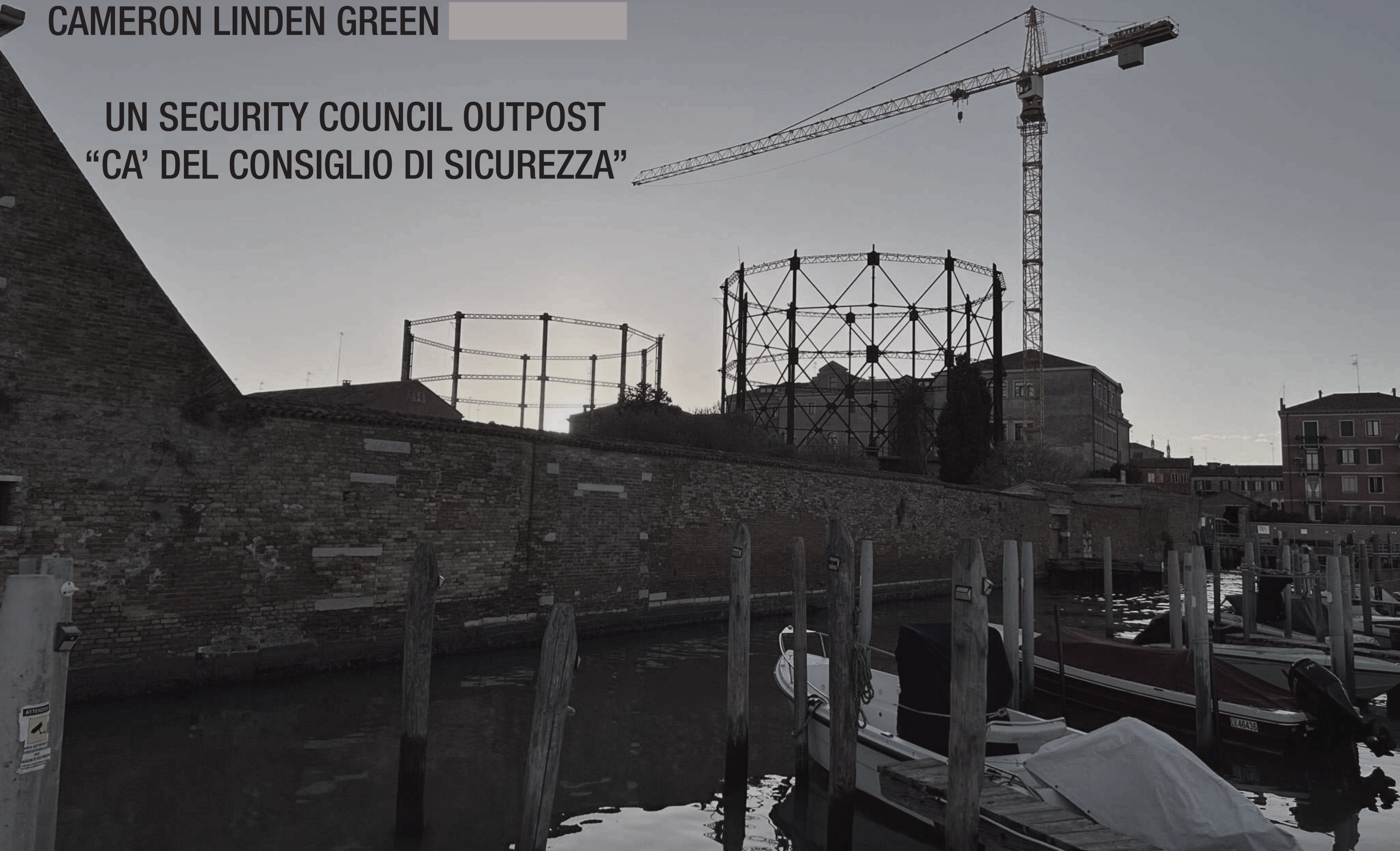


AD3 DESIGN THESIS
UNIT 11 - UNITED NATIONS
CAMERON LINDEN GREEN

UN SECURITY COUNCIL OUTPOST
“CA’ DEL CONSIGLIO DI SICUREZZA”



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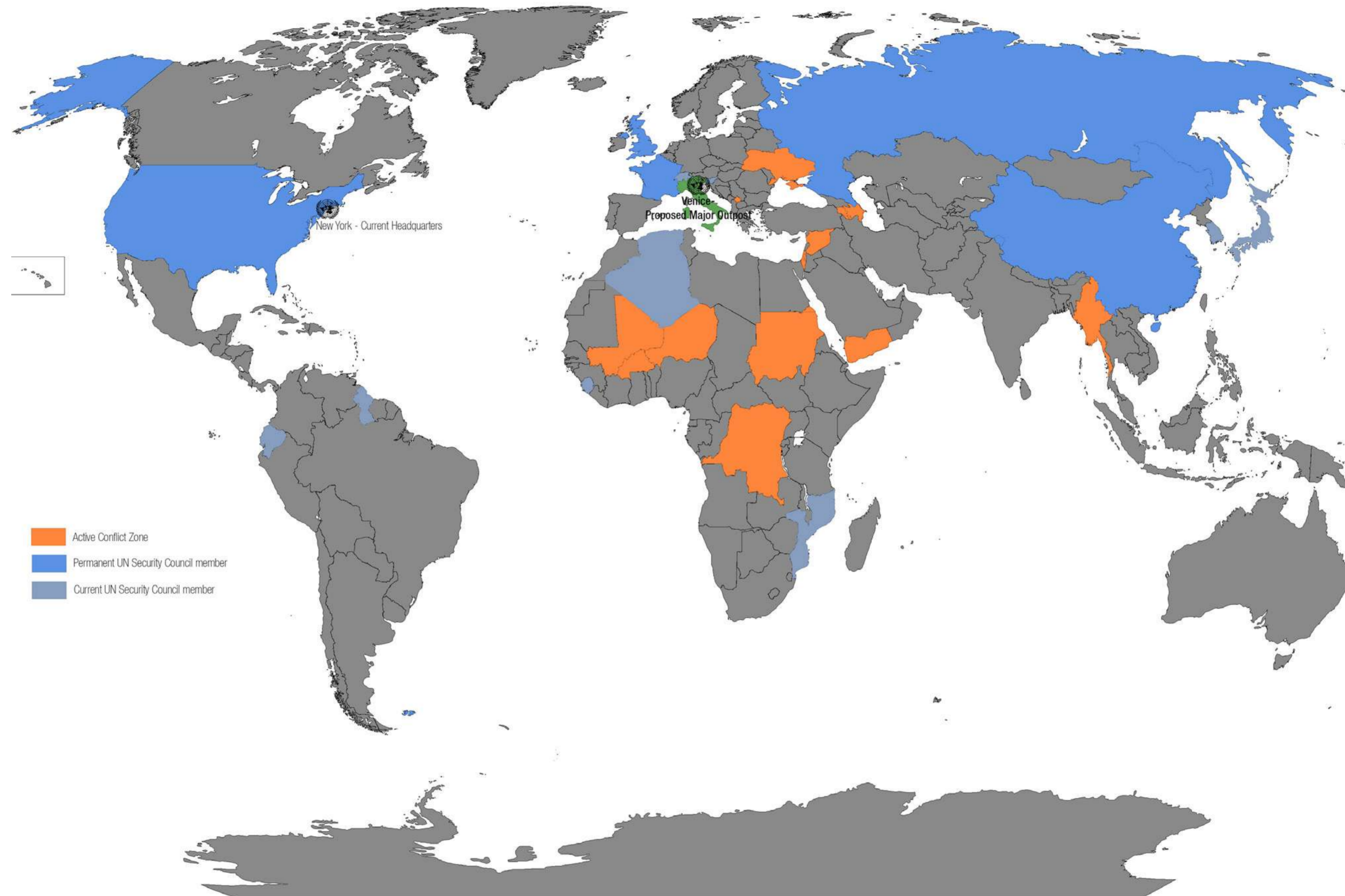
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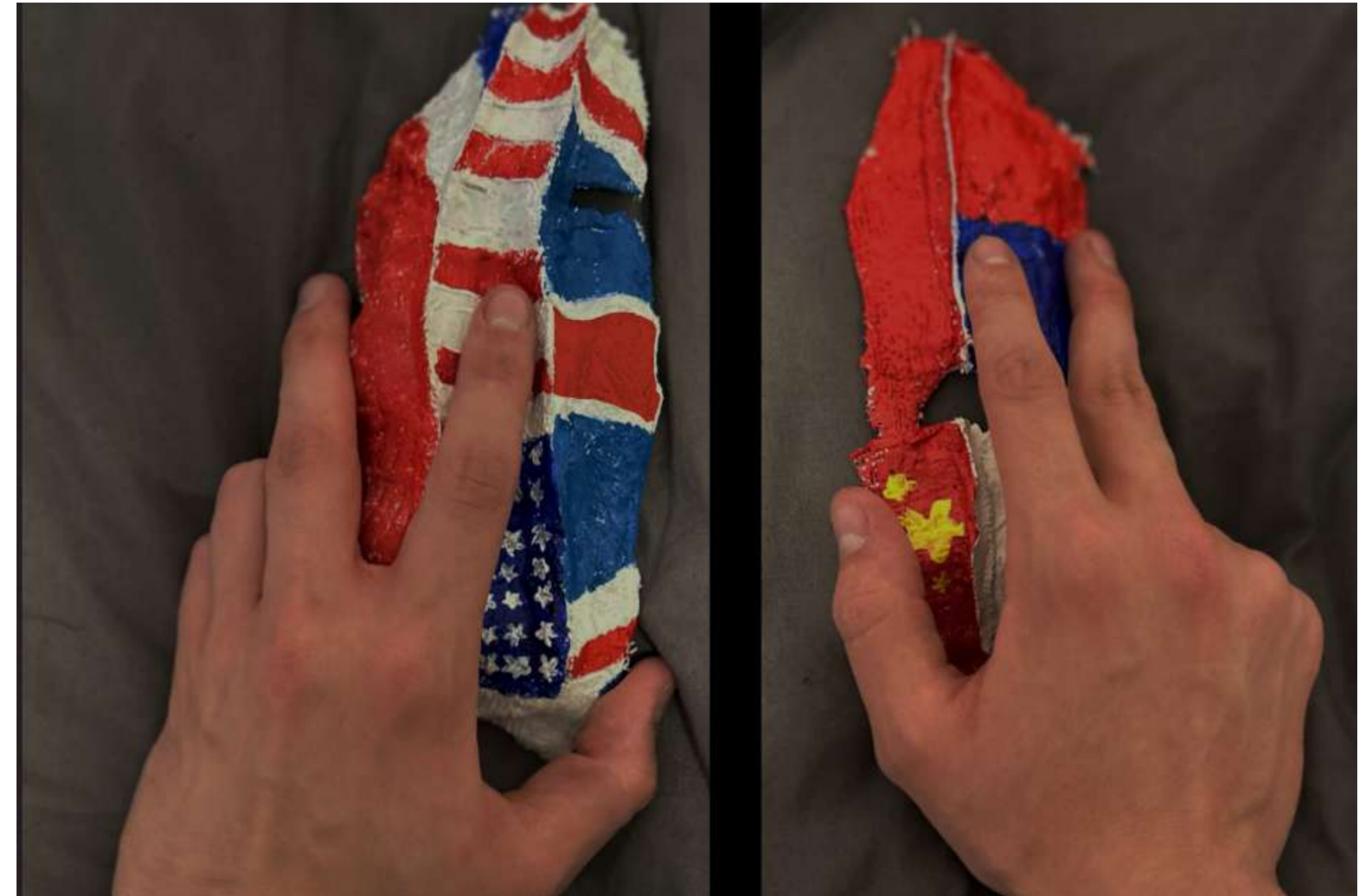




DESIGN BRIEF

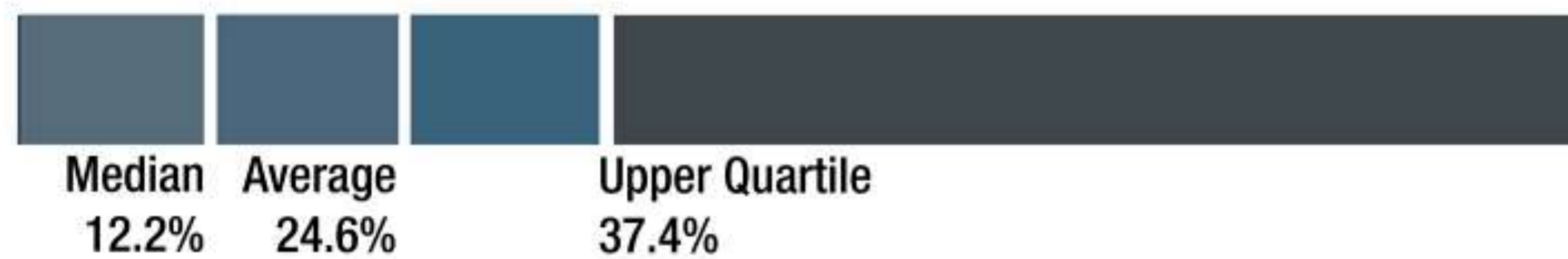
My project will be a key outpost for the United Nations Security Council - because currently, worldwide affairs are handled in the main UN office in New York, which is separated from key conflict zones by miles of ocean.

With wars raging in Ukraine, Israel, and many more places near the Mediterranean, there has never been a more crucial time for security discussions to happen on neutral ground close to these conflicts - something that Venice is famous and ideally geographically located for.



Social media poll:

“How confident are you in the United Nations as regards to them having a united approach on climate change?”



[SEMESTER 1] MASK PRIMER TASK

In Semester 1, in order to understand my client better, I used the task of making a mask for a Carnevale event (for which a pavilion was also designed) to represent the United Nations Security Council.

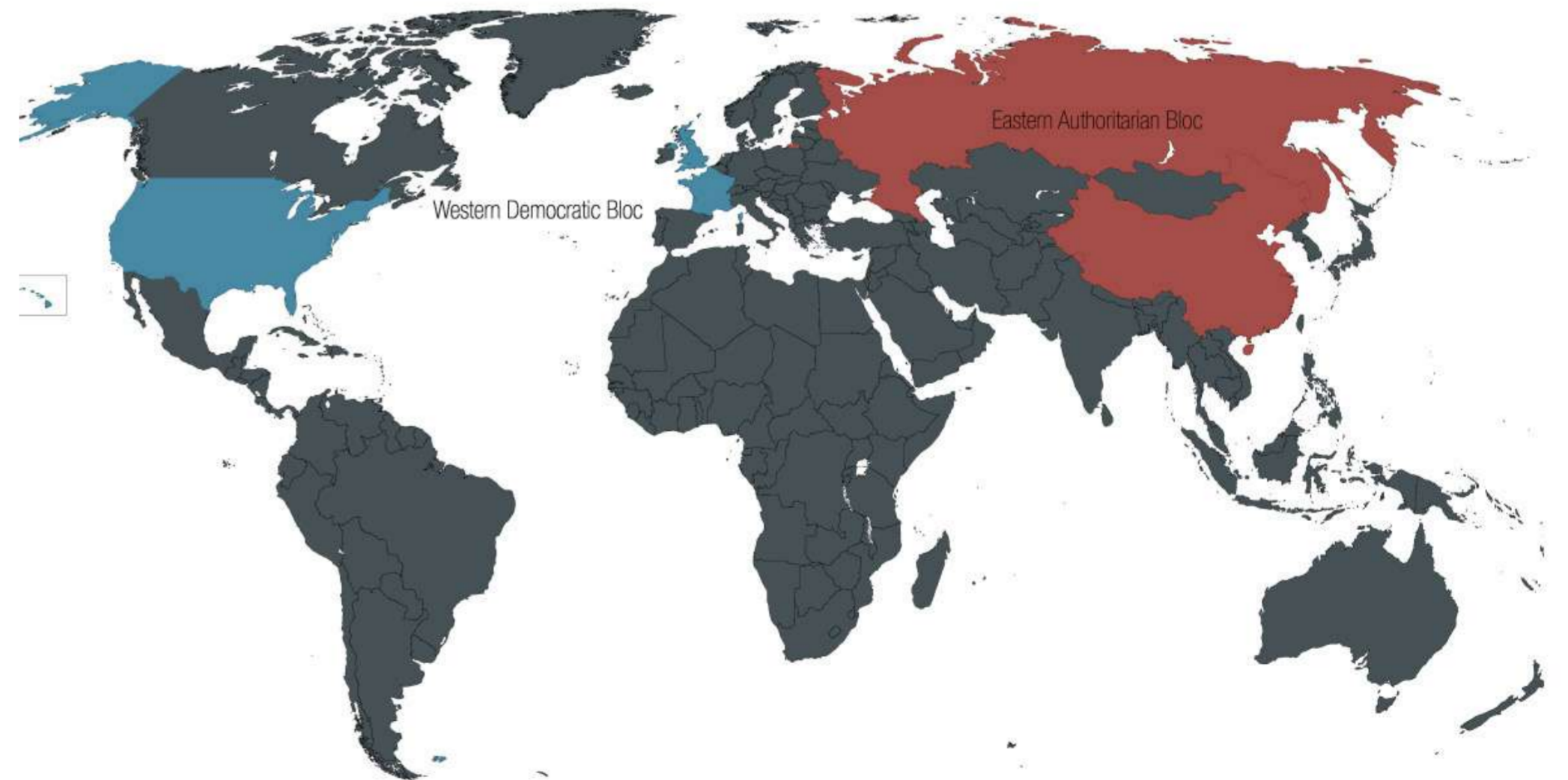
the other covers three fifths of the face, representing the three Western democracies - France, the UK and the USA. The two separate wearers of the mask show how deeply rooted divisions are in the United Nations.

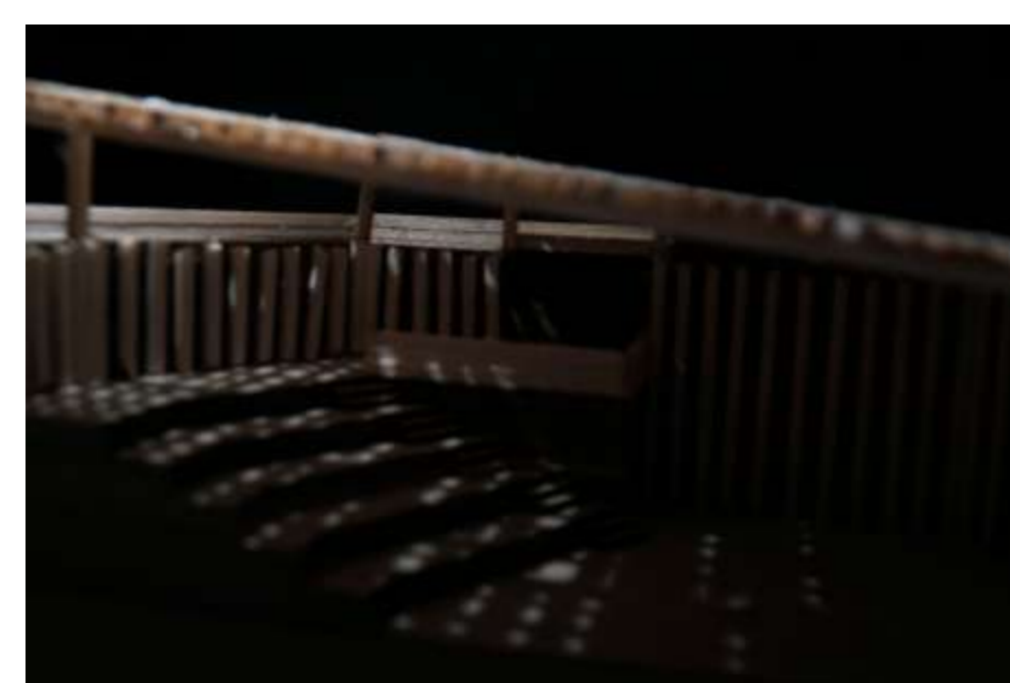
The mask is made to match each faction of the UN Security Council's permanent members - one covers roughly two fifths of the face, representing the two nations in the Authoritarian bloc, China and Russia, while

This leads into my project in that it seeks to reconcile these divisions by bringing the UNSC closer to where it is needed, and by re-establishing confidence in this institution to foster peace and stability.

NB: Excerpts from SEMESTER 1 INDIVIDUAL WORK.

Entire slide makes reference to or adapts SEMESTER 1 INDIVIDUAL WORK and therefore should not be marked as part of SEMESTER 2 WORK.





[SEMESTER 1] EVENT AND PAVILION | DEMOCRATIC SPACES

As a part of my Semester 1 work, which acts as a primer for this project, I explored the idea of democracy and democratic spaces, as a part of my study of the UN Security Council and a current lack of confidence in world leaders.

This firstly took the form of a small pavilion to be set up in the capital cities of each of the UN Security Council permanent member nations, in which people would vote

NB: Excerpts from SEMESTER 1 INDIVIDUAL WORK.

Entire slide makes reference to or adapts SEMESTER 1 INDIVIDUAL WORK and therefore should not be marked as part of SEMESTER 2 WORK.

on issues that concerned them the most, to then be debated in the afternoon - with anonymity in the process being provided by half-masks, that the people debating these issues would wear.

This evolved into a pavilion designed for the 2023 Architecture Biennale in Venice, intended as a space for talks to be held in neutral ground, in an environment conducive to free speech.

The Athenian Agora underpinned much of my thought process throughout - which went on to inspire Venetian democracy. This is seen in the initial pavilion through proportions used in historical Greek architecture, then the idea is carried forward to the final pavilion in its' atmosphere.



Figure 2- The Andron in Palazzo Vendramin Grimani



Figure 3- The Portego in Palazzo Vendramin Grimani



Figure 4- 1:500 Maquette showing the Palazzo's relation to the Grand Canal

[SEMESTER 1] PALAZZO TYPOLOGY | PALAZZO VENDRAMIN GRIMANI

In November 2023, our design unit visited Venice and studied a range of buildings - including traditional Venetian Ca' and Palazzi.

A particular example which I studied in a smaller group was Palazzo Vendramin Grimani - once used as a key residence for one of Venice's most important noble families. A member of this family even became a Doge.

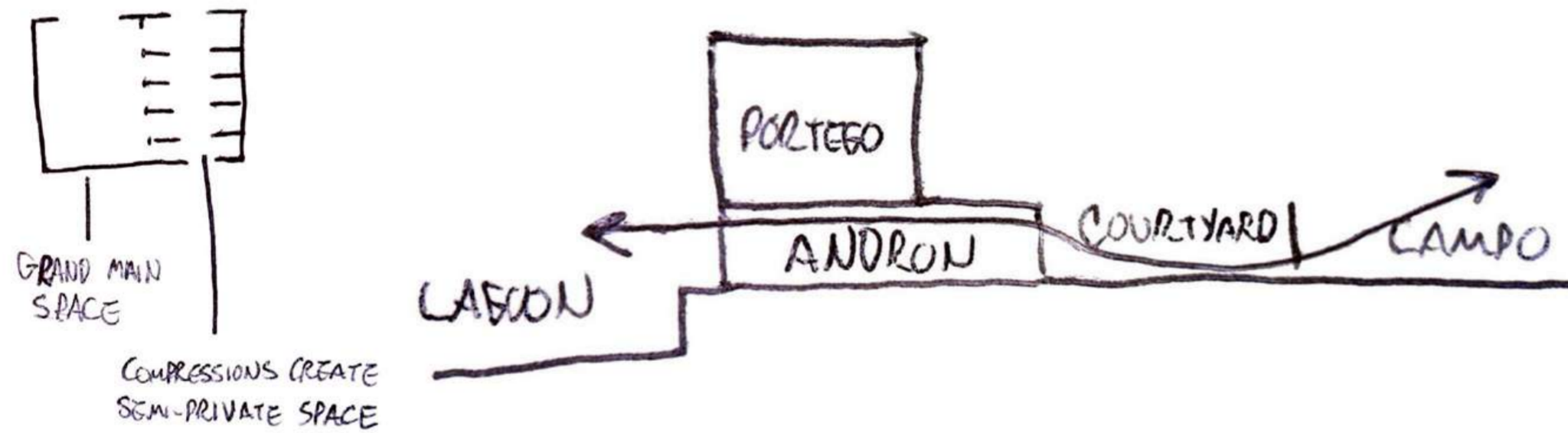
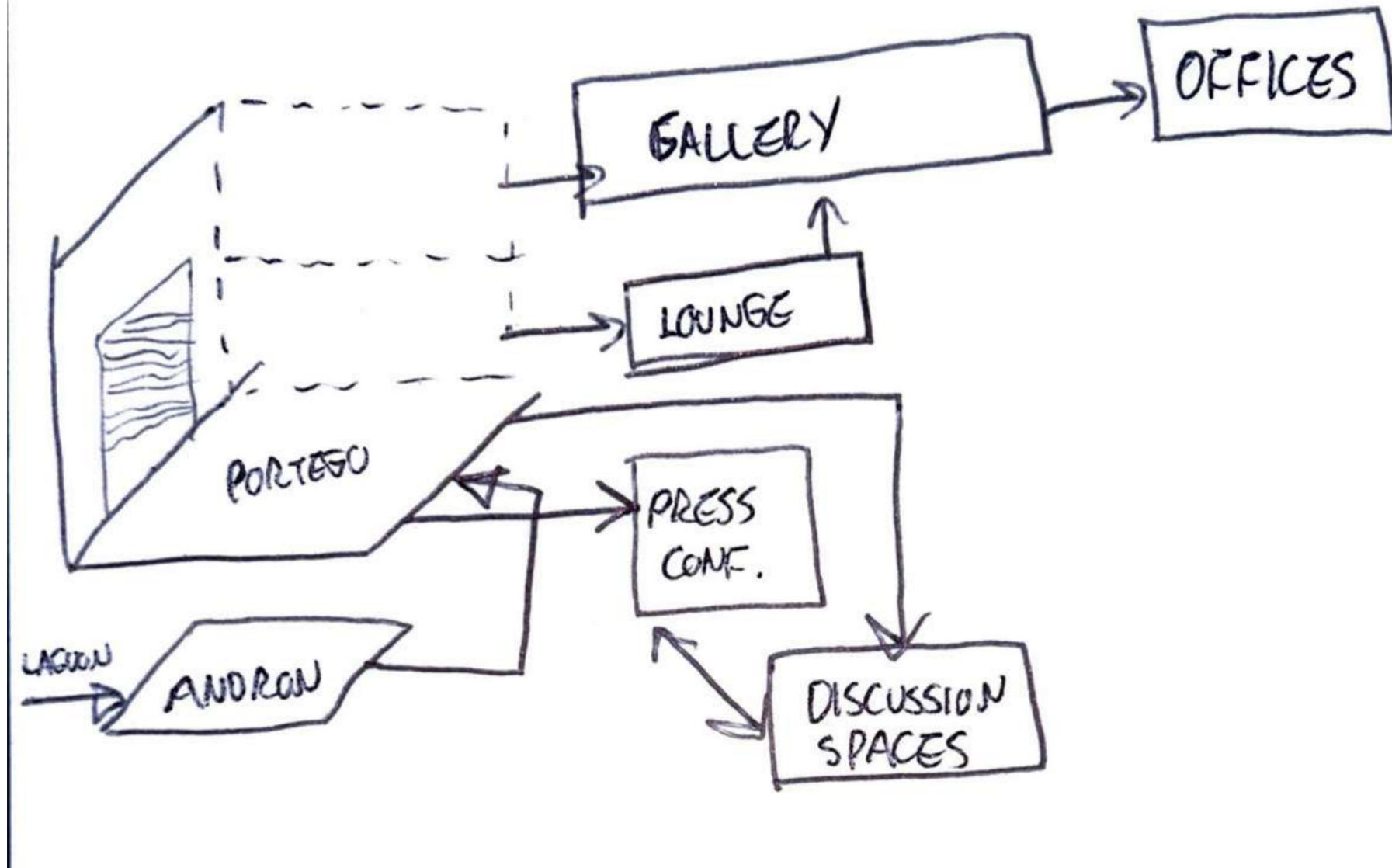
Key takeaways from this building are:

-A side entrance features alongside a courtyard entrance and a Canal entrance, all linked by the Andron, which runs the length of the building from the water to the courtyard.

-The Portego sits directly above the Andron, and all rooms in the first floor stem from it.

NB: Excerpts from SEMESTER 1 GROUP WORK | Visual by Zhutong Li | Group study by Cameron Linden Green, Srivinda Ladha, Zhutong Li. Entire slide makes reference to or adapts SEMESTER 1 GROUP WORK and therefore should not be marked as part of SEMESTER 2 WORK.

INITIAL CONCEPT FOR PROGRAMME



CONCEPT - PORTEGO SPACE

In the traditional Venetian Ca' typology, the Portego is the key space of the building - hosting key events and being the publicly facing room.

It is the largest and grandest of spaces in the Ca', with any other rooms in the building stemming from it.

My building's Portego will reflect this function and typology by having a large view to the lagoon, promoting a sense of peace which the UN Security Council seeks to foster.

The room will be double height compared to the rest of the building, emphasising its' importance and linking most of the building's spaces to it.



Figure 1 - Casa delle Armi, obtained from <https://divisare.com/projects/329826-luigi-moretti-giampiero-germino-casa-delle-armi> accessed 24 April 2024

CASA DELLE ARMI

ARCHITECT- Luigi Moretti
Rome, IT | 1933

The Casa delle Armi is a part of the wider Foro Italico complex, a Rationalist project intended to host the 1940 Olympic Games. Its' relevance to my Portego is the roof light, which elegantly admits light to the space in a large and uniform strip.

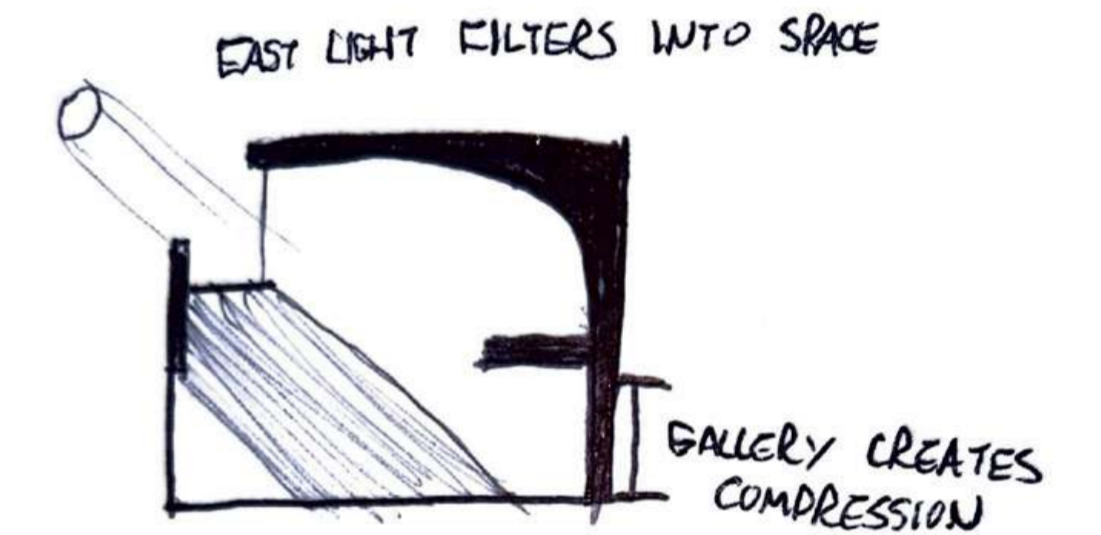
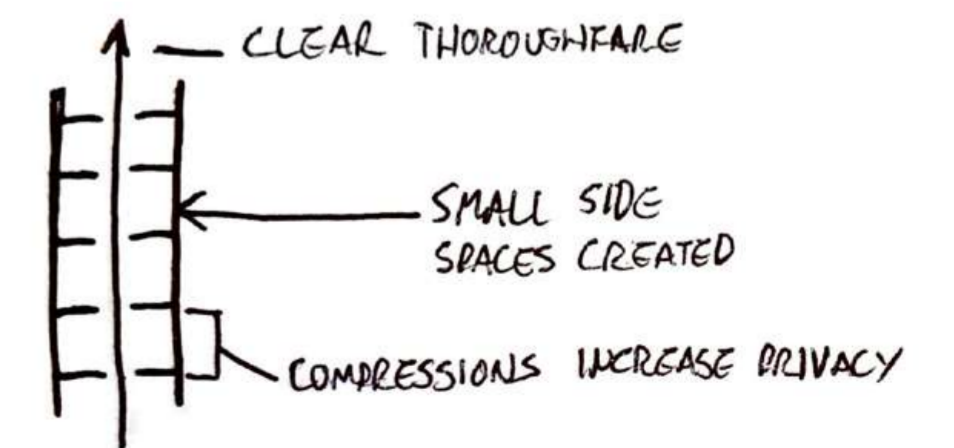


Figure 2 - Chipperfield's Procuratie Vecchie from the inside, obtained from <https://edition.cnn.com/travel/article/venice-procuratie-vecchie/index.html> accessed 24 April 2024

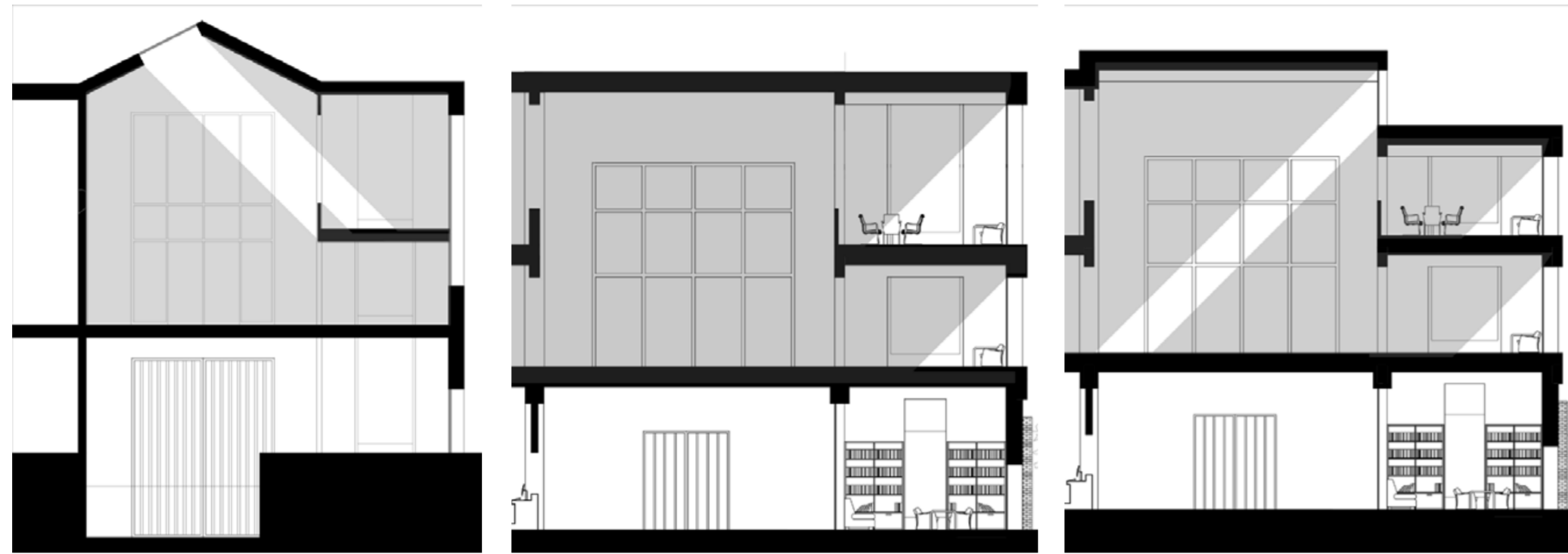
PROCURATIE VECCHIE

ARCHITECT- David Chipperfield
Venice, IT | 2017

David Chipperfield's renovation of Procuratie Vecchie is pertinent to my Portego, as it offers a guide on how to offset the incredible scale of the main portego. By introducing identical walls in a set rhythm, the space's scale can be countered by a series of side rooms that act as a space of retreat and greater privacy.



Iterations in section



Findings

+ Roof light provides a great atmosphere in the space

- Pitched roof on a Rationalist building does not work, and not possible with concrete frame

- Roof light would cause extreme overheating in the space

+ Flat roof provides link to Rationalist philosophy

+ Space will not be overheated

+ Timber provides better acoustic quality

- Lighting atmosphere is lost, alongside link to Casa delle Armi

+ Lowering lounge roof provides a more intimate atmosphere where it is needed

+ Roof light on the east facade re-introduces atmosphere created by roof light without overheating issues

PORTEGO SPACE - INITIAL TESTING AND ITERATION

From the initial concept, I experimented with a variety of materials and lighting strategies in order to reach my final space.

In terms of materials, I tested a timber floor and roof, modelled after the main space in the Senate Hall in London - however found that this muted much of the beauty and interaction with light that Terrazzo provided.

Much of the testing for my Portego happened in section - concerning how I achieved the lighting quality that my initial test provided without overheating. This ended in a window on the eastern facade, with the Portego's roof being raised relative to the rest of the building.







Figure 1 - First glimpse of concept from the lagoon between Murano and the sestieri of Castello and Cannaregio.

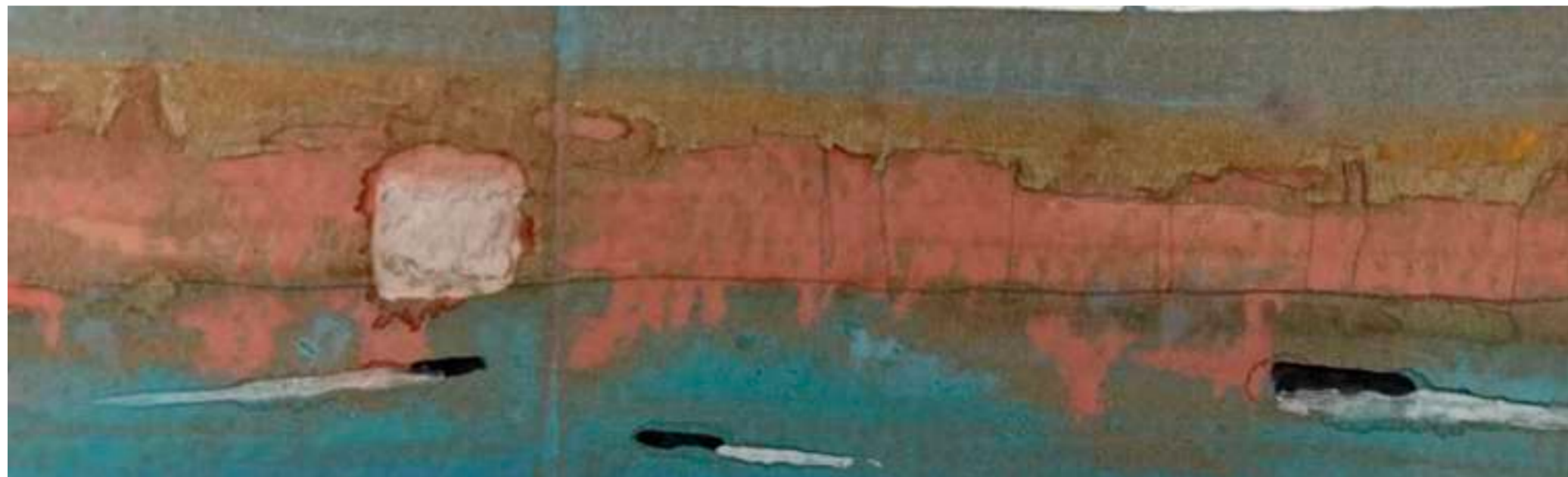


Figure 2 - Closer glimpse of the concept in the context of Castello North.

CONCEPT IN CONTEXT

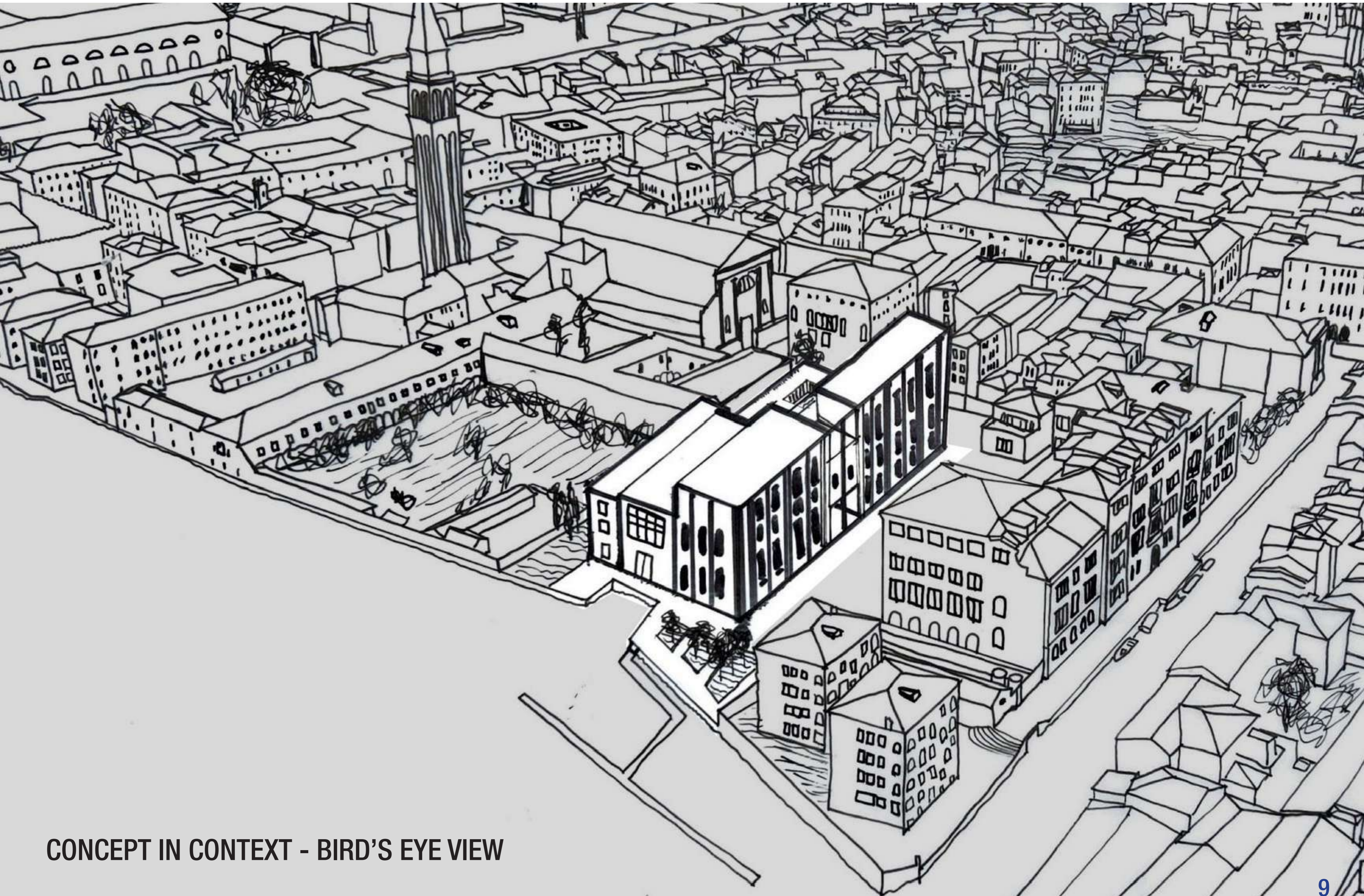
Inspired by the work of Paul Klee in representing landscapes and cities in an abstract manner, I crystallised how my concept will insert itself into Venice through the medium of watercolouring.

This involved the approach to the building, and how it will stand out in Cannaregio and Castello, moving into a closer look at how the building will appear in its' context.

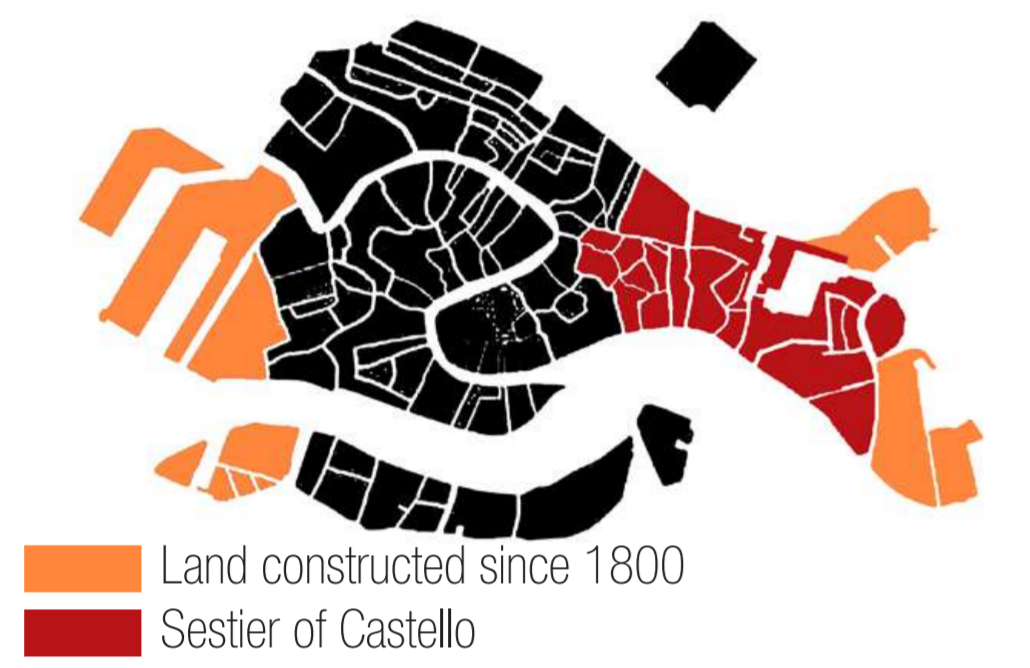
Something that struck me from the site was the view of San Michele and Murano surrounded by the lagoon - which my Portego will frame in order to provide a sense of internationality and protection, while also referring to its' context - Venice.



Figure 3 - View of San Michele and Murano from the site.



CONCEPT IN CONTEXT - BIRD'S EYE VIEW



Green Spaces map adapted from Semester 1 group work. Base map by Rhea Samaha

- Site
- Transport Link
- High-end Hotel
- Entertainment
- Consulate



CONTEXT ANALYSIS

The site is situated in the Sestier of Castello, which has seen some of the most radical changes and additions through its' history.

Castello is defined by large garden spaces in the Giardini and isles of Sant'Elena and San Pietro, as well as 19th-century architecture accompanied by Gothic and Renaissance architecture.

The site's primary aspect is the Lagoon, which is connected to the Grand Canal by a series of smaller canale. Through the lagoon, the site is also linked to other important areas of Venice - such as Murano and Lido (the latter of which holds a private airfield).

The Grand Canal hosts the majority of five-star hotels in Venice, as well as many spaces of interest, the train station, and the car park - consequently, the Lagoon will be a popular means of access to my site.

CONCLUSIONS

- Lagoon to be key facade and entrance, key spaces to centre around this.
- Open and green space to be a key part of my building, reflecting the urban fabric of Castello.
- Building should clearly link the land and the lagoon.



SITE AND CONTEXT PHOTOGRAPHS

The Gasometri site is located in a tight urban context, surrounded by buildings on most of its' perimeter. However, it has a large connection to the Lagoon, which can allow the provision of building materials to the site during construction, as well as general services when the building is in use.

A key feature that I will reflect in my building is the cloisters of the nearby monastery connected to the church, which in the summer months provide respite from the hot sun.

This will integrate my building into the urban fabric by reflecting nearby buildings, as well as incorporating a Venetian architectural device.



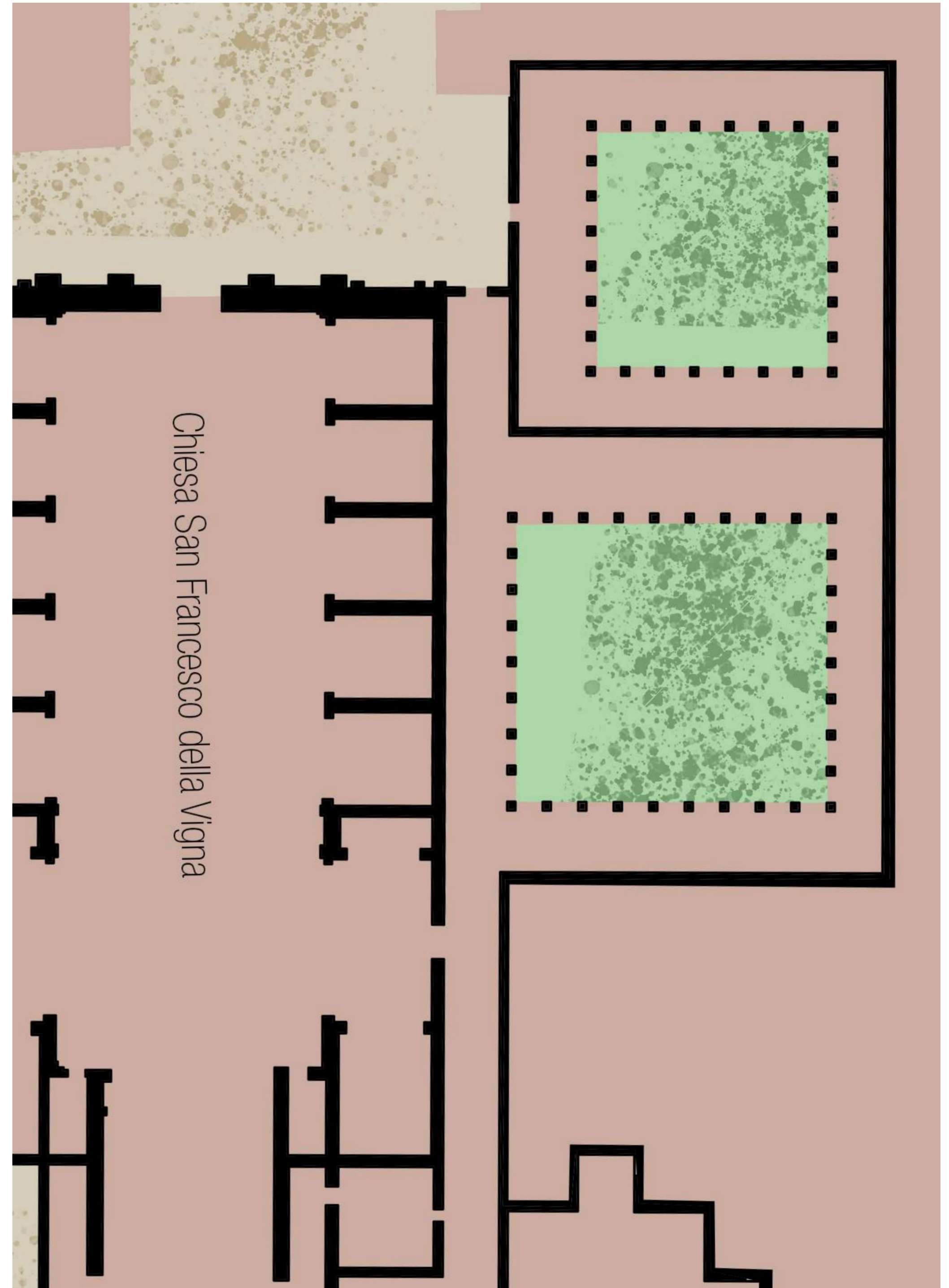
CLOISTER STUDY - MONASTERY OF S. FRANCESCO

My project will be located next to a monastery and convent, linked directly to the church on the site.

This is relevant to the United Nations Security Council due to the frequent need for reflection. A monk living in a convent will walk laps of the cloisters whilst praying a rosary in order to meditate.

In the same way, during the Cuban Missile Crisis in 1962, John F. Kennedy would sketch quick doodles in his notepad in order to calm his mind and make rational decisions.

This highlights the importance of spaces for thinking in a building concerned with high-level security and diplomatic talks - which can be reflected by incorporating cloisters in my project.



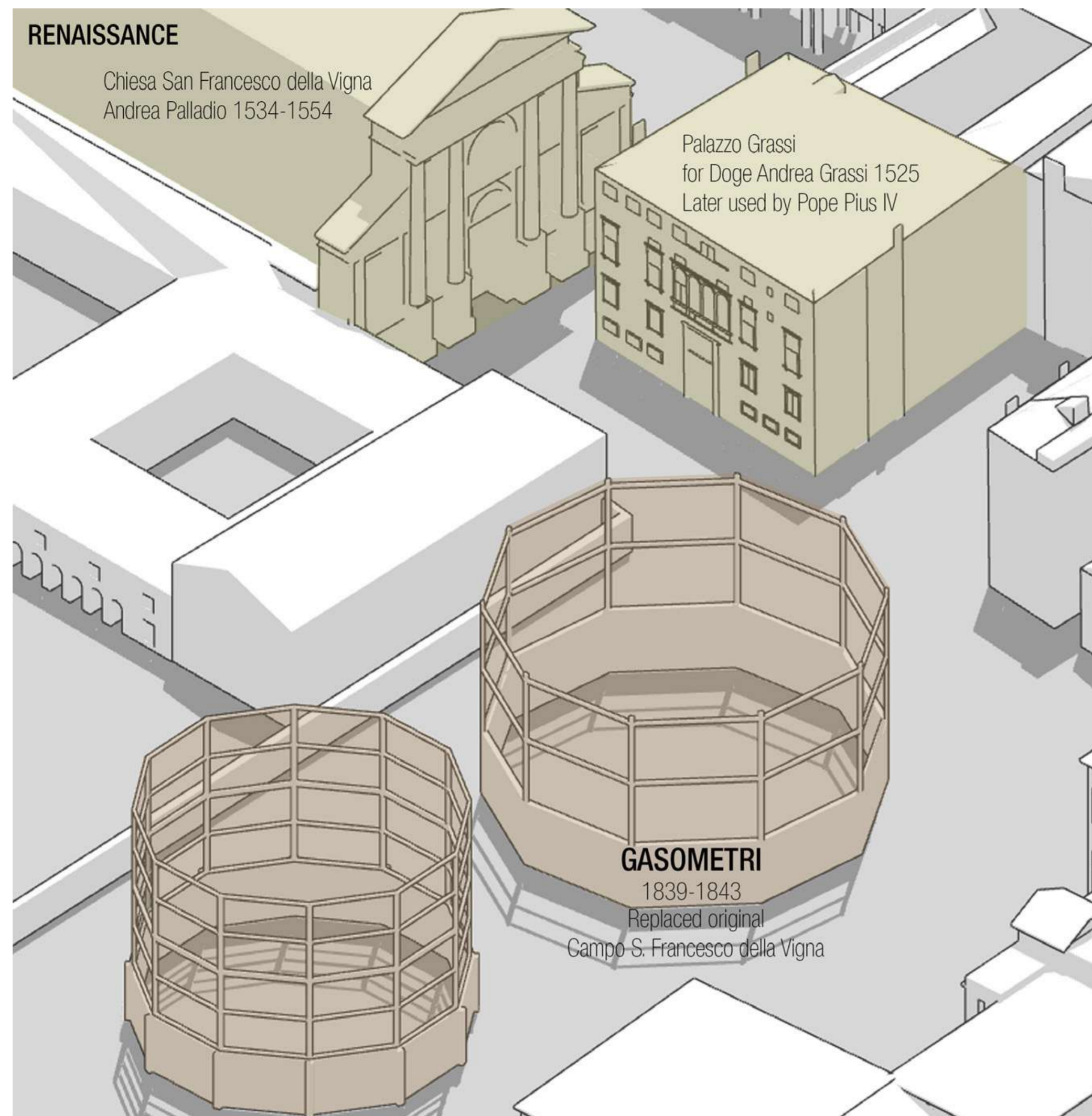
RENAISSANCE

Chiesa San Francesco della Vigna
Andrea Palladio 1534-1554

Palazzo Grassi
for Doge Andrea Grassi 1525
Later used by Pope Pius IV

GASOMETRI

1839-1843
Replaced original
Campo S. Francesco della Vigna



SITE ANALYSIS

-HISTORICAL SITE CONDITION

Before the gas holders on the site were built, a large campo stood in its' place. To match the Venice Charter, my project should attempt to restore this open public square. While the mass of the urban fabric will be modified, this will restore the pre-industrial urban condition.

The site's surroundings are predominantly Renaissance. There is a history of international institutions, specifically the Vatican through Pope Pius IV once inhabiting Palazzo Grassi.

-LAND USE

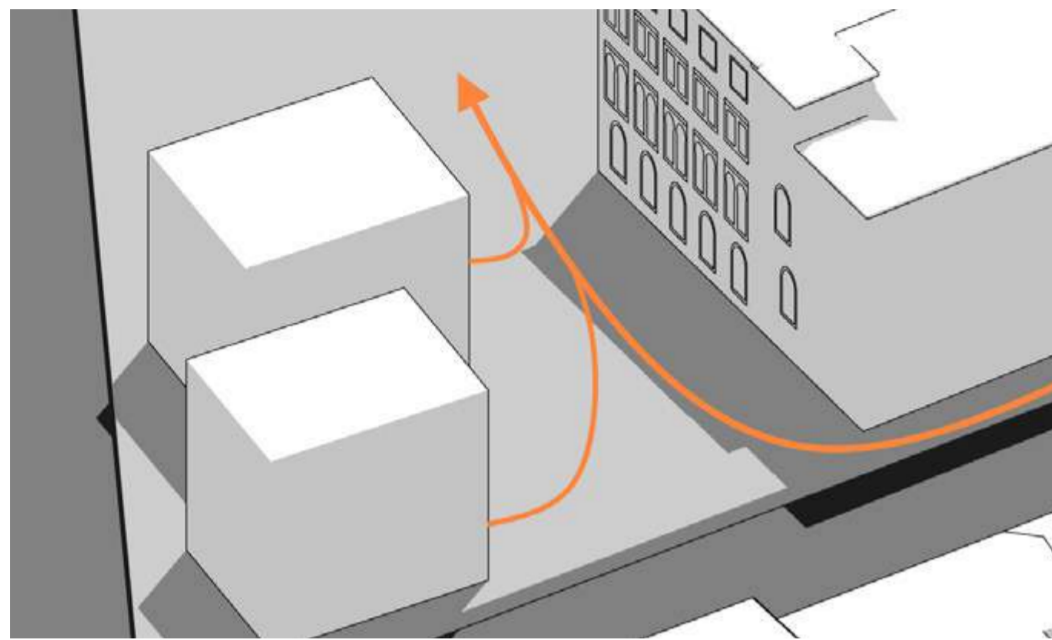
The site features a range of buildings, consisting mostly of technical colleges, religious buildings (mostly churches, with a convent by the site), residential buildings, and some hotels.

Noise levels will need to be considered to ensure my building has a minimal negative impact on local residents, as well as relations with the local technical colleges in order to positively impact the surrounding population.

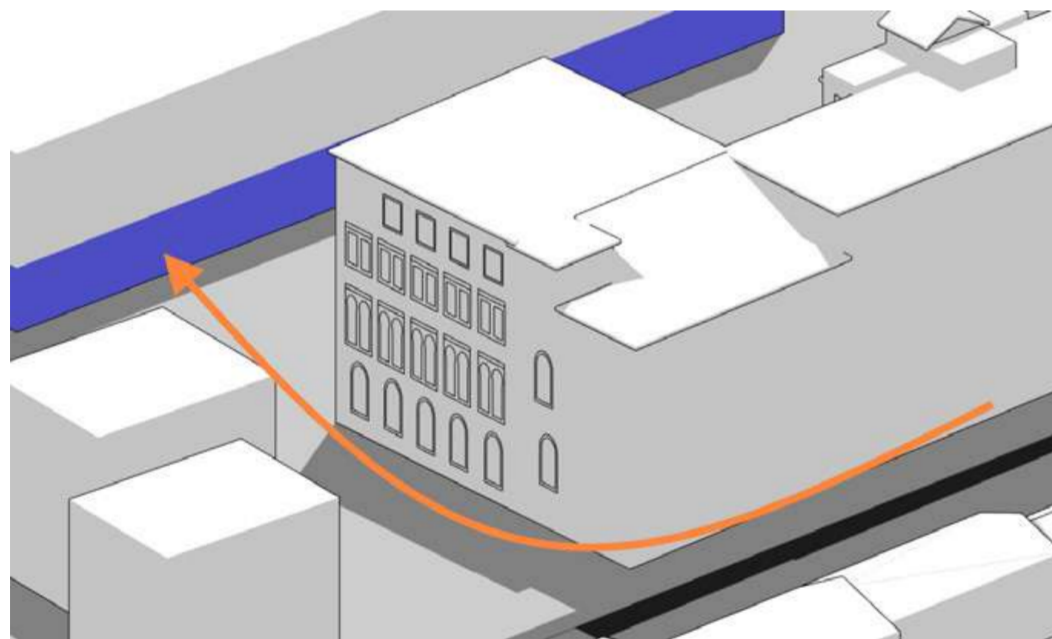


RESPONSE TO SITE

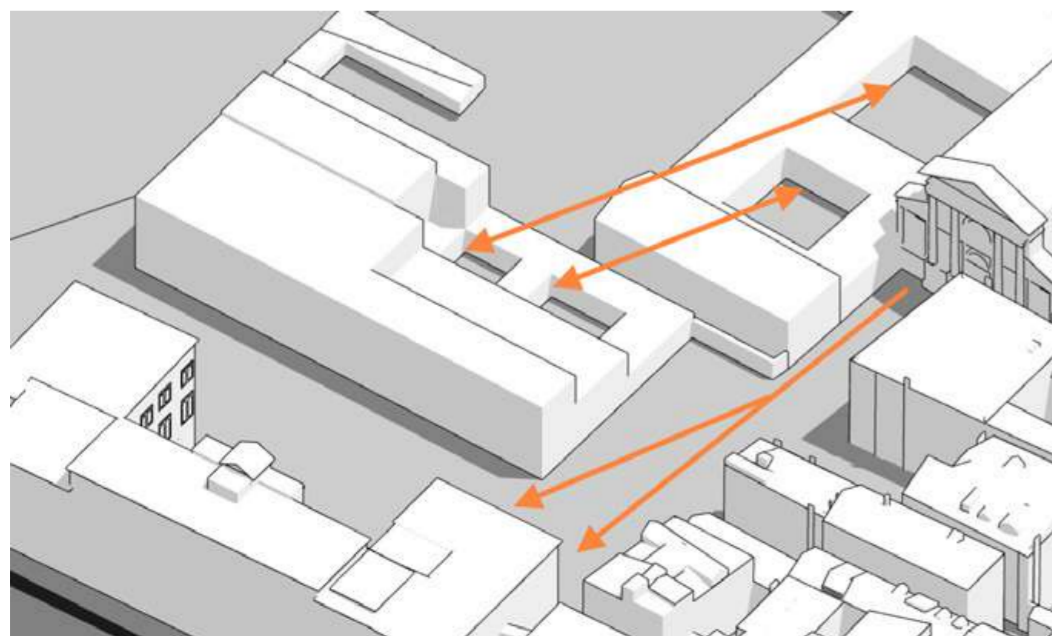
Calle created from destroying abandoned buildings, provides link between residential areas, schools, and my project.

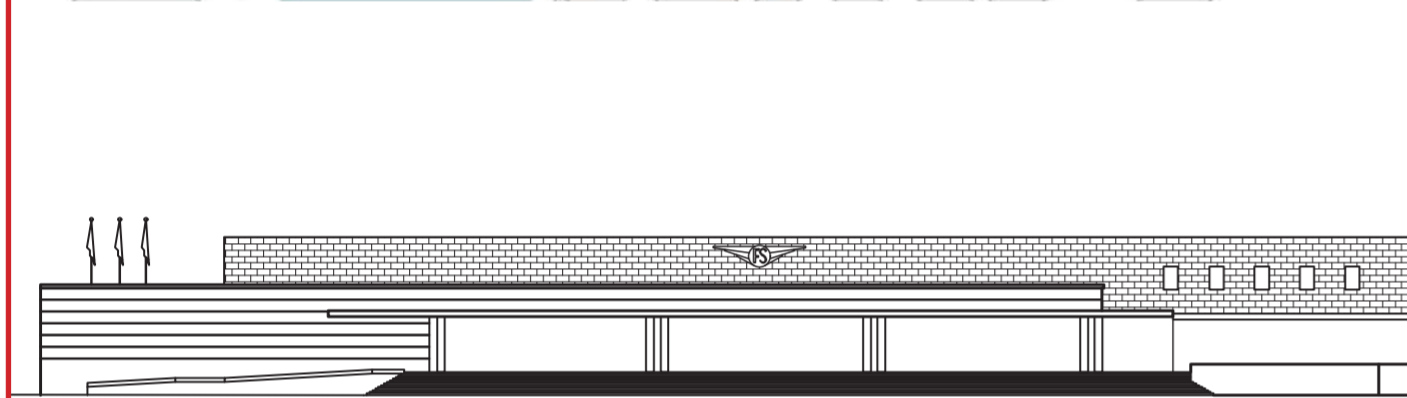


My project will link to the technical institute nearby through a café and a public conference centre on the ground floor, to establish a more personal link to the UN.



The iconic and historical Chiesa San Francesco della Vigna will be emphasised by the enlargening of the existing campo, and inclusion of cloisters in my building.





Stazione Santa Lucia

Architects
Angiolo Mazzoni, Virgilio Vallot, Paul Perilli

Construction
1924-1956

In 1865, the year before the formation of the Kingdom of Italy, a train station was built on the Grand Canal of Venice. This initially took the form of a Renaissance building, keeping in line with the architectural identity of Venice. However, with the advent of pan-Italianism, this was to be changed.

The Renaissance-era building was replaced by the design of Angiolo Mazzoni and Virgilio Vallot between 1924 and 1943, both architects being heavily affiliated with the Fascist Party. Following the fall of the Saló Republic, Paolo Perilli was contracted to finish the work that had been started under Mussolini's rule.

The current station's design features an open concourse, with little interruption between the platforms and the grand canal. This move directly interlinked Venice and the Industrial Revolution, which had previously had very little visible impact on the city.

Compared to its' neighbours - those being a Renaissance era church and a shopping centre, the station is stepped back, which allows for the creation of a new campo along the Grand Canal - which highlights the station as a hegemonic presence in its' surrounding context.

The open celebration of the Industrial Revolution as compared to the station's earlier iteration, as well as its' position relative to the Grand Canal, its' juxtaposition to its' surroundings and the form of the station displays the use of Futurism and Stripped Classicism as an architectural device in the propagation of Fascist ideology.

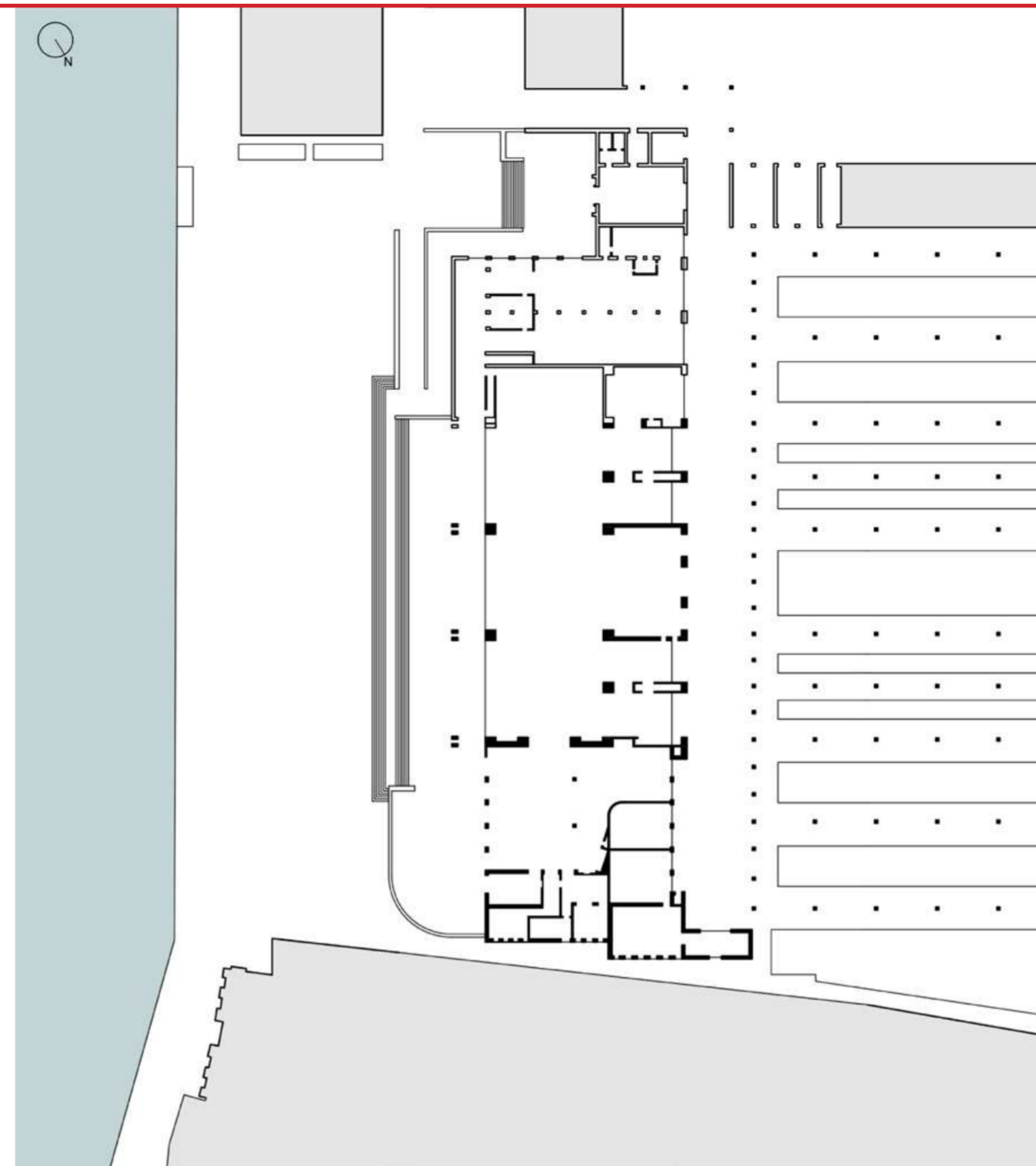
SEMESTER 1 WORK - EXCERPT FROM GROUP PUBLICATION | STAZIONE SANTA LUCIA PAGE BY CAMERON LINDEN GREEN

PRECEDENT STUDIES - STAZIONE SANTA LUCIA

An interesting example of successful Rationalist architecture in Venice is the primary train station, Stazione Santa Lucia.

Situated on the Grand Canal, its' design contradicts its' surroundings in that it is a Rationalist building situated among typically Venetian Renaissance and Gothic architecture. Despite this, it is generally seen positively by the people of Venice.

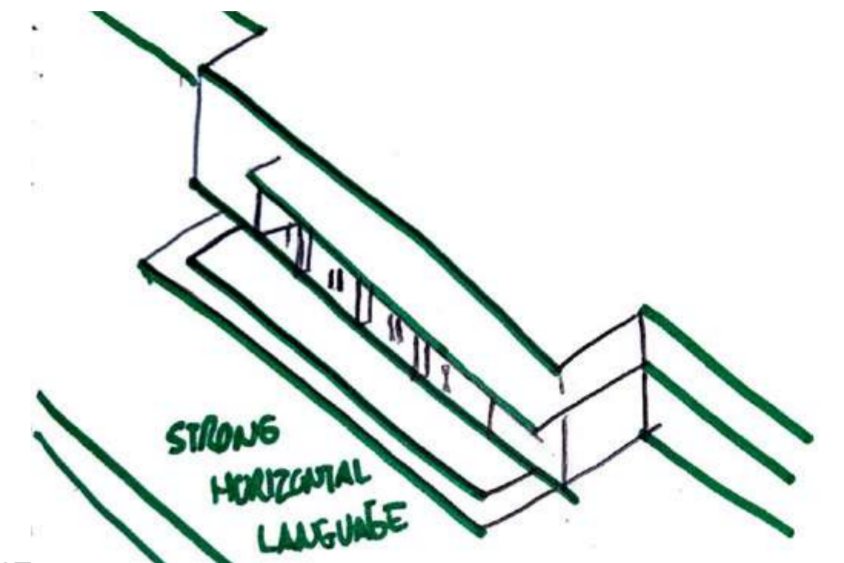
This station is applicable to my design as it replaced an older Renaissance station, and in doing so created a new campo - reflecting my intention to replace the Gasometri with my scheme.



SEMESTER 2 WORK - DEEPER ANALYSIS

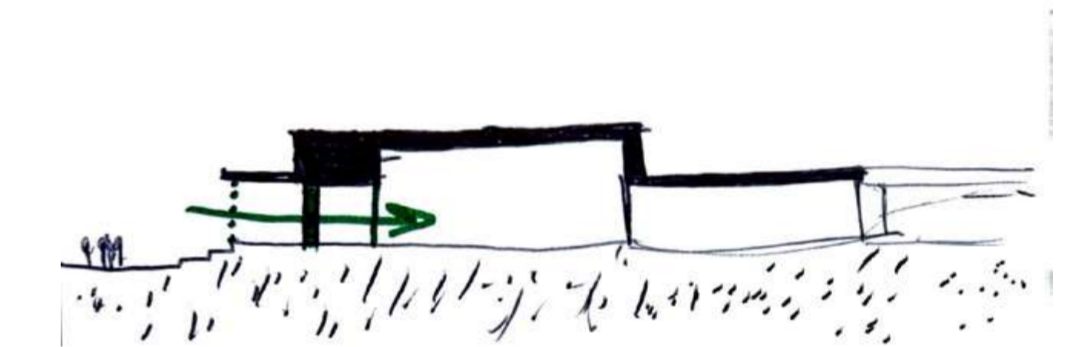
FEATURE 1.

Strong horizontal language emphasises new campo created by building's position.



FEATURE 2.

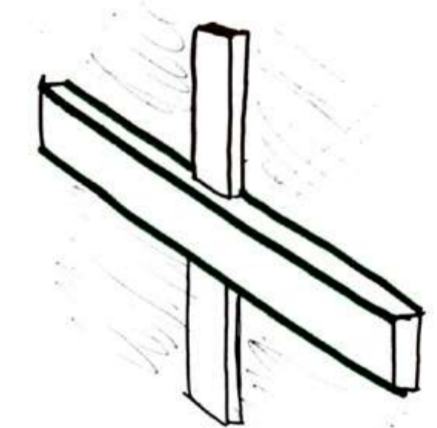
Recessed entrance invites the user into the station with a sense of sanctuary.



SEMESTER 2 WORK - DESIGN RESPONSE

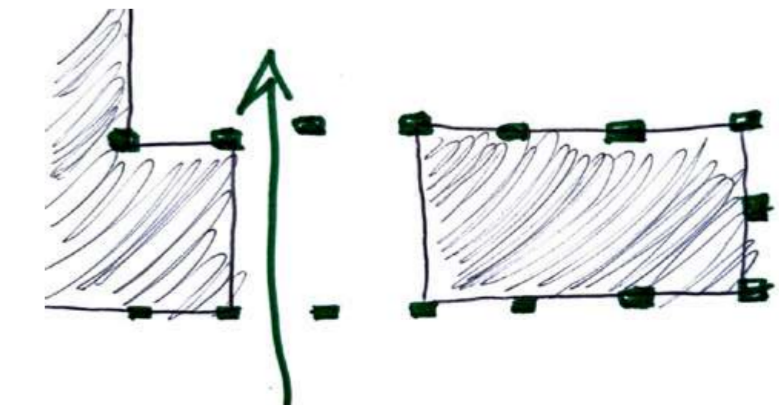
RESPONSE 1.

Horizontal beams on the exposed structure of the building will protrude compared to the rest of the structure, emphasising the new campo being created.



RESPONSE 2.

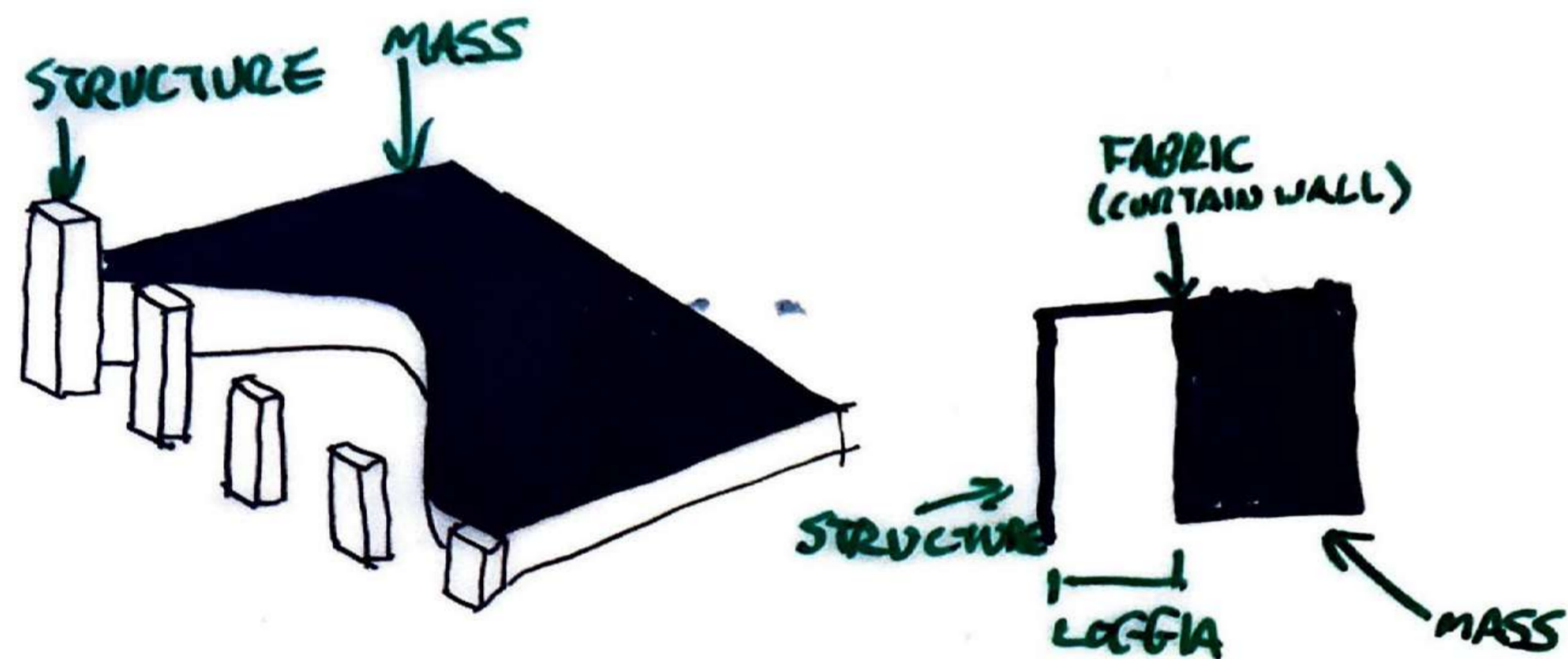
The building's fabric will not conform to the structure's shape, allowing for users to pass underneath the building into the cloisters.



Polish Embassy in Berlin - 2020, Jójko+Nawrocki Architects



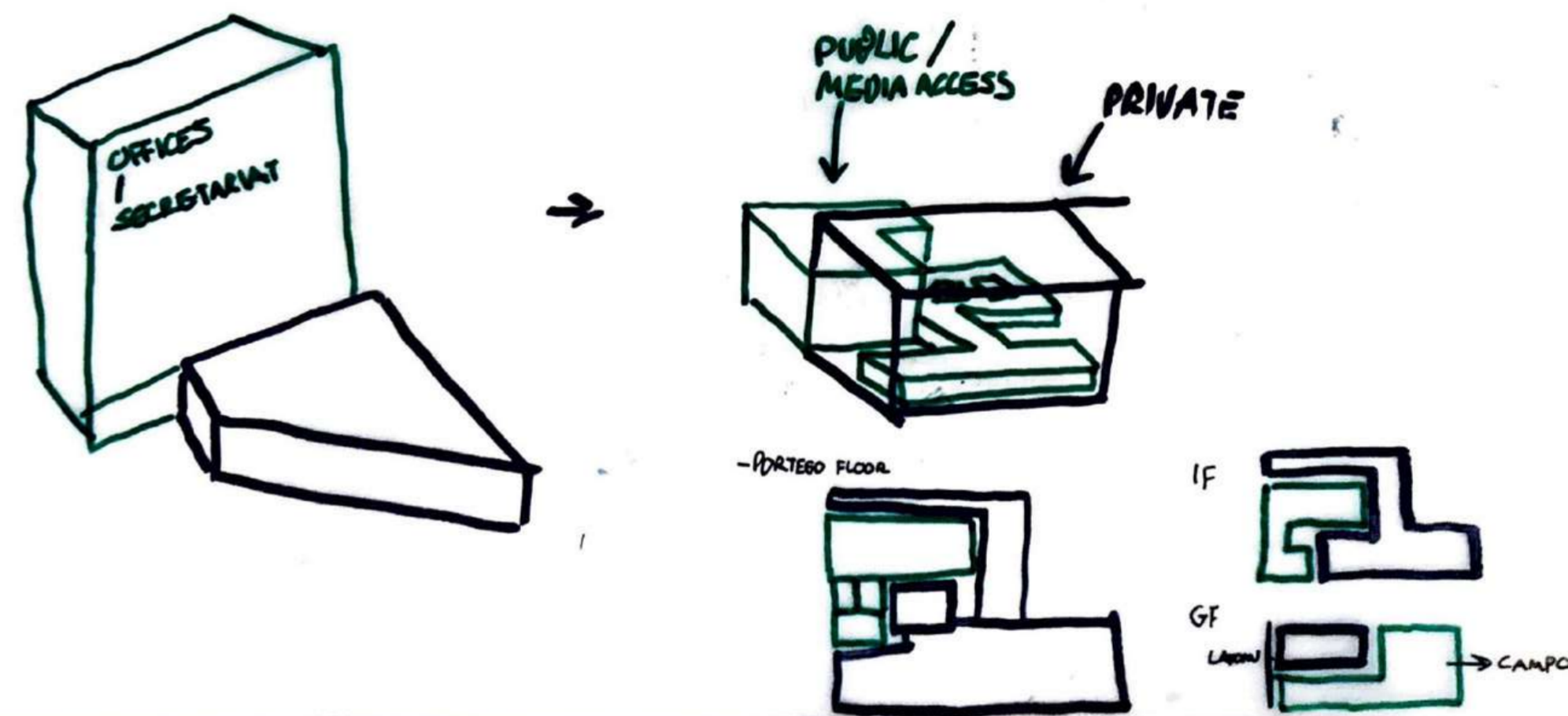
Figure 4- Polish Embassy in Berlin, obtained from <https://eurobuildcee.com/en/news/30465-strabag-wins-eur-60-mln-contract-for-polish-embassy-in-berlin> accessed 3 March 2024



Headquarters of the UN - 1948, Wallace K. Harrison et al.



Figure 5- UN Headquarters in New York, obtained from <https://www.un.org/en/visit> accessed 8 May 2024



PRECEDENT STUDIES - SCHEME

The Polish Embassy in Berlin offers a good lesson in how to detach the structure of the building from its' fabric, to create a loggia space where necessary.

This turns the structure of the building from an unexpressed necessity into a threshold for the building, offering a transition space between the public realm and the building.

This allows the building fabric to flow more freely, while the structure forms a key part of the facade. This honesty to material is in line with the philosophy of Carlo Scarpa, whose concrete design is well received in Venice.

This will help to maintain an orthogonal, Rationalist-inspired elevation, while bringing the public within the building's footprint to emphasise UN Sustainable Development Goal 10 - reducing inequalities by bringing the people closer to their leaders.

The UN Headquarters in New York offers a good example of how to arrange an outpost for one of the UN's most important sub-organisations - it uses massing strategically in order to separate different building functions.

The secretariat offices form part of the taller 'beacon' of the building, while the conference centre is lower down.

While my scheme will be of a smaller scale than the UN's headquarters, lessons can still be learned as regards to how I may approach massing - including separating the public and private, and distinguishing between formal meeting and conference spaces, and less formal spaces for conversations and breaks.

ITALY/INTERNATIONAL



RATIONALISM

Granite Tiles [Stazione Santa Lucia]



Stone Tiles [Foro Italico]



Concrete [Palazzo dell'INPS]



VENETO/REGIONAL



CARLO SCARPA

Prun Stone



Steel



Plaster

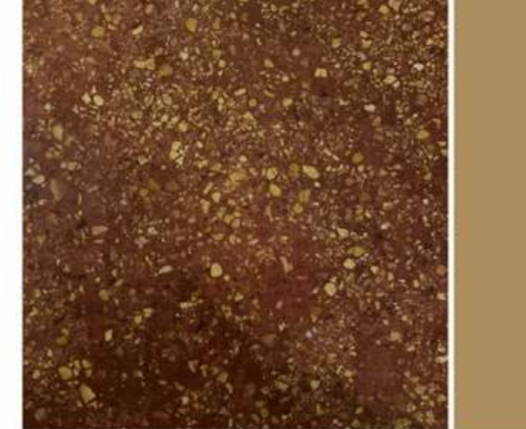


VENICE/LOCAL

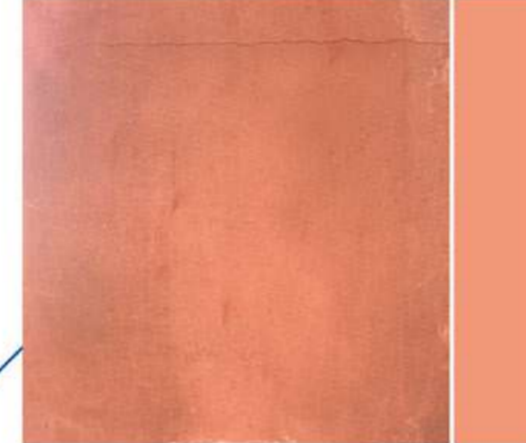


VENETIAN

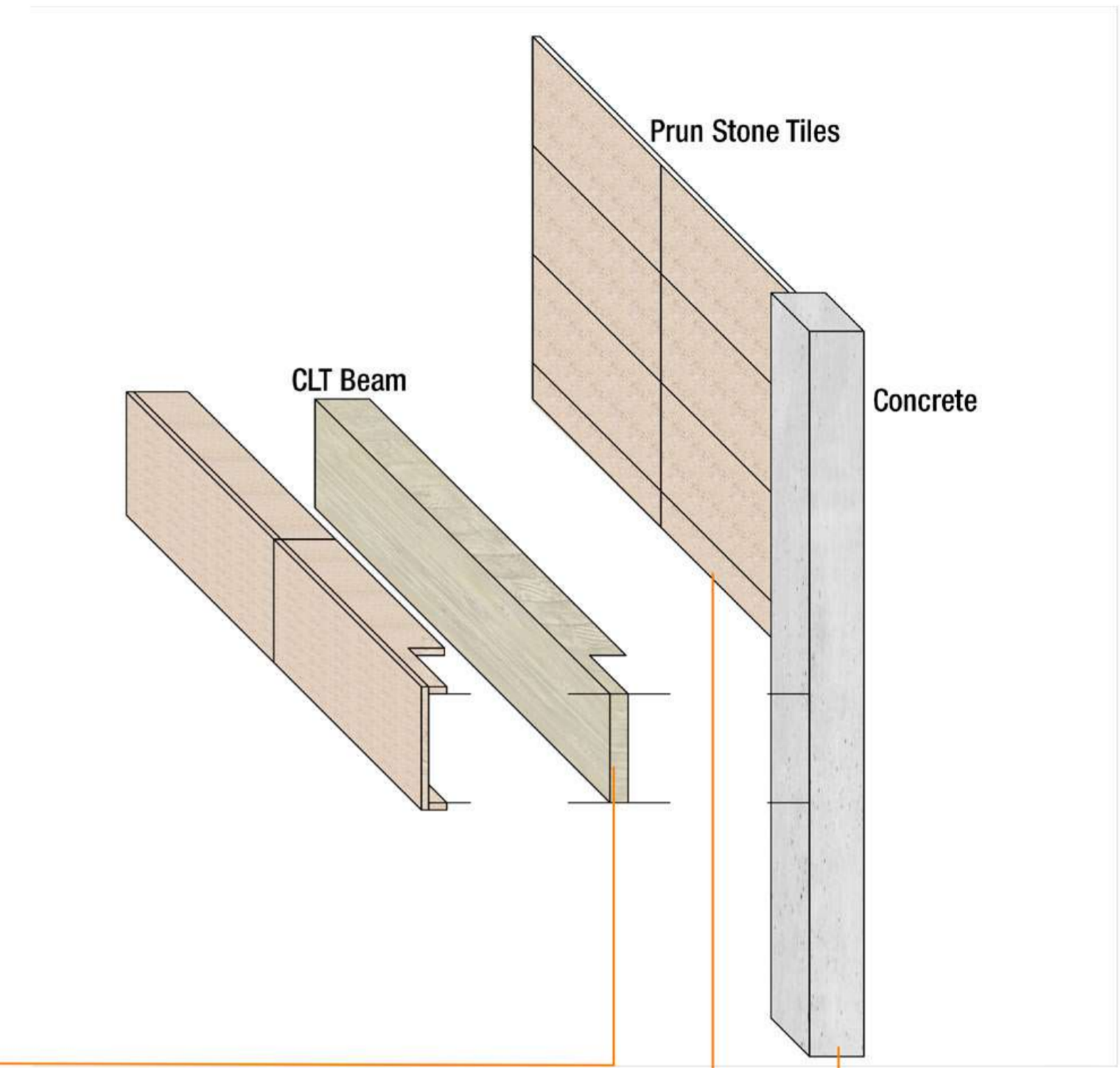
Terrazzo



Plaster



Timber



MATERIAL PALETTE

STRUCTURE EXTERNAL FACADE INTERIOR FLOOR



MATERIALITY

A range of technological and design factors influenced my choices for materiality, with the most important being:

- Embodied carbon
- Fire safety
- Link to Venetian urban fabric
- Success in previous use

I drew inspiration from a range of different categories - including:

- Rationalism from across Italy in order to anchor onto the philosophy that drove my Portego and hence my scheme
- Carlo Scarpa to link to successful Venetian architecture that propels from its' historical context
- Venetian Palazzi and Ca' to maintain a pathology to the context.

My final material palette uses concrete to reflect the structural materiality, then timber and prun stone to maintain a Venetian identity.

My facade will have different layers of varying depths in order to reflect different design influences - Prun stone tiles blend regional and national influences, concrete provides an international anchor, and Venetian materials will be used in the interior (Terrazzo, exposed CLT beams) in order to provide a local atmosphere.



Figure 6- Casa del Fascio, obtained from https://en.wikipedia.org/wiki/Casa_del_Fascio_%28Como%29#/media/File:Como_-_Casa_del_Fascio_-_27-09-2017.jpg accessed 9 May 2024

ITALIAN RATIONALISM

Much of what drove my design philosophy was Italian Rationalism, a Modernist movement that combined principles of Roman architecture and Modernist simplicity and functionality.

Despite finding its' origins in Fascism through Futurism, many Rationalist buildings are still in use across Italy today - including the Casa del Fascio (left) - whose structural frame is exposed and forms the main facade, while the building's fabric moves independently according to its' function.

Rationalism has many parallels to the Venetian renaissance through matching key principles:

- Symmetry in each bay
- Grand scale compared to the human level
- Emphasis on bright stone as a facade material.



Figure 7- Palazzo della Città Italiana, obtained from https://it.wikipedia.org/wiki/Palazzo_della_Civilt%C3%A0_Italiana#/media/File:20110307_Roma_Palazzo_della_Civilt%C3%A0_Italiana_lato_sx.jpg accessed 9 May 2024



Photograph of Ca' Vendramin Calergi, taken by self.



BAY STUDIES

Bay studies formed a large part of the way I developed the principal facade of my building - in particular, the details of it and how subtle alterations change the behaviour and depth of the facade.

This began with an initial 1:50 casting as a test, which I used to see how Prun stone may look on my facade as well as the arrangement of windows.

A more final 1:100 bay study cast followed, after finding that the lack of expressed structure made the facade too shallow - however, the colour of Prun stone matched Venice well.

This highlighted the importance of depth in my facade through the expression of my structure - especially in blending Rationalist and more Venetian design cues.

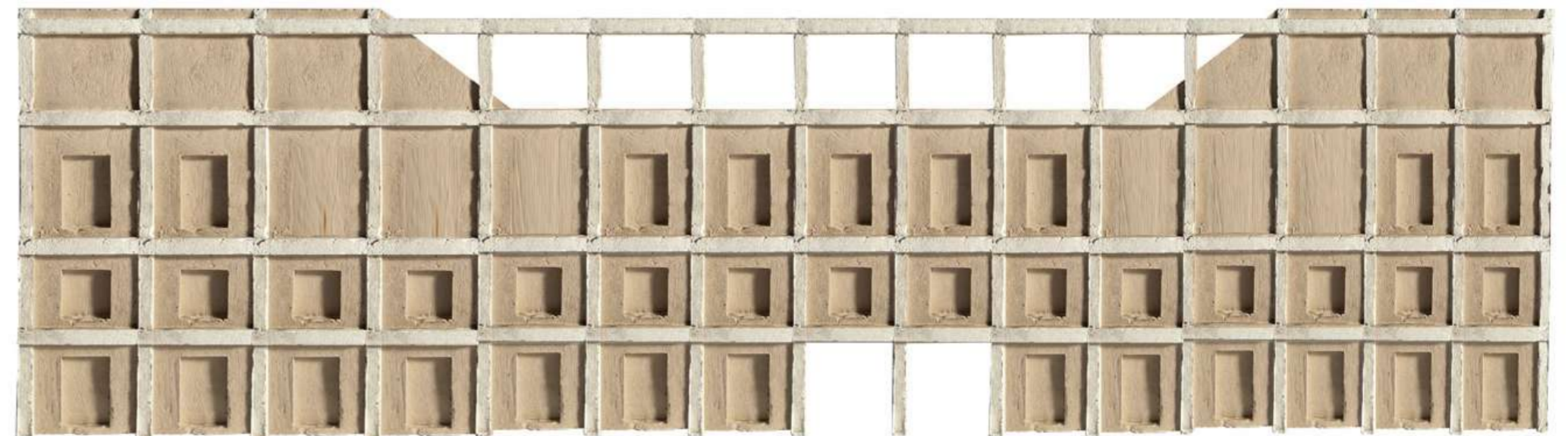




Figure 8 - Exposed structure on St. Catherine's College by Arne Jacobsen obtained from https://en.wikipedia.org/wiki/File:Arne_jacobsen,_st._catherine%27s_college,_oxford_10_%285023104207%29.jpg accessed May 8 2024

- 1. TRACING PAPER
- 2. TOOTHPICKS
- 3. PLASTIC
- 4. BRUSHED



Tests with plaster casting in formwork, with different materials for different detailed finishes

BAY STUDIES - MATERIAL AND DETAIL STUDY

An exposed structure underpins much of my design narrative - in particular, exposed concrete columns. As a part of this design language, I studied Arne Jacobsen's St. Catherine's College building in Cambridge. This building also features exposed concrete structure work, with the attention to detail in its casting leading to the building being lauded as "formal, almost classical" (Dawson 1995)¹, and in line with the spirit of the United Nations, the building was to be born of "a fruitful creative collaboration between architect and client" (Tyack 2013)².

I experimented with this through placing tracing paper, crinkled paper and toothpicks in my plaster mould, in order to see how it would affect the finish of my plaster. The tracing paper in particular returned a very smooth finish, which reflects the polished aesthetic of Rationalism very well. Reflecting the focus on detail that Arne Jacobsen is known for in his design, the horizontality of my building will also be emphasised by the vertical rhythm of my tiles - which will be much closer on lower floors.



Figure X - St. Catherine's College, Oxford, England, 2010. Obtained from https://en.wikipedia.org/wiki/File:Arne_jacobsen,_st._catherine%27s_college,_oxford_10_%285023104207%29.jpg accessed 3 May 2024
 1- Dawson, Susan. 1995. 'Working Details: New Light on Ivory Towers: Hodder Associates' Student Residence at St Catherine's College, Oxford Responds to the Detailing of Arne Jacobsen's 1962 Building', *Architects' Journal* (London), 201.20 (Emap Limited): p39
 2- Tyack, Geoffrey. 2013. *Choosing an Architect: Arne Jacobsen and St Catherine's College, Oxford*, Twentieth Century Architecture (Twentieth Century Society), p. 139



Final massing model on site

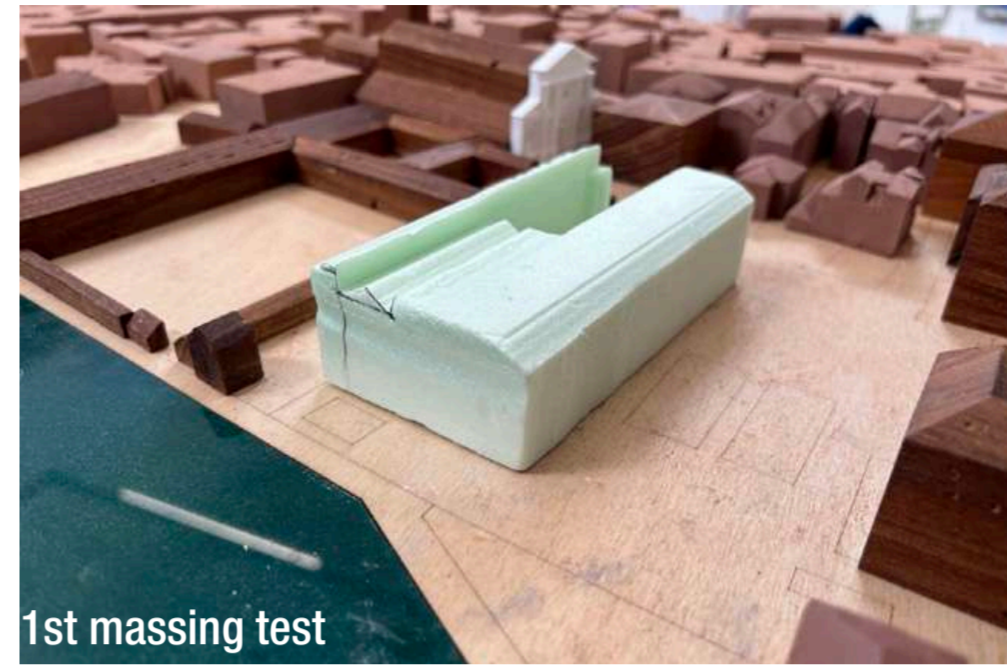
MASSING STUDIES AND ITERATIONS

My intention with my building and its' location on site stem from my analysis of the site, crystallised in three key ideas:
 -The building should respond to the Renaissance church boldly, yet respectfully (i.e of a similar height)

-The building should take advantage of the lagoon aspect.

-The building should restore the campo that predated the Gasometri.

This led to a series of massing tests, which evolved based on aesthetic qualities, programme evolution, precedent research and how each different test landed in the urban context.



1st massing test

- + Courtyard offers a threshold between outside and inside
- + Historical campo is restored by the building
- Pitched roofs contradict Rationalist influences.
- Courtyard is too tall on either side, users may feel boxed in
- Gallery connection to rest of building remains unresolved, too long and will not be used to access offices.



2nd test

- + Cloister reflects local monastery, inserts building into its' urban fabric respectfully
- + Flat roofs match Rationalist influence
- + Portego does not have any prominence relative to the rest of the building, which does not reflect its' importance to the programme



3rd test

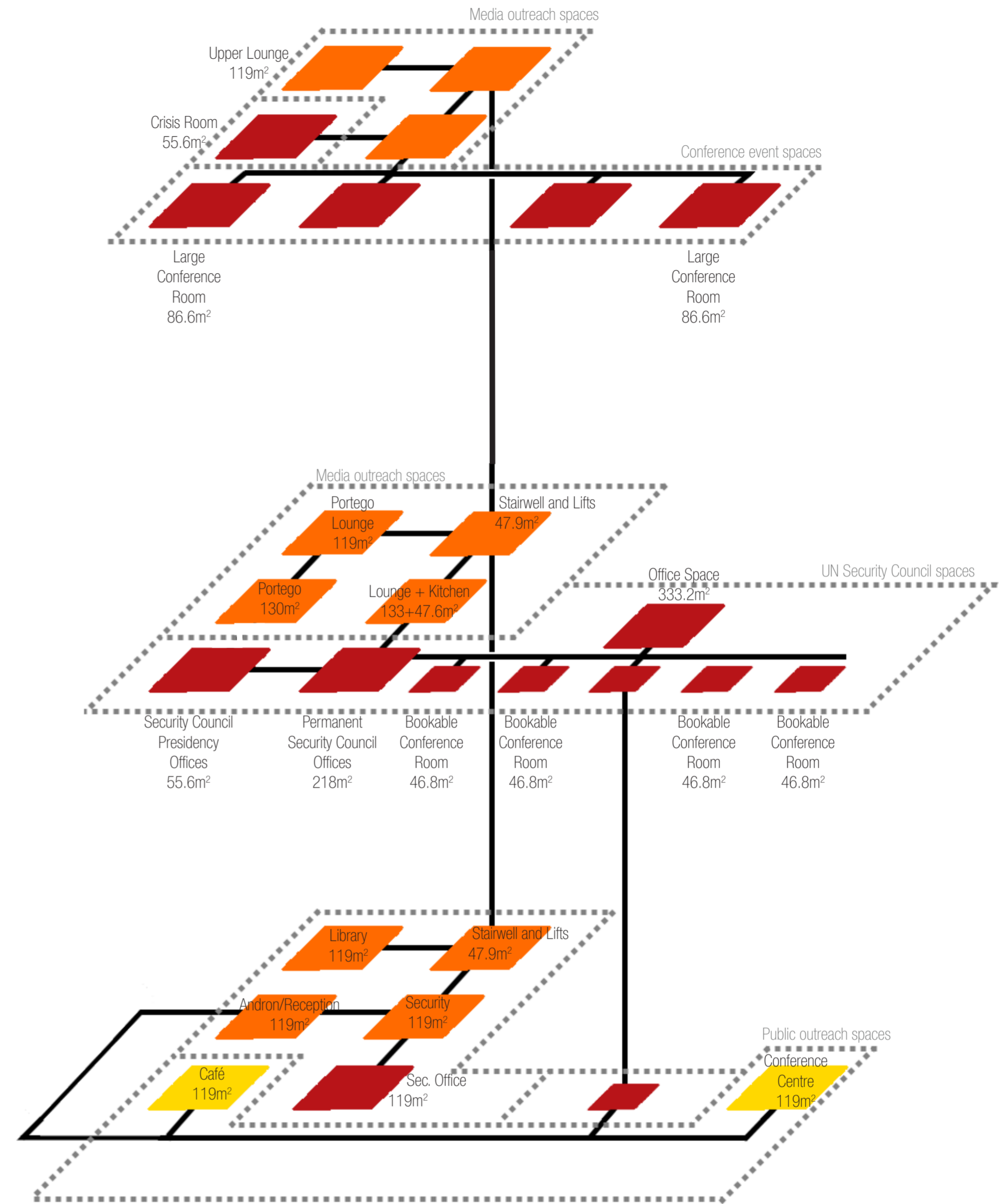
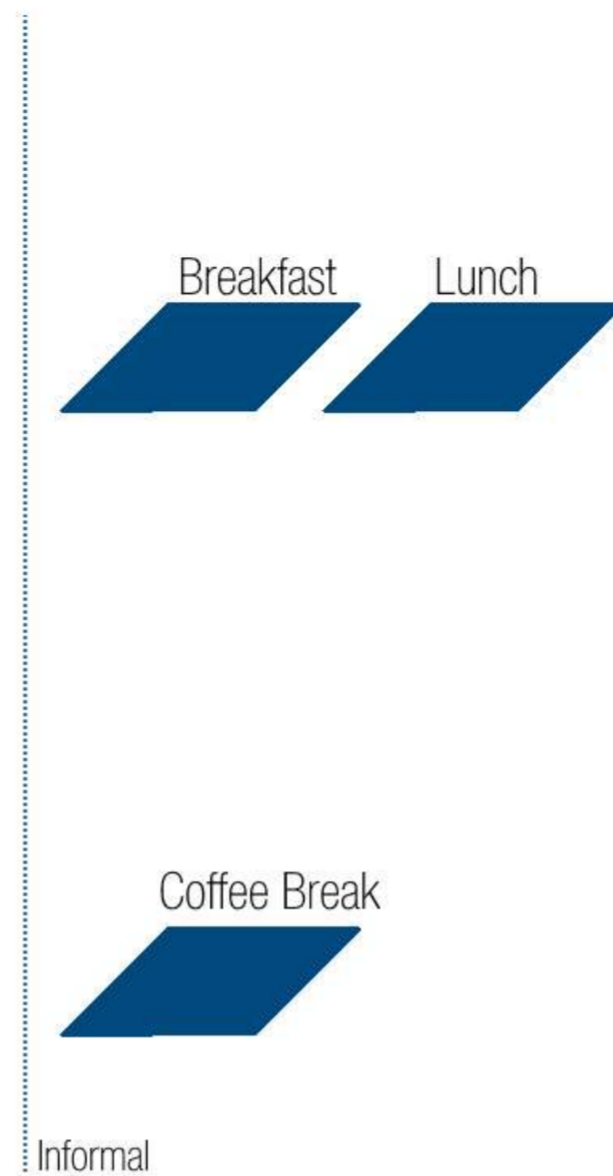
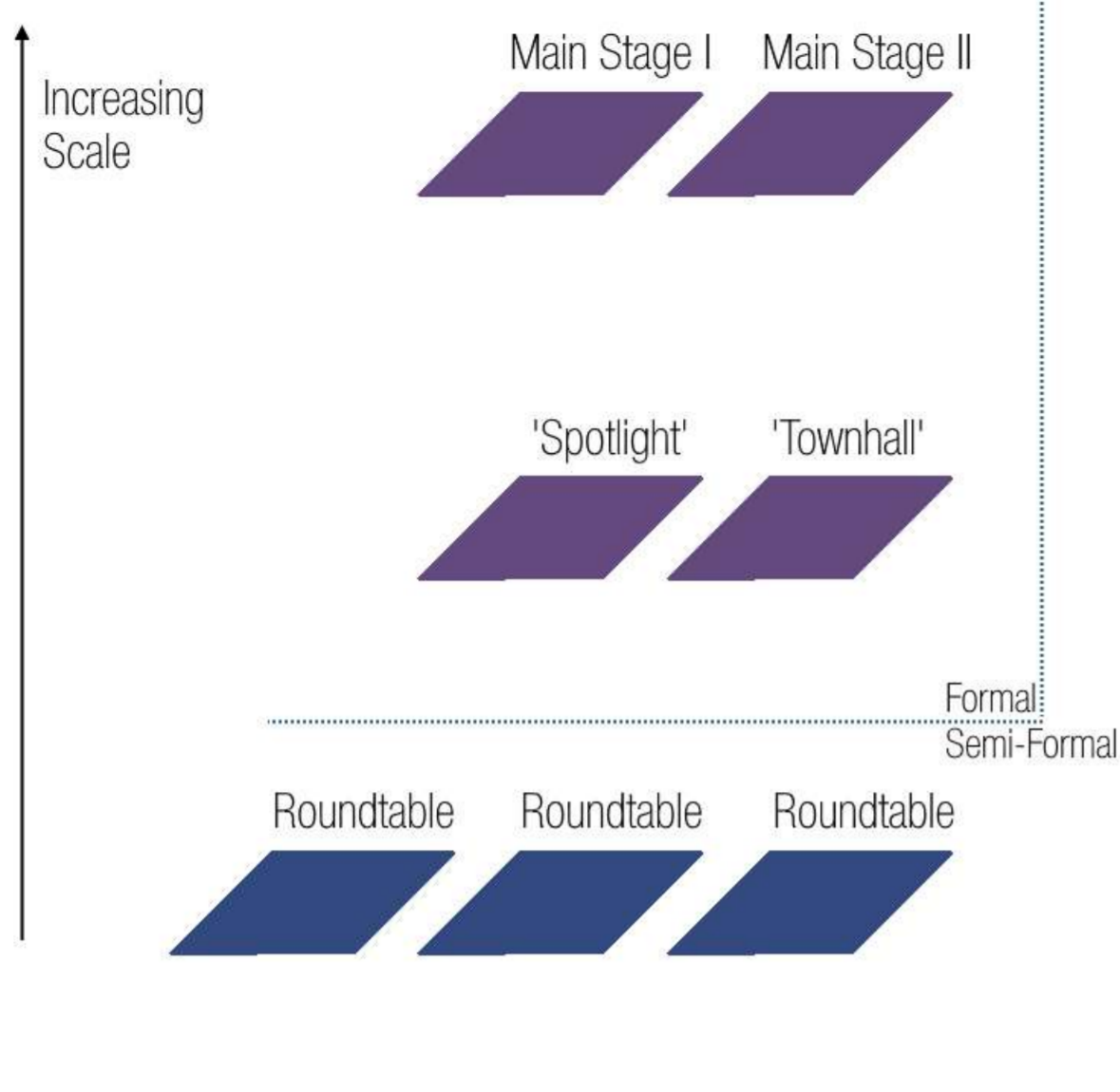
- + Portego is highlighted, meaning that its' importance to the programme is emphasised in the mass of the building
- + The cloister is better being fully parallel with the monastery rather than being chamfered, in terms of urban massing in plan.
- Building takes a timid stance compared to other tall buildings in campo, while the client warrants a more bold massing.
- The massing should transition more evenly from the lower-lying monastery to the taller technical college building.



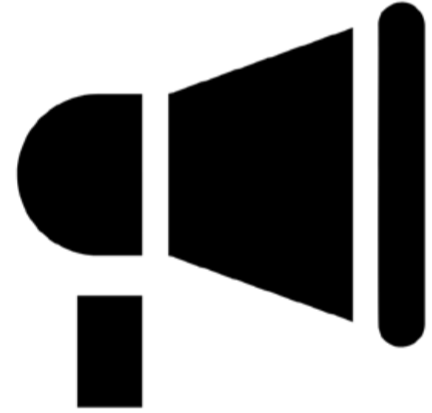
4th test

- + Building height strikes good balance between dominating its' campo and allowing the church to be the key building.
- Exposed structure maintains orthogonality so the fabric does not need to, in order to reflect work of Carlo Scarpa, allow the function of the lecture theatres to be expressed in the massing with a roof pitch.

Precedent: Munich Security Conference 2024



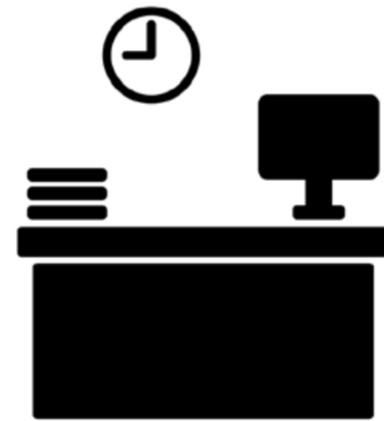
UN Security Council needs



Media and Public Outreach



Informal Discussion and Negotiation



Office Space Availability

SCHEDULE OF ACCOMMODATION

To determine the sequence of spaces in my scheme, I studied the Munich Security Conference 2024. This is relevant to the UN Security Council due to the presence of leaders such as Volodymyr Zelenskyy and Olaf Scholz.

A variety of event scales were hosted - from Main Stages hosting large audiences, down to invite-only 'Roundtable' discussions.

To adapt this schedule to the UNSC, an element of public outreach is needed, as this organisation is the public face of the United Nations' peacekeeping mission.

Likewise, more informal discussion space would be needed in line with the form many inter-nation discussions take, as well as office spaces to offer delegates a link back to their nation. This will also help establish a UNSC presence close to potential and active conflict zones like Ukraine, Israel, Kosovo and more.

Inspiration has also been drawn from the sequence of spaces in the UN Headquarters in New York, particularly in the definition of different functions of spaces.

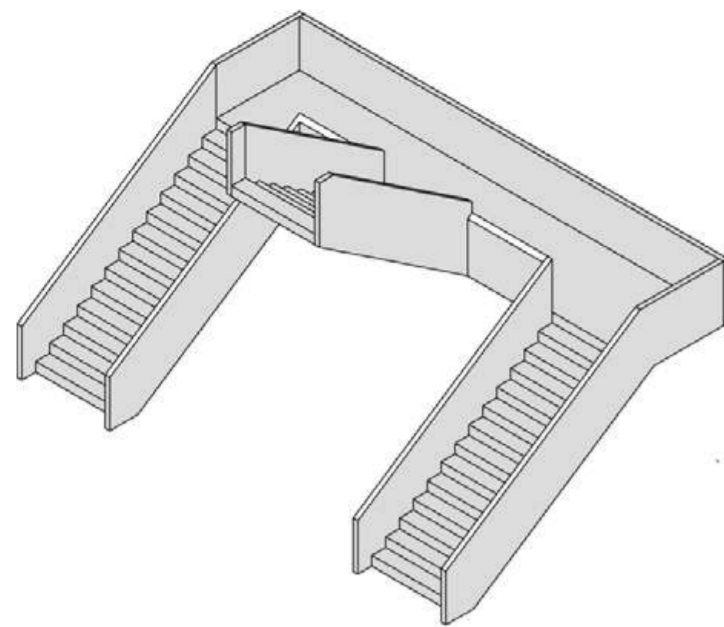
Offices have been situated towards the western facade of the building, more sociable and public areas towards the eastern facade, public areas on the ground floor, and lecture theatres on the top floor.

My final scheme combines a number of different functions in order to establish the presence of the UN Security Council more firmly in Europe:

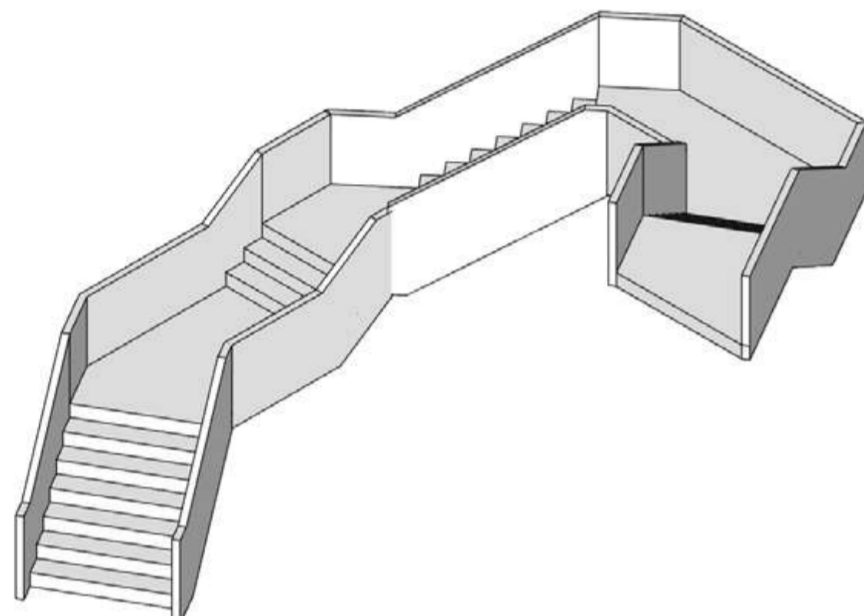
- Public outreach spaces, which work with local technical colleges to educate future generations.
- Media outreach spaces, to create a closer link between the people and their leaders.
- Conference event spaces, to promote discussion and talks.

Stairway testing and development

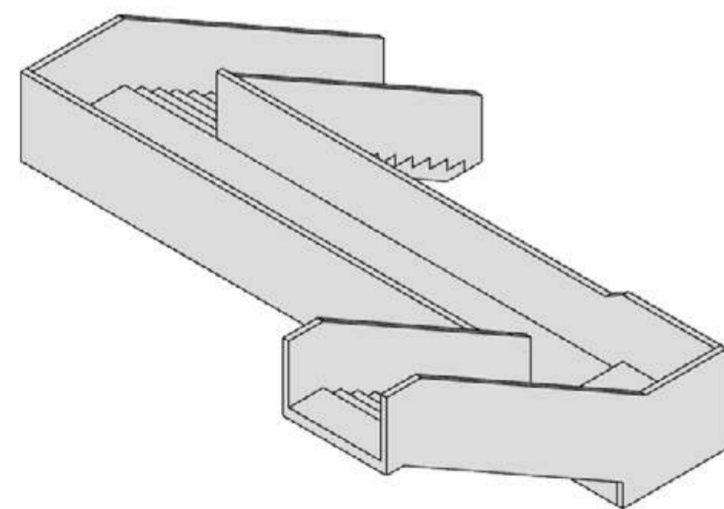
1. Grand entrance style



2. Promenade style



3. Orthogonal style



DESIGN DEVELOPMENT

ANDRON

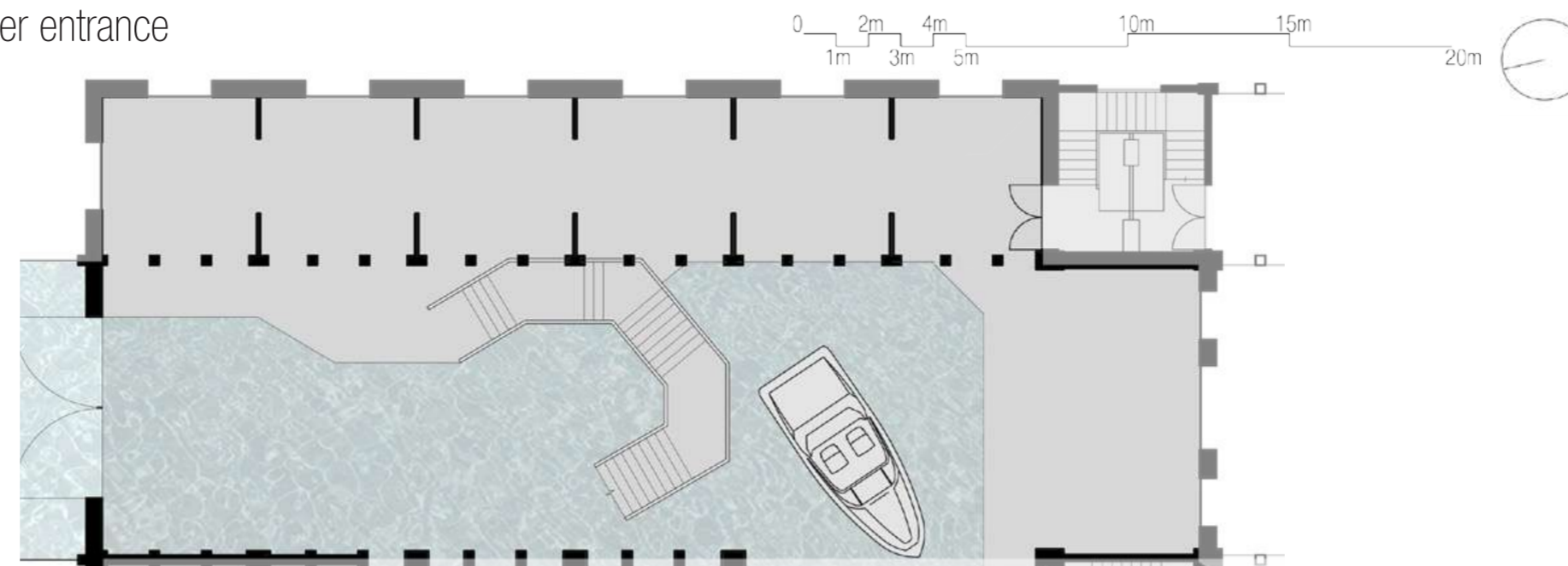
The ground floor of my scheme will feature the Andron, which in Venetian Ca' is the most important public room, traditionally used for sales.

This means that for my scheme, the Andron will be an important focal point - as the antechamber to the Portego for guests as well as focus of key ground floor spaces.

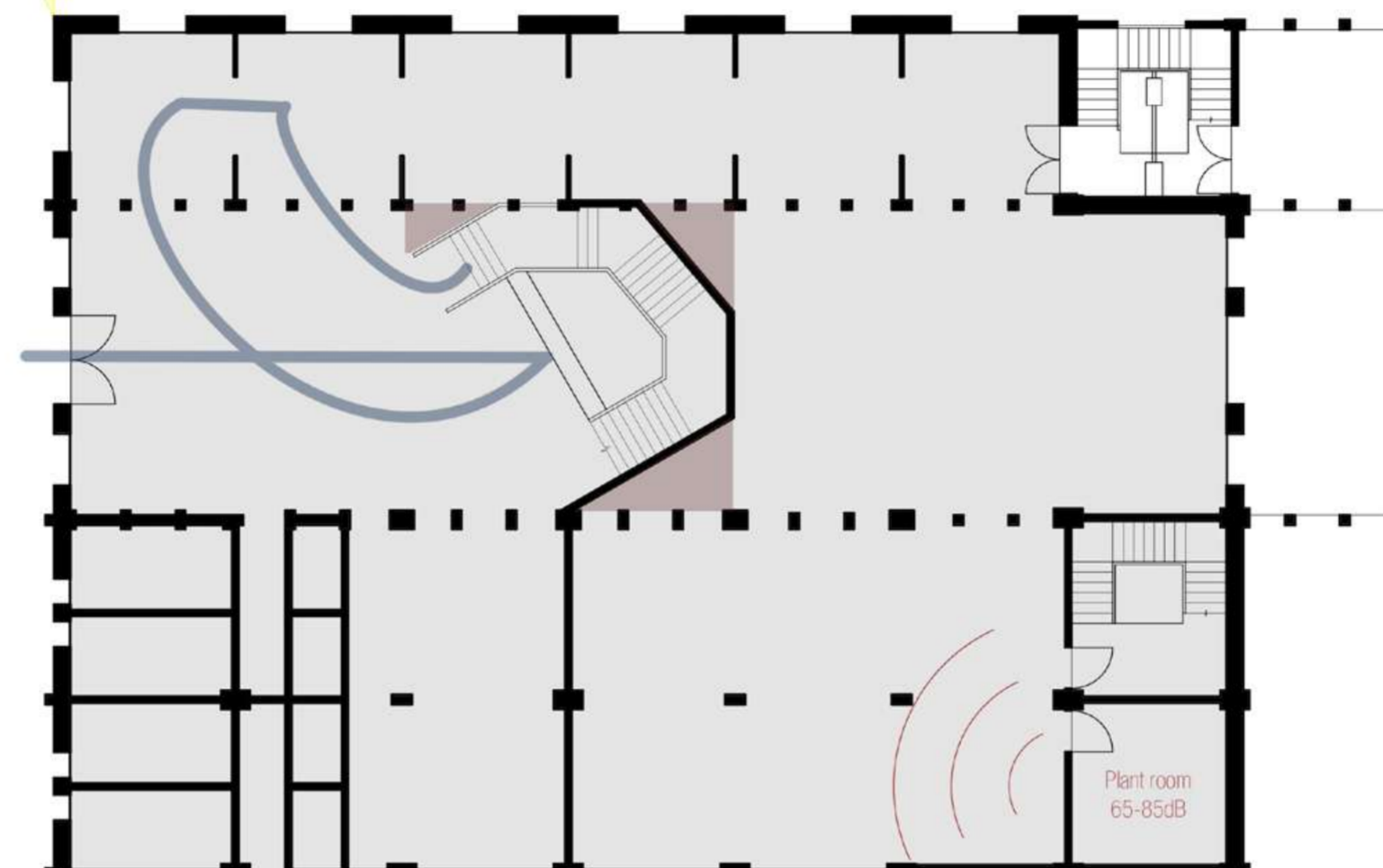
Key factors that influenced the development of this floor were the main staircase to the Portego, the link to the cloisters, and public-private thresholds.

Testing and development in plan

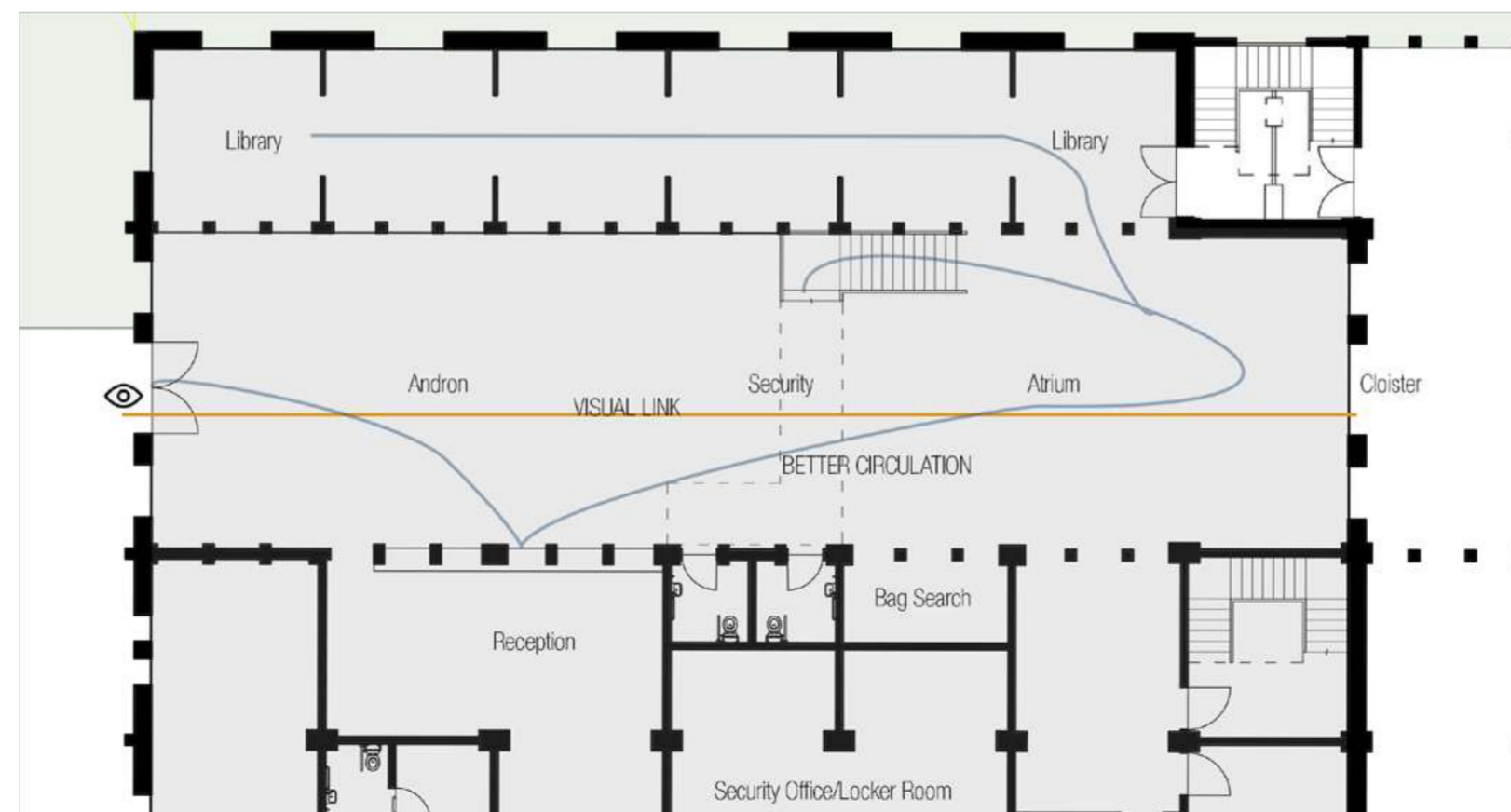
1. With water entrance



2. Water excluded, reception by stairs, library behind



3. Stairway defines threshold, library separated, even flow of people.



Findings

+ Staircase form adds drama to space, creates focus as entrance

+ Visual link to cloisters

- Space feels underused, makes andron transitional space rather than functional space in itself

+ Reception gives Andron purpose

- Circulation pattern not ideal, weaves in and out of colonnade and turns back on self

- No visual link to cloister areas, causes them to be secluded and less integrated

- Library has unusable space due to staircase form

- Plant room creates too much noise for library

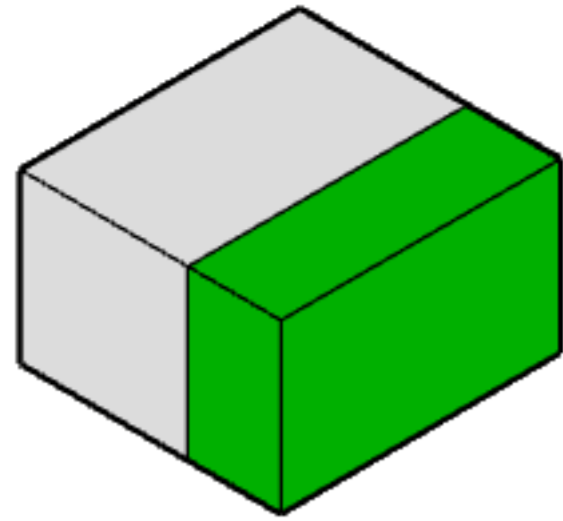
+ Visual link to cloisters

+ Clear hierarchy of spaces, library is behind colonnade to create necessary sense of privacy

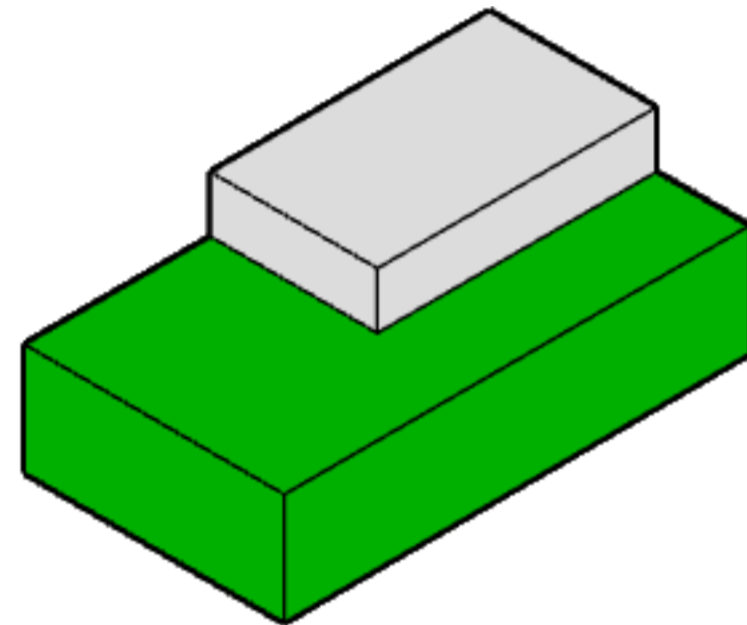
+ Staircase creates threshold into security area, defines public and semi-private domains

Visual links between spaces

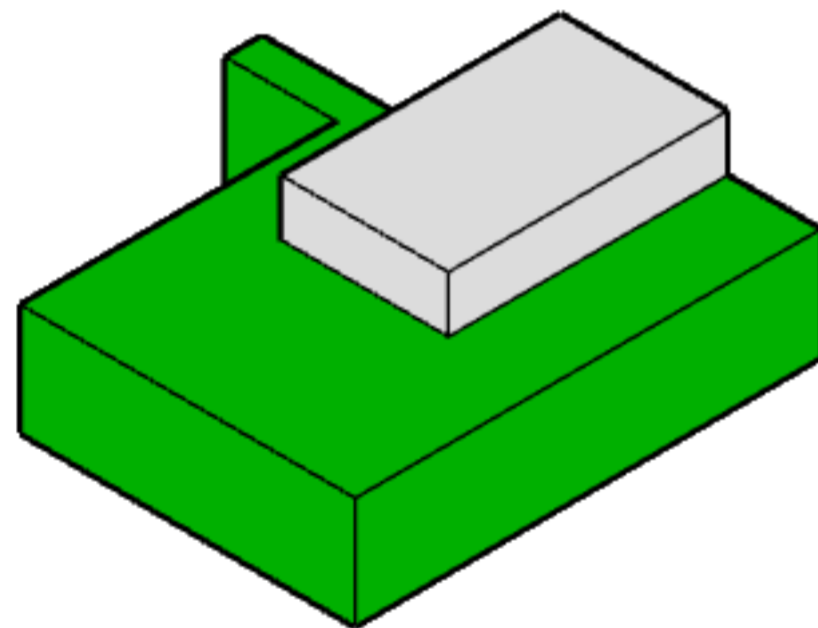
1. Gallery and side salone



2. Lounge, side salone and atrium



3. Lounge, side salone and office link



DESIGN DEVELOPMENT

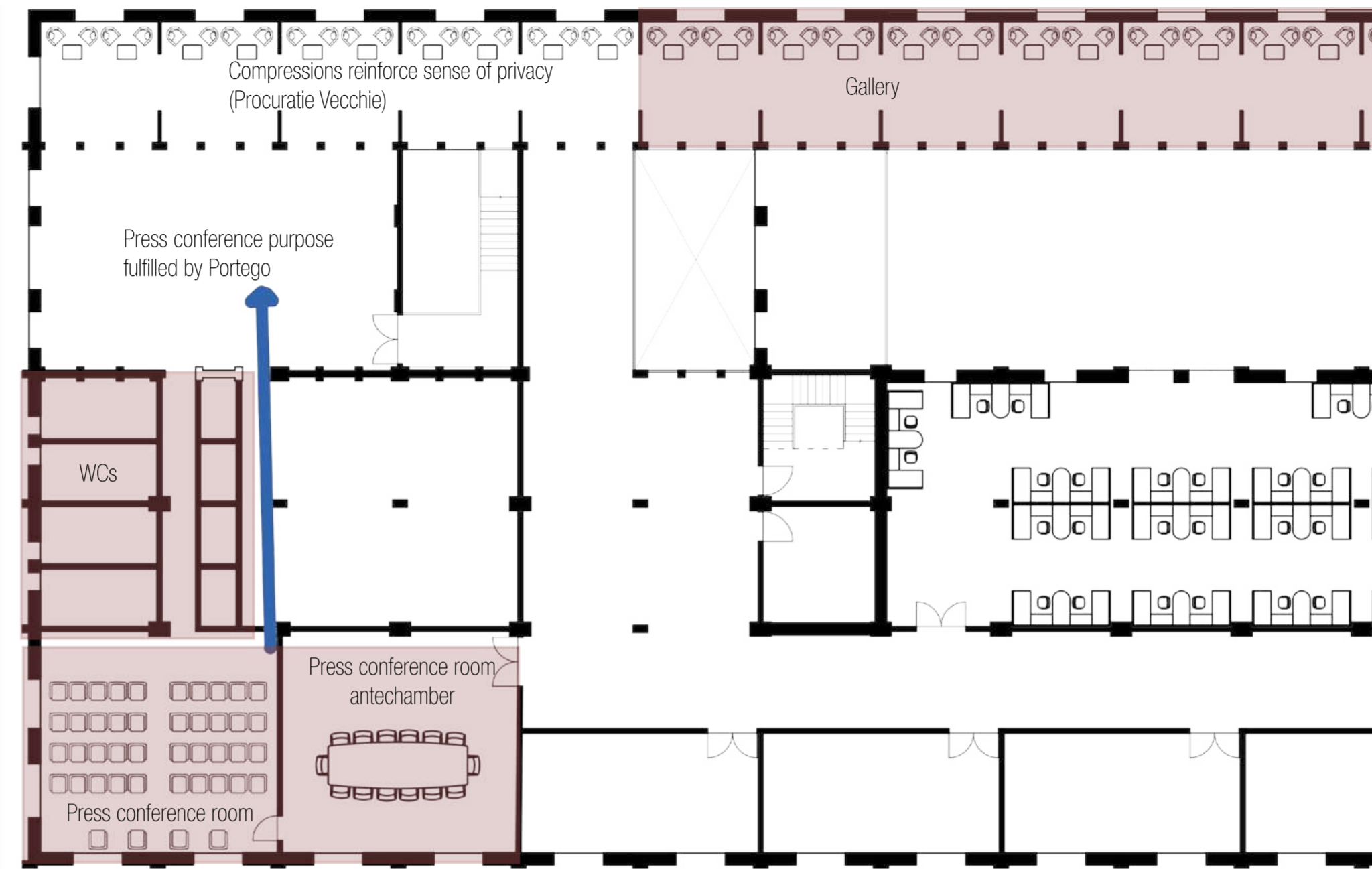
PORTEGO FLOOR

The Portego, in the typical Venetian Ca' typology, sits above the Andron, and serves as the key public space in a Ca'. In my building, this means:

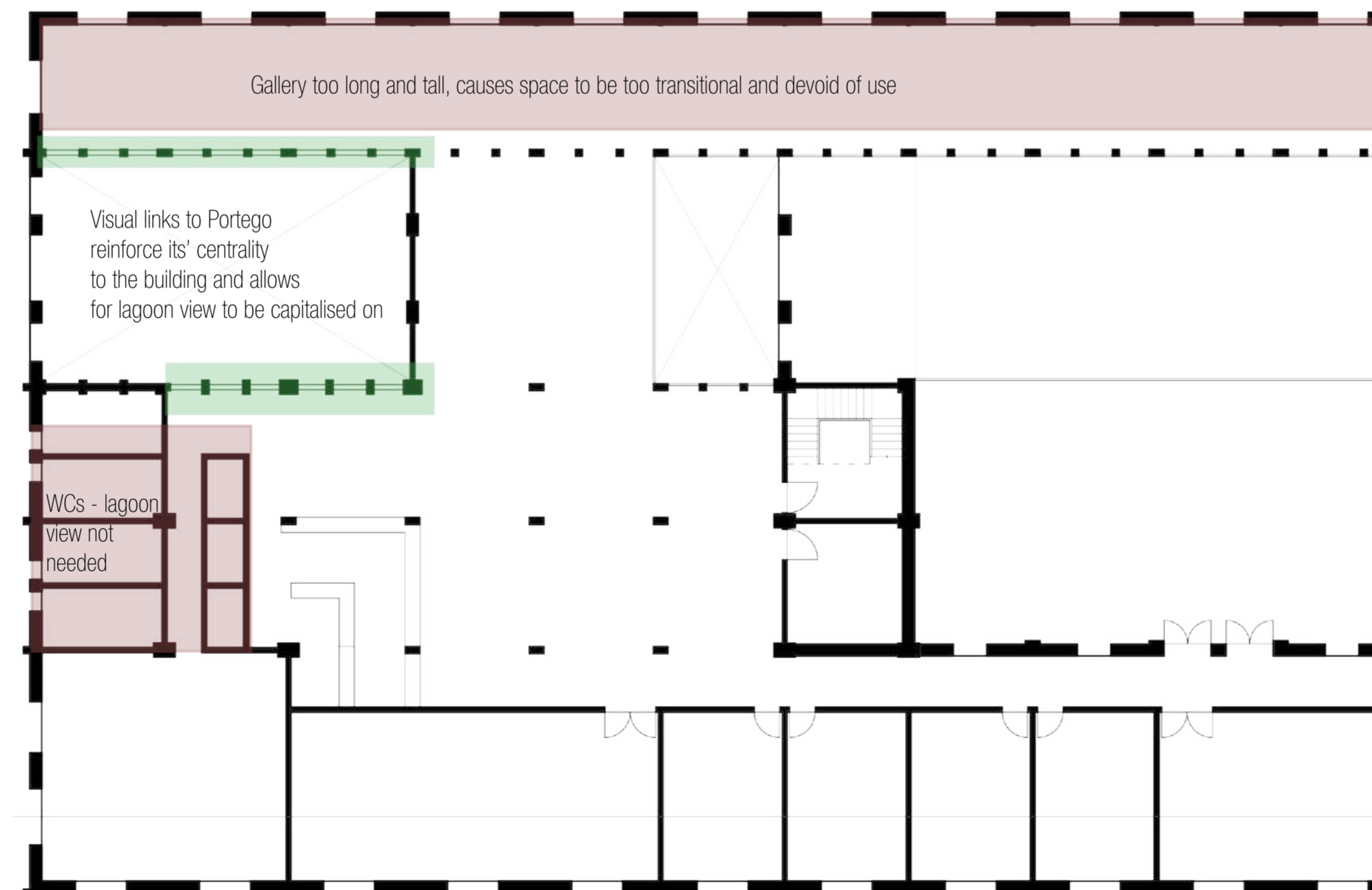
- Hosting press conferences
 - Drinks receptions
 - Acting as an anchor for the rest of the building
- This means that visual links to the Portego in other rooms are key, to reinforce its' centrality and importance.

Testing and development

-Initial lower Portego plan



-Initial upper Portego plan



Findings

- Press conference room not necessary, this will be held in the portego
- Offices for UNSC president & senior staff should be provided
- Conference room acting as antechamber to the press conference room is too large and is unnecessary given other conference rooms
- Offices need easy access, consider day-to-day use, everyday workers will not always wish to travel through grand spaces such as the Portego
- Toilets having lagoon view is unnecessary, this space could be used for a better purpose

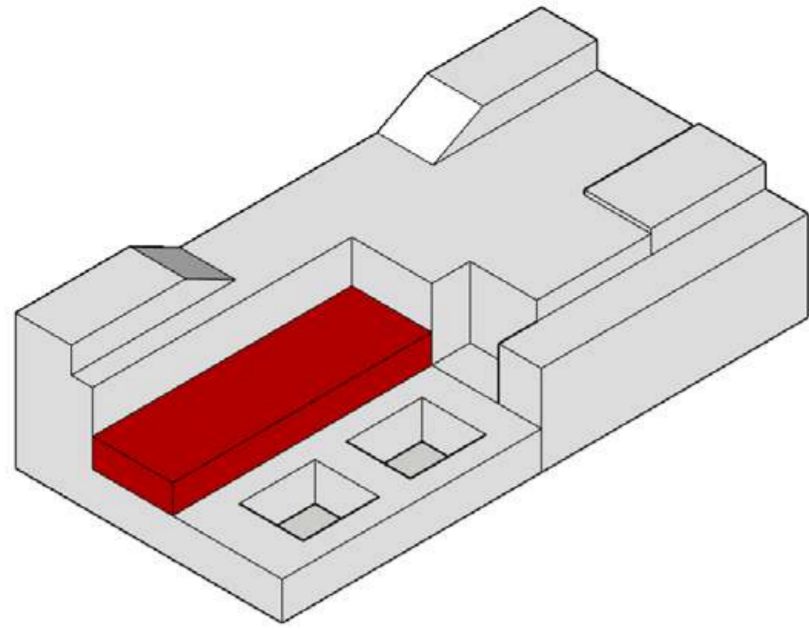
+ Lagoon framing enhances space

- Gallery too tall and does not promote human interaction
- Gallery space does not provide opportunity to stop, instead is too transitional as a space
- Crisis room needed

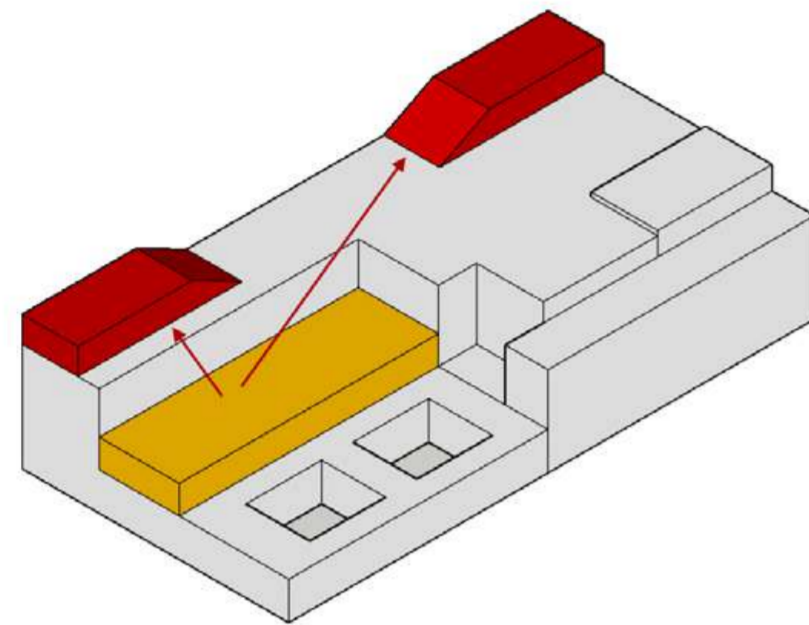
Responses

- + Small stairway provided from ground to first floor by the offices, in order to provide easy day-to-day access
- + Toilets moved away from lagoon window, in order to make room for crisis room
- + Press conference room and press conference antechamber replaced with Permanent UNSC Member offices.

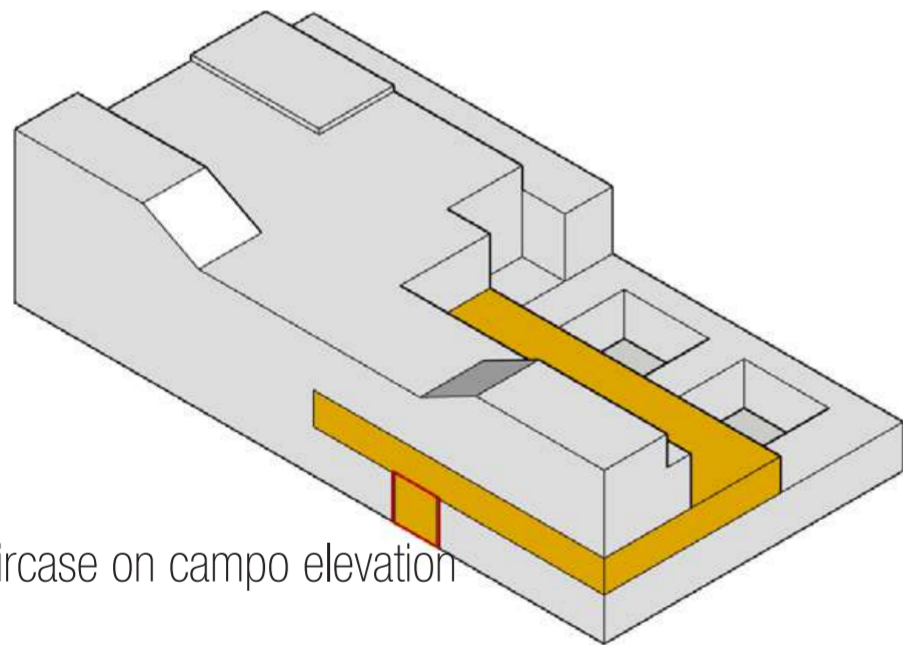
Location in scheme



Lecture theatres moved to top floor



New staircase added to offer direct access to offices



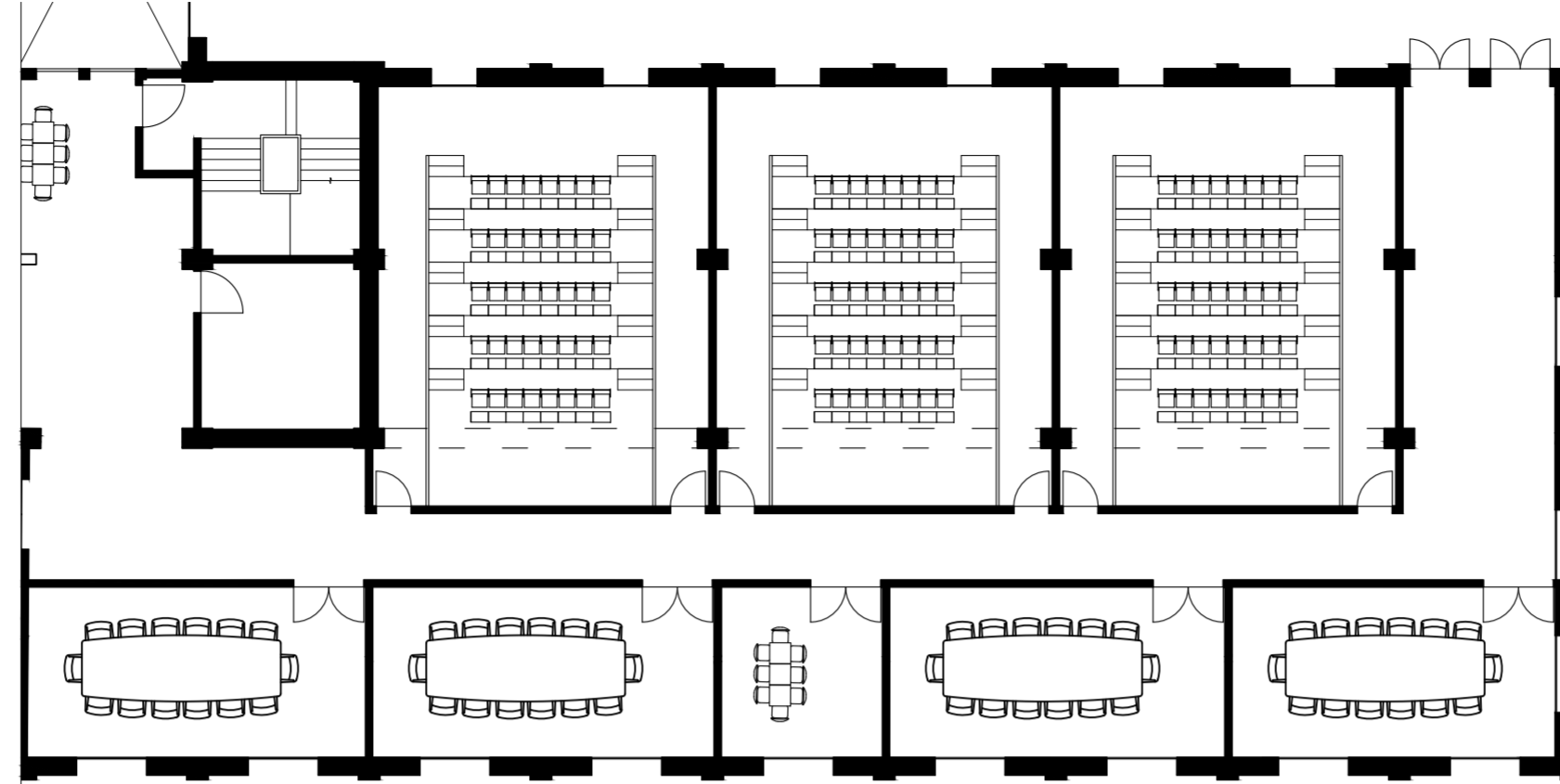
Staircase on campo elevation

DESIGN DEVELOPMENT OFFICE WING

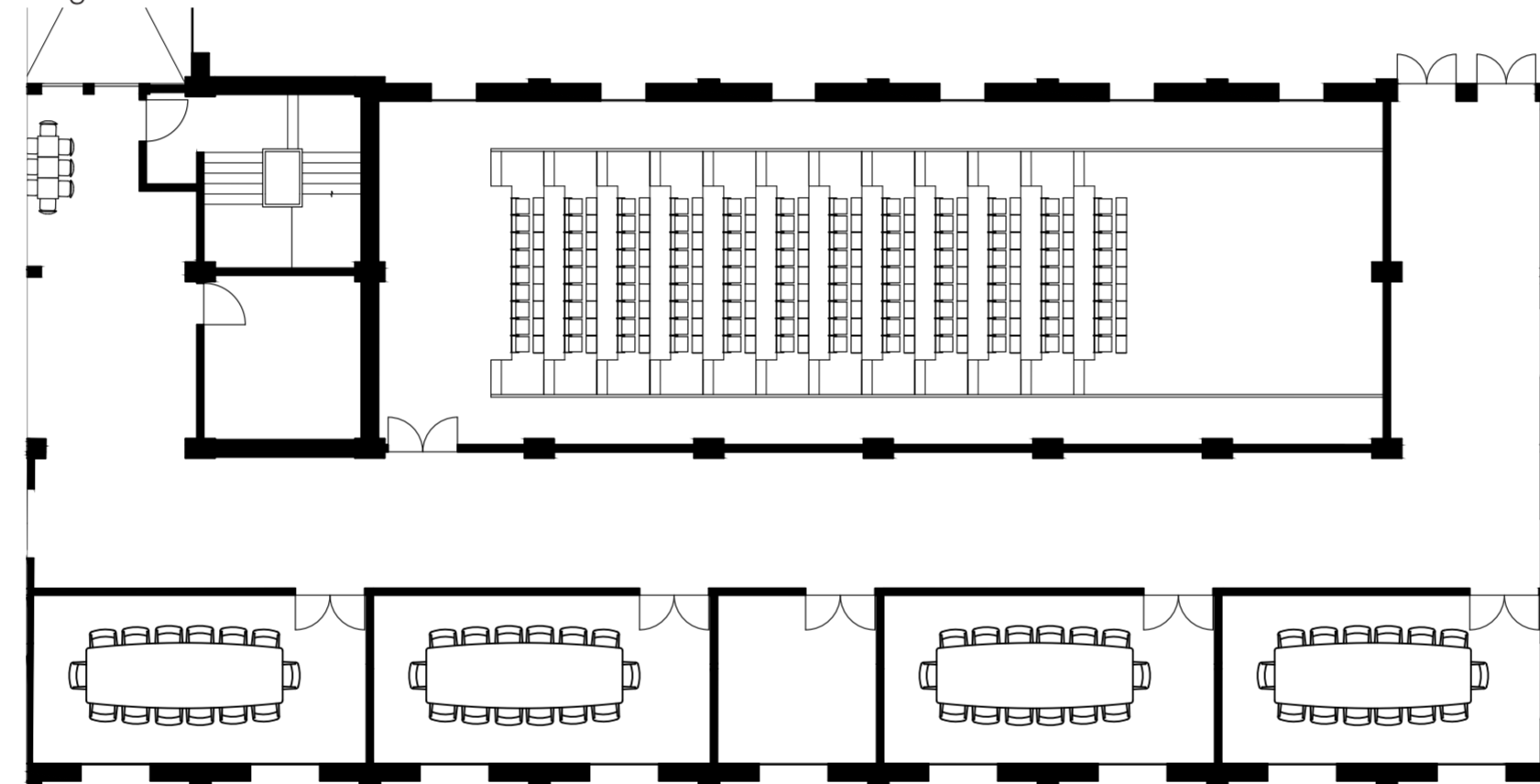
While my UN Security Council outpost will function as a public conference centre in the event of important world leaders holding talks for delegates, it also needs to be able to function in day-to-day use as a key outpost in Europe.

This means that an office space will be of paramount importance in the scheme.

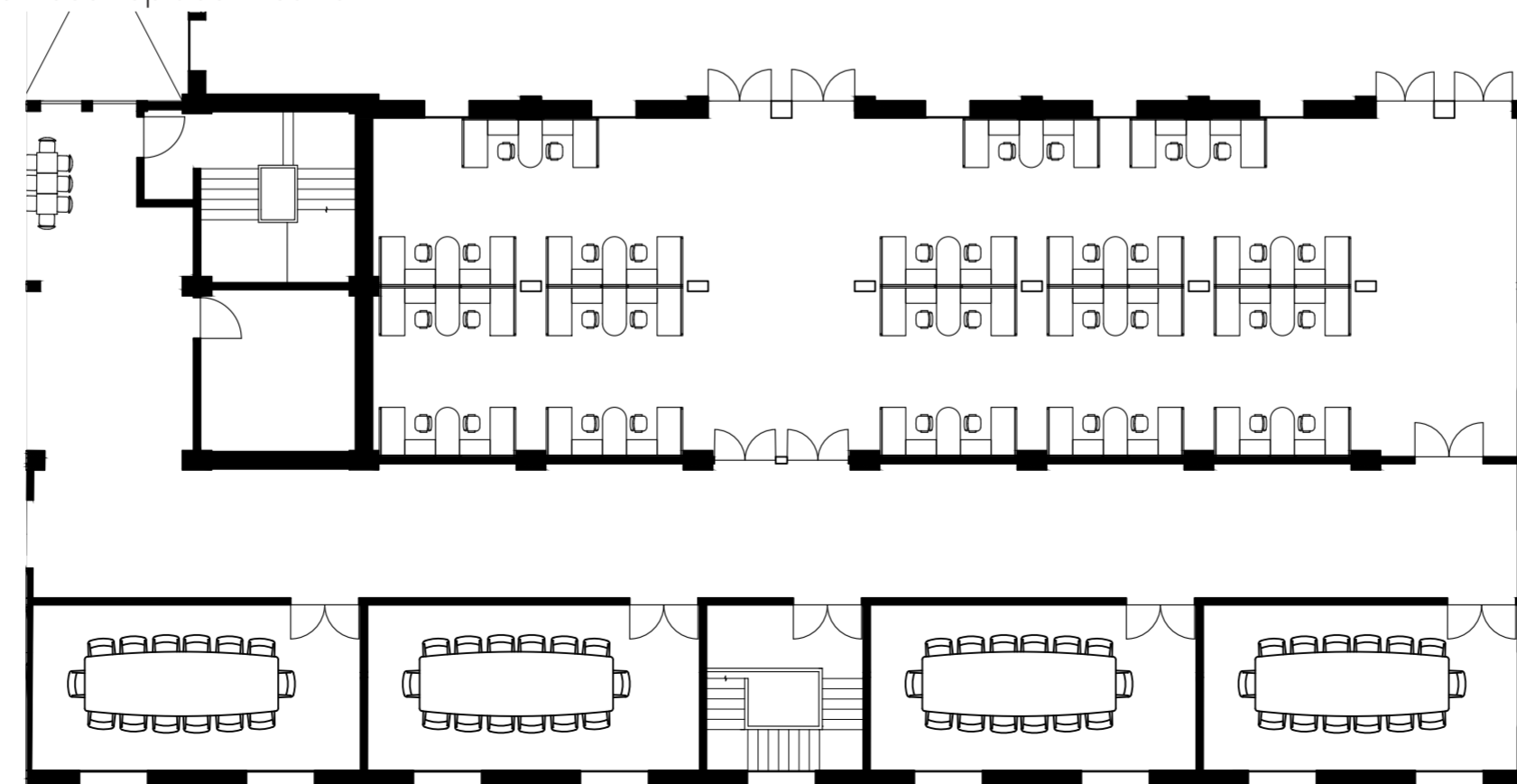
1. 3 lecture theatres tested



2. 1 large lecture theatre tested



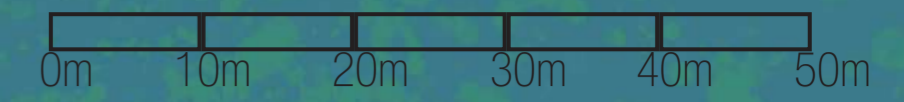
3. Offices replace theatre



Findings

- + East light very effective for filtering in natural lighting for talks in the morning
- + Lecture theatre proportions are correct
- Lecture theatre does not follow structural rhythm
- Three lecture theatres is too many, delegates may struggle to choose meetings
- + One lecture theatre means focused important talks can be held
- Office spaces are needed as per the schedule of accommodation, to allow delegates a designated working space
- + Visiting VIPs, political dissidents and speakers can use seminar rooms when necessary, however with an office, they can also be used in day-to-day operations
- + Hot desking spaces mean that delegates can use the Venice outpost whenever they are needed in the region for security reasons
- + Large terrace space offered outside of offices on top of cloisters
- + Staircase offered on campo elevation in order to offer quick and simple access to UNSC employees during day to day operations

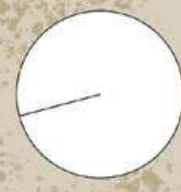
SITE PLAN 1-500



Chiesa San Francesco della Vigna



GROUND FLOOR 1-200



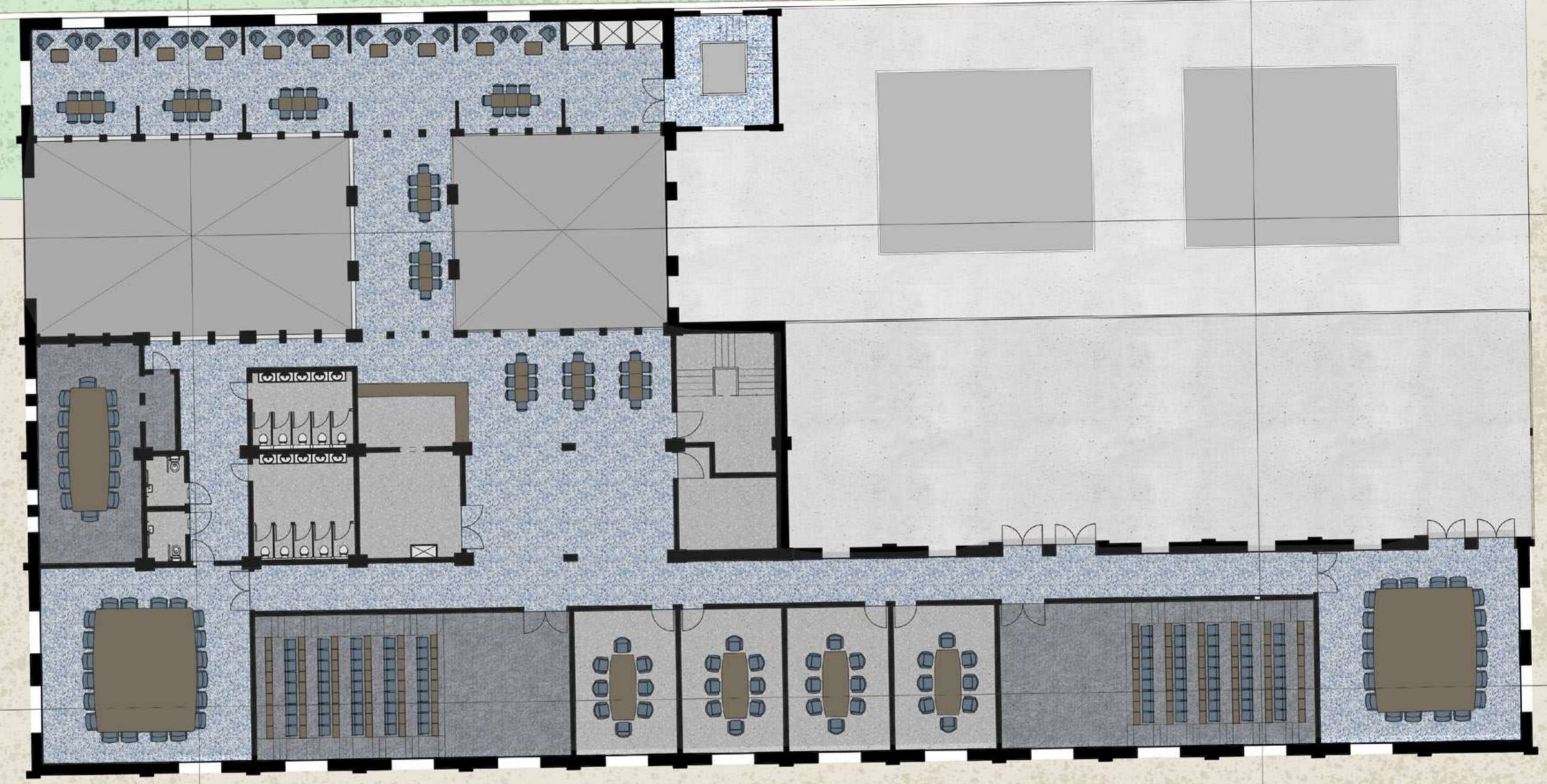
0m 5m 10m 15m 20m

1st FLOOR 1-200

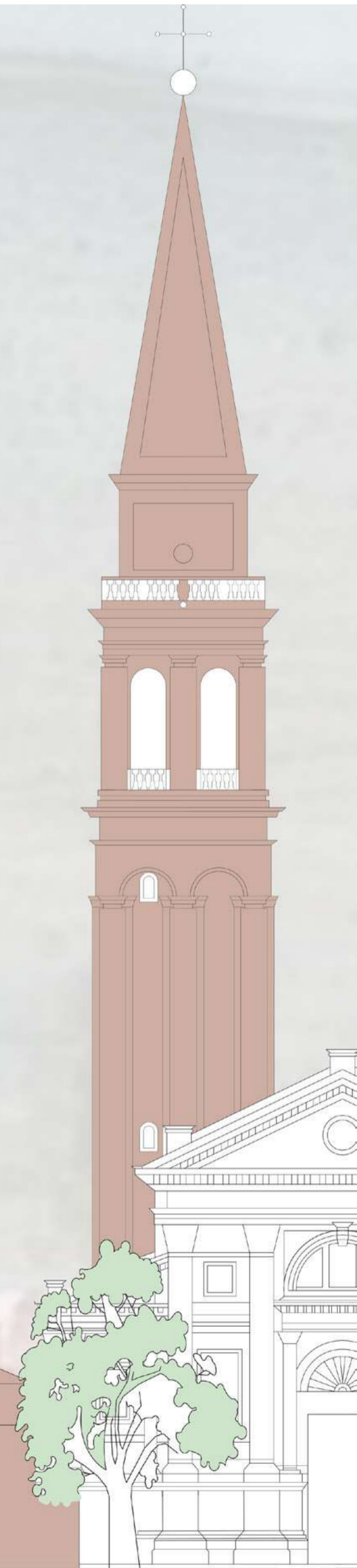
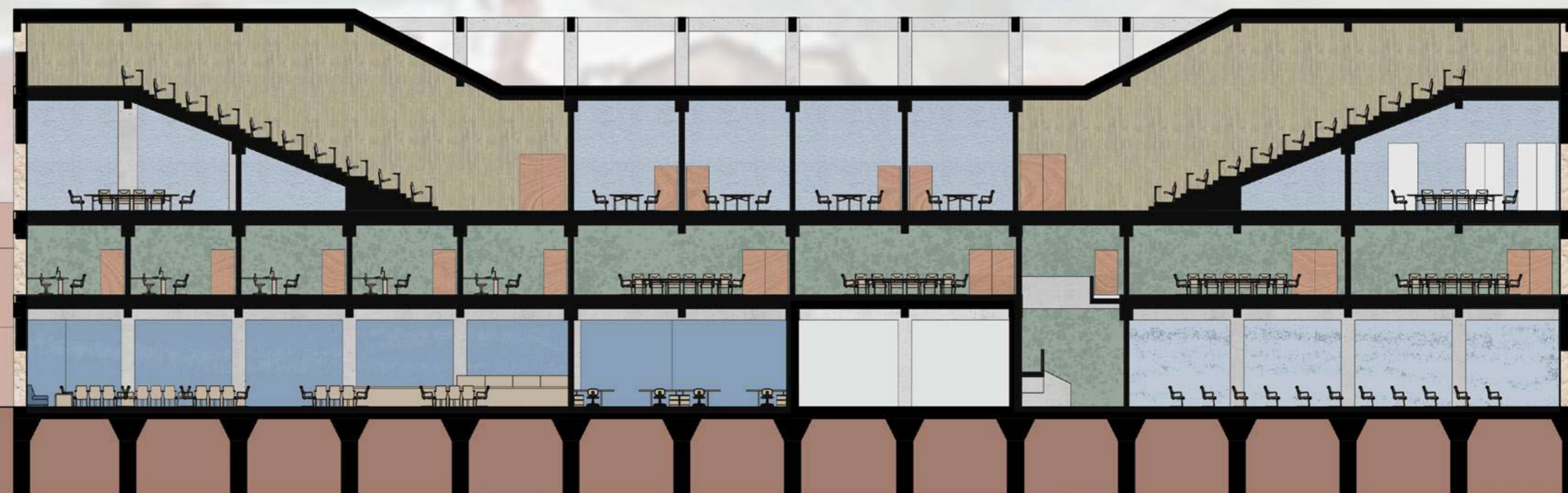


0m 5m 10m 15m 20m

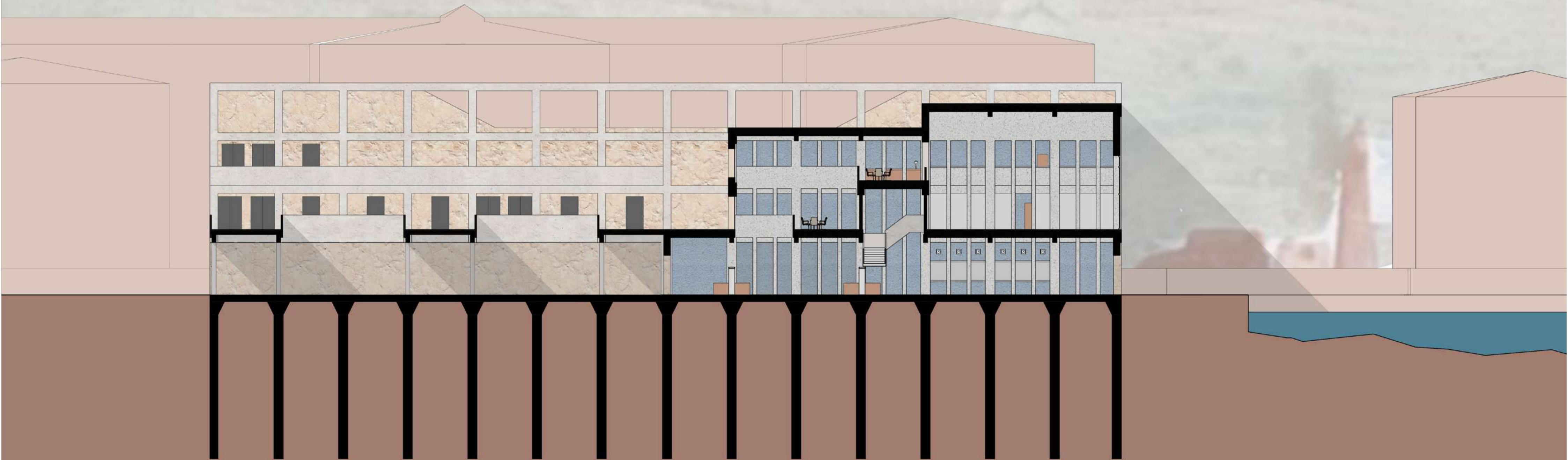
2nd FLOOR 1-200



Section AA
1-200



Section BB
1-200



Section CC
1-200



PRINCIPAL ELEVATION

1-200 0m 5m 10m 15m 20m





Cloister Terrace



Public Cloister

EVENT SCENARIO

Keynote speech by VIP

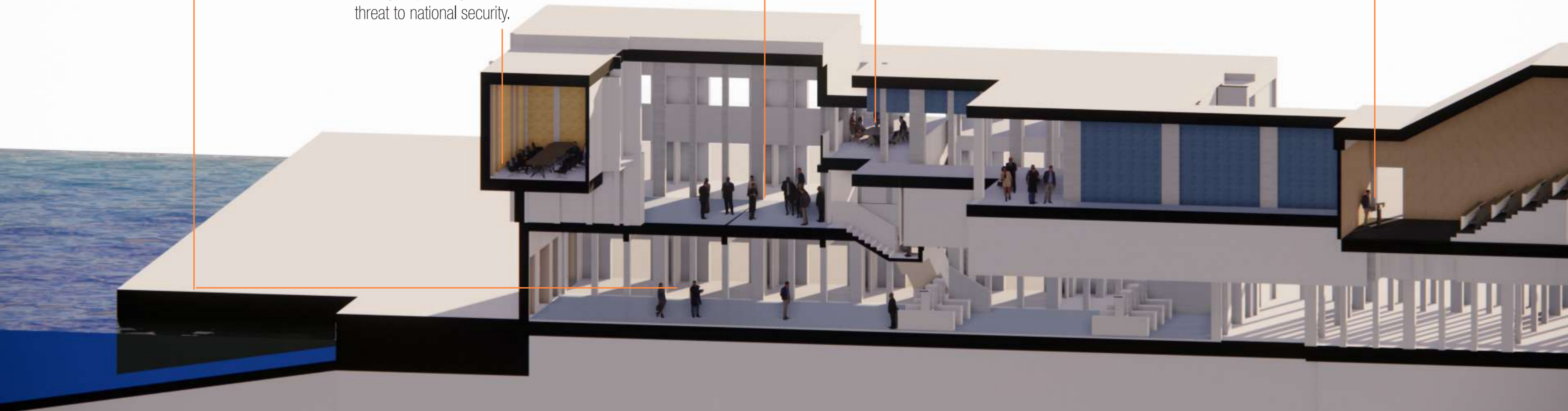
1. Ukrainian president and entourage arrive in Andron, all pass through security checks.

5. VIP is called to crisis room, following emergency intelligence about a severe threat to national security.

2. Media reception takes place in the Portego before the keynote.

3. VIP and entourage stop for a coffee in the lounge before keynote, go over final notes.

4. Keynote speech is delivered in the lecture theatre.





Entrance - Andron



From the Portego to the Lounge



Crisis Room



SUSTAINABLE AIMS

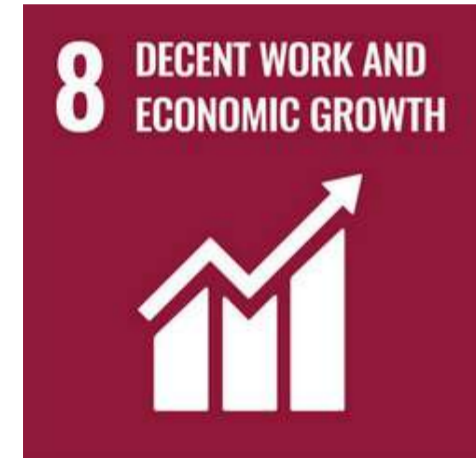
1. Fabric First

To keep the energy use of my building down, I will focus heavily on the building envelope, with emphasis on keeping the U-value below the Passivhaus standard of 0.15W/m2K.

2. Standards beyond Regulations

My building needs to be focused on the future above the present, so a focus on standards like the UN Sustainable Development Goals, the Venice Charter and the RIBA Challenge 2030 will drive my approach.

Key UN Sustainable Development Goals



My scheme should have a positive impact on the Venetian people and economy.



My scheme should promote equality through peace and security.



My scheme should protect the Venetian Lagoon and other marine life.



My scheme should promote confidence in peace and sustainability.

3. Passive Response to Site Challenges

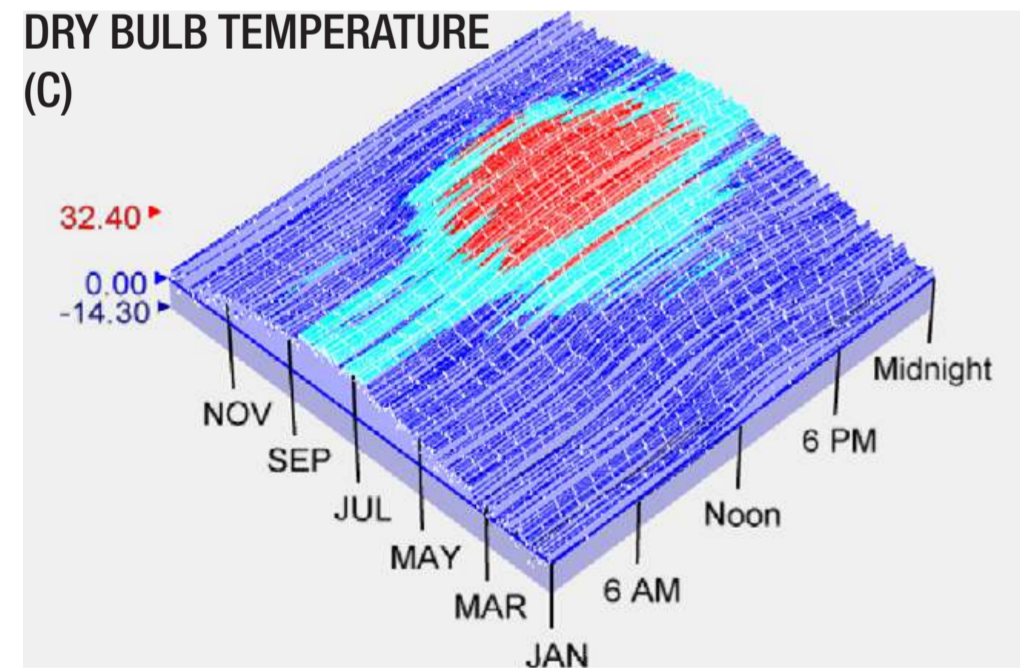
My context features a range of climate related challenges. To reduce my building's carbon footprint and respond to the climate emergency, my building's response to these should be as passive as possible.

4. Local Materials, Low Embodied Carbon

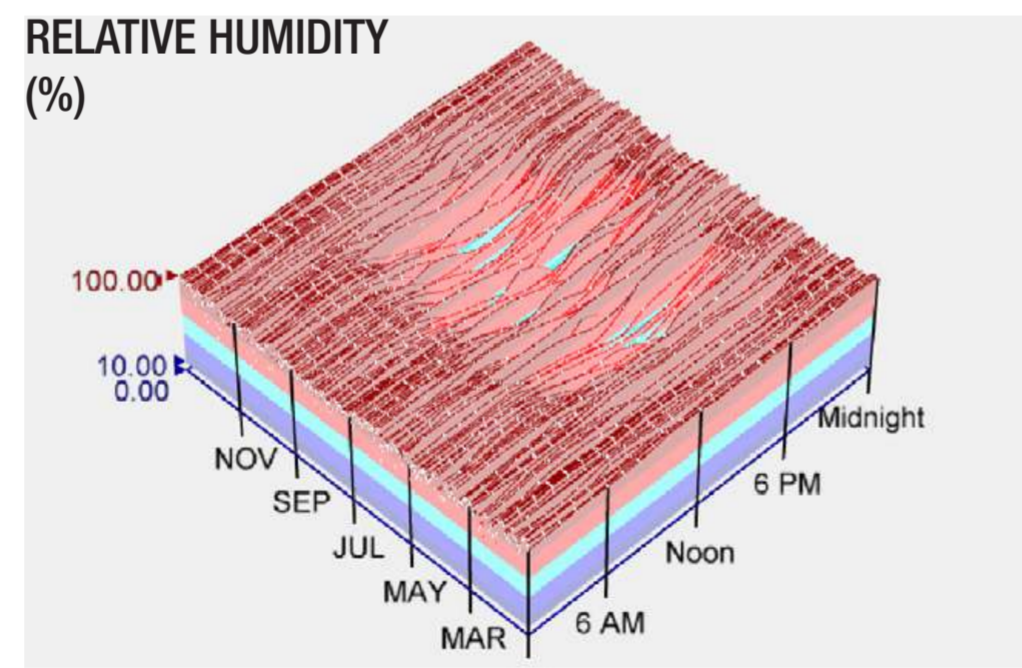
Embodied carbon comes mostly from transport - to minimise this, I will aim to source most of my buildings' materials from the Veneto region. The Embodied carbon will be measured in tCO2e (Equivalent tons of CO2).

SITE ANALYSIS

DRY BULB TEMPERATURE (C)



RELATIVE HUMIDITY (%)



DESIGN RESPONSES

-SOLAR

My project will need to be situated closer to the lagoon to capitalise on passive heating, as the site experiences overshadowing that may mute solar gains.

-WIND

For natural ventilation, the primary openings should feature on the north side of the building, as the prevailing wind comes from this direction and passes over the lagoon, offering natural evaporative cooling.

-TEMPERATURE

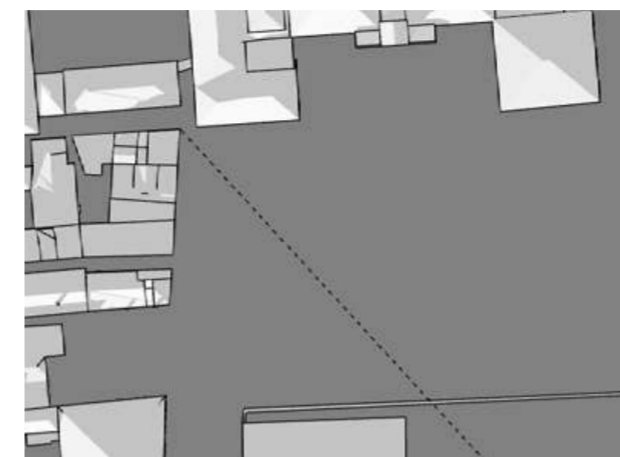
Shading should be employed where appropriate (on eastern and southern facades) to cool the building, as well as ventilation strategies, as the temperature is often above 25C. Some mechanical cooling is likely to be required.

-HUMIDITY

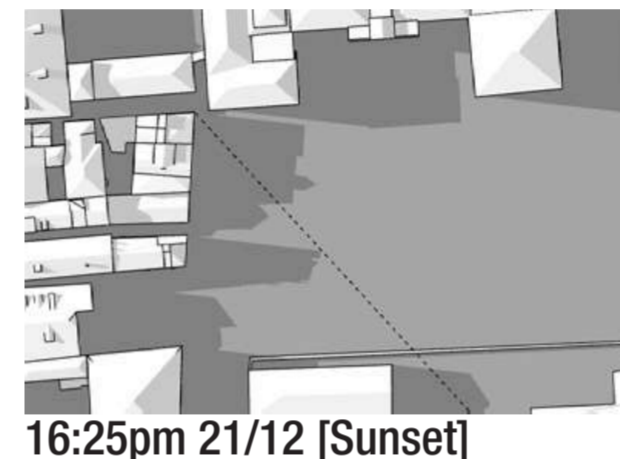
Appropriate vapour control membranes as well as adequate ventilation will be required to prevent damp and moisture, as Venice experiences high relative humidity levels.

-OVERSHADOWING

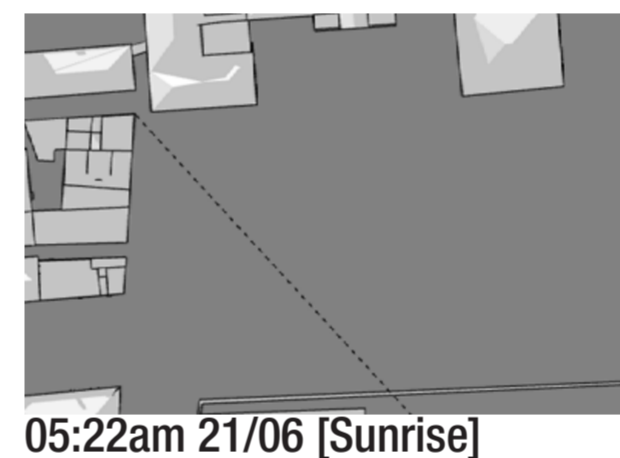
07:48am 21/12 [Sunrise]



12:00pm 21/12 [Noon]



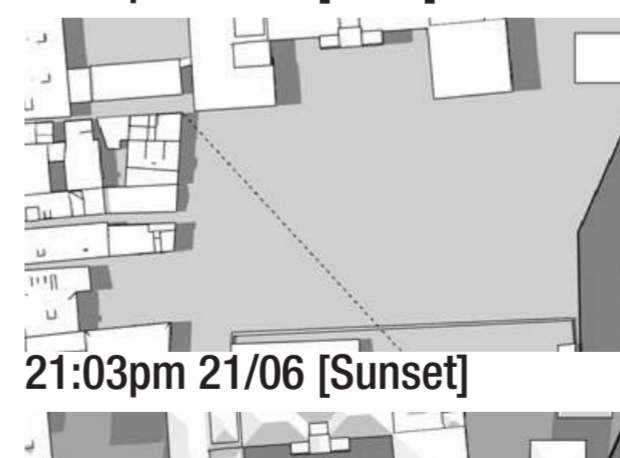
16:25pm 21/12 [Sunset]



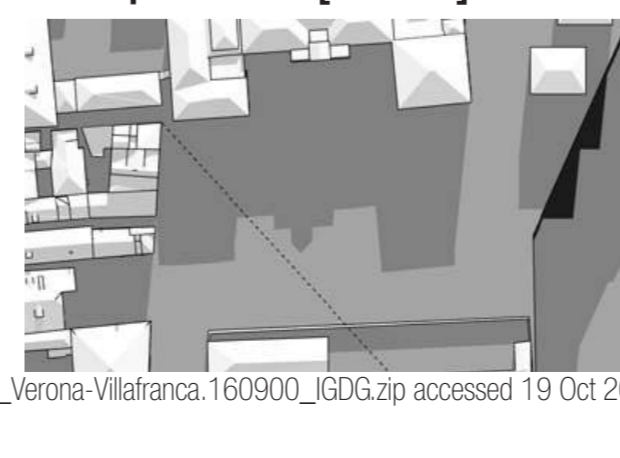
05:22am 21/06 [Sunrise]



12:00pm 21/06 [Noon]



21:03pm 21/06 [Sunset]



-SITE PLAN



-OVERSHADOWING CONCLUSION

During the summer months, overshadowing is far less of an issue - at noon, the site does not experience any overshadowing. This does, however, demand shading louvres on this facade, in order to cool the building.

Overshadowing becomes a major issue in the winter months - the east and west facades do not receive much solar gain thanks to the low sun altitude in the morning and evening. Large openings must therefore feature on the south facade in order to heat the building passively.

MATERIALITY

-My building will reflect local Venetian urban fabric, in line with the Venice Charter, through the use of **local materials** primarily in order to minimise embodied carbon through transport. My materials should also have minimal freshwater toxicity according to the BRE Green Guide - this issue is very pertinent to Venice. KgCO2e should be minimised, or even negative, so any carbon emitted in the construction of my building can be sequestered.

	Cladding	Insulation	Interior Wall	Interior Floor A	Interior Floor B	Columns	Beams
	Prun Stone	Cellulose ³	Istrian Stone Tiles	Terrazzo ⁵	Timber ⁶	50% GGBS Concrete	Steel
Distance from Venice	61km	173km	109km	Local/In-Situ	58km	7.2km	25km
Fire Safety ² (Euroclass, EN13501)	A1	B-s2d0	A1	C-s1d0	B-s2d0	A1	A1
Thermal Resistivity ⁴ (W/mK)	0.84	0.037	0.84	0.41	0.14	1.7	50.0
KgCO2e ¹ (60yrs)	33.3	-1.1	19.6	81.0	-48.0	80.0	6.2
Freshwater Toxicity (BRE)	A+	A+	A+	A	A+	A+	A+

-Distance from Venice

The insulation material, Thermofloc, is supplied the furthest away - however, this is justifiable as it will help me achieve my desired U-value. Terrazzo can be produced within Venice, however has a far higher embodied carbon than Timber.

-KgCO2e

Timber should be maximised wherever possible, in order to achieve more carbon sequestration. While less local, terrazzo is unlikely to achieve a negative carbon equivalent. The concrete frame has a high carbon footprint, however is necessary to support the design narrative through the structural philosophy.

U-VALUES

A key part of my sustainable strategy is a Fabric First approach - which I will measure with the RIBA 2030 Challenge in my energy balance calculation, and achieve using Passivhaus⁷ guidelines as a metric. This means my U-values should be, as a maximum:

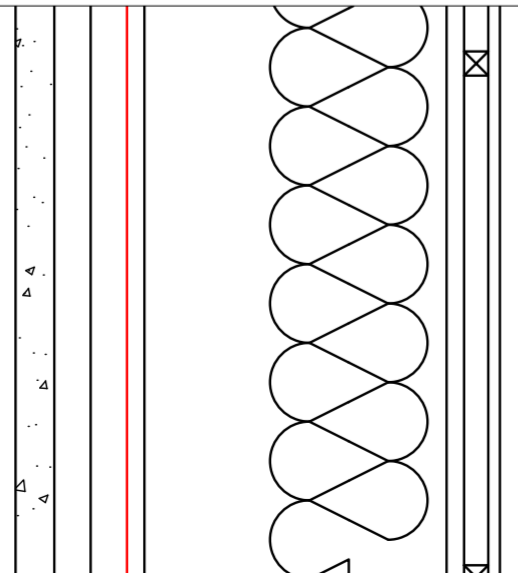
- Wall 0.15 W/m²K
- Roof 0.15 W/m²K
- Floor 0.15 W/m²K

Conclusion

My U-values are very low, which means that the building will not lose large amounts of heat through the fabric. This is owing to ~300mm of insulation in the wall and roof.

While this would lead to higher costs in reality, this is justified due to a large north-facing window in the Portego causing higher heat loss.

Wall



Material	Conductivity	Thickness (m)	Resistivity	R-value
Air Film	NA	NA		0.12
Prun Stone Tiles	0.84	0.04	1.19	0.048
Steel Battens	26.3	0.075	0.038	0.00285
OSB	0.042	0.018	23.8	0.429
Thermofloc	0.035	0.312	28.6	8.91
OSB	0.042	0.018	23.8	0.429
Timber Battens	7.69	0.025	0.13	0.0033
Gypsum	0.16	0.012	6.25	0.075
Air Film	NA	NA		0.12
Total		35.1	0.5	10.14

U-value = 0.099W/m²K

ENERGY BALANCE

Room	Volume (m3)	Median Comfort Temp ⁸ (C)	Mean Outside Temp. (C)	Occupancy	Ventilation Rate/Person ⁸	Total	ACH Rate
Library	726	23.5	11.75	32	10	320	1.59
Andron	1040	19	11.75	20	10	200	0.70
Security	518	23	11.75	18	10	180	1.25
Portego	1160	19	11.75	100	10	1000	3.10
Salone	517	19	11.75	20	10	200	1.39
Lower Lounge	412	23.5	11.75	40	10	400	3.49
Kitchen	148	20	11.75	3	60	180	4.39
Offices (council)	848	23	11.75	26	10	260	1.10
Offices (general)	1030	23	11.75	36	10	360	1.25
Conference Rooms	580	23	11.75	56	10	560	3.47
Upper Lounge	447	23.5	11.75	96	10	960	7.72
Roundtable Rooms	804	23	11.75	80	10	800	3.58
Lecture Halls	806	22	11.75	90	10	900	4.02
Meeting/Crisis Rooms	846	23	11.75	46	10	460	1.96

$$Q_{mec} = Q_f + Q_v - Q_s - Q_{pv} - Q_{int}$$

$$Q_f = \text{Average U-value} * \text{Average temp. difference} * \text{Building surface area}$$

$$= 0.116 * 10.1 * 5050$$

$$= 5,915.27W$$

$$= 7.98 \text{ kWh/sqm/yr}$$

$$Q_v = 0.33 * \text{Avg. air change rate} * \text{Avg. temp. difference} * \text{Building volume}$$

$$= 0.33 * 2.47 * 10.1 * 9880$$

$$= 81,400W$$

$$= 109.8 \text{ kWh/sqm/yr}$$

$$Q_s = \text{SHGC} * \text{Irradiation (on each facade)} * \text{Window area (on each facade)}$$

$$= 0.609 * (75040 + 54300 + 70700)$$

$$= 122000W$$

$$= 25.02 \text{ kWh/sqm/yr}$$

$$Q_{int} = \text{Total Occupancy} * \text{Activity Levels} * 17.5W$$

$$= 20.8 \text{ kWh/sqm/yr}$$

RIBA 2030 CHALLENGE MAXIMUM⁹ = 55 kWh/sqm/yr

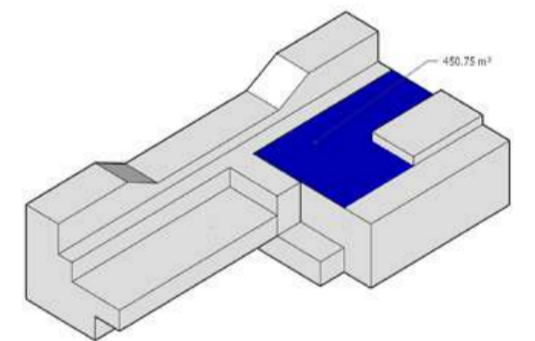
RIBA 2025 CHALLENGE MAXIMUM⁹ = 75 kWh/sqm/yr

MECHANICAL HEATING REQUIRED WITHOUT PV = 71.99 kWh/sqm/yr

MECHANICAL HEATING REQUIRED WITH PV = 48.1 kWh/sqm/yr

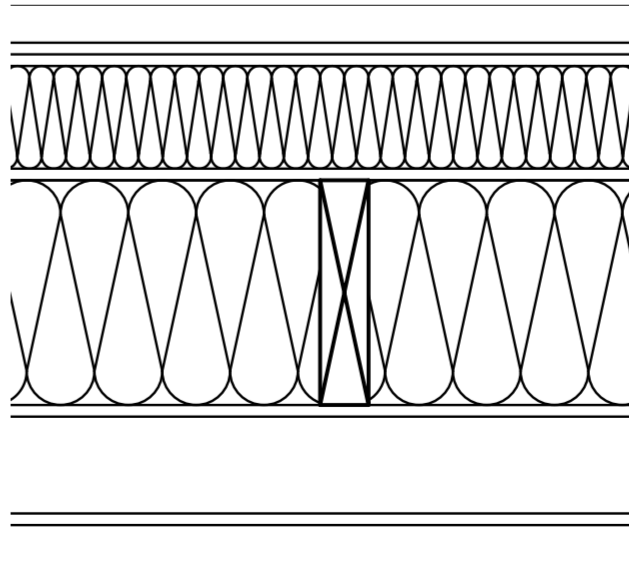
CONCLUSION

My scheme will meet the RIBA 2025 Challenge specification for energy balance without PV, however I found that by covering 405m² of my roof with PV, the building could meet RIBA 2030 specifications. This could, however, be expensive and raise conservation debates in a historical city such as Venice.



While used in the local vernacular, thermal mass and latent heat will not form part of my strategy - this is because a heavy masonry construction would demand massive amounts of material, which would need to be mined and extracted, and hence have a very high embodied carbon compared to a more lightweight strategy.

Floor/Roof



Material	Conductivity	Thickness (m)	Resistivity	R-value
Air Film	NA	NA		0.12
Terrazzo	0.41	0.012	2.44	0.029
Plywood Deck	0.14	0.018	7.14	0.129
Thermofloc	0.035	0.105	28.6	3
OSB	0.042	0.018	23.8	0.429
Thermofloc	0.035	0.232	28.6	6.63
OSB	0.042	0.018	23.8	0.429
Timber Battens	7.69	0.1	0.13	0.013
Gypsum	0.16	0.012	6.25	0.075
Air Film	NA	NA		0.12
Total		8.554	0.515	10.97

U-value = 0.091W/m²K

1- KgCO2e and Freshwater Toxicity values obtained from BRE Green Guide
 2- <https://ewipro.com/2024/02/14/the-best-non-combustible-materials-for-buildings/> accessed 1 May 2024
 3- <https://www.thermofloc.com/en> accessed 1 May 2024
 4- Littlefield, David (EDITOR). 2008. Metric Handbook : Planning and Design Data (London: Architectural Press) p. 39-3 Table 1

5- <https://cdulktl.co.uk/product/corian-domino-terrazzo/> accessed 1 May 2024
 6- <https://www.timbercladdingsolutions.co.uk/fire-protection-service/> accessed 1 May 2024
 7- <https://www.passivhaustrust.org.uk/>
 8- CIBSE Guide A Table 1.5

9- <https://www.architecture.com/about/policy/climate-action/2030-climate-challenge> accessed 1 May 2024
 10- PV gains calculated with https://re.jrc.ec.europa.eu/pvg_tools/en/ accessed 1 May 2024

STRUCTURAL STRATEGY

STRATEGY AND CONSIDERATIONS

Due to the large size of my site and the demands of my client and brief, my building will also need to be of a large scale.

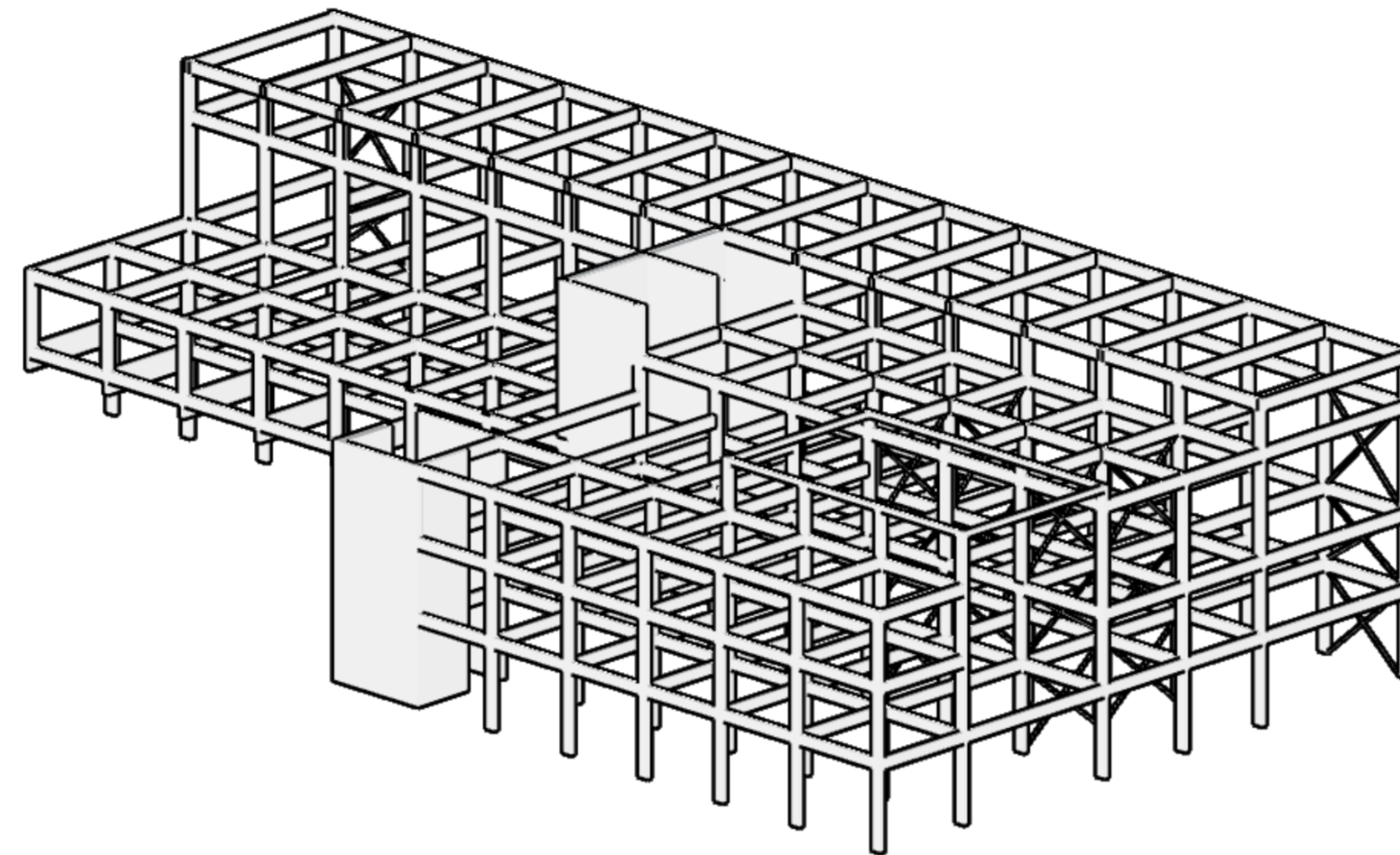
This is highlighted by the Portego, whose columns will have a maximum uninterrupted height of 5.2 metres.

To create a design language that reflects my building's 'layers', which help to merge Rationalism with a Venetian identity, my structure will be completely exposed - so material choices are key as well as sustainability.

The longest span for my beams will be 9 metres, so Steel was considered - however as mentioned in the materiality slide, timber has a far low KgCO2e value - unlike steel, it is carbon negative, and so alludes best to my sustainability strategy.

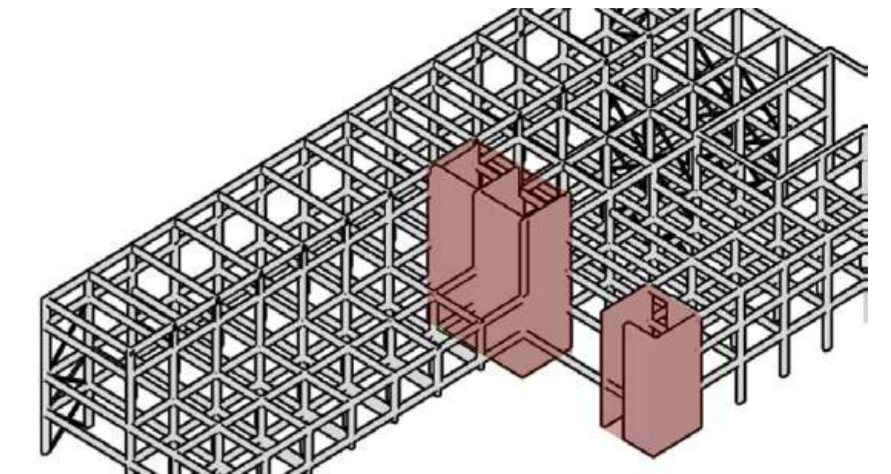
Concrete with 50% GGBS will be used for my columns, as while less sustainable, it will provide the desired design outcome and is ideal for a compression member.

DIAGRAM

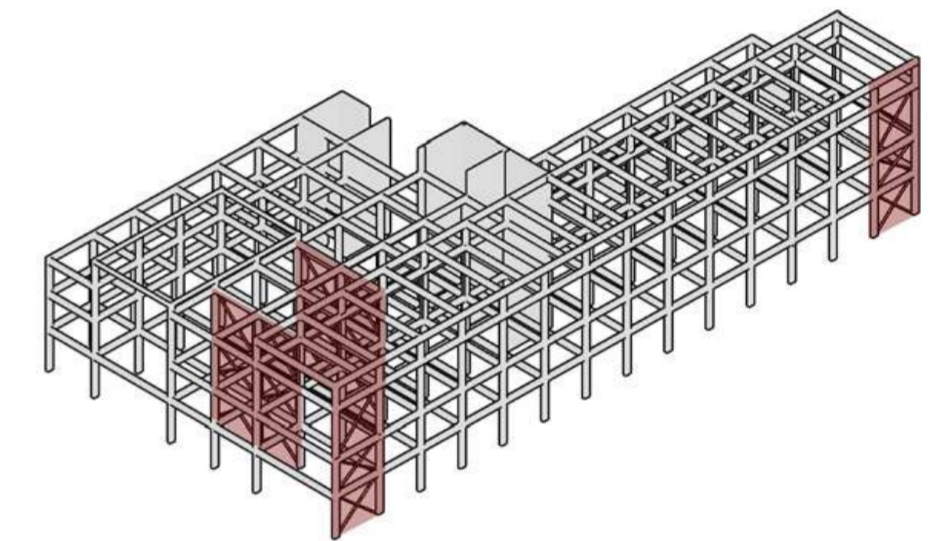


STABILITY STRATEGIES

1. Stable cores are placed centrally and run the full height of the frame to which it is attached.



2. To mitigate torsional stress, cross-bracing is used.



MEMBER SIZING

1- CAST-IN-PLACE COLUMN¹

Ideal height-depth ratio: 12-18

Max. height = 5.2 metres

When $5.2/d = 12$

$d = 433\text{mm}$

When $5.2/d = 18$

$d = 288\text{mm}$

Chosen $d = 300\text{mm}$, as Portego is most extreme height case, so higher end of H/d used.

2- GLUED LAMINATED TIMBER BEAM²

Ideal span-depth ratio: 14-18

Maximum span = 9 metres

When $9/d = 14$

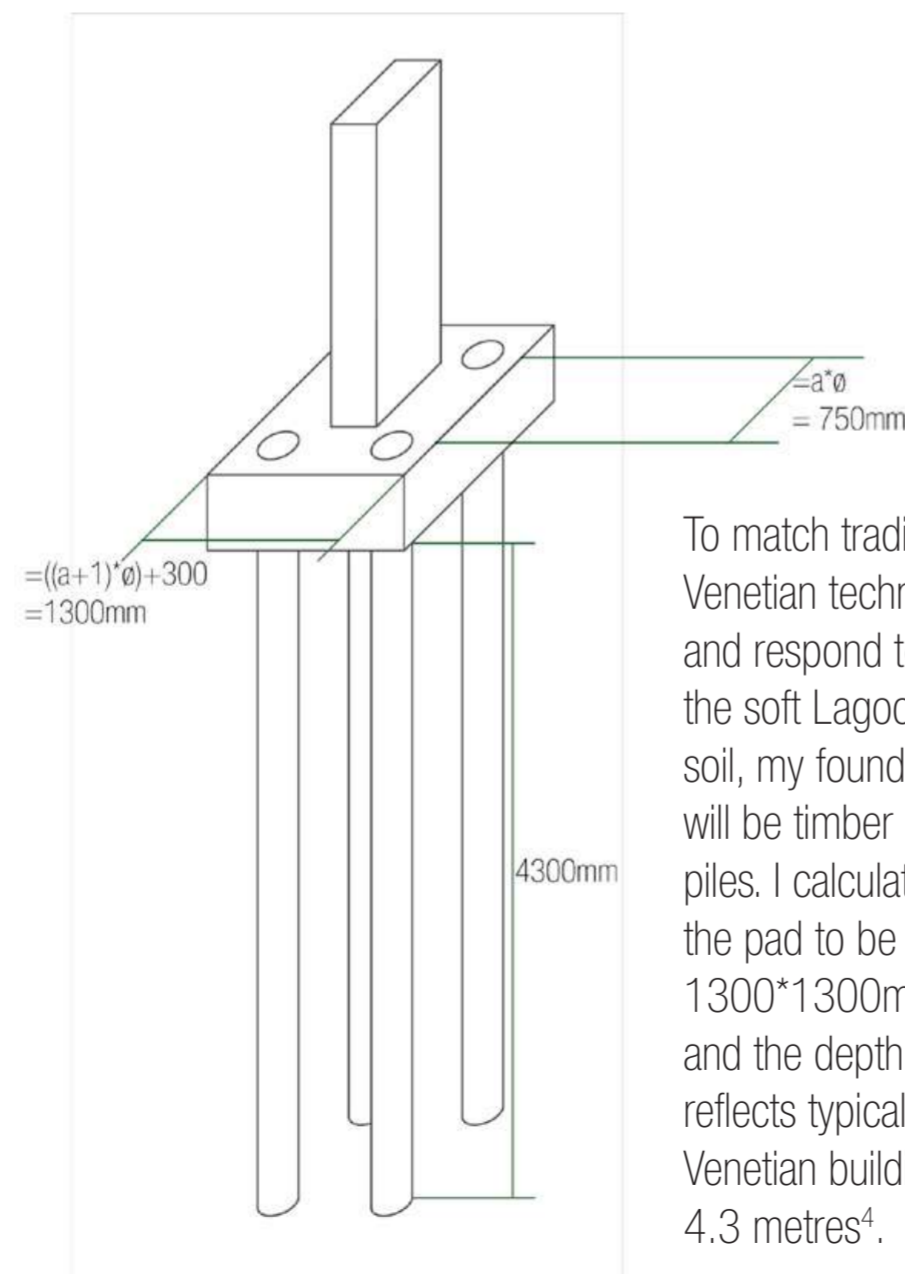
$d = 642\text{mm}$

When $9/d = 18$

$d = 500\text{mm}$

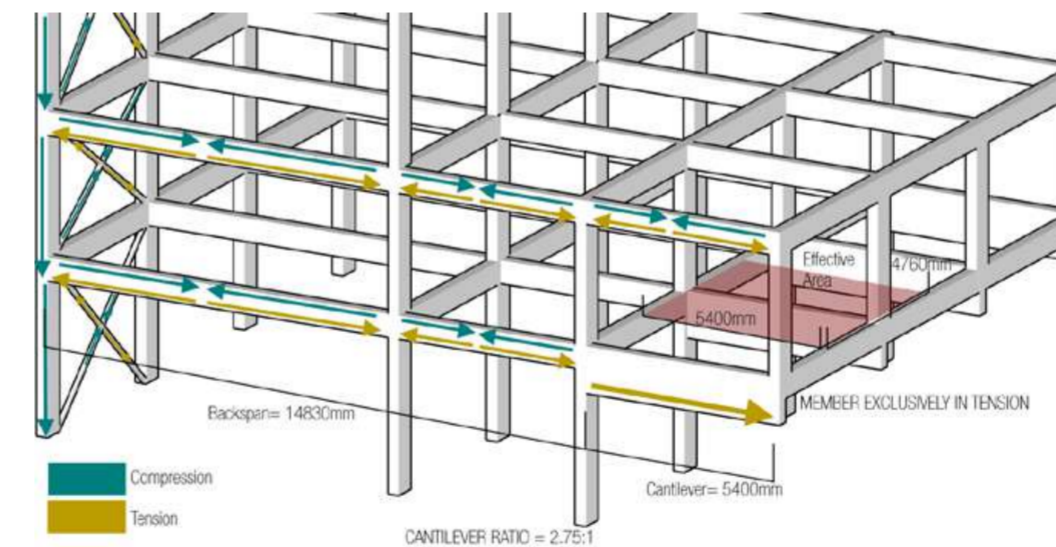
Chosen $d = 600\text{mm}$, as this will match the geometry of my concrete columns to create an elegant structure, as well as supporting high imposed loads from large amounts of people entering for events.

PILE DESIGN



To match traditional Venetian techniques and respond to the soft Lagoon soil, my foundation will be timber piles. I calculated the pad to be $1300 \times 1300\text{mm}^3$, and the depth reflects typical Venetian buildings at 4.3metres^4 .

CANTILEVER STUDY & LOAD PATHS



Effective area of cantilever = 25.7m^2
 Load of wall = $4.76 \times 4.405 = 20.97\text{kN}$
 Load of floor = $25.7 \times 0.83 \times 2 = 42.7\text{kN}$
 Column weight⁵ = 14.37kN
 Live load = $3 \times 25.7 = 77.1\text{kN}$

Glulam tensile strength⁶ = 50kN/m^3
 Minimum beam volume = 3.10m^3

Load on cantilever = 155.14kN

Length = 5.4m
 Width = 0.3m
 Long Section = 1.62m^2
 Min. Depth = 1914mm

ULTIMATE LOAD

DEAD LOAD

Wall weight per metre⁵ = 4.405kN/m

Floor weight per metre squared⁵ = 0.83kN/m^2

Total wall perimeter = 633.54m

GIA = $4,870\text{m}^2$

LIVE LOAD (Q_k)⁷ = 3kN/m^2

DEAD LOAD (G_k) (Excl. Structure) = 1.65kN/m^2

$$\text{Ultimate Load} = 1.35 \cdot G_k + 1.5 \cdot Q_k$$

$$= 1.35 \cdot 3 + 1.5 \cdot 1.65$$

$$= \mathbf{6.525\text{kN/m}^2}$$

The fabric of my building is very light, utilising a tile system for the facade and cellulose insulation. This is ideal for the soil condition of Venice, which is very soft, meaning a heavy building is likely to cause issues with regards to structural integrity.

1- Littlefield, David (EDITOR). 2008. Metric Handbook : Planning and Design Data (London: Architectural Press) p. 36-27 Table XXXI
 2- Littlefield, David (EDITOR). 2008. Metric Handbook : Planning and Design Data (London: Architectural Press) p. 36-17 Table XVII
 3- Sizing equations obtained from <https://www.thestructuralworld.com/2018/07/20/pile-cap-design/> accessed 24 April 2024
 4- Concluded based on <https://veneziaautentica.com/how-was-venice-built/> accessed 24 April 2024

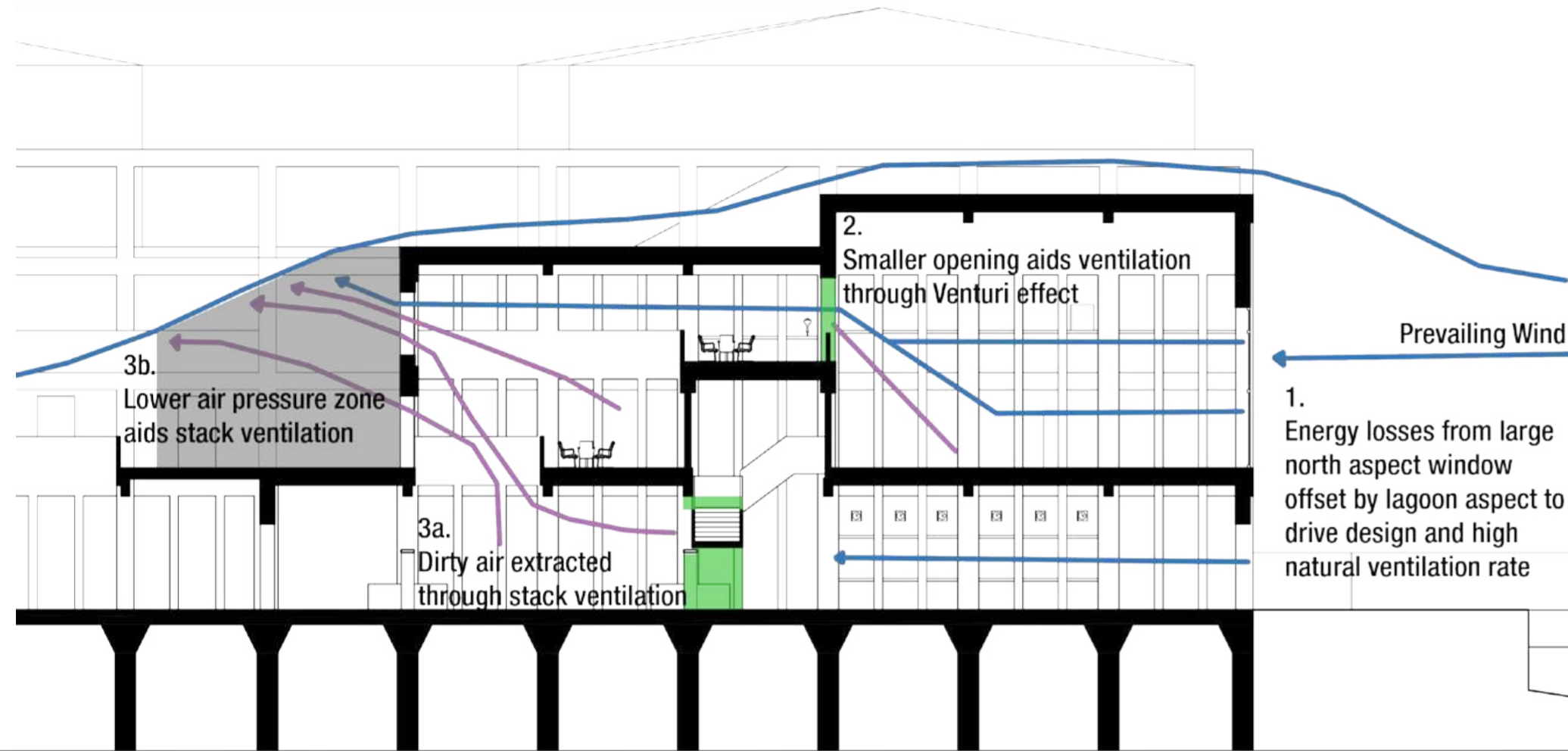
5- Littlefield, David (EDITOR). 2008. Metric Handbook : Planning and Design Data (London: Architectural Press) p. 39-3 Table I
 6- <https://www.woodscience.springeropen.com/articles/10.1007/s10086-015-1527-2> accessed 25 April 2024
 7- EN 1991-1, Table 6.2, Page 22

BUILDING SERVICES

IN SECTION

One of my key sustainability strategies as regards to building services will be passive ventilation. A number of strategies are employed, including:

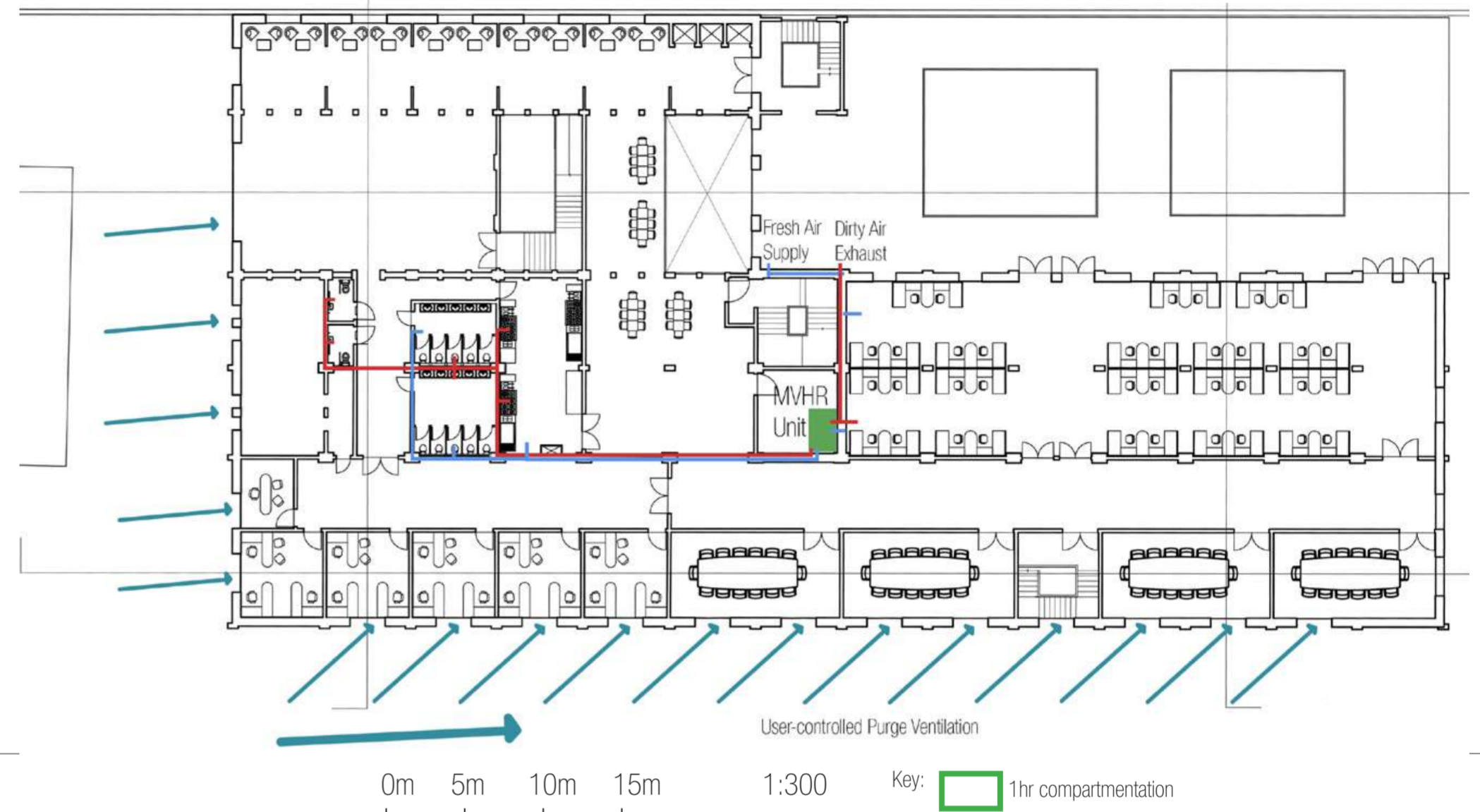
- Large openings where the prevailing wind comes from
- The Venturi effect to aid the regular passive flow of air
- Stack ventilation to remove dirty air from larger spaces
- Natural purge ventilation in smaller rooms, with openings designed to capture wind from the north when the user chooses to ventilate the room.



IN PLAN

Bathrooms: 1 supply, 1 extract
 Offices: 1 supply, 1 extract
 Disabled bathrooms: 1 extract

Dirty air exhaust situated 4m away from Fresh air supply and downwind to maximise system efficiency



FIRE SAFETY STRATEGY

Room	Floor	Maximum Occupancy	Main Escape Stair	Outdoor Stairs	Office Access Stairs	Portego Access Stairs	Stair Type	Floors serviced	Likely Max Occupancy	Req. Stair Width ¹	Stair Width
Library	G	32	N	Y	N	N	Main Escape Stair	G, 1, 2, Roof	469	1700mm	1700mm
Andron	G	20	N	Y	N	N	Outdoor Stairs	G, 1, 2	276	1100mm	1200mm
Security	G	18	Y	N	N	N	Office Access Stairs	G, 1	78	1000mm	1250mm
Portego	1	100	Y***	Y**	N	Y	Portego Access Stairs	G, 1	100	1000mm	1500mm
Salone	1	20	Y	Y	N	N					
Lower Lounge	1	40	Y	Y	N	N					
Kitchen	1	3	Y	N	N	N					
Offices (Council)	1	26	Y	N	N	N					
Offices (General)	1	36	N	N	Y	N					
Conference Rooms	1	56	14/56	N	42/56	N					
Upper Lounge	2	96	32/96	64/96	N	N					
Roundtable Rooms****	2	80	Y	N	N	N					
Lecture Halls	2	90*	Y	N	N	N					
Meeting/Crisis Rooms	2	46	Y	N	N	N					

SAFETY FEATURES

1. In the worst case scenario, the farthest distance to a safe room is 38.4 metres - the maximum permissible for this use case (Category 3, more than one exit) is 45 metres².
2. Rooms with occupancy higher than 60 (Portego, Upper Lounge, Lecture Hall) have two exits - as shown in section.
3. No exit leads through a hazard area, and the hazard area (Kitchen) is behind fire doors.
4. The lecture halls have two fire exits, with one on the roof in case the usual doors are not feasible for escape. This exit leads to the roof.
5. The entire building backs onto the lagoon, allowing for emergency service access.
6. The main escape stair and office access stair feature wheelchair refuges on each floor.

*In accordance with the maximum occupancy of the Portego, the space which is used for gatherings related to lectures, only one lecture hall can be used simultaneously with the Portego, so its' occupancy is capped at 90 for the purposes of fire safety design.

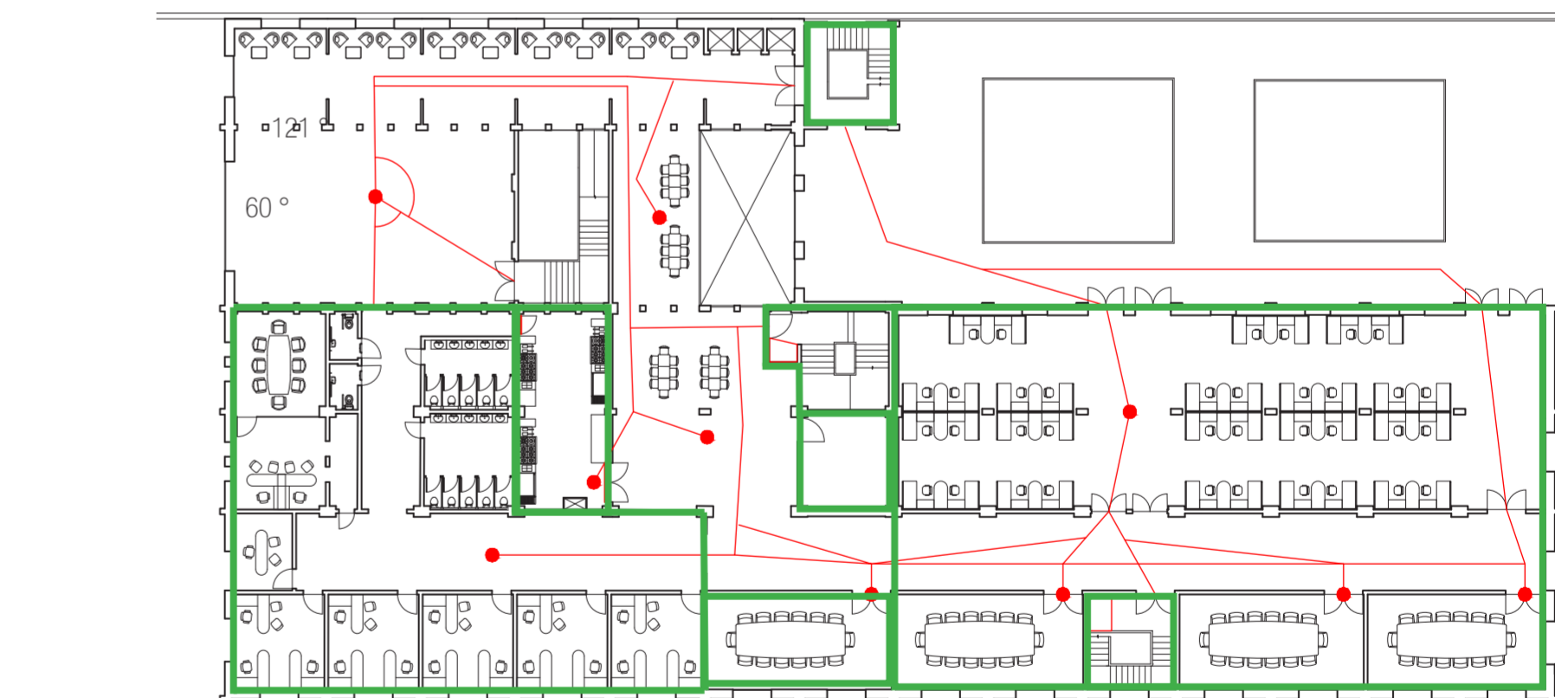
**If the Portego access stair is not available

*** Worst case scenario

**** 40 is the maximum occupancy for each Roundtable room.

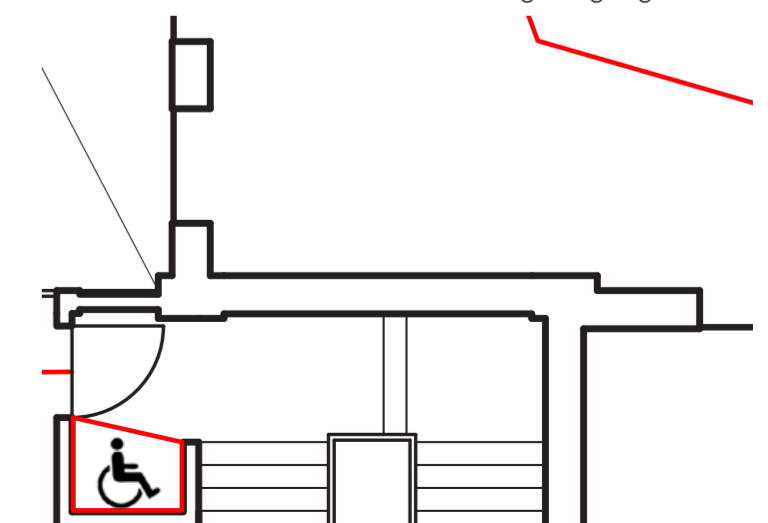
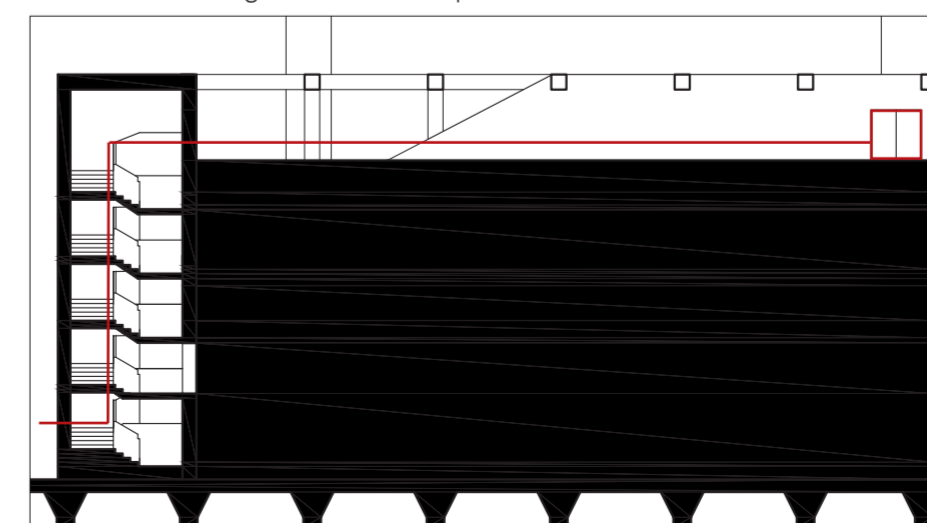
1- Approved Document B1 2019, Table 3.2, p32

2- Approved Document B1 2019, Table 2.1, p14



Section showing route from top of lecture theatre to fire stair

Main fire stair with wheelchair refuge highlighted

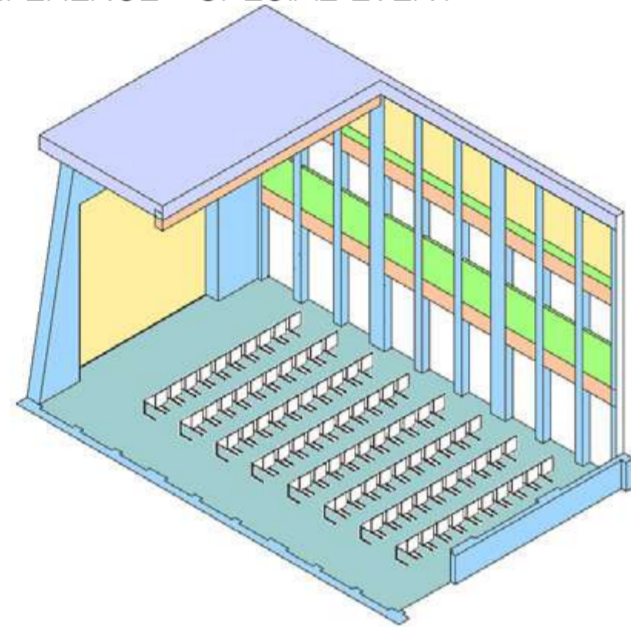


ACOUSTIC STRATEGY

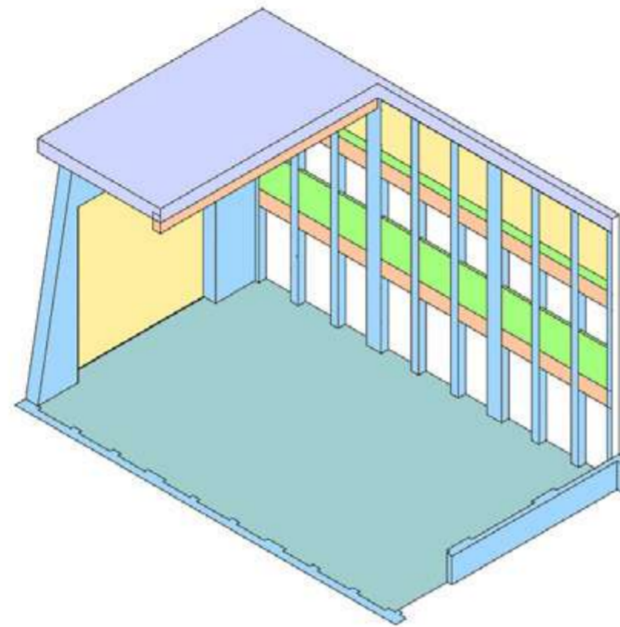
My project will include a range of different functions, and therefore, will require varying design strategies in terms of the acoustic quality of the room.

The space in which acoustic quality will be the most important is the Portego - the space needs to function as an event space for press conferences, as well as a large, open room acting as a focus for the building. This may include events such as drinks receptions and meals.

PRESS CONFERENCE - SPECIAL EVENT



MOSTLY EMPTY - DAY-TO-DAY



Material	Absorption Coefficient						Area (sqm)
	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	
Gypsum tile ceiling	0.45	0.7	0.8	0.8	0.65	0.45	125.15
Rough concrete	0.02	0.03	0.03	0.03	0.04	0.07	394.44
Stone tiles	0.02	0	0.02	0	0.05	0.05	143.8
Exposed Glulam beams	0.14	0.1	0.06	0.08	0.1	0.1	46.2
Windows	0.3	0.2	0.1	0.07	0.05	0.02	57.246
Terrazzo	0.01	0.01	0.01	0.01	0.02	0.02	130.44
Seated occupancy	25.6	49.6	59.2	60.8	64.8	72	
Standing occupancy (assumed 20)	3	7.6	8.4	8.6	9	9	

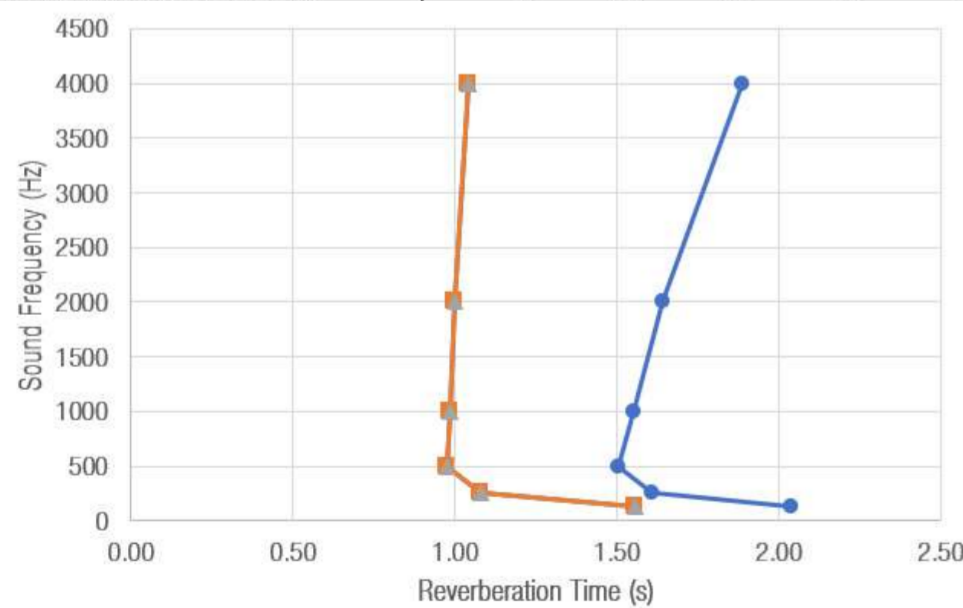
Room volume = 1,170 cubic metres (3sf)

Formula-

$$RT_{60} \cong \frac{0.161s/m V}{S_a}$$

RT₆₀ at full occupancy: RT₆₀ when empty:

125Hz = 1.56s	125Hz = 2.04s
250Hz = 1.08s	250Hz = 1.61s
500Hz = 0.98s	500Hz = 1.51s
1000Hz = 0.99s	1000Hz = 1.55s
2000Hz = 1.00s	2000Hz = 1.64s
4000Hz = 1.04s	4000Hz = 1.89s



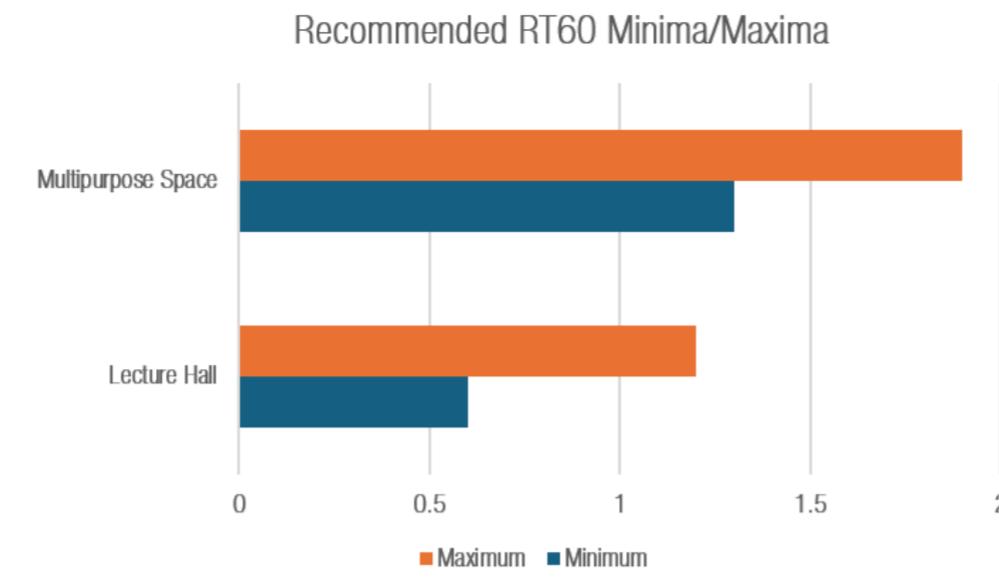
Conclusion

My Portego's RT60 varies according to occupancy - the room's reverberation is muted when it is more occupied, which makes the space suitable for press conferences and speeches.

The reverberation time can impact the room's atmosphere - and the fact that this value is higher when the room is less occupied means that when VIPs are being led through the main space, they will feel a sense that the building is grand, and hence an appropriate place for high-level talks and diplomacy.

While the minimum RT60 for my space is lower than that specified for a multi-purpose space, this is unlikely to be an issue - as generally, the higher the reverberation, the more uncomfortable the auditory experience.

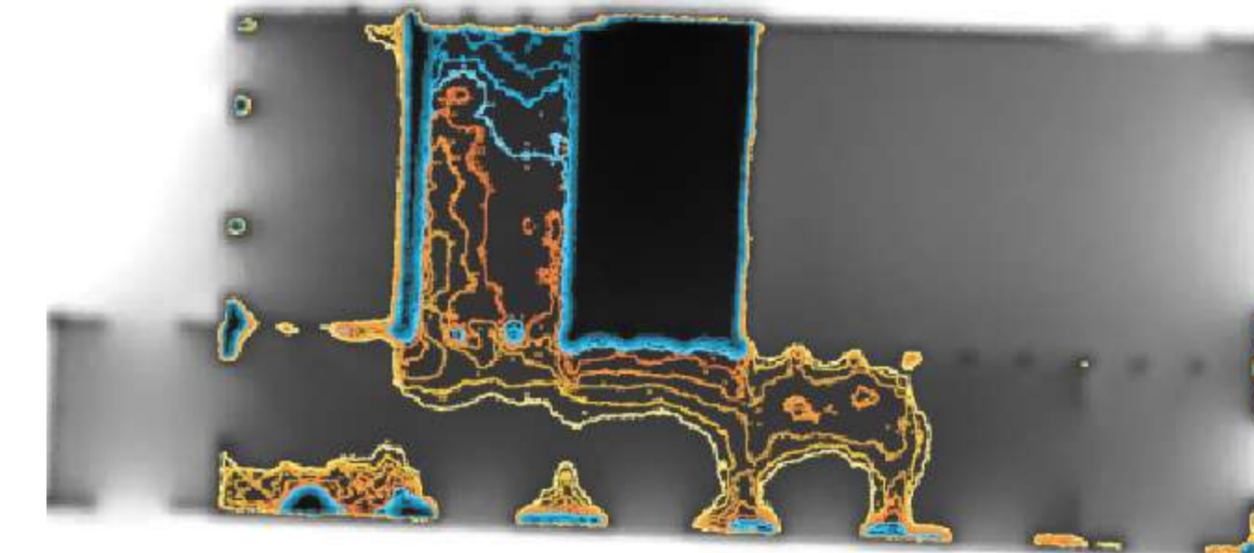
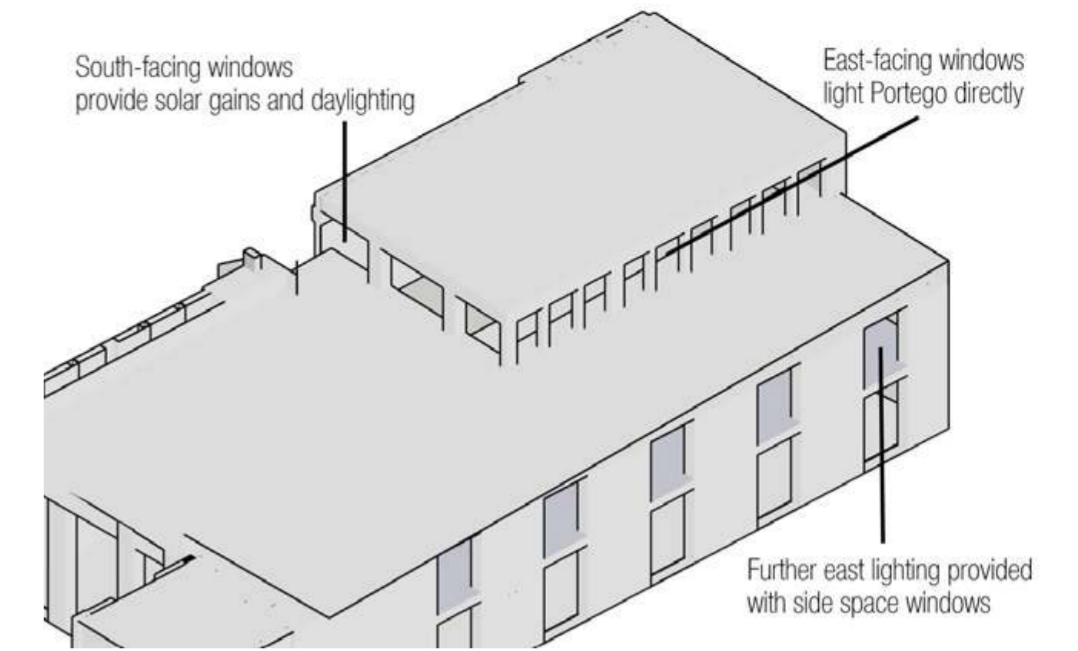
1- RT60 recommendations obtained from <https://commercial-acoustics.com/reverberation-time-graphic/> accessed 5 April 2024
 2- RT60 values obtained from https://www.acoustic.ua/st/web_absorption_data_eng.pdf accessed 5 April 2024
 Lighting study conducted using VELUX Daylight Visualiser 3



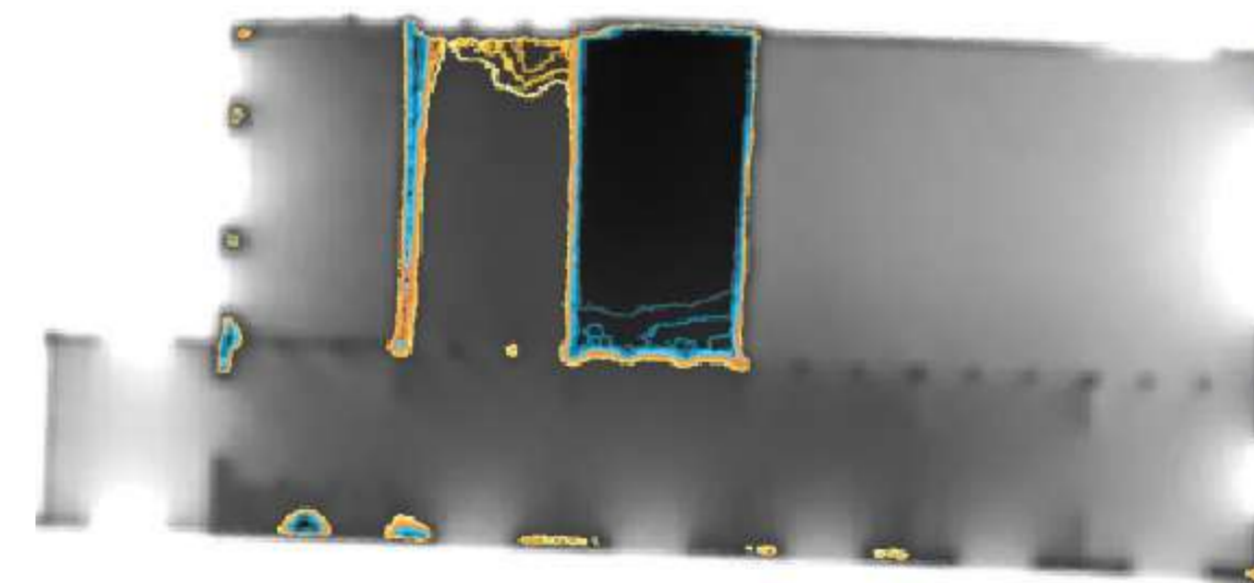
LIGHTING STRATEGY

Natural lighting should be considered in my building as much as possible, as it is desirable for user wellbeing and reduces dependency on artificial lighting, which uses energy.

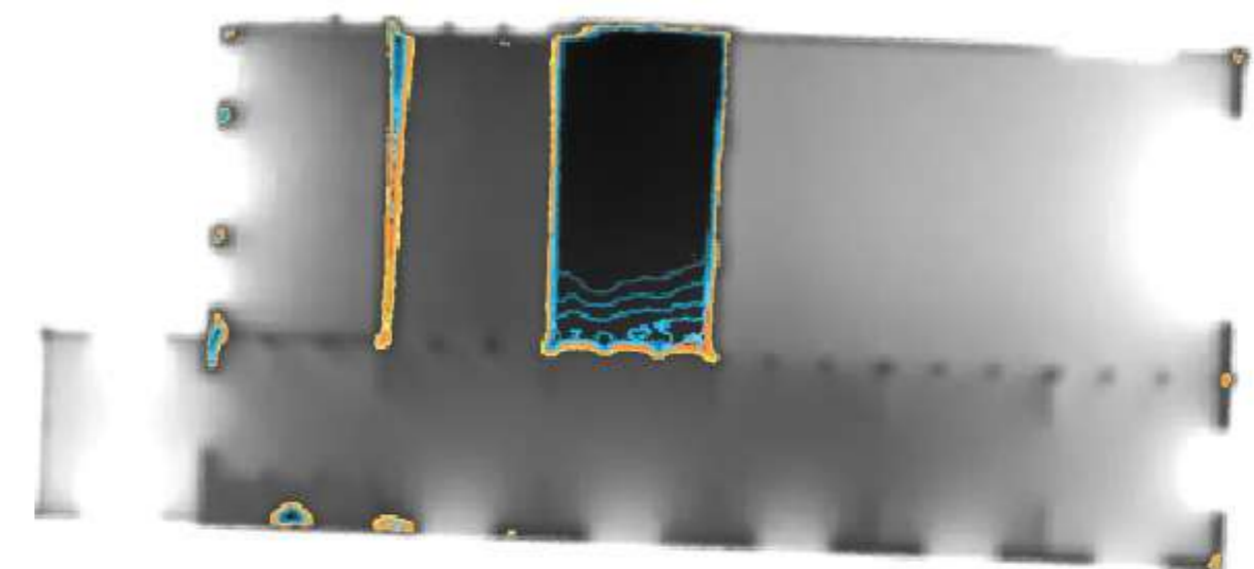
In my Portego this will be a particular focus, as it is the primary gathering space in my building. Furthermore, the main window is north-facing due to capitalising on views of the Lagoon - so natural lighting needs to be provided through other windows which, unlike the north facade, receive sunlighting.



21/12 1200hrs - Winter Solstice

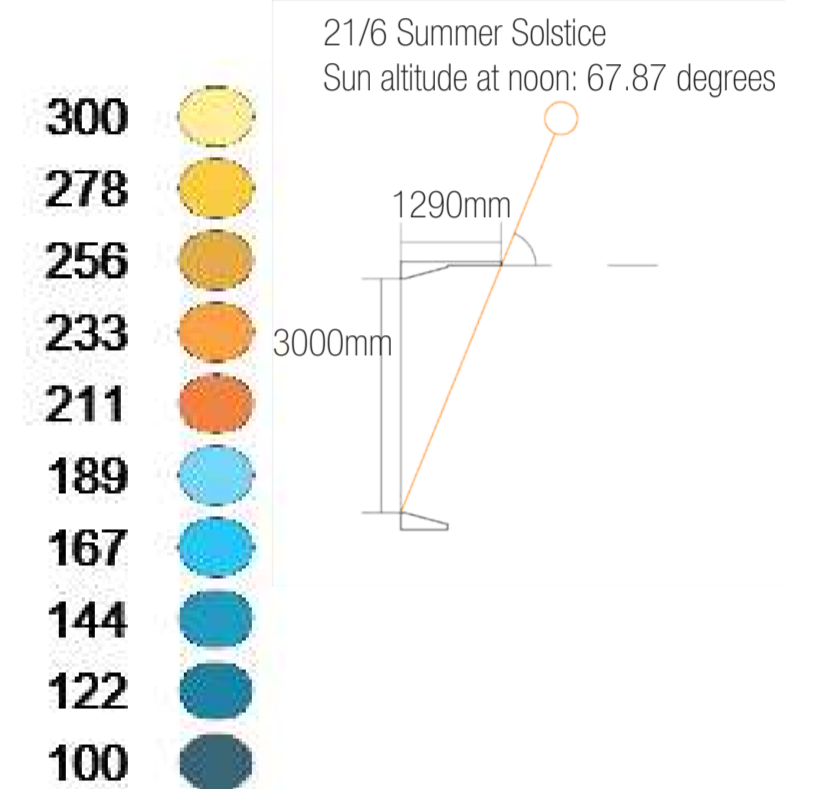


21/12 1200hrs - Spring Equinox



21/06 1200hrs - Summer Solstice

Lux levels South facade - Shading Louvre design



Thanks to lighting on the east and southern facades, due to the roof height of the Portego being higher than its' surrounding roofs, the Portego meets the lighting requirements for the space by having over 100 lux even during the Winter solstice at noon.

However, other areas of my building may not perform as well - for instance, corridor spaces and other internal rooms, such as the staircase visible in the plan. Furthermore, the Portego may experience overlighting, so shading should be provided through louvres, to mitigate the harsh summer light.

CONSTRUCTION STRATEGY

MATERIAL CHOICES AND CONSIDERATIONS

A key part of my design philosophy is keeping my **structure exposed** - however, this **complicates the construction strategy**, as **cold bridges are far harder to mitigate** when the fabric is inside of the structure rather than outside.

Despite its' **VOC emissions** and **inability to be recycled** due to being a thermoset plastic, the **timber beams are covered by 50mm of PIR insulation**, which **mitigates any thermal bridging** caused by the exposed beams inside my building.

The concrete columns are not exposed inside my building, and the travel distance of any heat energy through the CLT beams would be significant, so insulating these columns on the outside too was not necessary.

DRAINAGE STRATEGY AND PRECEDENT

Though my initial strategy for my building was to have a flat roof, and this is still my design intention - appropriate drainage needs to be provided. Therefore, my roof is on a 5 degree pitch.

A precedent I used was Cino Zucchi's House in Venice¹, which uses a sloped roof for drainage however maintains the appearance of a flat roof.

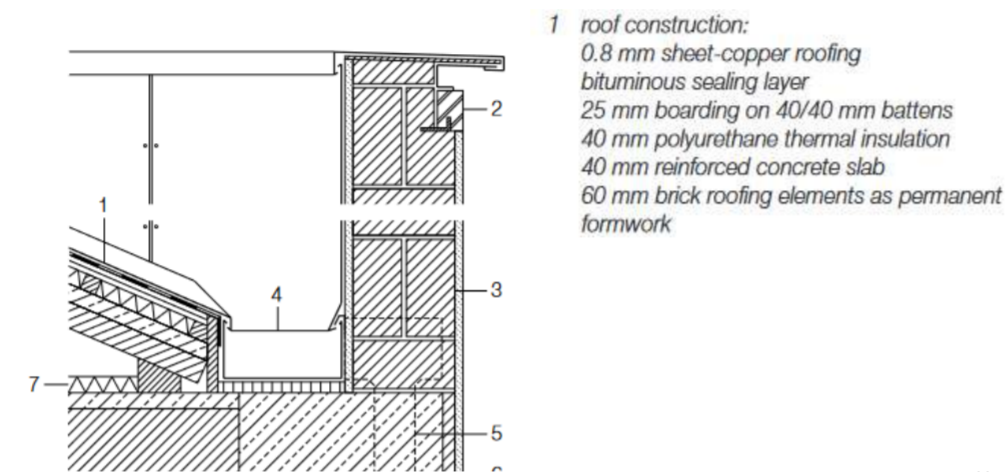
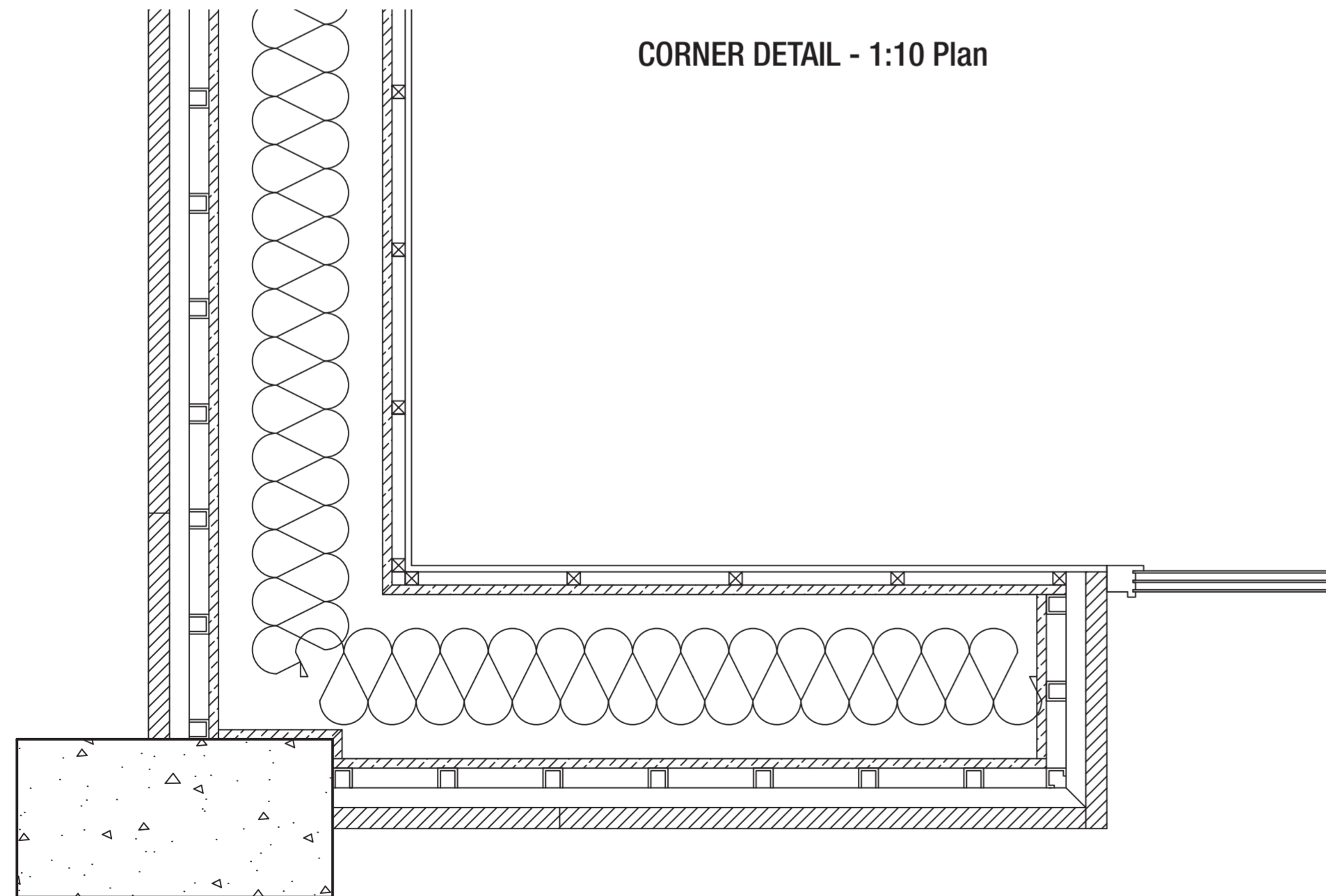


Figure 1- Excerpt from DETAIL Inspiration report on House in Venice, obtained from <https://inspiration-detail-de.abc.cardiff.ac.uk/house-in-venice-106670.html> accessed 24 April 2024

CORNER DETAIL - 1:10 Plan



NB: The first structural bay, as depicted in this detail, has since had the window on the western facade removed to accommodate cross-bracing.

¹ - <https://inspiration-detail-de.abc.cardiff.ac.uk/house-in-venice-106670.html> accessed 24 April 2024
Figure 1- Ibid

- Roof—
- 0.8mm Copper sheet roofing (sealed with bitumen layer)
- 25mm boarding on 50x50mm timber battens
- 18mm OSB sheathing
- 105mm Thermofloc cellulose insulation between timber bearers
- 18mm OSB sheathing
- 232m Thermofloc cellulose insulation between Glulam beams
- 18mm OSB sheathing
- 100mm timber battens, housing building services
- 12mm Gypsum board

- Beam and Thermal Bridge Mitigation—
- 40mm Lessinia Stone tile
- 37.5mm steel channel battens
- 50mm Recticel Eurothane PIR insulation
- 300x600mm Glulam primary beam

- Wall—
- 40mm Lessinia Stone tile
- 37.5mm steel channel battens
- 37.5mm steel counter-battens
- Vapour control layer
- 18mm OSB sheathing
- 330mm Thermofloc cellulose insulation
- 18m OSB sheathing
- 25mm timber battens
- 12mm Gypsum board

- Floor—
- 12mm Locally-produced Terrazzo
- 12mm Plywood
- 105mm Thermofloc cellulose insulation between timber bearers
- 18mm OSB sheathing
- 232m Thermofloc cellulose insulation between Glulam beams
- 18mm OSB sheathing
- 100mm timber battens, housing building services
- 12mm Gypsum board

- Ground Floor—
- 12mm Locally-produced Terrazzo
- 12mm Plywood
- 105mm Thermofloc cellulose insulation between timber bearers
- 18mm OSB sheathing
- 232m Thermofloc cellulose insulation between Glulam beams
- 18mm OSB sheathing
- Vapour Control Layer (connected to DPC 300mm above ground)
- 100mm 50% GGBS Concrete floor plate
- 50mm Sand blinding
- 200mm Hardcore

1:20 Section



Bibliography

AD3

1- Dawson, Susan. 1995. 'Working Details: New Light on Ivory Towers: Hodder Associates' Student Residence at St Catherine's College, Oxford Responds to the Detailing of Arne Jacobsen's 1962 Building', Architects' Journal (London), 201.20 (Emap Limited): p39

2- Tyack, Geoffrey. 2013. Choosing an Architect: Arne Jacobsen and St Catherine's College, Oxford, Twentieth Century Architecture (Twentieth Century Society), p. 139

AT3

1- KgCO₂e and Freshwater Toxicity values obtained from BRE Green Guide

2- <https://ewipro.com/2024/02/14/the-best-non-combustible-materials-for-buildings/> accessed 1 May 2024

3- <https://www.thermofloc.com/en> accessed 1 May 2024

4- Littlefield, David (EDITOR). 2008. Metric Handbook : Planning and Design Data (London: Architectural Press) p. 39-3 Table I

5- <https://cdukltd.co.uk/product/corian-domino-terrazzo/> accessed 1 May 2024

6- <https://www.timbercladdingsolutions.co.uk/fire-protection-service/> accessed 1 May 2024

7- <https://www.passivhaustrust.org.uk/>

8- CIBSE Guide A Table 1.5

9- <https://www.architecture.com/about/policy/climate-action/2030-climate-challenge> accessed 1 May 2024

10- PV gains calculated with https://re.jrc.ec.europa.eu/pvg_tools/en/ accessed 1 May 2024

1- Littlefield, David (EDITOR). 2008. Metric Handbook : Planning and Design Data (London: Architectural Press) p. 36-27 Table XXXI

2- Littlefield, David (EDITOR). 2008. Metric Handbook : Planning and Design Data (London: Architectural Press) p. 36-17 Table XVII

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7- EN 1991-1, Table 6.2, Page 22

1- Approved Document B1 2019, Table 3.2, p32

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1- RT60 recommendations obtained from <https://commercial-acoustics.com/reverberation-time-graphic/> accessed 5 April 2024

2- RT60 values obtained from https://www.acoustic.ua/st/web_absorption_data_eng.pdf accessed 5 April 2024

1- <https://inspiration-detail-de.abc.cardiff.ac.uk/house-in-venice-106670.html> accessed 24 April 2024

Climate data processed using Climate Consultant 6.0, EPW file obtained from https://energyplus-weather.s3.amazonaws.com/europe_wmo_region_6/ITA/ITA_Verona-Villafranca.160900_IGDG/ITA_Verona-Villafranca.160900_IGDG.zip accessed 19 Oct 2023

Lighting study conducted using VELUX Daylight Visualiser 3

List of Figures

AD3 [only figures from external sources]

Figure 1 - Casa delle Armi, obtained from <https://divisare.com/projects/329826-luigi-morettigiampiero-germino-ca-sa-delle-armi> accessed 24 April 2024

Figure 2 - Chipperfield's Procuratie Vecchie from the inside, obtained from <https://edition.cnn.com/travel/article/venice-procuratie-vecchie/index.html> accessed 24 April 2024

Figure 3- Green Spaces map adapted from Semester 1 group work. Base map by Rhea Samaha

Figure 4- Polish Embassy in Berlin, obtained from <https://eurobuildcee.com/en/news/30465-strabag-wins-eur-60-mln-contract-for-polish-embassy-in-berlin> accessed 3 March 2024

Figure 5- UN Headquarters in New York, obtained from <https://www.un.org/en/visit> accessed 8 May 2024

Figure 6- Casa del Fascio, obtained from https://en.wikipedia.org/wiki/Casa_del_Fascio_%28Como%29#/media/File:Como_-_Casa_del_Fascio_-_27-09-2017.jpg accessed 9 May 2024

Figure 7- Palazzo della Civitá Italiana, obtained from https://it.wikipedia.org/wiki/Palazzo_della_Civilt%C3%A0_Italiana#/media/File:20110307_Roma_Palazzo_della_Civilt%C3%A0_Italiana_lato_sx.jpg accessed 9 May 2024

Figure 8 - Exposed structure on St. Catherine's College by Arne Jacobsen

AT3 [only figures from external sources]

Figure 1 - Excerpt from DETAIL Inspiration report on House in Venice, obtained from <https://inspiration-detail-de.abc.cardiff.ac.uk/house-in-venice-106670.html> accessed 24 April 2024