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# FOOTBRIDGES OVER VARBITZA RIVER

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### ABSTRACT

This article reviews the service condition of three pedestrian suspension bridges. They are located in the Rodopi mountains, outside urbanized area. These bridges are crossing Varbitza river at different locations along its length and are mainly used by the locals in order to access the railway line (stations) running along the river. All bridges are suspension bridges with main span varying from 120m to 260m. Originally, they were built more than 50-60 years ago. Reconstruction of their superstructures took place 10 to 15 years ago. Visual inspection, made in the summer of 2021, reviews their service condition, which is further discussed in this article.

**Keywords:** long span suspension bridges; remote villages; structural concepts; reconstruction; service condition; detailing.

### 1 INTRODUCTION

Railway transport was widely used in Republic of Bulgaria during second half of the twentieth century and has good potential for modernization and development [1], [2]. One of the main railway lines, crossing Bulgaria from north to south, is line number 4, starting in the town of Ruse (on the Danube river) and ending at Podkova railway station (close to the southern border of Bulgaria with Greece), Figure 1. The last section of that railway line Momchilgrad-Podkova was built during the Second World War and put in exploitation in the end of 1944. It is around 17,5km long and has three intermediate stations/stops. In this section the line falls in the picturesque Rodopi Mountains region. Due to the difficult terrain, it was designed to follow the curves of Varbitza River without crossing it, thus leaving the villages on the other side of the river without access to the railway stations.

Around 15-20 years after the railway line was put into exploitation pedestrian bridges over the river Varbitza were built. They were intended to connect the remote villages, left on the other side of the river, with the railway stations. Since the riverbed of Varbitza is relatively wide all bridges were initially planned as suspension pedestrian bridges. Despite their relatively large spans, up to 260m, these bridges usually lack project documentation and were craft made utilizing steel cables from the regional mining industry. Adding poor or almost no maintenance makes them even dangerous to cross.