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Quality of Soskut limestones depending on facies and diagenesis (Tertiary, Hungary, Budapest)

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Tertiary coarse bioclastic limestone, as the well-known Soskut limestone (Miocene, Sarmatian) from the Karpathian Basin are commonly used as dimension stones in Budapest. The only quarry recently active close to the village of Soskut was opened the 18^{th} century. Limestones from this location were transported to Vienna (Stephans Cathedral) as well as to Timisoara (Rumania). Generally the limestone is traded as "Miocene Oolithe" giving the idea of a homogeneous quality. But marked differences in weathering characteristics give hints to a wide variety of qualities, reflecting different limestone types (facies types).

Soskut quarry is situated about 20 km SW of Budapest at the edge of a Miocene carbonate platform which episodic was influenced by terrestrial detritus. The genesis of Soskut limestones is revealed by detailed sedimentological analysis of the depositional environment and by microscopic studies (microfacies analysis). Varying limestone facies types correspond to different rock qualities interfingering laterally and vertically within the quarry. The sequence of about 60 m thickness is composed of three different units.

Whitish grainstones with ooids and oncoids (0,2 – 0,5 mm size) occur in the lower unit (20 m) in beds of 1 to 4 m thickness. The insoluble residue mounts up to 15% and is composed of quartz and feldspars predominantly forming cores of ooids. Varying amounts of isopacheous cements trigger limestone stability.

The middle unit (18 m), which is recently quarried shows a complete different composition. Varying amounts of matrix (packstones, grainstones) and different particles

of different sizes make up middle- to coarse-grained limestones rich in oncoids and aggregate grains. Biogenic components (foraminifera, Molluscs, algae) are very common.The insoluble residue varies between 8-25 %. Bentonitic clays are intercalated in lenses of up to some tens of meters lateral extension and 1 m thickness covering oncolitic carbonate sand bars. Locally coarse-grained layers with gravitationakl cements occur indicating inter- to supratidal position.

The upper unit ($>$16 m) of more homogeneous composition reveals large cross-bedded ooid-oncoid sand bars dipping markedly in SW direction. The limestones contain more foraminifera and predominantly reveal well-developed isopacheous cement rims and locally gravitational cements.

Quarrying in different units within the last 150 years resulted in a wide variety of facies types (different pore types, composition and size of particles, cements) reflected in varying weathering characteristics of Soskut limestones. The results show that a reliable classification of limestones in different qualities is has to be based on a detailed facies analysis in Soskut quarry and microfacies analysis of limestones. As result, weathering characteristics can be related directly to primary environmental conditions and diagenetic development of the limestones analyzed. This helps to find new material with comparable petrophysical characteristics for the replacement of weathered limestones and also supports optimized conservation of valuable monuments.