conference poster

Parapet Structure from Special Shaped TRC Blocks

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Introduction

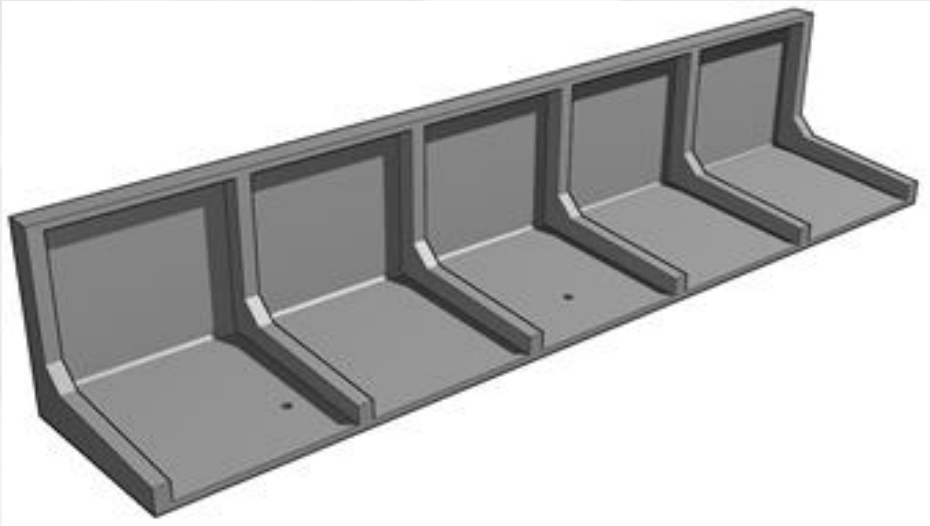
An important part of the building envelope with flat roof is the solution at the site of the low parapet wall. Currently, the most widely used solution in this place is based on the masonry wall which has many disadvantages. This is especially addition of another wet process into site construction which resulting to extend the construction time. Another significant problem is the risk of deformation of the masonry parapet wall (displacement due to shear stress in masonry) over time, which is often associated with a failure of the roof waterproofing layer.

The parapet made in the form of a specially modified beam (specially adapted bearing girder) is a more suitable solution, but these elements are always part of standardized construction systems with predefined dimensions (the possibilities of using are limited due to architectural design). Another problem may be the high weight of the parapet bearing beam and the resulting complications in terms of handling the precast.

Parapet structure from special shaped TRC blocks

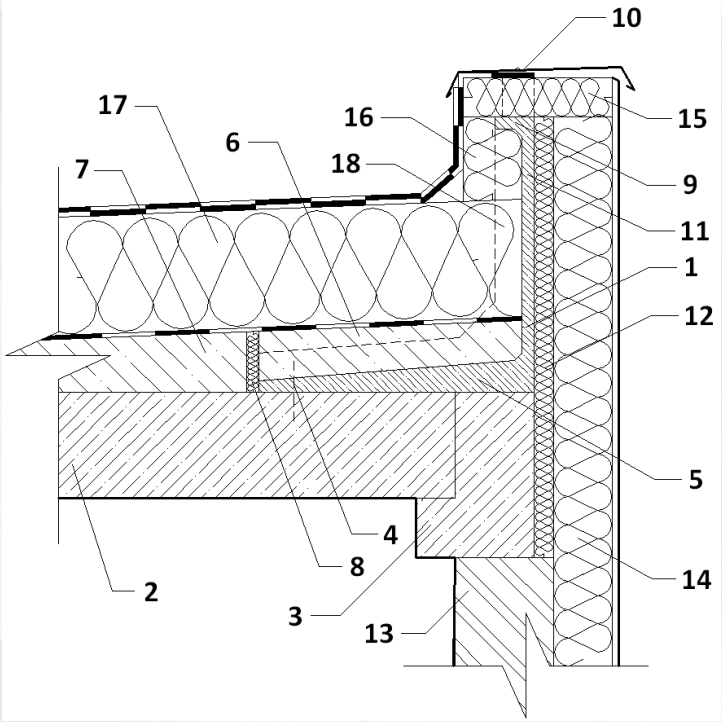
The above-mentioned disadvantages of existing parapet structures of flat roofs of buildings (masonry and parapet bearing beams) are largely eliminated using specially shaped parapet blocks made of textile reinforcement concrete (TRC). This parapet blocks have an optimized (lightweight) shape solution with a cross section in the shape of the letter “L”. The vertical wall of the parapet block is formed by a thin plate of TRC (30 mm thick), which is reinforced by reinforcing ribs (50 x 100 mm) at distances of 0.7–0.8 m. The stiffening ribs comprise common bending reinforcement. The bottom horizontal slab of the block has a variable thickness (thickness 30–80 mm).

The lower horizontal plate is made of TRC and, like the vertical plate, is reinforced with reinforcing ribs (50 x 100 to 137 mm) spaced 0.7–0.8 m apart. The variable thickness of the horizontal slab is advantageous both in terms of precast technology (concreting will take place from the outer surface of the vertical slab) and in terms of better stability of the shaped piece (lower centre of gravity).



Parapet structure from special shaped TRC blocks

The shape-optimized “thin-walled” design of the parapet block is advantageous both in terms of minimizing the weight of the precast element during transportation and the reducing of overall vertical load on the bearing structures of building. The subtle optimized shape of the precast block using TRC is also advantageous in terms of eliminating thermal bridges (easily combined with a large thickness of thermal insulation).



1 – parapet block,

2 – reinforced concrete ceiling panel,

3 – reinforced concrete beam,

4 – anchoring of parapet block,

5 – horizontal part of parapet block,

6 – monolithic concrete – layer forming a gradient and stabilizes the parapet block,

7 – monolithic concrete – layer forming a gradient,

8 – dilatation, elastic strip,

9 – the upper part of the parapet block,

10 – anchoring of parapet block,

11 – vertical part of parapet block,

12 – lower thermal insulation layer (compensation for reinforced concrete elements),

13 – filling masonry of perimeter wall,

14 – main thermal insulation layer (ETICS),

15 – insulation of parapet extruded polystyrene (XPS),

16 – insulation of parapet block,

17 – conventional roofing layers of flat roof,

18 – reinforcing rib of parapet block.

Thank you for your attention!

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