



Structural Analysis & Design Software

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Dipl.-Ing. (FH) Andreas Hörold
Organizer

Marketing & Public Relations
Dlubal Software GmbH

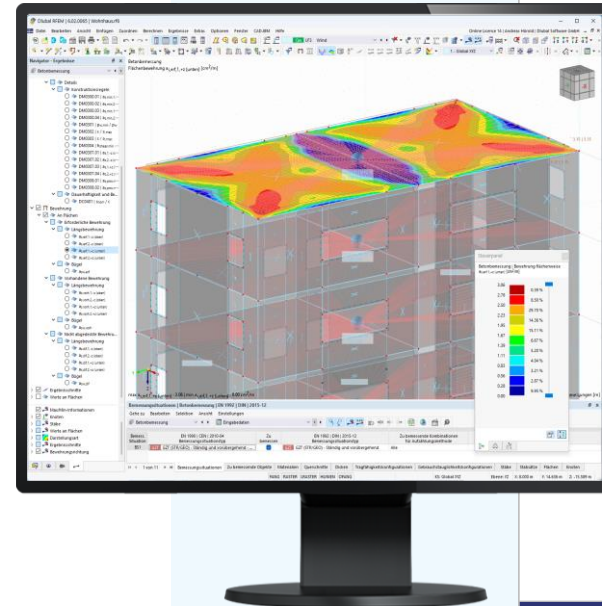


Dipl.-Ing. (FH) Jürgen Theilmann, M.Eng.
Co-Organizer

Customer Support
Dlubal Software GmbH

Webinar

News in RFEM 6 and RSTAB 9



Questions During the Presentation



GoToWebinar Control Panel
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Show or hide control panel



The screenshot shows the GoToWebinar control panel interface. At the top, there is a menu bar with 'File', 'View', and 'Help'. Below it is the 'Audio' section, which includes a 'Sound Check' indicator with a green bar and a question mark. There are two radio buttons: 'Computer audio' (selected) and 'Phone call'. A red 'MUTED' indicator is visible. Below this, there are dropdown menus for 'Mikrofon (2- Sennheiser USB h...)' and 'Lautsprecher (2- Sennheiser U...'. A volume slider is also present. The 'Questions' section is below the audio settings, featuring a text input field with the placeholder '[Enter a question for staff]' and a 'Send' button. At the bottom, the 'Webinar ID: 373-901-987' and the 'GoToWebinar' logo are displayed.



Adjust audio settings

Ask questions



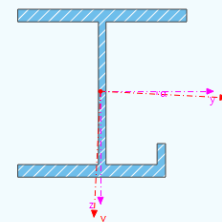
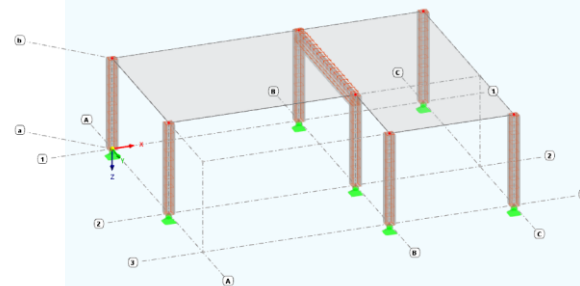
CONTENT

01 New features in RFEM 6 and RSTAB 9

02 New features implemented in add-ons and stand-alone programs

03 New add-ons

04 Prospects



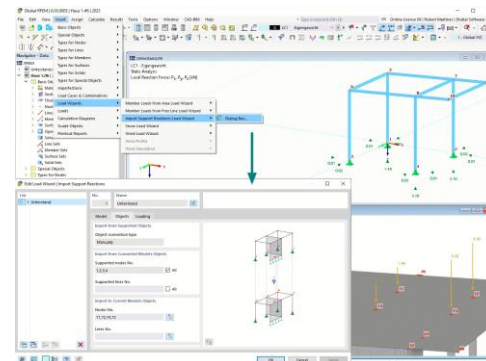


Features

Support Force Transfer from Other Model

- „Import Support Reactions“ Load Wizard
- Transfer of reaction forces as nodal and line loads from other model
- Based on item list concept

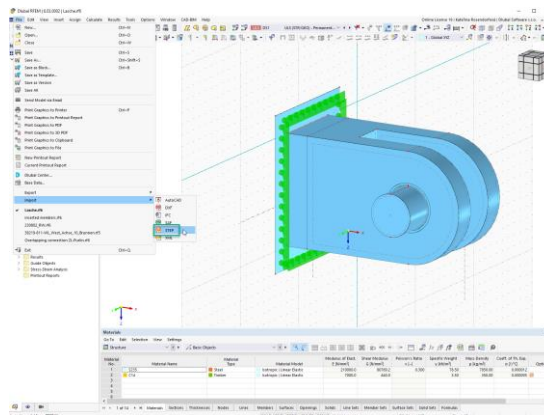
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New Interfaces

- Tekla Structures
- STEP
- ALLPLAN (*.asf)
- SVG (vector graphics)

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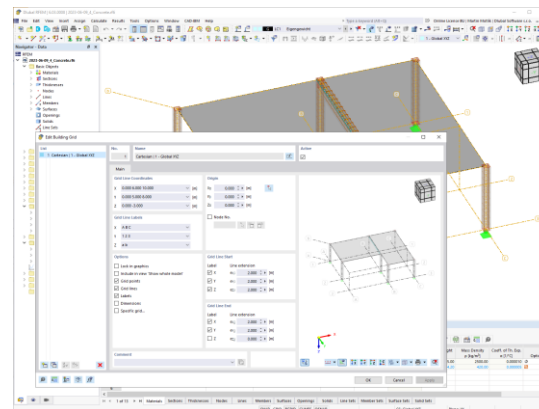


Features

Building Grid

- Intuitive input of grid coordinates and labeling of grid lines
- Optional dimensions
- Preview in input dialog box

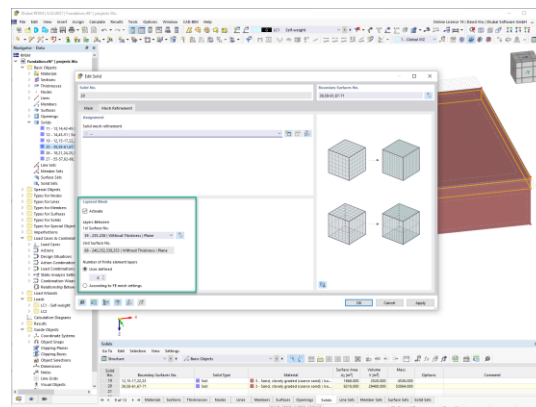
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Layered Mesh for Solids

- Division of solid by FE elements between two parallel and opposite surfaces

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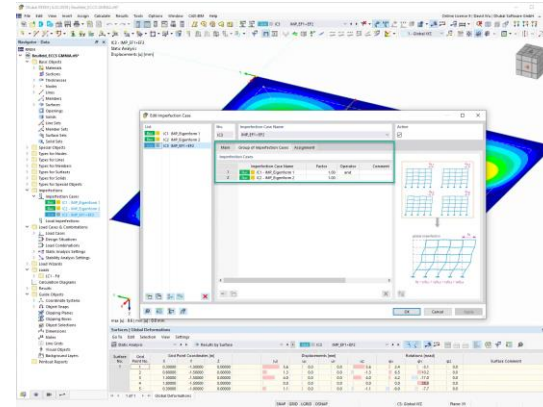


Features

Superposition of Several Geometric Imperfection Cases

- For example, for GMNIA analyses (buckling analyses)

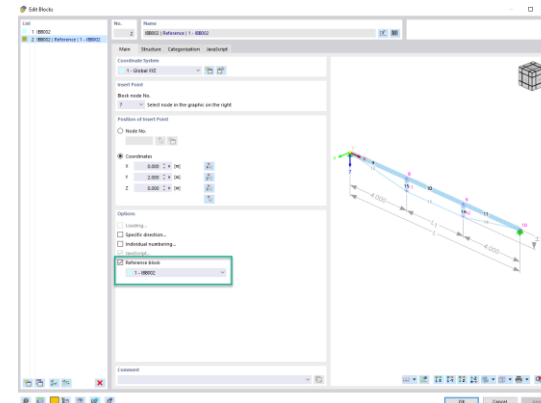
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Blocks with Reference Block Specification

- Definition of a reference block for several identical blocks
- Transfer of modifications on reference block for „child blocks“

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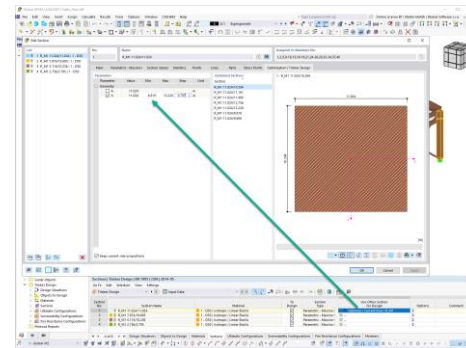


Features

Optimization of Cross-Sections

- Available in Design add-ons like Steel Design, Timber Design etc.
- For example, for standardized sections of a series, or for parametric cross-sections concerning width, depth and so on

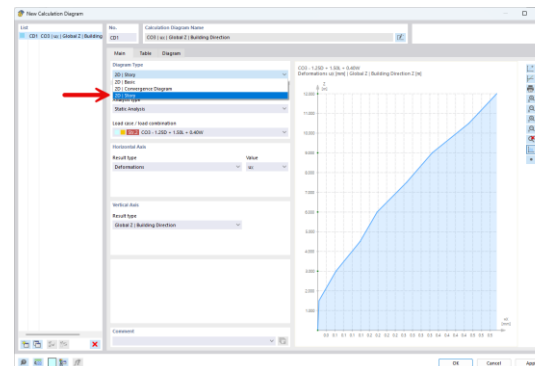
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Calculation Diagram Type „2D | Story“

- Creation of result diagrams via building axis
- For example, to visualize the seismic force over building height

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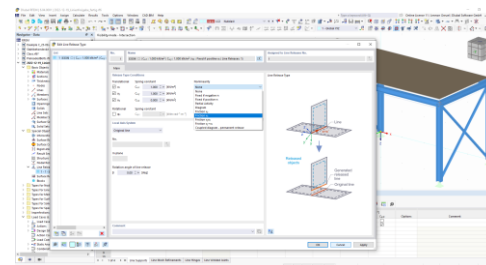


Features

Friction Properties for Line Releases

- Static friction effects between two supporting components along a line

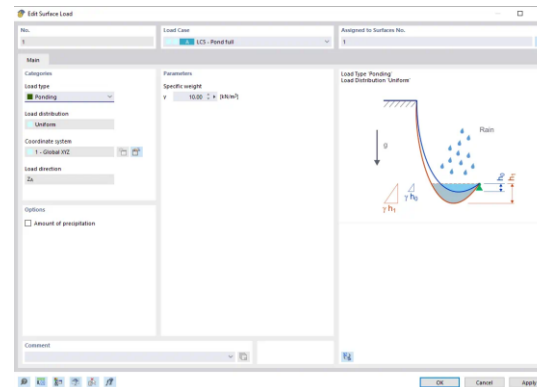
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Ponding Load Type

- Analysis of rainfall portions draining away and accumulating in ponding water on the surface
- Ponding size results in corresponding vertical load
- For example, for analysis of almost horizontal membrane roofs under rain loading

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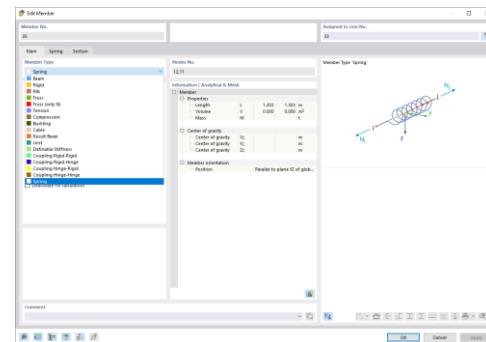


Features

„Spring“ Member Type

- Simulation of linear and nonlinear spring properties by means of a linear object
- Stiffness specifications given in force/displacement unit

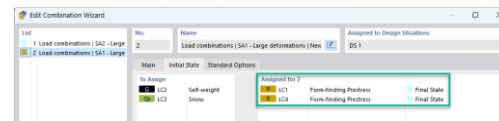
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Generating Combination with More Than One Initial State

- Different initial states (prestressing, form-finding, strain, and so on) for target combination
- For example, for load states on the basis of a form-finding analysis with varying imperfections

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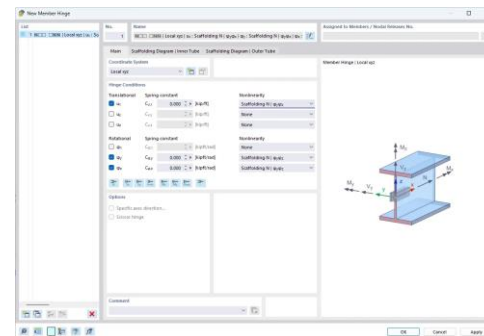


Features

Scaffolding Hinge

- Member hinge nonlinearty „Scaffolding N | phiy,phiz" for simulation of an inserted scaffolding tube joint

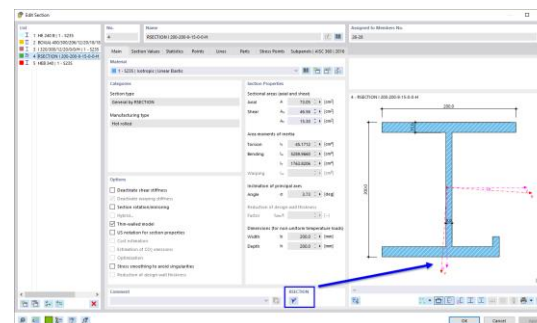
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Cross-Section Modification Using RSECTION

- Direct connection to RSECTION
- Open it in RSECTION, modify it and return it to RFEM/RSTAB

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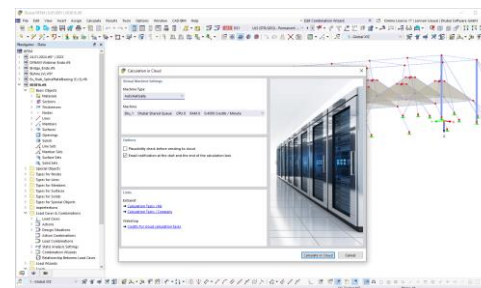


Features

Cloud Calculations

- Outsourcing calculation on a computing server in the cloud
- Option to select Choice between different powerful computing servers
- Calculation does not the limit processing power of your local computer
- Clearly arranged display of all calculation tasks in the Extranet

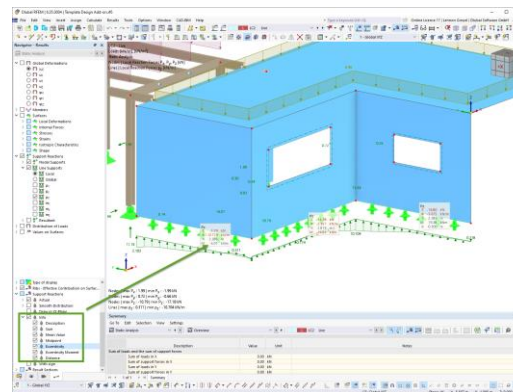
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Info Bubbles for Line Supports

- Additional information such as description, sum, mean value, and so on.
- Activation in Navigator - Results

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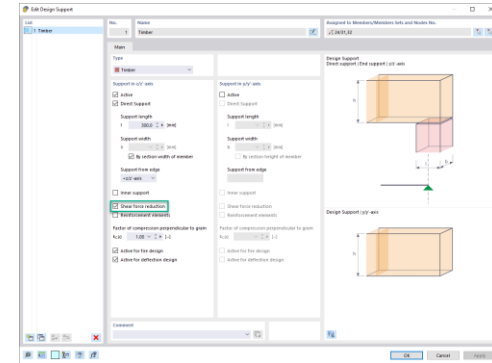


Features (Timber)

Shear Force Reduction

- Shear force reduction for design supports of „Timber“ type
- Shear design with governing shear force at a distance of the beam height from the support edge

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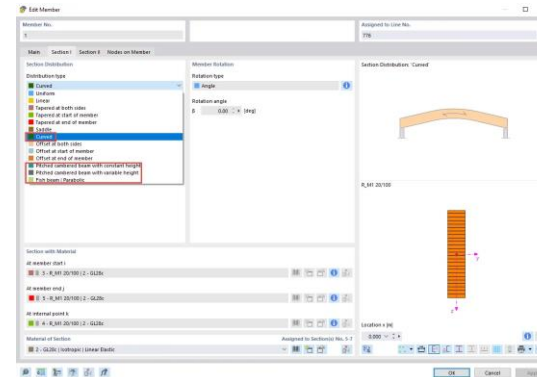


Curved Section Distributions

For curved beams (for example, made of glulam) the following is available:

- Curved
- Pitched cambered beam with constant height
- Pitched cambered beam with variable height
- Fish beam | Parabolic

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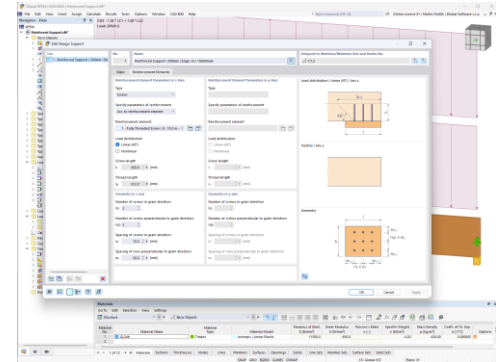


Features (Timber)

Transversal Compression Stiffening Elements for Design Supports

- Definition of fully threaded screws as transversal compression stiffening elements for "Compression Perpendicular to Grain" design check
- Bolt analysis for pressing-in and buckling
- Design shear resistance is checked in plane of screw tip

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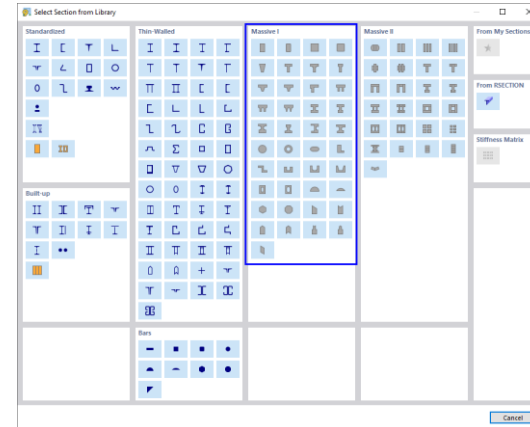




Timber Design Add-On

More Features

- SIA 265 (Swiss standard): Design of cross-sections of „Massive I“ type
- Implementation AS 1720 (Australian standard)
- Design of cross-laminated timber panels acc. to following standards:
 - SIA 265:2021-05 (Swiss standard)
 - ANSI/AWC NDS:2018 (US standard)
 - CSA O86-19 (Canadian standard)





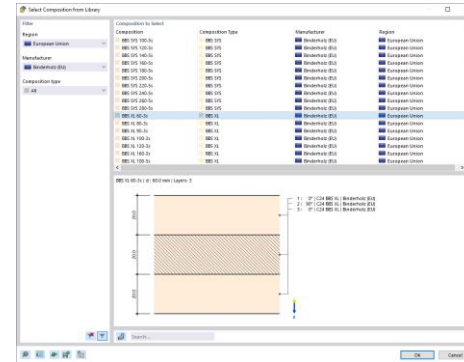
Multilayer Surfaces Add-On

Manufacturer Library for Cross-Laminated Timber

Compositions of companies:

- Binderholz
- CLT - CH
- Derix
- KLH
- Martinsons
- Pfeifer
- Piveteaubois
- Schilliger
- Stora Enso
- Södra
- Theurl
- Züblin Timber
- ... and more compositions for USA and Kanada

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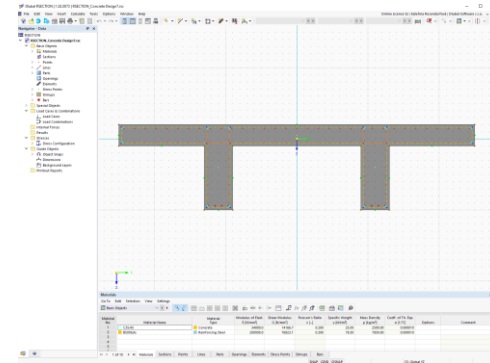
Concrete Design Add-On

Design of RSECTION cross-sections

- Creation of any cross-section including definition of concrete cover, shear reinforcement, and longitudinal reinforcement in RSECTION
- Import of reinforced RSECTION section in RFEM 6 / RSTAB 9 and design

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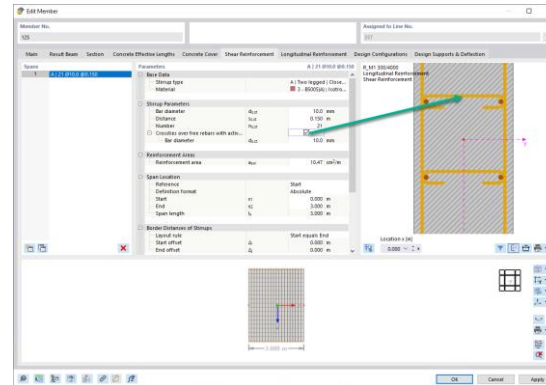
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"Crosstie" Reinforcement Option for Design acc. to EN 1992-1-1

- Arrangement of additional crossties on free rebars of longitudinal reinforcement
- Consideration for ultimate limit state designs and for design checks of secondary reinforcement

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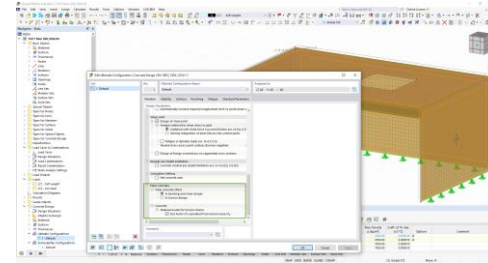
Concrete Design Add-On

Design of Fibre-Reinforced Concrete

- Design as per EN 1992-1-1 acc. to German „DAFStb Stahlfaserbeton“ guideline (German Committee for Reinforced Concrete)

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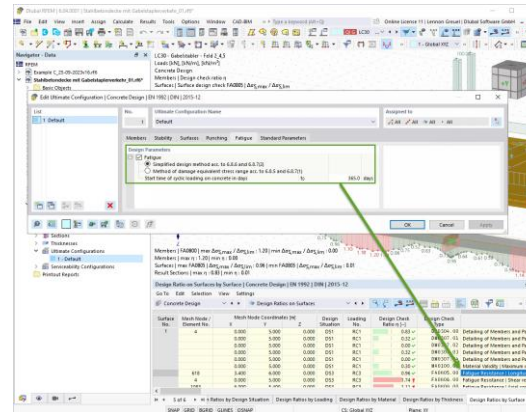


Fatigue Design acc. to EN 1992-1-1, Chapter 6.8

Two methods or design levels can be selected:

- Simplified design acc. to 6.8.6 and 6.8.7(2)
- Design of damage equivalent stress acc. to 6.8.5 and 6.8.7(1) (simplified fatigue design):

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Concrete Design Add-On

Seismic Design acc. to EC 8 for Reinforced Concrete Members

Seismic design includes, among other things, following functionalities:

- Seismic design configurations
- Differentiation of ductility classes DCL, DCM, DCH
- Option to transfer behavior factor from dynamic analysis etc.
- Capacity design checks of 'strong column - weak beam'

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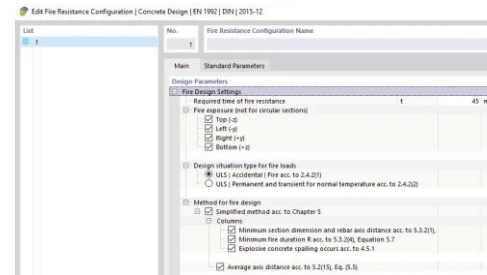
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Simplified Fire Resistance Design acc. to EN 1992-1-2 for Columns (Section 5.3.2) and Beams (Section 5.6)

Design checks for:

- Columns: minimum cross-sectional dimensions for rectangular and circular sections acc. to Table 5.2a and Equation 5.7 for calculating time of fire exposure
- Beams: minimum dimensions and center distances acc. to Tables 5.5 and 5.6

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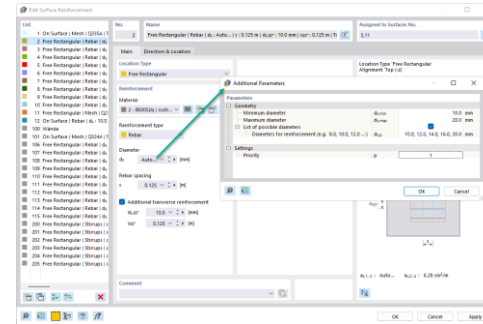


Concrete Design Add-On

Layout of Surface Reinforcement

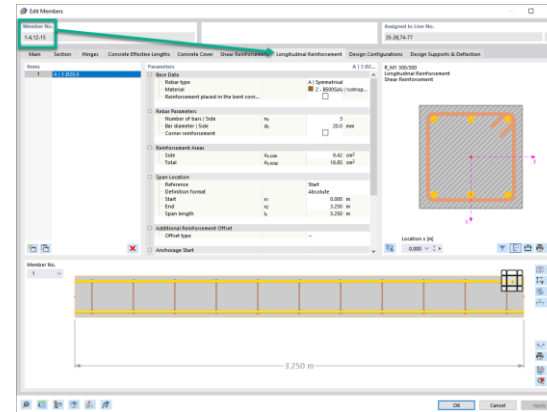
- Automatic layout in order to cover required reinforcement
- Selection whether to lay out rebar diameter or rebar spacing

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More Features

- Multiple editing of member reinforcement (definition for several members or member sets at the same time)
- Required reinforcement for serviceability limit state (limit stresses, minimum reinforcement due to restraint, limit diameter or limit spacing for indirect crack width control)
- Printing reinforcement graphics via print templates





Steel Design Add-On

Design of Cold-Formed Sections

Standards and codes:

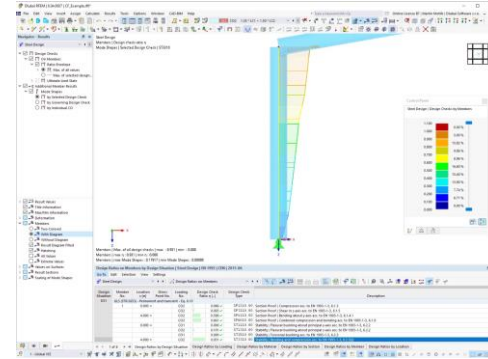
- EN 1993-1-3 (Eurocode)
- AISI S100 (USA)
- CSA S136 (Canada)

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New Standards and Codes

- SIA 263 (Switzerland)
- NBR 8800 (Brazil)
- AISC 341-16 (American seismic designs)



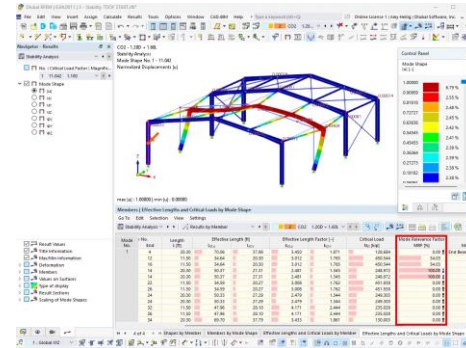


Add-On Structure Stability

Modal Relevance Factor (MRF) for Stability Analysis

- Assessing to which extent specific elements participate in a specific mode shape
- MRF can be used to distinguish between local and global mode shapes
- Determining equivalent buckling lengths of certain structural components

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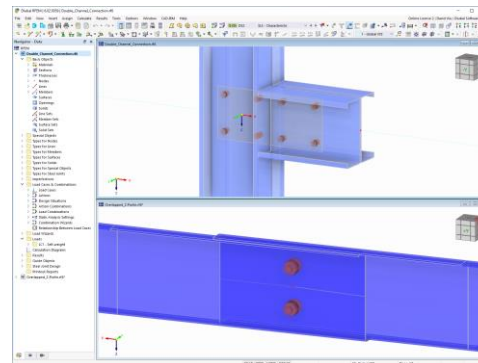


Steel Joints Add-On

Steel Joint Design for Built-up and Thin-Walled Cross-Sections

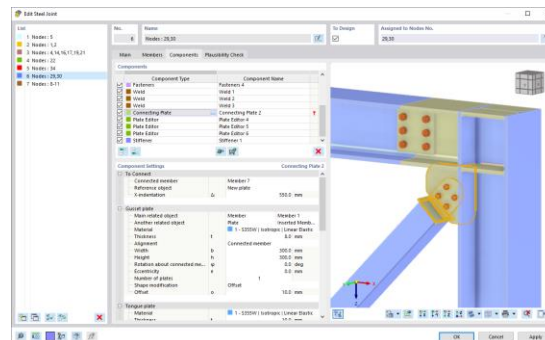
- Standards: Eurocode 3, ANSI/AISC 360

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New Components

- Connecting plate
- Member Editor
- Inserted member
- Auxiliary solid
- Cap plate



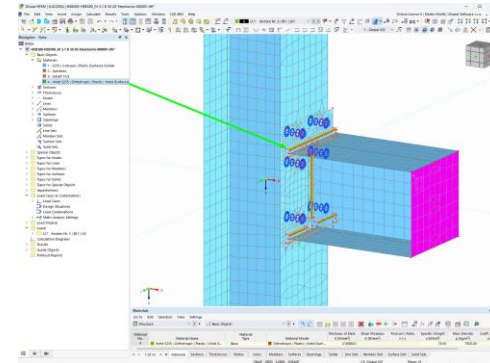


Steel Joints Add-On

Plastic Material Model for Weld Design

- "Orthotropic | Plastic | Weld (Surfaces)" material model
- Plastic calculation of all stress components

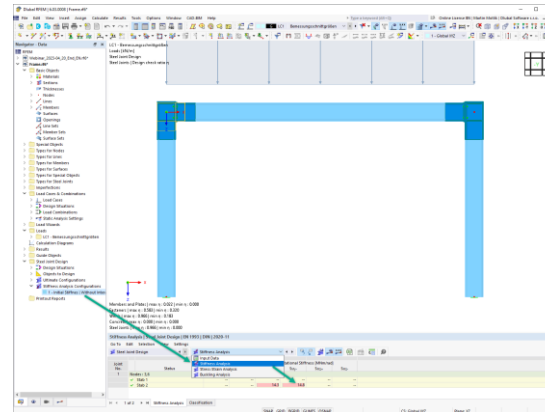
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Calculation of Initial Stiffness $S_{j,ini}$

- For internal forces and moments N , M_y and M_z (Multiple selection is possible)
- Display of stiffnesses with a positive and a negative sign

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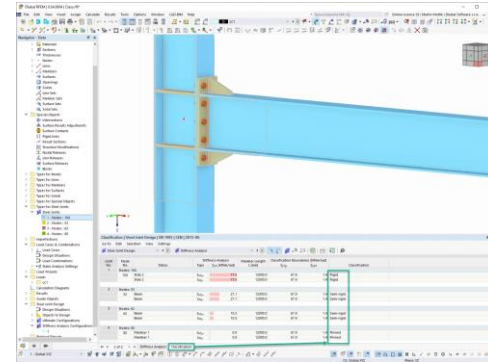


Steel Joints Add-On

Classification of Steel Joints by Stiffness

- Classification is displayed in tables as "hinged", "semi-rigid", or "rigid"

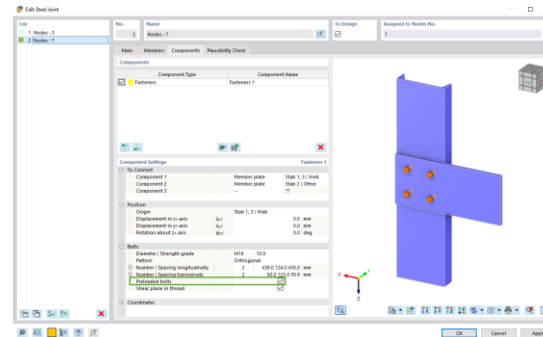
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Preloaded Bolts for Steel Joints

- Optional definition in bolt parameters of all components
- Impact on stress-strain analysis as well as stiffness analysis

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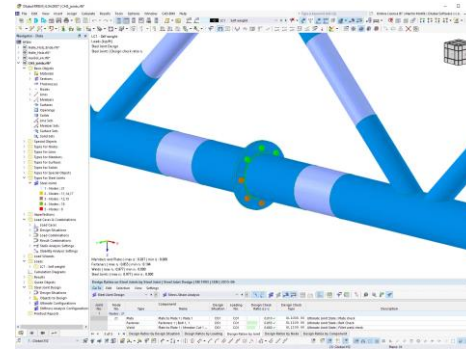


Steel Joints Add-On

Connection of Circular Hollow Sections

- Weld joint
- Connecting sections to each other or to planar structural components

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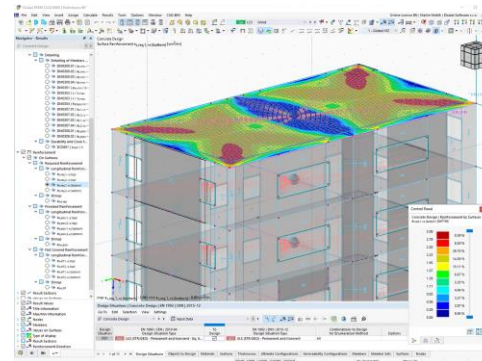
Building Model Add-On

Floor Analysis as Detached 2D Structures

Building model is calculated in two phases:

- Global 3D calculation of entire model, where slabs are modeled as a rigid plane (diaphragm) or as a bending plate
- Local 2D calculation of individual floors

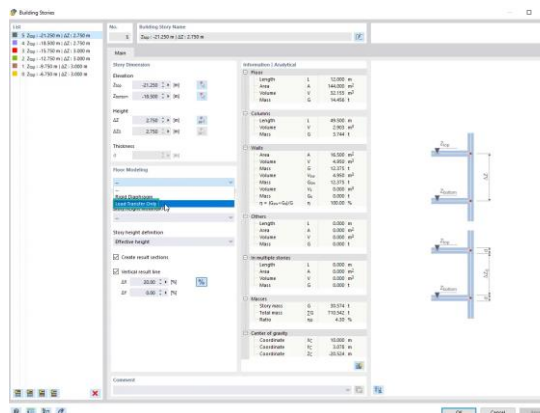
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"Load Transfer Only" Story Type

- Considering slabs without stiffness effect in and out of plane
- Collecting loads on slab and transferring them to supporting elements of a 3D model

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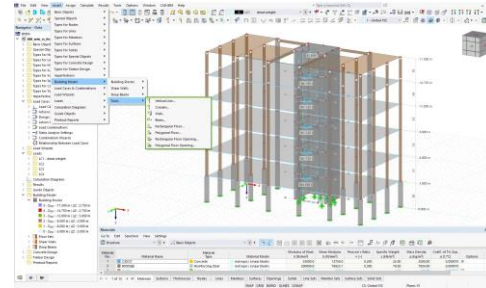


Building Model Add-On

Modeling Tools for Building Models

- Vertical line
- Column
- Wall
- Beam
- Rectangular floor
- Polygonal floor
- Rectangular floor opening
- Polygonal floor opening

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More Features

- Shear walls: automatic definition of result members of any cross-section
- Definition of deep beams
- Building story generator

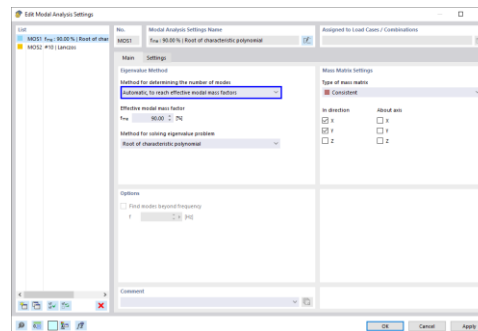


Add-Ons for Dynamic Analysis

Automatic Operation to Reach Specific Effective Modal Mass Factor

- Automatic increase of required eigenvalues until reaching a defined effective modal mass factor
- Possible to easily calculate required 90% of effective modal mass for response spectrum method

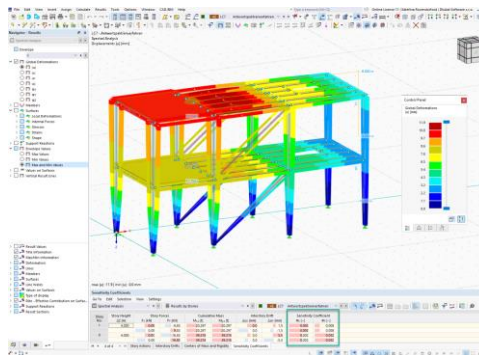
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Sensitivity Coefficient

- For a response spectrum analysis of building models
- Table display of sensitivity coefficients for horizontal directions by story
- Key figures for interpreting sensitivity with regard to stability effects

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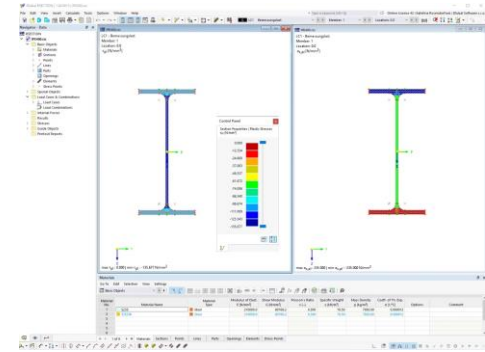


RSECTION 1

Plastic Resistance with Variation of Shear Stresses

- Using redistribution reserves for "Plastic capacity design | Simplex Method"
- Distribution of shear stresses over cross-sectional area
- Extended form of analysis especially for cross-sections subjected to shear loading

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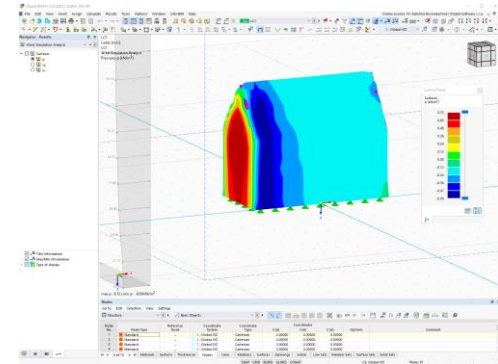


RWIND 2

Displaying RWIND Results Directly in RFEM 6

- Surface pressure
- C_p coefficient of surface
- Wall distance y^+ (steady flow)

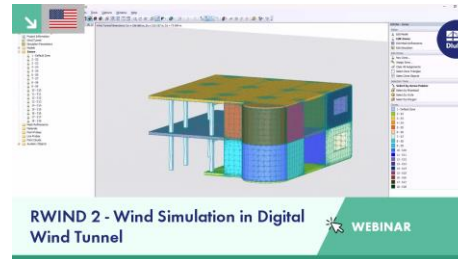
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More Features

- Generation of zones from RFEM surface numbers
- Support for verification / experimental data
- New scaling function for wind tunnel optimization
- Display of max and min values in each time step

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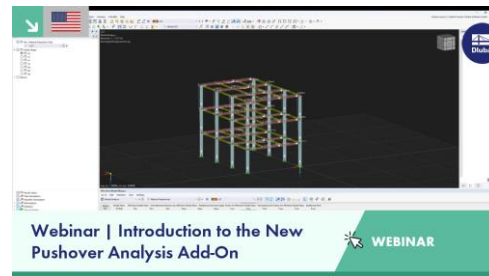
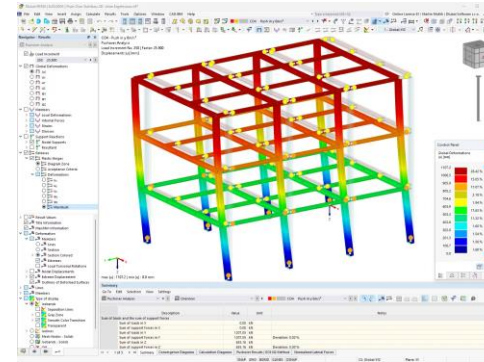
Pushover Analysis

Analysis of Deformation Capacity of Nonlinear Systems

- Consideration of real structural behavior in seismic analysis, leading to efficient designs
- Considering all nonlinearities
- Applying user-defined response spectra as well as response spectra from data base
- Estimation of system capacities in nonlinear range
- Evaluation via diagrams for better understanding

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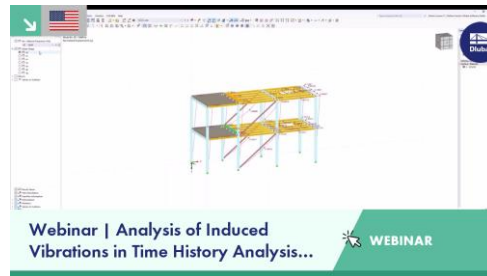
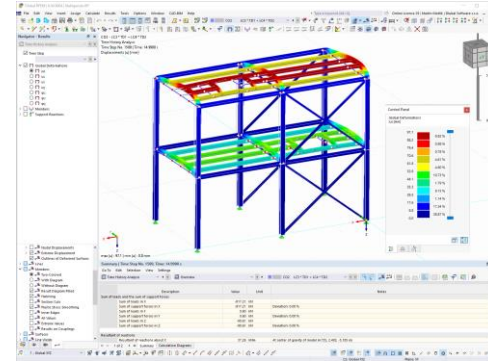
Time History Analysis

Dynamic Structural Analysis for External Excitation

- Analysis of time diagrams and accelerograms (acceleration-time diagrams exciting supports of a structure)
- Possible to enter and calculate several time history analyses at the same time
- Optional superposition of several force-time diagrams within load combinations, but also option for combination with static load cases
- Display of results in graphics, tables, and calculation diagrams
- Envelope (maximum and minimum results) over entire time is also displayed

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Planned Features (from 2023)

- Interface with Autodesk Revit 2023
- Interface with Tekla Structures
- Load transfer
- Building Model (load transfer)
- Time history analysis for accelerograms
- Pushover analysis
- Cloud computing
- Consideration of precipitation quantities
- Nonlinear concrete analysis
- Fire resistance design for concrete
- Foundation design
- Glass design
- Steel joint design of circular pipe sections
- Determination of cutting patterns for membranes
- Guidelines
- Interface for import of empirical wind tunnel data
- and much more



Planned Features (from 2023)

- Interface with Autodesk Revit 2023
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- Nonlinear concrete analysis
- Fire resistance design for concrete
- Foundation design
- Glass design
- Steel joint design of circular pipe sections
- Determination of cutting patterns for membranes
- Guidelines
- Interface for import of empirical wind tunnel data
- and much more



Planned Features (from 2024)

- Nonlinear concrete analysis
- Foundation design
- Glass design
- Determination of cutting patterns for membranes
- Design of timber frame wall assemblies
- Python console
- Steel joints: dimensioning and labeling tools, stiffness consideration, footing
- Partial deletion of results
- Moved loads
- Support load transfer to free loads
- Bridge combinatorics
- Damping elements
- Pulley members
- RWIND results completely in RFEM
- Hinge result diagrams
- Nonlinear time step analysis
- Scaffolding support
- Ground linearization
- Fire protection of timber surfaces
- Semi-rigid diaphragms
- Timber connections
- Independent mesh
- Concrete design: pushover hinges, automatic reinforcement layout for members, fire protection: zone method, definition of existing punching shear reinforcement
- RSECTION: welds
- Shear wall design + coupling beam design
- Enhanced plasticity design
- New standards for steel and timber structures
- Wind analysis using cloud computing
- Python: interface with BricsCAD, Excel, DSTV, SDNF
- AI chatbot
- and much more

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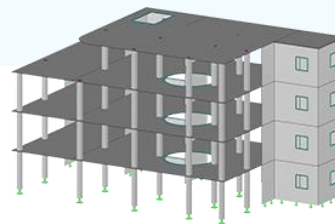


Daniel Dlubal, M.Sc.
COO of Dlubal Software GmbH



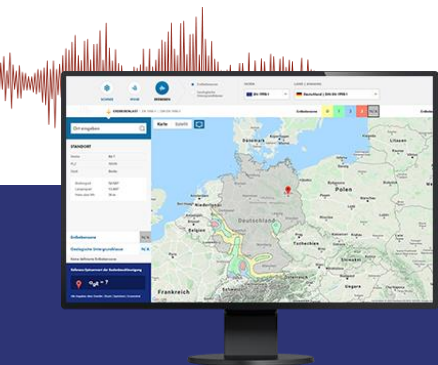


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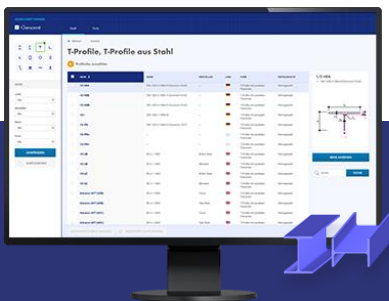
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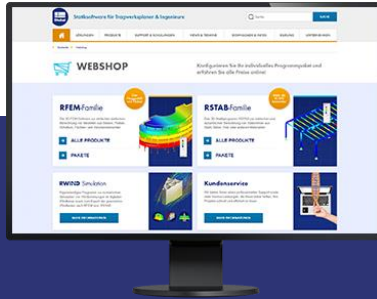
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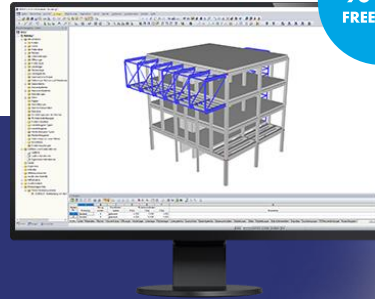
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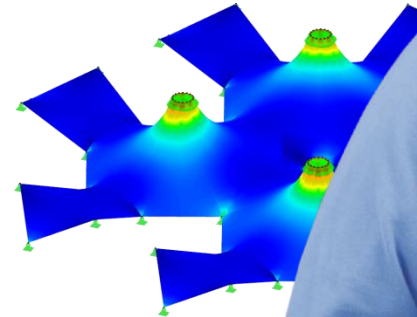
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Dlubal Software GmbH
Am Zellweg 2,
93464 Tiefenbach, Germany

Phone: +49 9673 9203-0
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