

# CASE STUDY: DLR BANK TUNNEL

## PROJECT OVERVIEW:

### Overcoming Challenges at One of London's Most Strategic Stations

The successful completion of a pivotal infrastructure project with the installation of new rails at the Bank DLR underground station. Undertaken during a rigorous 10-day blockade, this project addressed critical rail safety and reliability concerns, reaffirming Bank Station's role as a cornerstone of London's transport network.

The existing rails, last replaced in the 1990s, had reached the end of their service life, posing risks to train operations and passenger safety. This project was vital for ensuring the continued functionality of the DLR network, which accommodates over 123 million journeys annually.

By completing the rerailing under extraordinary logistical and technical constraints, our team demonstrated its commitment to excellence and innovation in railway engineering.

This DLR project stands as a benchmark for construction excellence, blending safety, sustainability, and community-centric practices. The team delivered the project on time and within scope, achieving remarkable environmental outcomes and stakeholder satisfaction, all while maintaining an incident-free record.



## PROJECT SCOPE:

- Installation and welding 1 mile of new 80lb rails
- Installing 5 km of temporary ventilation cabling and installing 50 temporary industrial fans
- Installing temporary fire doors, dust screening and heavy-duty protective sheeting
- Conductor rail and shoe protection gauging
- Installing negative return bond cables

## STRATEGIC IMPORTANCE OF BANK STATION:

Bank Station is a critical node in London's transportation infrastructure:

- **Depth and Complexity:** Situated 41 meters (135 feet) below ground, Bank Station is one of London's deepest and most complex transport hubs.
- **Connectivity:** Part of the Bank-Monument complex, it interlinks five TfL lines (DLR, Northern, Central, Circle, and District) and the Waterloo & City Line, with seamless access to the National Rail network.
- **Economic Impact:** Located in the heart of London's financial district, the station facilitates the daily commute of thousands of workers to Canary Wharf and other economic hubs.
- **Passenger Volume:** During peak hours, tens of thousands of passengers rely on Bank Station for smooth connectivity. Its operational reliability is essential to prevent widespread disruptions across London's transport network.

## CHALLENGES:

### TECHNICAL AND LOGISTICAL COMPLEXITY

Unlike similar rail projects that benefit from open tracks for delivery, this DLR underground tunnel necessitated innovative solutions:

### CRANING OPERATIONS:

All components, plant, and equipment were craned onto the DLR viaduct and transported deep into the tunnels using multiple track trolleys. With the site located over 5km from Poplar depot and lacking suitable access points nearby, all materials—including rails—were lifted into the site via a compact 100m<sup>2</sup> compound at Royal Mint Street. This created a significant logistical bottleneck, requiring meticulous planning and coordination to ensure the safe, efficient delivery and deployment of materials.

### RAIL DELIVERY:

Long welded rails were infeasible due to the constraints of the underground environment. Instead, 90 individual rails, each up to 60ft in length, were transported by road to a designated crane point. From there, they were carefully lifted onto the DLR and manually hauled 2km into the tunnels using Ironmen by skilled teams of operatives. This labour-intensive process required both expertise and precision to ensure the safe and efficient movement of materials without disrupting the confined work environment.



## CHALLENGES:

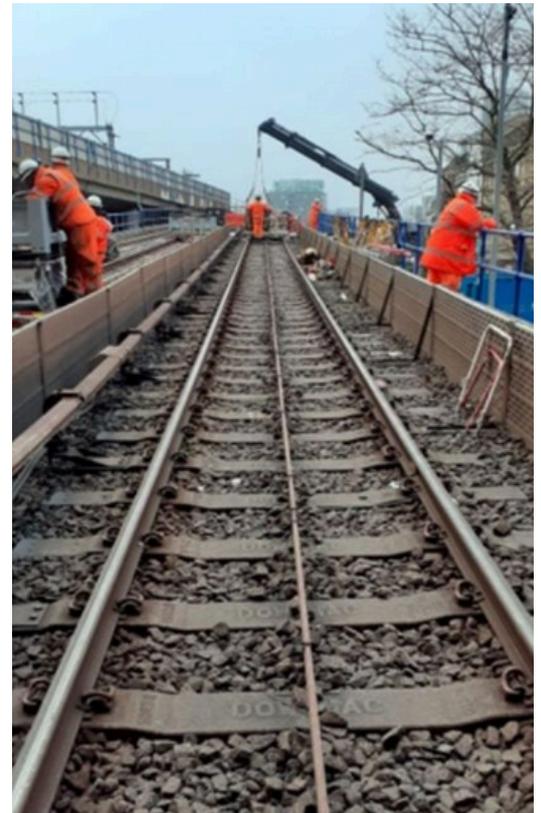
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### MATERIAL LOGISTICS:

Over 270 tons of materials, plant, and equipment were meticulously planned, coordinated, and lowered into the tunnels. This monumental effort involved precise scheduling, seamless teamwork, and highly skilled operatives to manage the limited access points and challenging logistics

### ACCESS AND SAFETY IMPROVEMENTS:

To facilitate safer working conditions at height and within track-level safety recesses at Bank Station, we deployed a combination of modular EPS blocks, lightweight fiberglass GRP access stairs, and a robust handrail system. The EPS blocks were used to temporarily fill the pits, creating a stable and secure platform for operatives to walk and position rails effectively in the 4ft area. These blocks were custom-fitted to accommodate infrastructure such as service trays and posts, ensuring no obstructions during installation and minimizing risks to staff. The GRP stairs provided safe and reliable access to elevated areas, meeting stringent safety standards while being lightweight and easy to deploy. Complementing these setups, the handrail system enhanced safety by providing critical support and fall prevention in elevated and confined areas. Together, these measures significantly improved safety standards while streamlining material handling and construction activities.



## CHALLENGES:

### LIVE OPERATIONS:

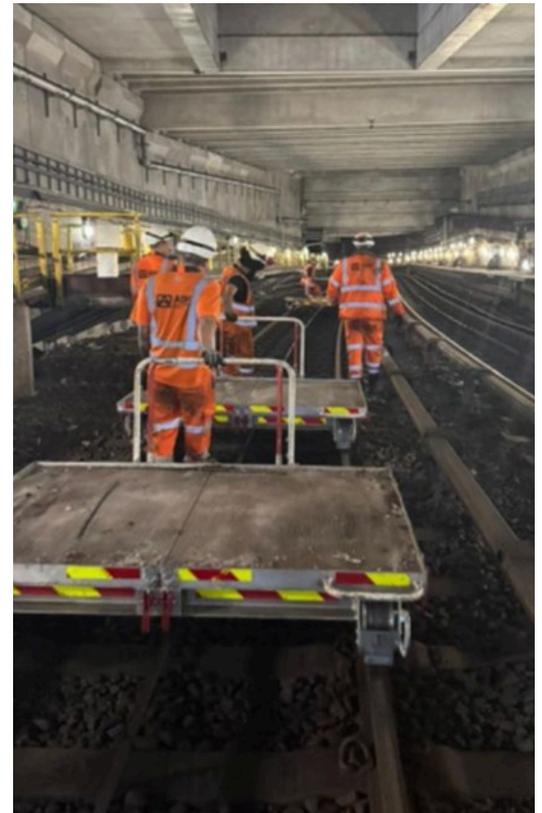
Tower Gateway Station remained operational throughout the project, requiring careful navigation around live signalling loop cables and axle counters to prevent service disruptions. Operatives and welders worked meticulously to avoid damaging any live cables, supported by the use of specially developed aluminium shields designed specifically for the DLR. Approximately 200 rail cuts were completed and by implementing these additional measures, safe operations were ensured in the confined tunnel environment at all times.

### EQUIPMENT DEPLOYMENT:

Heavy-duty protective sheeting and dust screening preserved the cleanliness of ticket halls and concourse areas, minimising disruption for passengers. This had to be installed across both platforms, walkways and walls throughout the Bank station area and up into the LUL stations above to avoid contamination from dust and debris created during the works.

### TUNNEL VENTILATION:

To address air quality concerns during welding, cutting and from dust created, the confined tunnel environment demanded increased ventilation solutions to ensure safe air quality during cutting and welding. This involved installing 5 km of cabling, powering 50 industrial fans, ensuring adequate airflow and worker safety and monitoring 24/7 for the 240hr period. Positioning 100kva generators over 1 mile from the main work site outside the tunnels to minimize noise and emissions in the confined space.



## CHALLENGES:

### **SAFETY FIRST: ZERO ACCIDENTS, ZERO INCIDENTS**

The project's highest priority was ensuring the safety of all workers and stakeholders. Over 13,000 cumulative hours were worked without a single accident or incident—a testament to rigorous safety protocols and proactive engagement:

100+ close calls were identified and rectified during the project, reflecting the team's commitment to pre-emptive safety measures.

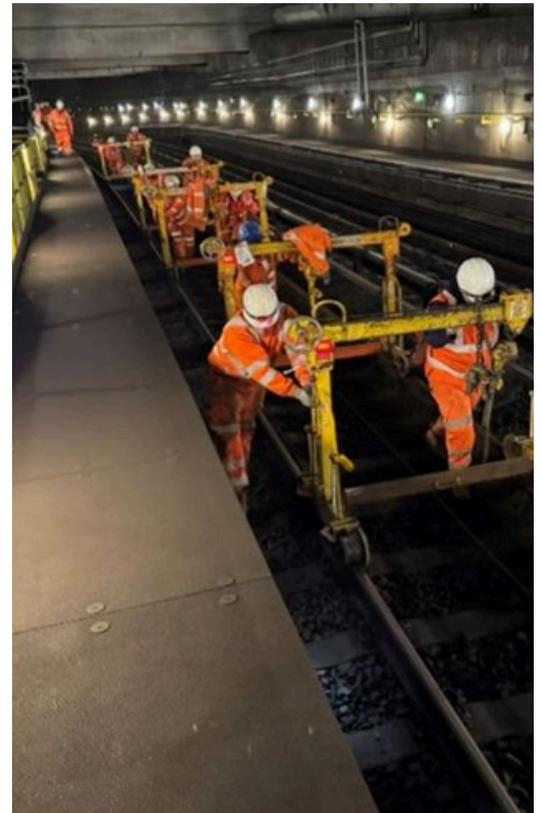
30 toolbox safety talks fostered a culture of awareness, collaboration, and vigilance.

Compliance with Section 61 consent requirements ensured that noise and dust levels were actively managed, resulting in zero noise or public complaints.

These measures underscored our belief that safety is not just a priority but a core value that drives operational success.

### **ENVIRONMENTAL: SUSTAINABLE CONSTRUCTION**

The project demonstrates how environmental responsibility, and operational efficiency can go hand in hand. Using small innovative practices and green technologies, the team significantly reduced the environmental footprint, setting standards in sustainable construction.



## CHALLENGES:

### FUEL AND EMISSION SAVINGS: ROAD RAIL VEHICLES:

Originally planned to use 2 RRVs operating 24/7 for 10 days, this methodology was revised to reduce risks to workers on steep gradients and improve air quality in the confined tunnel environment. This change not only enhanced worker safety but also saved approximately 4,800 litres of fuel, preventing the emission of 13 metric tons of CO<sub>2</sub>. The new approach also provided a more robust and environmentally friendly program for the DLR.

### HYBRID POWER SOLUTIONS:

The entire site lighting, tools and ventilation system was powered by a Stage V emission-compliant generator using Ultra Low Sulphur Diesel. These generators met stringent emission standards, significantly reducing particulate matter, nitrogen oxide, and sulphur dioxide emissions. This approach minimized environmental impact, lowered the site's carbon footprint, and ensured improved compliance with modern environmental regulations compared to traditional methods using multiple smaller inefficient generators.

To further enhance energy efficiency, our generators were integrated with battery storage systems, reducing generator runtime, cutting fuel consumption, and maintaining reliable power supply. These battery generators powered site operations without emissions, replacing traditional fuel-dependent generators.



## CHALLENGES:

### BATTERY-POWERED TOOLS:

The Husqvarna Rail Saws were utilised for cutting new rails, these produced zero emissions and enhanced worker safety through reduced vibrations, noise levels and avoiding use of combustible fuels inside the tunnel.

### ADVANCED LIGHTING SYSTEMS:

Flexible LED strip lights provided energy-efficient illumination while maintaining a compact and easy-to-deploy profile.

Cordless lighting towers ensured zero-emission and noise-free lighting.

### TEAMWORK AND RESILIENCE:

This project tested every facet of ASH Construction Group's capabilities, from logistical innovation to safety management. The collaboration between stakeholders our supply chain and our skilled workforce turned a challenging task into a benchmark success and set a new standard for infrastructure delivery.

## CONCLUSION

The rerailing project at Bank DLR station underscores ASH Construction Group's ability to tackle complex challenges while prioritizing safety, sustainability, and efficiency. This is a testament to our commitment to delivering world-class infrastructure projects that benefit London's commuters and economy.

Together, we've demonstrated what is possible when expertise meets collaboration.



## MANJIT SINGH BENNING - PROGRAMME MANAGER | DOCKLANDS LIGHT RAILWAY LIMITED

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"The Re-Railing works at Bank Station/Tunnel were critical and had a significant impact to operational prominence at the DLR.

Encumbered with safety, logistical, engineering and deliverability concerns ASH worked closely with the DLR team in planning the works.

Their flexible and open approach in an evolving project allowed us to make sure we were able to deliver 1600m re-railing and drop 96 welds whilst Bank Station remained operational during the busy Christmas period.

We look forward working with ASH in the future and developing our working relationships further."

