Project Report/March 2024

CFRP Plates Protect Furniture Warehouse Roof from Snow Loads

The centrally located German state of Thuringia is known as the home of winter sports and for the romantic, snow-covered Thuringian Forest. For concrete structures, snow means less romance, but rather a massive increase in the roof load, which can be threatening.

For this reason, the roof of the central warehouse of a well-known furniture manufacturing company was strengthened with CFRP plates (CFRP = carbon fibre reinforced polymer). The reinforcement system **StoConcrete Carbon Plate** with surface-bonded CFRP plates were applied. The support beams in the racking area of the warehouse were reinforced with a total of 1,300 metres of CFRP plates. Support beams distribute the loads placed on them into the connected walls or vertical supports.

The **StoConcrete Carbon Plate** system mainly consists of Sto S&P CFRP plates. In this warehouse, they were bonded onto the prepared surface using StoPox SK 41 to reinforce bending tension and the applicator additionally provided with steel brackets to reinforce transverse forces. Due to its low weight, the CFRP plate can easily be installed working overhead. In addition, it only slightly increases the weight of the structural components. Additional support while the adhesive is curing is not necessary. The plates are extremely tensile. Without substrate levelling, the system only adds 3 to 4 millimetres to the structure surface and therefore has little influence on the building's clearance profile. The original spatial impression can be completely restored with cladding or coatings.

StoConcrete Carbon Plate can be installed during operation. The system is also characterised by high cost-effectiveness and resource conservation.

StoCretec maintains a close cooperation with Simpson Strong-Tie GmbH who advises and supports planning and static design.

Properties of **StoConcrete Carbon Plate**

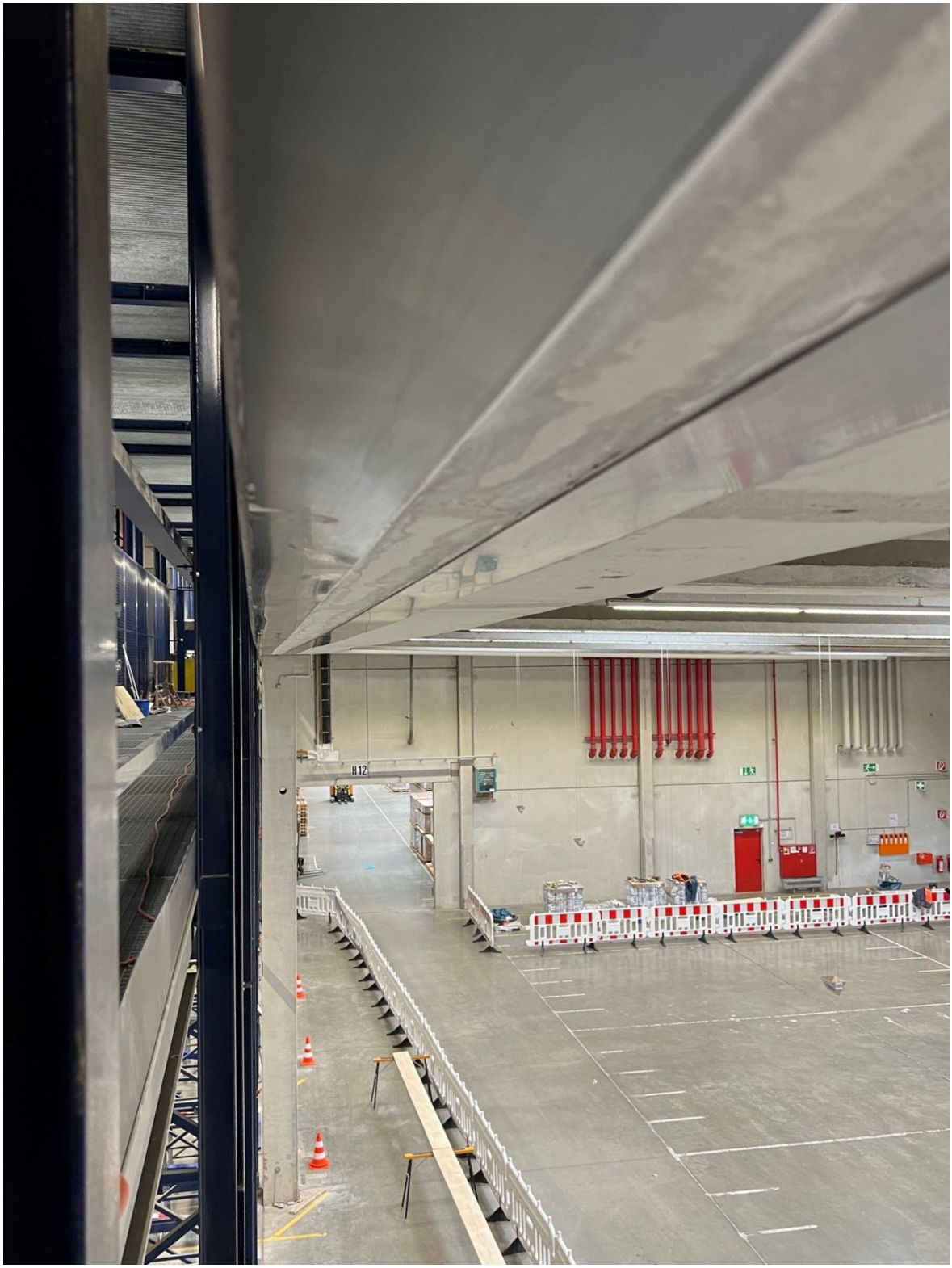
- StoCretec CFK reinforcing system
- For reinforcing concrete structures
- For increasing or restoring the load-bearing capacity
- Applicable by bonding in the slot, or bonding flat
- Economic, efficient, visually inconspicuous
- Without significant interventions in the architecture
- Short downtimes
- High durability without material fatigue
- Low weight
- Simple application
- System approved by German building inspectorate
- Structural calculation and assessment software for Sto S&P FRP systems, advice on planning and structural calculation and assessment from Simpson Strong-Tie GmbH

Who & What

Project:	Structural strengthening of warehouse roof, Thuringa, DE
Planner:	Bau-Consult Hermsdorf GmbH, Hermsdorf, DE
Applicator:	Laumann Betonbau und Sanierungs GmbH, Eckental, DE
Realisation:	4/2023
StoCretec Competence:	**StoConcrete Carbon Plate**

Reinforcing element	Sto S&P CFK Lamella
Adhesive	StoPox SK 41
Corrosion protection	StoPox ZNP
Cleaning agent for tools and lamellas	StoCryl VV

Photos: Simpson Strong-Tie GmbH, Bad Nauheim



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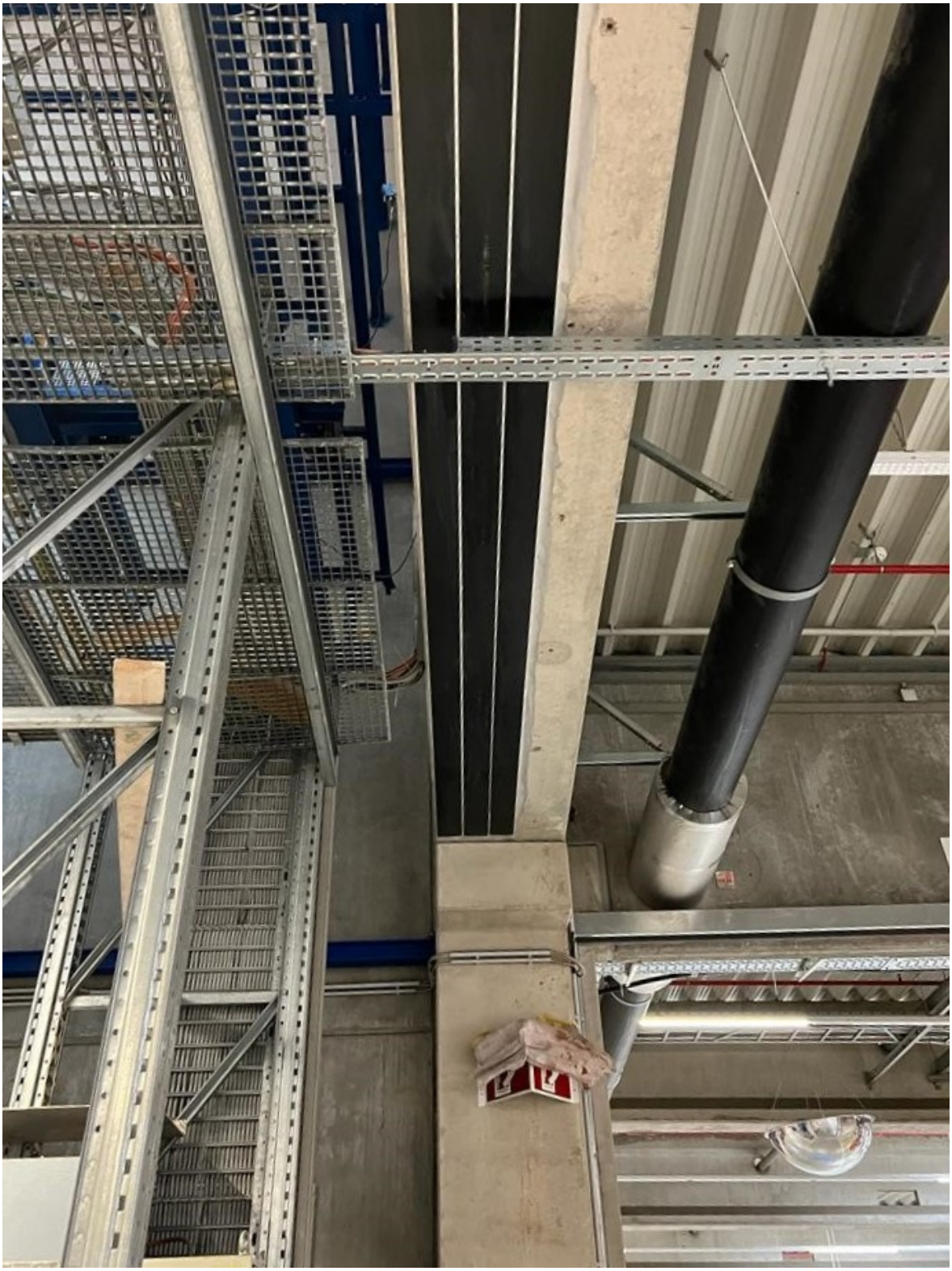

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