DECONSTRUCTIVE RE USE
Social strategies for Sloterdijks financial insecurities
Studying architecture means you learn a little of a lot. I thought higher education was there to make you the expert in one very specific subject, of which you know everything. As for architecture this turned out to be different. During the bachelor you get to known all the different departures, to prepare for the master where you chose for a specific specialization. When I was given the choice for my final graduation project, I was able to avoid decision making and choose none of these by applying for the studio Design as Politics.

During this graduation project I got to see all the aspects of the profession once more in depth, real-estate and housing, structural engineering, sustainable design and urban strategies have all been part of the project that should in the end provide me with a degree in architecture.

I would like to thank all the consulting experts for the expertise they have shared with me:

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Wouter Vanstiphout, Bas Gremmen en Anne Snijders

Anniek Roosenschoon
June 2014
Along with the financial crisis came the awareness for architects to have to reposition themselves in society. Building projects came to rest as a result of cuts and bankruptcy, the profession of the architect appeared to become superfluous as they are one of the actors that is easy to save on. At the same time it became clear the financial sector, who is often designated as the instigator of the crisis, was in control of the building sector. One of the huge problems we currently face in our built environment is the surplus of office buildings. These are being developed not necessarily because of the need for the square meters but more-over to make more money. These capitalistic interventions are justified because of the buildings sustainability, thus contribution towards a better world. While big companies proclaim how much carbon emission is being saved, the same amount of square meters is decaying just some miles away. Buildings that were, ten years ago, the sign of innovation and progress have now become the icon of a leaning market and hypocrite finance driven companies. Production in combination with our accelerating urge for innovation produces waste. Moreover it exhausts our natural resources which will soon be finished if the curve will continue this way. Seen the depletion of our planet, the standstill of building project is not a bad thing. At the same time the built environment does not yet serve our spatial needs, looking for example at the lack of social housing in the suburban areas. The task of the architect is not yet fulfilled, though should be continued by arranging our existing environment instead of adding to it.

Buildings and their elements should be reused to meet the new demands. Where large intrinsic office buildings to do not meet the requirements of dwellings for the lower class, these buildings will be arranged in such a way the intrinsic value of the building becomes suitable for new purposes. Building elements are being investigated on their qualities and method of deconstruction, leading to a toolbox which will enable architects to design with second-hand material. The toolbox is be applied according to a set of rules that meets the small scale of affordable housing. On the plot inside the mono functional office area, the large tower slowly transforms into a residential area, enabling the architect to fulfil his task by designing the built environment to meet the current needs.
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I. A CRISIS IN ARCHITECTURE
I. A CRISIS IN ARCHITECTURE

1.1 Dependence on finance
As the financial crisis hit in 2008, jobs in architecture dropped simultaneously. Obviously the financial system has great influence on our daily lives and my future profession; the architecture branch and the built environment, surrounding everyone. The high rate of vacancy in the office market illustrates this.

In the 70’s and 80’s money was present in overflow. Real estate investments appeared to be a profitable way for deposit and making more money. Capitalistic companies made deals with developers as investors would pay. Offices arose in large numbers and in little time. Though time moved on and trends changed. The demand for office buildings decreased resulting in a gigantic surplus, what we now call vacancy, leading to dilapidation of buildings and their surrounding area. Instead of the short sighted financial sector it should be architects again in charge of the built environment.

In order to fulfil the task of serving societies spatial needs, the transformation of vacant buildings is a good option. 60% of the structural vacancy however is not transformable in it’s current structure. Demolition would be the alternative, but the increasing scarcity of raw materials makes this impairment unwarrantable.

Short after we started investing in real estate it became clear we were ruining our planet at full speed. Sustainability was the magic word that would save our world, decrease carbon emission and the use of fossil fuels. Sustainable development is currently being applied everywhere, not at least in the architectural and building sector. Green building, zero-energy, climate facades, all became jargon of the architect. Recycling however, is something that does not often happen in architecture, since buildings are considered inert long-lasting objects. We recycle everything from newspapers to automobiles, and yet we continue to pile obsolete building materials into landfills. The current office market shows us they are actually not. Buildings should be able to follow more quickly on our changing trends, and do so in a sustainable way. How can we gain back the value of our built environment, in the field of finance, social equity and our planet?

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Aleid van Doorn [2014]
1.2 Re-positioning

Architecture started as an art, not as a profession. Vitruvius. Sir John Soane was the first to name architecture a profession. Ernest May was then the first architect for the government, which was a reversal as architecture was until then an art, a luxury. From now on architecture was also about ordinary people, concerning affordable housing. Still there is a big difference between the architect who works for a client with a program of requirements, or an architect that works for a client to make art, no matter the functionality as long as the architects image is presented. [Heintz, 2014]

Architecture is not just art, it is ‘reliant art’, as it has to meet certain requirements. This has to do with general science and technique, stability and safety as well as with a clients specific needs.
2. THE VALUE OF MONEY
2. THE VALUE OF MONEY

The falling housing market in the United States is due to subprime mortgages, a happening that was apparently bulky enough to influence a worldwide economy. The people who are influenced by economy are those who depend on money. I.a. we, the architects. The crisis in 2008 influenced a great part of the Western world. It has had different consequences in different countries, sometimes negligible, sometimes shocking. Greece is an example of the latter, as it was a country that went bankrupt, whilst many people never before realized a country actually could. Spain is another example of a country that was severely hit by the crisis. The housing market had to bear the consequences, but at the same time played a big role in the establishment.

2.1 A short history

The presence or absence of money has many consequences, also in fields where we would not directly relate to the financial sector. In order to understand these consequences a first understanding of the causes is needed. An understanding of money, how it came into being, and how it claimed such an important role in everyone’s daily life.

What is money?

1. Value is something that has always existed; back in the Stonehenge there was also value, and since human kind the value of things has been of great importance in order to life, to survive, to trade. 2. This could be done by use of stones, shells, feathers or bigger, cows, bizons, trees, etc. It was about quality and quantity, amount or size. 3. By the time mining was invented this was made more easy since metals such as gold could be shaped in exactly the same size, thus the same value and comparable. 4. The coin is invented. [1]
1. As people became more prosperous or due to inflation a lot of coins had to be traded as well as stored. Safe-keepers offered storage space for capital and gave a ticket in return as proof of the stored amount of coins.
2. Next to storage the safe-keeper could also lend out his coins at an interest rate, which could as well be handed out in tickets. Soon it turned out the check was much more manageable compared to the coins, thus became the new trading system.
3. This meant the coins stayed untouched in the safe, while in the outside world they switched owners frequently.
4. Now that such a big amount of coins was unused a third business popped up in his mind. Since no-one was aware of the actual amount of stored coins, he could lend out coins of others in order to receive even more interest. Banking was invented here. [1]

2.2 Banking
5. People could store their capital, deposit, and receive some interest for the time their capital was in hands of the safe-keeper, from now on called the banker. This capital was free for the banker to lend out to others, in return for interest to the bank. As long as this interest rate for lending out was higher than for storage, the bank could make its own money out of this business.
6. If there was not enough deposit though the bank had no way to make money. Thus they let no-one know what the value of the deposit was, and kept on granting loans. It was unlikely that all clients would come by at the same time to collect their deposit, so this risk could be taken. At the time it did happen, the court interfered. They couldn’t stop the bank since the baking system was leading for the prosperity, but in order to regulate the banks they came up with the fractional reserve system.
Money has become an obvious factor in our lives of which we are constantly aware, though we are not aware of its influence in a broader sense.

A pattern can be recognized in the appearance of a crisis; it is preceded by a wave of prosperity. Surplus and security with, as a result, the taking of high risks. These risks where too high and where taken by big companies that have had too much influence. Money was not enough. The more money they have, the more can be made out of it, which makes investing an interesting activity. The prosperity of the 70’s and 80’s had placed us in an apparently secure position and made big capitalist companies want to invest their capital. By that time the bank was not the most favorable solution, since the interest rate in the US was brought down to 1% by Greenspan in 2004 in order to regulate the financial market. As a result of this, big parties started to invest their money in assets such as real estate. Office buildings in the Netherlands became very popular, not because of the need for them to be used, but because of the need to invest. Office buildings became assets for bank capital and buffers.

During a financial crisis demands for withdrawal can exceed the banks funding buffer, thus forcing the banks to raise their additional reserves. This can be done by selling their assets. At the time when the crisis hit their assets, office buildings, turned out to be practically worthless, or at least not marketable.

7. The fractional reserve system means that only a part of the deposits need to be kept at the bank as reserve, the rest can be lend out to new costumers. Given that the fractional reserve ration is 1:9. If a customer goes to a bank to deposit €1000,-; this bank only needs to reserve 1:9 = €100,- as a buffer, the rest can be granted as loan for new customers. They loan the leftover €900,- to buy a cow from a farmer, who in his place deposits this amount on his bank. This bank needs to save €90,- and can loan the €810,- to a third client, will use it to buy a bicycle. This means from the initial €1000,- a cow worth 1000,- and a bicycle worth 900,-, are pays by only a 1000,-. Bank thus create money, which is in fact not there but is possible since it is very unlikely that all customers come to get their deposits at the same time.
2.3 Theory of Value

The main functions of money are known as a medium of exchange, a unit of account and a store of value. In all senses it has to do with the representing of a certain value. Value is a generic term which can be explained in many different ways. The explanations mostly attempt to explain the exchange value or price of goods and services. A key question in economic theories on value is why goods and services are priced as they are, how this value comes about and how to calculate the correct price, if such value exists.

The theories of value fall into two main categories: Intrinsic and subjective theories.

- **Intrinsic (or objective) value is the value contained in the item itself. In this case is mostly looked upon the process of producing an item and the costs involved in that process.**

- **Subjective value is what makes an item useful in satisfying human wants. Thus in this case the value is not determined by any inherent property of the good or the amount of labor required to produce the good, by the importance an acting individual places on a good for the achievement of their desired ends.**

2.3.1 Adam Smith

Adam Smith, cited as the ‘father of modern economics’, was the first to propose what is called the ‘labor theory of value’. This theory suggests that goods which take the same amount of labor to produce have the same value.

The following citation from his famous work ‘the wealth and poverty of nations’ explains on what the value of commodities is as well as being rich and poor:

Adam Smith, from *The Wealth and Poverty of Nations*

Every man is rich or poor according to the degree in which he can afford to enjoy the necessaries, conveniences, and amusements of human life. But after the division of labour has once thoroughly taken place, it is but a very small part of these with which a man’s own labour can supply him. The far greater part of them he must derive from the labour of other people, and he must be rich or poor according to the quantity of that labour which he can command, or which he can afford to purchase. The value of any commodity, therefore, to the person who possesses it, and who means not to use or consume it himself, but to exchange it for other commodities, is equal to the quantity of labour which it enables him to purchase or command. Labour, therefore, is the real measure of the exchangeable value of all commodities. Money is therefore compared to the labour intensity, the ‘toil’ as he calls it, to purchase commodities:
When considering the subjective value a distinction can again be made between value in exchange (the price one pays to purchase a commodity), value in labor (the labour needed to obtain a commodity) and the value in use (the importance in satisfying human needs).

The concepts of value, use value, utility, exchange value and price have a very long history in economic and philosophical thought. Adam Smith recognized that commodities may have an exchange-value but may satisfy no use-value, such as diamonds, while a commodity with a very high use-value may have a very low exchange-value, such as water.

2.3.2 Marx’ Use-value
Marx emphasizes that the use-value of a labor-product is practical and objectively determined. It inheres in the intrinsic characteristics of a product that enable it to satisfy a human need or want. The use-value of a product therefore exists as a material reality for social needs regardless of the individual need of any particular person. The use-value of a commodity is specifically a social use-value, meaning that it has a generally accepted use-value for others in society, and not just for the producer.

2.4 Conclusion
Money represents value. Value can be expressed in different ways: Value in labour and value in use (intrinsic) or value in exchange (subjective).

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1. Smith; The Wealth and Poverty of Nations
Vinoly in 2012 gekocht voor 140 miljoen euro door Deka Immobilien

The Rock in 2012 gekocht voor 133 miljoen euro door Deka Immobilien

De Tweeling nu nog hoofdkantoor van Stibbe en AkzoNobel, verhuizing gepland in 2016

Atriumcomplex in 2013 gekocht voor 115 miljoen door Vicory Advisers
3. THE BUSINESS OF REAL ESTATE

The Edge
nieuw hoofdkantoor
Deloitte, in aanbouw,
komt later dit jaar
op de markt
3. THE BUSINESS OF REAL ESTATE

3.1  Real estate and their business
The word ‘real’ derives from the Latin ‘res’, thing. Estate is defined as all of the things a person owns. Another definition is ‘a large piece of land with a large house on it’ [1]. Both explanations are close to the term as used throughout this thesis. Inextricably linked to this term is the business of buying, selling and renting. The business became more important than the objects itself. Real Estate became the business of those who had nothing to do with either the house or the land, but just the business of buying and selling it, in order to make money.

The Dutch word for Real Estate, Vastgoed, refers to ‘vast’ which means fixed, and ‘goed’ referring to its material value. One of the characteristics of estate, land, is that it cannot be produced and will never get lost. Nature can change though, for example by means of draining or excavation, or by what is located on the land surface.

In the 80’s and 90’s of the 20th century the low interest rate made it attractive and relatively cheap to buy buildings, real estate, in order to invest money, and make even more out of it. Buildings were being build not because of a demand for those square meters but because of the surplus of money and the low interest rate. An arrangement was developed in which all parties involved had their share and made their profit. The shareholders are:

- The (future) user, big companies
- The developer, the company that brings together all parties in order to support the deal (Construction companies included)
- The municipality, landowner to issue the land on leasehold thus making financial profit as well as benefiting from the new-coming activity.
- The investor, mostly a bank or insurance company to buy the real estate as its asset
A company and developer make an arrangement for a new office-building. The developer will supply the company with a building, whereas the company will assure the developer of a 10-year rent contract. This rent-assurance makes it possible for the developer to sell the building to an investor. The municipality gives out land in leasehold, meaning it receives money for the land as long as it is owned by third parties, though remaining the landowner. Liveability and movement in the municipality is a minor advantage which the municipality will use to justify the collaboration with the citizens. What happens is that the developer makes sure to construct the building for a maximum investment at 9x the annual rent. The investor buys the building for 12x the yearly rent and is thus sure to earn back at least the 10 years. Since the lifespan of a building is longer he assumes that he will make more money after the 10 years contract. After 10 years of happy renting, the company will have fulfilled the arrangement. The company is ready for a new office, on a better place with an innovative image. The whole cycle repeats itself. What is left behind is the investor with the building, looking for new tenants to pay him rent. What the investor probably did not foresee was the fact that office buildings would soon not be as attractive as before. Big companies started to shrink because of the crisis whilst at the same time a new way of working, flex or at home arose. The municipality was also left behind with a piece of ground which slowly become abandoned since no new tenants could be found.
3.2 Value in exchange

The investor owns this real-estate as an asset for the balance sheet, as part of his capital. The book-value is independent on whether the square meters are rented out, what matters is the existence of the floor surface.

What becomes more clear in this situation is the fact that these office buildings are not at all developed for the needs, but purely as financial products. The shareholders do not at all care about the spatial qualities but consider it purely as a property. A financial product with two sided value. On the one hand there is the user-value which is in the case of many office buildings worth nothing. On the other hand the building as part of the investors capital is still worth the amount of square meters, whether rented out or not.

A comparison can be made between money and the office market. The physical coin has an actual and continuous value; the amount of gold it consists of. The paper money represents the amount of physical coins stored in the safe.

The building is, comparable to the coin, a physical product made of materials, and has a same material value. The building owners balance sheet represents the physical building, as does the paper money. One again people came to collect their money, this time it was not the paper money representing an empty vault, but a balance sheet representing a worthless building.

Transformation would be the solution to make the existing vacant square meters useful again, however the taxation system for housing is different from office-buildings. The service areas are left out, while included in the office-building, which means less m$^2$ will be taxed when the function changes from office to residential [3]. Transformation hence means devaluation of buildings, and will therefore be a loss on the balance sheet.
3.3 Dutch financial district: Zuid-As

At this moment the Zuid-As is one of the few locations where architecture is still happening. New buildings arise, strikingly all off them mono functional office buildings. Seen the current situation one can ask some questions on this. An obvious explanation could be the fact that over 30% of the settled companies are in the financial sector, of which a lot of banks such as ABN, ING and many international banks. Money is created at the Zuid-As, even after the crisis hit. The vacancy in this area decreased to only 6.6% compared to the ‘official’ 15% vacancy throughout Holland. The existing vacancy is of a different type compared to other areas. The existing vacancy is called frictional vacancy. This type of vacancy supplies the demand and lowers the chance of a 'pork-cycle'. The pork-cycle describes the phenomenon of cyclical fluctuations of demand and supply. The supply becomes high after a period of high demand, and the other way around the product becomes scarce after a period of low demand. The ratio demand and supply do not run parallel due to the ‘breeding’ time of the product. This effect was first observed in the pig-market, hence the name, but is now also happening in the real-estate stock. A vacancy rate of 8% is considered healthy for the office market.
3.4 The Edge by OVG

The upcoming tree year in total 100,000 m² new office space will be added to the existing stock in the Zuid-As. A huge difference compared to the last four years, when no new buildings were completed.

Part of the added square meters will be the Edge, a 40,000 m² office building currently constructed for Deloitte. This well known company in consultancy, one of the ‘duurzaamheidsridders’ (literally translated ‘knights of sustainability’) as they like to call themselves, will move there end of this year. The sustainable image they pursue is obviously tangible in the appearance of the new building, as can be seen in the movie that introduces us to their new base. A James-Bond like scene shows us electric cars, personal regulation systems and integrated touch-screen windows, claims to be a future proof building that is above all Breeam-Outstanding. Watching the movie while knowing the current situation in office buildings rises two question:
1. Is it true there is no money for architecture?
2. Where is Deloitte based at this moment?

The first question is a difficult one to answer since one might ask if this is still about architecture. The second one turned out to be answered more easy; Deloitte is currently based just some kilometers away from there new location. Spread over two offices in Amstelveel and Amsterdam. Their main office in Amsterdam is situated in another monofunctional office area in Westpoort, Teleport, Sloterdijk, the Crystal Tower it is called.

3.5 Conclusion

The financial sector took over control on our built environment. Office buildings are being built as financial products above the need for them in an architectural sense. The value of the buildings lies not in the square meters but moreover in the existence of the building, as an asset of the owners capital.
4. MONOFUNCTIONAL OFFICE AREAS
4.1 Mono functional planning

With the industrial revolution the need arose for office employees, migration to the cities, and urbanization. This led to spatial problems and challenges that were addressed by the modern movement. The many industrial developments taking place inside the pre-industrial cities had a negative influence on the health of citizens, the growing working class was accommodated in small, unhygienic and unsafe housing, Revolution building.

A reaction to these problems was the division of functions such as industry, offices and residence, by means of ‘functional zoning’. This separated zoning would not only spatially provide distance between the factory smoke and the workers’ homes, but also figuratively in the sense of separating work from leisure-time and dwelling.

The idea of functional separation first came up in 1930’s CIAM meeting in Athens. A well known example of this type of planning is the ‘Functional city’ by van Eesteren, implemented in his urban plan for the extension of Amsterdam (Amsterdam Uitbreidingsplan, AUP) which was designed in 1935. On of the outcomes of this plan were the Western Gardencities (Westelijke Tuinsteden), an area which was specifically suited for dwelling. As the Second World War started short after the plan was made, the plan was postponed and finally executed between 1948 and the 60’s.

4.1.1 Office areas

The same kind of clustering happened to industry and office buildings. Because of the urban migration only few and expensive space was available in the city centre. Areas just outside the highway were therefore developed as mono functional office areas, where sectors would be clustered on affordable yet good accessible places.

Architects at that time were fascinated by machines and designed houses as ‘living machines’, the exterior expressing the explicit function of the interior, and ‘ideal’ buildings were designed to fit the accommodated function as precisely as possible.
4.2 Vacancy

The working class, once in need for separation between work and leisure, has by now new and different idea's on the way of working. The new large working class is the creative class. They are working more or less independently, have flexible working hours, and are often able to perform their work from home, just as well as from behind their desk at the company they work for. This way of flexible working is possible because of the rapidly developing technology where it concerns portable technology. Laptops, mobile-phones, complete archives, all can be carried in the pocket, making one very independent of its physical location. Suddenly the strict divided function zoning has become outdated and unnecessary. Moreover, people desire multifunctional spaces, that are inspiring and able to serve all their different needs for work, leisure and live at the same place.

The new way of working as well as the cuts to be made due to the crisis gave companies the need and possibility to shrink in office area. This decrease of need came right after the period in which offices were rapidly developed as is described in the past chapter. As we speak the earlier described finance-driven business has led to 15% vacancy of the total amount of office-space, about 7 million m$^2$. These are the official numbers as presented by the government, which is about the structural vacancy. Structurally means vacancy for three or more consecutive years with no perspective of future tenancy. It is assumed there is a very high amount of hidden vacancy, these are the square meters still rented though not used, which is about 27% of the Dutch office stock. Once these contracts end they will become officially vacant, thus the current 15% will increase in the future.

For the owner of a building, structural vacancy means no income while the expenses of maintenance, insurances and taxes still have to be paid. Socially and on an urban level, structural vacancy is a problem of location decay and dilapidation and initiates downgrading of complete areas. The vacancy in the Amsterdam office market is at a high level compared to both other European main markets as well as other Dutch cities, e.g. Frankfurt and Rotterdam, both with 12% vacancy, while the vacancy in Amsterdam is approximately 20% of the total office building stock.

1. Rijksoverheid, leegstand kantoren
2. Vastgoedmarkt.nl
3. DTZ Zadelhoff
4.2.1 Transformation
Transformation of the buildings is a way to cope with these buildings as well as their consequences. Of this vacancy-rate however it is expected a 20% can be upgraded to new sustainable office-buildings. Another 20% can be transformed to a new function, such as housing. From a study of the Amsterdam office market it is found that 60% of the vacant office space is not suitable for transformation [Remøy, 2010]. Reasons for these 60% are mainly money (book-value) and their location. 70% of the structurally vacant office buildings are situated on mono functional office locations. These are not considered suitable for housing (Geraedts & Voordt, 2007).
The spatial characteristics of office areas are in general high rise offices (starting form 20 until 100 metres high) with as a consequence large scale collective areas which are windy and impersonal. There is nearness of highways and railways, with nuisance as a consequence.
To transform such areas into suitable areas for residence a large scale intervention is required, adding a number of housing units that will generate this demand. A functional transformation of one building will not be successful, as it will not generate enough demand for facilities and services that are needed in or near a housing location.
The building structure and facade were found to be the two characteristics of a building that have the most influence on the buildings transformation potential#.

4. Remøy, 2010

Source: Vastgoedmarkt.nl
**4.2.2 Demolition**

Hans de Jonge, chairman of the government’s vacancy advisory committee, competition jury, says that 15-20% of the existing vacant office stock can be given a new function and believes that a “considerable” portion will have to be demolished.

Up to now owners are hesitating to demolish their property and they are still waiting for the situation to change. The Covenant mentions that regional funds have to finance demolition. According to Amsterdam’s alderman Maarten van Poelgeest the fund will be €50 million a year and it will be financed by the local authority, the developers and the owners.

It can be doubted whether, even though the developers would have foreseen the changing trend in the working-spaces, they would have reacted differently by abandoning their plans for developing new office building.

Still today with the knowledge of the current market crisis, new office buildings are being constructed. Plans that were made ten years ago will by know be finished. Financial consequences would be to big for the company and developer to quit the plans and stay with their previous office. Moreover, the development of offices is a profitable action for them as long as investors are eager to buy.
4.3 Teleport or Sloterdijk

Some places have a dominant appearance which is in a way generally admitted by the majority. In the case of Sloterdijk this appearance is miserable. One of the bigger train-stations in Holland lies in the centre of what is called Teleport. When exiting the station you find yourself in-between high buildings with closed facades and mirrored windows that give away the obvious function of these colossal office buildings (the functional architecture as mentioned before). The view is nowadays characterized by slogans and big boards crying out for attention. Big parking lots and breathtaking views should convince potential tenants to rent the striking amount of square meters that is currently out of use.

Research for the background of this mono functional office area leads to unexpected results. Black and white pictures of picturesque farms and a small church reveal the history of a small village called Sloterdijk. A different Sloterdijk on a different location, one might presume, though hidden behind large towers and the high way it turns out a part of the village still exists. Until 1921 Sloterdijk was part of the municipality Osdorp. From then on it was enclosed by Amsterdam and officially formed part of it. The first railway between Amsterdam and Haarlem ran through it and led to the railway-station Sloterdijk. In 1960 Sloterdijk was finally hit by the industrialization and urbanization and a new ringroad was constructed around Amsterdam for which Sloterdijk had to make place. Half of the village was demolished for the Coentunnelweg. Shortly after a new station was being build on the other side of the highway, which made the old station superfluous, and was hence demolished in 1985 when the new station became into use.

The area west of the village Sloterdijk was then seen as an important new office centre of Amsterdam. Other of such centers were Amsterdam South East (Amstel III), South WTC (Zuid-As) and the area of the Amstelstation. To prevent different types of companies to be scattered around the city the municipality cam up with a thematic division specific for every area. Next to Sloterdijk they saw excellent opportunities for the, by then emerging and promising sector of Telematics, from which the name is derived. The municipality did some large investments to make the area appropriate for this sector. The underground infrastructure of Teleport was state of the art: Even back in the 80’s there was already glass-fibre implemented and there were satellites to enable good communication. The set up of the public area was spacious and the excellent accessibility of the area should guarantee success.
Only ten years later the municipality of Amsterdam admits these high expectations were not fulfilled. One of the reasons they given for this disgrace are the fact that the originally planned dwellings were never realized because of nuisance of traffic and railway. This led to an monotonous area. Another reason is by the time Teleport started to develop its buildings the telecommunication office became 'footlose', independent of their physical space because of the fast developments in their sector thus not attracted by the excellent accessibility.

'New round for new opportunities', is what the municipality calls for in 2008. The image that supports the slogan shows the area as it is with the empty plots filled with high rise buildings. Six years ago, just after the crisis hit, this would seem as the ultimate solution for liveability and the succeeding of these areas. Today it may sound like a ridiculous proposal seen the current situation in these areas. Therefore a new vision is being developed and presented in 2012. ‘Vacancy as an opportunity’ is what they say today. Vacancy makes place for other functions within the area, where they suggest the office buildings to be transformed into hotels or expat dwellings. ‘Teleport becomes Sloterdijk’.

The vacancy is more present in the northern part of the area. The possibilities for transformation are better in the Southern part because of the smaller grain, the moderate size and the adapted zoning law. The assignment for the northern part of Sloterdijk asks for collective and more intensive efforts of the building owners and the municipality of Amsterdam [gebiedsstrategie 2012].

Arjan Snellenberg: The municipality does not want to take such a high risk to invest another time. They aim for liveability in the area, also outside office hours. Transformation might be a solution, where balconies are being added to ‘mis-use’ students. The strategy to demolish these buildings is not possible in this generation. We listen to the companies, they want more facilities, such as cafés and bars. Diversity is what we aim for.
4.3.1  The Crystal Tower
The present office of Deloitte, the Crystal Tower was only completed twelve years ago, in 2002. 23 of it's 27 floors are currently rented by Deloitte, the other two floors by AKD and some small offices and the left over two are already empty. When Deloitte moves out by the end of this year the almost 100 meter high tower will definitely end up high in the top 25 biggest vacant office buildings [bron, Volkskrant weer een kantoor leeg]

4.4  Conclusions
To cope with the vacancy in mono functional office areas a complete make over of the location is in most cases required. Previous transformations showed these large scale interventions never had time to be completed as time moves on and our demands change. In times of recession and uncertainty there is a call for small scale interventions.

How can a small scale intervention be effective in a large scale problem like this?
'We wilden op ééén locatie zowel de Amsterdamse en het Amstelveense kantoor samenvoegen', zegt Ger Glimmerveen, hoofd facilitaire zaken van Deloitte. 'Binnen de Crystal Tower paste dat allemaal niet.' Bovendien zijn de verdiepingen relatief klein en dat, zo is volgens Glimmerveen algemeen bekend, is niet goed voor de creativiteit van een 'kennisintensieve organisatie'.

Belangrijk voor de overstap is ook dat het financieel kon. Op de Zuidas heeft Deloitte voor tien jaar een huurcontract getekend met projectontwikkelaar OVG. Per maand gaat het iets minder kosten dan nu in Amstelveen en Sloterdijk. Deloitte had geen nieuwbouw hoeven plegen, geeft oprichter Coen van Oostrom van OVG toe, al had dat juridisch en financieel nog wel wat haken en ogen gehad. Terwijl de bouw aan de Zuidas in voorbereiding was, kwamen er twee andere opties: The Dam, het oude pand van KPN op Sloterdijk (nummer-4 op de lijst) en Ten Thirty, het oude gebouw van accountant KPMG in Amstelveen (het op eeéén na grootste leegstaande kantoor van Nederland). Het zijn twee relatief nieuwe gebouwen die de afgelopen jaren iconisch zijn geworden voor alles wat er mis is met de Nederlandsse kantorenmarkt. De huurders trokken in nieuwe panden een paar honderd meter verderop, terwijl hun oude onderkomens langzaam verloederen. Projectontwikkelaars en gemeenten profiteerden ervan.

Deloitte en OVG zijn volgens een bericht op de site van de ontwikkelaar 'mentaliteitsgenoten'. Ondernemende bedrijven die zich vol overgave storten op de duurzaamheidsbeweging, licht Van Oostrom toe. Maar dat zij zichzelf zien als duurzaamheidsridders, wil volgens hem niet per se zeggen dat je dus geen nieuw gebouw mag neerzetten. 'Het pand dat wij voor Deloitte bouwen, is zo milieuvriendelijk dat de energie van het bouwen, en zelfs het slopen van het oude pand, binnen een paar jaar is terugverdiend.'

'Met de kennis van nu' had Van Oostrom het geweldig gevonden als Deloitte het oude gebouw van KPMG had gekozen, door het grondig te renoveren. Maar ze hadden er geen trek in het oude huis van de rivaal te betrekken. 'Bovenal hadden wij een heel duidelijke voorkeur voor de Zuidas', zegt Glimmerveen. En dat is een imagokwestie. Deloitte wil tussen alle andere hoofdkantoren, banken en advocaten langs de ring zitten, niet langs de A9 in Amstelveen.

Ook de gemeente, met wederom Van Poelgeest voorop, juicht de nieuwbouw toe. Zijn woordvoerder: 'In zijn algemeenheid zijn wij tegen leegstand, maar Amsterdam wil internationale topbedrijven zoals Deloitte de gelegenheid geven om op de beste plek te zitten. Deloitte kiest voor een duurzaam kantoor dat in bestaande gebouwen niet mogelijk is.' Ook de 55 miljoen euro die OVG de gemeente voor de grond betaalde, was natuurlijk welkom. In 2010 gaf Amsterdam officieel toestemming voor de bouw. Het advies van de welstandscommissie dat het ontwerp na herhaalde aanpassingen bleef afkeuren, werd daarbij terzijde geschoven.

Van Oostrom geeft toe dat hij een beetje in zijn maag zit met de nieuwe vierkante meters. 'Ik vind dat ook iets moet weghalen als je nu nog iets bouwt.' Hij is hard bezig een passend leegstaand
Sloterdijk village
5. CULTURE OF PROGRESS & WASTE
5. CULTURE OF PROGRESS & WASTE

A conclusion drawn from the spatial strategies as seen in the Sloterdijk area as well as those seen in the general development of urban areas is that our demands are rapidly changing with regards to the built environment. If there is the need for specific functional office areas these will be developed with the best intentions, though once completed the foreseen clients are in need for completely different multifunctional zones, preferably in the city-centre. The same goes for buildings, once the tenants contract ends they will move soon as possible to a new building, with better comfort for the company, but above all a better image towards the outside world.

5.1 A crisis in growth

It is in the nature of people to move forward, to improve and to grow. This means our culture is in constant change, accelerated by our innovations. Periods in which this acceleration was tangible we call Industrialization. A first and second one have left their traces and a third one is about to happen. Products are rapidly being innovated to serve the current needs, new versions of I-phones are released every year, triggering our willingness to be part of that.

For architecture the process of design and production takes a long time compared to products such as cars en electronics. Flexibility is therefore a characteristic introduced in architecture in order to extend a buildings lifespan. If for example partition walls can be removed, the building will be suitable for lots of different functions, thus be useful for a longer period.

The current crisis is most of the times called a financial one, though it seems as if it is moreover a crisis in growth, according to Tomás Sedláček. A stable course ahead instead of up, is in our current society seen as decline. Apart from the technological inventions that support us to move even faster, this urge for progress has many other consequences.

5.2 Urge for sustainability

A trend that occurred parallel with the real estate investments in the 70’s is awareness of our planet and the knowledge that we are slowly ruining it. Climate change and the depletion of our planet are some of the main effects caused by our current living style. Sustainability was the word invented to answer these problems and moreover to solve them. It is a term which is by now used in such a broad way that the meaning became ambiguous. The word sustainability will in this thesis refer to a globally used
Sustainability is to meet the needs of the present without compromising the ability of future generations to meet their own needs.

The verb 'tot sustein' leads back to 'maintaining' and is an attitude we only recently evolved when the consequences became clear of the way we currently live. Our future generations will have a hard time in front of them if we continue the way we are using our world today. The effect of this insight has been gigantic. Any self-respecting individual will nowadays try to add to the goals as set by many agencies. So far this seems in vain, 'if we continue this ways the goals to reduce CO\textsubscript{2} emission in 2030 will not be fulfilled'.

To take part in this new sustainable lifestyle testifies responsibility for the world. A new trend occurred, that is being applied everywhere, not at least in the architectural and building sector. Of the worlds total energy usage and CO\textsubscript{2} emission the building sector is responsible for about 47% placed above traffic and industry. A conclusion drawn from this number is the fact that the architect can play a significant role in creating a sustainable world. All kind of attempts are made to develop new technologies in order to reduce energy usage and carbon emission. New terms evolve such as zero-energy buildings and even energy generating buildings. The attempts are rewarded with certificates such as LEED and BREEAM with the additions 'excellent' of even 'outstanding'. The world will know you are acting in a responsible way.

In the sense of architecture the attempts towards sustainable building are in a way two folded. No doubt the development of new materials as well as new buildings will lead to reduced use of energy in the future, though the attempts often involve production and material usage. The use of material is another issue in sustaining our world, since we are using much more raw materials than the world can provide us in a year. The growth of the world economy since 1960 keeps pace with the worldwide use of fossil fuels. This means we are more rapidly depleting our planet, as these are endless materials. Global recourse extraction is on the rise and demand for resources keep rising. In 2030 we will use 2,8 times the amount of recourses the world can provide us with. Only since the sustainability trend we have become more aware of this, and by know we notice the difficulty of decreasing our consuming-behavior, as we are very dependent on finite resources.
5.2.1 **Environmental costs**

The measurement of environmental costs is a method to measure a building’s sustainability, as applied by Dobbelsteen in his thesis for sustainable office buildings [bron]. The environmental costs of a building are considered in building materials, energy consumption and water consumption. The share of energy consumption is striking: it causes more than three-quarters of the environmental costs of a building. The use of building materials contributes approximately 20%. The environmental load by the consumption of water is nearly negligible: 3%.

These findings are based on a reference lifespan of 75 years of the building. When we talk about office buildings the average lifespan is shorter. Shortening the lifespan does not affect the results for energy and water, which are based on annual consumption values. However, this would importantly influence the impact of building materials. In the case of a shorter lifespan, the total environmental load of building materials would have to be divided by fewer years, increasing the annual values. The expectation is therefore an increase of the importance of building materials in case of a shorter lifespan. The supporting structure is responsible for the greatest part (almost 60%) of the environmental load, followed by finish and structural detailing.

5.3 **Culture of waste**

The lifecycle of a building indicates the period of the building’s physical existence. To show the difference between existence of a building and the actual use there is also the performance cycle. The latter indicates the period of functional performance which can differ from the existence, as is the case for office buildings.

The lifespan of a building lasts longer than the performance span. The in-between phase of these two can be considered waste.

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**waste • noun \ˈwāst\**

: a situation in which something valuable is not being used or is being used in a way that is not appropriate or effective

**rubbish • noun \ˈrub-bish, dialec-tbi\**

: things that are no longer useful or wanted and that have been thrown out

[Merriam-Webster, 2014]

Where progress means moving ahead, it means at the same time the superfluity of the existing, what we leave behind. Production is inherent to waste. Architects are involved in the large scale production process of the build environment. According to the above definition, the current office market can be considered waste, and all vacant buildings as rubbish.
In order to deal with this waste, different approaches and theories are generally accepted, such as the ‘waste-hierarchy’. This maps out the possible methods of waste management in a range of most to least preferable.

5.3.1 Waste management
In 1980 the Dutch government published an order for waste treatment. This order is called the Ladder of Lansink and is fixed top-down approach:

According to the waste hierarchy the most suitable solution to handle the vacancy problem would obviously be prevention.
- Prevention in the sense of office buildings means to foresee the situation and stop producing when there is no demand.
- Reuse is about the usage of materials in their current composition. As for buildings this would mean to reuse the building or its components in the current state.
- Recycling happens on a broad scale throughout the world. In our daily life, the separation of our garbage, glass becomes new glass, paper becomes new paper, green garbage is being composted where possible and the rest is being burned. Recycling below reuse because a process is needed to adjust the materials in to the desired form. For this process energy is needed thus recycling is less desirable compared to reuse.
- Energy recovery means the materials itself will not be useful in any state, though the demolition of the material can provide in energy, for example in heat when burning waste.
- Disposal, also called landfill, is the least desirable of all since this means the product will in no sense be useful anymore and thereby add to the pollution of the world, air or ocean.
The building-sector accounts for a very high percentage of worldwide waste production, what is called construction and demolition (C&D) waste. The wastes from the construction, renovation and demolition of buildings are estimated to be 40% of the solid waste streams in developed countries. At the same time the building sector is responsible for the consumption of approximately 3 billion tons of raw materials annually. This waste consists mostly of stony materials (90%), steel, glass and many other materials once used in the building. In general this C&D waste is used in landfill, under roads and in asphalt. In Holland a rate of 95% of C&D waste is being recycled in this way, which is above average compared to other European countries. Still this method of recycling can be seen as downgrading, since the use value decreases. Thereby landfill is polluting for the planet. To bring down the amount of waste brought to a landfill, many EU states have introduced landfill taxes. In 2008, the highest rate is found in the Netherlands who charges €88.21 per ton for low density waste and €14.56 per ton for non-combustible high density waste.

The International Council for Research and Innovation in Building and Construction came up with the next objectives:

- Develop systems to mitigate and ultimately avoid construction material waste
- Establish strategies to promote whole buildings, components and materials reuse
- Establish methods and strategies to enhance utilization of used construction materials.
5.4 Conclusion

In economics a stable course ahead instead of up, is in our current society seen as decline, and therefore moreover a crisis in growth. Our constant urge for growth, progress and innovation has mayor consequences for our planet. Sustainability became of high importance and is being implemented worldwide, not at least in the architectural and building sector, in order to decrease greenhouse gas emission. While working towards a sustainable world we are depleting it at the same time, as raw materials are getting scarce. Innovative production implies waste production and architects have a big share in this. Architects should not only be able to build new, to add, but also to handle the current stock and situation in case this is not anymore serving our current needs.
6. RE-USE ARCHITECTURE
6.1 Different scales of reuse

Reuse can happen in several scale levels, differing from the reuse of a complete building up to the smallest elements. The bigger the scale the more preferable, as this means the least adaptation, thus energy, labour and money.

6.1.1 Transformation

Reuse is in the case of office buildings currently highly encouraged by the government. This means the transformation of the office into a residential building to extend the performance span of the building. Transformation means a major change of a building with alterations of both the building itself and the function it accommodates. Where it concerns the 70% located in monofunctional office area’s the task is more challenging. In this case the complete area needs to be transformed as it is not suitable for dwelling in its current state. A properly transformed building will not function as long as the surrounded area does not provide the needed facilities.

Reuse can also be implemented on the scale of urban planning. An ancient example of such is the square in Italy, the amphitheatre in Lucca from the 2nd century. What was once a theatre has slowly disappeared through time. What is left is its spatial configuration, serving as a square, Piazza. Not the building is being reused, but its footprint and therewith its memory.

The reuse of construction elements happens long as we build. In the case of scarceness of materials this is a very logic procedure. Right after the second world war it was very common to clean all the bricks in order to sell or reuse them.

Urban transformation projects that are currently happening mostly involve complete make-over. Taking down the old in order to gain as much freedom as possible for the new. This is what also happened with the implementation of Teleport Sloterdijk. Instead of respecting what was already there and trying to take this into account, the memories were demolished to built something new.
6.1.2 Lucien Kroll

An architect who always considers the existing in urban and architecture projects is Lucien Kroll. When in 1994 Kroll was asked to design a sustainable office-building for the year 2040, he took the preservation of the existing building as a starting point for the new design. Not because of technical reasoning, moreover because in his opinion it was fundamentally incorrect to talk about sustainability if another building had to be demolished for it. Sustainability is according to Kroll more about civilisation and culture than it is about science. It is therefore no use to demolish what earlier generations have built in order to replace it with something new. Even if this means to continue on buildings of very low historical quality, or when it concerns buildings from the period Kroll hated most, namely Modernism. In all big cities for years they have been working on restructuring the city to meet new needs. Seldom this happens in the model of transforming the existing by interweaving new layers. The common strategies are either to perfect the existing or to demolish and replace it.

6.2 Different approach – Bricollage & Adhocism

If architecture is made by reused elements this involves a different approach of the designer. The form is not purely derived from the architect’s imagination but moreover from the intrinsic characteristics of the different elements and the way these are assembled. This type of approach is further described by the term Bricollage. Literally translated from French this means tinkering. Instead of creating a form that was pre-defined by the designer, the form will follow on the elements at hand, by tinkering, cutting, pasting, assembling and reassembling. It is often associated with scarcity and amateurism and as such it has an awkward relationship to ‘high’ architecture and contemporary consumer led production. However bricolage is also about the freedom afforded by constraints. Indeed imagination and invention are born of bricolage where the limitation set by the context is the channel to new modes of thinking. Perhaps bricolage is as much about a way of making things, as it is a general attitude. It displays a rare commitment to making beautiful things from the world that surrounds us, a world full of signs where all things can be matched by an idea where re-use and change generate a critical and original architecture.

Jencks came up with the name Adhocism for this type of problem-solving. He states that Adhocism urges us to pay less attention to the rulebook and more to the real principle of how we actually do things. According to Jencks we are immersed in forces and ideas that hinder the fulfilment of human purposes; large corporations standardize and limit our choice; philosophies of behaviourism condition people to deny their potential freedom; “modern

‘Adhocism declares that problems are not necessarily solved in a genius’ eureka!” moment but by trial and error, adjustment and readjustment’.

Jencks, 1972

3. Jencks, 1972
architecture” becomes the convention for “good taste” and an excuse to deny the plurality of actual needs. A comparison can be made between Jencks and Kroll concerning their aversion against modernism, which according to both architects is not able to fulfill the spatial requirements of the human being.

When reusing elements the form should follow by the elements characteristics and values, not by the final function of the design. Jencks critique on the built environment is the tending towards extreme visual homogeneity. As a result, written signs have to explain buildings—“bank, office, church” etc. It’s as absurd as a blank canvas titled “This is a Rembrandt”. This is what also happens in the mono functional office area’s, where office-facades only reflect the mono functional environment in their facades. The mirrored glass hides the function and complexity inside the building, needed to serve as a proper office. In opposition to this, Adhocism makes visible the complex workings of the environment.

6.3 Conclusion

Reuse is happening in architecture, but only on the bigger scale. Architectural elements are not often reused. There is architecture made out of reused elements, though not of elements originally meant for architectural purposes.

If architecture is made by reused element this involves a different approach of the designer. The form is not purely derived from the architects imagination but moreover from the intrinsic characteristics of the different elements and the way these are assembled. The form should follow by the elements characteristics and values, not by the final function of the design.
Housing design based on prefab concrete elements, form based on typology
7. OFFICE BUILDINGS DNA
In order to reuse the building elements a broad analysis needs to be done to map the materials of which the offices consist.

According to Remøy structural vacant offices have the following characteristics: They were constructed between 1980 and 1995, are located in low-status mono-functional office locations with insufficient facilities, have less parking places than other office buildings, are functionally obsolete (inefficient and inflexible), have glass facades, have a low quality interior appearance, are in technical decay, are not described by lack of climatic and workplace comfort, are not described by accessibility by car and public transport.

With Teleport being developed from 1985 on, these buildings are ‘new’ in the category of structural vacancy, but undoubtedly do belong to is seen the high vacancy rate and hopeless future. To get an average idea on the DNA of these office buildings different offices are analyzed, based on their building year, location within the area and building characteristics.

The analyzed offices are:

- Crystal tower, 1999-2002 [3]
Parking space (underground)

Based on grid [3M] 1800-3600-5400-7200

Facilitating core

Symmetry axis

Conclusions drawn from office building analysis
BUSILTEL II

Owner: Morley European property fund, Aviva
Client: Teleport Beheer BV
User: Deloitte
Purchase price: € 34.6 mln
Architect: AGS Architects
Year: 1989-1991
NLA: 12.500m²
Floors: 12
Height: 43m
BELASTINGKANTOOR

Owner: Tagis Property management
Client: Elsevier Amsterdam
User: Belastindienst (Tax authorities)
Architect: Ir A. Bonnema
Year: 1989-1994
NLA: 44,000m²
Floors: 22
Height: 82m
LA GUARDIA PLAZA

Owner: Spoorwegpensioenfonds, Achmea, KPN/TNT, Generali
Client: G&S Vastgoed
User: UWV
Rent price: € 170.- p/m²
Architect: SOM Architects and ZZP architecten
Year: 1999-2004
NLA: 63.000m²
Floors: 22
Height: 82m
THE CRYSTAL TOWER

Owner: TMW Immobilien Weltfonds, Pramerica
Client: Teleport Beheer BV
User: Deloitte and AKD
Developer: BAM Utiliteitsbouw
Purchase price: € 56.10 mln
Rent price: € 185,- p/m²
Architect: AGS Architecten
Year: 1999-2002
NLA: 20,000m²
Floors: 27
Height: 95m
All of the above mentioned buildings have a load bearing concrete structure, which is no exception for office-buildings from the 60s on. Many buildings that are labelled by DZT as being structural vacant are built in the period of 1980-1999. Since the switch of in-situ to prefab also occurred within this period, it is not clear what the percentage prefab and in-situ is. An estimation is that about 60% of the structural vacant buildings is constructed with prefab concrete elements. This percentage will increase with time, since currently almost 100% of the office buildings are constructed in prefab concrete. The four buildings have a load bearing outer wall with exception of the Guardia plaza, which construction consists of concrete columns. All load-bearing construction measure up to the standard building dimensions, based on the 3000mm grid. Most probably the load bearing walls are build up of precast concrete elements, with mostly hollow core slabs and sometimes lattice girder slabs as flooring system.

The office is build around a core where the vertical infrastructure and utilities are placed. The core is load bearing and in all cases provides the stability of the building. Because of its unique form of the core is mostly made of in-situ concrete. From this core on the office is build up with prefab elements for the wall and floor. In the core you find the elevators, staircases, toilets and drainage system as well as all electricity and water supplies led trough vertical shafts. The Belastingkantoor and the Crystal Tower have a symmetric floor plan, which simplifies the investigation of materials and elements taken both sides are identical.

7.2 Reduce, reuse or recycle concrete
As earlier mentioned the production of concrete accounts for 5% of the total CO₂ emission world wide. This fact makes concrete by far the most polluting construction material. The embodied energy of concrete is though far below that of materials such as metals and glass. It turns out this 5% is derived from the enormous amount of concrete used worldwide. Concrete is the most commonly used construction material in the world, and after water is the second most consumed product on the planet. Each year worldwide the concrete industry uses 1.6 billion tons of cement, 10 billion tons of rock and sand, and 1 billion tons of water. And its use is expected to double in the next 30 years.

The material gains its popularity from the many advantages such as freedom in form, strength and durability compared to the relatively low price. A high reflectance value can be achieved to aid in heat island reduction. It is generally locally available. It can be used without finishes, and, with the right mix, is resistant to weathering. And recycled materials can be incorporated into the mix, reducing consumption of raw materials and disposal of waste products.

1. Naber, 2009
2. Glias, 2013
Because of concrete's popularity and advantages, the reduction of the usage is not likely to happen as long as no cheap alternative is being developed. Nevertheless, the high amount of concrete usage makes the possibility for reducing, reusing or recycling of this material very effective in order to reduce carbon emission as well as raw-material depletion. Of the earlier C&D waste produced in Holland about 90% consists of stony materials such as concrete, asphalt and masonry. 95% percent of the waste is being recycled in Holland, a high rate compared to other European countries. Still most of the recycled aggregate end up in landfill under highways and in asphalt, which is the worst case scenario according to the waste hierarchy.

7.2.1 Recycling as aggregate:
The CO$_2$ emitted during the production process is attributed to the necessary ingredient cement. Apart from cement concrete consists of course and fine aggregates (gravel and sand), water and air. These are all natural materials that do not need energy-intensive processing. This is different for the cement. For this production clinker is needed which is made from limestone and needs an intensive process of crushing as well as heating up to high temperatures.

A lot of experiments are being done with the reuse of concrete. So far these experiments only involve the recycling of concrete. Recycling concrete means recycling the crushed concrete as aggregate in new concrete, meaning the other ingredients still need to be added. This is thus a way of recycling and will have no effect on the CO2 emission since the same amount of cement is needed in recycled concrete. The crushed concrete needs to be separated from its steel wiring as well as from other demolition waste coming from the building. This needs a cautious demolition process and intensive process after demolition. Thereby the quality of the new concrete with reused aggregate differs from ‘first hand’ concrete, thus strength and safety should be taken into consideration. The Dutch VBT 1995 allows up to 20% replacement of natural aggregate with RCA or recycled mixed aggregates (RMA) without a need for additional testing, for all concrete up to a characteristic strength of 65 MPa and for all relevant environmental classes (Dutch Standard NEN 5950, 1995).

Disadvantages of granulate:\n- down-cycling since quality is always lower than original concrete
- crushing costs a lot of energy
- no decrease of CO2 footprint since cement production is still needed and costs 97% of total CO2 emission of concrete.
7.2.2 Reuse as elements

In order to reuse concrete, the construction should be taken apart in elements. Since the current application of concrete happens with big elements and wet connections, the concrete is not at all easily taken apart. New research has recently started in Holland to investigate whether concrete structures can be taken apart in elements, called the 'donor-skelet'.

The load bearing structure accounts for 60% of the environmental costs of a building, due to the used materials as well as the energy needed to construct it. The reuse of complete elements will need a different process of demolition, such as deconstruction or dissembling.

7.3 Prefab concrete

Most concrete buildings are nowadays constructed with prefabricated elements. The elements are transported from the fabricating plant to the construction site where they are carefully put in place. Wet connections are used to create a rigid construction.

The choice for a precast construction is in most cases choosing a factory made (industrial) product. In order to benefit this system has to be consequently implemented. The rate of repetition should be high as possible in which standardization is important. This enables serial production of elements which is important for the economical viability of the construction. One step further for standardization of elements in one building is the standardization of complete structures for a specific functions. In this way one prefab element can be used in different designs making the construction even more affordable as well as speeding up the construction time. The elements are fabricated in stock and can thus be delivered right away when needed.

Building costs are rising over time, even when (price increasing) influences from architectural design is left out. The labour is about 50% of the total costs meaning a rationalized process with less labour needed is most affordable. Rationalized processes are in-situ constructions as well as pre-cast construction, both processes are often applied. It is predicted in the future the construction will move more in the direction of pre-cast construction. Some reasons for this are:

- Construction speed
- Limited size of construction site and machinery
- High quality which can be easy achieved in the factory
- Limited nuisance for surroundings concerning noise and dust during construction as well as demolition phase.
- Preference for comfortable and covered building sites (factory
halls can be easily adjusted to the rules for working conditions (ARBO-wet) compared to a building site).

The time will come when buildings made of concrete need to be demolished. A energy-intensive process which is easier with small elements.

The office-buildings build for companies who had a ten year renting contract did not need very high quality and be constructed cheap as possible in order to profit from the real-estate deal. For this reason the prefab concrete method is an obvious choice for the developer, as can be derived from the analysis of the above offices. In the case of Sloterdijk the building constructions are of too high quality according to Snellenberg. Compared to Amstel III where -so to speak- you can lean against the buildings to have them collapsing, this is not the case in Sloterdijk.

7.4 Conclusion
The reuse of concrete elements can be very profitable considering environmental costs. Concrete is more durable than the application it is used form thus the reuse for new purposes is likely to happen. The intrinsic qualities of prefab concrete can easily be optimized because the production takes place in a factory process. In order to reuse the elements, the method of assembling needs to be investigated based on which a design shall be made for deconstruction and details.
8. DECONSTRUCTION METHODS
8.1 Deconstruction versus demolition

At the end of the life span concrete buildings are usually being demolished. This demolition process takes place in several stages. First of all, reusable components are stripped from the building. These include glass elements, sanitary fixtures, wooden floor finishes and radiators. This is called non-structural deconstruction or soft-stripping. Once this is done the structural deconstruction can take place, dismantling the structural system of a building. In case of concrete structures this means cutting up the concrete, which is usually done with breaker shears (figure). The rubble that is left is taken to a crusher plant where the concrete rests are separated from the reinforcement steel and other rubble, and finally made into reusable aggregate.

The amount of reusable materials gained in this tradition demolition method depends on the client. The more materials suitable for reuse, the more accurate the process needs to take place, thus costs time and labour. The current market leaves no possibilities (read; no money) for reusability. Demolition companies have their jobs assigned comparable to architects, in a competitive position with other companies. The client will in this case unfortunately choose for the cheapest option, regardless the environmental impact\(^1\). The reason why there is not yet a developed trade in second hand construction accessories can thus be explained. In Western countries labour is more expensive than materials which makes demolition and waste-management the cheaper option compared to deconstruction and reuse. ‘Cheaper’ in the financial sense, not taking into account the environmental costs. If these cost would be taken into consideration it would become a complete different story. The mandatory calculation for environmental load of building introduced in january last year might be a first step to change this\(^2\).

Methods to reuse non-bearing element are well known and applied when there is financial support and a selling market. This happens for instance with facade panels, window frames, partition walls and doors. Methods for disassembling load-bearing elements are less known and applied. Steel and wooden structures can be convenient for deconstruction because of the mechanical joints. Concrete structures are rarely reused, since the elements are assembled with wet-connections. The trend towards the usage of precast-concrete should be an advantage for the deconstruction-market. This system is more easily disassembled compared to in-situ concrete, for which crushing is the only

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1. De Graaf, 2014
2. Peters, 2013
method. There are two case-studies in Holland where a precast-concrete structure was deconstructed in order to reuse the elements for new buildings. One took place in Middelburg in 1984.

A residential building was levelled down by taking off 5 floors. The rest of the building had to keep its function thus the element had to be taken off carefully. For this reason the elements came off in good condition and were proper for reuse. 114 new dwelling were build with the gained second hand materials. The project was called success, although it took two years and a lot of extra costs because of time and special equipment.

The other project took place eight years later, in Maasluis in 2000.

Like in Middelburg the aim of the project was to level down a residential building. This time there were a lot of problems concerning the stability of the walls. Approximately 300 supports were needed in order to keep the walls up. Unforeseen costs, since the building was not constructed according to the original drawings. This intervention made the deconstruction of the building economic unviable (de Graaf, 2014).

Until the 60's it was very common to reuse construction materials such as wood and bricks because of material scarceness. Especially right after the war, during the reconstruction. These days demolition companies had a lot of people employed, who were needed to chip of mortar from bricks in order to sell or reuse them. With the technical innovation people are replaced by machines. These are expensive investments, but speed up the process and make increasing expensive employees superfluous. Nowadays a demolition company has about 30 employees whereas they had 300 employees back in the 60's.

The contemporary machinery needed for deconstructing prefab constructions should be able to carefully though vigorous demolish the wet concrete joints. The pneumatic hammer and diamond-saw are most commonly used for this job. These techniques are still called hand-methods since they are relatively small and labour intensive compared to the shear and wrecking ball.

The labour intensity has its consequences for the safety. The hand-methods require workman to work inside and on top of the building, instead of the safe distance when controlling a crane. This means higher risk when parts unexpectedly collapse and more nuisance since man are more close to the machines. For the surroundings there is only little more noise production using
a diamond saw and a pneumatic hammer than there is with techniques used for the traditional demolition process. The dust that is produced can be minimized with water, which is also used in traditional techniques. The advantage of the labour-intensity in the deconstruction process is the generation of employment and specific knowledge of constructions.

The costs for demolition and deconstruction obviously depend on the buildings characteristics. A bottleneck for the costs is the height. Over 60 meters a crane can not easily reach all floors from ground level, thus different techniques are needed increasing time hence costs.

8.2 Tecorep

In Japan a new demolition system is recently being developed for high rise buildings. It is called the Taisei ecological reproduction system, in short TECOREP. Rather than using cranes to take the building apart from the outside, they start from the inside, taking the structure apart floor by floor from the top down. A crane inside the building lowers materials harvested from each floor to ground level, generating electricity to power other equipment in the process. Higher buildings are actually an advantage, since the crane can generate more electricity lowering materials over longer distances.

When a floor is completely stripped, the temporary columns and jacks holding it up are lowered, giving the building the outside appearance of shrinking into itself. Between salvaging reusable material and powering the project with clean energy, Tecorep reduces carbon emissions by 85%, according to the company. And because the demolition takes place within the building, it reduces noise and dust.

The method successfully brought down the Grand Prince Hotel Akasaka in Tokyo, the tallest building torn down in Japan to date. Hideki Ichihara, who runs Taisei’s construction technology development, told the Japan Times that most skyscrapers over 100 meters are torn down after 30 or 40 years. With 99 Japanese buildings set to fit that bill in the next 10 years, innovative deconstruction technology is an emerging field.

Next to Tecrep, another Japanese company called Kajima came up with a comparable system, but reversed; bottom up. Kajima demolished its former head office buildings using a world-first technique called the Kajima Cut and Take Down Method, which enables demolition work to be carried out on the ground floor. By starting at the bottom, gutting one floor, and then lowering the entire building down on jacks, one floor at a time, all the work can be performed safely at ground level.
8.3 Conclusion

New methods for deconstruction are recently being developed, as we start realizing our buildings do not perform as long as they exist. Deconstruction methods are not yet often applied, improvement can still be done on many different aspects, to make deconstruction more profitable above demolition.

DECONSTRUCTION COSTS

Saw machinery:

20 pk [3h/m²] = €5000.-
80pk [1h/m²] = €20.000.-
Blade: € 400.-/500.- [20m²]

TIME

Slabfloor: 2.36 m² = 5h saw + 1h (de-)mounting = 6h/slabfloor
6*32 = 24 days

Wall: Average 1.76 m² = 3.5h saw+ 1 uur (de-)mounting = 4.5h/wall
4.5*23 = 13 days

STOREY: 5 weeks [37 days] per storey with 1 saw + 1 week preparation

YEAR: 2.5 years

MONEY

Total per storey:
Slabfloor: 75.5 m² (4 blades)
Walls: 40.5 m² (2 blades)
6 blades per floor = €2.700.-

€10.000.- + €2.700.- = €12.700.- [18 months rent]

€254.000.- [362 months/30 years rent]
Sawing method

Machinery: Diamond saw on rail
Details of deconstruction

Original assembly

Deconstruction of wall elements

Deconstruction of floor elements

Dismantling of elements
Inventory
The inventory is the cornerstone of the reuse process. In case there is no inventory or the inventory does not include all the necessary information it is 100% sure that problems will occur which will jeopardize the whole process and even cancel it. Creating an inventory for an existing building, especially without drawings in digital format, is a time consuming process due to the time that has to be invested for the research and the inspection of the necessary drawings. Although “time is money”, it is preferable to invest extra time on the creation of a complete inventory.

Quality check
Reuse of structural concrete elements as individuals into a new design occurred very few times and it is important to reassure that they are safe to be reused. These elements were used for many years as part of a building and they proved that they can function properly. After the removal from the building they have to be checked in order to reassure that they can be used for 50 more years.

Deconstruction
The inventory might be the cornerstone of the reuse process but deconstruction is the most crucial process of reusing structural elements. It is the process that provides the elements that are going to be reused in a new project. It is important to be done very careful in order to maximize the quantity and quality of reused elements.

Modification
This is the phase where the element is getting ready for reuse in a new construction. The aim is to use elements with less modification as possible. In order to achieve the maximum reuse of elements with their original dimensions the architect and the engineer have to work together from the beginning of the design.

Construction
Building with prefabricated concrete elements is a well known process and contractors know very well how to solve any problem that occurs. In order to avoid unexpected issues it is advised to use the same workers for deconstruction and construction. With this way, the workers will be more cautious during deconstruction and they will be used with the idea of using existing elements. This means that deconstruction and construction has to be one phase while at the moment they are separate.
CRYSTAL TOWER

FAÇADE ELEMENTS

PER FLOOR

- AMOUNT
- LENGTH

2x

L: 6871 mm

4x

L: 5400 mm

2x

L: 7200 mm

2x

L: 4600 mm

2x

L: 3700 mm

5x

L: 2300 mm

2x

L: 5400 mm

4x

L: 5300 mm
CRYSTAL TOWER
FACADE ELEMENTS
PER FLOOR

- AMOUNT
- LENGTH

2x
L: 4600 mm

2x
L: 2300 mm

5x
L: 5400 mm
Possible reassembly of elements
9. DESIGN METHODOLOGY
9. DESIGN METHODOLOGY

With what is derived from the toolbox a new design is be made, that will serve the current spatial needs. Obviously one of the needs today is affordable housing. Instead of the large-scale blind and anonymous facades the aim is to come up with an architecture that meets the human needs and scales. To provide them with something they can use, own and maintain. Important for these buildings, as is missing in the office buildings, is the relation with the outside space. The scale of the outside spaces is currently too big to be comfortable. The aim is to create smaller outside spaces as well as to soften the edge between what is in and out. By means of re-positioning the elements towards each other, new spaces can be created. The creation of additional spaces in combination with the small scale elements has a prominent link to the 70’s Structuralism.

9.1 Structuralistic strategies

With the implementation of the functional city there was also critique on the architecture that followed on this. Large-scale intrinsic buildings that do not provide support for the user. These criticisms had more attention for the social effects of design and the human scale. Characteristics of the structuralism are buildings that are being constructed from a collection of smaller, mostly similar, elements units. Buildings often are assembled as a small town. The projects have a decentralised structure, collective spaces and more than one entry. The construction is often visible.

The fact that buildings age more quickly now than ever before has deprived architects of the basic certainty of their ability to make meaningful decisions, let alone to believe in anything that is immutable. Yet it is just this instability among architects that causes the useful life of buildings and structures to extend no further than could be envisaged at the design stage. If all the certainties were eliminated, as modern thinking is keen to do, there would be only "throw-away" architecture left. Its capacity to make a distinction between "competence" and "performance" is an essential part of structuralism as it relates to architecture. This means that we can distinguish between structures and their infill elements.

When we attach the concepts of competence (the potential at our command) and performance (the use we make of our potential) to architecture, then we are distinguishing between what is relatively speaking fixed and hence enduring (the long time cycle) and what is constantly subject to change (the short time cycle). And if we
wield this distinction with a certain tenacity this gives us the space for the unexpected, a space we need if we are to brave the lack of stability in our world.

For the repetitive building elements of structuralism prefab elements were very suitable and frequently applied, and example is the 'Burgerweeshuis' of van Eyk, which even has a roof made of prefab concrete elements.

The increasingly severe restrictions for building-insulation made the appliance of structuralism more difficult, due to the often applied overhangs leading to thermal bridges.

9.2 User participation

Another characteristic of structuralism is the participation of the used which is important. Back in the days it was John Habraken who came with his theory of user participation in housing. Herman Hertzberger and Lucien Kroll made important architectural contributions in the field of participation. Today it is Adri Duivesteiyn who succesfully continues with these ideas on user-participation.

Structuralism is originally derived from a social theory in linguistics. It shows that individuals and groups use language in their own (unmanageable) ways, each as his or her own instrument, and each adding his or her own colour to it. In so doing, people contribute to the forming and distortion of language, and in this way a language evolves under the influence of those who use it. Structure in itself does not mean anything more than cohesiveness, in which the separate components are capable of fulfilling a communal task in mutual dependency.

Adhocism connects to this theory. Opposed to purism and exclusivist design theories, Adhocism accepts everyone as an architect and all modes of communication, whether based on nature or culture. The ideal is to provide an environment which can be as visually rich and varied as actual urban life.

Lucien Kroll was even criticized by his attitude towards architecture and their future-users. Being called an an-architect he is proud to have this title. According to Kroll the best designs are those of which after some years of use the architect it not retractable. Instead of the repetitive thinking and spiritual laziness of industry, capitalistic and governmental clients and the architects who serve them, Kroll tends to start a dialogue with the future users in order to come up with new, spontaneous thoughts that provide a solution. Opponents of this participatory methods blamed Kroll to escape from his responsive situation as an architect, his professional skills
and being an artist. He would in this way support a direction that would mean the end of autonomous architecture, according to one of his critiques. According to Kroll systems and living environments will be easier to sustain when they are more complex. He therefore invites all possible actors to take part in the process of design, future-users, constructors, developers and engineers. Not to literally built what the individuals want, moreover to create a complex history of the project, even before it is being built. In this way Kroll builds an environment that belongs to everyone, from which the architect can distract himself after a certain period, without fear for the future developments. As can be concluded from other architects critique, his vision on the process of designing architect is not being shared by many colleagues. Mostly users are seen as the nonprofessionals led by professional architects, and economic motives or aesthetic inconveniences lead to demolition of the existing architecture. For Kroll, every trace, every element and every story can be of significance to increase the complexity and thus needs to be sustained.

9.3 Affordable Housing
In the Randstad there is a need for 700,000 dwellings until 2040 [Planbureau voor de Leefomgeving]. Structuralism and user participatory has both been implemented in housing designs. Since the industrial revolution and migration toward the cities the housing market has never provided the requirements, there has always been a lack of proper and moreover affordable housing. Many theories for housing design such as the above mentioned have been developed and implemented, though where it concerns social housing it is mostly not the aesthetics that matter. Go to any gathering of housing developers and advocates, and you will see many presentations featuring spreadsheets, but few with pictures of homes. This focus on money is driven by the institutions that finance the developments. These lenders tend to pay more attention to money than to aesthetics or design quality. The result can be housing that provides basic shelter but does little more, to the dismay of its residents and neighbours.

The current problem with social housing in Holland is the housing corporations who make losses on the development of these kind of dwellings. In Dutch this is called the 'onrendabele top', which means the costs for maintenance, service and other do not compensate the rent income. In general housing corporations are short of €100,000,- per dwelling, whilst the average price to built a house is €200,000,-. The solution for this loss is to build a mixture of social dwellings and 'middle class' dwellings, leading to corporations who do not built for the public they should actually serve.
According to Woonbron, a Dutch corporation based in Rotterdam the 'onrendabele top' can be avoided, as they prove in project that is currently being developed. Their solution lies in a discount on the land-price, a standard building-system (which would save on architects costs) and a proper deal for utilities such as water, gas and electricity².

High-quality design encompasses an array if considerations, such as proportion, sense of identity, size and rhythm of openings, circulation, access to light and air, sense of place, and the creation of spaces that are safe, easy to maintain, and suitable for the activities that take place in them.

Design is not simply a commodity that a developer can buy more (or less) of, but rather a process that unfolds continuously over the life of the project and that involves the entire development team. This is good news for everyone involved in the creation of affordable housing. It means that design excellence does not come about by luck or by finding a great architect at a great price, but instead by managing the design process creatively and effectively.

². Dorgan, 2008
positive space
2.

GFA: 65 m²
 ground floor: 65 m²
dwellings: max. 2 studios
Advantages: identified outside space
Disadvantages: small amount of rentable floorspace

3.

GFA: 84 m²
 ground floor: 52 m²
 first floor: 33 m²
dwellings: max. 2 studios
Advantages: identified outside space
Disadvantages: high amount of additional wall area

4.

GFA: 90 m²
 ground floor: 55 m²
 first floor: 35 m²
dwellings: max. 2 studios
Advantages: small amount of additional wall area
Disadvantages:
IO. POLITICAL IMPLEMENTATION
The reason why the strategy of deconstructive reuse has not yet been implemented is mainly because of the current market. It is more cheap to demolish and built new with new materials compared to deconstruction and re-use materials.

As I am to become an architect and not the politician, economist or urban planner I will light out some of the positions and opinions of people who are experts in this field of work.

Deconstruction costs significantly more labour compared to demolition. Labour is the most costly factor in deconstruction, making it unattractive in the current market situation. Labour is expensive not at least because of the current taxing system, making it unattractive for employers to hire employees. The current situation makes it attractive to invest in products and machinery instead of human labour. Since the crisis the unemployment increased. At this moment this leads to consciousness in the political class. Minister of Finance Dijsselbloem has several times hinted on a change in the taxing system. Already in the 90s pioneers pleaded for a change in the system, such as Eckart Wintzen. He stated to lower the taxes on labour, which we have infinite and increase taxes on raw material usage, which we have in limited amounts. This would lead to a system with more craft, more service and more thrift. Regarding deconstructive reuse, this system would imply on the one hand the advantages of hiring employees above machinery, and on the other hand make it more attractive to use second hand materials for construction projects.

1. Nu.nl, march, may 2014
Possible financial implementation

Rent office: € 185,- m2/year excl. TAX
(+ service costs: € 32,- m2/year)
Rent price: € 3.700.000,- p/year
Selling price: € 56.100.000,-
56,1 mln/3,7 mln = 15 year

DELOITTE: 2002-2014 = 12 year
PRAMERICA: Missing 3 years rent income = €11.100.000,-

Social housing: € 700,- p/month
€ 11.100.000,-:
1 month: € 700,- 16022 dwellings
1 year: € 8.400,- 1335 dwellings
3 year: € 25.200,- 440 dwellings
5 year: € 42.000,- 265 dwellings
10 year: € 84.000,- 132 dwellings

Social housing: ± 80m2
265 = 21.200 m2 = ± Crystal Tower
700,- per month for 80 m2 = 8,75 per m2 per month
105,- per m2 per year
Deconstructive re-use is a proposed strategy to meet the spatial needs of society in times of financial omission. As the crisis hit the profession of the architect appeared to have become superfluous. Work is scarce, as are raw materials and affordable housing, therefor challenges for the architect are not scarce at all. This research investigates the possibilities to regain control on the built environment, considering the current financial market and the increasing vacancy in mono functional areas in a rapid changing culture of progress, waste and depletion.