MWX

Masonry Design

MWX is a general design application to establish the structural safety of individual walls made of artificial bricks with rectangular cross sections. The analysis can be based on a simplified or a more accurate calculation method.

In addition to masonry that is subjected mainly to compression, you can also check walls that are subjected to horizontal forces in the direction of the plate or slab, thus enabling the analysis of bracing plates.

Basis of calculation

Calculations can be based on the following 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 corresponding national annexes for EN standards

- Germany
- Austria
- Great Britain

Types of masonry

Analysis in accordance with DIN 1053 allows you to calculate prescribed masonry and masonry subject to approval (approval database). In combination with DIN/ÖNORM EN 1996 **Wienerberger/POROTON** products are also avaiable. User-defined masonry can still be entered.
According to EN 1996, the material parameters have to entered in line with the national stipulations.

System

In addition to individual walls the structural systems of

- basement walls
- intermediate storey walls
- top storey walls

can be selected for the calculation. Floor slabs can be defined to be supported on the left, the right or both sides. Also projecting ceiling slabs (for balconies) are definable. In this case, it is always assumed that the wall to be verified is covered on its top surface by a solid floor slab and supports it.

Actions

The masonry wall to be verified can be exposed to vertical effects of actions resulting from

- wall loads from storeys above
- concentrated bearing loads at the wall head
- ceiling loads
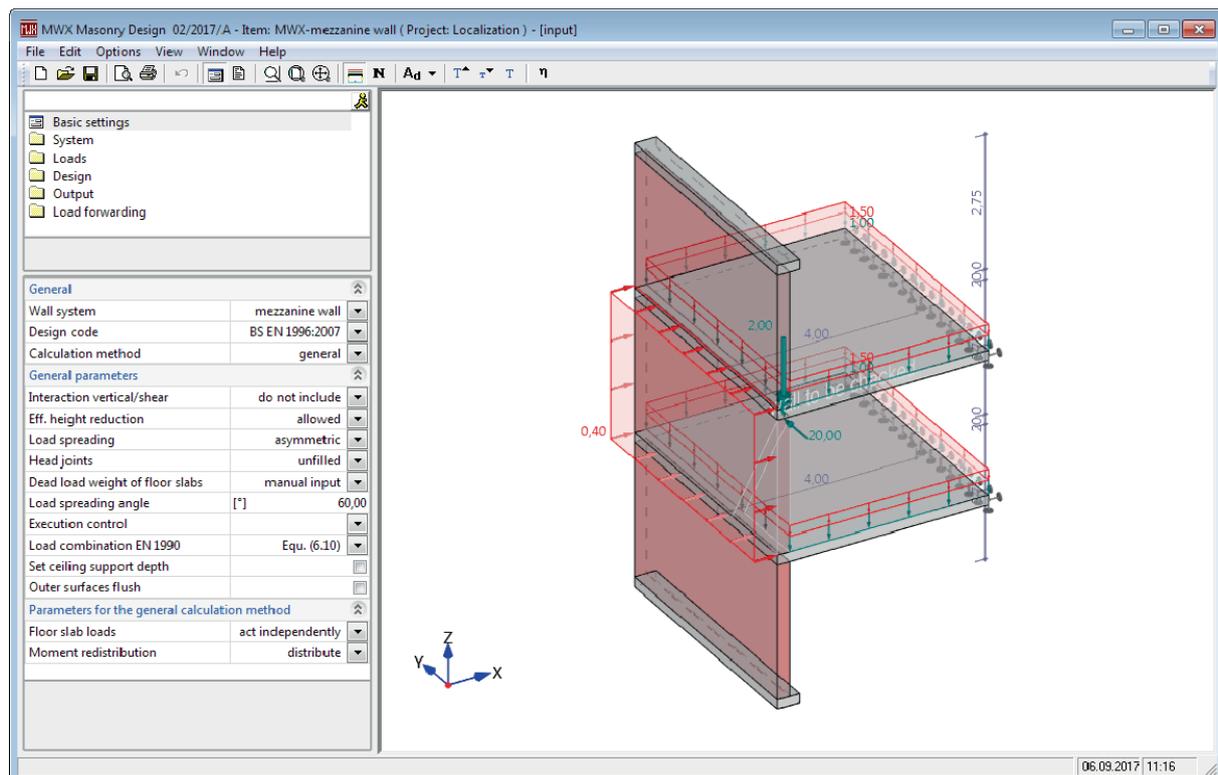
and/or horizontal effects resulting from

- wall loads applying perpendicular to the wall plane (e.g. due to wind and earth pressure)
- bracing loads applying parallel to the wall plane (e.g. due to wind or inclination).

Combinations of actions

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

Design

The design is performed in the form of a structural safety analysis for the defined system in accordance with the design code selected by the user. When applying the simplified verification method, MWX checks compliance with the limits of application. If these limits are not adhered to, you can apply the more accurate verification method.

Analysis

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

- compressive strength
- out-of-plane shear capacity
- in plane shear capacity
- permissible edge strain (only with DIN 1053)
- eccentricity of vertical loads (only with DIN 1053)

Each analysis is performed in the ultimate limit state. The underlying load combinations are indicated.

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+. Wall items can be imported into MWX in order to take over loads from superior storeys.

Integration with GEO

The MWX application is integrated with the Frilo building model and can therefore import masonry wall items directly from the building model to use them in the design.