IPHA ANNUAL CONFERENCE
September 2003

FIB recommendations
Precast prestressed hollow core floors

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VBI RESEARCH & DEVELOPMENT

FIB

The International Federation for Structural Concrete (fib - fédération internationale du béton) is a non-profit organisation created in 1998 from the merger of the Euro-International Concrete Committee (CEB - Comité Euro-International du Béton) and the International Federation for Prestressing (FIP - Fédération Internationale de la Précontrainte).

FIB

The objectives of fib as given in the statutes are to develop, at an international level, the study of scientific and practical matters, with the purpose of advancing the technical, economic, aesthetic and environmental performance of concrete construction.

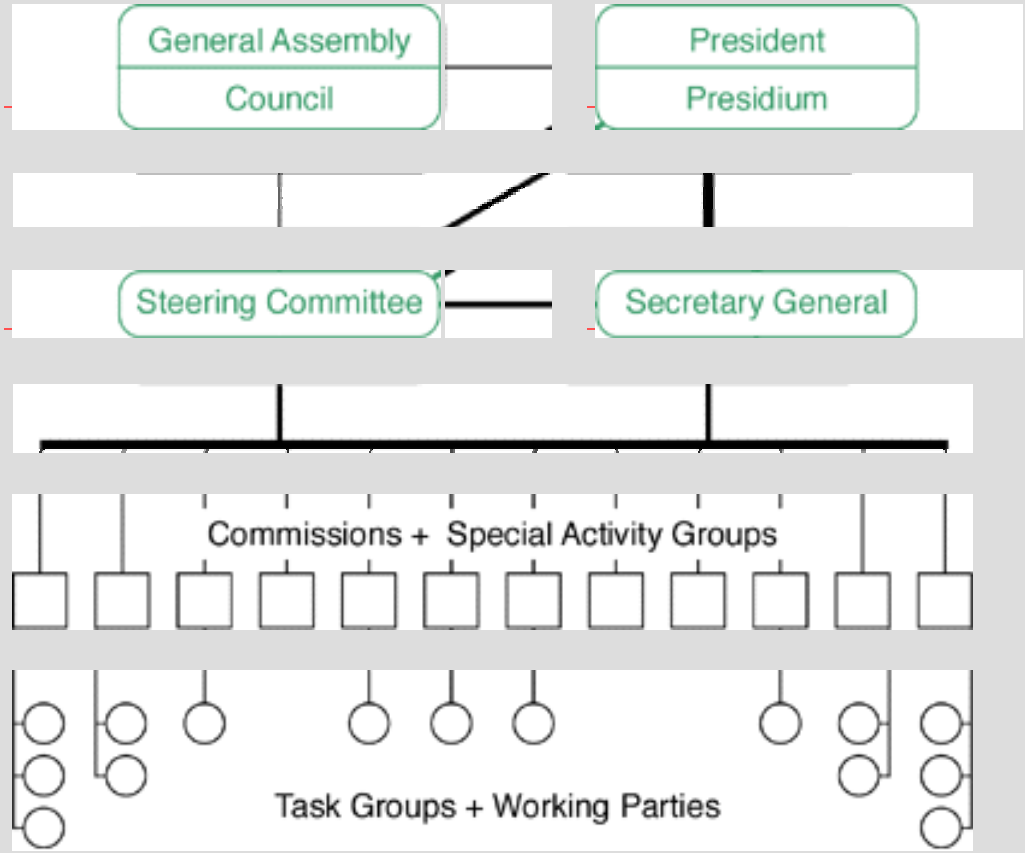
FIB

These objectives will be achieved by:

- the stimulation of research,
- the synthesis of findings from research and practice,
- the dissemination of the results by way of publications, guidance documents and the organisation of international congresses and symposia,
- the production of recommendations for the design and construction of concrete structures,
- the information of members on the latest developments.

FIB Recommendations Precast prestressed hollow core floors

Organisational structure



FIB Recommendations Precast prestressed hollow core floors

FIB Commissions

C 1 Structures

C 2 Safety and performance concepts

C 3 Environmental aspects of design and construction

C 4 Modelling of structural behaviour and design

C 5 Structural service life aspects

C 6 Prefabrication

- T 6.1 Prestressed hollow core floors
- T 6.2 Connections
- T 6.4 Precast bridges
- T 6.5 Precast concrete railway track systems

C 7 Seismic design

C 8 Concrete

C 9 Reinforcing and prestressing materials and systems

C 10 Construction

FIB Commission

C 6 Prefabrication

T 6.1 Prestressed hollow core floors

Chairman: Aad van Paassen

Former publications:

- Precast prestressed hollow core floors Recommendation
- Quality assurance of hollow core slab floors
- Special design considerations for precast prestressed hollow core floors: Guide to good practice

FIB Commission T 6.1 Prestressed hollow core floors

Aad van Paassen (Chairman)	The Netherlands
Arnold Van Acker	Belgium
Bruno Della Bella	Italy
Kim Elliott	United Kingdom
Gunnar Rise	Sweden
Spyros Tsoukantas	Greece
Sébastien Bernardi	France
Massimo Ferrari	Italy
Nordy Robbens	Belgium
Andrzej Cholewicki	Poland
Björn Engström	Sweden
Arto Suikka	Finland
Fritz Mönnig	Germany
Josef Hegger	Germany
Yoshihiro Murayama	Japan
Barry Crisp	Australia
Subbaiya Kanappan	India

FIB Commission T 6.1 Prestressed hollow core floors

Update of FIB recommendations

Precast prestressed hollow core floors

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Content list (revised 2003-8-21)

1. Scope of design
2. Specific design principles
3. Geometry
4. Shear capacity on rigid and non rigid supports
5. Flexural capacity
6. Deflection
7. Torsion
8. Topping/composite action
9. Punching
10. Restrained supports
11. Maximum point loads and line loads
12. Transverse load distribution
13. Dynamic actions

Content list (revised 2003-8-21)

14. Vibrations and resonance
15. Diaphragm action
16. Horizontal loads
17. Large openings
18. Progressive collapse (will be deleted)
19. Fire resistance
20. Acoustic insulation
21. Connections
22. Fixings
23. Tolerances
24. Weepholes
25. Transport and lifting
26. Design considerations in connection with manufacture

Goal:

FIB recommendations will be published in 2005.

Three headlines

- Hollow core element and element qualities
- Quality design aspects
- Calculation methods

Quality design aspects

Not only stress, load and span but also quality claims have to be considered, for example:

- measures to minimize the difference in camber,
- detailing of camber
- aesthetic of ceiling

Quality design aspects

For a good quality of the ceiling:

- Max. slenderness is 38
- Level of prestressing is average

Quality design aspects

For a good quality of the ceiling:

- Max. slenderness is 38
- Level of prestressing is average

For dwellings the max length of hollow core slabs are:

Strength of element	Steel trimmer in house-building			
	Length			
mm	none	1200 mm	2400mm	3600mm
200	7600	7400	6300	5200

Quality design aspects

For a good quality of the ceiling:

- Max. slenderness is 38
- Level of prestressing is average

For offices in relation to the loads the max. length of hollow core slabs are:

Strength of element	Industry and office building			
	Sprung ceilings		Without sprung ceilings	
Additional load*	5,00 KN/m²	6,50KN/m²	5,00 KN/m²	6,50 KN/m²
200	8000	7500	7500	7000
260	11000	10000	9000	8000
320	13000	12000	10500	9500
400	15000	14000	11500	10500

*: Additional load = 1,50 KN/m² + live load

Quality design aspects

For a good quality of the ceiling

For roofs:

- Max. slenderness is 45
- Level of prestressing is average

For roofs in offices in relation to the loads the max length of hollow core slabs are:

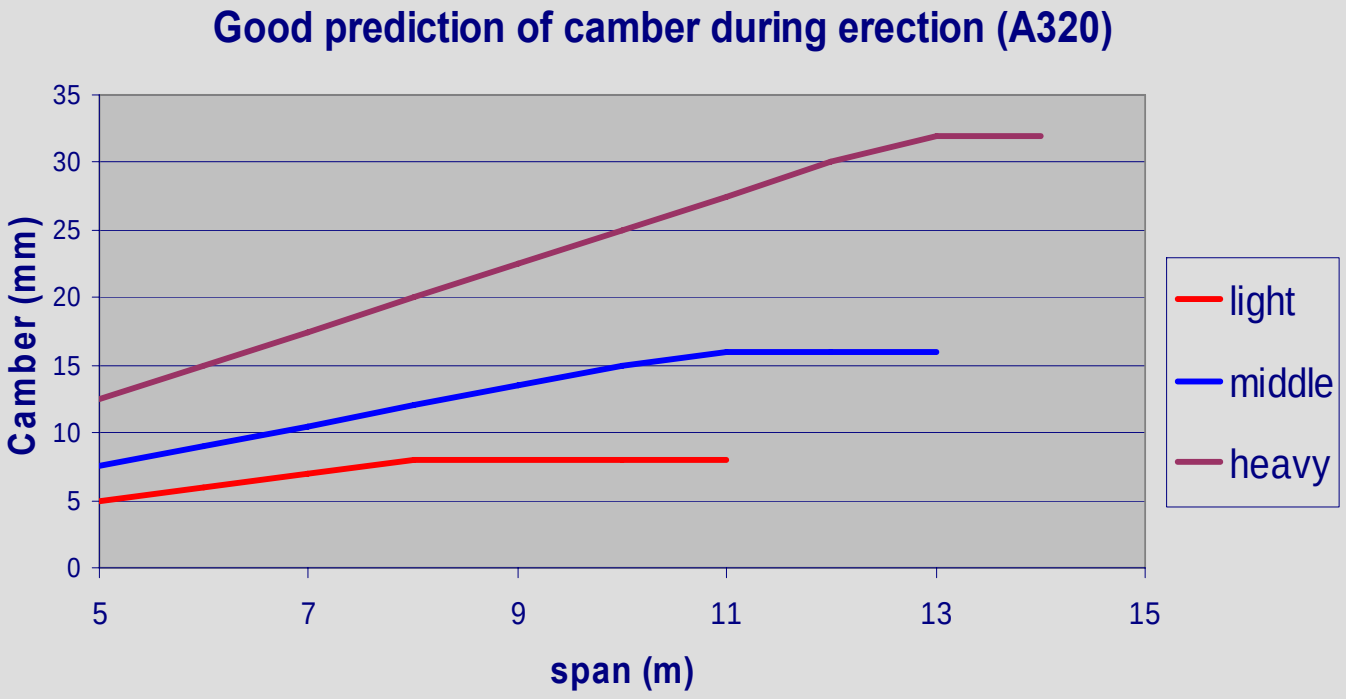
Strength of element	Industry and office building	
	Sprung ceilings	Without sprung ceilings
Additional load*	2,00 KN/m²	2,0 KN/m²
150	8000	6500
200	10000	9000
260	12500	11500
320	14500	14000
400	18000	18000
		*: Additional load = 1,00 KN/m² + live load

Quality design aspects:

Good prediction of camber after erection

Pre-stressing Camber (mm)

Light	**1,0/1000 x Element length ≤ 1/40 x Element height**
Middle	**1,5/1000 x Element length ≤ 1/20 x Element height**
Heavy	**2,5/1000 x Element length ≤ 1/10 x Element height**



Quality design aspects

International directive of safety for

- Erection of hollow core floors
- Hoisting regulations

Hollow core floors must be:

a quality flooring solution
with good design recommendations