

Space Management and Floor Systems – a Successful Alliance

A Technical Look at the Use of Space ‘Above’ and ‘Below’

The requirements on building spaces are getting more varied, complex and sophisticated as usage and integrated building facilities evolve. An answer to this are Floor Systems which offer a wide variety of solutions. Using the example of an office building, it will be demonstrated how Floor Systems as integral parts of interior construction combine aspects of space utilization in the broader sense and interior design.

Floor Construction in Facility Management

The management of building spaces is influenced by three areas of performance:

- space management
- the subtasks of building facilities
- the engineering of the floor structure

The operative space management supplies the technical and economic basis for the provision, maintenance, and adaptation of floor space. Subject to the requirements of functional areas, quantity and quality of spaces must be designed with a view to an efficient layout and equipment of the spaces according to the utilization concept.

Civil Engineering supports this with System Floors like hollow floors and access floors which offer conceptual and practicable solutions. The construction principle of System Floors can be described as a bearing layer for the floor covering, elevated on supports, which forms the bottom boundary of the room, and a horizontally oriented hollow space below, with a free cross section of about 95 %, for the integration of building facilities and a linear array of installations.

Reference Project

In a new office building of Digel AG in Nagold, a company focusing on international menswear, MERO-TSK International GmbH & Co. KG, product department Floor Systems, installed 2,800 sqm Floor Systems. In interior construction, System Floors as the bottom boundary of rooms function as quasi-adapters between the support structure and the utilization of the building.

Dry hollow floors and access floors were used in this project. Cooperating closely with Stikel Architects and the involved project partners, MERO-TSK installed structures fulfilling specific requirements for various types of floor spaces: in the foyer, the showroom, the offices, and in technical and IT areas. The requirements connected to the planned utilization resulted especially from extremely high point loads, flexible utilization concepts, the integration of building facilities, and the necessary compatibility with surface coverings which were partly made of bending-stiff materials.



Source: MERO-TSK International GmbH & Co. KG

Office buildings are ideal for the use of access or hollow floors (System Floors)

The Foyer



Source: MERO-TSK International GmbH & Co. KG

Heavy-duty floor structure in the foyer: articulated telescoping boom lift operating on a dry hollow floor

In this project, the technical capacity of Floor Systems is most evident in the foyer of the building where a heavy duty hollow floor was installed which also accommodated the heating pipes of the floor heating. This heavy duty hollow floor was required because the cleaning of the slanting glazed roof with a middle height of 15.5 m and of the inside of the high glazed facades was to be performed using an articulated telescoping boom lift. According to the regulations formulated in 'Load Assumptions for the Determination of Load-bearing Capacity' of the application guidelines of DIN EN 13213 Hollow Floors, this results in a load requirement with a maximum point load of 60 kN (6t). Therefore, the choice fell on a structure which fulfilled the project-related requirements on strength, load capacity and reliable deflection behavior. The substructure of height-adjustable steel supports was laid out in a grid of 300 x 300 mm.

A 2-layer bearing layer of panels made of 40 mm thick fibre-reinforced calcium sulfate was mounted on top. The bottom layer consists of panels measuring 600 x 600 mm with steel sheet reinforcement on the underside and force-locked horizontal connection.

The top layer of the bearing layer was cemented in an offset grid with half the distance between supports, all-over adhesion and also with force-locked horizontal connection. The top panels received millings for the insertion of the floor heating pipes. This highly load resistant and functional bearing layer structure is at the same time very bending-stiff, a trait which allowed the installation of 15 mm thick ceramic tiles as the surface covering.

The Showroom

During the planning stage, high load requirements were determined for the showroom, too, so the hollow floor construction of this room was dimensioned for a nominal point load of 11 kN. The System Floor Construction for this area of the building answered to three important aspects of interior construction: high load-bearing capacity, flexible space utilization allowing variable and varied presentation options, and a surface covering of parquet flooring.



Source: MERO-TSK International GmbH & Co. KG

Dry hollow floor with varied functions: integrated building services, parquet for the design of visible surfaces, variable utilization of spaces

The Offices

Office areas were outfitted with access floors. For one thing, this decision was arrived at with a view to the flexible utilization of floor space which would allow changes to the shape of rooms with mobile partitions to reflect different requirements imposed on the administration building by working processes over time. Secondly, only part of the area has false ceilings, so the complete infrastructure of electric wiring, IT cables, heating and cooling conduits, and the automatic fire detection system had to be accommodated in the hollow underfloor space of the access flooring. The requirements on the load bearing capacity of the access flooring are those of standard office areas with nominal point loads of 3 kN. Since the hollow underfloor space

was to be accessible at all points of the office area by way of individually extractable panels, carpet tiles were the chosen solution for the flooring.

The IT / Technical Areas

Access floors were also installed in the technical and IT areas. This being a classic application, the floor constructions were dimensioned for a load bearing capacity of 3 resp. 4 kN. The surface cover of linoleum ensures the antistatic properties of the floors in these rooms and their sufficient charge dissipation capability.



Source: MERO-TSK International GmbH & Co. KG

Access floors have many upsides and no downside, in the invisible subfloor space: room for cables, conduits, etc., on the topside: compatibility with an immense range of applicable floor coverings and the option of flexible space utilization and floor plans.

System Floor: Anticipating Developments in Space Management

Requirements on the flexible utilization of spaces and the implementation of complex building infrastructures are ever increasing and constantly pose new challenges for the space management. As a basis for a successful organization of these functions, design and realization of building technology must create the necessary pre-conditions, a task for which System Floors are ideally suited.

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