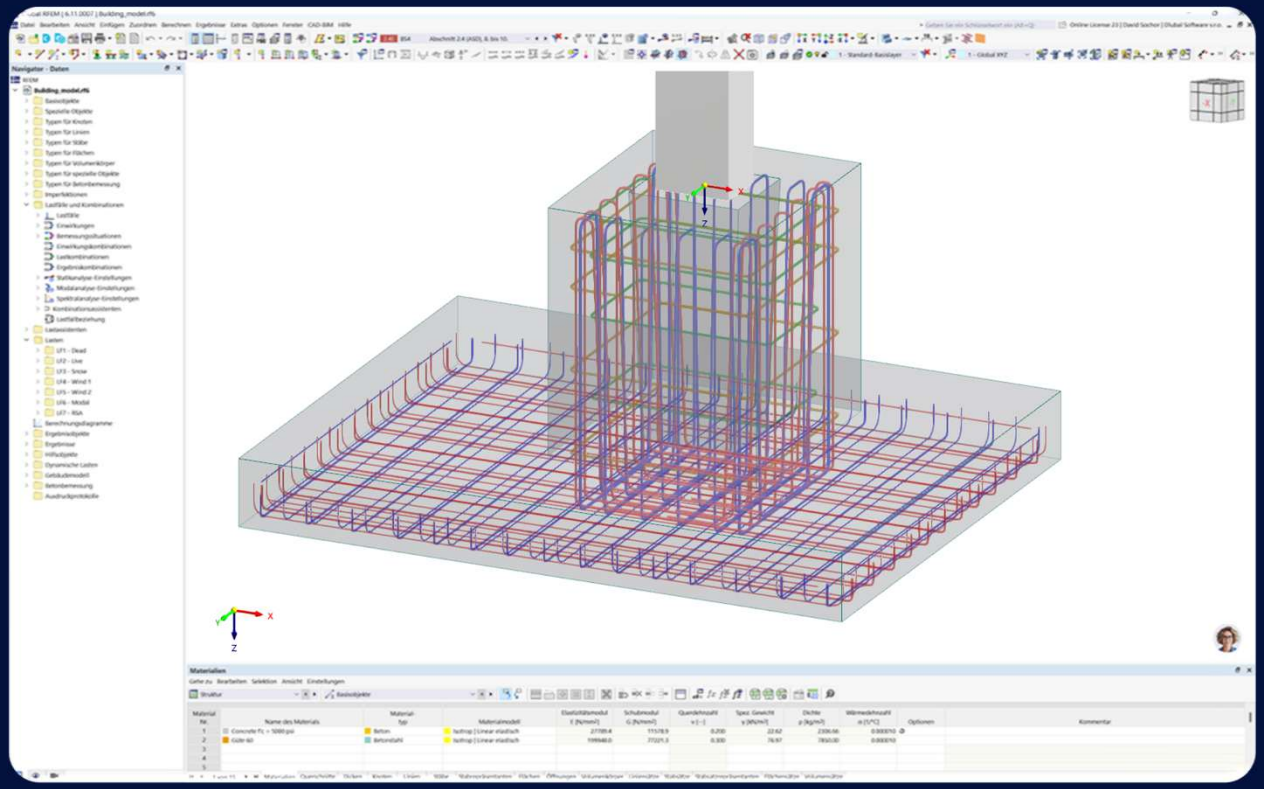
Webinar

Dlubal

News in RFEM 6 and RSTAB 9



www.dlubal.com

RFEM

Today with

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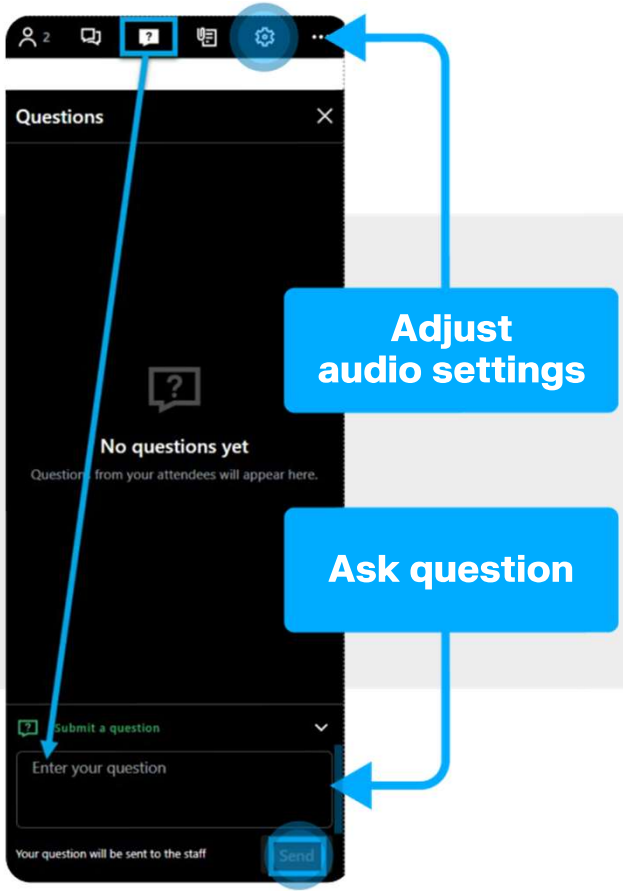
Co-Organizer

Customer Support
Dlubal Software GmbH

Questions During the Presentation

1

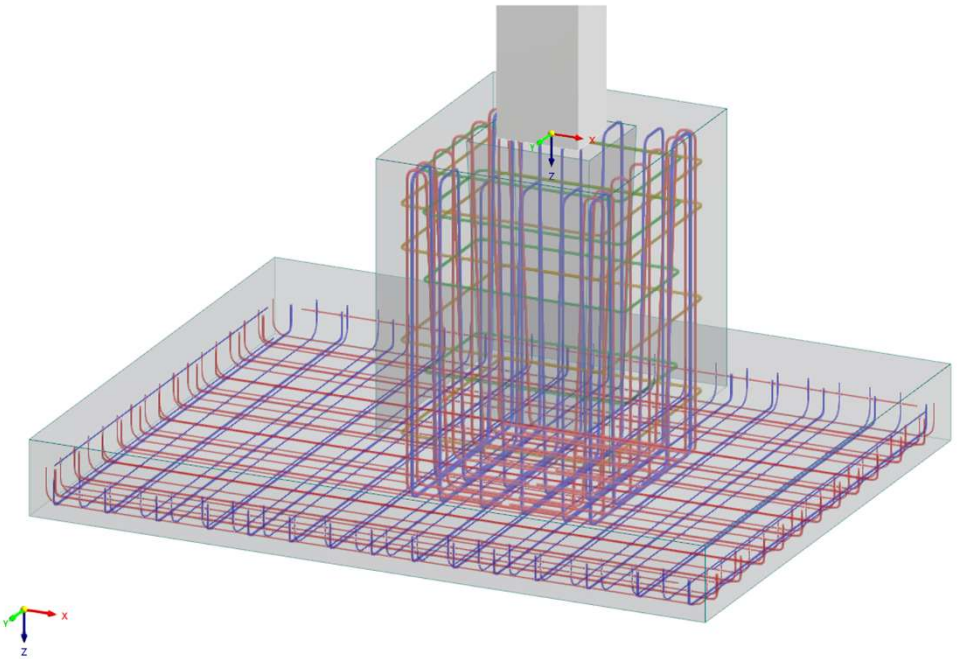
Webinar Control Panel Desktop



or **2**

info@dlubal.com

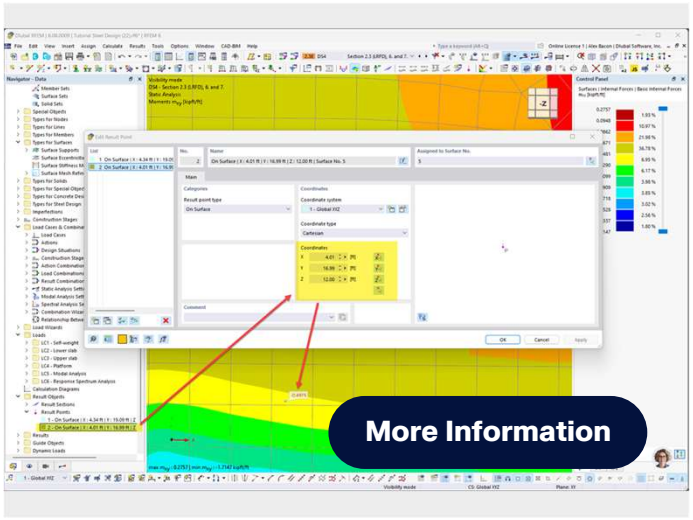
Content



Features in RFEM 6

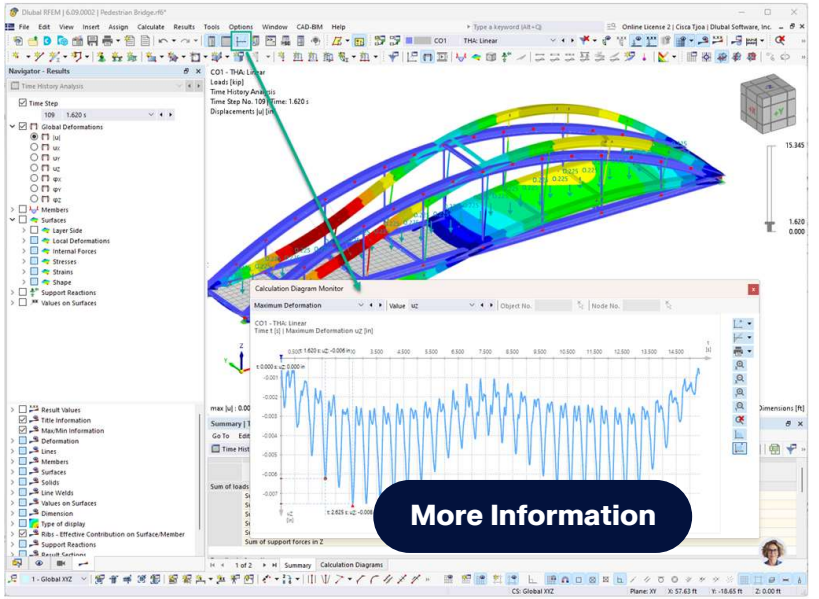
Result Points

- Enables targeted evaluation of result values at defined points
- Three result point types:
  - On surface
  - Spatial (especially for RWIND)
  - In solid



Calculation Diagram Monitor

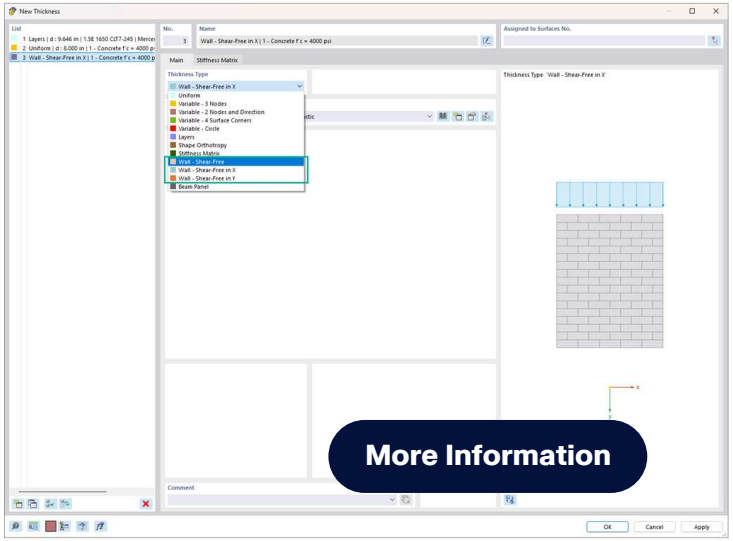
- Real-time display and animation of node results over time or load stages
- Can be opened in parallel with the program



Features in RFEM 6

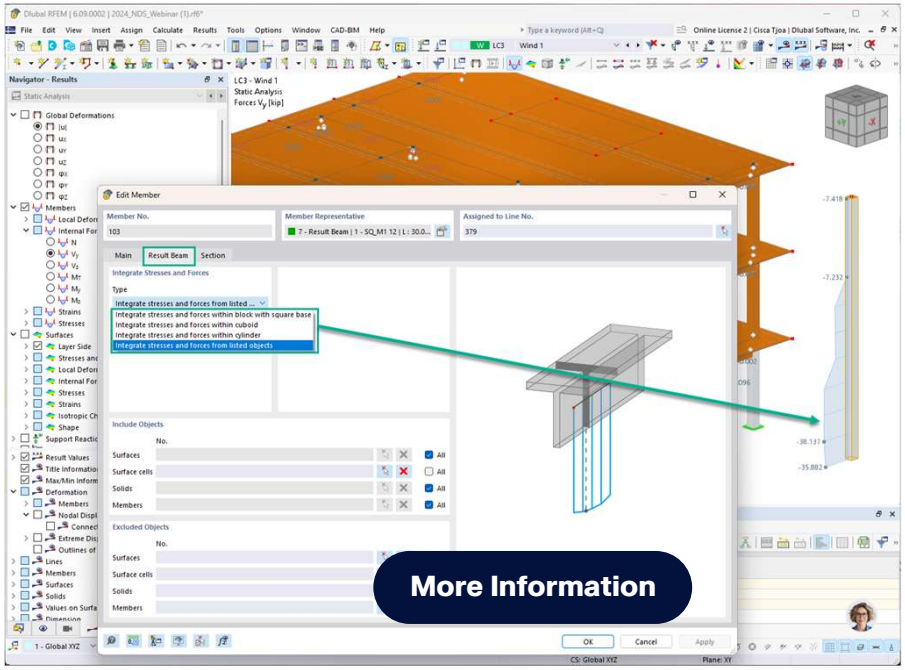
Thickness Type "Wall Shear-Free"

- The following thickness types are available for shear-free walls (e.g. masonry walls, timber panel walls):
  - Wall shear-free
  - Wall shear-free in X
  - Wall shear-free in Y



Member Type "Result Line"

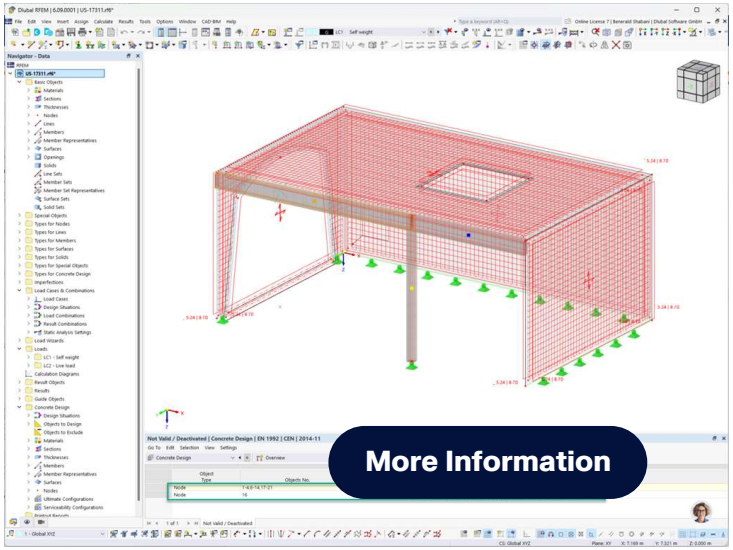
- Enables the integration of results from selected objects into a member force without having to specify a cross-section



Features in RFEM 6

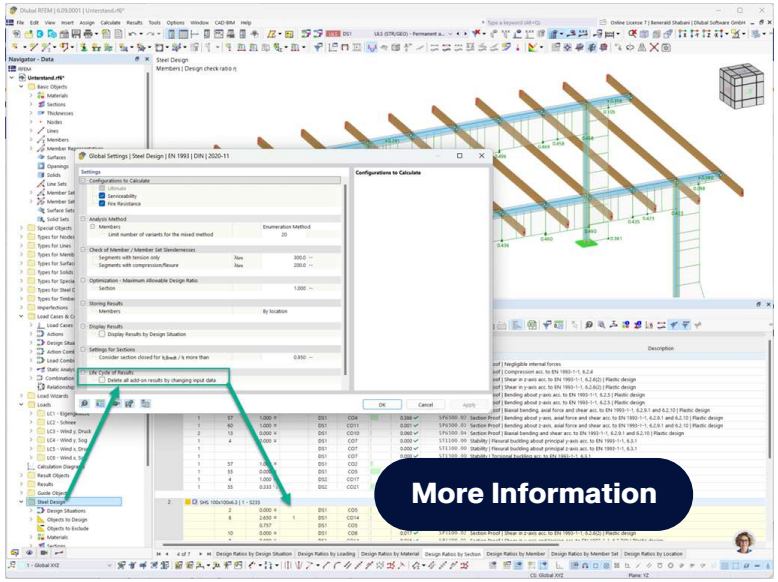
Error Messages for Invalid / Deactivated Objects

- Error messages for invalid or deactivated objects can be viewed in the table without prior dimensioning
- Allows corrections to be made to entries before calculation



Life Cycle of Design Results

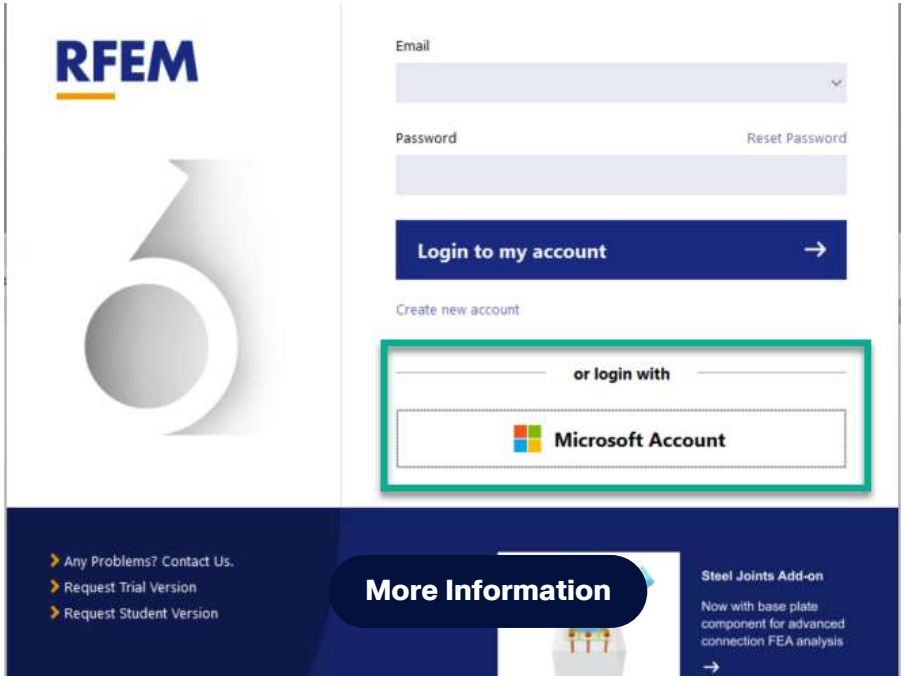
- Design results for steel, steel connection, aluminum and timber design are retained despite changes to the design properties → but declared invalid
- When the calculation is restarted, only the invalid results are updated



Features in RFEM 6

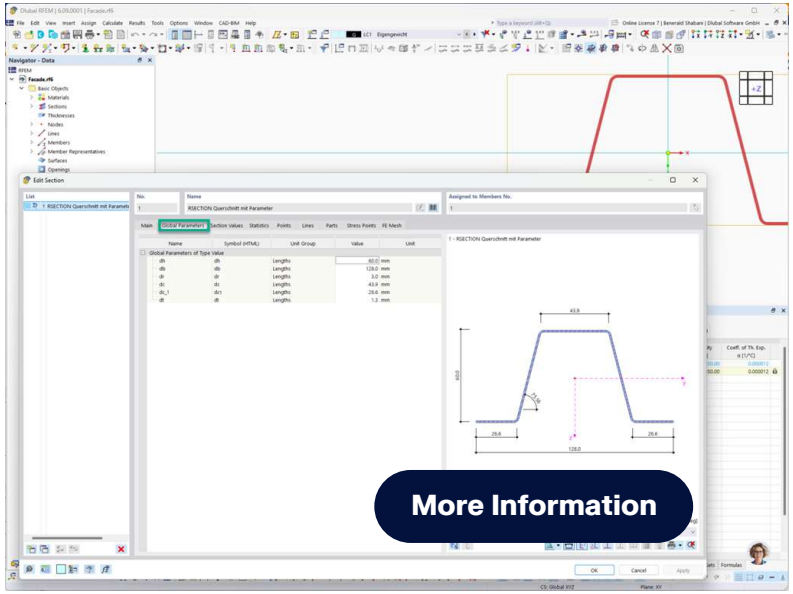
Program Login via Microsoft Account

- Option to sign in using your Microsoft account



Parametric RSECTION Cross-Sections in RFEM/RSTAB

- Parametric RSECTION cross-sections can be used in RFEM/RSTAB and easily modified if the corresponding parameters have been defined in RSECTION



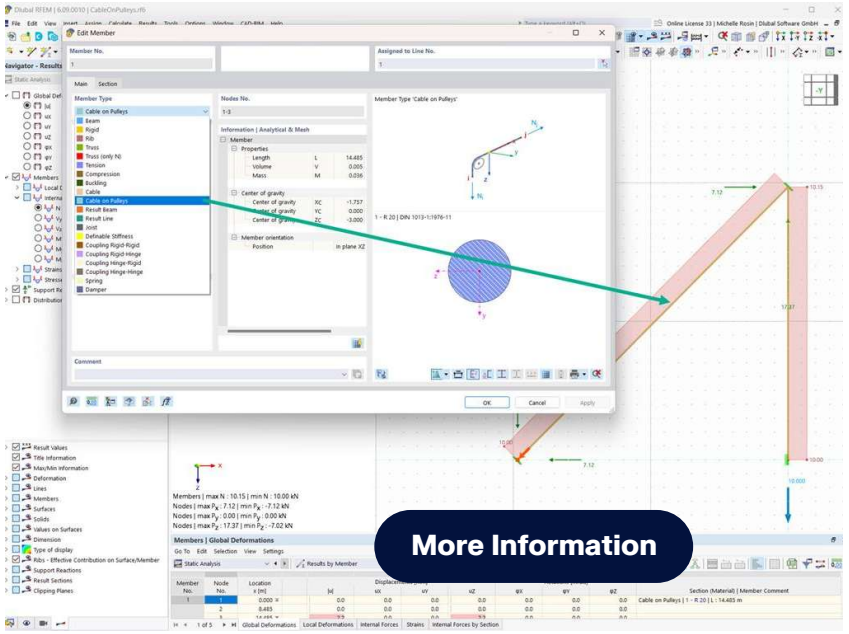
Features in RFEM 6

Dlubal API (gRPC)

- The API provides access to almost all modelling and calculation functions → models can be created, modified and analysed programmatically
- Communication is up to 15 times faster than traditional technologies such as SOAP or REST

Member Type "Cable on Pulleys"

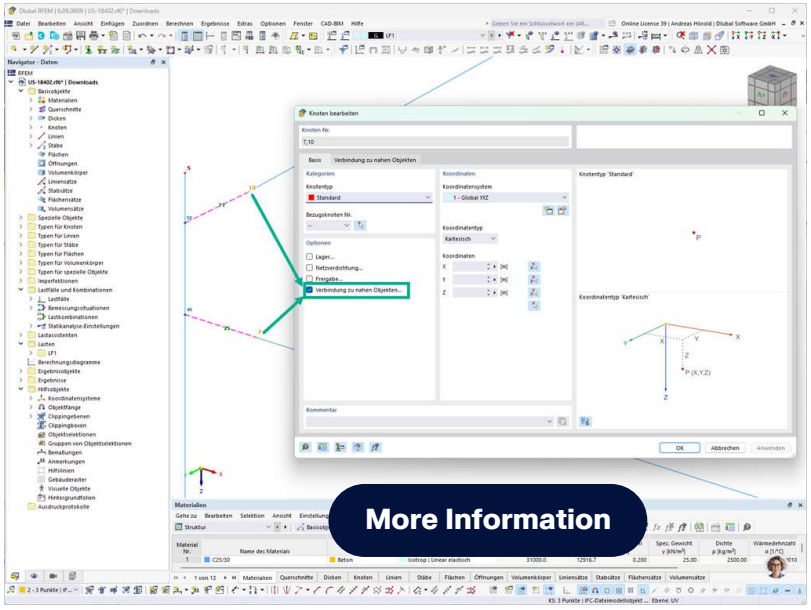
- The rod type enables the simulation of ropes that are guided over pulleys
- It absorbs tensile forces only and moves only in the longitudinal direction



Features in RFEM 6

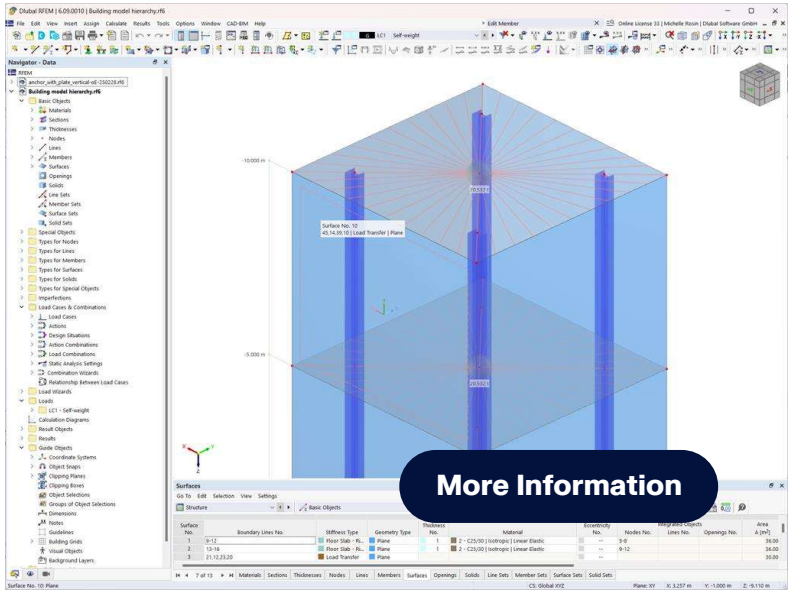
"Nodal Link" Type for Nodes

- Nodes are automatically connected to neighboring objects such as bars or surfaces by rigid bars
- The search area, object types and exclusion criteria are configurable



Hierarchy Between Load Transfer Surfaces and Floors

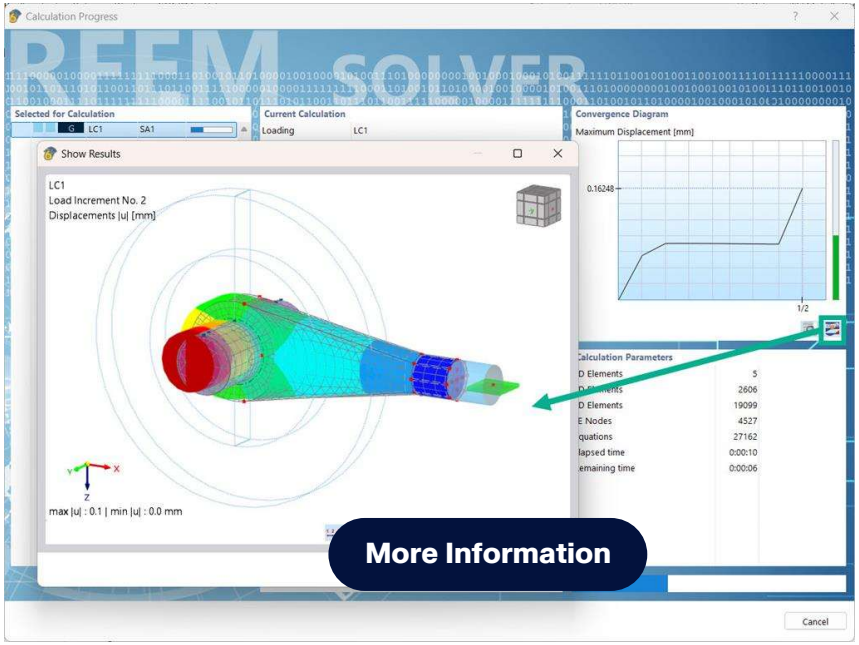
- Clear hierarchy between load-bearing surfaces and ceilings in the building model
- Enables walls made of load-bearing surfaces, e.g. for curtain walls



Features in RFEM 6

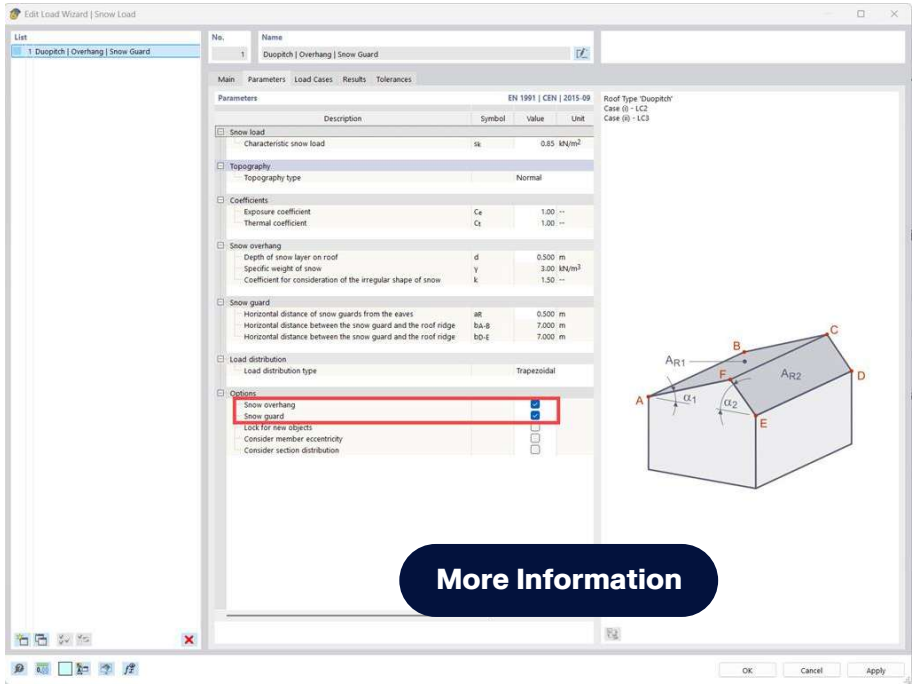
Graphic of Deformation Results During Calculation

- Model deformations of the calculation steps can be displayed in a graphic during the calculation



Snow Overhang and Snow Guard

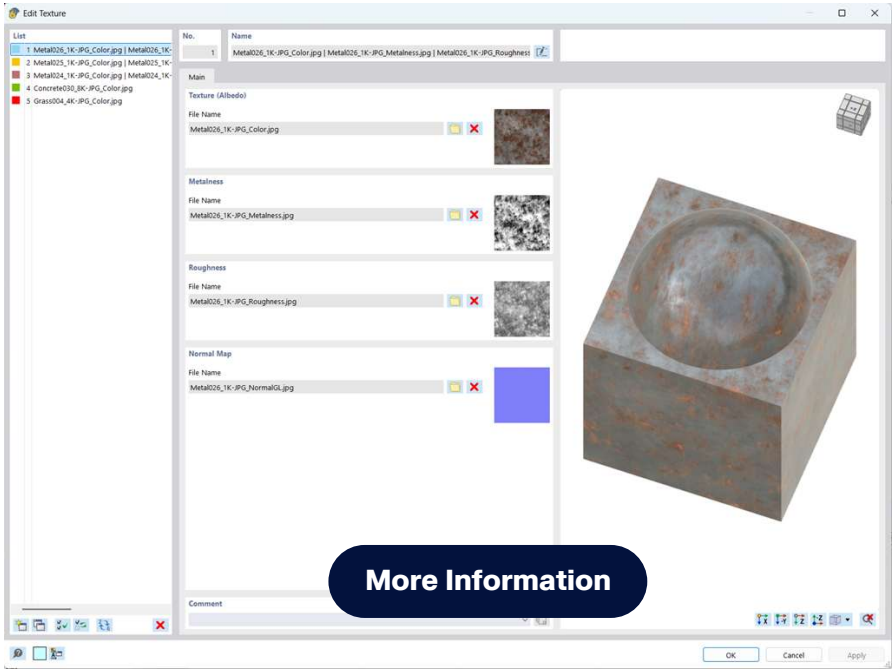
- Snow overhangs and snow guards in accordance with Eurocode can be taken into account in the Snow Load Assistant



Features in RFEM 6

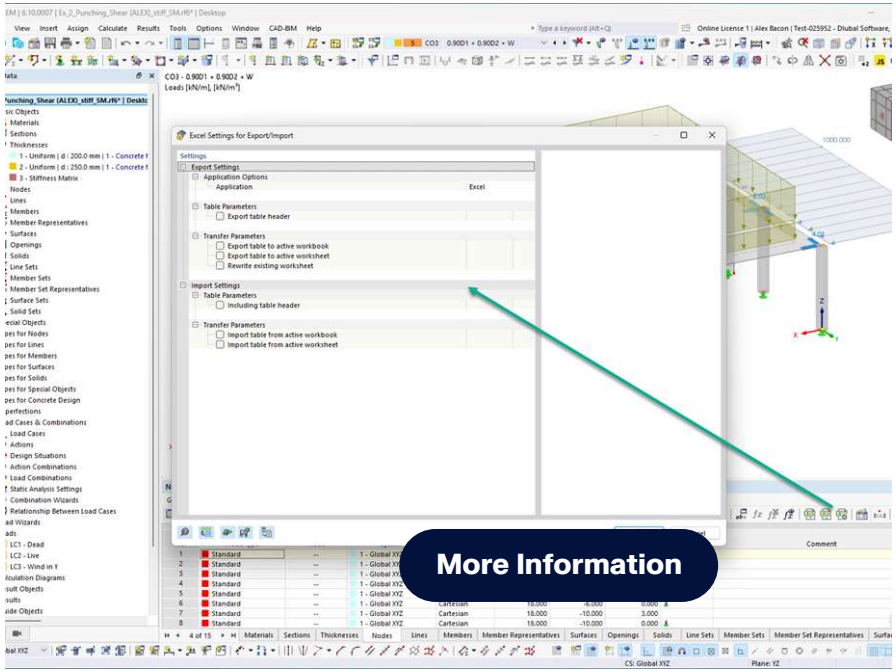
User-Defined Textures

- Materials can be given custom textures to make models look more realistic in the rendering



Import & Export of Excel Tables

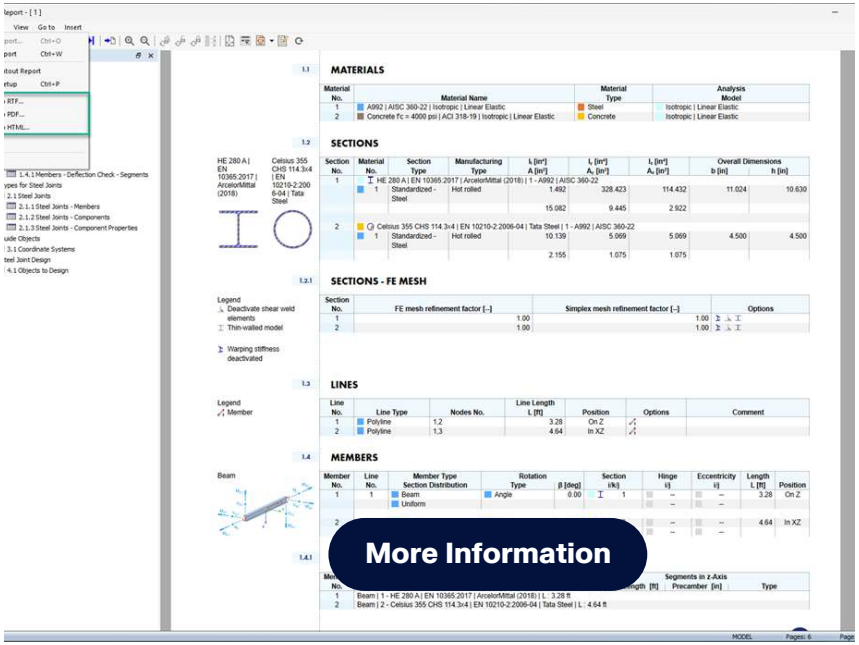
- Excel tables are imported and exported via the Dlubal API (SOAP) for seamless data transfer
- Customizable options for data exchange



Features in RFEM 6

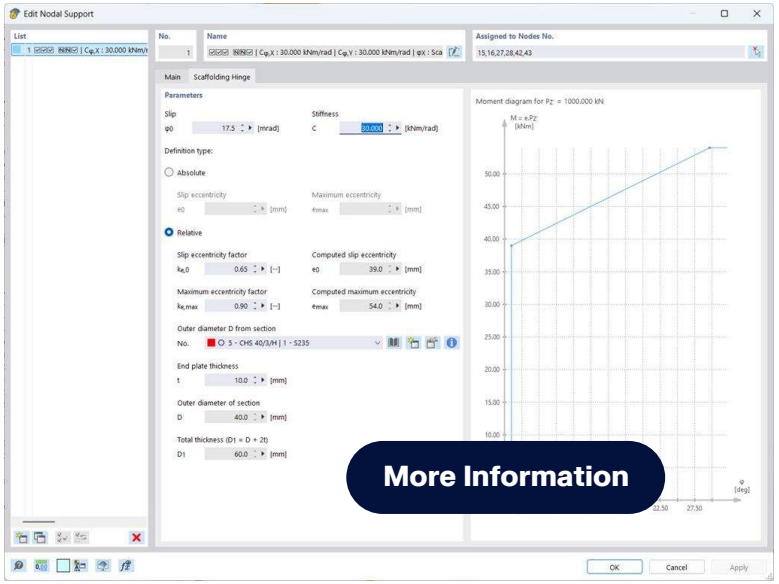
Export of Printout Report in RTF, PDF, or HTML Format

- The printout log can be exported in RTF, PDF or HTML format



Scaffolding Support

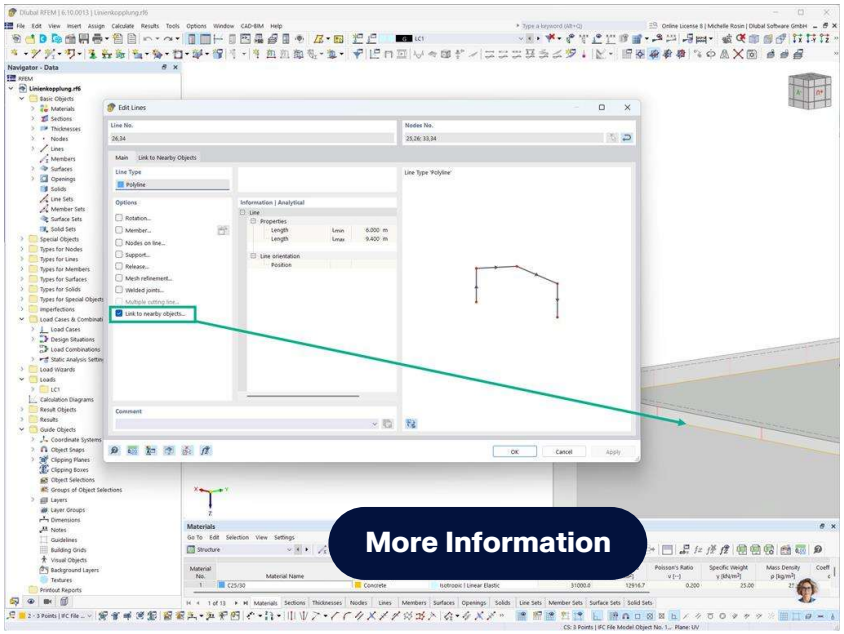
- Enables standard-compliant modelling in accordance with EN 12811-1 and EN 1065, specifically for scaffolding structures
- Use of the ‘scaffolding joint’ non-linearity for node bearing degrees of freedom ϕx and ϕy
- Creation of an M-ϕ working diagram possible



Features in RFEM 6

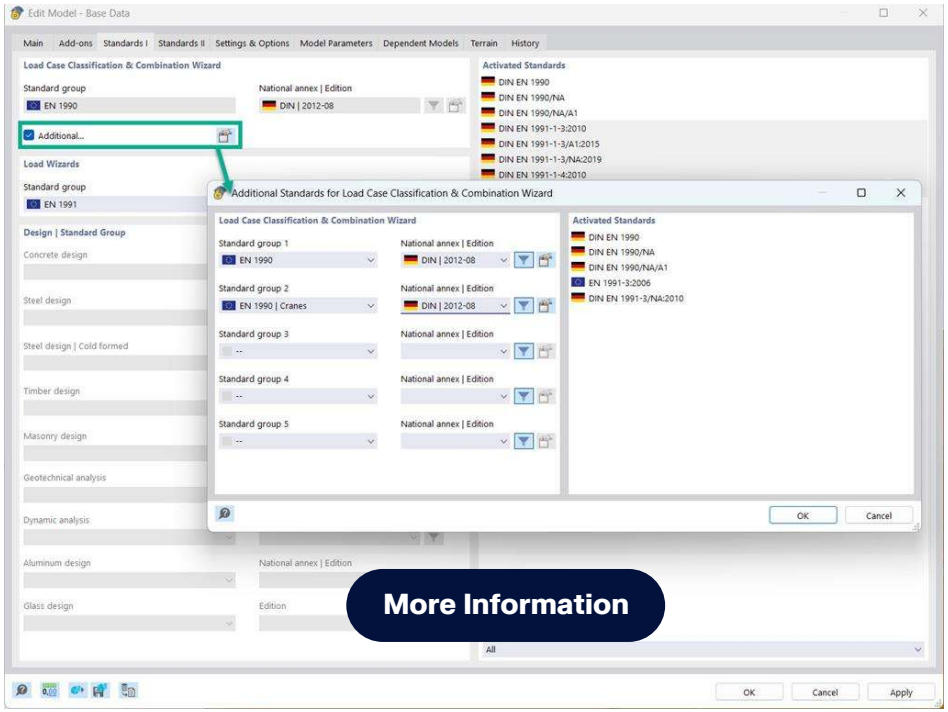
"Line Link" Type for Lines

- Line couplings automatically connect neighboring objects such as lines or areas using rigid couplings
- The search area, object types to be connected and objects to be excluded can be defined individually



Multiple Combination Wizards

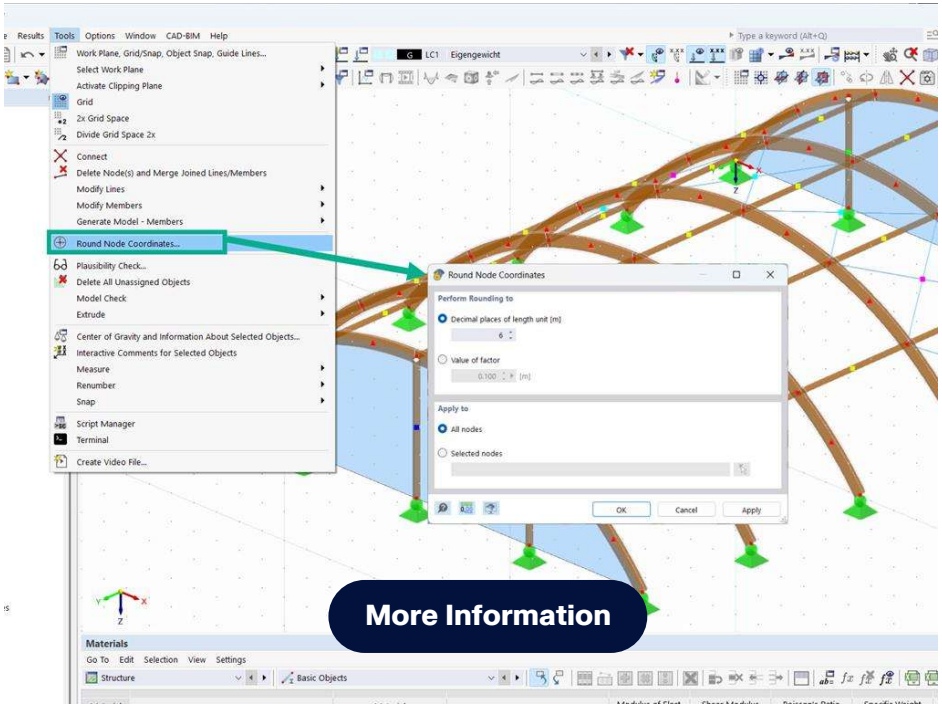
- Up to 5 load case classifications and combination assistants can be used simultaneously in one model



Features in RFEM 6

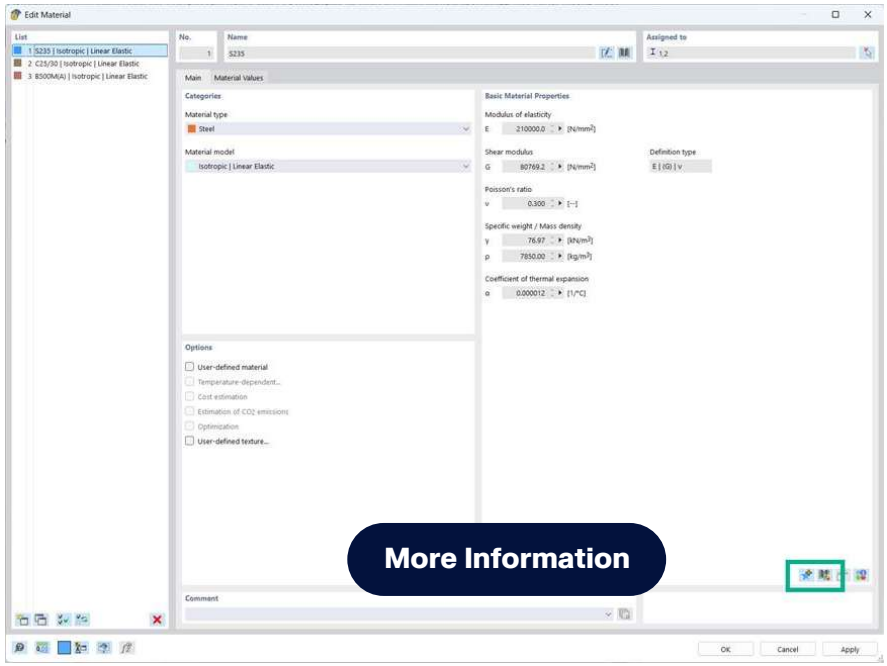
Round Node Coordinates

- Node coordinates can be rounded to a specific number of decimal places or to a defined factor



User Material Library

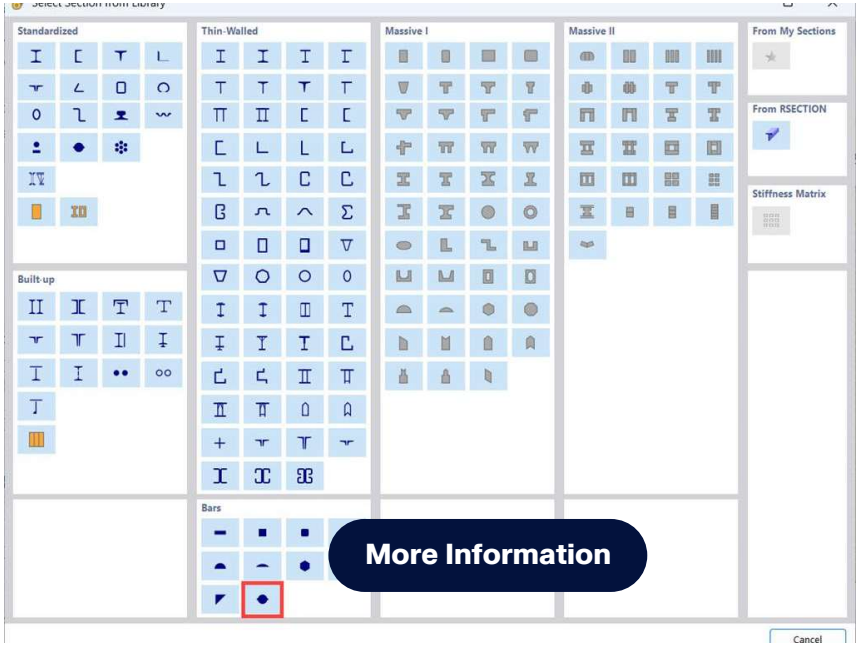
- Custom materials can be created, edited and saved for use across models
- The storage location of the user material library can be customized and shared with other users



Features in RFEM 6

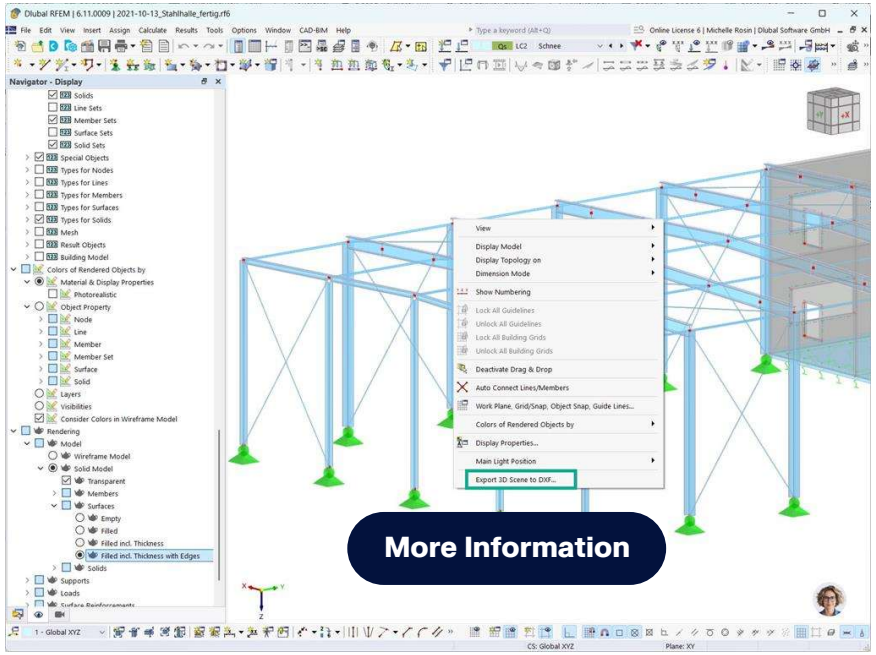
Parametric Rebar Cross-Sections

- Parametric reinforcement bar cross-sections allow you to define any diameter for precise and customized modelling



DXF Export of 3D Scene

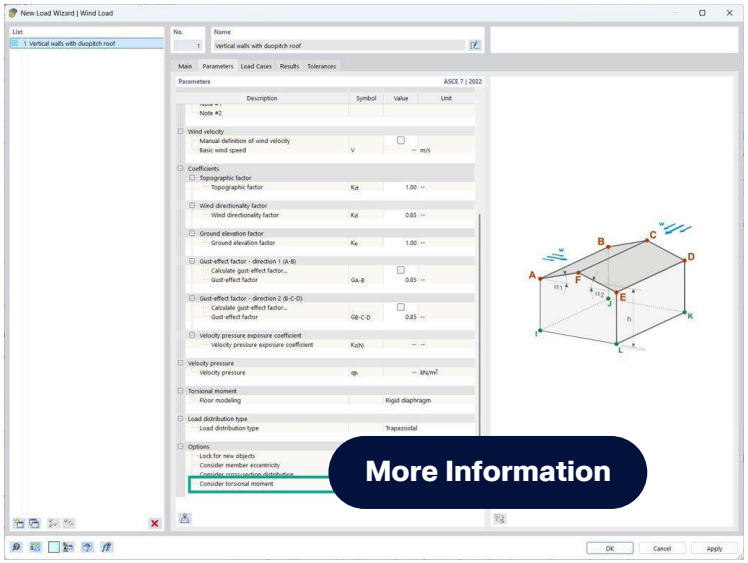
- Lines can be exported according to their visibility
- Depending on the rendering settings, boundary lines of bars and surfaces, center lines of reinforcement and steel connection graphics can also be exported



Features in RFEM 6

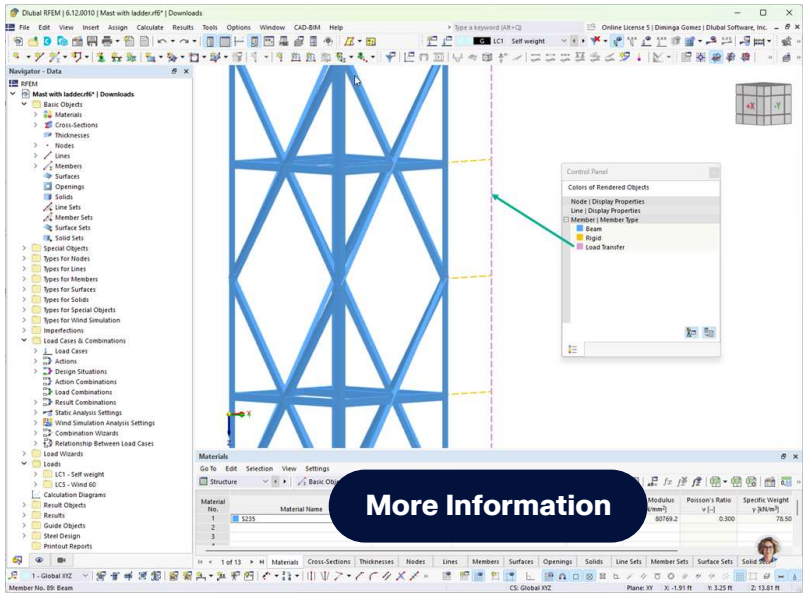
Torsional Moment Due to Wind According to ASCE 7

- Automatic generation of torsional moments around the building axis in accordance with ASCE 7
- Additional moment acts centrally around the building axis and takes into account positive and negative torsion



Member Type "Load Transfer"

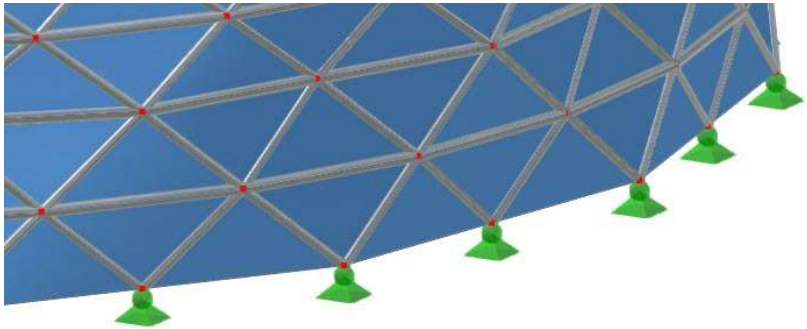
- The “Load Transfer” member type transfers loads directly to connected objects, but has no stiffness
- For other member types (e. g. beam members) load transfer properties can be activated → original stiffness is retained

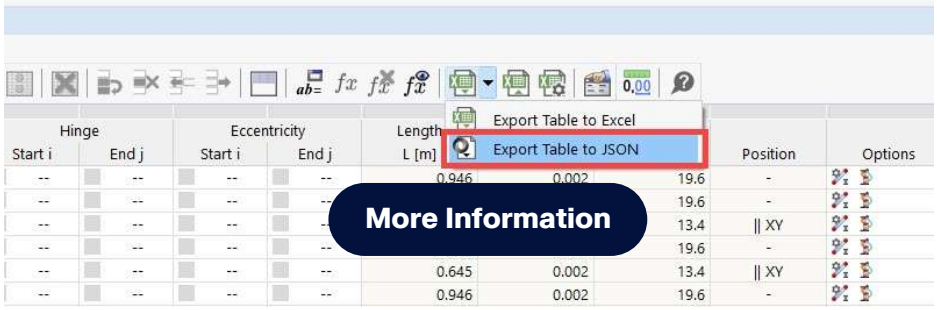


Features in RFEM 6

JSON Export of Tables

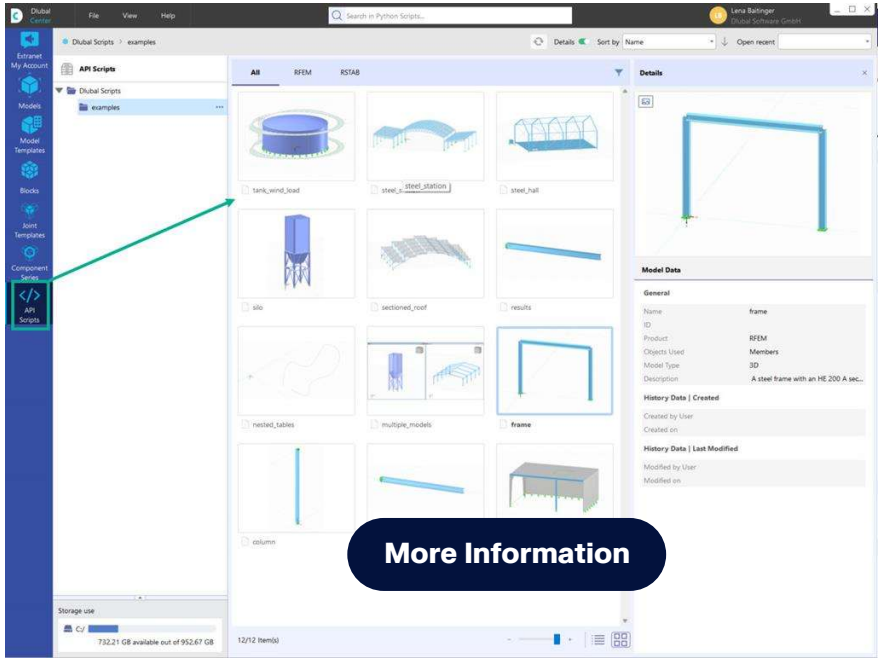
- Exporting tables in JSON (JavaScript Object Notation)





Dlubal Center with API Script Management

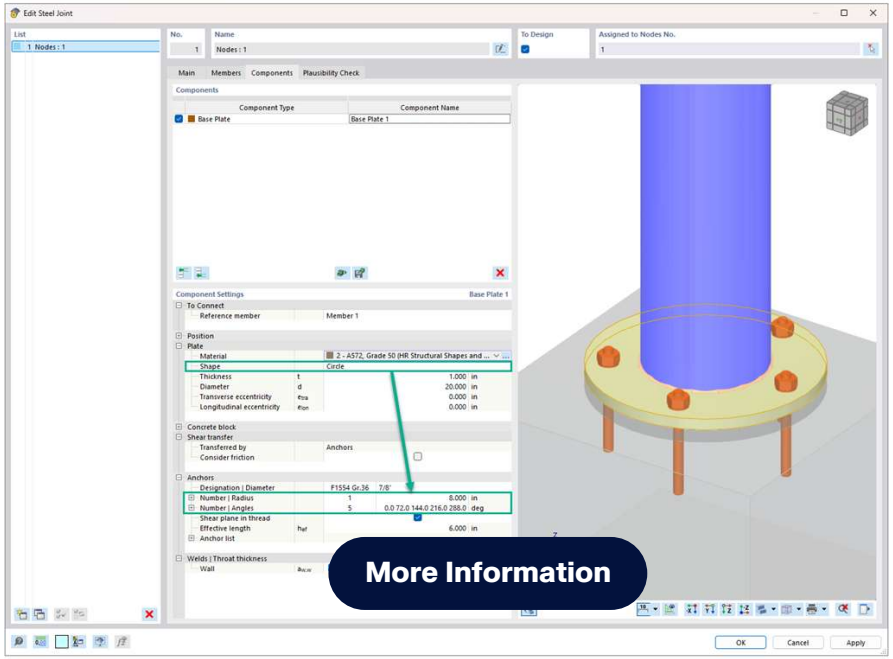
- The Dlubal Center offers the option to manage program-related scripts in the ‘API Scripts’ section



Features in Steel Joints Add-On

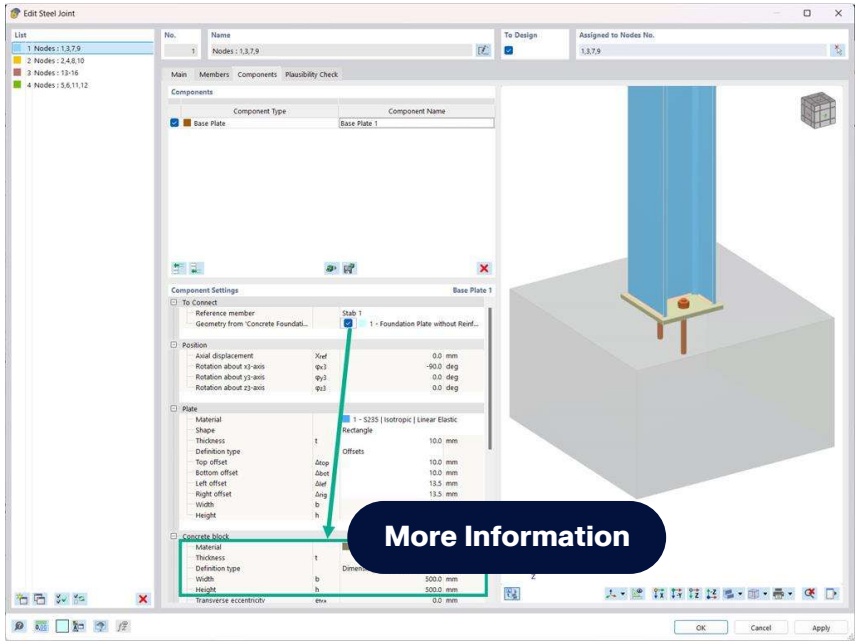
Definition of Circular Bolt or Anchor Layout

- Enables the definition of circular screw or anchor patterns



Transfer of Foundation Dimensions in Base Plate Design

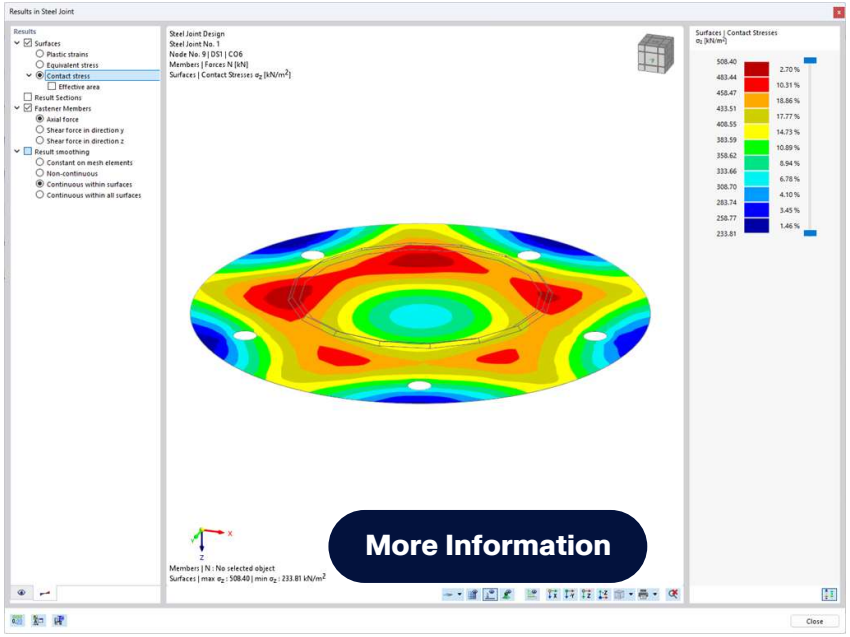
- Foundation dimensions and materials from the Concrete Foundations add-on can be transferred directly to the Steel Connections add-on for footing design



Features in Steel Joints Add-On

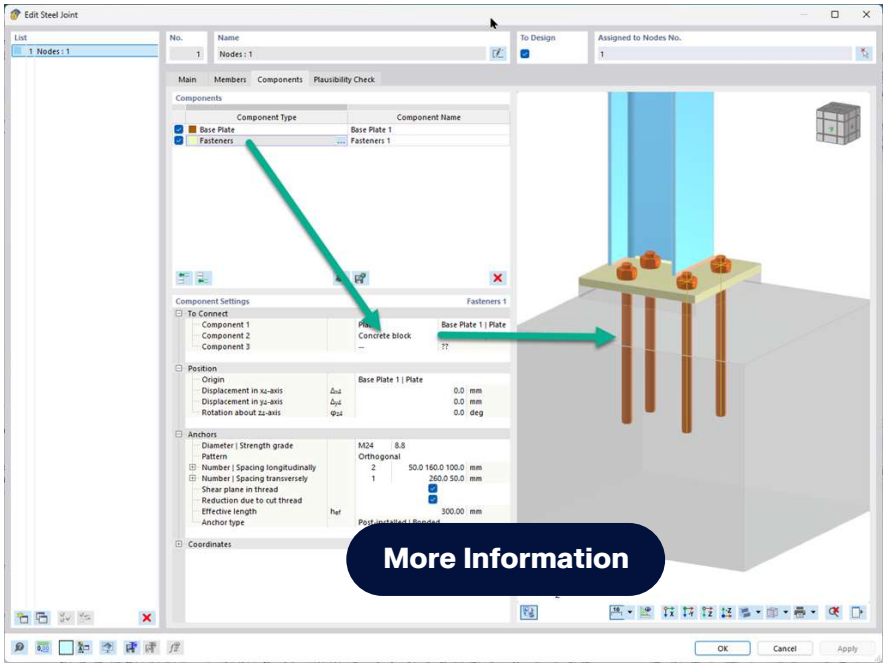
Graphical Display of Contact Stresses

- Contact stresses under foot plates can be displayed graphically in the results window of the Steel Connections add-on



Component "Fastener" with Anchor in Concrete Block

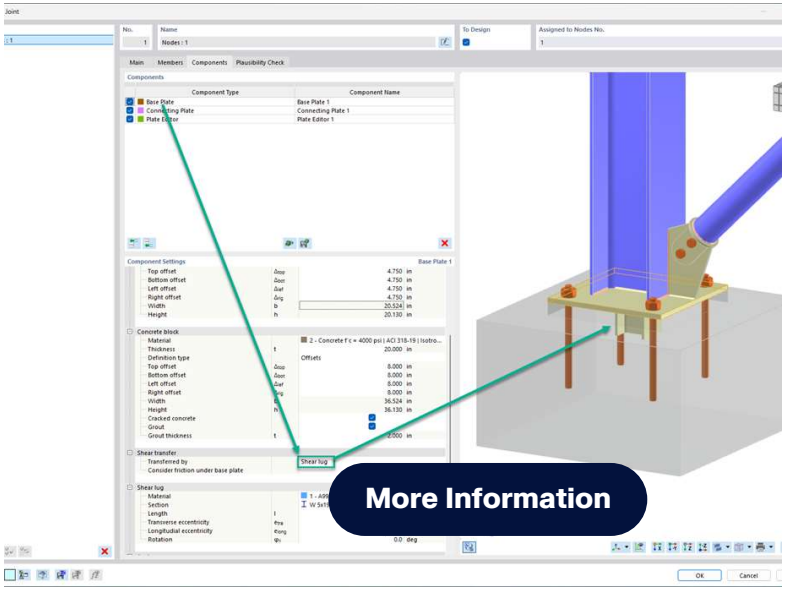
- Anchors can be defined in a concrete block and positioned relative to each slab in the connection



Features in Steel Joints Add-On

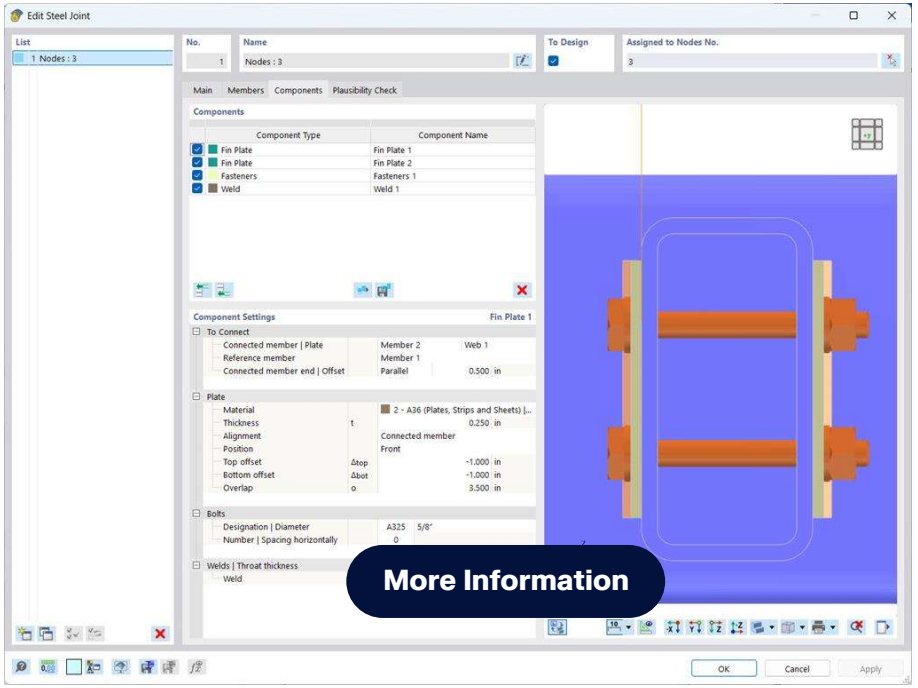
Shear Transfer via Shear Lugs

- Consideration of shear transfer between a base plate and a concrete block using shear anchors
- Supports standardized and thin-walled I, H, U, T, L, and cross-shaped profiles as well as flat steel, with central or eccentric anchor arrangement



Through-Bolt Design in Steel Joints

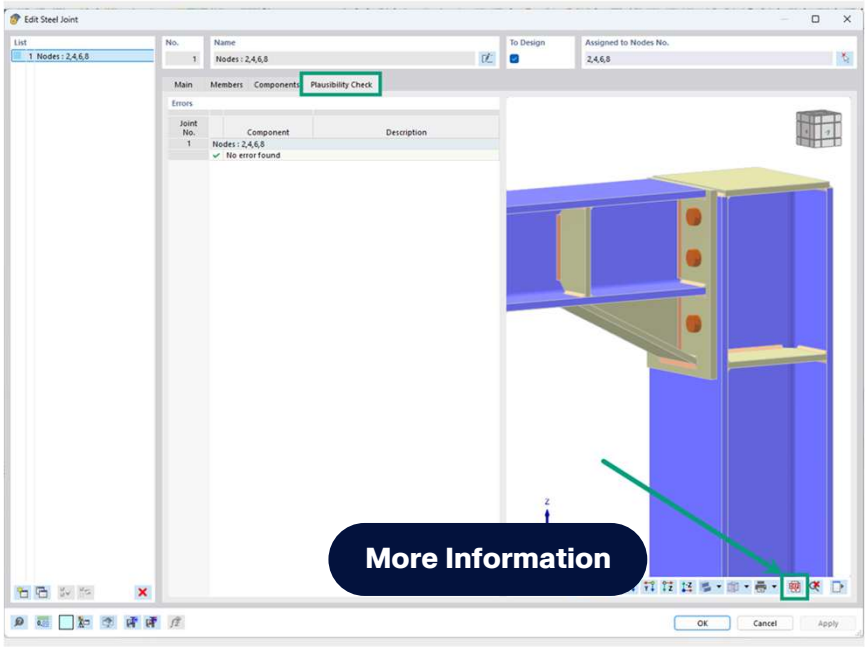
- Verification of through bolts in hollow section connections (HSS) in accordance with AISC 360 and EN 1993



Features in Steel Joints Add-On

3D DXF Export of Steel Joints

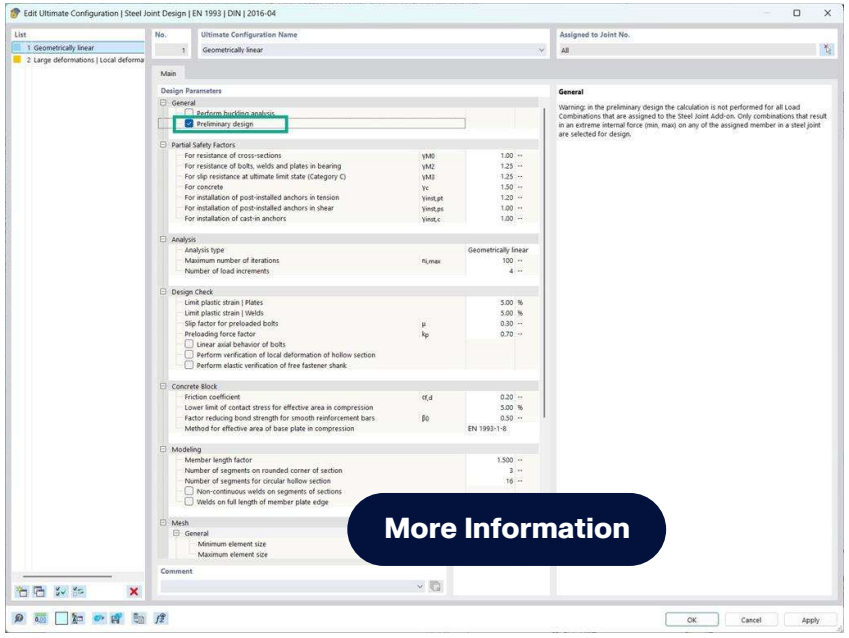
- Enables the connection geometry to be exported as a 3D line model to a DXF file, which can be further processed in CAD programs



Preliminary Design of Steel Joints

- The preliminary design in the Steel Connections add-on only selects combinations that result in extreme internal forces at an assigned member

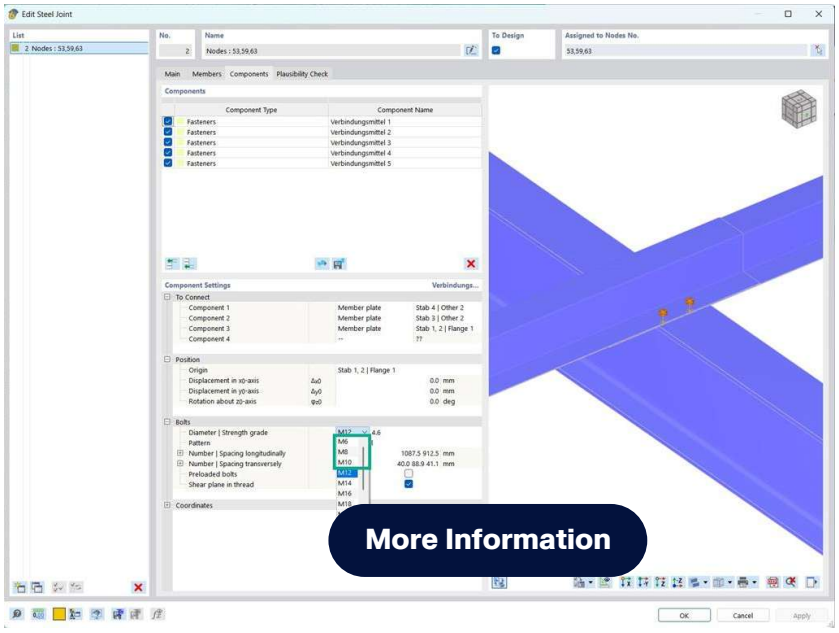
  →Acceleration of the design process



Features in Steel Joints Add-On

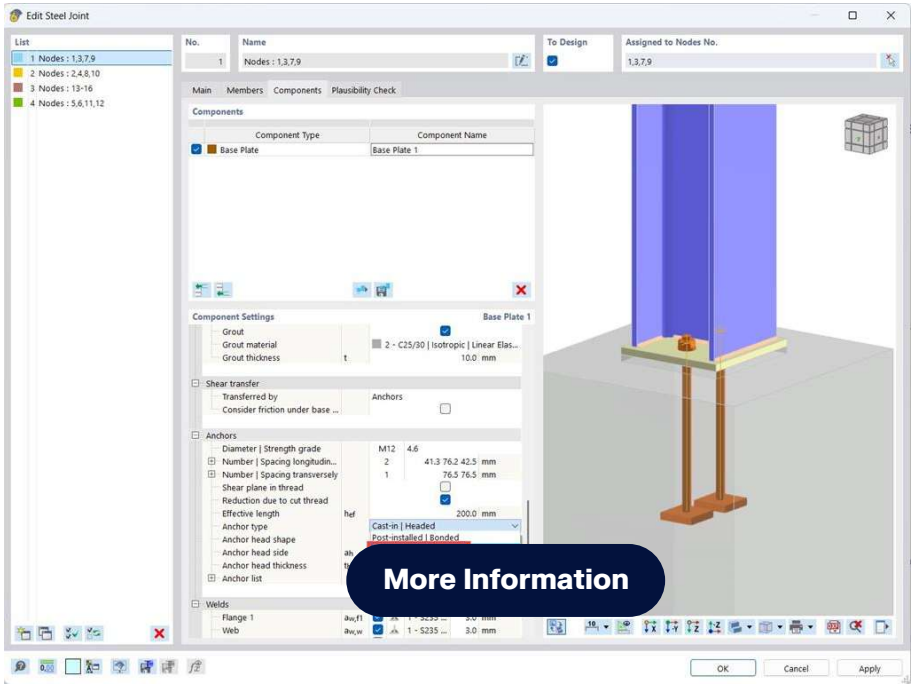
Extended Bolt Diameters for Design According to EN 1993-1-8

- Bolts and anchors with diameters from M6 to M64, also available outside the scope of EN 1993-1-8 (M12 to M36)



Hook Anchors and Headed Anchors

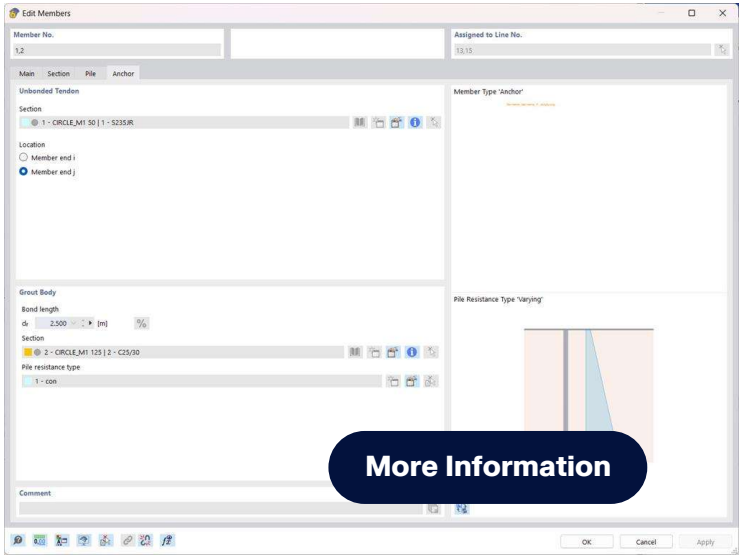
- Concrete-embedded hook anchors and head anchors are now available, including verification in accordance with Eurocode 3 and AISC 360



Features in Geotechnical Analysis Add-On

Member Type "Anchor" for Geotechnical Analysis

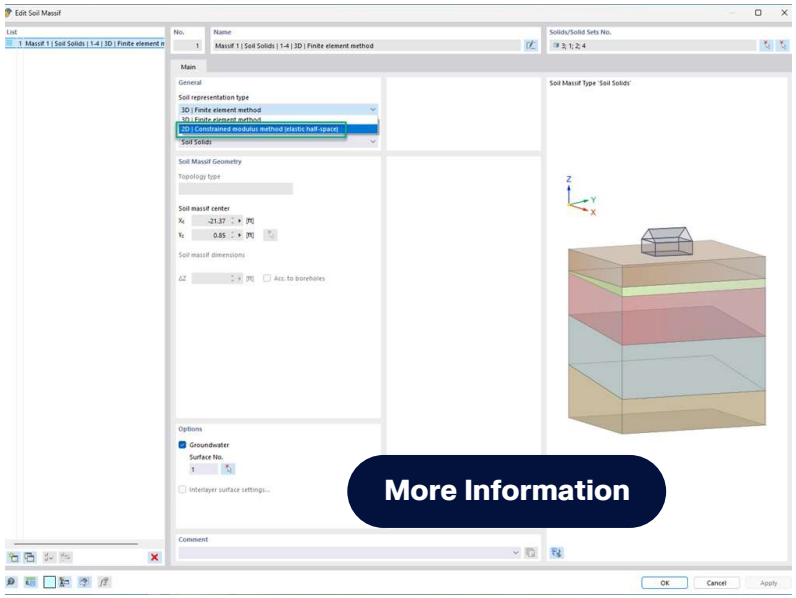
- The “Anchor” member type allows you to enter parameters for the tension member and the grout body of the anchor
- The anchor is stored in the soil solid to enable realistic geotechnical analyses



More Information

Soil Modeling with Constrained Modulus Method

- The constrained modulus method realistically simulates the interaction between buildings and soil
- It considers soil samples, groundwater levels, excavation, and bedding coefficients



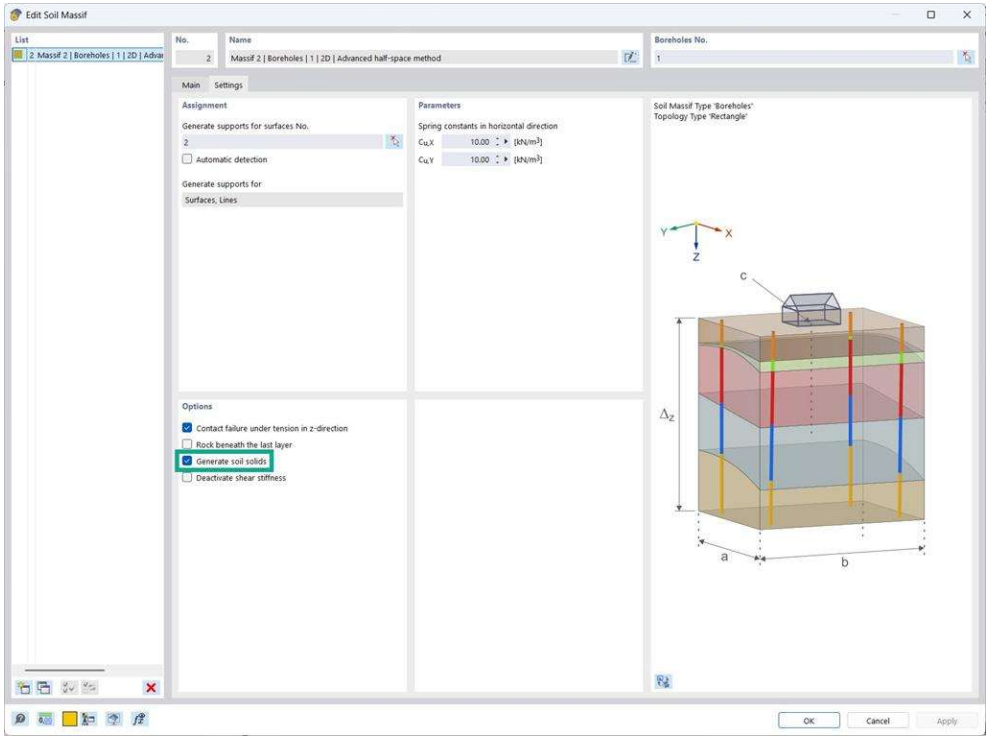
More Information

Features in Geotechnical Analysis Add-On

Stiffness Modulus Method | Generation of Soil Layers

- The stiffness modulus method enables realistic modeling of soil-structure interaction by generating soil stratification
- Two definition types for the generaation of soil layers:
  - Internal approximation of soil layers (faster, invisible layer boundaries) → based on RF-SOLIN from RFEM 5
  - Generation and mesh of 3D solids (visible layer boundaries, longer calculation time)

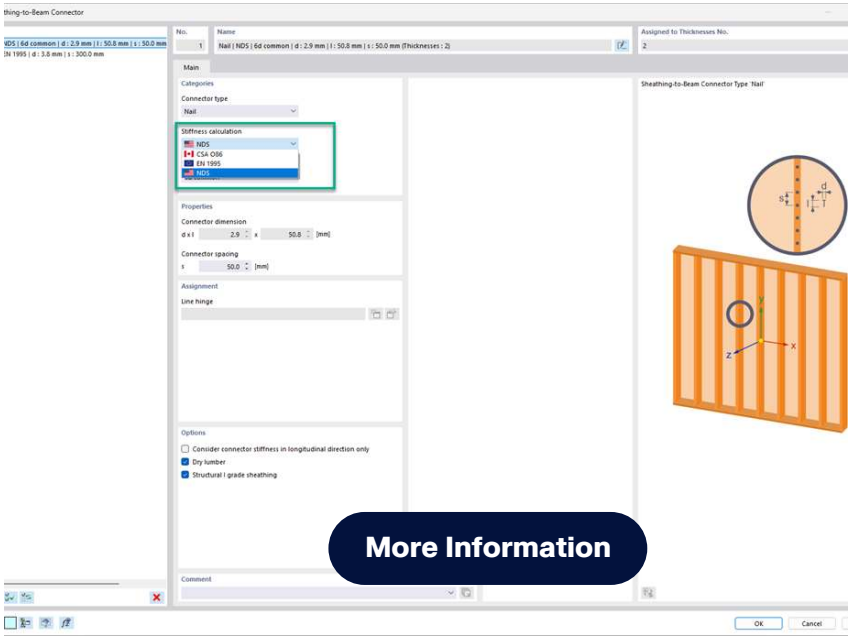
More Information



Features in Timber Design Add-On

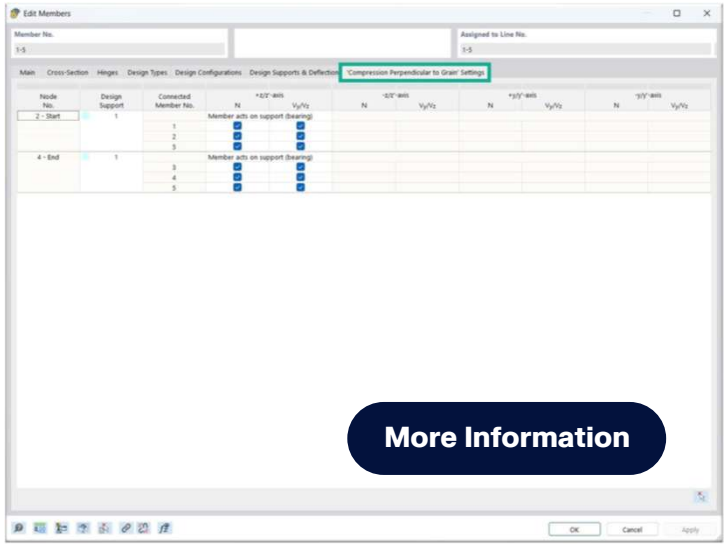
Beam Panel | Semi-Rigid Joint of Sheathing

- The flexibility of the nails is represented by nonlinear line joints in accordance with EN 1995, NDS, and CSA O86



Design of "Compression Perpendicular to Grain" at Nodes with Several Members

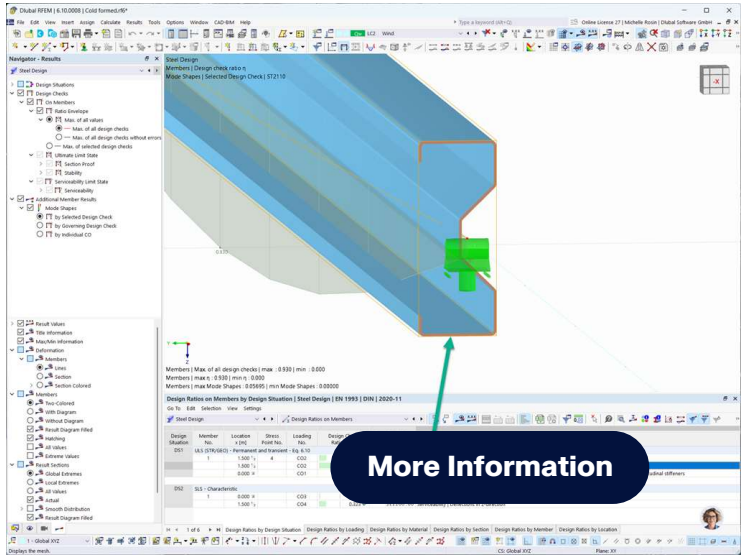
- Considers relevant internal forces of adjacent members, when a direct design support has been defined
- Only internal force components that generate compression perpendicular to the grain direction



Features in Steel Design Add-On

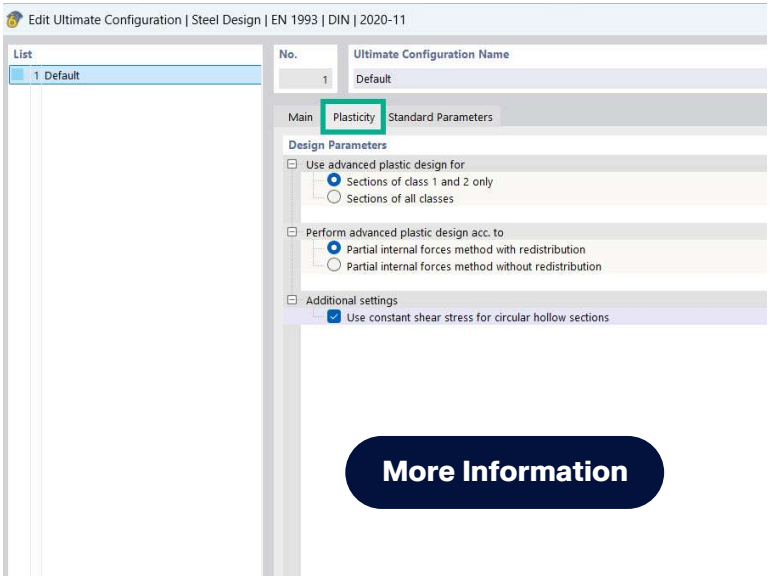
Stability Analysis of Cold-Formed Sections

- Stability checks for cold-formed RSECTION and database profiles with intermediate stiffeners (e.g., Sigma profiles) according to EN 1993-1-3
- Supports standardized and thin-walled profiles such as I, H, U, T, L, and cross-shaped cross-sections



Plastic Design According to EC 3 (Partial Internal Forces Method)

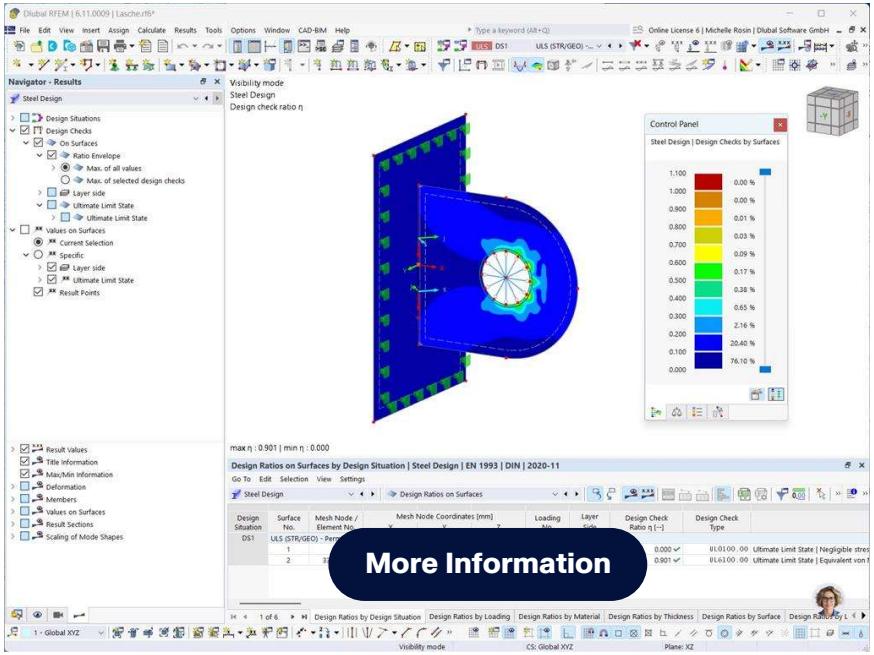
- Partial internal forces method is available for steel design in accordance with EN 1993-1-1
- Enables plastic checks even for cases outside the Eurocode specifications, such as interaction with arching moments



Features in Steel Design Add-On

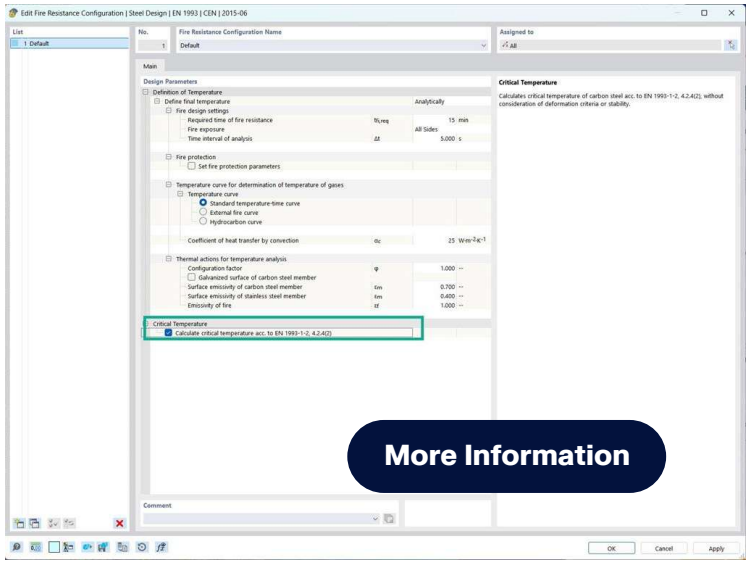
Design of Steel and Aluminum Surfaces

- Option to calculate areas in addition to bars in the steel and aluminum dimensioning add-ons



Critical Steel Temperature for Fire Resistance Design

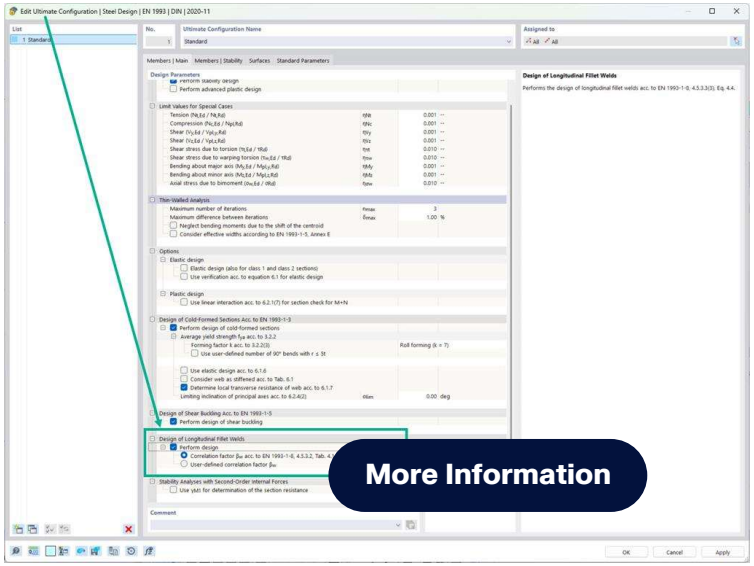
- The critical steel temperature is calculated for the cross-section verification in accordance with EN 1993-1-2, 4.2.4 (2)
- Supports the design of steel structures under fire conditions



Features in Steel Design Add-On

Design of Longitudinal Fillet Welds According to EN 1993-1-8

- Longitudinal fillet welds of welded cross-sections can be designed according to EN 1993-1-8
- The correlation factor $beta_w$ can be determined by the program or entered by the user

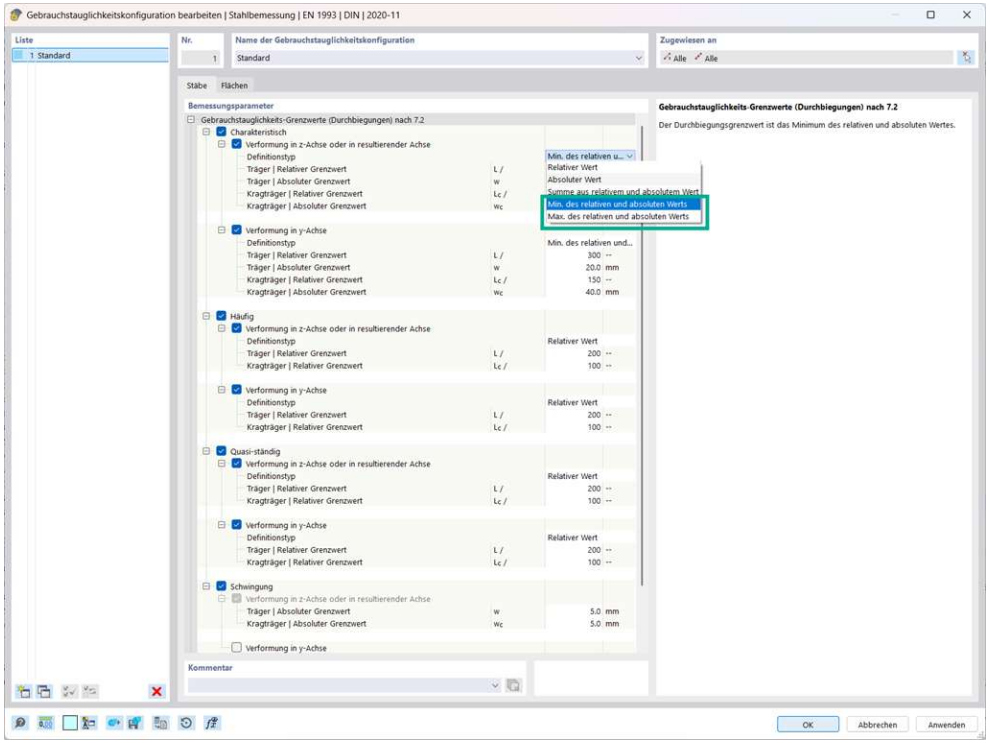


Features in Add-Ons Steel Design, Glass Design, Aluminum Design and Timber Design

Serviceability – Minimum or Maximum Relative/Absolute Value

- In the serviceability configuration of the Steel Design, Glass Design, Aluminum Design, and Timber Design Add-Ons, two limit values (absolute and relative) can be defined for the deformation calculation
- Enables precise and flexible adaptation to specific requirements of serviceability checks

More Information

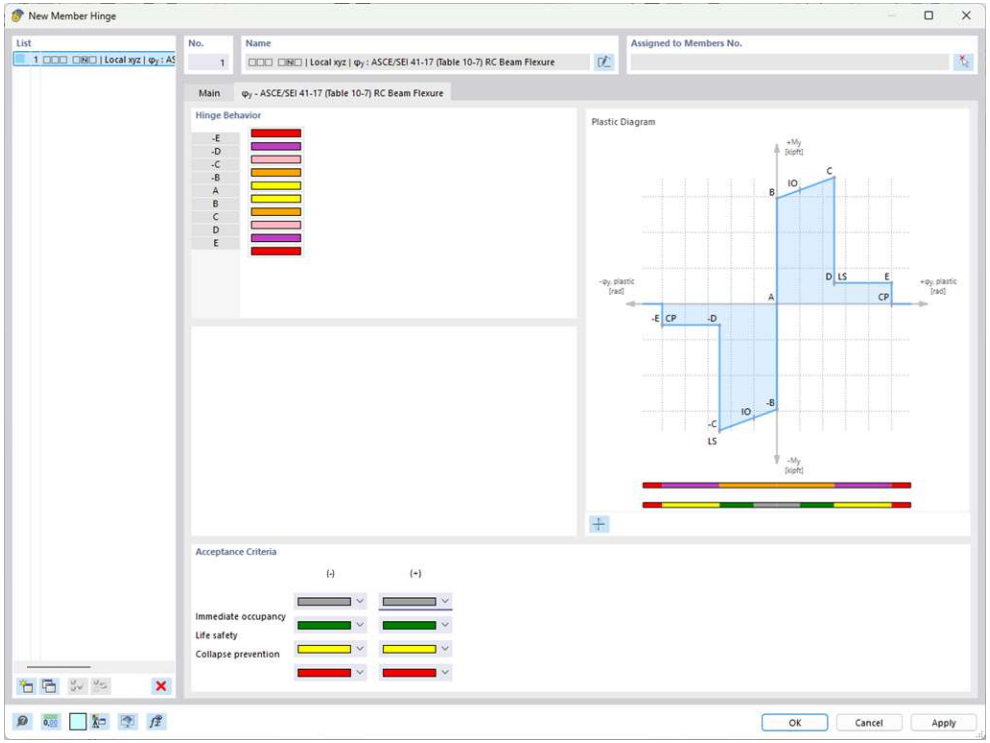


Features in the Add-On Concrete Design and Pushover Analysis/Time History Analysis

Plastic Hinges for Reinforced Concrete Beams According to ASCE/SEI 41-17

- Plastic hinges for reinforced concrete beams according to ASCE/SEI 41-17 Table 10-7 consider longitudinal and transverse reinforcement as well as shear force and calculate the hinge behavior
- Requires the Add-Ons Concrete Design and Pushover Analysis or Time History Analysis

More Information

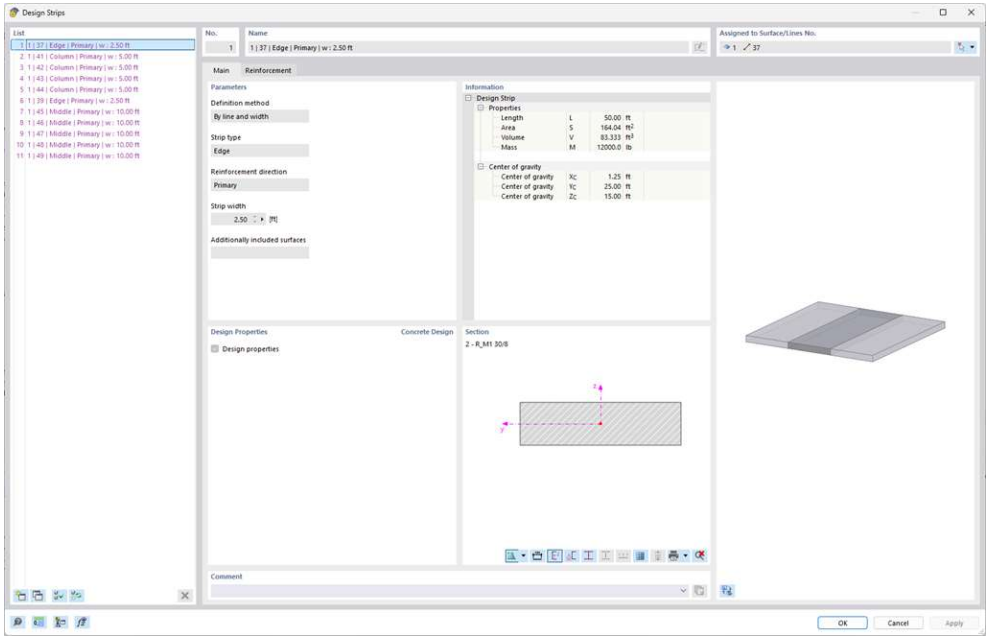


Features in Concrete Design Add-On

Design Strips – Reinforcement with Automatic Anchorage Length

- Design strips integrate internal forces from surfaces and automatically calculate the anchorage length of the reinforcement
- Automated generation: Strip widths can be created based on span and length according to ACI 318-19 or building grid dimensions

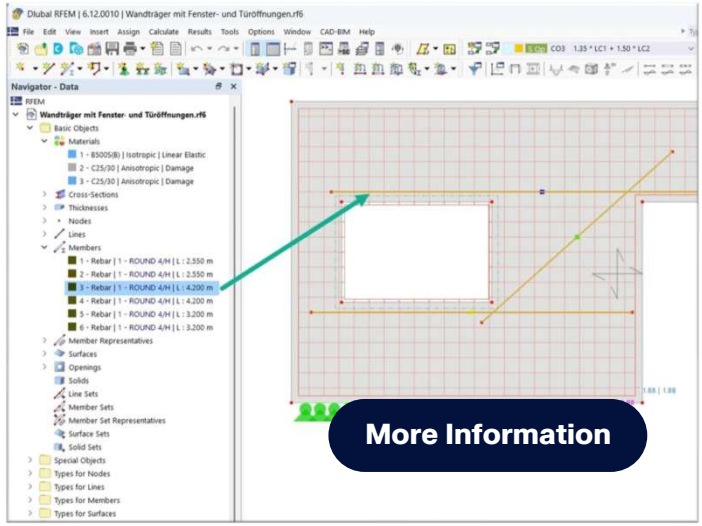
More Information



Features in Concrete Design Add-On

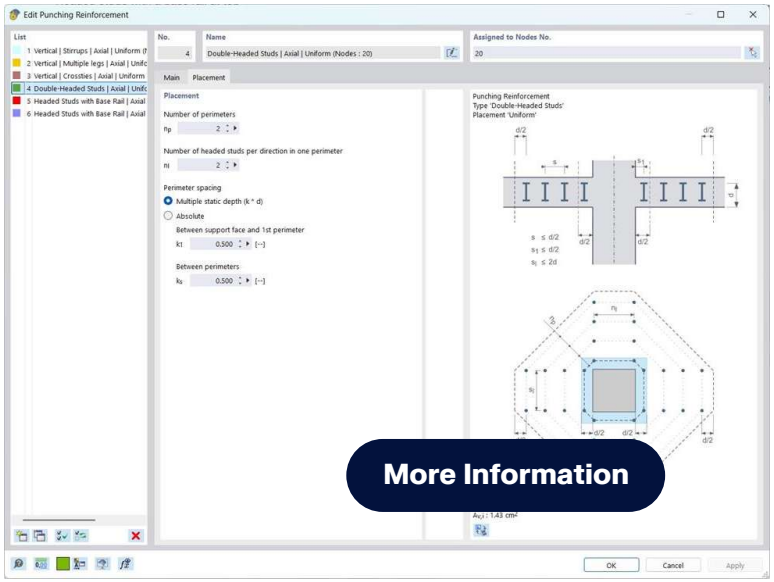
"Rebar" Member Type

- Automatic connection function to other elements such as surfaces when the member is physically located within this element
- Simulation of steel reinforcement using FE modeling
- Area of application: Truss method in areas of discontinuity in concrete



Punching Reinforcement Types According to ACI and CSA Standards

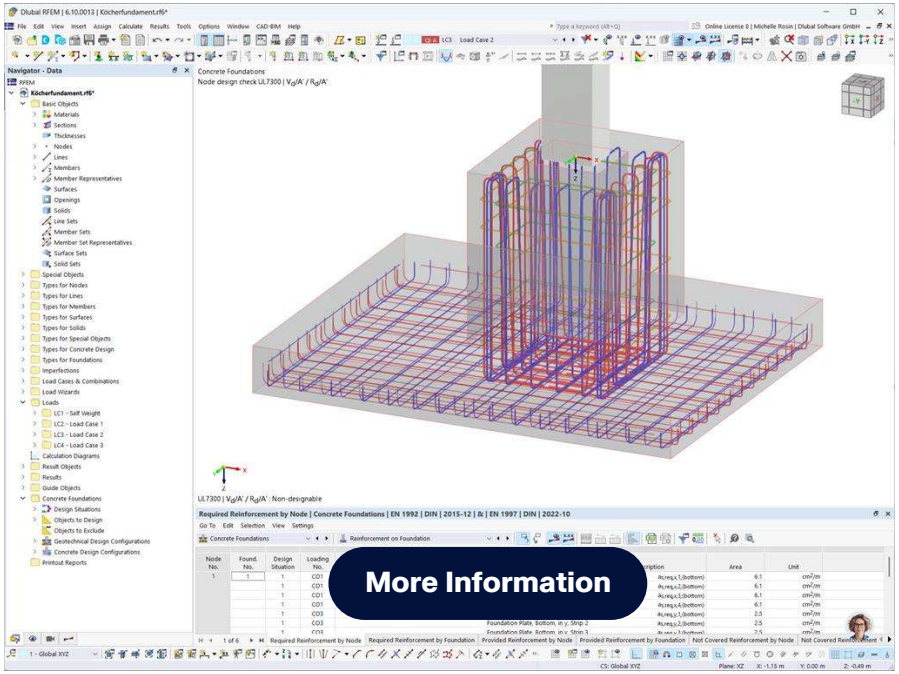
- Six different types of punching shear reinforcement are available for punching shear checks: stirrups, multiple legs, shear legs, double-headed bolts, head bolts with base rail at the bottom/top



Features in Concrete Design Add-On

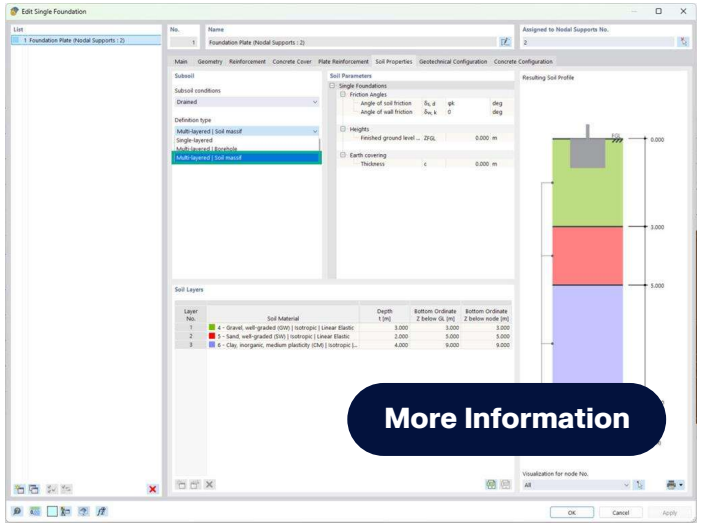
Foundation Type: Bucket Foundation

- Consideration of smooth or rough quiver sides



Definition Type "Multi-Layered | Soil Massif" for Concrete Foundations

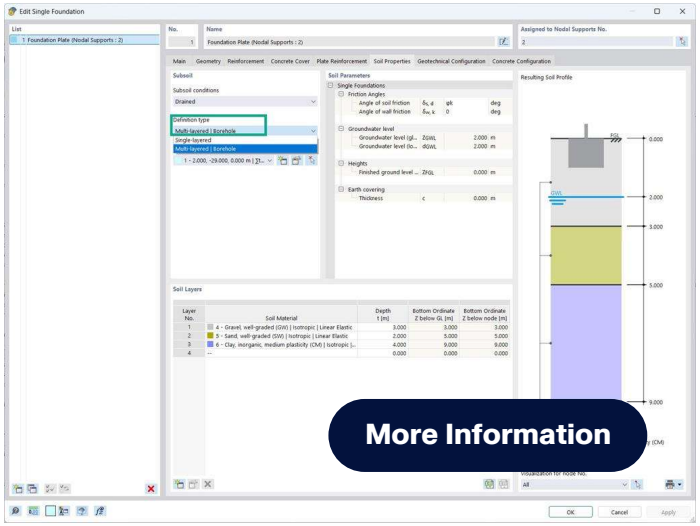
- Enables automatic determination of soil layers from an existing soil mass in the model, based on the respective foundation position
- This function is only available in combination with the Geotechnical Analysis add-on



Features in Concrete Foundations Add-On

Import of Soil from Borehole for Foundations

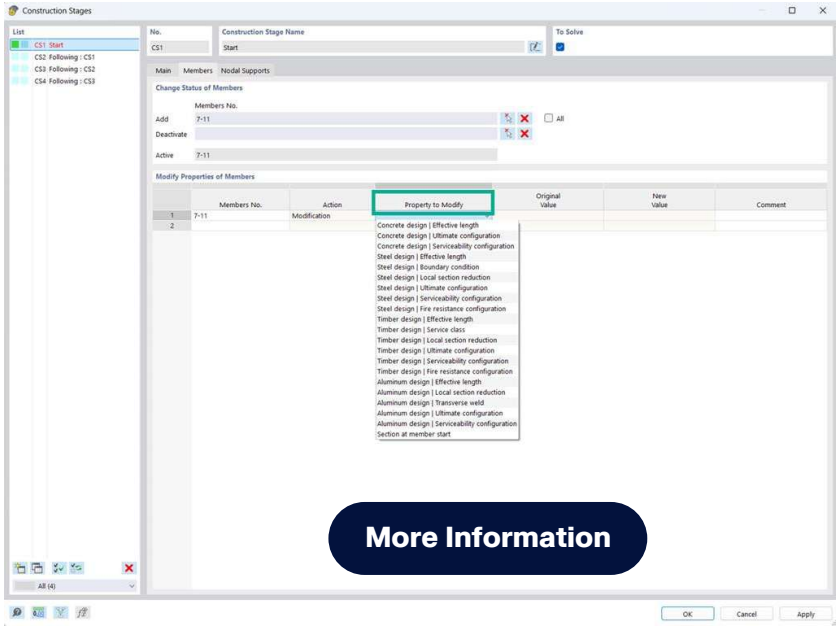
- Soil parameters, including soil layers, overburden, and groundwater, can be imported from a borehole profile
- Individual specification of material, layer thickness, and relevant geotechnical parameters for each soil layer



Features in Construction Stages Analysis Add-On

Modification of Design Properties for Construction Stages

- Allows you to modify the object and dimension properties of bars, surfaces, etc. in the individual construction stages



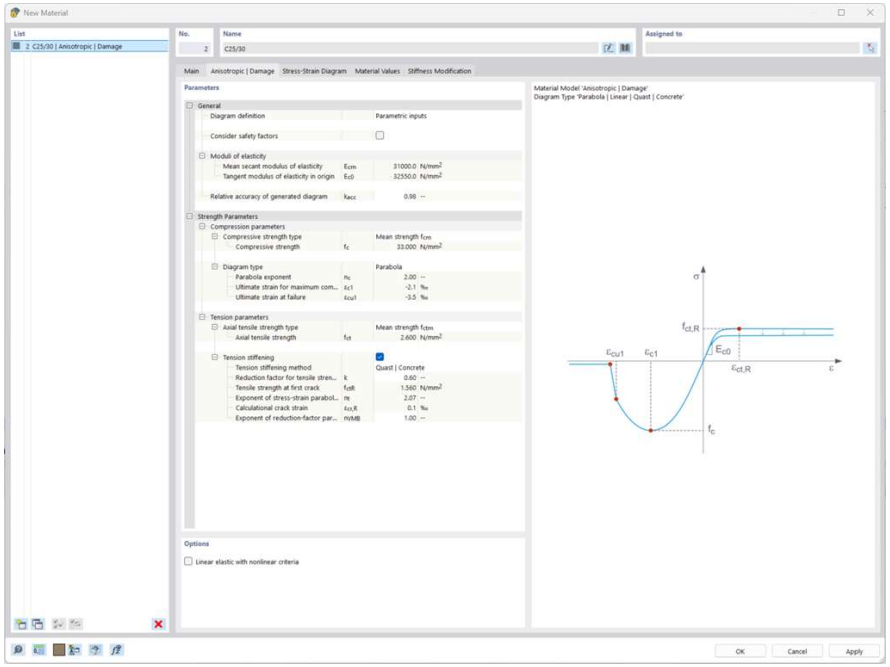
More Information

Features in Nonlinear Material Behavior Add-On

Nonlinear Material Model for Reinforced Concrete

- Consideration of damage, creep, shrinkage, and tensile stiffening in the analysis of concrete components
- Material models: Anisotropic | Damage, Isotropic | Plastic, Isotropic | Nonlinear Elastic
- Custom or standard-based stress-strain diagrams
- Long-term effects are taken into account by the analysis type ‘Static Analysis | Creep & Shrinkage (Linear)’

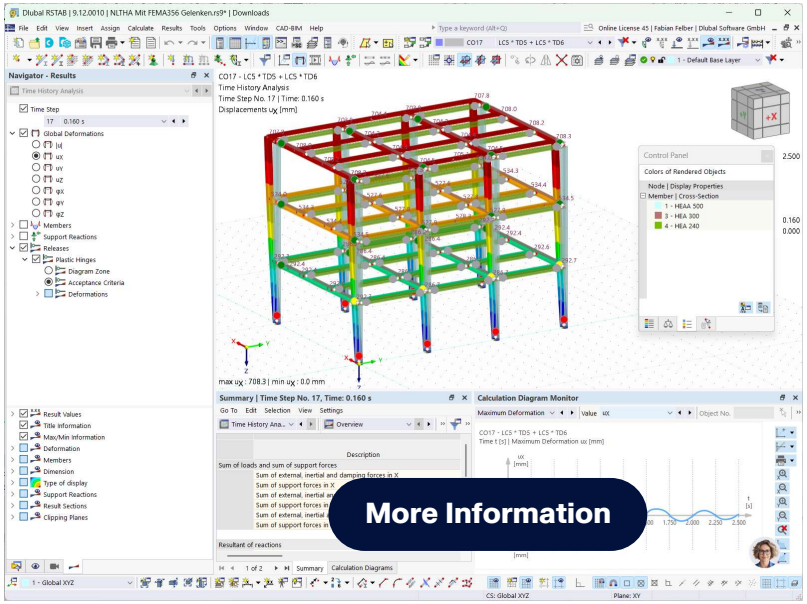
More Information



Features in Time History Analysis Add-On

Nonlinear Time History Analysis

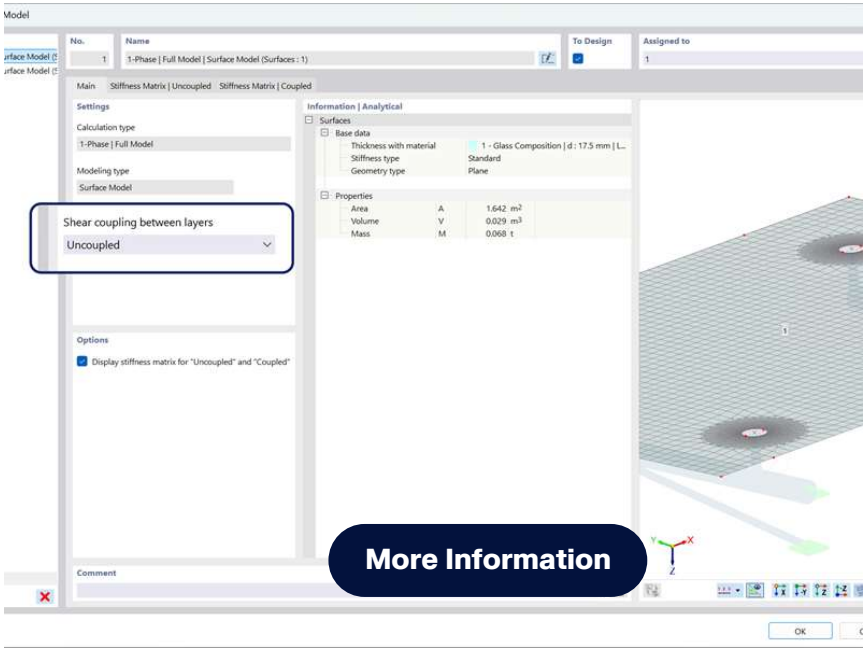
- The following solvers are available for considering nonlinearities:
  - RFEM: Nonlinear implicit Newmark solver
  - RSTAB: Explicit solver for first- and third-order theory



Features in Glass Design Add-On

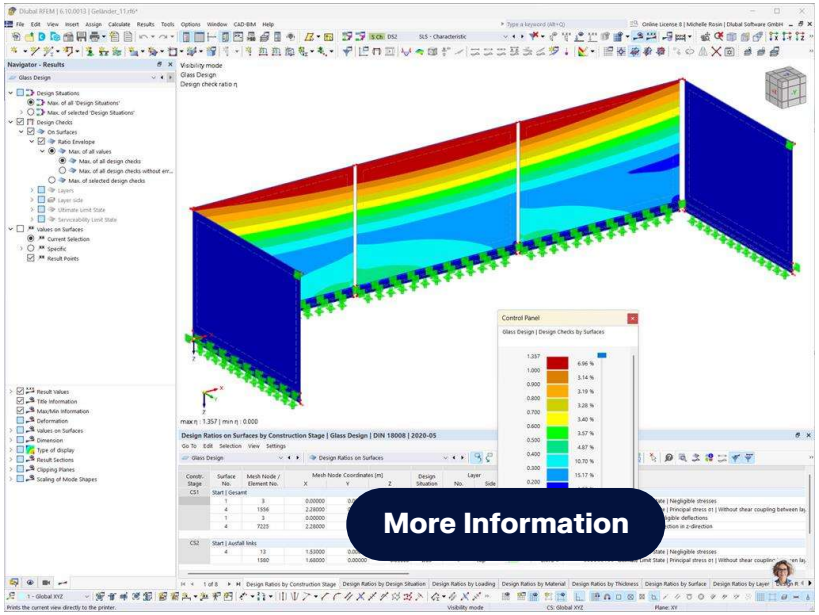
Glass Composition Model

- Automatic generation of a glass composite model when using surfaces with glass composite
- Flexible customization options such as activating/deactivating the shear composite



Glass Design According to American and German Standards

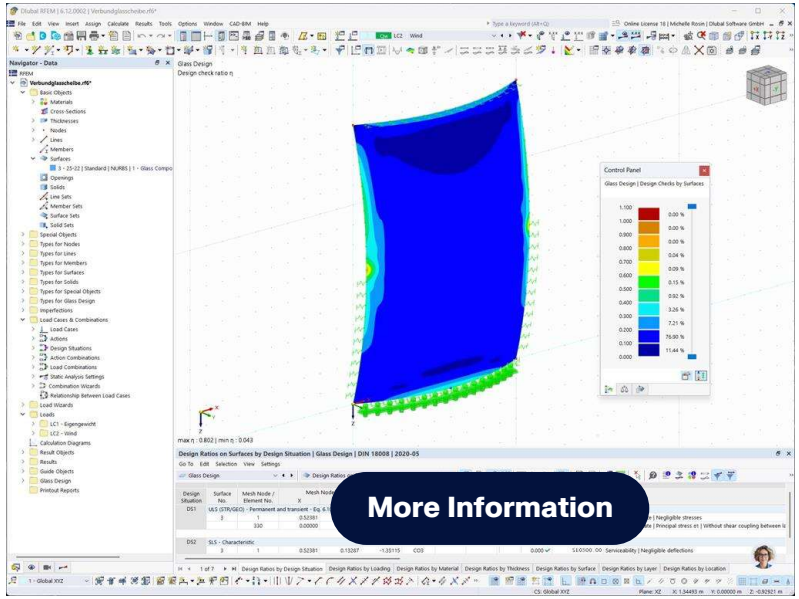
- Design of single panes and laminated glass in accordance with DIN 18008 (German standard) and ASTM E1300 (American standard) or independently of any standard



Features in Glass Design Add-On

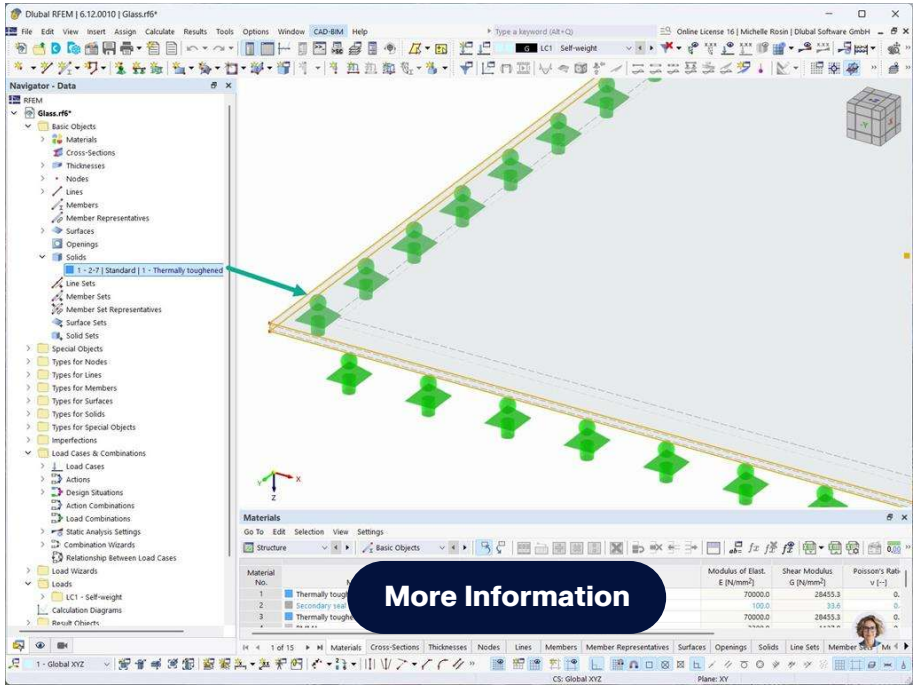
Glass Design of NURBS Surfaces

- Enables the design of NURBS surfaces in addition to flat and quadrangular surfaces, including curved four-sided glass surfaces
- Supports complex geometries for modern glass construction and facade projects in RFEM 6



Design of User-Defined Glass Solids

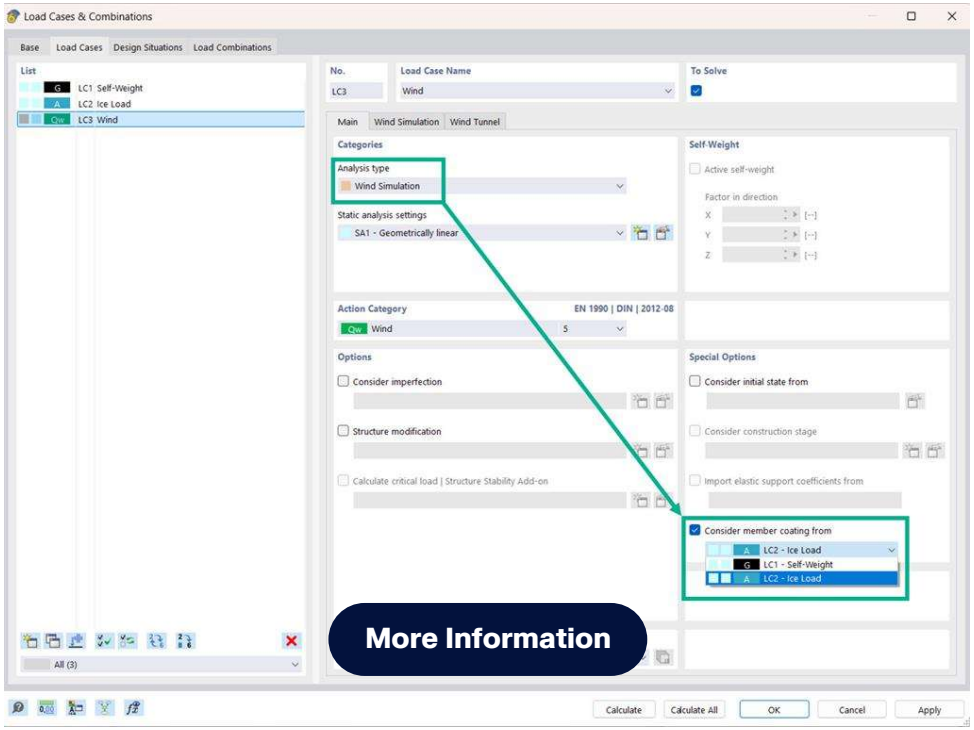
- Model and design glass panes as solids possible



Features in RWIND / RFEM

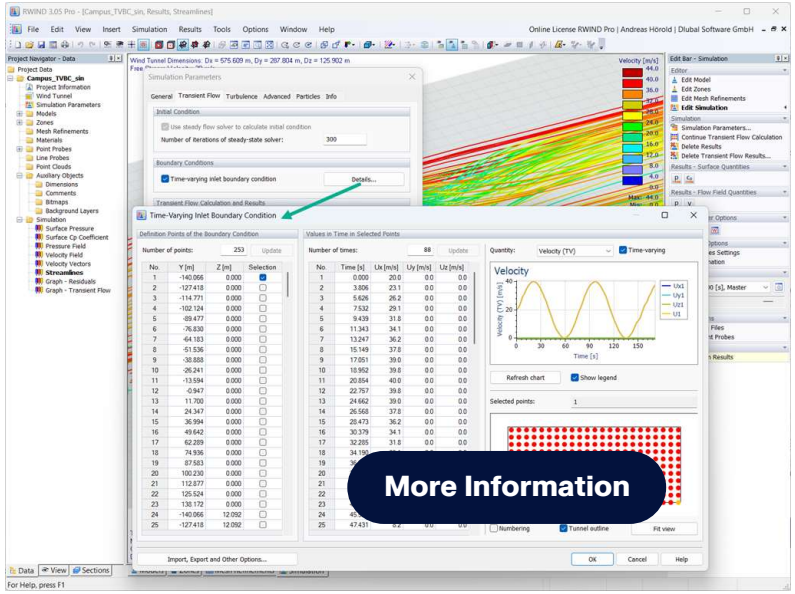
Wind Analysis with Ice Loads

- Consideration of optional rod coatings, such as ice loads, in wind simulation



Transient Boundary Condition at Tunnel Inlet

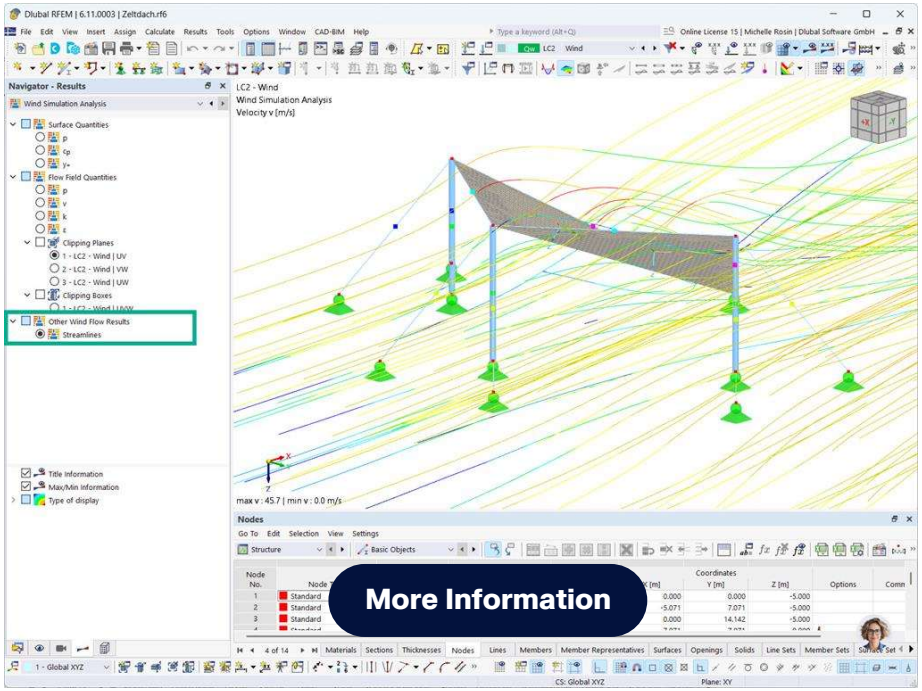
- Enables the definition of time-varying wind speeds at multiple points at the tunnel inlet
- Import and export of points and values via an XML file for flexible and precise wind simulation



Features in RWIND/RFEM

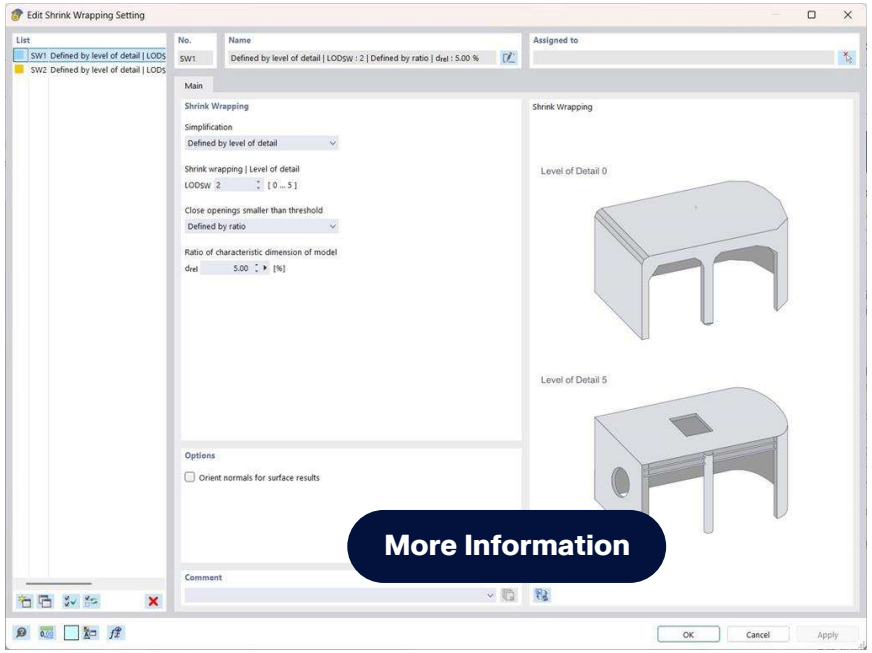
Streamlines

- Streamlines visualize airflow patterns by representing the direction and velocity of fluid particles along the velocity vector



Shrink Wrapping, Surface Roughness, and Surface Permeability

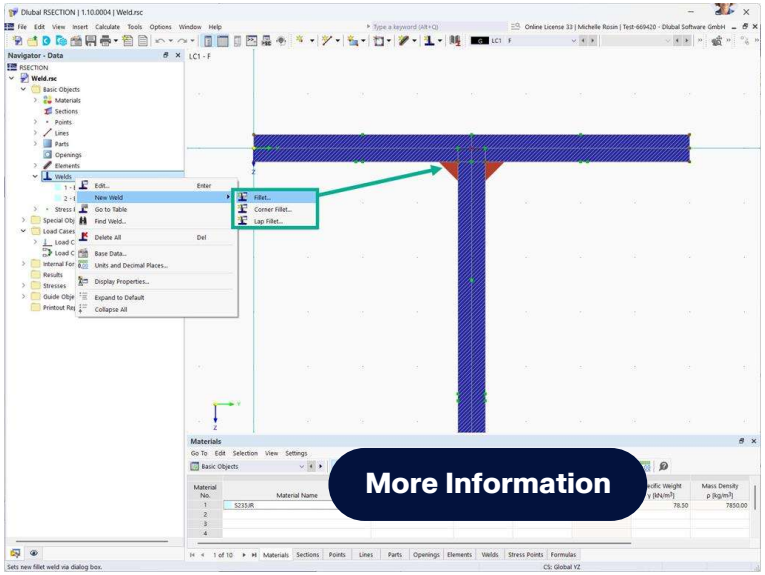
- Settings for shrink-wrapping meshing, surface roughness, and surface permeability available for wind analysis



Features in RSECTION

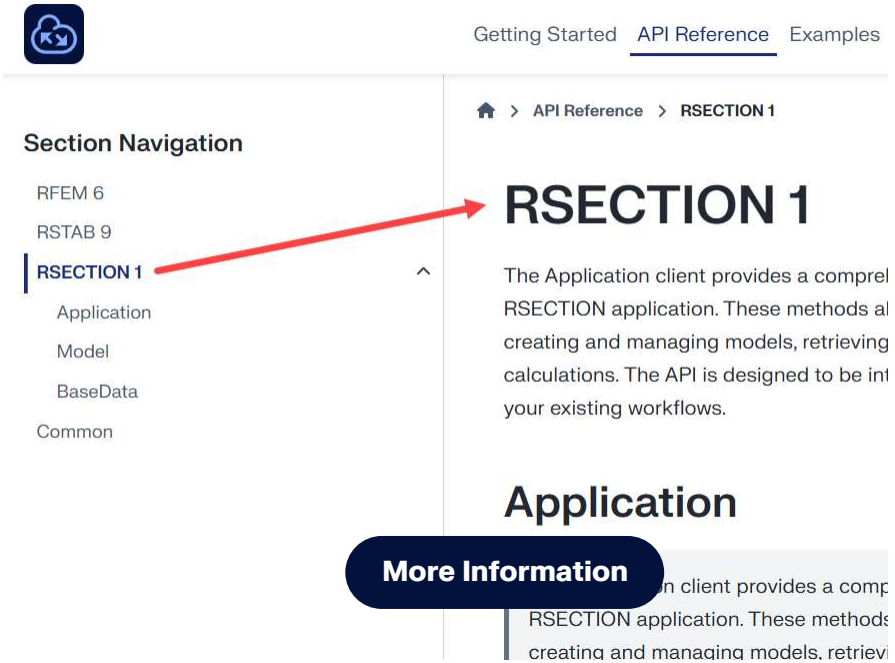
Cross-Section Definition with Welds

- Definition of weld seams (fillet welds, corner fillet welds, lap fillet welds) for thin-walled cross-sections
- Calculation of weld stresses



API (gRPC) | Client-Server Connection via API for RSECTION

- Enables client-server connections

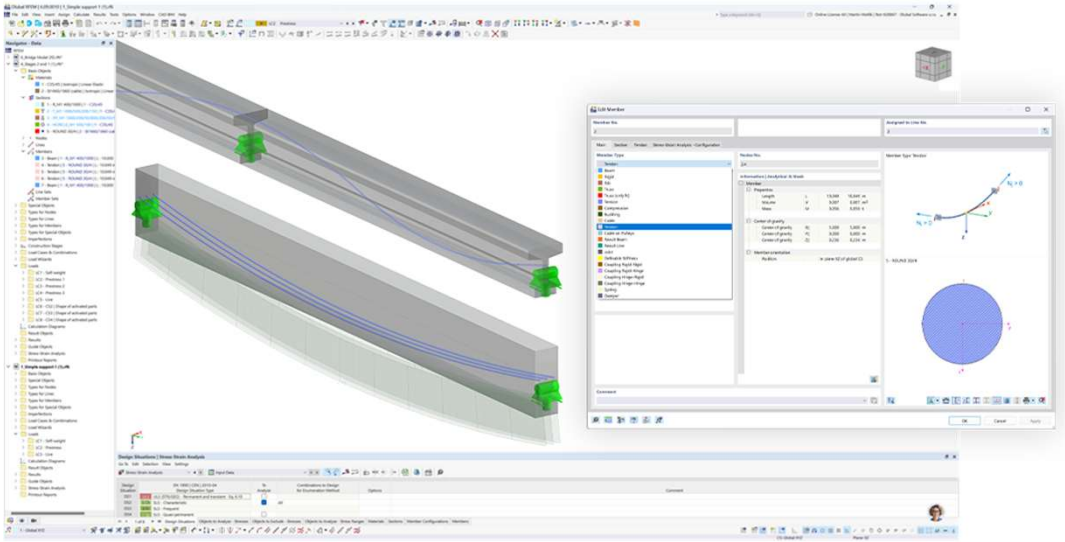


New Add-Ons

Tendons – Beta Version

- Realistic modeling of pre- and post-tensioned tendons with flexible 3D geometry definition
- Integration into FEM analysis, including construction state calculations, for precise and efficient solutions in demanding concrete structures

More Information

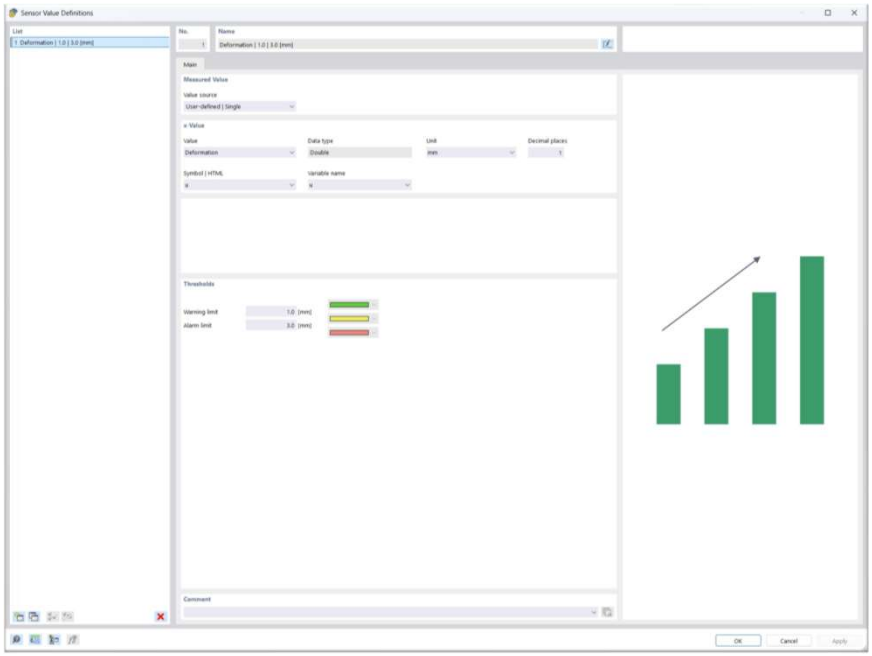


New Add-Ons

Digital Twins – Beta Version

- Enables sensors and their measurement data to be stored in the model

More Information

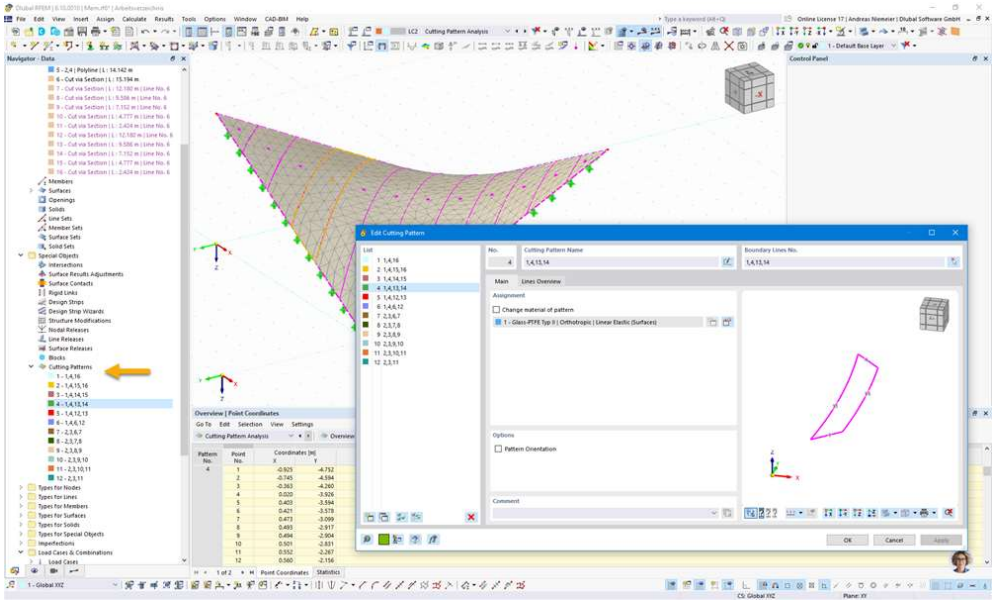


New Add-Ons

Cutting Patterns – Beta Version

- Division of multi-axially curved mesh surfaces into flat sub-segments suitable for manufacturing, based on data from form-finding analysis
- Precise control over compensation and seamless transitions between cuts, supported by an energy-based flattening method to minimize wrinkles during assembly

More Information



Prospect

Planned Features (from 2025)

- Nonlinear concrete analysis
- Completion of foundation design
- Glass design
- Cutting Patterns add-on
- Cable pulley members
- Nonlinear time history analysis
- Scaffolding support
- Soil linearization
- Pushover joints (concrete and new AISC standard)
- Extended plasticity design
- APIv2 – Extension and acceleration of the WS interface
- CAD add-on (Layer, CAD lines and surfaces, sketches)
- Design strips
- Tendons add-on
- Design of beam panel elements
- Mixed combinatorics
- Components add-on
- Stability analysis for foundation geometries
- Performance improvement through additional independent meshing forms
- Welds in RSECTION and RFEM
- Wood connection design
- Extension of metal designs with surfaces and welds
- SSO login technology
- Cloud RFEM for web service codes
- RFEM 3D window with DXF export
- Bentley DGN-Export
- Python-Coding with Mia
- Completion of column base design
- Steel connections as a standalone solution
- Composite cross-sections in RSECTION
- Craneway
- Tower modeling and design
- Design of curved timber beams

Prospect

Planned Features (from 2025)

- Nonlinear concrete analysis
- Completion of foundation design
- Glass design
- Cutting Patterns add-on (currently beta)
- Cable pulley members
- Nonlinear time history analysis
- Scaffolding support
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- Pushover joints (concrete and new AISC standard)
- Extended plasticity design
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- CAD add-on (currently beta)
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- Components add-on (currently alpha)
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- Bentley DGN-Export
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- Craneway
- Tower modeling and design
- Design of curved timber beams

Prospect

Planned Features (from 2026)

- Cutting Patterns add-on (currently beta)
- Pushover joints (new AISC standard)
- CAD add-on (currently beta)
- Tendons add-on (currently beta)
- Components add-on (currently alpha)
- Stability analysis for foundation geometries
- Timber connection design
- Python coding with Mia
- Steel Joints as a standalone solution
- Composite cross-sections in RSECTION
- Craneway
- Tower modeling and design
- Design of curved timber beams
- Insulating glass design
- Digital Twins ad-on (currently beta)
- Mia extension
- Beam panel (US standard)
- Automatic imperfections
- Slope Stability
- Anchor Bars for punching shear according to EC
- Seismic bracing Elements (BRB)
- Aluminum design (Canadian Standard)
- Steel Joints (Canadian Standard)
- Automatic dimensioning of Connections
- Geozone Tool update
- Bracing surface
- Seismic replacement loads
- Library for live loads (Dlubal Center)
- Designable blocks for glulam beams
- Nonlinear concrete design
- Foundation design (US standard)
- Approach of required reinforcement for serviceability
- Fire design for aluminum (EC 9)
- Automatic design of bar reinforcement
- Improving calculation performance
- Earthquake design for solid structures according to EC 8
- Welds in add-ons
- Wind load generation on irregular buildings
- Concrete design (Italian, Indian standards)
- Stepped foundations
- User-defined concrete cross-sections
- Masonry design
- MCP server
- License groups
- Model viewer on the web
- Frequency response analysis
- Explanatory images for formulas
- Design of composite structures
- Dlubal Calcs
- RWIND 4
- 2nd generation Eurocodes
- RVE material

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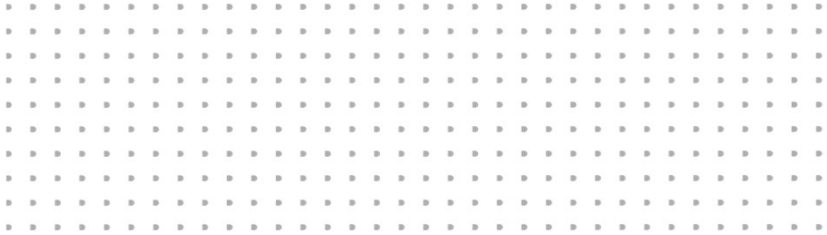

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