Summary

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Summary

On this issue

A few years ago prefabrication was still only an area of experimentation for a few scattered architects. It has now become a matter of everyday practice. The majority of German and Swiss enterprises have their system and are about to prefabricate entire building projects. On this subject, we have received a large number of contributions. In the next issue we plan to devote in detail to prefabrication and to architectural application of prefabricated elements.

The introductory article by Armin Neumüller treats fundamental problems having to do with the development of structural systems. In this context we are presenting university buildings, office buildings, government buildings, and housing. Our flashbacks are concerned, especially with prefabricated systems.

The subject of Interior Design takes us to Vincenz Creates the installation of the Ospag information centre in a 19th century building. Our feature for this month is the Regional Council building of Backnang by Roland Ostertag. Jürgen Joedike

Antrim Neumüller, Düsseldorf

Structural systems on the basis of axially modular networks or on structural grids in depth

(Pages 481–483)

The planning and the development of modular structural systems with plane elements or spatial cell structures are based on a certain number of fundamental investigations:

- Study of modules
- Description of static principles
- Systematic development of structural nodes
- Problems of transport and assembly
- Selection of materials.

The architect is obviously present at all levels of this research. Here are some essential planning elements:

- Horizontal 2nd order network: divides the 1st order network units with a view to establishing the structural grid, and determining the levels.
- Vertical network: establishes the levels.

All these networks are dependent on the human scale, on the character of the given location, on the factor of profitability, as on existing modular systems (Moduler, etc.).

- Structural nodes: They are essential for tying together the elements, they transmit stresses and have an influence that is determining on the networks and the structural system.

A distinction can be made between two fundamental network principles:

- The system of modular axes which gives rise to the system in two orthogonal axes, e.g., no carrying element can be dismantled, which reduces the flexibility of the individual floor and ground floor.
- The system of structural grids in depth, where the static function is ensured by the continuity of the components. An element is therefore capable of being removed, which permits unlimited flexibility.

Closed reticulated structure

Helmle, Wiescher & Assoziate, Stuttgart

Departments of physics and biology and psychology laboratory of the University of Regensburg

(Pages 494–498)

This complex is situated on the south side of the university between the department of mathematics and the department of computer science. In the competition program (May 1967), the client required that the pre-clinical and psychological research departments constitute a complex of buildings for research, teaching and living quarters. The concept for the arrangement was also to be laid out so that the students do not disturb research work in the main building.

To resolve these problems, the architects avoided vertical development. The complex is made up of buildings of two or three floors lighted and ventilated naturally. Each level is devoted to a specific function.

Basement: service, deliveries, storage, technical installations and a floor entrance.

Ground floor: teaching staff, students, workshops, practical projects, lecture rooms, library, coffee bar.

Upper level: research departments.

The structure is composed of prefabricated elements on a grid of 7.20 x 7.20 m. The interior partitions are of light concrete. The easily accessible and alterable technical installations are without suspended ceilings.

Despite its strictly functional character, the complex remains on the human scale, owing to its low-silhouette volumes and its numerous interior courtyards and its highly differentiated fittings.

Total cost of the operation: approx. DM 200,000,000

Built volume: m³ 350,500

Utility area: m² 37,000

Office building with prefab wall elements

Yoji Watanabe, Tokyo

New Sky Building, Tokyo

(Pages 490–492)

This building is situated in the Shinjuku district on an especially narrow site. Every unit, however, opens on to a south facing balcony, owing to the positioning of the wall elements. The problem for Watanabe was to express a symbolic and symbolic expression to show that structural units can be arranged like leaves of a tree.

The ground floor appears for the installation of offices and flats. Ground floor and first floor converge in an entrance zone. Above, there are 3 office floors topped in turn by flats, 4 units per floor.

The building has a steel skeleton construction. The outside walls are composed of sheet-metal panels 2.3 mm thick plus insulation.

This building appears to be constructed of industrially standardized spatial cell units. In reality, these elements are not visible from the structural point of view.

3 residence groups and a system

(Pages 493–496)

In our issue last devoted to prefabrication we presented the Jankowski system. Out of the buildings realized with this system we have selected 3 examples, located in Switzerland.

For location details on p. 14.

Niederwil: This complex comprises 5 houses in a continuous strip. Each two-story building is 50 m² in size and conceived on its own separate plan, with identical program. 3 workers and a crane operator can assemble a house in one day.

Triebach (arch.: W. Schlegel)

This group of 3 units in series was executed with the aid of the Jankowski system in order to cope with the difficult terrain, which does not permit the construction of ordinary cellars.

Structural details:
The details apply to the Swiss variant, which comprises 5 floor elements, 6 wall elements and 2 connecting elements.

Pneumatic constructions

Gernot Minke, Ulm

Definition and classification

(Pages 501–503)

Pneumatic constructions are all structures whose design and stability are obtained by means of the inflation of a skin which is thus kept tense. However, this general concept includes many systems which ought to be classified.

In the first place, we have to limit the notion of carrying structural cell. There should be eliminated all objects which can be classified as "containers" (containers, furniture). Finally, we ought to exclude all structures where the pressure between the membrane is not really a structural pressure (sail, parachute, tent). When all these limitations are taken into account, we get down to a more precise definition: stabilization.

In fact, the word pneumatic indicates only that the stabilizing medium can be either liquid or granular. These differentiations and exclusions are clearly expressed in II. 1.

II. Construction for Low pressure systems (differences ranging between 0.01 and 0.01 at. or from 100 kg/cm² (membrane) and high pressure systems (differences ranging between 0.02 and 7 at. or pressures on the order of magnitude ranging from 2000 to 70,000 kg/cm²).

Closed or open, carried by the medium the membranes can be rigid or flexible, or filled with it. The presence of supporting elements or supplementary stabilizing elements is also important for the classification. In wide spans there are either support points or linear elements which are supported.

In thin skins, the building is based on the membrane, which is supported by the surrounding walls.

The building appears to be constructed of industrially standardized spatial cell units. In reality, these elements are not visible from the structural point of view.

Membrane stabilized by inflation with supplementary stabilization by support point or linear system

(Pages 504–508)

In projects of this type, the size of the building is an essential factor in the selections of the carrying system and its design.

The tension on the membrane being proportional to the interior pressure and to the radius of curvature, it is often necessary to reduce this proportion with the aid of secondary carrying elements. If, in addition, account is taken of wind effects and the heating system, it becomes clear that the internal pressure cannot be kept constant, it can be seen that the difficulties increase with increase in span. These problems are resolved by the utilization of supplementary stabilizing elements.

The boundary conditions A, B, C, D, D with spans of over 30 meters it begins to be advantageous to employ these elements.

Gernot Minke, Ulm

Membrane stabilized by inflation with supplementary stabilization by support point or linear system

Interior design

Emil Donau, Vienna

OSPG information centre, Vienna

(Pages 509–512)

The OSPG company manufactures "Austrovi" sanitary equipment and "Lillen" porcelain known throughout the international porcelain industry. Also is the Austrian representative of the Swiss company "Schweizer AG für Keramische Industrie, Lauen". The information centre is installed in the former "Rappaport" palace. It is open to private customers as well as wholesalers, retailers and specialized dealers. Its main function is not so much to engage in publicity as to advise those who require solutions to their problems.

The historic classical facade facing the newly built garden demanded a great deal of tact and sensitivity of the architect. There is no visible advertising sign of any kind, and the building is integrated within its historic setting. The doors, which are semicircular, have been sanded and fitted with wooden mullions and equipped with glass panes giving the passer-by a clear view into the interior of the building. The ground floor is available to the public and the gallery the porcelain products are displayed, in the basement the sanitary equipment and the sanitary fitting is sold. A small conference room is available for orientation meetings.

The construction materials, natural coloured glass, light grey, ceramist, orange-red wall-to-wall carpeting, and the correctly placed lighting fixtures contribute to the optimum presentation of the articles.

Roland Ostertag, Leonberg

Regional council of Backnang

(Pages 513–516)

The site is located southwest of Backnang and is steeply sloping; it is very exposed from the town-planning point of view.

The new building was intended to centralize all the local administrative services. There was organized a competition, won by architect Roland Ostertag, in 1969, won 1st Prize.

The architect concentrated on tying in the new building with the existing building form to a complex that harmonizes with the skyline of Backnang. All the services accessible to the general public had, however, to be grouped on the ground floor.

The new buildings are on an L plan and with the old building enclose an inside courtyard. The main wing is perpendicular to the slope and descends in tiers towards Erbstrasserstrasse.

On the ground floor, an entrance lobby gives access to all the public services. The council hall is connected up with the new building by means of a transverse wing housing the department of motor vehicles.

The construction is a reinforced concrete skeleton braced by a stairwell and a vertical wall.

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