WSM+ Cantilevered retaining wall

Application options

The WSM+ application allows the verification of the structural safety of cantilevered retaining walls of reinforced concrete and their design. The retaining wall may be fitted with a toe and a heel. The heel top and the wall front and rear surfaces can be slanted. The base can be inclined.

The ground surface behind the wall can be horizontal or sloped upwards with a straight or polygonal soil profile. A downwards slope (negative slope) cannot be defined due to the restrictions of the applied calculation method.

The soil can consist of any number of horizontal layers. Stagnant groundwater can be considered as well as different lateral earth pressure situations (e.g. earth pressure due to compaction, increased active earth pressure).

Available standards

The calculation of the reinforcement can be based either on

- DIN EN 1992-1-1:2015 or
- ÖNORM EN 1992-1-1:2011

Foundation engineering standards

The geotechnical verifications can be based on:

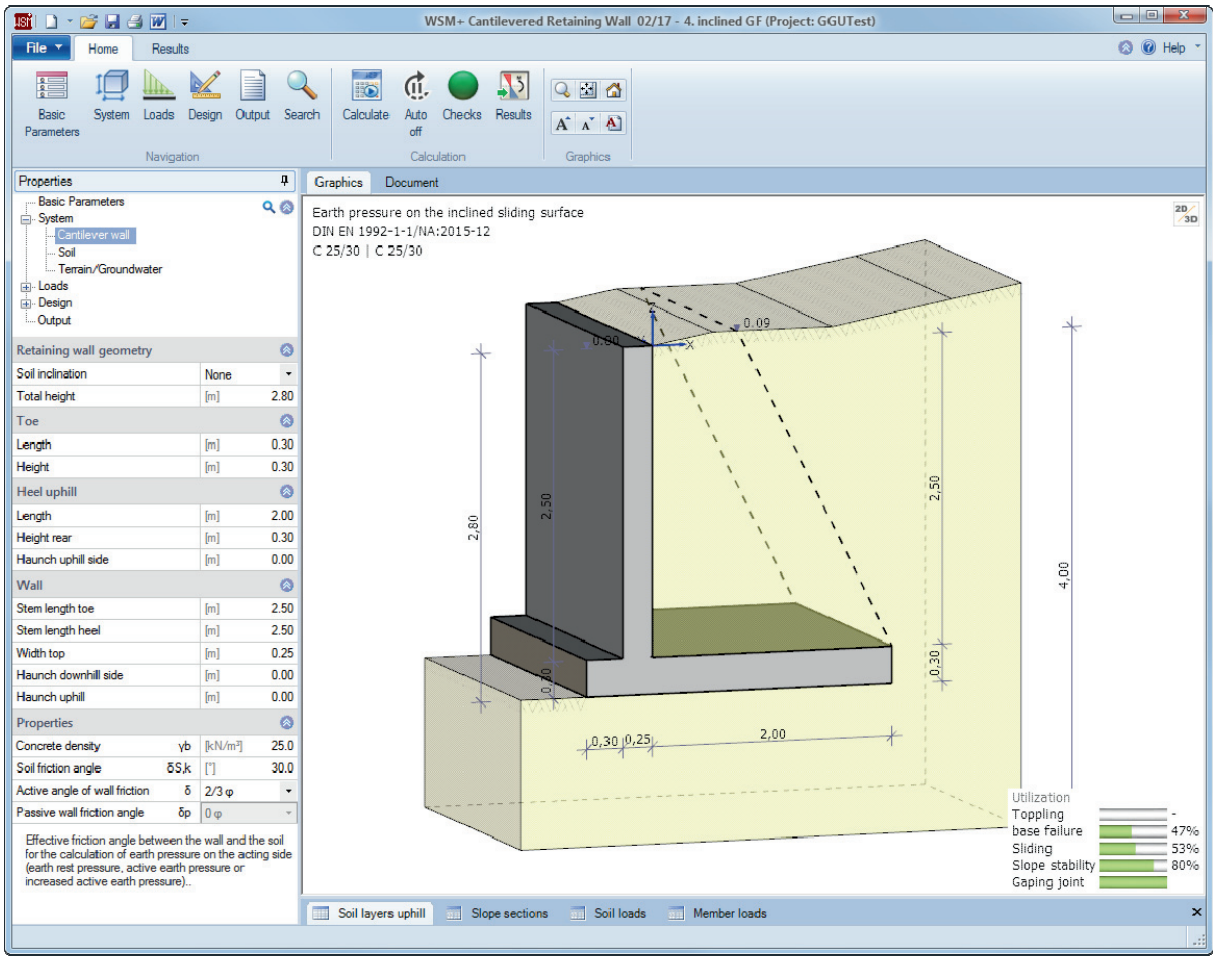
- DIN EN 1997-1:2014 or DIN 1054 in the persistent design situation
- ÖNORM EN 1997-1: 2009 in the design situation 1 in combination with any consequence class

Loads

- Uniformly distributed load on the toe
- Vertical force acting on the wall crown
- Horizontal force applying at a freely selectable height to the wall and the toe
- Moment acting on the wall crown and the toe
- Area load on the ground level, optionally applying distant to the wall
- Strip load, line load and block load applying at any position on the ground surface or inside the soil

Other actions

Stagnant groundwater can be considered.



Results

- Overview of the decisive load case combinations and the results of the verifications
- Output of the earth pressure behaviour on the wall and the plane of rupture as a graphic and in the form of tables.
- Verification of the stability against lateral buckling
- Verifications of the ground failure resistance and the sliding stability or
- Simplified verification in typical cases as per DIN 1054 10.6 (not with ÖNORM)
- Verification of the ground failure resistance
- Analysis of the gaping joint in the first and second core range (in combination with ÖNORM, this verification replaces the lateral stability verification).
- Additional features for verifications in accordance with DIN: It is checked whether the verification of the stability against incompatible torsion/ displacement is required. These verifications are not performed, however.
- Base pressure for each combination of actions.
- Reinforced concrete design in the ULS (ultimate limit state) of the wall on a freely selectable number of points (bending and shear force). Output of the required reinforcement.
- Reinforced concrete design in the ULS of the toe and the heel at their contact surfaces (bending and shear force). Output of the required reinforcement.

The geotechnical verifications are based on the persistent situation.