CONVERTING OFFICE SPACE

using modular prefab architecture to convert vacant office buildings

MSc graduation project | Faculty of Architecture - TU Delft | student F.P. Koornneef | proposal conversion Boompjes 60-68 - Rotterdam
Office vacancy levels across The Netherlands are rising. The office market has been overshooting for the last several years and under influence of a new working attitude (‘Het Nieuwe Werken’) and new ways of mobile communication, less physical office space is needed. Most of the vacant office buildings today will never be filled with desk jobs again.

Boompjes 60-68 in Rotterdam is one of these (typical) vacant office buildings. Just as many of the vacant office buildings today, it has been built between 1970 and 1990, according to standard office dimensions. The construction of the building is as a concrete frame: concrete floor slabs, supported by columns and concrete cores, which also provide for stability and the vertical transport within the building. The façade is non-structural and is suspended to the building (so-called curtain-wall façade). The columns are placed exactly 7.2 meters apart and the spaces between the columns can be subdivided by flexible wall systems based on a grid of 1.8 meters, the standard in office design.

The reason why these psychical aspects are mentioned is because these are the basis for the conversion concept, which will be introduced in this booklet.
One of the solutions for coping with office vacancy is conversion. There is only one problem: offices have never been built for another purpose other than facilitating an office job. This adds up to the fact that office façades and installations are often outdated and not fit for, for instance, an apartment. On the other hand, the concrete construction, the plan libre and vertical transportation are valuable features of the building and can be reused. But if you want to add new sanitary units, new walls and an entirely new façade, construction costs are high. And then there is the risk: you never know what you might run into during construction and adjusting the building.

To convert this building (and others), the standardization among many office buildings can be used in our benefit. Standard floor heights, dimensions between columns ranging from 5.4 to 7.2 meters (always a plural of 1.8 meters) and similar constructions - these are the principles for the conversion concept.
The idea is to see the building as a (standard) concrete framework, stripped of its façade and installations. These elements are non-structural and relatively easy (and cheap) to remove, rather than demolishing the whole building.

To get a better grip on construction for the new conversion, modular prefab architecture is introduced. Modular prefab units are deployed to convert the building more efficiently: it is like shoving drawers into a closet-frame. Because prefab construction is cost-effective and construction on site is better controllable, the building can be converted in a relatively short amount of time.

And then there is the flexibility of the building: the units can function as a living-unit, a working-unit or even as a hotel-room. And most important: they can be deployed and reused on different locations. Suppose you want the building to be converted back to an office after several years, remove the units and add a new façade.
Located in the inner-city area of Rotterdam, this office building is suited for conversion - especially considering the city’s ambition to attract more people and densify the city center. Whether this building should contain dwellings, hotel rooms, or a new work-living concept, depends on the design of the units and the demand on location.

Overlooking the Maas, but cut off from direct access by the busy traffic artery in front of the building, a part of the building needs to be redesigned. At the moment the ground floor of Boompjes 60-68 building has no connection to its direct urban environment. By converting the upper floors through deployment of prefab units, the ground floor needs to be redeveloped - site specific. Extra parking might be needed, or maybe a collective or public space, according to what is preferable at this specific location.

In most cases the construction of office buildings is suited for (light-weight) additions on top of the building. Because the concrete in the construction becomes stronger every year cantilevering units outside the building is also one of the possibilities. Adding more units on the roof could be an efficient way to add more living space and benefit from the flexibility of the building’s structure.
The façade of most vacant office buildings is useless: it is often outdated, architecturally unattractive and does not meet current requirements, building psychically. Looking at conversion, the façade needs to be adjusted or entirely replaced in most situations - expensive modifications for a building that is already dated.

And what about the mechanical installations, such as the HVAC system, that have to be replaced every 15 years? In most vacant office buildings the mechanical installations are even in need of replacement before moving in (or within several years). Again, expensive modifications. The same goes for the sanitary units inside the building.

For conversion, these problems preferably must be taken out by stripping the building to its core: the concrete framework.
The concrete framework is the most valuable part of the building. More than 60% of the total building material is preserved and can be used for years to come. Stripping the building to casco is relatively cheap, especially keeping in mind that rebuilding a new casco (and foundation) would cost even more. And while stripping the building, the units can be (pre)fabricated in the meanwhile to save time.

Now the building is ready for deployment. As drawers in a closet, the units are placed in the concrete framework. By canterlevering the units outside the building and placing extra on top, more living space is generated (see figure).

Important to note is that the ground floor will always need a site specific intervention. From the first floor up, the concept of deploying units is applicable in other buildings.
Again, the conversion-process explained - now in lay-out.

1. existing situation
2. stripped building
3. converted building

The converted building can contain different mixed-use programs, such as several floors with living-units and some floor with work-units (or combined). The work-units could be interesting for people looking for their own workplace with a comprehensible size within the city center. The residual space on every floor can be used as a collective space or can be filled in with green spaces.

As a financial model for the realization of this concept, leasehold (= erfacht) constructions could be one of the possibilities. Further investigation into these possibilities will be needed.
This is a draft-proposal for the conversion of a vacant office building in the city center of Rotterdam, Boompjes 60-68. The conversion and redesign of this office building should be seen as a case study for deploying modular prefab architecture. The concept is not solely meant for this specific site, but the underlying idea is that it should also be applicable on vacant office buildings elsewhere.

For more information on the project, visit: http://convertingofficespace.wordpress.com.

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