MWK

Basement Masonry Wall

The MWK application performs structural safety analyses for unreinforced basement walls of artificial masonry in accordance with the simplified method (without explicit calculation of lateral earth pressure) and the more accurate calculation method.

Simplified method:

MWK checks compliance with the limits of application. If these are not complied with, the more accurate method is available as an alternative.

The more accurate method:

Alternative analysis options when the simplified method provides too conservative results or the application limits are exceeded, e.g. at

- inclined terrain level
- mechanical compaction of the filling material
- pending groundwater
- Ground loading by adjacent building etc.

MWK performs the calculation of the lateral earth pressure and internal forces, combinatorial analysis.

Standards

- DIN 1053-1:1996-11
- DIN 1053-100:2007-09
- EN 1996-1-1
  (more accurate calculation)
- EN 1996-3
  (simplified calculation)

as desired, in combination with the national annexes

- Germany
- Austria
- Great Britain

System options

In addition to an individual wall, you can select structural systems of basement walls for calculation. In this case, it is always assumed that the wall to be verified is covered on its total top surface by a solid floor slab and supports it

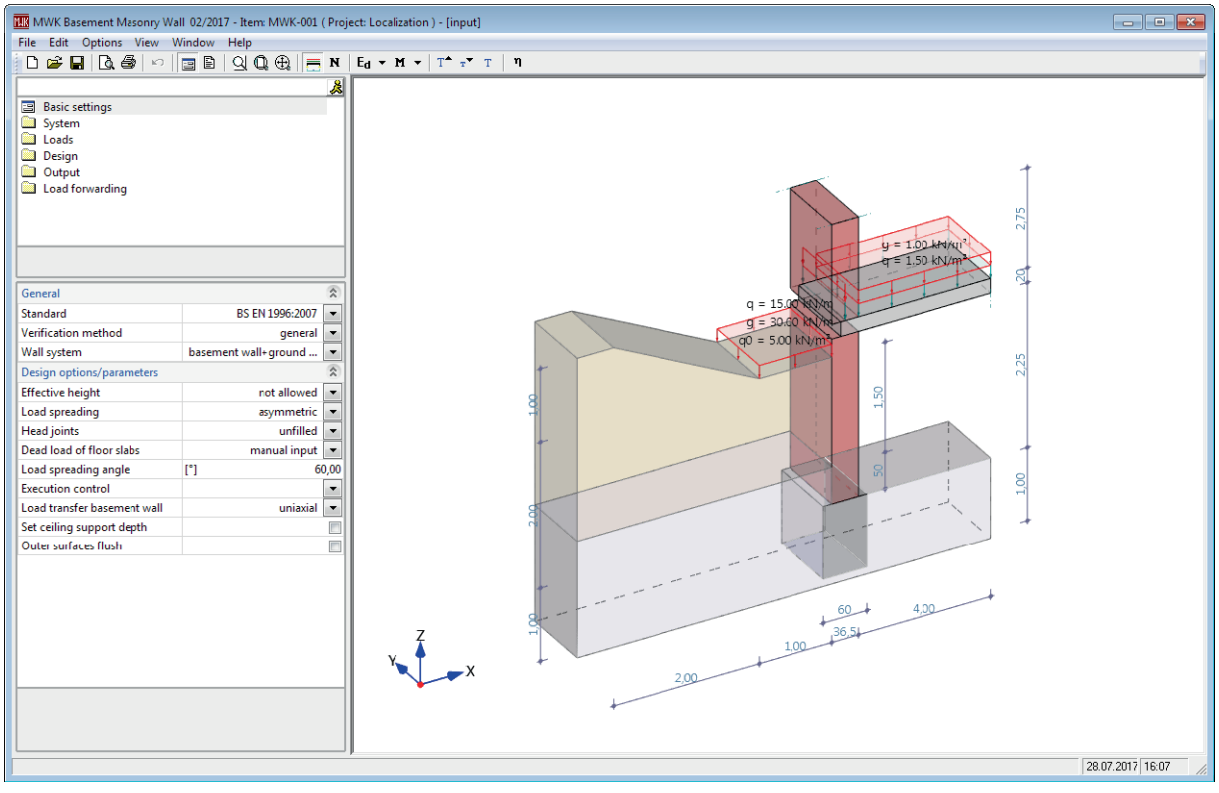
Types of masonry

The user can choose between prescribed masonry, masonry subject to approval (approval database) or user-defined material for the analysis. In combination with DIN/ÖNORM EN 1996 **Wienerberger** and **Schlagmann** products are also avaiable. In combination with EN 1996, the material parameters have to be entered according to the respective national stipulations.

Actions

In addition to earth pressure, the wall to be verified can be exposed to

- vertical wall loads from storeys above
- vertical concentrated bearing loads at the top of the wall
- vertical floor loads
- horizontal earth pressure



Surcharges

For the analysis of basement walls, the surcharge on the ground surface is of decisive importance. Available surcharge types are:

- uniformly distributed surface surcharge
- strip loads (parallel with the wall) acting anywhere in the soil (eg. adjacent strip foundations)
- concentrated loads acting anywhere in the soil

Combinations of actions

MWK generates automatically the appropriate load cases and load case combinations depending on the defined actions and performs the necessary analyses, whereby the decisive load case combination is determined for each individual design check.

Analysis procedure

Depending on the selected design code and the defined loads, the following design checks are performed:

- compressive strength
- out-of-plane shear capacity
- eccentricity of vertical loads (not necessary with EN 1996)

The underlying load combinations are indicated.

Calculation of the lateral earth pressure

The calculation of the lateral earth pressure is performed according to DIN 4085 or in accordance with the theory of Coulomb and the following national stipulations can optionally be taken into account:

- DIN EN 1997-1 / NA
- ÖNORM B 1997-1
- NA to BS EN 1997-1

The calculation of the earth pressure can be based on simplified assumptions for homogeneous soil types. Additional options include **layered soils**, , inclined and broken **ground surfaces** and hydrostatic pressure resulting from **ground water**.

Compaction earth pressure

The relevance of compaction earth pressure for the structural safety and, in particular, the serviceability of basement walls is often underestimated. A particular feature of the MWK application is the variety of standards and methods available for the calculation of the com-paction earth pressure:

- DIN 4085
- ÖNORM B 4434
- BS 8002
- *Franke* (lightweight compaction)
- *Spotka* (lightweight compaction)
- User-defined by specification of the effective depth and the earth pressure ordinate.

Output

Comprehensive adjustment options allow a detailed control of the analyses and the output of system, load and result values.

Load transfer

The characteristic values of bearing forces can optionally be transferred to the

- Strip foundation application FDS+ or the
- Edge strip foundation application FDR+.