



A new life: conversion of vacant office buildings into housing

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Received August 2006
Accepted October 2006

Abstract

Purpose – The vacancy of office buildings leads to financial problems for the owners and social problems for the community, e.g. vandalism, dereliction and deterioration. A solution may be found through the conversion of vacant office buildings into housing. Vacancy-threatened buildings are often part of the mediocre part of the building stock. Does conversion make sense in this case? What are the opportunities, threats and risks? What are the critical success factors? The purpose of this paper is to discuss financial, functional, structural, technical and aesthetic issues.

Design/methodology/approach – Through previous research at the Delft University of Technology, tools are developed to decide the potential for the conversion of buildings. This paper discusses the risks and chances, and brakes and triggers of transformation projects, based on case studies. These case studies are performed through interviews with professionals involved in the transformation process and through analyses of architectural drawings of the before and after situations. For each project two interviews were held, with the architect and the developer or client. The interviews focussed on the process of the transformation projects.

Findings – The conversion of nondescript and unarticulated buildings makes sense from the point of view of sustainability, both ecologically and in an urban regeneration context. These projects will only be interesting for developers of commercial real estate if they can be made economically feasible. Social housing associations also have additional social goals. Through a longer investment perspective these associations can wait for property increases through long-term externalities as result of upgrading of the area. In buildings that are kept because of economical or social feasibility there are strong connections between the target group, the location and the conversion costs.

Practical implications – The tools developed have proved to be useful for quick scans of the potential for building conversion. This paper is a first step in trying to depict a more detailed view of the risks and chances of building conversions. Knowledge of the risks and chances of conversion is required to make decisions concerning transformation projects.

Originality/value – The paper develops knowledge about transformation projects and decision support tools for the conversion of buildings, based on empirical studies.

Keywords Office buildings, Housing, The Netherlands

Paper type Research paper

Introduction

Problem

Office buildings in The Netherlands are experiencing high vacancy levels. In January 2006, the Dutch office market held 5.6 million m² vacant office space, or 14 percent of the total of 40 million m² office space. Around 3-5 percent of this is seen as necessary to provide for movement and growth. A part of this vacancy (about 1.5 million m²) is structural (or long-term), which is defined as vacancy of the same floor space for more than three consecutive years (DTZ Zadelhoff, 2005). The same tendencies are found in Germany, where Berlin, Düsseldorf, Frankfurt, Leipzig, and Munich all have vacancy rates of 10-20 percent of the total stock (Eurohypo AG, 2005).



Vacancy is a problem on different levels. Economically, vacancy affects the owner of a building directly. For society, vacancy presents problems of insecurity and social uncertainty and may bring about criminality ranging from vandalism and graffiti to break-ins, illegal occupancy and fires. As such, vacancy also has indirect effects through the negative image that it gives to the surrounding area and buildings. This can lead to deterioration of the area, with rising vandalism, technical decay and devaluation of its buildings. At the same time, the restrictive Dutch housing market presents a potential demand for vacant office buildings. In the Dutch situation, housing is an attractive adaptation option, given the tight housing market. Housing traditionally overlaps well with other aspects of the city core, supporting culture and leisure. In 2004 the Dutch Minister of Housing sought to build at least 25,000 dwellings within five years by converting empty office space into housing.

Objective

Functional transformation is only one of several possible ways to solve the problems of vacancy. The owner of a vacant building can also choose to have the vacant building demolished and build something else, he can have it renovated and rented out again as offices, he can sell it or he can simply do nothing – just hope for better times and wait for someone to rent the building. Most well known examples of candidates for conversion consider buildings with a proven architectural quality, while vacancy-threatened buildings are often part of the mediocre part of the building stock.

This paper aims to answer the following questions:

- What makes building conversion a good option for dealing with high levels of vacancy?
- Which buildings are suitable for conversion from office buildings to housing?
- Does conversion of the mediocre elements of the building stock make sense?

In answering these questions, we used numbers from DTZ Zadelhoff (one of the largest Dutch real estate brokers) and Neprom (Dutch Association of Project Developers) and used data from earlier studies to develop methods and instruments for deciding the transformation potential. We present two case studies of delivered conversion projects. These cases describe the use of the instruments and give information from Dutch practice on the feasibility of converting the mediocre buildings mass. These cases, together with 12 others that are currently being studied, will be presented in the book *Transformatie in Nederland (Transformation in The Netherlands)*, which that will be published in January 2007.

Vacancy

Market

Vacancy of office buildings has risen worldwide since the year 2000. Driven by the growth of the new economy, high-risk investments in real estate property increased at the end of last century. The burst of the internet bubble in 2001 was accompanied and reinforced by economic decline and a worsening competitive position of The Netherlands in general (Buck Consultants International, 2003). The effect on the real estate market was devastating. As a result of the cyclic behaviour of the real estate market, a huge number of buildings were at that moment being developed or built, and even now, buildings which were initiated before 2001 are being finished. Vacancy

related to the conjunctures in the real estate market can probably be solved when the situation in the market improves. But conjuncture-related vacancy can easily become structural vacancy. Organisations that move to new office buildings often leave behind buildings which do not fit present performance requirements. A lower structural demand of office space is expected, due to the decrease in the labour force through ageing and the worsening competitive position of The Netherlands, which leads to outsourcing of work to lower income countries. Part of the vacancy thus derives from market and economic changes. But the location and the building also play important roles.

Location

Some office locations are preferred to others, on both local and regional levels. Parts of a city try to outdo each other, but especially for bigger firms, location is chosen on regional grounds – national or even international. There are several reasons why some locations are less desirable than others, for instance poor accessibility by public transport or car and poor parking provision. Another factor can be a negative image of the area created by a poor spatial and visual quality. Agglomeration factors, such as other similar firms moving out, lack of facilities and a concentration of ageing premises, are also important. Finally, urban planning and zoning play an important role. For instance, mono-functional areas are more prone to experiencing vacancy; urban districts deteriorate due to negative market developments in a certain branch. Municipality plans to change the use of an area can also influence prospects of future development possibilities and thus trigger vacancy.

Building

Reasons to leave a certain building include negative image or identity through a bad spatial-visual quality, decay and shabbiness of the building or evidence of vandalism, or the technical quality of (parts of) the building are in a poor condition or its installations are out-of-date or malfunctioning (Healy and Baker, 1987). The functional lifespan of a building is over if the building is not able to meet the requirements of new office space, as in a lack of flexibility in rearranging space or inefficient use of space or poor accessibility. A large number of structural vacant office buildings were built between 1960 and 1980 (Neprom, 2003).

Building stock

Conversion to decrease the office supply

On the Dutch market, there are 5.6 million square meters of office space for rent at this moment. Most of this space is vacant. Owners of office buildings let out their buildings at low rates to try to keep them on the market. This leads to a general decrease in rents and income. Vacant buildings with huge “for rent” signs are a bad advertisement for the owner. Taking some of the non-conforming buildings off the market will lead to an increase in rents, as supply and demand will correspond better. According to DTZ Zadelhoff, a significant part of the office space – approximately one million square meters – should be taken off the market. Many office buildings are functionally or technically outdated and not flexible enough to be refitted, or have a bad spatial-visual quality. Also, the urban context of the buildings can be experienced as poor, from poor

accessibility, too little parking provision, the building being situated in a housing area or being affected by other agglomeration factors.

Conversion to increase the housing supply

The Dutch housing market is stressed. The figures regarding the scarcity of dwellings vary, but about 800,000 to one million dwellings are needed. Existing office buildings can of course be demolished and new housing can be built. However, the conversion of existing building structure is sustainable: building materials are reused, and the morphological structure of an urban area is retained. This contributes to an understanding of the place and increases its historical value. Transformation also saves construction time. For projects that have to be delivered in a short time-span, this makes transformation especially interesting. And, for both options, there is no need to conquer inbuilt land, which is already scarce in The Netherlands.

Which buildings are suitable for conversion?

Market

The longer a building has been vacant, the more likely it is that the current owner will be willing to sell the building or initiate a functional transformation. The subject of our research is the structural vacant building stock, defined as vacancy of the same square meters for three consecutive years in a building that was delivered more than three years ago.

Location

Locations in inner cities or on the edges of cities are interesting locations for housing developments. Due to poor accessibility by car and poor parking provision, several office buildings in such locations are having vacancy problems. However, many of the vacant office buildings are situated in office/industrial parks or along the highway. Highway locations are poorly accessible by public transport, and air and sound pollution are severe problems. Under the current circumstances these locations are not suitable for housing. However, office/industrial parks can be: by regenerating larger parts of an office location an interesting housing environment can be created. Different locations correspond to different housing types and different target groups. If a location is found to be suitable for housing, the next question is who – which target group – would like to live there?

Building

Ranging from reprogramming to demolishing everything but the structure, most buildings have a certain potential for conversion. A specific kind of building is one which has recognised architectural qualities or has monument status. The conversion and reuse of these buildings almost always succeeds, albeit with economic loss. The architectural quality or monument status will be kept without great changes in the façade or other characteristics. A program can be sought to reinforce the value of the building. The other extreme is the non-eloquent building stock. Apart from their lack of architectural quality, these buildings are often of poor technical or functional quality. They are outdated but, as revealed in our case studies, they can possibly be converted into housing. There are few definite vetoes to the building structure itself, but the floor height must reach the minimum floor height defined by Dutch building laws. This

minimum is currently 2.60 m of free height. Other important factors are the economic feasibility of conversion and urban zoning plans prescribing certain functions.

Instruments

In order to be able to judge office buildings on their potential for conversion into dwellings the “transformation meter” (Table I) was developed by Geraedts and Van der Voordt (2002). This instrument consists of criteria to measure opportunities and risk. The criteria used consider internal building and location aspects. While only a few internal building criteria are absolute, more of the location criteria can be the source to a negative transformation advice. Depending on the target group, the conversion of the building can be made economically feasible; the location, however, is not that easily changed. The transformation meter has been developed to assist decision-making at the beginning of a possible conversion trajectory.

In her thesis research at the University of Delft, Nicole de Vrij (2004) discussed a number of methods that have been developed to decide which buildings are suitable for conversion. The outcome of this research is a definition of four evaluation instruments, based on the “transformation meter”. de Vrij (2004) validates her method through case studies of 11 transformation projects. The first step is a quick scan, using the criteria of Geraedts and van der Voordt (2002) plus a few additional criteria such as the lack of an enthusiastic developer, the owner not being willing to sell the office building, or the city council not being willing to change the zoning plan. Further, a rough feasibility study is executed in this first phase. By applying this instrument, office buildings that are not suitable for conversion into dwellings are quickly identified. Second, potential target groups are recognised based on the local market, the location and the building. Third, the feasibility model gives an insight in the financial/economic feasibility of the project. Target groups are matched with rental prices and idealised floor plans. The idealised floor plans can be used to divide the office space into dwellings and an estimate can be made of the number and type of realisable dwellings. Development calculations can be made using costs and incomes. Fourth, a checklist makes a comprehensive risk inventory possible. Most risks can be averted when signalled in advance. Specific characteristics of the transformation project are listed, providing solutions for frequently occurring problems, organised by location and building characteristics. These are again subdivided into legal, economic, technical and functional/architectonic aspects.

The instruments developed at the University of Delft coincide with research done by Barlow and Gann (1993), presented in a report by the Joseph Rowntree Foundation. Their research focuses on the variables of buildings, owners, planning consent, finance and economical feasibility. These variables were isolated and researched. Cases were used to validate the research.

Brakes, triggers and risks

Brakes

One of the obstacles for conversions is the specialisation in competence of the actors in the real estate market. Developers, investors and owners of office buildings have little knowledge of other branches of the real estate market. Another problem is the price asked for vacant office buildings and the cost of conversion compared to the income from the new function. Prices are kept high through using unrealistically high book

| Aspect | Criterion |
|------------------------------------|---|
| <i>Location</i> | |
| Urban situation | Office on remote industrial zone Office in the middle of an office park Office in area defined as priority area for offices |
| Land property | Land rent |
| Vacancy | Vacant more than one year Vacancy of surrounding buildings |
| Character of urban situation | Location on or near city edge, ring roads Desolated area No greenery in the neighbourhood Social depreciation, vandalism |
| Distance and quality of facilities | Pollution; smell, noise, view Shop for daily errands > 1 km Meeting place (café, snack bar, etc) > 500 m Bank/post office > 2 km Basic medical facilities (doctor, pharmacy) > 5 km Sport facilities (fitness, swimming pool, sports park) > 2 km Educational facilities (nursery, school, university) > 2 km |
| Accessibility by public transport | Distance to station > 2 km Distance to bus, metro, tram stop > 1 km |
| Accessibility by car; parking | Many obstacles, limitations, poor flow Distance to parking place > 250 m < 1 parking place/100 m ² dwelling realisable |
| <i>Building</i> | |
| Year of construction | Building was built or renovated recently (three years) |
| Character of the building | Unrecognisable, non-eloquent Poor maintenance |
| Extensibility | Not extensible horizontally Not extensible vertically |
| Structure | Structure in technically bad condition Dense structural grid, < 3.6 m |
| Dimensions | Net storey height < 2.6 m |
| Façade | Façade openings not adaptable Impossible to create windows which can be opened manually |
| Entrance (building, dwelling) | Daylight entry < 10 percent of the living area Impossible to create a socially secure entrance Impossible to realise elevator in the building (if more than four floors) Distance from dwelling to stairs/elevator > 50 m Impossible to realise escape stairs according to escape demands |
| Installations | No or insufficient conduits realisable |
| Environment | Noise level at the façade > 50 dB Sufficient isolation between dwellings impossible Sufficient isolation of façade impossible Presence of dangerous materials in construction No or little sunlight |

Table I.
Criteria for low transformation potential (the greater the number of checkmarks, the higher the risk and the lower the transformation potential)

Source: Geraedts and van der Voordt (2003)

values. These values often do not correspond with the market value of the object in question and make redevelopment impossible. Until 1996 the rent per square meter for office space was higher than the rent per square meter for housing space. The value of offices is decreasing, while apartment prices continue to rise. This problem is thus getting smaller, but is still an important issue due to the costs of the conversion. Because of this, many investors and owners choose to keep their building on the office market, waiting for better times.

Municipal zoning plans and Dutch building laws are other brakes. Trying to develop housing in an area scripted for offices can lead to juridical debacles lasting for 18 months. With such uncertainties, conversion is difficult. The building laws are different for offices and housing. In particular, escape during fire, daylight submission and the noise level of the surroundings demand changes in the building structure which can lead to high costs or even make conversion physically impossible. Another problem is raised by the location of the vacant premises. Half of the vacant buildings are located in industrial areas and are considered unsuitable for conversion because of the characteristics of these locations.

Triggers

Knowledge about conversion and different fields of the real estate market is crucial to trigger transformation projects. Keeping a structural vacant building in the portfolio costs money and leads to financial loss. Redeveloping the building can be a better option. One advantage of a transformation project is the short time-span through which a transformation project can be developed. Conversion is a sustainable way of developing housing through re-use of buildings or parts of buildings. If a commercial program can be added to housing, the project can more easily be made economically feasible. Another trigger is the scarcity of space. Finding a central location for housing development can be difficult; finding a centrally located vacant office building is easier. Redeveloping central locations again can help to upgrade inner city areas and attract other investors.

Social housing corporations are a specific group of actors on the real estate market. For a social housing corporation, not only is economic feasibility important, but social feasibility is too. Another characteristic of these corporations is that they do not require an immediate return on their investment. The demanded return on investment is also lower than for a commercial developer. For these reasons, social housing corporations are more likely to take on a transformation project.

Risks

Through our case studies, we have learned that the large risks in transformation projects come from more than one source – one being the building itself, others being the market or the municipality. Older buildings especially do not correspond with the drawings or other available information, e.g. the construction turns out to be made of bricks, not concrete, the distances between columns are not the same throughout the whole building or the construction contains hidden asbestos. This implies hidden costs that are revealed during construction. Another problem that was stated in two of our cases is the housing market. At the moment that these developments started, the economy was increasing and the housing market was booming. At the moment of selling the apartments though, the market was saturated and some of the apartments

turned out to be difficult to sell. A third problem is due to procedures which have to be run at the municipality. Procedures for changing zoning plans or getting permission not to work with standard building laws can take a long time. This means that the time gained through conversion is lost through procedures.

These risks can be eliminated through better planning strategies. In feasibility studies the chances of problems like weak construction floors, asbestos, and old installations should be recognised. The choice of dwelling type and size should be based on serious analyses. The feasibility of the project can be reached through diversity, both in dwelling type and by adding another function to the building (e.g. commercial space on the ground floor). Agreements should be made with municipalities before starting a transformation project; this would lead to better cooperation during the transformation process.

Cases

Introduction

To explain the transformation process and main risk and success factors we will present two case studies. The introduction to each case describes the actions taken at the beginning of each project, responding to the quick scan and feasibility study as developed by de Vrij (2004). The cases are selected because they were not architecturally stunning buildings and were not monuments (which legally cannot be destroyed). The success of these projects has to be explained through economic and social feasibility.

Student housing in Groningen

The first case study is taken from Groningen in The Netherlands. This office building was built in 1980 for the Dutch telecom company KPN in the centre of the city. KPN had moved out and the building was vacant when the housing foundation In marked it as an interesting place to realise student housing. The reason for the interest of In was the location of the building in the city centre, close to public services and city (night)life and near other facilities that the foundation rented out as student housing. The corporation was also the developer of the project. Through a feasibility study the office building was regarded as suitable for housing. The building was already up for sale, but the price was originally too high. After some extra months of vacancy and intensive negotiations by the housing association, the price was lowered to an acceptable level. During the feasibility study, appointments were made with the municipality in order to be sure in advance that changing the zoning plan would be no problem.

Feasibility. Before buying the building, a feasibility study was done as to ensure economic feasibility. The building structure is a simple concrete structure of columns on a 5.4 m grid. In the centre of the building there is an elevator; the staircases are situated at each end of the building. This granted that nothing had to be done to the building as to make sure it would apply to the prescriptions for fire escapes. Another important factor was the state of the façade. The restrictions on noise on the façade are stricter for housing than for offices (maximum 50 dB for housing compared to a maximum of 60 dB for offices). The façade did not meet standards for housing, but the municipality was willing to make an exception. Another common problem is that in many offices, windows cannot be opened manually. In this building, though, most

windows could be opened, or at least one window per structural bay. This was an important factor in keeping down the cost of reconstruction. A third factor that can increase the cost of restructuring is internal installations. Heating, air and electric installations could be re-used. Sub-meters were placed to measure the electricity used by each unit. Radiators were re-used and were also given added meters.

Design. Little was done about the design of the building. The entrance was refurbished, as to allow for 83 students to use it on a daily basis. In the wall, 83 post-boxes were placed, together with 83 doorbells. A program was set up in agreement with the major student organisation in Groningen. This resulted in rooms of 20-25 square meters, each with its own kitchen, bathroom, address, mailbox and doorbell. Dividing walls between the units were made sound- and fireproof by using layers of gypsum plates. In this way, as little as possible weight was added to the construction. The converted building is an anonymous one, little was changed physically, but the use of the building is radically transformed (see Figures 1-3).

Luxury apartments in Eindhoven

An office building dating from 1958, originally built for the municipality health care office, later used as municipality offices, was recently abandoned. The building was not a monument, but the municipality thought it should be reused. A competition was held for real estate developers in cooperation with architects: the winning developer could buy the premises and would agree to convert the building into housing. During the competition, research was done to determine whether the building was suitable for housing. A feasibility study was also done. The developer who won and got the right to develop the project was a professional real estate developer, and aimed to develop and



Figure 1.
The existing façade was kept

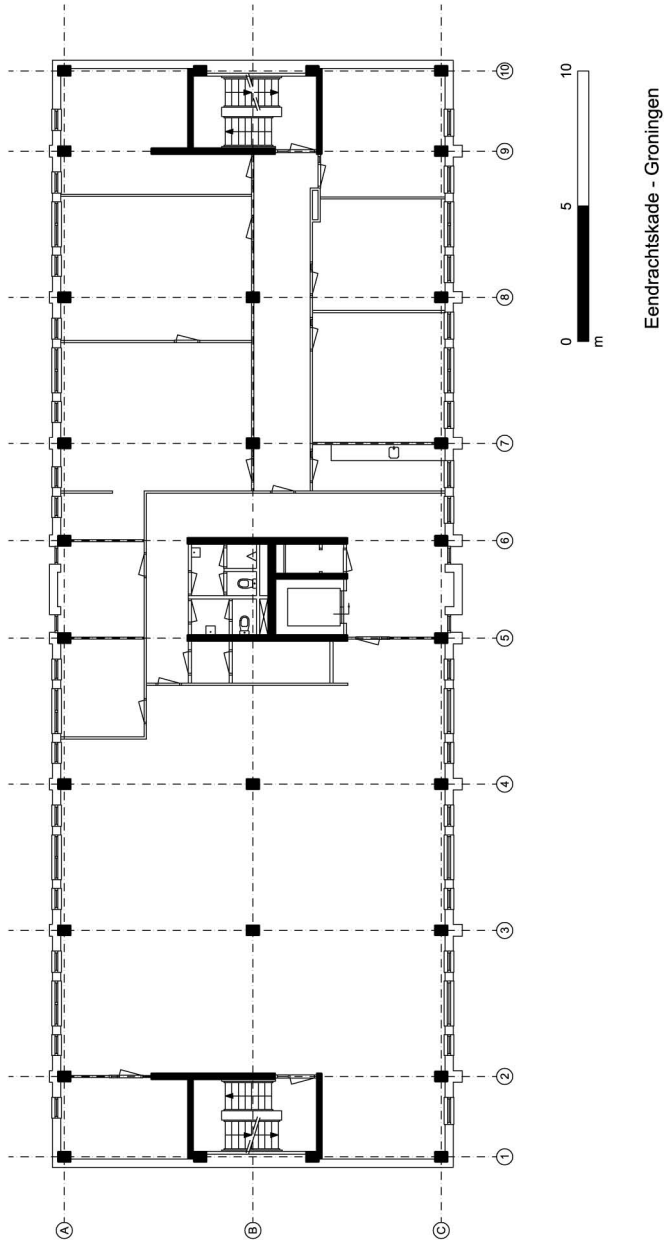


Figure 2.
Existing office building

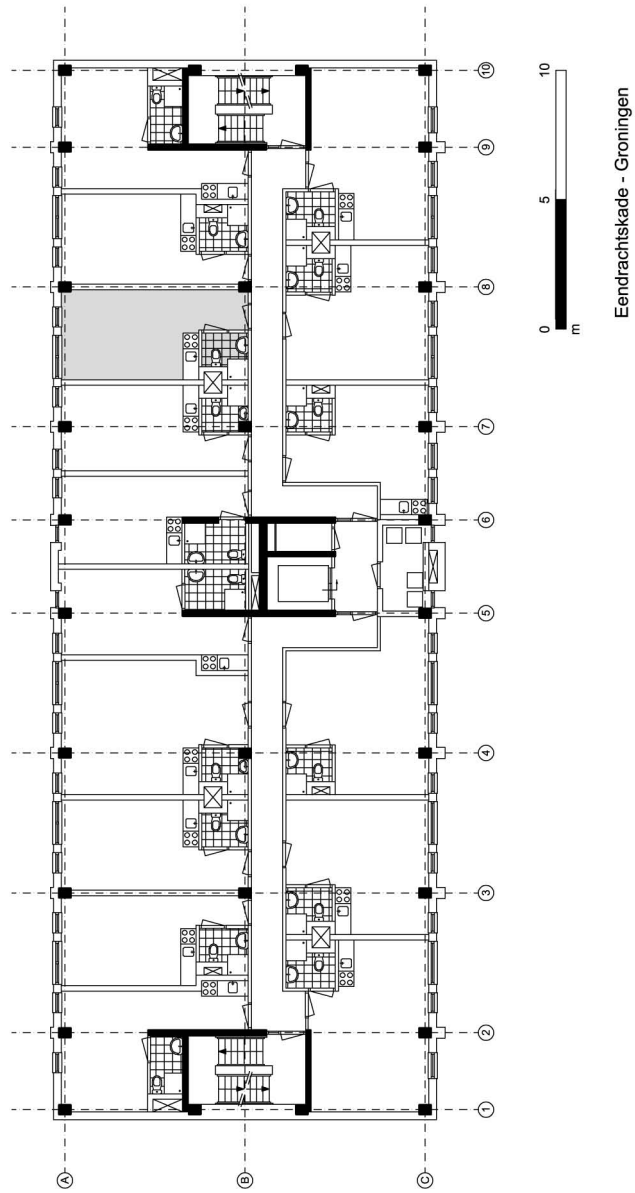


Figure 3.
Office building converted
into housing

sell the apartments. As it happened, a commercial housing corporation later bought all the apartments.

Feasibility. A feasibility study was done as part of the competition. In this case, there was no pre-defined profile of the renters or buyers. The developer together with the architect looked at the possibility of fitting apartments into the existing structure. Together with the costs of making the façade work technically, only top-end apartments were calculated to be economically feasible. The neighbourhood where the building is situated was also thought to be a suitable location for top-end housing. To create extra income and add value to the urban setting, the base of the building was given over to a commercial program (a pharmacy and a health centre).

Design. The existing building had various technical disadvantages: for example, the façade was outdated and not energy efficient. The floors were too thin to function well as the division between two apartments. There were several possibilities to solve these problems. Finally one concept was chosen that would solve all the technical problems; each apartment was designed as a box that was placed in the existing structure like a drawer in a chest of drawers. This also solved the isolation of the interior walls and floors as the façade. However, during construction it also became clear that the building was not built to modern standards. The measurements of the columns and the distances between them varied from floor to floor. The “drawers” had to be manufactured specially for each unit. This caused high extra costs. Another factor contributing to the construction costs was the state of the existing construction.

Although the façade was radically altered, the characteristic structure of the building and its identity were kept (Figure 4 and 5). The large-scale left-over spaces that this building comprised were kept public and open. This is one of the obvious qualities provided by the existing structure and which could not be provided for through a new building built specifically for its use (Figures 6 and 7).

Reflection and conclusion

Most examples of converted buildings are examples of successful architecture; buildings which become monuments. These buildings will be reused, whether they are functionally efficient or not. Converting nondescript and unarticulated buildings makes sense from the point of view of sustainability, both ecologically and in an urban regeneration context. These projects will only be interesting to developers if they are economically feasible.

In our case studies we have looked at buildings that were kept because of economical and social feasibility. In these projects there are strong connections between target group, location and the conversion costs. The former KPN building in central Groningen is interesting for student housing because of its location. The project was feasible because the price was reasonable, the façade did not have to be altered and the fire escapes were satisfactory. In the Eindhoven case, the façade had to be completely renewed because of severe technical problems. The building was completely stripped; the only parts to be reused were the concrete skeleton and the staircases. The construction even had to be reinforced. The conversion could only be made feasible if it was developed as high-end apartments. The location added force to this conclusion.

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Figure 4.
Typical floor plan before
conversion of the office
building into housing



Figure 5.
Typical floor plan with 16
units. The existing
elevator and staircases
were reused

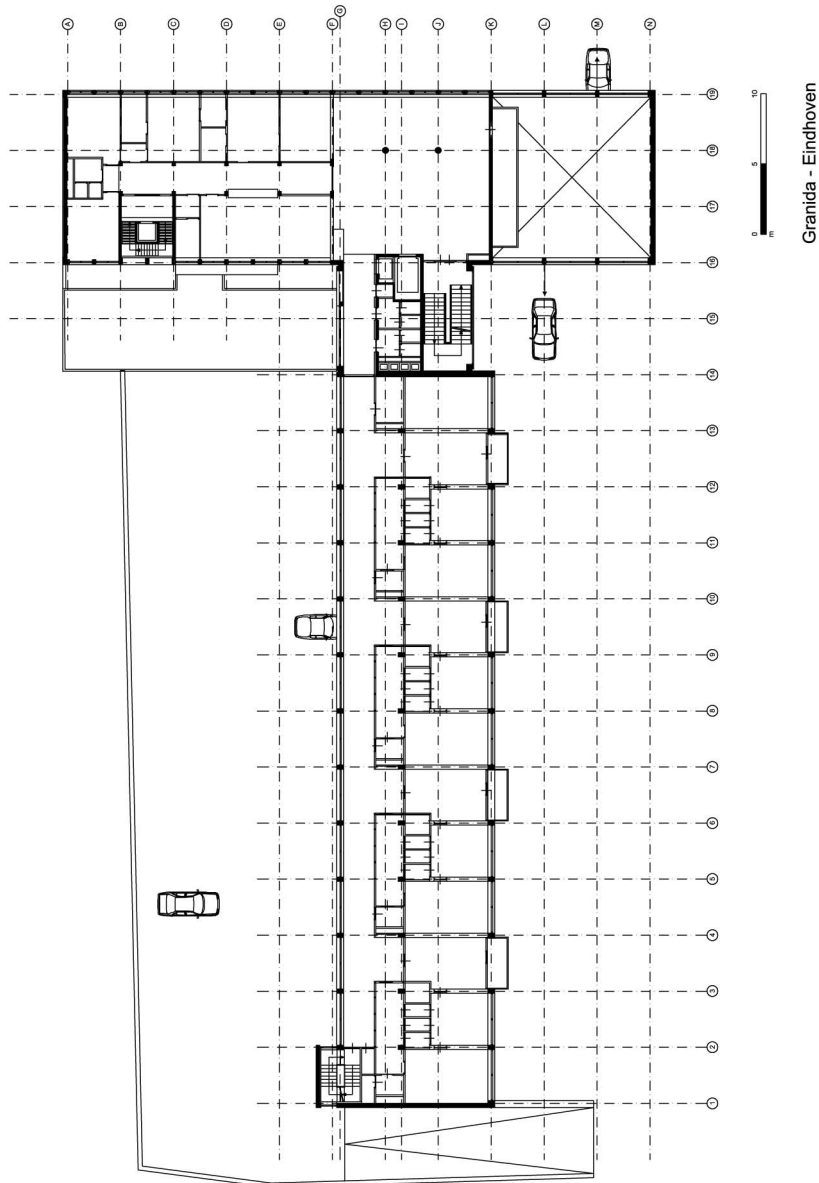


Figure 6.
Typical floor plan before
conversion of the office
building into housing

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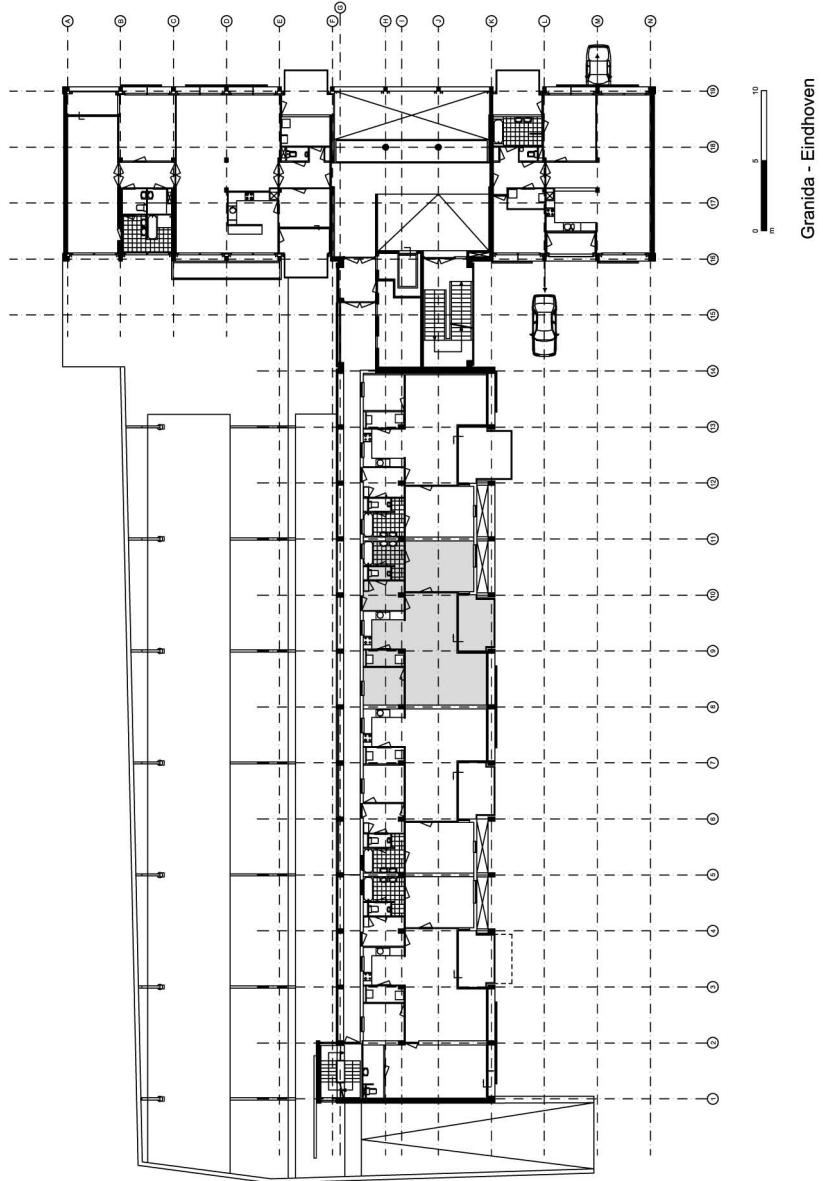


Figure 7.
Typical floor plan after
conversion into high-end
apartments

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