



Assessment and Repair of a historic brickwork covering of River Scheldt

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Abstract

The double brickwork vault covering the original course of River Scheldt, built in 1885, has been serving satisfactorily for 130 years. Recent inspections revealed that some areas at the intrados of the vaults show deterioration and may be pushed out. Careful analysis has been carried out, both by the rigid block method as by a conventional FE-code, simulating the cracks and defects found during inspection. Both methods confirmed that the load-carrying capacity of the covering is certainly sufficient for present effective loading. The analysis demonstrated that load paths may be diverted around damaged areas and the load-carrying capacity may be slightly reduced. This demonstrates that careful analysis may enable to preserve historic structures for many years to come

Keywords: Brickwork arch, rigid block method, realistic load, historic structure, load path.

1 Introduction

By the end of the 19th-century, the Zollikofen-De Vigne plan was implemented in the city of Ghent, to improve health conditions of living near the rivers Lys and Scheldt and to establish easy access from the historic centre to the Southern railway station. This also included filling up some of the smaller canals and ditches, as well as the covering of river Scheldt's original course. Some of these waterways were closed to prevent the spreading of typhoid and cholera.

The 160 m long covering of river Scheldt was built by a double brickwork vault in 1885. Fig. 1 shows a picture taken during the actual building, and may be useful in determining the quality of brickwork and the impact of these important works in the

city at that time. The construction required complete drying of the river bed, enabled by diverting the river flow through its multiple other arms around the city.

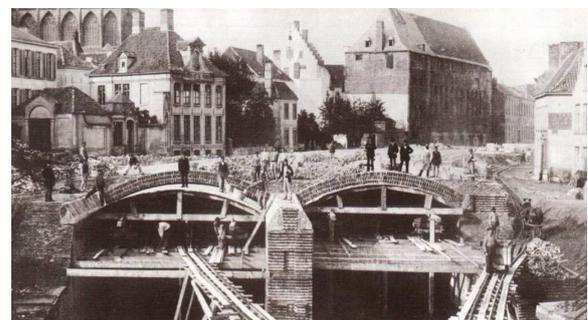


Figure 1. Covering construction in 1885

In 1960 the remaining part of the river's original bed was also covered completely, by diverting the