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7 ta' Novembru 2024
L-E.T. Mons. Charles J. Scicluna
Arċisqof Metropolita ta' Malta
Floriana

302/2024

Rikors tar-Rev.du Dun Roderick Camilleri, Arċipriet Parroċċa Santwarju Madonna tal-Grazzja, Ħaż-Żabbar

Re: Manutenzjoni, Restawr u Installazjani ta' Dawl Ġdid tal-Koppla tas-Santwarju

Nesponi bir-rispett illi:

Wara li nġibdet għall-attenzjoni tiegħi u wara li osservajt b'għajnejja stess il-bżonn ta' manutenzjoni u restawr estern li hemm bżonn fil-koppla tas-Santwarju qabbadt tim ta' esperti li jgħinu lill-Parroċċa tul is-sena volontarjament sabiex jagħmlu studju dettaljat tal-qada preżenti tal-koppla. Minn dan l-istudju (anness ma' dan ir-rikors, bid-dettalji kollha) ħareġ ċar li l-koppla tas-Santwarju teħtieġ manutenzjonijiet estensivi u kbar minħabba l-ħsarat kbar li hemm minn barra. Fost il-ħsarat hemm: xquq fil-bażi u fil-pilastri li jissapportjaw l-koppla; deterjorazzjoni tal-ġebla minħabba l-elementi tat-temp; biċċiet kbar taċ-ċomb nieqsa li bih miksija l-koppla li maż-żmien waqa'; u biċċiet mill-ġebla tal-koppla u l-lanterna li ttiekel u spiċċa.

Għalhekk qiegħed nitlob lill-Eċċellenza Tiegħek sabiex tilqa' t-talba tiegħi sabiex:

- Isir manutenzjoni u restawr tal-koppla tas-Santwarju skont il-bżonnijiet li ħarġu minn dan ir-rapport mehmuż sabiex il-koppla tkun fi stat tajjeb u ma jsirux iżjed ħsarat kemm fuq barra u kemm fuq ġewwa tas-Santwarju, anki fuq pitturi eżistenti.
- Issir sistema ġdida ta' dawl għall-koppla wara li jsir studju ta' liema materjal huwa l-aħjar li jiġi mixtri u mwaħħal mal-koppla tas-Santwarju minn barra.
- Il-ħlas għall-materjal u x-xogħol jistgħu jinqasmu bejn il-parruċċani (40%) u bejn fondi ewropej (60%) diment li niġu mgħotija l-iskema ta' fondi mill-Unjoni Ewropea taħt il-Fondazzjoni għall-Patrimonju Kulturali tal-Arċidjoċesi ta' Malta.

Filwaqt li ġentilment nistenna risposta għal dan ir-rikors, nitlob il-barka pastorali tal-Eċċellenza Tiegħek.

Fr. Roderick Camilleri.

Dun Roderick Camilleri
Arċipriet

PARROCCHIA B.M.V. GRATIARUM CIVITAS ŻABBAR

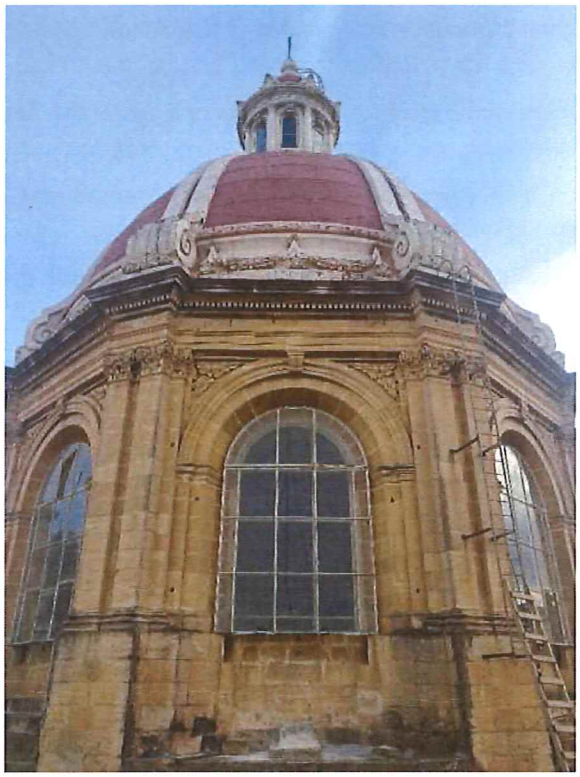
Preżentat fil-Kurja Arċiveskovili
Illum 8 ta' Novembru 2024
Charles Buġeja, Kanċillier

A Case for the Restoration of the Żabbar Parish Dome

Żabbar Parish Church, Sanctuary Street,

Żabbar, Malta.

Report no.: 1



Geotech1
engineering the ground

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1 Terms of reference and introduction

Żabbar, granted the title of Città Hompesch by the last Grand Master Ferdinand von Hompesch, is one of the largest cities of Malta and is located in the south eastern region of Malta in proximity to the historic three cities of Cottonera and the associated seaside destinations around the Grand Harbour (Figure 1-1). These locations have vast historical, architectural and social value and their status as major tourist attractions has been further reinforced over the past decades.

Conservation efforts to rehabilitate previously neglected architectural heritage include the development of the Vittoriosa, Senglea and Kalkara Waterfronts, and the redevelopment of the R.N. Naval Hospital at Bighi into the successful Esplora Interactive Science Centre. Recent initiatives to restore the fortification network forming the Cottonera Lines are set to make this rich heritage even more accessible to the public at large.

Much remains to be done to develop this heritage to its full potential, even outside the physical boundary created by the formidable Cottonera Lines. In this respect, Zabbar has much to offer, not only because it gives access to the exterior face of the greater part of these fortifications, but also because the village, in itself, is steeped in history and tradition, as attested by the exhibits within its central Sanctuary Museum, popular with locals and tourists alike, albeit somewhat overlooked and underrated.

Figure 1-1 – Aerial image of the south eastern region of Malta showing the location of Żabbar and its Parish Church (sourced from Google Earth, 2023)

Żabbar can therefore complement these and other locations, providing additional value by forming part of a heritage trail which takes the visitor through the varied history, through the ages, of this southern part of the Maltese islands. Central to such an initiative is the Parish Church and its Sanctuary Museum, both of which require only minor intervention to form part of such a trail. The setting of these two important buildings within the urban context and as uniquely aligned to the main throughfare of the village, Sanctuary Street, attest to their important role in the recent history of the village and its development.

There is scope for modernisation of the visitor experience to this museum, as a first informative destination and as an interpretative guide to the immediate surroundings. This can be reinforced by enhancing accessibility to the church itself, not only to its lavish interior, but also to the less-known church rooftop and crypt, which in themselves have a most interesting story, apart from providing a unique and unusual viewpoint to the far-field and the subterranean. In this respect, restoration of the upper sections of the church and its dome, as well as its crypt and access, would constitute a first but important step in achieving this ultimate goal of developing the full historical and cultural potential of this locality.

Figure 1-2 – Sanctuary Street and the majestic Sanctuary lit up for the Żabbar festa (photo sourced from https://mulberries.mt/explore/)

2 The Parish Church and Sanctuary Museum

The building of the Żabbar Parish Church commenced soon after to designs of Architect Tommaso Dingli, a Maltese architect of the late Renaissance period (Bonavia. K., 2005). Dingli was a sculptor and an architect, known for designing or participating in the design of several Maltese churches. These include the Parish Church of Saint Mary in Birkirkara, the Parish Church of Saint Mary in Attard and the Parish Church of Our Lady of Grace in Żabbar amongst others.

The Żabbar Parish Church was one of Dingli's last works, the construction of which was completed after his death in 1666. It is exhilarating to think how a population of a few thousands managed to construct a monument of such grandeur, which is solid evidence of the people's devotion to Our Lady of Graces.

The church was considerably remodelled during the centuries. The various alterations and additions over the last three centuries include the remodelling of the west front to a more ornate Baroque design, the replacement of roofs by a barrel vault to match that of the main aisle, the construction of the side aisles and chapels, inclusive of six new domes, and finally the replacement of Dingli's dome by the new and more elongated one that was completed in 1928. Sanctuary Street was set out to its current alignment around the same time, forming a grand processional approach to the west front of the Sanctuary that is one of a

kind in the Maltese Islands. More recently, around the middle of the 20th century, the construction of the Parish Church Hall and the Sanctuary's Museum was undertaken, later complemented by the formation of Mediatrix Square.

The façade of the Sanctuary as well as its entire perimeter, was extensively restored over the years 2009-2010, and the restoration of the statue of the Our Lady of Graces and the titular painting were undertaken thereafter. Lately, a planning application for the restoration of the façades of the Żabbar Sanctuary Museum, (PA/00690/24) has just been submitted.

3 The dome of the Parish Church

The dome of the Sanctuary is perhaps the most important landmark that epitomises the character and essence of Zabbar. Its dominance of the skyline and its visibility across the greater part of southern Malta inevitably defines Zabbar on the subconscious of both resident and visitor, especially when seen illuminated against the nightscape of the Maltese festa. Its upkeep, maintenance and restoration is therefore pride and duty of every true Zabbar villager and resident.

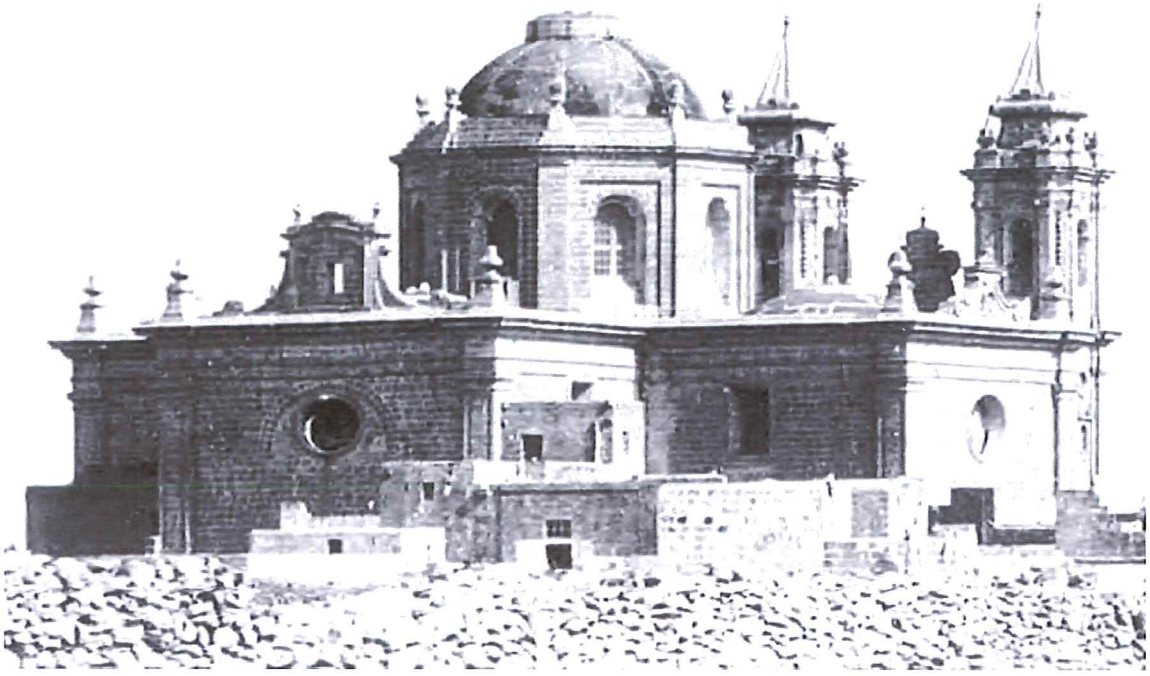


Figure 3-1 – Photo taken in 1902 showing the previous dome (reproduced from Karm Bonavia's "Il-Koppla tas-Santwarju" published September 2005)

The current dome replaces the older design seen in Figure 3-1 and sits on a 9-metre-high octahedral drum that is punctured by a corresponding set of stained-glass windows, one in each of the eight sides. This latter dome is larger than its predecessor, surpassing the height of the two belfries that complement the façade (Figure 3-1 and Figure 1-2). In section, the radius of the dome segments is slightly larger than the radius of the dome on plan (Figure 3-2 and Figure 3-3). This provides for lower horizontal thrust and therefore more efficient load transfer to the base drum when compared to its earlier and shallower equivalent (Figure 3-1).

The individual sides of the drum are separated by a set of double Corinth pilasters protruding from the eight corners of the octahedron, each forming the base of a set of rib arches that define both vertical and plan profiles of the dome. At either lower and upper levels, these ribs are terminated by scrolls carved into the

same masonry voussoirs that define the ribs. The scrolls at the upper levels are of a smaller size than those at the base, immediately above the drum, and these smaller scrolls are then transformed to the circular columns forming the lantern and yet still to single ribbed arches forming the uppermost small dome at the top of the lantern. The column and rib arch designs are replicated on the interior of the main dome but not within this smaller dome over the lantern.

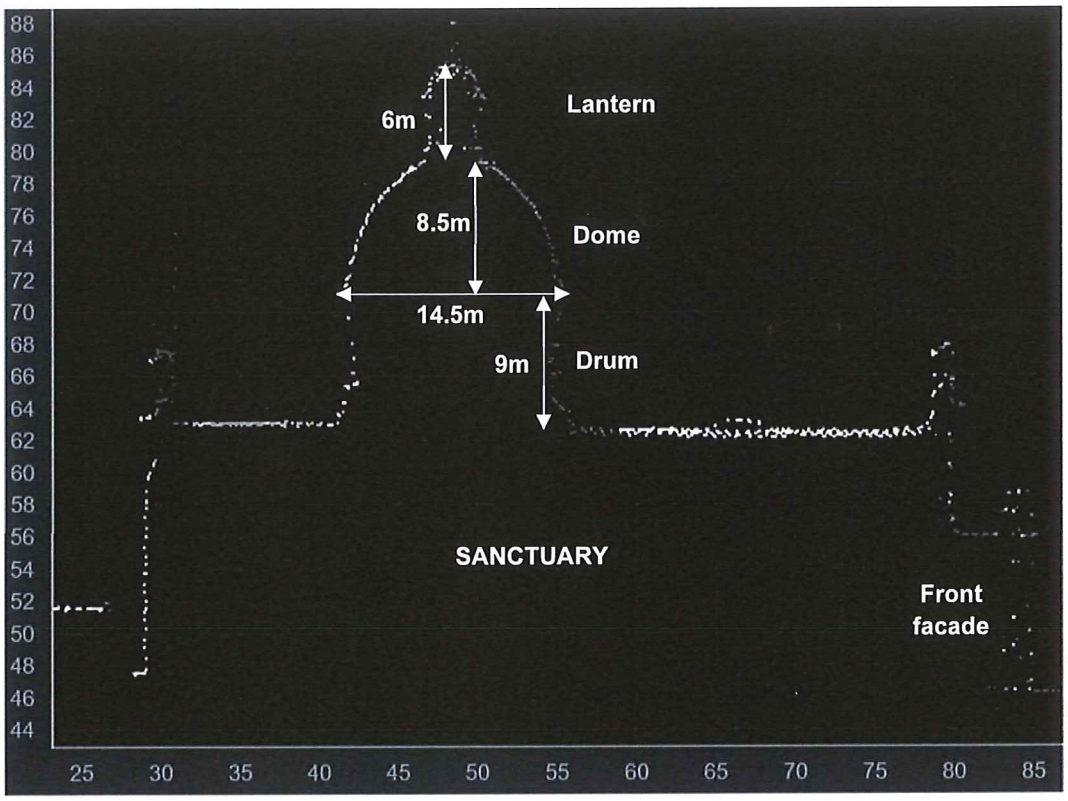


Figure 3-2 – Basic dimensions of the dome as shown in a section from the 3D Territorial Lidar Model for Zabbar (sourced from http://www.um.edu.mt/projects/cloudisle)

A single layer of curved masonry panels forms the dome between the rib arches below the lantern. These panels have been painted in the characteristic red colour seen from afar, but close inspection reveals that this colour has not been applied directly to the masonry, but instead to a thin lining of lead sheet that serves to waterproof the dome and that was installed in the 1970s.

Perit Ġużeppi Pace, the designer of the current dome, estimated the current dome to be heavier than its predecessor, requiring strengthening of the church's foundations at the main crossing. Such strengthening was implemented out of sight, within the crypt underlying the church, by recycling some of the stones that previously formed part of the replaced dome.

Over the years, there is no evidence of major maintenance interventions, other than the usual routine application of waterproofing paint. Of note are the stained-glass windows within the drum, that had been covered by external perspex screens following damage caused to the stained-glass during a hailstorm.

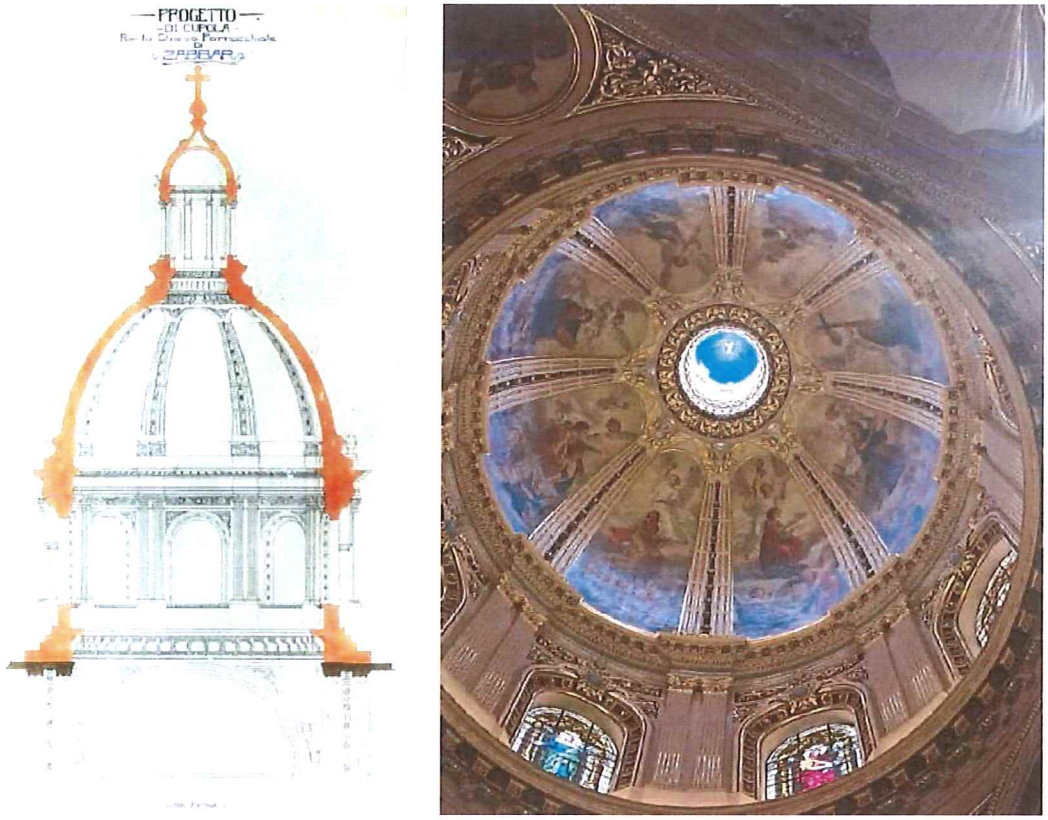


Figure 3-3 – Architectural drawing prepared by Perit Guzeppi Pace, dated the 25th of March 1926 and presented to Archbishop Mawru Caruana (reproduced from Karm Bonavia's "Il-Koppla tas-Santwarju" published September 2005), and (right), internal view of the dome.

4 Observations

The drum, dome and lantern were inspected by the undersigned on the 8th of December 2023. A detailed photographic survey of the drum, the dome, the lantern and the interior is presented in *Appendix A: Photographic Survey*, which is subdivided into sections highlighting features and observations made on the respective architectural elements.

In summary, the observations made during this visit consist of the following:

4.1 The drum and its base, including the supporting pilasters within the church interior

On the exterior, sparse cracks of limited width (<2mm) were observed above the extrados of the arch supporting the drum over the main aisle, where the vault ('troll') of the nave meets the pendentives supported by the four main pillars at the central crossing. Such thin cracks are normal and expected within a heavy masonry structure of this kind, typically formed as the main thrust line of force finds its way through the various stone components of the structure. Although not of concern from a structural point of view, these cracks present propitious entry points for rainwater, which is then led into the internal core and infill and possibly finding its way to the interior surfaces, damaging the decorative mouldings and frescoes in the vicinity of the annular base of the drum. Furthermore, cracks of this kind, and the associated thermally induced movement across the seasonal cycle, often compromise the applied waterproofing lining that in some places was seen to span across these same cracks.

Figure 4-1 – A crack observed beneath the north-east facing side of the drum, that is overlying the barrel vault of the main aisle.

Minor cracks, of width not exceeding 2mm, were also observed within the internal pilasters supporting the dome, specifically at the junction between the corner pilasters and the walls of the choir, immediately behind the main altar. These cracks follow the vertical joints in the masonry and suggest redistribution of forces created by the sheer weight of the dome. Although the scale of these cracks do not indicate major problems, they inevitably compromise the interior finishes and the attached marble cladding in some places. It is therefore suggested that these cracks are monitored over time, before reparatory interventions are attempted.

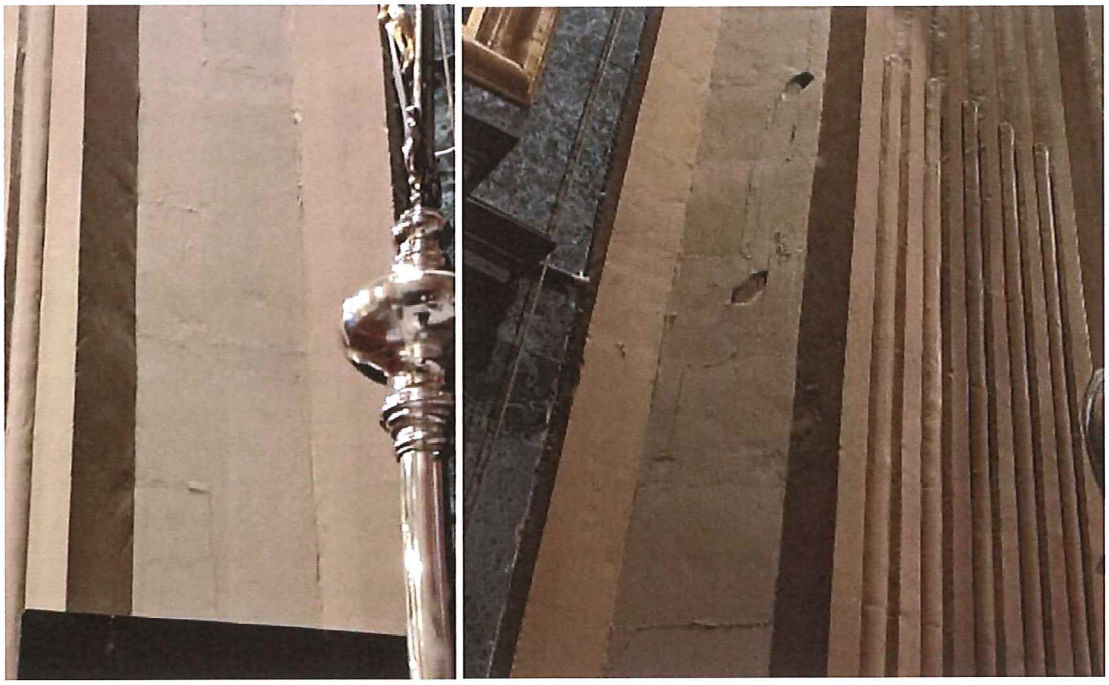


Figure 4-2 – Fine cracks within the pilasters at the main crossing supporting the dome, behind the main altar

Within the external fabric of the drum, and specifically at the upper cornice, the stone masonry is exhibits severe deterioration, such that sections of the stone mouldings forming the frieze have been severely weathered and disfigured (Figure 4-3) Signs of stone exfoliation are also visible within the lower sections of the drum pilasters, in some places leading to localized cracking and delamination. The masonry at the drum's level is noted to have a red patina, resulting form the natural weathering of the stone and possibly from washout of the paint applied on the lead lining above.

Figure 4-3 – Weathering and deterioration of the frieze below the main cornice of the drum.

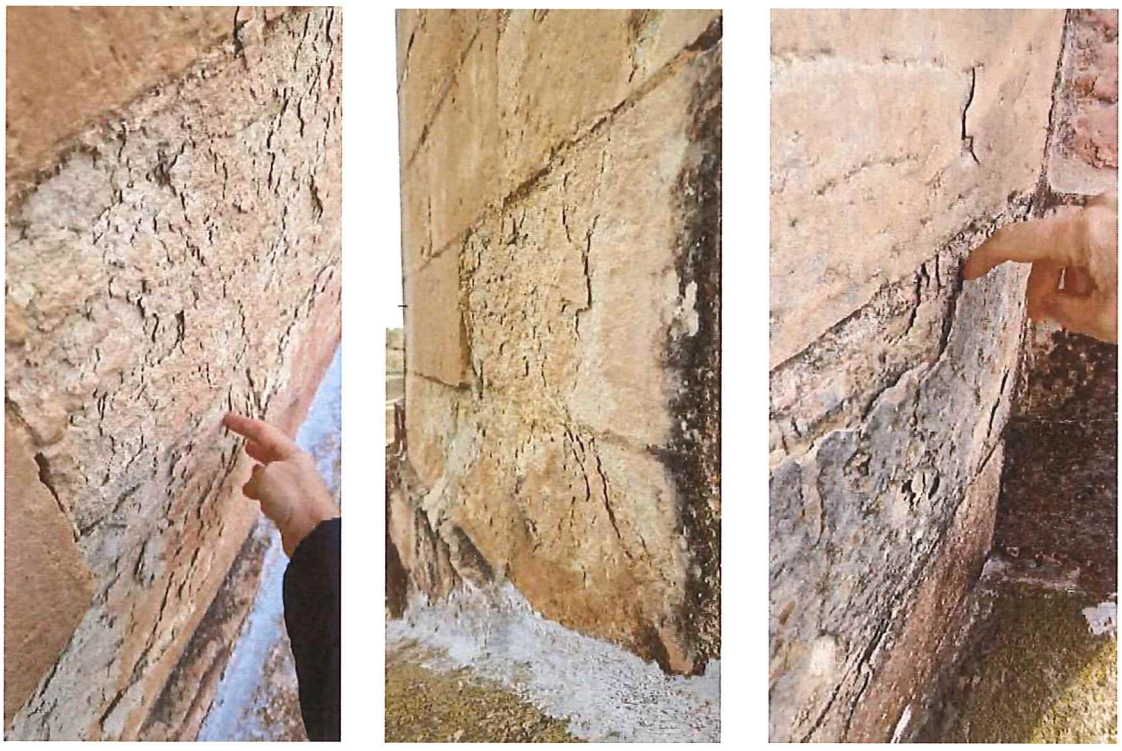


Figure 4-4 – Examples of exfoliation within the stonework at the base of the drum. The stone fabric is also noted to have a red patina.

4.2 The dome

The masonry fabric of the dome, beyond and above the drum, is generally in good condition and there are no obvious indications of problems of a structural nature. The main concerns about this part of the structure are related to the finishes, specifically the lead lining, and the storm water management system.

Delamination of the white paint that has been applied on the dome's and lantern's masonry is noted to be considerable. This paint was tested on the spot for inherent elasticity and was found to be relatively brittle, possibly because the type of paint used was not of the elastomeric type. There are also signs of weathering of this paint system, this being seen to be clearly flaking our outright missing in several exposed parts of the masonry, especially where around those areas subject to considerable wind turbulence. This implies that several zones of the underlying porous stonework may not be fully impermeable to intense stormwater downpours.

Figure 4-5 – weathering of the paint system, exposing the underlying masonry

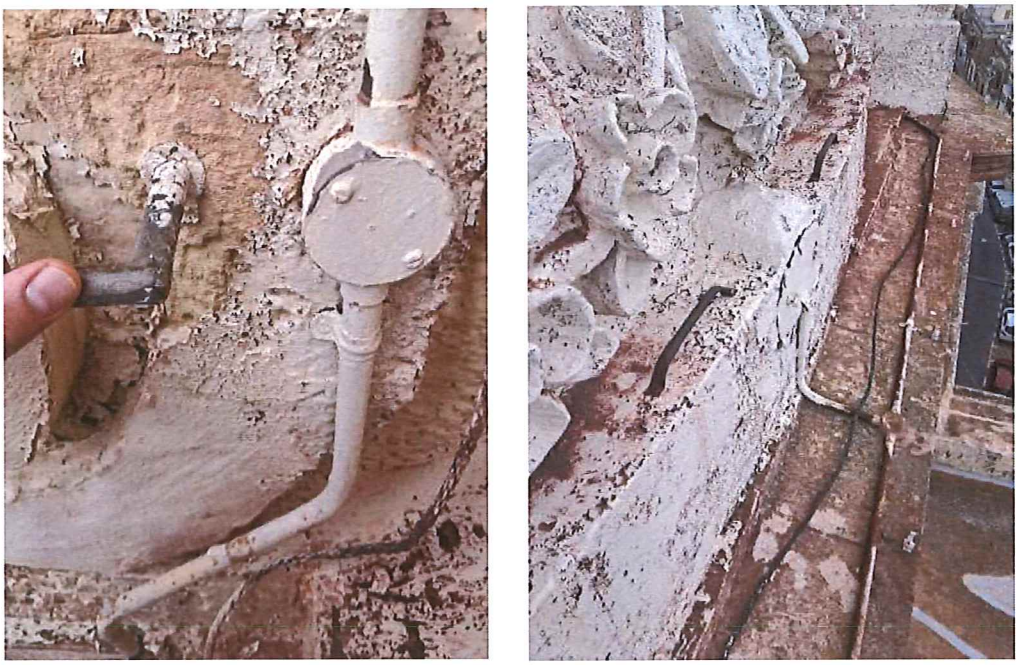


Figure 4-6 – Deteriorating paintwork and preferential storm water paths, compromising integrity of service perforations

Closer inspection of the mouldings and semi-horizontal surfaces at the lower levels of the dome also revealed preferential water paths and zones of more intense water-related deterioration of the finishes and underlying stonework. It is the opinion of the undersigned that stormwater management, over the dome surfaces, can be improved by judicious implementation of better falls across some of the horizontal surfaces and subsequent application of an elastomeric liquid membrane, possibly reinforced with a glass-fibre mesh in the more exposed locations. An exercise of this kind would need to be preceded by removal of all vegetal encrustations and treatment of deteriorated zones of the stonework. This would include treatment of several indents, channels and fixtures intended to provide a foothold or handhold or to enable the passage of service runs related to the dome lighting system, such that necessary interventions of this kind are detailed in the proper manner.

The lead sheet lining system is generally in good condition, but there are several locations where this has been compromised or where it is missing completely. The lining system is generally subject to intense peeling forces during windy days, and these forces have succeeded in removing parts of the lining system across the ribs, leaving the underlying stonework completely exposed. This is of concern since rainwater penetration will eventually damage the interior finishes, which are not only priceless but also extremely difficult to access. These zones of missing lead sheet therefore need to be replaced, and the correct seam joints with the existing lining implemented to ensure adequate shedding of water flow. This would need to be preceded by treatment of the underlying masonry with liquid membrane to create an additional layer of protection.

The same peeling forces have also resulted in cyclic in-plane movement of the lead sheets relative to the underlying masonry. Although most of the lining remains intact and firmly attached to the underlying masonry by point fixtures and square washers, this movement has resulted in widening of the holes at the fixing points, such that some of these are now slots rather than circular holes. In some instances, the accumulated movement has been large enough for the slots to develop well clear of the overlying washer, such that the resultant opening now creates an entry point for rainwater. It is therefore clear that the lining needs to be thoroughly inspected for such occurrences, and where these are identified, the fixture is removed, the lead sheet is patched up and a new fixture is introduced to secure the lining to the masonry once again.

Figure 4-7 – missing lead sheets and slotted hole created by cyclic movement of the lead sheet relative to the fixture and the masonry.

4.3 The lantern

The lantern is the least accessible part of the structure and this could only be inspected at close range by an assistant (Mr. Franco Caruana) who managed to climb to the lower annulus of the lantern.

The lantern is generally in good condition from a structural point of view. There are however the same indications of deteriorating masonry mouldings and a compromised water proofing system. Signs of water penetration in the form of flaking paint are observable within the interior of the lantern, calling for a timely intervention to prevent the situation from deteriorating further. In a similar manner to the interior of the dome, the interior of the lantern is very difficult to access, making reparative interventions very costly and disruptive.

Figure 4-8 – closeups of masonry mouldings at lantern level showing deterioration and flaking protective paintwork

There is no visible lead sheet lining at lantern level, but the uppermost part of the structure is very difficult to access and the presence or otherwise of lead lining and deterioration could not be ascertained at this stage.

During the inspection it was also noted that the wooden apertures at lantern level require routine maintenance work, in the form of treatment to the joints in the timberwork and periodic paintwork. On the same note, the apertures and protective screens of the stained-glass windows of the drum require similar maintenance work and in some cases, replacement of some isolated shattered panels.

5 Restoration interventions and preliminary cost estimate

The above observations call for a phased restoration process that needs to be preceded by all the necessary investigations, approvals, and procurement processes. Several preparatory studies are envisaged to be required to analyse the existing state in more detail and to identify the appropriate restorative and protective methodologies, prior to any physical work being implemented on site. These are envisaged to include:

- Dimensional surveys,
- Deterioration mapping
- Studies on the current state of the lead lining sheets and the stone masonry

Following these, the appropriate restoration methodologies will need to be identified and all the necessary documentation prepared to facilitate the statutory approval and procurement processes. This documentation is envisaged to consist of the following:

- Method Statement detailing the restoration methodology,

- Drawings of the proposed works, if necessary
- Architectural lighting design
- Specifications for each item of the required works
- Bills of quantities for the required works
- Submission of the relevant documentation to the Superintendence of Cultural Heritage.
- Planning application
- BCA application, inclusive of drawings and methodology for the setting up of the necessary scaffolding system. The church structure would need to be analysed in this regard so that the scaffolding system can be designed and implemented.
- Health and Safety plan

Certain restoration techniques may also require site trials in order to determine the adequacy or otherwise of certain techniques. In this manner, the eventual techniques earmarked for implementation may be better tailored to the performance requirements.

Once the appropriate procurement route is identified and the works awarded to a prospective contractor, the actual works on site can commence. This would need to be preceded by all the works necessary to erect the scaffolding system and its eventual certification.

The actual restoration works and the subsequent installation of the architectural lighting would be defined following the preparation of the above mentioned documentation. Initially these will include the removal of metal inserts, raking out of joints, removal of existing render, brushing to remove flaky stone and dirt, removal of vegetal and biological growth, and chiselling away of deteriorated masonry.

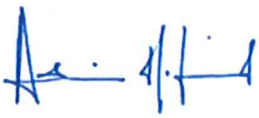
Restoration work can then commence, including pointing of open joints, plastic repair and consolidation of deteriorated stonework, lime and/or epoxy injection interventions, pinning of delaminated stone, replacement of deteriorated stone blocks with new worked stone inclusive of all the necessary sculpture, and any other works necessary to address the existing problems outlined in the previous sections.

The subsequent stages will address the waterproofing system, specifically the repair of the lead lining sheets, and the application of liquid membrane and/or specialist coatings to the exposed masonry.

The final stages will involve restoration and painting of the timber apertures and replacement of the damaged protective screens to the stained-glass windows, and the installation of the architectural lighting system.

All the above stages will need to be supported by all the relevant QA/QC documentation, inclusive of tests on all the relevant materials used during the restoration process.

At this preliminary stage, a detailed cost estimate is still to be prepared, but the overall cost of the restoration process to the drum, dome and lantern and the implementation of an architectural lighting system are estimated to amount to around €300,000 excluding VAT, based on a comparison to similar projects. It is recommended to initiate the documentation process described above, to enable a more accurate cost estimate.



Adrian Mifsud

B.E.&A.(Hons.), M.Sc.(Lond.), Ph.D. (Melit.), D.I.C., Eur.Ing.(FEANI), Perit

Christian Schembri

B.E.&A.(Hons.), M.Sc.(Lond.), D.I.C), Perit

6th February 2024

Appendix A: Photographic Survey

Figure 0-1 – Aerial image of the Zabbar Parish Church's Dome centred approximately at a latitude of 35°52'29.39"N and a longitude of 14°32'2.83"E (sourced from Google Earth, 2023)

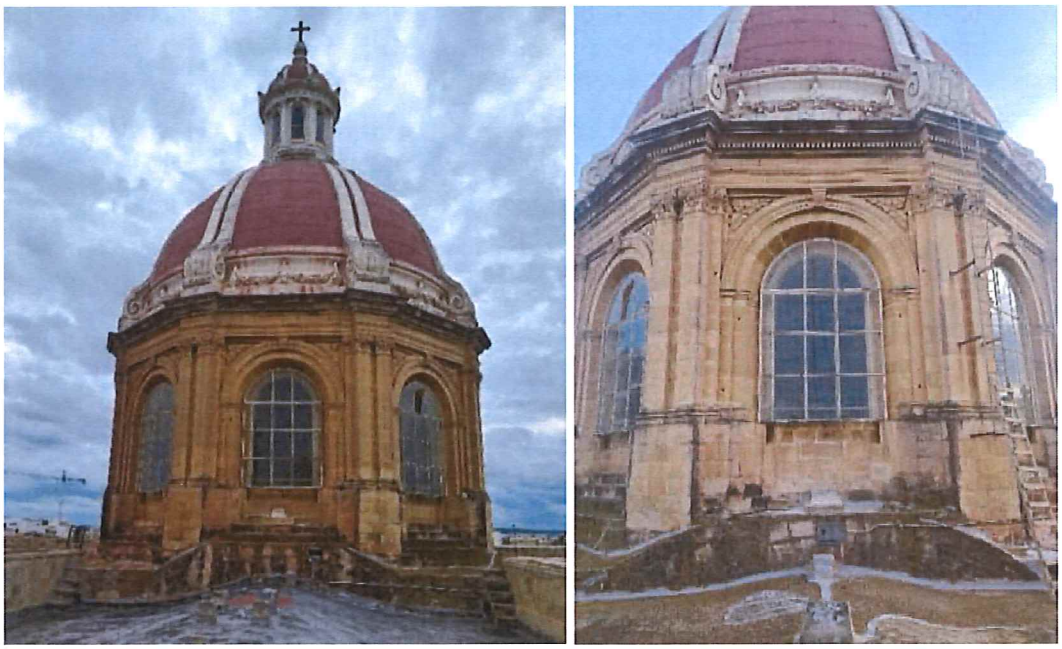


Figure 0-2 – (left) View from location 1 from the north-east, that is the dome's side facing towards Sanctuary Street, (right) View from location 2 from the north-west, that is the dome's side facing towards Mediatrix Square.

Figure 0-3 – (left) View from location 3 from the south-west, that is the dome's side facing towards Fgura, (right) View from location 4 from the south-east, that is the dome's side facing towards Żejtun and Marsascala.

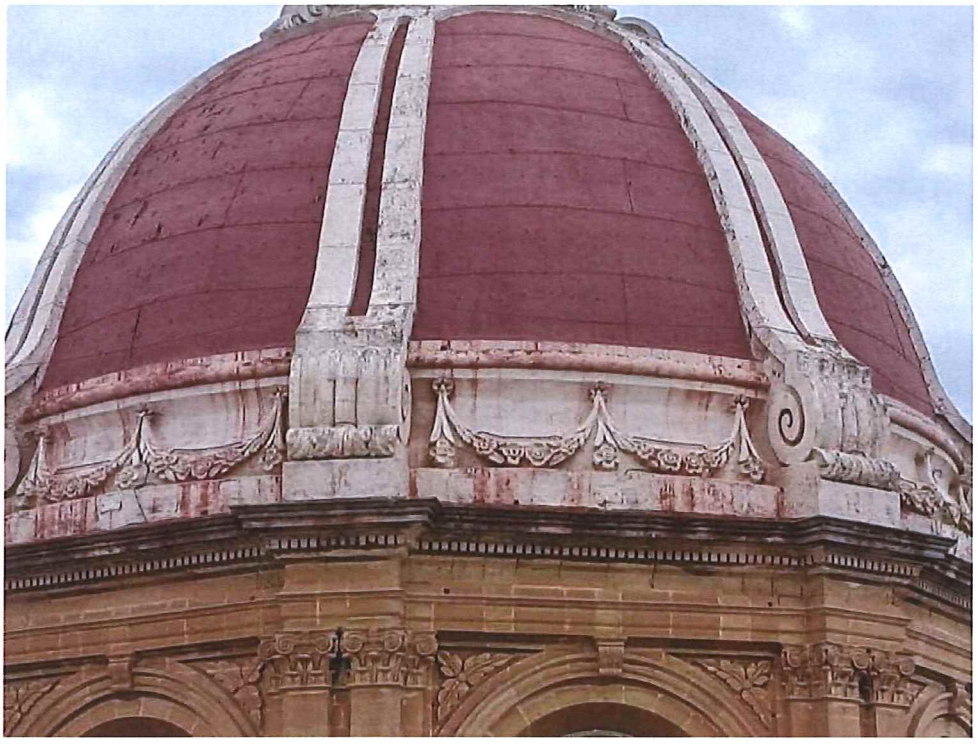


Figure 0-4 – Close view of the dome

The drum

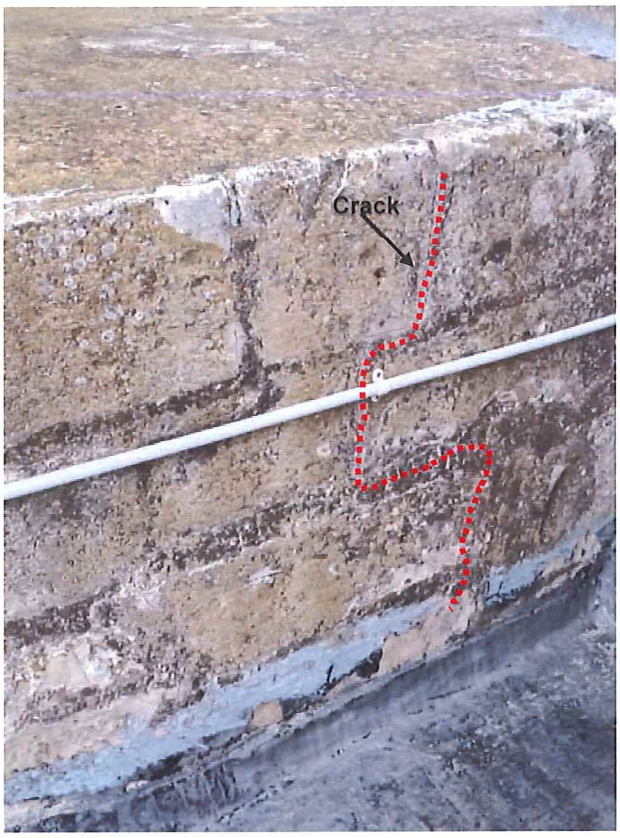


Figure 0-1 – A crack observed beneath the north-east facing side of the drum, that is overlying the barrel vault of the main aisle.

Figure 0-2 – Exfoliating stone and cracked stone especially towards the drum's base. The stone fabric is also noted to have a red patina.

Figure 0-3 – Weathered stone at several locations of the cornice at the top of the drum

The dome

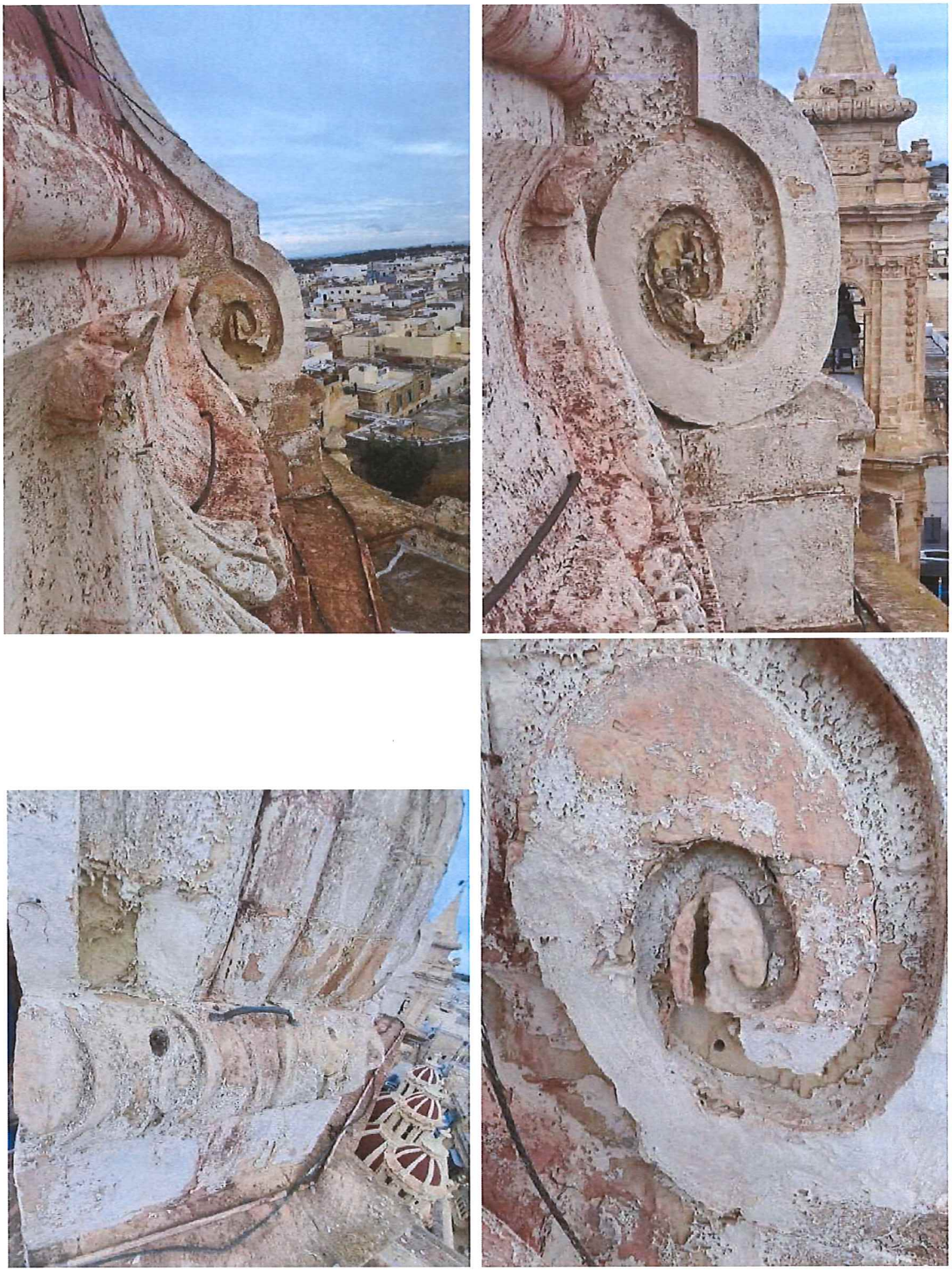


Figure 0-1 – Stone weathering

Figure 0-2 – Exfoliating white paint, vegetal deposits, paint deposits at preferential zones showing possible water entrapment.

Figure 0-3 – Delaminating and detachable lead sheets used as waterproofing.

The lantern

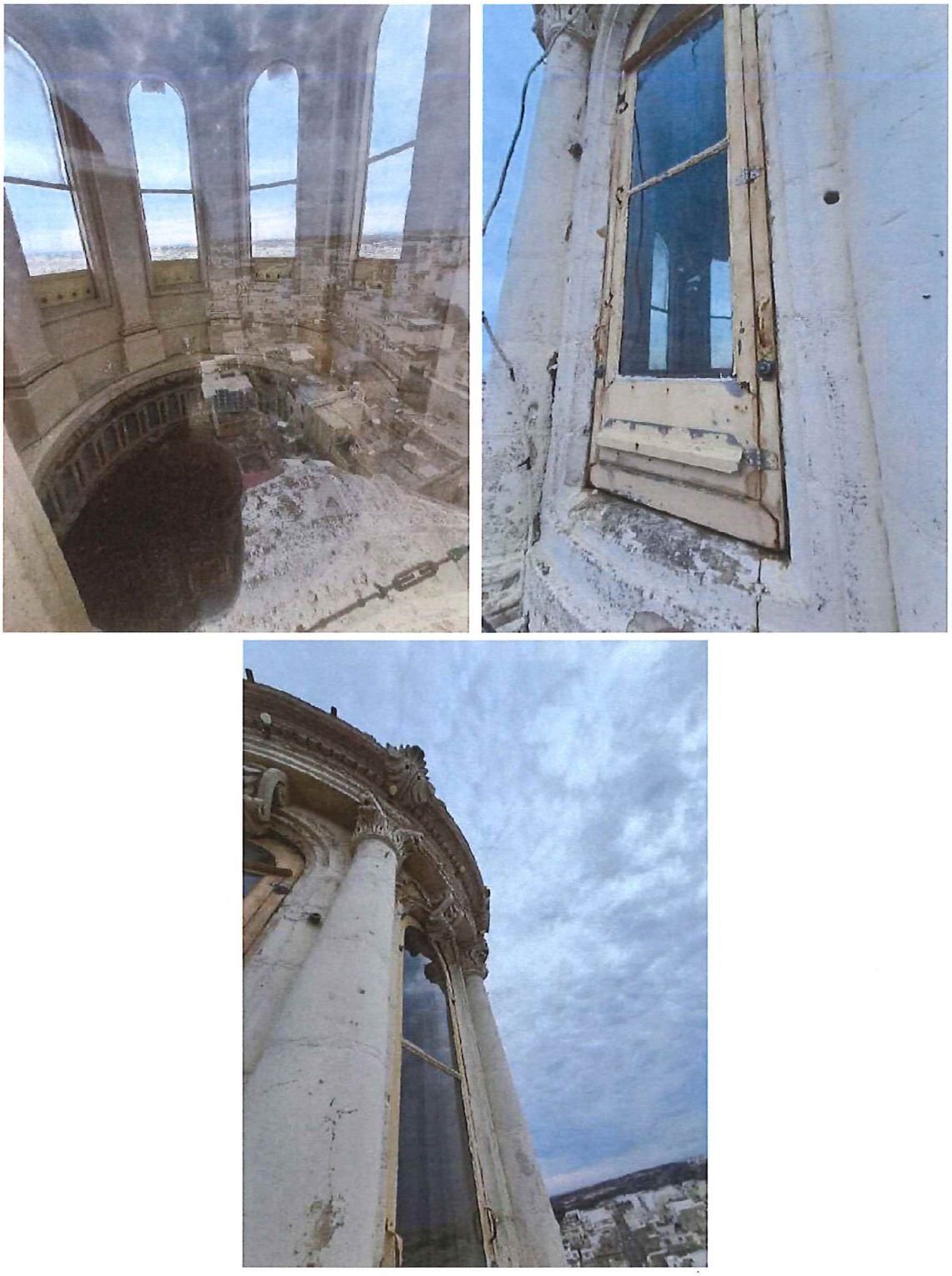


Figure 0-1 – Exfoliating paint and apertures requiring maintenance.

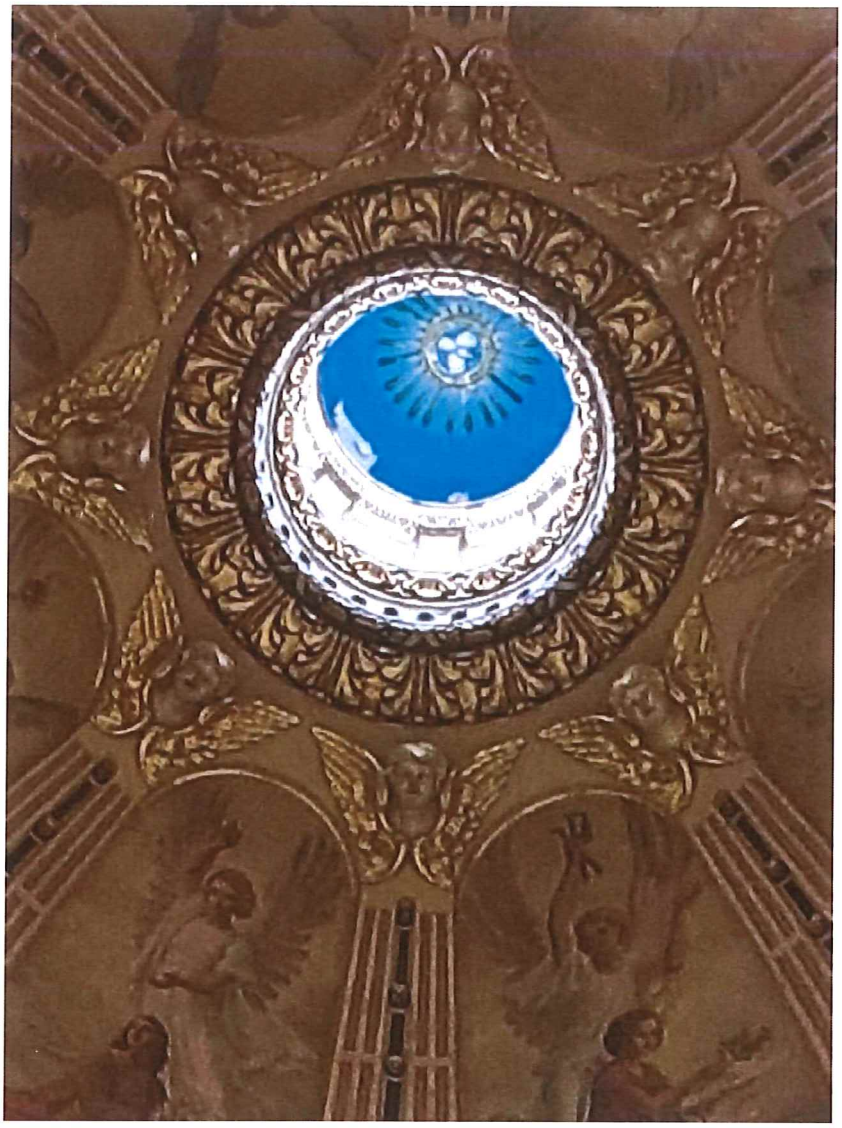


Figure 0-2 – Signs of water penetration in the form of flaking paint within the lantern.