



SIKA AT WORK

GOLDFINGER HOUSE, SOLIHULL

CONCRETE REPAIR:

Sikagard®-550W
Sikagard®-545W
Sikagard® 680 S
Sika® Monotop®-615
Sika MonoTop®-3020
Sika® Monotop®-4012
Sika® Galvashield® XP
Sikagard®-706 Thixo
Sikadur®-41 CF Normal
Sika® Parex E33

BUILDING TRUST

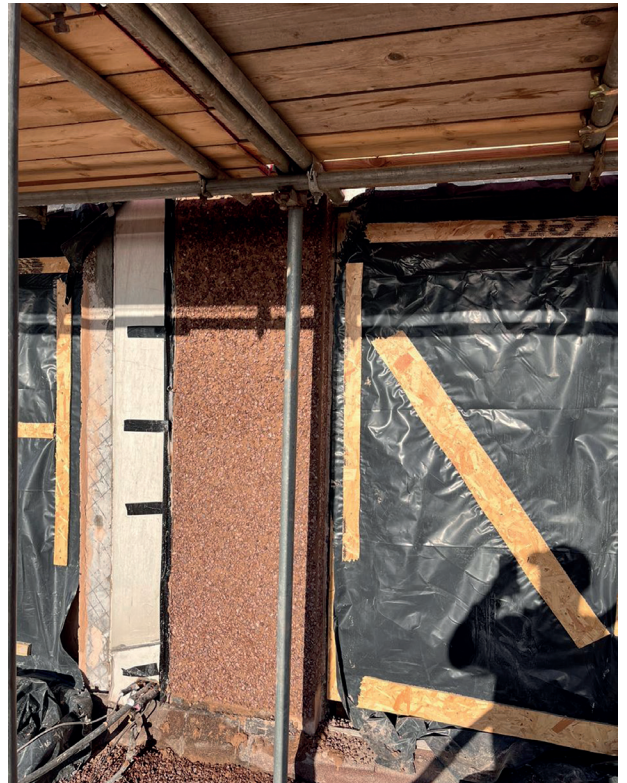


GOLDFINGER HOUSE, SOLIHULL



AT A GLANCE

WHEN A BUILDING CONDITION SURVEY OF GOLDFINGER HOUSE BY CHARTERED BUILDING SURVEYORS BAILLIE KERR REVEALED SERIOUS STRUCTURAL DEFECTS, IT TURNED TO SIKA TO RECOMMEND PRODUCTS FOR THE REMEDIATION WORKS.



Sika® and Baillie Kerr worked closely together to create the best specification for the listed building owned by the Chartered Institute of Payroll Professionals (CIPP).

Baillie Kerr then appointed Gunite (Eastern) to carry out the required renovations. All three companies worked closely together during the works to ensure the specification continued to be workable and in order to make any necessary amendments such as switching to Parex Reproface to protect the listed building requirements.

The Challenge

The iconic Goldfinger House was designed by Hungarian-born architect Ernő Goldfinger, known for his brutalist tower blocks built to combat Britain's post-war housing crisis. On 24th November 1995, it had become a listed building, requiring Solihull Borough Council's conservation officers to be consulted on refurbishment works.

Renowned Chartered Building Surveyor Baillie Kerr engaged specialist concrete testing company Martech to undertake a detailed abseil concrete survey and also testing of the concrete elements to the building. This revealed numerous defects including coating failures, carbonation and chloride issues which had caused corrosion and led to delamination and spalling. The report stated, "It is important that a proprietary concrete repair system with a good track record be used in conjunction with a specialist contractor."

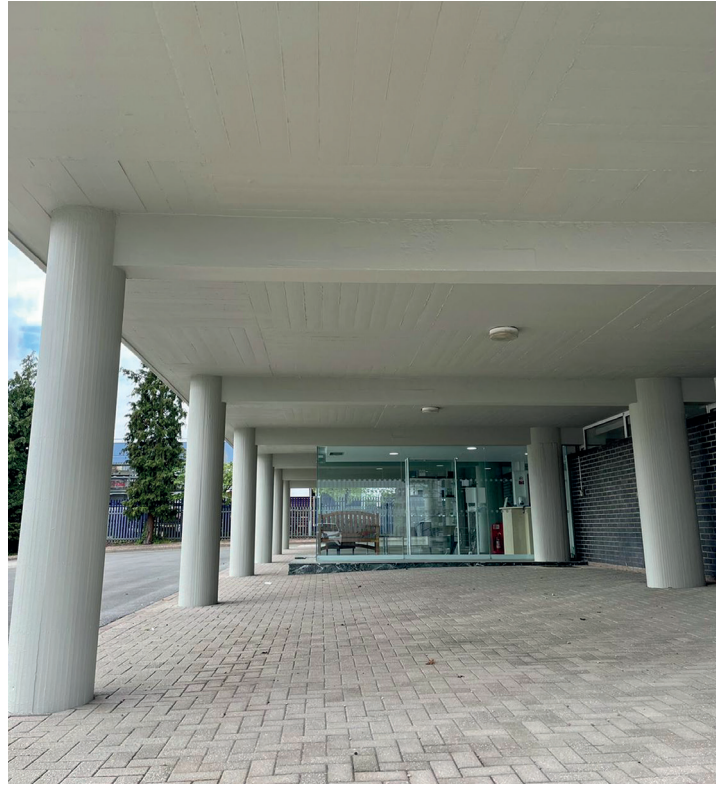
Consequently, Baillie Kerr consulted Sika, the global leader in specialist chemical-based products that protect buildings and make them stronger. Sika's technical experts conducted site visits and recommended further testing before recommending solutions to fix the issues identified and rehabilitate the building structure.

As leaders in the field of concrete repair and with first-hand knowledge of the building, Gunite (Eastern) was appointed as lead contractor.

Being a listed building, the appearance of Goldfinger House could not be changed by the refurbishment works and the need for colour-matching of standard concrete and aggregate panels proved a particular challenge.

An external spiral staircase on the side of the building descending from a fire exit to the ground presented an unexpected complication. Tests showed the steel staircase was high in chlorides and at risk of corrosion. As the structure is a considerable distance from the sea, Sika suspected de-icing salts were the most likely culprit.

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The solution

The project's complexity demanded rigorously tested, proven and innovative products to meet the added challenges posed by listed status. With over 33,000 employees worldwide and 84 global, local and regional R&D facilities dedicated to materials research, Sika rose to the challenge.

Sika specified a Total Corrosion Management solution, comprising steel and concrete primers, repair mortars, galvanic anodes, corrosion inhibitors and protective coatings, which would repair the structure while maintaining its listed aesthetic.

To meet project requirements for colour-matched concrete and sustainability, the following Sika Sustainability Portfolio Management (SPM) products - which reduce emissions and make a direct contribution to LEED v4 Green Building requirements - were among those chosen:

- Sika MonoTop® -1010 - A new high performing and sustainable bonding primer and corrosion protection slurry for concrete repair and protection, containing fly ash as a supplementary cement material (SCM). The replacement of Portland cement with fly ash results in an approximate 25% reduction in Global Warming Potential (GWP).
- Sika MonoTop® -4012 - This one-part, cementitious, fibre reinforced, low shrinkage repair mortar also contains recycled raw materials.
- Sika MonoTop® -3020 - This one-part cementitious, polymer-modified, low shrinkage surfacing and finishing mortar contains recycled SCM and produces less dust than similar materials.

The specification also included various corrosion management products, protective coatings and primers.

Sika's approach was to break the structure down into coated and uncoated elements and those with aggregate panels so the correct solutions could be used to address the various issues. While a project would normally have one specification, this process resulted in **seven different product specifications**, making it unusually complex.

With sustainability a priority, the innovative Sika MonoTop® concrete repair system was chosen for its effectiveness and sustainability credentials - **saving up to one tonne of CO₂ per 100m²**.

However, as the MonoTop® -4012 repair mortar dried darker than the substrate concrete, it was visibly different. To match the substrate colours Parex (a Sika company) Reproface was used as a finishing mortar. Elsewhere, protective coatings were used to match the colour without compromising long-term durability.

As for the spiral staircase, typically anodes would be an effective solution in a chloride contaminated environment, but the stairs' size meant these would not fit. Sika thought creatively about possible alternatives and supported by data, determined judiciously placed Margel capsules would be effective within these areas through releasing corrosion inhibitors over a period of 12-48 months, creating a well bonded layer of corrosion inhibitor around the reinforcing steel. This would result in a passivated protective layer reducing exposure to chlorides, water and oxygen.

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Results

The choice of Sika's newest MonoTop® range was key to minimising the project's environmental impact. Each British Standard-approved product within the system, including the bonding primer, repair and levelling mortars, contains recycled waste materials. This led to the following CO₂ savings:

- Sika MonoTop® -1010: 3.5kg of CO₂ savings per 25kg bag x 4 bags = 14kg saving
- Sika MonoTop® -4012: 1.5kg of CO₂ savings per 25kg bag x 2 bags = 3kg saving
- Sika MonoTop® -3020: 1.5kg of CO₂ savings per 25kg bag x 3 bags = 4.5kg saving

In addition to its superior CO₂ performance, MonoTop's dust reduction technology reduces particle emissions by up to 70% during application. This not only creates a safer, less polluted environment for site operatives, but also protects the ecosystem by preventing particulates from soiling plants and machinery.

Mindful of environmental considerations, Gunite captured all dust at source to avoid releasing silica into the air, minimised water jetting, used sustainable, water-based products where available and recycled waste.

This project highlights Sika's ability to work collaboratively with multiple parties to see the project through. Sika is not just a supplier: it engages early and takes an active role in assessing which of its market-leading products best meet the structure's requirements, before advising contractors on their application. It then remains closely involved until the project's completion.

Alastair Baillie, Managing Director of Baillie Kerr summed up the successful project: ***"Sika provided comprehensive specification support services encompassing concrete repair, corrosion management and coating systems and in conjunction with the main contractor, Gunite (Eastern) Ltd, provided additional very helpful material options for matching the external aggregate facings and other finishes to this Grade 2 listed building which was predominantly protected due to its innovative architectural use of concrete."***

FOR FURTHER SUPPORT AND INFORMATION:

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