MJF GROUP

Project managed & installed by…

vebrospeed at Cheshire Fire & Rescue Service, UK

vebro

PROJECT SHOWCASE

Polymer flooring to the rescue! Vebro Polymers & MJF team up to transform Cheshire fire stations

Vebro Polymers – in partnership with MJF Specialist Flooring – has recently undertaken the rapid refurbishment of an aging community fire station, originally built in the sixties, which sits in the heart of a rural townscape and forms a critical part of its emergency response service.

Cheshire Fire & Rescue Service is responsible for fire protection, prevention, intervention and emergency rescue across the unitary authority areas of Cheshire East, Cheshire West and Chester, Halton and Warrington. It operates a total of 28 fire stations.

The refurbishment work that has taken place at Congleton Fire Station forms part of a multi-phase, five-year, modernisation programme for Cheshire Fire & Rescue Service in conjunction with Cheshire Fire Authority. The regional roll-out serves to educate specifiers and end user clients on the benefits of resin over other more traditionally used systems, which fail to stand up to the service criteria imposed upon the floor over the time.

Funded through the Procure Partnerships Framework (Northwest), and managed by main contractors, Wates, the project involves a multi-million-pound design and build contract to redevelop and upgrade 19 fire stations located across the territory.

The single-storey Congleton Fire Station originally opened in 1967. A survey commission by the Redevelopment Programme in 2017, highlighted its deteriorating condition alongside insufficient investment having been made to sustain pace with more modern purpose-built facilities.

Works identified for completion at Congleton Fire Station included enhanced insulation to the roof and installation of double glazing throughout. Photovoltaics were also to be installed to allow the building to switch from gas to all electric heating.

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We are pleased with the results of the refurbishment works at Congleton Fire Station. The project will allow fire and rescue teams to better serve the local community with even faster response times from a modern fire station fit for the future set within a state-of-the-art facility.

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Justin Coleman, Wates Smartspace

On the roof, cladding was to be removed from the tank room and the chimney stack was to be lowered. Photovoltaics would also be installed on the accommodation block and appliance bay roofs with safety handrails added to the perimeter of the roof.

At the front and rear of the station, two bay doors were to be replaced and one appliance door opening was to be bricked up and rendered. New doors were planned to the rear.

To the side elevation, a glazed screen was to be bricked up and rendered and a new door installed. Walls and fascias were to be either cladded or colour rendered while all timber framed windows and doors would be replaced with new aluminium versions.

Internally all walls and floors were to be refreshed and upgraded; with a full replacement of the existing terrazzo tile flooring.

Having been an eye sore in the town for several years, thanks to the extensive work that has taken place both inside and out, Congleton Fire Station now has a new lease of life, providing facilities equipped to deal with the modern demands of the fire rescue service and extending the building life span for many more years to come.

The project demonstrates how good collaboration and design can create something that, although specific to its context, can be retrofitted for the future.

As a result of the works delivered by Wates, the building has reclaimed its prominent position at the centre of the community and the frontline of the South Cheshire market town's emergency response.

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Client: Cheshire Fire & Rescue Service
Location: Cheshire, UK
Main contractor: Wates
Building surveyor: David Trowler Associates

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spotlight on the floor

Fire engines in the UK can vary in weight depending on the model and equipment used, but typically weigh between 14 and 18 tonnes when fully loaded. That's a whole lot of rolling load on the surface of the floor, not to mention in one of the most heavily trafficked areas of the fire station.

As such, flooring in appliance bays – where the fire engines are housed, but also serviced and washed – needs to be extremely tough, durable, slip resistant in wet service conditions and resistant to chemical exposure. Prior to works commencing on site, Vebro Polymers was invited to tour the facility alongside both Wates and David Trowler Associates to survey the existing flooring surface and make recommendations for a suitable floor-build-up.

From initial inspection the pre-existing terrazzo tiles were struggling to sustain the pressures of the service criteria being imposed upon them. Although in a reasonable condition and showing a strong bond to the underlying concrete substrate, cracks and signs of impact damage were visible in several locations across the floor.

The bulk of the cracking had occurred over heating pipes within the concrete slab – underneath the terrazzo tiles. Other cracks were visible where the main point loads were being imposed on the floor predominantly around and beneath the fire engine tyres. This could also be seen at both entrance and exit thresholds.

Another issue noted during the initial site survey, was the tiles' smooth surface profile, which would be prone to becoming slippery when wet, posing a slip, trip risk for those using the station.

From slip-car tests conducted on site, it was clear that the terrazzo tiles installed within this station did not meet either BS Standards or UKSRG Standards for slip resistance in wet conditions, which calls for a minimum slip resistance requirement in the wet of >36 PTV (Pendulum Test Value).

While the terrazzo tiles likely recorded a PTV of 36 when initially laid, it is considering the wear of the slip resistance over time. Therefore, the slip resistance should be specified at a minimum of 10% more than what is required, to allow for degradation of the surface profile over time.

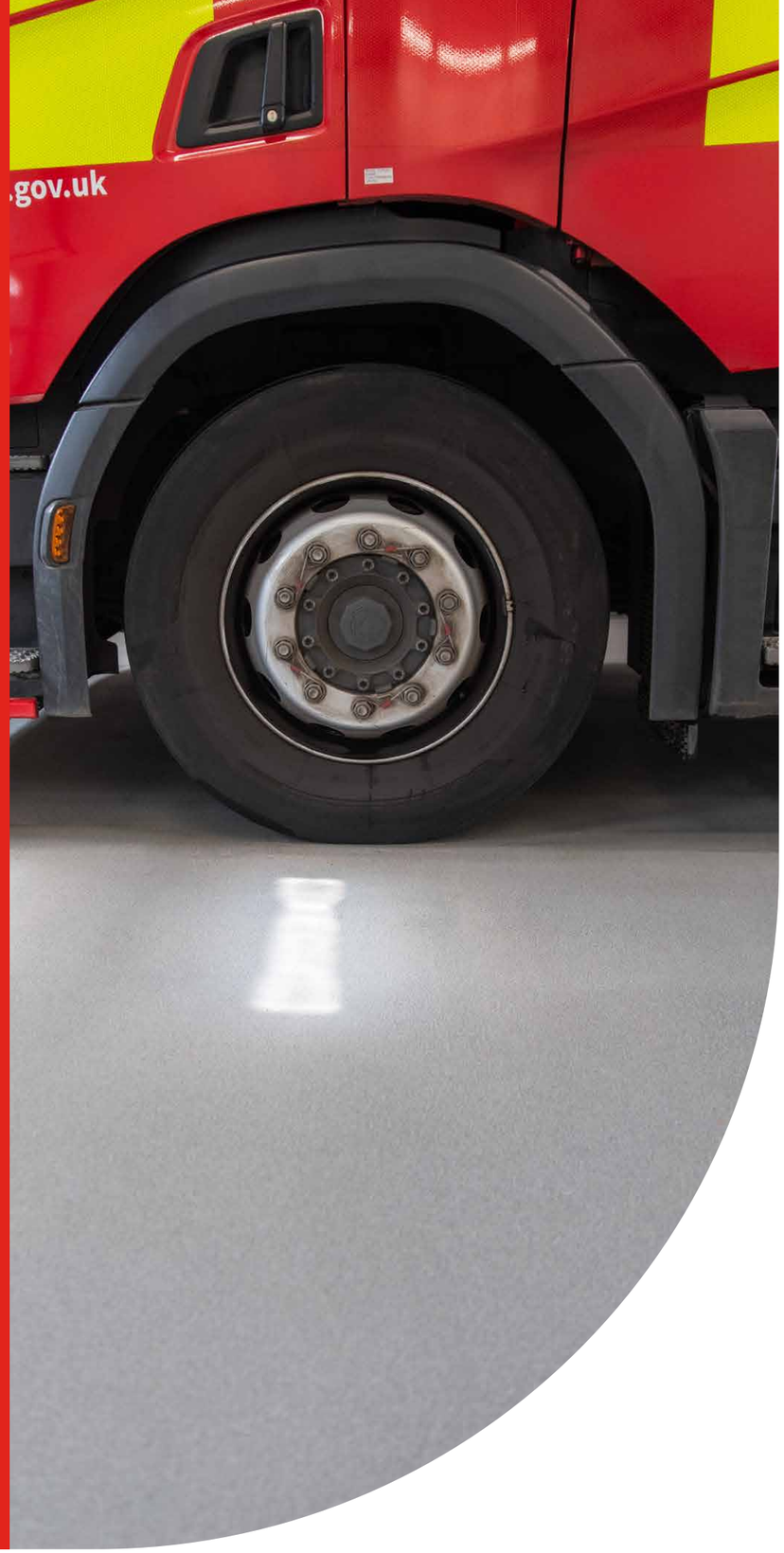
The client was also advised that alternative cleaning methods and processes to those currently deployed on the terrazzo tile flooring would be required to clean and maintain a textured resin flooring system, which they seemed happy to oblige.

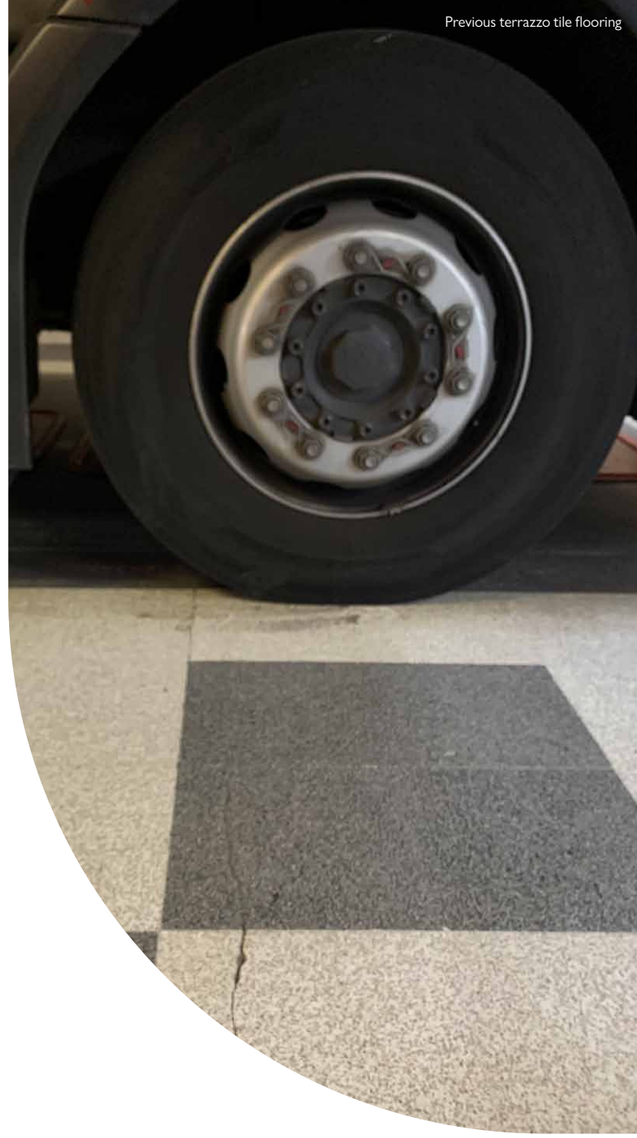
After a successful tender process, MJF were contracted to project manage and carry out the installation of the **vebro**speed Quartz SR system at Congleton Fire Station alongside other stations involved in the roll-out.

This involved the removal, repair and preparation of the existing tiles prior to the installation of the **vebro**speed Quartz SR flooring system within a live, operational emergency response environment.

The successful installation of MMA flooring is often considered a dark art. The material cures very quickly and requires impeccable floor preparations to ensure a high-quality finish.

MJF's extensive experience and training – not only in the application of MMA flooring but also in programming and project management were critical skills that were brought to the project, without which could have proved disastrous to the overall outcome.





Previous terrazzo tile flooring

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As many know well, the success of any installation often lies in the detail of any preparation work undertaken. Despite the relatively small area, the volume of surface preparation prior to the installation of the **vebro**speed Quartz SR system was substantial.

Ahead of works commencing on site, a core sample was taken from the existing surface. This enabled Vebro Polymers in conjunction with the MJF team to determine the overall depth of the floor, the thickness and quality of the concrete as well as to identify any screed layers that had been installed below the terrazzo tiles.

The core sample would also give a good indication of the bond between the tiles and the substrate across the area as well as the thickness of the tile itself and the extent of wear and tear. A review of the core was necessary to both confirm the proposed specification as well as alert the teams to any potential for unknowns or additional costs.

Preparation works on site included the removal of areas known to house old air heating systems or pipework. These areas were infilled with **vebro** MMA Repair Mortar – a fast-drying product that can be bulked out for deep-section repair. Likewise, all the damaged terrazzo tiles, or tiles that were found to be loose and / or that had de-bonded from the substrate were removed and again infilled with **vebro**speed MMA Repair Mortar.

Other preparatory work involved lining the maintenance / service pit with visqueen followed by a damp-proof membrane to prevent dampness or contamination rising into the infill as well as back filling the pit with an MOT Type 1 Hardcore Aggregate or a High Density, Non-Compressible Insulation / Void Former like Foamglas. This was terminated a minimum of 100 mm from the top of the surface, with this void filled with v-Screed, which was left to cure before installing the MMA resin finish.

An expansion joint was placed around the service pit to prevent any cracking of the new MMA surface due to expansion.

Finally, all remaining terrazzo tiles were mechanically prepared by enclosed captive shot-blasting or vacuum-assisted diamond grinding to remove any polish or contaminants from the surface. Edges were finished using hand tools to the same standard. Any tiles that de-bonded through the grinding process were removed and infilled with the same MMA repair material as described above. Only then was the surface ready to receive the **vebro**speed Quartz SR system. This process took seven days to complete.

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Resin applicator: MJF Specialist Flooring
Material supplier: Vebro Polymers
Total floor area: 150 m²

vebrospeed Quartz SR: fast cure flooring fit for a fire station

The prospect of a facility shutdown or a tight opening deadline can often be a daunting one. Methyl methacrylate (MMA) flooring can achieve results that are not possible with other resin systems which is why they are widely used in airports, kitchens, leisure facilities, fast food outlets, supermarkets, and emergency services facilities that have limited or no shutdown capacity.

The **vebro**speed Quartz SR system from Vebro Polymers was specified and ultimately installed by the MJF Specialist Flooring team across two appliance bays and adjacent utility areas at the newly refurbished Congleton Fire Station.

The system, based on MMA (methyl methacrylate) chemistry is a multi-layer, fast-drying flooring system which sees decorative quartz broadcast to excess across a self-smoothing MMA bodycoat to a textured, slip resistant finish that can achieve a PTV value of >40 in wet service conditions.

The system offers several benefits to the end user client: most notably its fast return to service. With each layer ready to overcoat just 60 minutes following application, meaning that installation can take places in the smallest of downtime windows, making it an excellent solution in live refurbishment scenarios.

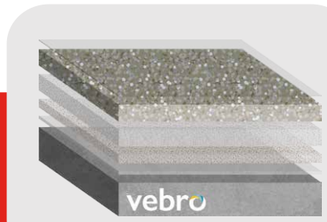
Other advantages of the system include its seamless, easy-clean properties, high compressive strength, excellent scratch resistance, decorative appearance and slip-resistant, profiled finish – safeguarding emergency service workers underfoot.

The system was installed over an area totalling just shy of 150 square metres and took a crew of five a total of seven days to complete.

system **design**

The full floor build-up incorporated the following products:

vebro MMA Metal / Ceramic Primer
vebro Natural Quartz *(0.4 – 0.8 mm)*
vebrodeck MMA Membrane
vebro Coloured Quartz Blends
vebro MMA Binder
vebro MMA Filler
vebro MMA Flex Seal (Clear Silk)



MMA flooring: a **sustainable** choice

Incorporating environmental considerations into the retrofitting and renovation of community buildings is crucial for creating sustainable, energy-efficient spaces that serve future generations.

MMA flooring can be installed on a host of substrates including concrete, steel, tiles, and other resin materials, meaning that often the previous floor covering – in this instance the terrazzo tiles – can simply be floored over rather than removed and disposed of in landfill.

MMA is also an ideal product for unheated construction sites or cold storage rooms as it can be installed at -20 degrees Fahrenheit. MMA flooring is non-toxic and extremely low in VOC however it does exhibit a distinct odour in its wet state, which although harmless is difficult to ignore. During installation this odour can be eliminated with proper ventilation and once the material cures the odour will rapidly disappear.

Typically, MMA flooring reaches full physical and chemical cure within 60 minutes of installation, meaning that the surface can be subject to full operational use under an extremely tight turnaround. This minimises downtime or operational loss for a facility, which can often be a costly exercise.

Furthermore, unlike labour intensive trowel applied resin systems, MMA flooring can be flow applied allowing large areas to be installed at a significantly faster rate whilst at the same time ensuring a quality finish free of trowel marks.

MMA flooring is 100% non-porous and monolithic creating an impervious, pinhole free surface offering a high level of protection against chemical attack and an inherently hygienic surface.

Such floors can last more than 15 years if properly maintained. This long-life span is a result of MMA's ability to penetrate and chemically bond to the substrate. Maintaining an MMA floor is simple as they can easily be cleaned with a damp mop and do not require labour intensive and costly steam cleaning. They also do not harbour dirt or bacteria as the surface is impermeable to liquids and does not have pinholes. Furthermore, at the end of the MMA floor's life, an additional layer can be applied on top to refurbish quickly and easily. The additional layer chemically fuses to the existing floor creating a monolithic system that will not delaminate.

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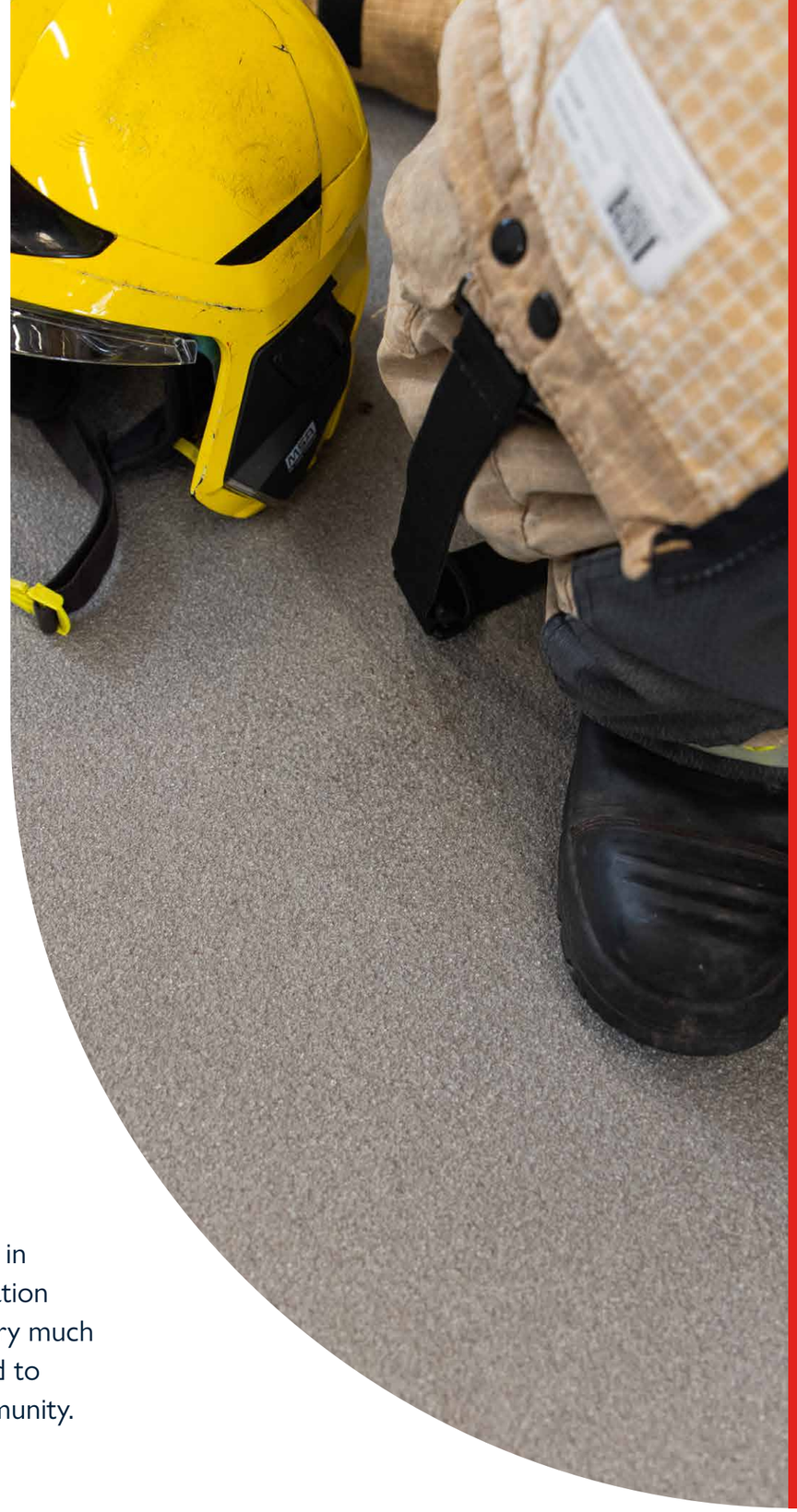

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We’re delighted to support and invest in local communities through our fire station refurbishment programme. We are very much looking forward to the next phase and to continue giving back to the local community.

–

Scott Camp, Wates Smartspace

through the eyes of the main contractor

Wates

The live operational nature of Congleton Fire Station meant that the project required a robust programming schedule to minimise the downtime window and disruption to rescue teams occupying and working in the facility.

The priority throughout the refurbishment was to ensure that the team could continue to respond to emergency calls as required. This had to be managed via various risk mitigation strategies and careful programme management to reduce any impact on services.

Wates are renowned for delivering complex and time sensitive projects in live working environments, managing highly specialised and critical resilience projects for teams working in the emergency services sector, as such regular team briefings involving all parties – including the operation fire safety team on the ground in Congleton – were observed pre, during and post-installation so as to ensure everyone was aware of the schedule of works to be adhered to, as well as voice concerns or challenges arising from refurbishment works.

Thanks to a thorough pre-qualification and specification process coupled with careful programme management and extensive surface preparation, the project was executed without issue, delivered to the client on time and on budget, allowing project teams to progress through the roll-out programme.

Working with Cheshire Fire & Rescue Service, Wates has developed a five-year community impact plan, including the commitment to employ local suppliers, creating opportunities for employment and training and engaging with local students. At the time of writing, this had already delivered £2.1m worth of social value.

Equality Diversity & Inclusion Training (EDI)

Cheshire Fire & Rescue Service hosted a half day training course for Wates employees and its supply chain directors to discuss EDI and how it should be incorporated into how prospective staff are employed. The course was very emotive and had a big input with both Wates and the supply chain directors.

Government Kickstart Programme

A key social investment for Wates was supporting the Government-backed Kickstart scheme, which aims to provide paid job placements with local employers, funded by the Government.

Through the initiative Wates employed an Assistant Administrator to work on the Cheshire Fire Service programme. Wates engaged with the Kickstart programme, partnering with national provider The Prince’s Trust who are delivering a sector-based programme in partnership with recruitment agency Manpower UK for the administrative elements. The Kickstart initiative aims to bridge the skills gap in the industry and provide job opportunities for young people at risk of long-term unemployment.

Through the initiative, Wates identified 60 new national job vacancies, underpinning the business’ community investment commitments. This enabled Wates to create six-month fixed job roles for 16-24 years olds, who are directly employed by Wates during this period.

designing for duty: the evolution of fire stations

Over the years, the fire service has undergone a remarkable transformation, adapting to changing environments, embracing technological innovations, and expanding its role beyond traditional firefighting. As such, it is fair to say that so too has the use of fire stations changed over time.

From early bucket brigades to modern fire stations equipped with the latest technology, fire station design has evolved to meet the changing needs of firefighters and communities.

The earliest fire stations were simple structures designed to house the necessary equipment for fighting fires, such as buckets, ladders, and hand pumped water engines. These early fire stations were often staffed by volunteers and were in the centre of town to ensure quick response times.

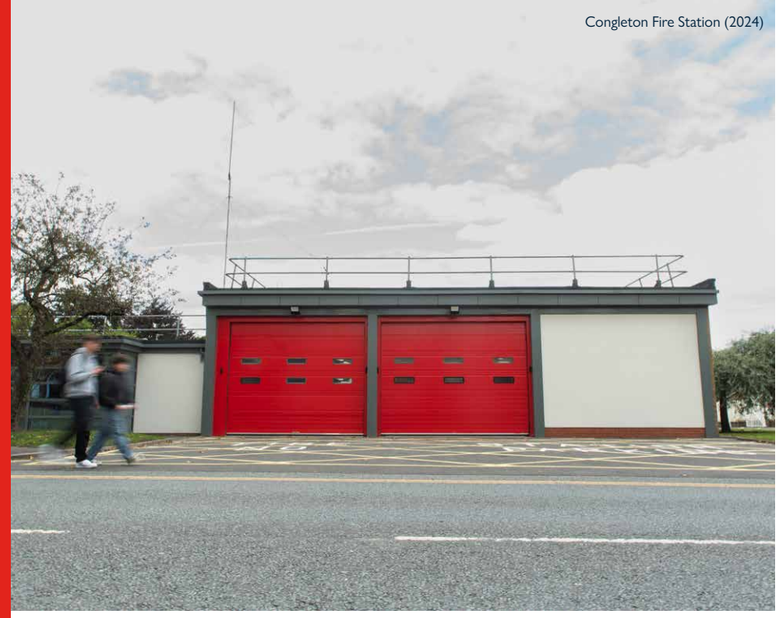
In the late 19th century, the introduction of motorised fire engines led to a significant shift in fire station design. Fire stations needed to be designed to accommodate larger and heavier vehicles, and the design of the fire station itself needed to be adapted to ensure that the fire engines could be quickly and efficiently dispatched to emergencies.

In the early 20th century, the Art Deco and Beaux-Arts movements influenced fire station design, leading to the creation of fire stations that were not only functional but also beautiful. These fire stations were often adorned with ornate carvings, mosaics, and sculptures, reflecting the cultural and artistic trends of the time.

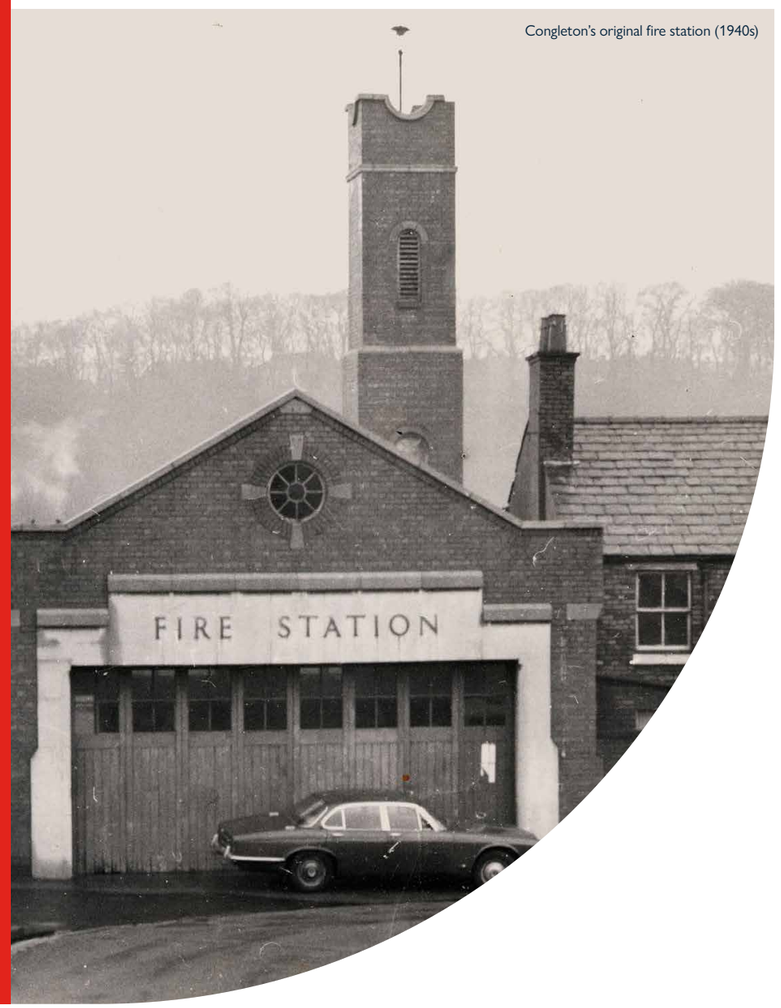
During World War II, fire station design was influenced by the need to conserve resources and support the war effort. Many fire stations were designed to be easily converted into bomb shelters, and fire departments were encouraged to use materials that were readily available and affordable. In the post-war period, fire station design shifted to reflect the growing importance of safety and efficiency. Fire stations were designed to ensure that firefighters had quick and easy access to their equipment, and new technologies such as automatic doors and alarm systems were incorporated into fire station design to improve response times.

In the late 20th century, fire station design began to incorporate more sustainable and environmentally friendly features. Fire stations were designed to incorporate solar panels, energy-efficient lighting, and other sustainable technologies to reduce operating costs and minimise the environmental impact of firefighting.

Today, fire station design continues to evolve, with a focus on creating spaces that are not only functional but also adaptable, sustainable, and community focused. Fire stations are being designed to accommodate multiple functions, from training exercises to community events, and new technologies are being incorporated into fire station design to improve safety, efficiency, and sustainability.



Congleton Fire Station (2024)



Congleton's original fire station (1940s)

Congleton Fire Station (1992)

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> Today, fire station design continues to evolve, with a focus on creating spaces that are not only functional, but also adaptable, sustainable, and community focused.

working **together**…

vebro

MJFGROUP

Cheshire
Fire & Rescue Service

Wates

David Trowler Associates
Chartered Building Surveyors

vebro polymers.com

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