Historic structures made of bricks no longer produced challenge conservators to find appropriate substitutes before the dwindling number of originals currently used for replacements are exhausted. If reproductions made from original source clay and using original manufacturing techniques cannot be manufactured, qualified substitutes based on the characterized physical properties of the originals should be created.

Properties such as compressive strength, saturation coefficients, and rates of absorption need to be identified for these bricks and considered in the choice of replacements, as differences in performance can damage the original brick or cause instability in the structure. A range of testing methods that do not determine physical properties, such as thin-section petrographic analysis, can be utilized to garner as much information as possible to further the understanding of the physical properties.

In the case of Savannah Grey bricks from Savannah, Georgia, which have not been produced since the Civil War, conservators still use salvaged Greys as replacements. Attempts to recreate this singular brick by modern brick makers such as StoneArt have been unsuccessful, either in performance or appearance. The number of bricks required to meet ASTM standards cannot be removed from a building of known origins; the tested bricks must come from salvage, meaning the date and building origins typically cannot be determined and test results may not be conclusive. Also, testing approaches should be as non-destructive as possible. Given the limitations of the case study, a range of tests were performed on the bricks to determine which results could aid in characterizing the physical properties of Savannah Grey bricks as compared to the tests’ availability, destructiveness, and cost.

In this study, data obtained from thin-section petrographic analysis of the Savannah Grey bricks and potential substitutes is compared to data yielded from several other testing methods, including inductively coupled plasma mass spectrometry (ICP-MS), and X-ray diffraction analysis (XRD), to determine which method, or combination thereof, is the most helpful in producing information to characterize the original brick and possible appropriate substitute brick. The results of this study aim to bring attention to the importance of the suitability of replacement bricks in historic built fabric.