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Dipl.-Ing. (FH) Andreas Hörold
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Dlubal Software GmbH

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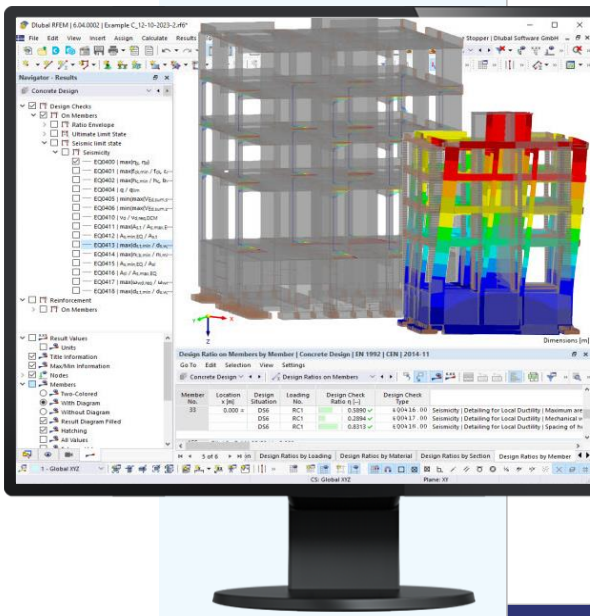
Webinar

Seismic Design of Reinforced Concrete Structures in RFEM 6



Questions During the Presentation

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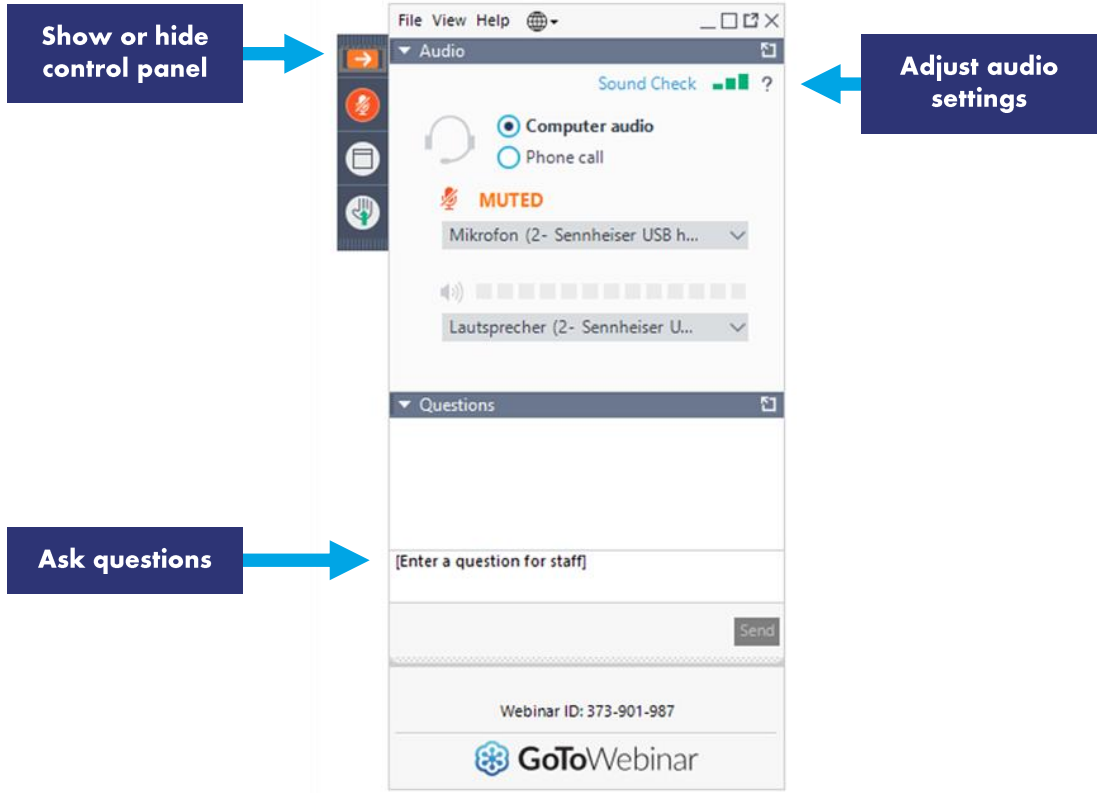


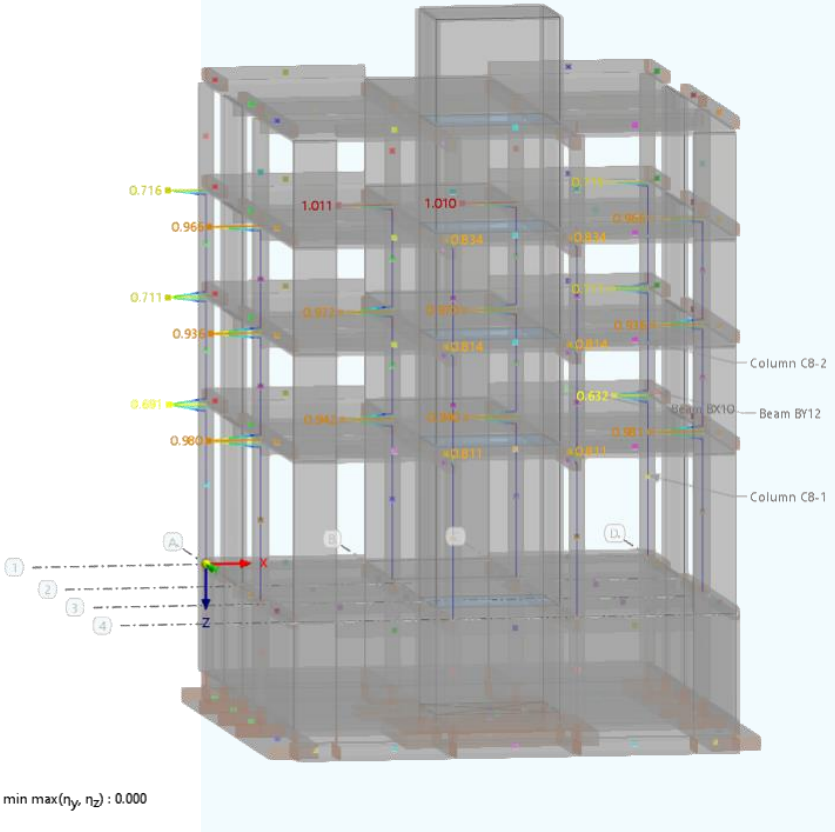
CONTENT

01 Presentation of model and loading

02 Modeling of design objects

03 Design of reinforced concrete structure according to EC 8

04 Prospects



Stäbe | EQ0400 | max max(η_y, η_z) : 1.011 | min max(η_y, η_z) : 0.000
Stäbe | max η : 1.011 | min η : 0.000

Webinar

Design process

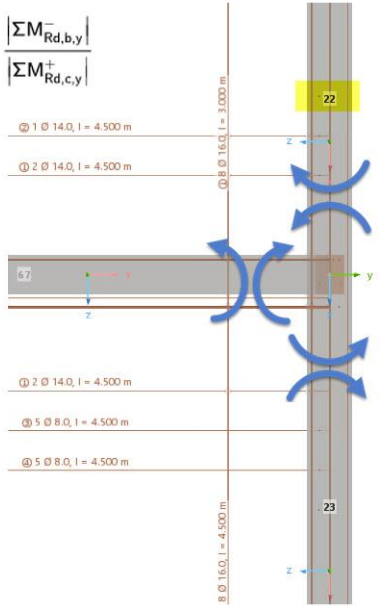
1. Determination of the design parameters
2. Conceptual design and preliminary member sizign
3. Analysis and design acc. to EC 2 — Webinars provided on Dlubal website
4. Seismic analysis acc. to EC 8, clause 4 — Webinars provided on Dlubal website
5. Ultimate limit state design
6. Capacity design acc. To EC 8, clause 5

Content of current webinar

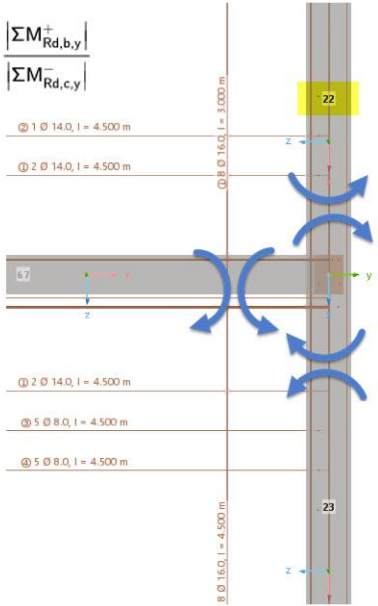
Capacity design

Ratio between Moment resistances acc. to eq.(4.29) - “Strong column – weak beam“

$$\eta_y^+ = 1.3 \cdot \frac{|\Sigma M^-_{Rd,b,y}|}{|\Sigma M^+_{Rd,c,y}|}$$



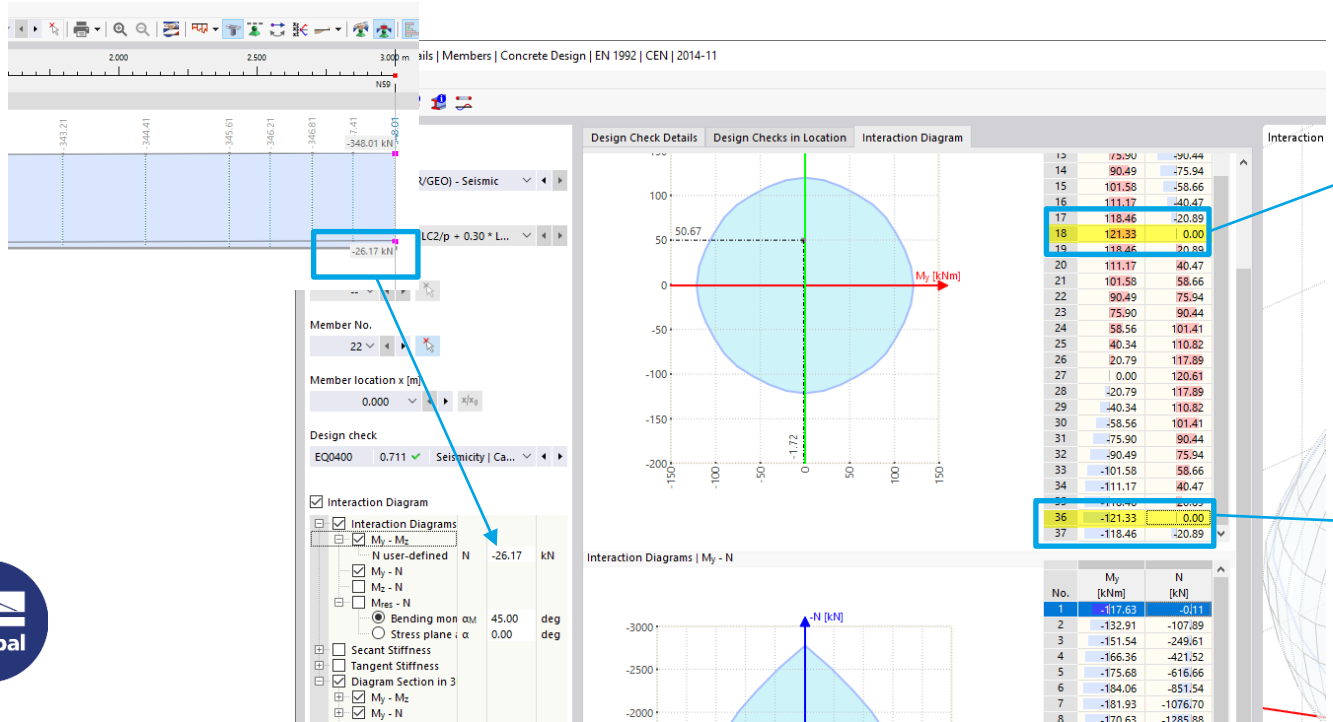
$$\eta_y^- = 1.3 \cdot \frac{|\Sigma M^+_{Rd,b,y}|}{|\Sigma M^-_{Rd,c,y}|}$$



Webinar

Capacity design

Ratio between Moment resistances acc. to eq.(4.29) - "Strong column – weak beam"



$$\Sigma M^{-}_{Rd,b,y} = |M^{-}_{Rd,b,y,67}| = 112.20\,kNm$$

$$\Sigma M^{+}_{Rd,c,y} = |M^{+}_{Rd,c,y,22}| + |M^{+}_{Rd,c,y,23}| = |121.31\,kNm| + |121.87\,kNm| = 243.18\,kNm$$

$$\eta^{+}_{y} = 1.3 \cdot \frac{|\Sigma M^{-}_{Rd,b,y}|}{|\Sigma M^{+}_{Rd,c,y}|} = 1.3 \cdot \frac{|112.20\,kNm|}{|243.18\,kNm|} = 0.600$$

$$\eta_{y} = \max\left(\eta^{-}_{y}, \eta^{+}_{y}\right) = \max(0.583,\ 0.600) = 0.600$$

Nachweis EQ0400 | EN 1992 | CEN | 2014-11

Seismizität

Kapazitätsregel für Biegung | Kapazitätsbemessung der Stützen unter

$$\Sigma M^{+}_{Rd,b,y} = |M^{+}_{Rd,b,y,67}| = 109.02\,kNm$$

$$\Sigma M^{-}_{Rd,c,y} = |M^{-}_{Rd,c,y,22}| + |M^{-}_{Rd,c,y,23}| = |-121.31\,kNm| + |-121.87\,kNm| = 243.18\,kNm$$

$$\eta^{-}_{y} = 1.3 \cdot \frac{|\Sigma M^{+}_{Rd,b,y}|}{|\Sigma M^{-}_{Rd,c,y}|} = 1.3 \cdot \frac{|109.02\,kNm|}{|243.18\,kNm|} = 0.583$$

Webinar

Capacity design

Capacity design shear

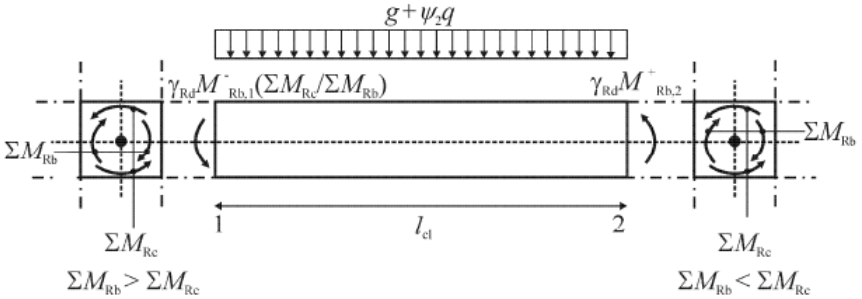


Figure 5.1: Capacity design values of shear forces on beams [DIN EN 1998-1:2010-12]

Links

- **Webinar reinforced concrete design in RFEM 6 und RSTAB 9**
  https://www.dlubal.com/en/support-and-learning/learning/webinars/002636

  https://www.dlubal.com/en/support-and-learning/learning/webinars/002783

- **Seismic Design According to Eurocode 8 in RFEM 6 and RSTAB 9**
  https://www.dlubal.com/en/support-and-learning/learning/webinars/002705

- **Seismic Load Maps**
  https://www.dlubal.com/en/solutions/online-services/snow-load-wind-speed-and-seismic-load-maps

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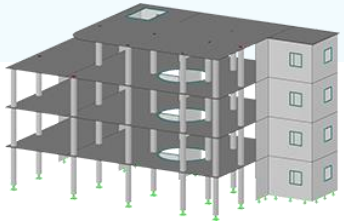

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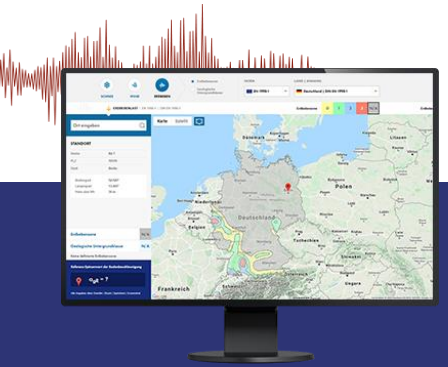

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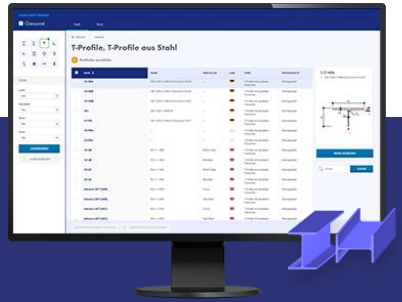
With this free online tool, you can select standardized sections from an extensive section library, define parametrized cross-sections and calculate its cross-section properties.



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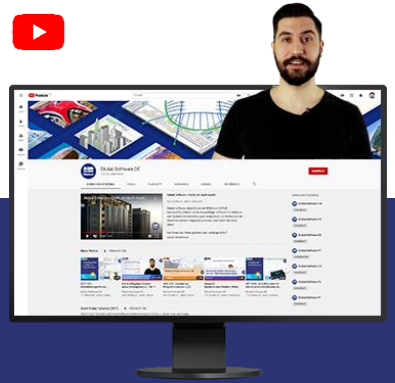

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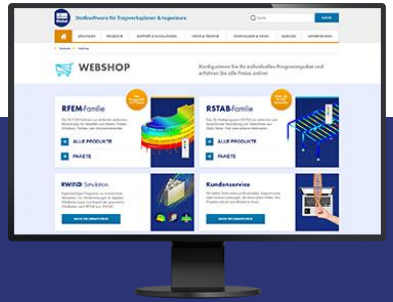

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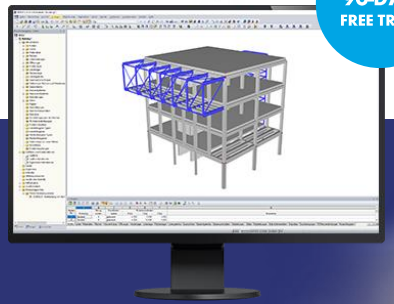

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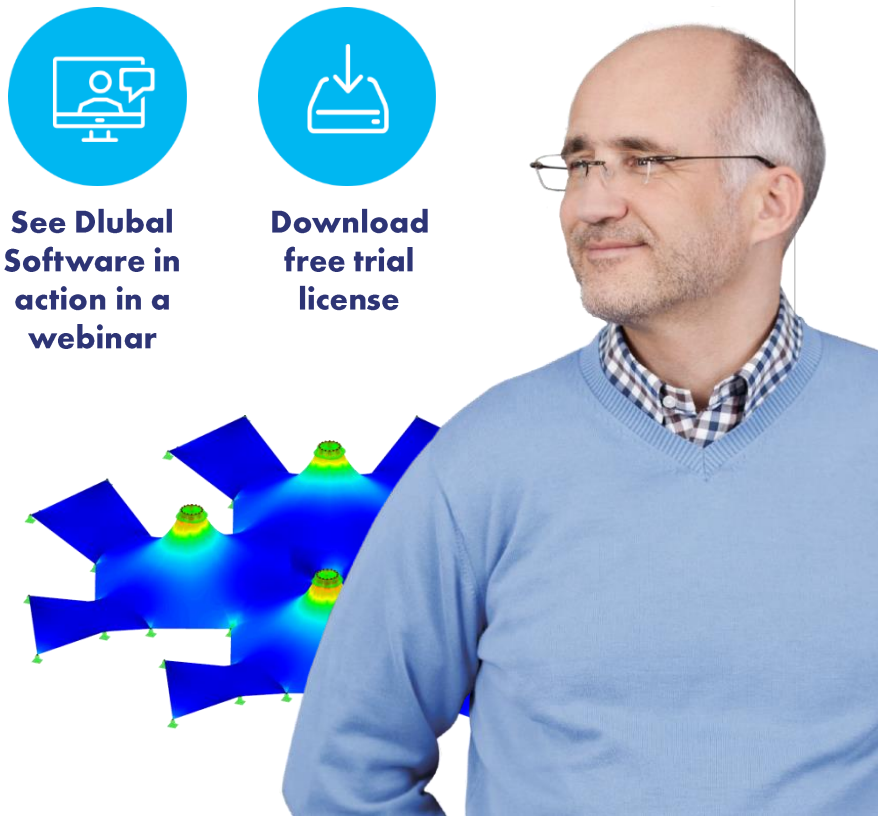

Dlubal Software GmbH
Am Zellweg 2,
93464 Tiefenbach, Germany

Phone: +49 9673 9203-0
E-mail: info@dlubal.com

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