JOURNAL OF WATER AND LAND DEVELOPMENT

e-ISSN 2083-4535

Polish Academy of Sciences (PAN), Committee on Agronomic Sciences
Section of Land Reclamation and Environmental Engineering in Agriculture
Institute of Technology and Life Sciences (ITP)

JOURNAL OF WATER AND LAND DEVELOPMENT
2020, No. 47 (X–XII): 176–185
https://doi.org/10.24425/jwld.2020.135045

Available (PDF): http://www.itp.edu.pl/wydawnictwo/journal; http://journals.pan.pl/jwld

Received 27.11.2019
Reviewed 17.06.2020
Accepted 26.08.2020

Waterside dwelling
Functional and architectural conditions

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For citation: Tulkowska-Słyk K. 2020. Waterside dwelling. Functional and architectural conditions. Journal of Water and Land Development. No. 47 (X–XII) p. 176–185. DOI: 10.24425/jwld.2020.135045.

Abstract

Contemporary challenges related to rapid urbanization, migration, deepening inequalities and climate change inspire to contemplate the future of dwelling. The article aims to present particular solutions in housing that use advantages created by the relation to the water. The aquatic neighbourhoods become a field of experience for residential architecture, where traditional systems are enriched with new elements and solutions. Some of these solutions can be brought back to the system and improve the overall catalogue of answers for the development of traditional dwelling.

The analysis discusses contemporary housing projects 1998–2005 and includes: the program overview, basic numerical parameters, accessibility details and relation to the context. Current water-related examples are accompanied by a reference to standard solutions developed in the modern era. All presented designs use traditional components of dwelling program, grouping day zone elements and separate them from private spaces. In basic parameters development is visible in bigger areas of living space. In terms of accessibility housing on or close to water gives new opportunities, as well as in relation to the context.

The paper presents research on different types of dwelling located by the water, with particular emphasis on functional and architectural advantages, which may be used to improve contemporary housing models. The proposed guidelines can be used in further studies on housing typologies in aim to develop more open and flexible spatial layouts.

Key words: *architecture, housing, modern dwelling, tradition, water*

INTRODUCTION

The concept of a dwelling is associated with an existential need to provide warmth, security and protection from the environment. Contemporary challenges related to rapid urbanization, migration, deepening inequalities, climate change and environmental degradation make us contemplate the future of dwelling. The search for new places enabling the realization of housing needs is accompanied by the development of technology and striving for balance with nature.

Floating house is not a novel idea. Villages on water have appeared in various forms and different parts of the world, such as Africa (Benin) [PIELKE 2013] South America (Bolivia, Peru) and Asia (Cambodia, China, Indonesia, Thailand and Vietnam) [WANG, WANG (eds.) 2014]. These dwelling systems may appear in a form resembling standard huts or as house boats. The Uros community lives on Lake Titicaca in Peru in houses built of the local totora reed [MORRISON 1992]. Some communities in Aberdeen, Hong Kong inhabit boats floating on the sea. Some authors (e.g. VANEECHOUTTE *et al.* [2011] and RHYS-EVANS [2019]) suggest that, in history of humans, the relationship with water was more important than we think. Modern floating homes appeared in the 1980s. The aquatic areas become a field of experience for single- and multi-family buildings, in which traditional systems are enriched with new elements and solutions [BAKER 2015]. Buildings like barges moored in a canal or port are equipped with traps connecting to the mainland and technologically advanced solutions that enable the environment to be clean and to save energy. Concept derived from the tradition of building by the water, an important part of, among others, Dutch and British heritage, affect the modern housing development, enriching the overall catalogue of functional and aesthetic solutions.

Literature on floating homes includes mainly researches related to environmental protection, flood risk prevention and new technologies involved in improving conditions for settlement on the water. Floating architecture becomes a more and more important topic related to the climatic change and floating structures become relevant for many areas in the world. In regions with variable sea levels or floods, these constructions can help to adapt existing settlement areas to new conditions. The self-sufficient energy and supply systems used for floating settlements can be adapted to rural areas. These issues are the subject of research, conferences and publications on existing and future solutions. Series: "Floating Architecture-Building at the and on the Water" presents papers of conferences organized by the Faculty of Architecture and Urban Planning at Brandenburg University of Technology Cottbus-Senftenberg (BTU) [STOPP, STRANGFELD 2020]. "Large floating structures: Technological advances" [WANG, WANG (eds.) 2014] is a compilation of key floating structures presenting the technological advances made in this field of engineering and may be used as a practical reference for ideas, research and design of developing urban projects to engineers and urban planners. Patricia MARTINEZ [2018] in: "Floating houses: Living over the water" describes a growing trend to build greener and more sustainable floating homes, presenting the examples from cities like Amsterdam or Seattle, in which grow floating neighbourhoods offering all the comforts and amenities of traditional houses. In the book "Living on water: Contemporary houses framed by water" [Phaidon Press 2018] we find examples of residential architecture with special relationship to water. Some of these houses are built on water itself, others have a water view or are reflected in water. Amphibious architecture is a distinct case, in which the technological solutions are used to adapt to the changing water level creating an alternative flood mitigation strategy. Amphibious construction also embraces some hybrid solutions. The weight of a structure may be partially supported by both land and water concurrently or elevated temporarily. Another strategy represents "wetproofing", in which users move from a lower to an upper level during the days of flooding. International Conference on Amphibious Architecture, Design and Engineering deals with broadly understood amphibious architecture. Subsequent editions are accompanied by events and publications on conditions, technologies, strategies and initiatives undertaken around the world. Amphibious design also includes the ideas of land use planning, potential sites analysis, social issues and policy concerns. The latest trends in amphibious dwelling architecture are presented in "Amphibious housing in the Netherlands", where we find various housing types developed for environment related to water such as floating, amphibious or pile dwellings, mound and dike dwellings.

The issue of housing development is addressed in literature mainly in aspects related to new areas of application and technical details or in the romantic approach to aesthetic and psychological relationships with aquatic environments. In this article we would like to concentrate on functional and general architectural issues related to living on or by the water.

MATERIALS AND METHODS

The article aims to present particular solutions in housing that use experiences and advantages created on relation to the water. On the base of the typical qualities and layouts specific for the traditional living space, we look for the advancements applied in dwellings related to water and further – expected impact on the development of a modern apartment/house.

Neighbourhoods related to water become a field of experience for new ideas, in which standard elements are enhanced with new solutions. We suspect that some of these solutions can be brought back to the system and improve the overall catalogue of functional and aesthetic answers serving the dwelling development. We assume that the origin of the modern dwelling lays in the achievements of modernism, hence the analysis embraces contemporary waterside housing projects (1998–2005) referenced to key features of a standard apartment or house. To get a picture that reflects the complexity of the functional and architectural problems, studies embrace: the program of the object, including residential and service rooms and their interrelationships, surface parameters illustrating the comfort of living and affecting the standard of the object, the way of getting inside and relations with the outside, layout and availability of day/common and night/private zones, and response to the context. Research is based on the qualitative case studies and includes examples of contemporary water-related residential projects, which are referred to historical models of dwelling. This method was chosen to define the most important features affecting the functions and layout of the apartment as well as to indicate the characteristic advantages developed in water-related houses.

Studies embraced different scale and type of buildings to highlight analogies and differences related to:
– program components serving the functions and activities inside the flat;
– surface parameters, determined by: total area of the flat (measured along the outer contour of the walls) at the level of the day zone, including balconies and terraces, living space (all rooms), kitchen and the smallest bedroom area; in the examples concerning multi-family housing, a characteristic residential unit was selected for analysis;
– availability, i.e. the number of entrances and connections with the outside;
– internal circulation, including zoning;
– situation in the context.

Criteria for the selection of the case studies:
– cases representative for three different types of housing: 1) individual extensive, 2) individual multiplied / grouped and 3) multifamily;
– time range including contemporary projects that can be considered a manifestation of a modern housing (1998–2005);
– structures representing different relation to water: 1) amphibious, 2) traditional, adjacent to water, 3) traditional, on the water.

The one-family extensive structure is represented by an amphibious house in the Gouden Kust in Maasbommel which was designed by Boiten Raadgevende Ingenieurs and Factor Architecten in the first years of the 21st century. Low and dense type is represented by terraced houses Nieuw Terbregge by Mecanoo (Rotterdam, 1998–2002). Finally, the multi-family housing was analysed on the base of Silodam designed by MVRDV in 1995–2003 in the port of Amsterdam.

Research questions:
- what are the characteristic features of the internal layout that distinguish the residential buildings related to water from the traditional ones?
- if and how relation to water influences the program and function of dwelling object?
- what guidelines resulting from the analysis of buildings on the water can be formulated for a traditional dwelling to improve its functionality?

RESULTS AND DISCUSSION

GOUDEN KUST

Boiten Raadgevende Ingenieurs, Factor Architecten, 2005, The Netherlands: Maasbommel. The floods that hit the Netherlands in 1993 and 1995 led to increased interest in the concept of floating homes. The first amphibious solutions are located in Maasbommel on Lake De Gouden Ham, where a total of 46 residential units were built on water. The project uses two types of houses: floating, which lie on water thanks to a concrete float (14 units) and amphibious (32 units), which float only when the water level rises [NILLESEN, SINGELENBERG 2010]. These houses go up during high water due to their foundation on a concrete body equipped with pile foundations. The free connection to the Maas River causes significant fluctuations of water level. During periods of normal water (with a NAP ratio of +2.60 m), buildings at the foot of the dike, where the ground meets water, lie on dry ground with a free access to the gardens on the slope. When the water level rises (NAP +3.10 and above), the garden slowly submerges and the house moves up. In the planning stage designers expected that the structures would float once every five years [VROM 2001]. In February 2011, the solution was tested for the first time in high tide.

Both types of houses were built according to a similar principle and set on a concrete float supplemented above with a lighter timber frame structure. Concrete elements weigh 72 t, and skeletal structures – about 22 t. The low centre of gravity ensures stability. Ordinary concrete with aggregate providing waterproofness was used to ensure water resistance. The joints have been reinforced with tight sealing strips. The floats measure about 2 m in height and their interiors can be partly used as basements or additional bedrooms. Fluctuations of water level, and hence, different heights of the residential boats in relation to the embankment, require flexible connections of the installation, taking into account a maximum height of 4.5 m.

On the ground floor of one of the 32 amphibious villas there is a kitchen, living room and large terrace open to the water. On the first floor there is a bedroom, bathroom and separate toilet. On the lowest level there is an additional bedroom and a large storage space. The wide spaces between the houses allow unrestricted views to the water. Some residents have created flood-proof gardens, choosing plantings that can handle occasional draft. Terraces with views in the sheltered back of each residence provide privacy.

Fig. 1. Plan of the house in Maasbommel; source: own elaboration

Main features and parameters:

– program: utility room, entrance, rectangular living space, kitchen – available through the living room, toilet (ground floor), bedroom, bathroom and toilet (upper floor), bedroom and technical room (float level);
– surface parameters: gross area: 102 m^2, usable floor space: 98 m^2, kitchen area: 11 m^2, smallest bedroom rea: 12 m^2;
– accessibility: pedestrian access via the terrace/gangway shared by neighbours; possibility of arriving by boat, no places for cars;
– circulation/zoning: entry through the hall, separated stairs up; private area upstairs, additional bedroom at float level.
– relation to the context: thanks to the combination of units along the causeway and the joint gangway, possible wide views towards the water.

As a historical reference for a low-density house we use the concept developed by Le Corbusier at Cité Frugès (1924–1926, France: Pessac/Bordeaux), where a new type of apartment has been created on the base of modern industry potential. This goal was achieved by standardization, which involved, among other things, the use of modular geometric elements. In the application of the module, Le Corbusier saw the possibility to improve the construction process through prefabrication, as well as to execute the idea of a machine for living, which realized contemporary needs by standardized forms [BENTON, HUBERT 2016].

Rationalization of solutions, the use of various combinations of basic modules [GANS 1987], concerned five types of houses. Plans of all units were based on two modules, basic: 5 m by 5 m and half: 5 m by 2.5 m, put together in various combinations. Le Corbusier presented an innovative approach to standardization, which differed significantly from the German and Dutch attitude (where complex compositions were created by repetitions of homogeneous parts). Apartments, regardless of their size, were zoned. The living area included a living room with open or separated kitchen, the private area – bedrooms, bathroom and toilet. Similar to the prototypic Maison Citröhan [DAVIS 2005], the structure was made of reinforced concrete frames. The walls did not have a supporting function. Le Corbusier used the Dom-Ino system, which enabled the creation of various combinations of solid and emptiness inside the frame. The architecture was dominated by simple blocks of various proportions, cut through with banded windows and enriched with additional elements such as stairs, roofs and terraces.

Program included separate kitchen and L-shaped living space on the ground floor and 2 bedrooms and a bathroom on the upper level. Usable floor space was: 77.5 m^2, with kitchen of 6.5 m^2 and smallest bedroom – 9.5 m^2. Circulation included zoning with private area located upstairs.

NIEUW TERBREGGE

Mecanoo, 1998–2002, the Netherlands: Rotterdam. Nieuw Terbregge is located in the northern suburb of Rotterdam, near the Bergse Voorplas Lake. It was designed as a set of residential units with gardens and at least two parking spaces per apartment. The goal was to create houses

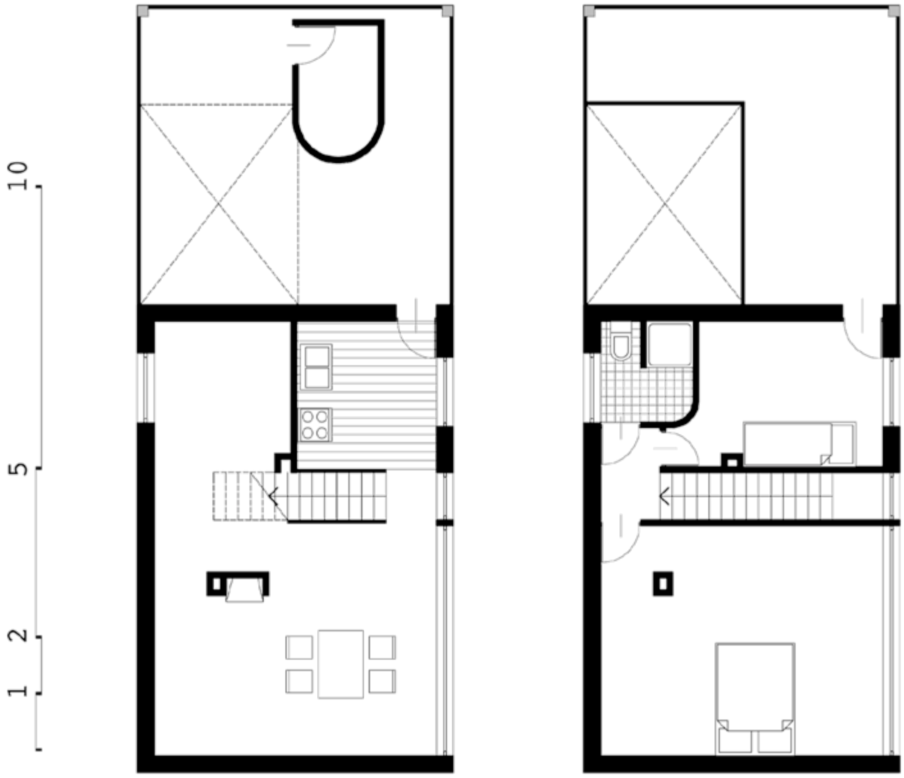

Fig. 2. Plan of the house in Pessac; source: own elaboration

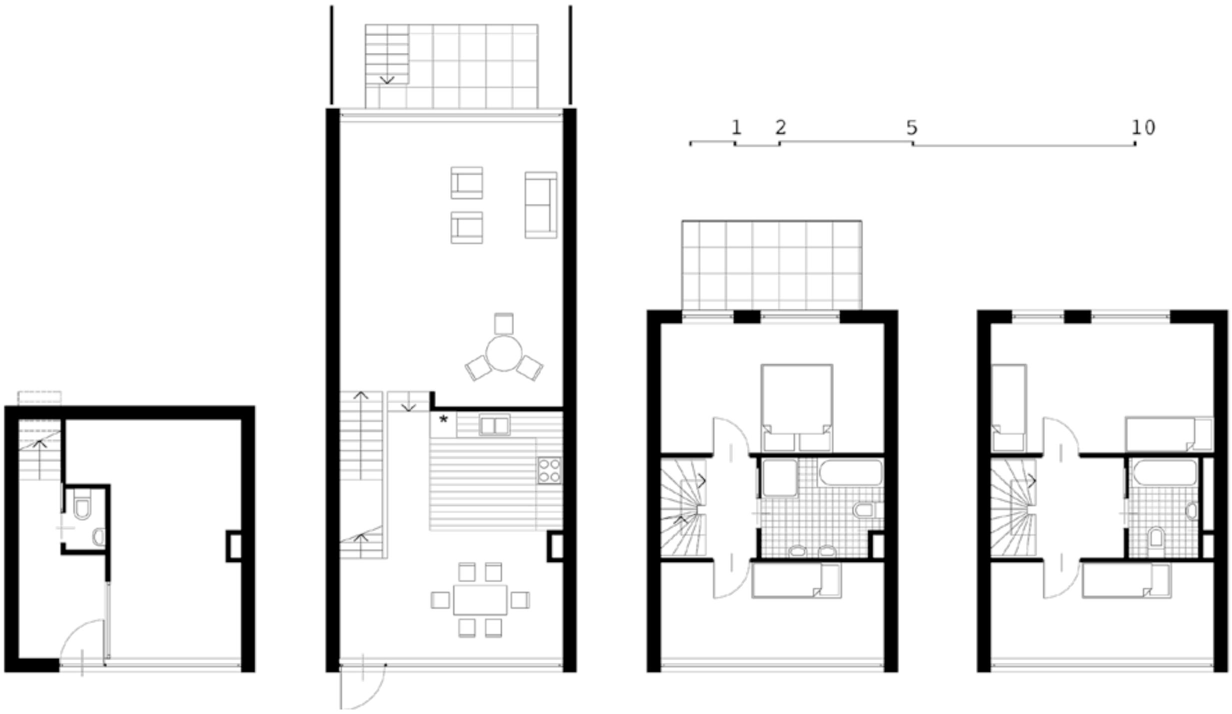

Fig. 3. Plan of the house in Nieuw Terbregge; source: own elaboration

with a flexible internal layout, with cars parked close by, a safe and clearly visible playground for children. The answer is four peninsulas/colonies consisting of double rows of segments connected by a wooden terrace that is the equivalent of a common courtyard. On the floor below, there is a garage covered with openwork gangways and openings enabling the overgrown trees to connect two levels [VALLE 2007]. Between the peninsulas, on the narrow canals, there are pedestrian bridges connecting the neighbouring colonies. Finished in raw wood, they are an element emphasizing the informal nature of common spaces and provide an additional playground for children. Technical facilities (such as a central heating node and a room for trash containers) serving the community are located at the street side, near the garage entrance. Terraces are used for fun, recreation and neighbourly activities. Kitchens and dining rooms open through wide windows to the courtyard, encouraging using it as an extension of the house interior. The living room on the other side is equipped with a small terrace above the canal and an equally wide opening to the water. The interior layout of the house is typical. At the garage level there is a small hall, toilet and utility room. Two levels above the living room and kitchen contain bedrooms, two on each floor and bathrooms. The facades are divided into rectangular vertical fields finished with larch wood and white plaster. From the channel side, the rhythm of the houses emphasizes the use of various materials in the living room zone, from plywood in various shades of brown and red to sheet metal cladding [BULLIVANT 2003].

The innovative housing complex designed by Mecanoo is developing a high intensity model into a concept that takes into account the new nature of common space. To separate car traffic from pedestrians, the functional zones are arranged one above the other. Each house has convenient access to the garage and pedestrians have a courtyard at their disposal. Wooden openwork courtyards, with a floor entering the apartments interior, become an innovative interpretation of a cosy street or yard, which is a playground, extension of the house and a meeting place offering a holiday atmosphere. Bridges and passages between the colonies introduce an element of adventure, strengthening the sense of freedom and emphasizing the informal character of the neighbourhood. The connection with water is highlighted by the exit from the room directly towards the canal, providing the possibility of using the boat as a mean of transportation.

Main features and parameters:

– program: kitchen and dining room, living room (ground floor), 2 bedrooms for 3 people, bathroom (upper floor 1), 2 bedrooms for 3 people, bathroom (upper floor 2), utility room and toilet (garage level);
– surface parameters: gross area: 79.5 m^2, usable floor space: 137 m^2, kitchen area: 8 m^2, smallest bedroom area: 11 m^2;
– accessibility: pedestrian entrance from the garage level, entrance from the shared terrace/courtyard to the kitchen, entrance from the water side, via the private terrace into the living room; parking spaces for cars – in a shared underground garage;
– circulation/zoning: access to the living space through the kitchen with dining room or directly from the terrace above the water, stairs to the first floor by the kitchen; private area on upper floors.
– relation to the context: a housing estate with an autonomous, original layout, ensuring access to water and contact with a shared terrace/courtyard, developing the traditional layout between the street and the garden.

Typical compact plan of a terraced house is represented by the unit designed by Jakobus Oud in Kiefhoek estate (1928–1930, Rotterdam). The dwelling program was

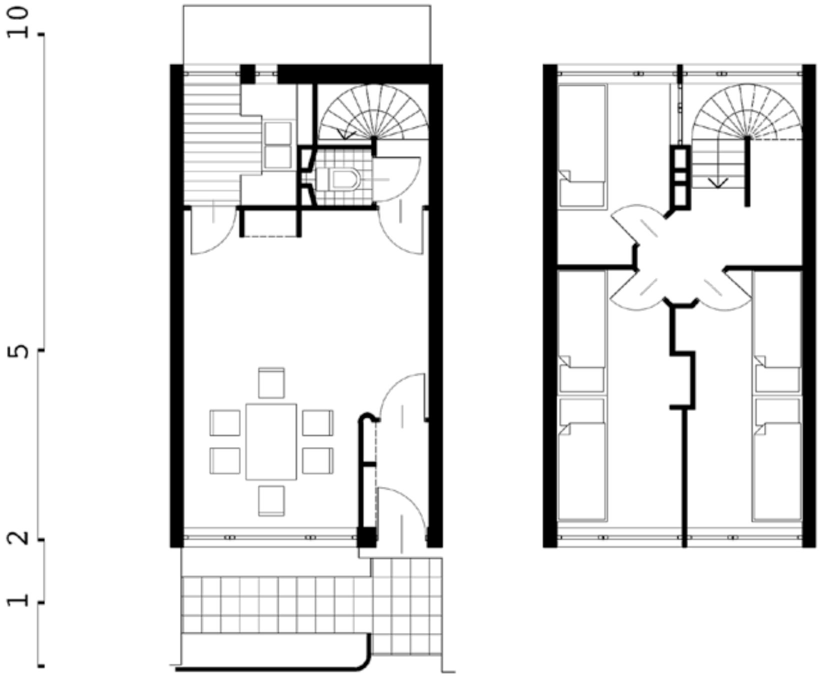

Fig. 4. Plan of the house in Kiefhoek; source: own elaboration

closed in two levels 4.1 m by 7.5 m. On the ground floor there was a small hall and living room at the entrance from the street, as well as a kitchen, toilet and a staircase. Initially, it was planned to equip the apartments with built-in wardrobes, an ironing board, a cabinet and window between the kitchen and the room, a shower and a washbasin at the sleeping level, which were given up due to cost savings [OUD 1930]. The kitchen was supplied with a sink, drainer and cupboard. It was ventilated through a pipe installed by the chimney from the toilet above the roof. A semi-circular staircase led upstairs to three bedrooms with bevelled corners forming a minimum-sized hall. Oud has used limited resources and every fragment of space to create a fully-fledged, functional apartment, ensuring optimal living conditions. In a very small parents' bedroom, he designed an additional window to the staircase, which optically expanded the space. The basic type of house was dedicated for a family with six children. Financial availability, fast implementation and high quality were the priority. Oud was looking for a car-for-living solution ("Wohn-Ford"). He carried out numerous analyses, which aim was to find a good functional system in the possible smallest area [OUD *et al*. 2001]. Hence, he derived a span of 4.1 m, considering it to be the correct measure of the width of the room, which also doubled the width of the bedroom. It also gave the right size of the plot, in accordance with the planned divisions of the ground. The structure has been rationalized in terms of costs, time and future exploitation. The massive load-bearing sidewalls were made of brick, the ceilings included 14 cm by 30 cm concrete beams (eventually made as wooden). The external facades were prefabricated and inserted together with window and doorframes. Dimensional standardization referred to all building elements, which facilitated the implementation and assembly. The walls were finished with white cement plaster.

The program embraced living space on the ground floor and private zone on the first floor. Usable floor space was limited to 49 m^2 with the smallest bedroom area of only 5 m^2.

SILODAM

MVRDV, 1995–2003, Netherlands: Amsterdam. As a part of the expansion and renovation of western docks in Amsterdam, elements of the old port infrastructure were integrated into the fabric of the city to create a new district with a mixed function. The pier was equipped with an underground car park and remodelled silo buildings. A new residential building was planned at the end of the wharf, in the current of the Ij River. Silodam, which was completed in 2003, contains 157 different residential units, including 142 private apartments and 15 apartments for rent, 600 m^2 of commercial space under a spacious terrace from the east, a marina for small boats in the open colonnade at the base of the building and two automated parking garages for 109 cars inside the dock. The varied structure of the block resulted from the need for living spaces of different size, maintenance costs and ownership [RYAN 2012]. Apart from flats for rent or ownership, the building includes offices, work, commercial and common places. The ten-story, rectangular block, divided into four sections – "houses", is a mixture of types of apartments and semi-public interiors in contact with water. Each part has a different functional layout and plan. The use of a 5.4 m module resulted in a flexible, repeatable structure. Five transportation verticals, connected to a horizontal network of corridors and galleries, service the whole. A sequence of semi-public spaces was created: from the gallery through the gaps and corridors to the other side and above. All houses are connected to the main hall, public terrace, boat dock, barbecue area, garden, library, fitness room and

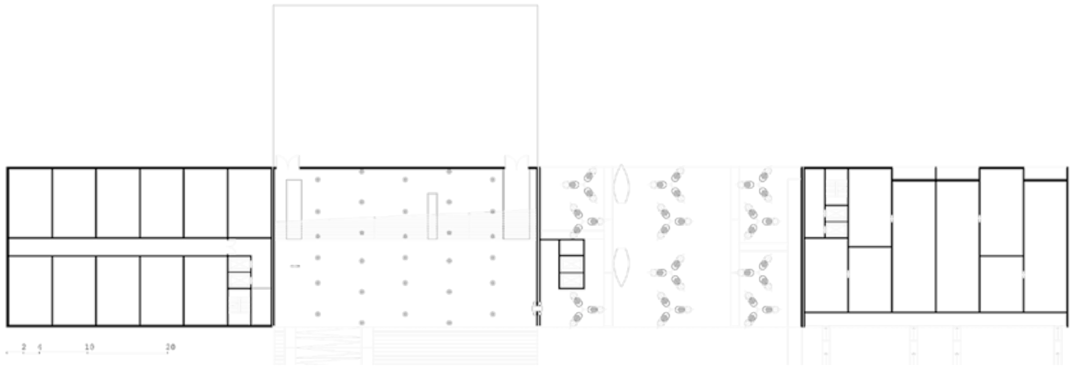

Fig. 5. Plan of the lower level of Silodam; source: own elaboration

playground. Silodam resembles a set of ocean containers or a technological composition of cubes constituting templates of window and wall materials, details and colours. Windows in various sizes and shapes are intertwined with zones of glazed curtain walls and straight balustrades. The use of bright colours: orange, blue, white, red, terracotta and black enhances the impression of diversity [IBACH 2014].

Silodam is a new interpretation of Dutch functionalism. The minimalism of the shape harmonizes with the industrial neighbourhood. Standing on the terrace separated from the pier by the body of the building, we take advantage of the peace, silence and distant views of the Amsterdam port. The diverse group of residents includes owners of exclusive apartments, tenants of economical dwellings, groups sharing spaces of a co-housing character and hotel guests.

Although it is not a floating object, Silodam draws on the tradition of building at the interface with water, which is an important part of the Dutch heritage. It occupies a place taken from the sea, enables reaching the house by water. Like a barge moored in one of the channels, it emphasizes its dual nature with a line of gangways connecting the mainland with a living place. It is also technologically modern. It cares about keeping the environment clean and manages energy efficiently.

Main features and parameters:

– program of the apartment: varied, depending on the type of unit, traditional layouts divided into rooms and studio type (open space), hall, kitchen, living room (entrance level), 3 bedrooms for 4 people, bathroom, toilet, utility rooms (level up or down), balconies;
– surface parameters: gross area: 111 m^2 (one level), usable floor space (both levels): 159 m^2, kitchen area: 20 m^2, smallest bedroom area: 10,5 m^2;
– accessibility: entrance from the public corridor; no parking spaces for cars;
– circulation/zoning: independent entrance to the living space and the kitchen, stairs to the first floor along the living room; private area upstairs.
– relation to the context: a residential in open space, without close proximity, giving the possibility of distant views, negating the traditional layout between the street and the garden.

The evident reference for Silodam, due to its scale and multifunctionality, is Le Corbusier’s Unité d’Habitation (1947–1952, Marseille). It was located in a large park, with the main façades facing east and west. The model orientation allowed access to sunlight for every apartment. The north wall was completely closed due to cold winds blowing from this direction. The 56 m high building was designed on a rectangular plan with dimensions: 165 by 24 m. The block was placed on pillars, leaving the ground floor as open space for car and bicycles parking and pedestrian crossings. Only a hall with reception rooms and staircases was separated.

Pilotis were the key solution in Unité d’Habitation. As the first of the points of modern architecture, they were designed to free the basement for pedestrians and cars, as well as grass and trees [MUMFORD 2002]. Their role was to unlock the perspective so that the narrow ravines of the streets between the buildings no longer defined the view lines. 337 apartments in 23 types were designed in the building, from single rooms to flats intended for families with eight children [SBRIGLIO 2004]. Typology was based on the same concept of two duplex apartments that connected on both sides of the inner street. 213 units represented two basic types of projects, 98 m^2 of area each. These standard units occupied the entire depth of the building and had two loggias – on the east and west facade. Other types incorporated about 20 larger apartments and 79 smaller ones, 26 of which were single level. The service was provided by corridors running along the long axis of the building, called internal roads, one per three floors, as in the Narkomfin building in Moscow [GINZBURG 2006] and Hans Scharoun’s hotel house for single and childless married couples designed for the WUWA exhibition in Wrocław [URBANIK 2002]. Most flats consisted of two levels connected by an internal staircase. The 4.80 m high living room opened onto the park through a large 3.66 m by 4.80 m window. The kitchen was centrally ventilated; its equipment included a four-burner electric kitchen with an oven, double sink, fridge and worktop.

Unité was the result of Le Corbusier's twenty-four years of study on a modern apartment, housing estate, city. It was a prototype of a new building expressing the way of life of the machine age people and a symbol of the fundamental reform of modern urban planning [SHERWOOD 1979]. He created conditions for a harmoniously developing community in all the basic activities of everyday life.

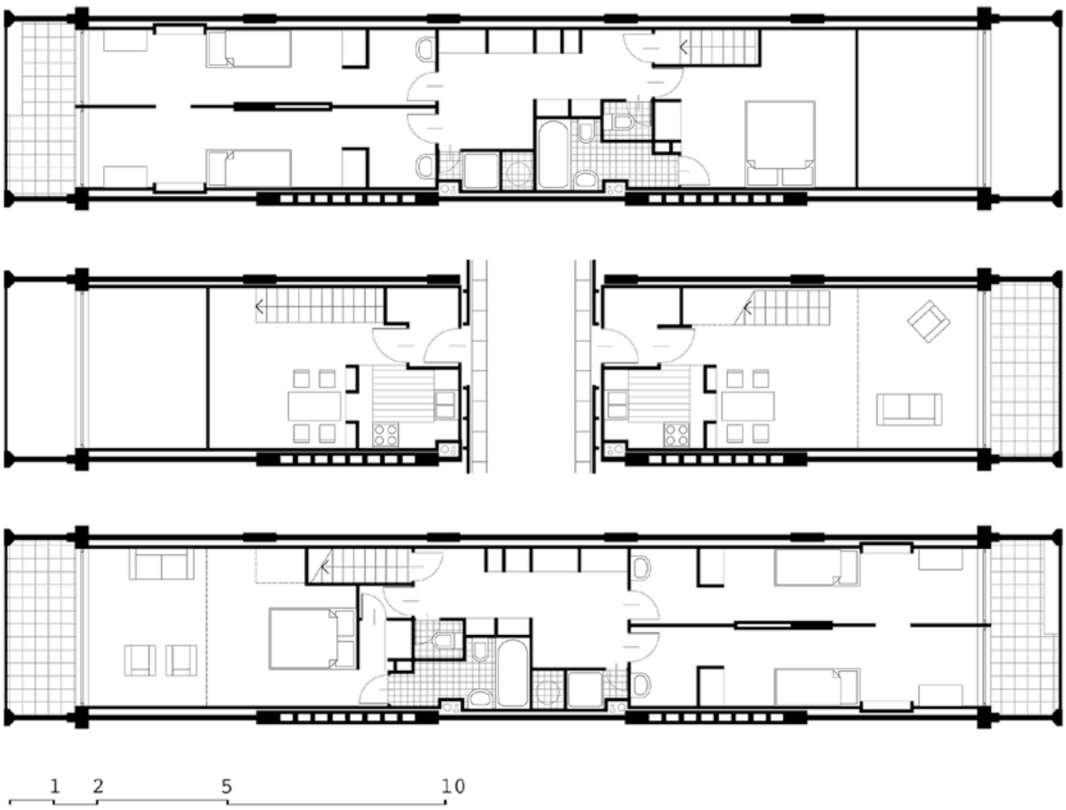

Fig. 6. Plan of the apartment in Unité d'Habitation; source: own elaboration

Main features and parameters:
- what are the characteristic features of the internal layout that distinguish the residential buildings related to water from the traditional ones?
- if and how relation to water influences the program and function of dwelling object?
- what guidelines resulting from the analysis of buildings on the water can be formulated for a traditional dwelling to improve its functionality?

DWELLING PROGRAM

While comparing the classical dwelling layouts with contemporary housing on water, we look for analogies and new or innovative elements. All three present-day examples use traditional components of dwelling program, grouping day zone elements and separate them from private spaces, such as bedrooms (Photos 1–3). Fulfilling the expectations of a contemporary user requires high standard sanitary equipment and comfortable service areas. The added value lays mostly in multilevel relationship with water resulting in wide views but also brings the reinterpretation of a traditional house located between the street and the garden. In basic parameters characterizing the living space, progress is visible in bigger areas of rooms, however this seems to be the feature independent from relation to water. Today we expect more comfort and flexibility from the living space.

In terms of accessibility housing on or close to water gives new opportunities. We can reach our home on foot, sometimes by car but always by boat. It improves the structure of living space by adding new entrance levels. This influences the circulation system, opening new possibilities and directions of motion inside a house or creating unexpected connections with the outside. In relation to the context, house near the water usually brings new values. It often manifests reinterpretation of a traditional configuration between the street and the garden, as in Nieuw Terbregge (Photo 2) where the reality of the traditional living quarter was enriched by new layers and connections, or Silodam (Photo 3, which seems to be inspired by a huge barge or set of containers creating new Unité d'Habitation.

Guidelines for a traditional dwelling design, with emphasis on improving functionality, inspired by waterside housing:
- increasing accessibility through designing more entries on different levels and additional connections with outside (yard/garden/terrace/balcony);
- flexible use of rooms with special function and location, including adaptation of technical spaces (as in Gouden Kust house where float level is partly used for bedroom);
- improved circulation and flexible room layout based on not restrictive zoning;
- introducing individually designed openings related to the attractive views as an element of the improvement of the comfort and quality of living;
- introducing different types of open layout enabling individualisation of space and transformations depending on needs;
- architectural openness to different materials and aesthetics.

Photo 1. Houses in Pessac (phot. *K. Tulkowska-Słyk*)

Photo 2. Nieuw Terbregge (phot. *K. Tulkowska-Słyk*)

Photo 3. Silodam (phot. *K. Tulkowska-Słyk*)

CONCLUSIONS

Model solutions for contemporary dwellings are changing, although they retain a common modernist idea of a functionalistic place to live. Comfort does not determine an optimal target state, but the ability to react to changes and constant monitoring of ambient parameters. The pursuit of functionally, environmentally and economically efficient solutions is supported by means of interdisciplinary creation. Contemporary housing projects are based on models that assume flexibility at all stages: planning, construction and exploitation. The pace of changes regarding the residents' needs and expectations as well as external conditions is so significant that exceeds the horizon of durability of a building substance.

The dwellings we design today are combinations of known components. The development of technology and science introduces fresh ideas, but the substance is mostly traditional. Residential architecture must provide users with many years of comfort, be a source of satisfaction and guarantee stability and fulfilment of several individual and social needs. A changing society requires new housing solutions. The demand for innovation is related to the pace and nature of civilizational changes. In the last years, it was exceptionally large and brought innovative solutions regarding functional systems, typology of rooms and buildings, housing concepts as well as materials, technologies and equipment.

The paper presents arguments for undertaking research on detailed characteristic of the different types of dwelling located by the water, with particular emphasis on functional and architectural advantages, which may be used to improve contemporary housing models. The author believes that the proposed guidelines can be applied in further studies on housing typologies and form recommendations for more open and flexible spatial layouts developed in the future.

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