Future Construction

SHORT REPORT

Title

Improvement of the practical application of construction standards – Project part 4: Timber construction

Reason / Initial situation

The purpose of the research project was the pre-normative research in preparation of thepractice-oriented updates and further development of Eurocode 5 for the design of timber structures (EN 1995-1-1; EN 1995-1-2; EN 1995-2).

The research followed the strategy that first of all vulnerabilities and excessive regulations of Eurocode 5 were assembled as part of an anamnesis. Then, as part of a diagnosis phase it was reviewed, in how far these deficits have relevance in practice. Subsequently improvements and simplifications were developed as a remedy to the issues and partly validated using comparative analysis. The results of this research should be implemented in the German and European standard committees.

Object of the research project

Particularly the following mentioned key issues of the Eurocode 5 have been identified as in need of improvement by the viewpoint of German users: the regulations concerning dowel type fasteners, design and scaling of reinforcement methods. Furthermore the calculation of wall and floor elements and verification of serviceability limit state were prioritized.

By creating a new classification of bolt type fasteners determined by diameter the standard was considerably simplified. Hitherto fasteners had been classified by type.

Furthermore dimensioning and detailing rules have been developed for the currently insufficiently normatively regulated range of cross-pressure reinforcements. In addition, practical design rules have been prepared for the arrangement of reinforcing elements, which reduce the blocking effect on the free shrinkage and swelling.

With the help of the extended shear field theory, a detection method for floor elements was derived, which allows a more accurate dimensioning of the elements. By taking into account the influences of the introduction of the external loads and the free edges of elements et al the previous constructive restriction of a staggered floor element arrangement cancelled and thus the use of prefabricated floor elements are facilitated.

If necessary, the effects of the suggestions for improvement on Eurocode 5 were also examined on specific components and compared with the assessment results of the previous Eurocode 5.

Conclusion

In the research project pre-normative proposals for improvement and simplification for most chapters of Eurocode 5 have been identified in the sense of a remedy. The focus was on improvement of ease of use based on the previous experiences in Germany and based on analysis of specialist literature. In all revised topics a reduction of the number of NDP and of German additional rules has been achieved. The remedial proposals led to updated and practice-oriented drafts of code texts for Eurocode 5 and for the related National Annex.

Within the scope of the ongoing evaluation of the European collated comments after the systematic review and during the rework of Eurocode 5 up to the next official code draft (expected end of 2020) future proposals for change and improvement of other countries have to discussed. Thereby it is necessary to assess these proposals from the point of view of ease of use, safety and economy (e. g. by comparative analysis) und to compare with the German proposals. During this process further rework and optimisation of the proposals are expected.

Eventually new research topics will be established which have not been identified as key topics so far.

Project data

Short title: Improvement of the practical application of Eurocode 2

Researcher: Dipl.-Ing. Markus Bernhard
Prof. Dr.-Ing. François Colling
Dr.-Ing. Philipp Dietsch
Dipl.-Ing. Matthias Gerold
Prof. Dr.-Ing. Patricia Hamm
Prof. Dr.-lng. Martin H. Kessel
Dipl.-Ing. Marion Kleiber
Dr.-Ing. Mandy Peter
Prof. Dr.-lng. Mike Sieder
Dr.-Ing. Tobias Wiegand

Project management:
Dipl.-Ing. (FH) Johannes Niedermeyer
Holzbau Deutschland – Institut e.V., 10117 Berlin, Kronenstraße 55-58

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