Relation between project and the wider social context

Over the last couple of years, economical realities and societal individualisation have brought ‘Zelfbouw’ (Do-it-yourself building) back to the forefront of residential development. There is no money for large-scale housing projects anymore and the market is locked. Additionally, there seems to be a civil discontent with local planners and strategies. All the while, people are still looking for affordable housing in Amsterdam. This leads to the search for alternative models and civilians taking matters into their own hands. Today, Zelfbouw is viewed as a succesful method to develop the city on a small scale.

Over the years, several types of locations and collaboration have emerged. At first, only individual lots with privately commisioned projects were developed. Soon groups of people started developing appartment buildings in collective private commissions. Another variant called ‘Kluswoning’ is to revamp an existing building. The casco is tackled by the collective and the infill by the individual.

Fig. 1. Supply/demand Zelfbouw market (Gemeente Amsterdam, 2014)

A very different urban trend is also visible in Amsterdam: office vacancy. The demand for offices is in decline with no end in sight. No investors are willing to do the large investments to convert or redevelop the real estate into something useful. However, many small can make a great. From a financial point of view, Zelfbouw certainly seems to be a way out of a stagnant situation: the expenses can be split into affordable chunks.
However, Zelfbouw can be messy. Buildings are complex and the task of designing, contracting and constructing will seem daunting to even the professionally trained. Not to mention the huge overhead and process redundancy created by customizing every little thing. That is why I’m introducing an infill system that will drastically simplify this process. By developing a catalogue of pre-designed components, the user is given a toolbox and enough freedom to create his or her ideal home (or workspace, atelier etc.). This way, the process can be controlled, quick, sustainable and affordable. The system balances the avoidance of technically, financially or socially undesirable situations with freedom of individual expression, architectural quality and sustainability.

Finally, people can be messy. What happens if several people back out of their collective agreement during the design phase? What happens if a family abandons their selfmade home that was part of a group effort? On a larger scale, what happens when the way we live, work and leisure change as it has in the last decades. A building needs to be resilient to these changes. The building has permanence, not some group collaboration or some supply and demand fluctuation. This is why my infill system is set up to depend only on the building. There is no group dependancy: everybody is a private commisioner within the larger system. There is no functional dependancy: the system functions as a monofunctional housing block and as a multi-use hybrid. And as long as we need human-scale space, it is resilient to the evolving of functions. Lastly there is no time dependancy: people can build when they want. The building can grow or shrink incrementally.

Geen zelfbouw, maar Keuzebouw (not Do-it-yourself building but choice-building).

**Relation to studio theme**

The setup of the studio is to provide a theme as a starting point: a location with a problem that can be solved with technology. Early on, I became interested in the problem of office vacancy, but not so much in the location the theme provided it with: Sloterdijk. I started reading up office vacancy in a more sociological sense, not a local one. Furthermore, the technologies I had in mind at the time (parametric component systems and fabrication) seemed to defy the notion of being applied to a singular instance, in other words a location. So my goal became not to convert one office building, but to develop a strategy that could convert many office buildings.

While the theme certainly kickstarted this line of thought, I haven’t looked back at Sloterdijk ever since.
Relation to studio methodology

Architectural Engineerings’ methodological line of approach is called “Practice-based Research”. The idea is to investigate and research a technical aspect or innovation within the realm of architecture and compile the findings into a technical research paper. The research results are then used as a driver through the design process.

My research has focused on examining the causes of office vacancy, incremental conversion tactics, facade dismantling, bottom-up spatial organisation and climatic autonomy. As will be discussed in detail in the next section, expert advice urged me to abandon several conclusions of the research. This started on the level of the general conversion tactic, which subsequently rendered the facade dismantling research useless. Further down the design process, bottom-up became unappealing as a way of spatial organisation. However, the research was a stepping stone towards that conclusion. Conclusions about creating an autonomous unit have been useful throughout.

Although the research portion of the project becomes less prevalent as the design ramps up, there have been some additional subject matters I’ve had to investigate. As a consequence of the changed conversion tactic, I’ve had to research ways of weather proofing a cold concrete structure. Going from a modular to a panel-based unit urged me to look into component systems and connections. Finally, my goal of creating a sustainable, comfortable unit has led me to examine damp-open building and sustainable materials.

Overall, the methodology has served me well. It has left me very informed about a great number of aspects. It’s regrettable some of the research had to be abandoned. My project setup has always been very broad. Perhaps if the research had been more focused on a particular aspect, more of it would have remained useful in the design phase.

Relation between research and design

In my technical research paper I’ve proposed my intention of developing a strategy to incrementally convert vacant office space with autonomous units. I’ve divided the design research over three levels: the building, the spatial organisation and unit. The main goal hasn’t changed much. However, over the course of the P3 and P4 phase, distinct changes have been made on each of these design levels, altering both the final product and the design thinking that goes along with it.
Building
I’ve altered the main conversion approach. In the research paper, I had laid out four tactics, preferring an ‘Incremental facade replacement’. To reiterate:

*A part of the old facade is dismantled when a unit moves in behind it. The unit would have to be designed with generic connections to the old facade in order to prevent leaking and thermal bridges. The costs are incremental, the facade expression will be interesting and gardens or balconies will be possible. The only downside is a higher cost per unit, because of incremental facade dismantling. This may be avoided if it becomes possible to dismantle from the inside.*

After careful consideration with structural and construction experts (Ir. M.H. Meijs and Ir. J.C. Daane), this approach was deemed highly expensive at best and logistically impossible at worst. To dismantle small parts of the facade at a time is to divide a large project into many small ones, creating relatively large overhead costs. Considering the necessity of a construction crane, building permits, security measures and hazardous garbage disposal, this approach could never be legitimately applied to a building that has people living in it while it’s being upgraded.

The main takeaway here is that a successful approach should allow the incremental addition of units to be as quick and clean as possible. Facade demolition is messy and the one-of-a-kind type connections between new and old facade are arduous.

Instead I’ve opted to reconsider another approach, which is to ‘Strip the entire facade’:

*This would leave a casco building where simple units with insulated walls could simply be shoved in. It’s a low-cost approach with an interesting architectural result. Unfortunately a concrete or steel building structure isn’t prepared for the temperature or weather changes it would face when stripped of its protective layers, the facade. The temperature changes would cause stretching and shrinking, causing cracks and eventually ‘concrete rotting’.*
In this scenario, the logistical problem of dismantling and rebuilding many parts of the building is reduced to a single project. Furthermore, a framework of ‘connection plugs’ (plumbing, wiring, circulation) can be prearranged in this initial investment. In a much truer sense, the unit becomes autonomous from the building. Although I’ve argued against the concept of initial costs, it seems a small compromise is unavoidable.

The fears expressed about concrete rotting are justified. However, in consultation with a structural engineer (Ir. J.C. Daane) several methods in combating these issues came to light. Stretching and shrinking of concrete due to temperature changes are unlikely to cause cracks if the construction is properly dilated (most are). Furthermore, rotting and fire risk can be avoided if the construction is treated with the proper coatings.

The new approach relaxes the limitations on the type of buildings the strategy is applicable to. The first approach necessitates a facade that can be dismantled per floor, without affecting the facades of the floors above and underneath. The new approach has no such technical restrictions to the facade and simply prefers a one that can easily be dismantled as a whole. Thus the new approach broadens the applicability of the strategy. Urban and architectural considerations still apply for building choice.

The quality of communal and circulation space is now changed as well. With the old approach, the building is continually wrapped in a facade, old or new. Communal space exists as an interior corridor. With the new approach, the communal and circulation space is actually outside, creating elevated streets and opening up possibilities for all kinds of public amenities.

**Spatial organisation**

At the time of writing the technical research paper, I was searching for a rule system that would allow circulation and communal space to form as a resultant of the placement of units. In other words: a bottom-up approach. Users would first use my system to design their ideal home, and then the system would pick the optimal location according to their formal and contextual preferences. The reasoning behind this was that if the building was to be upgraded incrementally, the imposition of a top-down communal
space would limit the placement options and as such its flexibility in accommodating varied functions.

Fig. 4. Potential sequence progression
I’ve stepped away from this line of thought for several reasons. The first is a technical one. When considering the possible tactics for placing the central connections it became apparent that, for optimal maintenance and reachability, it would be best to create a fixed horizontal shaft under the circulation route, which would subsequently also be fixed. Fixing the circulation and communal space goes right against any bottom-up ambitions, but I soon noticed it would do more good than bad.

Fig. 5. Central plumbing and wiring position options

Although my previous stance was that control should be transferred to the end-user as much as possible, fixing the route beforehand allows me to actually design the communal space and predict certain qualities. The generation of these communal spaces in the design phase is still rule-based in order to be applicable as a tactic to a range of buildings. However, once built they cannot be altered.

The communal space has several functions for which it can now be designed. First of all, it serves to buffer against a negative aspect of vacancy, being unusable space. With my system it’s still possible for dwellers to use and to some degree arrange and furnish the space that isn’t yet occupied. Think of parklets, public furniture and playing ground. As I’ve stated in the beginning of the technical research paper, this participatory aspect of the strategy is important for end-users’ mental ownership over the communal space. A fixed communal space can help frame end-user initiatives. Jane Jacobs teaches us the importance of mixed agendas for a lively neighbourhood. To this end, a fixed route can shape possible lot sizes and as such, invite end-users of differing socio-economic backgrounds and differing functions (both housing and non-housing).
Secondly, the design can allow for social activities by broadening of the circulation route at certain points. Thirdly, the route can be shaped by sightlines in- and outside the building, daylight considerations and even interlinking staircases, which can serve to connect communal spaces among different floors. Finally, and most interestingly, the fixing of a route can abolish the boring notion of orthogonality and create a space that is reflective of an abundance of choice and individuality.

The resultant space of the route shape can be freely divided up into lots. The orthogonal direction of the left and right boundary of the lot is fixed. This is to ensure outside views and preempt property issues. One can basically assume the neighbour will build a wall there and take account
beforehand.

Fig. 6. Communal space shaping diagram

In this design process I was reluctant to take control away from the end-user in shaping the space, but in the end it proved to allow for a much richer design than a space that is simply a residue of built units. Figuring out which freedoms are best left to the architect and which ones are an expression of user individuality has been one of the main hardships of this project.

Unit
The impositions made to shape the unit mostly stemmed from the design decisions I had made on the level of the spatial organisation. Contrary to
expectations, limiting the choices for spatial organisation has enlarged the possibility of individual expression for the unit. As I look back I find my zealous adherence to an orthogonal grid quite detrimental to clear design thinking. The new spatial organisation invites quirky shapes and interaction with the context. A new way of looking at the unit design was neccessary.

While, the design of the unit wasn’t very far along during the writing of the technical research paper, I did have the clear conviction that it was going to consist of a single outer shell to be manoeuvred into the building as a whole. A single module basically presupposes a rectangular plan and has limited dimensions due to the fact it has fitting and transportation. A better option would be to use a panel-based approach. This imposes some detailing difficulty, but enables the possibility of do-it-yourself building, plan customization and easy maintenance.

**Unit construction type**

*Fig. 7. Module-based versus panel-based*

The effect of changes on the level of the spatial organisation and of the unit affect the design process for the user. At first, the idea was that the end-user would design his/her own ideal unit, separate from context. It would then be given a location by following the rule system and the contextual preferences of previous users. However, this ‘design phase’ was limited to size, position relative to the lot and facade cladding. Using the new systems, a lot more freedoms are offered. A lot is chosen, the plan boundary is defined, simultaneously defining resultant private outside space. The plan can have any shape thanks to the panel-based construction method. A functional zoning scheme is applied and tuned, defining room functions and complying, while complying with climatic requirements. Eventually wall perforations can be defined by the user and they can be filled with a preapproved selection of window or door frames. Finally the user selects one of many preapproved facade claddings.