

## **Courtyards' Effect on the Sustainability of Archaeological Buildings in Historic Cairo, Egypt**

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### **Abstract:**

Cairo is full of many ancient Islamic buildings that are dated back to successive historical periods extending from the 1<sup>st</sup> century AH (7 AD) to the 13<sup>th</sup> century AH (19 AD). The inner courtyard was the central unit in most of these buildings, whether these buildings are religious, civil or military buildings. Courtyard is used for the purposes of ventilation, lighting and providing additional space.

Given the value of these buildings and the need to preserve them in order to achieve sustainable development, this paper aims at studying the effect of inner courtyards in Cairo's archaeological buildings on the preservation and sustainability of these buildings. That could be done by conducting laboratory tests and analysis of archaeological building materials for some of the selected buildings with and without courtyards.

The study relied on the analytical and comparative methodologies to achieve its goal, by comparing samples of the main building materials taken from two archaeological buildings in the Mamluk cemetery, one with a central open courtyard (Qurqumas madrasa) and the other without a courtyard (Qaitbay madrasa), with the samples taken from two archaeological buildings in Al-Moez Street, one with a central open courtyard (Al-Ashraf Bersbay complex) and the second without a courtyard (Suleiman Agha Mosque). Whereas, the analytical method relied on conducting a set of examinations and analysis, including: scanning electron microscope (SEM), X-ray diffraction (XRD), determination of water content ratio (WC), determination of water absorption ratio (WA), analysis by a scanning electron microscope with an elemental analysis unit EDX, and measuring compressive strength (CS).

### **Keywords:**

Courtyard – Historic Cairo – Islamic architecture – Sustainability – Examination and Analysis  
- Mamluk cemetery - Al-Moez Street.