

Fact sheet 4

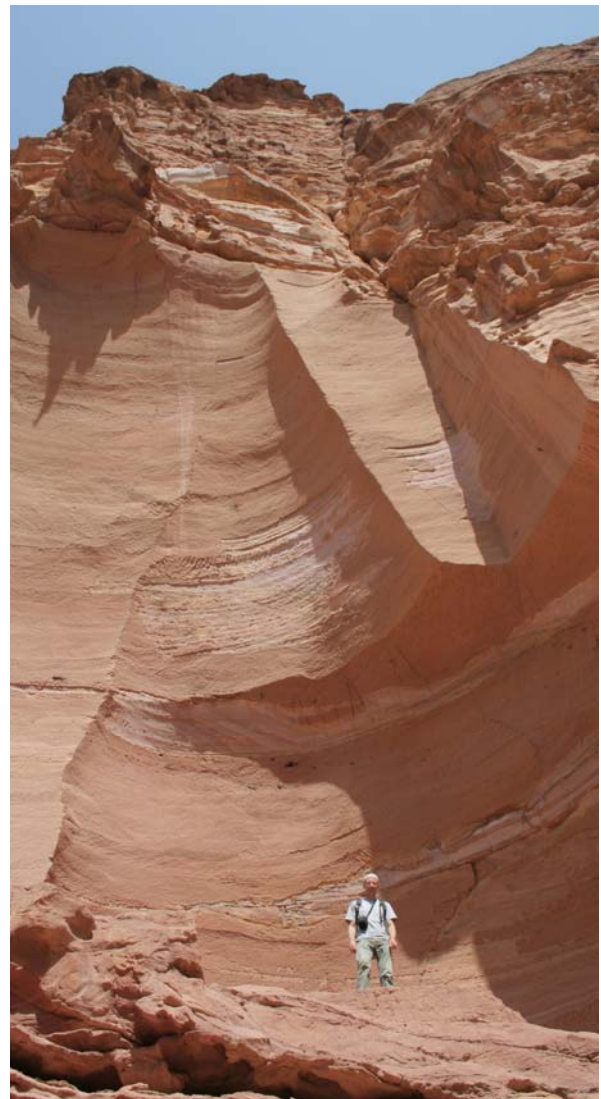
Stone resource geometry, occurrence and the resulting layout of quarrying

The exposure of stone resources in the landscape is the result of multiple geological processes; from the formation of the rocks, through transformations of them through weathering and landscape forming processes. The geometry and outcropping pattern of the resource establishes the physical conditions of quarrying, to which quarrying methods to a large extent must be adapted. Consequently, it also represents the condition of how the morphology resulting from the transformation of the natural landscape by quarrying visually appears. Putting it on the edge, the human transformation of the landscape can be described as the morphology resulting from quarrying minus the resource's occurrence in the landscape before quarrying was initiated.

Since quarrying is about removing pieces of rock from the landscape, being able to reconstruct the situation before quarrying is an important part of characterizing quarry landscapes. In the case of an underground quarry (gallery quarry) leaving a distinctive cavity in the resource, such interpretations may be easy to do. In many other situations, however, it is far more difficult. For instance, if the resource occurs as scattered blocks on the surface the resulting quarry landscape may be visualized as small, scattered heaps of debitage and spoil. Although the former may appear more visible and apparently larger, it is not necessarily more important or technically sophisticated. Numerous important quarries have been overlooked due to their invisibility.

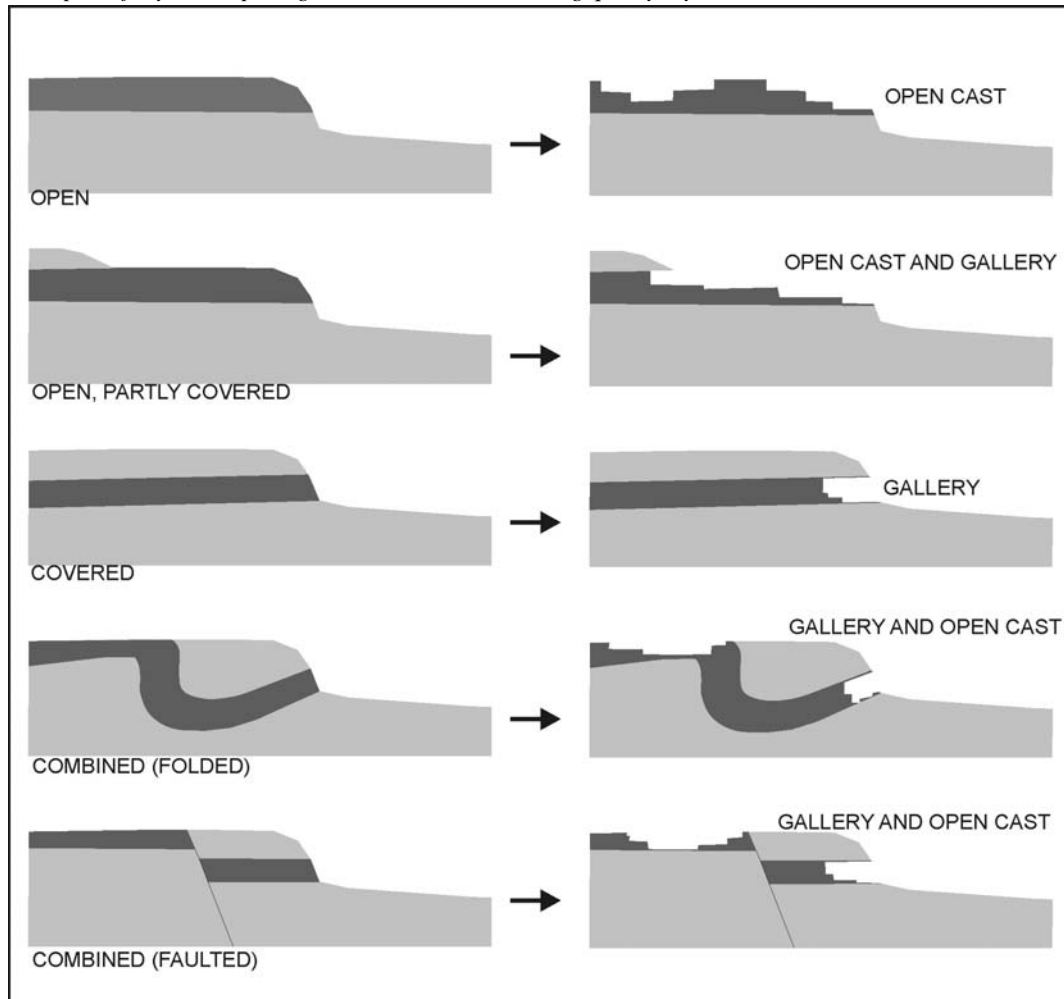
A simple division of stone resource geometries, as appearing in the bedrock, is in five classes: layered (sedimentary, some metamorphic and volcanic rocks), massive (many plutonic rocks), veined (diabase and other dyke rocks, some travertine), lens (some metamorphic and igneous

rocks) and irregular (not fitting the other categories). In addition, rocks can be exploited from superficial deposits, such as in situ boulder deposits, scree deposits and other deposits involving sediment transport (i.e. river beds). Depending on the initial situation, quarrying will develop differently, as shown in the examples below.



Steep and tall sandstone quarries at Petra, Jordan, carved with picks and chisels.

Examples of layered deposit geometries and the resulting quarry layout



Open cast sandstone quarries situated in a horizontal layer of good quality sandstone (upper limit marked with the dotted line). Gebel el Silsila, Egypt.

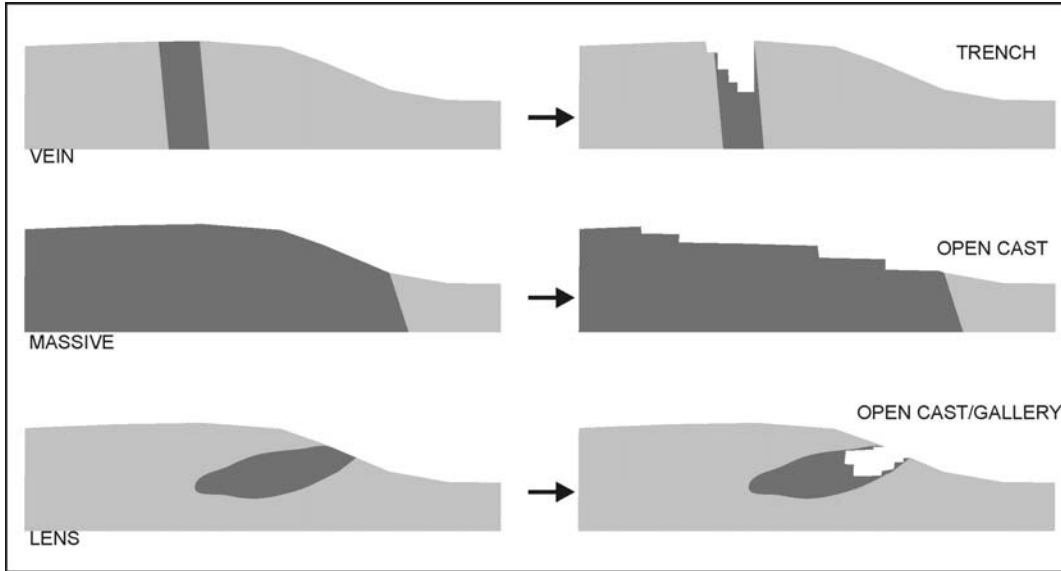


Horizontal layer of basalt (above dotted line) exploited during the Old Kingdom. Faiyum, Egypt.



Gallery quarry following a high quality sandstone layer. Gebel el Silsila, Egypt

Examples of non-layered deposit geometries and the resulting quarry layout



Massive deposit of granite, Aswan, Egypt ("Unfinished Obelisk Quarry")



Lens-shaped soapstone deposit, Egypt. All the quarries are situated along the margin of the deposit where the quality is best (close to the dotted line).



Trench quarry caused by extraction of a dyke rock, Norway.

Examples of surface deposit geometries and resulting quarry layout

