



Reflection Paper:  
**VAM Catalogue**

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Studio: Re-Housing graduation studio  
Track: Heritage & Architecture (RMIT)  
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## Introduction

The essay is a reflection of the research and design process and production of the graduation project in the past one year. The reflection is one part of the last stage of design of the graduation studio Re-Housing, which is under Chair of Heritage & Architecture at the Faculty of Architecture of Delft University of Technology. The theme of the studio is about transformation of existing post war housing stock built with non-traditional-building-methods (Heritage & Architecture, 2016, 8). VAM-system building is the main focus of the design and research approach discussed in this essay. One of the Intervam flats located at the Camera Obscuradreef in Overvecht, Utrecht (see Figure 1) was taken as the example for study. Research and design approach of the project is examined on three aspects, including the relationship between research and design, the relationship between the methodology of the graduation studio and the one applied for the project, and the relationship between the project and the wider social context in this reflection.

## Relationship between Research and design

The starting point of the design comes from results of the research. The design process started with the two-months research, during which the VAM system and the assigned site, Camera Obscuradreef in Utrecht, was intensively researched in three aspects: architecture, cultural value and building technology. The framework of the architectural, cultural and technical analysis is based on 6's system of Steward Brand (1994): site, structure, skin, service, space plan, stuff + 1's of "story". (Figure 2) Cultural value evaluation was assimilated into a matrix (Figure 3) which is scaled on the y-axis according to the 7 S; and different heritage values designated on the x-axis: age, historical, artistic, commemorative, use, newness, conflict value of Alois Riegl's (1928) theory. Technical analysis was integrated in one axonometric drawing (Figure 4). (Chung et al., 2017, 1) Architectural research was conducted within the framework of 7 "s", and possibilities and problems of each section were examined. The research products express chances, obligations and dilemmas of the system in fields of architecture, building technology and cultural value respectively.

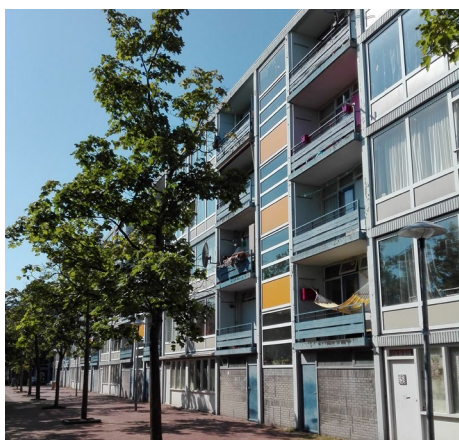


Figure1. Intervam flats in Camera Obscuradreef

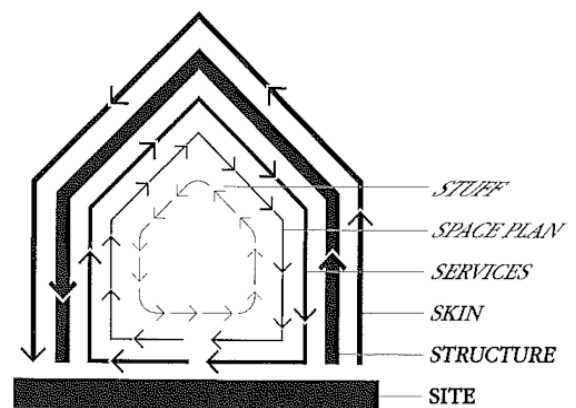


Figure2. The 'S'-system of Steward Brand (Steward Brand, 1994)



Analysing the research results, the main problems of the system is revealed. For my personal point of view, it can be concluded as the conflict between the Intervam flats designed for unitary residents in 1960s, which are large families, and more diverse tenant groups and their modern lifestyle. Current occupants include not only large families but also single tenants, who are mainly students and young commuters, starters and those with smaller size. For increasing number of smaller households, more small apartments with more open space-plan are in need. In addition, the new family structure and resulting new lifestyles are conflicting with the original plan, since they require better relationship between serving spaces and served spaces. The problem results from the interior space, which is difficult to be transformed in a large scale in most of the social housing cases, since emptying the apartments and relocating current tenants can be both time-consuming and costly. Moreover, the problems stated above can be universal to most of Intervam flats and neighbourhoods. Nevertheless, repeatedly re-designing different Intervam flats may result in repetitive work as well as unnecessary long design and construction period, since there are a large number of existing Intervam flats with similar problems and building typologies. Thus, instead of solving problems observed in Camera Obscuradreef, a sufficient solution for VAM system itself is essential.

The research question is thus proposed based on research products and resulting problem statement, which is: how to re-design Intervam flat to serve residents with diverse requirements in an efficient way? The solution is proposed as a catalogue of proposals for renovation of most of Intervam flats. Space plan is the major part of the scheme, and the minimum units of renovation is scaled down to one apartment to maximizing the flexibility of the scheme and reducing the cost of relocation. The re-designed floor plans prototypes are the first part of the catalogue, and fragments, including interior fragments and exterior fragments are also designed as part of the catalogue to serve the floor plan and make the products at various location to fit different urban context.

Detailed design of the fragments is influenced by further research on specific requirements of different tenants. Different special requirements shared by various occupant groups are researched and categorized in order to support design of variants. In the catalogue, each variant of interior fragments are to fulfil some of the requirements (see figure 5).

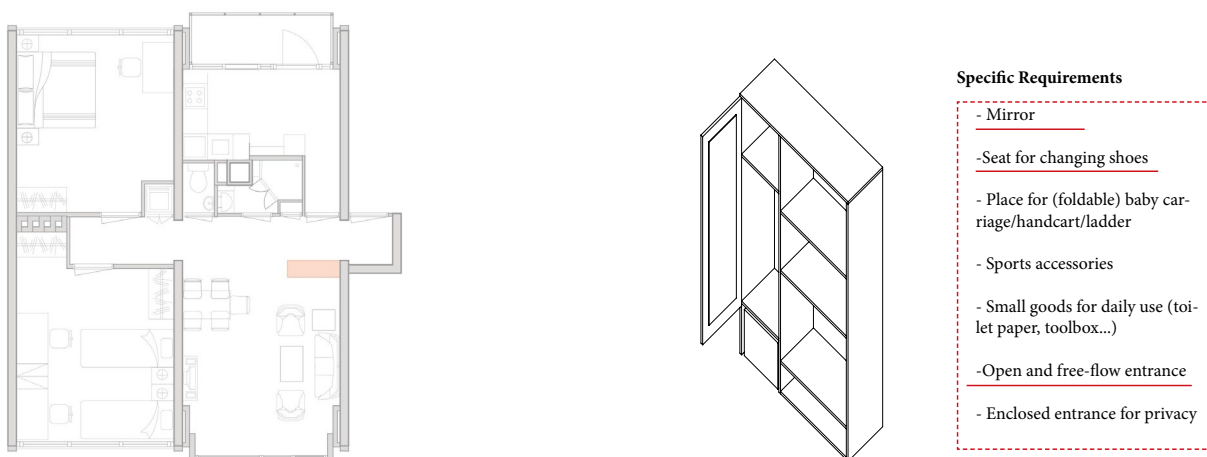


Figure 5. One page of the catalogue: the interior fragments



## Relationship between the methodological line of the graduation studio and that of the design approach

The Chair of Heritage & Design investigates research and design, which is conducted by methodology of bringing together “the fields of cultural history, technology, and architectural design in a single holistic approach”. (Heritage&Architecture, 2016, 5) (Figure 5.) The methodology of the design approach follows that of the graduation studio, In the whole process the proposal is designed and modified according to the research about architectural characteristic, figures in building technology and cultural value of VAM system.

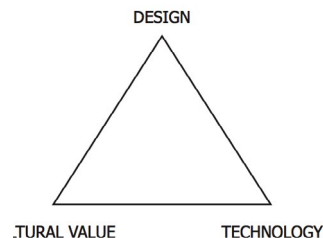


Figure6. Combination of design, technology and cultural value (Heritage&Architecture, 2016)

The general design methodology was inspired by the historical value of VAM system. The value embodied in the system is the spirit of Modernism. Modern architecture includes “the link between the phenomenon of architecture and that of the general economic system” (Peckham and Schmiereknecht, 2013, 26). Arising from standardization and rationalization, the general economic system propose requirement on minimum working efforts, which can be revealed in design and construction of Intervam flats. Developed for fulfilling urgent requirements of dwelling due to baby boom in 1960s, the starting point of VAM system is to provide large number of dwellings in limited time, and standardization is a vital working method to achieve the goal. Both Standardized floor plans (see figure 6) and prefabricated and standardized building fragments (see figure 7) were designed and applied for efficient design and fast construction. Exploration for a successful economic system can be regarded as historical value of VAM system.

Inspired by the original ambition of the system, the graduation project tries to react and update the historical

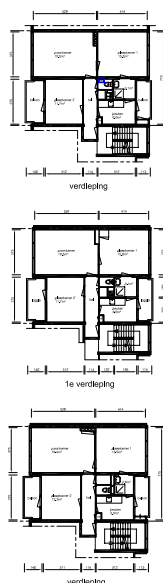


Figure 7. Floor plans of Intervam flats in Camera Obscuradreef, Marco Pololaan and Stanleylaan (Mitros, n.d.)

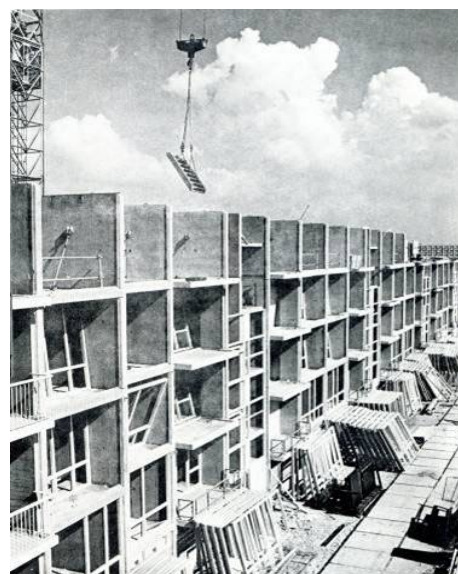


Figure 8. Construction of Intervam flats (Priemus & Van Elk, 1971)

value of the system and to provide standardized modules for most of Intervam flats for efficient future renovations. The design approach focuses on the system itself. Consequently, attention of the research and design was focused more on Intervam flats, including the floor plans and building fragments, than the urban context of one specific site. The design methodology was also developed to add new value to the system, including efficient renovation process, financial benefits, sustainability, and new use values based on requirement of new tenant groups.

Consequently Intervam flats at various locations were researched for design decisions. Since the research during P1 was concentrated on Camera Obscuradreef, the neighbourhood was treated as a lab during the P2 period. Re-designing floor plans was major task at that stage, and tests about various floor plans, possible combinations of variants, mixture of tenant groups and more potential adding values were executed based on its condition. The catalogue of floor plans (see Figure 8) was designed. Afterwards, in order to serving the system and improve the design, other Intervam flats in Overvecht and Kanaleneiland were researched during P3. The flats at various locations share similar building typology, while differ from each other in both position of shafts that leads to different sanitary design, and façade design. In the case interior and exterior fragments can fit different conditions but follow same design and construction principles were proposed.

The methodology of designing prefabricated fragments influences the focus of building technology. The majority of efforts were spent on achieving the re-designed floor plans and searching for solutions of fast installation of fragments with less influence on the surroundings. In general, criteria were set for choice of material, structural scheme and construction method, including easy delivery, quick installation, lightweight to be supported by the structure and with proper cost.

Nevertheless, the tight relationship between architectural design, cultural value and building technology are

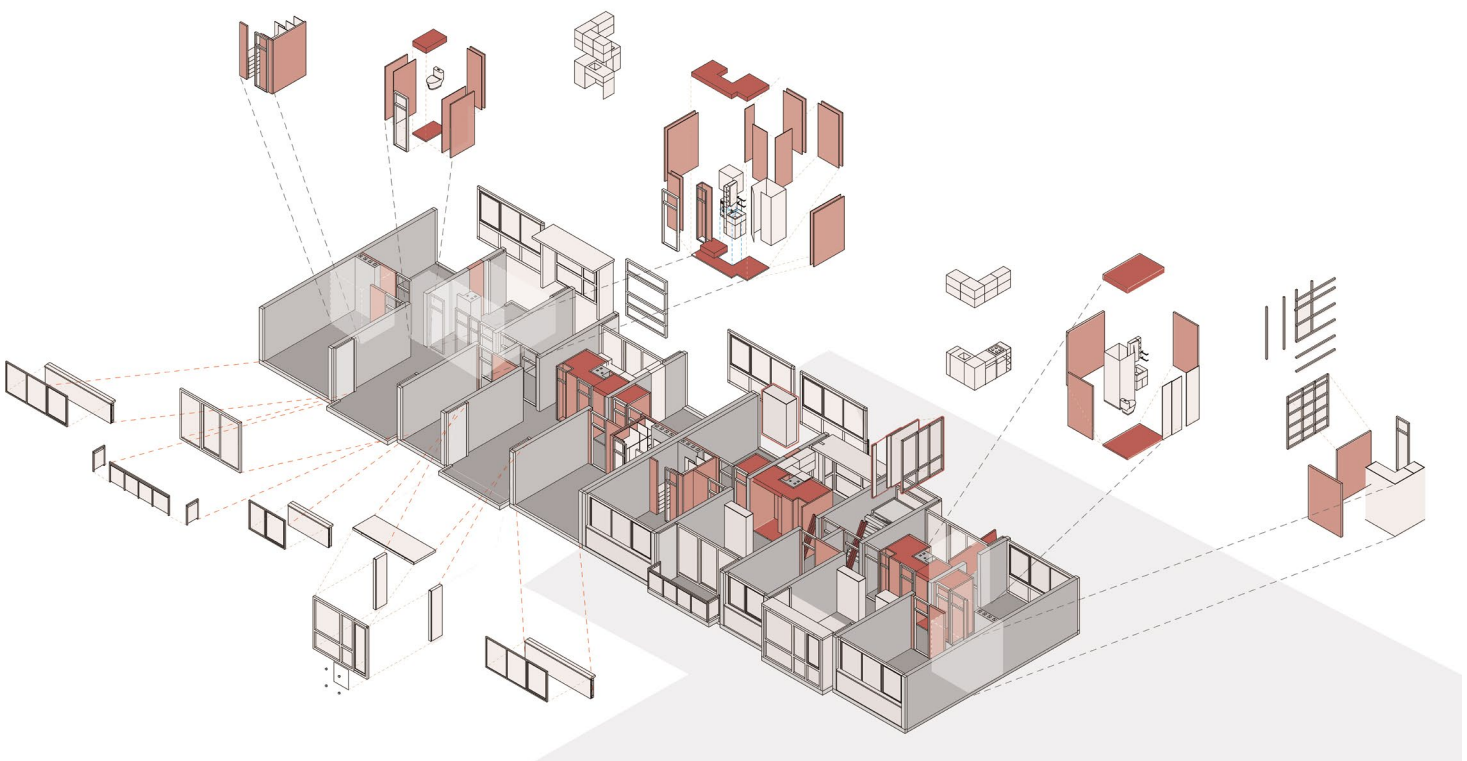


Figure 9. Assembly scheme of the graduation project

expressed on the limitation of the approach as well. The limitation is especially embodied in the relationship between architectural design and building technology.

The architectural ambition is to design a renovation method that can be conducted to one apartment with less affect on the surroundings, shorter construction period and provide better quality of living. The quality of living, in my opinion, should be achieved by transforming the space plan, however scaling the minimum renovation unit down to one apartment means changes on spaces are restricted. Kitchen and sanitary, for example, are restricted in a certain spot, since shaft, pipes and other evacuation facilities should be kept for other apartments that has not been renovated. (See Figure 10). The proposal of suspended balconies on facade is abandoned since for structural strength and thermal behaviour. Conversely, the building technology performance are limited by the architectural concept. The order of renovation may lead to relatively insufficient insulation of some part of the transformed apartment (see Figure 11). Keeping the original cladding untouched also results in small thermal bridge at some spots.

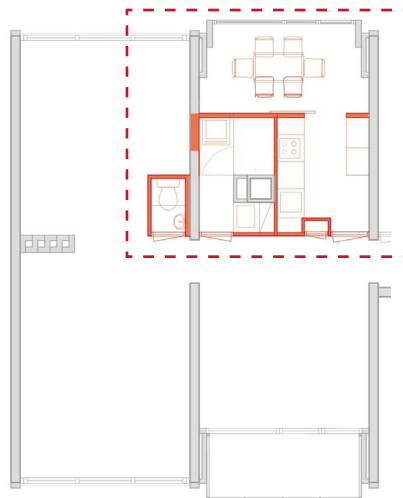


Figure 10. The re-designed floor plan

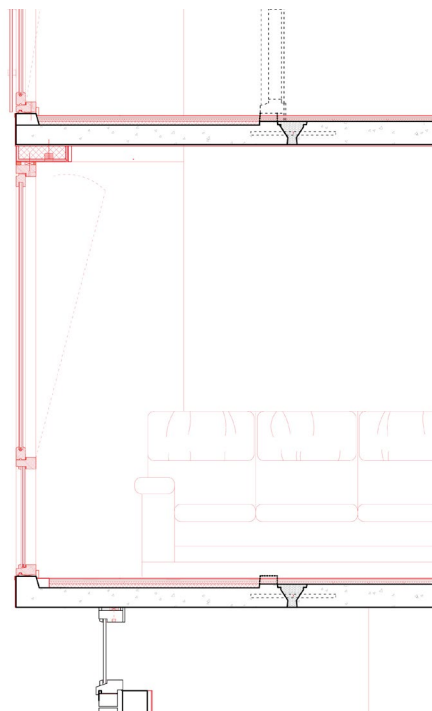


Figure 11. Detail of the enclosed balcony with insufficiently insulated floor

## **Relationship between the design approach and wider social context**

The design is inspired by the wider social context, and trying to contribute to the wider social context. The problems of housing shortage require not only large number of newly built dwellings, but dwellings with adequate condition renovated in an efficient process. The design approach, which is a catalogue of renovation proposals, tries to fulfil the requirement by exploring the possibility of applying standardization and mass-production to renovation projects. It aims at giving full play of individual efforts and variety, and yet taking full advantages of mass-production and standardization. As a result, housing cooperation may be able to provide sufficient renovated dwellings that can accommodate tenants with more diverse requirement, bringing both enhanced financial benefits for the housing cooperation as well as better quality of living for occupants. Additionally, the design can be regarded as an exploration on solutions for sustainable use of Intervam flats. The renovation may activate the Intervam flats and diversify their functions, and even serve as reference for other renovation and re-use of social housing.

## **Sources**

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