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2) Where do you situate your project within TU Delft? This should be as succinct as possible. graduadation manual: " the relationship between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)." max. 100 words.

During the design studio, The Advanced Housing Design, in the master track Architecture and Dwelling and research, I was introduced to co-housing. This form of housing is widely used on an international level to provide housing for target groups with low incomes. I applied this form of housing in my graduation project as a means to protect the target groups from the speculative and dynamic housing market in the Netherlands. The design consists of the collective and private living. The design serves as the new and affordable form of housing in the Netherlands. The architecture translates this housing model into a hybrid residential building.

1) How are research and design interrelated within your entire graduation project? How did your research and design investigations influence your final design? Graduation manual: "the relationship between research and design" That's the most important aspect of the report. If you find it helpful, you also may illustrate with key representations of your project (diagrams, drawings, renderings, photos) but it isn't mandatory. 600-800 words.

In 2017, I had to witness up close the extreme increase in housing prices and unmanageable rental housing sector. Finding an affordable home to suit your needs is difficult for many Dutch people. During the studio, I was introduced to co-housing which is practiced in several European countries. The introduction of this form of housing on a large scale would provide a solution for "affordable housing". Although co-housing is a possible solution, for many Dutch house seekers it is an unknown housing model. In my report, I studied the characteristics of co-housing and space typologies in this form of housing, but first I started with the causes of housing problems and market speculation in the Netherlands and how the housing market, municipalities/government, banks and the Dutch community can offer solutions for the introduction and continuation of co-housing. The acceptance and continued existence of co-housing in the Netherlands offers future perspective and a stable housing market for the financially vulnerable target groups. After researching the economic and social possibilities, I researched typological characteristics of collective living. I searched for essential key elements that cohousing consists of so that I can use them in my design that offers both collective and private living. Because my design consists not only co-housing, but also private housing units that can be bought and sold. The entire design, including the houses for sale, are under the management of the cooperative. The private housing units also attract families or couples who want to live for a long period. The literature and case studies showed that the degree of collectivity determines the resident profile and household structure. The more shared spaces and facilities in a cluster housing the scarcer the private spaces and facilities. This means that the degree of "living together" determines the private space and facilities. Families want more private spaces, facilities, and permanence in their homes. Shared living, which is cheaper, is more attractive to starters and housing seekers who are looking for shorter periods of time. By researching housing and space typologies, I obtained housing programs and building blocks that I based my design on. The output of the research is an input into my design. In my research I used 4 case studies, La Borda, Lacol, Barcelona en WagnisART, bogevischs buero architekten stadtplaner GmbH + SHAG Schindler Hable, München - Mehr als Wohnen (house A), Duplex Architekten, Zürich -WagnisART, bogevischs buero architekten stadtplaner GmbH + SHAG Schindler Hable, München -



Figure 1. Analyse drawing clusterhousing units and shared space with different amount of facilities

Kalkbreite, Müller Sigrist Architekten, Zurich. Each community building has its own characteristics and spatial qualities. The difference between the housing typologies analyzed in the case studies is in the amount of amenities available to the housing unit. Presence of its own facilities and extra rooms makes the residential unit less dependent on the shared facilities. The absence of these amenities encourages residents to use the shared amenities. Figure 1 shows a diagram that by withdrawing facilities in the private spaces, residents become more dependent on the shared spaces. Residents are encouraged to make more use of these spaces and thus interact more with fellow residents. The programming of shared living, based on the distribution of facilities, is used as a key element in my design. Cluster housing is programmed according to the key elements. Different space typologies that occur in the residential buildings form the basis of community building. While programming spaces in the floor plan, this was taken into account. Which space is private and which can be shared? How big should these spaces be, how does the circulation space work? Where are the collective spaces located outside the cluster homes and by whom may they be used? The themes that come up in these questions such as, housing and space typology, circulation, programming of facilities, and accessibility/user groups, came out of the research. During the design process, these themes suffered in the programming of the building to housing plan.

3) What is the relation between your research method and your gained research

insights? Here you identify the different types of research you performed and, what their (scientific) merits are. graduation manual: "Elaboration on research method and approach chosen by you in relation to the graduation studio methodical line of inquiry, reflecting thereby upon the scientific relevance of the work". This parts helps you to critically reflect on the merit of your work, scientific or other. 500 words.

In my report, I primarily used literature research and case studies. The literature searches consist of statistics, reports and studies from government agencies or commercial groups that have conducted research on behalf of municipalities and the government. In addition, I used studies by university researchers. Studies conducted by municipalities or government itself are market studies based on statistics. These form the basis of my interest, objective and problem statement. The introduction and first chapter of my report is built from these literature searches. The second chapter took a spatial turn through the case studies reviewed. In this section, I used floor plans and photographs for my analyses. The projects' websites provided imagery and the general information such as program, location, and size. The conclusions I drew in the third chapter came from the analyses I made in chapter 2. From the information given and my own interpretation, I arrived at key elements used in my design. Such as the use of circulation spaces, attractiveness of shared spaces, amenities in the private living units and programming of collective spaces. The analyses provide spatial data and assumptions for use. A shared kitchen or living room still does not mean that all residents use it equally. Researchers who support cohousing will be less objective in their research. Shared living will be glorified while the target group may have other housing needs. Although shared living could be an ideal solution in housing affordability, I have also considered the housing needs of the target groups in the Netherlands. Even residents of a cluster home must have enough space to live without the shared spaces. As a result, my design also

made room for private housing. Not every low- and middle-income housing seeker is in favor of cohousing. Offering co-housing as an alternative and low-cost housing model is more appropriate than forcing every low-income housing seeker to live in a cluster home. Thus, in addition to literature studies and case studies, it is also important to conduct field research about the target groups and their housing needs. I can therefore say that my design is a mild form of co-housing, adapted to the Dutch community and housing market.

4) How does your project relate to contemporary societal issues and challenges including the changing role of the architect? graduation manual: "Elaboration on the relationship between the graduation project and the wider social, professional and scientific framework, touching upon the transferability of the project results." 150-200 words.

By looking back several years, we have seen that the Dutch housing market is unstable, unpredictable and manipulative. The fragility of the market creates many problems and uncertainties among the low and middle income class. The cooperative housing model is primarily a tool to work against the fragile housing market. The affordable housing is realized by the cooperative. These are residents' initiatives that come together and program and realize their own housing challenge. While this model is used in many European countries it is quite new among the Dutch population. Legally, economically and socially it is not yet strongly represented. The introduction of this model in the Netherlands, acceptance and persistence provides opportunities for low-income housing seekers. Residents build their homes themselves and act as a non-profit organization. Architects collaborate more with future residents and serve as professionals who put housing needs into a design. Intermediaries are avoided and communication between designer and user becomes closer and more direct. As a designer it has been important to know the qualities and characteristics of co-housing well, these are the ingredients. In this way, this housing model can be applied in any neighborhood, city and even country by making adjustments according to local housing needs.

5) "Discuss the ethical issues and dilemmas you may have encountered in (i) doing the research, (ii, if applicable) elaborating the design and (iii) potential applications of the results in practice. 150-200 words.

The introduction of a new form of housing will create many questions among housing seekers. The literature I studied on co-housing paid less attention to the possible negative sides of the housing model. Each community building developer glorifies co-housing and seems to look at this housing model less objectively. Although these projects are realized by residents' initiatives, it is logical that the residents find shared living ideal, but how do the housing seekers view shared living who know quite little about this housing model. Population groups in different countries can show large differences in housing preferences, so this model can be chosen more quickly or not. Dutch people who have previously lived in student accommodation are partly familiar with the shared living model. Because their housing preferences of the target groups showed that families and solo households want to share less in their future home because they often had to do so during their study period. Introducing a fully shared living model would be a radical solution. On the contrary, the target groups strive for a more private living environment. The design of shared housing can only function through participation of future residents, this is different from what traditional housing developers are used to in the Netherlands.