BIBM CONGRESS COPENHAGEN
NOVEMBER 15TH 2021

NEW EUROPEAN ASSESMENT FOR PUNCHING SHEAR REINFORCEMENT

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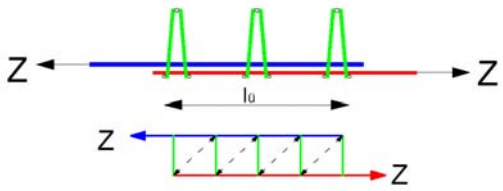
FILIGRAN®
TRÄGERSYSTEME

Two Way Spanned Slabs with Lattice Girders

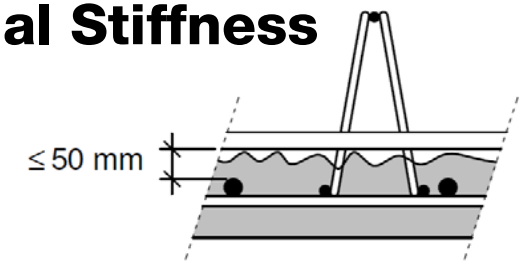
Two Way Spanned Slabs with Lattice Girders

Reinforcement laps

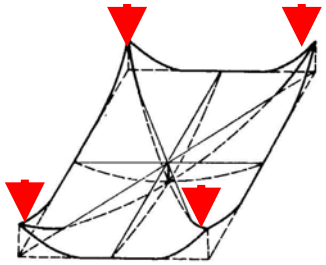


Deflection

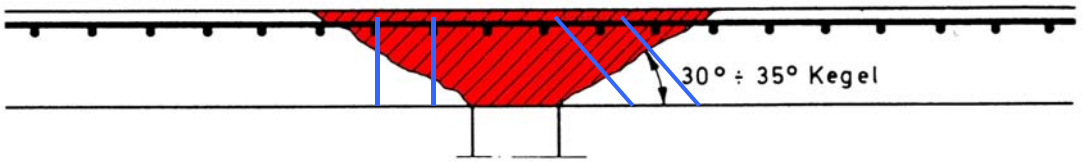
Biaxial Stiffness

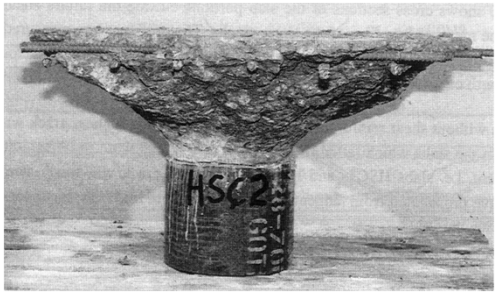


Torsional Stiffness



Flat Slabs - Punching Shear Failure





Filigran-Punching-Shear-Reinforcement FDB

Diagonals ∅ 9mm

Protruding loops

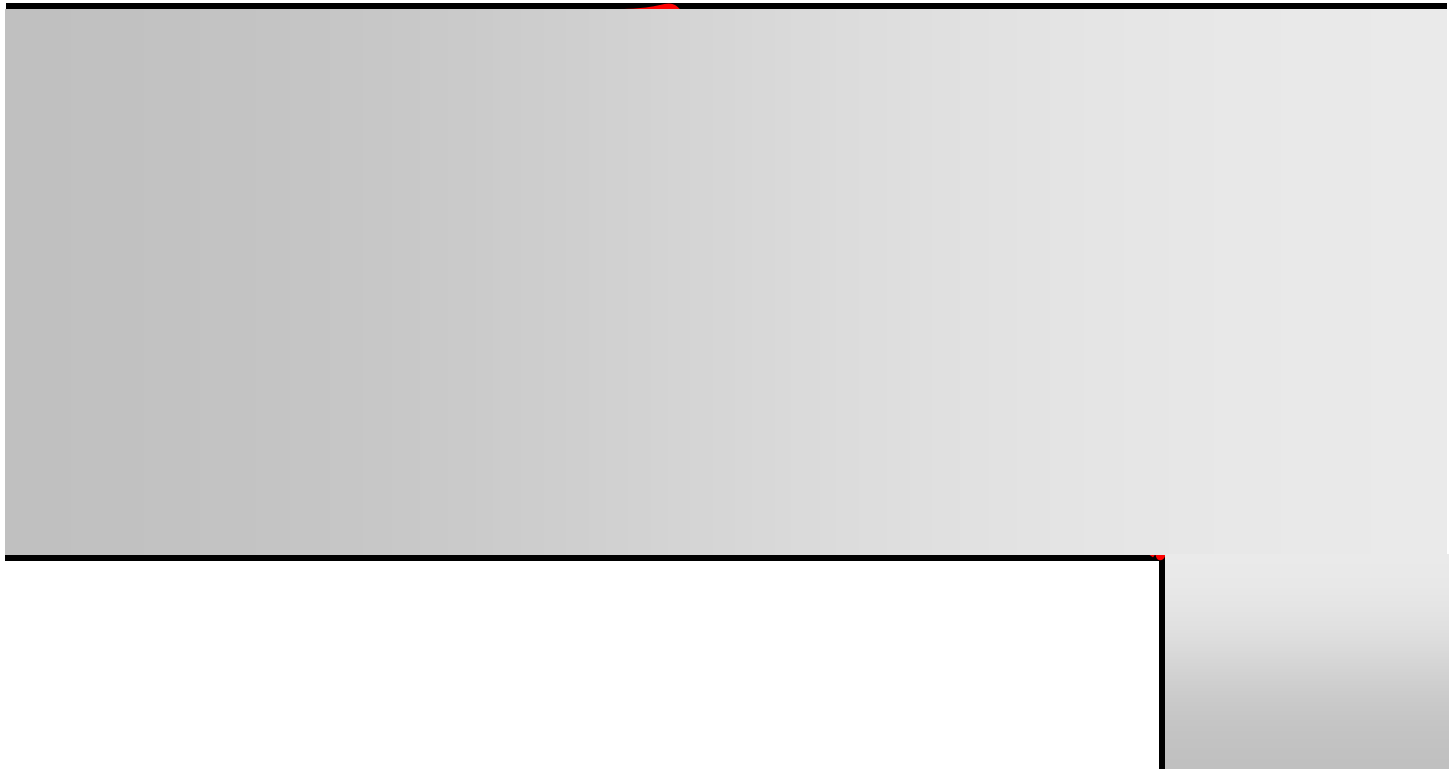
Inclination (2 cm)

Ribbed bars

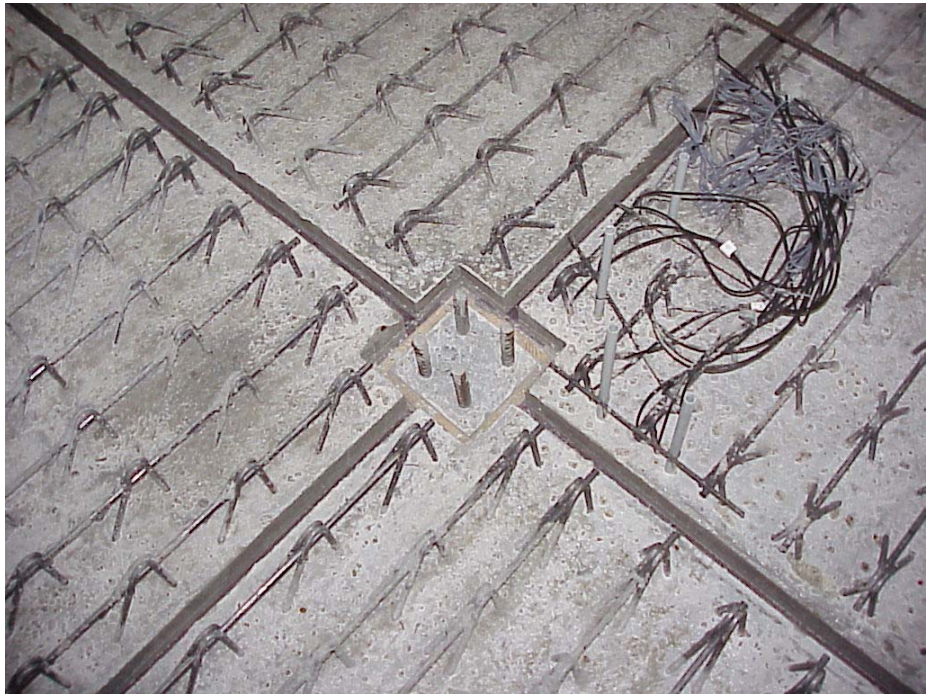
Lower chord ∅ 10mm

→ only parameter height → easy stockpiling

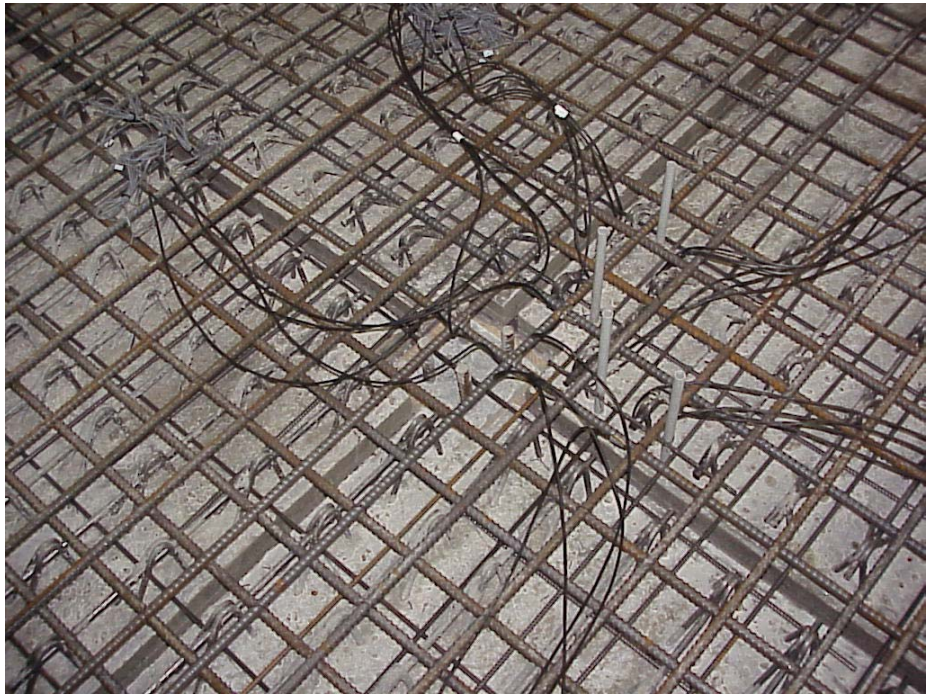
Possible Punching Shear Cracks



Full Scale Tests at University Aachen



Full Scale Tests at University Aachen

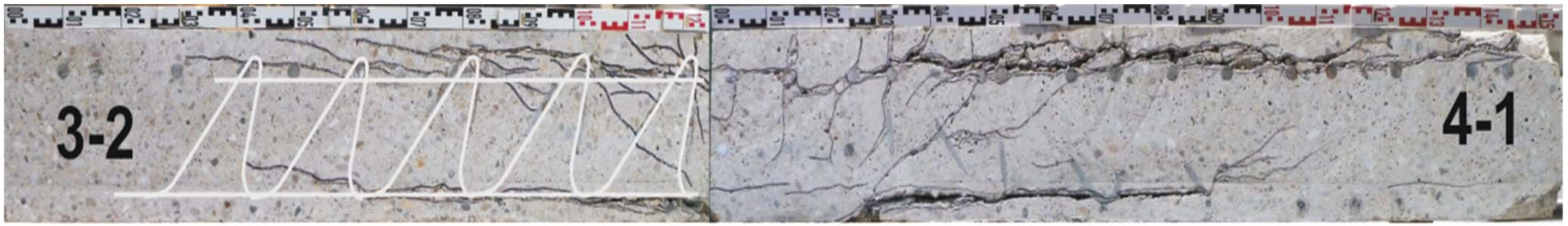


Full Scale Tests at University Aachen

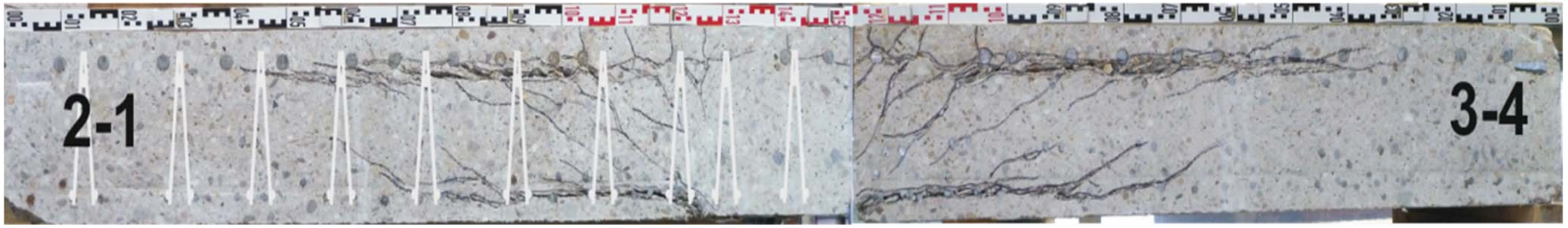
Crack Pattern After Testing

Internal Crack Pattern - Section

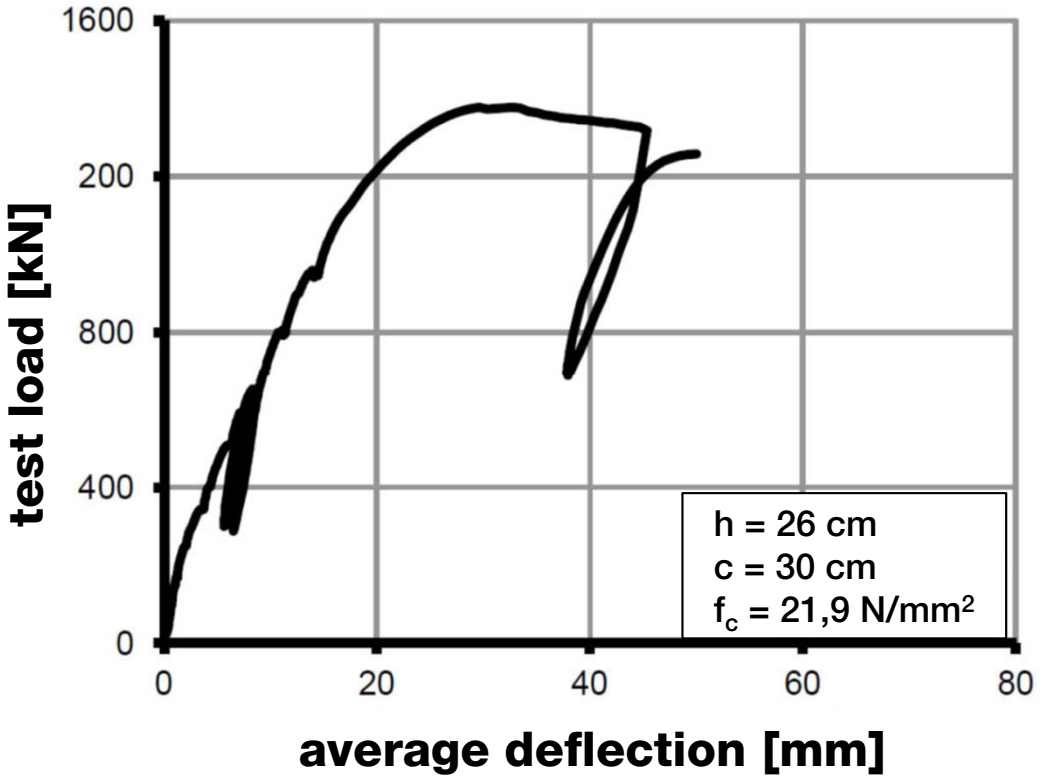
Internal Crack Pattern - Both Directions



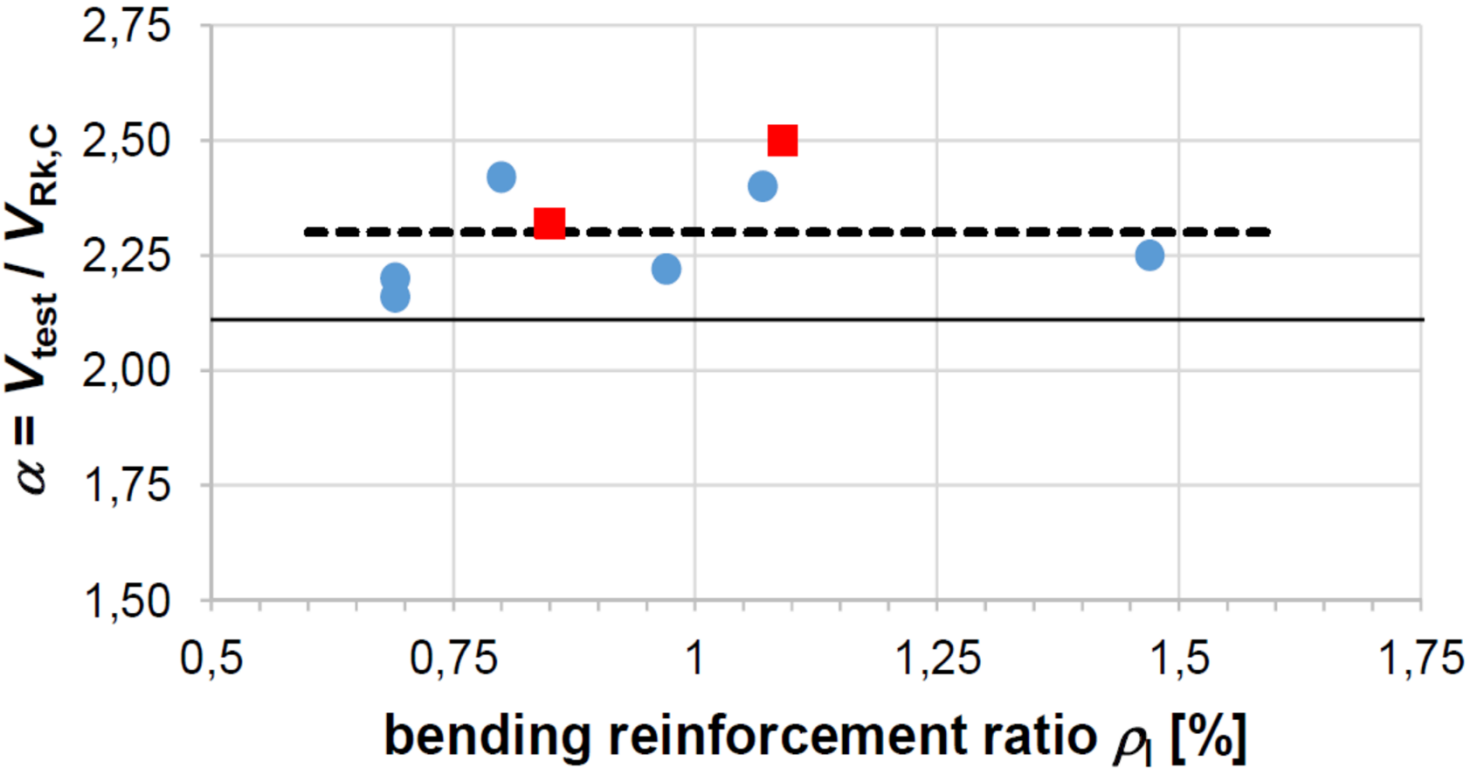
schematische Anordnung der Gitterträger

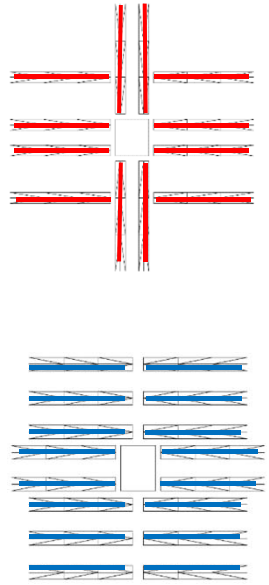


Load-Deflection-Curve

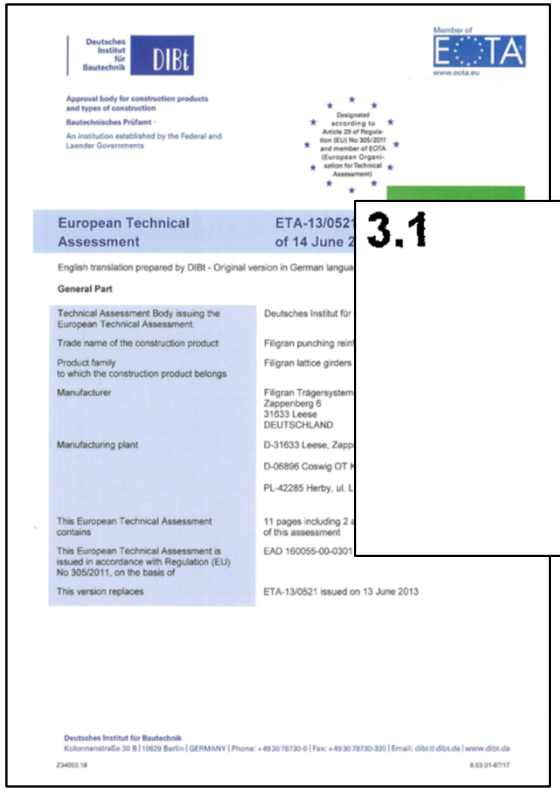


Evaluation of Maximum Shear Load





European Technical Assesment



Deutsches Institut für Bautechnik DIBt

Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Member of EOTA

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Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-13/052… of 14 June 2…

English translation prepared by DIBt - Original version in German langua…

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für
Trade name of the construction product	Filigran punching rein…
Product family to which the construction product belongs	Filigran lattice girders
Manufacturer	Filigran Trägersystem… Zappenberg 6 31633 Leese DEUTSCHLAND
Manufacturing plant	D-31633 Leese, Zapp…
	D-06896 Coswig OT …
	PL-42285 Herby, ul. L…
This European Technical Assessment contains	11 pages including 2 a… of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 160055-00-0301
This version replaces	ETA-13/0521 issued on 13 June 2013

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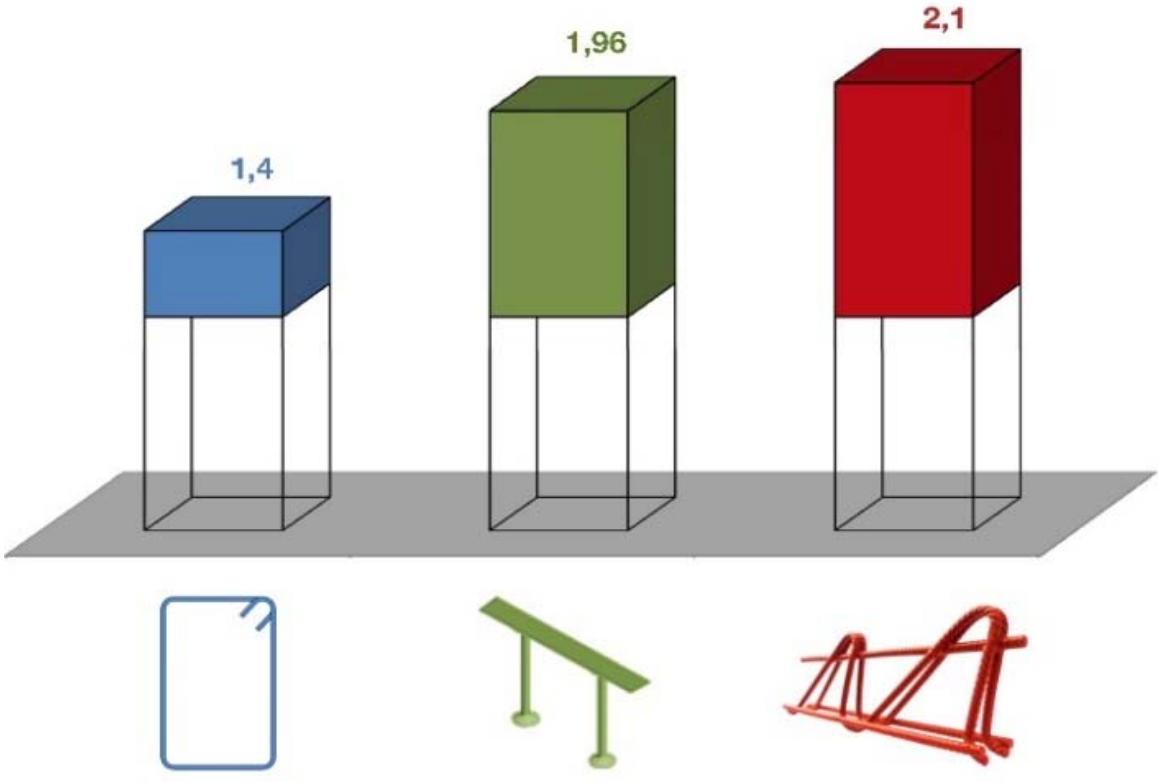
Z34003.18 8.03.01-67/17

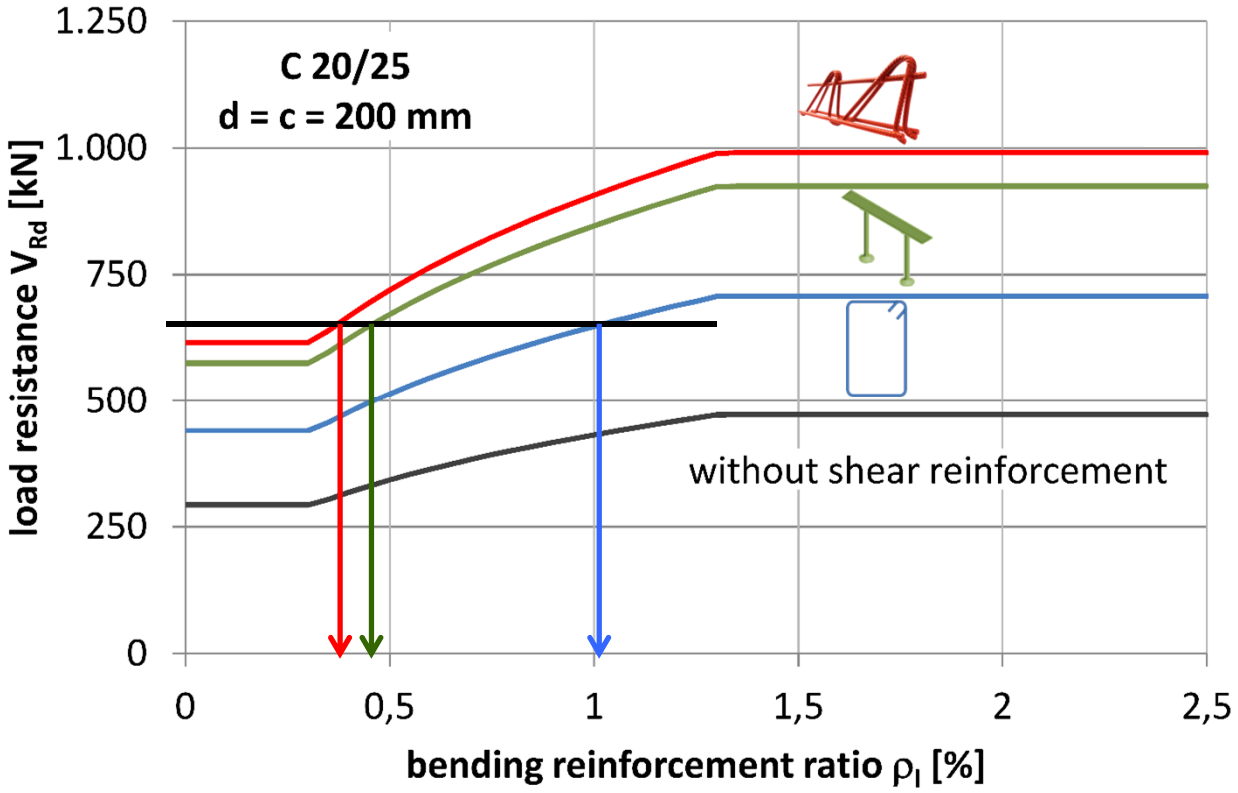
3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Increasing factor for punching shear resistance	$k_{pu,msl} = 2,1$ $k_{pu,csl} = 2,1$ $k_{pu,asl} = 2,1$

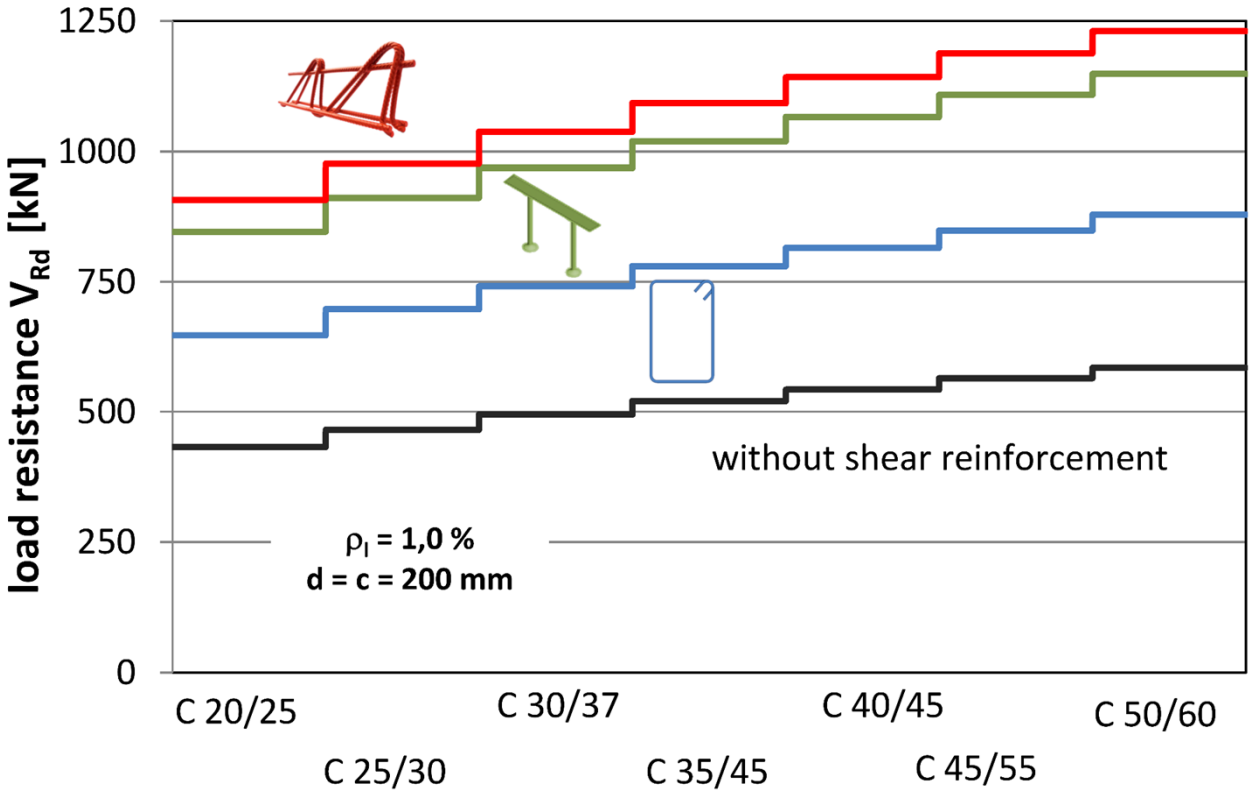
Punching Shear Resistance in Comparision



Option: Reduced Flexural Reinforcement

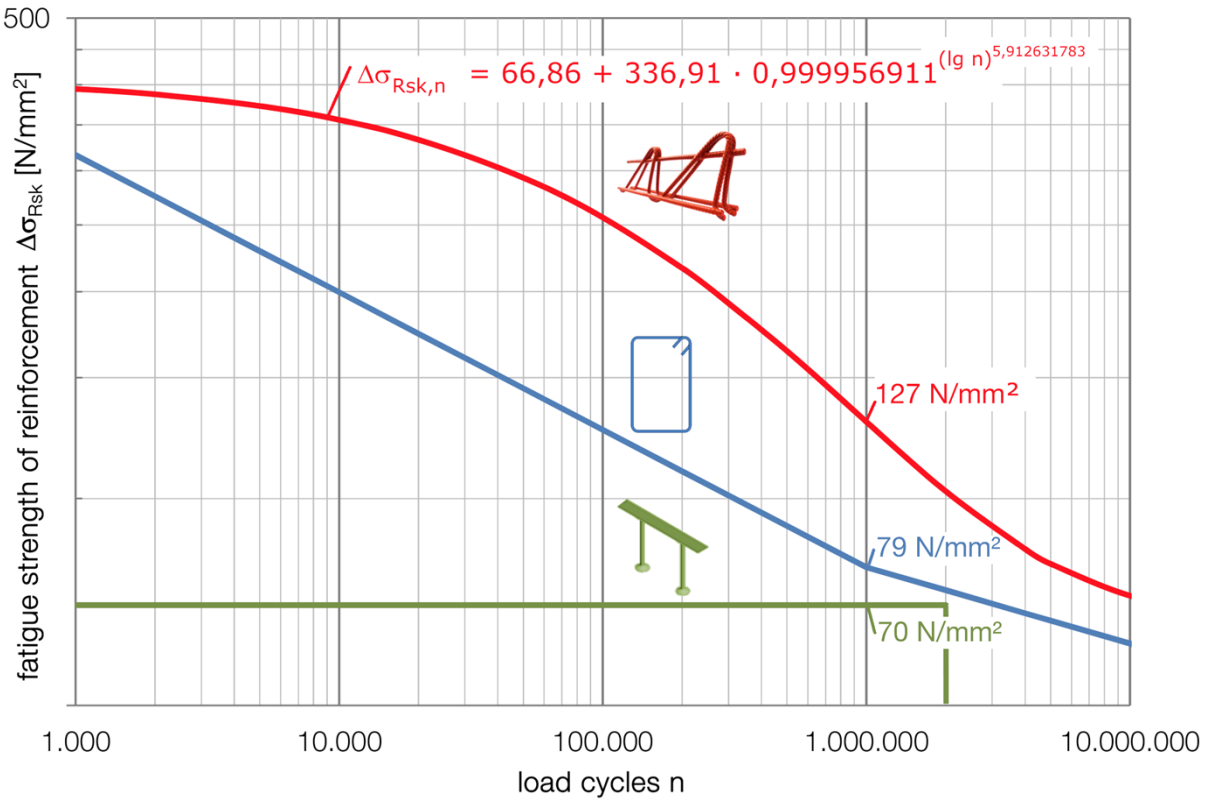


Option: Reduced Concrete Strength

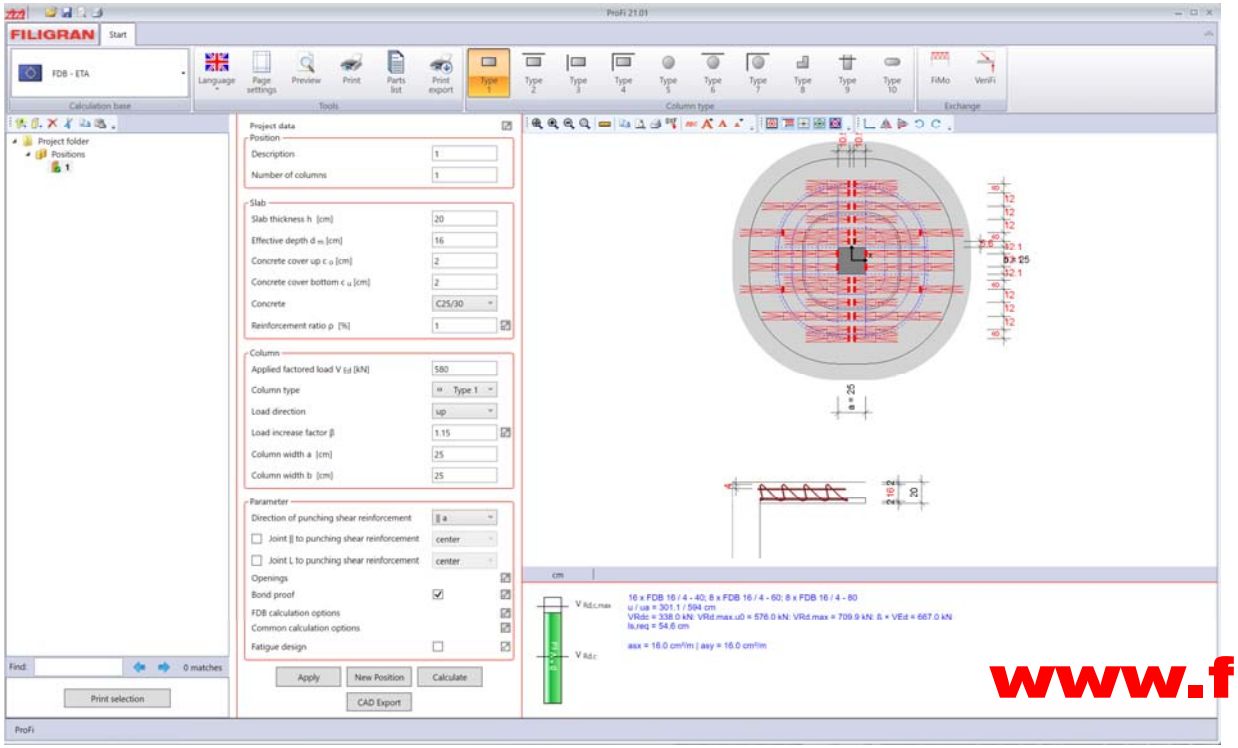


Surface of Precast Slabs: Untreated

Fatigue Resistance of FDB

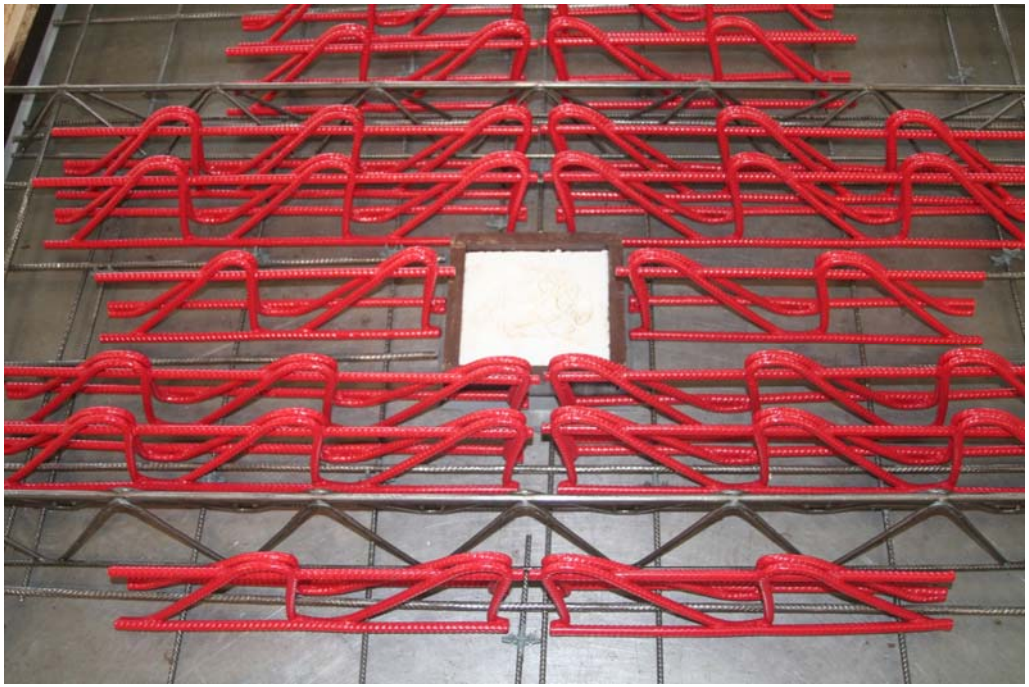


Design-Software ProFi



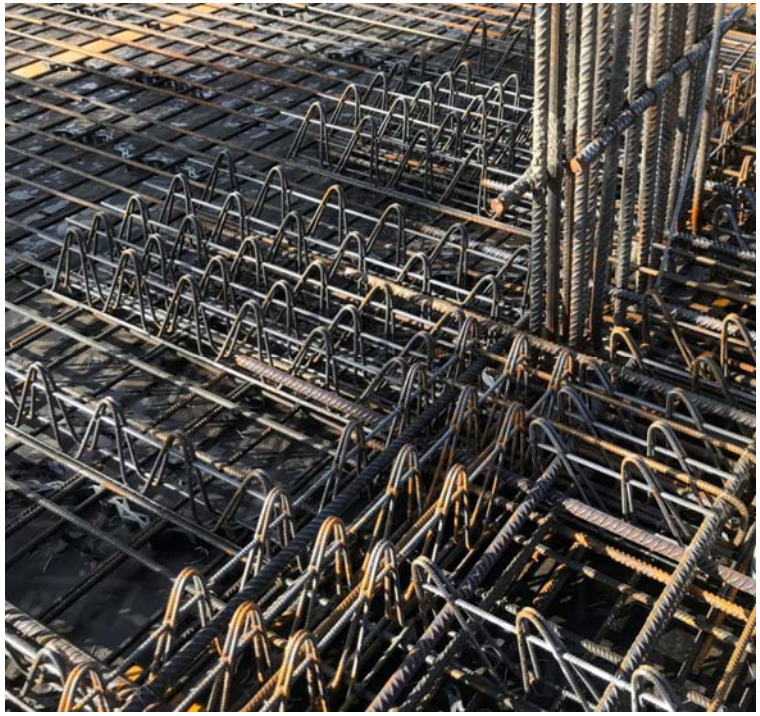
www.filigran.com

FDB - Installation

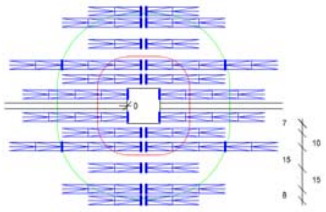


Precast - parallel

In-situ - cruciform



Application of FDB



- easy to install
- easy to stockpile
- highly effective
- $V_{Rd,max} = 2{,}1\ V_{Rdc}$
- successful application

Thank you for your attention!

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