

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	--
Student number	4878841

Studio		
Name / Theme	Public building graduation studio 'the vertical campus'	
Main mentor	Ir. Henk Bultstra	Architecture
Second mentor	Ir. Ger Warries	Building Technology
Third mentor	Ir. Sien van Dam	TD
Argumentation of choice of the studio	The reason why I chose this graduation studio is due to my interest in exploring the different branches within architecture. Till now, I have been primarily focused on housing design since my interest lay there. But the public building side of architecture also intrigues me, so this is why I wanted to explore this side of architecture for my graduation studio. I would like to explore how architectural design influences the interplay between public, collective, and private spaces, and I want to delve into the spatial dynamics of these zones within the building.	

Graduation project	
Title of the graduation project	Dynamic mixed-use vertical campus
Goal	
Location:	Above the train tracks of The Hague Central Station
The posed problem,	Safety features are one of the multifaceted aspects of university campus design, focusing on adaptability, spatial dynamics, and safety in the sense of a communal feeling. However, this last aspect deteriorates on the public character. How can this be combated by designing for interaction?

research questions and	<p>How can university campuses be designed to be adaptable or flexible in terms of converting spaces among public, collective, and private uses?</p> <p>In what ways is the architectural design of university campuses giving shape to the dynamics between public, collective, and private spaces?</p> <p>How is a communal experience established in public buildings, and what are the implications for public access and use?</p> <p>And how can university campuses be designed to focus on interaction, creating this communal sense of feeling?</p>
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design assignment in which these result.	<p>The vertical campus in The Hague will be designed to the vision of designing for interaction, mixed-use and creating a hybrid flow of functions throughout. This will be achieved by implementing the specific findings of the research into how a building can be designed for interaction, and how different spaces can be dynamic and adaptable among the public, collective and private realm. The hybridity of the building is a product of the adaptability of the spaces the building facilitates. This ties into the research on how the architectural design shapes the dynamics within the building. By creating vertical connections both visually and in routing, the vertical campus can facilitate a fluid dynamic within the building, and also stimulating interaction amongst its users. Lastly the vertical campus deems to create a communal feeling that will positively benefit the user experience of the building, but this comes at a cost of the public character. This relation between public and collectiveness needs to be properly designed to facilitate both the visitor as the community within the building. Establishing different zones of public interplay and social interactions</p>
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[This should be formulated in such a way that the graduation project can answer these questions.
The definition of the problem has to be significant to a clearly defined area of research and design.]

Process

Method description

The approach to addressing this multifaceted problem is multidisciplinary and will utilize different research methods. This mixed-method research will be composed, combining literature studies with case studies analysis.

First the theoretical framework of the paper will be created by literature research. Here the realm of public space will be researched and what its impact is. Examples of research that will be utilized for this part of the research are (Madanipour,

2003), (Whyte, 1980) and (Marcuse, 2014). These literature pieces could provide the groundwork of what true public space is and with this information combined with the research of Hillier and Hanson (1984) on the social logic of space, conclusions could be made on how the different types of spaces should work within the building, and how to stimulate interaction between these spaces. This can then be tested based on the findings of Ching (1979) on his research into architecture, form, space, and order.

This theoretical knowledge gained from the literature research can then be tested based on practical examples. These practical examples serve as the case studies that will be utilized to assess the theoretical examples against. Several sorts of case studies will be utilized in this research, as mentioned earlier different kinds of case studies are interesting for different reasons.

Different types of stations and navigational routes will be taken as case studies to analyze how they implement wayfinding and control the flow of people. This is interesting for public building since these buildings deal with a great flow of people arriving and leaving the building. Therefore, Delft Central Station, HS2 Euston Station and De Weenatunnel will be taken as case studies.

Different types of hotels and appartements will be taken as case studies to analyze how they design spaces that intent to promote interactions between its users. This lesson can then be implemented in my design that aims to stimulate interaction between the users. Therefore, Marriott Marquis, Parkroyal Hotel and KJ Plein Powerhouse will be taken as case studies.

Different types of university campuses will be taken as case studies to analyze how they deal with public, collective and private spaces. Also, the security factor will be considered during this case study to see how open or how closed these university campuses are and where the interaction aspect show. Therefore, University of Cambridge, University of Oxford, Learning Hub University of Singapore and Roosevelt University vertical campus will be taken as case studies.

Lastly, different types of public buildings facilitating retail and offices will be analyses to see how they deal with the public flows and interactions within the buildings. These findings can then be implemented in the design for the vertical campus. Therefore, SOHO Tower, Galaxy SOHO, Atlassian Central, NEXT Delft, IBM Powehouse, Forum Groningen, Amare, Huis van de stad and Little Island will be taken as case studies.

The graduation studio uses a specific method known as Research-by-Design. Research-by-Design focuses on design work as a special form of research. It considers theory and practice, analysis, and imagination as inseparable and as a medium to help conceive and develop architectural ideation. Research is not only about preparation, description, and explanation, but also more importantly about projection and speculation. Research is therefore a form of design and design a form of research. The findings from the different case studies will be reflected towards the design, with the main take aways from the analysis influencing the design. But this implementation in the design might differ from the reference, finding the way how to implement these findings in the design in research in itself.

Literature and general practical references

The literature that will be utilized to gain the theoretical knowledge are the following articles:

Bodnár, J. (2015). Reclaiming public space. *Urban Studies*, 52(12), 2090–2104.
<https://doi.org/10.1177/0042098015583626>

Ching, F. (1979). *Architecture, form, space & order*. <http://ci.nii.ac.jp/ncid/BB18970529>

Gehl, J. (2011). Cities for people. In *Planning News* (Vol. 37, Issue 4, p. 6).
<https://um.dk/da/~media/Graekenland/Documents/News/Invitationer/Invitation%20to%20event%20Cities%20for%20People%20Thessaloniki%2028%20April%202013.pdf>

Heerwagen, J. (2000). Green buildings, organizational success and occupant productivity. *Building Research and Information*, 28(5–6), 353–367.
<https://doi.org/10.1080/096132100418500>

Hillier, B., & Hanson, J. (1984). *The social logic of space*.
<https://doi.org/10.1017/cbo9780511597237>

Loftness, V., Hakkinen, P. J., Adan, O., & Nevalainen, A. (2007). Elements that contribute to healthy building design. *Environmental Health Perspectives*, 115(6), 965–970. <https://doi.org/10.1289/ehp.8988>

Madanipour, A. (2003). *Public and private spaces of the city*. In Routledge eBooks.
<https://doi.org/10.4324/9780203402856>

Malmberg, L. (2017). *Building design capability in the public sector: Expanding the horizons of development*. <https://doi.org/10.3384/diss.diva-134167>

Marcuse, P. (2014). THE PARADOXES OF PUBLIC SPACE. *Journal of Architecture and Urbanism*, 38(1), 102–106. <https://doi.org/10.3846/20297955.2014.891559>

Mumford, L. (1970). *The culture of cities*. Mariner Books.

Nadel, B. A. (2004). *Building Security: Handbook for Architectural planning and design*.
<http://ci.nii.ac.jp/ncid/BA70307180>

Whyte, W. H. (1980). *The social life of small urban spaces*.
<http://ci.nii.ac.jp/ncid/BA00601503>

The case studies are utilized to analyze how a communal feeling is created in public buildings, how to design for interaction, and what are the implications for public access and use are. Within this context different type of cases are analyzed to highlight the different approaches and evaluate both the pros and cons of such approaches.

Stations & navigation routes:

- Delft central station
- De Weenatunnel
- HS2 Euston Station

Hotel & apartment:

- Marriott Marquis
- Parkroyal Hotel
- KJ Plein Powerhouse

University campuses:

- University of Cambridge
- University of Oxford
- Learning hub, University of Singapore
- Roosevelt University – vertical campus

Retail and offices:

- SOHO Tower, Beijing
- Galaxy SOHO, Beijing
- Atlassian Central, Sydney
- NEXT Delft, Delft
- IBM Powerhouse
- Forum Groningen
- Amare
- Huis van de stad

Landscaping:

- Little Island, New York

Reflection

This research aims to get a better understanding of the different zones and their interplay specifically within a university campus design. This is of great importance for the design process of such a university building, especially with the changing needs of such a university building with decentralized learning.

The interplay of interaction within the building and public, collective, and private spaces harbors a way stronger relation to how the building is used in the present and the future. With a better understanding of this, the vision of mixed-use through the building and a hybrid flow of functions throughout can be achieved. This problem is also of great importance due to its direct impact on the functionality and usability of university campuses.

As urbanization accelerates and our societies evolve, the demand for adaptable and flexible public spaces is increasing. University campuses play a central role in our communities, serving as hubs for public knowledge and intellect, collective engagement, and individual privacy. The ability of these buildings to adapt to evolving needs and foster positive interactions is therefore crucial. Additionally, the sense of communal feeling of such spaces have become increasingly relevant in the face of a sense of belonging. Understanding how architectural design influences these aspects is vital for creating environments that enhance the use and accessibility of these buildings.

Time planning

Previous period of the P2 was to reflect on the learning from the group site analysis and formulate a design approach for the area as whole. With this information, the step to the personal ambitions and design goals could be made. And the start of the design process commenced, with the determination of location of the plot that could facilitate all the design ambitions formulated and envisioned by me.

This period till the P2 presentation was to formulate a design based on the individually formulated design goals and ambitions and work this design out till the point of the division of functions and typical floorplans. With us now being on the brink of a new period, the P3 timeframe will be utilized to further develop this design, but on a more advance and detailed scale.

My design concepts and ambitions are now clearly developed and implemented in a design. During this P3 timeframe I want to dive deeper in the technicalities of my design with the building structure, the building climate systems and their sustainability impact and the façade design of the building.

Sustainability lays at the core of my design projects as it aims to redesign and add value to a till now disregarded as useless space in the city center. This ambition to reclaim this specific area of the city center and reuse it to facilitate a public building is in itself a sustainable approach to the use of the land.

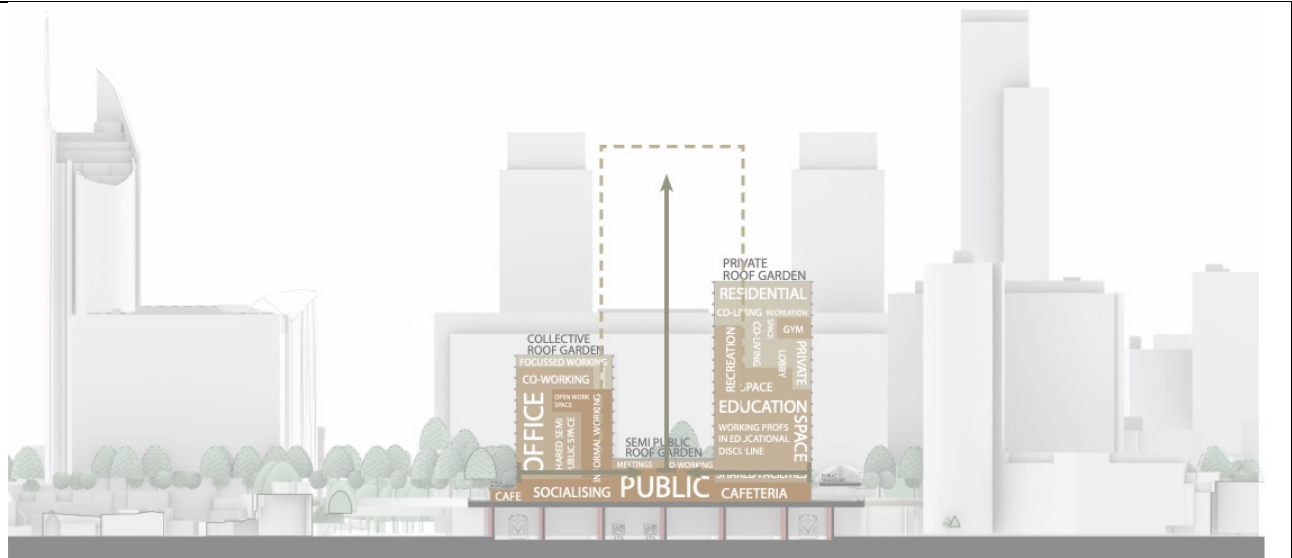
Zooming in on my design project the entire building structural system, the façade design in combination with the exoskeleton and the climatic design for the different building parts are very interwoven with each other and therefore demand a lot of attention to properly design and implement. All these aspects focus on implementing sustainability in the project each on their own way, for example in futureproofing the building, generating green energy, reducing material use, implementing a need driven climate system and increasing the biodiversity of the area. But to implement all these different sustainability aspects and properly interweave this on the detail scale is very time consuming and complex. This is what my P3 time schedule will entail with the focus on step by step developing these aspects of the building, making sure these elements will be properly implemented and complement each other in the final design.

Final Reflection

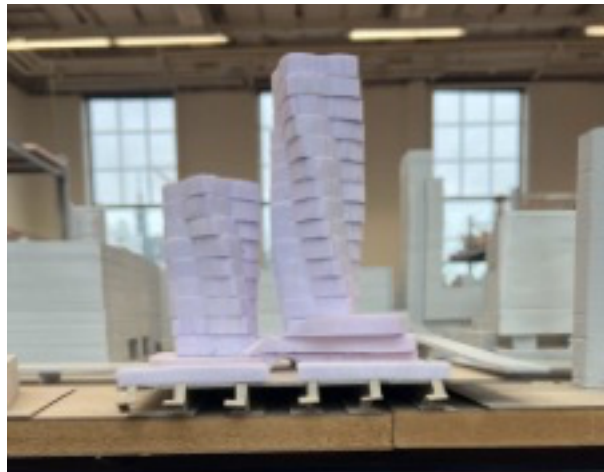
Reflecting on the year long process of the MsC 3/ MsC 4 master course Public Building.

During the start of this course with the areal research of The Hague center it was a bit hard for me to find it very interesting. This was due to fact that I myself live in The Hague and I thought that I already knew everything about the center since I am there a lot. So, this was a bit of a barrier for me at the start of the course, but once we really started to look deeper than the standard layout and observable things, I started to realize that there were actually things that I didn't know or always had perceived in a different way. This made it actually quite fun to learn things about a very specific site that I thought I already knew but actually I could still learn a lot about. So, this P1 time opened my eyes to look at what I already knew in a different way to learn new things.

With this new found information about the site I landed on a design plot for my project that I first perceived as a lost and nonfunctional space. This really intrigued me into looking at this area in a whole different way. From the start it was clear to me that I wanted to create a design that connected the people, the neighborhood and pushed the users to connect and interact with one another. And with this research into the site, I realized that this design plot had the potential to facilitate these ambitions with the proper design interventions.



With this the design process started. As mentioned above I had a clear view of the ambitions that I wanted to express in my design, but I really struggled with giving these design ambitions shape. The first few weeks for me were not that productive since I struggled with myself on setting the first design steps and I was really not too sure on how to do it. But after I while I thought let's just try some things, so I did, I started in creating the connection axis on a raised floor level over the train tracks connected to the fly over. In this manner I connected the new 'ground floor' of the building with the axis I drew to the central station. This was my first attempt into creating axis in the plot and finding the things I wanted to connect to. It was not a shock that this first attempt was very limited and only focused on creating a space for my plot above the train tracks and a single axis that would connect the plot.



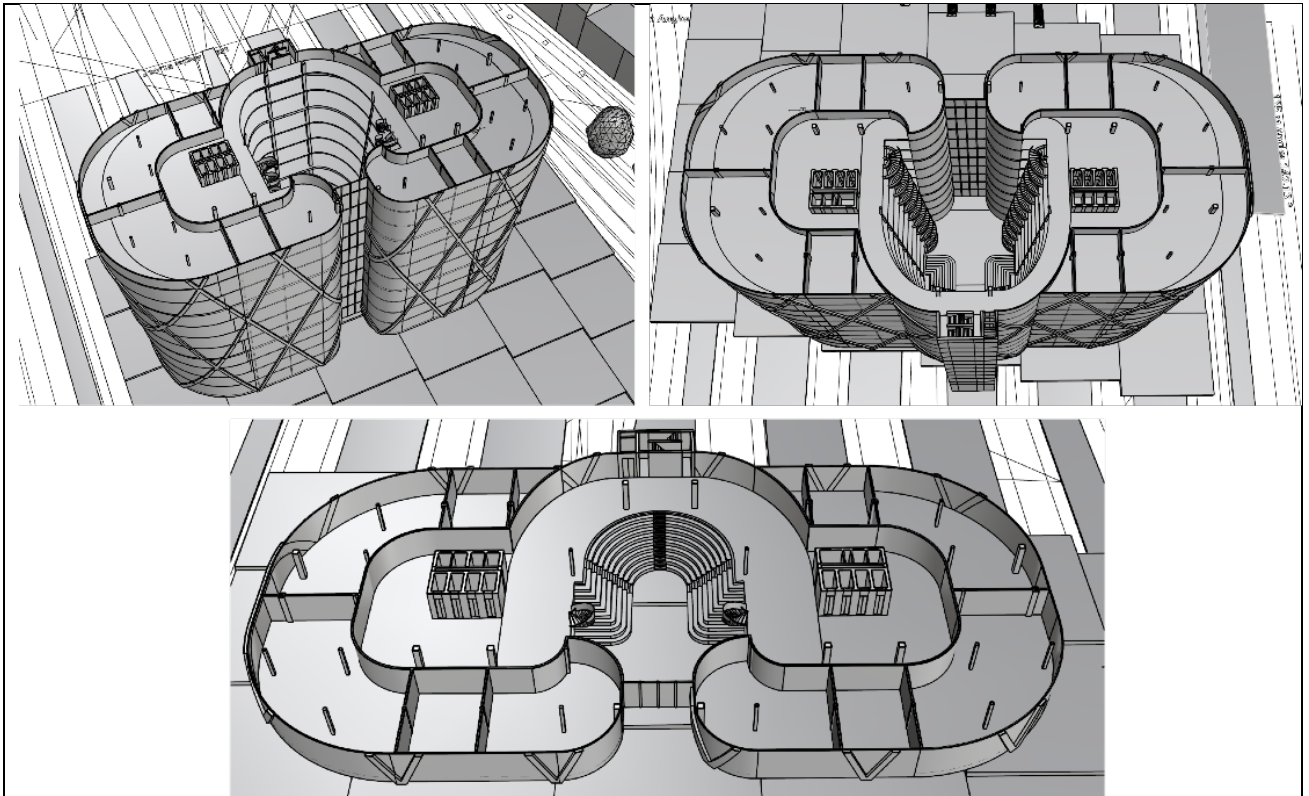
With this first step out of the way I realized that the approach that I took was way too simplistic. The plot consisted of all these different layers, the train tracks, the train platforms, the fly over level and the neighborhoods on the side. But my first attempt only acknowledged 1 of all these levels being the fly over. Creating a solid new 'ground floor' above the train tracks was not the correct approach. So, it was back to the drawing board for me. I needed to find a new way to create something above the train tracks that would at the same time connect all the different levels.

Here I really started to look into and study reference projects for my research part. I

wanted to research how a design or a landscape intervention could facilitate the connection between different layers. For me The Little Island from Thomas Heatherwick was a very important reference that I studied to understand how a pathway like park could facilitate the connection from both different layers but also the connection with the people to add functional space. With this research really influencing me I came up with a new design to creating the connecting factor between the layers of the train platforms and the connection with the flyover level. This came to a park design with different rising points and visual connections to connect the different layers. This was a good breakthrough for me in the steps of creating the different levels of my design facilitating the connection between people and the neighborhood in my design. With this new approach for the first level I started with the design for the ambitions I wanted to realize in the building itself.

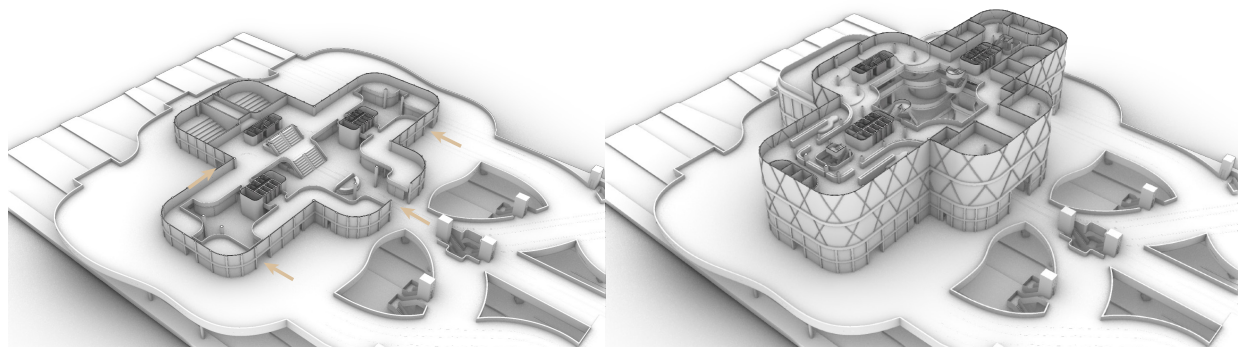
For the design of the building, it was very important to me to facilitate the connection between people and the functions within the building and connecting the people with each other by stimulating interactions. For this I had two things in mind how I wanted to do this. First was by creating a flexible design so the functions of the building could be open to change and facilitate either very open and public functions but be able to transform in a more collective setting if needed. This would in my mind create a very community like feeling in the building to be able to go from very public to more collective thus creating a better connection between the people. And on the other hand, I really wanted the design of the building to facilitate spaces where people would be forced to connect with each other. By creating public walk routes through the building or open and connected spaces so people would always see each other and this way connect instead of creating very anonymous spaces in the building.

With these ambitions I started to analyze other reference projects to see how you could implement such interactive design interventions. For me the building I work at Next Delft, but also Atlassian Central in Sydney and The learning Hub in Singapore really stood out in the way they dealt with these ambitions I had. Creating navigational routes with interaction and seating spaces on the stairs like in Next delft, the flexibility that is created in the Atlassian Central building by implementing a new kind of structural principle and the way communal walk routes are designed in the Learning Hub building with visual lines of sight also connecting the people, really opened my eyes on how I wanted to implement such things in my design. Like I mentioned earlier, before I researched these ambitions that I had, I really struggled to give them shape but after this research I had a great starting point to give the building shape to facilitate these things that were important to me. With this research done I designed a new building completely scrapping what I had before and focusing on creating these interactable stairs, a communal walk route in the building and creating these visual lines of sight in my building with a bit atrium at the heart of the collective walk route.



With this design I came to the pin up before the P2 presentation, but during the presentation to the tutors I realized that the vision I had was not really coming across like I had hoped, and I received very valuable feedback. The main thing was that I wanted to create very flexible floorplans but with my approach I did the opposite constraining them a lot, also the connection from the different layers at the park level was not very prominent. The slab I created did have rising points from the train platforms but was far from inviting to go up or down. And the atrium that I created lacked a function except navigational routes. But this meant that I had to pretty much scrap the design again and create a new design in a very short time frame to P2.

So, these weeks leading up to P2 were very stressful for me since I had to do a lot in a short time but with the good feedback from the tutors, new reference projects that I analyzed like Forum Groningen, KJ plein Powerhouse and Amare I managed to create a new design that better connected to my ambitions and facilitated better connections on the different layers of the building but also on the navigations levels that already existed.



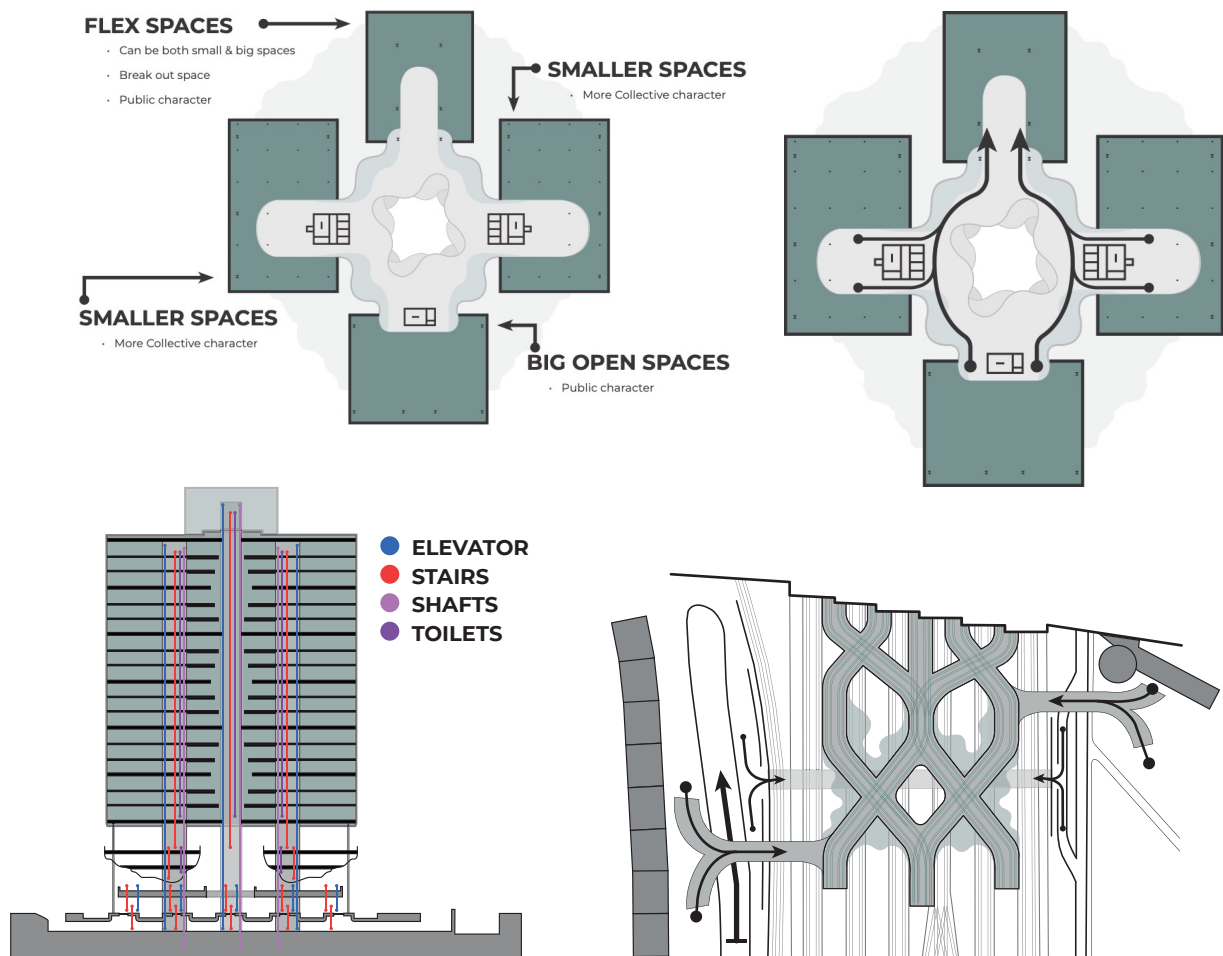
This design created a better flow from all the different navigational levels by implementing cores that connected all the layers, visual lines of sight with big voids in the park reducing the darkened effect of the park on the train platforms below and a new central collective routing around the atrium and having more functional spaces connected to this collective walk route around the atrium and then flowing into more private parts of the building the further away from the atrium. This design that I presented at P2 was a huge improvement from the design that I had during the pin up and it was very nice to hear that from the tutors during my P2 presentation.

But nonetheless there were still some points where my ambitions were not coming to full fruition in the current design. The main feedback I received that day was that the organic interactive walk route around my atrium that I created was being limited by the design formfactor that I had already set out in a shape. This organic interaction had to be cramped into the shape I designed and this caused design problems around the edges of this atrium. I had to let the design ambition of the interacting atrium dictate the shape not the other way around. The other points being that yes, I did create a better connection in the axis following the train tracks by connecting the park, the train platforms and the building on top, but the connection perpendicular to this train track axis was still nonexistent. Therefore not fulfilling my ambition to connect the neighborhoods on the sides of the train track. Lastly by placing my building on the park that I created, the building itself formed a barrier for people to flow over this raised park that I envisioned as an axis for future expansions over the train tracks.

With this very valuable feedback from my P2 presentation I had a lot of new work to do to really bring all of my design ambitions to full fruition in my design. So, I turned back to research to look into creating new navigational connections through the analysis of Delft Central Station, HS2 Euston Station and De Weentunnel. These projects thought me how I needed to create these flows and add functions to these navigational routes to stimulate their use. The analysis of the Marriott Marquis hotel, IBM Powerhouse and Parkroyal Hotel thought me on how I wanted to properly implement the organic atrium function in the building and add functions to this routing and let the shape of this atrium be dictated by the function I wanted it to fulfill. And the analysis van Huis van de Stad on how a grid like pattern could influence the appearance of the façade and how this related to the functions behind the façade.

This final part of the research really influenced me to take the needed design steps to bring my ambitions to full fruition. With this I created new navigational flows to connect the two neighborhoods by implementing a bike tunnel underneath the project, adding function to that tunnel with a bike storage space, connecting the different layers of the project with visual connections. Adding an over ground walkable ramp to the raised park connecting the neighborhoods, adding flows and functions to the raised park to stimulate its use. Raising the building as a whole to lift the barrier of the building on top of the park and connecting the building with visual connections this way by making the center of the building on top of the bike storage and in the middle of the navigational flows over the park this way connecting all the different layers both physically and visually. With this new connection in the center the building center took the needed space to fully express the design ambitions it needed to fulfill. By letting this organic heart of the building be shaped like it needed and adding the functions to the side of this heart the whole building started to work like I intended it to by providing different kinds of

functions in the different parts of the building that were constructed in a way to fit those kinds of spaces with other construction spans. Creating two buildings for smaller spaces and functions, one building at the back for big open spans and a building in the front with flexible spaces ranging from big and open to smaller spaces.



This final design form that I landed on after fully scrapping my design 3 times truly feels like the full embodiment of my design ambitions at their full potential. But reaching this point was only possible by making these previous designs to learn from them what worked and what did not. This was the embodiment of my research through design process of this graduation process. And this was only possible by truly evaluating on the feedback that I received each time from my tutors, the research into the different reference projects that I utilized during my design process and reflecting on the mistakes that I made along the way.

With this main overall reflection done on the process I go into the reflection questions:

- What is the relation between your graduation project topic, your master track (A, U, BT, LA, MBE), and your master programme (MSc AUBS)?
 - The master architecture Public building program focuses on the topic of designing a future-proof multiplicity concept for education and the public building that facilitates this function. The aim is to introduce multiplicity at the core of the building to assist the educational functions and the function of the building as a whole, adding value to the environment they are build in. So, the relation by graduation project topic being "Safety features are

one of the multifaceted aspects of university campus design, focusing on adaptability, spatial dynamics, and safety in the sense of a communal feeling. However, this last aspect deteriorates on the public character. How can this be combated by designing for interaction?" and my master track and programme is the approach to add a diverse sense of functions that assist one another in their spatial dynamics, design these functions in an adaptable way so they can be converted from public to more collective or house a whole different function if needed, future-proofing the building in that sense and designing for interaction to add this wanted value to the environment they are built in.

- How did your research influence your design/recommendations and how did the design/recommendations influence your research?
 - As mentioned in the overall reflection research played a very big and important role for me in the design process. Doing the research let me in to taking the needed steps in my design to bring my design ambitions to fruition. Because without the research into reference projects I was very stuck in making my design decisions. The recommendations from my design tutors were also of great importance for me, Henk Bultstra (Design mentor) challenged me each and every time to look at the things that I had done and researched in a different way. This led to me changing a lot of the things that I did, but most importantly gave me a better understanding of the impact of the things that I did and if they actually had the impact that I intended. My Theory & Delineation mentor Sien van Dam helped me in forming the questions and the ambitions that I really wanted to incorporate in the design and therefore helped me lay the foundation of the entire design process as a whole, which was of extreme importance to be able to create such a design project. My Technical Building Design mentor Ger Warries helped and guided me into making the correct technical design decisions to be able to facilitate the design ambitions that I formulated for the project as a whole. This was of great importance for me since these ambitions were of great impact in technical aspects of the building and these then had great impact on the design as a whole again.
- How do you assess the value of your way of working (your approach, your used methods, used methodology)?
 - The way I have worked this graduation program has given me tremendous value. And is something that I will take with me for the rest of my life. It really changed the way I worked on large scale projects both project and educational wise but also on a personal level and experience. Starting on the educational part of value of the way I worked. Before this graduation process, I always started designing by just doing something that first came to mind work that out and see how it works along the way. This was also the way I first approached the design of this project, but as you can read in my overall reflection this gave me a lot of problems and got me really stuck in the design process. With the guidance of my tutors and the theory aspect of this graduation course I was introduced to a for me new way of using research to your advantage whilst designing. And this was a big eye opener for me since I didn't keep beating my head against a rock trying to come up with a design on my own and then testing if it would work, but the research really guided me into understanding the implications that

different design choices had then translating these things to fit my context and ambitions. So, this was a big value for me to realize and implement in my way of working.

- On the personal level this graduation process also had a big impact, as my tutors and student counselor are aware of during this year there were some very big changes in my personal life that really impacted me and my ability to study. To help me with this I sought professional help which was a very big step for me since I never talked about it or let people know how I was really feeling. So, this professional help really did wonders for me with dealing with it all, guiding me in my graduation process, distancing myself from the situation to focus on the things that I needed to do and facilitate a great working environment at the office of the company that I work for to work on my graduation process (being allowed to work in the office building 24/7 on my own). So, this graduation process has had massive personal impact for me and is something I will take with me for the rest of my life.
- How do you assess the academic and societal value, scope and implication of your graduation project, including ethical aspects?
 - The design ambitions that I formulated focused on adding value to both the academic and societal aspect of the building. So, in my eyes the graduation projects core is about adding this value in creating a connecting factor both in and around the project. Creating the interaction and lifting the barrier of the train tracks connecting the neighborhoods stimulates the inclusivity of the project it invites everyone to be part of the building with the added public functions throughout the building. The adaptability of the building pushes the envelope of lifelong learning by being able to change over time and constantly add new and interesting functions to the building stimulating the neighborhood, the city and the community the project is part of for constant growth and exploration.
- How do you assess the value of the transferability of your project results?
 - One of my design ambitions was to create a blue print for the new way of building and densification in the city center by creating a way that does not infringe on existing qualitative public space and adds value to the environment without taking any. This ambition was realized by creating a new value above an existing navigational axis that exists in every big city and still has potential. Being the train tracks, every big city has them and the space above is rarely utilized. My project created this blue print on how this space above the train tracks could be utilized to add qualitative functions to the city center and therefore could very well be transferred to other cities to utilize this space.