

Municipal Hospital, Brandenburg Project Report



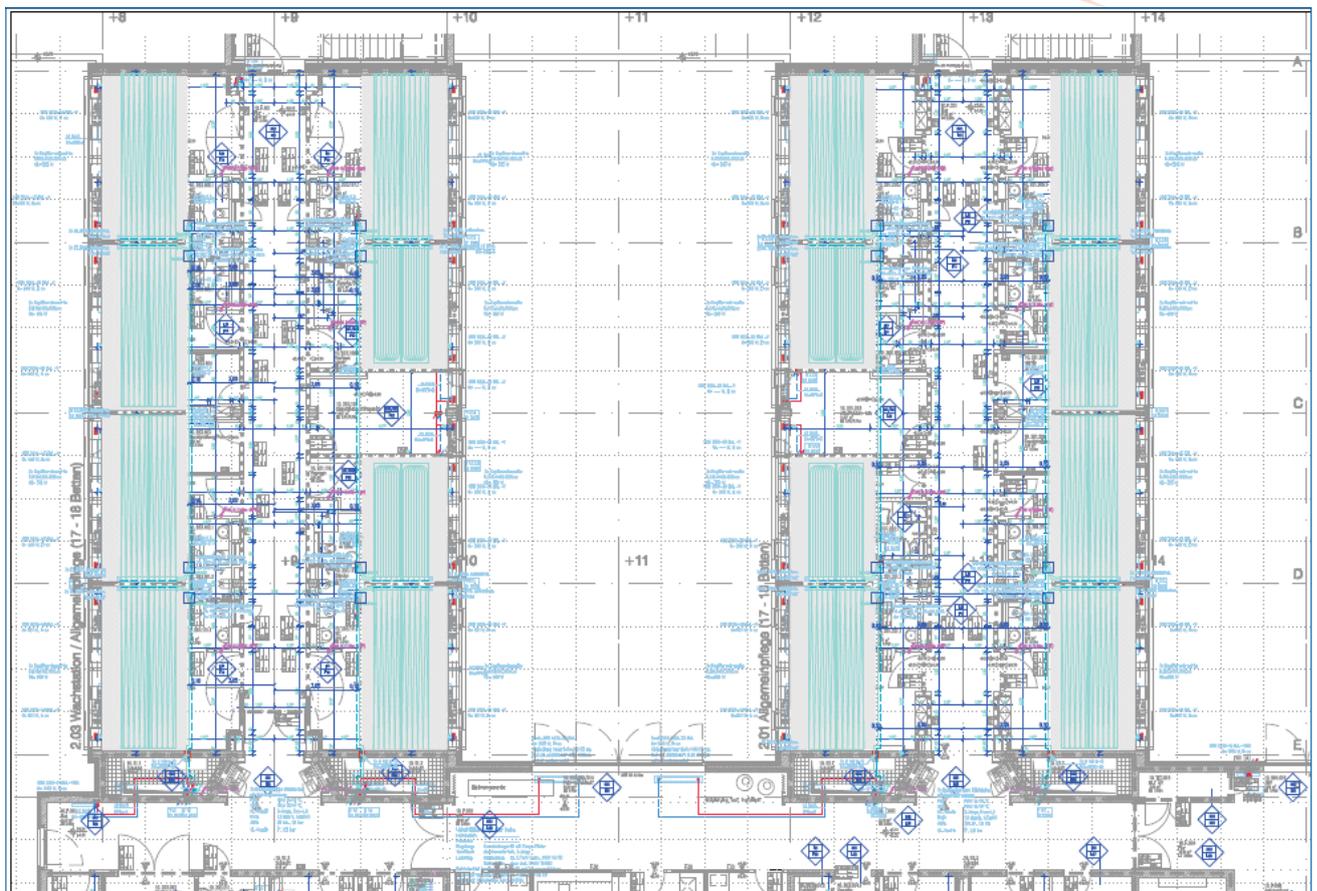
Project Details

Project:	Städtisches Klinikum Brandenburg (Municipal Hospital), 2 nd construction phase (ward building)
Place	Brandenburg an der Havel
Time:	2010-11
Use:	Hospital
Area:	4,000 m ²
Type of ceiling:	Plaster cooling ceiling
Architects:	Heinle, Wischer und Partner Freie Architekten GbR, Berlin
Engineers:	Hyder Consulting GmbH Deutschland, Halle (Saale)
Cooling Ceiling:	INTEC Versorgungstechnik GmbH & Co KG, Neubrandenburg
Capillary Tube Mats:	BeKa Heiz-und Kühlmatten GmbH, Berlin

The new eastern building was opened in November 2011. The three-storey construction comprises 350 beds that are used by different wards of the hospital. All patients' rooms are cooled in summer via cooling ceilings. The plaster cooling ceilings with about 4,000 m² capillary tube mats cool invisibly and save space due to their very low construction height.

Capillary tube mats produce a healthy and agreeable room temperature and consequently provide optimal ease and comfort in the patients' rooms. In addition, they save about 30% energy consumption in comparison to cooling by conventional air-conditioning. Combined with a clever concept where cold is gained from heat, the cooling ceilings operate very economically.

Building Concept and Installation



The new three-storey ward building comprises a long central block with four side wings on each side. Here, the patients' rooms of different wards are situated.

The cooling ceiling installation consists of 19 modules with 8 rooms per module. A system separation in two circuits ensures a reliable, efficient and long-lasting operation of the cooling ceilings without water treatment.

The cooling station is situated in a separate building next to the ward building. Here, cold for the cooling ceilings is gained from district heating by means of two absorption refrigeration machines and adiabatic re-cooling.

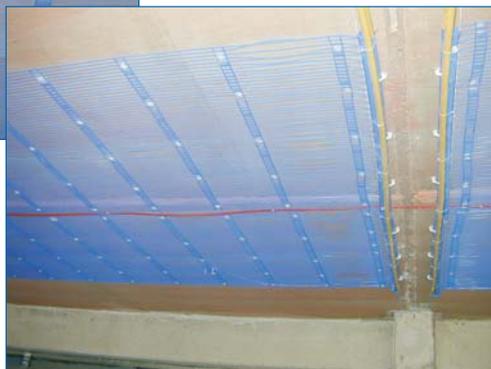
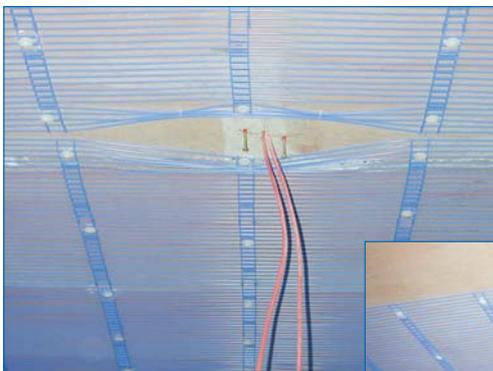
Components of the technical installation:

- cooling energy gained from district heating via 2 absorption refrigeration machines with 568 kW each
- adiabatic re-cooling
- plaster cooling ceilings with BEKA capillary tube mats type K.S15
- control engineering (individual room control, dew-point monitoring with set-point adjustment)
- fan coils in rooms with heavy duty (surgery, engineering)

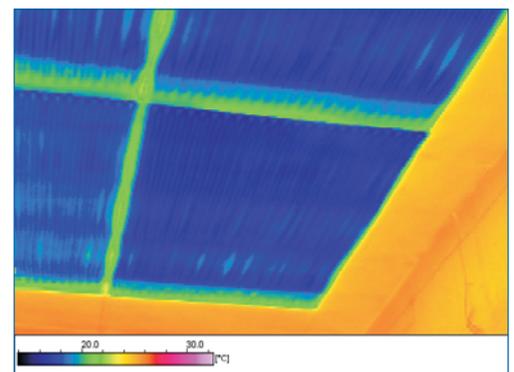
Plaster Cooling Ceiling with BEKA Capillary Tube Mats



The slightly thicker distribution and collector pipes are plastered only for fire safety reasons. The pipes run between partition walls and are thus invisibly covered. Due to the flexibility of the mats, single capillaries can be spread directly while mounting the mats and thus make small gaps for smoke detectors.



For the plaster cooling ceilings of the hospital pre-assembled capillary tube mats of the type K.S15 were used. They were fixed with anchor bolts under the raw concrete ceiling and plastered with a plaster layer of only 15 mm. Thus, the thin capillaries lie very close to the surface and enable an optimal thermal effect. Temperatures spread absolutely evenly. There is neither draught, nor noise, nor dispersing dust or germs. In this way, even in warm summer, the indoor climate is pleasant and hygienic; and energy consumption is low.



The thermogram shows: absolutely uniform surface temperatures with BEKA capillary tube mats.

Production and Distribution of Cooling Energy



Following the advice of the consulting engineers at Hyder, and cooperating with the public utility company, the hospital implemented a concept where cooling energy is generated from heat. This sustainable solution has advantages for both parties: The „Stadtwerke Brandenburg“ (public utility) reaches a better heat consumption, and the hospital benefits from special prices for cooling energy. The utility company erected a separate supply building with two absorption refrigeration machines (568 kW each) that transfer heat from the local distribution network into cooling energy. Returning cooling water is cooled again by adiabatic coolers.



Automatically, the set point is adjusted according to the dew point. This means, the flow temperature is always 2 kelvin higher than the dew-point temperature. In this way, cooling capacity of the ceiling is raised because reaching dew point and thus (temporary) switching off of the cooling ceiling is less likely.



Municipal Hospital Brandenburg



According to its general principle, the Municipal Hospital Brandenburg orientates all its services to the physical, psychological and emotional well-being of its patients. Likewise, the hospital feels bound to the principles of economy and ecology which are reached, for example, by energy saving and a reasonable use of resources. Beyond this background, the hospital decided to use efficient and comfortable ceiling cooling in the new ward building.

