

# SEARCHING FOR THE BOUNDARIES OF SPACE EFFICIENCY

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## **ABSTRACT**

This research searches for the boundaries of the efficiency of space and of the relation of the program of a building. This to minimize the extend of new built objects and reduce the waste of valuable space. This can be done by creating an active adaptable building that changes appearance to facilitate the user of the building and space. This composed out of the concept of 'Hybrid building' and 'space efficiency'. To implement this into an existing building a program and design guidelines need to be introduced. Facilitating activities will have the need for adapting to all activities, in this case seven that are researched in the context of The Hague. Adaptability can be summarized into big and small adaption moments. The big has a need for adaption of the space size, services and skin. And small adaption moments are adaptable via multifunctional infills. The importance lies in the complete separation of the shearing layers of the building and therefore each layers has his own adaptable character. This all to reduce the waste of space within an existing structure.

**KEYWORDS:** *Space efficiency, hybrid building, adaptivity, futureproof, multifunctional,*

## **I. INTRODUCTION**

This research paper is called; 'Search for the boundaries of space efficiency' which has double sided meaning. The boundaries are of the utmost importance because this research is about the transformation of an existing office building. Searching for these boundaries not only means the boundaries of the existing, but also the possible programming. In a time of urbanization and densification we need to maximize our existing building stock to get the most out of our buildings, to be able to handle the increase of inhabitants. The Netherlands is a densely populated country that needs to cope with expansions with limited space because, space is a limited and exhaustible resource . In 2008 the city of The Hague was one of the most dens cities in the Netherlands with 7 times more that the national average (Werkgroep Binnenstedelijk Bouwen, 2010, p. 133). The municipality of The Hague needs to grow even more towards 2040, meaning 25.000 new dwellings and 500.000 square meters of office space. This can be solved by creating new buildings, horizontally or vertically which will result in a massive surge of building materials and stress on an already dense city. Another answer lies in the use of the existing building stock (Gemeente Den Haag, sd).

We built structures that could last for a hundred years, infills that last for 20 years but the effectiveness is not taken into account. This 100 year structure is only used for 8 hours, and is closed in the weekends. That's only an effective use of less than 30 percent. A flexible approach to our environment is now necessary for a wide range of reasons: 24-hour work patterns based in the home; changing family size and groupings; ecological issues that are questioning the desirability of commuting; lifestyle issues that envisage a more fulfilling personal life; and the possibility of remote working due to communications technology (Kronenburg, 2007, p. 92).

## OBJECTIVE

The objective is to see the building as a facilitator of different activities in an active adaptive personality to provide the best usage. This should be included in the existing structure to reach an as high as possible efficiency of space that reduces the waste of space. This research is focused on maximizing a multifunctional program and active adaptive, physical changing, properties. In this specific case related to the Bruggebouw Oost in The Hague, the case study. This objective results in answering the main research question: *How to design an active adaptive building within an existing structure by maximizing the efficiency of space?*

To answer this main question other questions needs clarification. First looking at (1) the contemporary theme's concerning multifunctional building (2) The program look at actual use and relations. Eventually (3) researching the kind of adaptable architecture and their guidelines. This was done with the following methodology (figure 1)

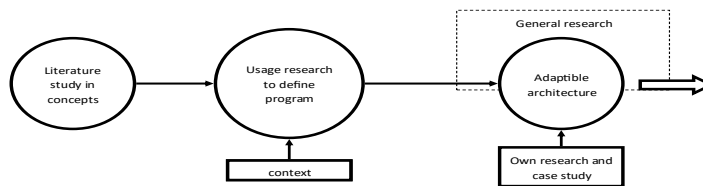


Figure 1 Methodology

## II. RESULTS

### Contemporary concepts about maximizing building usage

There are multiple concepts about an all-round buildings strategy. One of the main one is the 'Hybrid Building concept'. This concept, originated in the end of the 19<sup>th</sup> century urges that: 'The Hybrid building functions like a city under an urban roof' (Aurora Fernandez Per, 2011, p. 16). This type of building is formed, according to Steven Holl, by a new public space containing living, working, recreation and cultural facilities (Aurora Fernandez Per, 2011, p. 9). The permeability of the hybrid makes it accessible from the city and the private use of its services extends its timetable to 24 hours a day. Another use category is created, a full-time building (Aurora Fernandez Per, 2011, p. 43). The problem with references in the hybrid building concept is that they are mostly static ones. This concept does not solve the waste of space issue briefed by in the introduction. By combining the hybrid building concept with the concept of 'space efficiency' a active efficient building can be created. In this research space efficiency can be described as the intensity that space is used. The Space Management Group of the University of Lincoln concluded space efficiency into three main factors (Chiddick, 2006, p. 6) and to understand what these factors mean they need to be measured. In this research the expression of the three factors can be described as followed in figure 2.



Figure 2 Definition of space efficiency

The ways that space efficiency works within an framework of existing space and unlimited time is important to define so that the change, and ways to change, can be chosen upon this definition.

The focus in research lies in the understanding of three main topics resulted out of the space efficiency definition: The program defined in:

- User and time: The specific user of a space and the intensity of the use over a timeframe
- Space itself as an static matter relatable to, in this case, an existing building.

## PROGRAM

The program of the building is focused on multifunctionality. By defining the potential of this multifunctional character, and with that the program, can be done in two ways concerning ‘hybrid buildings’.

The view in this paper lies in the middle. By using the context to create zoning that is an architecture made of the event. Through research the program could be defined in specific users and the time being used.

### Users and time

To start investigating the use of specific spaces. First these users must be defined. In this case the following activities are investigated (figure 3 and Appendix 1).

Retail      Meeting      Education      Sports      Healthcare      Offices

Figure 3 Activities taken into account

Defining the users, and the activities possible a good interpretation of the actual usage withing the context is analyzed. Within this research a lot of correlation is spotted in the form of function changing. The research (Appendix 2, 3 and 4) introduced a conclusion (figure 4) where the changing point could be seen. This graph shows the actual use per function over the time-lapse of a week. Especially these point are important to design for they are most demanding for the existing building.

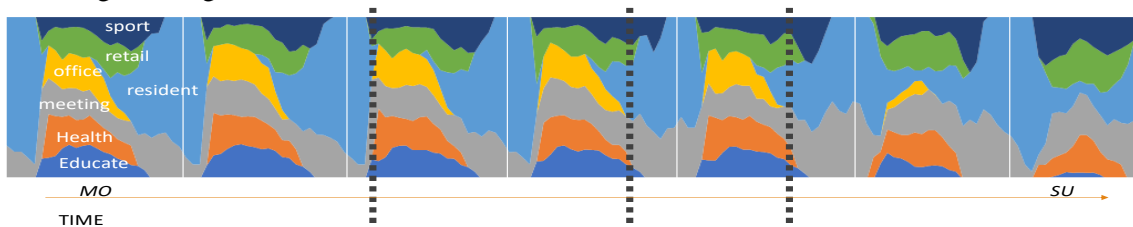


Figure 4 Result use research

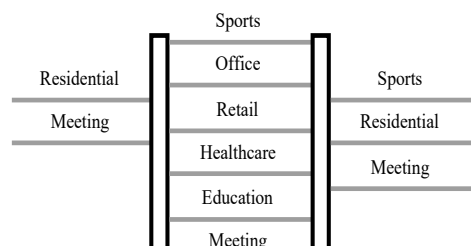


Figure 5 Three main adaption points

Major changes occur in the form of three different adaption points (figure 5). These will ask the maximum of the existing structure. Next to this main adaption points there are a couple of small changes is usage per day that could enhance the design and maximize the usage of the building even more.

- Café around offices will be full around 13.00 and the offices will be significantly empty around that time.

Next to that these cafes are closed during the weekend.

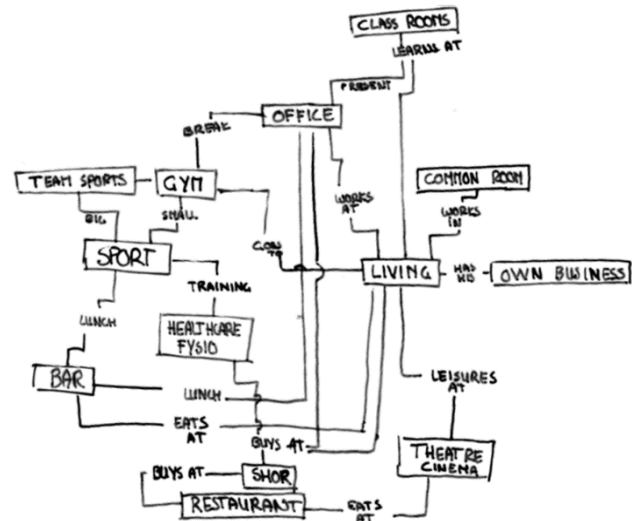
- Some functions, like sports have a slow raise, and other functions, like healthcare have a high raise.
- Most of the activities are taking place from 08:00 till 18:00

With the previous drawn conclusion function combinations can be made and by doing so a program within timeframes can be provided.

The case study research (Appendix 5) provided a couple of common programmatic relations. That are visualized (figure 6) to understand their relation and the working they have to each other.

Mutual coordination for the mixing of functions is essential. Therefore a couple of properties need to be researched (M. Hek, 2004, p. 88)

- Do these functions support the business process
- Do they experience noise pollution
- Do they experience visual discomfort



And this all in relation to each other. These activities are different within every context. The eventual function, connected to the activity is based on this context and the function of the building itself, what should in provide.

Figure 6 Programmatic relations

### Building layers

The design strategies for a multifunctional, flexible, building are different than usual and to design it building layers need to be carefully treaded. To understand the design guidelines needed to make a space efficient building the building is dissected into the 'Shearing Layers' theorized by Brand. Although this theory is the base for the rest of the research mild changes are implemented to let it fit into the hybrid building, space efficient concept.

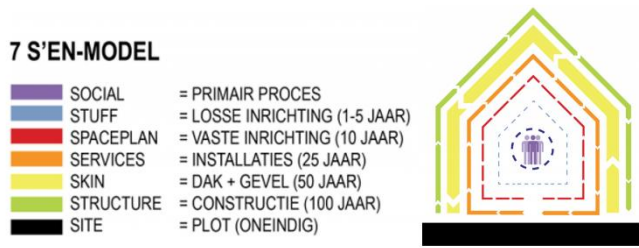


Figure 7 Shearing layers by Brandt extended by Schimdt

The building layers (figure 7) according to the 'Adaptable Architecture' described by Richard Schmidt. They are structured by size beginning, in the top layer, with the 'smallest'; social working towards the context. Underlined layers are comprised by Schmidt and the others are taken from the point of view of Brandt.

### Design strategies

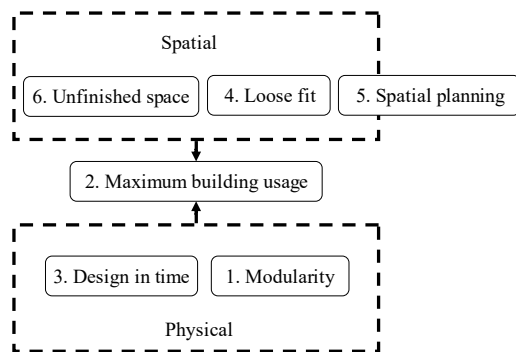


Figure 8 Design strategies within this project

Adaptable architecture is much written about. There are a couple of design strategies the design could embrace to stimulate his design for the purpose of maximal usage. These are mostly concerning new developments and not the transformation of the existing building stock. A couple of these design strategies need to be taken into account but are not applicable for this project. In his book 'Adaptable Architecture', Richard Schmidt defines multiple strategies to maximize the usage of a building (Appendix 6)

The main objective here is maximal building usage, which is closely related with other design strategies needed to gain the goal. Some of these are connected in multiple ways and in different sectors. In figure 8 the design strategies are located within the demanding opponent like an existing building, in this case the Bruggebouw, or provided physical changes to comprise the effectiveness of the used space. The design strategies are defined in Appendix 10 and the outcome through the building layers are presented in this chapter. All the specific design strategies are clustered per building layer and supported by further research when necessary. Next to that conclusions are drawn due to the implementation within an existing building, this is further discussed in Appendix 11.

### **Designing active adaption guidelines**

#### ***1) Social***

Social issues with a multifunctional program is found in the shared ownership of spaces. This is especially true in the division between more public and more private functions. By creating a, partially, hybrid building, and by activating the building. It is important to understand the public/private character of the activities. This will provide insight in the relationship between them and the orientation in the building. In this case care needs to be given when adding those together as shown in Appendix 9.

Conclusion, care between the division between public and private functions. Physical sectioning is, in this layer, inevitable.

#### ***2) Space***

The space itself is closely related with the layer of space plan. The spaces need to be complied out of standard sized rooms to fit anonymous functions and next to that a sector of rooms that is complied out of a variety of functions to fit a range of functions. Multifunctional spaces that can change their specific functions. In this case the room height of the room is more important because this has to do with the fixed height of the existing building concluded in Appendix 7 and 8.

Conclusion, a variety of room sizes need to be created to fit every activity. The most common needs to be multiplied to cope with the anonymous function and be a multifunctional room that can physically change their appearance.

#### ***3) Stuff***

The stuff within the space needs to be movable for a quick functional change. The weight will influence the adaptability. Another approach is to create multipurpose components that can fulfill multiple users desires. Movable interior for quick function change

Conclusion; Create multipurpose or movable interiors.

#### ***4) Space plan***

Within the space plan the separation of the shearing layers are of the utmost importance. Linking multiple layers together, lets say structure and space-plan, the adaptability is decreased. Within the spaces plan there are three types of spaces needed, open spaces, supporting spaces and oversized spaces. There is a need for blurriness between these spaces because that creates variety of spaces withing specific zoning. The program can be defined in a thematic, combination based on the interaction of elements, and the disparate, combination allows pieces to exist mutual, program function (Fenton, 1985, p. 6). The sizes of these spaces can be linked to Appendix 7 and 8.

Conclusion; creating open, supporting and oversized spaces that are located within specific zones and locations within the building, more open next to the proximity of the building.

### 5) Services

For the quick adaptational character of the building every service component needs to be easy accessible. Next to this the service itself need to have a form of adaption in itself that can be adjusted for the specific function. The users need to adapt his surroundings by configuring services, this may create energy reduction and better livability. Service adaption can be reached in multiple ways. By creating personalized panels with services included to fit a specific function. Or centrally based by calculation the service on the most demanding function possible. This could endanger the financial feasibility of the project. To reduce the energy demand of a building climate sectors need to be created. This can be made by putting different functions with the same climatological demand together. This table is informative over the extra technical design aspect specifically per function. The total building has his own general comfort concept.

Conclusion, every components needs to be easy accessible and able to handle the most demanding function or be build function specific.

### 6) Skin

The skin of the building needs to be reversibility from components into elements. This show an external expression or repression of the program that refers to the communication of the building parts through its external treatment. Functional expression can also be deceptive, as sometimes the relationship between form and function is reduced to symbolic allusion The form of a hybrid building can be separated into three categories; Fabric, graft and monolith (Fenton, 1985, p. 7).

#### Fabric

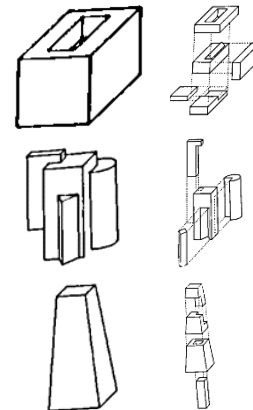
*The form of the building is connected to envelope and continuous and reverse to the place in form of sight lines, and wall treatments. The program can express itself in proportion of windows and materials.*

#### Graft

*This form expresses its functional components either volumetrically or in its elevation. This means a clear expression of the program which relies on their familiar parentage per function within the building.*

#### Monolith

*This form is a monolith structure with a metropolitan life within a single building block. It is a self-generating symbolism. It is an efficient accommodation of the most extreme functions and has displayed greatest versatility.*



### 7) Structure

In this layer the separation of the shearing layers are most important. Combining this layer with another layer will decline the adaptability of the building and infill. It is important to introduce, or work with, a standard grid that creates a simple plan. This results in a better handling of multiple functions. Program that is unable to fit within the confinement of the gridded plan, eventually overflow their own boundaries and found diluted realization in the mixed used complex (Fenton, 1985, p. 6).

Conclusion; the structure needs to be separated from the other layers. The existing building has an own grid structure that needs to be taken into account. There needs to be an overflow quality for functions that could step out of their boundaries.

### 9) Surrounding

Cultural buildings are the key in establishing identity for a community, this will let the building mee a profit for its surroundings and will stimulate the value of the building itself. The creation

of a flexible community by creating spaces outside of the home where meetings between individuals may occur (Kronenburg, 2007, p. 58).

### **Positive and negative side of adaptable architecture**

Creating adaptable architecture has its up- and downsides, as has all. A couple of risks and benefits are described below. These should be taken into account in the design process.

**The End user;** Unlike standard building concepts this adaptive building can only be tested when built. Monitoring and evaluations must record the usefulness of the building and the use of the end user. Understanding the position of the building is important, understanding that the building is only a facilitator in the best way and users are not universal and can vary. Nor is this user static and can vary over time (Robert Schmidt III, 2016, p. 117).

**Culture;** Culture is important but hard to distinguish and design for. Culture can be divided in national, sector and organisational. The national culture, in the Netherlands, has a strong tendency for the transformation of old buildings and giving them a second life. The next to themes are more hard to implement. They are about the culture of the sector and the individual. By creating a multifunctional building where all the functions want to express themselves, and the individual does not want to work or live in a faceless block, cultural thought needs to implement what is culturally acceptable in space and form (Robert Schmidt III, 2016, p. 119).

**Occupation;** The occupation of the designed building can go two ways. Designing adaptable for first use, excluding the future because this is uncertain. Or designing different optimums in sizes and changing demands. Then a more universally appropriate system could be applied to a band of typologies with similar building forms. The risk of this is by creating a faceless building that is everything but nothing. The end user needs to have their tolerance for the building itself (Robert Schmidt III, 2016, p. 126).

**Risk of adaption;** The construction industry is a conservative sector and does not like uncertainties. Time and costs are tensions between designers and developers. This against long-term and short-term visions of both parties. Especially because the benefits of adaptability are always uncertain at the time of designing (Robert Schmidt III, 2016, p. 134).

## **III. CONCLUSIONS**

Before concluding the main research question given in the introduction; '*How to design an active adaptive building within an existing structure by maximizing the efficiency of space?*' it is important to understand that the real effectiveness of adaptive architecture, relating to the end user, is hard to define without practical monitoring. This is one risk when putting different activities within one building. By integrating the 'Hybrid building' concept together with the frame work of 'space efficiency' and active adaptive building emerges that could accommodate multiple functions. Those functions are defined in seven activities that all have their own character, usage per time, service demands and public private relation. The heights note is about separating the layers of the building to allow for quick adaption. Then the main factors of this design are physical changes, spatial qualities and infill, and the existing building as a boundary maker. By accommodating three main functions, differentiated by height, multiple functions can be introduced without hard changes. The win is in combining the three heights into an active system that can create three within one space. Then the smaller changes can be made in by adding multifunctional infills and separate spaces that are multifunctional, supporting or oversized.

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# APPENDIX – THE BOUNDARIES OF SPACE EFFICIENCY RESEARCH

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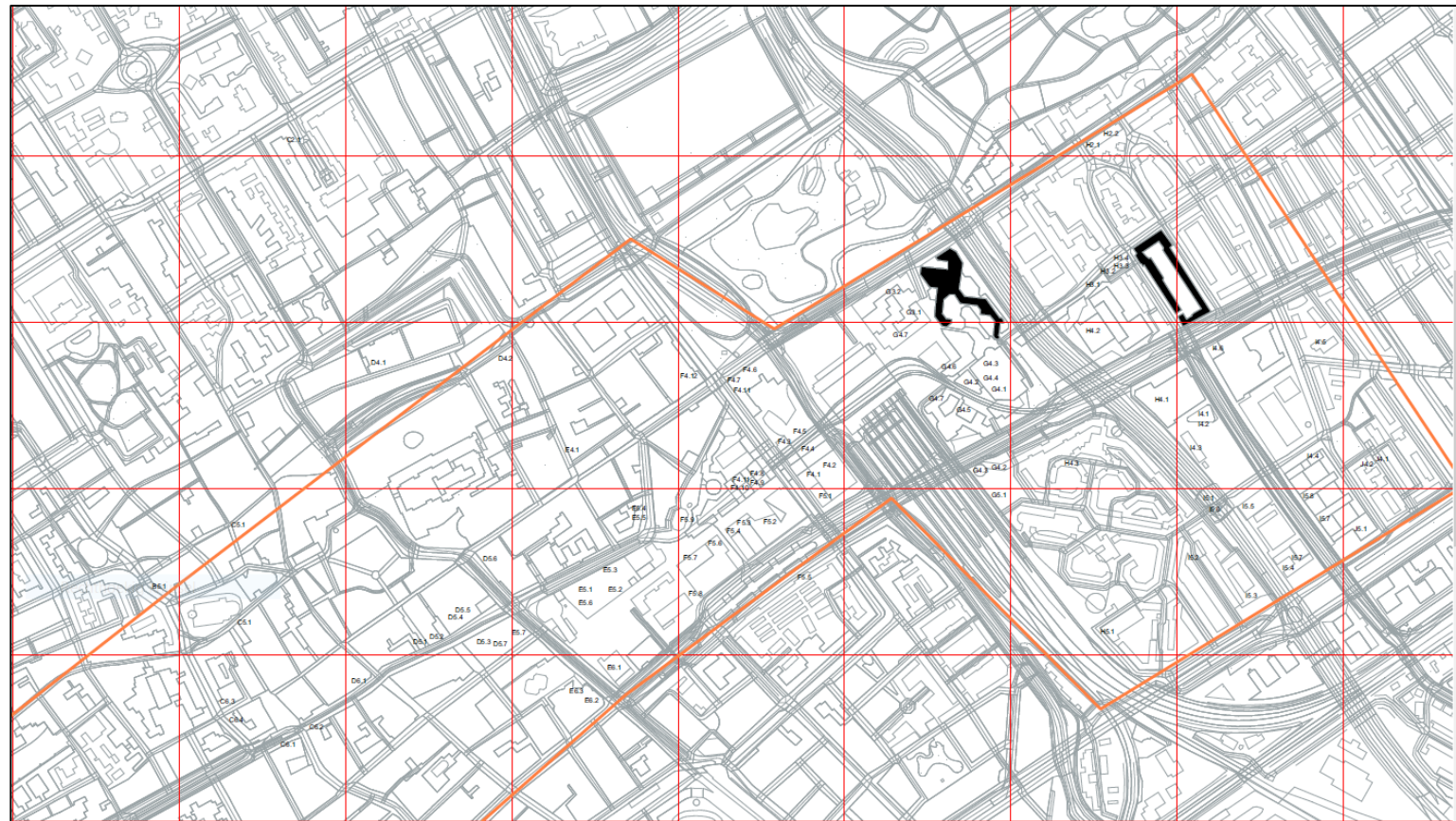
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## I. FUNCTIONS DEFINED WITHIN THE ACTIVITIES

Activities:	Functions consisting:
<b>Retail</b>	Shops, Grocery stores, Pharmacy
<b>Meeting</b>	Church, Cinema, Theatre, Casino, Café, Disco, Museum, Library, Daycare
<b>Education</b>	Classroom, college
<b>Sports</b>	Tennis field, Gym, Sports hall, fitness center,
<b>Healthcare</b>	Care home, Medical center, General practitioner
<b>Offices</b>	Office, Bank building, City Hall, Governmental

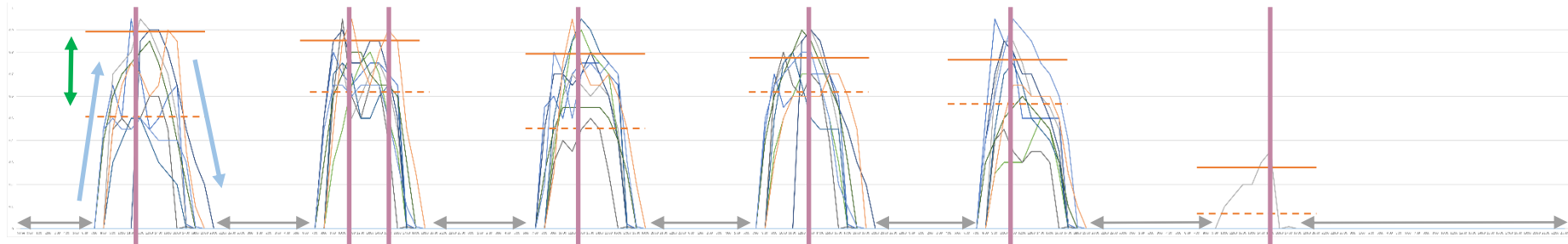
## II. MAP OF FUNCTIONS IN THE HAGUE

Every code is a function, corresponding with Appendix 3 and 4.



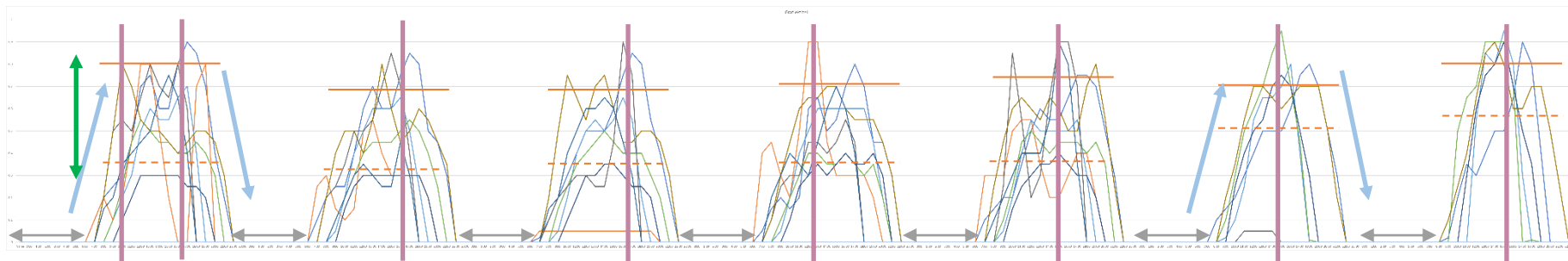
### III. FUNCTION USAGE PER TIMESLOT

#### OFFICES



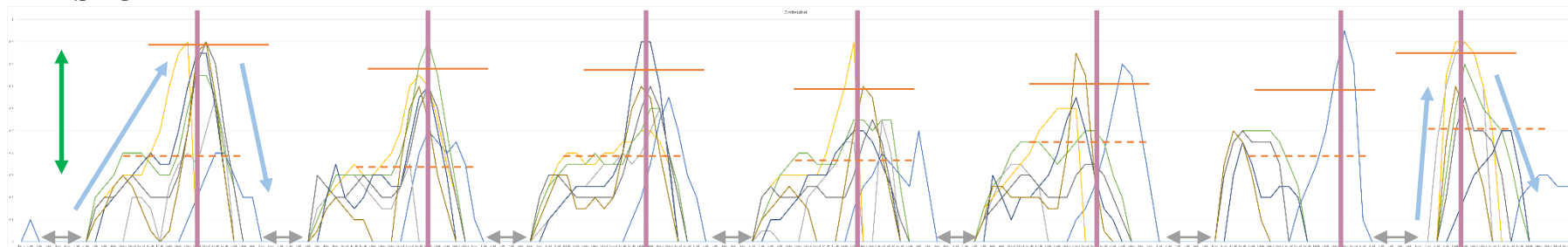
What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	Peak: Mo – Fr 12.00 – 13.00, Tu: 11.00 and 15.00 Wednesday quiet, children free? Friday not so busy	Peak: Sa: 15.00
Busy and quiet	Approximately the busiest and quiet times.	Busy: around the 90%, Monday the highest Quiet: Friday the 40%	Weekend is more closed.
Rise and fall	The extend of the rise and fall of use	Quick rise around 07.00 in the morning Quick fall around 17.00	Weekend is more closed
On or off	The timeslots the functions are on or off	Most functions are closed from 20.00 till 07.00	Mostly closed
Variation in use	Variation in use between busy and quiet, and per day.	Mo, We, Fr more variation Tu and Th less variation	Mostly closed

## RETAIL



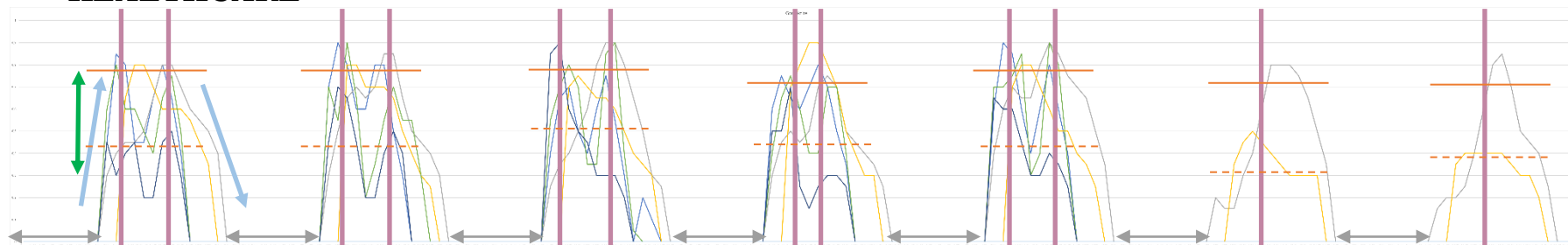
What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	Stretched peaks espacially during the week. Peaks around 10.00 and 15.00	Peaks around 10.00 and 15.00
Busy and quiet	Approximately the busiest and quiet times.	Busy around the 70% Quiet around the 40% 7 days a week	Busy around the 70% a 80% Quiet around the 50% a 60%
Rise and fall	The extend of the rise and fall of use	Less quick of a rise but a quick fall	Quick rise and quick fall
On or off	The timeslots the functions are on or off	Closed from 22.00 – 06.00 Short off.	Closed from 22.00-06.00 Short off
Variation in use	Variation in use between busy and quiet, and per day.	More variation per function	Less variation per function

## SPORT



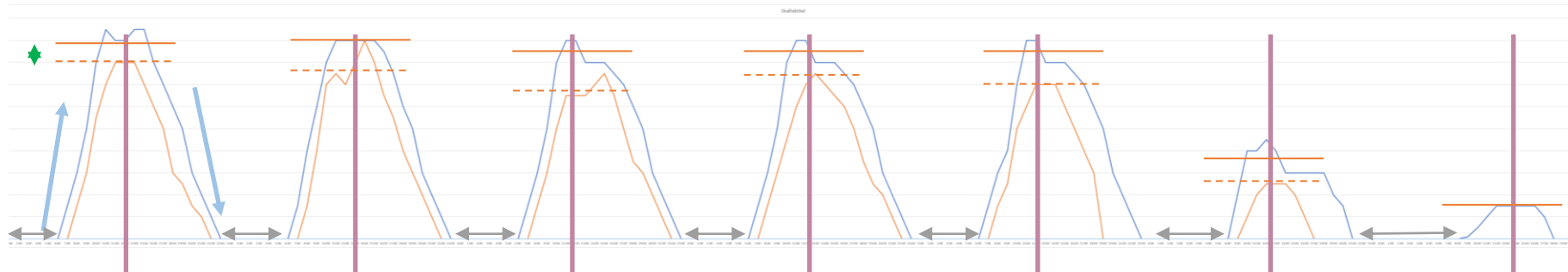
What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	During the week the peak around 18.00	Peak Saturday around 22.00 Peak Sunday around 10.00
Busy and quiet	Approximately the busiest and quiet times.	Busy in the midday Busiest on Monday 90% Quiet around 40%	Busy on Sunday around 90% Sunday very busy
Rise and fall	The extend of the rise and fall of use	Monday to Friday slow rise and quick fall	Saturday slow raise and quick fall Sunday quick raise and slow fall
On or off	The timeslots the functions are on or off	Closed from 01.00 till 06.00 Short off.	Closed from 01.00 till 06.00 Short off.
Variation in use	Variation in use between busy and quiet, and per day.	During the week little differentiation between day. Much variation from quiet and busy	During the week little differentiation between day. Much variation from quiet and busy

## HEALTHCARE



What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	Ma-Di-Wo-Fr: Peaks on 09.00 and 15.00 Thursday peak at 10.00 and 13.00	Sa-Su: Peaks around 13.00
Busy and quiet	Approximately the busiest and quiet times.	Busy around the 80% Quiet around the 50%	Busy around the 80% Quiet around the 40%
Rise and fall	The extend of the rise and fall of use	Quick raise and slower fall	Quick raise and slower fall
On or off	The timeslots the functions are on or off	Closed from 21.00 till 07.00 Long time closed	Closed from 21.00 till 07.00 Long time closed More functions closed in the weekend.
Variation in use	Variation in use between busy and quiet, and per day.	During the week little differentiation between day.	Much functions closed. Large variation between functions.

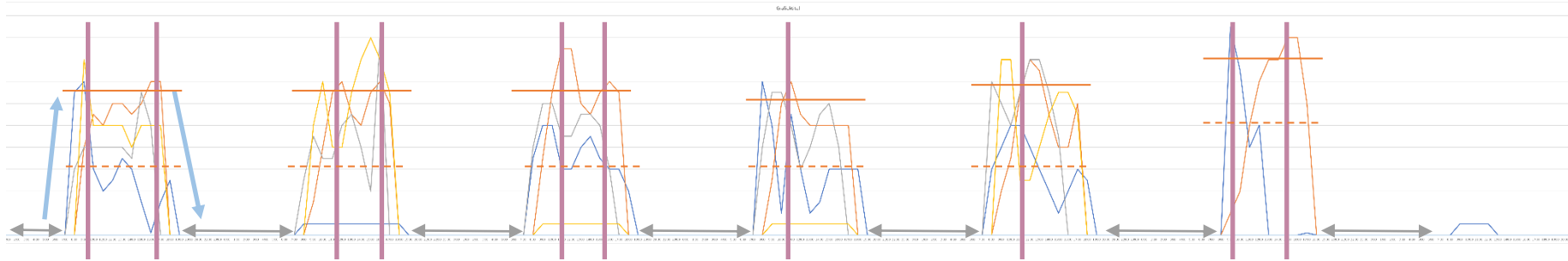
## EDUCATION



What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	Peak every day around 13.00	Peak every day around 13.00
Busy and quiet	Approximately the busiest and quiet times.	Busy around the 80-90% Quiet around the 70-80%	Weekend all around 50%
Rise and fall	The extend of the rise and fall of use	Resendable quick rise Resendable quick fall	Resendable quick rise Resendable quick fall, couple functions close
On or off	The timeslots the functions are on or off	Closed from 22.00 – 06.00	Closed from 22.00-06.00
Variation in use	Variation in use between busy and quiet, and per day.	Much repetition	Much repetition



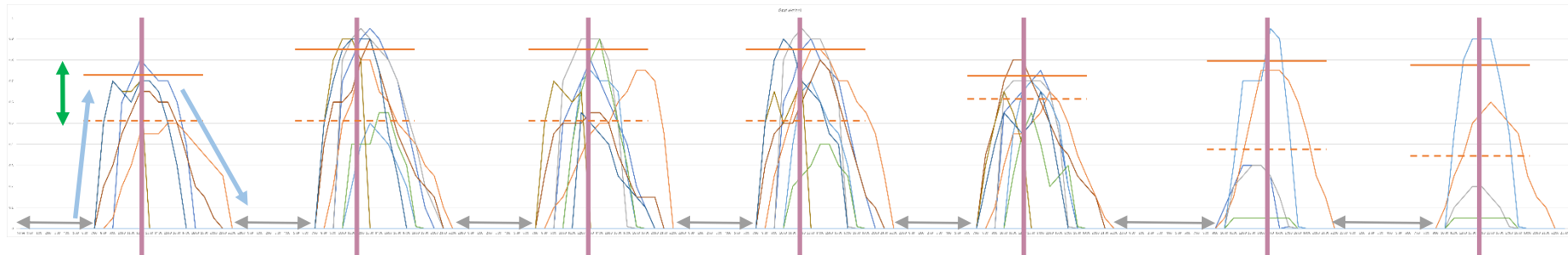
# INDUSTRIAL



What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	Peaks around 10.00 and 17.00 Th, Fr: one peak around 11.00	Sa: peak 10.00 and 15.00 Sunday closed
Busy and quiet	Approximately the busiest and quiet times.	Busy around the 70% Quiet around the 30%	Sa : Busy around the 80% Sa: Quiet around the 50%
Rise and fall	The extend of the rise and fall of use	Quick rise and quick fall	Quick rise and quick fall
On or off	The timeslots the functions are on or off	Closed from 18.00 till 07.00	Sa: Closed from 18.00 till 07.00
Variation in use	Variation in use between busy and quiet, and per day.	Less variation per function	Less variation per function



## MEETING 1: PLACE OF LEISURE



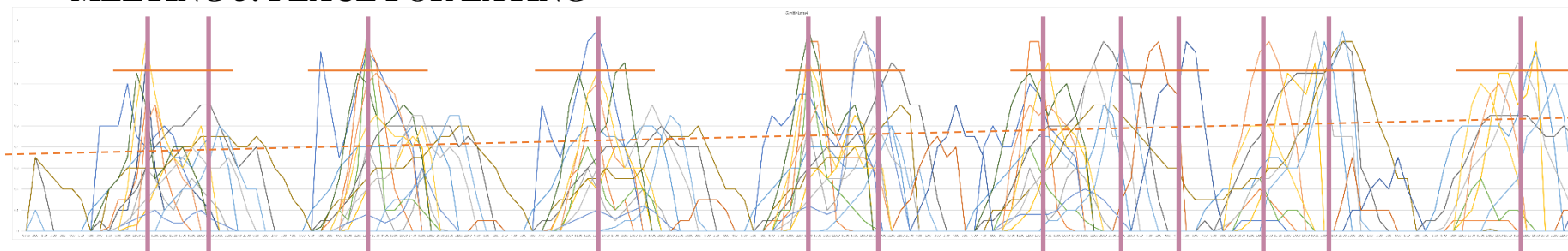
What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	Peaks around 12.00 till 14.00	Peaks around 14.00
Busy and quiet	Approximately the busiest and quiet times.	Busy around the 70 and 80% Quiet around the 50 and 60%	Busy around the 70% a 80% Quiet around the 40%
Rise and fall	The extend of the rise and fall of use	Quick rise and quick fall	Quick rise and quick fall
On or off	The timeslots the functions are on or off	Closed from 22.00 – 07.00	Closed from 22.00-07.00 More closed in the weekend
Variation in use	Variation in use between busy and quiet, and per day.	Less variation per function	More variation per function

## MEETING 2: PLACE OF RELIGION



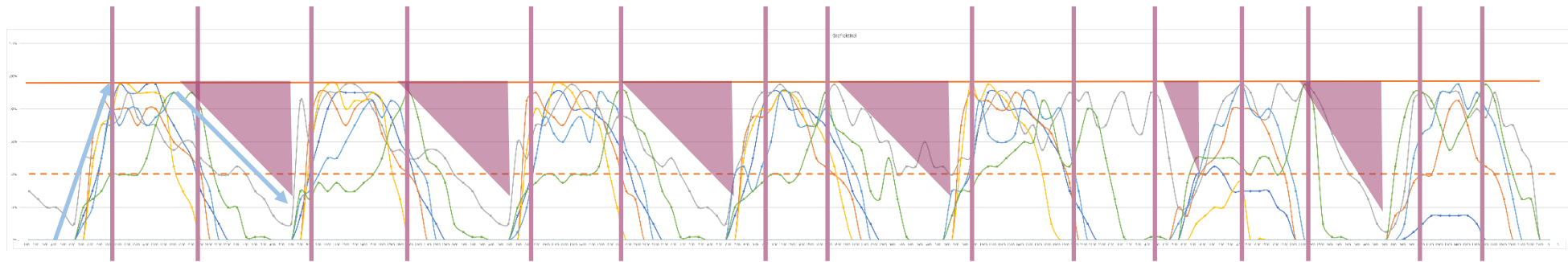
What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	Peaks around 13.00	Sa: Peaks around 13.00 Su; Peaks around 11.00
Busy and quiet	Approximately the busiest and quiet times.	Busy around the 20%	Busy around the 95%
Rise and fall	The extend of the rise and fall of use	Easy rise and an easy fall	Quick rise and quick fall
On or off	The timeslots the functions are on or off	Almost always off.	Almost always off.
Variation in use	Variation in use between busy and quiet, and per day.	More variation per function	More variation per function

### MEETING 3: PLACE FOR EATING



What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	Peaks between 12.00-13.00 and 18.00 and 19.00 Low around 18.00 Three times a day peak	Peaks around 13.00 and between 18.00 and 20.00 Three times a day peak
Busy and quiet	Approximately the busiest and quiet times.	Busy around the 80% Quiet around the 40% From Thursday continues on	Busy around the 80% Quiet around the 50% a 60% Continues on
Rise and fall	The extend of the rise and fall of use	Mixture but More quick rise less quick fall	Mixture but More quick rise less quick fall
On or off	The timeslots the functions are on or off	Not closed, base point at 06.00	Always on
Variation in use	Variation in use between busy and quiet, and per day.	More variation per function	More variation per function

#### IV. RESULT USERS RESEARCH



What:		Week	Weekend
Peaks and valleys	The approximately highest and lowest point per timeslot	Mo: 11.00 and 20.00 Tu: 09.00 and 19.00 Wo: 08.00 and 18.00 Th: 10.00 and 17.00 Fr: 09.00 and 20.00	Sa: 05.00 and 14.00 and 22.00 Su: 10.00 and 17.00
Busy and quiet	Approximately the busiest and quiet times.	Busy around the 95% Quiet around the 40%	Busy around the 95% Quiet around the 40%
Rise and fall	The extend of the rise and fall of use	Quick rise between 06.00 and 09.00 Slow fall starting from 17.00	Quick rise between 06.00 and 09.00 Slow fall starting from 19.00
On or off	The timeslots the functions are on or off	Biggest holes between 20.00 and 06.00 (purple) Many functions around the peaks	Biggest holes between 22.00 and 06.00 (purple) Many functions around the peaks
Variation in use	Variation in use between busy and quiet, and per day.	Less variation except for Friday most variation and 24h busy	Less variation

DATA

FUNCTIONS	SPACE EFFICIENCY																														
	TIME AND USE																														
	X, Y, Z, Time Use																														
Education	C College room	0% 0%																													
		0% 0%																													
Healthcare	H Hospital	0% 0%																													
		0% 0%																													
Industrial	I Workplace	0% 0%																													
		0% 0%																													
Meeting	M Cafe	0% 0%																													
		0% 0%																													
Retail	R Grocery store	0% 0%																													
		0% 0%																													
Sports	S Gym	0% 0%																													
		0% 0%																													

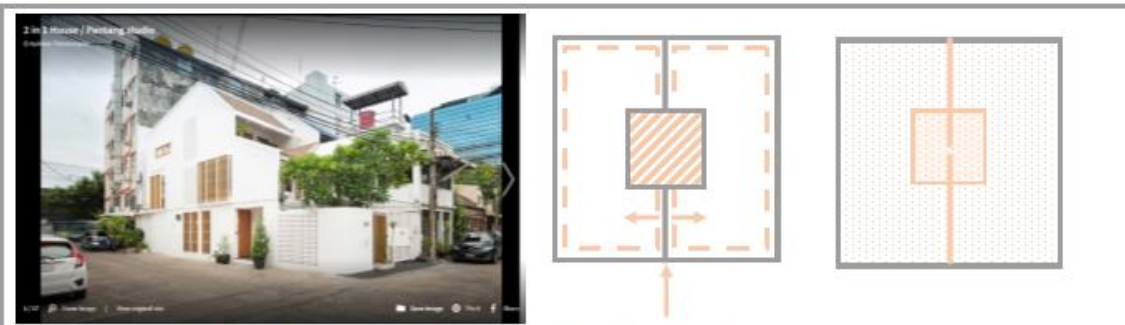








## V. CASE STUDY RESEARCH ABOUT IMPLEMENTATION



[https://www.archdaily.com/927018/2-in-1-house-pantang-studio?ad\\_source=search&ad\\_medium=search\\_result\\_projects](https://www.archdaily.com/927018/2-in-1-house-pantang-studio?ad_source=search&ad_medium=search_result_projects)

Space **200** m<sup>2</sup>

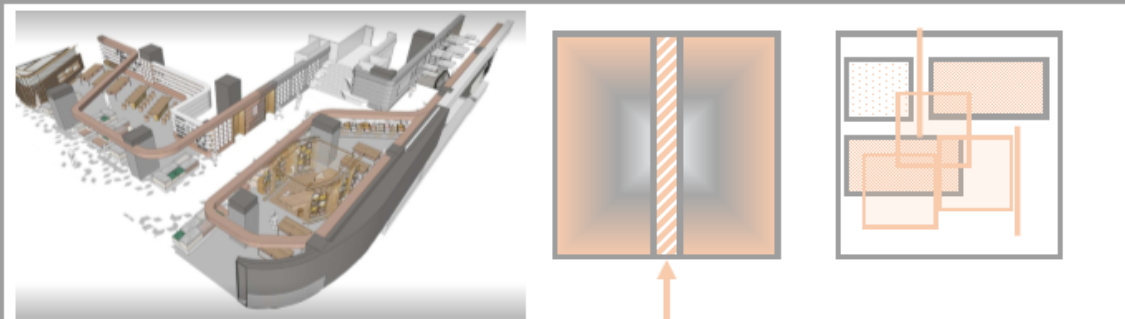
SE (1 good / 5 is bad)

Users **Dwelling**

COPE WITH CHANGE: **1 (Quick)**

Time **18.00-08.00** from..to..

BUILDING USAGE: **5 (only one function)**



[https://www.archdaily.com/920597/social-house-by-xintiandi-kokaistudios?ad\\_source=search&ad\\_medium=search\\_result\\_projects](https://www.archdaily.com/920597/social-house-by-xintiandi-kokaistudios?ad_source=search&ad_medium=search_result_projects)

Space **4000** m<sup>2</sup>

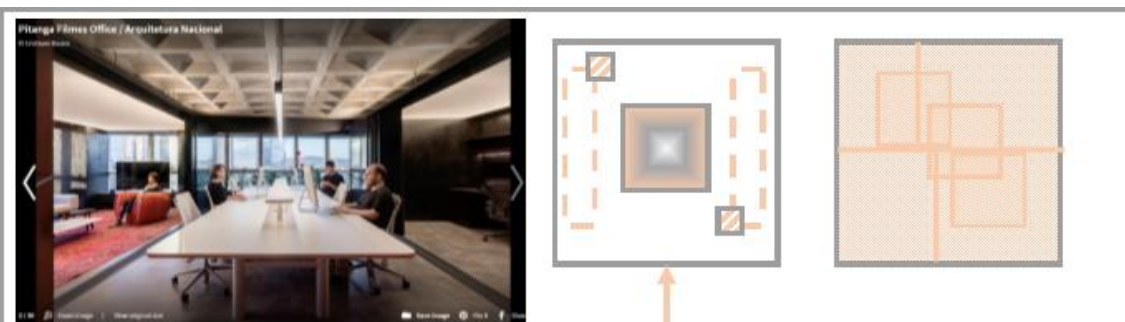
SE (1 good / 5 is bad)

Users **libr, cafe, office, read**

COPE WITH CHANGE: **2 not isolated**

Time **Near 24H** from..to..

BUILDING USAGE: **1 much mixture**



[https://www.archdaily.com/923735/pitanga-filmes-office-arquitetura-nacional?ad\\_medium=gallery](https://www.archdaily.com/923735/pitanga-filmes-office-arquitetura-nacional?ad_medium=gallery)

Space **100** m<sup>2</sup>

SE (1 good / 5 is bad)


Users **Offices**

COPE WITH CHANGE: **1 Quick**

Time **08.00-18.00** from..to..

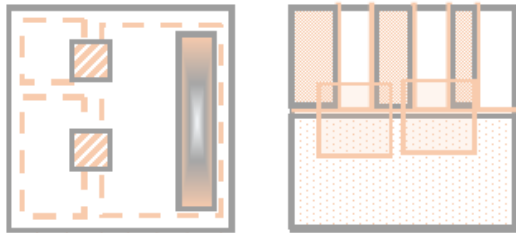
BUILDING USAGE: **3 (no diff function)**

Europaplatz Multipurpose Center / Planning Association Bauart Architects and Planners + URBANOFFICE Architects




[https://www.archdaily.com/926702/europaplatz-multipurpose-center-planning-association-bauart-architects-and-planners-plus-urbanoffice-architects?ad\\_source=search&ad\\_medium=search\\_result\\_projects](https://www.archdaily.com/926702/europaplatz-multipurpose-center-planning-association-bauart-architects-and-planners-plus-urbanoffice-architects?ad_source=search&ad_medium=search_result_projects)

Space **xxx** m<sup>2</sup>  
 Users **Dwelling, shop, dining, religious**  
 Time **24H** from..to..



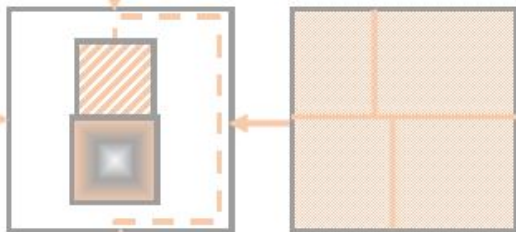
SE (1 good / 5 is bad)  
 COPE WITH CHANGE: **4 (not quick)**  
 BUILDING USAGE: **1 24H used**

SML Headquarters / Some Place Studio




[https://www.archdaily.com/924713/sml-headquarters-some-place-studio?ad\\_medium=gallery](https://www.archdaily.com/924713/sml-headquarters-some-place-studio?ad_medium=gallery)

Space **5580** m<sup>2</sup>  
 Users **Offices**  
 Time **08.00-18.00** from..to..



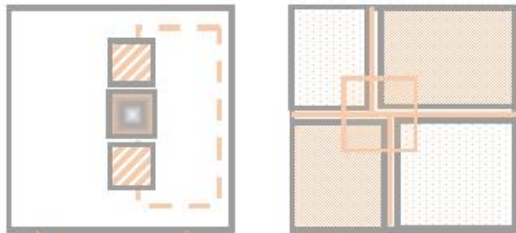
SE (1 good / 5 is bad)  
 COPE WITH CHANGE: **2 mostly**  
 BUILDING USAGE: **4 monofunctional**

Multifunctional Center Doelum-Noah plus studio-nuy-van-noort

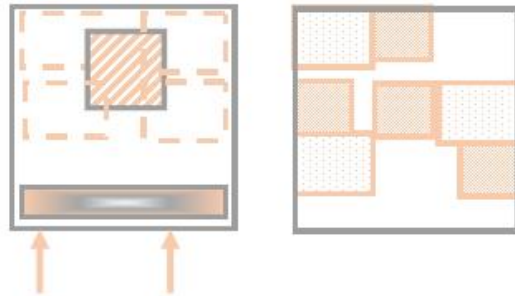


[https://www.archdaily.com/926658/multifunctional-center-doelum-noah-plus-studio-nuy-van-noort?ad\\_medium=gallery](https://www.archdaily.com/926658/multifunctional-center-doelum-noah-plus-studio-nuy-van-noort?ad_medium=gallery)

Space **7200** m<sup>2</sup>  
 Users **Dwelling, sports, culture**  
 Time **24H** from..to..

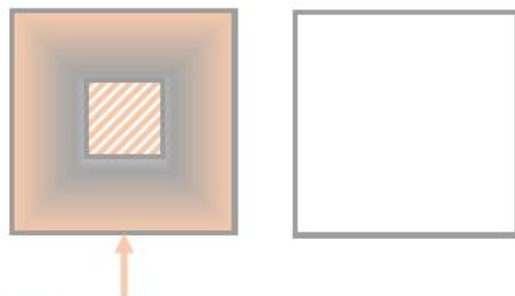


SE (1 good / 5 is bad)  
 COPE WITH CHANGE: **4 to long time**  
 BUILDING USAGE: **3 not used continue**



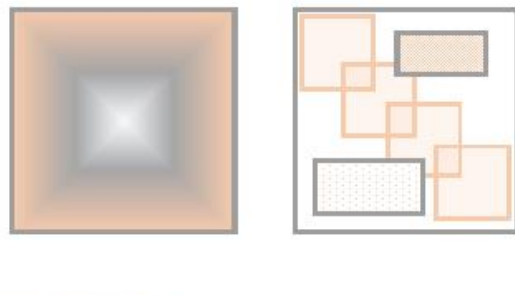
[https://www.archdaily.com/69110/speculative-project-seeks-to-take-advantage-of-nyc-air-rights-for-affordable-housing?utm\\_medium=email&utm\\_source=ArchDaily%20Let](https://www.archdaily.com/69110/speculative-project-seeks-to-take-advantage-of-nyc-air-rights-for-affordable-housing?utm_medium=email&utm_source=ArchDaily%20Let)

Space **XX** m<sup>2</sup> SE (1 good / 5 is bad)  
 Users **Dwelling, relax, dining, art, green** COPE WITH CHANGE: **1**  
 Time **24H** from..to.. BUILDING USAGE: **1**



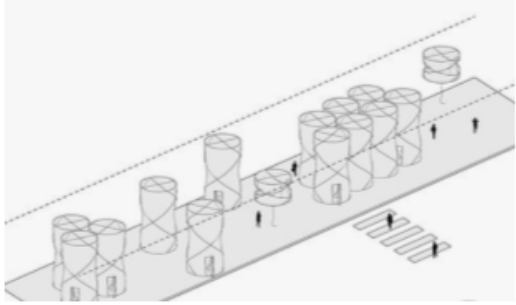
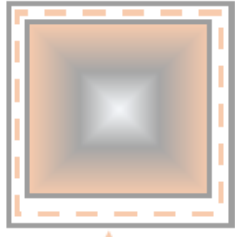
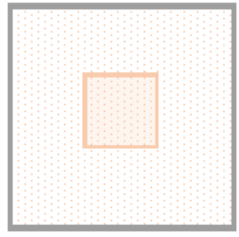
[https://www.archdaily.com/43629/cop15-pavilion-mapt?ad\\_medium=gallery](https://www.archdaily.com/43629/cop15-pavilion-mapt?ad_medium=gallery)

Space **xx** m<sup>2</sup> SE (1 good / 5 is bad)  
 Users **Exhibition multifunc.** COPE WITH CHANGE: **1 (multifunc)**  
 Time **10.00-20.00** from..to.. BUILDING USAGE: **4 (one big space)**



<https://www.archdaily.com/511966/urban-platform-wins-first-in-lisbon-open-room-competition/>

Space **XX** m<sup>2</sup> SE (1 good / 5 is bad)  
 Users **Dining, chill, walk** COPE WITH CHANGE: **1 (but outside)**  
 Time **24H** from..to.. BUILDING USAGE: **1 (but outside)**


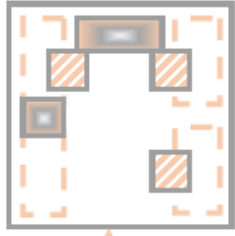
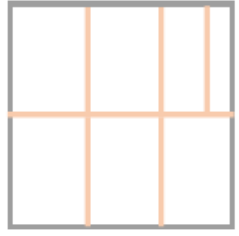
<https://www.designboom.com/architecture/mobile-lanterns-transform-paris-publicspaces-multifunctional-platforms-1week1project-04-27-2018/>

Space **20** m<sup>2</sup> SE (1 good / 5 is bad)

Users **MultiF, dwelling, shop** COPE WITH CHANGE: **1 (but outside)**

Time **24H (not known)** from..to.. BUILDING USAGE: **1 (but outside)**

---

<https://www.ahmm.co.uk/projectDetails/19/Kentish-Town-Health-Centre?image=2>

Space **XX** m<sup>2</sup> SE (1 good / 5 is bad)

Users **Public, offices** COPE WITH CHANGE:

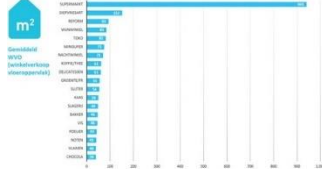
Time **08.00 — 18.00** from..to.. BUILDING USAGE:

## VI. BUILDING LAYERS

Building layer	Explanation
<u>Social</u>	Humans in and around the building that interact with, and play a role in, the life of the building
Stuff	Components or objects that reside inside the space users inhabit
Space plan	Components that enclose the spaces users inhabit
Services	Components that supply and transport physical flows like energy, water, communication, elevators
Skin	Exterior surfaces to keep up with fashion or technology or for repair.
Structure	Components which support the primary transferring of vertical loads and horizontal bracing
Site	The legal boundary in which the building sits
<u>Surroundings</u>	The larger physical context in which a building sits, outside of its specific lot boundaries, comprising both human-made objects and natural geographic conditions.

## VII. SPATIAL REQUIREMENTS PER ACTIVITY

Height and size, through BENG references unless otherwise shown

Activities:	Functions:	Size	Size informatino														
Retail	Shops	53 t/m 370 m <sup>2</sup>	<a href="https://www.inretail.nl/kennis-en-inspiratie/winkelvloeroppervlakte-mode/">https://www.inretail.nl/kennis-en-inspiratie/winkelvloeroppervlakte-mode/</a> Height minimal of 2,6 meters (BB)														
	Grocery stores	941	 <p><a href="https://www.agf.nl/article/168921/winkeloppervlak-supermarkten-blijft-groeien/">https://www.agf.nl/article/168921/winkeloppervlak-supermarkten-blijft-groeien/</a></p> <p>Height minimal of 2,6 meters</p>														
	Pharmacy		Height minimal of 2,6 meter														
<b>General activity</b>			<b>Size between 53 and 941 m<sup>2</sup>; Height 2,6 meters</b>														
Meeting	Church, District building																
	Cinema	5000 m <sup>2</sup> (BENG)	Same as theatre														
	Theatre	88 m <sup>2</sup>	<table border="1"> <tr> <td>Breedte:</td> <td>8 meter</td> </tr> <tr> <td>Breedte tussen gordijnen:</td> <td>7,30 meter</td> </tr> <tr> <td>Diepte:</td> <td>11 meter</td> </tr> <tr> <td>Diepte tot gordijn:</td> <td>7,50 meter</td> </tr> <tr> <td>Hoogte (tot grid):</td> <td>4,35 meter</td> </tr> <tr> <td>Breedte toegangsdeur:</td> <td>0,88 meter</td> </tr> <tr> <td>Hoogte toegangsdeur:</td> <td>2,47 meter</td> </tr> </table> <p><a href="https://www.uu.nl/parnassos/zalen/theaterzaal/voorzieningen-theaterzaal">https://www.uu.nl/parnassos/zalen/theaterzaal/voorzieningen-theaterzaal</a> Height 4,5 meters; size depending on number of visitors</p>	Breedte:	8 meter	Breedte tussen gordijnen:	7,30 meter	Diepte:	11 meter	Diepte tot gordijn:	7,50 meter	Hoogte (tot grid):	4,35 meter	Breedte toegangsdeur:	0,88 meter	Hoogte toegangsdeur:	2,47 meter
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	Casino		Height 2,6 meters														
	Café		<a href="https://www.missethoreca.nl/restaurant/artikel/2017/06/horecainrichting-de-juiste-hoeveelheid-zitplaatsen-per-bedrijfstype-de-horeca-10123200">https://www.missethoreca.nl/restaurant/artikel/2017/06/horecainrichting-de-juiste-hoeveelheid-zitplaatsen-per-bedrijfstype-de-horeca-10123200</a> Height 2,6 meters														
	Disco	484 m <sup>2</sup>	<a href="https://www.spronsen.com/wordpress/wp-content/uploads/De-Discotheek-en-Club-in-beeld-2017.pdf">https://www.spronsen.com/wordpress/wp-content/uploads/De-Discotheek-en-Club-in-beeld-2017.pdf</a> Height 2,6 meters														
	Museum	5000 m <sup>2</sup> (BENG)	Height 2,6 meters														
	Library		Height 2,6 meters														
	Daycare		Height 2,6 meters														
<b>General activity</b>		484 till 5000m <sup>2</sup>	<b>Usually Height 2,6 meters, Cinema, theatre 4,5 meters</b>														
Education	Classroom college		<a href="https://daf9627eib4jq.cloudfront.net/app/uploads/2017/09/Collegezaals-toel-Campus-Campus-Den-Haag-Universiteit-Leiden-Studio-Leon-Thier.pdf">https://daf9627eib4jq.cloudfront.net/app/uploads/2017/09/Collegezaals-toel-Campus-Campus-Den-Haag-Universiteit-Leiden-Studio-Leon-Thier.pdf</a> Square meters per Bezettingsgraad Bouwbesluit														
<b>General activity</b>		Depends	Height 3 till 4,5 meters high														



Sports	Tennis field		<table border="1"> <thead> <tr> <th>Soort ruimte</th> <th>Maatvoering [m]</th> <th>Hoogte [m]</th> <th>Inhoud [m<sup>3</sup>]</th> <th>Nagatenrijd</th> </tr> </thead> <tbody> <tr> <td>Gymnasiekkleed</td> <td>tot 14 x 22 m</td> <td>5,5 m</td> <td>≤ 1.700 m<sup>3</sup></td> <td>≤ 1,0</td> </tr> <tr> <td>Sportzaal</td> <td>13 x 22 m</td> <td>7 m</td> <td>1.701-2.100 m<sup>3</sup></td> <td>≤ 1,1</td> </tr> <tr> <td>1/3 sporthal / sportzaal</td> <td>14 x 24 m</td> <td>7 m</td> <td>2.101-2.400 m<sup>3</sup></td> <td>≤ 1,2</td> </tr> <tr> <td>Sportzaal</td> <td>16 x 28 m</td> <td>7 m</td> <td>2.401-3.200 m<sup>3</sup></td> <td>≤ 1,3</td> </tr> <tr> <td>Sportzaal</td> <td>22 x 28 m</td> <td>7 m</td> <td>3.201-4.350 m<sup>3</sup></td> <td>≤ 1,4</td> </tr> <tr> <td>2/3 sporthal</td> <td>32 x 28 m</td> <td>7 m</td> <td>4.351-6.300 m<sup>3</sup></td> <td>≤ 1,5</td> </tr> <tr> <td>Sporthal</td> <td>24 x 44 m</td> <td>7 m</td> <td>6.301-7.400 m<sup>3</sup></td> <td>≤ 1,6</td> </tr> <tr> <td>Sporthal</td> <td>28 x 48 m</td> <td>7 m</td> <td>7.401-9.500 m<sup>3</sup></td> <td>≤ 1,7</td> </tr> <tr> <td>Sporthal</td> <td>28 x 48 m</td> <td>9 m</td> <td>9.501-10.400 m<sup>3</sup></td> <td>≤ 1,9</td> </tr> <tr> <td>Sporthal</td> <td>28 x 88 m</td> <td>7 m</td> <td>10.401-17.250 m<sup>3</sup></td> <td>≤ 2,0</td> </tr> <tr> <td>Sporthal</td> <td>35 x 88 m</td> <td>10 m</td> <td>17.251-29.000 m<sup>3</sup></td> <td>≤ 2,3</td> </tr> </tbody> </table>	Soort ruimte	Maatvoering [m]	Hoogte [m]	Inhoud [m <sup>3</sup> ]	Nagatenrijd	Gymnasiekkleed	tot 14 x 22 m	5,5 m	≤ 1.700 m <sup>3</sup>	≤ 1,0	Sportzaal	13 x 22 m	7 m	1.701-2.100 m <sup>3</sup>	≤ 1,1	1/3 sporthal / sportzaal	14 x 24 m	7 m	2.101-2.400 m <sup>3</sup>	≤ 1,2	Sportzaal	16 x 28 m	7 m	2.401-3.200 m <sup>3</sup>	≤ 1,3	Sportzaal	22 x 28 m	7 m	3.201-4.350 m <sup>3</sup>	≤ 1,4	2/3 sporthal	32 x 28 m	7 m	4.351-6.300 m <sup>3</sup>	≤ 1,5	Sporthal	24 x 44 m	7 m	6.301-7.400 m <sup>3</sup>	≤ 1,6	Sporthal	28 x 48 m	7 m	7.401-9.500 m <sup>3</sup>	≤ 1,7	Sporthal	28 x 48 m	9 m	9.501-10.400 m <sup>3</sup>	≤ 1,9	Sporthal	28 x 88 m	7 m	10.401-17.250 m <sup>3</sup>	≤ 2,0	Sporthal	35 x 88 m	10 m	17.251-29.000 m <sup>3</sup>	≤ 2,3
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<b>General activity</b>		Min. 308m <sup>2</sup>	Height 5,5 till 10 meters From 5,5 till 10 meters high																																																												
Healthcare	Care home	974 m <sup>2</sup> (BENG)	Without beds Height 2,6 meters																																																												
	Medical center																																																														
	General practitioner																																																														
<b>General activity</b>		100 till 900 m <sup>2</sup>	Height 2,6 meters																																																												
Offices	Office		<table border="1"> <thead> <tr> <th>Aantal personen</th> <th>Aantal vierkante meters</th> </tr> </thead> <tbody> <tr><td>1</td><td>10</td></tr> <tr><td>2</td><td>14</td></tr> <tr><td>3</td><td>18</td></tr> <tr><td>4</td><td>24</td></tr> <tr><td>5</td><td>30</td></tr> <tr><td>10</td><td>60</td></tr> <tr><td>15</td><td>90</td></tr> <tr><td>20</td><td>120</td></tr> <tr><td>30</td><td>180</td></tr> <tr><td>40</td><td>240</td></tr> <tr><td>50</td><td>300</td></tr> <tr><td>60</td><td>360</td></tr> <tr><td>70</td><td>420</td></tr> <tr><td>100</td><td>600</td></tr> </tbody> </table>	Aantal personen	Aantal vierkante meters	1	10	2	14	3	18	4	24	5	30	10	60	15	90	20	120	30	180	40	240	50	300	60	360	70	420	100	600																														
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40	240																																																														
50	300																																																														
60	360																																																														
70	420																																																														
100	600																																																														
	Bank building																																																														
	City Hall																																																														
	Governmental		<a href="https://skepp.nl/nl/blog/kantoorruimtetips/zoveel-vierkante-meter-kantoorruimte-heb-je-nodig-per-persoon">https://skepp.nl/nl/blog/kantoorruimtetips/zoveel-vierkante-meter-kantoorruimte-heb-je-nodig-per-persoon</a> Height 2,6 meters																																																												
<b>General activity</b>		Depends	Height 2,6 meters																																																												
Residential	Student	2,6 meters	28 till 49 m <sup>2</sup> <a href="https://www.cobouw.nl/woningbouw/nieuws/2017/09/hoer-nederlandse-huizen-steeds-kleiner-worden-101252350">https://www.cobouw.nl/woningbouw/nieuws/2017/09/hoer-nederlandse-huizen-steeds-kleiner-worden-101252350</a>																																																												
	Elderly	2,6 meters	66 till 74 m <sup>2</sup> <a href="http://www.bestandewoningbouw.nl/de-huisvesting-van-ouderen-in-de-tijd/">http://www.bestandewoningbouw.nl/de-huisvesting-van-ouderen-in-de-tijd/</a>																																																												
	Family	2,6 meters	120 m <sup>2</sup> <a href="https://www.cbs.nl/nl-nl/achtergrond/2013/04/tweederde-van-alle-woningen-eengezinswoning">https://www.cbs.nl/nl-nl/achtergrond/2013/04/tweederde-van-alle-woningen-eengezinswoning</a>																																																												
<b>General activity</b>		2,6 meters	28 m <sup>2</sup> till 120 m <sup>2</sup>																																																												

## VIII. CONCLUSION OF SPACE RESEARCH

Activities:	Functions:	Size	Height
Retail	Shops, Grocery stores, Pharmacy	53 and 900 m <sup>2</sup>	3,00 meters
Meeting	Church, District building, Cinema, Theatre, Casino, Café, Disco, Museum, Library, Daycare	400 till 5000 m <sup>2</sup>	3,00 meters 4,50 meters for Cinema and Theatre
Education	Classroom, college	Depends (BMBB)	3,00 till 4,5 meters
Sports	Tennis field, Gym, Sports hall, fitness center, bowling ally, billiard room	300 m <sup>2</sup> minimal	5,50 till 10,00 meters
Healthcare	Care home, Medical center, General practitioner	100 till 900 m <sup>2</sup>	3,00 meters
Offices	Office, Bank building, City Hall, Governmental	Depends (BMBB)	3,00 meters
Residential	Student, Elderly, Family (all apartments)	28 till 120 m <sup>2</sup>	3,00 meters

Rooms of 3,00, 4,5 till 5,5 and 10 meter high.

## IX. PUBLIC PRIVATE RELATIONS

Activities:	Functions:	Public/Private
Retail	Shops, Grocery stores, Pharmacy	Public (1)
Meeting	Church, District building, Cinema, Theatre, Casino, Café, Disco, Museum, Library, Daycare	Semi public (2)
Education	Classroom, college	Semi private (6)
Sports	Tennis field, Gym, Sports hall, fitness center, bowling ally, billiard room	Semi public (3)
Healthcare	Care home, Medical center, General practitioner	Neutral (4)
Offices	Office, Bank building, City Hall, Governmental	Semi private (5)
Residential	Student, Elderly, Family (all apartments)	Private (7)

## **X. DESIGN STRATEGIES BACKGROUND**

### 1) Modularity

<b>Design strategy</b>	<b>Information</b>
<b>Reversible</b>	<b>Capacity for the construction to be separated into its constituting parts (with minimum if any damage)</b>
<b>Movable stuff</b>	<b>Furniture, equipment or fixtures that can be moved throughout the building freely</b>
<b>Component accessibility</b>	<b>Components within the building can be easily accessible; other components are not damaged in the process</b>
<b>Functional separation</b>	<b>Separation of functions into different constituting parts; 1:1 function to component relationship</b>

### 2) Maximize building use

<b>Design strategy</b>	<b>Information</b>
<b>Multifunctional spaces</b>	<b>Spaces that can be used for multiple uses</b>
<b>Use differentiation</b>	<b>Inclusion of a mixture of uses</b>
<b>Mixed demographics</b>	<b>Services more than a single demographic</b>
<b>Multiple/mixed tenure</b>	<b>Occupied by multiple tenants that may or may not operate under the same tenure agreement</b>
<b>Shared Ownership</b>	<b>Occupied by multiple individuals or organizations</b>
<b>Isolatable</b>	<b>Space or a wing that can function in separation from the rest of the building</b>
<b>Multiple access points</b>	<b>Provision of multiple entry points that can serve different uses or users</b>

### 3) Design in time

<b>Design strategy</b>	<b>Information</b>
<b>Service zones</b>	<b>Separate control/distribution of services among defined areas to allow increased user control</b>
<b>Configurable stuff</b>	<b>Furniture, equipment, etc. which have multiple states</b>
<b>Multifunctional components</b>	<b>Does not move or change states but can serve multiple functions</b>
<b>Not precious</b>	<b>Often cheap temporary solutions and can withstand a degree of knockability</b>
<b>Extra components</b>	<b>Provisional inclusion of components that go beyond the necessary means of the building to function</b>

### 4) Loose fit

<b>Design strategy</b>	<b>Information</b>
<b>Open space</b>	<b>A large space that is relatively undisturbed with immovable obstacles (e.g. columns)</b>
<b>Support space</b>	<b>Spaces typically not defined in the brief, but are necessary for functional support</b>
<b>Oversized space</b>	<b>Space that is sized larger than the market standard or functional necessity in plan or section</b>



## 5) Spatial planning

Design strategy	Information
<b>Typology pattern</b>	<b>Designing to a typology or standardized use/spatial pattern</b>
Joinable/divisible space	Space that can be joined or divided to support multiple spatial configurations
Modular coordination	Spatial coordination between systems which have physical consequences
Connect buildings	Capacity to link together or separate buildings
<b>Standard room</b>	<b>A series of rooms of all the same sizes</b>
<b>Spatial variety</b>	<b>A variety of sized rooms to cater to different users and size groups</b>
<b>Spatial ambiguity</b>	<b>Blurred boundaries between interior and/or exterior spatial uses through soft boundaries or proximity</b>
<b>Spatial zones</b>	<b>Spatial separation of different types of functional spaces into designated areas</b>
<b>Spatial proximity</b>	<b>Center location or close proximity of related elements</b>
<b>Simple plan</b>	<b>A geomatically simple plan, deductible into a series of linear/rectangular shapes</b>
<b>Standard grid</b>	<b>Standardized dimensions with few anomalies</b>
Simple form	Straight, vertical and horizontal surfaces, few complicated forms such as curved or slanted.

## 6) Unfinished space

Design strategy	Information
Space to grow into	Provisions for additional space (non-existing) to be added horizontally or vertically
Phased	'unfinished' space that requires additional work to make it usable
User customization	Usable 'finished' space that is designed to be decorated or appropriated by the user

## XI. DESIGN STRATEGIES WITHIN AN EXISTING STRUCTURE

### **Modularity – separation of the physical parts of the building into defined functional entities.**

Dark gray described the literature of adaptive architecture and the black text describes the integration in existing building structures.

*This design strategy asks for **reversible** and **movable** components. By spreading these across several layers objects or panelized solutions can increase the usage and change of functions. These components need to be **accessible** for a quick adaption. This reversible, accessible components ask the need for separation of the functional building layers, because combining them would lose it's quick adaptive qualities. These solutions can be seen in the form of facade elements but also in the 'stuff' layer where modularity is found in the objects places per function. The size and load of these objects will influence the adaptability of the space.*

<b>Skin</b>	<b>Stuff</b>	<b>Services</b>	<b>Space plan and structure</b>
Reversibility of components into elements	Movable interior for quick function change	Accessibility of components for quick adaption	Separation of the shearing layers

In the transformation of an existing building especially the functional separation can be problematic. In this case that means that the façade is a weak point because they are load-bearing and, if combined with the layer of skin or service, create a glitch in the shearing layers.

**Maximum building usage – increase the timeframe in which the building is used throughout the day, week and year**

*Important assets for creating maximum building usage is the multifunctional space that can accommodate a variety of functions. This can also be an undefined space for events. To enhance community engagement a mixture of use and demographics is needed within the object. For this multiple tenures are needed. This mixture demand several, individual entrance point per activity, which also strengthen the security and visual linkage of the user. This has all an effect on the ownership of the building and the spaces, which is less clear with multiple tenders.*

<b>Social</b>	<b>Space</b>	<b>Space plan</b>	<b>Site</b>
Social problems with multifunctionality by shared ownership of spaces	Multifunctional spaces that change to specific functions	This multifunctional space has his effect on the space plan	Varyity of functions

In a transformation project multifunctional spaces are limited to the existing structure. Creating multiple entrances in this case is not hard. Because of the length of this building, the shared ownership strategy could be problematic, for this, mainly traffic space is difficult to exclude from more private sectors of the building.

**Design in time – capacity of the physical parts to provide options for the users based on time.**

*This strategy is focused on the physical changes the user can exercise to express it's own services desire. Next to this own preference the specific use per user can provide a reduction in the energy demand of services of the building by only providing what is needed. This can be done by zoning specific services mostly combined with a building management system. Next to user adaption component can be used, or designed, to fulfill multiple purposes.*

<b>Stuff</b>	<b>Service</b>
Multipurpose components that fulfill the users desire.	The possibility of the users to adapt his surroundings by configuring services, this may create energy reduction

In this case, achieving ‘design in time’ has to do with the adaption of services and this is partly a digital and financial question and partly an implementation withing the existing building. This is not difficult to achieve in the current building.

## **Loose fit – Spatial considerations beyond a minimal standard or that defined by the brief**

*The loose fit strategy divided certain spaces into three divisions, stressing that achieving them all provides the maximum benefit. **Open spaces** will provide easy separation for different functions. These open spaces should be supported by ‘**support spaces**’ that are not defined in the design brief but are adapting changes between or inside a particular function. The third division is an **oversized space** separated from the structure and designed to handle different functions with different needs.*

### **Space**

All the spaces have their interpretation and (problems) with these layers.

### **Space plan**

In the current building this design strategy is difficult to implement, sizes are fixed, open spaces are possible in the horizontal way but vertically, floors need to be removed. This is possible in a technical sense. In the view of space efficiency an oversized space is not desirable and needs to be adaptable to reduce the waste of vertical space.

## **Spatial planning – spatial consideration for the way spaces are laid out; their boundaries, dimensions and relationships to one another**

*A good division between **standard room size** and **spatial variety**, a variety of sizes formality or closedness, need to be implemented. This is the most profitable by putting them into **designated areas** that have the **same functional demand**. The **blurriness** of specific spaces can create variety of these spaces. It is important to fit this all into a **standard grid** that create a **simple plan** with easy to understand spatial layouts.*

### **Space**

Are compiled by the use of **standard and variety of room sizes**

### **Space plan**

Has a need for **blurriness** that creates a **variety** of spaces within specific **zoning**

### **Structure**

The **standard grid** that creates a **simple plan**

This is highly usable in the existing structure. The need for a standard grid and simple plan could be a problem because of the size of the building. The zoning and blurriness will eventually be via activity.

## **Unfinished space – capacity to add to or ‘complete’ an aspect or layer of the building**

*Unfinished spaces not only describe spaces that are not finished so that the users themselves can finish them suitable for their needs but also described a space to grow into when the this is needed. This demand could change overtime. This has all to do with the amount of user customization.*

### **Space plan**

All the spaces have their interpretation and (problems) with these layers.