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CROSSING THE VIAMALA GORGE

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Cultivated Debate: The Viamala gorge must be crossed when travelling from Eastern Switzerland to Italy over the passes of Splügen or San Bernardino. The *bad way*, as suggests its name, was improved in different phases from the late middle-ages until nowadays. A great step to a more comfortable way was the erection of two bold masonry bridges by the bridge-builder Christian Wildener in 1739. Since then, the Viamala gorge became attractive for tourists, too. It was one of the key-points on the Grand-Tour from Germany to Italy through the alpine trails of Graubünden. Many painters and writers were impressed by the sublime scenery: *A sudden crack in the globe, marked by burst rock, like a giant wound...* was the statement of art historian Andrew Marbot. Later on, in 1903, in the centre of the gorge a series of stairways leading down to a platform close to the Hinterrhein river was opened to the public. Again, the dramatic descent into the narrow rocky crevice became an attraction for tourists. This passage crossed the gorge on a little bridge, which had decayed and needed to be replaced.

I was very happy that our office was called for replacing this bridge. Time after time, my whole professional life circled around the Viamala gorge, from the earliest until the latest design. In 1980, still being a student, my first project was built, the restoration of the roof of the church St. Johann at Hohen Rätien sited at the north entrance of the Viamala. At that time, the Viamala Gorge had become a passageway for cars running to the South, breaking their journey for a few minutes to step down the stairways in the centre of the gorge. In the 1990^{es}, a group of people searched for opening the gorge for hikers on its whole length and they started to restore the historic trail on the east hillside which still was visible in large parts. Along the sides of the Traversina ravine, the old trail was completely rotten and I proposed to build a bridge to link the remnants of the trail. Therefore, the first Traversina crossing was built, a 47 m spanning footbridge, erected by a large helicopter. Some years later, our office built the Pünt da Suransuns stress-ribbon bridge on the same trail, about two kilometres further south. Unfortunately, the first Traversina footbridge was destroyed by a rockfall in 1999. It was replaced by a bigger rope-truss bridge at a safer place.

The latest achieved bridges of our office are the above-mentioned Viamala crossings for the Hinterrhein river viewpoint. We proposed two adjacent bridges to replace the one old bridge. The two bridges mirroring each other give people a better perception of what they are walking on. The 75 cm narrow catwalks create a feeling of safeness, as the two handrails form a protecting space, while the view is open down into the gorge and towards the second bridge. An existing dead end of the trail is captured by the longer bridge and therefore made more attractive for walkers. And when there are lots of people it is possible to have a separate crossing for each direction of traffic. The bridges are slender arches in stainless steel, covered by planks of larch wood. They have been opened in spring 2017.

Structurally, the new bridges are two-hinged arches. They act as Vierendeel frames built-up by the arch, the walkway profile and the lower part of the balustrade posts. As the size of the bridges is small, the stresses are comparatively low and there are no vibration problems. All connections were welded in the workshop. With the help of a mobile crane the bridges could be placed as a within a few hours. First the structures were set on the horizontal surface of the concrete abutments. Then the arches were set into compression by twisting the screws at their springs.

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Fig. 1: The new bridges