



## Extended Lifespan for Bearings and Expansion Joints

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### Summary

Many decades of experience, including analysis of actual damage, has led to improvement in the durability of bridge bearings and expansion joints. Basic recommendations are given using simple principles for the arrangement and the design type selection. New technologies for sliding elements to eliminate wear problems are described. Complementary advice for dimensioning, anchorage equipment, manufacture and installation ensure the highest performance level at acceptable costs. Links to applicable international standards and national regulations simplify the process.

**Keywords:** bridge bearing, bearing arrangement, anchor plates, PTFE, UHMWPE, bearing installation; expansion joint, fatigue, eigenfrequency, maintenance.

### 1. Introduction

Many types of bearings and expansion joints used for bridges since the middle of the last century have performed poorly; some of them are unreliable and easily damaged. Damage to such structural components results not only in high replacement costs, but also in difficult-to-repair consequential damage to other parts of the structure which together with the associated traffic restrictions add to the cost.

In more than thirty years of experience the author has amassed substantial knowledge in these fields. This leads to the proposal of possible means of extending the lifespan of bearings and joints up to the structure's lifespan. All the principles elaborated are independent of specific manufacturers.

Intentionally the advice does not consider the state of the art standards and regulations. There are too many cases, where the specifications and requirements lead to inadequate performance. My understanding is that, any engineer has a duty to scrutinize regulations and, if different solutions will bring advantages, to convince the clients and get their approval for the best solution.

### 2. Bearings

#### 2.1 Bearing arrangement

Whenever it is possible separate bearings for horizontal and vertical load transmission should be used, (even when more expensive).