Summary
Design column baseplates subjected to axial force and bi-axial moment as well as shear and torsion. Base Plate can design plates of any general shapes that support steel columns of any shape.

Detailed Description
The Baseplate Connection Design module allows you to design column baseplates subjected to axial force and bi-axial moment as well as shear and torsion. The program also gives you the option to make baseplates stiffened or unstiffened.

Base Plate can design baseplates of any general shapes that support steel columns of any general shape. Base plates can also bear directly on concrete or grout or can be supported on studs.

The analysis of the new Base Plate makes the following assumptions in the design procedure:

- Transfer of the column forces to the base plate is effected through an effective area, determined by the column geometry and the plate stiffeners (if any), between the base plate and the concrete.
- A plane is used to represent the strain across the effective area. The equilibrium point is determined iteratively to balance the internal forces with the applied axial load and biaxial bending.
- If the base plate bears on concrete or a grout layer, the program evaluates the bearing stress using the plane of strain and a parabolic stress-strain curve as per the relevant concrete design code.
- For each individual bolt, the program uses the plane of strain to determine its state of tension or compression.
- Where bolts work in tension or as studs in compression, the program checks the base plate’s resistance to the bending moment due to the bolt forces.
- Torsion transfers to the bolts as shear.

On completing the analysis, the program displays the resulting design forces and factors of safety for each of the load cases:
- Concrete bearing stress.
- Bolt tension or compression force.
- Bolt shear force.
- Base plate bending stress.
For a better understanding of the analysis of the program, the strain diagram shows the effective bearing area used as well as the plane of strain used to find equilibrium.

The program also includes functionality to generate detailed drawings of the connection for editing and printing using Padds or other CAD systems.

**What makes this module Special:**

- Shear and Torsion.
- Baseplates and columns of any shape.
- 3D Stress and Strain representation.

**Supported Design Codes**

- Eurocode 3 - 2005
- SANS 0162 - 2005

**Workflow**

Each connection program can be used in stand-alone mode, but the strength lies with the ability to use the design links from Frame or Sumo to transfer the necessary information to the design program. A drawing of the final design can be saved in either a Padds file or DXF format for final fabrication drawings.