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ABC RESEARCH MATRIX USED IN URBAN RESIDENTIAL AREAS

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ABC Research Matrix used in Urban Residential Areas

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Keywords: Analysing; Building; Construction; Time; Space; Structure; Material; Services; Arise; Continue; Expire; Regeneration.

Abstract: It is necessary to analyse the existing before changing it. That is the only way to regenerate buildings, parts of cities and urban landscapes with conscience. New applied research methods are needed to develop a sustainable environment including our heritage.

Past, present and future are all relevant to the buildings. Three levels of analysis have been used to cover these phases. The objective of my research was to identify the qualities of buildings which are relevant when trying to shift from decay to preservation. The influence of construction engineering, the way we can learn from it now, and the way in which a building is able to accommodate change determine the chances of a building's long term survival – the outcome of the interaction of continuity and change.

My research method starts with the contextual aspects: commission; location; architect; typology and design process. The information obtained in the observation stage is reduced to the contextual information which affected the design, creation, existence and preservation/decay of the building. The later sections, which consider the building(s) itself in greater detail, are initially ordered by time: creation, existence, and preservation/decay. Within these, the elements of the building(s) are analysed at three levels: space (interior and exterior); structure (load-bearing elements and elements which determine the structure); matter (shaping the space through materials which affect light, colour, texture, surface, sound, impression, smell, size and weight); building services (climate control, comfort, maintenance and communications). In this way the Analysing Building Construction (ABC) Research Matrix was created.

An application of the ABC research method has been used at the residential district of Jeruzalem, Frankendaal, Amsterdam. ABC research created new opportunities for Frankendaal.

Introduction

The built environment is continuously changing and such changes are particularly important when regenerating buildings. These changes add something to existing buildings and make new programmes possible. The existing buildings - history - determine continuity and form a clear additional, time-dependent layer. In general, the large number of buildings built between 1940 and 1970 cannot be listed (in the Netherlands) as national monuments and are therefore essentially unprotected especially the residential post-war areas. Furthermore, buildings from this period in particular are currently being considered for regeneration or threatened with demolition.

Apart from studying relevant literature and other sources I studied seven buildings to develop a method for analysing buildings to be able to understand them: Analysing Building Construction.

Research Themes

The research resulted in the Analysing Building Construction research method guided by the following themes:

Observation - with an engineer's eye

I considered engineering and technology and the views of both architectural critics and practising architects about technology by studying the relevant literature and sources. Technology evolved after the Second World War as a result of the use of new materials, changes in legislation and standards, and the industrialisation of the construction process. This last aspect was primarily relevant to residential construction projects. Building practices changed after 1940, however, the role of technology in the process did not change materially. Comments about the contribution, or lack thereof, of technical progress to a higher architectural quality were always personal visions primarily shaped by personal taste and habits.

Architects developed from supervisors to architect-managers of the entire construction process. Time schedules became an important instrument and working together with structural engineering and building services consultants became steadily more important. The cooperation between these parties affected the overall result, and all needed each other. Consequently, regular teams of architects and consultants developed, e.g. Peter Rice and Renzo Piano. The best results were developed on the basis of synergy between the two disciplines.

Research analysis

When designing either completely new objects or objects to be incorporated into an existing structure it is important to learn from the past. Not to copy it, but to analyse it and apply the lessons learned while respecting the present context. We have to evaluate knowledge and methods and develop our own design method. This applies to architecture students as much as to practising architects.

This learning aspect is emphasised when a design commission concerns an existing building, but even a new build project always has a context. When dealing with an existing building that building provides the primary context and immediately becomes an element of the key points of the architect's brief.

In my view, studying criticism, experiences and interviews, and thoroughly analysing the work of others is not adequately included in the education and training of architects as designers. It would appear that architecture (the study of the requirements for constructing buildings) education should teach students the skills to do this, and appreciate the rewards.

Regenerative conclusions

This theme defines the approach I took when developing the conclusions of my thesis. Regeneration concerns changes which add a new period, a new generation, to the lifecycle of buildings.

Life means change and the past means that we progress in a spirit of tradition and memory. Furthermore, change cannot happen without continuity. Changes to buildings are affected by both financial and technical considerations.

As a student, the examples set by Gunnar Asplund and Carlo Scarpa showed me that although designing new buildings (even when embedded in the existing context) is an exciting challenge, making changes within the context of an existing building is actually a far greater challenge. The existing adds a layer of history which can never be created in a true new build project.

Figure 1: Elevator placed in the ANDB building of P.H.. Berlage in Amsterdam, 1987.

During the design and construction of the Trade Union museum (Vakbondsmuseum) in Amsterdam, housed in the building of the former Dutch Diamond Workers' Union (Algemene Nederlandse Diamant-werkersbond, ANDB) designed by Hendrik Petrus Berlage, I was introduced to issues related to National Monuments and making changes to such buildings. See figure 1.

The examples by architects such as Renzo Piano, Norman Foster and Herzog and de Meuron demonstrate that leading architects can produce excellent results when regenerating buildings. The opinions aired by the original architects whose buildings are being changed make it eminently clear that some of them object to any changes to their buildings. Around 1950, architecture critics still felt that architecture amounted to an inviolable work of art. Optional changes were therefore considered an anathema. Architects also resisted changes to their work and event went to court to defend their copyright - it appeared that demolition was not prevented by this copyright but that changes to a building were.

Views about changes also changed themselves. In some cases the original architects are engaged to regenerate their own work. This requires them to take enough distance from “their building” to be able to accept it as a new commission. Of course, this is more likely to happen under legislation which allows listing after 30 years, than under the Dutch system where the period is 50 years.
To give regeneration a real opportunity, it is particularly important that those initiating projects are prepared to consider regeneration and do not automatically choose demolition. Bringing about this change in attitude is particularly relevant with respect to buildings and urban residential projects dating from after 1940. There are definitely opportunities for such buildings in both the near and distant future. Demolition amounts to a waste of energy and is neither durable nor sustainable, while reuse, changes in use and regeneration of buildings are. A good example is provided by the Stationspostkantoor (distribution post office) in Amsterdam which in 2003, after demolition of part of the building, was repurposed as the Stedelijk Museum CS and offices for architects, designers, etc. Perhaps this good example will inspire others. Without a past there can be no future, and changes can only occur if there is continuity. See figure 2.
The “creative re-use” advocated by Latham can produce a built environment stratified in time and therefore rich in appearance and the way it is experienced. Demolition is sometimes the best option and there is no need to preserve everything. However, a careful assessment which gives serious consideration to repurposing, reuse and regeneration provides many opportunities for creating a rich spectrum of buildings.

Figure 2: Stationspostkantoor temporarily in use as Stedelijk Museum, Amsterdam 2007.

Research Method

The work for my research didn't only result in relevant conclusions, but also in a research method which will be applied to the subjects covered by ®MIT at the Faculty of Architecture of Delft University of Technology and could be used on international scale. It is a method to analyse the existing before changing it. That is the only way to regenerated buildings, residential urban areas, parts of cities and urban landscapes with conscience.

Analysing Building Construction aims to discover the qualities of a building, rather than its value. Observation, the first stage of the research, aims to obtain information from the literature, the building itself, archives and interviews with stakeholders. The second stage, analysis, includes structuring, analysing and interpreting the information. In the third stage, conclusions can then be drawn on the basis of the research themes discussed above. The information is structured in accordance with the research brief. In the long term, it will be possible to identify connections (concerning both buildings and building construction) between the results of Analysing Building Construction, using the research themes as defined before.

The information obtained in the observation stage is reduced to the contextual information which affected the design, creation, existence and preservation/decay of the building. As far as the typology is concerned, we should not only consider the functional or chronological classification of buildings based on building type. Instead, we should analyse the buildings on the basis of a spatial typology, as the spatial conditions will either remain the same or change when the function of the building changes.

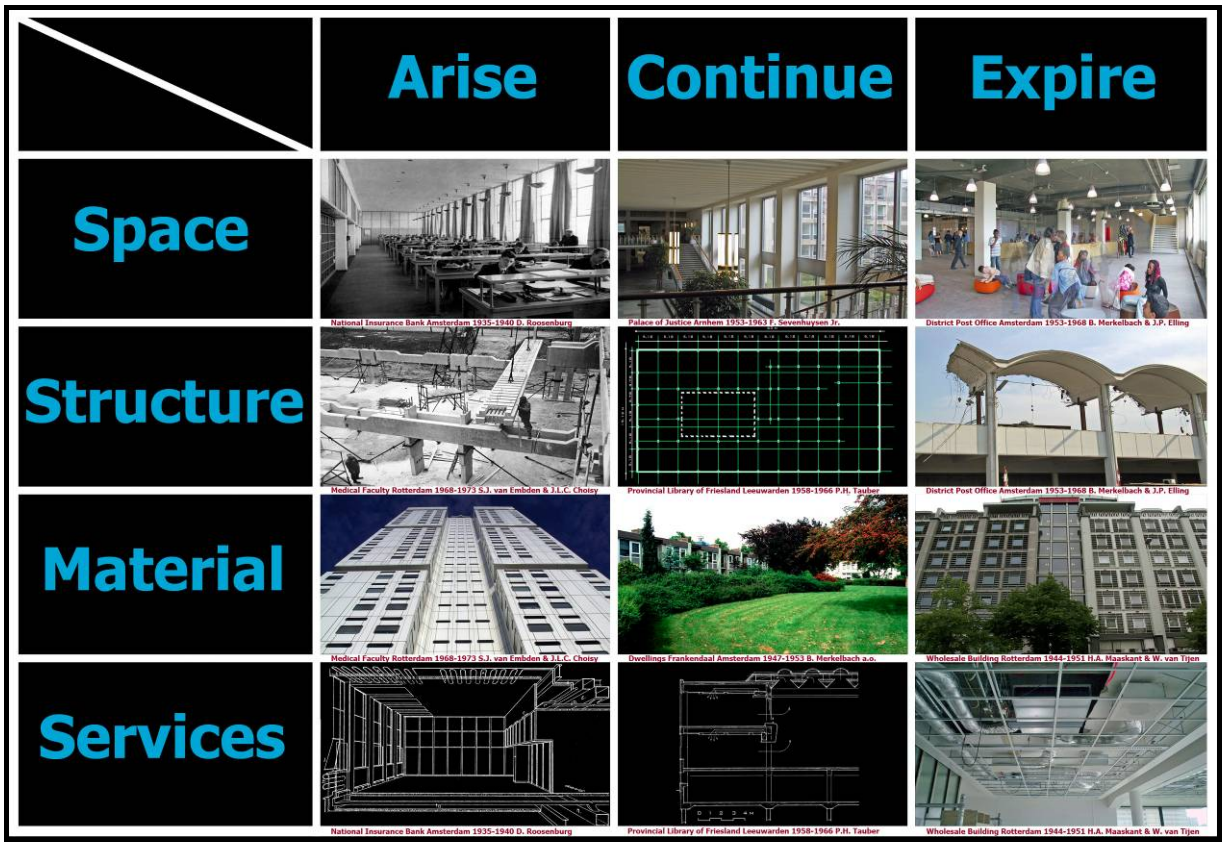


Figure 3: Analysing Building Construction Research Matrix.

ABC Research Matrix

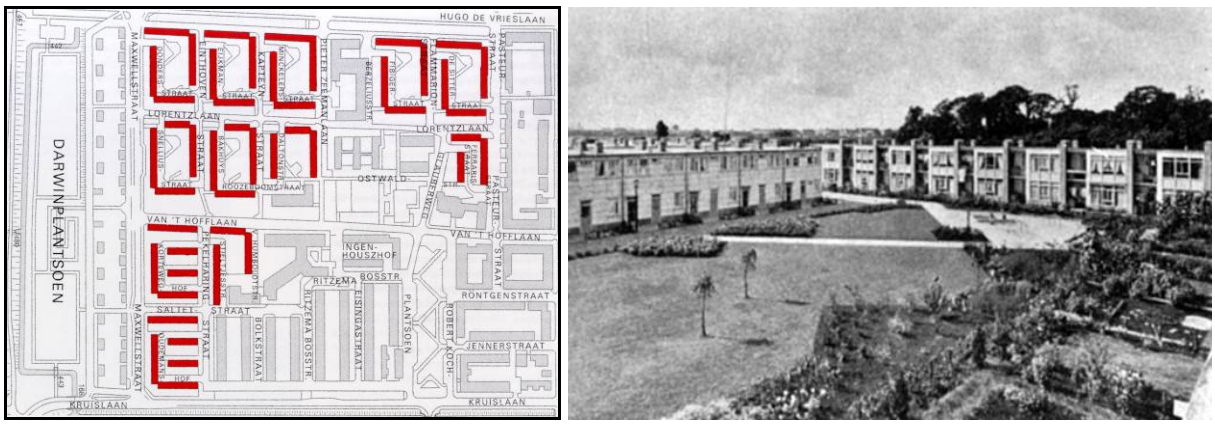
Context is the title of the first section in which the contextual aspects are discussed: commission; location; architect; typology and design process. The later sections, which consider the building itself in greater detail, are initially ordered by time: arising, continuing and expiring. Within these, the elements of the building are analysed at three levels: space (interior and exterior); structure (load-bearing elements and elements which determine the structure); material (shaping the space through materials which affect light, colour, texture, surface, sound, impression, smell, size and weight); building services (climate control, comfort, maintenance and communications). By combining this the actual ABC Research Matrix was created. See figure 3.

Case Study

Learning from existing buildings by investigating them should be a regular element in architects' education. A course on Restoration and Renewing, my working field at ®MIT at the Delft Technical University, should not be limited to preservation, but especially address new designs in existing contexts, where internal changes will always be necessary. Such changes can provide the impetus to ensure the survival of buildings. The method has can been applied as well for urban residential area as well for solitaire buildings. In the field of this conference I will present the research I worked out for Jeruzalem Frankendaal in Amsterdam as a commission from Bertus Mulder from the architects office 'Werkplaats voor Architectuur' in Utrecht.

Context

The architects were B. Merkelbach (1901-1961), Ch.J.F. Karsten (1904-1979) and P.J. Elling (1897-1962). The commission included the construction of 792 dwellings designed as duplex apartments (upstairs and downstairs) which could later be combined into larger houses. The urban design was developed by J. Mulder (1900-1988) within the Algemene Uitbreidingsplan (General Expansion Plan) for Amsterdam, under the supervision of C. van Eesteren (1897-1988). Interesting urban planning features include the first use of an open cluster structure around courtyards within a strip layout; the greenery designed by M. Ruys (1904-1999) and the playgrounds designed by A.E. van Eyck (1918-1999). See figures 4 and 5.

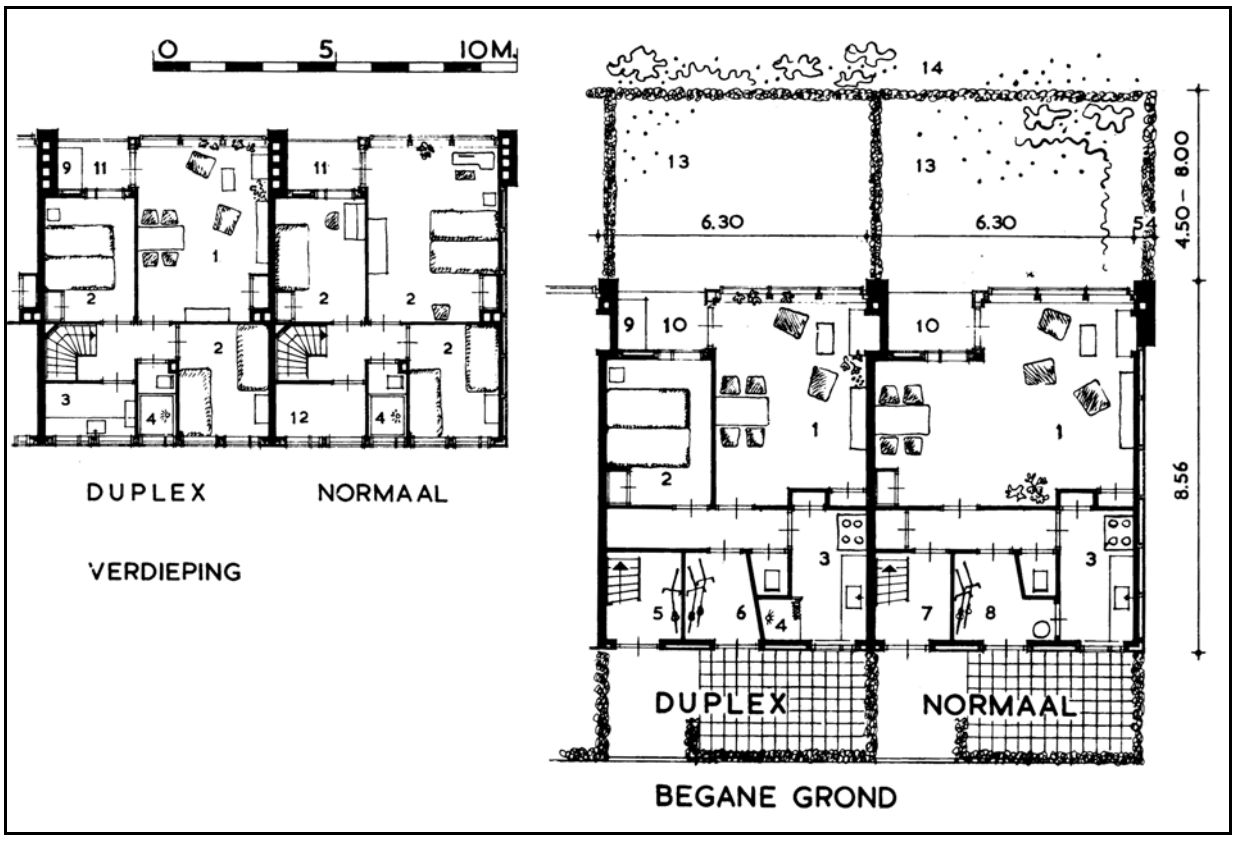


Figures 4 and 5: site plan and original appearance of one of the courtyards.

Buildings

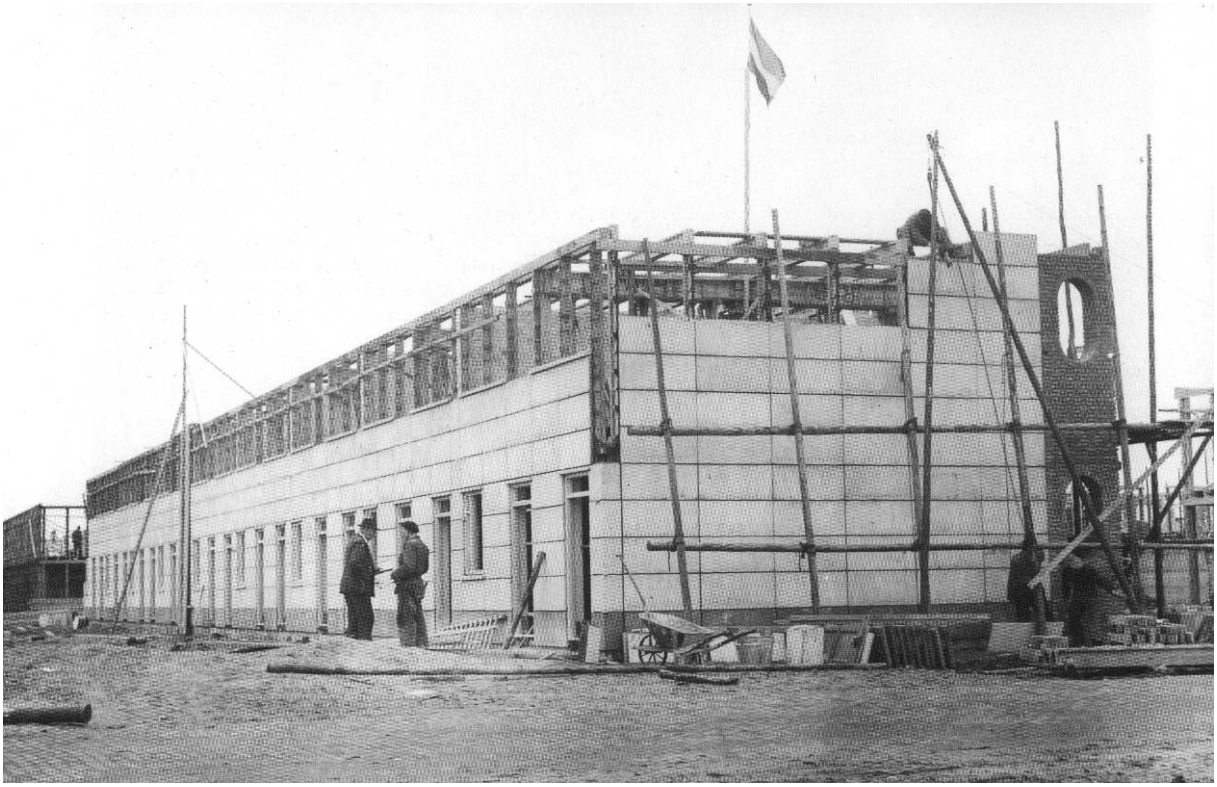
The houses were designed on a grid of 6.30 metres. The use of pre-fabricated concrete meant that this could be realised in a single span, allowing freedom in the use of the space. The facades were built with 50 x 116 cm concrete panels. On the side facing the garden, the facade was divided by the vertical chimneys in fair faced brickwork, balconies and loggias. At the front, the flat facades were divided by the vertical rainwater pipes, and only the front doors which would continue to be used after the apartments had been joined into one house had concrete canopies. All elements were designed to suit the dimensions of the Dotremont-Ten Bosch building system. This was the only project built in the Netherlands using this system. The roof had a slight pitch to the front of the house, hence rainwater fittings were only needed on this side.

See figures 6-11.



first floor, duplex & joined ground flour, duplex & joined

Figures 6 and 7: floor plans of the houses, initial design for duplex houses and joined after.



Figures 8 and 9: houses under construction, using the small element building system.

Figure 10: 1950 interior.

Figure 11: originally presentation of the facades.

Conclusions

The duplex design, based on the assumption of change; a building system using small concrete elements; the location in a garden village near the city centre of Amsterdam in the general expansion plan; Merkelbach as the architect and Amsterdam city architect; the first courtyard layout and the integration of environment and architecture; the question why only a few houses had been combined by 2002 and the inappropriate renovation (devaluation) in 1987; plans for demolition and later re-design started in 2001. Those were reasons to work out this case study. See figures 12-16.

The building system determined the design and provided opportunities for future changes. In 1987 the wooden window frames on the rear elevation were replaced by plastic frames, the loggias were closed up, the concrete was painted and the end elevations were fitted with cladding. In 2003 Bertus Mulder (1929), of the Werkplaats voor Architectuur, made a plan for the regeneration of the houses after the proposed demolition lead to protests from residents and architects alike. I got the change to practice my ABC Research Matrix at this project. I finished my research before Bertus Mulder started his (re)design project. Conclusions of my report where adopted by Mulder and made proposals possible for mature solutions.

Firstly, the changes made in 1987 would be undone. The support structure, determined by the building system, made it possible to join dwellings either horizontally or vertically. The original architectural design could be regained by fitting internal thermal insulation. The originally designed window frames could be reproduced because the drawings of it still existed.

The residents did not feel the need for refurbishment. They were happy with the low rent and the unique location. The target group of the duplex houses moved from families to single people, the elderly and students. The site became the victim of the new approach of the housing association, rather like that of a commercial project developer, to make money from the site through new building projects. However, under pressure it was decided to regenerate the houses. In 2005 the plans were postponed for an indeterminate period for financial reasons.

Figure 12: the facades in 2003

Figure 13: facade covered with wood and brick around 1987.

Figure 14: garden faced facades in 2003, roof detailing, balconies and chimneys have been changed.

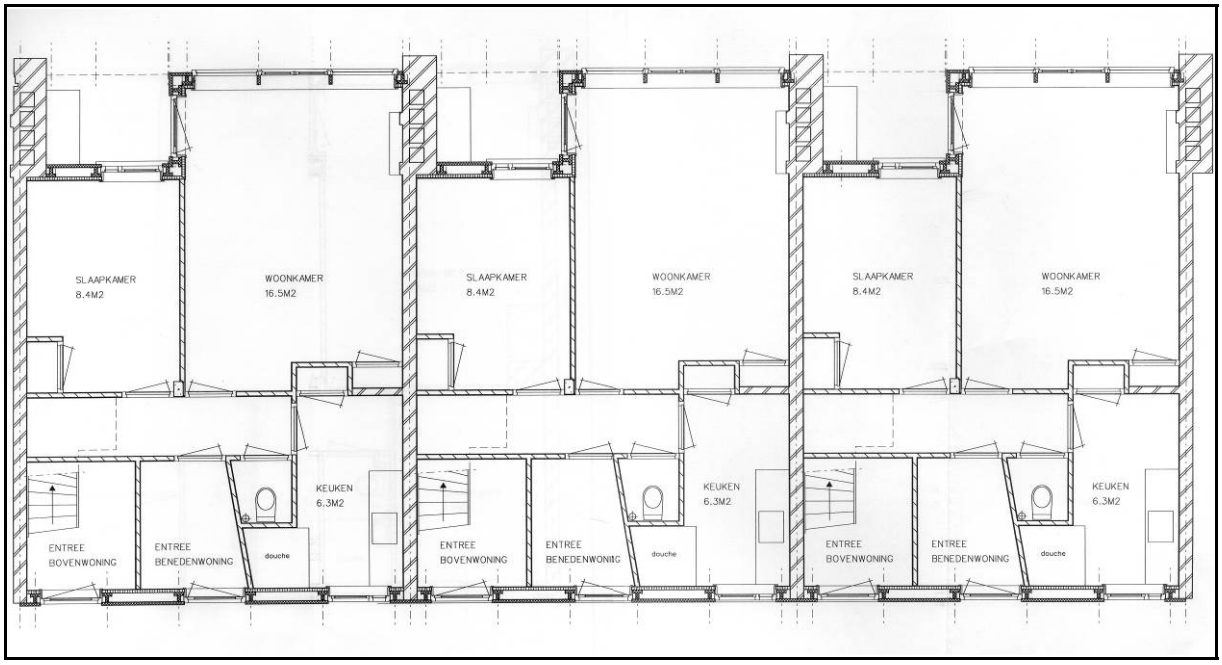


Figure 15: originally designed floor plans (1950).

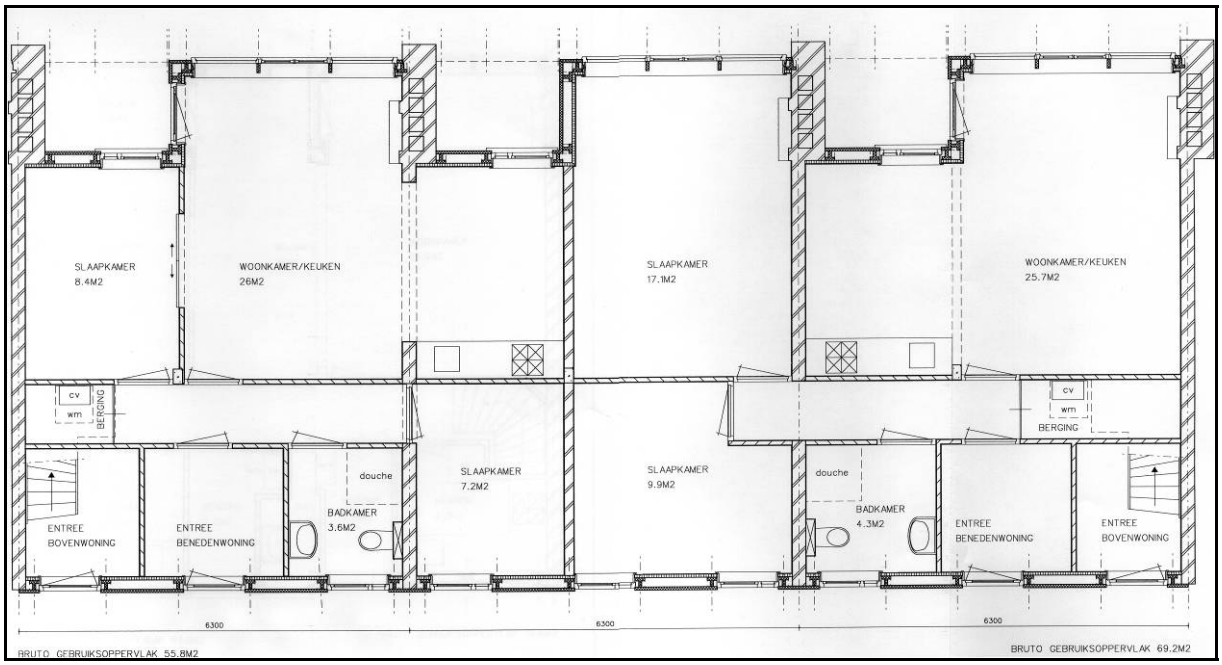


Figure 16: new design, combining houses, by Bertus Mulder (2003).

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