

A Timber Propping for Villa Tarabya A Timber Liberty Architecture in Istanbul

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Abstract Villa Tarabya on the Bosphorus shore in Istanbul, a masterpiece of Liberty architecture designed in 1917 by Raimondo D'Aronco, the famous Italian Architect who introduced the Liberty style in Istanbul, was built for the summer office in Istanbul of the Italian Embassy in the local light framing *bagdadi* timber technique. No longer used since decades, Villa Tarabya is today severely damaged by the strong wind of the area, rainwater, marine salts, leakage; the fall of a tree on the left side of the building caused cracks on the walls and the floors. A project of urgent measures was presented and carried out, aimed at protect the construction from further damage; it included repair of the more decayed parts of the covering, propping of the staircase body, designed to prevent from collapse the failing sections and the parts of the floors at three levels.

Keywords timber architecture, structural failures, timber propping

1. INTRODUCTION

The Villa Tarabya estate, situated on the West bank of the Bosphorus, in the area of Istanbul known as Tarabya, is one of the architectural masterpieces in Liberty style designed for Istanbul at the beginning of the last century by the Italian architect Raimondo D'Aronco as the summer residence of the offices of the Italian Embassy in Turkey. The estate, which includes two annexes and a garden, is property of the Italian State and run by the Ministry of Foreign Affairs.

The main building is made of a timber structure on a basement that, in the parts surrounding the stairs, is in masonry. The walls are generally made up of two appropriately distanced wooden fillet linings which, in order to give continuity to the surface, were subsequently plastered according to a local construction technique called *bagdadi*, an age-old technique derived from *opus craticium*. The mortar for the plaster contains vegetable fibres so as to provide traction strength; the distancing of the fillets ensures that the mortar inserted in the interstices is well fixed.

Some floors have been constructed with brick vaults on metal profiles that have also been used for door and window frames.

2. CURRENT CONDITION

The whole estate has undergone rapid and serious deterioration since it lost its function of Embassy.

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The Authors of this study have verified a soil crush affecting much of the ground floor, causing cracks in the walls. Other damage was caused to the northern walls by the fall of a tree some years back. The infiltration of water from the roof - the roofing and drains are in particularly bad condition - has generally ruined the walls and much of the flooring. Moreover, the structures, owing to damp, have been attacked by biotic agents such as fungi (especially *Serpula lacrimans*) and insects.

The intense damp and the presence of marine spray have favoured the corrosion of metal elements such as the double T profile structures which help sustain the staircase.

3. INTERVENTION

The reason for choosing these timber elements, rather than steel props, are the following:

- to favour the international tendency *timber to timber* in repairing antique timber structures;
- to set up propping that is not excessively rigid but flexible and has greater resistance to brief but intense actions;
- to avoid the dangers of instability given the significant height of the single floors of the building - dangers which are more accentuated by extremely thin and less adaptable steel props than timber ones;
- to be given a longer period of execution than the period usually granted when using extensible metal elements. More time would allow for a more thorough acquisition of on-going knowledge of the structure to be propped;
- to obtain further information concerning timber propping given the aim of opening the building yard and illustrating the characteristics of the work strategies underway adopted as well as the finalities of the project in the restoration of the Villa as well as the finalities of the project to visitors;
- to further acknowledge the already well-known capacities of Turkish carpenters.

A timber system of propping has been developed for the first three floors (ground, first and second floor). Instead, a more rigid structure that can adapt with greater ease to the significant strain to which the floorings are subject to, has been ideated for the third floor.

The vertical elements are passed across the floorings and between the timber beams. These, between one floor and another, are connected at the head. The prop which crosses the flooring is blocked by the same flooring at its upper extremity, while the base of the prop overlaps the former and is blocked by pegs, planks, etc.

During the months of planning and implementation of the project a considerable decrease in the rigidity of the beams between the second and third floors, with consequent deformation of the walls on the top floor became apparent. It was thus absolutely necessary to insert sloping beams on the second floor.

4. IMPLEMENTATION

The implementation of the propping operations took place between June and July 2008.

The work was carried out in full respect of the project both regarding the main wooden prop (in Danish silver fir) and the more modest localised work: propping of the staircase using joint-tube; propping of the canopy also using joint-tube that integrate the multi-directional scaffolding in the overall work were also made.

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