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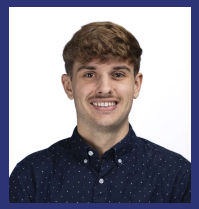
Amy Heilig, PE
Presenter

CEO – USA Office



Alex Bacon, EIT
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Technical Support Engineer

Cisca Tjoa, PE
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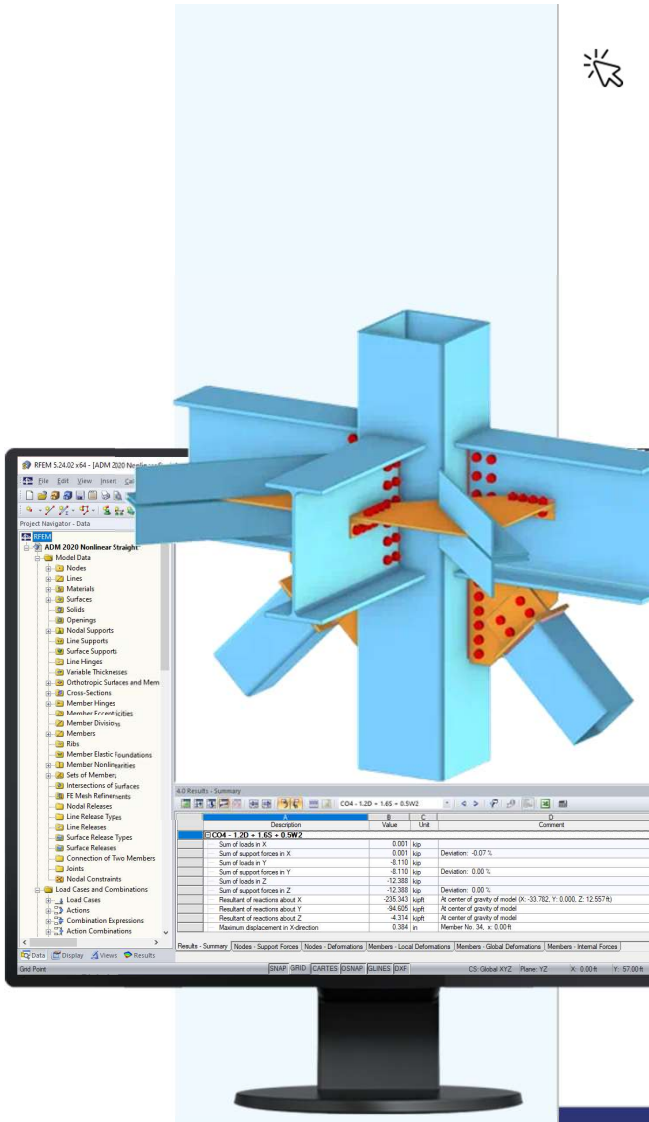
Webinar

AISC 360-16 Steel Connection Design in RFEM 6



Questions During the Presentation

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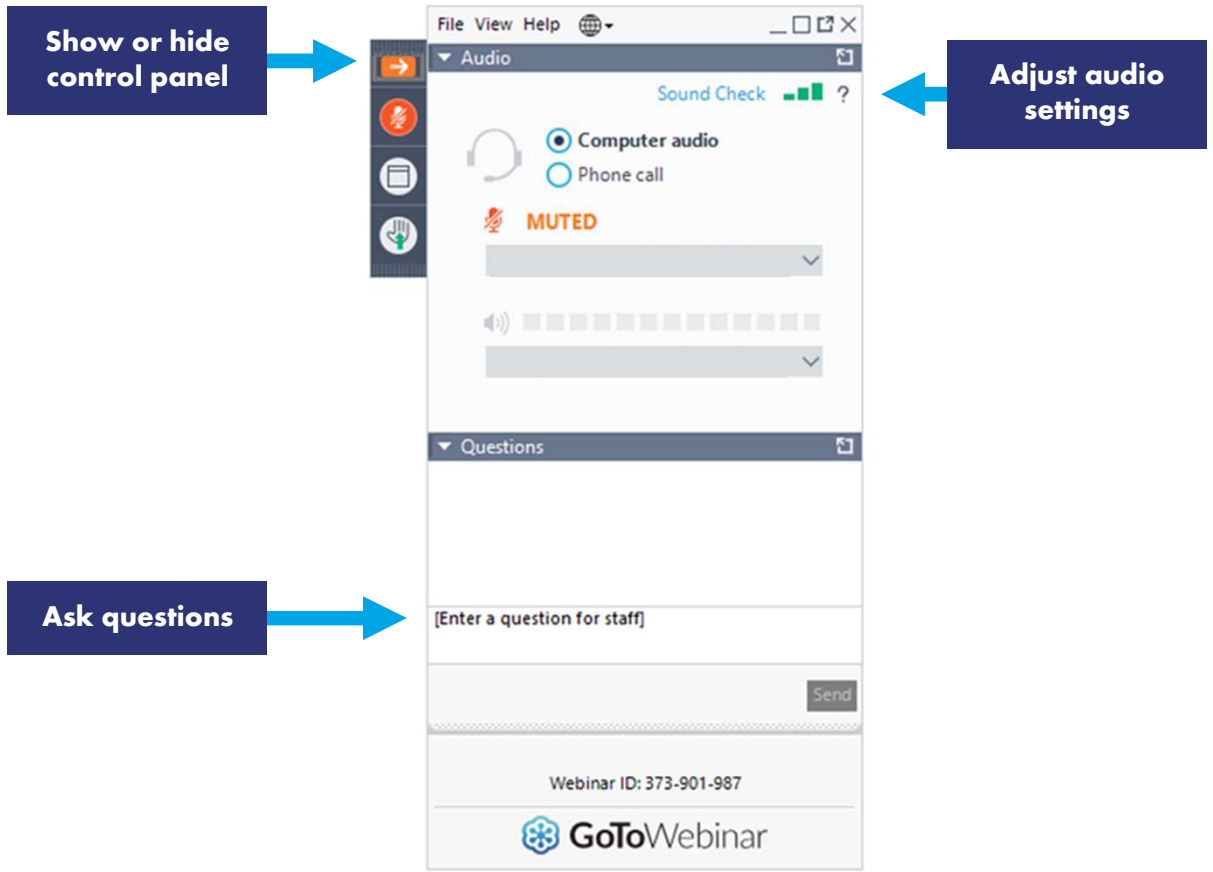
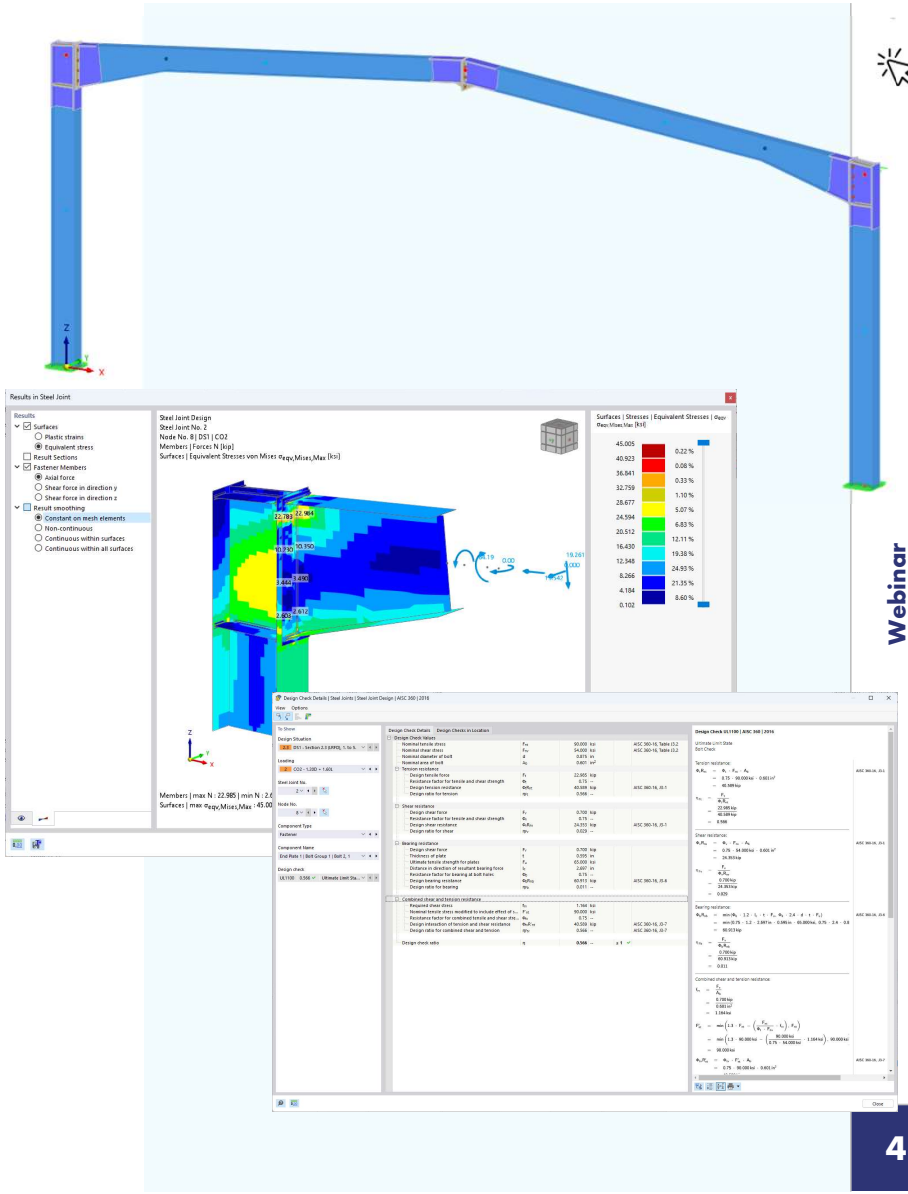


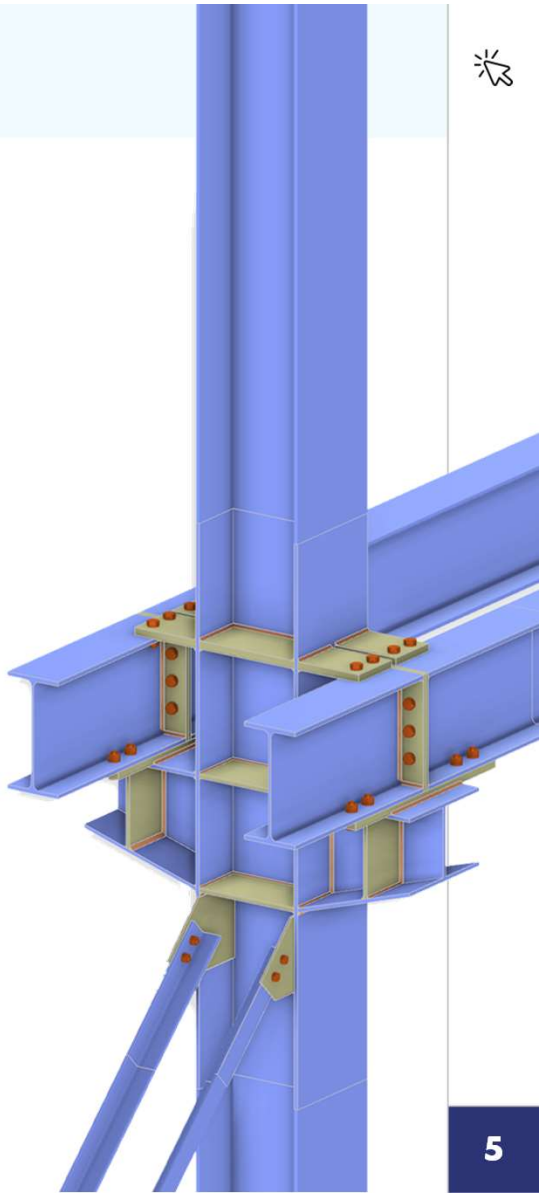
Content



Webinar

Why FEA for Steel Connection Design?

- Design of non-standard connections
- Components/members both in-plane and out-of-plane
- Consideration of complex loading
- Automatic submodel generation requiring minimal expertise level
- Additional buckling analysis submodel
- More precise results with less assumptions
- Validation tool for non-standard connections



RFEM Steel Connection Design Concept

- Automatic FEA submodel generation
- 1D member elements → 2D elements
- Bolts and welds → 1D and 2D elements
- Linear elastic material → Nonlinear plastic material
- Geometric nonlinearities
- Automatic member end force transfer
- AISC plate, bolt, and weld design
- Buckling submodel with failure modes and critical load factors
- Integrated member design in RFEM

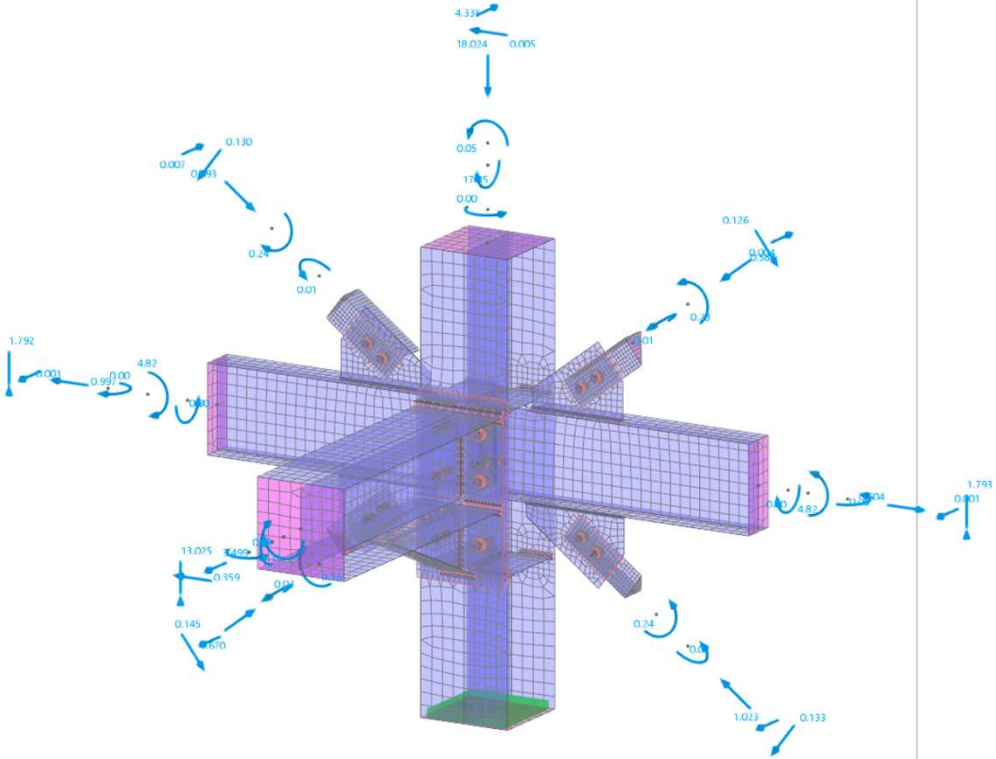
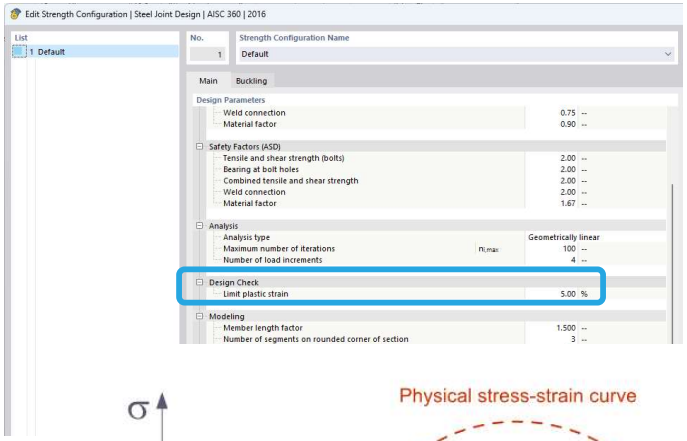
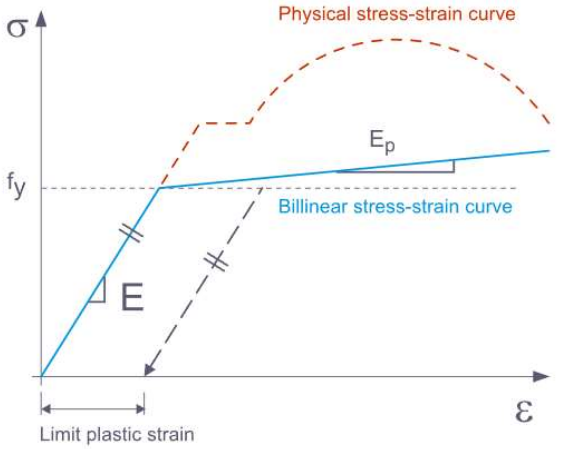


Plate Design Check – Plastic Strain Limit

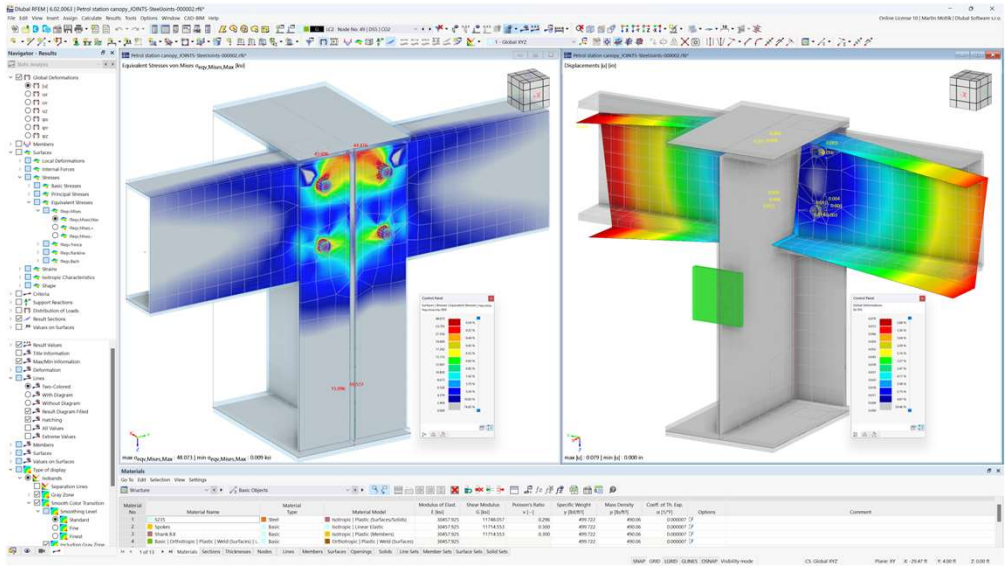
- Plastic strain limit is the strength limit state criteria
- Flanges, webs, plates, etc. converted to 2D surfaces
- Nonlinear plastic material model assigned
- Von Mises yield criterion stress failure hypothesis
- E_p = E/1000 of steel material
- Utilize plastic behavior of steel with internal force redistribution after slight yielding
- Default value $\varepsilon_{p\text{-}limit}$ = 5% (EN 1993-1-5 Annex C.8 Note 1)
- Relevant correlation to actual steel plate behavior





Steel Joints Add-on Future Developments

- Support of round HSS sections
- Preloaded bolt input (slip-critical connections)
- AISC 360-22 standard updates
- Joint stiffness export to RFEM model
- Base plate design
- BIM integration
- Timber member connection design
- AISC 341/358 design checks



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