VILLA FLORIDA CIVIC CENTRE

A Spanish building with a long, fascinating background has been completely restored and given a new lease of life

After being abandoned for a number of years, the palace of Villa Florida, located in the upper part of Barcelona, has been restored and renovated to create a new civic centre.

The building was previously the home of a nursery school. Designed by the architect Pedro de Azemar it represented a remarkable example of Catalonian modernism. This particular architectonic style developed in Barcelona between 1880 and 1930, and was Spain's answer to European Art Nouveau, but with certain special characteristics. Even though this style spread as an architectural style with a considerable following throughout Europe, modernism is still tightly connected to its place of origin, Catalonia. Modernism was contrary to the unattractive style of industrial architecture typical of the first half of the 19th century, and developed new concepts in architecture inspired by nature.

More than one hundred architects were responsible for the modernist Catalonian buildings, the most noteworthy of which were Antonio Gaudí, Lluís Domènech i Montaner and Josep Puig i Cadafalch.

Around twenty years ago, Villa Florida went through a phase of total abandon, worsened by various arson attacks and acts of vandalism. Finally, the Barcelona city council decided to convert the building into an area open to the general public, and promoted a contest to find the best ideas, with victory going to Alberto Aguirre.

Not only did the winning project propose to readapt the building into a civic function centre, it also set out three main objectives: restore the structure in a modernist style, respect the project devised by Pedro de Azemar in 1904 and renovate the part of the building which could be still identified as part of the ancient residential and agricultural construction, whose origins date back to the middle of the 16th century. It was on this land that Villa Florida had been built, and later seriously damaged during the Spanish Civil War (1936-1939). Halfway through the restoration project, while the demolition and cleaning phases were still under way, the ancient remains which indicated the birth of the building were unearthed, obliging the designers to change the original project and highlight the building's slow transformation during the successive five centuries of its history.

As a finishing touch, the project wished to eliminate all the additions which had been made over the years, and replace them with a single, more modern structure, complementary to the ancient part of the building. This new rectangular shaped building was completely dressed in corten steel sheets, which also help to create a ventilated façade. Corten steel (composed of 60% steel and 40% iron) is a material which changes colour over the years, until it has a completely "rusty" finish. After rejecting other metallic materials, such as aluminium or lacquered aluminium,

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Photo 1.
The state of deterioration and abandonment in which Villa Florida was to be found prior to the restoration work.

Photo 2.
Cleaning and rebuilding phases of the facades of the building.

Photo 3.
Mapei renders, mortars and coatings, along with the highly-skilled workmanship, gave Villa Florida a high quality finish.

Photo 4.
The façade after repair.

this material was chosen for its close compatibility with the colour of the render chosen for Villa Florida.

A Difficult Restructuring Project Requires High-quality Products

Because of the complex nature of restructuring an ancient building, such as in the case of Villa Florida, designers and building companies decided to consult the Mapei Technical Service Department when choosing the most suitable products to use. With this project, after a series of surveys of the building, the department recommended a number of solutions from the MAPE-ANTIQUE range, products particularly suitable for the restoration of masonry deteriorated by capillary rising damp.

A specific range which includes dedicated products which are applied on the walls for consolidating brick, stone and tuff walls in ancient buildings.

The products in the MAPE-ANTIQUE range contain no cement, and stand out from other products on the market because, apart from having very similar physical and mechanical characteristics to the materials used in the original project, they also offer high resistance against physical and chemical attack by aggressive agents, such as sulphates, chlorides and nitrates already present in the walls, or carried into the walls by rising damp.

The macro-porous structure of these products allows the water contained in the walls to evaporate off, thus guaranteeing that damp structures dry off quickly without forming efflorescence on the surface. With traditional render, if the speed at which the water evaporates off is particularly high, salts may form crystals inside the render and in the wall and generate pressure which has the capacity of seriously damaging the render. With the

Photo 5. A detail view of the temporary support used for the vaulted roof to avoid it collapsing.

Photo 6. A detail view of the operation to repair and seal the cracks.

Photo 7. Application of the layer of PLANITOP HDM mortar strengthened with MAPEGRID G 220 mesh on the outer face of the vaulted roofs.

Photo 8. The vaulted roof after strengthening and restoration.

products in the MAPE-ANTIQUE range, on the other hand, this phenomenon does not occur because the content of free lime is completely absent after only a few days. The use of products from the MAPE-ANTIQUE range on site offers a number of advantages: similar mechanical strength to traditional hydraulic lime-based systems; similar workability to traditional aerated lime-based systems; high vapour permeability; high resistance to sulphates, thanks to the fast chemical reaction between the lime and the Eco-Pozzolan (a very light-coloured, inorganic, synthetic pozzolanic material, which is particularly rich in amorphous silica with a highly-reactive, large surface area) which consumes all the free lime extremely quickly; no alkali-aggregate reaction; negligible conductivity, due to the low level of free lime which also eliminates the formation of efflorescence; may be tinted on site with coloured pigments or oxides. The Mapei Technical Service Department recommended the works director to repair all the facades which were particularly deteriorated with MAPE-ANTIQUE RINZAFFO and MAPE-ANTIQUE MC. To apply the products correctly, it was first necessary to remove all the portions in poor condition. The surfaces were then thoroughly and carefully cleaned with water to remove surface efflorescence and to eliminate the soluble salts present in the walls, and only after carefully preparing the substrate, a "salt-resistant" layer of MAPE-ANTIQUE RINZAFFO was applied, a product specially developed for restoring ancient buildings in stone, tuff and bricks. Within two hours, once the MAPE-ANTIQUE RINZAFFO had hardened, the surfaces were smoothed over with MAPE-ANTIQUE MC, a light-coloured dehumidifying mortar.

Consolidation of the Vaulted Roofs

During demolition of the west wing of the building, three circular brickwork vaulted roofs were uncovered, which up until that moment had been hidden beneath thick layers of mortar, and on which rested a terrace which had been added at a later date. The roofs were very poorly conserved, with deep cracks over their entire surface and in the arches which joined the three roofs together.

The original intervention planned – a strengthening system comprising a reinforced concrete structure resting on the outer face of the roofs – was considered to be too risky and was advised against, to avoid overloading the already weak structure which was on the point of collapsing.

Because of this risk, the Mapei Technical Service Department proposed a less drastic solution to the designer, with a minimum load on the structure and a lower impact on the final work, recommending the use of the Mapei reinforced structural strengthening system for masonry, using MAPEGRID G 220 alkali-resistant fibreglass mesh and PLANITOP HDM two-component mortar.

The consolidation operation of the vaulted roofs began by first removing the old terrace on top of the roofs. To make sure that the strengthening system bonded well, special care and attention was paid when preparing the substrate on which it was to be applied: the surface had to be perfectly clean and free of dust and residues of oil, and solid with no loose parts.

After preparing the surface as described above, a metal trowel was used to apply a first layer (approximately 3-4

IN THE SPOTLIGHT

MAPEGRID G 220 + PLANITOP HDM

MAPEGRID G 220 is an alkali-resistant, special mesh made up of primed glass fibres which, thanks to its special woven pattern, increases ductility and distributes stresses more evenly in reinforced masonry work.

It is used in conjunction with PLANITOP HDM (two-component, high-ductility cementitious mortar which have been awarded the **CE** mark in compliance with the standard **EN 1504-3**) for structural strengthening of masonry work. The system adheres perfectly to the support so strongly that localised stresses provoke failure of the support itself, rather than of the support/strengthening system interface.

It ensures excellent tensile strength, resistance to atmospheric agents and high dimensional stability; it is long-lasting and resistant against chemical attack; it does not rust; it is light and easy to handle, to cut and adapt to the conformation of the support.

mm thick) of PLANITOP HDM two-component, high-ductility mortar specially developed for stone, brick and tuff masonry. While the product was still fresh, MAPEGRID G 220 fibreglass mesh was placed on the surface, and was then carefully pressed into the mortar with a flat trowel so that it bonded perfectly with the mortar.
MAPEGRID G 220 is a special alkali-resistant mesh made up of primed glass fibres which, thanks to its special woven pattern, guarantees that the masonry is more ductile. The "package" created as described above has the capacity of distributing the stresses more evenly over the whole surface of the strengthened elements if the structure moves. A second uniform layer approximately 2-3 mm thick of PLANITOP HDM was then applied, so that the mesh was completely covered. The operation was completed by smoothing over the surface with a flat trowel while it was still fresh.

Faithful to the Original

Restoration of the building had to be faithful to the original materials, the typical decorative finish of Catalonian modernism and the original colours and construction details. The slate tiles were replaced with another shape of slate tiles in an anthracite colour. The stone ashlars which decorated the Northern façade were removed, numbered, restored and then put back into their original position. The wrought-iron railings and parapets below and around the windows, a typical feature in that era, and the decorative mosaic and splashes of colour below the balconies were all removed and restored, or rebuilt where necessary.

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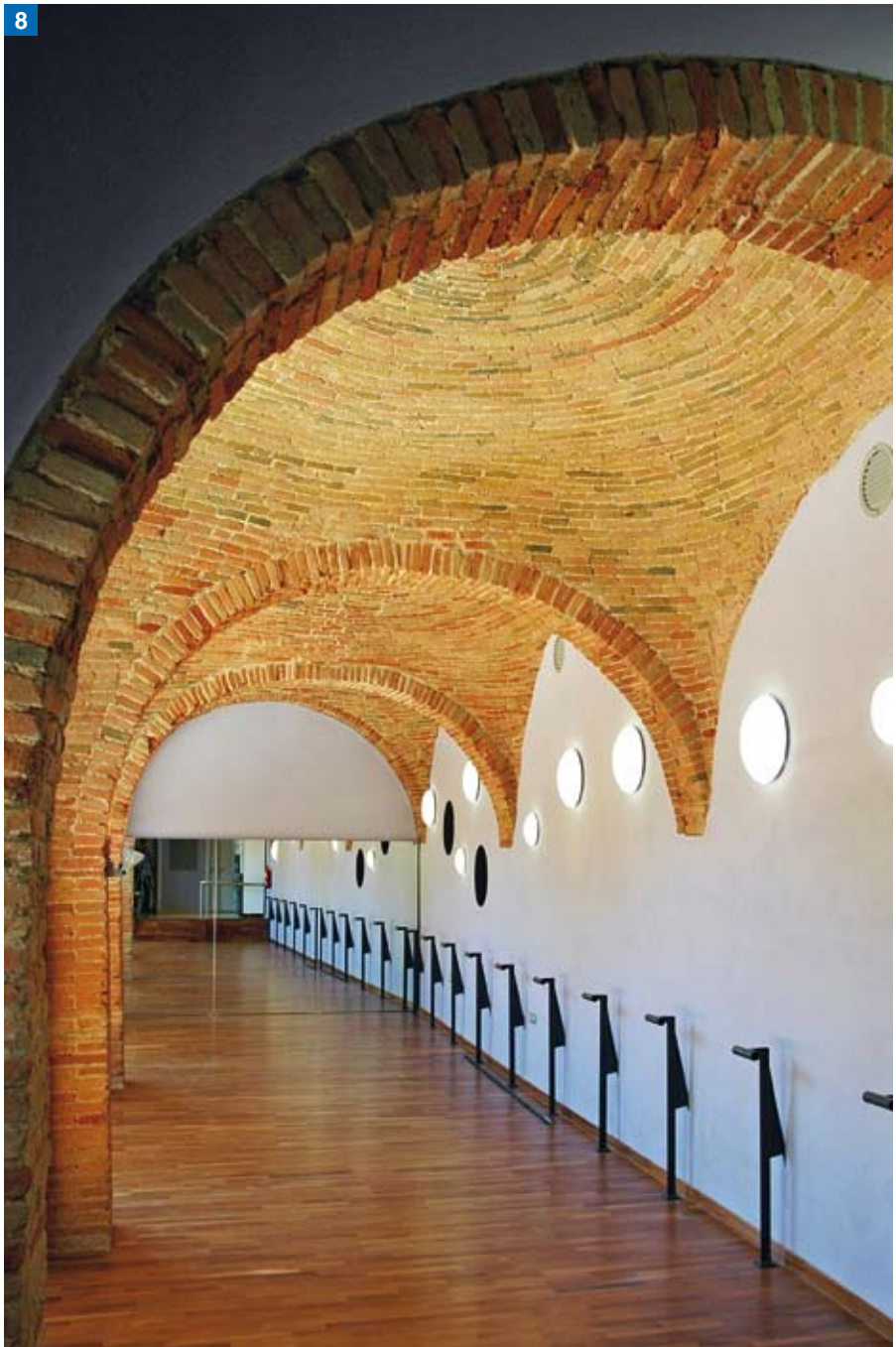

Mapei Products: *the products mentioned in this article belong to the "Building Speciality Line" range. The technical data sheets are available at the web site www.mapei.com. Mapei products for the restoration of masonry buildings and for the repair of concrete structures have been awarded the CE mark in compliance with European standards EN 1504. Mapei products for internal and external screeds have been awarded the CE mark in compliance with European standard EN 998-1.*

Mape-Antique MC (CE EN 998-1): *pre-packed, cement-free, Eco-Pozzolan-based, light coloured dehumidifying mortar for the restoration of damp stone, brick and tuff masonry.*

Mape-Antique Rinzaffo: *cement-free pre-packed, Eco-Pozzolan-based, light-coloured "salt-resistant" mortar or scratch-coat to be applied before creating dehumidifying renders with Mape-Antique MC, Mape-Antique CC and Mape-Antique LC on stone, tuff and brick substrates.*

Mapegrid G 220: *primed alkali-resistant fibreglass mesh for "reinforced" structural strengthening of stone, brick and tuff substrates.*

Planitop HDM (CE EN 1504-2, *coating* ***(c),*** *principles* ***PI, MC*** *and* ***IR; CE EN 1504-3,*** *class* ***R2):*** *two-component, high-ductility mortar, for thicknesses of at maximum 6 mm, used for "reinforced" strengthening of masonry structures in conjunction with Mapegrid G 220 and for smoothing and levelling surfaces in concrete, stone, brickwork and tuff.*

TECHNICAL DATA

Villa Florida Civic Centre, Barcelona (Spain)
Designer: Pedro de Azemar
Period of Construction: 1904; between 1936 and 1939, the building was partially rebuilt after being damaged during the Spanish Civil War

Period of Intervention: 2006-2007
Intervention by Mapei: supplying products for the restoration of the facades and consolidation of the structure of the three circular vaulted roofs
Designer and Works Director: Alberto Aguirre Arquitectos
Client: Barcelona Municipal Council
Main Contractor: Contratas y Obras
Laying Company: Jam, Vilanova del Vallés (Barcelona)
Mapei Co-ordinator: Diego Rubio, Ibermapei (Spain)