



Sustainability of Timber Bridges - the magic triangle Standard construction drawings– Maintenance Costs - Lifetime

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SUMMARY

In Germany thousands of traffic bridges are built and have to be replaced every year. The German government and the road construction authorities prefer standard structures and standard details for cost-saving reasons. Standard construction drawings for timber bridges have not been published yet in Germany. That's why 39 standard construction drawings have been generated for timber bridges: To this day 11 details for standardisation have been developed to improve the durability of timber constructions; additional 28 drawings show part of the constructions more in detail.

This presentation gives an overview of all **standard construction drawings** and it gives detailed information with reference to bridges in alpine countries. Together with the **lifetime** and the **maintenance cost** of a bridge (a field research project by the author), the drawings build the so called "magic triangle".

KEYWORDS: Bridges, timber, heavy load structures, long and efficient life, design considerations, durability, sustainability, lifetime, maintenance costs



1 INTRODUCTION

2 REPLACEMENT DIRECTIVES

3 STANDARD CONSTRUCTION DRAWINGS (Construction References)

3.1 General

The aim of the second project [10] was to generate standard construction drawings for a selection of traffic bridges made of timber. This set of H (“Holz” is the German word for timber.) design drawings could be the basis for the new generation of the official standard construction drawings and could be also used in the ZTV-ING for timber bridges.

3.2 Application of Standard construction drawings

The timber protection by the construction itself has a higher priority as the chemical protection (refer DIN 68 800 Part 2 [4]). Chemical timber protection is not a substitute, it is only a support. 11 H-standard construction drawings show how to protect timber constructions – Most of these examples have already been used frequently:

Additional 28 standard construction drawings were produced for important elements of timber bridges. They complete the standard construction drawings from the government’s bridge catalogue, as well as that of the DB Netz AG (Federal Railway Network), and take the particular features of timber construction into account.

4 SUMMARY

Existing traffic bridges made of timber have already shown the high degree of suitability of this material in a rough environment. These examples can send an obvious signal to the public.

So far, the official drafts of highway board departments and community authorities rarely include bridges made of timber. Special proposals based on timber bridges are often rejected or not accepted with reference to the Federal Replacement Directive, because typical cross-sections are not available or standard construction drawings have not been verified. That’s why verified and generally accepted standard construction drawings for timber bridges are absolutely necessary in order to open the market for civil engineering timber constructions.

If we take the realistic replacement values, combined with modern construction methods for timber bridges, and if good standard construction drawings are distributed and type-inspected timber bridges are developed, then the market opportunities for timber applications can be decisively improved.