



The peculiarities of composition and geotechnical properties of marls (by example of the Southwest Caucasus)

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Carbonate formations of different genesis are the second most abundant series of sedimentary formations. Marls massifs form large geological bodies in southern regions of the European part of the Russian Federation, in particular, on Southwest Caucasus.

Now intensive exploration of the Black Sea off-shore zone of Caucasus and applying areas takes place, including Mzimta-river during erection of various constructions of Olympiad "Sochi-2014". Therefore investigation of structure and geotechnical properties of marls, met in the top part of a geological section, becomes so essential.

The object of the present researches is the strata of marls. They compose the bottom part of a Mzimta-river valley in area of a outfall Kepsha-river (in an average part of the basic valley). For this area aptian, albian and cenomanian terrigenous-carbonaceous formations development is typical. The age of rock masses has been confirmed by findings of the faunistic rests (*Audouliceras sp. indet.* (K_1ap_1) and *Aucellina sp.* ($K_1al_2^{1/2}$ - K_2cm)), and also the descriptions nanoplanktons.

Research of rock structure, including microscopic descriptions and total chemical analysis has been made. It has revealed, that the strata is composed of mainly clay marls and clay dolomitic marls (more than 58% and 5% of the investigated sampling accordingly), and also marl clays (more than 27%).

As the marls (in the examined sampling) are characterized by the density from 2.26 g/cm³ to 2.66 g/cm³, we can classify them both to dense (more than 57% of studied specimens) and to very dense types of rocks. For specimens presented by marl clays prevail density performances, typical for very dense types of rocks is common.

The analysis of investigation results of strength shows that:

1. Strength of unsaturated marls is varying from 3 MPa to 75 MPa. Among the investigated samples prevail (> 75%) marls, characterized by strength from 15 MPa up to 50 MPa. Strength of unsaturated marl clays changes from 2 MPa up to 62 MPa. Among the investigated samples prevail (up to 40%) marl clays, characterized by strength in an interval 5-15 MPa and 15-30 MPa.
2. Strength of saturated marls varies from <1 MPa to 22 MPa. However, more than 80% of samples were destroyed during water-saturation. Statistically significant dependence between values of strength of saturated marls and a ratio in their structure of carbonates and clay minerals was registered.