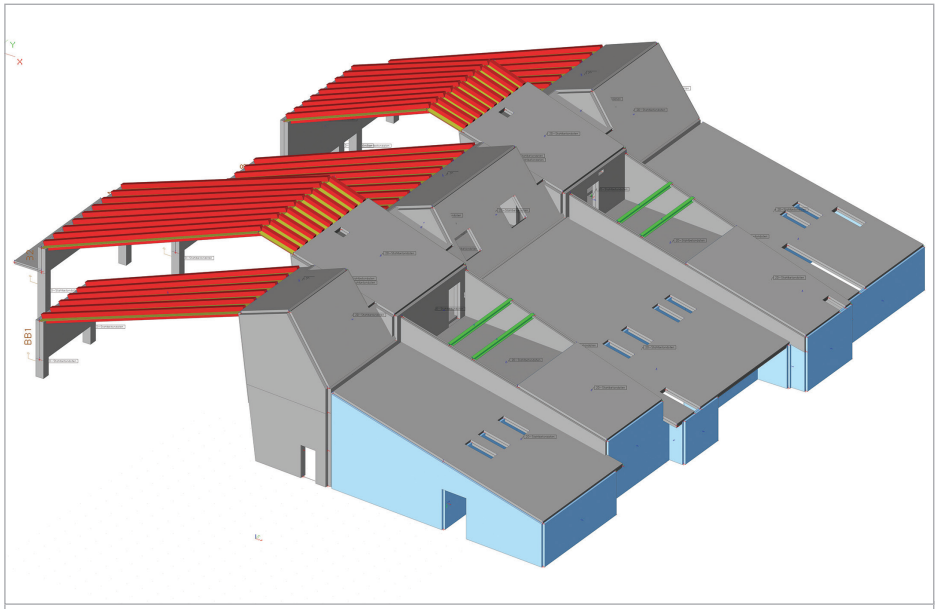
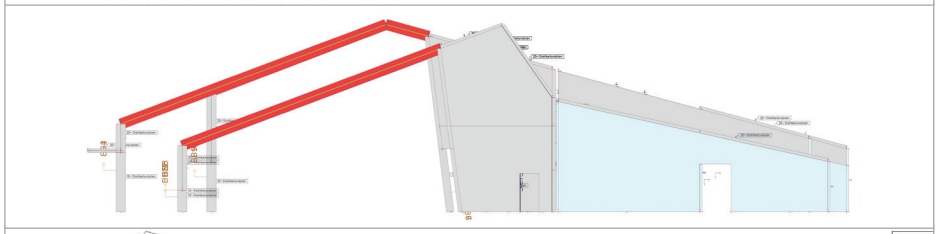
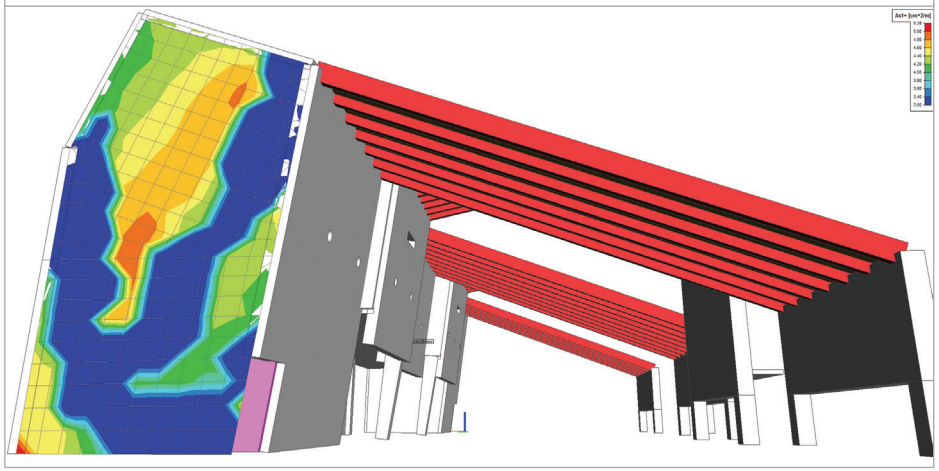
Construction of a New Student Dining Hall - Haßloch, Pfalz, Germany







Software: Frilo Statics, GLASER -isb cad-, Scia Engineer

Stipulations
The objective was to construct a joint yet separate building made of reinforced concrete, timber and brickwork, with the entire building to be divided into a hall and a food preparation area.

Specifications
The hall functions as the actual dining hall where the food is distributed to the students. In order to accomplish this, a widely spanned timber construction of laminated timber trusses was chosen for the roof. In the front area, reinforced concrete panels on steel posts are used as supports for the laminated timber trusses. In the rear area, a stable and rigid core of reinforced concrete was constructed for bracing purposes. It also contains all the technical facilities. The structure is shifted and arranged in an offset pattern in the floor plan as well as in the elevation. Altogether, there are five adjacent buildings, which, although they differ in height, dimension and inclination, have been united to form one single hall. Adjoining the rear part of the hall, the food preparation area is built in the conventional way, while the individual houses are shifted and arranged in an offset pattern as well.

Basic dimensions
- Length: 35.00 m
- Minimum width: 35.50 m
- Maximum width: 38.00 m
- Minimum height: 2.70 m
- Maximum height: 10.20 m
- Roof pitches: 12.5°, 15°, 20°, 55°

Programmes used
- Scia Engineer
- Frilo Statics
- GLASER -isb cad-

Structural calculation
To realise the structural system, the whole building was modelled in Scia Engineer in 3D. This process enabled the determination of the various intersection points of walls, ceilings and roof constructions. As almost no wall is parallel to its adjacent wall, and the roof constructions have different pitches, too, all the resulting intersection points had to be described and recorded exactly. This was the prerequisite for construction planning. Detailed modelling of the whole system in 3D provided the basis for the complex formwork and reinforcement drawings. By using Frilo along with Scia and GLASER -isb cad-, this project was successfully planned and concluded.

Thoughts on the building
Starting with the strip foundations and the 25 cm thick floor plate that runs at two levels, the reinforced concrete disks that are 50 cm thick were initially erected on the 50 cm x 50 cm stanchions at the start of the construction site. Through the roof construction that is inclined and reduces the load, as it is horizontally made of laminated timber trusses, these disks and stanchions had to be supported with sufficient rigidness to be able to greatly limit deformations and to ensure usability. Following this, the rigid reinforced concrete section with walls that are 40 cm thick and ceilings that are 30 cm thick rose towards the sky from the centre of the base plate. It was possible to achieve a high level of rigidity due to the thicknesses used in order to realise the rigid core on the one hand, and to be able to withstand the seismic loads placed upon the entire system on the other. Right from the start, all the openings of the entire technology had to be jointly taken into account for this reinforced concrete structure. This could only be achieved through the extremely good cooperation between the heating planner, the ventilation planner, the designer of the sanitary facilities, the electric planner and ourselves. The preparatory building was constructed in a solid brick construction in the rear section with a slight time delay. In this process, reinforced concrete ceilings that are 30 cm thick were placed on lime-sand bricks which joined with the reinforced concrete core in terms of their incline and orientation. Finally, the hall had a crown placed upon it, using the laminated timber trusses that are 24 cm x 56 cm thick. These were placed upon them by means of a frictional coupling on steel mounting parts that we specially developed and set in concrete for this purpose.

Kreidemacher Ingenieure

Contact Lothar Kreidemacher
Address Fritz-Lederle-Straße 6a
67071 Ludwigshafen, Germany
Phone +49 621 57 25 323
Email ing@kreidemacher.de
Website www.kreidemacher.de

Vita of Kreidemacher Engineering Consultants: 1964 - Founded by Friedrich Kreidemacher; 2007 - Succession of Lothar Kreidemacher; 2014 - 50th anniversary of the engineering consultants.
Bio of Dipl.-Ing. (FH) Lothar Kreidemacher: 1971 - Born in Neustadt an der Weinstraße in Germany; 1992-1997 - Studies at the Fachhochschule in Kaiserslautern (University of Applied Sciences); 1997-2007 - Structural engineer in various engineering offices; 2002 - Training as a health and safety coordinator; 2007 - Took over the engineering office.
Services: Preparation of structural calculations for building construction, civil engineering and bridge construction as well as formwork and reinforcement drawings, construction and shop drawings. Technical processing in the field of reinforced concrete construction, steel construction, timber construction, masonry and earthwork. Inspection of construction works in compliance with the German Standard DIN 1076. Planning, technical processing, tendering and site management of the restoration of all types of bridge constructions. Preparation of files containing the essential data of engineering structures pursuant to DIN 1076 (“Bauwerksbücher”).

Project information

Owner	Kreisverwaltung Bad Dürkheim
Architect	CBA
General Contractor	Rohbau: Philipp & Wahl GmbH & Co. KG, Ludwigshafen
Engineering Office	Kreidemacher Ingenieure
Location	Haßloch, Pfalz, Germany
Construction Period	07/2011 to 03/2013

Short description | **Construction of a New Student Dining Hall**

For this project, different materials such as timber, reinforced concrete and masonry have been used to reflect the interplay of various materials in modern architecture and the art of engineering. To realise the new dining hall, five adjacent “houses“ were united into one building. A 3D modelling was the only way to realise and accomplish this construction. All corners and edges have different inclinations and directions, which draws special attention to the interplay of the roof construction of laminated timber trusses and the neighbouring reinforced concrete panels and walls. The core of reinforced concrete in the middle forms the bracing heart of the construction and the connection to the adjacent masonry.