

Kagraner Steg – New GFRP Pedestrian Bridge in Vienna

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Abstract

The paper describes the new superstructure for Kagraner Steg pedestrian bridge in Vienna, Austria. The original one, made of timber in 1991, must be replaced due to exploitative problems and frequent traffic disturbances during repair measures. The existing foundations must be used for the new superstructure. Different material options were compared in the concept design phase. Finally, glass fibre reinforced polymer (GFRP) was chosen due to its low weight, high strength, and minimal maintenance cost. To justify its initial higher costs, a life-cycle costs analysis has been performed. The results of the analysis compared with conventional carbon steel alternative solution, are presented. In addition, the article reviews the challenges met during the design of the new GFRP superstructure of Kagraner Steg.

Keywords: GFRP; pedestrian bridges; refurbishment; life-cycle costs analysis (LCA).

1 Introduction

Kagraner Steg is a pedestrian bridge that runs along the east bank of the Old Danube Channel in the 22nd district of Vienna, Austria. It brings the pedestrian and bicycle traffic under the very busy Wagramer street road bridge, that crosses the channel. Thus, connecting upper and lower Old Danube pedestrian routes (Figure 1).

The bridge has a total length of appr. 140m and consists of two ramps and a central part, hanged on the road bridge above it.

Originally built in 1991 from solid timber, after 30 years of exploitation, the municipality of Vienna has initiated its replacement due to many repair measures that bring traffic disturbances and high maintenance costs.



Figure 1. Kagraner Steg – Plan view

The design requirements for the new bridge were:

- To keep the existing width and clearance under the road bridge;