آجر سفال تبریز

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Producer of different kind of bricks and hollow block

For the regions of the country, that there is the danger of earthquake, the building has to be constructed as the earthquake resistance building.

For the large building such as high-rise building and so on there are, either the steel or reinforced concrete frames that resist the dynamic forces during the earthquake.

The facing and the partition walls of the building also must be constructed accordingly to resist such forces.

The structural engineer considers these conditions upon the state building codes.

For the houses and the buildings up to 4 stories, constructing the earthquake resistant frames and in the mean time strengthening the covering and the partition walls is not efficient as far as the costs are involve.

When building experiences earthquake, vibration of its foundation will move back and forth with the ground. These vibrations can be quite intense, creating stress and deformation throughout the structure. If the walls are not connected to the ceiling and the foundation, walls move apart and the ceiling collapse.

Therefore the masonry works should be reinforced to connect all the structural parts of the building together. Pictures 3, 4 and 5 shows an example for such reinforcement.

The aim of this project is to define the production facilities and plant for the manufacturing of the fired clay bricks and blocks, for the walls and the ceiling, in order to construct the earthquake resistant building, i.e. reinforced masonry, up to 4 stories.

The criteria are as follows:

- Integration of the frame within the load carrying walls and the ceiling
- The facing and the partition walls be resistant to the seismic loads
- As much as possible, decreasing the total weight of the building since the effect of the seismic forces to the building, are proportional to the building weight.
- The climate insulation and noise reduction be done in the mean time.

The fired clay brick blocks, if used and mason according to the standards, can cover all of these criteria described as follows:

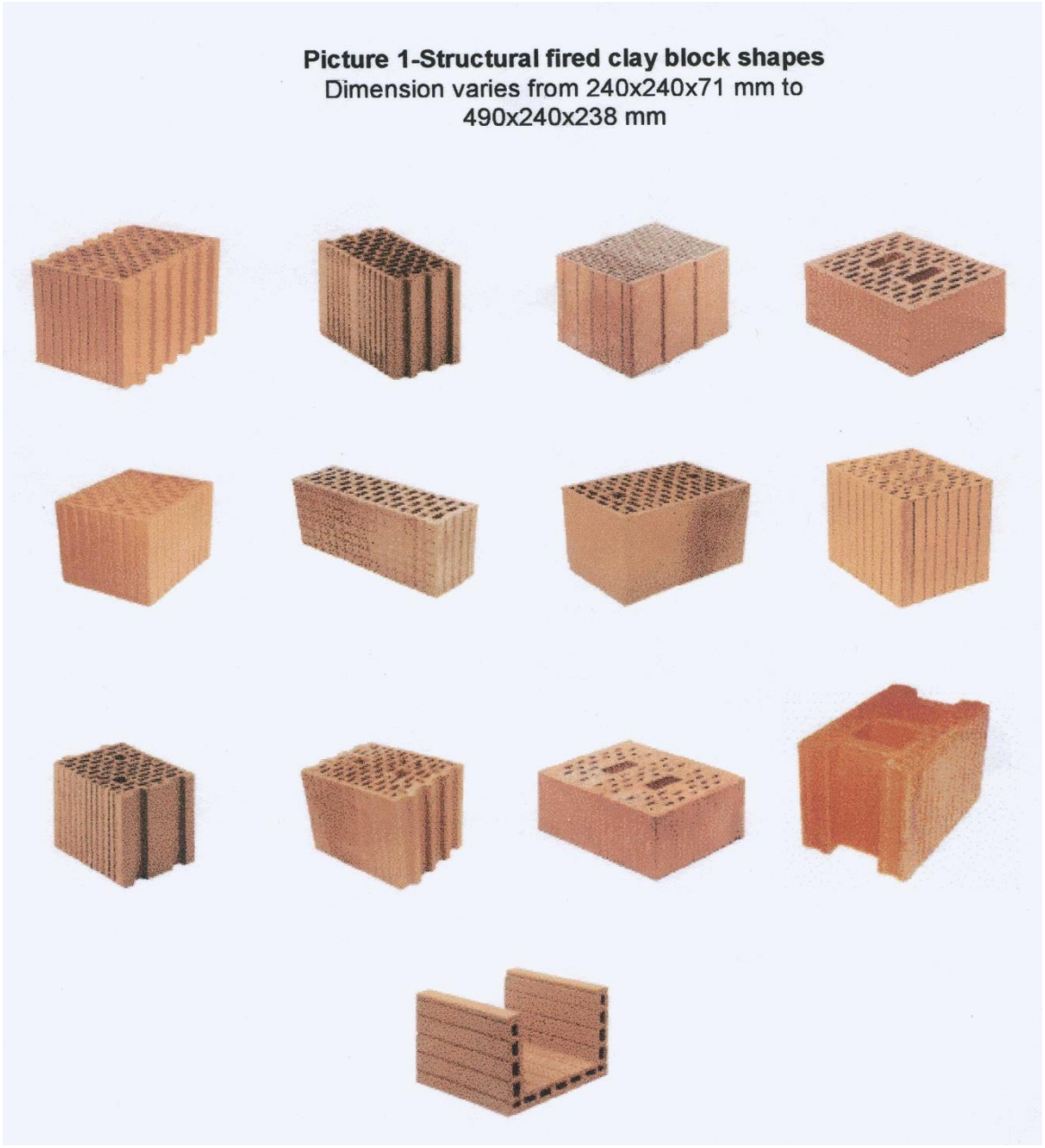
The blocks have the special shape and dimension, in order to be locked together and permit the necessary reinforcement in the joint mortar with the rebar, horizontally and vertically.

The facing will be connected to the block walls and since the partition walls work as the shear walls, therefore the danger of collapse will be reduced considerably.

The blocks have a density of about 0.8 t/m3, therefore the total weight of the building will be less than the conventional building, considerably.

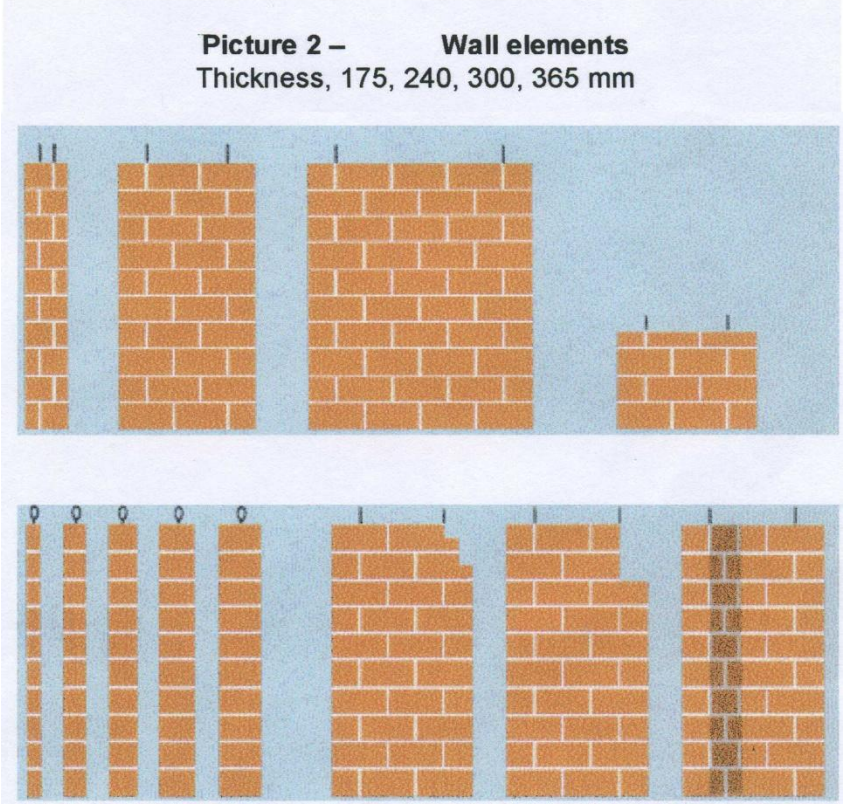
Due to the special shape, size, perforation and the low density, the insulation properties and for the climate and noise is already existed.

Below there is some description:



Picture 1-Structural fired clay block shapes
Dimension varies from 240x240x71 mm to
490x240x238 mm

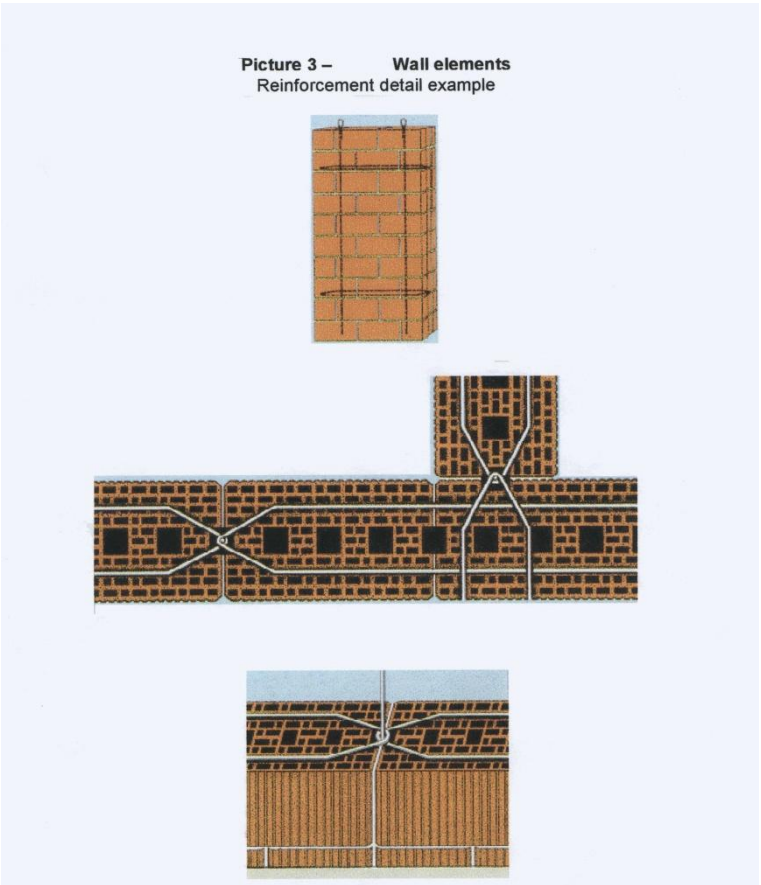
Picture 2 – Wall elements
Thickness, 175, 240, 300, 365 mm



The masonry for the walls and the installation of the ceiling will be done in place or can be prefabricated.

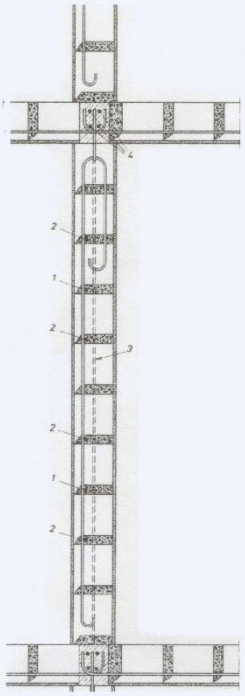
The system is reinforced masonry works; a sample detail for the reinforcement can be seen in picture 3. The vertical and the horizontal rebars, will connect every structural elements together.

Picture 3 – Wall elements
Reinforcement detail example

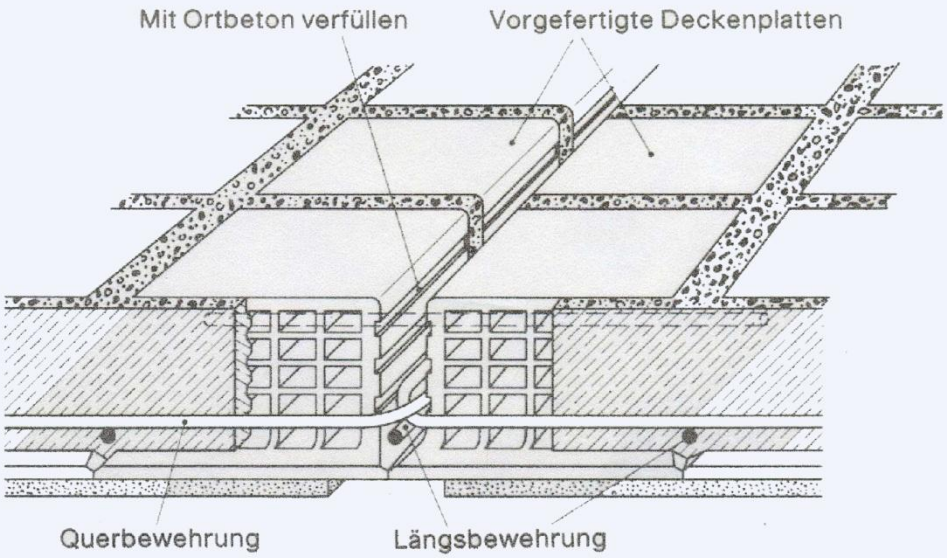


The walls and the ceiling is connected together with the rebars, making building resistant to the horizontal seismic loads and the vertical loads, a sample detail can be seen in picture 4.

Picture 4 – Reinforcement example
Connecting walls and the ceiling together



Picture 5 – Ceiling detail example



The ceiling blocks similar to wall blocks will be produce in the plant.

For more information for the reinforced masonry building see:

Uniform building code (UBC) USA

DIN 1053

DIN 4159

DIN 1045

DIN 4109