Expansion joint renewal with 'zero' impact on traffic - an optimal solution for urban bridges

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Summary

A solution to the demands to be addressed in the specification, design, installation and replacement of expansion joints on urban bridges is presented: the Tensa®Flex Sliding Finger expansion joint and the associated traffic management system Mini-Fly-Over. The expansion joint type is quiet and durable, with long-term benefits for local residents, while the traffic management system was developed to minimise the difficulties and traffic disruption associated with its installation as a replacement for an existing expansion joint. The successful implementation of the traffic management system to install the sliding finger joints on a major highway bridge with almost no impact on traffic is described, proving that clever solutions which take account of the needs of modern urban society can always be developed.

Keywords: Expansion joint, replacement, renewal, traffic management, low noise

1. Introduction

Bridges in urban settings may often be subjected to particular demands that do not apply to bridges in remote areas. For instance, noise from traffic passing over the bridge should be kept to a minimum in order to reduce the impact on nearby residential areas. And the impact on traffic during installation and maintenance or refurbishment work on the bridge should also be minimised, as bridges in and around cities tend to cater for much larger volumes of traffic which would be inconvenienced by the congestion such works would cause.

Fig. 1: A Tensa®Flex expansion joint

These topics are especially relevant in the case of the expansion joints which serve such an important role in providing a driving surface for traffic while also facilitating bridge movements due to temperature variations, wind, traffic loading and so on. Expansion joints have the potential to be a significant source of noise on a bridge, so their design should limit noise emissions as appropriate. In addition, since expansion joints are less robust and more highly stressed than the main structure, it must be recognised that they will need to be replaced several times during the lifetime of the bridge, with a correspondingly higher potential to impact on traffic during installation or replacement works. A clever solution to these twin demands is described below.

https://doi.org/10.2749/222137810796063940