

**Applications**

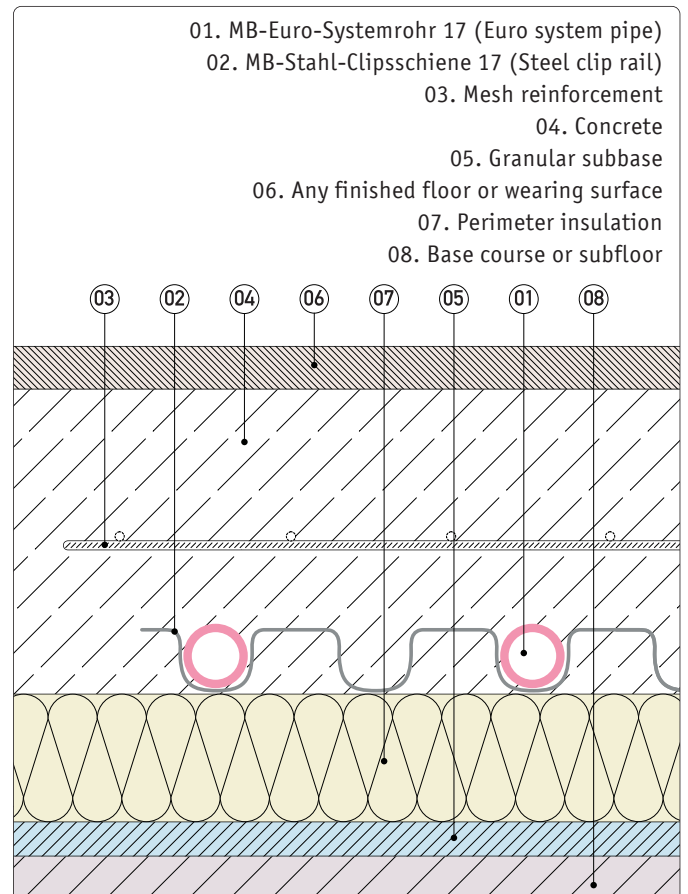
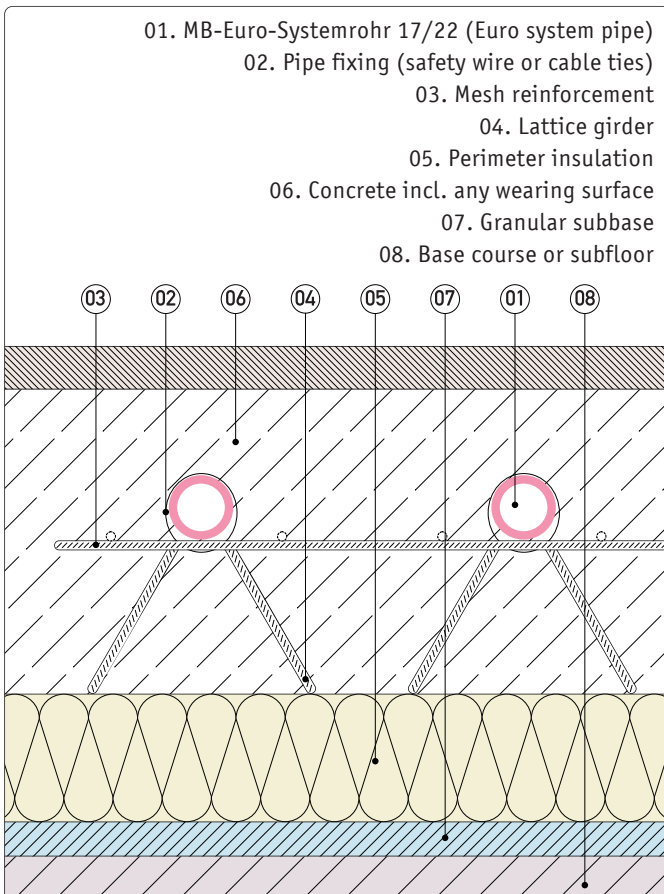
The MB-Freifläche (Open space) is a system to keep frost and snow off exterior areas. These areas are exposed to normal weather conditions. The following applications are heated with MB-Freifläche (Open space): Football turf, loading platforms, approaches, yards, airport runways, building entryways, pavements and similar.

**Load capacity and construction**

On principle suitable for any traffic load. The entire construction is determined by the structural engineer. The structural engineer assesses the requirements based on how the area is used. This includes e.g. concentrated loads of parked vehicles and their dynamic loads when approaching/leaving. The construction layout shown below is merely an example. Both the placement of the MB system pipes as well as the resulting fixation in the construction are always based on the specifications of the structural engineers. MULTIBETON offers structural engineers various (including custom) solutions for fixing the MB system pipes. The height reference point on the site which must be met must be checked to ensure the planned construction height is given throughout. When planning the construction layout, the relevant laws, regulations, directives and standards must always be observed.

**System installation**

Installation follows the MULTIBETON plan. Then follow the MULTIBETON installation and technical guidelines. Planning and creating the MULTIBETON underfloor heating/cooling must further comply with the relevant laws, regulations, directives and standards. Additional instructions of manufacturers for other trades and the recognised rules of technology and proper trade workmanship must be observed.



The illustration and design are non-binding and only exemplary.

### Substrate and base course

The substrate must be able to support the concrete construction. Otherwise an additional base course is required. Ideally, the entire area should have a homogeneous mixture, good consolidation and drainage. If the substrate does not offer adequate load-bearing properties, an additional base course will be used. The base course absorbs loads from the concrete slab and transfers it to the substrate. The base course is over the substrate and should have the same homogeneity and thickness. Base courses are typically gravel, aggregate or cellular glass gravel.

### Granular subbase

A granular subbase consisting of a thin layer of concrete or even sand is typically installed over the substrate or the base course.

### Insulation

Installing insulation under the ground slab is advisable. This reduces loss to the ground. This insulation must be resistant to moisture. Perimeter insulation is recommended.

### Water drainage

It's extremely important for condensate to be purposefully drained using suitable drainage systems or slopes. The condensate must not collect at the edge of the open space heating and form additional ice.

### Frost control

The heating circuits for the MB system pipes must be filled with suitable antifreeze. The ratio of antifreeze to heating water depends on the total amount of fluid and lowest outdoor temperatures expected.

### System separation

Due to the water/antifreeze mixture in the open space system, the system is connected to the heating system via heat exchangers. To prevent the heat exchanger and the primary end from freezing if the heating system fails, e.g. a thermostat should shut off the pump for the secondary circuit if the temperature falls below the -3 °C limit.

### Control unit

A suitable control unit must be installed to ensure the area is kept free from snow and ice. This measures the air temperature, soil temperature and humidity taking into account the system capacity and delay.