

CONCRETE PROTECTION

Flexcrete's anti-carbonation coatings have been chosen to create an architectural statement on a new build clinic in Taiwan, and previously on three historic buildings in Portsmouth, in the UK

The new clinic in Tai-Nan City, Taiwan, has been designed by the renowned Yuen Ken architectural practice. The lower two floors of the building are used as a clinic and the third floor is the Doctor's residence. The clinic has a contemporary style distinguishing the building from others in the same row and as the building is tightly sandwiched between two old buildings, the architect was seeking the use of anti-carbonation coatings to increase the aesthetics of the structure and provide the external walls with effective weatherproof protection from the humid conditions and heavy rains typically experienced in Southern Taiwan. As the building is a medical facility, it was important that any structural coatings used were non-toxic and totally safe to use in this type of environment.

Monodex coatings manufactured by Flexcrete Technologies, part of AkzoNobel, were chosen to coat the new external walls totalling 1,000m² following a recommendation by Parallel Industrial Co Ltd, Flexcrete's distributor in Taiwan. A key reason for the specification of Monodex coatings was their waterborne nature. As they cure without releasing hazardous solvents or heavy odour and are non-toxic, non-leaching and non-tainting, they could be safely and rapidly applied to this medical facility.

IMPRESSIVE PROJECT

This project is deemed so impressive that it is being put forward for the Taiwan Residential Architecture Award - an annual awards scheme run by the Taiwan Architecture publishing company which produces several architectural magazines and is regarded as the pioneer in promoting building design in Taiwan. The award is judged by 10 professional judges and projects are judged in four stages - application and eligibility, primary vote, first final vote and second final vote.

The clinic's external walls were initially coated with one coat of Bond-Prime before the application of one coat of Monodex Textured. Monodex Textured is a highly engineered, waterborne, single component, acrylic-based decorative wall coating with an attractive textured finish. As well as having an attractive textured finish, Monodex Textured is also highly protective. It waterproofs surfaces for at least 10 years, yet allows high levels of entrapped substrate moisture to escape without causing blistering or delamination. It also incorporates an advanced in-film, non-leaching biocide, inhibiting the growth of mould and algae for many years, and is able to withstand substrate and thermal movement without cracking or flaking.

In order to achieve the desired finish for this project, Monodex Textured was overcoated with Monodex Ultra. Monodex Ultra is a rapid drying, minimal VOC, elastomeric water-based coating with a smooth, matt finish. Able to extend the service life of both newly constructed and existing buildings, it is ideal for the external decorative protection of facades, soffits and elevations of structures in temperate and tropical climates. Flexcrete's Monodex coatings are available in both standard and special colours, of which white and dark red were selected by the architect to maximise the aesthetics of the building.

PREVIOUS REFERENCES

Previously, the structural facades of three prominent buildings and structures along Portsmouth Harbour were protected using Flexcrete's coatings, including the city's tallest structure, the 170m (558 ft) tall Emirates Spinnaker Tower. The other two buildings are Europa House which counts as the sixth tallest building in Portsmouth at 64m (207 ft) and Boathouse 4, an iconic building within Portsmouth Historic Dockyard.



Flexcrete's anti-carbonation coatings have been chosen to create an architectural statement on a new build clinic in Taiwan



The Emirates Spinnaker Tower (top) and Europa House (bottom) were previously painted using coatings from Flexcrete

The Tower was painted in Flexcrete's Monodex Smooth coating in blue and white for the Louis Vuitton America's Cup World Series. Monodex Smooth is a water-based, high build, elastomeric, decorative coating which was specified due to its protective properties, fast curing nature and ease of application by brush, roller or airless spray. This was crucial as the coating was applied by specialist access contractors The Abseilers Limited, so they were able to rapidly apply the coating by brush and roller to the concrete legs of the structure whilst

using roped access equipment and techniques. The coating of the concrete legs complements the existing AkzoNobel International coating applied to the steel elements of the structure.

The bottom 50m of the concrete legs were painted in a special Portsmouth blue colour, and white above. It was then decided to enhance the appearance even further by requesting a supply of Emirates' individual corporate metallic gold colour to cover a large central section of the Tower. This led to Flexcrete developing Monodex Metallic, the world's first metallic anti-carbonation coating which is applied as a lustrous feature finish over an existing Monodex Smooth base coat.

Monodex Metallic and Monodex Smooth are both single component, water-based coatings so are user-friendly and cure without the release of strong odour or hazardous solvents. They are ultra-fast drying, enabling two coat applications on the same day and can be applied all year round. Throughout their lifetime, they have excellent colour retention and strong UV resistance. Both standard and special colours can be created.

EUROPA HOUSE PROTECTION

Another Flexcrete coated building in close proximity to the Emirates Spinnaker Tower is Europa House, an 18-storey tower block which was formerly the headquarters of Pall Europe. It had remained empty for some time before it was acquired by Empiric Student Property to develop into high quality student



accommodation to cater for the growing student population at the University of Portsmouth.

Monomix – a high strength, shrinkage compensated, waterproof cementitious mortar – was used for concrete repairs initially. Rapidly applied by trowel, it can be applied up to thicknesses of 80mm in a single application. It develops exceptional bond strength, excellent tensile and abrasion resistance, high diffusion resistance to acid gases and chloride ions and low permeability to water, even at 10 bar pressure.

Monodex Smooth coating was also specified to provide anti-carbonation and decorative protection. One of the primary reasons for specification is that the coating could be applied at a temperature of 3°C, and rising, and a minimum of 2°C, above dew point, which outperformed competitive products. Monodex Smooth has an anticipated minimum service life of 15 years and provides the equivalent of 300mm concrete cover and 279% elongation to accommodate cracks. The main contractor for the project at Europa House was Midas and the application work was carried out by Southern Joint Services (SJS) and Richardson Decorating.

BOATHOUSE PROTECTION

The third Portsmouth structure protected with Flexcrete coatings is Boathouse 4 which was constructed during the 1930's rearmament period. It forms part of the UK's maritime heritage and was used during World War II to construct the three man midget X-Craft submarine. In 2014, Portsmouth Naval Base Property Trust (PNBPT) received a £3.75m grant from the Heritage Lottery Fund to transform the historic building into the Boatbuilding and Heritage Skills Training Centre. The Centre opened its doors to the public in April 2015 and a series of courses are delivered by the International Boatbuilding Training College Portsmouth and Highbury College.

Both internal and external concrete repairs were initially required. Fastfill was used in areas where rapid setting repairs were a priority and Monolite was used where an ultra-high build, lightweight, non-shrink cementitious mortar was required. Both can be applied up to 100mm in a single application and only require the addition of clean water on-site. Monomix HD was used where outstanding abrasion resistance was required. As all of Flexcrete's mortars are waterborne, non-hazardous and virtually



odourless, they could be safely applied during the refurbishment works whilst other trades continued as normal.

Monodex Ultra – an anti-carbonation coating with a design life of 10 years before first maintenance – was subsequently used on all concrete elevations both internally and externally. Monodex Ultra is very fast-drying and offers a cost-effective solution for the internal or external refurbishment of buildings. It incorporates an active biocide which inhibits the growth of mould and lichens, ensuring the coating retains a clean, attractive appearance throughout its lifespan. The main contractor for the Boathouse 4 project was Interserve and Flexcrete products were applied by QST Construction Services Ltd. ■