

CONNECTIONS

Building an Open Source Dashboard
for Structural Design

Structural Engineering in 1 (!) Slide

- Focus on buildings and bridge design
- Responsible for the “skeleton” of structures (what makes things stand up)
- Provide sizes of structural members
- Work with other built environment disciplines
 - Architecture, Mechanical, Electrical, Plumbing (MEP), Construction

Software in Structural Engineering



MASTAN2 v3.5

Bentley



SOFiSTiK



code_aster



HEXAGON
PPM

 SIMULIA

 SkyCiv

CLOUD ENGINEERING SOFTWARE

Open  FOAM

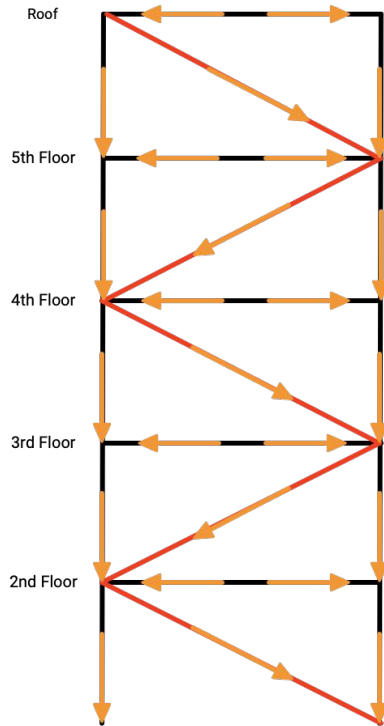


Software in Structural Engineering

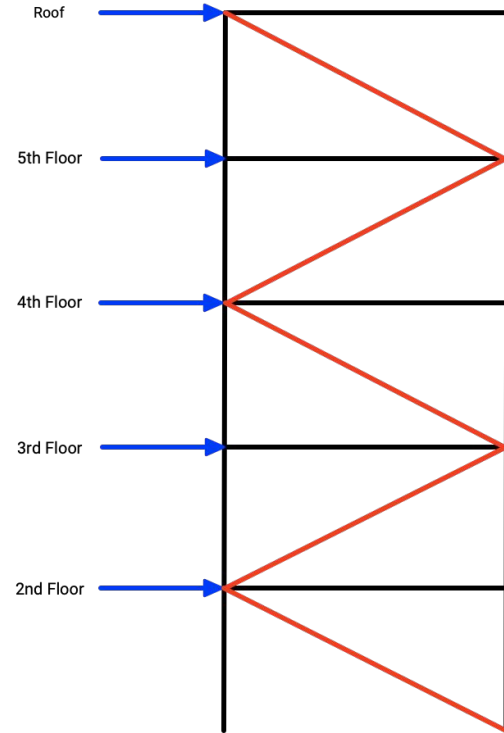




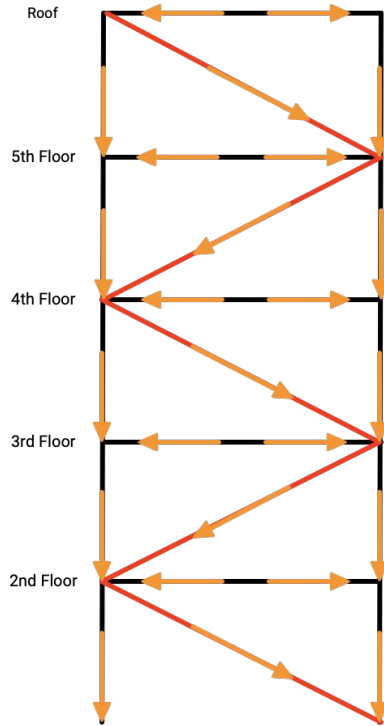
Gravity Loads



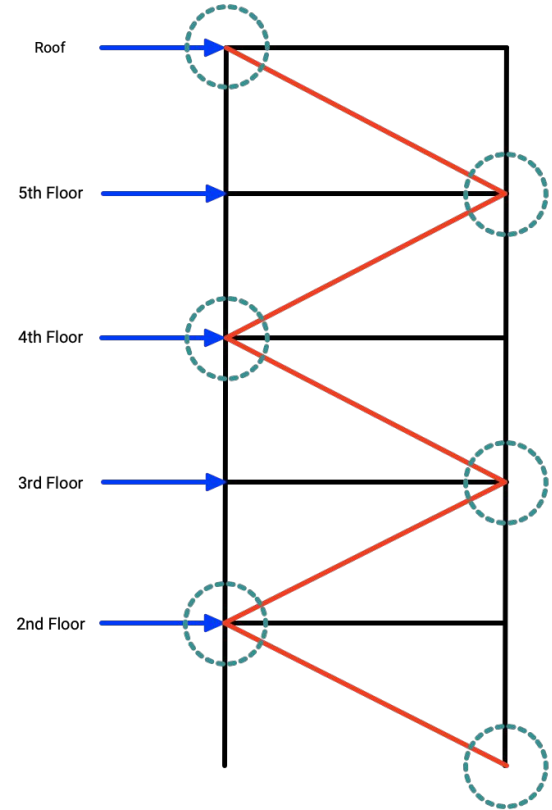
Lateral Loads



Gravity Loads



Lateral Loads



Connections: Gusset Plates

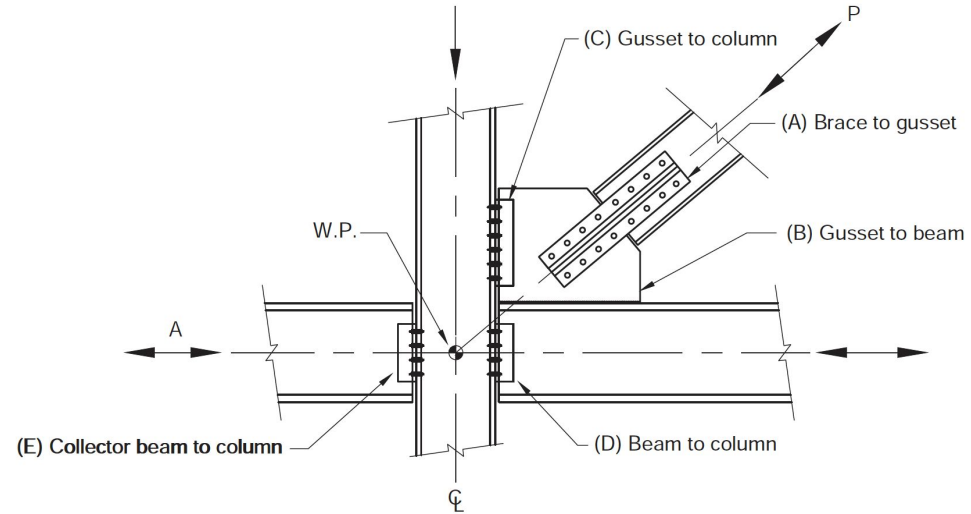
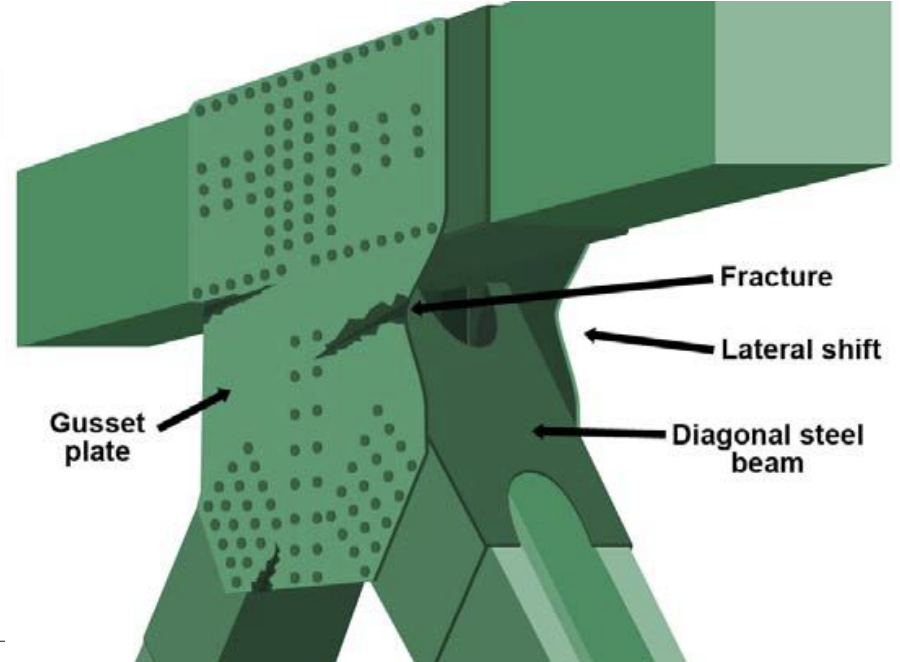
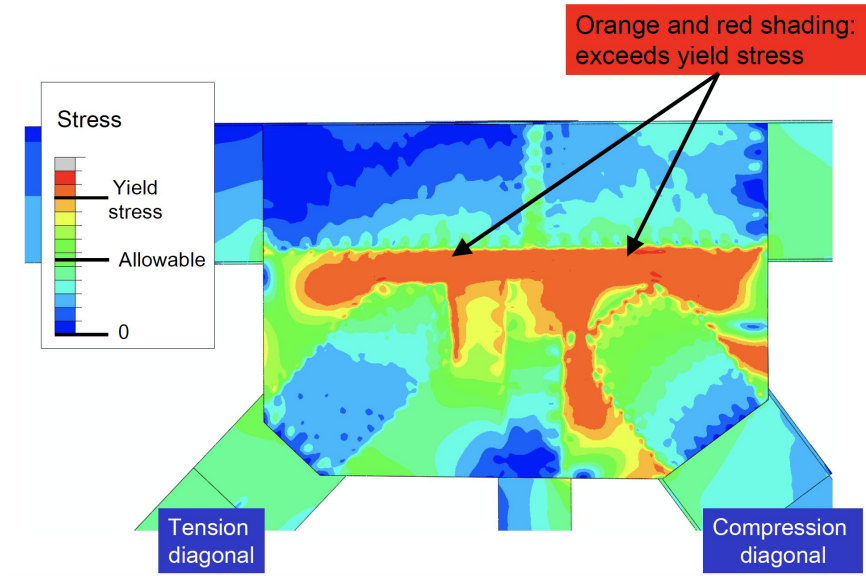


Fig. 3-1. Concentric (corner gusset) bracing connection.

Gusset Plates - I-35 Bridge



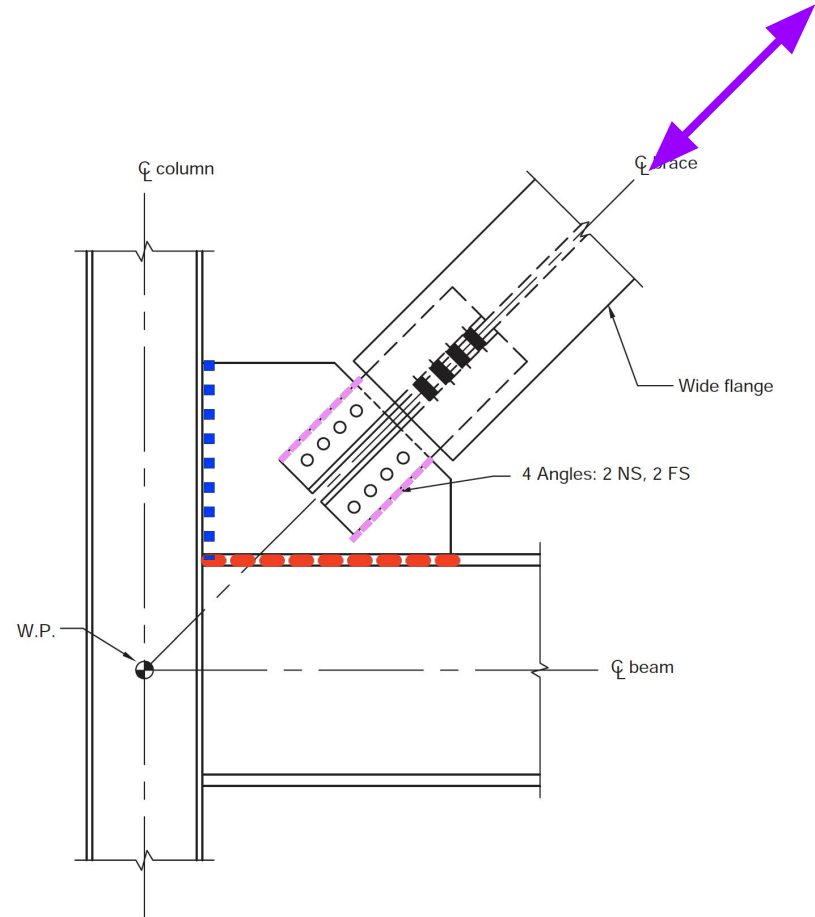
Gusset Plates - I-35 Bridge



Gusset Plates - Design

Parameters:

- Beam Interface Length
- Column Interface Length
- Thickness
- Force Demand
- Connection Length



Workflow

Previous:

- Microsoft Excel (Tabulation) - \$
- Rhino/Grasshopper (Visualization) - \$\$
- Autodesk Revit (Shared 3D model representation) - \$\$\$

Current:

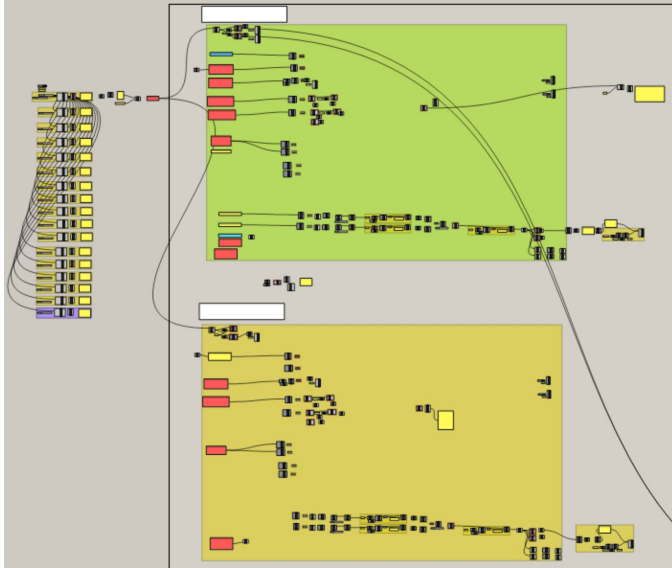


- Numpy/Shapely/COMPAS
- Plotly
- Dash
- PyLaTeX
- Code Aster/FEniCS

Workflow

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