



## BMW Welt Munich

The BMW Welt in the north of Munich is a masterpiece of innovative architecture. Since October 2007, it has served as multifunctional stage for all kinds of events: concerts, exhibitions, conferences, live broadcasts, banquets and much more. The integrated meeting area includes convention rooms of various sizes for conferences, lectures and presentations. Shops and catering opportunities complete the most versatile adventure you experience in the BMW Welt.

The spectacular experience and delivery centre was designed by COOP HIMMELB(L)AU, Vienna. The range of services provided by SSF Ingenieure in the planning and construction phase encompassed the entire execution planning for the architecture and the supporting structure, together with construction supervision for all-trades.

### Flexible partitioning on several levels

The inner topography convinces by its varied density of rooms and floating partitioning of the areas.

The main element of the BMW Welt is the large, transparent plaza with sculpted roof and a double cone derived from the already existing central building.

The plaza is not only a market place for a wide range of different uses but also an unmistakable symbol for the BMW Group. The inner topography stands out with its differing room densities and flexible partitioning of the effective areas. The vehicle delivery zone „Premiere“ is the heart of the plaza, with the customer lounges hovering above and offering a view of the event room and BMW headquarters.

### Specifications

Number of storeys	8
Plot size	25,000 m <sup>2</sup>
Effective space	67,400 m <sup>2</sup>
GFA (gross floor area) above ground approx. underground approx.	73,000 m <sup>2</sup> ca. 28,500 m <sup>2</sup> = 40 % ca. 44,500 m <sup>2</sup> = 60 %
Gross cubic space	531,000 m <sup>3</sup>
- max. building length	approx. 180 m
- max. building width	approx. 130 m
- max. building height	approx. 24 m

Picture credits: Florian Schreiber Fotografie for SSF Ingenieure GmbH

### Parking

The underground storeys offer parking on 2 levels for around 600 vehicles, together with a fully automatic day storage facility for approx. 250 new vehicles ready for delivery to customers.



### The roof structure

The roof structure measuring around 16,000 m<sup>2</sup> in size consists basically of an upper and a lower girder grillage with a basic grid of five by five metres. The upper layer is shaped like a cushion at the top. The lower layer is shaped by simulated reactions to the areas below. Between the layers, inserted struts link the two layers of girder grillage, creating a spatial supporting structure.

Moved air flow	400,000 m <sup>3</sup>
Number of storeys	2,700 kW
Plot size	3,800 kW

### Technical installations

The building is operated by making full use of natural resources to minimise energy consumption. Enveloping surfaces of glass with low heat transmission coefficient ensure that the requirements of the Heat Insulation Ordinance are met on the one hand, while generating thermally comfortable surface temperatures on the other. Floor and wall structures enhance the storage capability. Thermal uplift currents and also warm air cushions are mostly discharged straight to the outside in the layered part of the roof so that they do not encumber the effective areas below. This saves energy and protects the environment.

### Energy-saving and environment friendly

Ventilation of the building is implemented using the large wall areas and partly the edges of the roof. The large wall elements pointing west can be opened as an expedient measure when outside temperatures exceed +5°C throughout the summer months. While this provides specific partial ventilation at lower temperatures, once the outside temperatures exceed +20°C large expanses of glazing are opened to turn the inside areas into exterior space. This generates currents similar to source air in the building; these are then heated by inner heat sources, resulting in a thermal forced-ventilation effect from bottom to top. Solar energy is put to passive and active use in energy generation by means of photovoltaic systems with 810 MW peak output.

- 1 Interior view to the double cone during construction
- 2 Double cone during construction
- 3 Excavation pit with uplift anchors and ground surface of approx. 15,500 m<sup>2</sup>



Picture credits: SSF Ingenieure GmbH

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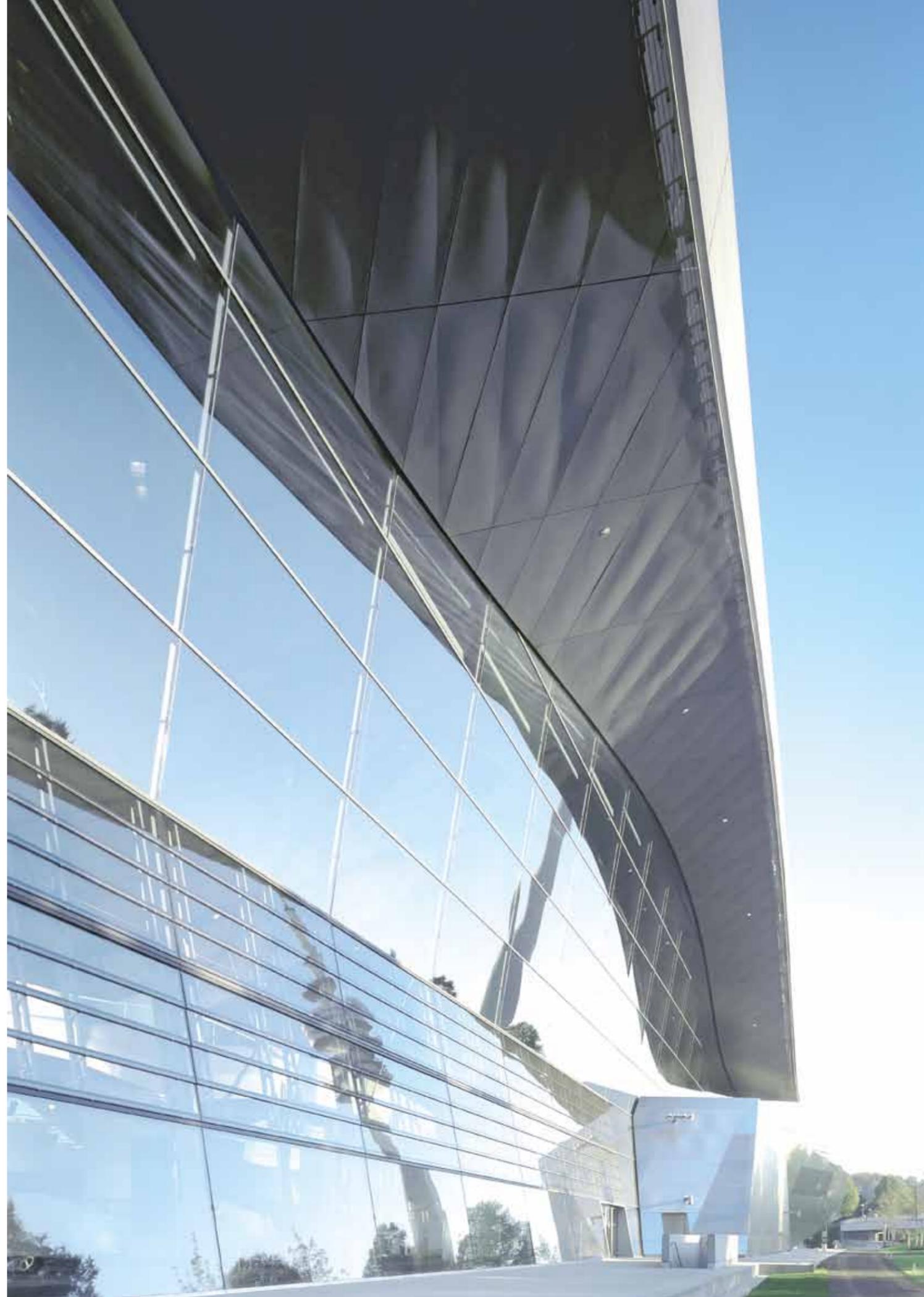


#### Shell dimensions

Concrete base plate „white tank“	approx. 20,000 m <sup>3</sup>
Concrete outer wall „white tank“	approx. 3,500 m <sup>3</sup>
Total reinforcement	10,000 t
Total concrete	approx. 60,000 m <sup>3</sup>
Total reinforcing steel	approx. 9,000 t
Hand-laid steel bars	3 million m
Total glazing	approx. 14,500 m <sup>2</sup>
Roof surface	16,000 m <sup>2</sup>
Net weight lounge	2,500 t
Steel structure roof	3,000 t
Glass facade	15,000 m <sup>2</sup>
Stainless steel sheeting outside	10,000 m <sup>2</sup>

#### The facade

The facade is a modified post-and-beam system. A kink in the posts at 7.50 m and further bracing at 15 m reduces the free spans to achieve small post cross-sections in ratio to the facade height. Another advantage of the kink is that vertical deformation of the roof can be absorbed by elastic bending deformation of the posts. This eliminates the need for expansion joints in the roof. The glazing is clamped directly to the beams and adhered to the butt joints.



SSF Ingenieure AG  
Consulting Engineers

Munich  
Berlin  
Halle  
Cologne

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