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Criteria for the correct selection of repair natural stone for monuments – an example of decision making on Charles Bridge in Prague

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Most of the architectural heritage of European cities has been built from local natural stones. The range of traditional stones has been, however, depleted by rapid development of artificial building materials during 20^{th} century, namely of concrete, and massive imports of alien stones. The maintenance and restoration of monuments must, however, continue and needs for traditional materials arise. The major question of restorers and architects to geologists is if the supply of traditional material can be renewed or if stone of similar qualities can be supplied from another source.

This study focuses on the availability of traditional natural stones for the restoration of monuments. A possible solution is shown on the example of Charles Bridge in Prague (Czech Republic) – a prestigious engineering work of a Gothic architecture and one of the best known symbols of Prague historic centre. Charles Bridge has suffered from bad maintenance after the 2^{nd} world war. Inappropriate maintenance was partly caused by the closure of quarries providing original natural stone. Introduction of new types of sandstones during large repairs in 1960s and 1970s did not improve the condition of the Bridge.

Due to the missing written documents on the stone resources used in the past (till end of 19^{th} century) and due to the several types of stones occurring in the Charles Bridge facing masonry, a new rating system was adopted. The rating consists of the following parameters: length of service, extent of use durability and availability. According to this rating, Carboniferous arkoses have been found to be the most suitable materials for the repair works. As this stone type is not available at present, the possibility of re-opening of abandoned quarries and/or exploration for a new deposit have been pro-

posed during preparation of new restoration plans in 2000s. The supply of traditional stone type would be beneficial not only during maintenance of Charles Bridge but also for restoration of other monuments where Carboniferous arkoses have been used since about 12^{th} century.