Toolbox TB

Verification modules

Application possibilities

Frilo-Toolbox is a set of small simple modules for verification.

In every structural engineering office everyday duties include repeating the same small typical calculations.
Frilo-Toolbox includes a set of various routine functions, which will be extended step by step.
The verifications can be executed directly or alternatively through Frilo.Document.Designer – in this case the results will be integrated directly into the project document.

The Toolbox is subdivided into following groups:

- Reinforced concrete
- Timber
- Masonry
- Steel (in the future)

Standards

DIN EN and ÖNORM EN

BBV-Ultimate Deformation

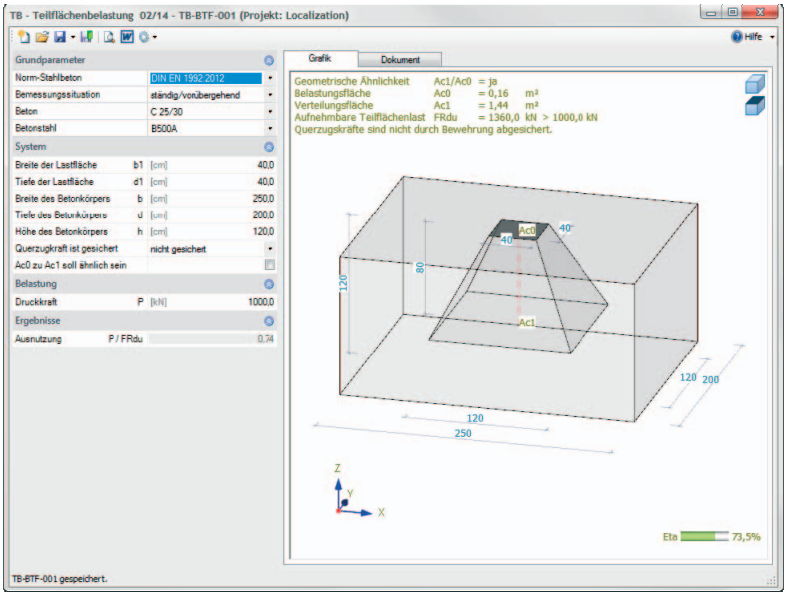
The simplified analysis for limitations of deformations according to EC2 can be performed with TB-BBV module. Users can optionally define the predetermined dimensions, required and provided reinforcement or directly the effective length l_{eff} and provided reinforcement ratio ρ.
Furthermore, it can be defined if the member has to bear any light partition walls, which can be damaged due to deformations.

The program performs the following calculations:

- Determination of the required effective depth d
- Check of additional National Annexes conditions
- Calculation of the effective length l_{eff}

BDS-Column Load Transfer

Module TB-BDS allows to verify the transmission of column loads through reinforced concrete slabs (made of normal concrete) according to EC2.



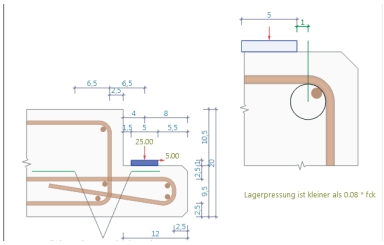
Types of columns: rectangular or round. The column can be located in the centre, the corner or on the edge.

The module performs the following individual calculations:

- required concrete quality for slabs
- required compression reinforcement, if necessary

New: BLD/BLU/BLW

Line Corbel Plate/Beam/Wall



BQD-Shear Dowel

TB-BQD verifies shear force reinforcement steel dowels.

Particular calculations:

- Check of load-bearing capacity for dowels
- Check of load-bearing capacity of concrete
- if necessary, calculation of required reinforcement

BSZ-Splitting Force

TB-BSZ verifies the splitting tensile force and tensile force along the edges.

Calculations:

- reinforcement reqiured on account of splitting tension
- reinforcement reqiured for bearing tension along the edges
- if necessary, required transverse tensile reinforcement

BTF-Partial loaded Area

TB-BTF analyses area loadings applied on parts of structures, according to EC2.

Calculations:

- acceptable compression reinforcement
- if necessary, the further required compression reinforcement

BVT-Composite Joint Beam

Module TB-BVT allows to verify connecting joints in reinforced concrete girders according to EC2. Members with shear force along the joint which can be verified:

- Rectangular cross-sections
- Deep beams as downstand beams with in-situ concrete slabs or half-precast slabs with in-place concrete complement

Calculations:

- maximum load-bearing capacity of the joint
- required bond reinforcement

BWT-Wall Support

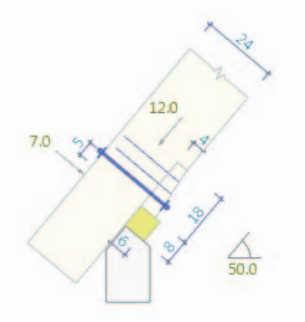
With module TB-BWT an analysis of single-span wall girders can be performed.

Calculations:

- required tensile reinforcement
- if necessary, required suspended reinforcement
- analysis of struts

New: BXB/BXP/BXW

Fire Protection
Beam/Plate/Wall+Column



HHP-Timber Pressure

The module TB-HHP can verify the compressive stresses in timber members which are subjected to perpendicular loadings (eg. supports pressure) taking into account position of loads, geometry and material.

Calculations:

- Calculation of k_{c90}
- Calculation of k_{mod} coefficient and transverse compressive strength $f_{c,90,d}$
- Calculations of resultant support area A_{eff}
- Analysis of stresses for transverse compression σ_d

New: HHS

Timber Pressure, Steel Plate

New: HPK

Purlin Support with Cleat

HSA-Rafter Support

TB-HSA can perform analyses of support pressure of rafters, considering the load position, geometry and material.

Calculations:

- Calculation of k_{c90}
- Calculation of k_{mod} coefficient and compressive strengths: transverse $f_{c,90,d}$ or parallel to the grain $f_{c,0,d}$
- Calculations of particular
- resultant support areas near rafters and purlins or tresholds
- Stress analysis of pressure σ_d near rafters and purlins or tresholds

New: HSF/HSK/HSV

Rafter Base Point/with Cleat/ with Haunched Cleat

New: HUS

Sleeper Anchoring

MAP-Bearing Pressure

TB-MAP performs the analysis of bearing capacity for compressive support stresses depending on load position and chosen masonry type.

Calculations:

- Verification of permissible load limits
- Determining of the height and width of required concrete pads when the external load is exceeded