Facilitate

BELZONA'S FACILITIES MAINTENANCE NEWSLETTER

NOVEMBER 2010

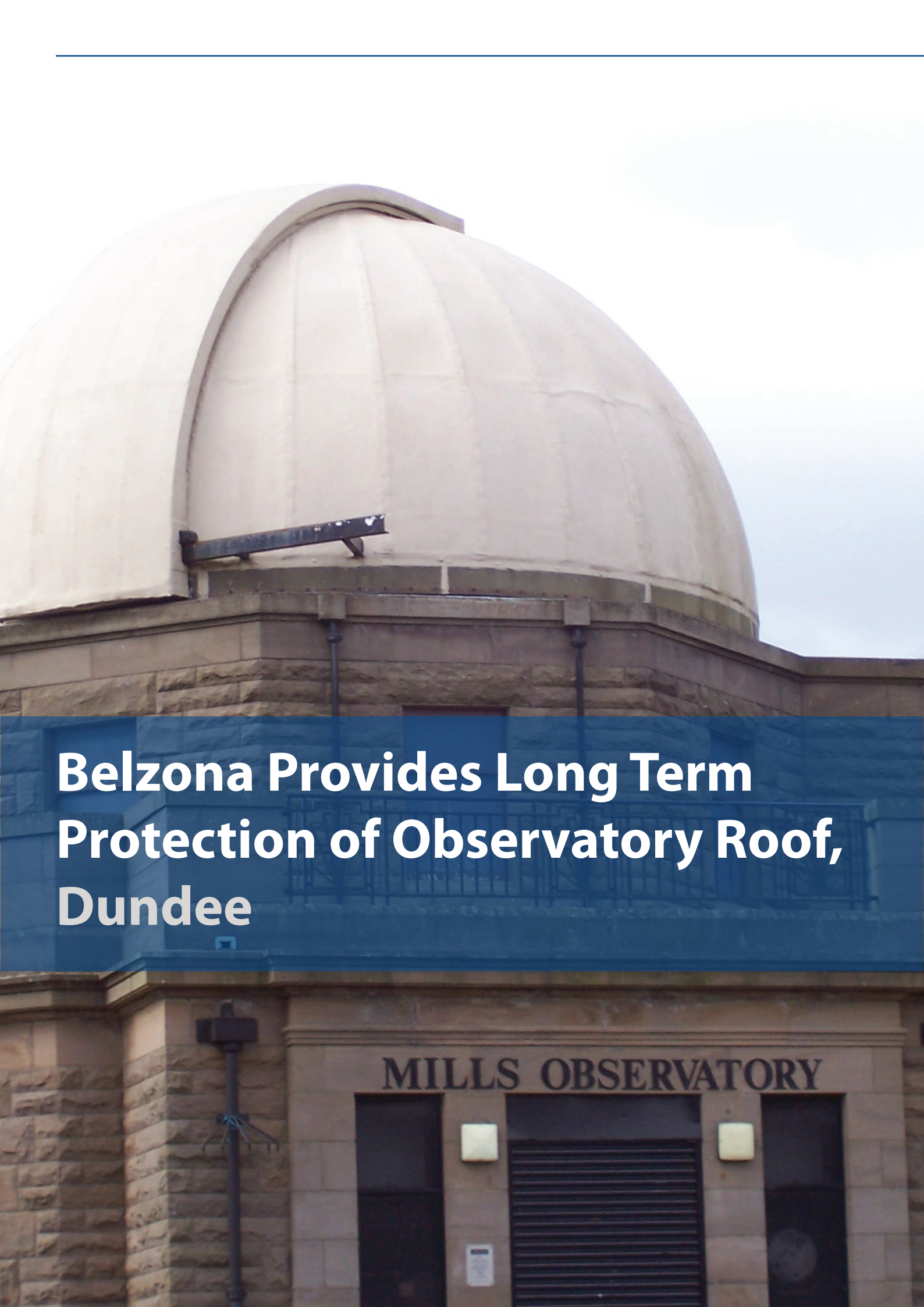
INSIDE FACILITATE

Prevent Theft of Lead

Belzona Prevents the New Crime Sweeping Britain

BELZONA®
Repair • Protect • Improve

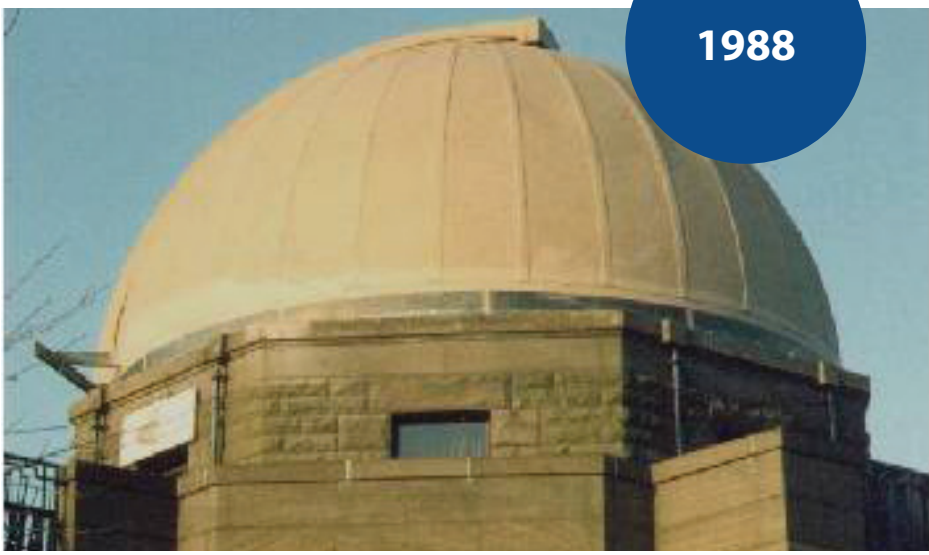
Featuring, Longevity Corner, **Authorised Contractor Profile,** Belzona Helps Restore London Landmark & Much More...



Belzona Provides Long Term Protection of Observatory Roof, Dundee

In 1974 the famous Mills Observatory in Dundee, Scotland was suffering severe maintenance problems caused by water ingress into the delicate dome structure. If the damage was left untreated, a number of further structural defects may have occurred which could result in costly implications including further expensive replacement costs, disruptive structural work, safety hazards and reduced life of structure.

After an inspection of the roof, Belzona specified one of their roof repair and protection systems which would prevent water ingress into the dome and reduce further maintenance costs.



A fully reinforced Belzona 3111 (Flexible Membrane) System was originally applied in 1974. This is a single component solvent free microporous coating for the long term repair and protection of all types of roofs. This versatile liquid applied material provides outstanding weatherproofing and waterproofing properties with excellent protection against infrared and ultra violet radiation and lends itself to application onto complex contours.

Following this original Belzona application, the roof was refurbished in 1988 with a single layer of Belzona 3111 (Flexible Membrane) to assure complete weatherproofing for future years. To provide enhanced appearance Belzona 5151 (Hi-Build Cladding), an exterior coating with self cleaning properties was applied in 2003.

Re-visiting again in 2010, the Belzona system is still in excellent condition providing complete weather protection to the roof structure, building fabric, interior décor and equipment. At the same time, the self cleaning properties of the Belzona 5151 (Hi Build Cladding) have maintained this landmarks pristine appearance.

The Mills Observatory is the only full-time public astronomical observatory in the UK. Built in 1935, the Observatory is classically styled in sandstone and has a distinctive 7m dome which houses a Victorian refracting telescope, a small planetarium and display areas. The dome is the only surviving Observatory dome in the world made from papier-mâché. Today, more than 10,000 people a year now visit the Observatory and make use of its unique facilities.

“Re-visiting again in 2010, the Belzona system is still in excellent condition providing complete weather protection to the roof structure, building fabric, interior décor and equipment.”

Application in 1974

Belzona Helps Restore Famous London Landmark

Belzona together with Blunt Construction Limited one of Belzona's Approved Specialist Applicators have recently completed a project by applying a Belzona high performance liquid applied membrane system as a lead alternative to help restore one of London's historic landmarks, The Monument.

The works are part of a much larger £4.5 million project, carried out by Principal Contractor CWO Ltd and funded by the owners of The Monument; The City of London Corporation to restore the famous structure built in 1678 and dedicated to the 1666 Great Fire of London.

This is one of four listed historic buildings where Blunt Construction and Belzona products have been specified by Julian Harrap Architects. Julian Harrap, Principle for Julian Harrap Architects explained,

"We have previously worked with Blunt Construction applying Belzona products on the refurbishment of the listed early 20th century wind tunnels at Farnborough over a period of five years in which we had a productive and cooperative relationship. This application was also supported by the Belzona Technical department. We felt that the repair to The Monument was another opportunity in which we could work with Blunt Construction. The Belzona solutions helped avoid the need to replace lead flashings which would be expensive and potentially damaging. The Belzona product's weatherproofing capability is beneficial for safe guarding the Portland stone for the foreseeable future."

Blunt Construction's Specialist Applicators began preparations by carefully cleaning and light abrading to the existing Portland Stone surface. Following this, the surface was cleansed of dust ready for application of the product. One coat of Belzona 3931 (Porous Surface Conditioner) was applied to the prime stone surface ensuring that the coating was retained within the agreed area which would help ensure high adhesion of the Belzona 3131 (WG Membrane). Belzona 3131 (WG Membrane) was chosen as it would provide an alternative to lead that would fully encapsulate and protect the sandstone from future deterioration.

Once the surface was fully prepared, a first coating of Belzona 3131 (WG Membrane was applied by brush, reinforced with a layer of Belzona 9351 Mesh. The liquid base of the Belzona 3131 (WG Membrane) binds to the reinforcing sheet to form a tough, flexible and elastic polymeric film which can tightly follow all contours and provides greater strength and resistance to cracking.

Following this, a second layer of Belzona 3131 (WG

Membrane) was applied, again reinforced with Belzona 9351 mesh ensuring that the joints overlapped. This was repeated once again with the Belzona 9351 mesh. To complete the application, a further two coats of Belzona 3131 (WG Membrane) was applied, this time, specifically colour customised to match the rest of The Monuments Stonework.

By using a cold applied cost effective repair and protection system, this innovative Belzona membrane also provides an excellent lead alternative with weatherproofing capabilities, subsequently preventing moisture ingress and future deterioration. This solution is at a fraction of the time and cost of using lead.

AUTHORISED CONTRACTOR

A.R.G. (MANSFIELD) Ltd

We are a 16 year old privately owned general construction company, operating generally throughout the East Midlands region with an extremely wide and varied client base.

On a day to day basis we can be called upon to attend Education and Health establishments, Police stations, Fire stations, Ambulance stations, Churches as well as some well known high street names and Local Authorities, to carry out a variety of tasks.

Armed with the vast array of Belzona Polymeric repair composites and industrial protective coatings we are always confident that we can complete the required tasks and leave the client totally satisfied with our services.

In recent times we have been called in on numerous occasions following the "Tar and Feather" brigade ie: Bodge it and Scarper Ltd. Trying to deal with flat roof problems which are usually poor details around penetrations. The stock reply from clients is generally that we have lived with this problem for years and each time it is "repaired" as soon as we have bad weather the "repair" leaks again and we start the whole process again. When we are given the opportunity to deal with these problem areas the clients soon realise that they have spent a lot of wasted money over the years without anything to show for it.

We are increasingly getting involved with metal roofs which are typically failing at cut edges and fixing points. The fixing points fail due to mechanical and thermal movement which enlarge the fixing holes and damage the seals. Belzona 3131 (WG Membrane) or 3111 (Flexible Membrane) are the answer and the clients cannot believe the finished repairs.

In recent times we have been involved with repairs to copper clad roofs at Nottingham Trent University and Belzona 3111 (Flexible Membrane) bright green has been the answer to the Universities facilities management.

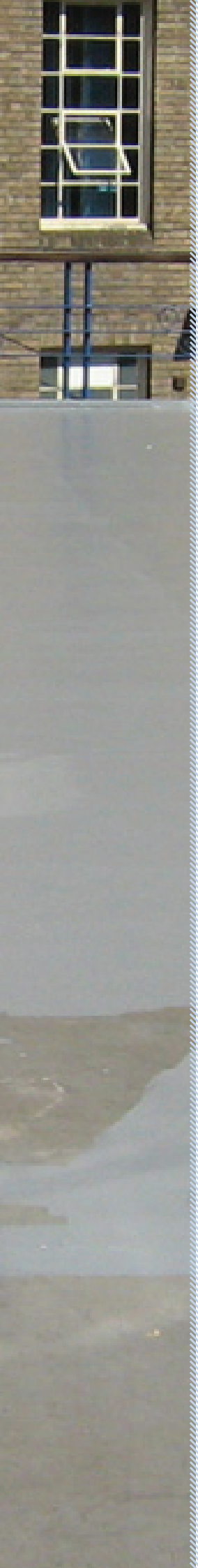
Clients are slowly realising that roof repairs need to be carried out correctly using high performance materials which are applied to the best possible standards.

Currently more than 50% of Europe's construction budget is being spent on the repair and refurbishment of existing structures.

We have, over the last six years, carried out a total of 10 No. refurbishments to various Fire stations throughout Nottinghamshire which incorporated a fair amount of Belzona products in them, much to the benefit of all concerned.

WORDS: ALLAN GREGORY, Managing Director of A.R.G Mansfield

Works in Progress on a canopy at Central Nottinghamshire Police Station using Belzona 3131 (WG Membrane).



Long Lasting Concrete Repair and Protection from Belzona

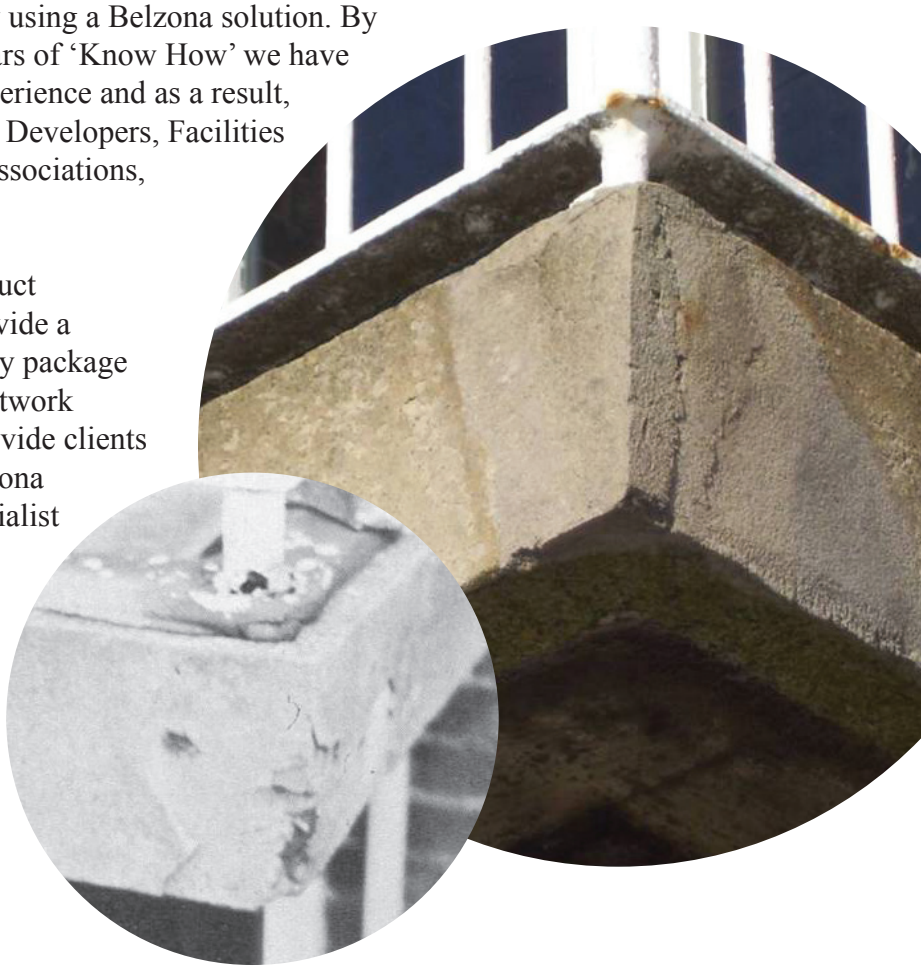
Walls, stairs, roofs, lintels and other structural members are all susceptible to deterioration through attack from carbonation. If the deterioration is not addressed the integrity of the concrete will be seriously undermined with the potential for structural failure, environmental damage and safety hazards.

Gordon Cairns, National Sales Manager for Belzona explains, “These costly after-effects can easily be avoided by using a Belzona concrete repair and protection solution. By utilising a cold applied cost effective repair composite, concrete structures can now be repaired and protected from carbonation. This preservation and long term protection of the concrete eliminates possible structural failure and safety hazards.’

In 1980, Belzona was asked to repair this concrete balcony that had suffered from spalling due to the detrimental effects of the environment. Belzona specified their product Belzona 4141 (Magma Build), a two component, lightweight system for rebuilding damaged vertical and overhead concrete which was used to repair the damage.

Twenty seven years later, Belzona revisited the application to find that it was still in excellent condition, with no signs of further spalling, carbonation, shrinkage or cracking.

Gordon Cairns further commented, ‘This application is a perfect example of the longevity achieved by using a Belzona solution. By utilising Belzona’s 58 years of ‘Know How’ we have gained many years of experience and as a result, confidence from Property Developers, Facilities Managers and Housing Associations, Specifiers worldwide. ’



Belzona is not just a product manufacturer but can provide a complete supply and apply package through its contracting network specifically created to provide clients with direct access to Belzona quality products and specialist application services from a single source. It is Belzona’s mission to meet specialist repair and maintenance needs in its target industries and markets worldwide.

FIGURE 1.2

TECHNICAL ARTICLE

CONCRETE REPAIR

Effective repair of concrete is an essential factor in achieving and extending the efficiency of any building or structure.

We generally think of concrete as a modern building material, yet it is one of the oldest and most durable building materials dating back as far as the Romans. Since then, the practice has developed to such an extent that reinforced concrete is now one of the major structural materials available to the construction industry and is proved successful in both performance and durability. Regardless of this success however, there are still many examples of failure of concrete units as a result of premature reinforcement corrosion.

Reinforced concrete is vulnerable to attack from a number of different elements such as abrasion, impact, vibration, chemicals and pollution. It is due to its porous nature and weak electronic forces which hold individual cement crystal together that it will deteriorate and corrode. The high pH value of the concrete pore structure provides a protective coating of oxides and hydroxides on the surface of the steel reinforcement. Without this layer, which is known as a 'passive' film, the steel would be exposed to the air and moisture in the pores, leading to rapid corrosion. It is the main reason why reinforced concrete is a durable construction material. However, the passive layer itself can be attacked by chlorides in salt and the alkalinity of the concrete can be reduced by reaction with atmospheric carbon dioxide, a process which is known as carbonation.

Carbon Dioxide which is constantly present in the air dissolves in water to form a mildly acidic solution. Unlike other acids that may chemically attack and etch the surface of the concrete, this acid forms within the pores of the concrete where the carbon dioxide dissolves in any moisture present. As this reacts with the alkaline substrate, the pH value drops and moves as a front through the concrete. When it reaches the reinforcing steel, the passive layer decays exposing the steel to moisture and oxygen making it susceptible to corrosion.

For denser concrete, the rate of carbonation will be low and, given an initially appropriate depth of cover, steel will remain protected from corrosion throughout the life of the structure. However, if the concrete is permeable, or severely cracked, paths will be available for the access of atmospheric gasses, leading to increased depth of carbonation with consequent corrosion of the reinforcement.

FIGURE 1.3

Completed Application

FIGURE 1.1

Corrosion of the reinforcing bars can ultimately cause spalling and eventually the breakdown of concrete.

Deterioration through carbonation of concrete has become an increasing problem in buildings and structures; however the extent of the damage can greatly vary depending on a number of different factors such as quality of the cement, the grading and choice of aggregates, the amount of care that was taken during mixing and pouring and the depth of concrete over the reinforcement. In addition to this, over the years, there has also been an increase in atmospheric acidity and this, together with poor quality concrete, has lead to carbonation being a major problem in concrete structures today.

Belzona Polymerics Ltd, a design and manufacturer of industrial protective coatings and polymer repair composites provides a solution to the repair of damaged concrete. Belzona 4141 (Magma Build) is a two component lightweight, non porous concrete repair material specifically designed for rebuilding severely damaged or worn vertical/ overhead concrete surfaces. It is important that Belzona 4911 (Magma TX Conditioner) is used before application of Belzona 4141 as required for maximum adhesion.

This high build repair system has been found to be particularly effective not only in rebuilding spalled areas of concrete, but also as a corrosion preventative system on exposed reinforcing bars due to it's impermeability to water and chemicals. It requires no form work or supports and requires minimal access to equipment. Other added benefits of repairing concrete with Belzona 4141 (Magma-Build) are it's non-shrinking and impermeability leading to permanent repairs. The fast cure and ease of application allows economical repairs to be carried out with the minimal amount of scaffolding.

By way of a case study, Figure 1.1 shows the concrete lintels of a Housing Authority that had spalled badly due to environmental damage, revealing the reinforcement bars underneath. The Housing Authority was fitting new windows and their requirement was that the repairs were carried out quickly and effectively as the appearance was becoming unacceptable.

Belzona 4141 (Magma-Build) was an ideal product for this application in particular due to the shape and size of the repair areas and colour matching as near as possible to the substrate. As the application would have to be carried out on a vertical level, Belzona 4141 (Magma-Build)'s lightweight properties are designed specifically for these types of applications requiring no support work.

Before beginning the application, the damaged area had to be cleaned and prepared. All loose material from the lintel was removed either by hand or using a wire brush. Belzona 4911 (Magma TX Conditioner) was then applied to all areas that could be repaired. The Belzona 4141 (Magma-Build) product requires no specialist tools so was hand applied and moulded to the shape required. Figure 1.2 demonstrates the Belzona 4141 (Magma-Build) being applied.

The Belzona solution was chosen as the best way to affect a very quick and simple repair that could be done all at once without the need for formers to be left in place. The ability of Belzona to protect and resist further spalling was also a prime consideration of the client. Alternative was the use of traditional sand/ cement mortars that would have lacked future protective performance and would have required a much wider time frame to complete. This scheme saw 20 lintels of around 2 metres each complete in just less than three days. Figure 1.3 shows the end result.

This small case study shows just one of the many applications that Belzona 4141 (Magma-Build) can be used for. Other common application areas are stonework, roof ledges, bridges, canopies and pump pedestals. The Belzona product range is manufactured to stringent quality and environmental control guidelines complying with the internationally recognised requirements of ISO 9001:2008 and ISO 14001:2004.

Prevent Theft of Lead

There is a new crime sweeping Britain as thieves strip millions of pounds of lead flashing from buildings to sell on to unscrupulous dealers, as the demand for it is soaring. Thousands of properties, including many churches and historic buildings have been targeted so far, and as a result, the damage costs can be extremely expensive. With the cost of lead set to remain at record highs, the lead theft problem shows no sign of going away soon.

In response to this problem, Belzona are offering a liquid applied polymeric membrane system for the long term repair and protection of lead work. In addition to the major issue of theft, lead is also susceptible to damage and deterioration through attack from extreme weather conditions due to being a commonly exposed area of any building.

By utilising a cold applied repair and protection system, lead work can be fully encapsulated resulting in a highly effective theft prevention system. This Belzona membrane also provides weatherproofing capabilities, subsequently preventing moisture ingress and reducing deterioration which results in long term roof protection and preservation of lead.

By way of example, in 2008, this local school had recently suffered from theft of the lead from their roof. The damage was so extensive that if not addressed, it would lead to structural defects resulting in a potentially disruptive high cost maintenance repair.

A Belzona local representative was contacted to provide a cost effective solution to repair the damage and to protect against future deterioration the lead work. The repair was completed in just less than one week. Revisiting the application in 2010, the school has not experienced any further problems, and the repair is still in service and in excellent condition.

Please complete the form below for your FREE Belzona survey

BELZONA®
Repair • Protect • Improve

1. What is the problem area?

○ Roof ○ Wall ○ Floor ○ Structural Metal ○ Other

If Other Please State:

2. Is it inside or outside?

_____

3. What is the environment around the area?

○ Clean Air ○ Polluted Air ○ Splashed with Chemicals

○ Partly Immersed in Water or Chemicals ○ Totally Immersed in Water or Chemicals

○ Other

If Other Please State:

4. What is the total area to be treated?

_____

5. What is the substrate?

_____

6. What is the condition of the substrate?

○ Dirty ○ Rotting ○ Painted ○ Millscale ○ Porous ○ Greasy/ Oil

○ Cracked ○ Moss ○ Powdery ○ Blistered ○ Corroded ○ Leaking

7. Is the area subject to-

○ Stress ○ Impact ○ Abrasion ○ Point Loads ○ Pedestrian Traffic

○ Vehicular Traffic

8. What alternatives have been used previously?

_____

_____

9. What alternatives are being considered now?

_____

_____

10. Do you have contractual arrangements and contractor?

_____

_____

Please complete the return address on the back of the survey, Thanks.

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