A WALKABLE SCULPTURAL STRUCTURE
STRESS RIBBON BRIDGE AT TIRSCHENREUTH, GERMANY

Wolfgang STROBL
Managing Director
Schüßler-Plan
Generalplanungsgesellschaft
Berlin, Germany
wstrobl-spg@schuessler-plan.de

Summary
As part of a landscape architectural competition the pedestrian and cyclist bridge perfectly reflects the concept of the State Horticultural Show: Nature. In the course of the opening the sculptural bridge with a length of 85 m was brought into service on May 29, 2013.
The paper deals with conceptual design development, appropriate solutions, aspects of detailed design, assembly and dynamic excitability.

Keywords: aesthetics; structural concepts; stress-ribbon; wooden structure; high strength steel; dynamics

1. The Project
The story of the bridge project is closely linked with the small town of Tirschenreuth located in a forested rural region with a series of lakes and ponds. The specific occasion were urban restructuring measures including a State Horticultural Show with the title: “Nature at Tirschenreuth”.

Fig. 1-2. A walkable sculptural structure

2. Conceptual design
Architects and engineers discussed two main aspects:
- the best location for the bridge
- a significant object representing “Nature at Tirschenreuth”
It was therefore a straightforward decision to choose a natural structure made from untreated wood as a direct link across the new lake. The basic demands were:

- provide a "clear view" on the water surface and surrounding landscape. Hence, a minimum of supports in the lake and a light long-span structure were required
- on the other hand: a concise statement making wood visible and give people access to the haptic dimension of the material

Fig. 3. Clear view on the water surface and surrounding landscape

Now the challenge was how to reconcile these diverging positions?

Wood is not material of first choice for a long-span bridge above water. As wooden structures usually become quite massive following questions were to be answered:

- Can the primary supporting structure be of different material far better suited to a long-span-construction?
- Can the bridge deck consist of massive wood only, whereas the primary structure remains a kind of invisible?
- Can the bridge deck and the railing define an integrated and unique shape?

Fig. 4. High strength steel and wood: a unique shape

The answer was staring us in the face. In a critical debate the concept of a stress-ribbon as a minimized primary structure in combination with a wooden deck was developed. The unique form combined with high-tech materials makes the bridge a structural statement of the 21st century.

3. Detailed design and assembly

Fig. 5-7. Assembly of stress ribbon and wood structure

4. Dynamic excitability

Already during the design phase a dynamic absorber has been developed serving following goals: adaptation to measurement results, minimized dimensions and subsequent mounting. Further enhancement of the dynamic absorber led to a hardly perceptible combination of leaf springs and oil dampers.

Fig. 8-9. Dynamic absorber, mounted under the bridge