



A methodology for assessing the future stone repair needs for a city: an example from Glasgow, Scotland

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Glasgow is the third largest city in the United Kingdom. It has many late 19th and early 20th century sandstone buildings, mostly built using local Carboniferous sandstones from quarries located in and around the city. Today, all of the original quarries are closed, and there are no building stone quarries in the region. Most stone used for repairs is imported into Scotland, and has different petrographic and compositional characteristics. To ensure future supplies of appropriate replacement stone, research was undertaken to determine the building stone needs of the city, in terms of the specific types of sandstone required, and the quantity of stone needed. Stone condition surveys were undertaken of 230 façades, selected to be representative of sandstone buildings throughout the city. A range of building types, ages and architectural styles were surveyed. Information on stone condition was digitally superimposed onto georectified and scaled photographic images to provide accurate size measurements of areas requiring stone replacement. A stone decay classification was devised to record the types of stone decay/damage present. Over 130 stone samples were collected and analysed petrographically and compared to specimens from historic quarries in the Glasgow area. Ten distinct types of sandstone are identified, each matched to the original quarry sources. The samples were compared to sandstones from active quarries in the United Kingdom to identify where possible the closest matching alternative stone. Data from the façade surveys is extrapolated to provide an estimate of the quantity of new stone required for the future repairs to the city's buildings. A number of key sandstone types have been identified for which there are no currently-active quarries. The results of this project will provide background information to stimulate the quarrying industry to reopen historic quarries or open new quarries for the correct repair

and maintenance of Glasgow's stone built heritage.