



A cable-stayed footbridge made of glued-laminated wood – design, erection and experimental investigations

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Summary

The presented footbridge, with a main span length of 90 m, is one of the longest cable-stayed bridge structures made of glued-laminated wood. The footbridge joins two countries, Poland and Slovakia, and has been erected in a very attractive tourist area. Inhabitants waited for a footbridge almost 100 years, from 1914 to 2006.

On 12 August 2006 about 1000 people (inhabitants and tourists) took part in the Opening Ceremony. On the last Sunday of summer holidays 2006 about 11000 pedestrians crossed the border during one day, as notified by the frontier police. It shows, how this footbridge is important in this region.

The design and erection processes as well as experimental investigations concerning dynamical behaviour of this footbridge are described in this paper.

Keywords: Cable-stayed footbridge, glued-laminated wooden deck, design, erection, dynamic experiments.

1. Introduction

A newly erected footbridge [1 – 3] over the Dunajec River is located in the Pieniny National Park, Poland. The structure is situated between the mountain resorts of Sromowce Nizne (Poland) and Cerveny Klastor (Slovakia) and is situated in a very attractive tourist area. The main goal of this new transport means is connection of recreational regions located on both sides of the border. Before the footbridge's erection, the location of the nearest road frontier crossing forced tourists to make a circumferential journey between both resorts of about 15 km. The footbridge has shortened this journey to only 150 m. The new object is also important because intensive development of this region and improvement of the tourist infrastructure for summer and winter sports are planned in near future. Erection of the cycle-pedestrian footbridge is the first stage of this project.

2. Design process

2.1 Preliminary draft and aesthetic consideration

The basic assumption made by the investor was design a footbridge with glued-laminated wooden deck. The investor's wished to create a footbridge as a landmark structure. Because of low investment funds, aesthetic considerations were limited to the dominant elements – the pylon and supports (Fig. 1).

It was decided that the colours of the footbridge should correspond with the surrounding landscape of the Pieniny National Park. All steel elements and cables are steel-silver. Concrete elements are painted in light-grey colour. All wooden elements have remained in their natural colours (Fig. 2).

It seems that glued-laminated wood for the girders was a proper choice. The structure suits the highland character of the region and the material is friendly for pedestrians.