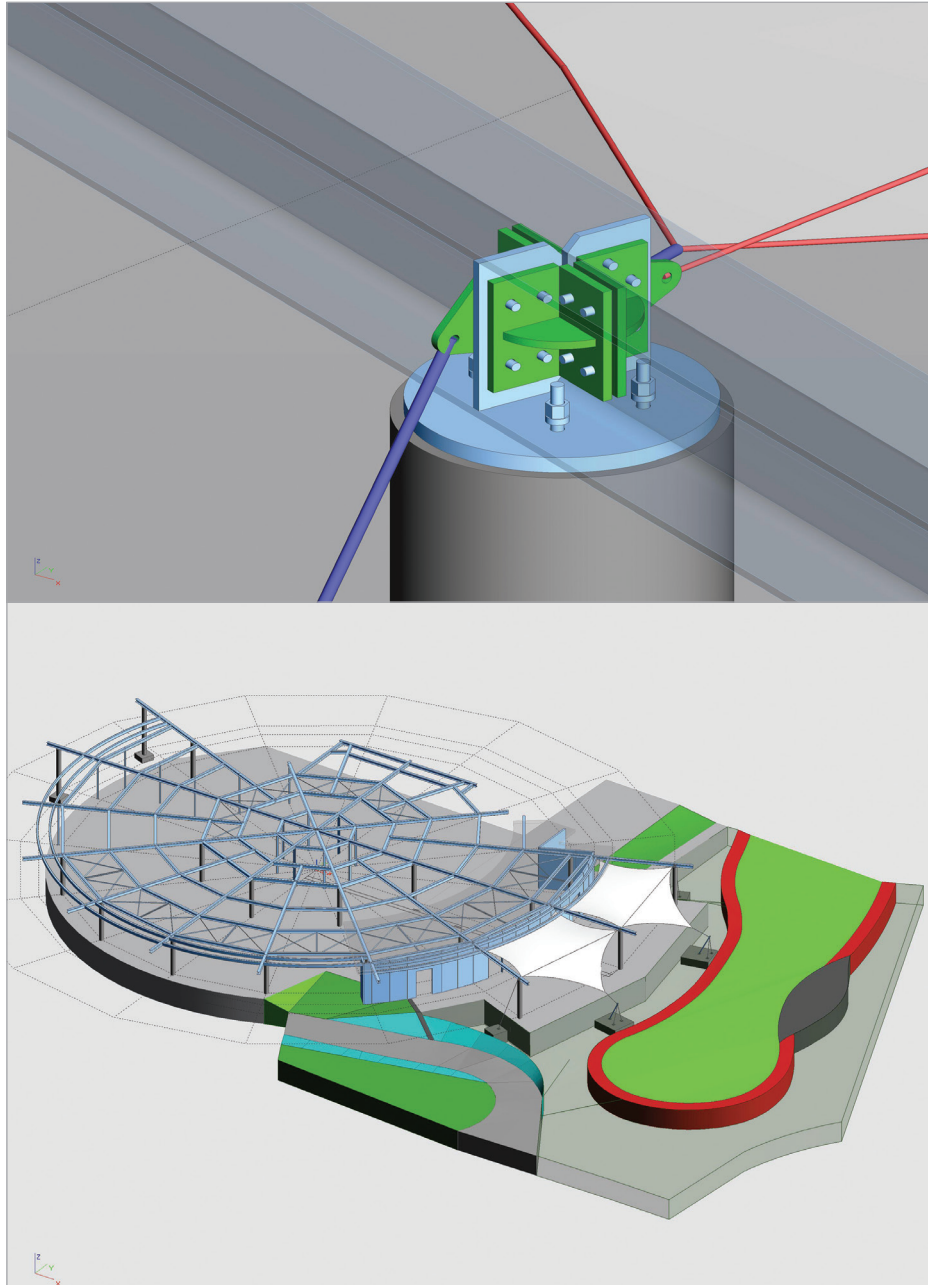


Cafe Open Space Membrane Covering, BASF - Ludwigshafen, Germany



Software: Scia Engineer

Client

BASF SE, the largest chemical company in the world, is headquartered in Ludwigshafen, Germany. The BASF Group comprises subsidiaries and joint ventures in more than 80 countries and operates six integrated production sites and 390 other production sites in Europe, Asia, Australia, the Americas and Africa. BASF has customers in over 200 countries and supplies products to a wide variety of industries.

BASF was founded on 6 April 1865 in Mannheim, in the German-speaking country of Baden, by Friedrich Engelhorn. He had been responsible for setting up a gasworks and street lighting for the town council in 1861. The gasworks produced tar as a byproduct, and Engelhorn used this for the production of dyes. BASF was set up in 1865 to produce other chemicals necessary for dye production, notably soda and acids. The plant, however, was erected on the other side of the river Rhine at Ludwigshafen because the town council of Mannheim was afraid that the air pollution of the chemical plant could bother the inhabitants of the town. In 1866 the dye production processes were also moved to the BASF site.

Order

It was planned to renew the environment around the plant cafe building in Ludwigshafen and the open space in front of the cafe with many tables and seats that had to be protected from the summer sun.

Two variants of membrane covering - permanent as a cone and temporary as five-point anticlastic sail - were developed, integrated into the environment with the existing buildings and presented.

The temporary five-point sail solution - only for the summer time - was chosen.

Software and modelling:

The given surroundings with the existing cafe structure were built up in Scia Engineer with the Structure and 3D-Free-Modelling tools. The environment with the appropriate part of the site structure was exported as DWG/DXF to the form finding software - Formfinder - to

find and adjust the required form and then to Forten Software for the membrane design.

The results of the formfinding and membrane calculations were imported back in Scia Engineer to design the support steel structure, anchors, edge/corner details and foundation. All membrane reactions on the existing steel beams and regular loads were set in Scia too so that the additional load for the site building could be verified. The fully detailed structure was developed in one 3D model to be able to consider every distance and height in 3D-Space precisely.

All the overviews, elevation, execution and detail drawings were processed and created in Scia Engineer with the help of the appropriate modelling and drawing tools.

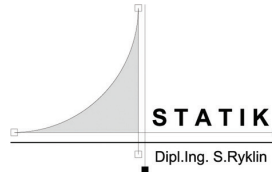
Execution

The covered area of the two anticlastic twin membrane parts amounts to approx. 320 sq m and gives sufficient sun protection for all the open space cafe places. Soltis86 from Ferrari, Italy, was used for the covering.

The steel beams of the existing structure received newly designed anchor details. Four new foundation blocks - two with tension rods and two with steel bracing units - were created. Additional tension rope was spanned between the tops of the columns to achieve sufficient stability during assembly. The planning was completed by April 2011. The first assembly took place at the end of May and lasted about 4 hours.

The production and execution were managed by the company Planex Technik in Textil GmbH LU, Germany.

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Sergej Ryklin - Born in 1963 in Moscow
1981-1985: Civil Engineering; "Bridges/Tunnels"; Since 1993: Structural designer and verifier at "Römhild & Hecker" Consulting Engineers in Landau, Germany; Since 1997: Structural designer; 2008-2009: Master's Study at the Institute for Membrane and Shell Technologies, Anhalt University of Applied Sciences, Germany

Range of Capacity: Planning and optimisation of steel, aluminium, solid, composite, timber and membrane structures; Project consultancy; Building physics calculations; Dynamics calculations, Project verification

Philosophy: Flexibility in planning due to integral 3D design with the ability to find feasible and low-cost solutions from the draft stage on.

Experience: Residential and industrial buildings, parking spaces, pedestrian bridges, swimming pools, silos, membranes...

References: Daimler, John Deere, SAP, DB...

Project information

| | |
|---------------------|-------------------------------|
| Owner | BASF Ludwigshafen |
| Architect | Dipl. - Ing. S. Ryklin STATIK |
| General Contractor | Planex Technik in Textil GmbH |
| Engineering Office | Dipl. - Ing. S. Ryklin STATIK |
| Location | Ludwigshafen, Germany |
| Construction Period | 10/2010 to 05/2011 |

Short description | Cafe Open Space Membrane Covering, BASF

According to the renovation of the environment around the plant cafe building by the BASF chemical company in Ludwigshafen Germany, the open space in front of the cafe with many tables and seats had to be sun protected. The temporary solution with two twin five-point sails - only for the summer time - was chosen. The given surroundings with the existing cafe structure were built up in Scia Engineer using Structure and 3D-Free-Modelling tools. The environment with appropriate parts of the site structure was exported as DWG/DXF to the form finding software - Formfinder - to find and adjust the required form and then to Forten software for the membrane design. The results of the formfinding and membrane calculations were imported back in Scia to design the support steel structure, anchors, edge/corner details and foundation. The fully detailed structure was developed in one 3D model to be able to consider every distance and height in 3D-Space precisely. The production and execution were managed by the company Planex Technik in Textil GmbH LU, Germany.

