decades of conservation and was fully restored and returned to public display in 2016.

I was specifically interersted by the classical opeining seen in the background of the painting, and thought that it might be able to serve as an interesting balcony/viewpoint overlooking the river Arno in my final building.



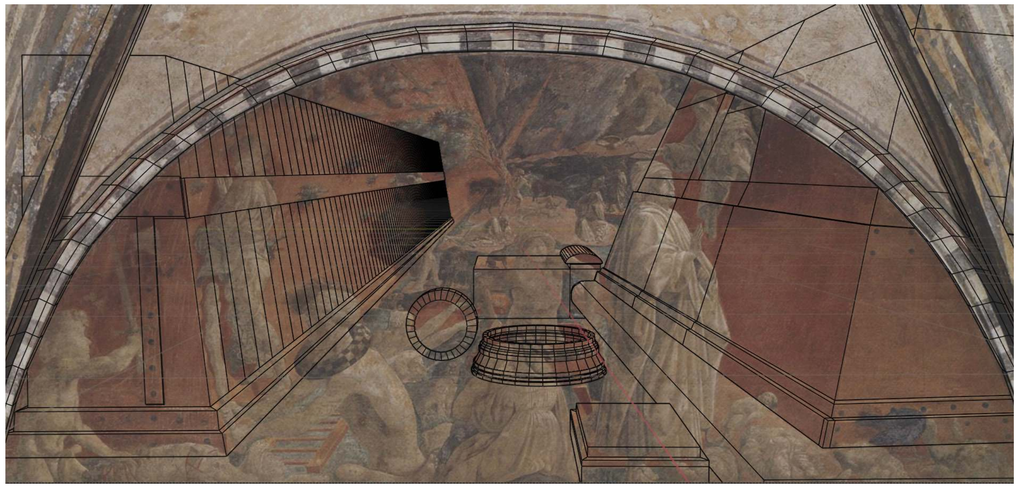


SCENES FROM THE LIFE OF NOAH, PAOLO UCCELLO

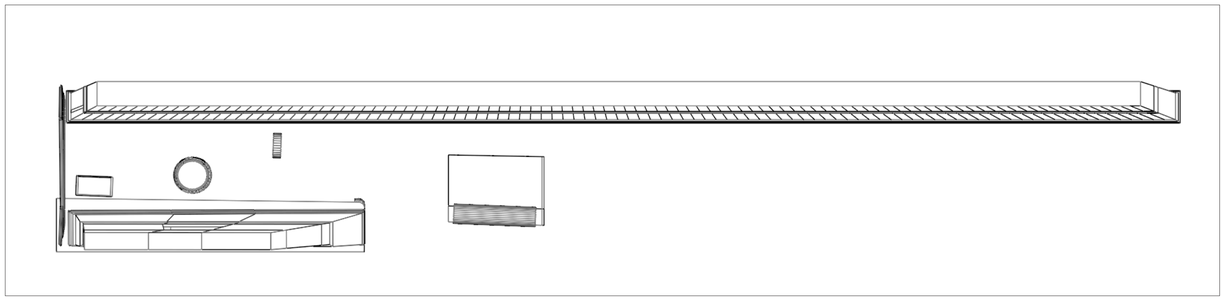




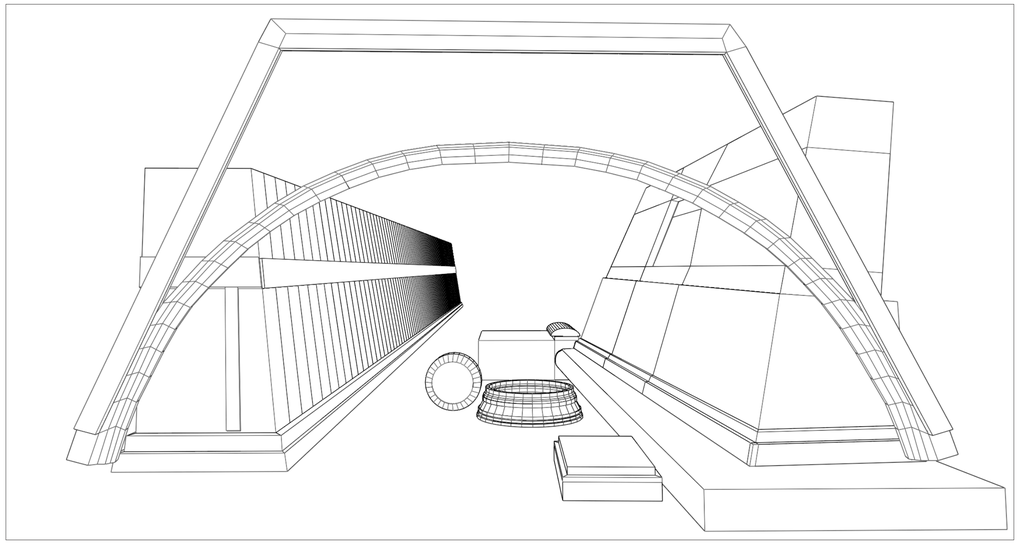
1966 PRESS IMAGE OF DAMAGE CAUSED BY FLOOD



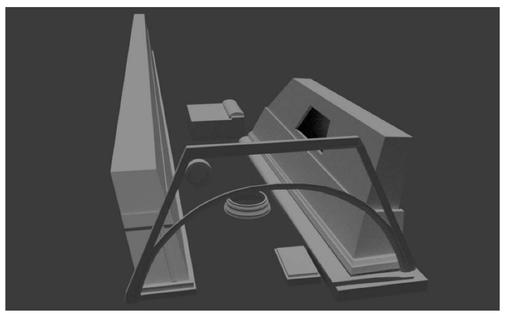
PAITNED GEOMETRY OF INTERST

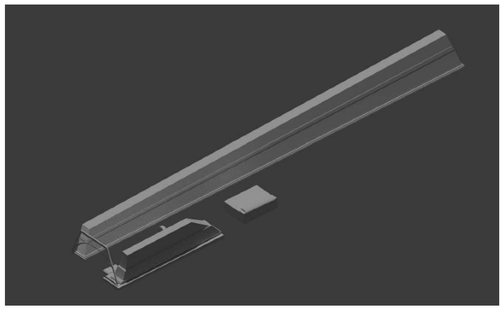


PLAN VIEW



MODEL OUTCOME





Paolo Uccello’s Story of Noah (c. 1430–40) forms part of the Stories from Genesis cycle in the Green Cloister of Santa Maria Novella, Florence. The fresco suffered from centuries of humidity and was further damaged by the 1966 Arno flood, leading conservators to detach and restore it. Following extensive conservation work between 2011 and 2014, the fresco was returned to public display before being reinstalled in its original setting.

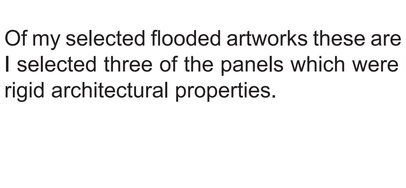
The paintings subject matter referring to Noah’s flood adds another layer to its relation to my building. I like the irony of a legendary fresco depicting a biblical flood being damaged and nearly destroyed in one of Europe’s largest floods of this century.

The architecture I extracted from the the painting provided a great opportunity to bridge the gap between the raised city street and the disconnected Arno by creating a large scale ramp.

GATES OF PARADISE, LORENZO GHIBERTI

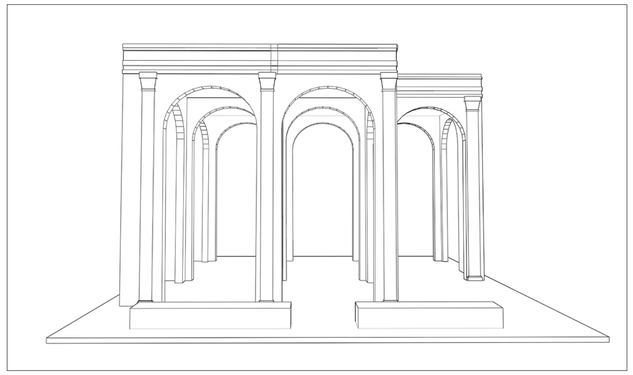
SELECTED PANEL

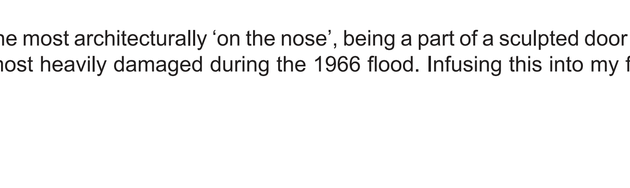


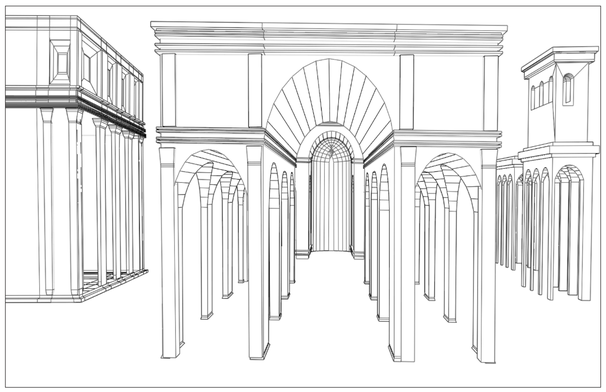




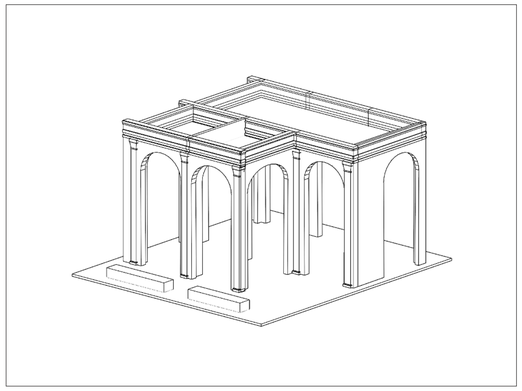
PERSPECTIVE VIEW

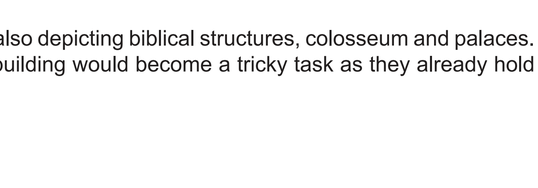


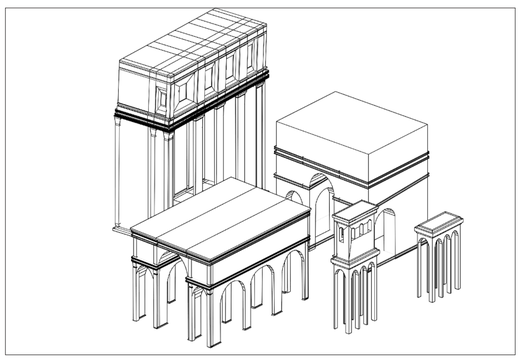




MODEL OUTCOME









PRESS PHOTO DEMONSTRATING DAMAGE AND SCALE



SELECTED PANELS HIGHLIGHTED IN BLUE

Lorenzo Ghiberti’s Gates of Paradise (1425–52) are the east bronze doors of Florence’s Baptistery, renowned for their pioneering use of perspective and relief. Following damage and deterioration accelerated by the 1966 Arno flood, the doors underwent extensive conservation and were eventually replaced by replicas, with the restored originals preserved in the Museo dell’Opera del Duomo.

Of my selected flooded artworks these are the most architecturally ‘on the nose’, being a part of a sculpted door and also depicting biblical structures, colosseum and palaces. I selected three of the panels which were most heavily damaged during the 1966 flood. Infusing this into my final building would become a tricky task as they already hold rigid architectural properties.

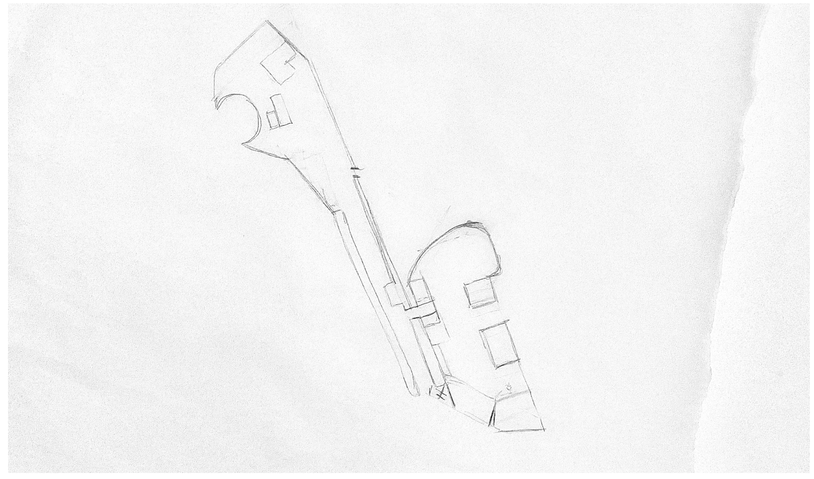
OSCAR LAKATOS - UG3 - YR3

ORGANISING FLOODED GEOMETRIES



ORGANISING COLLECTED GEOMETRIES OVER SITE MODEL

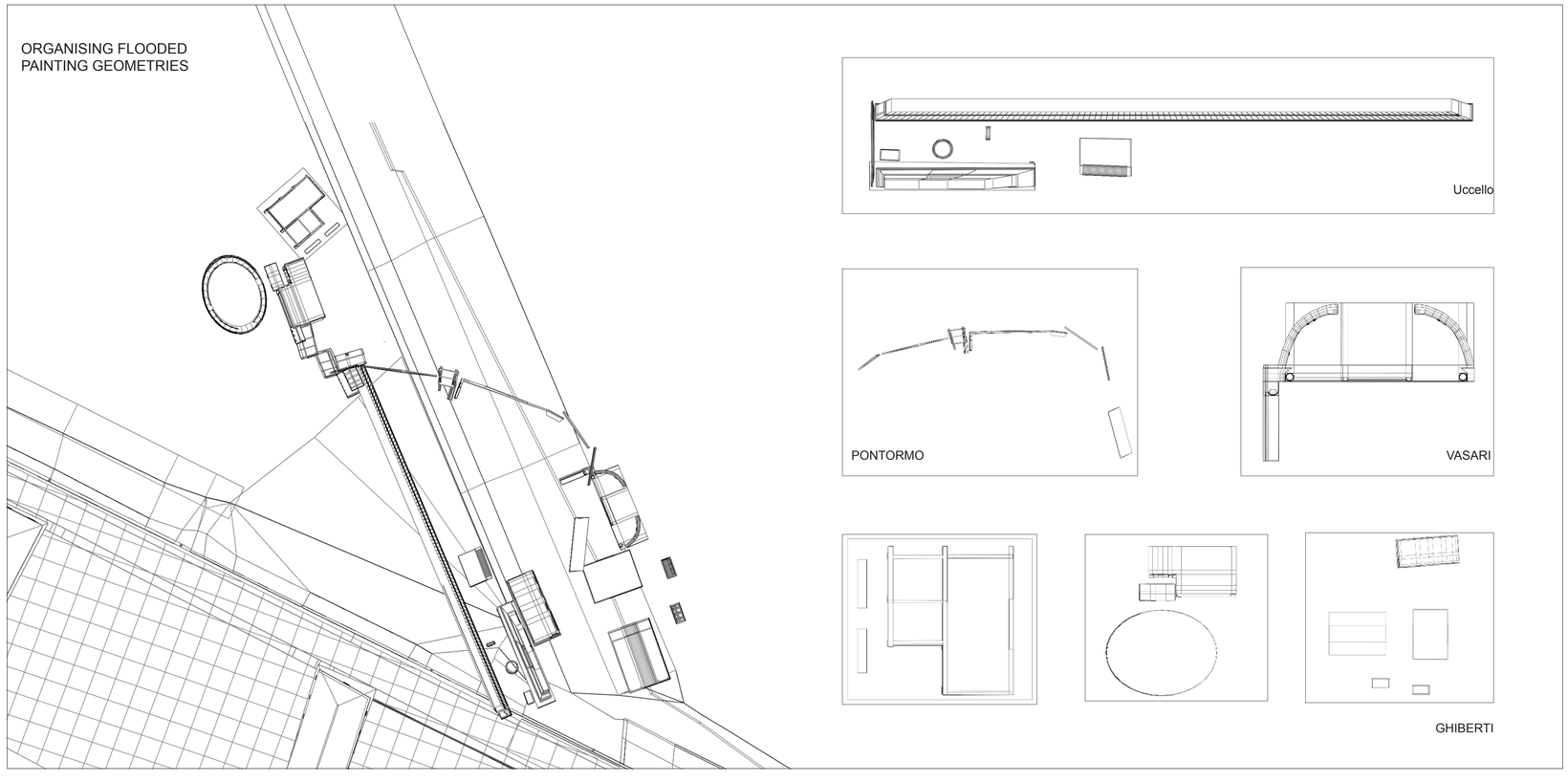




FIRST PLAN SKETCH

Once I had modelled all of these flooded geometries I decided to look at ways in which they would lie over my site. Importing them into my site model I begin to explore ways in which I could find coherence between these models whilst allowing them to find some sort of coherence with the Weir di Santa Rosa.

After a few attempts I landed on this organisation of painted spaces seen in plan view on the right.



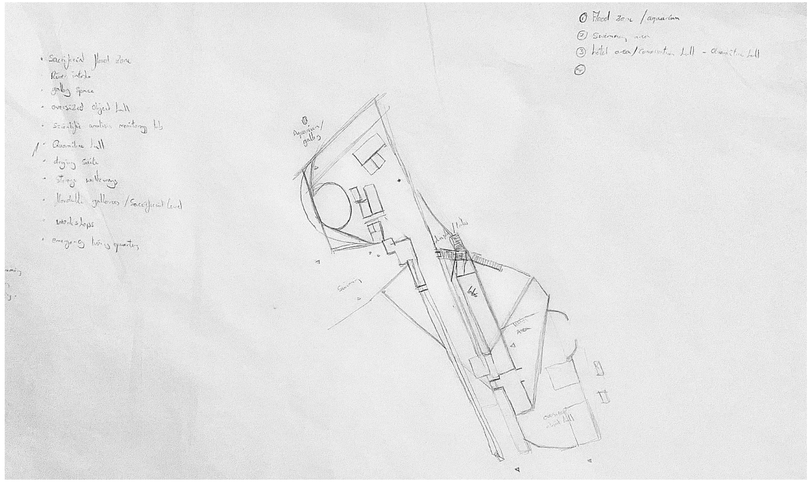
OSCAR LAKATOS - UG3 - YR3

DEVISING MY FIRST BUILDING PLAN

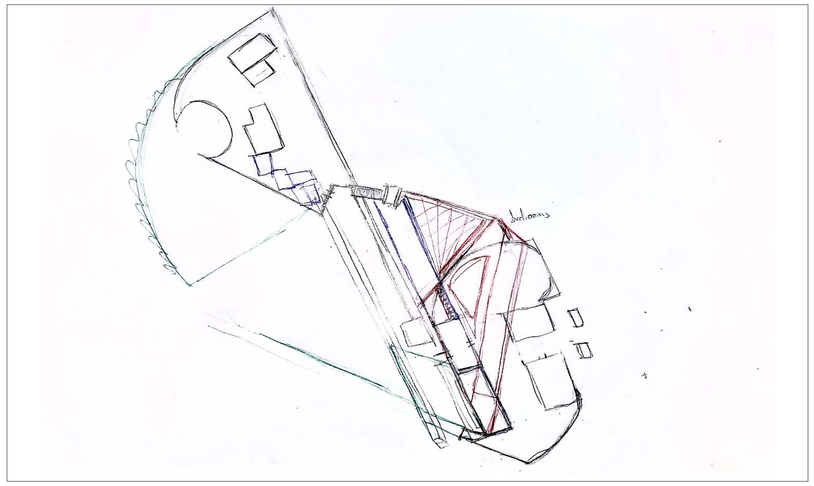
ADDING SPACES ESSENTIAL FOR ART RESTORATION

INITIAL ESSENTIAL SPACES

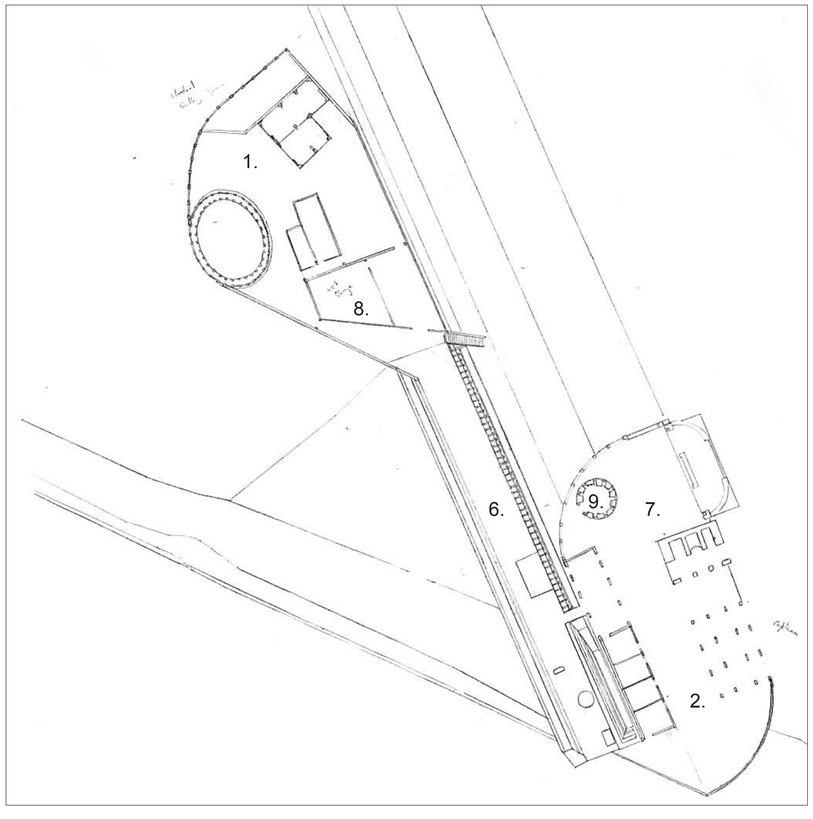
1. GALLERY SPACE
2. DAMAGED PAINTING HALL
3. SCIENTIFIC MONITORING LAB
4. QUARANTINE HALL
5. DRYING SUITE
6. STORAGE WALKWAYS
7. RESTORATION WORKSHOP
8. WET STORAGE
9. ART ELEVATOR



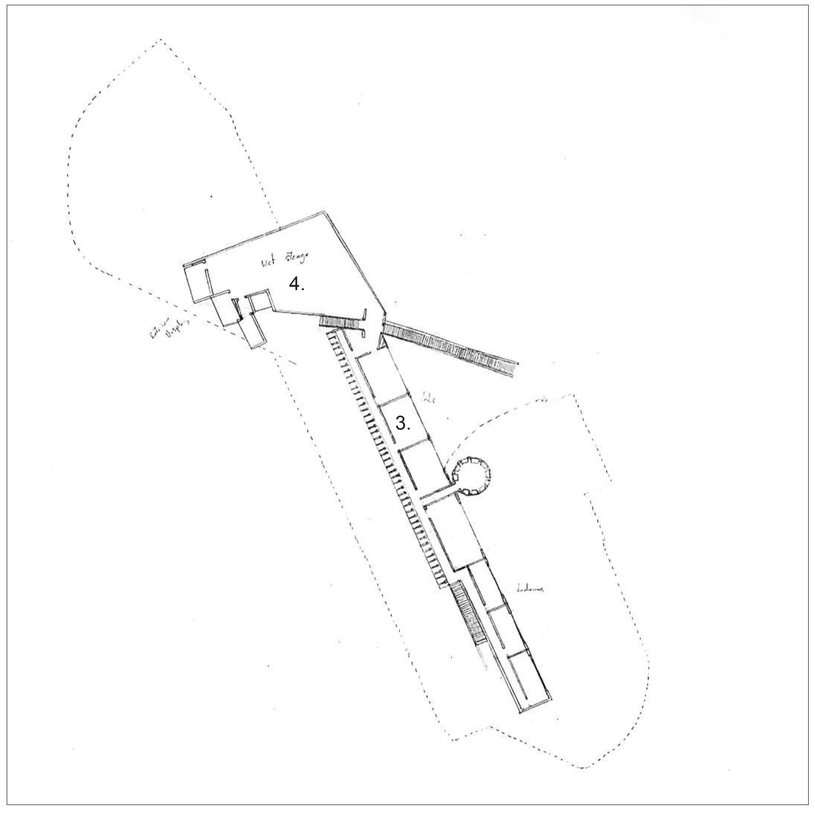
SKETCH WITH RESTORATION SPACES



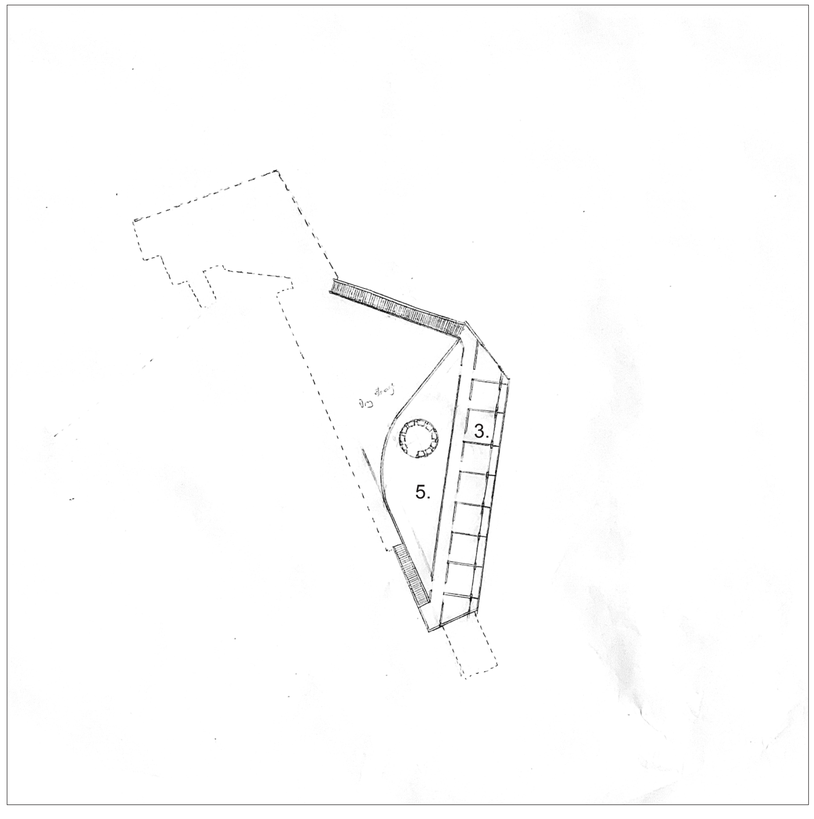
EXPLORING ORGANISATION OF SPACES



FIRST ITERATION GROUND FLOOR

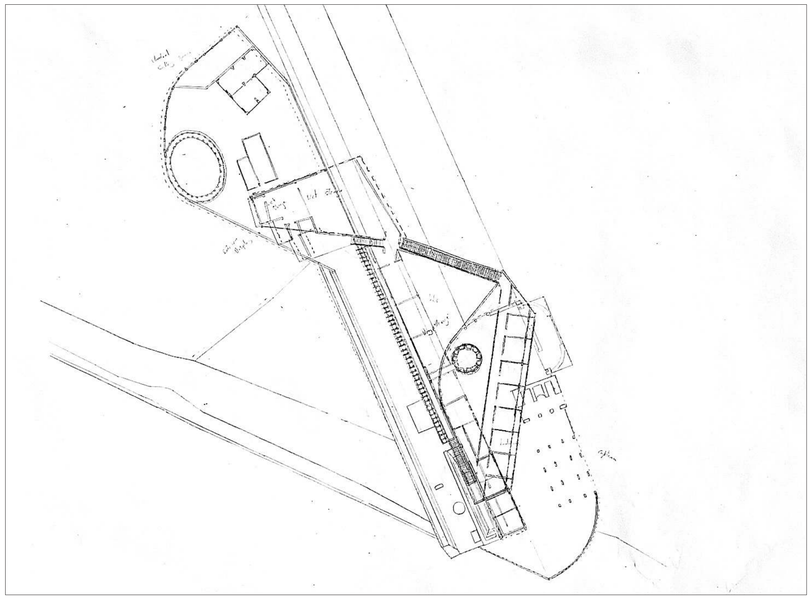


FIRST FLOOR

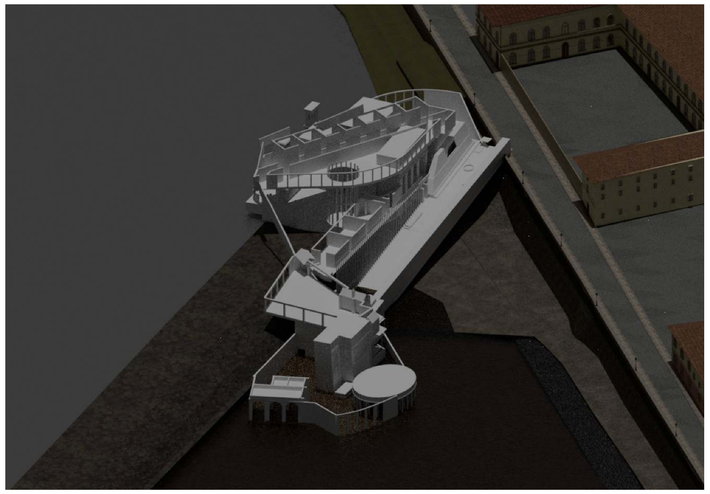


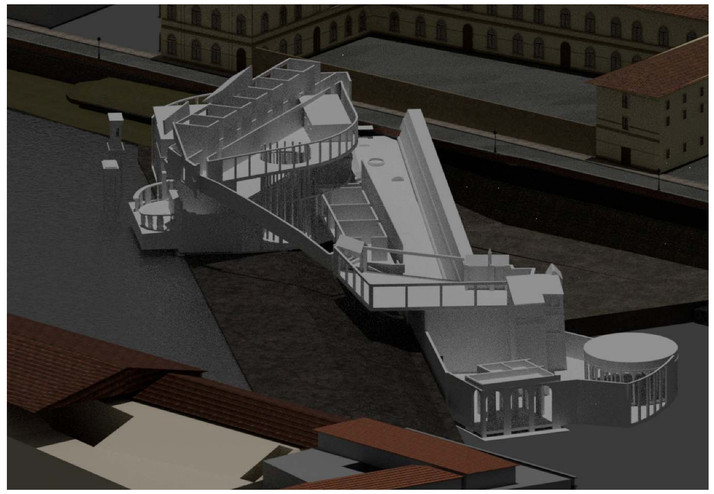
SECOND FLOOR

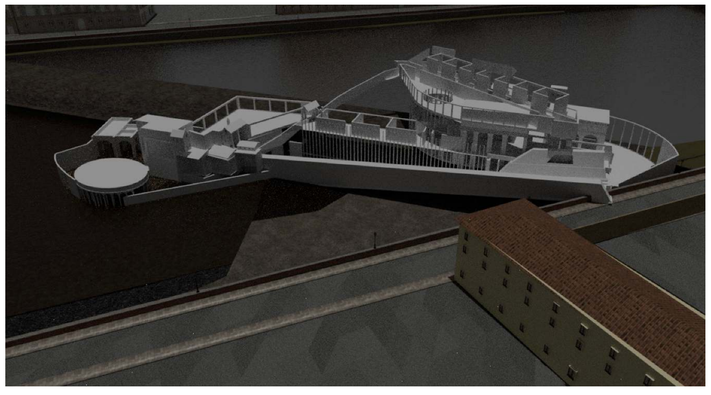
FIRST MASSING ITERATION

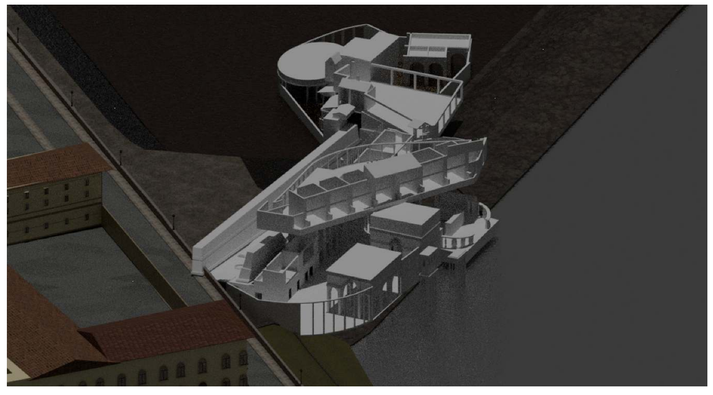


LAYERED PLANS TO DISPLAY BUILDING SHAPE













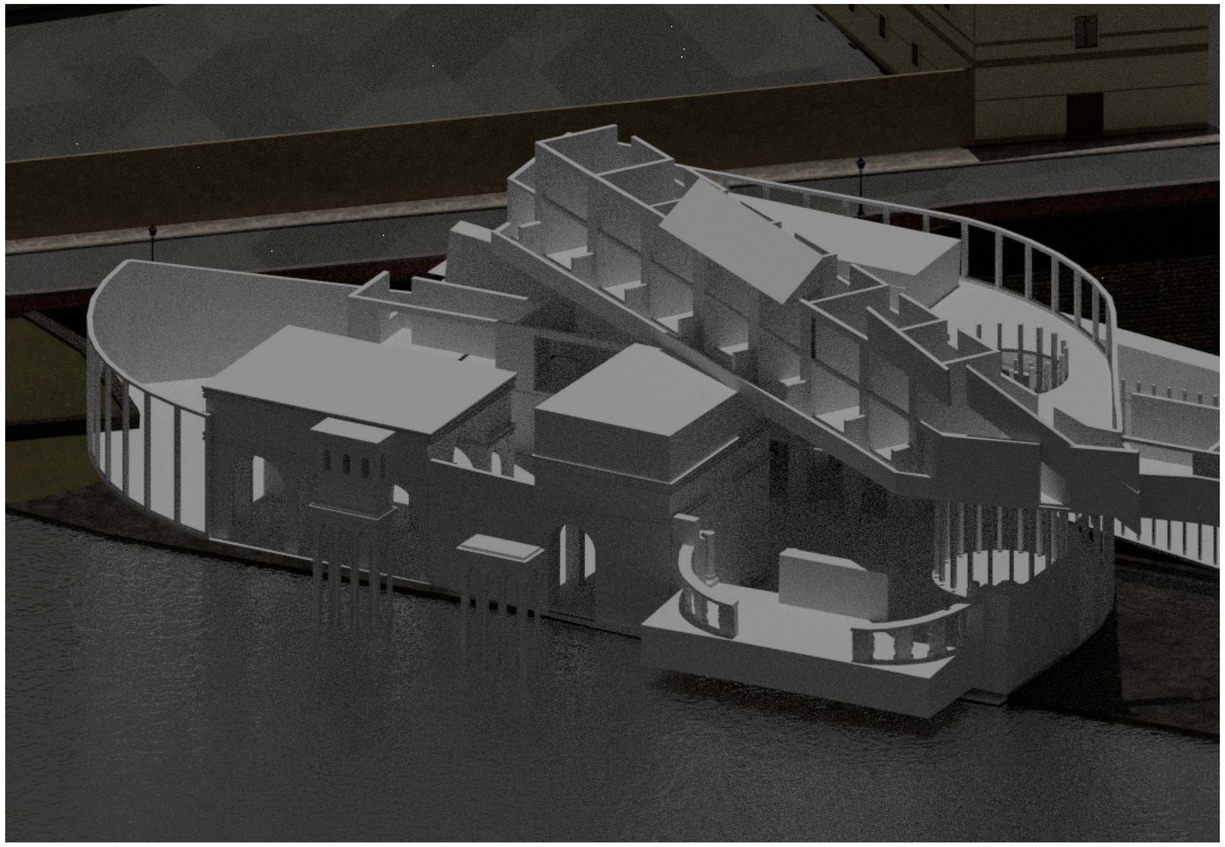
From my plans and massings you can see that I've tried to find a coherent flow through these artistic geometries whilst grounding them specifically to my site. For example using Pontormo's geimetry as a central stairway from the base to the top of my building.

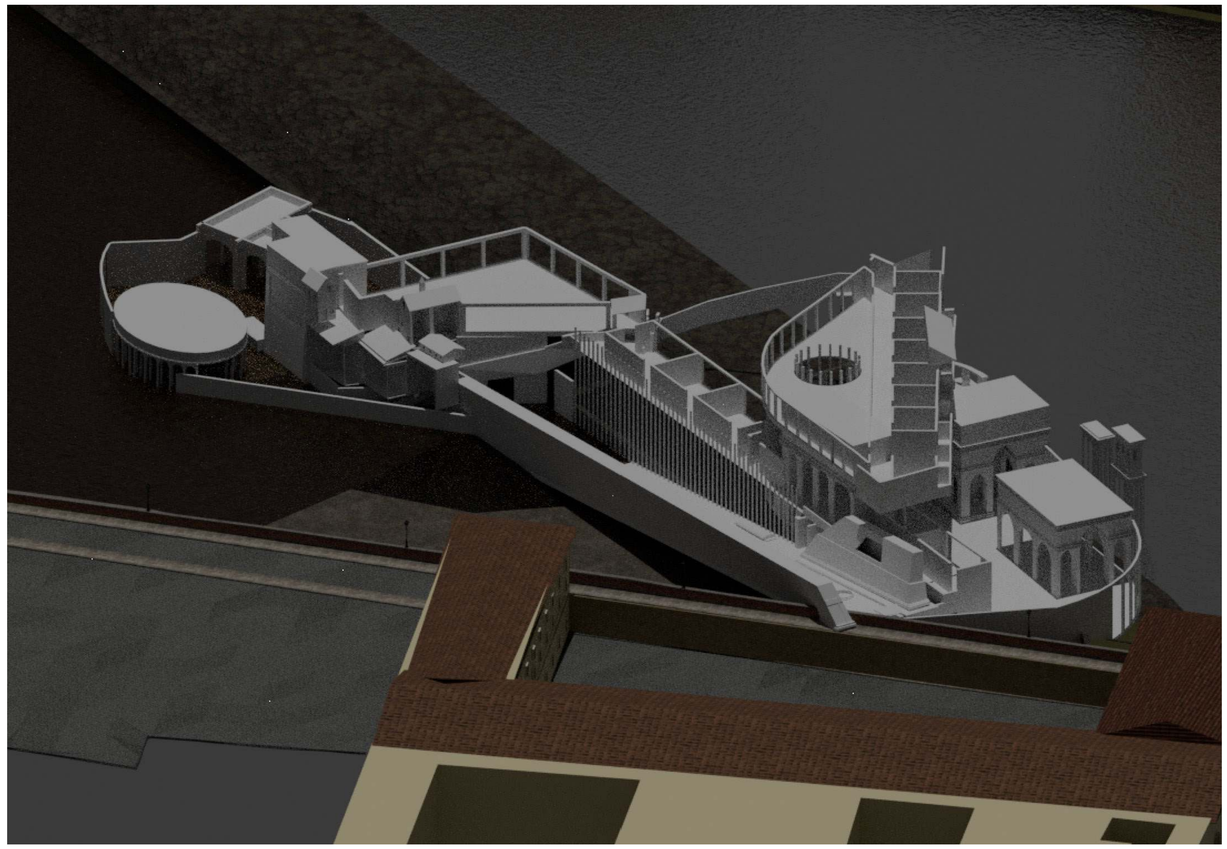
I've immediately established the building's relationship with the river allowing Uccello's 'Flood of Noah' to litereally flood itself by descending down below the water's surface.

Ghiberti's colleseum geometry became a semi submerged gallery space whilst buildings from his other panels became part of a large art storage hall.

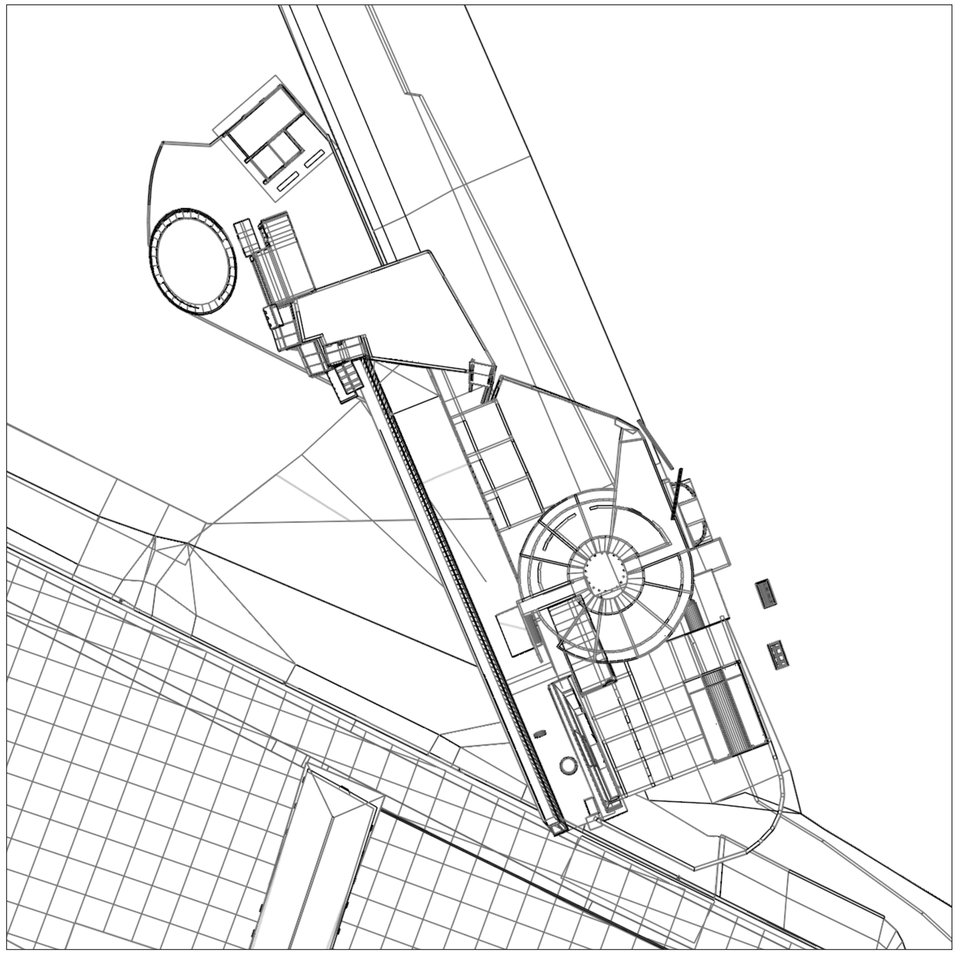
I also employed a central art elevator to raise the dry space up above the river Arno, creating verticality and separating it from the rest of the buiding.

FIRST MASSING RENDERS

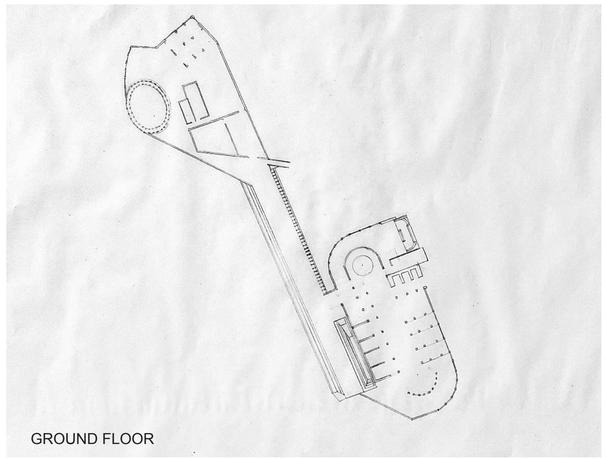




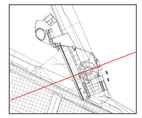
SECOND ITERATION PLANS & SECTIONS

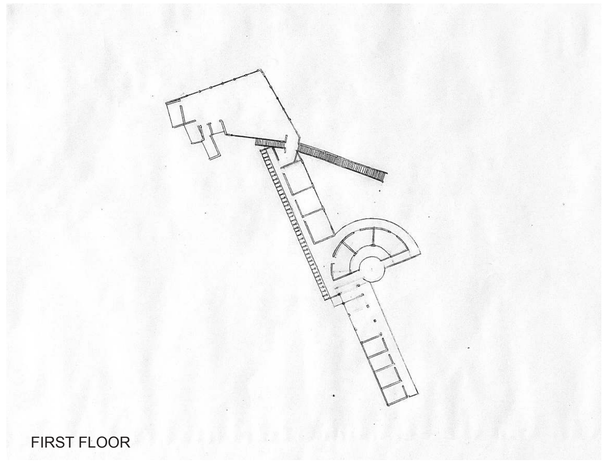


LAYERED PLAN VIEW

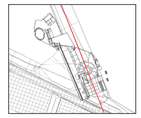


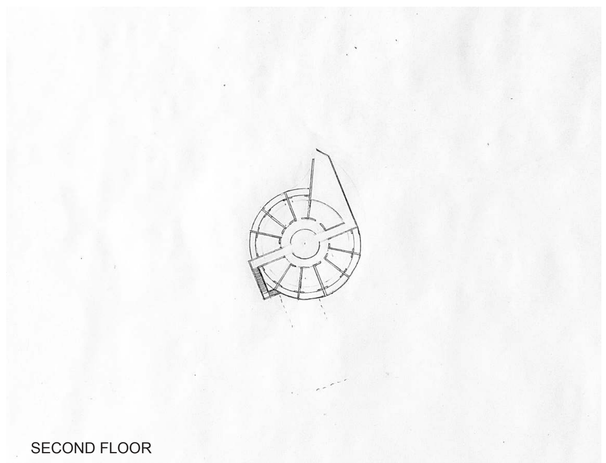
GROUND FLOOR



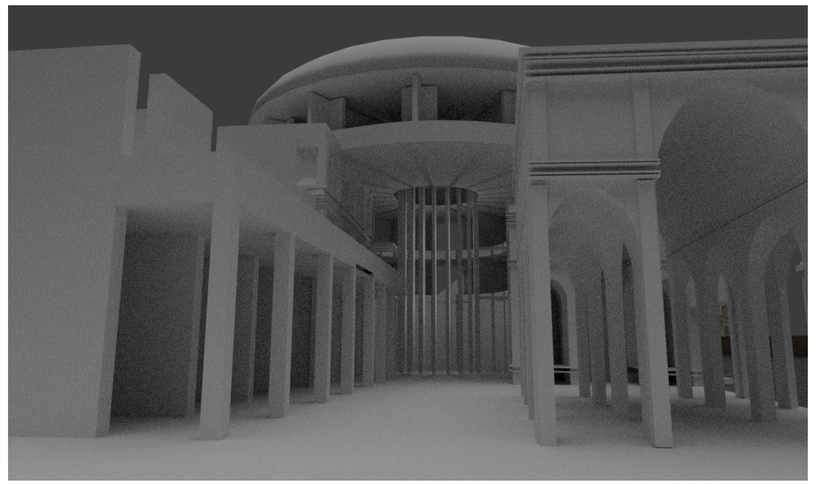


FIRST FLOOR





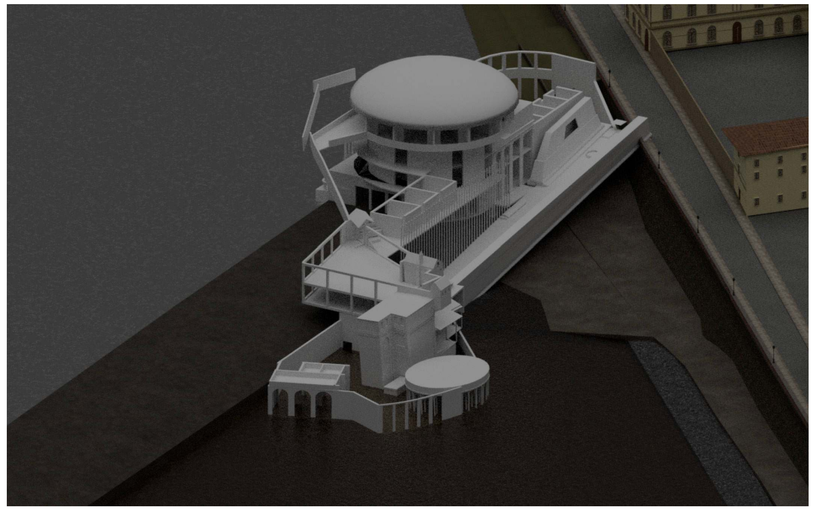
SECOND FLOOR

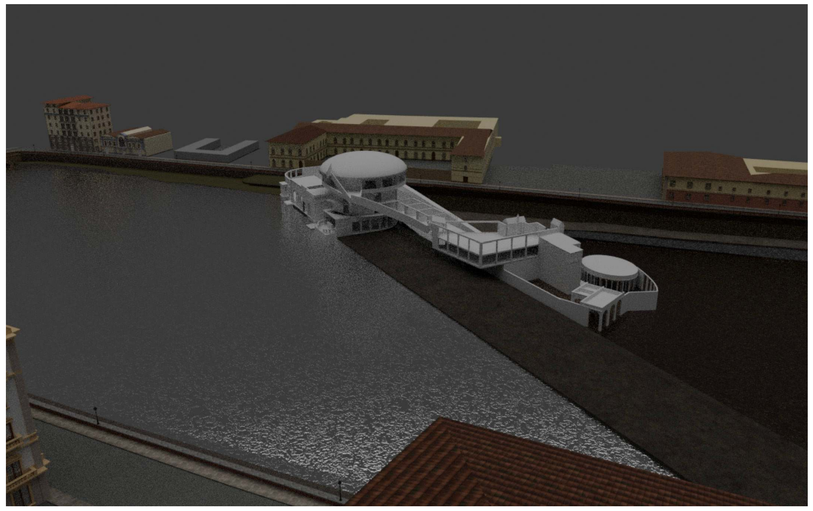


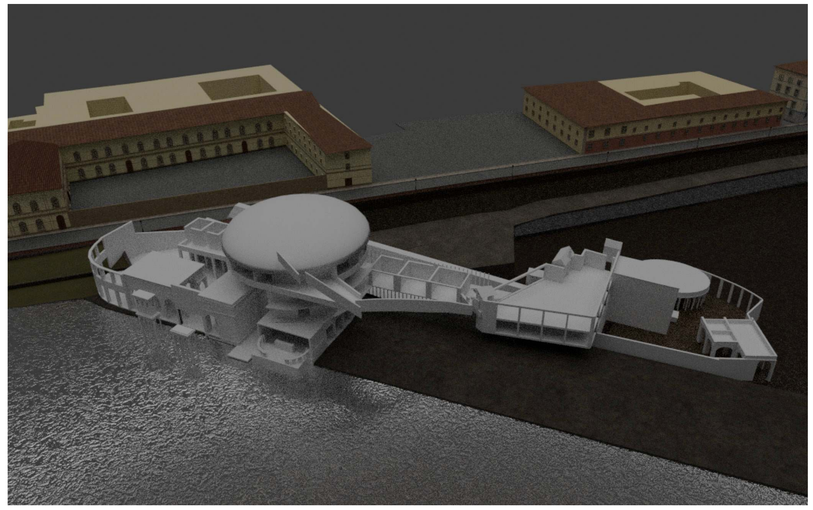
For my second iteration I kept the same general organisation of painted spaces. I felt that the previous iteraition of my top floor sat awkwardly above the rest of the building, therefore I shifted these laboratory spaces into a central dome orbiting the art elevator.

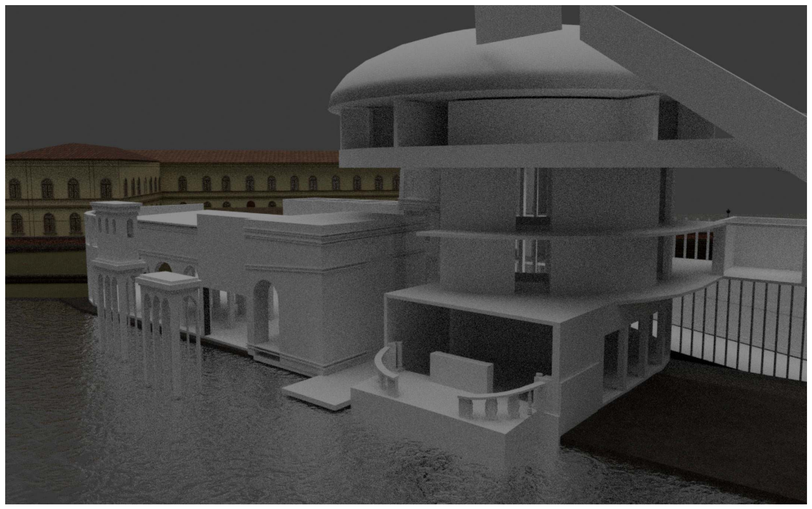
I also began to explore the spatial opportunity for my building in section which you can see in the top right of this page.

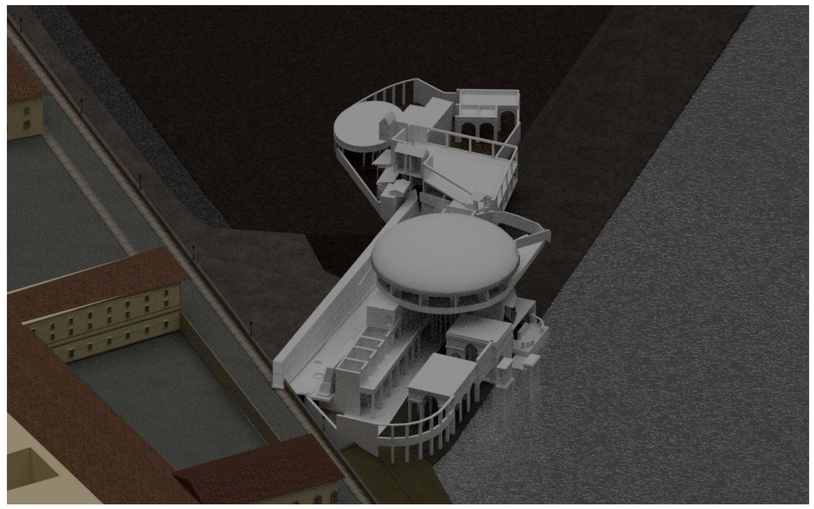
SECOND MASSING RENDERS

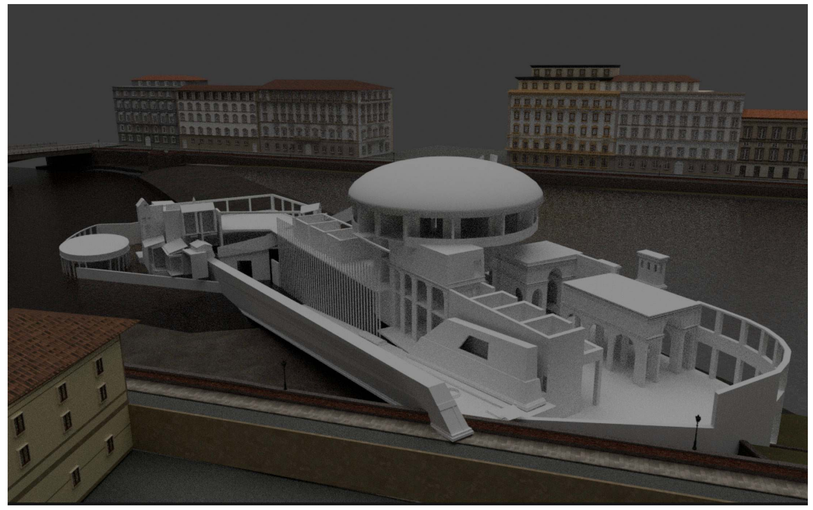








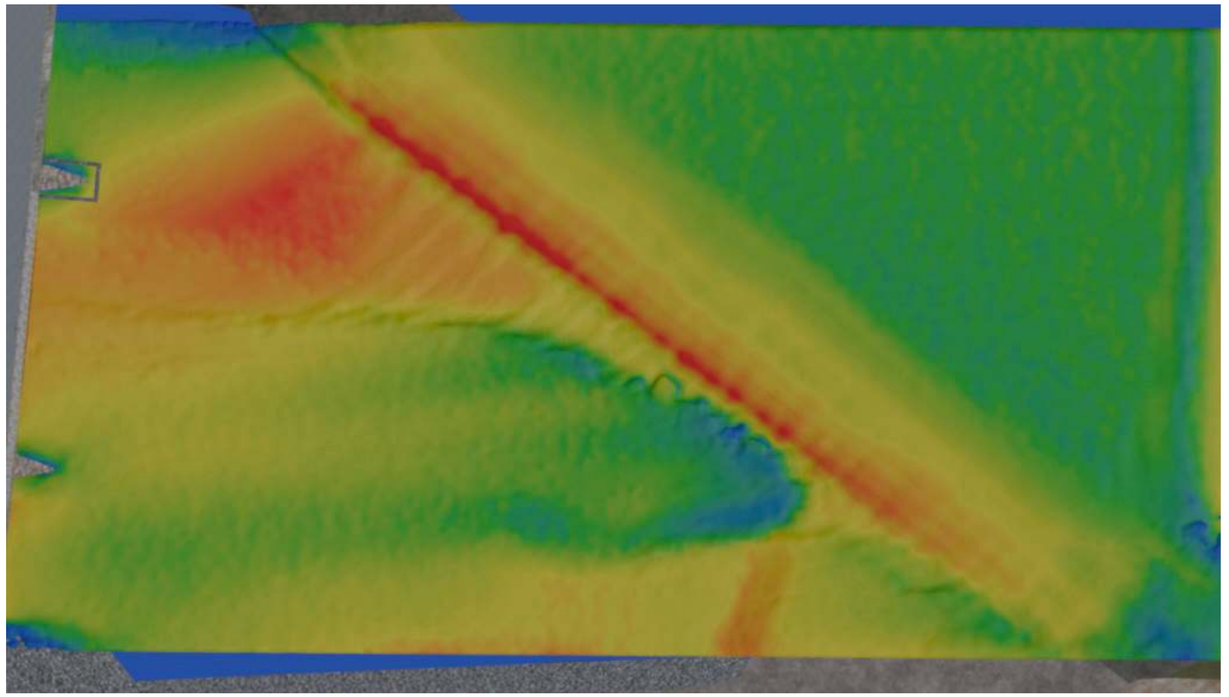




DESIGN DEVELOPMENT - PART 2

RESPONDING TO THE ARNO’S FLOW AND HYDRODYNAMICS

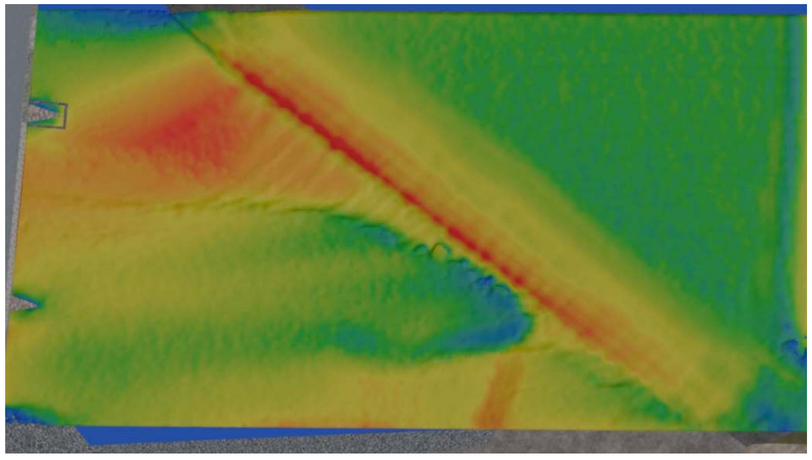




TESTING BUILDING HYDRODYNAMICS



SATELLITE IMAGERY OF ARNO'S FLOW



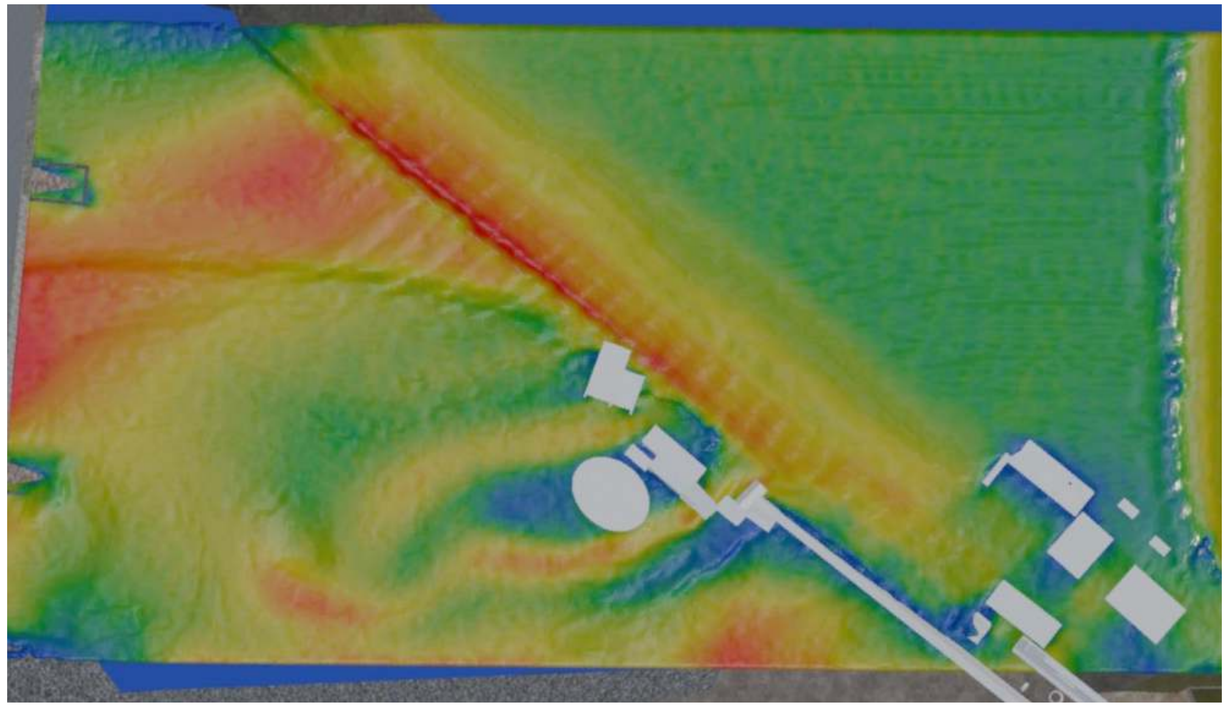
HYDRODYNAMIC MODEL DEVELOPED TO MIMIC THIS FLOW

My technical dissertation explored river dynamics and focuses on allowing the bottom floor of my building to let in the rivers flow acting as an extension of the weir rather than disrupting it.

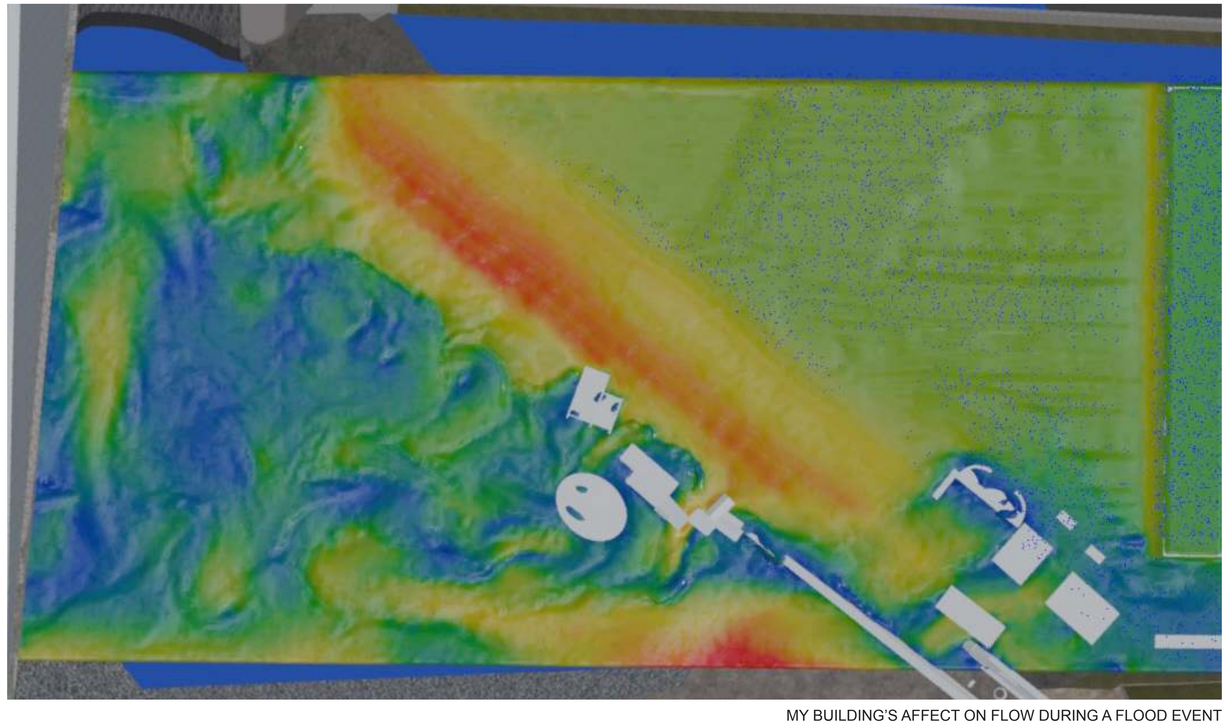
In order to achieve this I had to find a way of making my building as hydrodynamic as possible. The natural first step to take in this process was by creating a digital fluid model to accurately simulate the Arno's flow over my site.

Once I had modelled this simulation I placed my first building iteration at the center of it to see how it affected the rivers flow.

From the images on the right you can see how disruptive this iteration was especially during flood periods. This meant I had to rethink the design organisation of my extracted geometries.

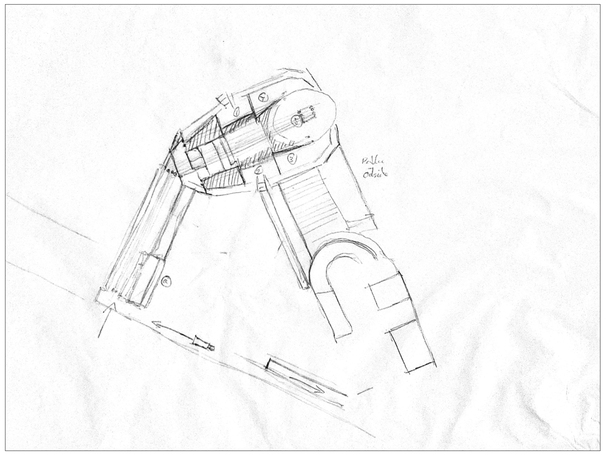


FIRST ITERATION PLACED IN HYDRODYNAMIC MODEL

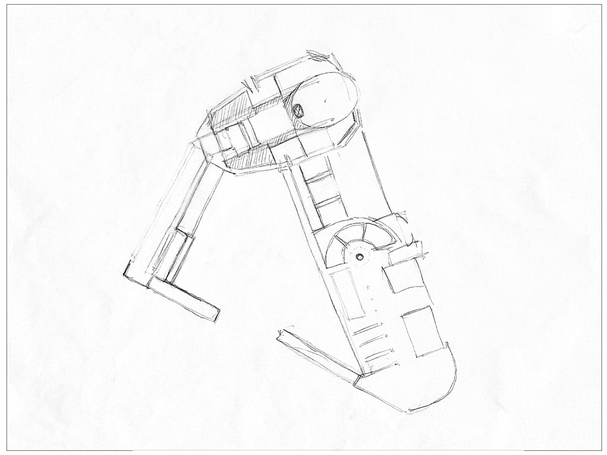


MY BUILDING'S AFFECT ON FLOW DURING A FLOOD EVENT

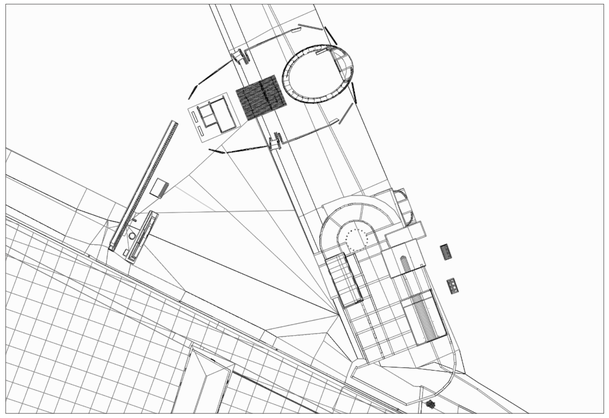
THIRD ITERATION - REACTING TO THE ARNO'S FLOW



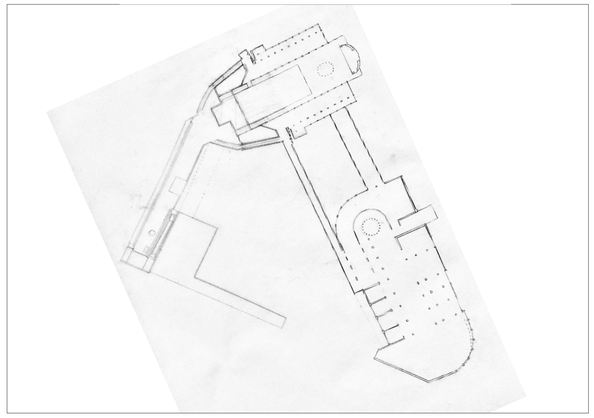
SPATIAL ORGANISATION SKETCH 1



SPATIAL ORGANISATION SKETCH 2



ORGANISED GEOMETRY



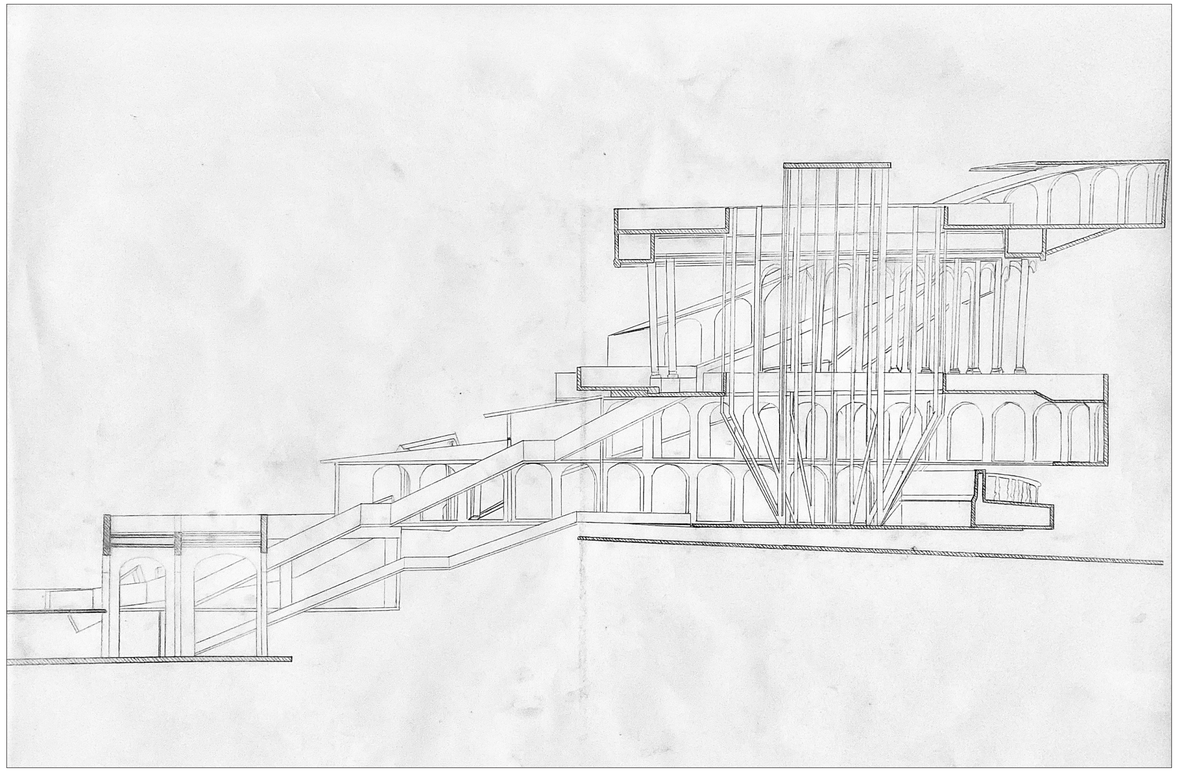
LAYERED PLAN

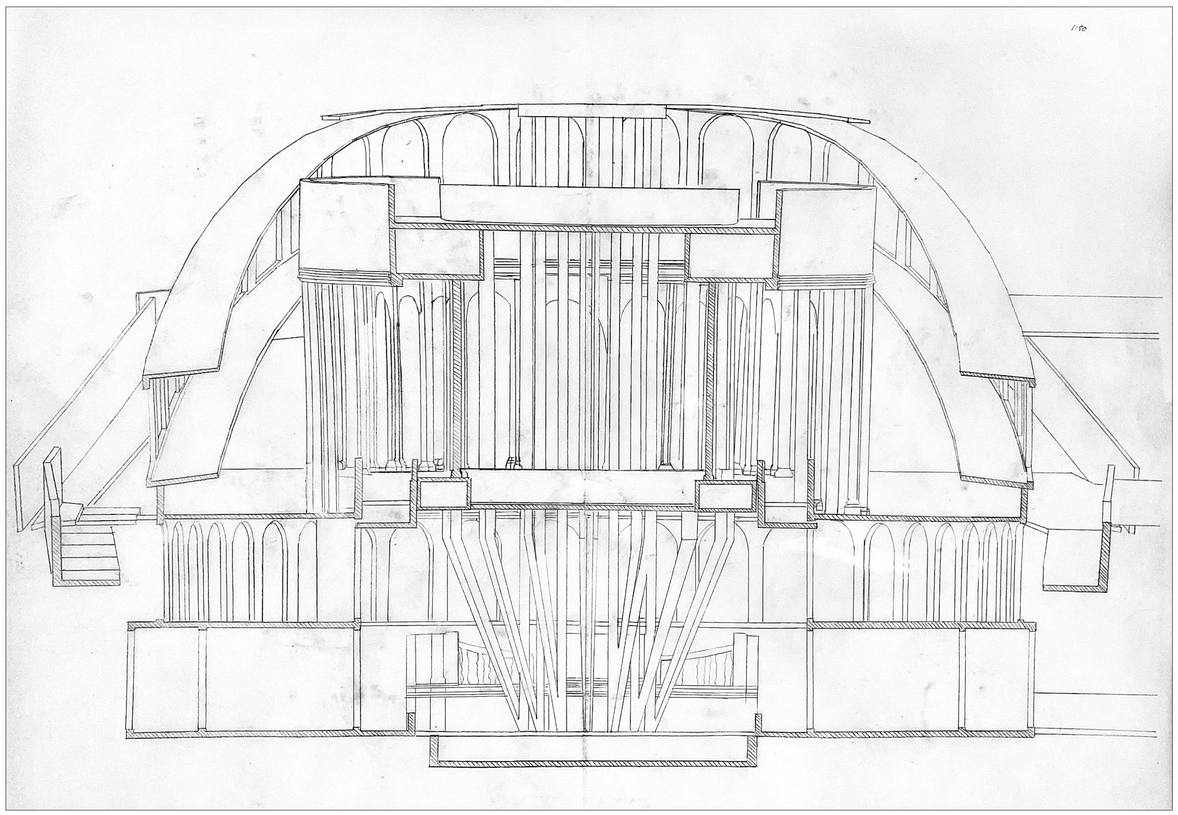
My third iteration responds to the Arno's flow, with the ground floor consistently facing perpendicular to the Weir di Santa Rosa.

The key spaces for my building are maintained but this time the flooded art geometries are organised differently on the north side of the building.

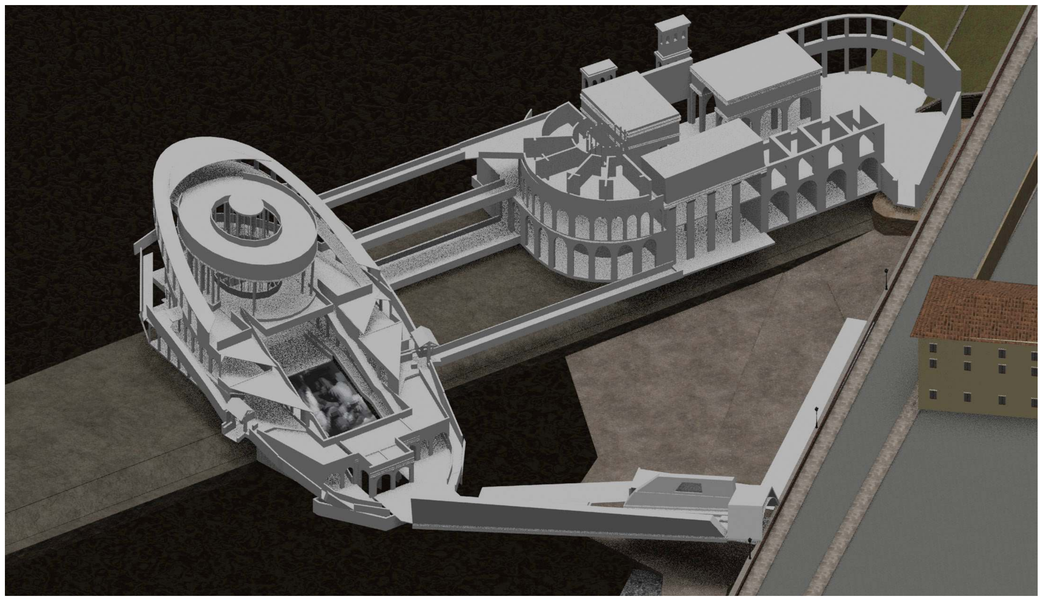
Uccello's flood of Noah was shifted to the west still serving serving as a large ramp but now also doubling as a damaged art drop off point, linking perpendicular to the road south of my site.

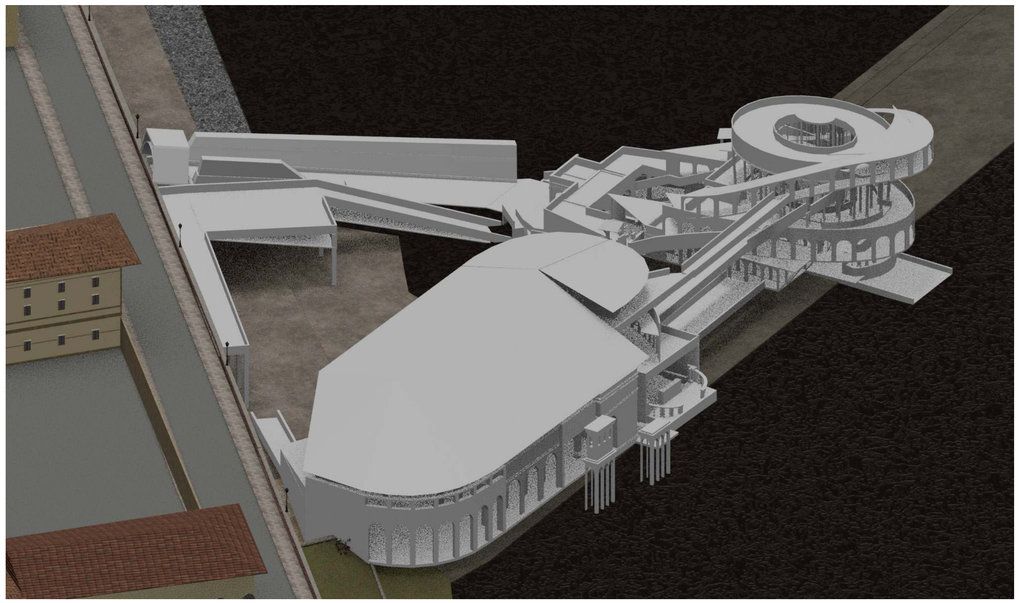
Pontormo's structures symmetrically encase Ghiberti's architecture acting as large staircases from the base to the top of the building. The Colosseum structure still serves as an exhibition space but is now placed high above the water's surface in order to reduce hydrodynamic disruption.

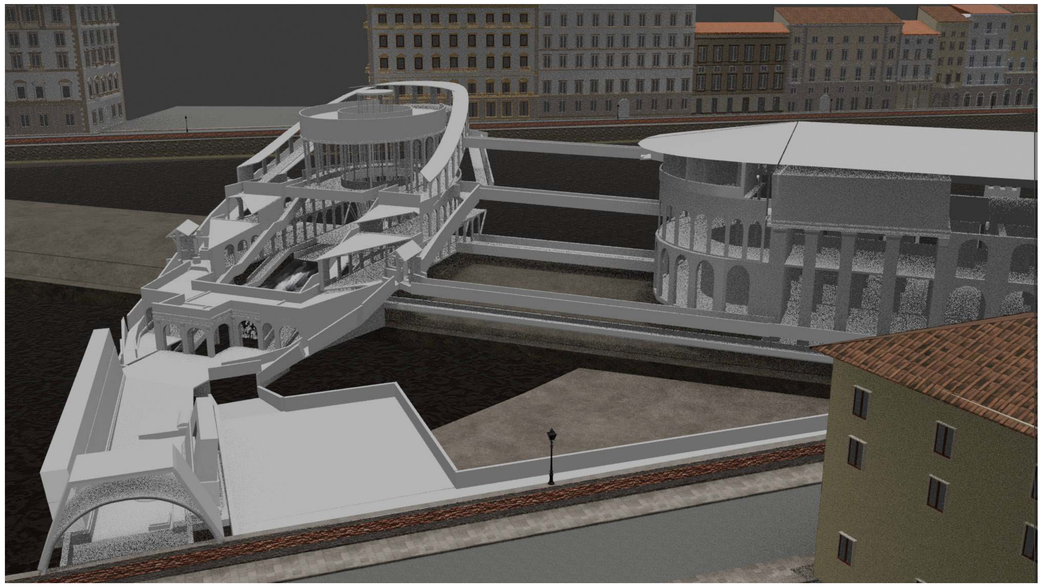


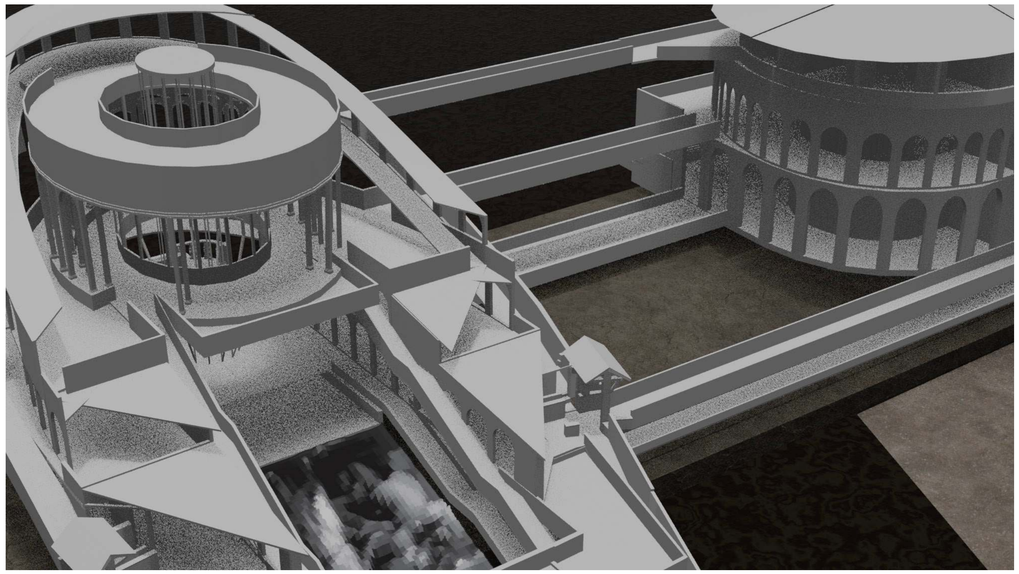


THIRD ITERATION BUILDING MASSINGS









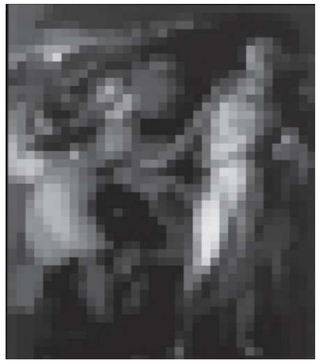
OSCAR LAKATOS - UG3 - YR3

TECH CONCEPT FOR HYDRAULIC PAINTING RECREATION

EXPERIMENTATION PRIOR TO BUILDING REDESIGN







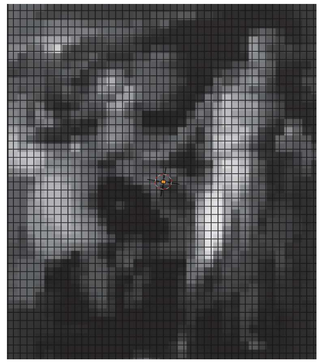
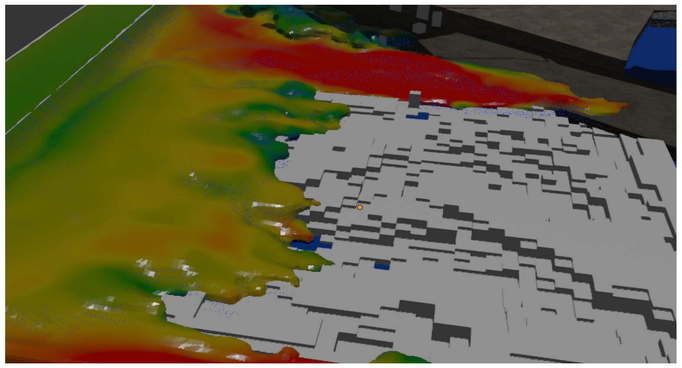
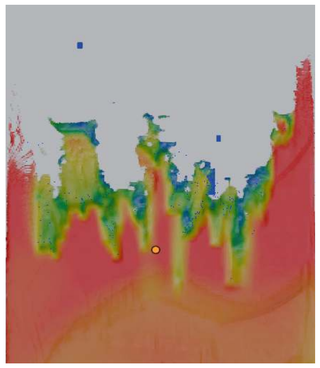
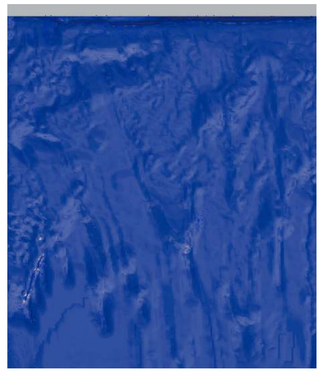


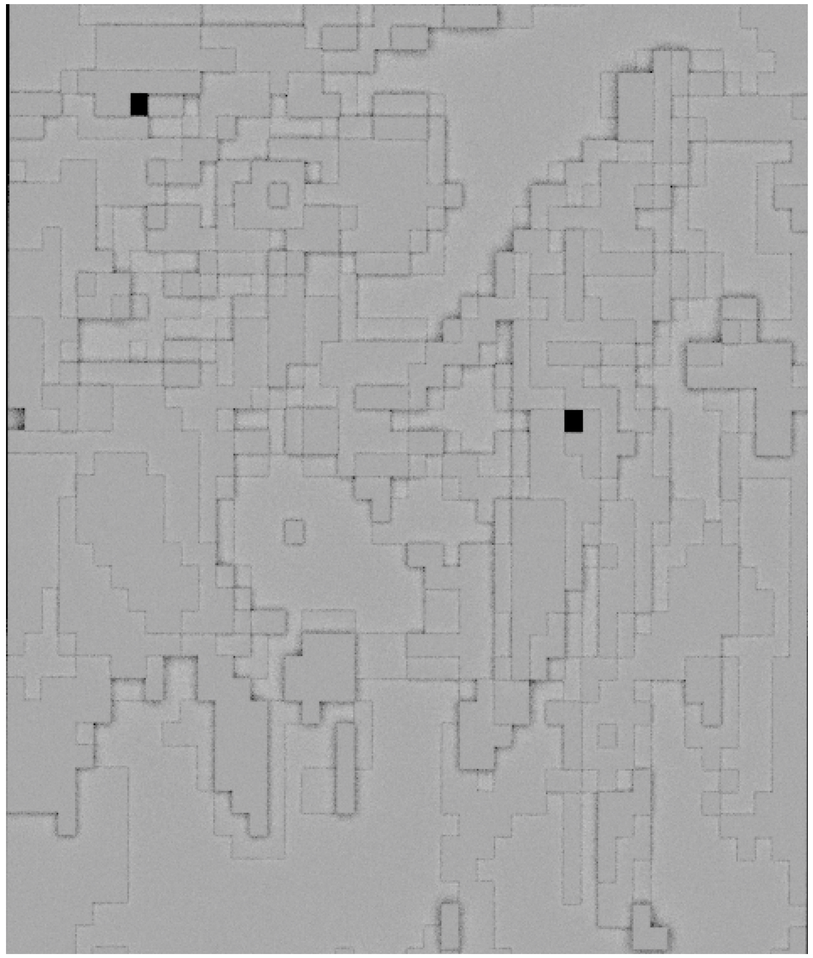
IMAGE GOAL







INITIAL TESTS



FIRST RIVER BED ITERATION

Before redesigning the spatial organisation of my building I developed concepts for hydraulic paintings in hope to design an river exhibition space, the idea was to use the Arno's flow as the artist.

I started by choosing a painting damaged in the 1966 flood (Noli Me Tangere by Pontormo). I then converted this image into black and white in order to get a better read of tonal shifts. My aim was mimic tonal variation in the painting with turbulent water from the river.

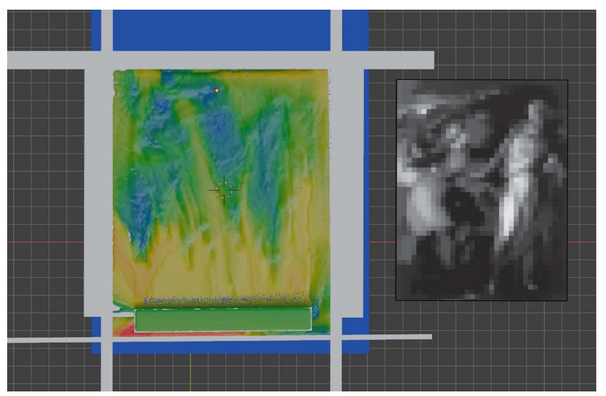
I developped an artificial riverbed to induce variable levels of white water to correspond to the lighter tones within the painting.

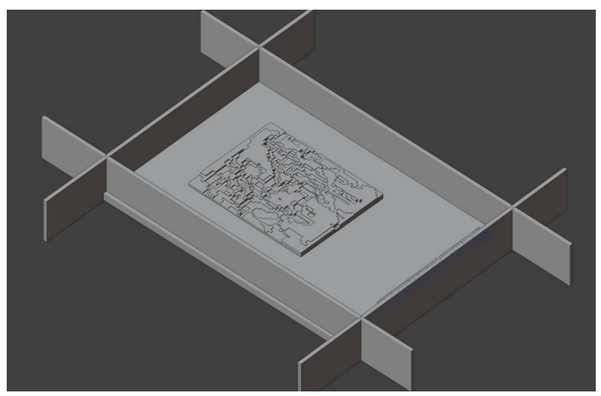
I started by using the same blender shader I used to measure the velocity of the Arno's flow (seen in earlier environmental slides). I constructed a flow pool in blender, placing my river beds at the center of this pouring with the pixelated painting visible at all times to compare river flow with my final goal.

When I saw very reactive changes in river velocity over initial riverbed surfaces I knew that my idea was plausible and that it had enough weight to drive my tests forward.

The simulation was scaled to fit my building size and flow poured over each iteration had initial velocity to match the average Arno river velocity at that point over the Santa Rosa Weir.

BLEDNER SET-UP

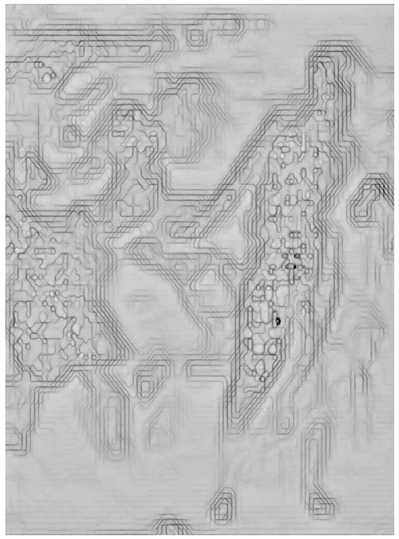


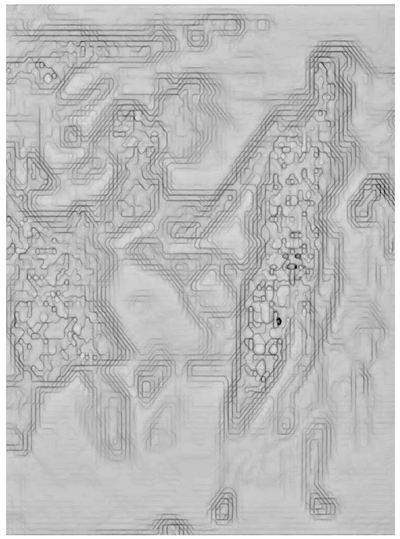


OSCAR LAKATOS - UG3 - YR3

ARTISTIC RIVERBED DESIGN

RIVER = ARTIST **ARCHITECTURE** = EASEL **STONE** = CANVAS **WATER** = PAINTBRUSH







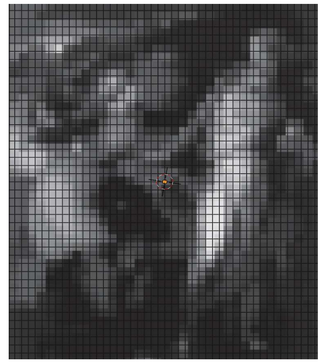
PONTORMO PAINTING REFERENCE



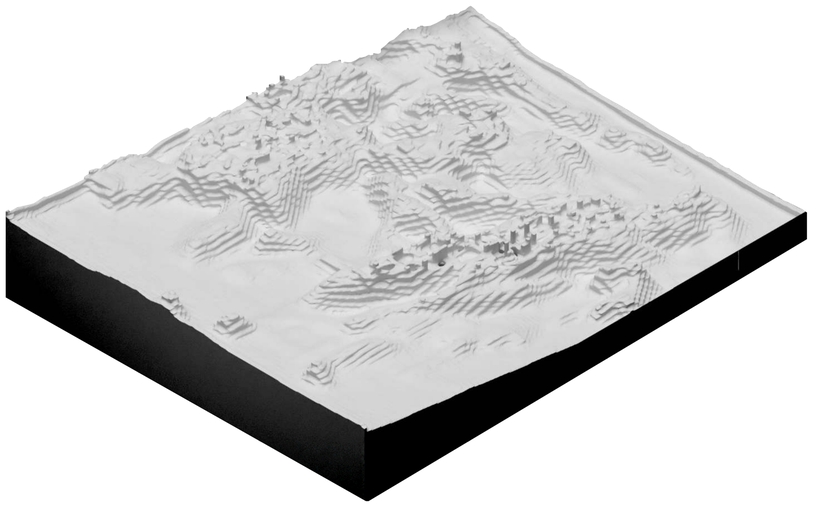
PAINTING TINE SIMPLIFICATION



PATINGING DETAIL SIMPLIFICATION



INITIAL EXTRUSION MARKERS FOR RIVERVBED

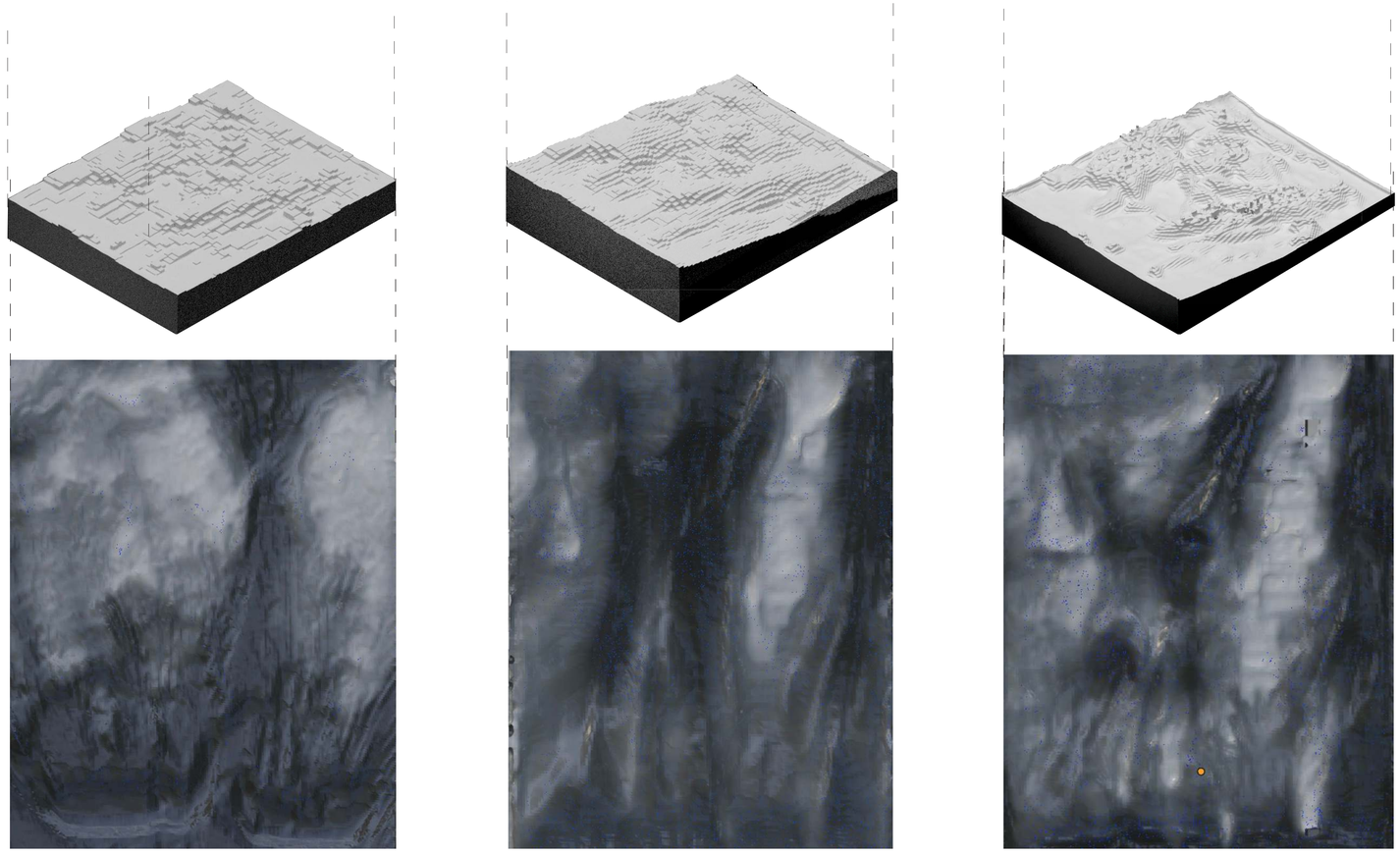


FINAL PONTORMO RIVERBED DESIGN

From the inital success of my technical research I subsequently wanted to make the ground floor of my building predominantly a space dedicated to displaying art created by the Arno itself.

Using the river's flow as the artist I designed artificial riverbed which dictated the distribution of white-water from the Arno's flow in order to re-imagine imagery of these flooded paintings that have already become pivotal to my buildings design.

I attempted to break the surface of the Arno's flow in order to recreate paintings that were broken by the flow of very same water.

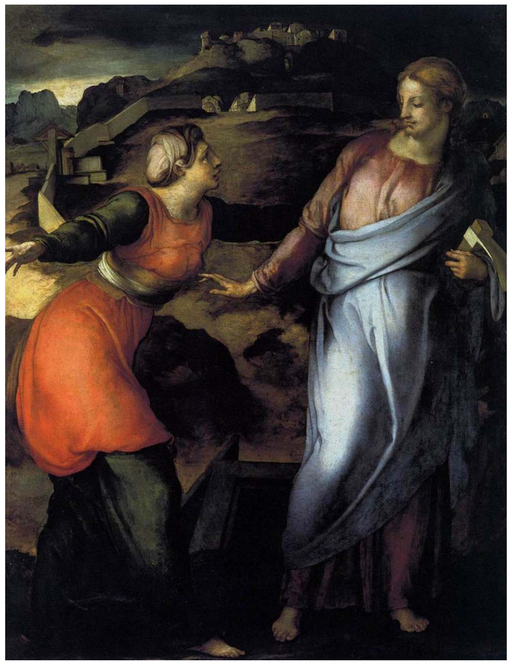


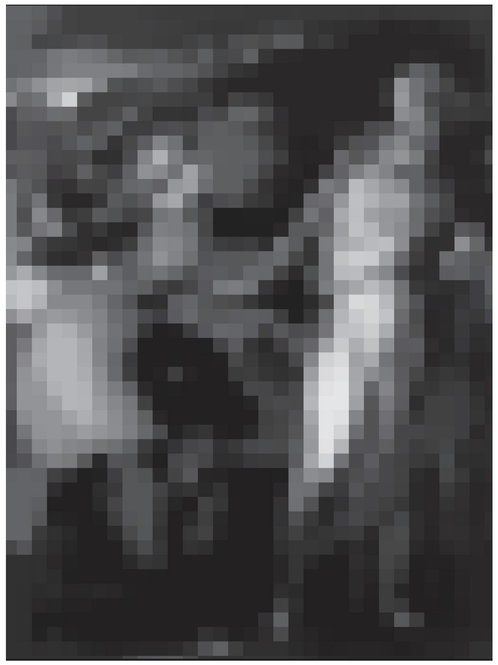
TECH INVESTIGATION PROCESS

OSCAR LAKATOS - UG3 - YR3

OUTCOME OF ARTISTIC RIVERBED DESIGN

BLUR YOUR EYES FOR THE BEST RESULTS



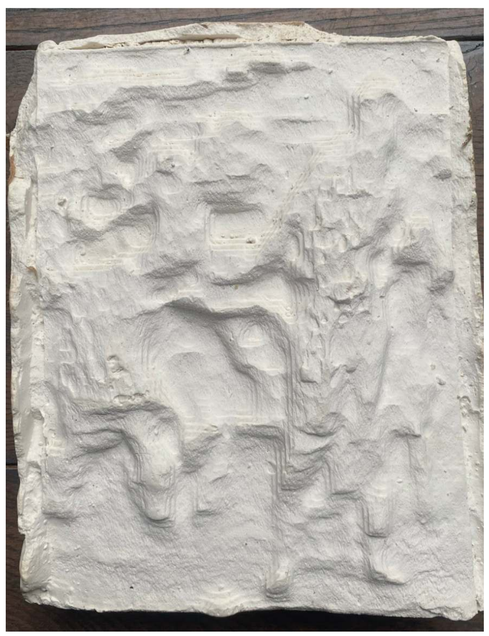












PHYSICAL MODELS OF THE ARTIFICIAL RIVER BED

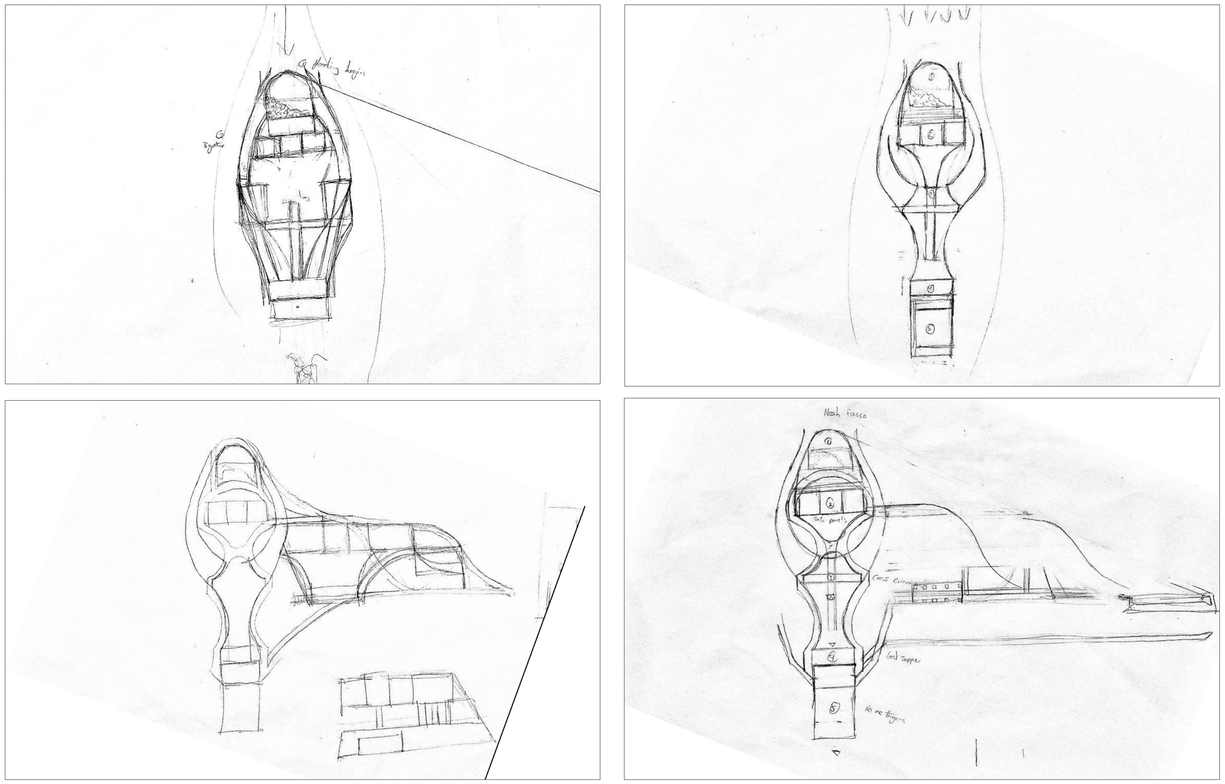
From these images you can see my riverbed's impressions on flowing water in an attempt to recreate Jacopo Pontormo's 'Noli Me Tangere'. Given the success of the results I decided to 3d print the riverbed design and later cast it in order to mimic sanstone degredation from water over time.

You can see this physical model in the bottom right. The aesthetic of the fluid degredation was something that interested me.

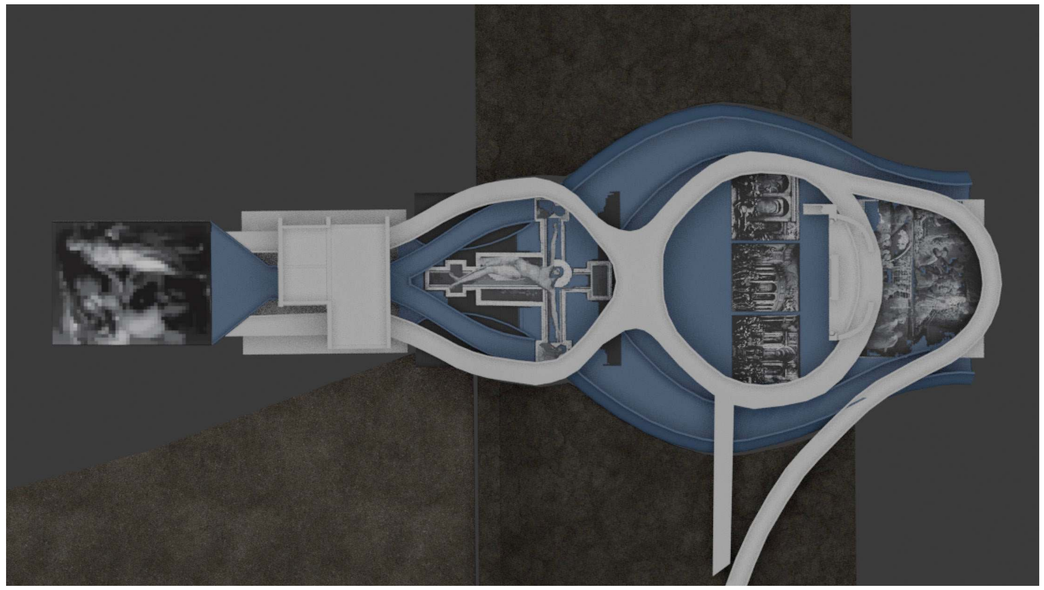
As the model eroded the white water impression becomes less sharp and the river painting fades but the riverbed itself becomes more fluid in form, greater resembling the painted brush strokes seen in the original painting.

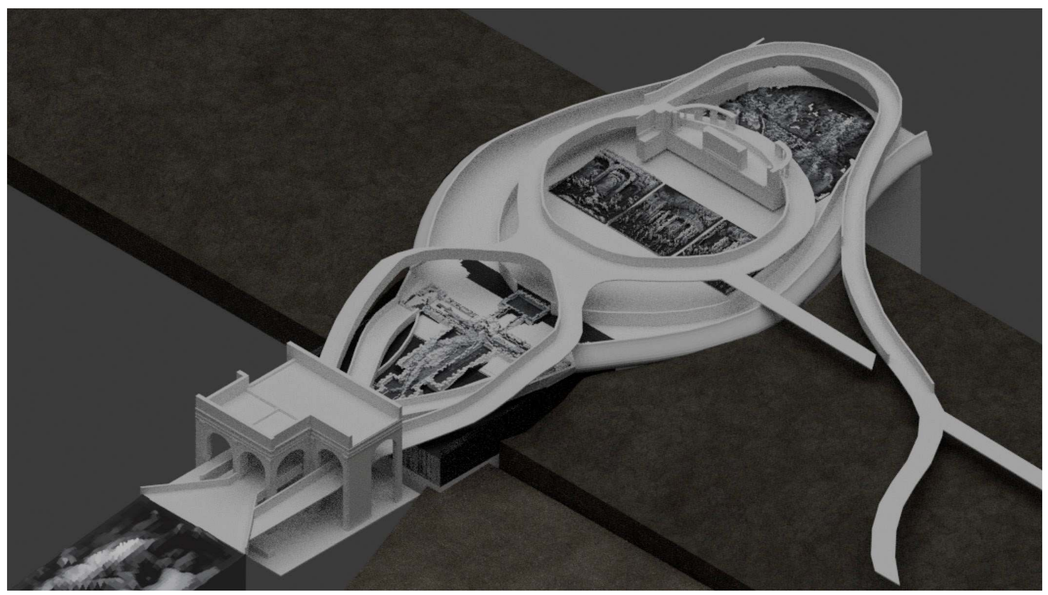
Using sandstone for these riverbeds means their structure is more exposed to the Arno's erosive power and as a result becomes fluid in itself. This means every time you visit the building a different display of river art will be exhibited as these beds change shape and the Arno's flow inevitably changes.

DESIGNING RIVER EXHIBITION GROUND FLOOR



SKETCHES OF RIVER EXHIBITION WATERWAY





I expanded the same logic used for Pontormo's painting to other pieces of art damaged during the floods of 1966. I then applied the same extrusion logic developed in my technical research to each one of these artworks, creating a series of 6 sandstone slabs.

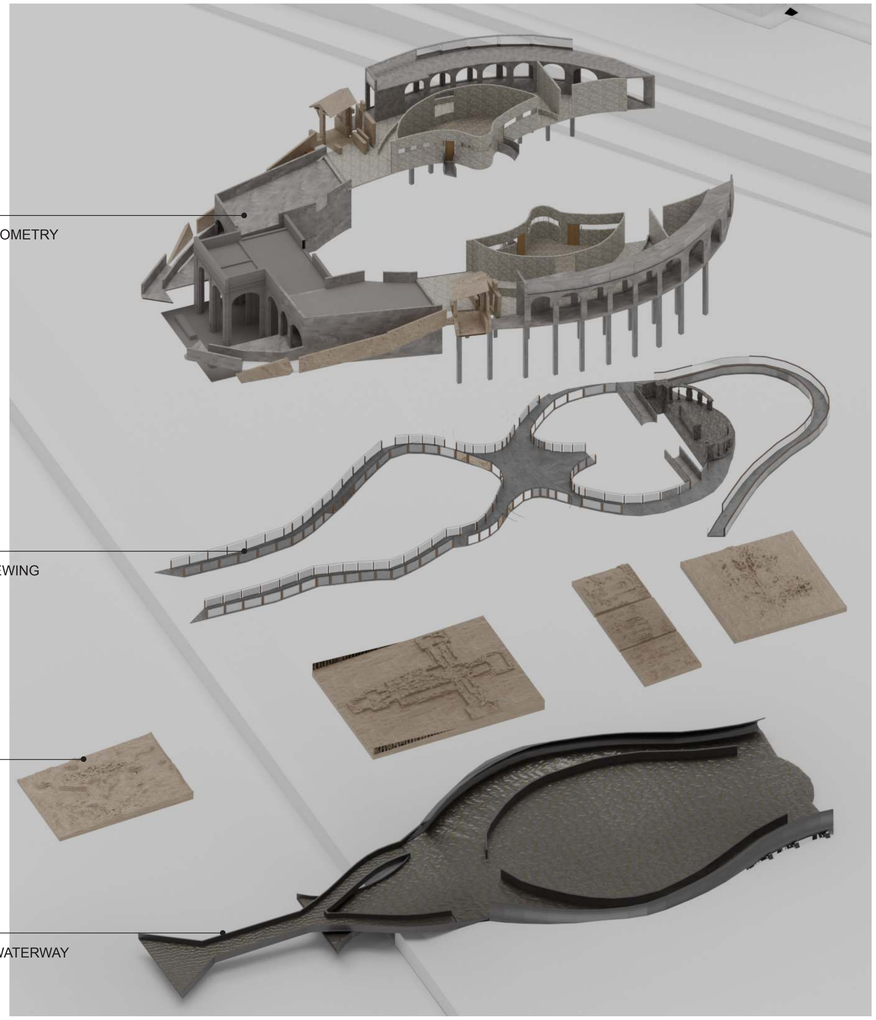
With each slab corresponding to a individual pieces of damaged art in 1966 I choreographed the placement of these 'riverbeds' through the center of my building in accordance to their biblical chronology. I then built a waterway around this arrangement allowing water to flow complementary to the artwork.

In many ways the organisation of these sandstone slabs dictated the architectural plan for my building as the spatial organisation is designed with the view of this artistic water channel as a first priority.

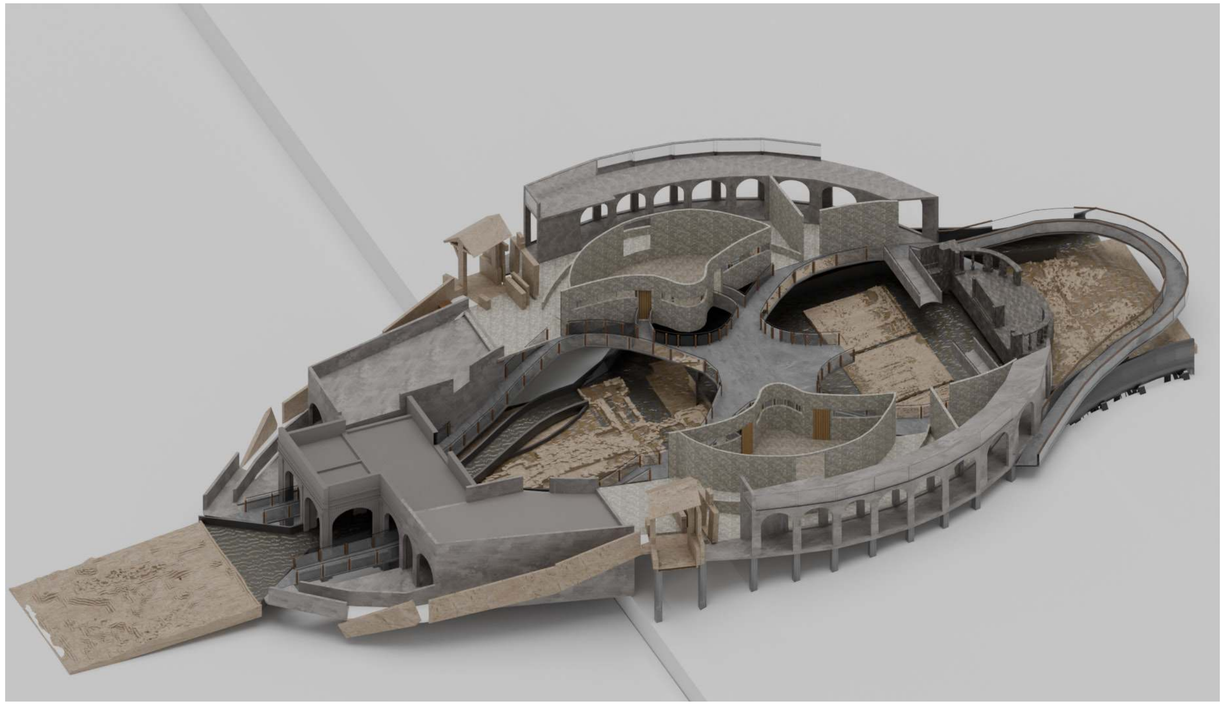
This exhibition space acts as the hydrodynamic center of my building, with the steel waterway replacing a small section of the weir and therefore becomes an extension of the local infrastructure. **This whole region of my building is designed to be completely flood-able and doesn't increase flood risk in the area.**

DESIGN DEVELOPMENT - PART 3

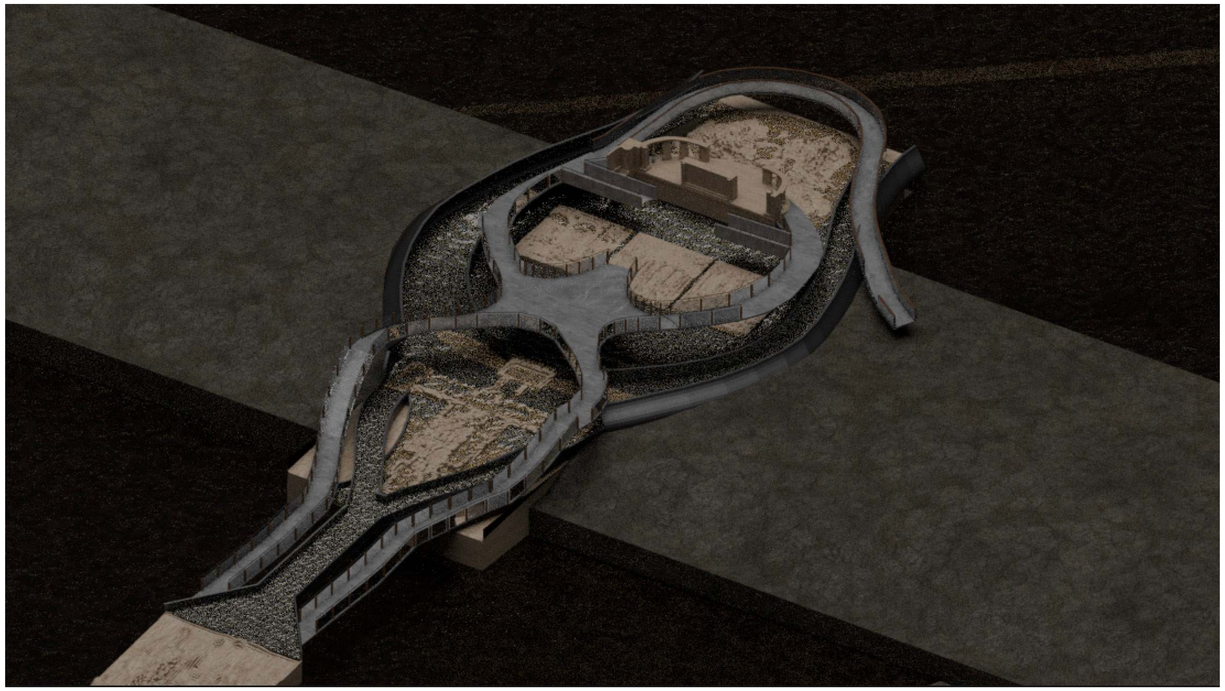
BUILDING AROUND TECHNICAL VIEWPOINTS WHILST MAINTAINING P1 GEOMETRIES



GROUND FLOOR MASSING



GROUND FLOOR MASSING



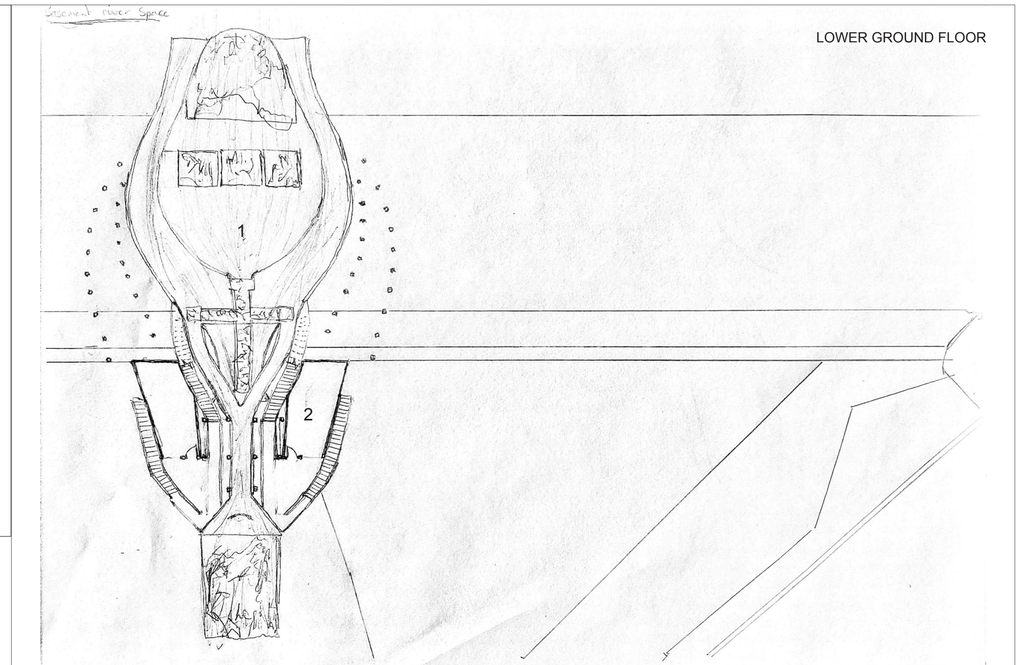
Now that I had established my river exhibition space on the ground floor I wanted to make the building more publicly accessible whilst maintaining its programme as an institute for art restoration. Therefore I decided to prioritise and build around viewpoints of this river art for both students studying at the institution and the public visiting.

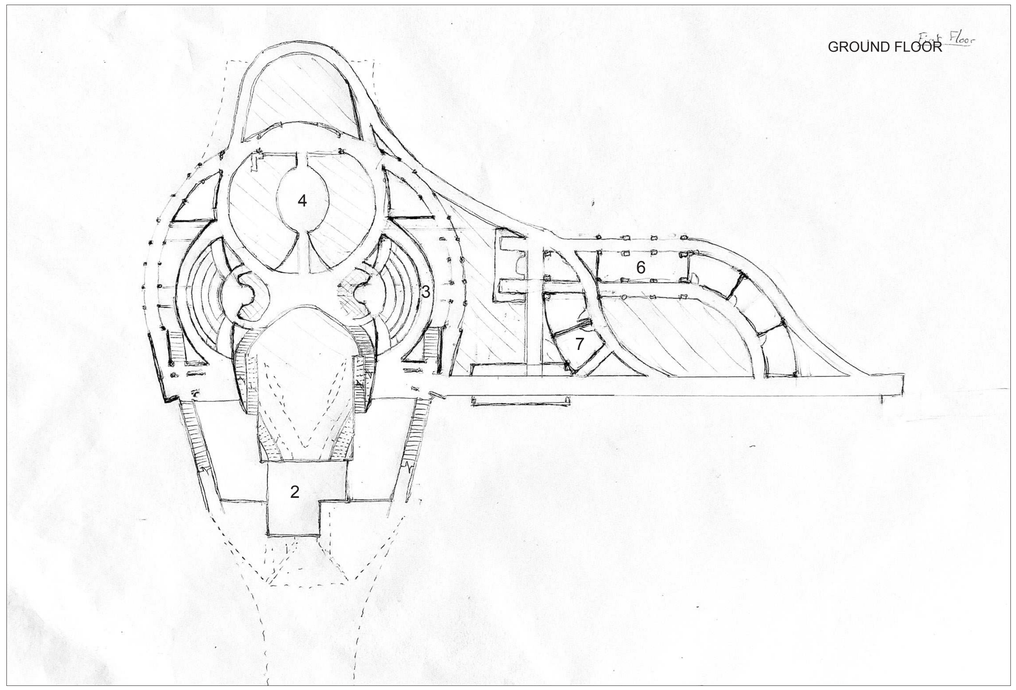
This meant developing spaces for public & private use as well as a mix of both..

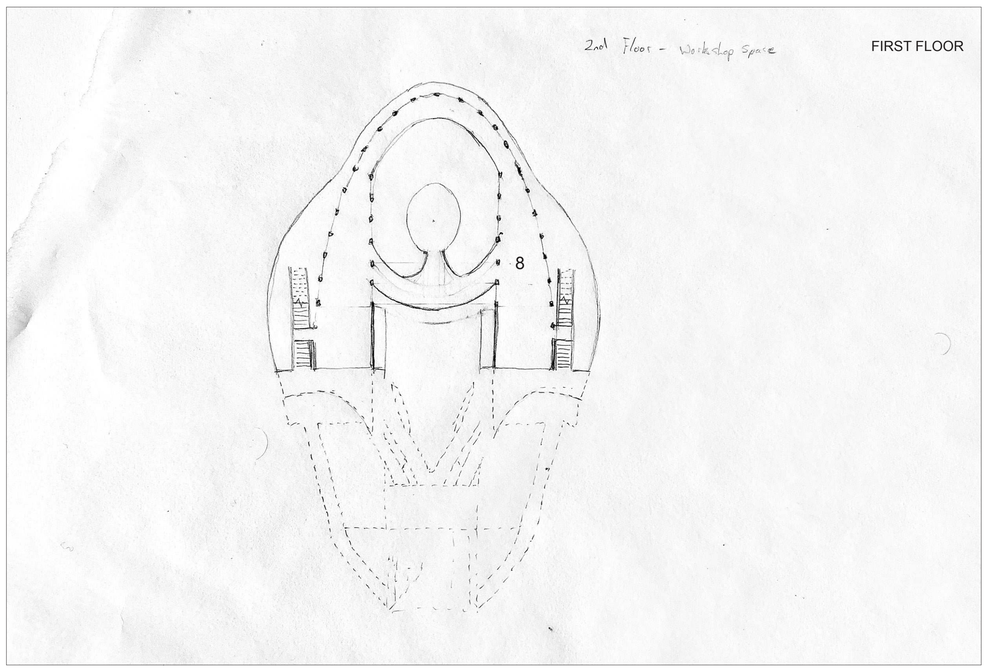
NEXT ITERATION OF PLANS

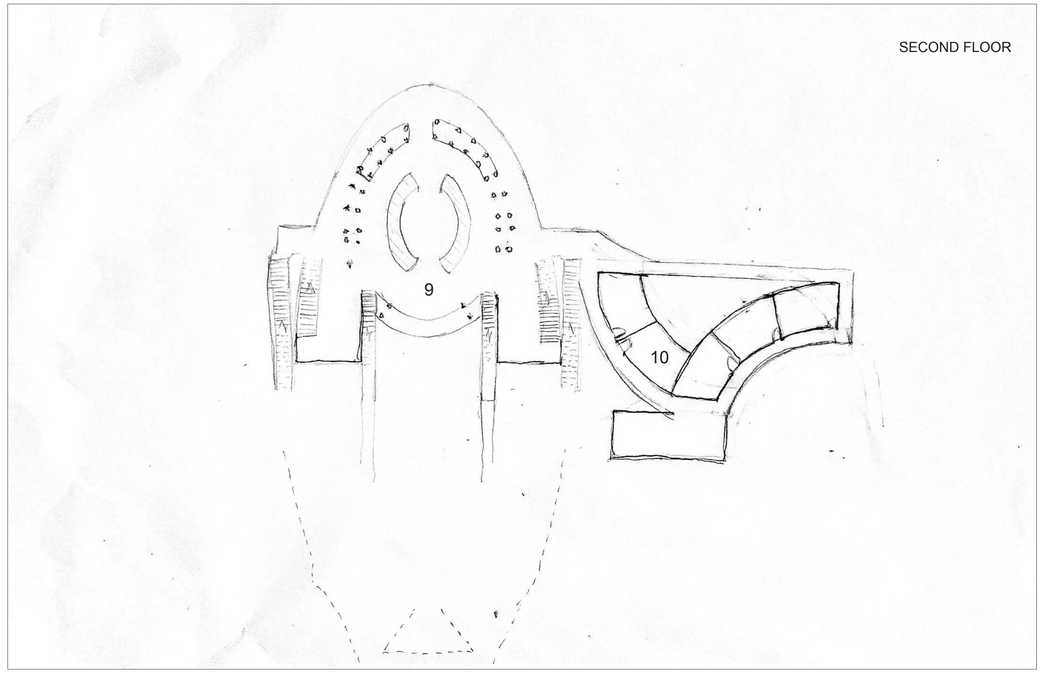
INITIAL ESSENTIAL SPACES

1. RIVER EXHIBITION SPACE
2. RESTORATION WORKSHOP
3. RIVER VIEW BALCONY
4. LECTURE THEATRE
5. CENTRAL ELEVATOR
6. RESTORATION LIBRARY
7. CLASSROOMS
8. STUDENT SPACE
9. EXHIBITION SPACE
10. RESTORATION LABS

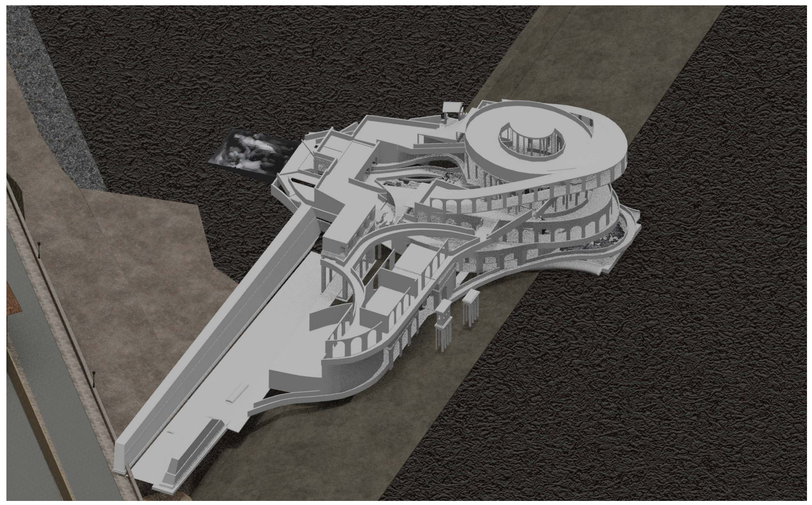


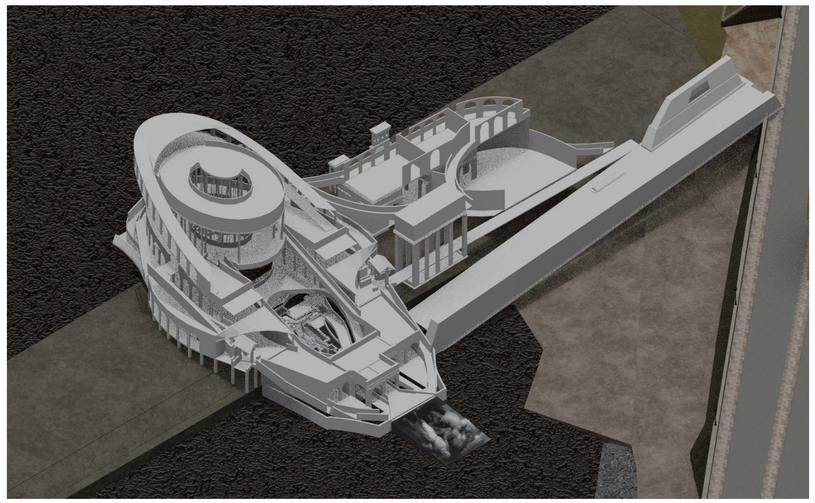


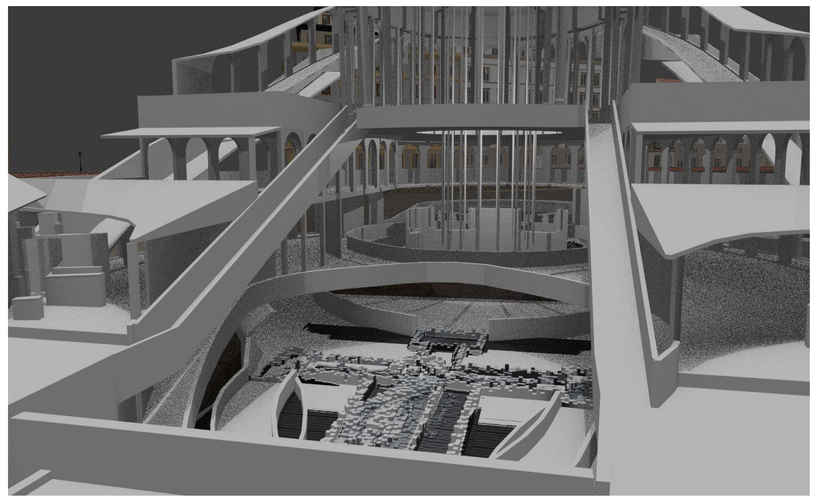




FIFTH ITERATION MASSINGS



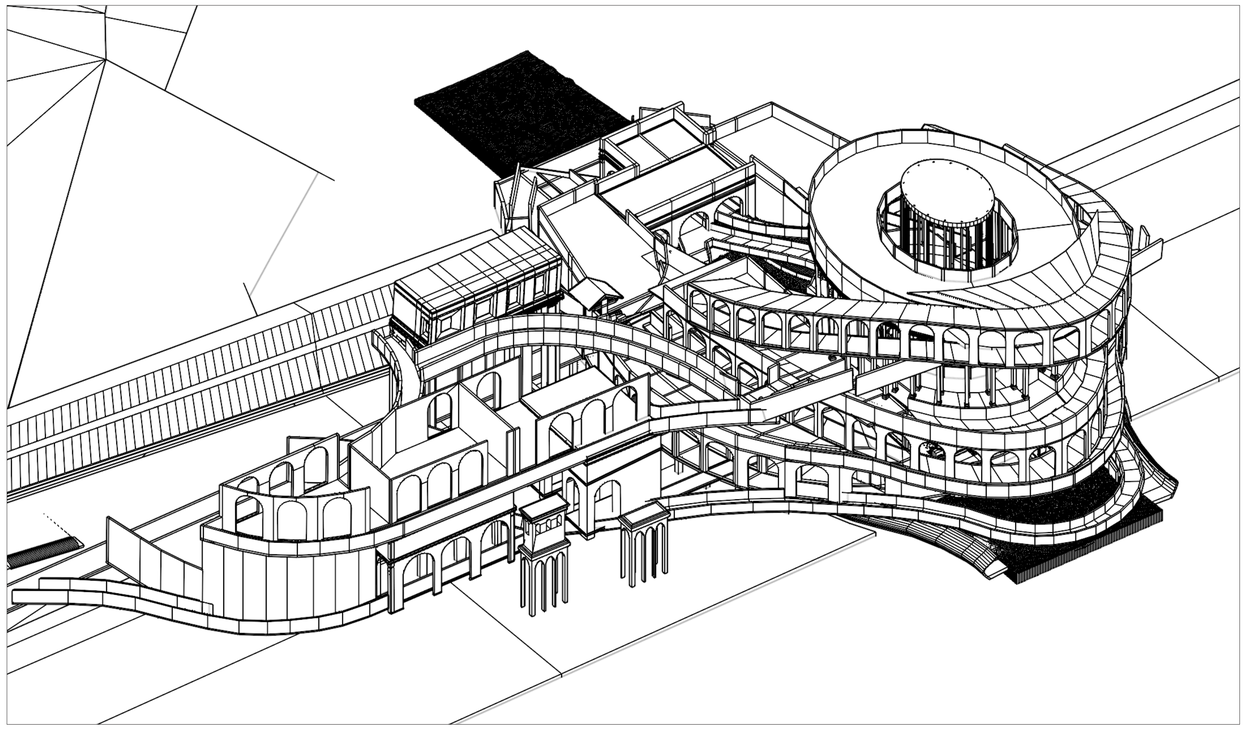




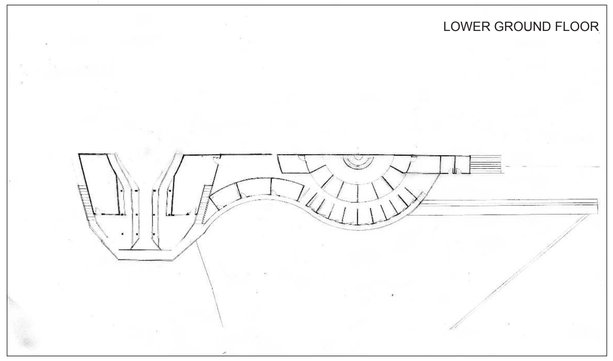
From my fourth iteration massing you can see how the building has reverted back to a parallel Uccello slope down the Santa Rosa weir.

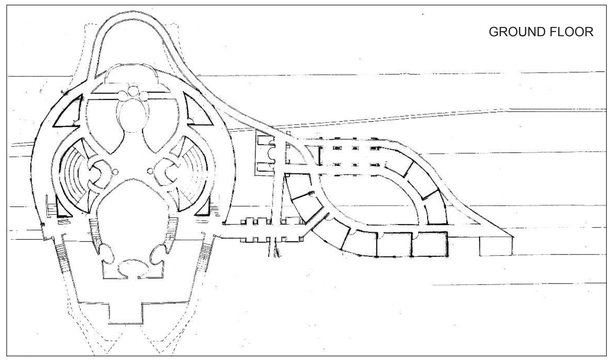
From my previous hydrodynamic diagrams and photographs of my site visit it is obvious that this point in the weir is least exposed to water flow as, due to the weir's diagonal shape, the most is intense and turbulent flow is pushed to the north side of the river..

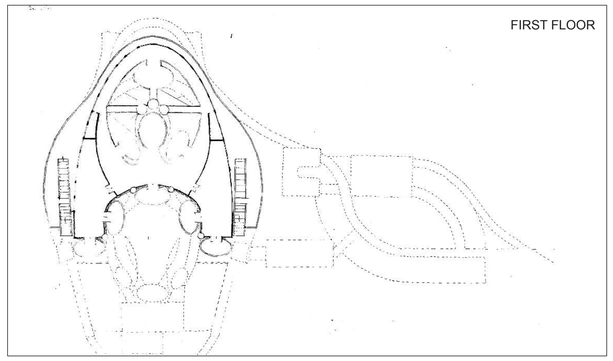
Therefore it was safe to building perpendicularly with a 2 meter raise connecting the southern street to my building. This would require hydrodynamic piling to reduce flood risk, something that I visit later.

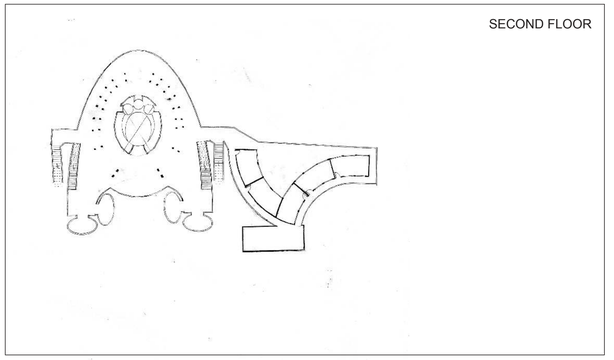


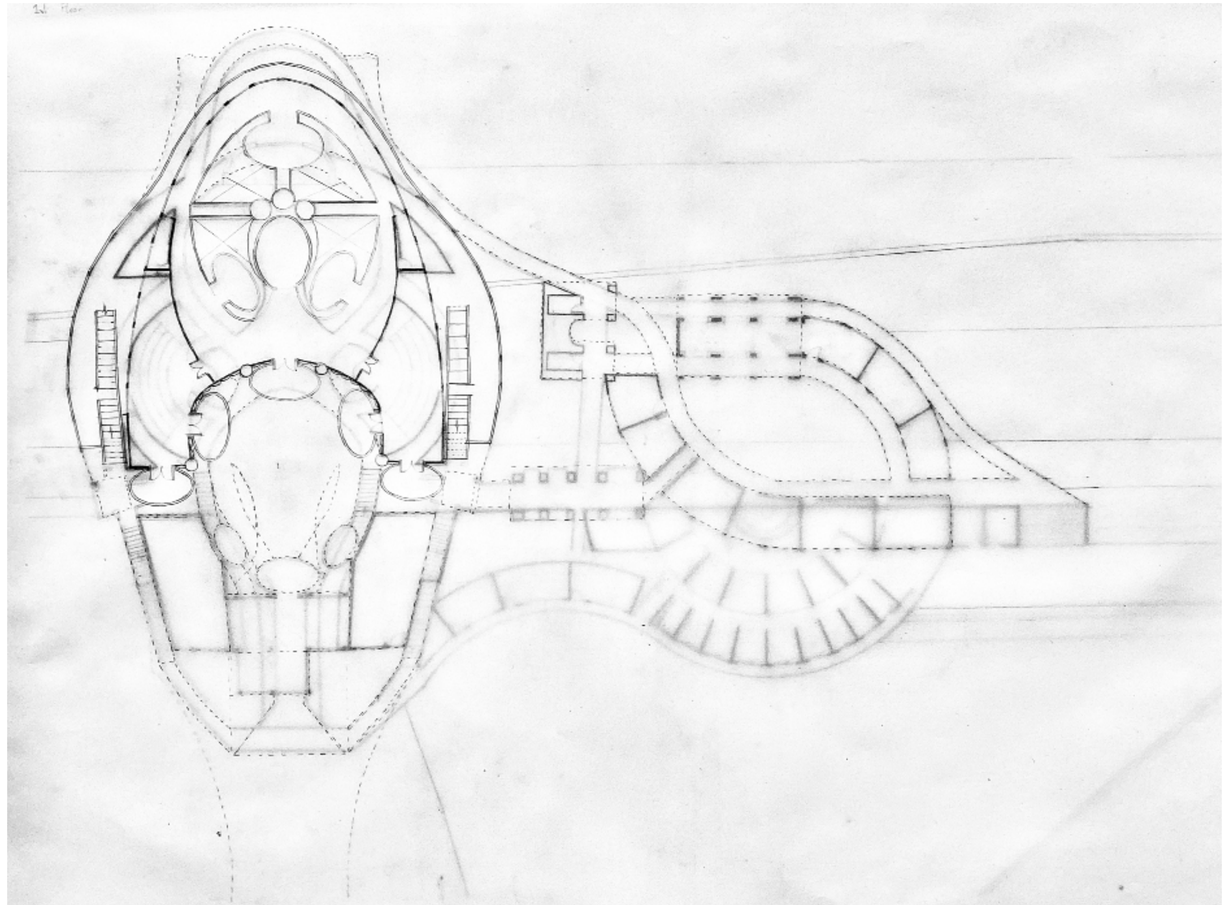
SIXTH ITERATION OF PLANS









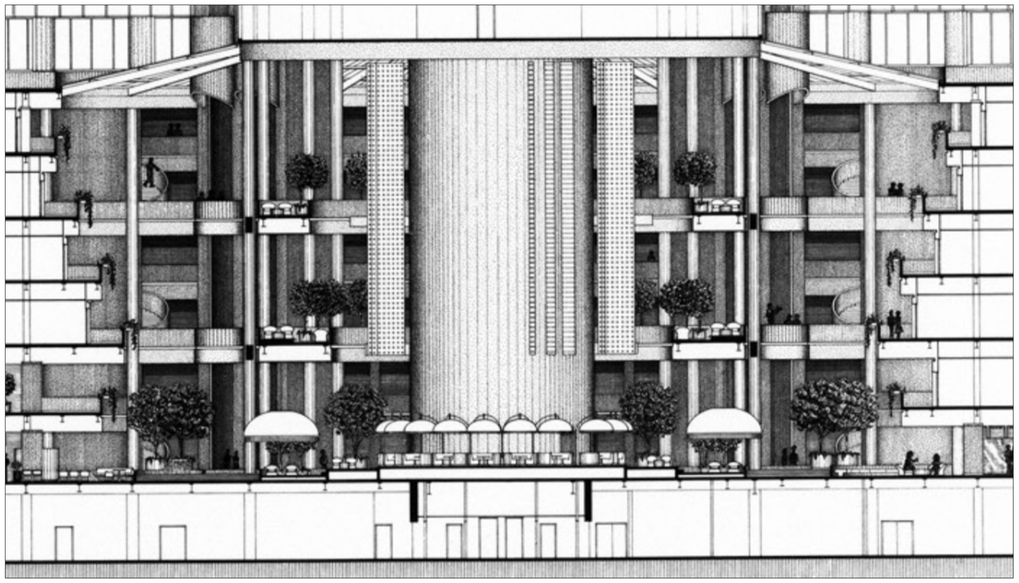


This iteration of plans work with the previous model but this time try to establish more clear, flowing routes for building users. This designs a route for damaged artworks, starting at a drop off zone on the southern road, moving through quarantine, drying and lab spaces, before reaching an exhibition ready zone where it awaits to be presented in the top floor gallery space.

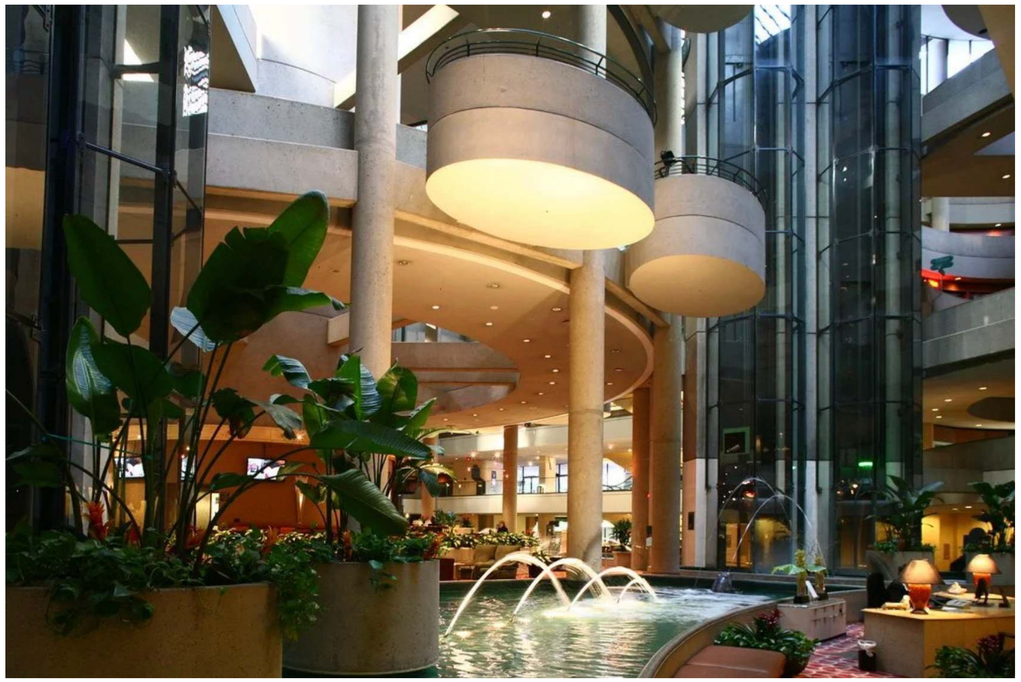
This development introduces a far more complex lower ground section to my building largely dedicated to the flow to damaged or flooded artwork.

The student working spaces and public tours revolve around this transport of damaged art, while providing no disruptuion to the art itself. Students have some overlap with the physcal art whilst tourists and are kept completely seperate.

WESTIN BONAVENTURA HOTEL - REFERENCE



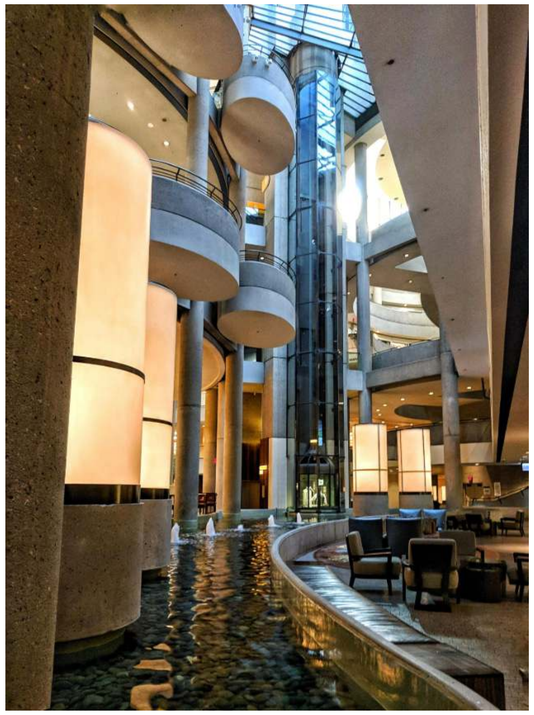
SECTION SHOWING THE ORGANISATIN OF THESE BALCONY EXTENSIONS

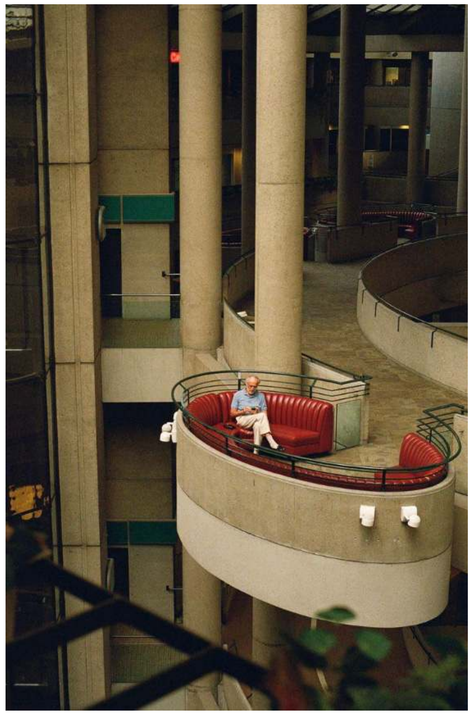


IMAGES OF THE HOTEL INTERIOR

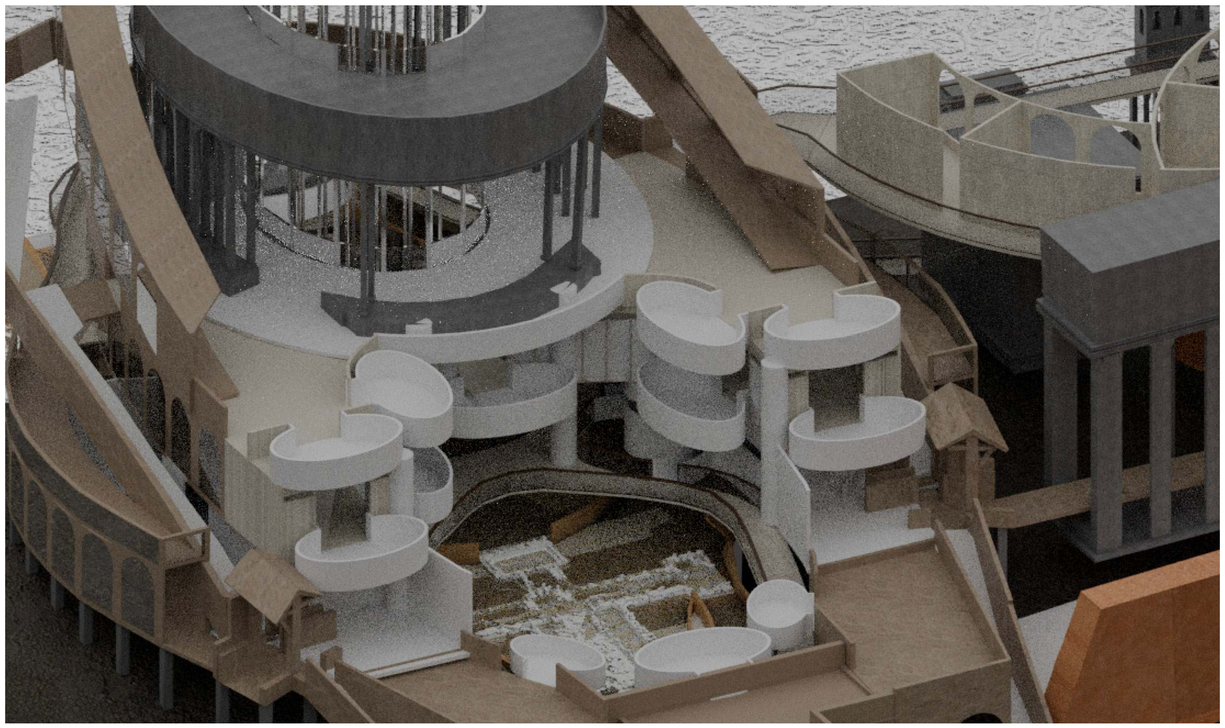
Given that a key part of my buildings revolves around viewpoints of both the Arno, my extracted painted geometries and my tech artificial river beds, I wanted to design a unique architectural language with individualised the importance of these specific viewpoints whilst presenting building users with a comfortable space to socialise, relax and separate from work.

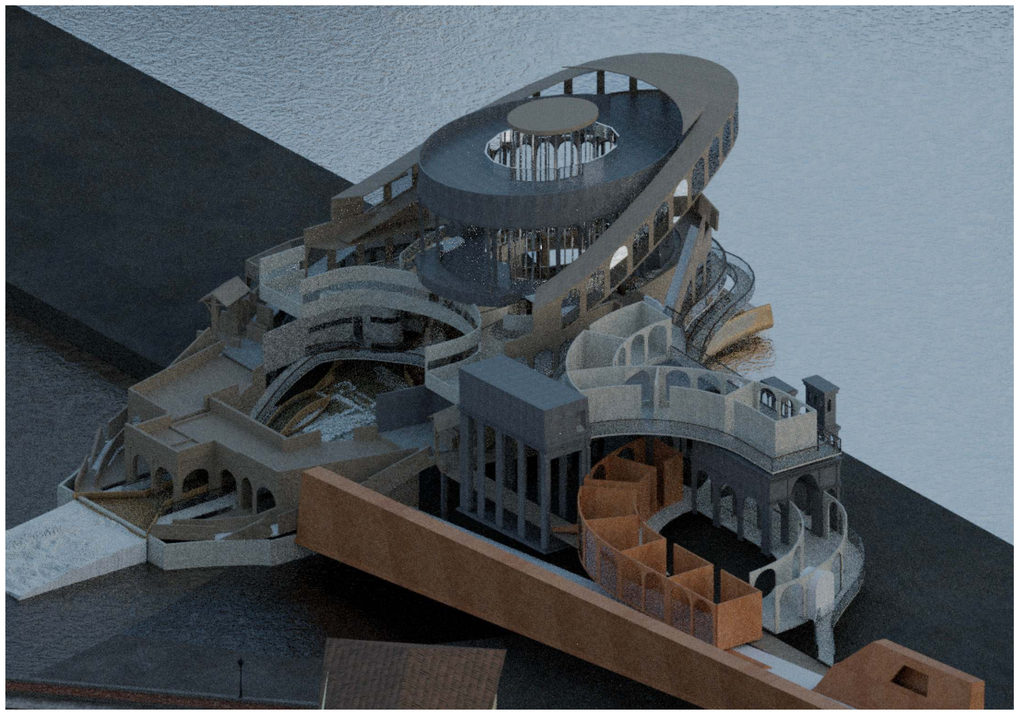
I thought The Westin Bonaventure Hotel in LA displays the exact architectural quality I required. These oval concrete extensions add nuance to the building's flow whilst defining visual coherence within the building's vertical layering. This became a major source of inspiration for the balcony spaces in and around the central waterway of my building.

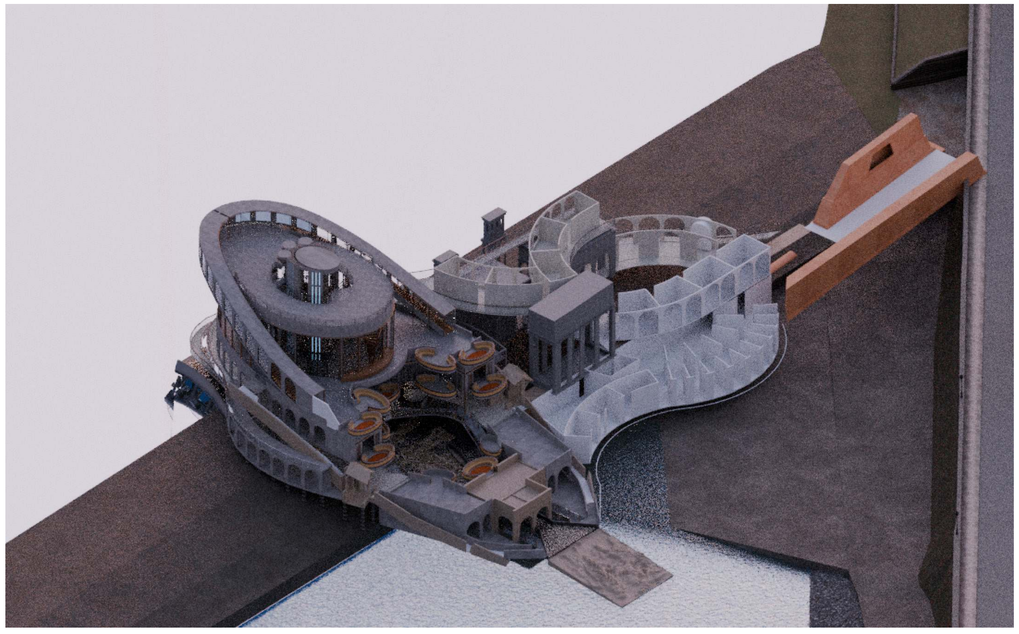




DEVELOPING VIEWPOINTS AND EXPLORING MATERIALS



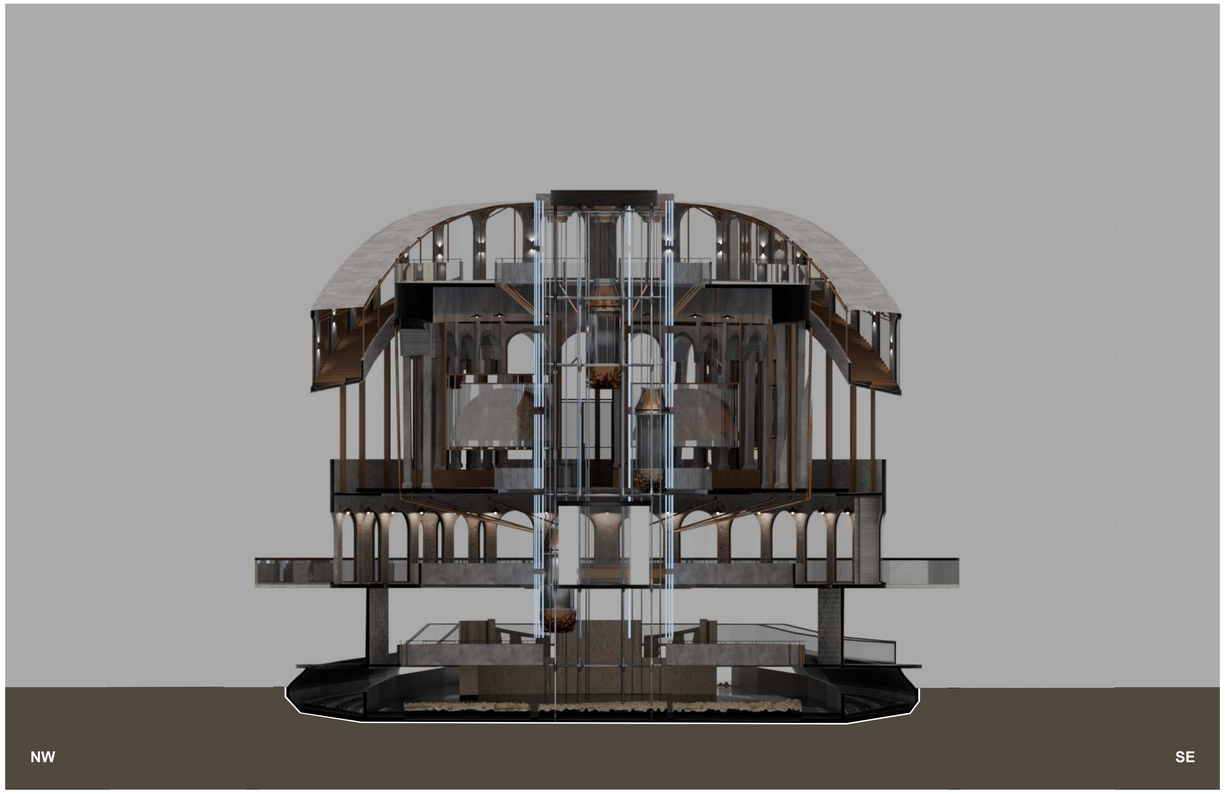


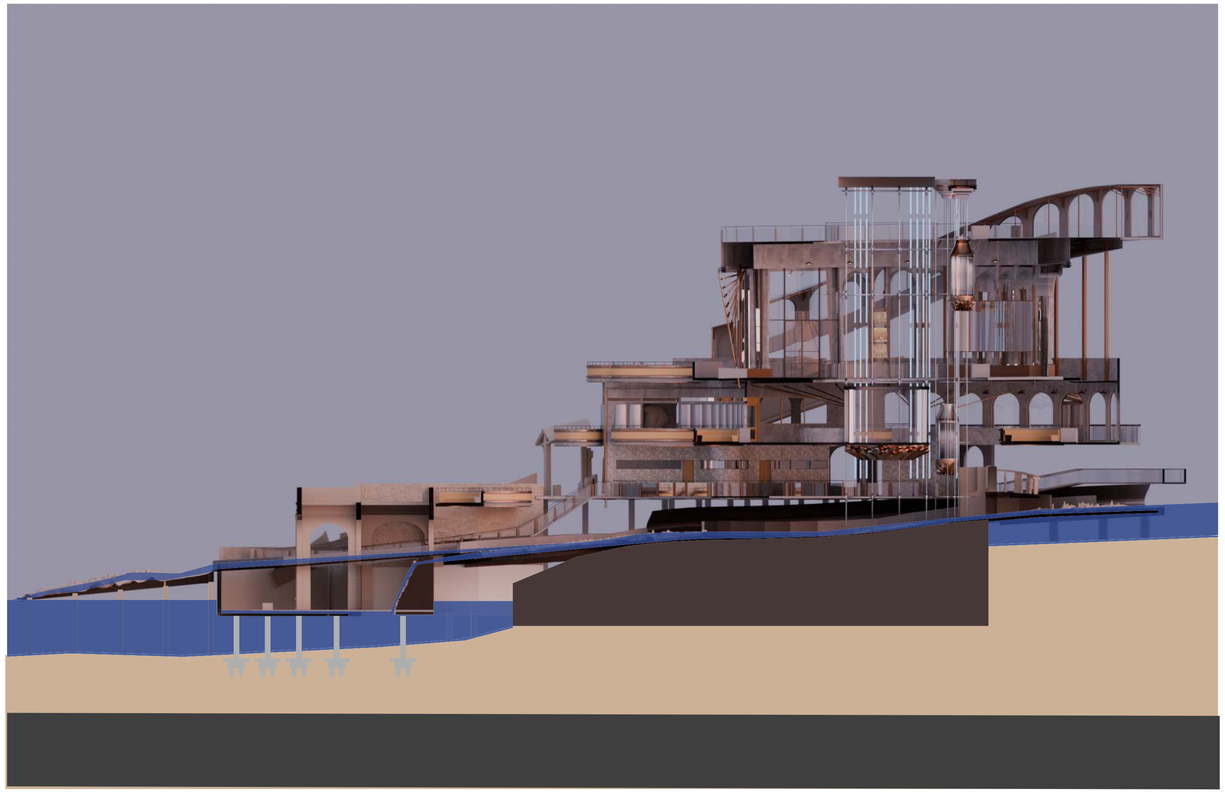


The material pallet at the beginning of my final model was messy, confused and disorganised there was very little hierarchy. My goal for these renders was to explore the aesthetic qualities of the material, with a great question being whether I wanted my building to merge with the organic qualities of the river by using more erosion prone materials such as sandstone, or to stand strong against the water flow and give a sense of hydrauic security.

I quite liked the idea of juxtaposing the buildings materiality with the buildings form. I wanted to echo the flowing nature of my plan and its surroundings, whilst presenting users with a strong, safe and water ready material palette. therefore I decided to use concrete (locally sourced) for the core structure of my building.

LAST ITERATION RENDERED SECTIONS

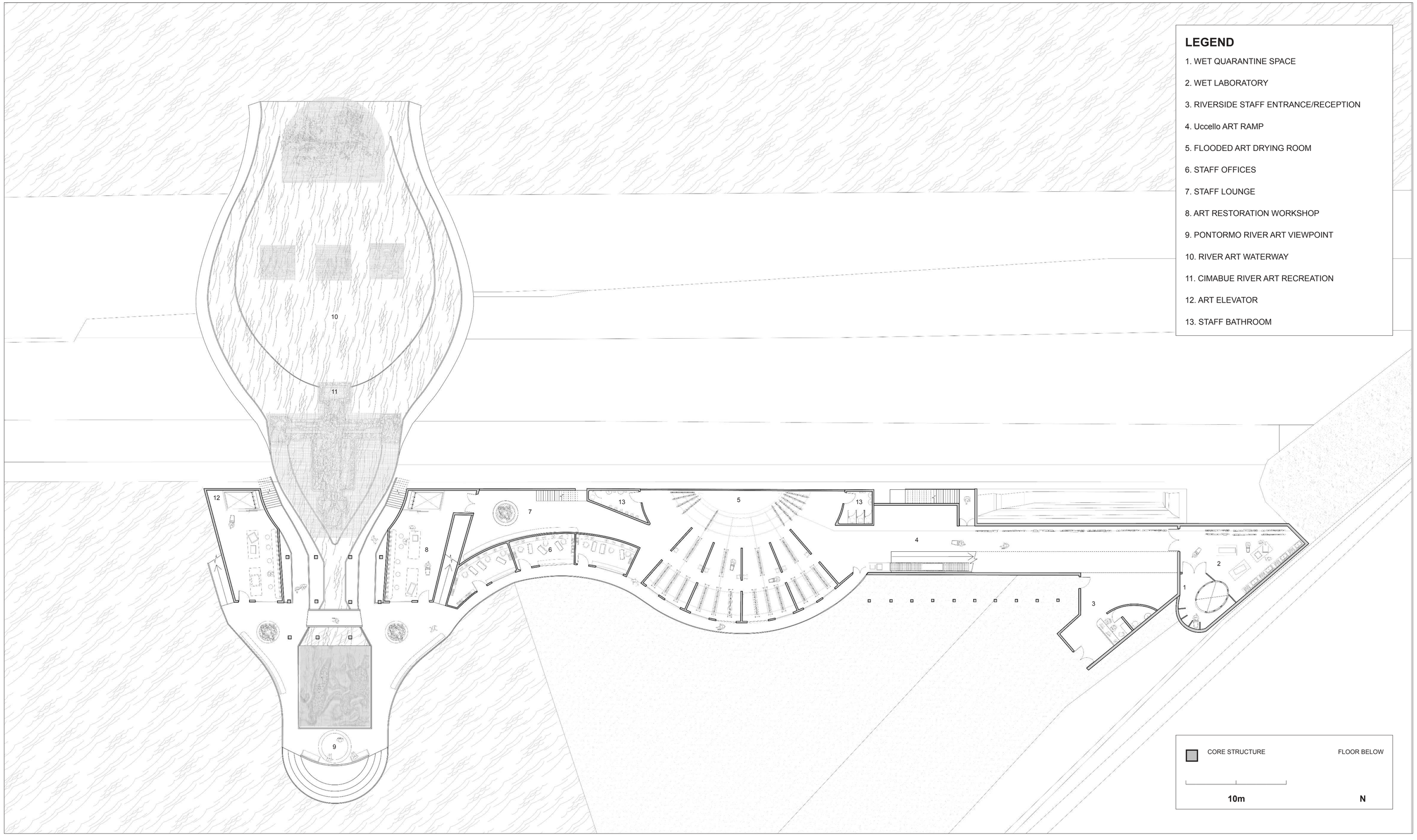




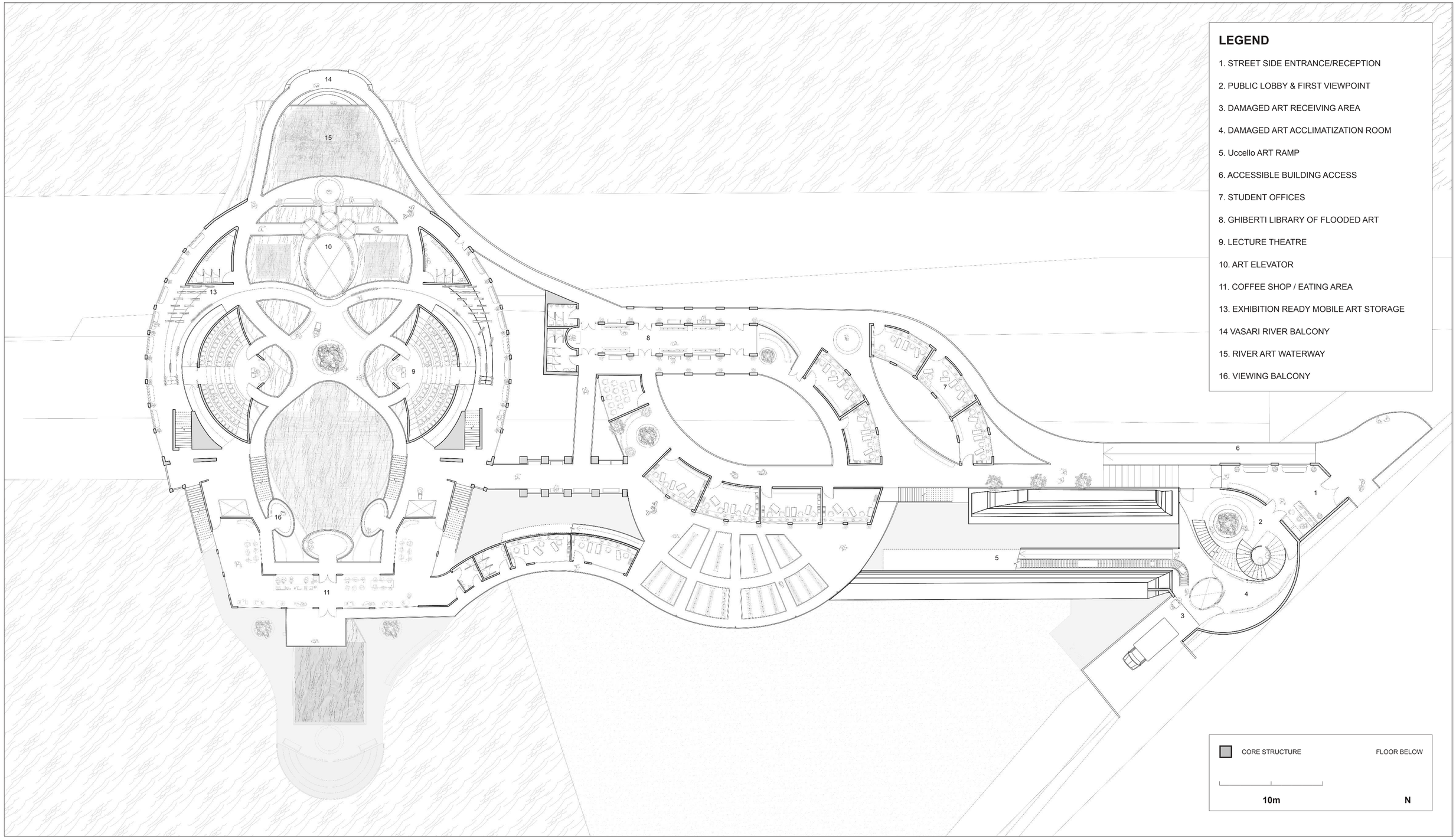
These earlier rendered sections give a taste for how the building's central interior spaces interact with one another. They displays how the central oversized art elevator becomes a key focus point for the building's flow.

In these renders the architecture still feels slightly confused, simplified and lacking hierarchy, something that I aim to improve in the development of my final iteration

FINAL LOWER GROUND FLOOR PLAN



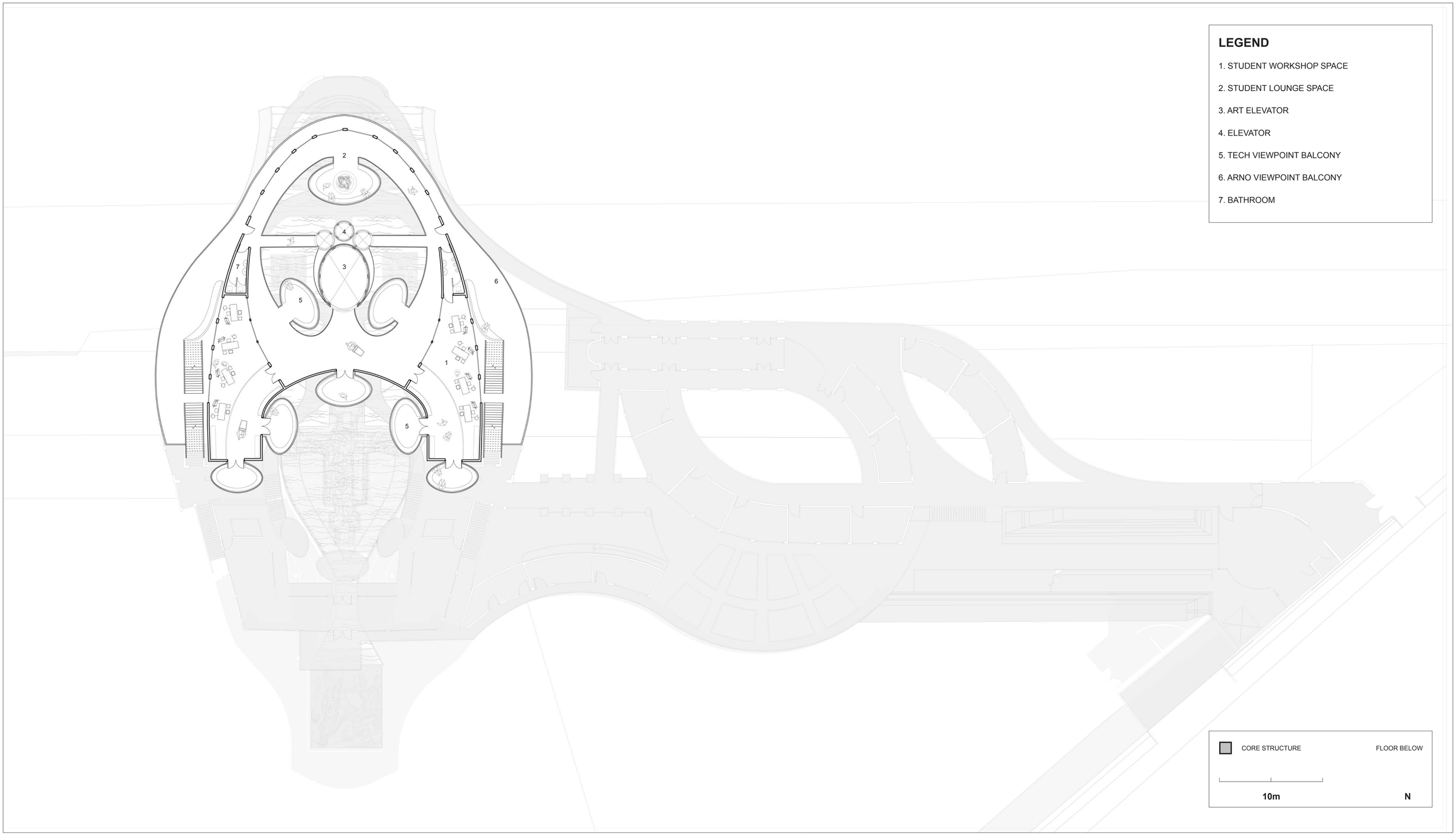
FINAL UPPER GROUND FLOOR PLAN



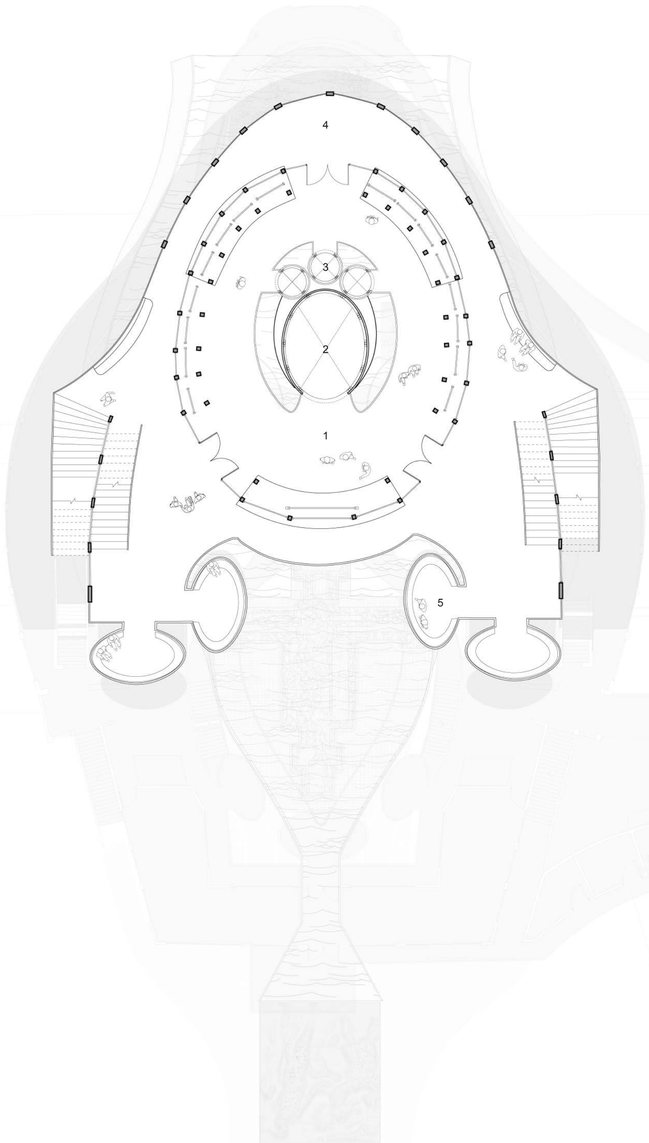
LEGEND

1. STREET SIDE ENTRANCE/RECEPTION
2. PUBLIC LOBBY & FIRST VIEWPOINT
3. DAMAGED ART RECEIVING AREA
4. DAMAGED ART ACCLIMATIZATION ROOM
5. Uccello ART RAMP
6. ACCESSIBLE BUILDING ACCESS
7. STUDENT OFFICES
8. GHIBERTI LIBRARY OF FLOODED ART
9. LECTURE THEATRE
10. ART ELEVATOR
11. COFFEE SHOP / EATING AREA
13. EXHIBITION READY MOBILE ART STORAGE
14 VASARI RIVER BALCONY
15. RIVER ART WATERWAY
16. VIEWING BALCONY

FINAL FIRST FLOOR PLAN



FINAL SECOND FLOOR PLAN



LEGEND

1.EXHIBITION SPACE

2. ART ELEVATOR

3. ELEVATOR

4. SMOKING AREA

5. TECH VIEWPOINT BALCONY

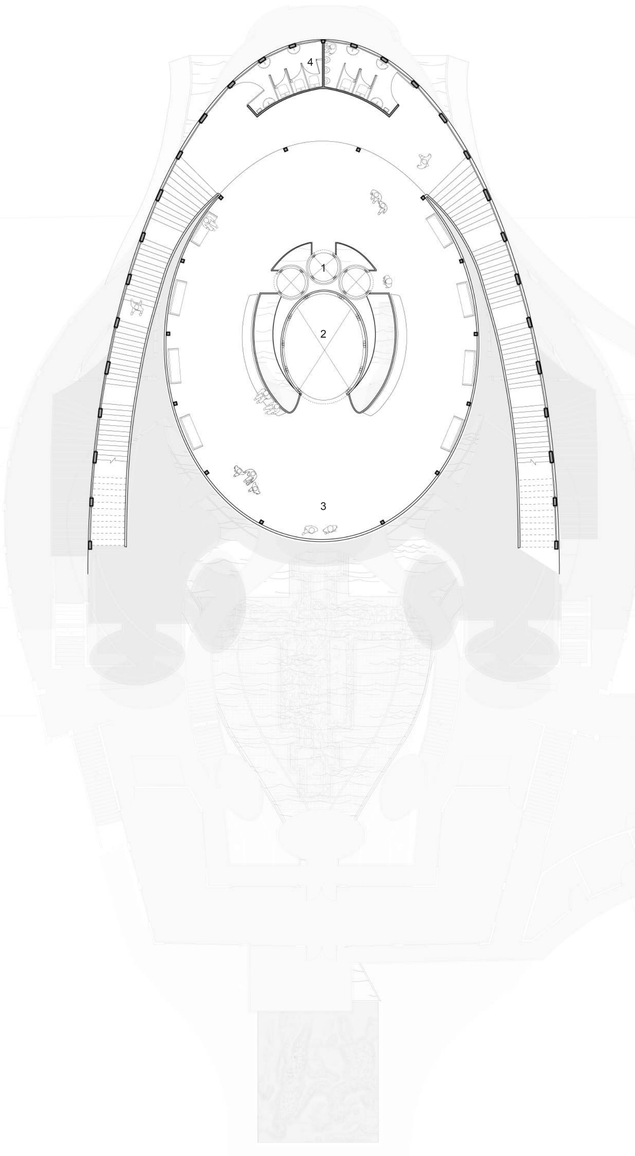
CORE STRUCTURE

FLOOR BELOW

10m

N

FINAL TOP FLOOR PLAN



LEGEND

1. ELEVATOR
2. ART ELEVATOR
3. BALCONY VIEWPOINT
4. BATHROOM

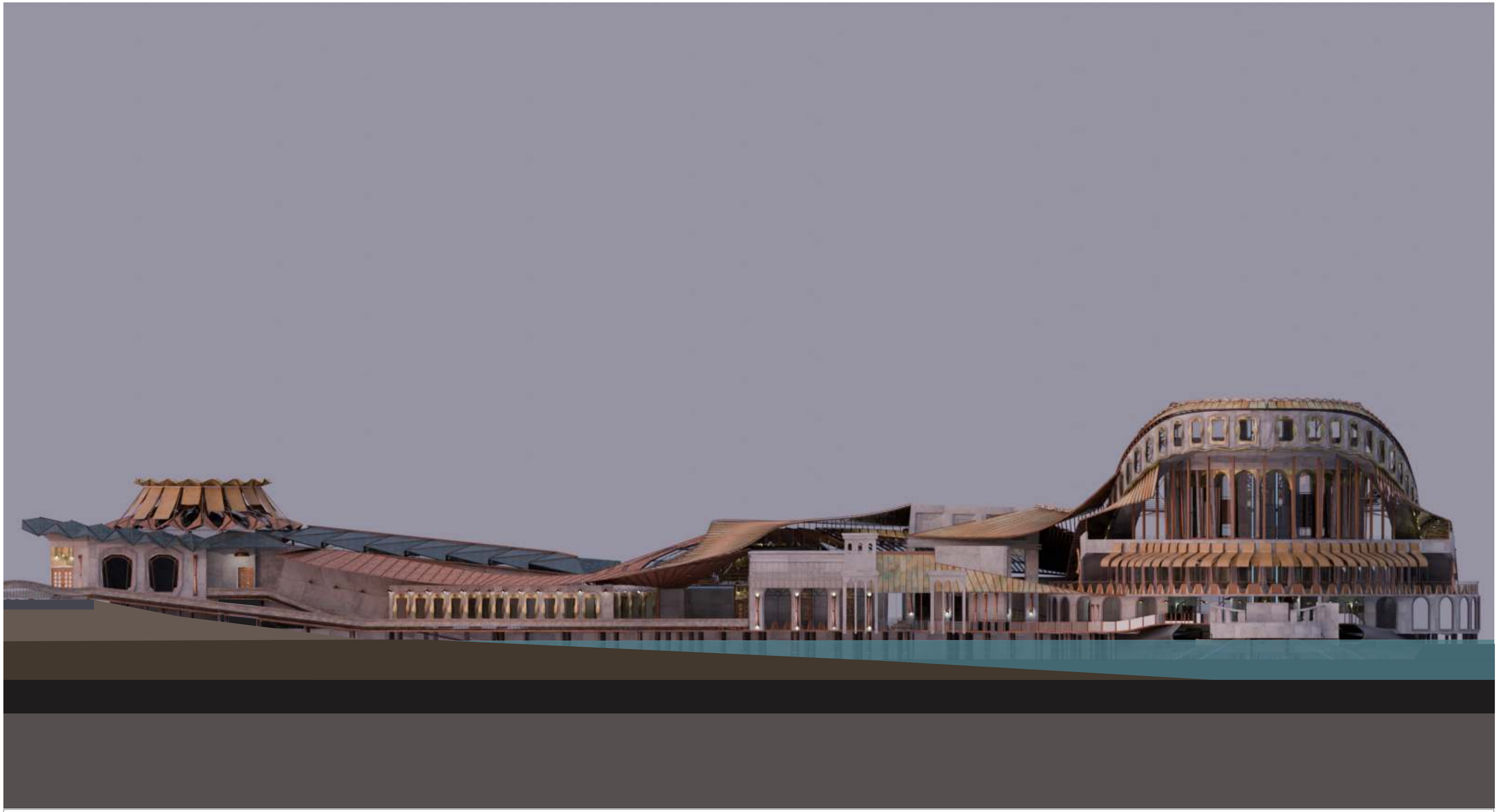
CORE STRUCTURE

FLOOR BELOW

10m

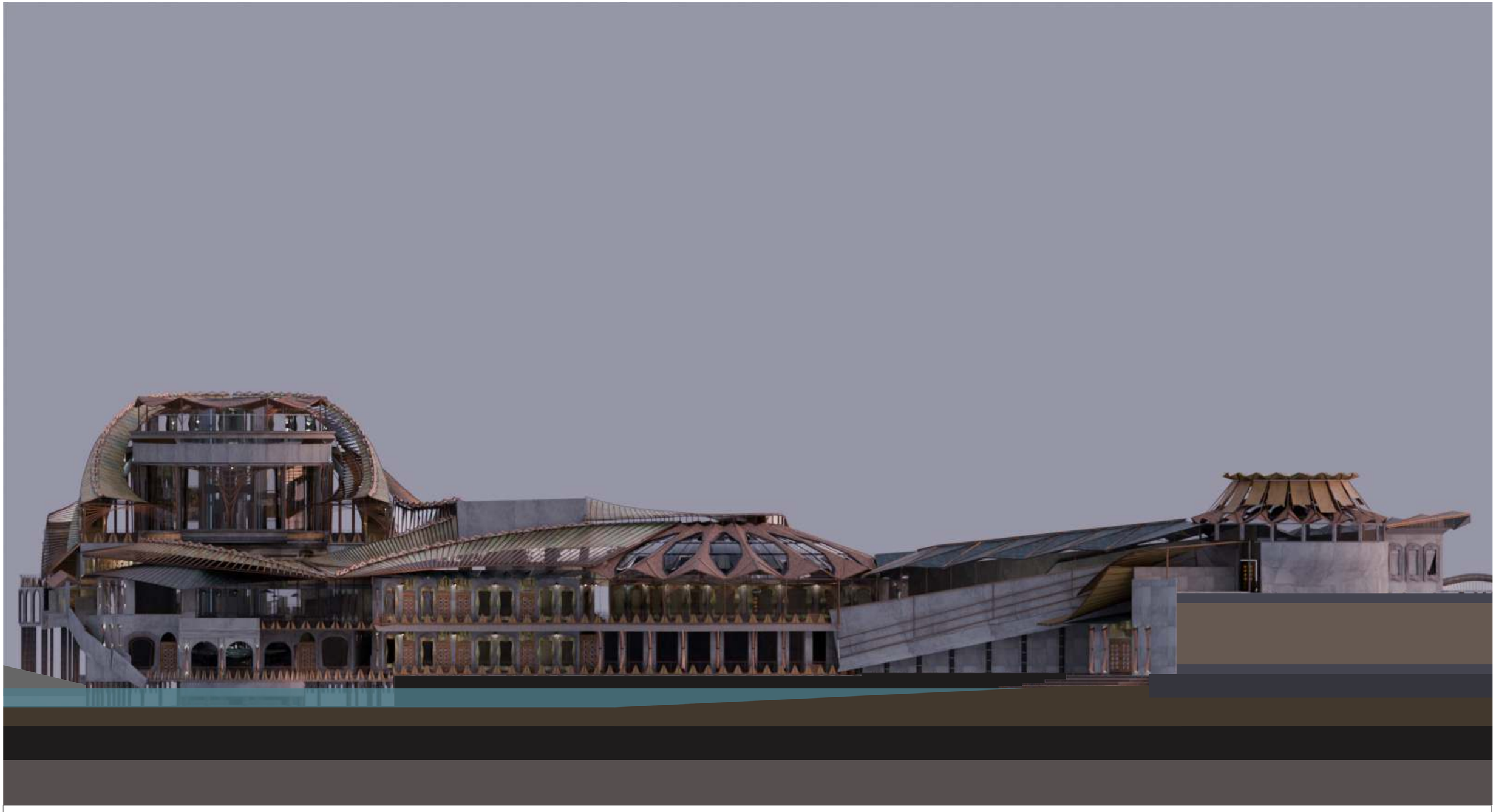
N

SOUTH WEST FACING ELEVATION



20m

NORTH EAST FACING ELEVATION



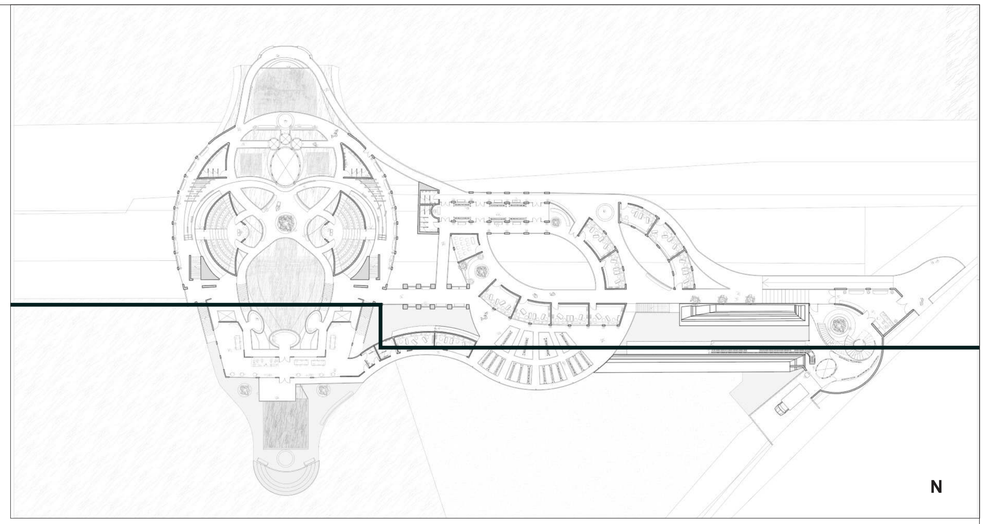
20m

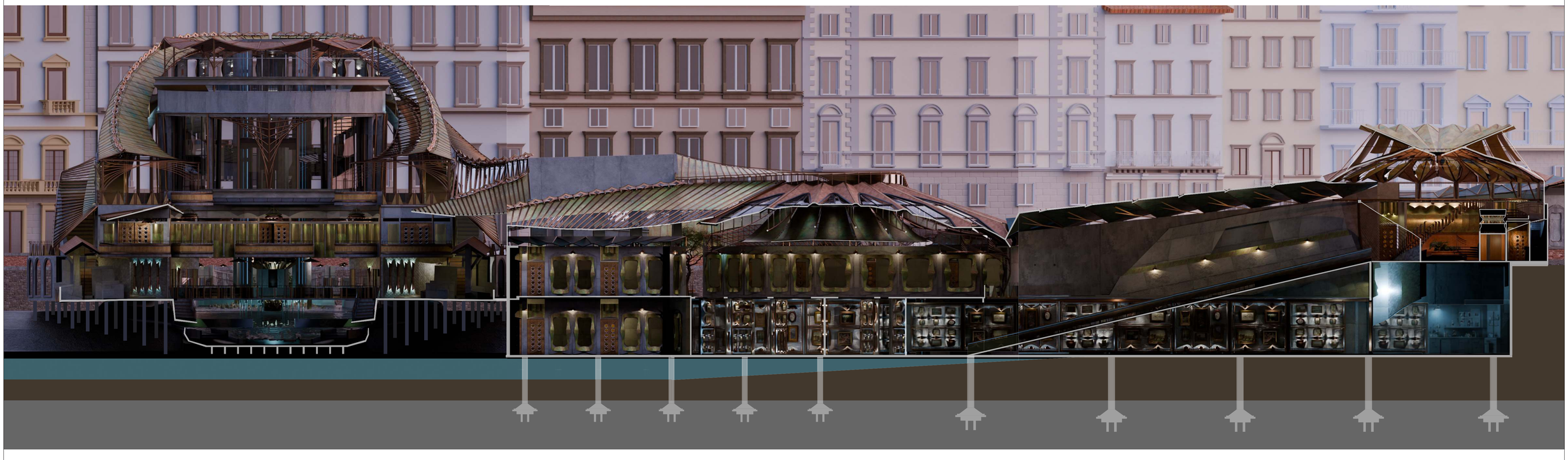
RENDERED SECTION A

LEGEND

1. ARNO VIEWING BALCONY
2. FINAL EXHIBITION SPACE
3. RIVER ART VIEWING BALCONY
4. CENTRAL ELEVATOR SHAFT
5. RIVER ART WATERWAY
6. STAFF OFFICES
7. ART VIEWING BALCONY
8. STUDENT WORKSPACES
9. DRY ART STORAGE
10. ART DELIVERY RAMP (Uccello)
11. WET ART QUARANTINE ROOM / LAB
12. PUBLIC ENTRANCE LOBBY
13. RAIN CATCHMENT ROOF
14. WIND CATCHING ROOF

SECTION CUT | RIVER ARNO | RIVER SEDIMENT | RIVER INFRASTRUCTURE





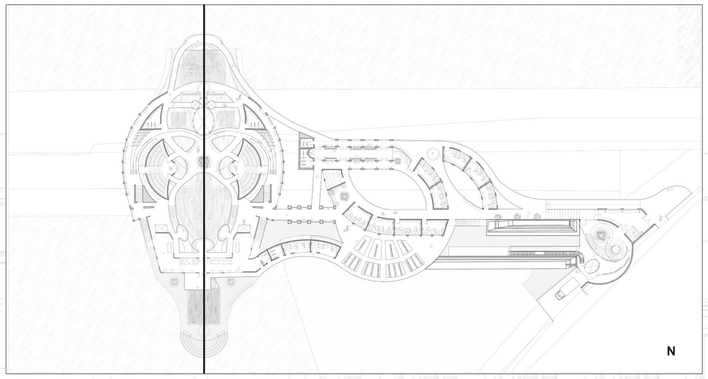
20m

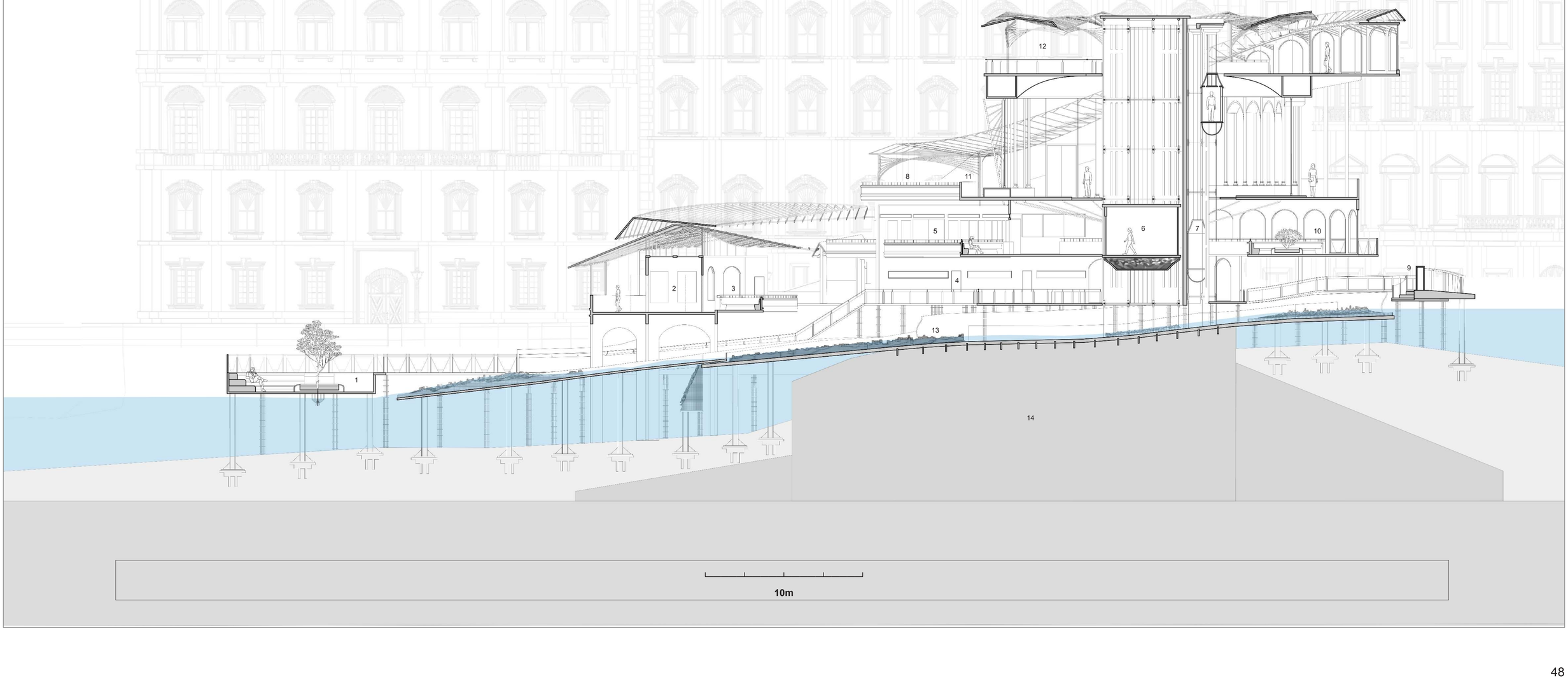
FINAL SECTION B

LEGEND

1. GHIBERTI RIVER VIEWPOINT BALCONY
2. CAFE AREA
3. RIVER ART VIEWING BALCONY
4. LECTURE THEATRE
5. STUDENT RESTORATION WORKSHOP
6. ART ELEVATOR
7. REGULAR ELEVATOR
8. RIVER ART BALCONY VIEWPOINTS
9. VASARI RIVER BALCONY
10. STUDENT LOUNGE AREA
11. STAIRS TO TOP FLOOR
12. TOP FLOOR ARNO VIEWING SPACE
13. RIVER ART SLABS & WATERWAY
14. WEIR DI SANTA ROSA

SECTION CUT | RIVER ARNO | RIVER SEDIMENT | RIVER INFRASTRUCTURE

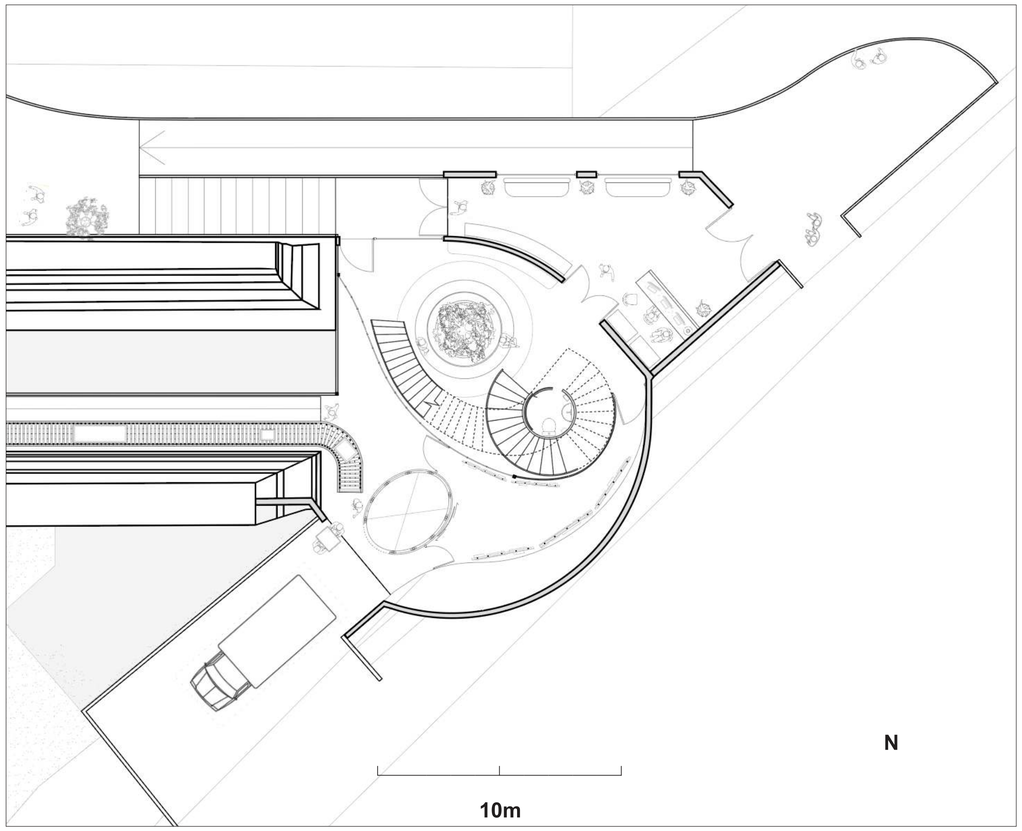


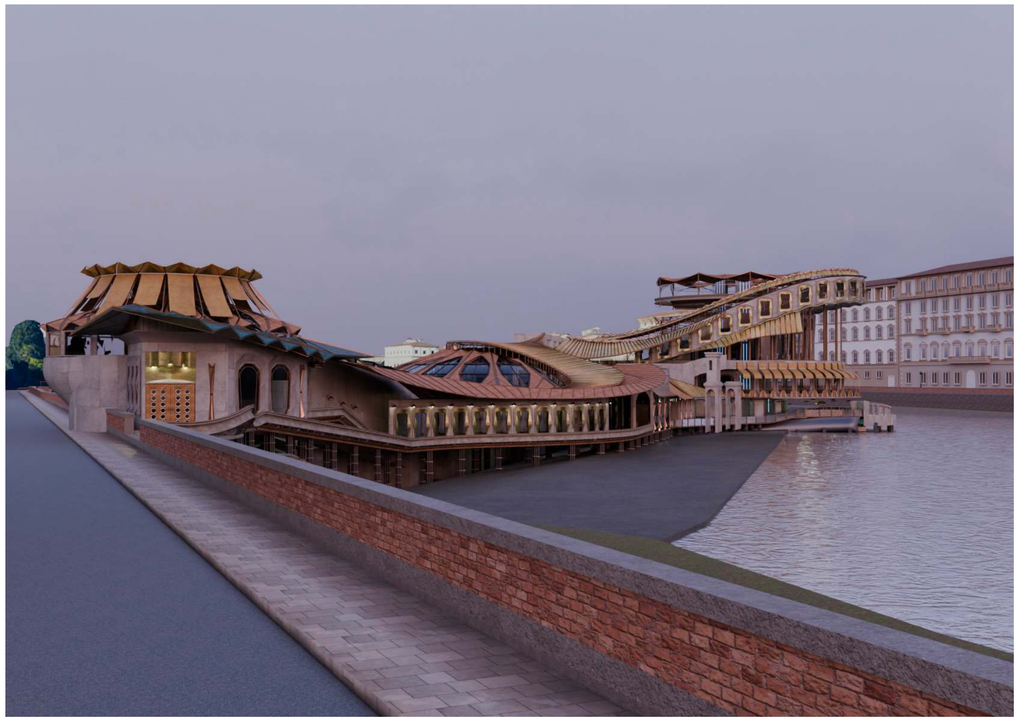


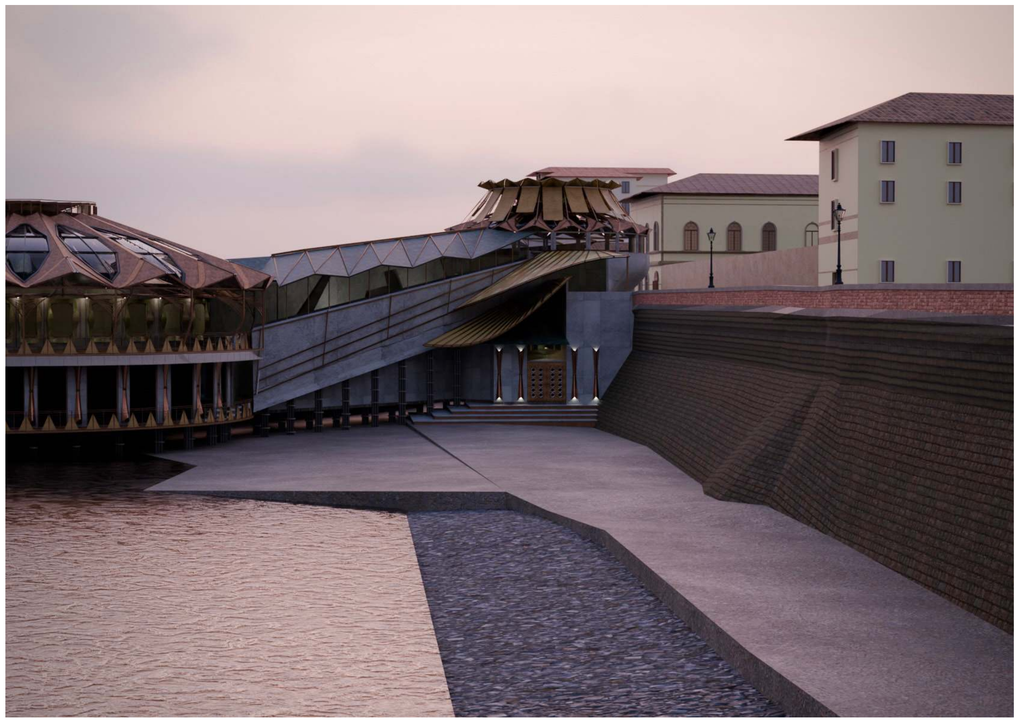
APPROACHING THE BUILDING

DESIGN OBJECTIVE:

ENSURING SECURE AND UNDISRUPTIVE ENTRANCE POINTS







The building has two entrances across two levels. The public entrance is located on the east side of the upper ground floor, while the western entrance is dedicated to art deliveries. This minimises disruption to the main road and provides a dedicated unloading area for damaged artworks.

An accessible ramp (1:12 gradient) provides wheelchair access throughout the building.

A separate riverside entrance serves the lower ground floor via a path accessed approximately 100 metres downstream (see site context page). This improves security for valuable artworks and equipment while reducing interference with private storage and laboratory spaces.





OSCAR LAKATOS - UG3 - YR3

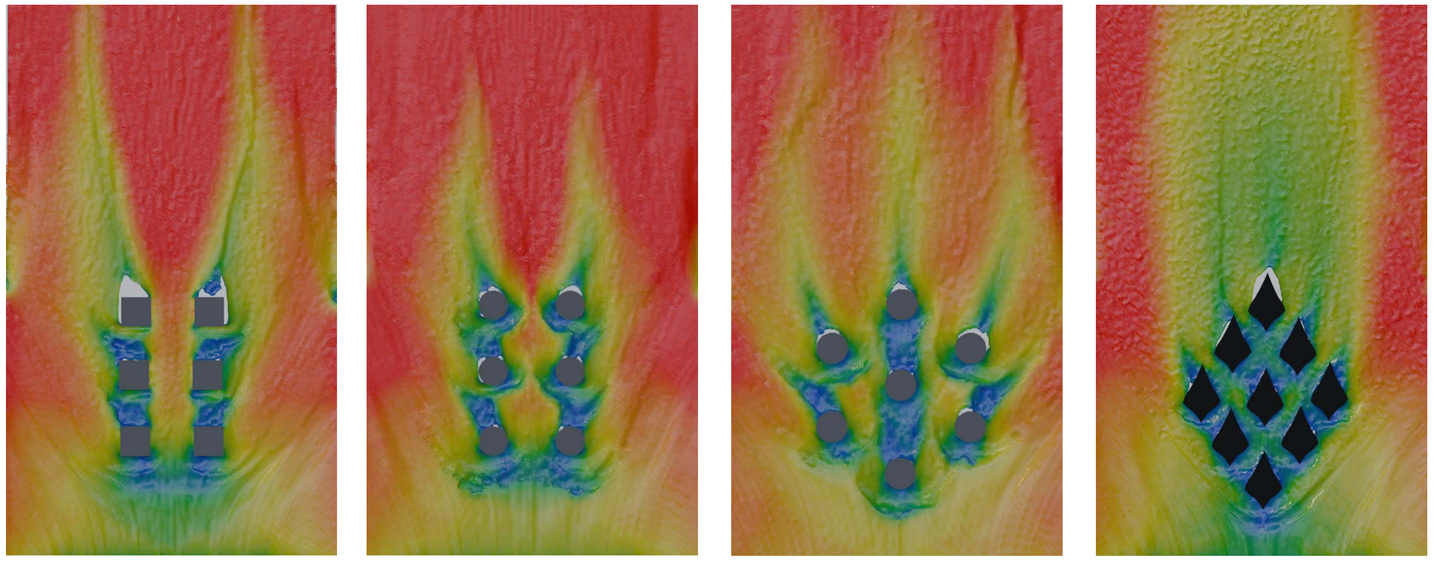
HYDRODYNAMIC PILE DESIGN

DESIGN OBJECTIVE:

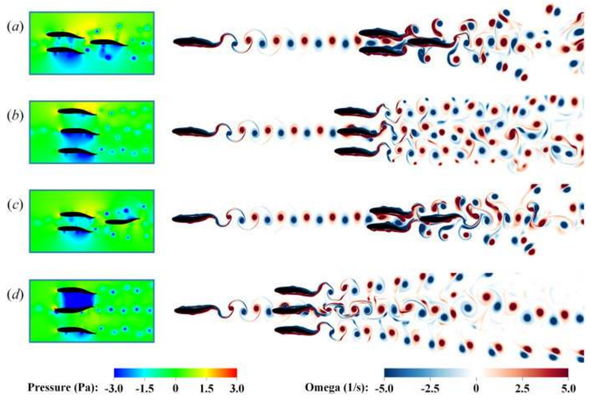
AIMING TO MAINTAINING REGULAR RIVER FLOW WHILST SUPPORTING BUILDING STRUCTURE

0 m/s

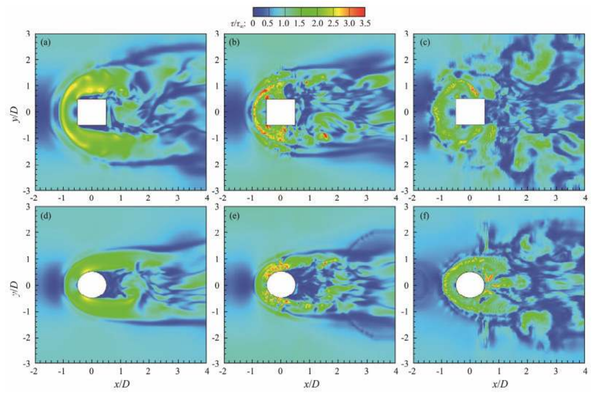
3 m/s



RECTANGULAR PILES	CIRCULAR PILES	HEXAGONAL FORMATION PILES	HYDRODYNAMIC FORMING
Standard rectangular piling proved to be the least hydrodynamic form in my testing. My hydrodynamic test indicates turbulent flow after the pile formation.	Employing circular piles in the same formation slightly reduced downstream turbulence as you can the yellow/green water blending into the red more quickly.	Employing a hexagonal formation spread the turbulence over a wider area, slightly reducing its intensity downstream.	I decided to position and form pile shapes after being inspired by fish school hydrodynamics. This greatly improved downstream flow consistency, greatly reducing the river turbulence my building would be exposed to.

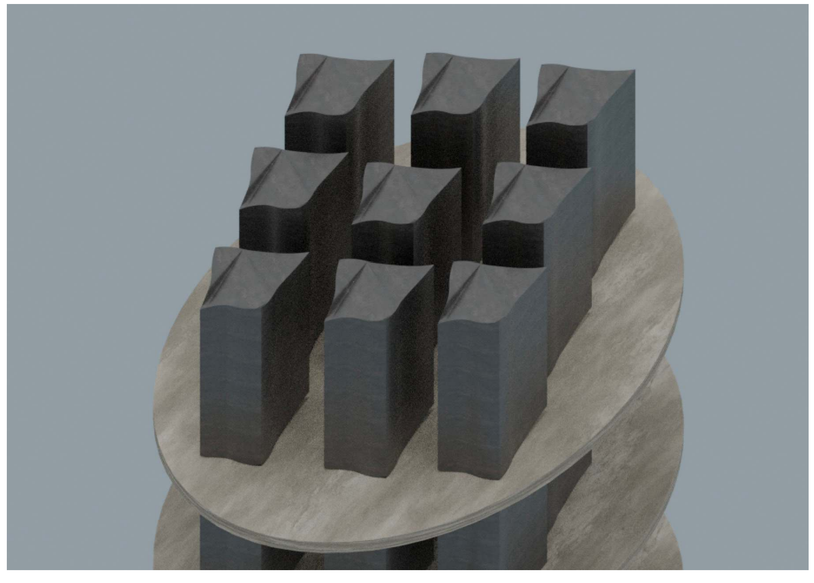


Hydrodynamics of fish schooling - used to inform my design



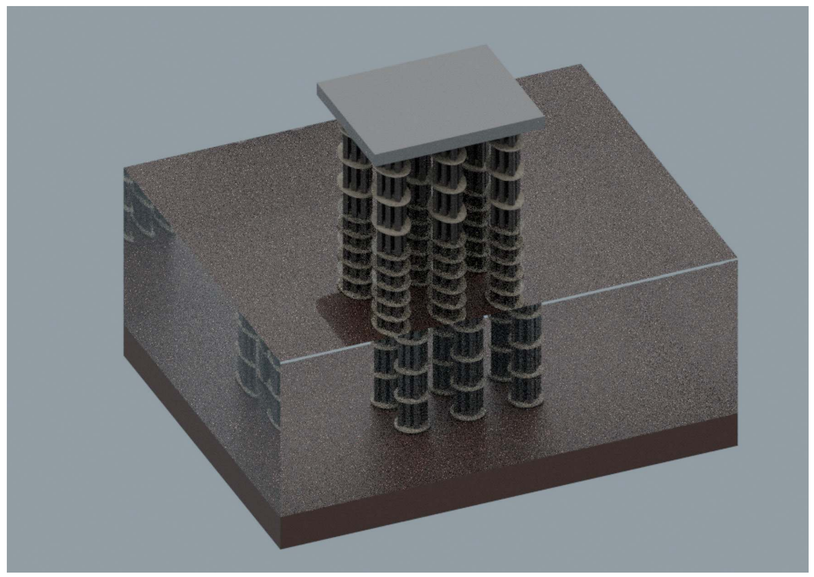
More detailed hydrodynamic pile tests done by scientists

Renders of pile design



The piles consist of hydrodynamic steel beams bound together by circular concrete slabS.

This design is vital to retain consistent water flow over my artificial riverbed designs, as well as reducing erosion and river disruption as a result of my buildings elevated structure. This allows regular river flow to persist without structural interruption to botht he weir and my building.

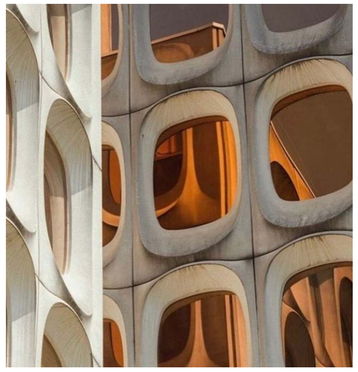


OSCAR LAKATOS - UG3 - YR3

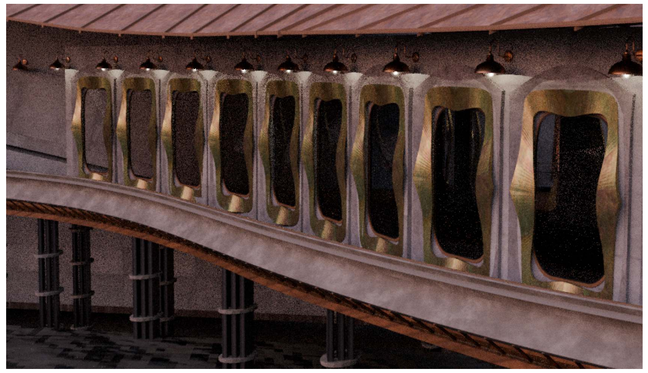
BUILDING ENTRANCES



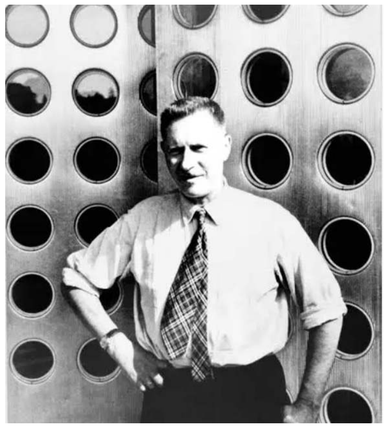
CLASSICAL PAINTING FRAME



CBR HEADQUARTERS BRUSSELS



MY WINDOW DESIGN



JEAN PROUVE - DOOR INSPIRATION



SUBMARINE OF Uccello'S FRESCO & RUST MATERIALITY





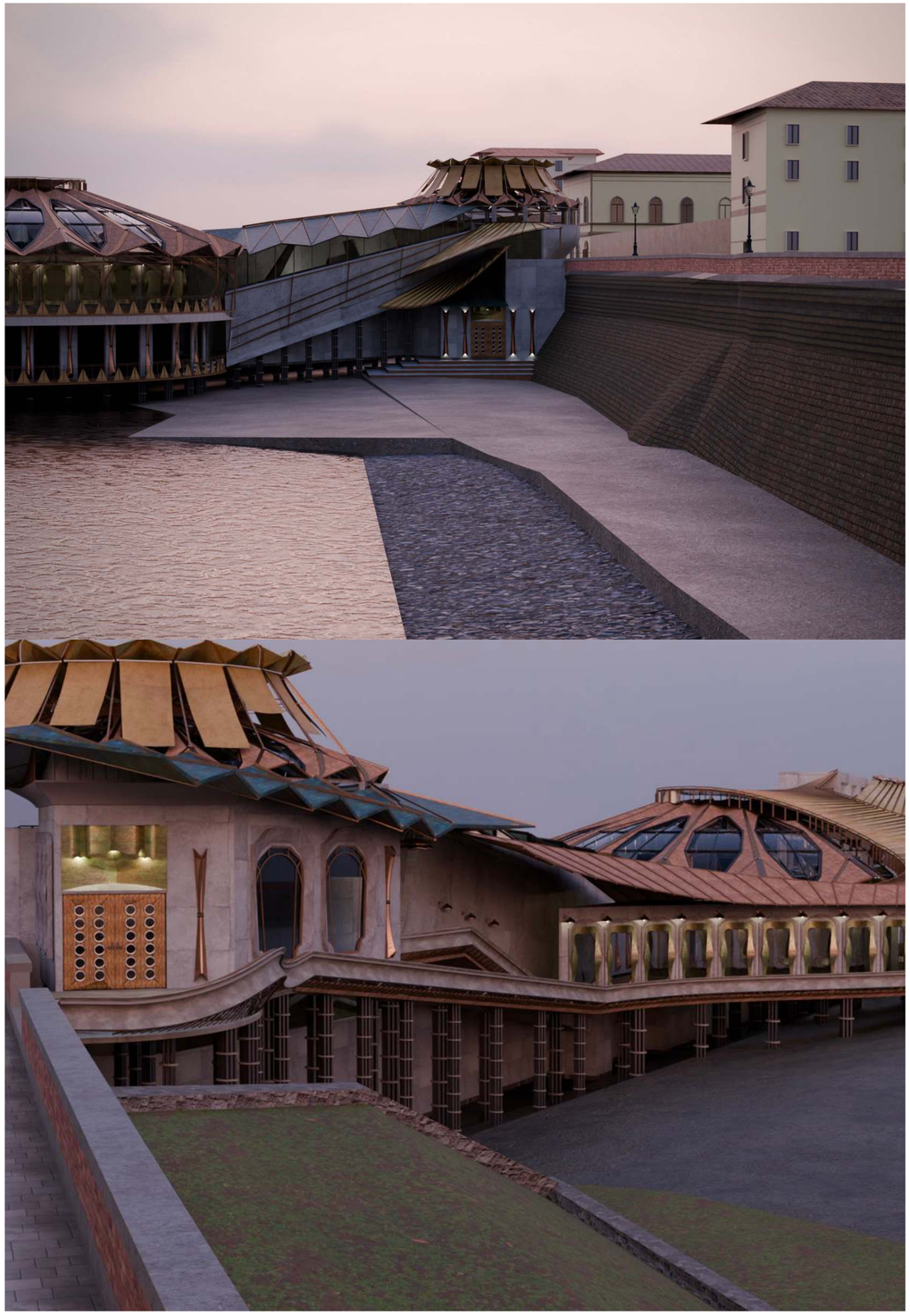
MY DOOR DESIGN

DESIGN OBJECTIVES :

1. ATTENTION TO FLOODED ART DETAIL
2. CLASSICAL PAINTING FRAME FORM INSPIRATION

The entrance design combines Florentine architectural references with the project's narrative of flood-damaged art. The window frames reinterpret ornate classical painting frames using curved copper elements set against complementary concrete insets.

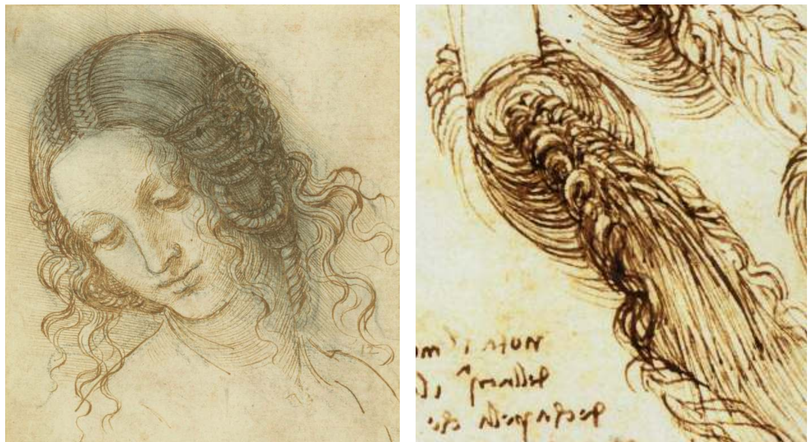
The main entrance draws from Uccello's Story of Noah, particularly the figures emerging from what looks like a submarine hatch. Circular glazing set within weathered iron panels creates a robust, almost submerged character, reflecting Uccello's aesthetic and the building's relationship with the Arno.



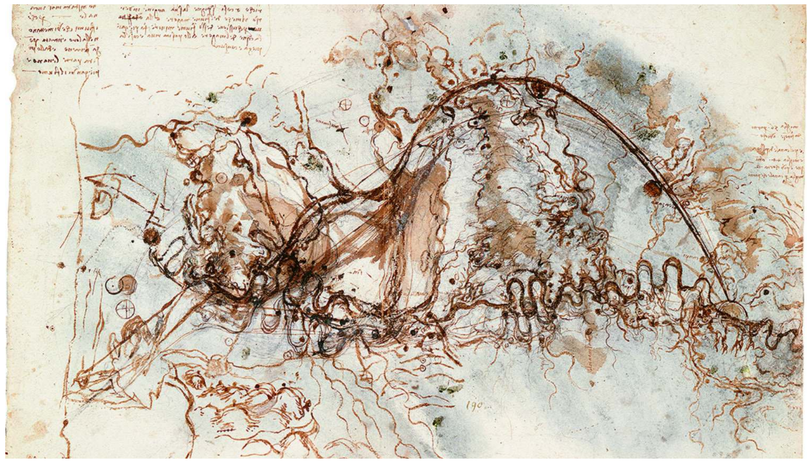
LEONARDO DAVINCI - ROOF INSPIRATION

DESIGN OBJECTIVES :

1. RELATING FLUIDITY TO SHELTER
2. SMOOTHING RIGID CONCRETE MATERIALITY
3. VISUALLY REFERENCING A FLORENTINE LEGEND



SIMILARITIES BETWEEN HAIR SKETCHES AND FLUID SKETCHES

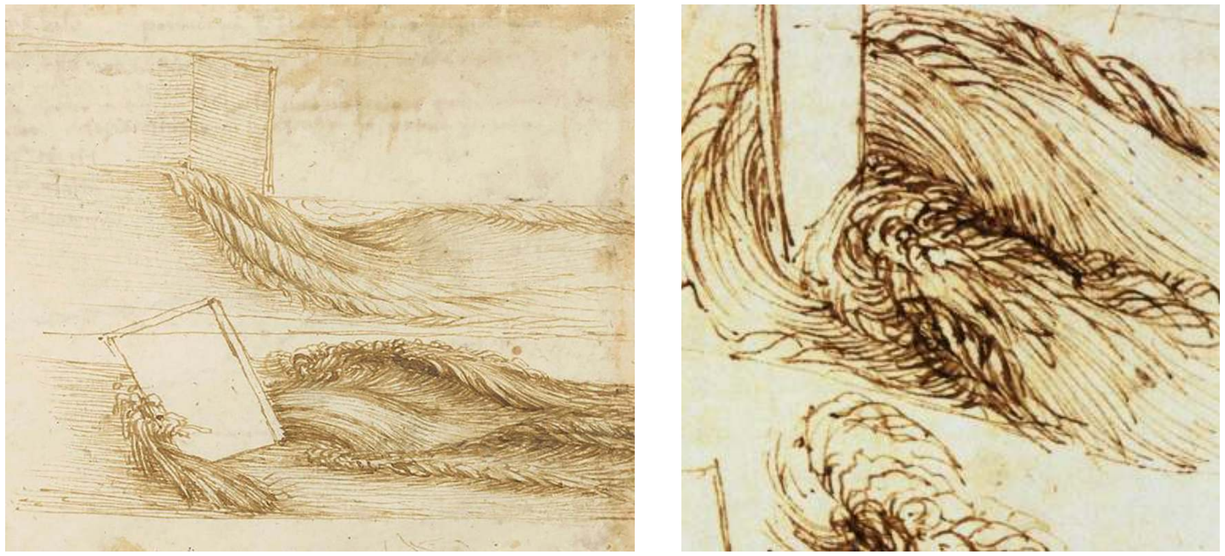


DAVINCI'S PLANS TO REDIRECT THE ARNO'S CHANNEL TO PREVENT FLOODING

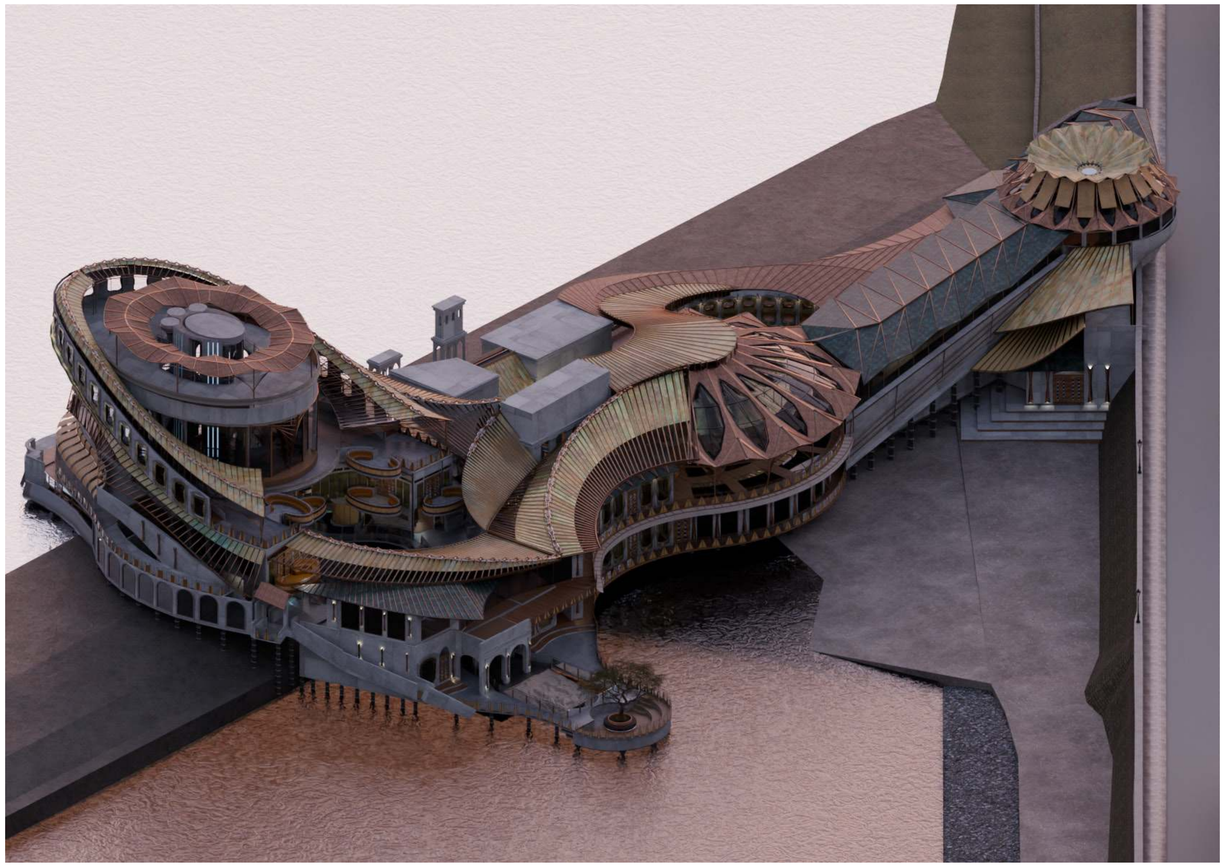
Leonardo da Vinci's hydrodynamic sketches informed the development of my building's roofscape. His studies of water flow, often related to his investigations of the Arno, provided a visual language that connected the project to both Florence and the river.

The similarity between his sketching of hair and water particularly interested me when thinking about designing the top of my building

The flowing roof forms reinterpret these sketches, softening the building's more rigid concrete structure while reinforcing the project's narrative of water, movement, and flood restoration. The colour palette is also very similar to his drawings.



SKETCHES WHICH INSPIRED MY BUILDING'S FORM





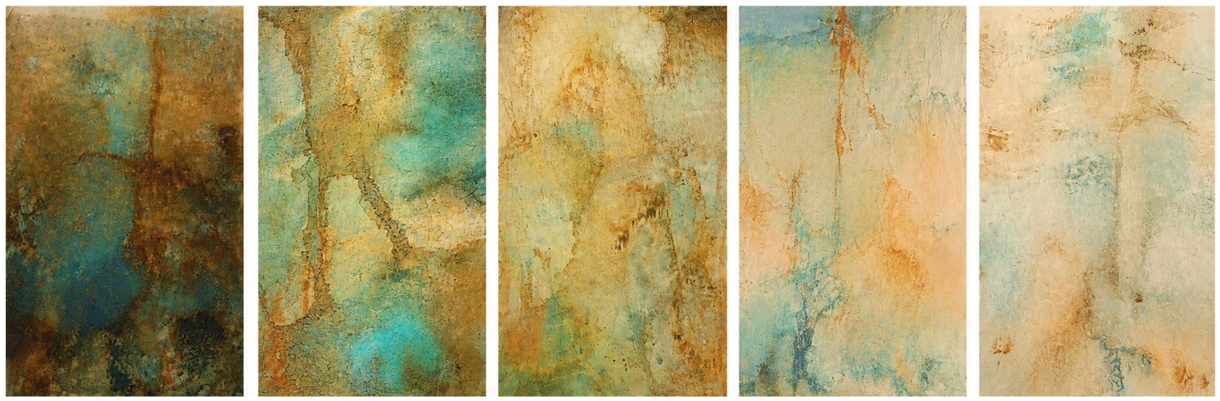
STAINING CANVAS WITH RUST AND PATINA

DESIGN OBJECTIVES :

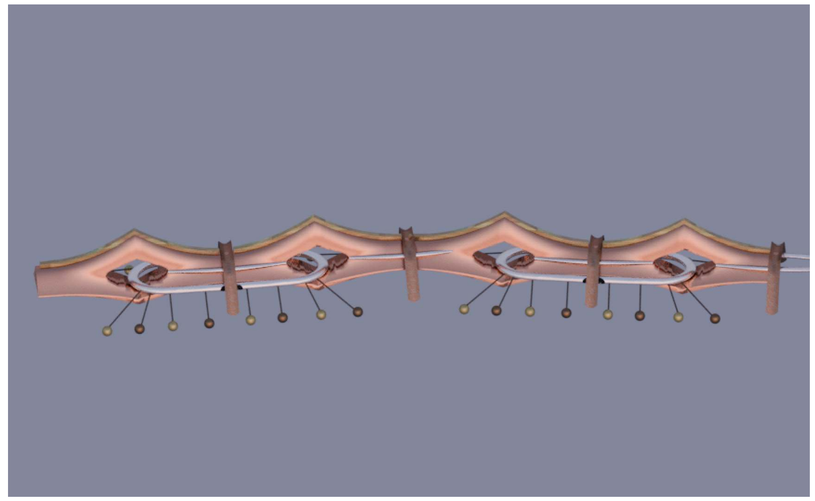
1. USING WATER DEGRADATION TO GENERATE AN ARTISTIC VISUAL OUTCOME
2. USING MATERIAL DAMAGE TO MIMIC FLOODED PAINT



MY FLOOD TESTED CANVASES



USING AI TO INFUSE MY EXPERIMENTS WITH WEATHERED METALS - SIMILAR TO ARTWORKS IN THE BOTTOM RIGHT





Weathered materials also play a key role on my roof design. To achieve the swooping fluid affect of my roofs I utilise stretched canvas and allow it to become eroded and stained by Florence's environment.

To give this an artistic quality to the de-colouration of the canvas my roof stretches the canvas sheets with rusted iron beams. I designed roof ridges to further expose these sheets to weathered metal, with exposure to rain creating these interesting coloured stains. Below these ridges lies cylindrical wheels used to retract the strectched canvas and control building lighting.

On the right you can see artworks which employ a mixture of copper, iron and water to create similar pattern on canvas. I simmulateed these effects over canvases that I had previously tested with flood water, I then used the results to inform the texture of my final roof.

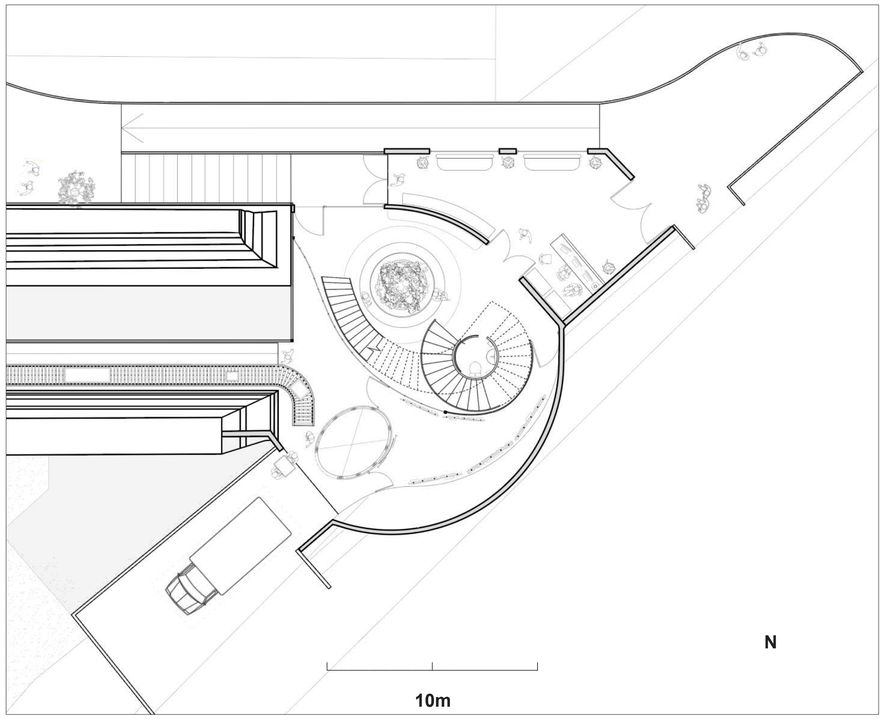
AZANE - BRONZE PATINA ON CANVAS



BEN FEARNSIDE - IRON & COPPER STAINING



PUBLIC LOBBY & DAMAGED ART DROP OFF



DESIGN OBJECTIVES :

1. PRIORITISING PUBLIC INSIGHTS
2. MAINTAINING ARTISTIC PROTECTION
3. WORKING WITH RAIN

The public lobby is my buildings first key example of providing the public with transparent view into the art restoration process, whilst maintaining important physical separation to prevent further damage or contamination to the artworks (which are quarantined under very specific conditions).

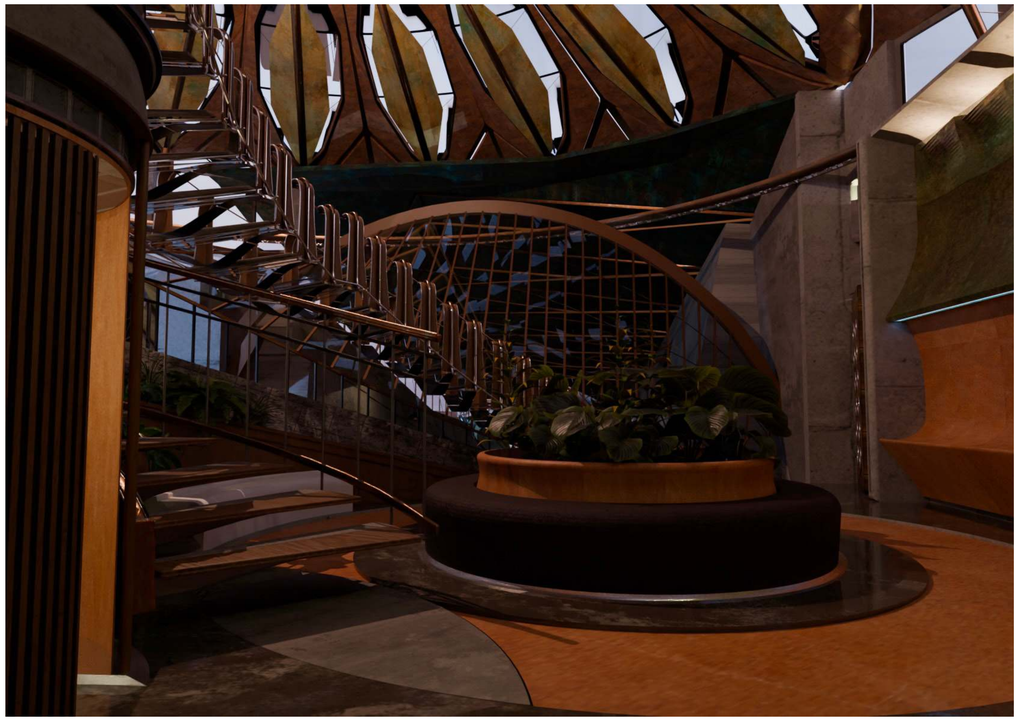
As the public enters the lobby they are confronted with a staircase providing a view down into Uccello's 'Story of Noah' geometries. When looking down into this view they will see damaged artworks being delivered and transported into either a wet quarantine or dry story space, giving insight into the buildings restoration function.

This demonstrates the buildings careful visual recreation of flooded artworks, its combination of these geometries with restoration functionality, as well as its sensibility to the delicate and particular nature of this process.

The roof sheltering this room is design to cellected rainwater and accumulate it in the center, releasing it at specific times and letting it run through an internal gutter system orbiting the lobby. The goal being to generate the sound of water flowing in all directions

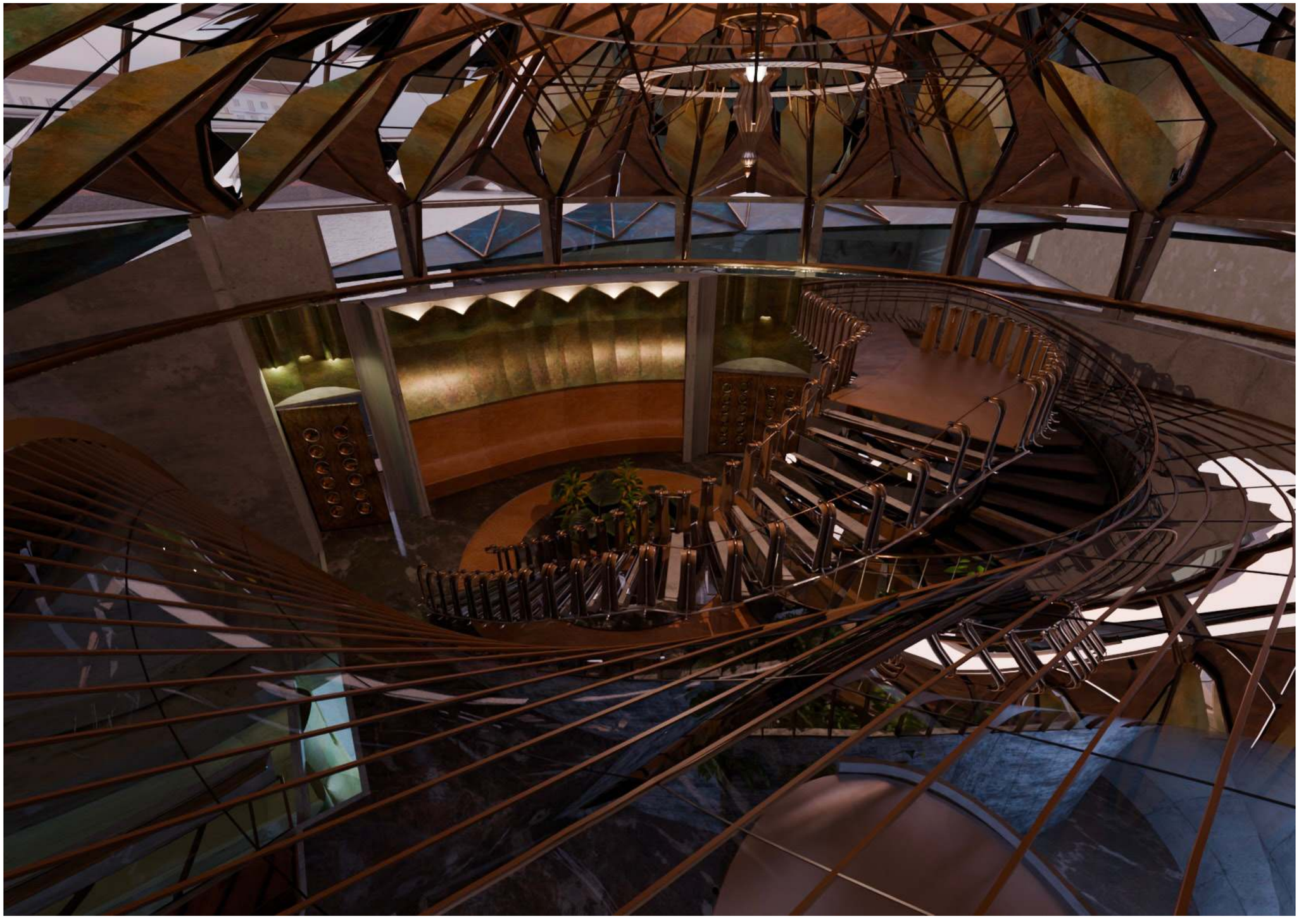


RAIN COLLECTION ROOF



LOBBY INTERIOR





OSCAR LAKATOS - UG3 - YR3

ART DESCENT INTO STORAGE OR REPAIR



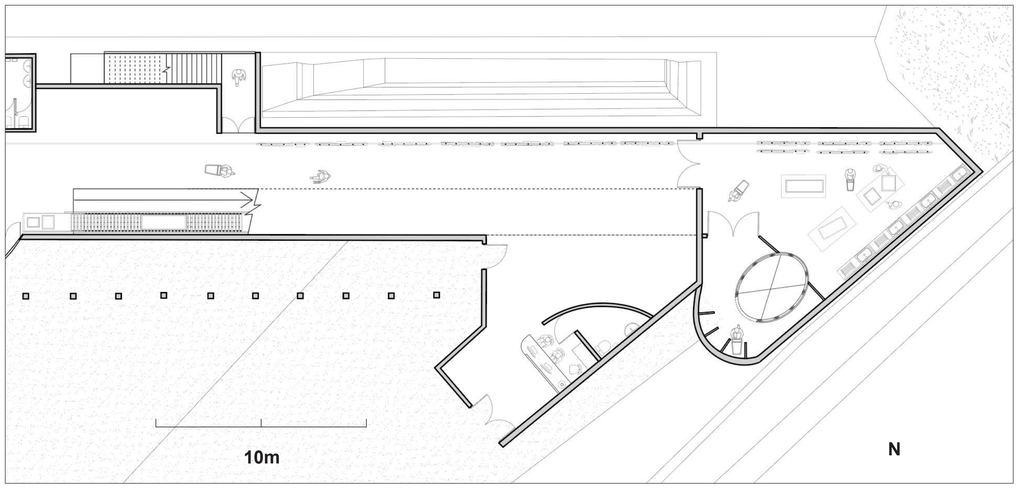
SMALL STORAGE



VERTICAL STORAGE



HORIZONTAL STORAGE

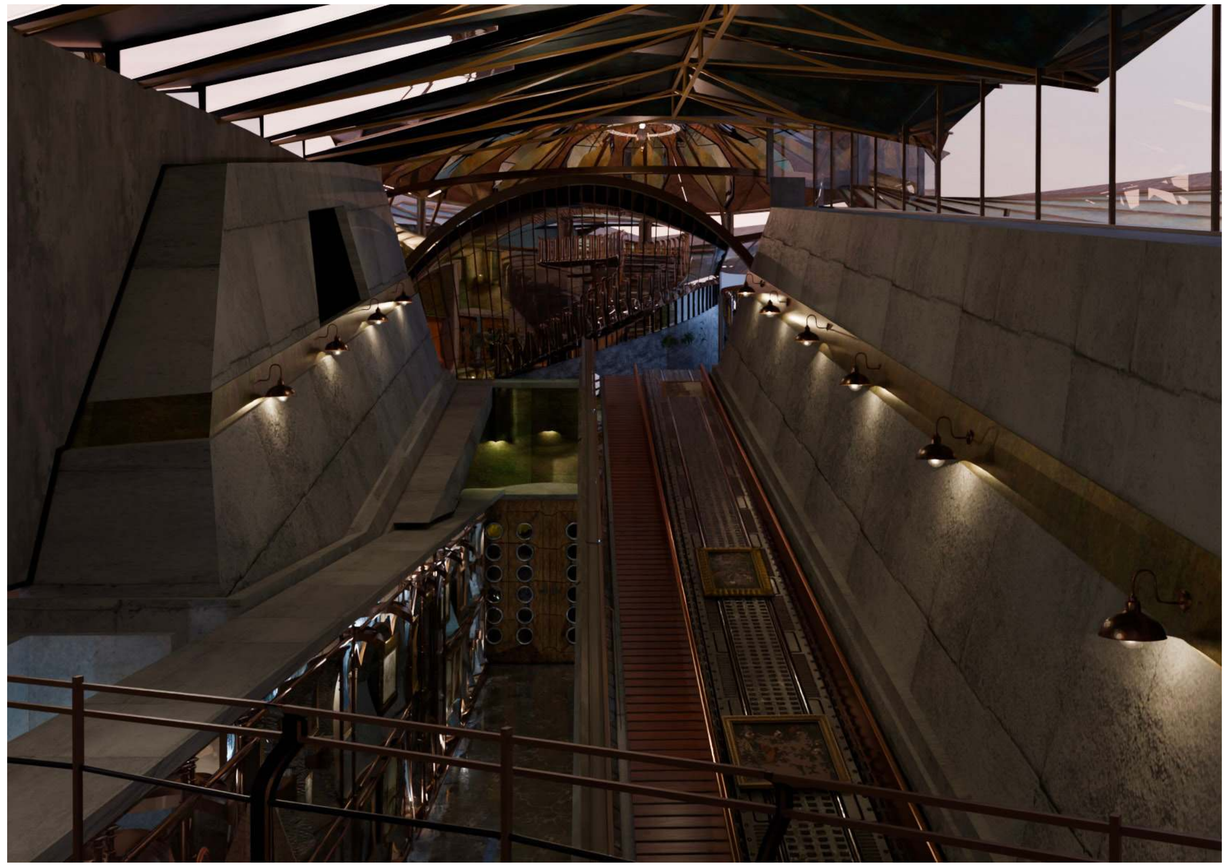


DESIGN OBJECTIVES :

1. PRIORITISING PUBLIC INSIGHTS INTO THE RESTORATION PROCESS
2. MAINTAINING THE CLIMATIZATION OF DAMAGED ART

As pieces of damaged artwork enter the building they are either quarantined and later send in an art elevator down to a wet laboratory space to receive emergency restoration work (without contaminating other art), or they descent down a long conveyor belt starting from beside the public and ending in a dry storage zone where they are allocated based on size and orientation to one of three mobile storage racks seen above.

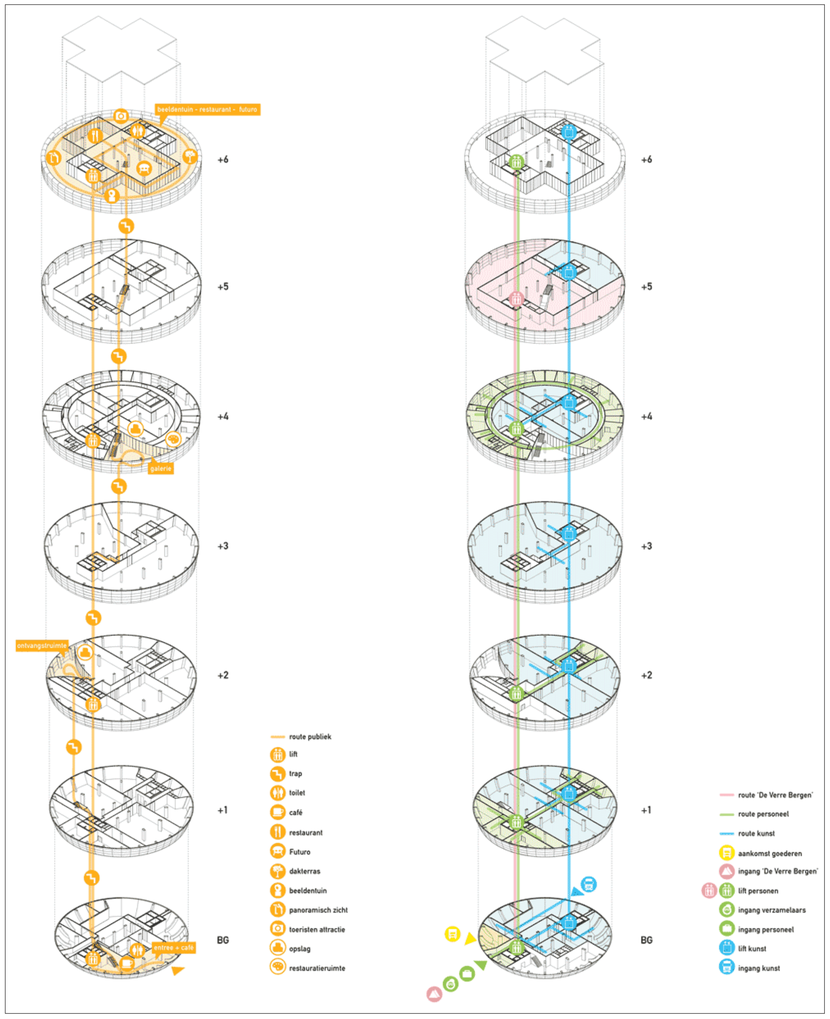
The roof above is consists of small slit windows angles specifically towards the sun to allow limited but consistent sunlight (for art protection), whilst being made of darker tiles to absorb heat and contribute to the drying process of these damages artworks.





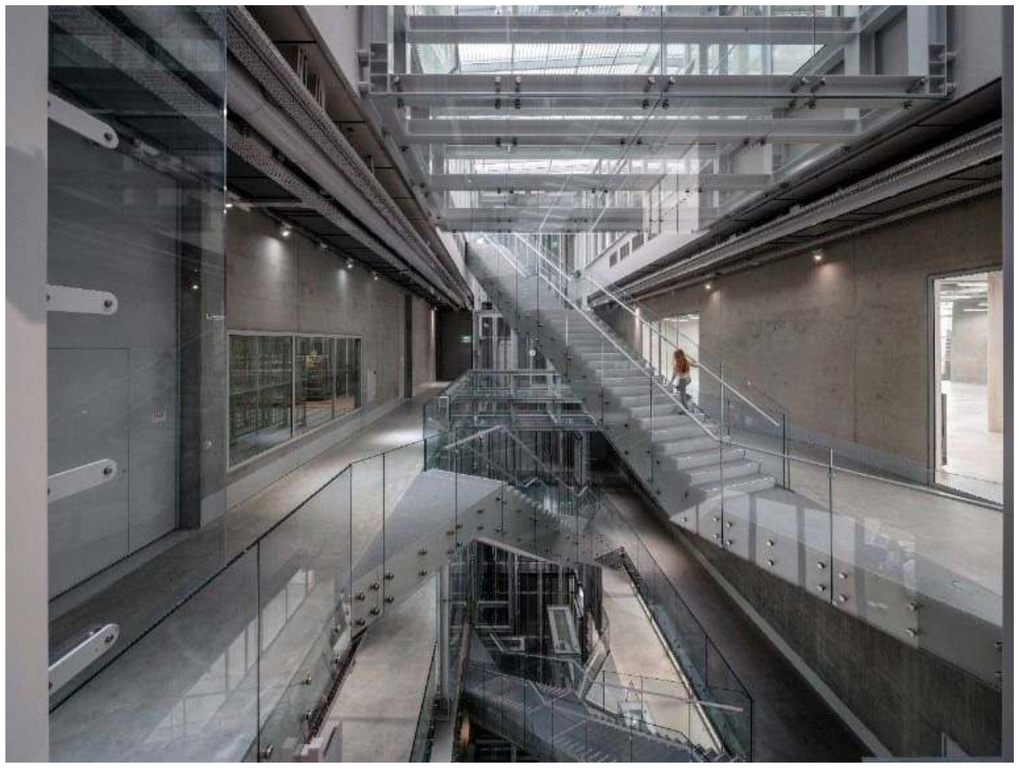


ROTTERDAM ART DEPOT MUSEUM - REFERENCE



SPATIAL SEGREGATION BETWEEN VISITORS AND DISPLAYED ART

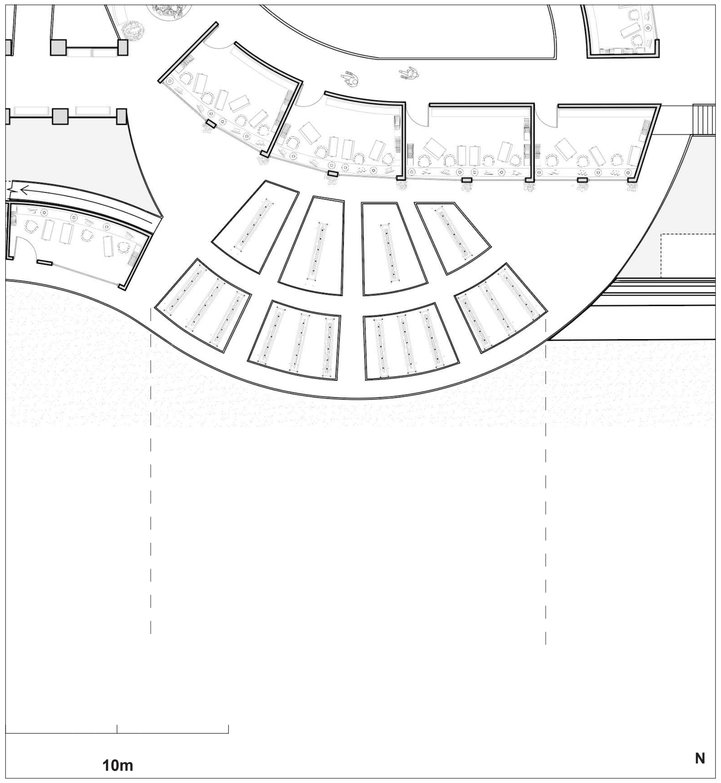


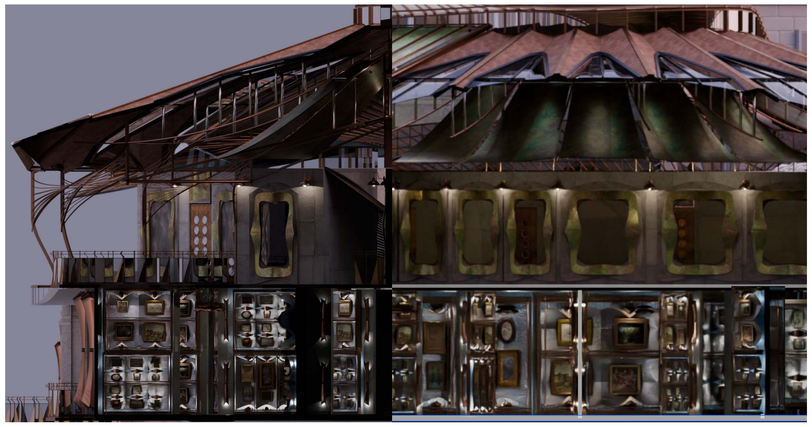


The flow of the Rotterdam art depot greatly inspired the spatial organisation of art vs public vs private spaces in my building. This idea of visually presenting the process of art restoration to the public, while keeping paintings under very different controlled climate conditions is something that stood out to me.

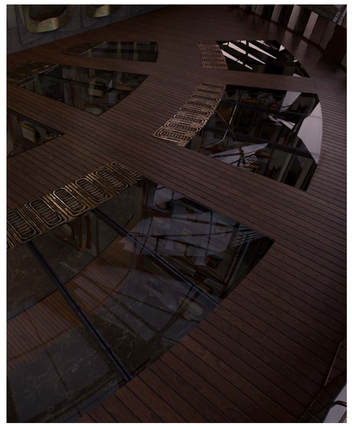
This project's great success in combining programmes (a museum and restoration/conservation space) is another key element of my design project inspired by this building as it became the first publicly accessible art storage facility.

PUBLIC BALCONY VIEWPOINT





SECTION OF WIND CATCHING ROOF



AIR VENTS LEADING BELOW

DESIGN OBJECTIVES :

1. UTILISING CHANGE IN RIVER SOUND SCAPE
3. PROVIDING UNIQUE PUBLIC INSIGHT TO ART STORAGE
2. ENHANCING PREVAILING WINDS TO ASSIST THE DRYING OF ART

This large balcony space sits directly above the circular dry storage space for damaged art. It is a short walk from the entrance lobby and this time provide the public with a more intimate insight with the damaged artwork.

The paintings are stored in the floor below, submerged between the visitor’s feet. Their view of the work becomes unorthodox, looking down on the art instead of directly across to it. This is the first part of the building overlapping the Arno’s flow, with water falling and dipping just below the storage rooms.

This change in sound-scape adds to the visual narrative of flooded artworks, reminding the Florentine people of both the Arno’s everlasting presence and its destructive qualities.

The roof design in this part of the building also adds to its functionality. Opening up to the predominant Grecale North-easterly winds the ceiling adopts 5 large curved copper panels to direct these winds down into window vents leading to storage space below, assistsing the drying process of flooded art.



VIEW OF GHIBERTI’S EXTRACTED GEOMETRY

V&A STORAGE HOUSE - REFERENCE

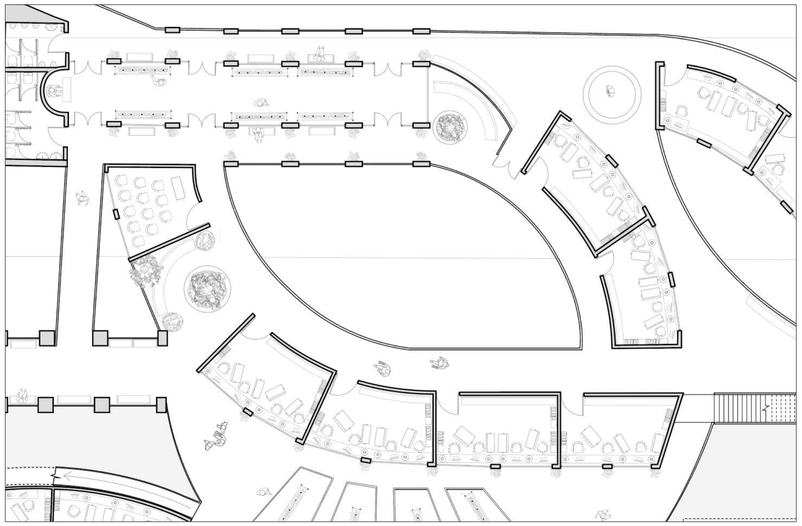
This downward view onto specifically stored artworks was greatly inspired by the large window in the central atrium space of the V&A art storage house.







FACADE REFLECTIONS OF DAMAGED PAINT



FACADE FOCUS POINT IN PLAN

10m

N

DESIGN OBJECTIVES :

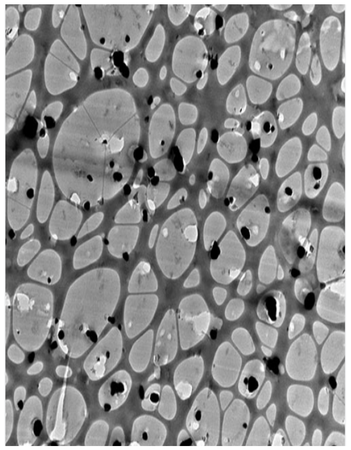
1. GENERATING INTERESTING WORKSHOP FACADE LOGIC
2. GIVING VISUAL INSIGHT INTO THE RESULT OF DAMAGED ART

The central workspace of my building consists of 6 student workshop rooms all orbiting a large section of the Santa Rosa weir. In plan these rooms look fairly standard and don't live up to the unique geometries of Giberti's library structure which sits just across from them.

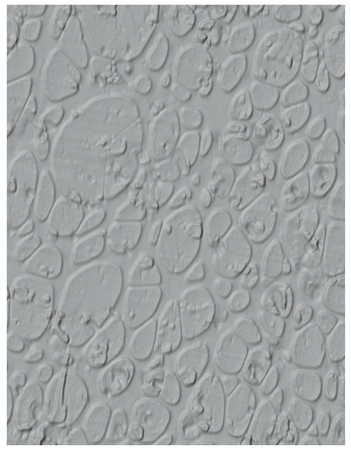
Therefore I wanted to create interesting facade elements to these room which directly relate to the student's study of art restoration. I created a geometry code allowing for wall panels to extruding and conform mimic grayscale imagery of damaged artworks

The scale varies from a microscopic look at contaminated red oil paint, to much larger aerial views of oil spills, oil being a great factor in the damage caused in the 1966 flood. I decided to model these walls unsing copper as this itself would corrode and decolour over time in a semi- exposed wet area.

MICROSCOPIC VIEW OF DAMAGED RED OIL PAINT



BLENDER RECREATION

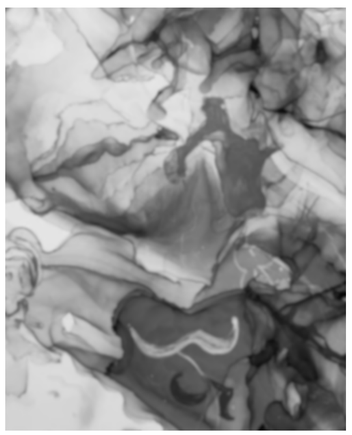


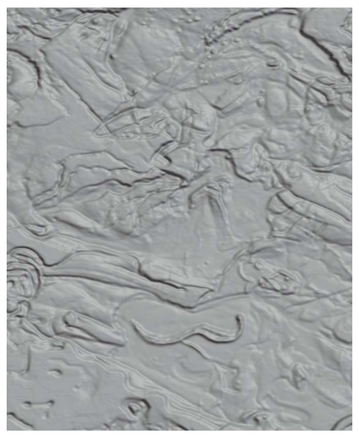
CRACKED OIL PAINT



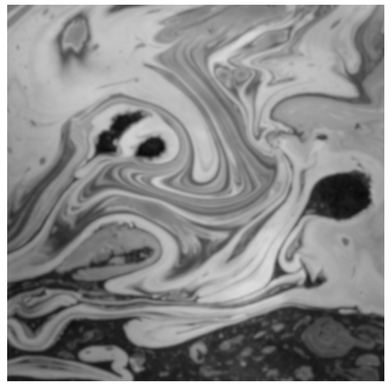


CONTAMINATED WATER COLOUR

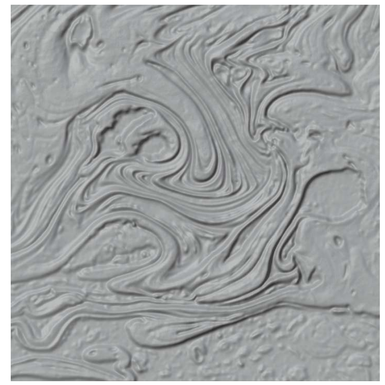




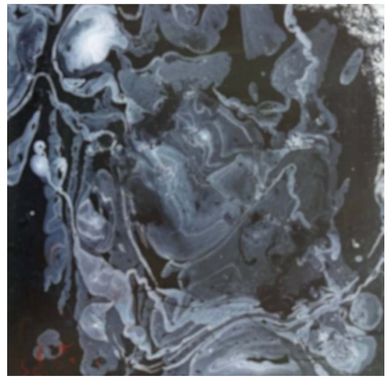
OIL SPILL IMAGE - CAUSING EXTENSIVE DAMAGE IN 1966

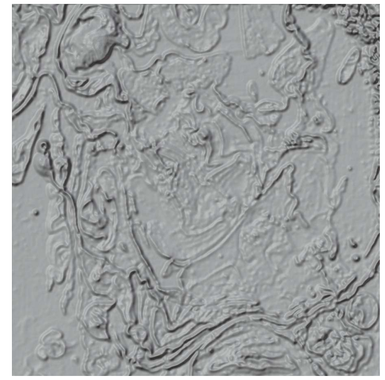


BLENDER RECREATION

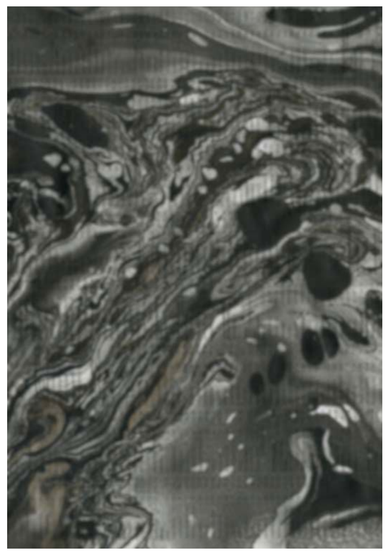


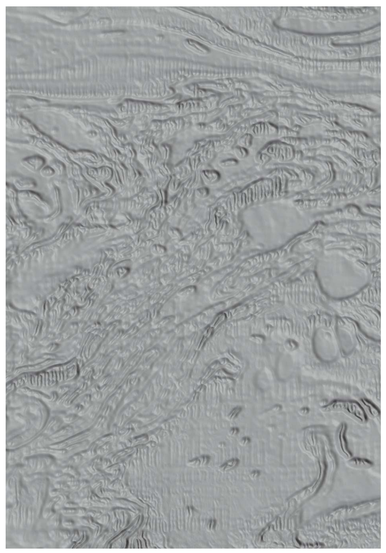
OIL AND WATER CONTAMINATION





LARGE SCALE OIL SPILL



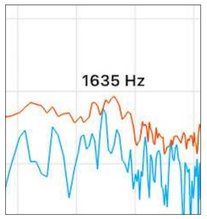




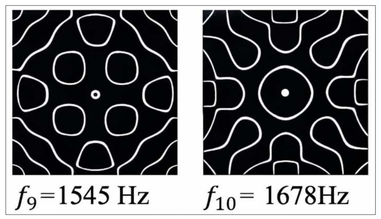




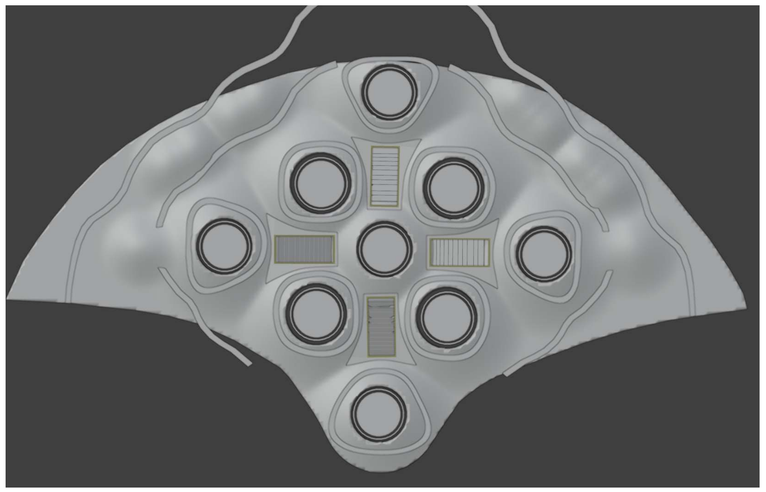
LECTURE THEATRE



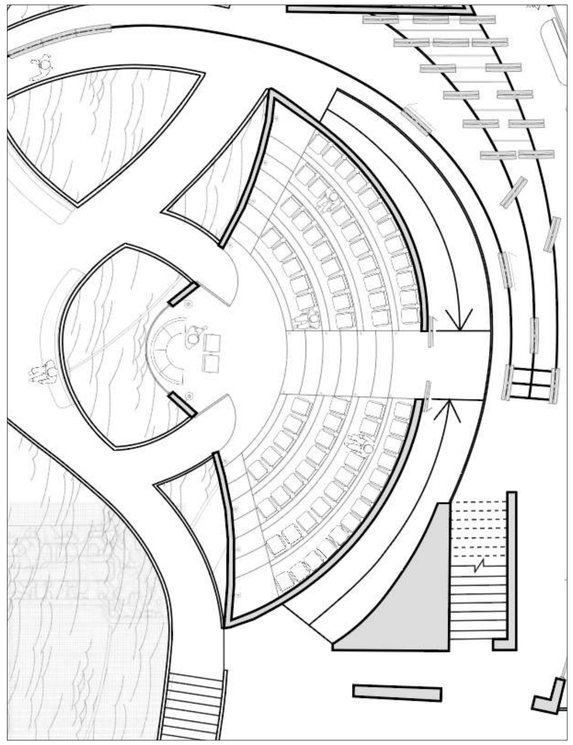
SCREENSHOT OF RECORDED SITE FREQUENCY

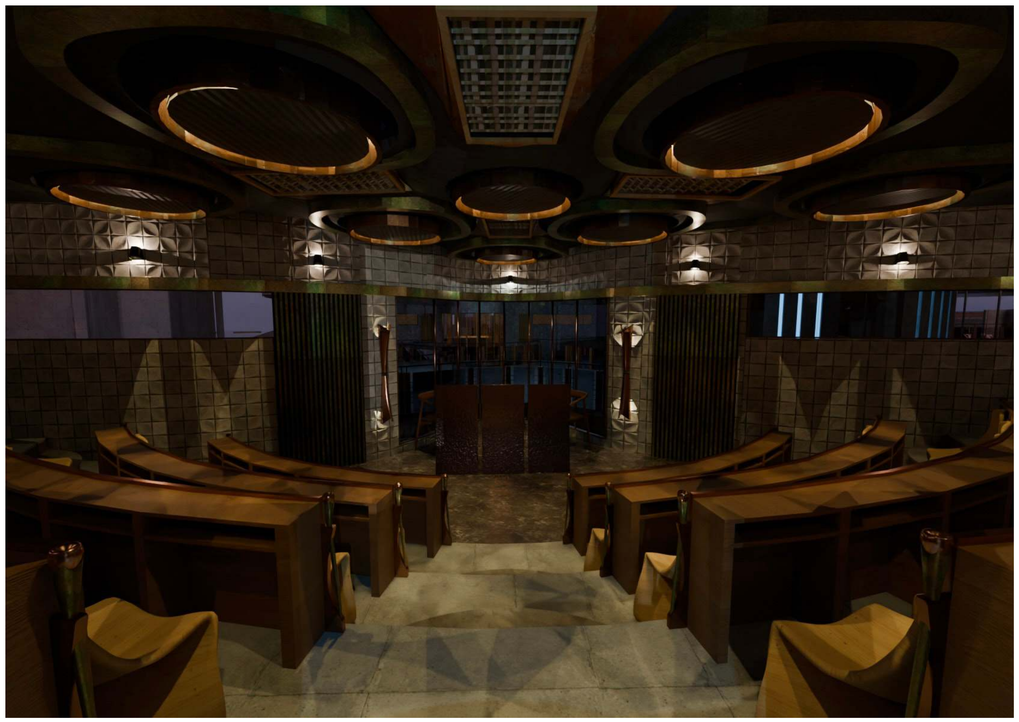


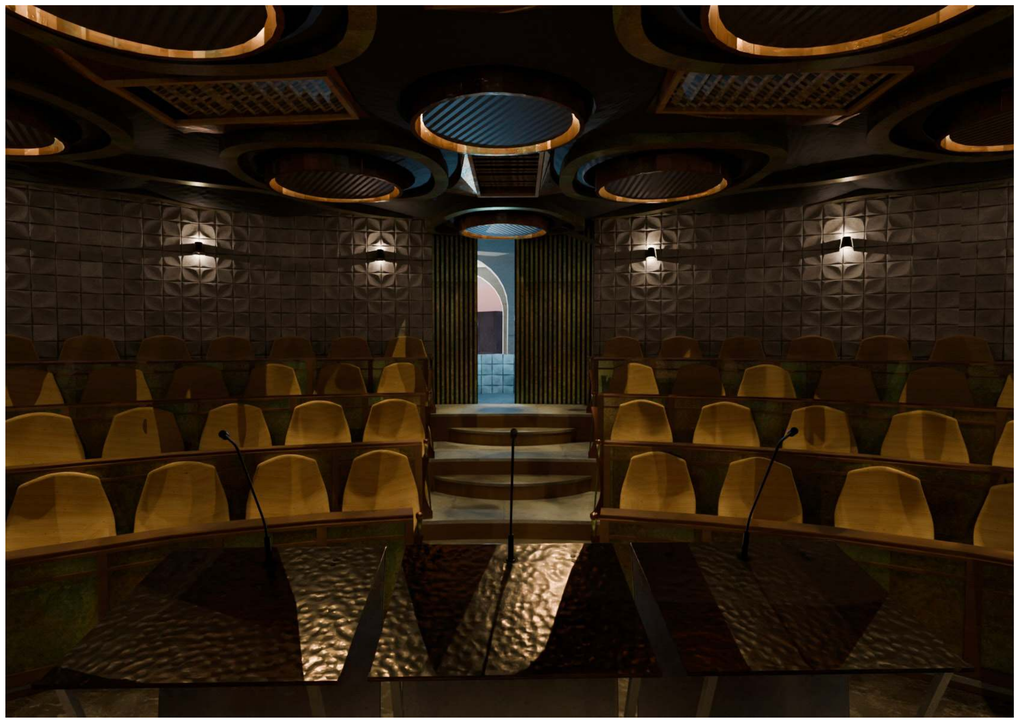
CYMATIC PATTERN OF THIS FREQUENCY



SITE SOUND FREQUENCY INSPIRING CEILING DESIGN







DESIGN OBJECTIVES :

1. ECHO THE ARNO'S SOUND IN A SPACE WHERE IT MUST BE REJECTED

A vital element to a lecture theatre is the sound control and given the theatres position directly above the weir I wanted to somehow reflect the river's sound in the architecture.

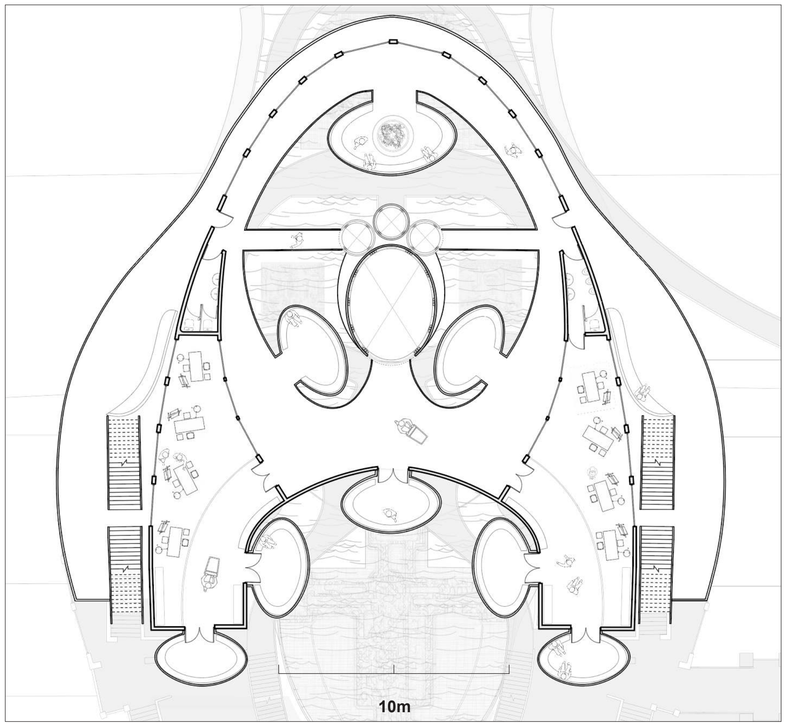
I used curved concrete wall textures to assist acoustic absorption of the room but most importantly I based the ceiling's form, light distribution and sound panelling on the cymatic pattern generated from the sound frequency of water running over the Santa Rosa Weir.

Luckily I recorded the frequency with my phone when visiting the site in Florence (see screenshot above) , meaning I was able to take a numerical reading and convert this into an architectural form.





RESTORATION WORKSHOP



DESIGN OBJECTIVES :

1. ADHERE TO REQUIREMENTS FOR MEANINGFUL ART RESTORATION WORK.
2. CONTINUE THE BUILDING'S FLUID NARRATIVE.

The workshop space consists of a single rain gutter intruing and dividing the room between grey and a slightly elevated white marble. The grey zone indicates a zone of material storage and movement toadjacent river view balconies, whilst the white zone highlits an area of stric art restoration space.

Each workshop cinists of four student workspaces which the white floor highlighting spilt chemicals, dirt and potentially contaminating materials. This is a design method used in scientific labs and i believe it is just as important in t a restoration space.

The ceiling's form mimics a water ripple emerging from a splash like chandalier., with multple air extraction arms extending down to remove potentially hazardous chemicals via ventialtion.

In my particular renders you can see how the room would be organised if working on the segmented restoration of Vasari's last supper (each panel is to scale to the real restored painting).

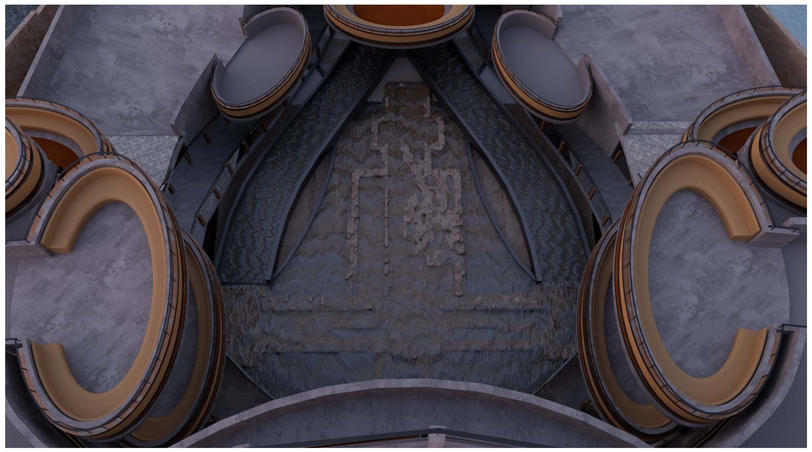








ARNO RIVER ART EXHIBITION





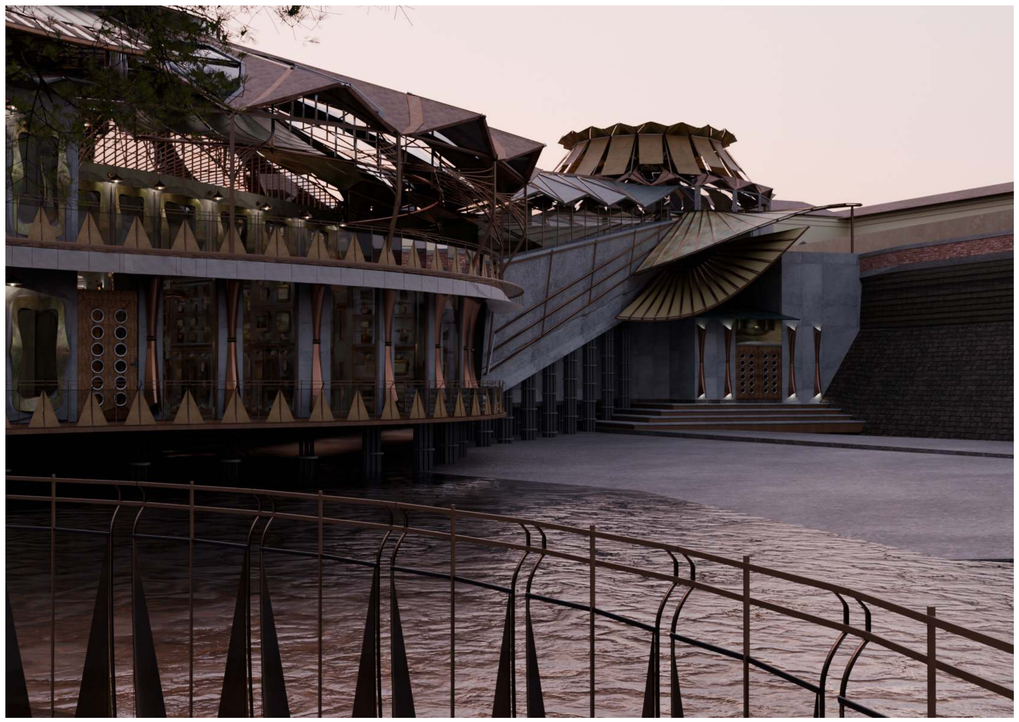
TECHNICAL VIEWPOINTS IN ACTION

DESIGN OBJECTIVES :

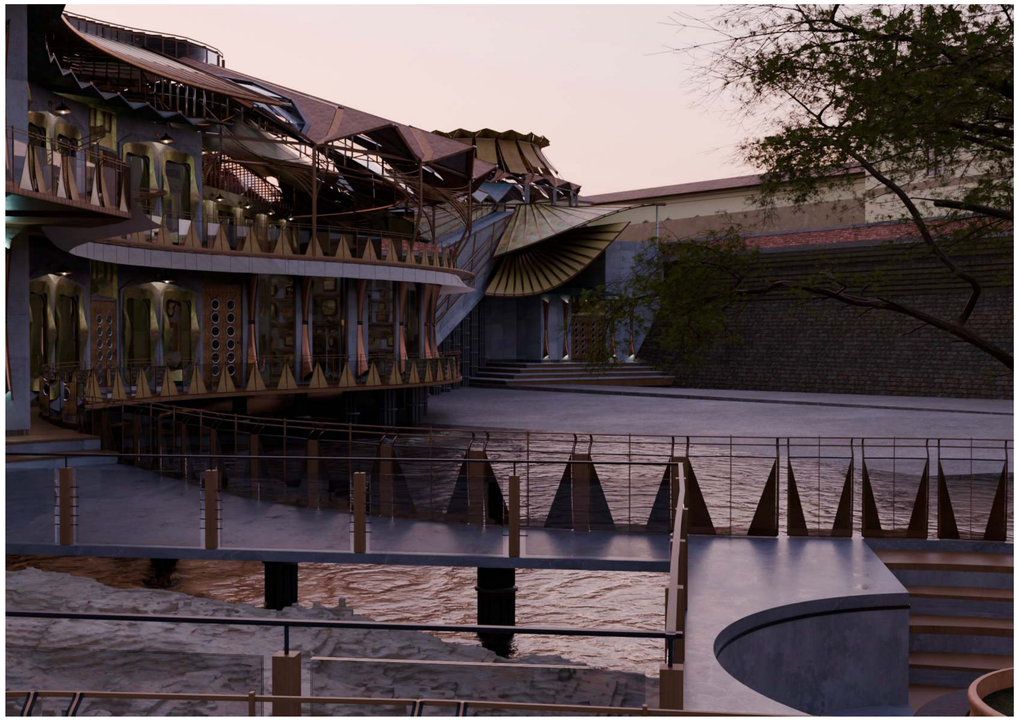
1. EXHIBIT MY TECHNICAL RIVERBED RESEARCH AS BEST AS POSSIBLE
2. PREVENT HUMAN DAMAGE TO THE RIVER.

The lower ground floor river balcony marks a key point in my design of the Arno river art exhibition. This was the central focus of my tech dissertation and attempted to influence the river's whitewater to recreate and impression of artworks lost or damaged in the 1966 flood.

The exhibition's western most point consists of with a visual recreation of Pontormo's 'Noli Me Tangere', seen in my earlier tech slide. Here the river water flows over the carefullly crafted artifical river bed and ends its journery through my building, rejoining the Arno's main flow.

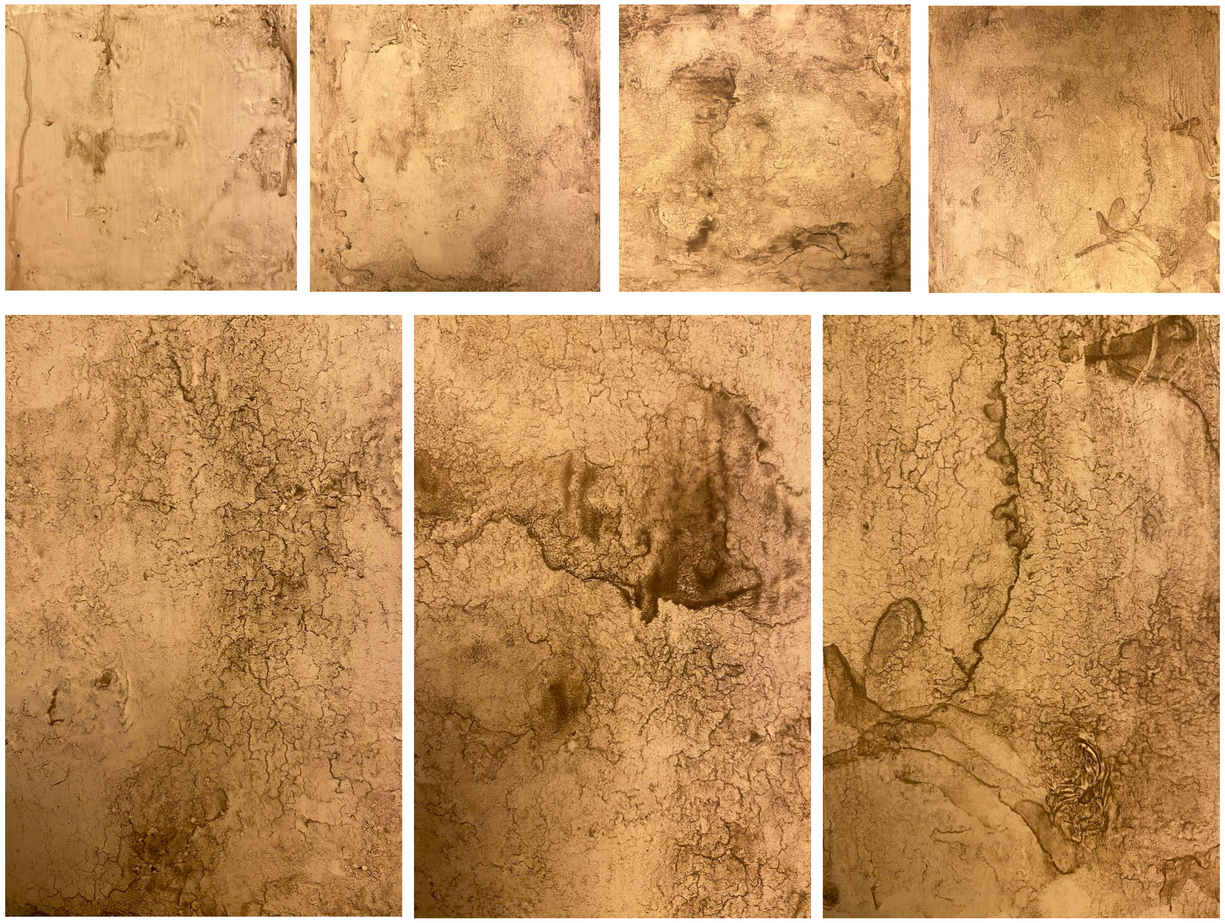


VIEWS FROM RIVER BALCONY





CONTINUATION OF THE RIVER ART EXHIBITION



OUTCOME OF MY FLOOD TESTED PAINTED WOODEN PANELS - SAME MATERIAL USED FOR VASAR'S LAST SUPPER





As the public move past the central art balcony they start overlooking a different form of art. They are confronted by the buildings central river waterway, with the Arnos flow attempting to recreating a series of flooded artworks. They can navigate this exhibition how they please, with all directions providing equally interesting viewpoints which my next renders willl display.

There is a cafe/eating area adjacent to the exhbition should people need to sit down, this is is a closed off area designed to keep litter and snacks away from both the art and the river.

This part of the ground floor also works around lecture theatre, naturally mixing students to the public and acting as the buildings central communal space.

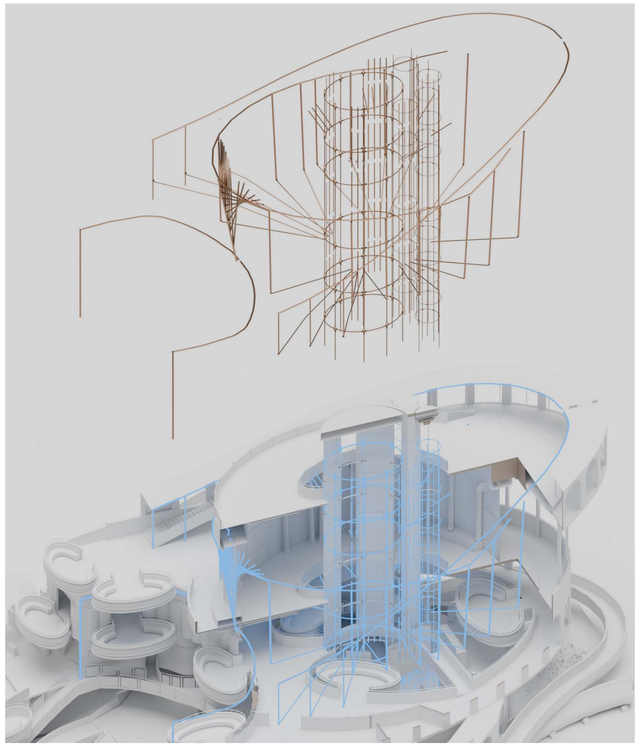
The river viewing balconies are coated with a layer of flooded wooden panels, revealing the effect water can have on both artistic and architectural materials. As seen from my experiments above the damage caused by flooding can often produce surprisingly beautiful results.

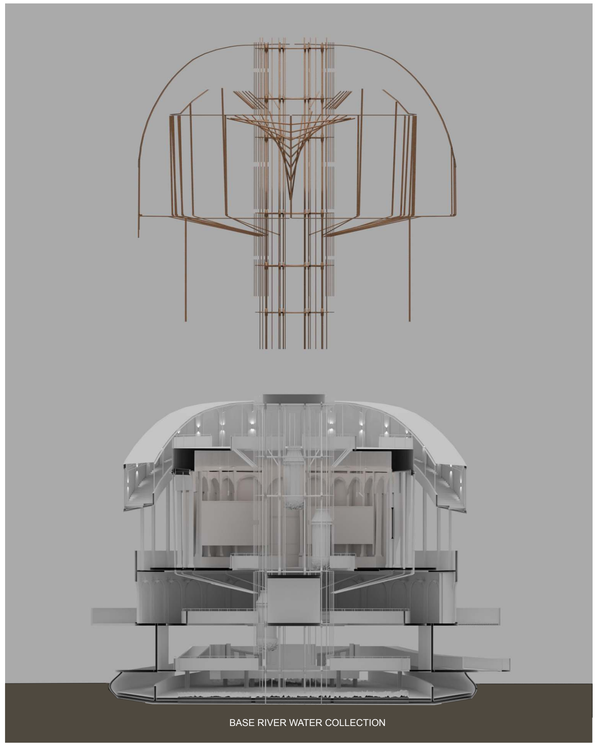






ELEVATOR LOBBY





BASE RIVER WATER COLLECTION

RAIN GUTTER DESIGN COMPLEMENTARY TO CENTRAL ELEVATOR SHAFT

DESIGN OBJECTIVE :

1. ALLOW WATER TO FLOW THROUGH THE BUILDING AND IMPACT INTERIOR CONDITIONS

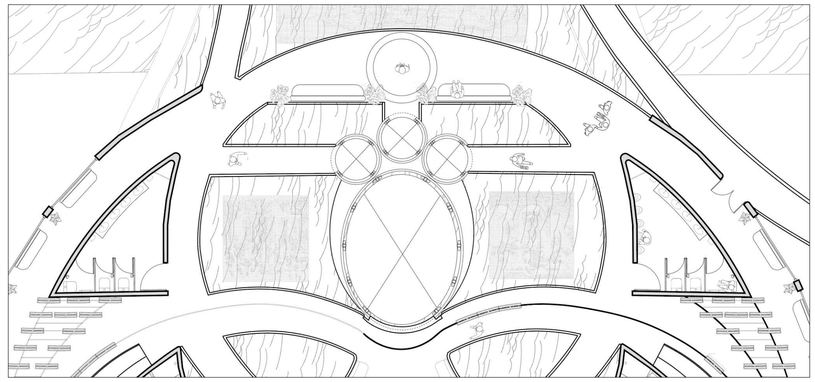
On the eastern side of the ground floor river art exhibition comes to an end at Vasari's Last Supper River Balcony. The architecture begins to revolve around a circular elevator shaft. This consists of one over sized lift to transport large pieces of art as well as three regular sized elevators for the faster movement of people. One of these elevators skips the floor above and provides a faster uninterrupted route past the exclusive student zone and straight up to the public art exhibition space.

The central shaft is accompanied by a designed gutter network complimentary to my structure of my building in order to create an intricate rainwater collection system. There are approximately 80-100 rainy days a year in Florence with an average of 700-900mm of rainfall a year.

Not only is the rain stored in the building's fire safety sprinkler system, but it is also directed to flow down a series of blue lights creating a rippled lighting effect and allowing water to make more of an impression on the upper floors.



EARLY RENDER OF GUTTER DESIGN



PLAND AND SECTION OF ELEVATOR SPACE



RESTORED ART - FINAL EXHIBITION SPACE



GHIBERTI'S SIXTH PANEL ON THE GATES OF PARADISE (DAMAGED IN 1966 FLOOD)

DESIGN OBJECTIVES :

1. ROUND UP ALL OF THE BUILDING'S ROUTES IN ONE CENTRAL SPACE
2. CONCLUDE MY BUILDING'S NARRATIVE FOR FLORENTINE FLOODED ART

The final space in my building is the art exhibition space, where students can finally showcase their hard restoration work to the public. This acts as the final point of the public route through the building and is also the damaged art's final destination in its restoration journey.

The three main architectural streams of the building collide, with students, restored artworks and the public all reach the same central point to celebrate Florentine art and history. You might recognise this architectural geometry from earlier models of Ghiberti's panel of a Colosseum like structure.

The Biblical significance of the panel becomes a great reflection of my building's design. This specific panel damaged in the 1966 flood depicts Joseph's distribution of grain from a central storehouse during the 7 year Egyptian famine.

Just as Joseph's granary became the civic center during a period of scarcity, this exhibition space is intended to become Florence's contemporary repository of recovered cultural heritage after disaster of 1966.

On top of everything people are able to go up to the top floor balcony to access the building's best view of the river Arno and the surrounding city, hopefully reconnecting the Florentine citizens with the river they once feared.







EXTERIOR VIEWS



