

# MWM

## Multi-storey Masonry Wall

The MWM application performs structural safety analyses for **wall systems** extending **over several storeys** (including the basement if any). The walls consist of unreinforced, artificial brickwork.

The use of MWM is particularly recommended for regular wall systems consisting of several walls on top of each other.

The calculation is performed in accordance with the simplified method if the applications limits are complied with. Otherwise, a more accurate calculation method is used and the analysis is performed in accordance with masonry standards based on the partial safety concept.

### Bases of design

The design for masonry can be based on the following standards

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

as desired, in combination with the national annexes for

- Germany
- Austria
- UK

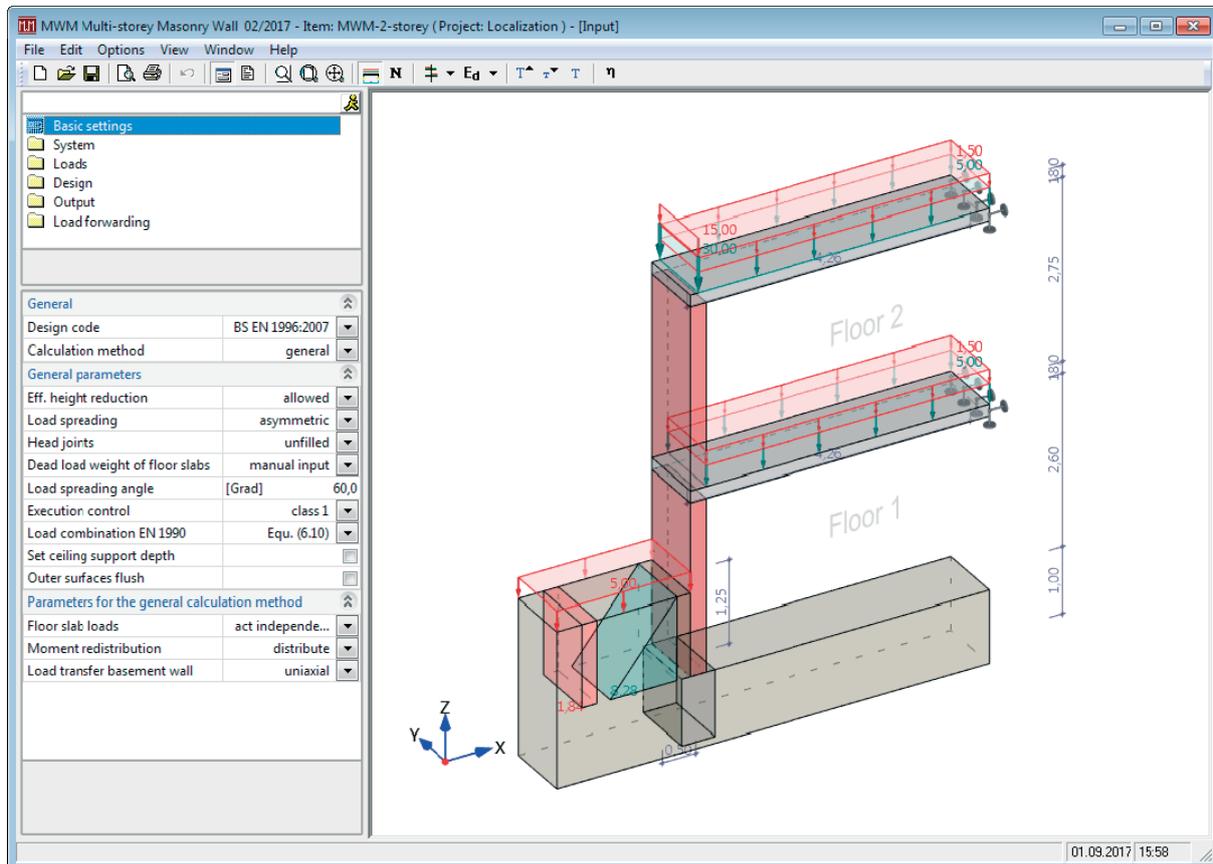
### System

In addition to an individual wall, the structural system of basement walls for the calculation can be selected. 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/POROTON products are also available.

In combination with EN 1996, the material parameters have to be entered according to the respective national stipulations.



## Actions

In addition to earth pressure resulting from lateral earthfill, the wall to be verified can be exposed to

- uniformly distributed vertical wall loads from storeys above
- linearly variable vertical distributed loads from storeys above
- vertical concentrated bearing loads at the top of the walls
- vertical floor loads

## Combinations of actions

MWM automatically generates 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 in accordance with the theory of Coulomb and takes optionally the following national stipulations 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.

## 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+. Individual walls can be transferred together with their loading to the masonry application MWX (general masonry analysis) in order to perform – if required – required additional analyses (e.g., in-plane shear analysis for bracing walls). Entire walls can also be exported to the basement wall application MWK in order to examine more complex subsoil conditions and loading situations.

## Interface GEO - MWM

For the design of Masonry wall items an interface GEO/MWM is integrated in GEO – 2D Building Model.

