Dutch Housing Graduation Studio
“Between Standard and Ideals”

P4 report

CITY > HOME
Young Professional Living

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In this P4 report there will be a description, explanation and reflection upon the various ways in which research has been used in the graduation process and which relation there is between the research carried out and the design.

In order to be as complete as possible with all the different kinds of research there will be a general part that discusses the position of the research within the master track of architecture, the relationship of the research between the graduation project and the social and scientific framework and the ethical issues and dilemmas that were encountered while doing the research.

Afterwards in a rough chronological order the different methods of research during the project will be discussed and the relationship with the design. Also with each of the researches that are mentioned in the P4 report there will be an explanation why this method was chosen and an evaluation of the research. Finally at the end there will be an overall conclusion regarding the research process as a whole.

According to my own opinion research is an essential part in the design process. It is an opinion that grew stronger during my architectural education. I have witnessed in my own design process that the more accurate knowledge you have as a designer the more precise decisions can be made, which eventually leads to better results.

At the start of my architectural education with my first design projects, research seemed a nuisance that kept us away from designing. The integration of research and design often was lacking which led to a separation between the compulsory research part and separately the design part. As a result, it was hard to make the right design-decisions, because of the lack of accurate knowledge. Decisions were instead made on assumptions and personal preferences. During evaluations this led to situations in which the design was very debatable and therefore often not as convincing as it could have been towards the tutors.

Through increasingly complex projects the value of research grew more important. Having the right knowledge turned out to be essential for a good design process. My experiences have shown me that the right research makes the design process easier and has a direct impact on grades, because it allows to be more accurate, make stronger, better decisions and presents a retraceable process that allows others to understand how and why the design is shaped a certain way. Being able to provide convincing insides in the process leads to more engagement of tutors and in the future of potential clients, which can result in better results. Research for me is laying at the very basic of architecture and for me has become an integral part of the design process.
The architectural research is not the same as a researcher doing a formal research with the aim of producing a scientific research report. The aim in the architectural research is to design a physical solution for a specific problem. The design, in this case an apartment building with micro-units, is a result that is shaped by so many different factors that it is impossible to call the design a purely scientific design. The aim of scientific research is to come up with one conclusive answer. In architecture and many other design related professions the end results will always vary. With architectural competitions for example, not one design will be the same. This is because there is not one answer to the question. Yet this doesn’t mean that an architect just randomly comes up with an idea, often there is a lot of research that have shaped the design which for an outsider may not be directly apparent, but the performance and quality of the building will largely depend on the accuracy of this research. This report is aimed to provide the principles of the underlying research.

**Relationship between the research and the Architectural education**

The research that is conducted connects in multiple levels of the MSc Architecture, Urbanism and Building Sciences. The master program comprises also Urbanism and Building Sciences. Although these tracks focus on different aspects more, the graduation project can’t work without these fields as well. The research carried out about the compact city is very much a philosophy within the field of Urbanism. Yet some of the principles have been eventually integrated within the architectural design of one single building.

Within the master track of architecture, the research on how to densify and use plots of land as efficient as possible are interesting for all fields within the field of architecture. Building on infill areas and how to deal with these places is a field that exceeds just the field of dwelling. What I have experienced during the design process is that when you would design an office, which is far more flexible to design compared to a dwelling project, the methods will vary. However for different dwelling projects dealing with the surroundings on an infill location will be similar.

Zooming in further to the studio topic the connection will be very clear. Those who watched the news can’t have missed that The Netherlands is struggling with the housing market. There is a large shortage of dwellings, especially for groups with lower incomes and starters. Housing prices are booming making the topic of dwelling very relevant. The studio’s main emphasis according to the Graduation Manual are flexibility, transformation, high density building schemes and sustainability. All these topics can be found back in the research conducted. The build-
ing is aiming at a target group for who it is now very hard to find affordable housing. It is a group that prefers to live near the city centre because of their lifestyle. The focus has been towards density and studies have been done to research in which way the site that is transformed can be used as efficiently as possible. Another important aspect is flexibility, as the main structure of a building often last longer then the rest of it. Look at the canal houses of Amsterdam. A lot of them have seen many transformations over the time and are even today highly attractive. Sustainability in every of my projects have been very important and the way the building works is very sustainable. The way the dwellings are shaped with minimal unit sizes means that the first step of the ‘Trais Energetica’ has been reduced. Not only in way of energy consumption, but also in building materials that are getting scarce. Through every stage within the wide profession of Architecture there are links to other specializations, however the primary focus clearly is towards the search of finding solutions for the housing needs of today and the cities of tomorrow.

Transferability of the research

The research is on many fields transf erable. Many of the aspects researched are relevant to the current issues in the field of Dutch Dwelling. Amsterdam and many other cities are growing because many people choose to live in the city. Cities have expanded dramatically over the last hundred years and many cities like Amsterdam are getting short on space to expand. Amsterdam is touching the borders of the municipality and must grow through building on infill locations. Currently there are a lot of transformations of former harbour areas, but these are also limited. The future aim is therefore on intensification and densification of the city. Most of the denser cities are facing a lot of issues because of poorly executed density strategies. Through the research I have learned that this field is very complex. Just like in architecture there are many factors involved in creating solutions that work and there is not enough research or good understanding on how to do this. The research done is a good step in creating better cities and deals with one of the main issue’s cities will have to deal with in the coming decades.

Also, I have been doing research at alternative ways of living in dwellings. The last hundred years we have started to enjoy living in very large houses and enjoying the luxury of having specific rooms for specific purposes. This is however not very efficient. Especially when the square meter prices are getting high. I believe that in the future we will spend more attention to our interiors. What always wondered me is that the car industry manages to sell cars with very high standard interiors, but in our houses the level of
integration of different things lacks. We collect separate furniture that can do only one thing and needs its own space. Living smaller allows to spend the saved money on smart interior spaces. Beds that can fold in and out from the wall for example or tables that can extend when there are guests. This kind of flexibility together with good integrated storage makes living in smaller spaces much more comfortably. The current demographic trends are that young adults will be living longer on their own or as a couple longer without children. The flexible interiors of micro-units have been shown a very effective way to live more compact. For families with children there are also good opportunities, but this group is much harder to house in micro-units as there are a lot of routines mixing together whereas in a one- or two-persons household this is much less. All this information that is gathered from researching micro-units, space saving solutions and flexible, multipurpose furniture is precious knowledge that can easily find its way into future projects.

The research done about density and using a plot in the most efficient way has taught a lot about how different typologies perform on a location. It has though me a lot about how to use tools like the FSI, GSI and OSR to assess different solutions. This is a method that will be easily transferable to future projects as well. The knowledge gained for assessing different urban lay-outs within this study also taught me a lot. The older city centres are so dense because of the high GSI rates that they can achieve. This is often why the density can be so high, but without having to build highrise buildings. Highrise is often not the best choice for creating high quality living environments. Within the research I have been looking too at the work of Jan Gehl and listening to his research made me understand a lot of the post-wat architecture better and all these studies and research add a lot to building up a better base of knowledge that will be relevant in a lot of different situations in the future. So apart from the personal gains of the research there is a very relevant and important issue to which the research that is affecting a large portion of humans around the world. Being specialized in creating good cities and being able to fill the gab in knowledge that has been identified in this research will be very valuable.

E t h i c a l  i s s u e s  a n d  d i l e m m a s  d u r i n g  t h e  r e s e a r c h

Architects have an important role designing buildings in which people spend a significant amount of time of their lives. The ethical issues that I have been facing has to do with the question if it is ethical to provide such small living units for people to live in. There is a housing shortage, so people will anyway live in these houses, even if they are small. Is it ethical? I have been doing research to the target group and that
has helped me to determine if the minimal space is an ethical decision and my conclusion is that it is ethical for this target group. Precedents show that these types of buildings are often specific for a target group and there is a selection process on for example age. This raises another ethical question, can you select on a specific group of people? Again my own research has shown that it is not the perfect situation, but that it is ethical because of the specific kind of dwellings that are being built and just like in the case of elderly housing it makes sense to reserve them to a specific group. The other reason why a selection of dwellings is ethical in this situation is because this group can live so compact, it allows other groups to live in the larger dwellings in the city. Young Urban Professionals spend a lot of time outside of their dwellings and need a dwelling that is more of an extension of the city then that it is a separate unit. Young Urban Professionals need more contact with like minded people so communal spaces matter more. For these spaces to work it is important to have like minded people as well. All together it makes that the concept of YPL (Young Professional Living) with the micro-units is ethically justified. Leaving out the communal spaces and constructing the building in the middle of fields will not work. Then people feel trapped in small spaces, so there is a fine balance in the design and you should not judge the design-concept separate from the contexts in which it sits.
One major part of the research has been literature research. It has been very helpful in gaining a lot of knowledge and understanding of different topics. Especially when there is a good research paper that is relevant. It helps tremendously, because a good research report embeds knowledge gained from previous researches that have been carried out, so these are good sources of information. This kind of research is often backed up with convincing studies and therefore provides with empirical data. Finding the right research with empirical research has been the aim, but for some subjects there are too many different variables that influence the results and making the empirical data questionable. In some cases, empirical data is contradictory.

Generally, the method of research can be split up into two parts quantitative meta-analysis and qualitative research. Quantitative research is objective and includes statistical data. The amount of research is reviewed and has conclusive answers. Qualitative research is when there is a large amount of research and a quantitative research in not possible. A qualitative research is subjective and aims at identifying new themes or concepts. With a qualitative research an interpretation is made based on the research that has been reviewed. Because of the quality of different researches conclusions can be drawn, yet subjective. In the graduation research the main topics have been researched via quantitative research, but because the architectural research is not comparable with a research report specifically aimed at solving one problem it has been impossible to conduct a quantitative research on all the different aspects. Therefore, for certain areas of the research qualitative research was enough to have a convincing enough argument.

The biggest struggle in my literature review was to find the right scope of the research. I have been keeping the subjects a bit to wide in the beginning. The result is that the body of knowledge is way to vast to review and that makes the research less comprehensive and too time consuming. Scoping the research to a very specific goal has been the main hurdle during the graduation track. Eventually I have managed to bring all the different aspects together and present them in a coherent way. But in further researches to overcome this it is important to spend more time in scoping the research then to quickly wanting to start researching. Personally, I am interested in a lot of different things, so I can get easily distracted into a specific area. Not having the right scope with the correct borders can easily get you drifted away from the target and I have found myself in these situations several times. The main aim (what I want to do) somehow disappear to the background and causing confusion at the guiding tutors. I have set up researches earlier and always had trouble in framing the right questions. This gradu-
ation track being especially difficult because of the many different aspects coming together to form one research report.

A good conclusion is that I have done a good research, but it could have been sharper and less time consuming with the right scope. Eventually through extra research all the areas have been brought together for the final presentation, but by investing more time in future researches about how to set up the research will greatly help the process.
For an architect it is important to have a good understanding of the location. The architecture that will take place on the location will react with it surroundings and impact the quality of the area. An architect has many different methods of researching a location. I have used different techniques, like phenomenology. Going to the site on different occasions and observing what is going on. Taking in the location not with mere sight but using all the senses. Listening to traffic, looking at how people behave, smells, shadows, traffic streams, etc. For me it is the best way to get a good understanding of the location. Visiting a site is crucial. Utilizing Streetview to review a location is therefore not enough as this is only focussing on the visual aspects of the location. Many of the observations done in a later stage were backed up with statistical data to make a strong argument. One of these is the traffic flow on the location. There seemed to be a busy stream of traffic in the various times that I have visited the site. Looking at data later proofed that the stream of cars follows this pattern frequently. Something that by only looking at the road lay-out would have probably been overlooked.

The next step is to look up different data that is not always directly apparent to the observer’s eye but is important for the architect to understand. Mapping, for example, places of specific facilities can confirm certain observations, but at times can also lead to unexpected insights. That is why I have been making a lot of reduction drawings that show only a specific characteristic of the location. Many of these drawings don’t make it in the research report but remain important as they may had led to unexpected findings. The ones that are shown are the analysis drawings that bring important conclusions of the location forward and to my opinion also help in the transferability of knowledge, because mere observations are good, but much stronger in presentations when backed up with visual representations of these observations so that clients or tutors also gain this understanding.

The analytical drawings are a good way to get an understanding of the ‘as-is’ situation, but for me the best tool to gain understanding at a deeper level is to look at the development of the location in order to understand why certain buildings are there. Especially on an historical place as the location in Amsterdam. There are good historical maps available of the location providing with an overlay of different time periods. It is providing insight in the buildings that were build and demolished. An interesting fact of the location researched is that in the building block on the west side of the location some buildings have some slanted walls. The reason why these buildings have different angels is because in the past the tram rails were going right through the middle of the building block. It also gives insights in the importance of different
Map that confirmed the traffic streams that were observed during the location visit and which helps making the observation transferable towards others.

Reduction drawing showing the historical buildings in relation to the location in the centre of the drawing. The red buildings are national heritage buildings and the orange municipal heritage buildings.
buildings. There is a large building standing on the south-east of the location that housed the first municipal power plan to electrify the tram network and east of the plot used to be an end station. Even before the tram went through the location there was a military zone with towards the north the entrepot docks, which was a crucial point in the development of trade in the city of Amsterdam. Understanding the location helps to deal with the location in a careful manner not to harm the rich history of the site. It can also lead to a building that can highlight some aspects of this past.

All this knowledge needs to be brought together in the end and weight to make a conclusion on how to treat the location and the surrounding and what kind of interventions can take place. One good way to do that is to reason via a SWOT analysis. To write down the Strengths, Weaknesses, Opportunities and Treats it gives a good overview on elements to reflect interventions back to the location. One of the opportunities for this location is the placement in the middle of a lot of amenities. This is because of different routes that meet at the location. This is also why the car traffic is more at this place. These amenities make the location very attractive. The other opportunity is the lack of quality and density. It is an underdeveloped site and that gives a lot of potential. The square meter prices are the lowest among the fortification ring and yet it gives incredible access to the city centre, with also a good connection to the metro station. All these insights help framing a solid approach to the location.

The location has been important in shaping the design. Although there was quite a lot of freedom, because there is not a very strict grid to stick too. However, to make the building integrate in the network the grids have been researched and the building is reacting to these. Also, the building is providing with two different impressions from the city centre view and from the outside of the city centre. This has been a conscious decision that is influenced by a lot of different other factors too. The stepped design comes from seeking ultimate densification, meaning that it should not negatively impact the surroundings, but also daylight been an important factor with the building on the west side.

What makes these studies always so interesting is that you get to know so much about the location and thereby also on the rest of the city that you start looking completely different at the city. This is important for different projects in Amsterdam where the research will be easily transferable. Where I can still improve my work is on the Urban Sections. These I will draw in an earlier stage to better chart the relationships to interventions on the location in relation to the surrounding buildings. This was left out for too long, and highlighting some issues in a later stage causing some delays there.
Map showing the heights of the buildings in relationship to the location.

This research was to provide insights in how the location is perceived from different angles. The numbers relate to photographs that are included in the research booklet.
After discovering what the target group would be for the graduation project meant finding suitable precedents for the design. To my opinion precedents are important in a design process, because they are good bodies of knowledge. During a literature research the researcher takes information from different previous researches done in the same subject comprising the body of knowledge that is already present. The researcher then can choose to verify these researches or to use the research as a basis to conduct further research. The same is true in architecture when looking at architectural precedents. Other architects have been doing research in how to design certain types of buildings and their experiences are valuable to an architect to understand what works and what to avoid in the design process.

However, when the researcher is exploring a new field it will be hard to find a good body of research. This is the same that happened during the graduation process in which I found that there are a lot of similar precedents available, but to the specific type of building that I want to design are very limited options.

In my search for suitable buildings I found that the concept of ‘Young Professional Living’ comes under many different names and has is rapidly gaining popularity. The concept seems to find a niche in the market and this has led to the development of a lot of new plans. The few existing concepts that are built and in use do not have floorplans online and through asking for the floorplans from the organisations that run them or the architects I have been unsuccessful. This made doing a thorough precedent study very difficult.

When diving deeper into the websites of developers it is easy to find a lot of plans for future YPL [young professional living] concepts. Some developers who haven’t opened their first YPL concept have already plans for four or more buildings to be constructed in the future. The rooms that become available seems to vaporize due to the high housing needs. The concepts being not only interesting for the people that live there, but also being very attractive to developers, which makes me believe that the developers rather not share the floorplans and details of their buildings.

After countless hours of searching I instead have chosen to compare various concepts that are close to the Young Professional Living Concepts. Student housing, Co-housing and Micro-apartment buildings were used to estimate the communal spaces and how the buildings will be used. The Collective Old Oak in London, which is a YPL concept did not wanted to share their floorplans after email contact but has a ‘Street-view’ through certain parts of the building and that allows to see the communal spaces. Finding a lot of similarities between some of the
Analyzing made hard, because of the lack of floorplans. However the Collective Old Oak in London offers a Streetview - which proofed very useful assessing the building.

Change= concept is one of the first that offers Young Professional Living. This developer is planning on opening at least four more similar projects in the coming years. Many other developers are jumping in with their plans for the future.
buildings have led to an assumption on how much communal spaces and what for communal spaces are needed in the building, like having a lot of communal kitchens.

Apart from e-mailing The Collective Old Oak and many other developers did not lead to any floorplans that I could use in a formal drawn precedent study. As mentioned earlier I expanded the precedent search and used it as a tool to try and identify the answers to the questions which I had. Most of the questions were related to the placement, amount and usage of the communal spaces. In order to do this, I not only looked at plans but watched presentations and read researches about co-housing and micro-housing, as well as communal living (or co-living). Having a wider body of knowledge turned out to really broaden the view in looking at the concept. I found out that the lack of a formal floorplan study really was made up by a deeper understanding of how these concepts work and together with the impressions that I was having from the existing floorplans in which I could estimate the amount of spaces versus the amount of units, allowed me to put together a good program for my own design.

For the micro-units I have been studying a lot of different plans and also here I noticed that the micro-units are still gaining popularity but are not a widely spread phenomena for a Western target group. In Hongkong it is not difficult to find a cramped, small apartment, but a micro-unit is much more then just being small. It is much more about using every inch of space to it’s fullest potential in a multifunctional way. Not having a bedroom that is separate is, because it doesn’t make sense to have a room of 20m² which is only getting used at night while the rest of the house is not used at that time. It is a luxury we are unaware of. Yet when you are living as a couple or alone it is very easy to turn the living room into a bedroom. There is not need for rooms. This way of thinking is different then from the goal of designing just little apartments.

For me to develop more variation I have been looking at a lot of variations and I found out quickly that when you are having a narrow and deep micro-unit the options are very limited. Another interesting conclusion was that when you compare cubic meters instead of square meters a lot of duplex apartments with large open ceilings are not efficient as potentially that could have been a bedroom. However, quality is also important and having an open ceiling instead of a bedroom shows the strength too of a micro-apartment. This open ceiling is the result of skipping the bedroom and placing it in a flexible way in which there is multifunctional use. So, there are lots of ways of thinking about micro-units. The research and the collection of floorplans really helped me to get good ideas to integrate in the dwelling design.
Other concepts of Micro-Housing filled the void of information and worked well to research different topics. Like SongPa Micro Housing of SsD with extends living into the collective realm.

A selection of micro-units researched. Redrawing the floorplans in the same scale and with the same drawing style made it easier to compare different solutions and types.
In the search for strategies for densification I performed typological research and in order to measure the scores of the outcome of the research I have been looking into the FSI, GSI, OSR and the number of floors of the building. These different parameters are in a relation to each other and that allowed to make a graph though via calculating two values the others can be determined. However, it is important to understand that the numbers are average numbers. So in an urban context having a tower block and a low-rise area means that the average height will be shown in the graph. Right in the beginning when I was starting the research, I realized that the numbers work best in urban contexts and that there are a lot of factors that determine the score of the urban contexts. Do you for example include a park and where do you place the border of the site?

For my site the main importance was to look at different typologies. Looking at different buildings let to another obstacle. Calculating the GSI was very important and small differences were affecting the outcome so much that I needed to change the method of working, because if you have a tower, or any other typology and it is fitting exactly to the borders of the plot then because the GSI is so high a logical conclusion can no longer be made. My project location has a very odd shape and so it is impossible to fill up the whole site with one large massing so instead I focused the research to become more specific to the project location. Different typologies were imported to the location and places on the site. Because the GSI would always be related to the project location’s plot size there was a very clear distinction visible between the opportunities of different typologies.

The selection criteria of the different typologies were another factor that could shape the outcome of the research. To exclude this as much as possible the strategy was to include as much variation as possible. Soon I also discovered that certain typologies can never be constructed with the type of housing I was going for. This was another aspect that made the study complex. In order to overcome this, I have also been looking at design studies for the location that are often related to the typologies studied on the location but were made to fit. The other typologies were built to fit a certain location and therefore will not be as efficient on the new location.

Later in order to make sense of the figures, reference numbers were used from urban contexts to try and establish a frame of reference to what these numbers were meaning. Also, in order to see how these numbers related to the plot size the Jordaan was imported to the location and with those characteristics a study design was made. The outcome showed here too that there was a drastic drop in GSI. This is also one of the more important conclusions.
This image shows the different tools to assess the studies with in order to determine the performance of the different studies and to compare them.

This illustration indicates the influence of the plot size. This is the reason why all the typologies were imported to the project location.
The GSI is playing a very important role in the design, because the building height is limited, so to raise the FSI the GSI needs to go up and this eventually starts clashing with daylight access to the dwellings. In the older urban plans from before the 19th century they have this insanely high GSI score and score high on the FSI too, while being relatively low. I believe this is one of the reasons why these neighbourhoods are so attractive. However, it does mean that not everywhere enough daylight access is guaranteed conform today’s standards. A big achievement was then that I was able to design a building that fits on the location and is providing good daylight access and matching the GSI score of the Jordaan projected on the location with a GSI score of about 55%. Achieving this amount of GSI and designing a building would not have been possible without this study. The study also extended beyond it’s original purpose of being a typology study to become a score chart in which the design studies were tested and that allowed to understand what needed to improve.

The backdrop of this chart is that it is not possible to put good limitations in the graph that show when crossed that the building is too intrusive to the environment and I kind of fell into that trap. Holding on for a long time to a very optimized shape that architecturally was a huge challenge. Until at the P3 the feedback said that I really had to downscale the massing. A gut feeling, I had for a long time, but that was the biggest setback in the design process. Luckily the building blocks of the building were flexible enough to redesign the massing plan and what helped tremendously is that I had tried about every single urban plan and typology on the site, so with the new limitations set it became easier to redesign and coming up with a building very much inspired by number five in the graph the Casa Economica in Rome, Italy. However, designed to fit perfectly and twice on the location. Also, the dwelling typologies are completely different, but with the knowledge from the earlier study everything came together. Resulting in a very high GSI and thereby a high FSI, but without creating a high building that would intrude too much into the urban layout.

It was a very fun and most important a research that taught me a lot. Being able to play with so many different typologies and assessing them really provided a good insight in different possibilities and constraints of different implications. Also, the method to asses the building masses in an early stage provided with an extra tool that can be used in the design process. The studies on this difficult location translate very well to other locations which most likely will have easier shapes and when a difficult location comes up having the sense of scale of the buildings assessed really helps in my own opinion to design buildings that make the best use of the land available.
Impression of the graph with all the typologies. Different colours refer to different categories. A larger diagram can be found in the P2 report.

Projection of the Casa Economica on the project location to assess the typology on the location, like which has been made for all the reference projects.
In order to determine the massing of the building a lot of studies have been done. Doing a massing study is researching which basic volume the building should have, but also in a later stage shape the building in a more refined way. The research goes beyond the making of mere foam models. It was an integration of many different methods. The reason why this massing was so important was that apart from the esthetical aspect, the typology of micro-units turned out to be quite limiting. In the design process of a family apartment there are different rooms that can be organized in various ways. With the micro-units there is only one room. The other aspect was the aim of using the location in a way that would provide enough densification. Looking for methods to reach a high GSI score for example as well as a good FSI score. Initially I really managed to push the GSI, and FSI to the maximum and provide for an insane number of dwellings for the location. However, the esthetical part is also very important. The building needs to integrate with its surroundings in a good way. This means that the sun and other adjacent buildings get enough sunlight. That the building adds to the quality of the public spaces. The model developed between the P1 and P3 did not had this integration enough that is why it was decided to remodel the massing in the late stage.

In order to get these interests right it is important to get some good parameters before the start of making the models. I also understood the limits with the micro-units and developed building-blocks, which were important with the other factor of flexibility that included a few more factors in the research of the shape and massing of the building. Most of the conclusions during this research were based on the interpretation of the designer. Some of the factors made it possible to judge a massing if it worked or not, the FSI and GSI helped to determine what the density is. The sun and the urban sections helped determining the impact on the surrounding buildings.

The way that the research took place is that after determining the factors that have influence, I started sketching based on the location and its surroundings about possible solutions. These sketches would then translate to foam models into a scale model with the surroundings to be able to see the massing in comparison. The massing would start either with addition. Little blocks that would be stacked together to form a mass or with subtraction. In this method I would cut away and be left with a volume at the end. In which a building can be carved out. Both methods came to the same kind of conclusion to which building massing would be most appropriate.

After having the initial model there is need for more detail. The initial model is rough and not on the correct size. The next step is to add detail. It is like making a statue from one piece of stone. The rough
Initial studies consisted out simple pieces of styrofoam in which the dimensions did not really matter that much. It was much more about the rough set-up of the plan.

Impression of one of these studies in the ‘virtual scale model’. In this model there is already some rough estimates given for spaces. To see how the earlier rougher models perform and make better fitments.
contours are visible, but the detail need to be brought into the design. At this stage in the search of the right massing there is the addition of sketching and measuring. Which is reflected again in new models placed in the 1:500 scale model. The level of detail is already higher and when a satisfying massing is found the computer comes in. In ArchiCAD I make scale models at a much quicker pace and the scale model 1:500 exists also in this virtual environment. Working digitally has many advantages, but also a lot of drawbacks. A certain kind of intuitive working is gone.

There are so many parameters in finding the right massing, because something has to be matching with the concept, the target group and fit in the surroundings, but apart from these aspects there remains (often) some artistic freedom. A computer can help visualizing things that would takes hours to make in a scale model with very complex things, but as I experienced it can work the other way around too. In the search for the right massing there has been in my research therefore always a parallel development between the physical model and the digital model and in-between were the sketches.

The more information that is gathered the more detailed these studies are getting. When I had to redo the massing studies after the P3 I realized that with the large amount of research that was already done with the older models, that shared a lot of characteristics with the second massing, I experienced that this knowledge proved useful. It gives a deeper kind of understanding of the implications of the design in the foam model and it gave me as a designer a lot of creativity at a detailed level. Something I haven’t experienced earlier as in these stages I would otherwise be more bound to a computer model and not doing massing studies. It learned how powerful even an abstract foam model can be in even when other parts are already at more detailed levels. It really helped me to discover a massing style that suits all the needs now perfectly.
Even after the computer model there is foam models in later stages as-well to shape the building massing more. In this stage the modular building bocks were more developed so the dimensions are more precise.
With the architectural expression is meant all the research that went into shaping the building after the massing. One of the key elements was which style to give the building. The surroundings were the first thing to research and that was not really giving a strict framework. There is a lot of freedom on the location. So, with the massing in mind I did a research of categorizing the building styles. The main aim was to see the variety of building styles and approaches. The categories roughly existed out of the classical buildings, like the former powerplant and the typical canal houses. Partially interesting were the old warehouses in this category and the implications of referring to the style were researched. In this research the location research came back too. Would making a reference to a warehouse make sense here and how does it work with the massing? Eventually I have chosen a different reference. Other styles included architecture that tried to be a revival of an old style. An aim to make a building look like the old canal houses. Within this style there are different variations, some quite literal and others a little more abstracted but with a clear reference, like Java Island where the canal houses and the warehouses are very good recognizable in the style.

Another category is an older style, but then more abstracted implemented, like the Hyatt Hotel or the dwellings at the Oostenburgervoorstraat. The references to older styles are visible, but it takes a bit deeper observation. Also, an interesting category in which Nemo or the Eye fits is where architecture is related to the location. Abstract representations which are not based on older styles for example but are formed with strong concepts and have a clear identity on themselves. All these researches helped to start with a wide scope and to be aware of the styles around the location. The choice for an abstracted form of the Amsterdam School came forward from the building mass, location, expression and concept. Again, showing the complexity of designing. There is not a mathematical formula of deciding the best form, shape, expression of a building. There is always an influence of the personal interpretation of the designer, but the better the designer looked at all the options and gains enough understanding, he can come to the best decisions, so the role of research is still essential.

After having a rough style, it is important to shape the building. To design the building to express what it should, but also to make it a good place to live. Design good spaces, think of light, shadows, materials, etc. So much comes together. The method of searching starts with finding inspiration. In this case looking at reference buildings from the Amsterdam School, but also look beyond these buildings. Try out different implication with sketches or computer studies.
A more direct representation of the canal houses found in Amsterdam is this design from Heren 5 for the Houthavens.

Hyatt Hotel, Sarphatistraat. An example of an abstracted representation of an older style that is found in Amsterdam.
Trying to find the right proportions of the characteristic windows of the Amsterdam School was a difficult search. One of the complains of the Amsterdam School is the lack of daylight, because there are not enough windows. In current day architecture there are rules about daylight access and having deep narrow dwellings means that a large portion of the façade needs to be open. So together with calculations I have been shaping these windows in the façade and try to come up with different lay-outs to create the desired façade layout while also remaining flexible enough to be modular and fit different bay-widths.

The way I visualized these studies is by making one model and copy it several times to make a façade and then adjust and render an image. I would draw these studies in ArchiCAD, but the representation is there too technical and cluttered so with a live connection I can update a model in a render program. At the beginning of the second semester of the graduation track I have specially bought a laptop with a high-end video card, so I can walk real-time through a rendered design. There is a lot of detail and fine tuning possible. These images I would publish and compare after several studies to come to a decision based on the pros and cons of the studies.

The biggest trap with this way of working is that creativity can be limited. That is why I also worked with sketches and 2D studies in the computer. But eventually these will be tested in the 3D model. Drawing everything in detail and 3D also has been very time consuming but does give a good overview of the building. With scale models testing these different implications would take too much time, so there is this fine line between scale models and computer models in which one works better then the other.
A few impressions of renderings in different stages of the design. The live connection and the real-time rendered environment makes it easy to image how the building will look in real life and gives tools to check different materials, shadows and scale.
One of the innovations that has became part of the building is the parking garage. The target group is a group that is using a lot of technology and so with an app a shared car can be reserved and will be automatically ‘served’ by the parking system. There is no need to find a parking spot in a garage anymore. It also helps getting the car out of sight and putting more emphasis on the bicycle. On of the remarks that can be made about the parking system is that when everyone wants a car in the morning to go to work the system may not live up to the capacity. The expectancy is that most people that live in the complex have work in the city and therefore do not need a car on a regular basis. Even the supermarket is across the street. It is a push towards using more public transport and bicycles to get around the city.

A system was needed that could also be easily removed. The final system is a system that can be repurposed somewhere else when the car is no longer needed. With this I did research and there are many systems like carrousels parking and puzzle parking systems. There can be made differences between fully automated and semi-automated systems. Way more different approaches then initially thought. The research really brought a good overview and finally I was able to find a fitting system that fit the criteria.

Same was with bicycles. I was thinking that they required a similar press on a button solution and I did a lot of research on which systems are available. One of the most used systems is a carousel but had the issue of depth of groundwater. These systems seem to be mostly vertically organized. Although horizontal solutions also existed, I have preferred an ordinary system because of the speed of using it. The capacity of the system horizontally for example is pretty limiting. With shared bikes it would have been easier, but I wanted a place for personal bicycles. An extensive research that eventually led to an ordinary solution over an innovative solution as the ordinary in this case will perform better.

- PARKING SOLUTIONS -

Carrousel parking is one of the many options for automated parking. The same works for bicycles. Downside of this system is the height of the systems and the large structure that needs to be made.
Fire safety is one of the highest priorities in the design of the building but appeared to be one of the main challenges in the design process. One of the rules in the building code is that you are not allowed to flee in front of a neighbouring door on your way out of the building without having an alternative escape route. Normally when building generic dwellings there is enough space to have emergency staircases and with some flexibility. However, the design is a stepped roof design. This means that officially the building will be littered with a lot of staircases. This is undesirable, so an alternative had to be made. Escape routes over the roof were researched for example. Also, different studies have been done with fire compartments extending over different floors. One of the most interesting solution was what I refer to as a waterfall staircase. Straight staircases going all the way done through the building in one fire compartment to escape the building. This worked for most of the floors in the design from the design before the P3 presentation, but it was inevitable to cross to a different fire compartment. After the P3 the new design could feature the waterfall staircase as a safe escape route, as well as an architectural element. However, there was a need to cross another front door to reach it. With the introduction with an atrium and many collective spaces and the concept that is all about meeting, interaction and therefore transparency, a sprinkler installation which is uncommon in apartment buildings was introduced. This solved a lot of problems and made for a much higher standard of architectural design, because no longer do all the rooms need to be protected with fire resistant glass.

For the research on possible solutions I have been studying the rules about fire safety in the building code, but also have been looking at a lot of solution from hotels, as they have similar issues with small units. Here too when the design gets a little less standard very soon there is the introduction of sprinklers. After trying out many of the alternative solutions to avoid sprinklers the conclusion is that sprinklers are in this design the only logical solution and will lead eventually to a safe building. Even in the case of a huge fire and failing sprinklers there is an alternative to enter a spacious rooftop garden which is in reach of the ladder of the fire department and if even that would not be an option there is a solution of jumping down three meters and escape there. Which is the most worst of worst case scenario in which every safety feature is failing. Logically the first situation of sprinklers and the emergency staircases are safe enough to meet the Dutch building code.
There has been a lot of different researches conducted. Some small and some large. Too much to mention in this report. Architectural research is very multifaceted and is asking a lot of skills from the architect. Working with foam, different software, literature, reference projects, technical documents, etc. The aim being to bring all the puzzle pieces together and find out how everything fits together. Finding how to bring all these different pieces together is what makes architecture for me so interesting, but it can be overwhelming to deal with this much information. The different researches that has been done all have been contributing largely to the project as a whole. They are forming a fundament on which the whole project is based. Sometimes research is to find opportunities, be innovative, yet other times it is about problem solving, like in the case with fire safety.

It is research that is factual, that is based on academic research papers, but it is also research that speaks to the human senses, and everything in-between. Visual impressions, feelings and sounds from the location. Even a sense of feeling safe or unsafe come at play in the research and the shape of the building. It also makes that the architect can commit to one project and spend his whole life doing research to the perfect building, although that would not make sense. That is why the element of flexibility is so important. In a world of change making a building that can adapt is crucial. The same goes with this building. Some of the commercial spaces on the ground floor can be easily transformed to become more communal space, or to become offices for example. To me it is this flexibility that makes up for the fact that in architecture not all answers can be scientific proven the best, but can just like us humans, adapt to different situations.