

*SHERWIN-WILLIAMS®*

# London Covered

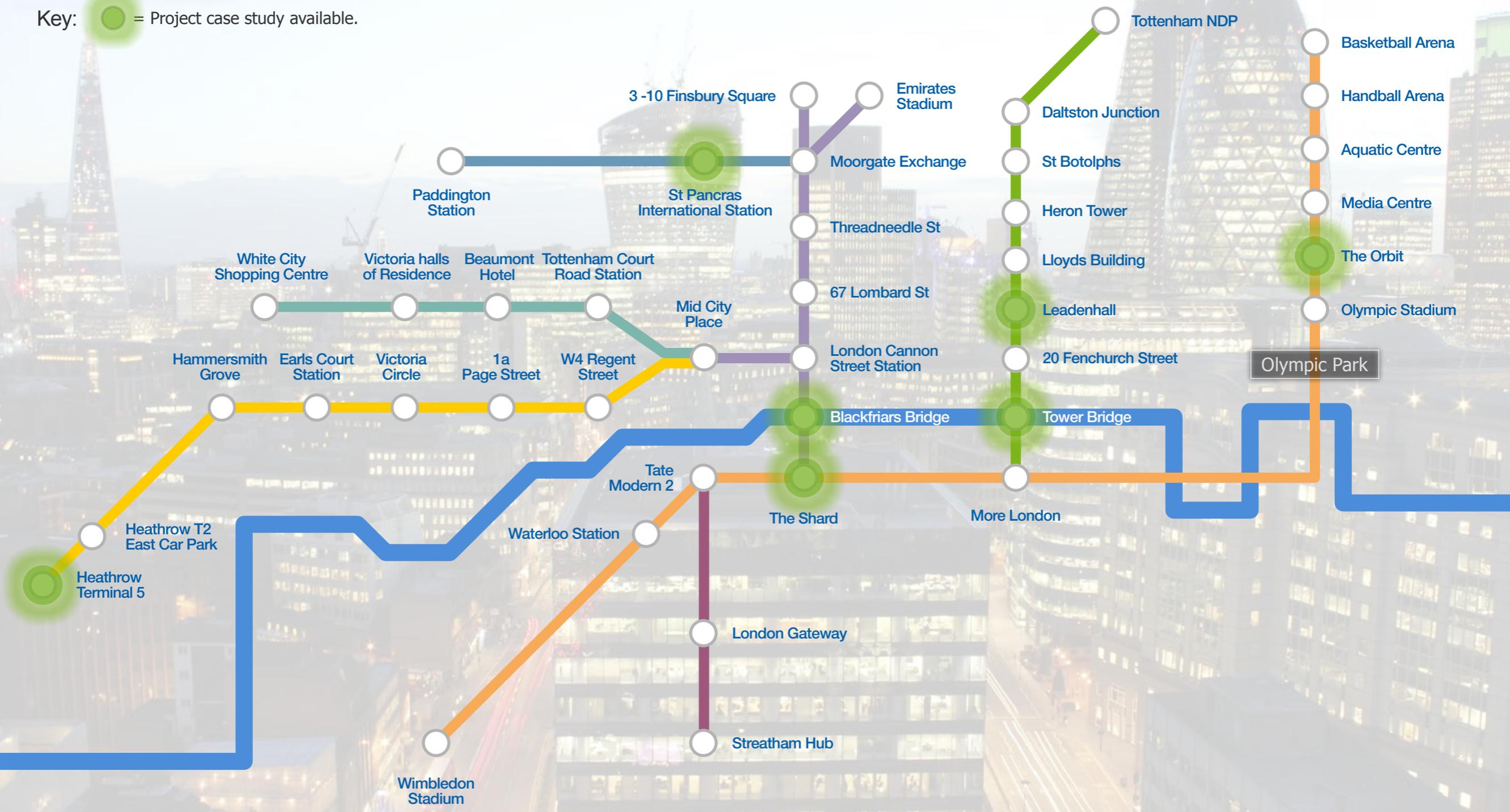
Take a look at how our coatings are used within the United Kingdom's capital city.

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# SHERWIN-WILLIAMS®

Key:  = Project case study available.



**London**  
we've got it covered

## Heathrow Airport Terminal 5

Opened in 2008, the main building complex is the largest free-standing structure in the UK, and is designed to handle 35m passengers a year.

The main terminal building is 396 m (1,299 ft.) long, 176 m (577 ft.) wide and 40 m (130 ft.) tall. Its four storeys are covered by a single-span undulating steel frame roof, and it is the size of five football pitches with each section weighing 2,200 t. The building cost £4bn to construct, with over 60,000 people involved in its construction, including Sherwin-Williams. 850,000 litres of FIRETEX® products were used in the construction of the terminal.

### Intumescent coatings for fire protection:

Substructure: F908, M78, M79 & M782

Superstructure: M78

Electrical substation: M95

Baggage Handling Area: M455, FX2000, M71V2

Windposts: FX2000, FX4000, FX8000

# Heathrow Terminal 5



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## St. Pancras International Station

Serving over 6.5m passengers each year, the undercroft area at St. Pancras International Station includes 680 cast iron columns, cross members and buckle plates.

As St. Pancras replaced Waterloo Station at the London end of the Eurostar, the decision was taken to refurbish the Main Train Shed. The paint had to protect and decorate the 140 year old structure, matching the English Heritage's original colours.

This project required a coating specification to give at least 25 years anti-corrosion protection.

### Specification Requirements:

**Undercroft:** Wet abrasive blast-clean. Epigrip M902, FIRETEX® FX1000 or FX7000 and Resistex C237. Main train shed: UHP Water blast to remove all unsound paint, Epigrip M902 and M905 and Resistex C237 at 50µm DFT.

**New train shed extension:** Blast clean to Sa2½ (BS EN ISO 8501-1), Epigrip J984 at 50µm DFT, Epigrip C401 at 125µm DFT, Resistex C237 in two coats.

### Protective coatings for anti-corrosion:

Undercroft area – Primer Epigrip M902, Top coat Resistex C237. Train shed extension – Primer Epigrip M902, Mid coat Epigrip M905, Topcoat Resistex C237.

### Intumescent coatings for fire protection:

FIRETEX® FX1000/FX7000.

# St Pancras International Station



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## Leadenhall

The building contains 610,000 sq ft of office space, incorporates 18,000 tonnes of steel.

In its concept, the structure was to have no central concrete core, with an external steel frame as well as a central steel core providing lateral stability and featuring 26 passenger lifts at its northern core. This presented numerous challenges through the construction phase for architects, engineers and for Sherwin-Williams as supplier of coatings for fire and corrosion protection. 610,000 m<sup>2</sup> of Sherwin-Williams protection coatings were used on the project. The development's tapering shape, which when viewed from the west will appear to 'lean away' from St Paul's Cathedral, delivers varied sizes of floor plates, all offering spectacular views over London.

**Intumescent coatings for fire protection:**  
C69, FX2002, M95, C237.



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# Leadenhall



## Blackfriars Rail Bridge and Station

With the River Thames below, inherent issues of dampness and humidity meant that the choice of coating would be of particular importance, because Network Rail specified a minimum service life of 25 years to first major maintenance.

All the new steelwork that formed the station canopy and the entrance/ticket halls located at each end of the bridge were coated with the glass flake epoxy protective system. In total more than 60,000 square metres of new and old iron and steel was coated. The benefits to customers using this system for the bridge and highways sector comes in terms of labour saving costs, lower energy usage and volumes of paint required.

**Protective coatings for anti-corrosion:**  
L574, M922, C137V2.



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# Blackfriars Rail Bridge & Station



## Orbit Sculpture Tower

Situated next to the Olympic Stadium the Orbit Sculpture Tower.

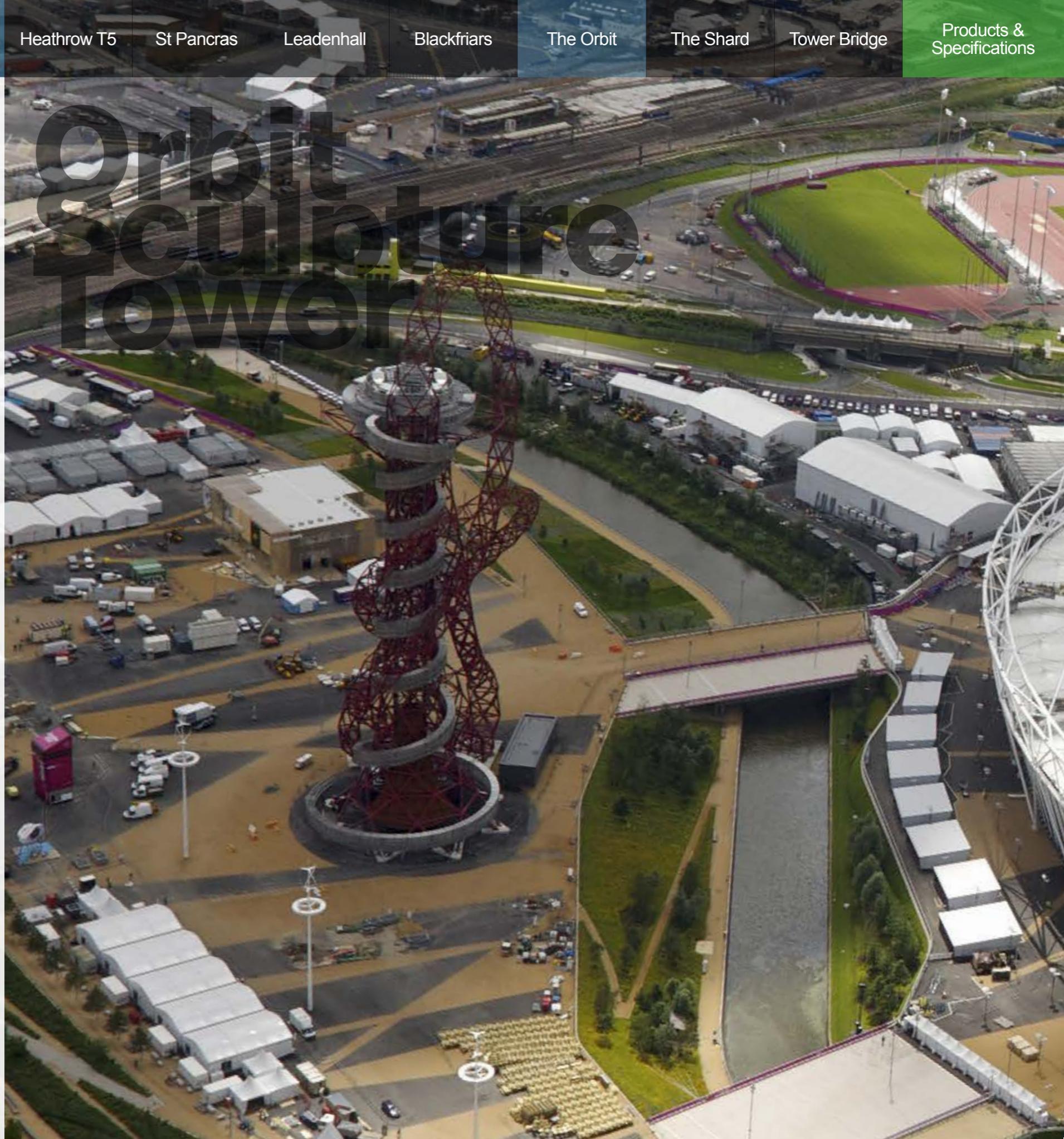
Britain's tallest sculpture at 114.5 m high, is also coated in Sherwin-Williams' coatings, as is the Olympic Aquatic Centre, Olympic Handball Arena, and Olympic Basketball Arena. The Olympic structures required a complex specification.

### Protective coatings for anti-corrosion:

C400V3, M902, C237V2.

### Intumescent coatings for fire protection:

FX1000, FX2000, FX7000, FX8000 & M72.



# Orbit Sculpture Tower

# The Shard of Glass

An aerial photograph of The Shard skyscraper in London, showing its distinctive glass facade and the surrounding cityscape, including the River Thames and other buildings.

## The Shard of Glass

Designed by the Italian Architect Renzo Piano. The Shard is a 87 storey skyscraper in London that forms part of the London Bridge Quarter development.

Standing approximately 306 m (1,004 ft.) high, the Shard is currently the tallest building in the European Union (2014). The glass tower has 72 habitable floors, with a viewing gallery and open-air observation deck on the 72nd floor, at a height of 244.3 m (802 ft.).

### Protective coatings for anti-corrosion:

C400V3, C137V2.

### Intumescent coatings for fire protection:

C69, M95/FX2002/FX4000, C137V2.

# London Heathrow Terminal 5

# Case Study

## Project

London Heathrow Terminal 5 is part of the London Heathrow Airport complex, serving the UK capital city of London. The Terminal 5 project included several new buildings; the new terminal, a control tower and railway station.

It was designed to handle 35m passengers a year and was built at a cost of £4bn.

Officially opened in 2008, the main building in the complex is the largest free-standing structure in the United Kingdom being 396 m (1,299 ft.) long, 176 m (577 ft.) wide and 40 m (130 ft.) tall. Its four stories are covered by a single-span undulating steel frame roof, with glass facades angled at 6.5 degrees to the vertical. The area covered by the roof is the size of five football pitches, and each section weighs 2,200 t.

The building's lead architects were from the Richard Rogers Partnership and production design was completed by aviation architects Pascall & Watson. The engineers for the structure were Arup and Mott MacDonald.

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# London Heathrow Terminal 5

# Case Study

## Specifications

**Substrates:** Steel

**Requirements:** To provide fire protection to the core terminal building which included substructure, roof and facade, superstructure and baggage handling steelwork.

**Substructure:**

Passive fire protection with 90 & 120 mins fire rating.

**Roof and Facade steelwork:**

Protective coatings

**Superstructure:**

Passive fire protection with 60 mins fire rating

**Electricity substations:**

Passive fire protection 120 mins fire rating

**Area coated:** 850,000 litres of FIRETEX® products

**Client:** BAA

**Main contractor:** BAA, AMEC – building services, LainO'Rourke, MSCP.

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## System

The project had multiple requirements for passive fire protection including coatings to protect over 60, 90 and 120 mins fire ratings.

A range of FIRETEX® products were selected from Sherwin-Williams to achieve appropriate fire protection to the structure. In addition the FIRETEX® range offered easier application and a more aesthetically pleasing finish to exposed steel work. These products included:

**Substructure:**

90 and 120 mins fire protection with C137V2, C237 and M71V2 topcoats.

**Superstructure:**

60 mins fire protection with C137V2, C237 and M71V2 topcoats.

**Electrical sub station:**

120 mins protection with M95.

**Baggage handling steelwork:**

M455V2, FX2000 and M71V2.

**Windposts:**

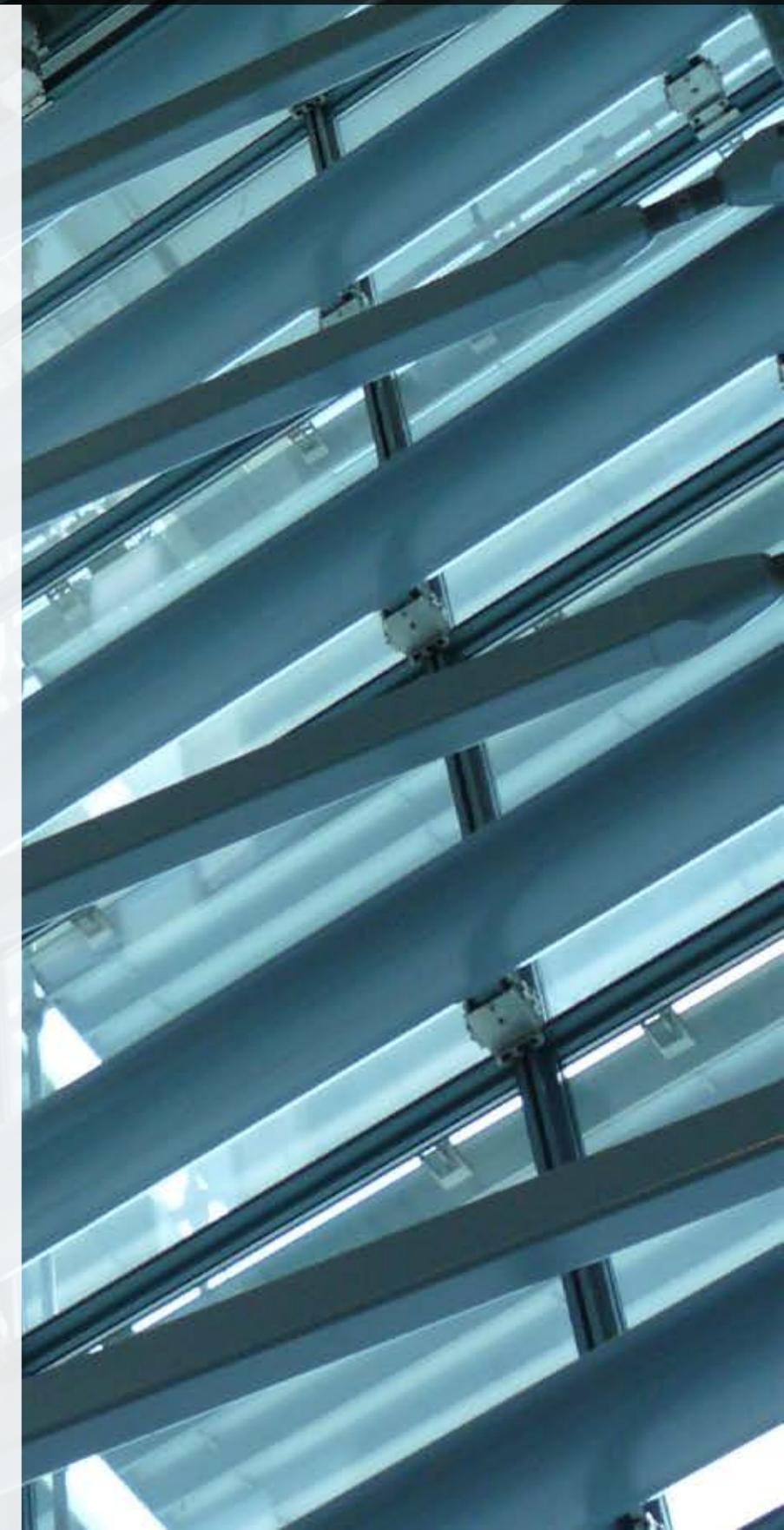
60, 90 and 120 mins fire protection with FX2000, FX4000, FX8000.

**Roof steelwork and internal facade:**

C400V2 and C237.

**External facade:**

J984BS, C400V2 MIO and C137V2.



# St. Pancras International Station

# Case Study

## Project

Serving over 6.5M passengers each year, the undercroft area at St. Pancras International Station includes 680 cast iron columns, cross members and buckle plates, all of which require 60 minutes fire protection. These cast iron columns support the rail deck and platforms for the Eurostar trains, and house a number of shop units and cafés.

With St. Pancras replacing Waterloo Station as the London end of the Eurostar, the decision was taken to refurbish the Main Train Shed. The paint had to protect and decorate the 140 year old structure, matching the English Heritage's original colours.

The new 'train shed' was constructed to replace the existing one whilst the maintenance work was carried out. Now complete, the train shed will become the terminal set to serve trains from the North. This project required a coating specification to give at least 25 years anti-corrosion protection, 60 minutes passive fire protection to a preferable finish.

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# St. Pancras International Station

# Case Study

## Specifications

**Substrates:** Steel, cast and wrought iron

**Requirements:**

To provide anti-corrosion protection and decoration as well as 60 minutes fire protection to the Undercroft area.

**Specifications:**

Undercroft: Wet abrasive blast-clean followed by Epigrip M902 at 100µm DFT, FIRETEX® FX1000 or FX7000 to required Dry Film Thickness (DFT) and Resistex C237 at 50µm DFT

**Main train shed:**

UHP Water blast to remove all unsound paint, Epigrip M902 and M905 at 100µm DFT and Resistex C237 at 50µm DFT

**New train shed extension:**

Blast clean to Sa2 ½ (BS EN ISO 8501-1), Epigrip J984 at 50µm DFT, Epigrip C401 at 125µm DFT, Resistex C237 in two coats.

**Area coated:** Total area approximately 150,000m<sup>2</sup>

**Client:** London and Continental Railways

**Main contractor:** CORBER (Costain, Laing O'Rourke, Bachy and Emcor Rail)

**Consultant engineer:** ARUP

## System

The system selected for the undercroft comprised: Epigrip M902 applied at 100µm for anti-corrosive properties, followed by FIRETEX® FX1000 or FX7000 to give 60 minutes fire protection, and Resistex C237 which has excellent colour and gloss retention properties. All the iron was prepared with a wet abrasive blast-clean.

The paint system for the main train shed was selected due to its Network Rail certification and approval. Ultra high pressure water blasting was used to prepare the surface, the coating system consisted of Epigrip M902 followed by Epigrip M905 (both at 100µm) and then covered with the Resistex C237 topcoat at 50µm.

The steel in the new train shed extension was blast cleaned to Sa2.5 and then a four coat system was used. The system chosen is not a standard specification but was selected after discussions with Rail Link Engineering and Watson's Steel for a practical and cost effective system whilst maintaining performance levels for the project. The zinc rich primer Epigrip J984 was applied at 50µm, followed by the MIO C401 at 125µm. The new train shed was finished with 2 coats of C237 at 50µm.



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# The Leadenhall Building

# Case Study

## Project

The leaning modern glass and steel structure known as the 'Cheesegrater' for its distinctive shape has made the Leadenhall Building a new, iconic London landmark.

The building, opposite Lloyd's of London, contains 610,000 sq ft of office space, incorporates 18,000 tonnes of steel, with components made and assembled far and wide developed by British Land and Oxford Properties. In its concept, the structure was to have no central concrete core, with an external steel frame as well as a central steel core providing lateral stability and featuring 26 passenger lifts at its northern core. This presented numerous challenges through the construction phase from 2011 to 2014 for architects, engineers and for Sherwin-Williams as supplier of coatings for fire and corrosion protection. The development's tapering shape, which when viewed from the west will appear to 'lean away' from St Paul's Cathedral, delivers varied sizes of floor plates, all offering spectacular views over London.

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# The Leadenhall Building

# Case Study

## Specifications

**Substrate:** Steelwork.

**Requirements:**

To guarantee 90 minutes fire protection.

**Specifications:**

The whole structure was sprayed prior to site assembly using FIRETEX® C69 blast primer, intumescent build coats of FIRETEX® FX2002 and FIRETEX® M95 epoxy intumescent with a top coat of Resistex C237 with a dry film thickness (DFT) of between 1-13mm.

**Area coated:** 610,000 m<sup>2</sup>

**Client:** British Land/Oxford Properties.

**Main contractor:** Severfield Group.

## System

Because of the nature of the development as a major London landmark, the Sherwin-Williams Protective & Marine Coatings division's Fire Engineering & Technical Services Teams, working with structural steel specialist Severfield, had to ensure the highest standard of design and application from both a finish and aesthetic perspective as well as a protection point of view. Many of the elements - including beams, columns and large transitional nodes within the mega-frame

- were a complex bespoke design and required specific and complex fire protection analysis by the fire engineering team at Sherwin-Williams as well as coating application methodology in Severfield's own shop facilities.

Further challenges were presented by the floor plate construction methods from 'slim floor' construction in the basements to conventional down-stand beams in the upper floors. Sherwin-Williams used Building Information Modelling (BIM) on the floor plate fire design to seamlessly integrate the coatings into the Severfield 3D model.

There was a need for different intumescent technologies due to the large variance in the building's environmental conditions. The mega-frame exoskeleton has large temperature and humidity fluctuations and this led to the need for thick film epoxy fire proofing. The steel remains wholly to view due to the glazed exterior and so the finish was architecturally high, another difficult achievement using a high thickness epoxy intumescent. For fire protection, the whole structure was sprayed prior to site assembly using FIRETEX® C69 blast primer, intumescent build coats of FIRETEX® FX2002 and FIRETEX® M95 epoxy intumescent with a top coat of Resistex C237 with a dry film thickness (DFT) of between 1-13mm, depending on the thickness of the steel, giving 90 minutes of fire protection. These coatings ensured that the unusual design elements had the optimum protection but would also fit with the overall vision as an important visual landmark in the City of London.

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# Blackfriars Rail Bridge and Station

# Case Study

## Project

As part of a five-year project, the task of protecting the existing Blackfriars rail bridge and the new station that runs along its length presented a specific challenge for Sherwin-Williams in that a common protective coating system for old and new steelwork was preferred. With the River Thames below, inherent issues of dampness and humidity meant that the choice of coating would be of particular importance, because Network Rail specified a minimum service life of 25 years to first major maintenance.

The roof of the new station was covered with 4,400 photovoltaic panels, providing up to half of the energy needed to run the railway station below and making it the world's largest solar-powered bridge. First Capital Connect, which manages Blackfriars Station, expects the panels to cut the station's carbon emissions by an estimated 511 tonnes a year, further reducing the carbon footprint of its train routes to the south east of England. As a major advertisement for London's efforts to become a sustainable city, with tourists and workers viewing the landmark as they enter the capital, the project was of paramount importance.

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# Blackfriars Rail Bridge and Station

# Case Study

## Specifications

**Substrate:** Steelwork.

**Requirements:**

25 years protection against high humidity and salinity levels.

**Coatings:**

Metagard L674 Epoxy Blast Primer, Epigrip M922 Glass Flake Epoxy, Resistex C137V2 Acrylic Urethane Finish.

**Area coated:** 60,000 m<sup>2</sup>

**Client:** Network Rail.

**Main contractor:** Balfour Beatty.

**Consultant engineer:** Severfield Group.

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## System

Because of its success in the repainting of the Forth and Tay Rail bridges and all the new steelwork for Leeds station, a glass flake epoxy system was chosen. The main contractor, Balfour Beatty, selected the Severfield Group to supply and fabricate the steelwork for the new station and Pyeroy to repaint the existing bridge. Both sub-contractors selected Sherwin-Williams Protective & Marine Coatings EMEA as their preferred paint supplier.

The existing paintwork on the rail bridge was removed by abrasive blast-cleaning. The three-coat repainting system comprised; Metagard L574 Blast Primer at 25µm minimum dry film thickness (mdft), Epigrip M922 Glass Flake Epoxy Intermediate at 400µm mdft and Resistex C137V2 Special Finish at 50µm mdft. A stripe coat of Epigrip M922 at 200µm mdft was applied between coats 1 and 2.

All the new steelwork that formed the station canopy and the entrance/ticket halls located at each end of the bridge were coated with the glass flake epoxy protective system. In total more than 60,000 square metres of new and old iron and steel was coated. The benefits to customers using this system for the bridge and highways sector comes in terms of labour saving costs, lower energy usage and volumes of paint required. In addition, the higher volume solids coating system meant that fewer volatile organic compounds (VOCs) were emitted during the process.



# Products & Specifications

A semi-transparent red rectangular box with a white border containing the text "Passive Fire Protection".

Passive Fire Protection

A semi-transparent blue rectangular box with a white border containing the text "Protective Coatings".

Protective Coatings



# Tower Bridge



## Tower Bridge

Tower Bridge has stood over the River Thames in London since 1894 and is one of the most recognisable landmarks in the world. It is the bridge of London seen in movies and on advertising literature for the capital city, and is the only bridge on the Thames which can be raised.

The original specification included total removal of the existing paintwork by abrasive blast-cleaning, but would have meant the bridge had to be closed for three months.

Transport for London wanted to keep the structure open to prevent disruption during the busy summer period and alternative ideas were explored.

Repainting from cradles could keep the structure open but blast-cleaning was not possible from cradles.

After discussions, a Network Rail approved system based on mechanical methods of surface preparation was agreed to remove all unsound existing paintwork.

A surface-tolerant epoxy coating system was chosen.

### Protective coatings for anti-corrosion:

M902, M905 and C137V2.