Adaptive Reuse
- A Case Study in Ulvsunda

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This project takes as its study area a block of industrial land facing an uncertain future. Starting from the idea of resource use can it be developed in a way to avoid obsolescence and demolition? What urban qualities could this imply? And how can that densification be designed to remain open to future change?

I would argue that the issue most pressing for sustainable buildings in the foreseeable future is resource use. The physical stuff they’re made of. Part of that lies in construction and materials, how and with what we build. The second issue concerns the reuse and adaptation of existing buildings.

Cities will forever change, it could thus make sense to design buildings with a level of flexibility in housing different uses over time, thus avoiding obsolescence when economic, social or political factors drive change in the city.

The site and context of my project is that of Ulvsunda. A former industrial area that lies very strategically in a zone of development around the city center. Plans for its redevelopment were started in 2006 but planning came to a halt after speculators had bought up several of the properties. The reason for this is the nearby Bromma City Airport and the inability to plan for housing in the area due to noise regulations around that airport. This has left the area in a planning vacuum, with little activity.

Meanwhile in 2013 a new extension of the tram line ‘Tvärbanan’ opened which means the connectivity to the rest of the city has changed dramatically. At the same time, in 2013, certain height restrictions around the airport were lifted. That is a new strong incentive for increasing density and value in the area and implies that something other than houses could be developed while it waits, potentially for a very long time, for a final political solution as to what should become of the area.

Had the plan been fulfilled the fate of many of these quite humble buildings would have been demolition. The fact that the plans were halted gives me a window of opportunity to work with the existing buildings and to develop them under their specific current conditions so that they may survive into the future.

If industry and society once went towards homogeneity and the mass-produced object today it is leading to increased individualization and we see new types of households and differentiated styles of living or dwelling. To resolve housing in the traditional sense of segmentation may never resolve that issue completely. People must be trusted to make their own solutions. But there must be a framework for doing it.

In a first phase I looked at the densification of a block of land, and in a second phase the development of specific buildings. An important part of this project is its design method, in short working from the outside-in, in model and facade, and solving the plans last of all, integrating material choices and construction in each phase. The purpose of this method is to achieve inherently flexible structures. I’ve worked with three houses, two typically early modern in its scale and materials (built in 1946) and one typically post-war modern (built in 1967) facing a street.
Legal noise limit for residential use

Leq 54dB

Leq 55dB

59.4 m height restriction

Site Plan

Scale - 1:1000
Strategy
The existing buildings can be seen as dynamic-stable structures. Characterized by a strong architectural language they refer to the past and the collective memory of the city. This makes them stable frameworks in that city. On the other hand they are adaptable structures offering the possibility to appropriate and modify space, as well as to integrate new elements. It is thus characterized simultaneously by stability and openness. In keeping with this idea the development I propose are buildings general in their interior structure and at the same time specific in their urban expression.

While looking at flexible accommodation primarily for changing functions such flexibility also has a value for changes within the same function, offering different forms of living configuration. The buildings are conceived as a type of shell-and-core building in the tradition of concepts such as Supports, Base building, Frame etc. The design effort lies in permanent parts like structure, accesses and facades.

Solids
I’ve adopted and adapted one of those concepts to fit the needs of this area, namely that of ‘solids’

A solid is a sustainable building without a predefined purpose. It should accommodate a range of functionality such as residential, business, culture and light production and its tenants decide how to allocate the space within the building. In that way it responds to the demand on the area over time.

The concept implies that the tenants can determine the use, size, configuration and even the rent of their spaces. This is achieved through a subdivision of floors into lots and tenants can combine one or more lots to create their space, a set of lots. The allocation of all lots is done through a combinatorial auction, an auction where all lots are sold at the same time. Each bid from a tenant consists of a set of lots and the monthly rent you are willing to pay for it. The system has been tested in Amsterdam, once in 2011 and a second time in 2013.

A very basic mix of functions is insured through use quotas. Over time spaces could increase or decrease in size by swapping lots with neighbors.

Densification: Additions create new spatial situations
The first part of my project was on an urban scale, about densification of the site, where one of the questions I asked myself was:

How can you define urban space in a field of objects?

I chose a scheme that continues to add objects large enough to stand on their own in this landscape. Since the major idea is to add buildings over time, so each individual addition need to ‘fit’ on its own. That requires a certain scale. The placement of additions is done to turn discreet objects into communicating objects, to create a streetscape. To this are added smaller objects to create corners and form a more closed fabric.

Zoning
One of the reasons that interested me is the belief that in examining the conversion of a formerly mono-functionalist industrial area one could also draw some important lessons for the restructuring of other mono-functionalist areas in the city, notably residential islands, of which there is a great number in Stockholm awaiting renewal.
Massing and urban design
Due to the tramline and its stops the former back sides of the buildings could be reinterpreted as their new front sides. While they were still industries these were their functioning sides, the street façade was closed, the backs more open. These new front sides are strengthened by building upwards creating a conceptual section with tall fronts.

The street is redefined by the additions to the smaller houses and a cut through one volume, and defined spatially by a small ‘blocker’ element defining a corner to the streetspace.

A new volume in the back is positioned with respect to the noise curve from the airport and faces up to the site’s large neighbor, the area’s only protected building, resolving a kink in these buildings’ directions and creating a gathering space where they meet.

Merge to create a new whole
For the intervention strategy the main thing to has evolved into being not the sharp readability of existing and new but the full assemblage, the new whole.

Volumetric interventions
The main building built on the site of a former industry was used to make forklifts but production moved away in the 80’s and it was basically abandoned by the 90’s. It was bought by one of the large housing developers when planing commenced. Until recently the halls were used for distribution storage but today the halls are empty, only the two office floors at the corner are used.

The large strategic volumetric interventions consist in in opening the structure up to daylight and access, and as mentioned building up towards the new front sides, and a new volume in the back.

For the smaller buildings daylighting is improved by cutting an atrium, and the demolition of an addition to the narrow part of it.
Opening the structure to daylight is done by cutting out one floor in the middle of the large building to create a hall with two volumes flanking it. This hall serves complementary uses to whatever mix of tenants currently are found there. Initially it could serve as a joint prototype lab/maker space and office meeting spaces and lunch room. Since it is climate protected simple pavilions can be built to house those functions and create different zoning of the space. An existing hall in the back is given skylights and converted into a salle polyvalante. New entrances are created and a new internal street cuts through the volume.
New facades take cues from the industrial vocabulary in expressing their rhythms of structure. Several of the facades are 'deep' or layered and perform different functions. Layering is also used as a way of modulating the existing, where both old and new can shine through, a merger of new architecture and old.

One example of that layering can be found on the new entrance facade of the main building Gjutmästaren - the basic idea here was to preserve most of the existing facade, raw as it is and only cut new and visible entrances and additional doors that also serve to bring in light.

The existing façade is modulated through an additional layer, a light construction standing in front of it. This came about due to the poor state of the upper inaccessible part of this façade which is falling apart. Conceptually and practically it is a scaffolding made permanent so that the façade can be maintained periodically instead of taking it all down and the façade is protected from the worst rain if there are unseen cracks. The other “function” of it is to make it visible that something different is going on here. But this is also the major sunny side of the building so not used as scaffolding it is terraces (and potentially could serve as access). At the bottom since I want to lower the terrain to remove barriers loading docks are introduced to take care of deliveries. These also function as sunspaces and a social place for gathering. There is another quite literal layering taking place just to the left of it where the rest of this rather beaten up wall with many previous changes is covered with a wood trellis and climber plants but otherwise kept as is.
SOLIDS

**Solids - Allocation**
What is desired is a way to RE-allocate spaces over time in a predictable way that avoids stagnation. It is possible to imagine that in a more traditional way but there is a benefit to the rules being transparent and as fair as possible to everyone involved. It is a system that communicates turnover and makes evident the time aspect of use. The idea is to encourage change in allocation. But there also needs to be a measure of stability. I settled on cycles of five years - with the option to hold on to your space for one additional cycle.

In the first cycle after construction functions are predetermined at 50% production and 50% offices due to current zoning ordinances. This basically mean subsidized space since very low bids could win space. Five years later some space is predetermined for both uses but the majority is for the market to decide. Whenever housing is an approved function it too is reserved a certain percentage of allocation.

**Solids - Layout**
Layout starts with the grid and access. In this case there are essentially two forms of access, point access and gallery access. The depth and grid shifts accordingly. Initial spaces are formed aligned to accesses and corners (following imaginary magnets) then 'stradler' spaces or secondary spaces are inserted to create larger complexity and variance. With spaces completed service shafts are positioned with access from each primary space (towards darker areas and with approximate reach of 5m from most points.)
The addition has a thick façade towards the noisy side and an open one towards the view of the water. Conceptually it is closed on one side and open on the other. The thick façade also serves as access and provides balcony space between baffles towards the southern sides. The baffles also have a function for glare control. Acoustically the mass of the solid baffles helps absorb low-frequency noise from the airplanes before it reaches the façade. To avoid that mid and high frequencies get trapped bouncing around the insulation on the walls is open through perforated panes since it is already protected from rain (similar to the back wall of auditoriums). The baffles also serve as columns so that it can be attached to the floors without causing a thermal break; it only relies on the connections for lateral bracing.

Another conceptual reading of the two sides is as back spine with meaty parts attached to it. Since the spine wraps around the corner then so does its opposite side so that they interlock in a twist. The cut in addition marking the main public entrance separates the façade and the building in two halves, a deep and a shallow one which are basically two different typologies, one with a predominant central access, and one with predominant single side access.
Valsverket

Following the general conceptual section the north side is the new street-side. The first intervention is to lower the ground to the new front side to make what is now a half-floor into a full accessible floor and avoid stairs. Opening it up to this side. Digging down already makes this façade a full three floors as opposed to the two floors facing the street. Given the extra floor at the bottom the height of the building can be consistent and the facades differently so that they expressed the conceptual section of tall urban and shorter semi-public side.

Tallness is expressed in the new tower, in the relief niches framing windows and in the blending of materials where there is a continuation in the use of brick for the extension. The new brick sits on a newly created soffit and soldier course to mark the line of transition and white mortar is used to bring out the contrast of the color tone of bricks.

The short side emphasizes the two entities. But this was a compositional co-nundrum – how do you add two stories to a two-story façade emphasizing their difference that doesn’t make the building look too top heavy? My response was to first ‘mask out’ part of the height of the extension by dragging the brick up 1 m changing the proportions. Then the house falls in from the façade where it has access for the addition, and moveable screens are added as modulation to this part in black metal /cast iron. The neighbouring building instead falls back with an anegele facade.

Closing remarks

I think this project, not least the theory around it has changed in a way how I perceive architecture, and the reading of my role as architect. I have come to see buildings not as fixed things but as ever changing only at a different time scale, and architects as editors of that change. Instead of the design of complete objects, this is more of a constant bricolage, editing and reconfiguration. I have come to see these buildings not as finished objects but as living, changing; sometimes slow sometimes fast - over time.

I have also come to appreciate simpler buildings in a different way, which in turn influenced my design. These building are not monuments, treating them as such would be to do them wrong. Rather I have chosen a strategy of morphing them into the future respecting what they are.

If I see the city as a constant overlayering or rewriting you start, or else you add chapters to a previously started story but you can never expect to be the one to finish it. You must expect others to continue to write that story for you, perhaps long after your’re gone. And so there is some headroom left, some engendered spaces left empty in the design when filling it was not essential.

Many times I started with a ‘bold’ move and ended up achieving a similar and generally more interesting effect I believe by simplifying it and adapting it to the building, merging the two to achieve a complex whole.