Trimble Engineering Solutions

AISC Student Steel Bridge Competition

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Danny McPherson, PE

Purdue University, West Lafayette, IN
  ● BSCE, MSCE Structural Engineering

Ruby+Associates, Bingham Farms, MI
  ● Steel building design & detailing, connection design, construction engineering
  ● Used Tekla Structures for project work

Trimble, Kennesaw, GA
  ● Tekla Structures specialist for engineering firms
  ● Steel buildings, bridges, concrete & rebar

Trimble

- Structures
  Engineering, Construction, Fabrication

- Geospatial
  GPS, Surveying, Laser Scanning

- Transportation
  Shipping, Navigation, Safety

- Agriculture
  Farming, Water, Sustainability
Structures
Supporting Every Phase of the Life Cycle

Our Customers
Engineering Software

Tekla Structural Designer
- Analysis model for member design
- Apply loads to structure
- Analyze stresses, deflection, etc.
- Design & optimize members
- Produce reports & calculations from results

Tekla Structures
- BIM model with fabrication-level detail
- Accurately model structure with connections
- Measure material quantity, weight, center of gravity, etc.
- Create design & fabrication drawings
- Export fabrication data

Tekla Structural Designer
Tekla Structural Designer

Modeling a truss

- Import Tekla Structures model (or model from scratch)
- Import DXF to trace geometry
- Model internal, top and bottom chord members; Copy truss
- Use AISC shapes or custom sections
- Add beams and horizontal braces
- Define fixity

Tekla Structural Designer

Loading a truss

- Select load combinations (ASD or LRFD)
- Auto-generate common combinations
- Add point, line, area loads
Tekla Structural Designer

Analyzing a truss
- Check forces, stresses, design checks
- View and animate deflection
- Create member reports

Tekla Structures
Tekla Structures

Modeling a structure

- Import Tekla Structural Designer model (or model from scratch)
- Model members with AISC shapes or custom profiles
- Accurately model connections including plates, bolts, welds, cuts

Thanks to:

Tekla Structures

Modeling a structure

- Get accurate material quantities
- Measure weights and centers of gravity
- Create Excel reports to help calculate cost
- Ensure constructability and avoid material waste
Tekla Structures

Creating drawings from a model

- Create design drawings (plans, elevations)
- Generate assembly, part drawings for fabrication shops
- Plot construction drawings to help with bridge assembly

Tekla Structures

Creating fabrication data

- Export CNC data for direct entry to fabrication machines
- Plates, angles, tubes, etc.
Example Projects

Umatilla River Bridge

Tekla BIM Awards

- 190' x 44' bridge in Oregon
- 2500 parts, 173 tons of steel, 433 drawings
- Axis Steel Detailing
College Park Connector Bridge

Tekla BIM Awards

- 200’ pedestrian bridge in Georgia
- HSS design, 250 tons of steel
- International Design Services, Inc.

Puente 6 VAS

Tekla BIM Awards

- 450’ bridge in Guatemala
- 950 tons of steel
- Aceros Arquitectónicos
Resources

Tekla for Students

https://www.tekla.com/solutions/campus

Tekla Campus for higher education

Our mission is to transform the engineering, construction, and operations industries by investing in the next generation of skilled professionals and industry influencers.

Register