
The London Tube network fights a never-ending battle with corrosion, as environmental conditions and heavy wear combine with age. As 2013 saw the 150th anniversary of the Metropolitan Railway - the world's first underground railway – one Underground renovation project has won awards for exemplifying the theme of “heritage with strength”.

London-based infrastructure specialists Rhinoceros took on the works to strengthen underpinning and replace decorative fittings and all of the faience tiling throughout the complex structure, which includes 5 separate entrances at different levels and passes beneath one of London's busiest road intersections.

Main girders spanning station platforms were suffering from extensive corrosion, in part due to their concrete cover being less than 50mm in places. One street entrance to the subway network had also received a direct hit from a double-decker London bus, requiring extensive rebuilding, and tiles throughout the structure were badly cracked and stained.

Demolition and removal of the old tiles was followed by concrete repairs and installation of stainless steel mesh (EML) to reinforce new rendering of all walls, in preparation for re-tiling. Eml mesh was secured using 9000 Reiner Fixings, while corroded areas of steel were cleaned back to clean steel and primed with Fosroc zinc rich primer followed by concrete repairs with Fosroc Renders A finish coat of Renderoc GP approx 22mm was then applied through the Eml to provide a true base for the faience tiles. These were fixed using Ardex X77 adhesive.

The original faience tiles, in stone oatmeal colour and contrasting detail stripes, were originally made in 1935. Replacements were sourced from the original manufacturers (Shaws of Darwen, still in business). Expert work was required since long horizontal stretches had to be matched with the complex underground topography.

Parapets and plinths

Rhinoceros craftsmen concurrently cleaned, repaired and re-polished granite plinths dating from 1935 at the entrances to the pedestrian subways. These had suffered considerable deterioration and damage, not least from a number of vehicles including two London buses. Also, during WW11, a bomb had been dropped on the road above the subways causing considerable damage.

Using traditional stone mason skills and natural materials, crushed granite and marble, Rhinoceros craftsmen restored the original beauty and lustre of these stones. The new finish is a terrazzo type granolithic material, a close match to the original. A new spheroidal steel parapet was manufactured, replicating the original bronze parapet installed in 1935.

New brass handrails were installed where the originals were beyond repair, and other signage was repaired. Lighting was replaced in modern but sympathetic style, along with electrical wiring. The project was topped off with new London Underground signs following the original 1930's design.

As usual in London, all work had to be completed while maintaining passenger access through the subways.

Monument tube station was originally opened in 1884, then linked to Bank station in 1933. Its pedestrian subways carry both passengers and an additional high volume of foot traffic under the busy road junction of King William Street, Gracechurch and Cannon Streets with Eastcheap.

The work by Rhinoceros was recognized with a winning award for Craft Skills at the National Railway Heritage Awards 2013. The award, for 'craftsmanship skills in the use of materials and/or modern technology in the repair or conservation of an historic railway or tramway building or structure in any ownership' is sponsored by First Rail.

(Materials used include a range of concrete repair materials and high strength renders from Fosroc. Fixings by Reiner, Tile adhesive and grouts from Ardex, Lighting by Holophane, Stainless Steel conduit from Lasnek, cables from Anixer. Tiles from Shaws of Darwen. Specialist sub-contractors Cast Iron Welding Services for parapets, F W Hall Ltd for handrails and Rupert Harris Ltd for restoration of bronze signage. B & T Asphalt for gullies and drainage channels.)