W018 – Timber Structures

Report of the Worldwide Meeting

on “Design of Load-bearing Timber Structures”

in Delft, August 28 - 30, 2000

by

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CIB W018-Timber Structures had its annual meeting at the Conference Centre of Delft University of Technology on August 28 to 30 last year. The Section Steel & Timber of the Department of Civil Engineering invited W018 and it was the first time after 1974 that the Working Group met again in Delft. The reason for the invitation was to commemorate the 75th birthday of emeritus Prof. Ir. Jan Kuipers, one of the oldest participants of the Group.

Delft Timber Research Group

The chairman of W018, Prof. Dr. Ing. Hans Joachim Blass, recalled the prominent role played by the Delft tests on timber joints, nailed or bolted as well as with toothed plate and split-ring connectors. Famous are the tests in the field of long duration behaviour, for example there are a few series of joints which survive now 38 years of sustained loading and which are still monitored. The active participation of the Delft timber research group resulted in several proposals for standardisation of testing and of design rules.

Prof. Kuipers thanked the chairman for his kind words and said he felt honoured by W018 gathering in Delft in the year of his 75th birthday. He mentioned some anecdotes from the history of W018 and he thought that the rules and standards that needed reconsideration.
**Participants**
A number of 40 scientists from 14 countries – Australia, Canada, Denmark, Finland, France, Germany, Israel, Japan, Poland, Sweden, Tsjech, United Kingdom and USA and of course The Netherlands – participated in the technical discussions about the 23 presentations, dealing with a number of subjects. A rough overview of the different items is given below.

At most international technical conferences there are many participants, sometimes many hundreds of people. The W018 group is relatively small and therefore sufficient time can be allowed after every presentation for detailed comments or critical remarks.

Also present were the members of Project Team Eurocode 5 – Timber Structures, who at the moment are dealing with the redrafting of the present standard. If researchers want to influence parts of the technical content of the Eurocode 5 this Working Group W018 offers the best possible forum. Comments can be mild or severe. Presenters who try to hide, for instance, the method of analysis by introducing so-called black boxes, will be asked to reveal all, as this group does not allow any secrets.

Altogether it was a very fruitful meeting, which will leave its marks on the revised Eurocode 5.

**Issues discussed**
At the conference the following issues were put forward:

*Safety of timber structures*
In the near future all European timber designers will be confronted with the introduction of a safety approach, which is already common in a number of EC-countries. Non-timber people drive this probabilistic approach and they might turn things in a wrong way for timber structures, unless timber researchers provide the necessary support. It was mentioned that in Denmark the probabilistic safety approach harmed the competitiveness of timber by raising the safety coefficient by 10% for this material only. Without active involvement of timber researchers this might happen on a European scale. Therefore, a new COST-action (European Co-operation in the field of Scientific and Technical research) is started, sponsored by the European Committee to gather both groups around the table with the intention to learn from each other.

*Timber connections*
Presentations dealing with timber connections are important, because timber structures are almost without exceptions built up with the application of mechanical jointing devices. A German contribution dealt with the limited plasticity of connections when using large size dowels and bolts. The theory assumes that the fastener reaches the full plastic bending capacity. However, due to premature splitting of the timber this capacity is seldom attained. A solution was presented in reducing the value of this bending capacity dependent on the steel quality and fastener diameter and forwarded this approach for adoption in the new Eurocode 5.

In Scandinavia a number of research projects dealing with glued-in steel rods are in progress. The Norwegians, Swedes and British reported about the influence of the type of glue and hole clearance on the performance of connections with glued in rods. A Danish study proposed new design rules for Eurocode 5 with regard to the lateral stability of timber beams. A Dutch presentation was about the fracture of timber beams loaded perpendicular to the grain by connections. The theory presented caused a lot of discussion as it involved a new approach to
the problem. Some of the remarks resulted in a modification of the paper before it was included into the conference proceedings.

Timber and wood based materials
A Swedish study was presented about the climatic influence on the appearance of cracks in glued laminated wood.

An item of great importance for seismic active regions like West Canada, USA and Japan was the behaviour of OSB sandwich panels subjected to dynamic actions. A Japanese report compared a number of design models for the behaviour of timber framed houses. Not less than three contributions dealt with the behaviour of timber in fire conditions. The first one gave an overview to what extend the strength and stiffness properties of the material are affected at increasing temperatures. The second concentrated on a design model for strength of beams and studs in sandwich panels. The third compared design models from America, United Kingdom, Sweden and the Eurocode 5 - part 2 (fire).

Last but not least Dr. Janssen, from Eindhoven University of Technology, presented a number of draft standards for the structural use of bamboo. His aim was to gather support from this Working Group to turn these draft standards into ISO standards. There was a lot of interest from delegates for the type of connections used in bamboo structures. A number of conference participants have a close connection to ISO/TC165 and acknowledged their full support.

Excursions
During the two days conference, there was time for more relaxing activities. A cultural excursion was organised to visit places of interest in the old historical centre of Delft. After having visited the “Porcelain Fles”, the producer of the famous Delft blue pottery, the participants went on a scenic boat trip through the old city canals. They also visited two museums, Lambert van Meerten, an old patriciers house, and The Prinsenhof, with old Dutch paintings. This latter museum is also the place where the founder of the Dutch Royal Family, Willem van Oranje, the Silence, was assassinated in 1581. At the end a still working windmill, “de Roos” was visited, here an old brick construction, in many other cases timber structures.

In the evening a conference dinner was held in restaurant Vermeer, in the honour of Jan Kuipers.

Close of the meeting
The chairman thanked all organisers and members for their contributions, which made this meeting a success. He promised that W018 would be back in Delft after 12 years, to commemorate the 50th-anniversary of the long duration tests on connections at TU-Delft.

Next Meetings
The next meetings are planned in:

- 22-24 August 2001 in Venice
Kyoto (2002)

NOTE: A description of the Proceedings of the W018 Delft Meeting is included in the New CIB Related Publications section of this Information Bulletin. An announcement of the W018 meeting in Venice in 2001 is included in the Forthcoming Meetings section.