


# A PROCESS-BASED APPROACH TO CONSERVATION:

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**St Paul's Anglican Pro-Cathedral (1839 – 1846), a prominent landmark and icon of Malta's colonial past in Valletta's skyline, has recently undergone a significant restoration campaign completed in 2024, co-funded by ERDF (European Regional Development Fund - Operational Programme I – European Structural and Investment Funds 2014-2020) and the inestimable support of the Save the Valletta Skyline Appeal. In 2016, The Restoration Appeal Committee entrusted AP Valletta with the restoration project.**

AP elected to adopt a transdisciplinary approach to the restoration of the tower and spire, setting off with a series of archival and historical studies, non-invasive investigations, and structural analysis in the preliminary stages for a holistic examination of the existing structure to inform the design of interventions. Restoration works began in 2020, revealing further discoveries on the construction technics implemented within the monument as well as previously undocumented repair interventions.

Credits: Guillaume Dreyfuss

# ST PAUL'S ANGLICAN PRO-CATHEDRAL

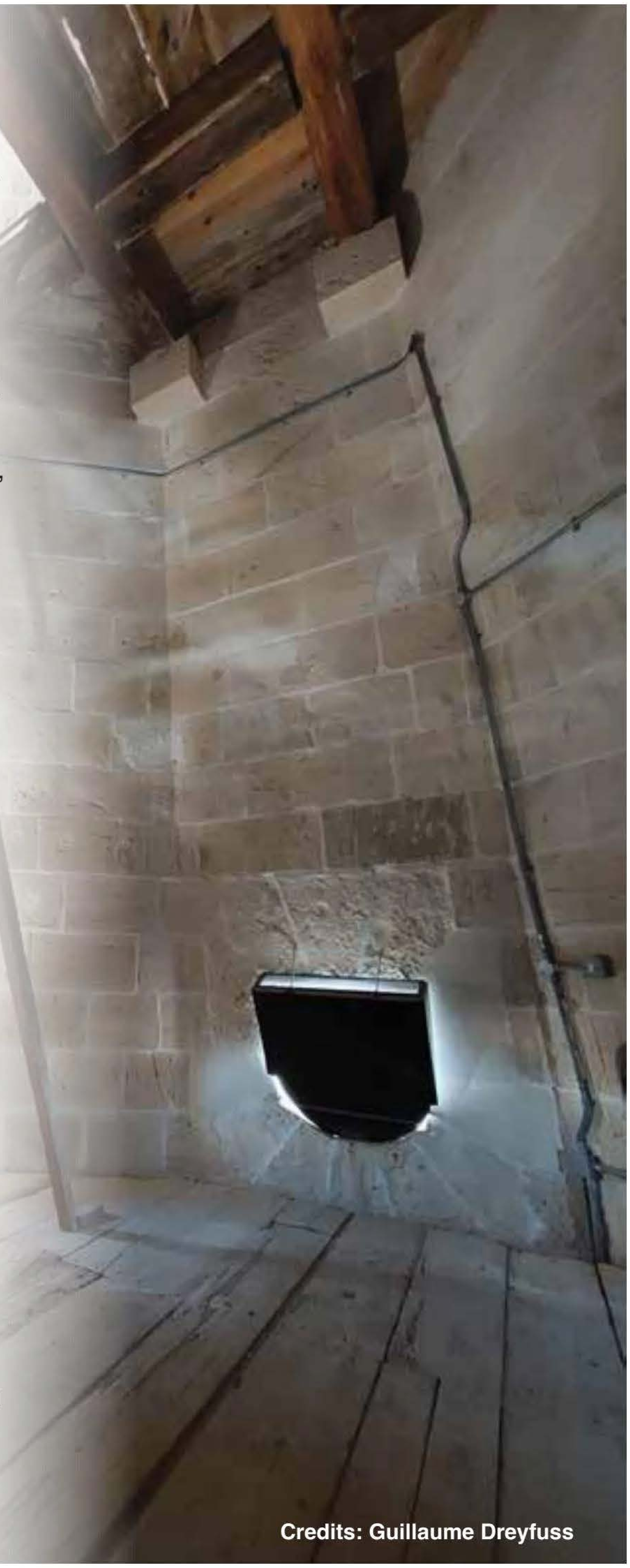
(PART 1)

The monument's unprecedented height, at 67m, makes it the tallest historical structure on the island, and undoubtably a feat in construction in the Maltese tradition of the 19th century. The masonry construction uses high-quality Globigerina Limestone and a thin-joint construction, the latter not widespread practice in local buildings. The internal structure consists of six timber platform levels, supported on a series of beams, assembled as the construction of the masonry structure went along.

The restoration approach was informed by preliminary research and studies and planned to retain the intrinsic qualities and values of the historical structure, whilst ensuring the structural stability of its complex assembly and its long-term preservation. The combined approach on both archival records and building structure had stressed the possible correlation between the masonry surface disruptions and the presence of embedded metal. Visible masonry surfaces exhibited deterioration patterns attributable to severe alveolar decay and cracks, due to the expansion of embedded metal located within the wall thickness. Approximately five thousand six hundred stone blocks (5600) were checked by tapping to determine whether the stone surface was detached where underlying cracks were not visible. To retain the original fabric as well as the time-gained surface patina, dowelling of the detached surface combined with lime injection was the preferred method of repair.

The intervention limited stone replacement to a minimum, also allowing for the original mortar joints to be retained. Wherever required for the structural stability of the monument, stone replacement was carried out to respect the original stereotomy, with most ornamental elements not requiring replacement and being retained. The urns located at the four corners of the tower terraces were reconstructed in local hardstone, using CNC technology, to reintroduce the transition between the tower volume and that of the spire which had been missing since early in the monument's lifetime. The restoration of the monument was capped off with restoration of the cross atop the spire, providing a visible testimony to the in-depth restoration of this iconic Maltese landmark.

As an integral part of the restoration process, each stone block was coded and referenced to photographic records at distinct phases, with images taken before, during and after interventions. This was cross-referenced with stone replacement drawings - on elevation and on plan - to understand how day-to-day decisions could affect the structure, stereotomy and aesthetic of the tower and spire. Site data and recording of interventions are critical for the future preservation of the monument, with previous interventions exposed and those carried out in the most recent restoration campaign modelled using H-BIM technology (Heritage – Building Information Modelling). The early introduction of the technology into the project's cycle, combined with high-definition imagery (through UAV photogrammetry and UAV inspections in 2019) and surveying technologies (including point cloud through laser scanning in 2017), archival research and a transdisciplinary approach to the project created a rich database crucial to the understanding of the building and as a guide for the intervention adopted, generating in parallel a collection of all crucial elements for the future preservation of the building.



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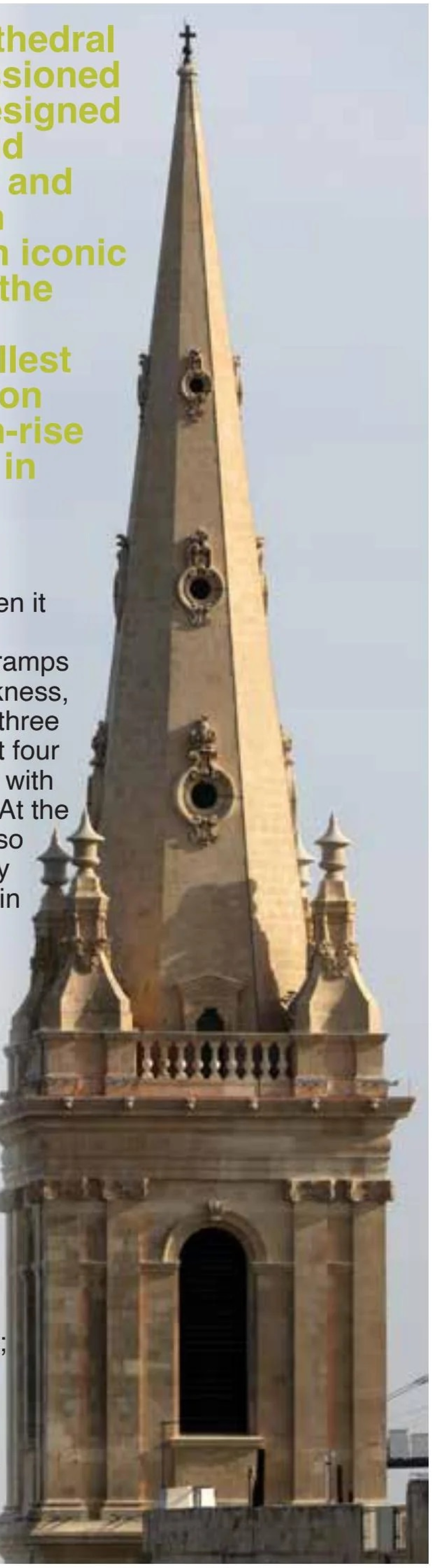

**St Paul's Anglican Pro-Cathedral (1839 – 1846) was commissioned by Queen Adelaide and designed by Richard Lankesheer and William Scamp. The tower and spire of St Paul's Anglican Pro-Cathedral has been an iconic and powerful presence in the Valletta skyline since its construction. Being the tallest among all local construction until the recent era of high-rise buildings, it is itself a feat in engineering.**

This was evidenced during the early research into the building's history when it was noticed that parts of the masonry structure were reinforced with metal cramps (staples), embedded into the wall thickness, at eight different levels externally and three levels internally, running on average at four metre lengths each, in some locations with two cramps per level on each facade. At the level of the spire, lead joggles were also evident within mortar joints, particularly on the internal facades as well as within the existing finials.

Initial investigations consisted in identifying possible iron locations which were not recorded on historical documents. Challenges in locating theses metal cramps were dealt with non-invasive techniques, such as ground penetrating radar (GPR), and confirmed with endoscopic visualisation where the already established cracks were wide enough to allow non-destructive insertion of the instrumentation. The results confirmed the initial indications; however, the known extent of embedded iron was only revealed during the actual works and after the scaffolding structure was fully erected. Another of the initial investigations carried out on the structure

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# ST PAUL'S ANGLICAN PRO-CATHEDRAL
(PART 2)

pertained to the movement being exhibited by the masonry structure, which resulted in structural cracks. This was carried out through the installation of a structural health monitoring system (2019), thanks to a group of brave abseilers, with the resulting data allowing for tailor-made interventions to be designed on the structure.

The corrosion and expansion of the metal was creating large pressures on the masonry work, resulting in significant cracks. The metal was removed in areas where the inevitable need for stone replacement allowed for it, while in areas where the metal cramps could not be accessed without severely damaging the fabric, an Impressed Current Cathodic Protection (ICCP) system was designed and implemented. Here an electrical current is passed through the historical metal elements to halt the corrosion process, and therefore, the resulting expansion that causes stresses on the adjacent masonry elements. The system is connected to a data processor, that allows for the system's performance to be analysed and controlled remotely, with actions taken as required for the continual preservation of the structure in its totality. Furthermore, a new structural health monitoring system has now been installed as part of the completed restoration campaign on the masonry structure for the continual monitoring of any movement and the timely implementation of any action required.

The systems implemented, only possible due to recent developments in technology, allow for the monument to be constantly monitored to ensure it is preserved for future generations. With the monument's preservation in mind, other systems installed include fire detection and lightning protection, for the continual protection of the tower and spire. Energy-efficient LED lighting, both externally and internally, were also designed and installed to maintain its iconic visibility on the Valletta skyline throughout the night.


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