

# 'Sozial Schnell Gut', Rhineland-Palatinate (GER) - Competition

project **Ideas competition for affordable housing in Rhineland-Palatinate**

awarding authority **'Bauforum' Rhineland-Palatinate (GER)**

participation **restricted ideas competition**

services **WW+, Esch-sur-Alzette (LUX) / Trier (GER) architecture**

facts **- modular building system for apartment housing  
- different apartment sizes  
- low tech building**

dates and numbers

gfa **1.589 m<sup>2</sup>**

ufa **855 m<sup>2</sup>**

gv **4.612 m<sup>3</sup>**

competition phase **05/2016 - 06/2016**

## Design concept

In order to meet the requirements of the task, a reduced and conservative design vocabulary was deliberately chosen. On the one hand, this provides an opportunity to respond to a wide range of urban development situations and, on the other hand, the 'simple' geometry of the building structures ensures a high degree of flexibility and functionality, in both the building composition and the interior floor plan layout. The buildings, and their floor plan typologies, have been designed with a high social mix in mind. Accessibility and the associated possibility of long-term independent living as well as the promotability of the dwellings formed further fundamental considerations of the design and influenced the floor plan dimensions, the scale of the staircases, hallways, window openings, door widths, etc.

The developed modular construction system provides an opportunity to create semi-detached houses as well as multi-storey residential buildings with a very high level of prefabrication.

For the multi-storey residential building type, the vertical access system is based on a so-called 'Zweispänner' principle (two-apartment floors). In a four-storey construction, a maximum of 8 dwellings can thus be accessed via the common staircase. A higher design is also entirely conceivable. Depending on the combination of the required dwelling sizes of 60m<sup>2</sup>, 80m<sup>2</sup> and 90m<sup>2</sup>, building units can range from 23.5m to 26m. Depending on the existing topography and urban development context, these can either be joined together in a row or combined (e.g. as a cluster). The semi-detached house type functions as a two-storey structure with an interior staircase. Access is provided via a common entrance courtyard. The design, construction system and building lines correspond to those of the multi-storey residential floor plans. In principle, there is no basement. The cellar storage areas are located in the stairwell right in front of the dwellings. This means that users can use not just the actual storage room, but also the movement area in front of it. Here bicycles or pushchairs can be stored without being in the way. Should an underground cellar room (house connection room) be required for technical equipment reasons, this can be incorporated beneath the stair module. The supply would be provided from here through the dwelling shafts.

## Construction and joining

The dwellings / storeys consist of three modules.

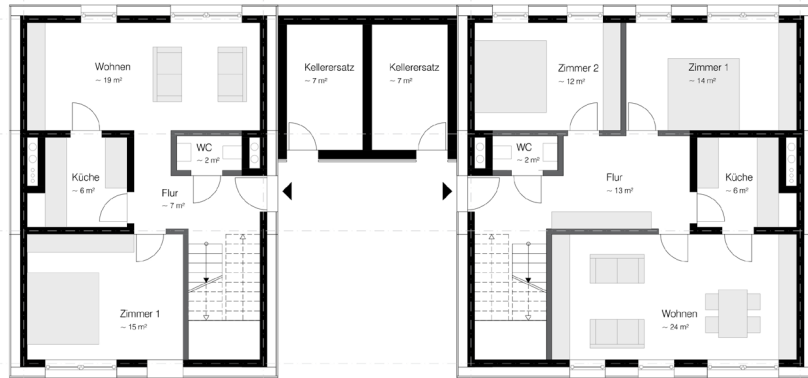
1. The inner module comprises the fixed sanitary block as well as the vertical installation shafts; on the basis of the chosen size, this module can be delivered to the building site as a complete prefabricated element. The maximum measurement (11.0m x 2.9m) can be delivered by truck without the need for a special permit.
2. The two outer modules are made up by the living and sleeping quarters. These are erected using board



ground floor - overall complex



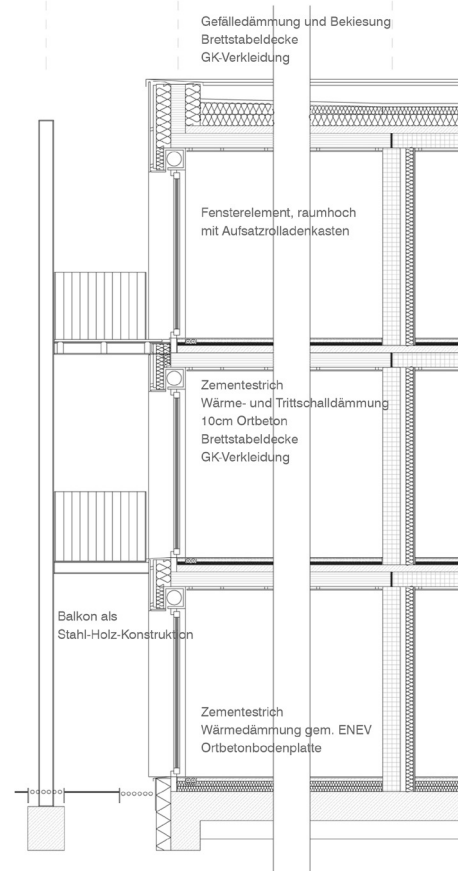
elevation



ground floor - duplex house



elevation - row house



facade cross-section

stack wall respectively ceiling elements like a construction kit on site. The individual wall and ceiling elements can be completely prefabricated in the workshop. In principle, the residential modules consist purely of the loadbearing external walls. All the interior walls are designed to be non-loadbearing lightweight walls. This ensures a maximum floor plan flexibility. The sanitary modules form the bracing core. They are installed on an in-situ concrete floor slab. The floor slab can, depending on ground conditions, be designed to be load-bearing or else be supported on strip foundations. The board stack ceilings of the individual storeys are supported on the one hand by the external walls and on the other hand by the inner module. To ensure noise insulation between the individual residential units and to increase the inert mass of the building for 'energy storage' purposes, the board stack ceilings are foreseen with an in-situ concrete surface. The inner core and the external walls form the supporting structure of the building. The load-bearing grids and the extension grids are independent of one another. The internal walls can be flexibly placed on the extension grids and can be fitted to suit individual user requirements. The movement surfaces within the dwelling as well as the sanitary cell are designed to meet accessibility requirements. The balconies and the staircase are designed as self-sufficient structures and are located in front of or next to the residential modules.

#### Explanations regarding the façade

The external walls, including the façade, are prefabricated in the factory and delivered to the building site. The external wall construction consists of a board stack wall meeting static requirements, with mineral thermal insulation and a rear-ventilated façade. As shown on the plans, it can consist of vertical wooden battens. Large-format panels are, however, also conceivable. The individual wall or ceiling modules can also be delivered by truck without the need for a special permit.

#### Fire prevention

Avoidance of hollow spaces within the construction through the use of solid wall and ceiling elements. Short emergency escape routes. The first emergency escape route is designed as an open staircase. This minimises the requirement for both constructional elements and technical equipment such as smoke and heat extraction systems. The second emergency escape route is provided in the upper storeys with the option of supporting a street-side ladder. Installation shafts can either be designed as their own fire compartment according to fire resistance class F90, or else horizontally partitioned at ceiling level. Free accessibility from all sides of the building so that preventive fire extinguishing is possible.

#### Material concept

The floor slab is made of in-situ concrete, so that – in contrast with a wooden floor – mounting the building on pillars can be avoided. For the external walls and façade cladding, the building material wood is preferred as a renewable raw material. The ceilings are designed as a wood-concrete composite construction. Façade featuring a rear-ventilated system, e.g. a vertical timber cladding; but other materials / formats, e.g. fibre-cement plates, are also conceivable. In general discreet, conservative colours, to allow high degree of flexibility in response to varying local circumstances. Internal walls in lightweight construction, e.g. drywall construction, can be flexibly adjusted to the needs of the user. Balconies, staircases as prefabricated steel-wood construction.

#### Energy and resource efficiency

Due to the flexible location of the buildings, an energy concept has not yet been fully defined. Depending on location, the concept must be individually adjusted to the infrastructural and geological circumstances found on site. In principle, the heat supply relies on wall radiators within the individual dwellings. Heat supply, ventilation technology and technical equipment.

- Decentralised, e.g. within the individual residential units (gas boilers, decentralised domestic ventilation with heat recovery)
  - Centralised in a utility room beneath the stair tower
- The designed static system allows for an individual adaptation in terms of wall structures, proportion of opaque façade surfaces, insulation thicknesses. The roof – in accordance with the overall concept – is to feature integrated solar thermal energy or photovoltaic panels.