



■ Commercial Buildings

Reference Details:

Owner State of Bavaria, represented by the ministry for education, science and arts, represented by Technical University Munich +++

General Contractor (design, erection, supervision and startup) Siemens AG/ KWU +++

Development Bauamt Technical University Munich; Architects: Prof. Fred Angerer, Peter Gehring, Heinz-Joachim Hafen +++ **Sub-Contractor (reactor building)** Arge DYWIDAG / Hochtief

DSI Services Supply of 2500tons of GEWI® threadbar reinforcing system.



A mega projects benefit from the GEWI® threadbar reinforcing steel splicing system

Garching, Germany: Experimental Reactor FRM 11 - Reactor Building

The threadbar reinforcing steel splicing system is currently being used in two large projects, one of which is the neutron source reactor building of the Munich Technical University and the other is a new freight terminal in the Zurich airport in Kloten. In both cases the DSI splicing system was advantageous due to its unique ability to combine flexibility and economics.

The reactor building is square up to about 11.2 m transitioning into an octagonal shape in the plan view. A gently arched roof closes the building. The walls are 1,8m thick, dimensioned to resist heavy airplane crash. Seismic and flood loads were also considered in this design.

The construction demanded high performance reinforcing technology. The pressure vessel geometry of the building translates into completely closed loop tension reinforcement. Mechanical splices are more reliable and take up less room compared to the regular lap splice - a fact that is beneficial in very dense reinforcement layouts. The biggest problem in this case is the construction sequencing where first the corners were cast followed by the walls in between.

Each corner automatically restrains the reinforcing bars that are coupled on both sides and require exact fitting. The mechanical splice system had to accommodate construction tolerances as well as movement due to concreting. The GEWI® threadbar splicing system was chosen due to its rugged

rolled on thread and hardware. The choice of overlenght couplers facilitated installation.

28 mm Ø GEWI® threadbar encloses the whole building with two vertical and perpendicular layers. Sizes 20 and 25 mm Ø were used for the inner walls. Upon completion of the reactor building a total of 2,500t of threadbars and 45,000 coupler splices as well as 13,500 end anchorages will be installed.

More and more scientists require access to an intensive neutron source for various research projects. Research with neutrons is very important to many different sciences, especially physics, materials, chemistry, molecular biology, micro electronics as well as medicine. The research reactor Munich I (FRM or nicknamed the "atomic egg") built in 1957 could no longer cover the steadily growing demand for neutrons.

The new high flow research reactor II (FRM-II) in Munich-Garching, Germany went on-line in the year 2002 and meet the neutron demand with a 5 times higher reactor power (20MW) compared with the "atomic egg", generating a 50 times higher neutron production. FRM II consists of the reactor building, where the reactor core and most of the installations for the experimental applications are located, a neutron control unit with integrated offices and additional installations.