Monitoring of the Seitenhafenbridge in Vienna

Roman GEIER
Dipl.-Ing. Dr.
Schimetta Consult
Vienna, AUSTRIA
roman.geier@schimetta.at

Roman Geier received his civil engineering degree in 1998 and his PhD in 2004 from the Technical University Vienna. He currently works as general manager of Schimetta Consult, an international oriented consulting and engineering company

Thomas MACK
Dipl.-Ing.
Schimetta Consult
Linz, AUSTRIA
thomas.mack@schimetta.at

Thomas Mack received his civil engineering degree in 2005 from the Technical University Innsbruck. He has been working with the Austrian consulting and engineering company Schimetta Consult since 2008 with focus on monitoring.

Erich KREBES
Dipl.-Ing.
Dpt. Bridge Construction
City of Vienna
Vienna, Austria
Erich.krebes@wien.gv.at

Erich Krebes received his civil engineering degree in 2005 from the University of Natural Resources and Life Sciences, Vienna. Recently he is working as one of three bridge inspectors at the Municipal Bridge Authority Vienna.

Summary

More and more bridges without bearings and expansion joints have been designed and built in recent years as a result of the numerous advantages which integral bridges have all through their life cycle. This type of a bridge with larger load bearing structures not exceeding 100 m has been accepted meanwhile also by clients. With increasing length however, temperature variations have significant effects on the movements and thus on the soil-structure interaction which, when we speak about a long integral construction, is relevant in terms of measurement. The Seitenhafenbridge in Vienna presented in this article is currently the longest integral bridge in Austria. Having regard to its total length of about 130 meters, the client requested and installed a complex system for the monitoring of the movements of the construction. The monitoring system constantly measures the temperatures and the movements of the construction, like for example deflection, inclination, length variation and ground pressure at the abutment. The data are continuously assessed and summed up in intermediary reports for the client in order to provide an overview on the actual behaviour of the structure.

Keywords: Integral Bridge, Monitoring, Measurements, Soil-Structure-Interaction, Movements

1. Introduction

For the longest integral road bridge in Austria, the Seitenhafenbridge in Vienna, a monitoring system was designed for the observation of the significant movements and deformations taking into consideration the changes in temperature according with the Austrian Guidelines for the Monitoring of Civil Engineering Structures.

The Austrian Guideline RVS 13.03.01 [1] deals with the monitoring of bridges and other civil engineering structures and enlarges on the field of application of different monitoring systems and sensors. Quality assurance, control and monitoring of road bridges are described in the RVS 13.03.11 [2]. These guidelines are the basis for the planning of monitoring systems.

Experience gained in Austria over the past decade regarding monitoring has taught us that for a more widespread and successful application of this technology we need to branch away from previous strategies because only very few projects have been monitored so far, and in many cases the focus was on research projects. Based on practical experience in recent years, 3 key theses [3] have been deduced that are of core significance to increasing the implementation of monitoring systems.

(1) Monitoring may not replace conventional inspection. This technique should be a supplement to determine structural condition and load bearing capacity. Moreover monitoring may present a tool to determine specific load bearing conditions during construction processes or specific load cases during erection and/or operation.

https://doi.org/10.2749/222137814814070316