VOID

PROCESS AND DEVELOPMENT

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Diploma project - Master in Architecture
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01 | WHY PORTO?

Porto is today a shrinking city, in need of new goals and revitalization. It is also a UNESCO city with a long history and many old beautiful buildings, many of which are now abandoned and derelict.

Both of us had visited Porto previously and had become aware of the deteriorating state of the city. Therefore it followed naturally to wonder if something could be done about this and in that case, what?

02 | WHY HOSTEL?

Both of us are fond of traveling, having backpacked several months around the world. During this time we have mainly stayed at hostels or at simple digs. Having seen many different standards, both good and very bad, we, as students of architeccture, developed our own idea of what a hostel should be. This combined with the wide range of design possibilities when making a hostel made this an assignment very interesting.

Though we considered many other functions for our assignment and also working on a larger scale, we decided that this was a scale and function we wanted to explore further.

03 | PORTO TRIP

To find a building, and get to know the city even better, we traveled to Porto in the beginning of January.

As the historic center is very small it was easily walkable, and thus we started our trip walking the city and getting a feel for it.

Having done this we went to visit Porto Vivo, the public entity responsible for the revitilization of Porto. Here we met the forthcoming Ana Leite Pereira, who helped us a lot throughout our trip. She helped us find suitable buildings for our project and provided us with information about these buildings. She also showed us into a few buildings that she thought might be interesting for us.

We then went on in search for other interesting buildings and ended up finding several, each with their own qualities. Since this was still early into our trip we were not yet ready to choose our building, so we went to get some more input.

This is when we met Tiago Ilharco, a sivil engineer working with refurbishing old buildings in Porto. He showed us interesting builings that he was working on, and tecniques that were used when refurbising these buildings, giving us a deeper understanding of the measures needed when working with the old historic buildings.

We also met with Arrebita, a volunteer institution working with the revitialization of buildings in Porto. From the head of this company we got a deeper understanding of the actors working in Porto, and what would make a hostel work. He especially underlined the need for making the hostel something unique and working with the exsisting structure.

CHOOSING OUR BUILDING

With a solid foundation for choosing the buildings we wanted to work with, we set down some criteria for the choice. We wanted:

- A building that was representative of the typical buildings of Porto

- A building providing interesting situations to work with, preferably where several buliding units could be merged

- The availability of entering the building and being able to measure it.

Based on this we looked at the buildings that we had found most suitable, one palace, a typical 19th century buildings spanning from street to street and four neighbouring buildings placed in the medival part of Porto.

These two building in Rua Ferreira Borges have the typical narrow layout of portugese buildings, and traverses the building volumes to the next street.

The old palace in Rua das Flores is a two storey building with elegant details located in a pedestrian street.

The mail issue with this building is that we could not enter the building to measure it or take pictures, due to safety issues regarding the interior walls and floors being unstable.

These are four connected buildings where each unit is in a different state, spanning from fairly good to completely derelict. The big variation triggered ideas about all the interesting possibilities this could provide as a transformation project.

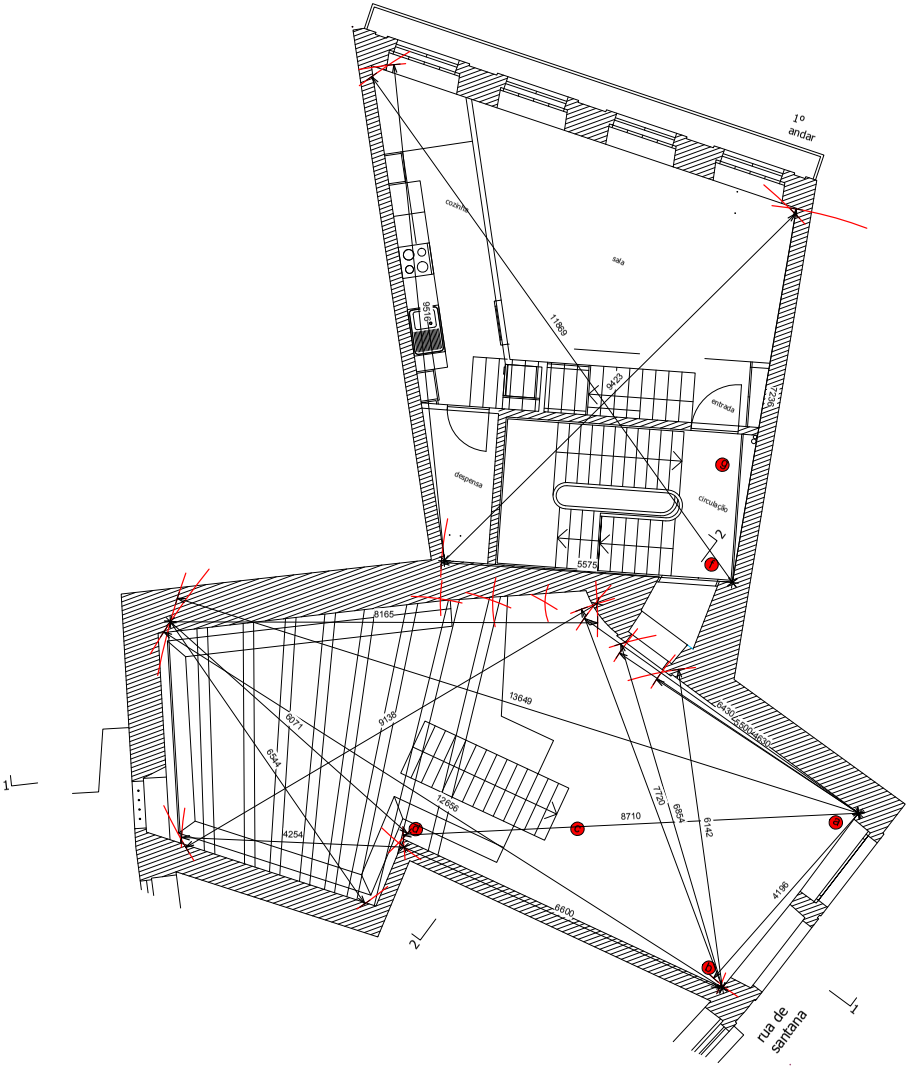
There is also a difference of two levels between one of the buildings and the others and it was easily accessible.

These aspects made this the building of our choice.

04 | BUILDING ANAYISIS

After finding the building we wanted to work with, we could begin the analysis and measuring of it. We had been so lucky as to recive a full set of drawings of the building from Porto Vivo, and went on to control these. The control of these drawings showed that the accuracy of them was more than sufficient for the basis of the project, and better than we could accieve in the one week we had there. We focused instead on measuring what we found to be insufficiently measured in the drawings we had recieved and making a extensive photo documentation of the buildings.

We only had access to two out of the four buildings in the project so these buildings were in the center of our focus.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05 | BORNEO/TRAINING

After returning from Porto mid January Marius left for 2 weeks to go diving in Borneo, whilst Martin was left working on a model and learning the intricacies of Rhino and Grasshopper.

06 | MAIN CONCEPT

When together again to work we started to work with our main concept. There were many aspects to focus on. We started working on the general functions of the buildings and with what approach we could take when working on them. We knew that we wanted a hostel, and also to lay the grounds for an interaction between the locals and the tourists.

Because of this we wanted a space where this could happen. This would be the restaurant. The idea also came to us that we could create a office where one could rent an office space during a stay, or if one had a sole proprietorship. This function could be another space for the interaction between locals and tourists. Further on the most public functions would be closest to ground level and would become more and more private further up.

Being a UNESCO area, there were certain guidlines that applied to the buildings, one of these being that the carachteristics of the facade were to remain the same. These were guidelines that we wished to follow and therefore set as a rule that the existing facades were to remain the same.

We identified aspects of the buildings that would be important to us. A typicality of the houses in Porto and in the cityscape of Portugal is the way they are organised in narrow side by side houses, and also with the different floors organised on the same level as the neighbouring houses to create a consistency in the facades. So though it might look like somewhat of a mess, with different colored tiles and many different types of roofes and building widths, it is an organised mess. This division of houses was something we saw as a great potential and which we wanted to maintain and accentuate.

The buildings were from what we have learnt, probably built between the 17th and 19th centuriy, with modifications being made up to date. Being built in this period they have carachteristics typical of this, having beautiful bordering stone walls, something we were intrigued about from the moment we entered the building. We have tried to maintain the wall to as large a degree as we could permit ourselves, due to it's integral part of the building history,

Entering the building we were also struck by the verticality of the interior space. The original character of the building was exposed due to the whole of the interior having been cleaned out - something that we found to be inspiring and hence an aspect we have based much of our project on.

07 | BUSINESS CONCEPT

A way to make the transformation stand out as an example would be to add a buisiness concept where the expense of creating it would be smaller. We created a concept where a large degree of the building would be created as a workshop, involving the students of Porto, providing them with valuable work experience, and with much of the materials provided by sponsors, where possible.

Another ambition we had was to work with different sections, not having to construct the entire building at the same time but working in building phases.

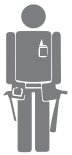
The first part of creating the hostel would be finding an investor who finances the construction.

The investor hires an organisor to organise the project. This can be the same person as the investor, or for instance a instance like Porto Vivo or Arrebita. These companies have lots of experience in renovating old buildings in Porto

The organisor contacts the Porto university students with an offer to participate in a renovation workshop

The students who participate get the oppurtunity to gain valuable working experience, improve the city of Porto and provide cheap labor

With the guidance of professional workers the workshop is a cheap way of building the hostel



Many companies in Porto are interested in renovating the old buildings and can help with sponsoring materials. The organiser contacts these companies, thus lowering the cost of construction materials

After several workshops in different building phases the building is completed

Tourist stay at the hostel due to its good location, a great atmosphere, and interesting facilities.

Locals come to the hostel to enjoy food, and atmosphere in the restaurant and mix with the tourists

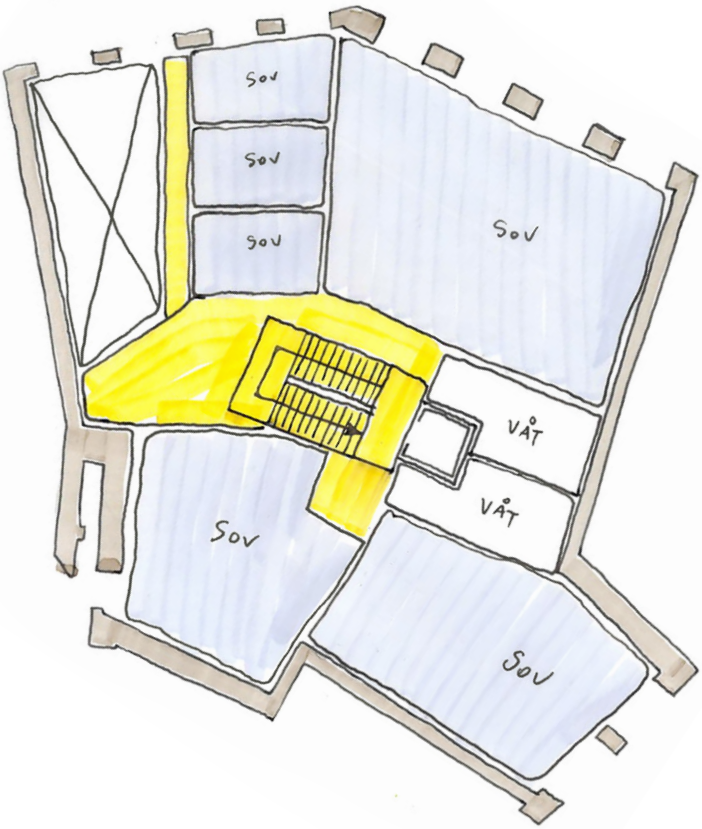
Interactions between the people visiting the hostel, be it tourists or locals, help create relations

Due to locals and tourists leaving their money behind and an efficient way of managing the hostel, there is a good possibility of generating a good income

08 | CIRCULATION #1

After working out some main guidelines, we started working on the circulation of the buildings, which presented major challenges. This due to one of the buildings being two levels above the others combined with difficult angles to work with. We found out that trying to make the building universally accessible would be an unneccessary struggle, as even getting into the street or building to begin with is anything but universally accessible.

Although we still wanted to make communication and circulation as easy and comfortable as possible. With the rooms up to eight floors above ground level, we wanted to implement an elevator, and the only suitable location without affecting the facade would be in the tallest building. We wanted it to go all the way down to the ground floor something that meant digging down into the floor of the tallest building. There was a lot of discussion concerning the respect towards the building as it stands today, but in the end we concluded that a little sacrifice for drastically improving functionality would benefit the building in and all it's other important historical elements.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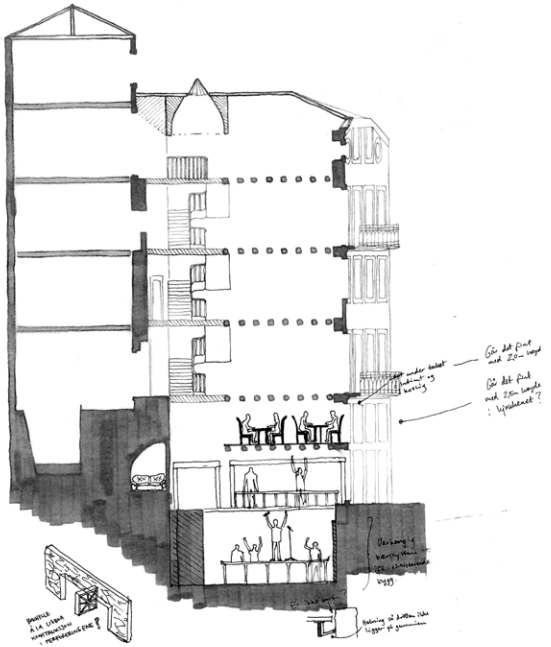
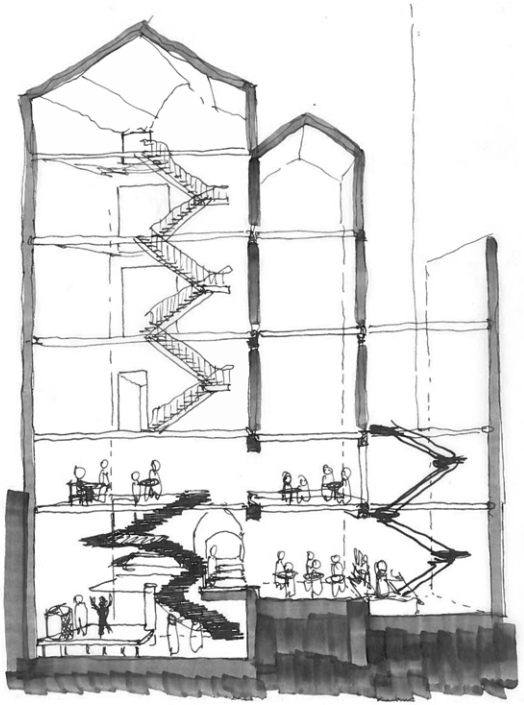
09 | BUILDING TASKS

Working with the building structure that exists in Porto we wanted the buildings to be percieved as different entities and gave them different tasks.

We made the choice of using the larger of the buildings for rooms and the smaller of the buildings for bathrooms and verandas. We also had the idea that the restaurant would span over the three lower floors of building C.

Another thing we wanted to do was to connect the buildings to each-other by placing openings. There would be more openings in the first floor where the experience of the binding of buildings would be most important.





10 | MIDTERM

The midterm was a very good point for us as we realised the importance to start exploring the using architecture.

For preparation to the midterm we had decided to make a model that we could later work with but that would also be solid and robust. We therefore decided to build a lasercut contour model of mdf. It proved to be a total failure. After spending several days preparing the digital file, the cut results left the model with dark, burnt edges that refused to connect with white spray paint. Several time-consuming strokes of acrylic paint lightened the edges, poorly and unconvincing, and unluckily deformed the model. We have ended up not using the model for anything else than the understanding of the building.

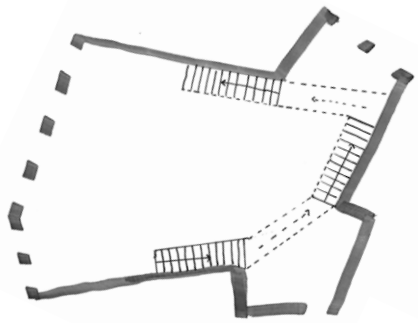
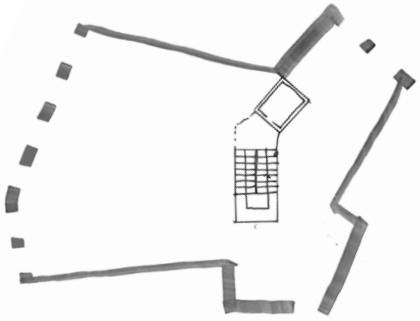
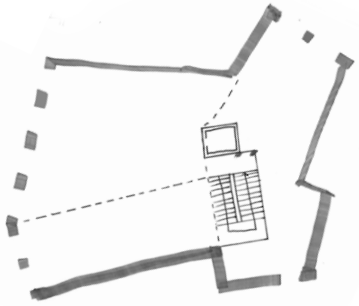
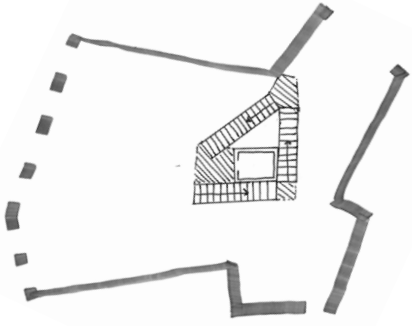
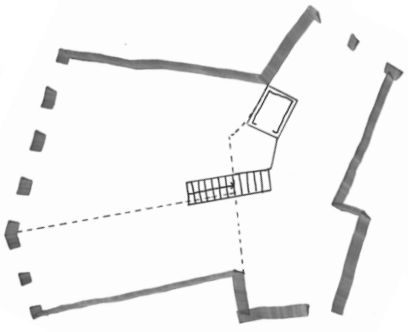
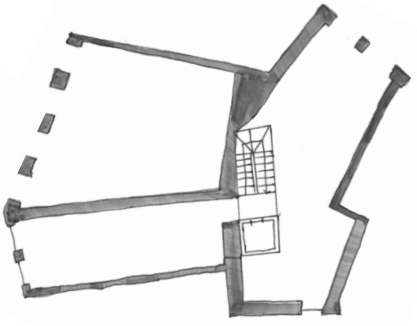
11 | RETROSPECTIVE

After the midterm and the critique and input we recieved, we took a look back at our own ideas, and on the scale of our interaction.

We began working towards the extremities of our interaction, looking at what would happen should we only care about the outer shell, and what would happen should be try to maintain absolutely everything. Both of there we knew were unlikely to provide us with the results we were looking for, but we did learn a lot from it.

When working only with the outer shell we found that we would still need to have circulation in the tallest building . This was the same as we had found to be the best solution, when working with a minimum intervention, so we made the decision to put the vertical circulation there. We also found that, when working with a maximum intervention that it did not give us very big advantages when it came to room structuring. When working with minimum intervention we found that the buildings were not well connected enough to work as one entity, so we decided that a middle path where we combined what we found from our work with both interventions would be the solution. This exercise was important to us because we had to reconsider what elements were important to us and which level of intervention we wanted.

We also made a new, simple cardboard model that we found worked much better than the contour model we had made for the midterm.

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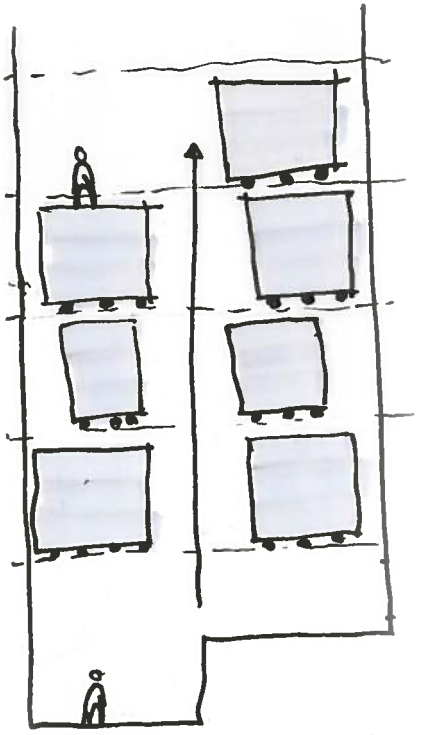
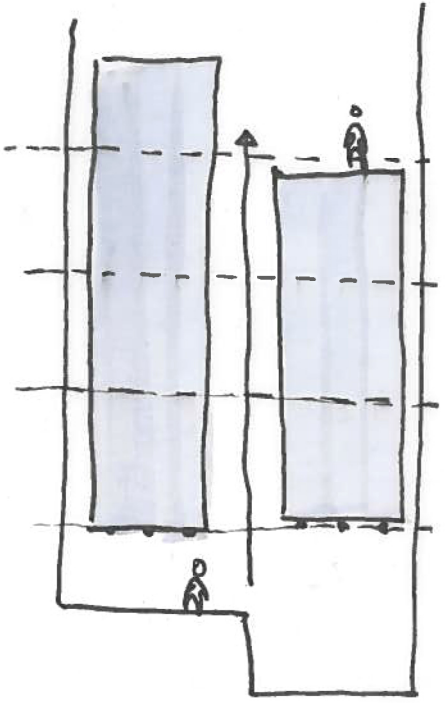
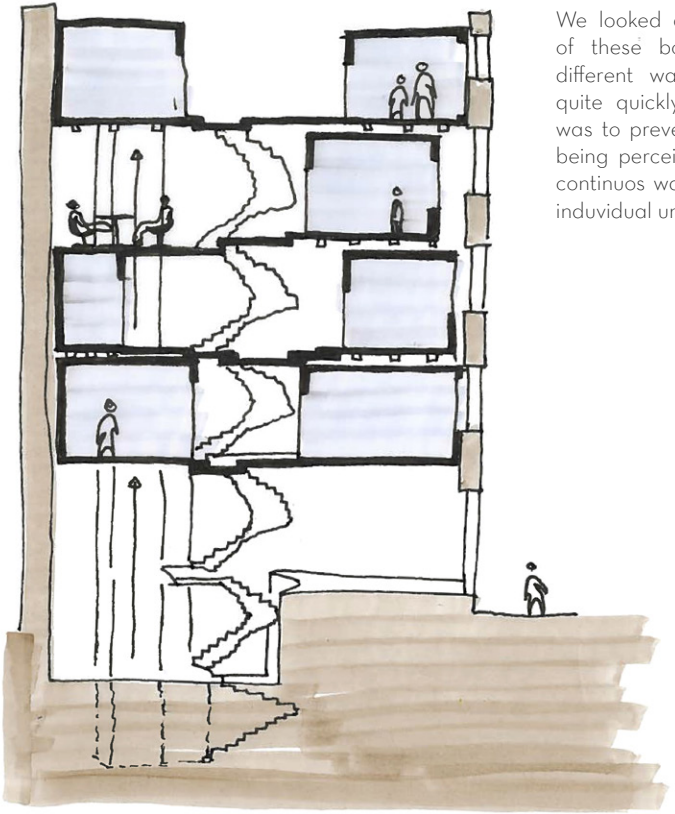
11 | BOXES

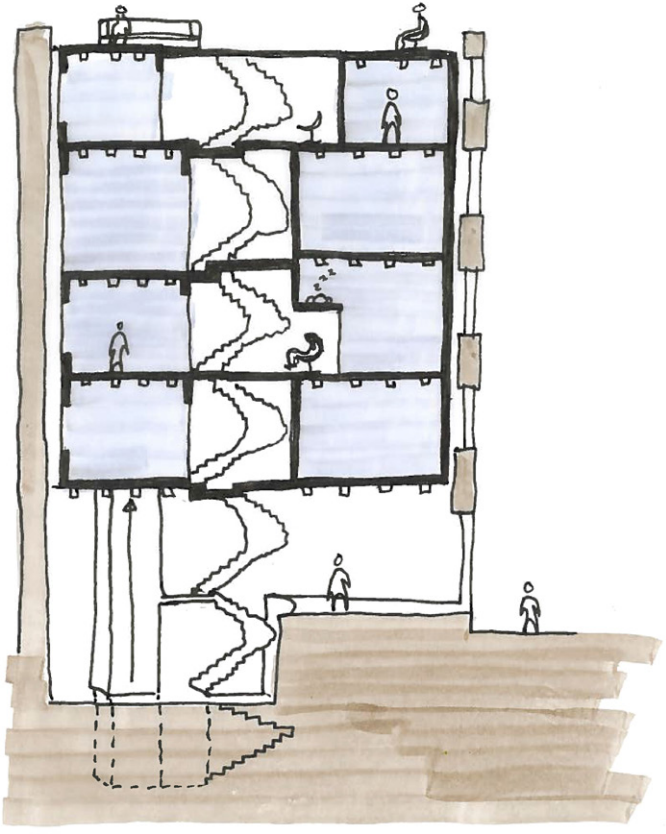
We wanted to showcase the existing walls and also make the construction process easier. At this point Martin came up with an idea of somehow using boxes with a distance to the walls and using the existing beams and beam structure to support them. This would clearly define which parts of the structure were new and which were existing and also make the construction of the rooms easier.







We looked at the potential of these boxes in several different ways and figured quite quickly that our wish was to prevent the boxes of being perceived as one tall, continuos wall, but rather as induvidual units in each level.



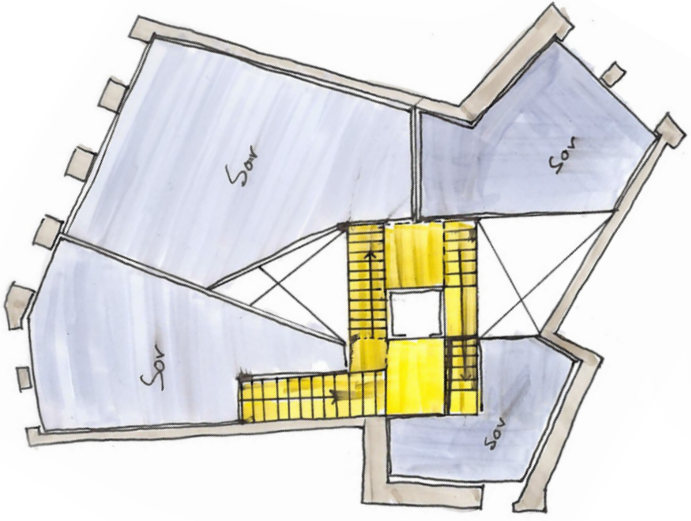
12 | CIRCULATION #2

We had now found a interesting concept we wanted to work with and a general organisation of the projects. From here we started exploring the circulation of different spaces, how we could connect the buildings and more of how the circulation could function.

We also looked further into the aspect of fire safety in Portugal and asked our friend Tiago and other portugese friends of how this worked. The responce we got was that in a transformation like this it was only necessary to have one flight of stairs and that fire regulations were quite vague. We did not think this was the way to go, but were unsure wether to introduce another flight of stairs or if it could be solved another way. This was something we wanted to explore a bit in this phase.

Further on we found that the idea we had generated of an office floor was working against the flow of our project and that this space would be better used for the hostel. A shared office function might be an idea that could be housed in another building but this was not the right one.

Another thing that we discovered in this phase was that a change of the entrance location to the restaurant would work better for the flow inside the buildings.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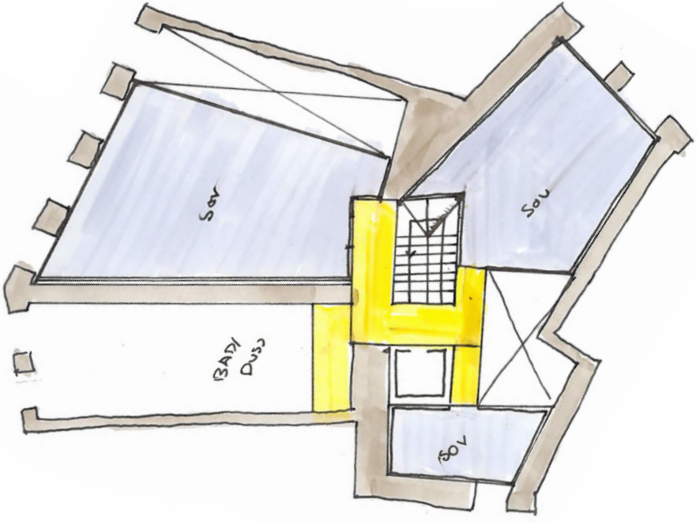
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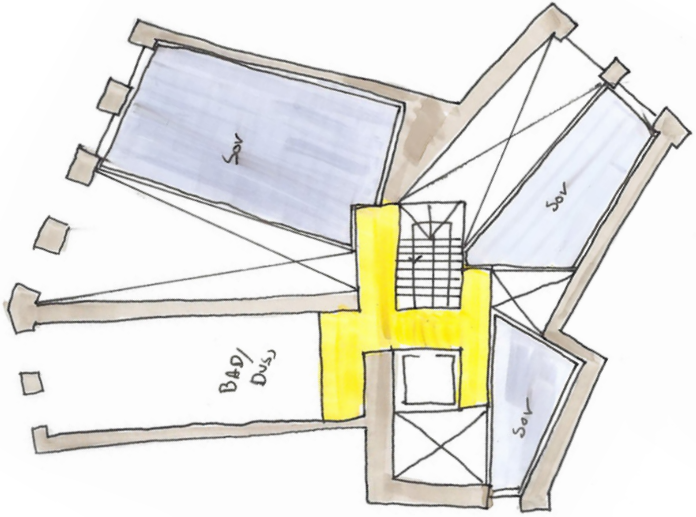
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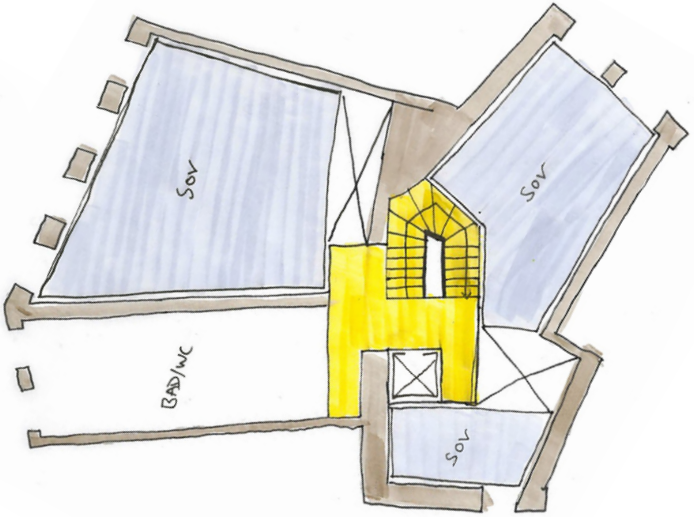
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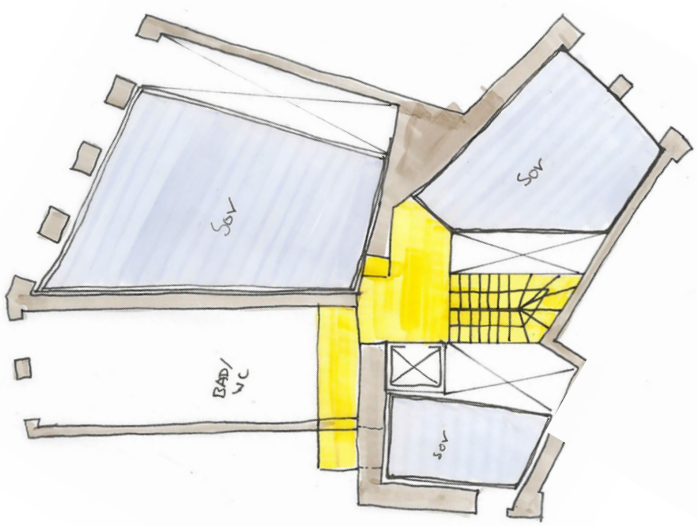
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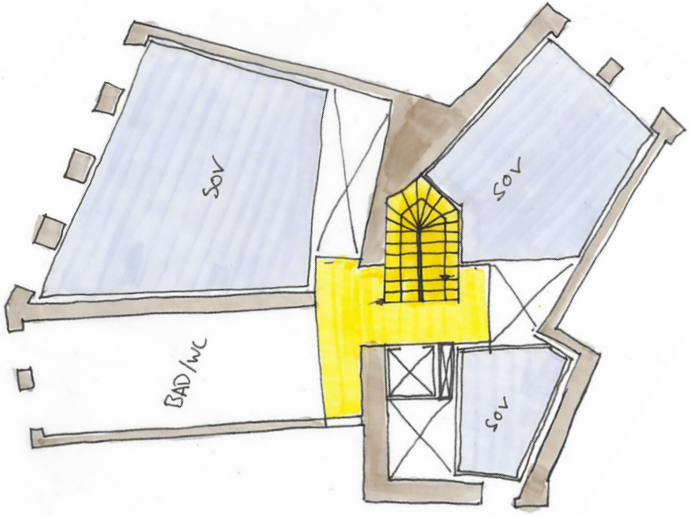
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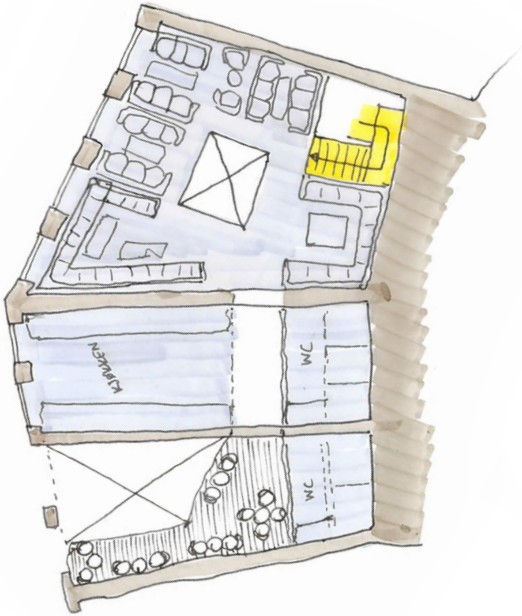
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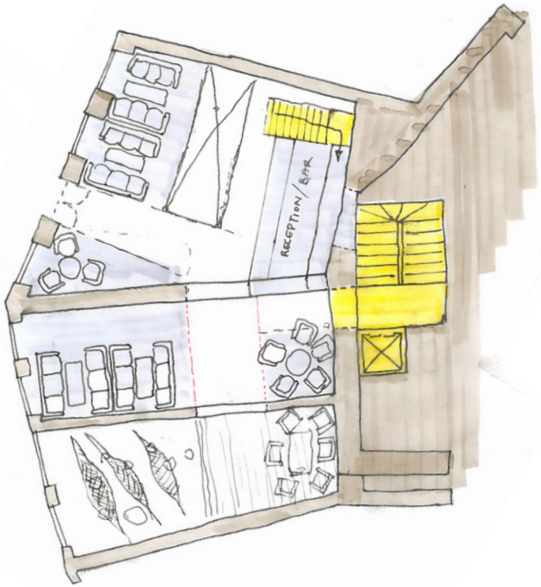
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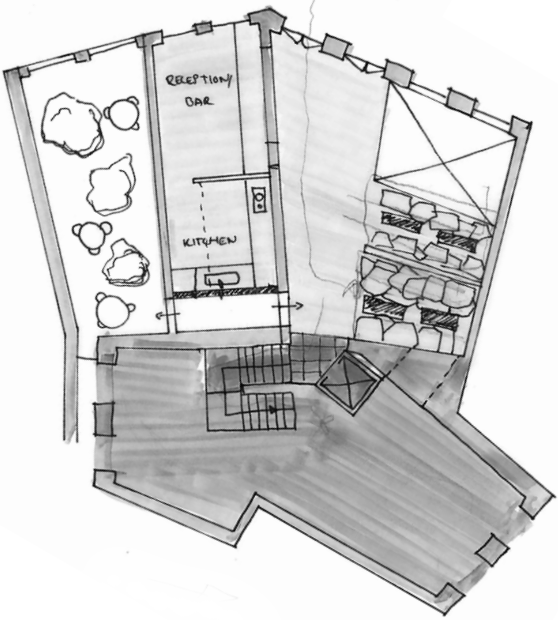
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13 | BOX LAYOUT

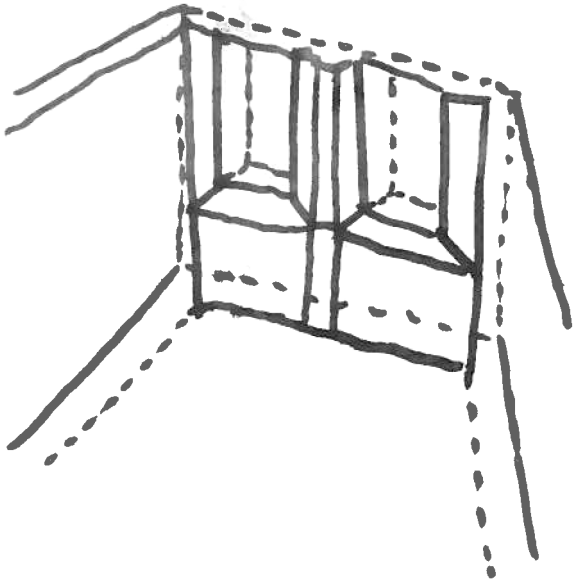
From this point we could further explore the principle of the boxes and what we wanted them to be. We looked at what advantages and disadvantages the boxes would have opposed to building directly into the walls.

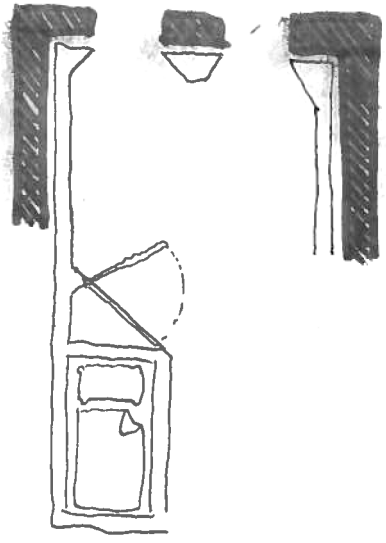
There were some obvious elements, such as that this would somewhat expose the stone walls and leave them untouched. It would also make the technical details easier as the gap between box and wall would work as a air gap and remove the transition of moisture from stone wall to insulation, with the details that would involve. Another element to it would be that the construction would be easier. The existing walls are slightly tilted, and we knew that this would make cutting materials more difficult without the boxes.

The negative side that we could see with this principle was that there would be an element of area lost, but we found the principle to be so exciting and with so many advantages that we decidied to go with it.

We had both stayed in plenty of hostels and dorms we knew what we liked and did not like. One thing we were sure we did not want was completely open beds. We wanted to create a certain degree of privacy, or, as much as can be achived in a dorm. Therefore we started working with walled beds that turn away from eachother. This idea and the beds developed quickly and soon the layout of the beds were ready.

We also had the idea of exposing the walls in windows inside the boxes as a different kind of view. This could be done by illuminating the walls to provide an aesthetic experience and lighting the inside of the boxes as well.





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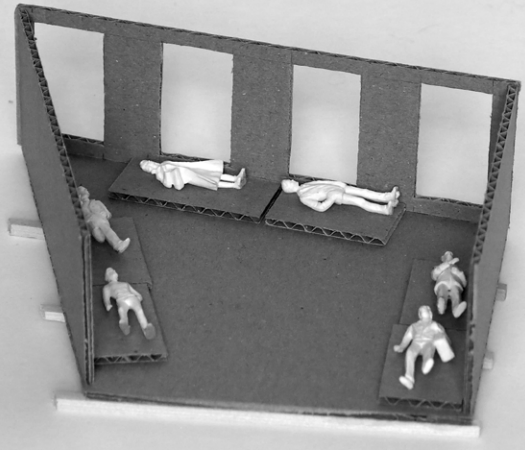
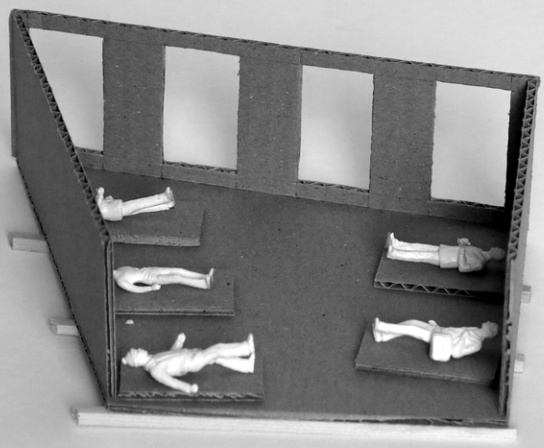
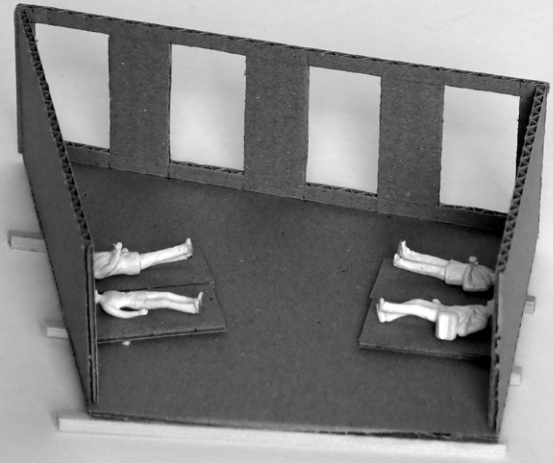
Materiality of the boxes would be an important element inside the voids. We wanted them to be seen clearly as new elements, but also to use materials and building techniques that were used in the portugese tradition. We considered several materials but ended up with wood because of it's warm appearance and presence in the portugese building tradition. We found several walls covered with wooden battens and mortar that generated the idea of using wooden slats as cladding for the boxes.

We did several model studies to see how the boxes would affect the space and how they would appear in the voids. We experimented with the concept of more massive boxes spanning over several floors, but ended with smaller boxes as these would appear lighter and could each rest on the existing layer of beams.







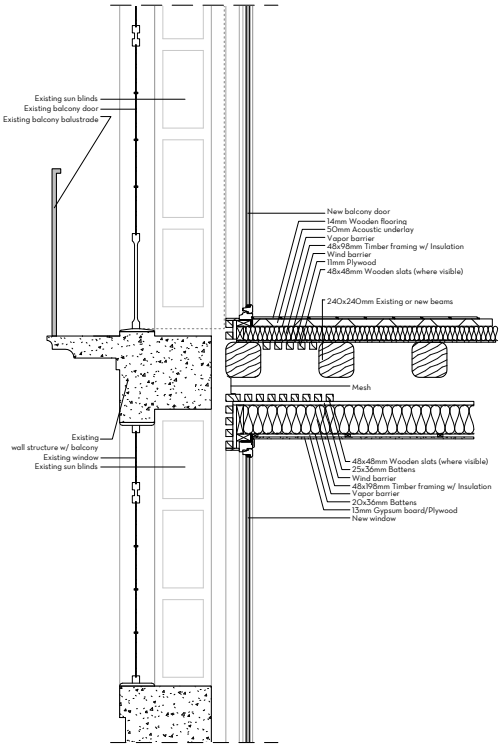
14 | BOX DETAILING

Further on we needed to find out how thick the walls would be, how they would be detailed, how new beams could be attached into the old holes and how the box openings would work towards the existing openings.

To explore how thick the walls would be and their U-value we used a calculating program at rockwool.no. We worked towards a U-value of 0.3 - 0.4 W/m^2K and ended up with a wall of about 18 cm. We did the same with the door and thus ended up with a final thickness for walls, floors and ceilings.

To find out how new beams should be fixed into the sockets we contacted our good friend Tiago who explained to us that they could normally be inserted in two different ways. One way was using joist hangers, and another way would be to knock out some of the mortar or stone in the wall, push the beam into the hole and fill it back up with mortar. we felt that making use of the current holes would work better with the history of the building, and thus opted for this where circumstances permitted it.

Another small detail that was also added, though a bit later was a small net at the border of the edges, as to keep birds and small animals out of the gaps between box and stone wall


Existing sun blinds
Existing balcony door
Existing balcony balustrade
Existing
wall structure w/ balcony
Existing window
Existing sun blinds
New balcony door
14mm Wooden flooring
50mm Acoustic underlay
Vapor barrier
48x98mm Timber framing w/ Insulation
Wind barrier
11mm Plywood
48x48mm Wooden slats (where visible)
240x240mm Existing or new beams
Mesh
48x48mm Wooden slats (where visible)
25x36mm Battens
Wind barrier
48x198mm Timber framing w/ Insulation
Vapor barrier
20x36mm Battens
13mm Gypsum board/Plywood
New window

Since the existing materials in the project have such a strong character the choice of new materials and their task was especially important and something we discussed and worked on to a large degree.

We had previously formed ideas about the materials that we wanted to use, but we now sat down and looked at the reasons for our choices and if they were right. What materials were suited to the different areas and what would they give to these areas.

Areas where people would walk a lot and pass through should be a robust material. We ended with a light pigmented concrete that would be the same on much of the walls and constitute all of the distrubution area.

The area on top of the beams would be made of wood so that it could be supported by the existing structure.

PARQUET

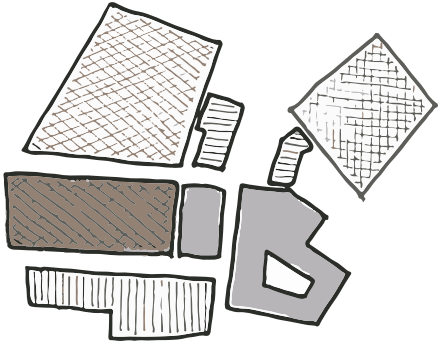
TILES

HARDWOOD FLOOR

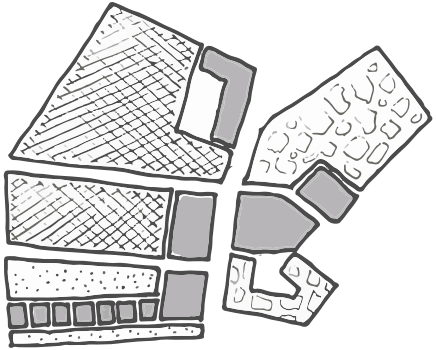
EXISTING STONE

CONCRETE

GRAVEL



Typical hostel floor



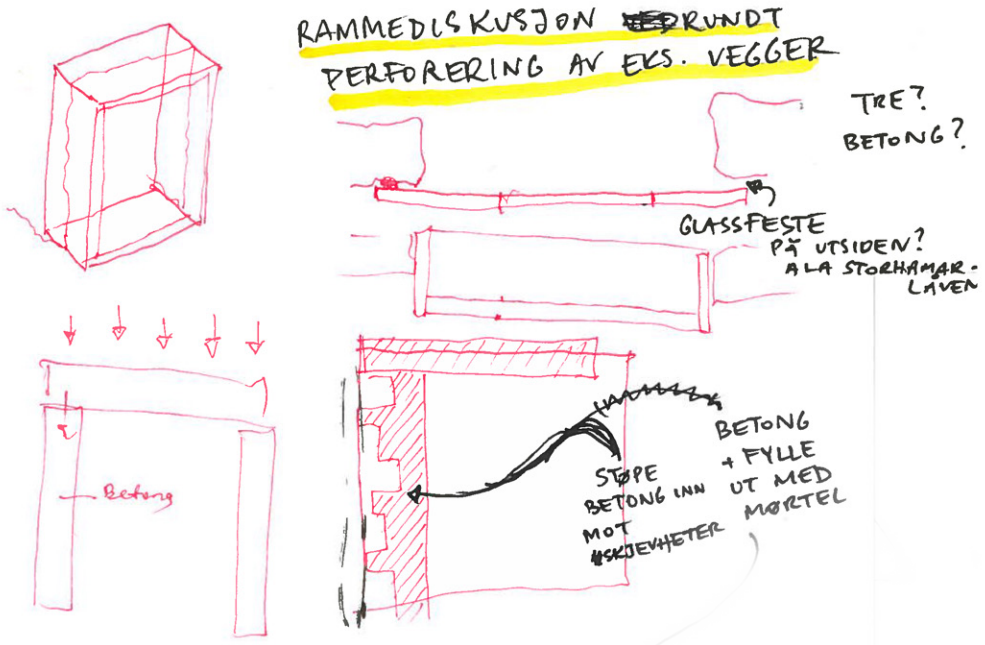
Street-connected floors

The frames around the newly cut openings would be concrete - a modern way of constructing openings where they before used stone.

The entrance area would be white gravel with a few plants (rarely seen in Porto) and with light concrete steps.

The stairs had become a large part of our project and we made a stair concept where they were to cast shadows just as the existing beams, so it was important they were light stairs. We did not want to mimic the old stairs as this would be copying, and not something we strived for.

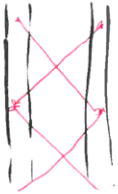
The bathrooms floors also needed to be robust and be able to deal with water spillage and showers. Therefore we initially here thought of concrete, but that came in conflict with the present wooden beams, which were to maintain. That resulted in the use of square tiles, similar to the facade tiles on the buildings of Porto, but a dark, modern and uncarved version of them

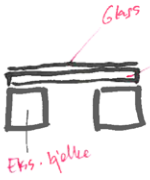

RAMMEDISKUSJON ~~ED~~RUNDT
PERFORERING AV EKS. VEGGER
TRE?
BETONG?
GLASSFESTE
PÅ UTSIDEN?
A LA STORHAMAR-
LAVEN
BETONG
+ FYLLE
UT MED
MØRTEL
STØPE
BETONG INN
MOT
SKJEVHETER
Betong

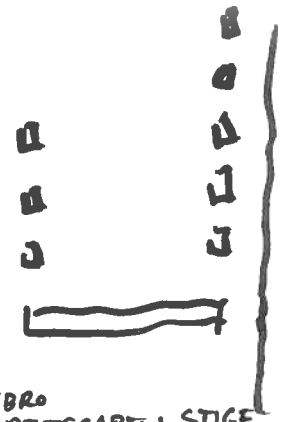
DISKUSJON MED JON

-Vi gikk fra betonggangbro til å tenke transparens gjennom gangbroene

FORSLAG OG TANKER OM UTFORMING







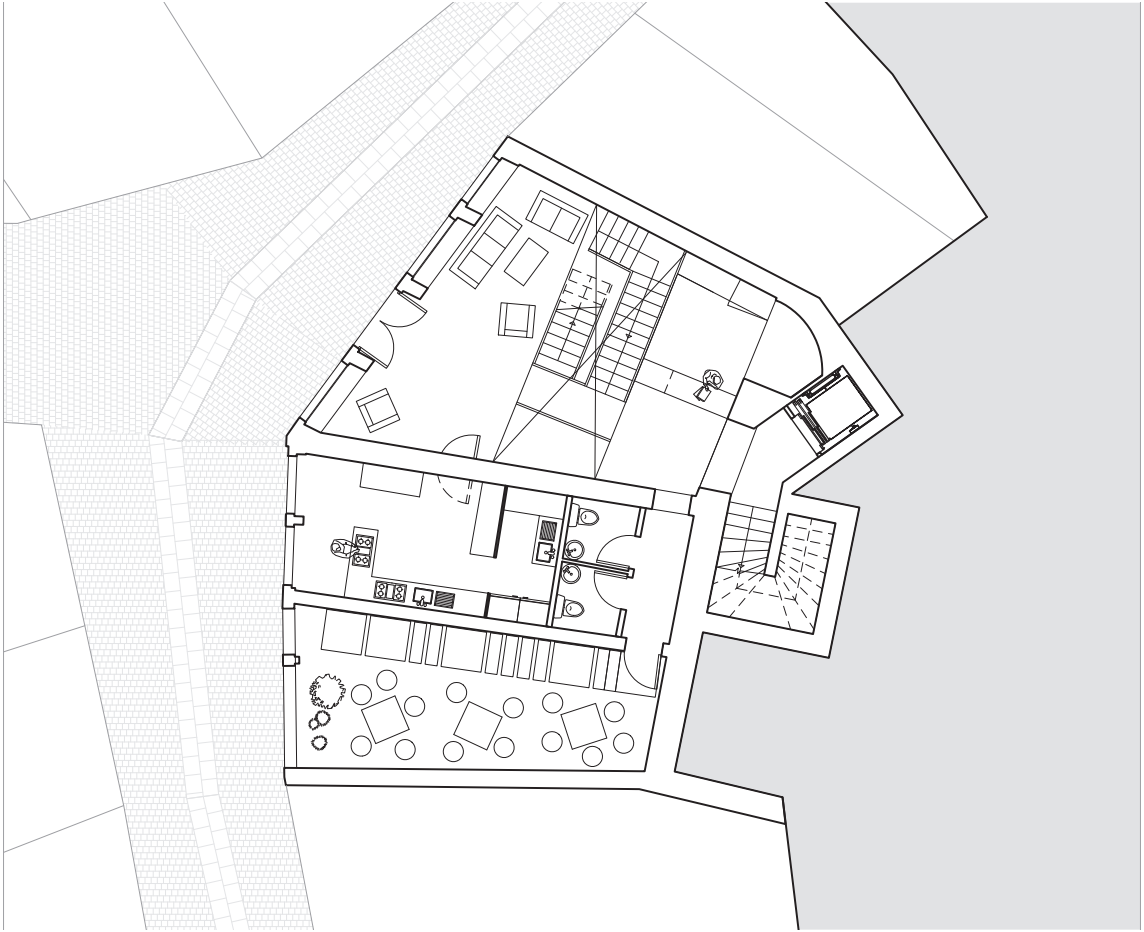
GANGBRO
+ FIRE ESCAPE I STIGE

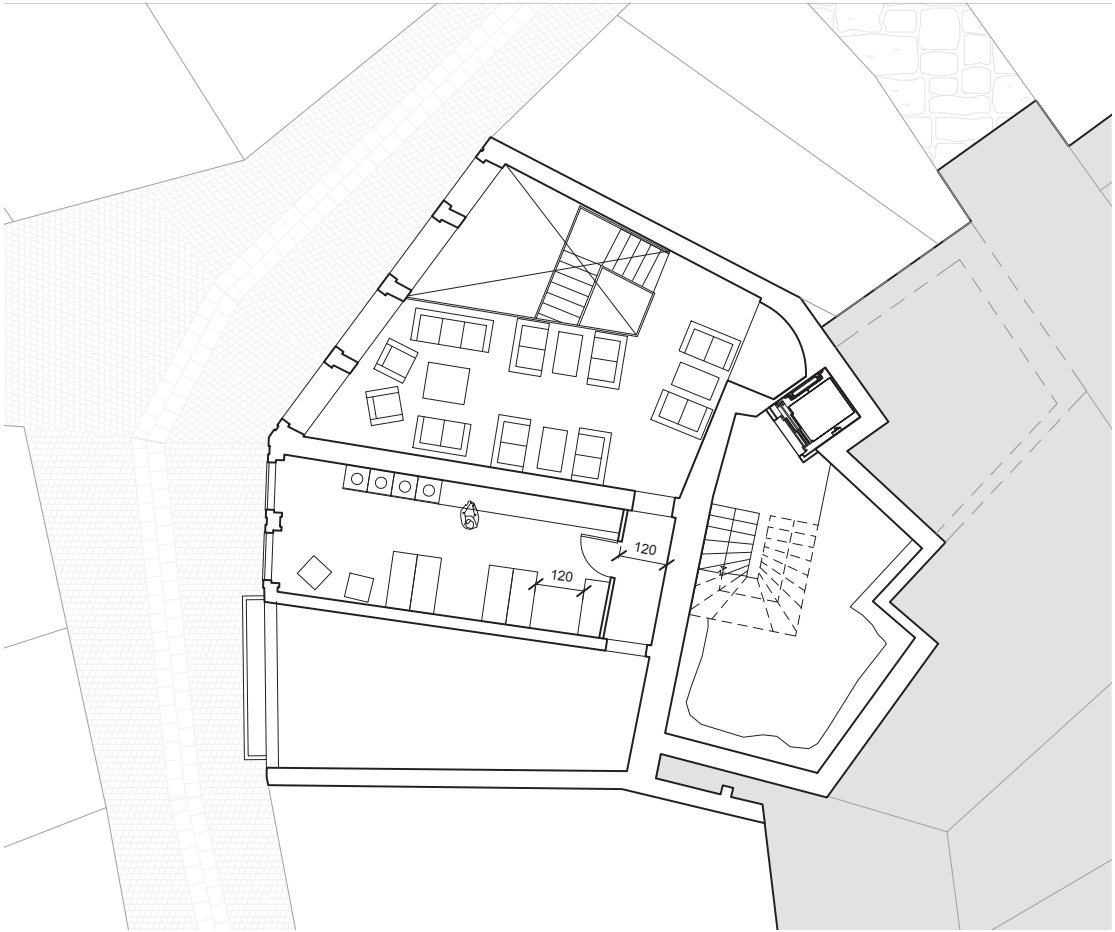
One of the professors at NTNU, Finn Hakonsen, had taken an interest in our project as he is a Porto enthusiast. He offered to have a sit down with us, bringing his portuguese vit.ass Carla, and talk about the project to give us some feedback. The talk led to a general rethinking of the layout, the main output being a relocation of the entrance to the empty building shell (building A), and giving the stairscase more space and importance, also making it a fireproof cell. The talks we had also led to a more open ground floor and relocation of the kitchen and restaurant storage and facilities.

The reason for the relocation of the entrance was primarily to make the entrance more of an experience. Instead of walking directly into the building one would walk through the void and under the terraces before entering into the distribution space. This also led to the restaurant having more rational space.

The stairs was something that we had struggled a bit with and relocating them was something we had previously thought about. Relocating them would remove one set of boxes, but this set were a difficult one without particular qualities and with little flexibility. Relocating them would also allow them to be a more sculptural element and become a firecell, improving upon the firesafety of the building.

The relocation of the restaurant kitchen opened up the ground floor and offered a better understanding of the different building unit in context with each other. It left us with some issues to be solved as where to put storage space and toilets for the restaurant.

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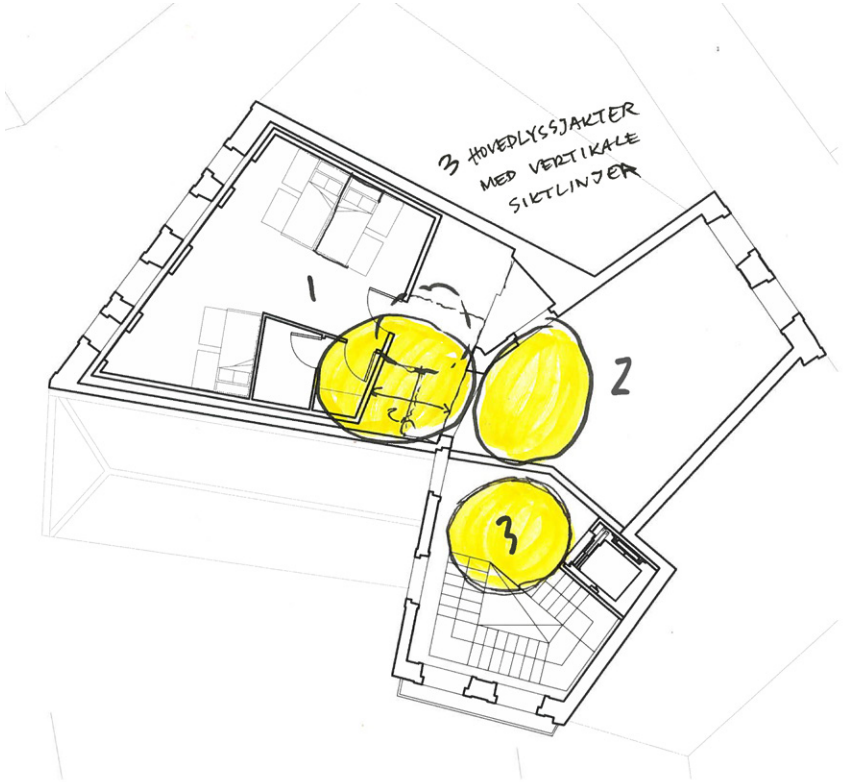
3 HOVEDLYSSJAKTER
MED VERTIKALE
SIKTLINJER
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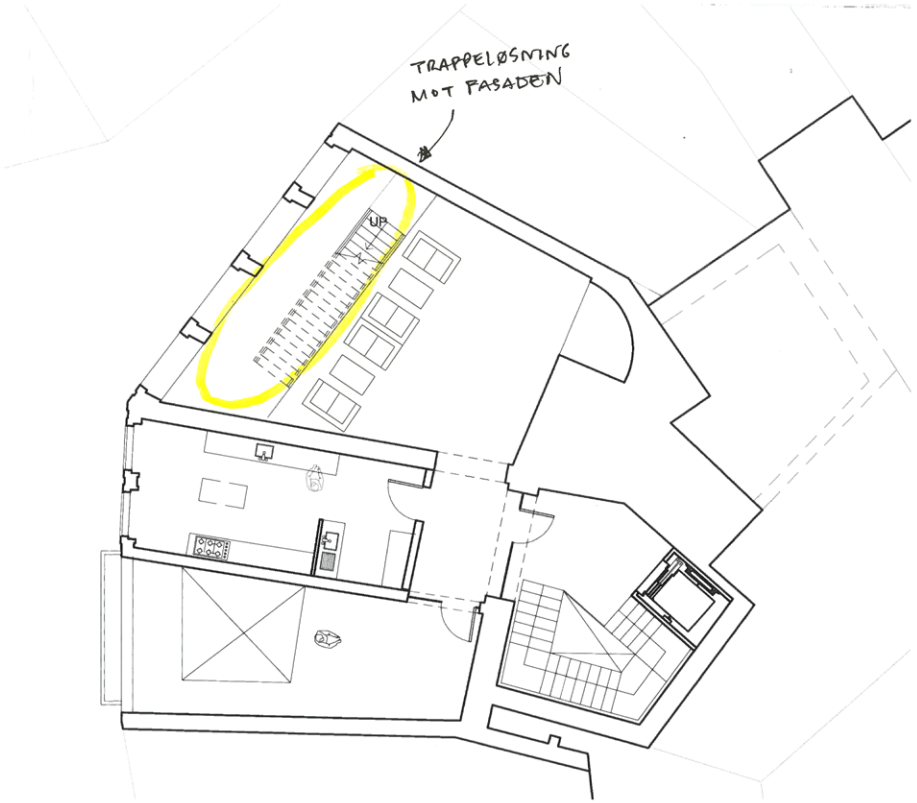
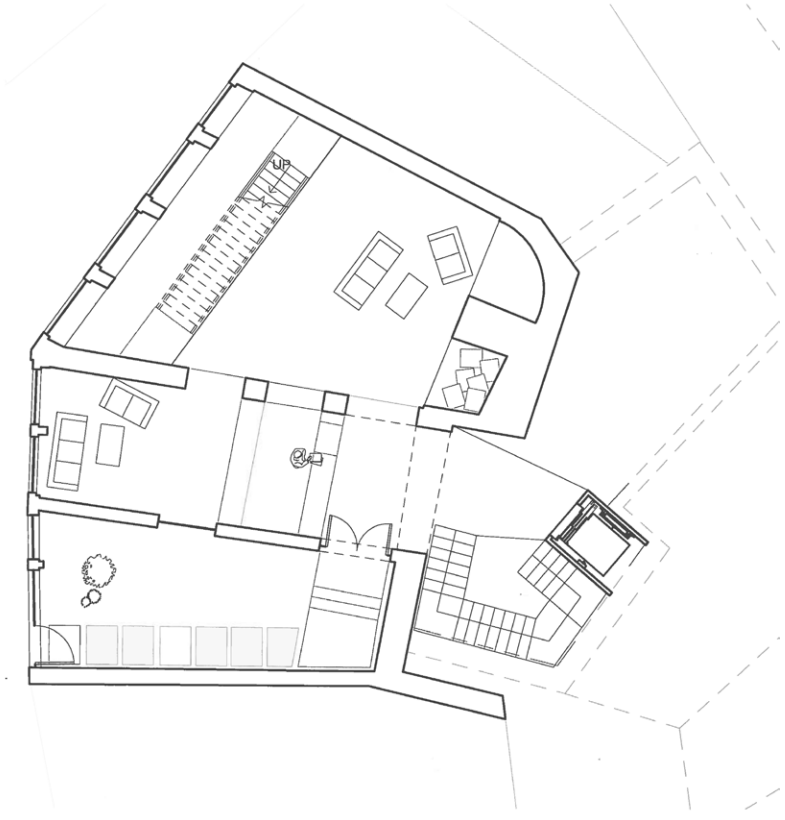
2
3

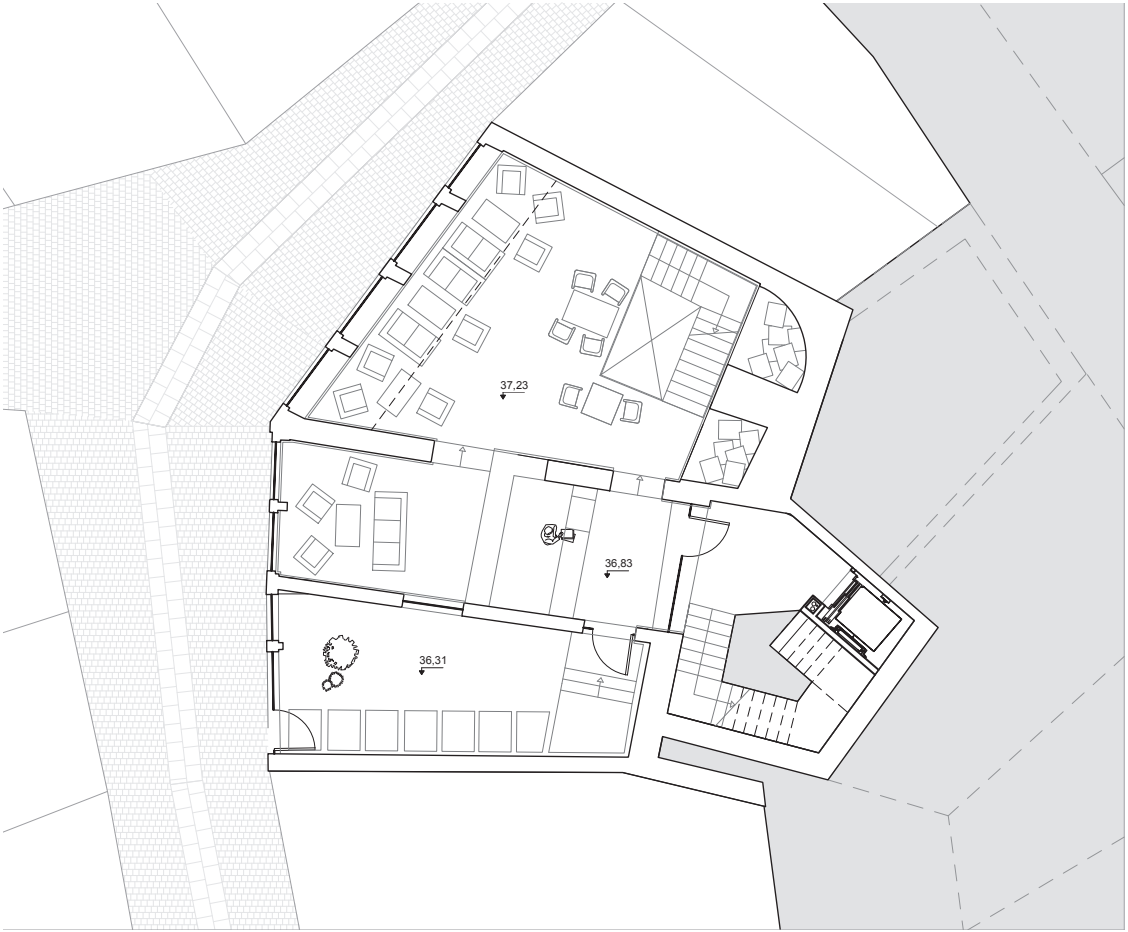
17 | THE RESTAURANT

From here we went through several different scenarios of how to organize the restaurant. We ended up removing the restaurant in the basement and put the toilets and storage space here. This would leave us without a tree floor restaurant, but it would make more sense to leave these facilities in the lightless basement floor.

We looked at different ways of placing the stairs in the restaurant and here ended up in placing them in a void that went over 3 levels, and, similar to the other stairs, attached them to the walls highlighting the difference between old and new. We also left a double height ceiling towards the window giving a feeling of the height of the space and making the existing beams more visible. In addition to this we opted for folding the floor up to create the railing and give a more unified look.


TRAPPELØSNING
MOT FASADEN
UP

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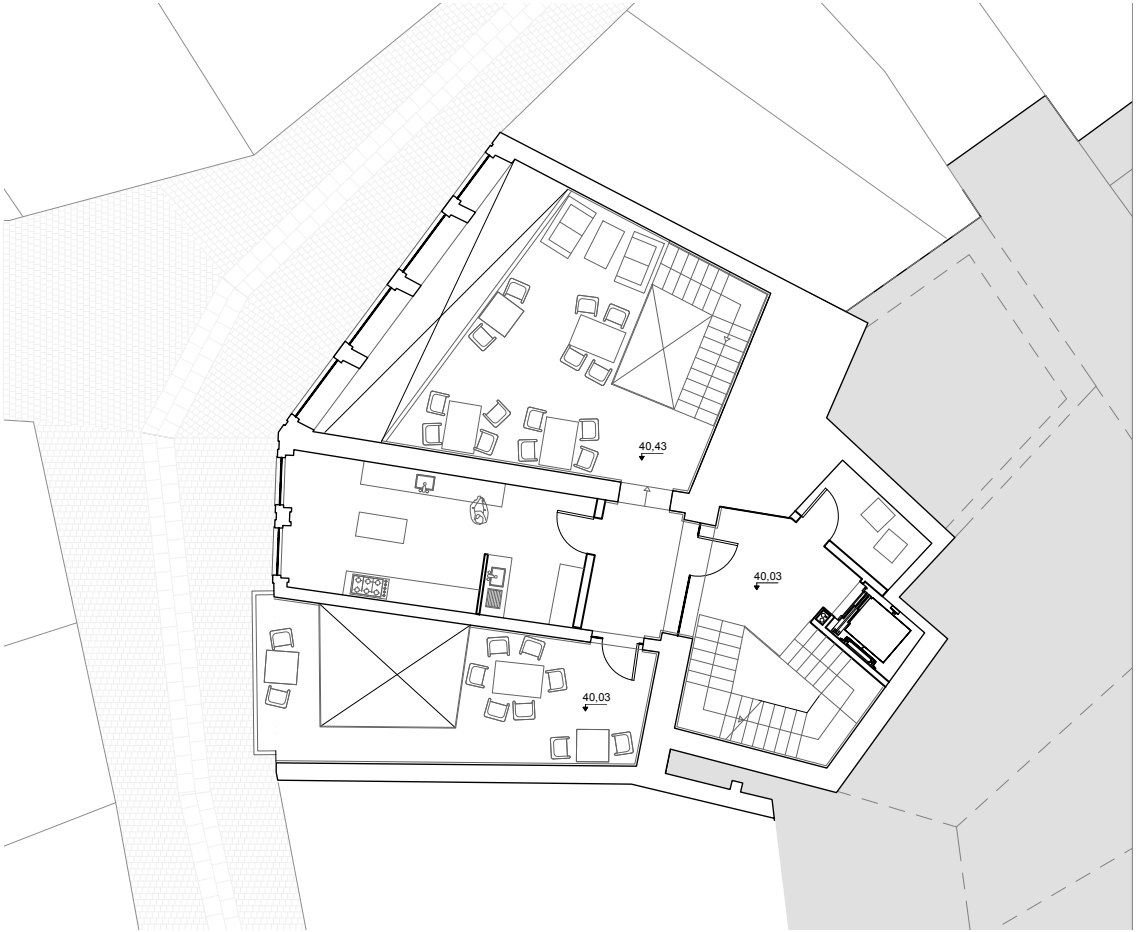
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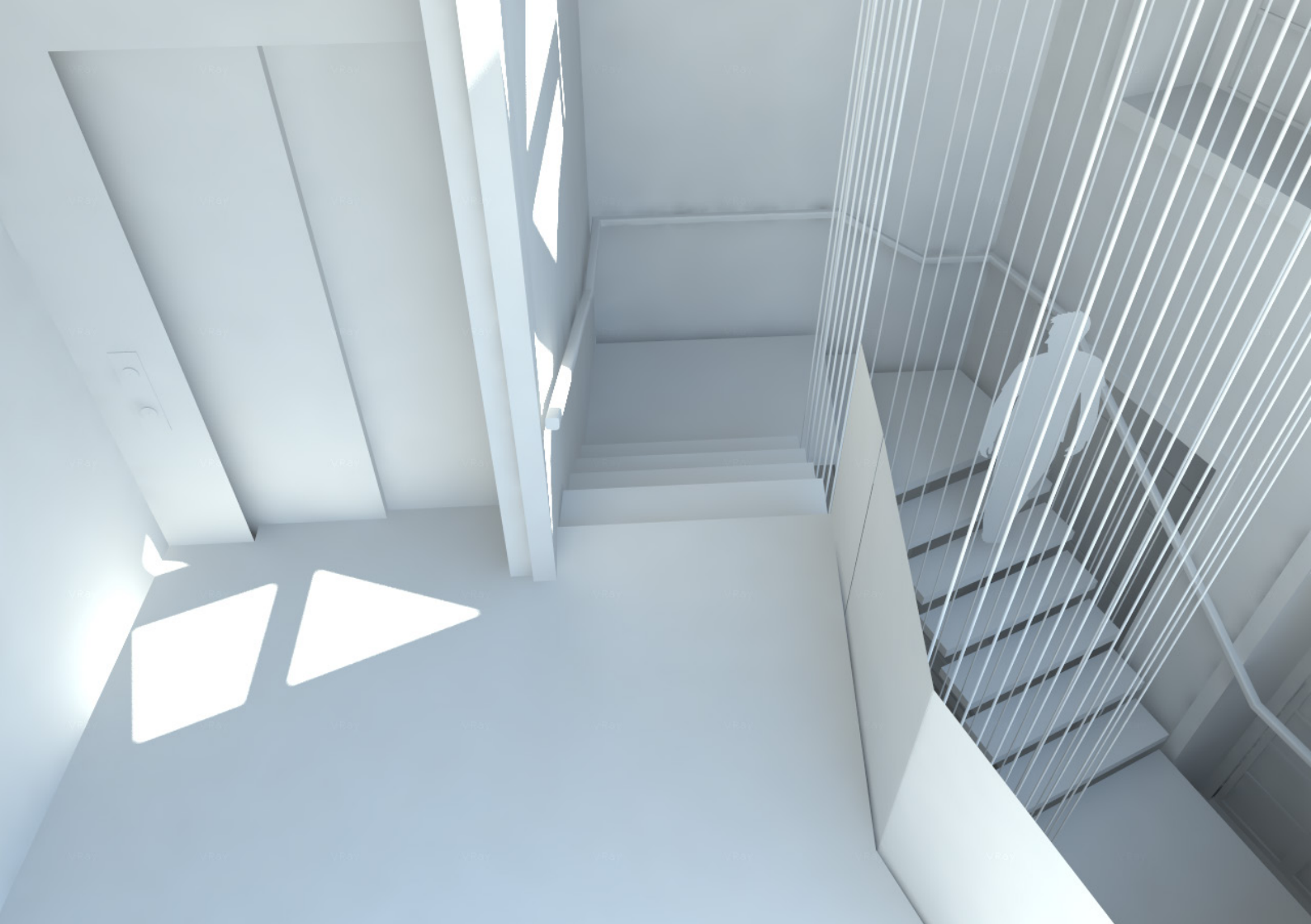
Four weeks ahead of the delivery deadline we started to lay the base for and produce the final material. This meant working on our computer models for production of the renders and illustrations, finishing plans and sections and laying the ground work for the models.



We have both brought our own skillset to the project and that it is because of this skillset that we decided to work together. Though there has been bumps along the road, we feel that it has mainly been a steady process we have dealt with through the project, and have tried, to the extent we could, to investigate and work on every aspect of the building.

There has been a bit of timewasting, especially building the contour model, and we also believe that we should have started investigating with architecture sooner and learnt the building layout this way instead of trying to figure it and work out all the kinks first.

After we started to work with it using architecture we discovered many new elements of the building and ways of using these elements to our advantage.