



Nationwide Coverage Provided by 12 Enigma Service Centres around the UK

Design & Engineering

The Enigma in-house design and engineering team boast a wealth of experience and are industry-leading in scaffolding design, collaboratively working with our clients, to provide innovative solutions and technical expertise to solve complex challenges. By utilising the latest design and planning software along with our knowledge and experience, we can offer economical solutions to complex access requirements. Our design team have gained an invaluable reputation for excellence by delivering safe, reliable projects and are trusted by many national construction organisations.

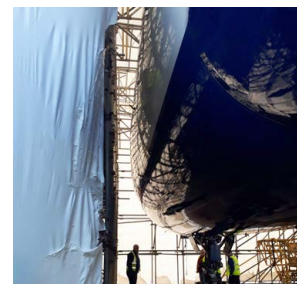


We work closely with clients to make things possible by applying our know-how to solve complex problems.

Specialist Aerospace Project Design Expertise

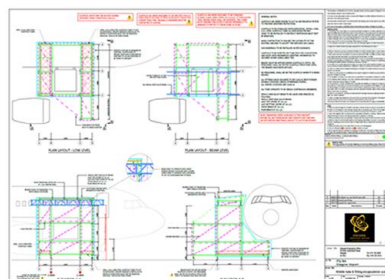
Many of our projects require innovative specialist designs to minimise the risks of incurring any potential damage. The Enigma in-house design team have extensive experience creating and implementing bespoke designs, by delivering safety-first simple, economical solutions. For example, our project at Glasgow Airport presented many complex engineering challenges, apart from a short programme, the other ones being:

- Erecting a temporary structure large enough to accommodate passenger aircraft and capable of withstanding high wind loads during winter months. This presented an additional challenge due to a dominating opening in the structure significantly increasing these loads.
- Providing a roof structure that was not only completely watertight but also able to support the weight of significant snow loading.
- The structure was located within the aircraft parking area outside of the hanger, therefore it had to be completely free-standing utilising high volumes of kentledge to prevent the temporary structure from overturning during high winds. Additionally, engineers utilised extremely strong Mills scaffold fittings to transfer the high loads.
- The weather protection solution had to suit all three aircraft types however, this posed a problem due to the A319 engines not being compatible with the structure. To solve this problem engineers designed a cantilevered section within the access hanger to provide weather protection over the engines.
- Stair access and a walkway platform were required to both the front aircraft cabin door and the top of the fuselage.
- Cabin door access had to be carefully designed to enable the door to open outwards over the platform area while avoiding any potential clashes. The platform also had to telescopically extend into the side of the aeroplane once in position with a compatible solution for all three types of aircraft.
- Access to the top of the fuselage was designed as a suspended platform from beams. This platform also had to be telescopic to enable safe access once the aircraft was in position.
- Both the roof and suspended access platform had to carefully account for the overall heights of all three aircraft, including the increased lifting height from the Mototok tug during the positioning of the aeroplane.
- An additional late project specification requirement was to extend the structure allowing enough clearance for the cargo hold door to fully open and a mobile door to close, giving weather protection.



Bespoke Solutions

Many amendments and revised solutions were required to accommodate site constraints. However, this was made possible in extremely short time scales by collaboration between our in-house design team and the client's operational teams and representatives. The project was delivered on programme.

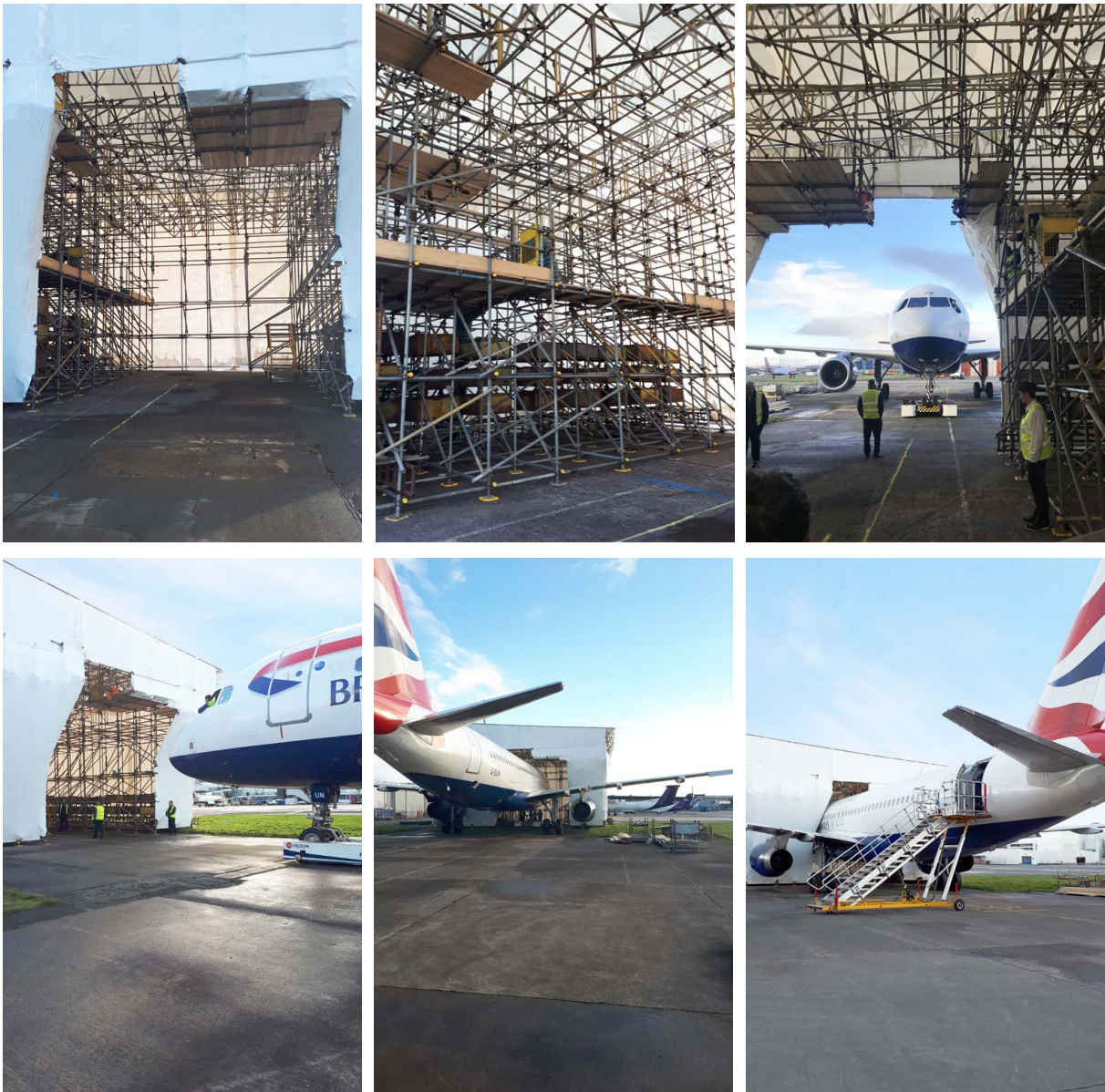


Case Study

Airbus Wi-Fi System Installation - Glasgow Airport

Principle Contractors: British Airways & Interserve Technical Services Ltd. Value of scaffold sub-contract - £90,000

Enigma were engaged to provide encapsulation and access services to the front of Airbus A319, A320 and A321 models, enabling the installation of a new aircraft Wi-Fi system. Our works needed to be carried out during a short period, ensuring the client could maximise the time available to undertake their flight operations. Seasonal timing of the project presented additional challenges for the design team with the requirement to consider increased wind and snow loads. The design also incorporated beam-work support to house bins of scaffold fittings to act as kentledge and stabilise the structure.



Enigma designed and provided a free-standing scaffold structure incorporating safe access to the top of the fuselage area and cabin door, complete with weatherproof encapsulation to protect the front of the aircraft. The design included many critical dimensions, ensuring the aircraft could manoeuvre safely in and out of the temporary enclosure whilst maintaining unobstructed access to the cargo doors. Also, due to the Wi-Fi installation position on the aircraft, the scaffold had to be cantilevered over the engine areas to provide suitable working platforms.

Case Study

1st Class Cabin Refurbishment Project - Cardiff Airport

Principle Contractor: Interserve. Value of scaffold sub-contract - £500,000

Enigma was engaged to design, supply and construct a purpose-built temporary scaffold enclosure. The structure needed to provide access to Boeing 747 & 777 aircraft to aid the refurbishment of the 1st class cabins.

A fully-equipped workshop space was built in front of the temporary aircraft nose docking station with a 50-metre mezzanine floor to provide designated access into the British Airways storage area. This enabled seating, instruments, tools and equipment to be transported around the temporary site without disrupting the three permanent service bays within the main British Airways aircraft hanger.

The structure also had to provide a total envelope effect around the aircraft and incorporate adequate waterproof sealing protection from the external environment.



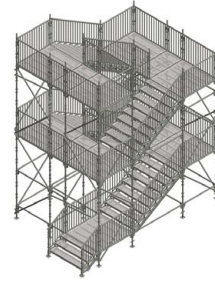
The free-standing scaffold structure was held in place by 120 x 1-tonne bags of 75/45mm stones and erected using tube & fitting scaffold with a Cassette Roof System. Tec-bolts were used to secure the internal and external sheeting.

The scaffold included two working levels for access, dependent on the aircraft type currently docked. Once the aircraft docks, an inflatable 'ring' seals around the fuselage, providing a 'clean' environment for working on the nose section. Sliding platforms are then extended out to gain access to the aircraft in 4 locations.

Public Access Stairs

HAKI Public Access Stairs can handle high volumes of footfall to ensure safety in-line with leading UK standards, the 2.5m wide stairs can accommodate up to 36 people per lift at any one time. With specialist additional design features including child-safe, adjustable handrails and slip-resistant solid steel decks helping to protect the public against falling from a height. In-line and spiral configurations are available to suit all applications, providing flexibility with specialist project requirements.

HAKI Public Access Stairs can also, be easily combined with the HAKI Bridge System and Cladding to provide temporary footbridges.



HAKITEC 750 Temporary Roof System

The HAKITEC 750 temporary roof system is simple to build and uses very few components and can be built in-situ from a scaffolder safe zone or placed into position with a crane if space is available. Also, by utilising an innovative roll-out installation method, safe erection from guarded platforms removes the requirement for scaffolders to venture onto roof trusses. The flexible system can be tailored to cover large spans by creating durable strong structures that have a long service life with the ability to construct polygonal or mono-pitched roofs.

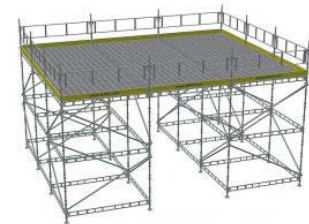
To cover the temporary roof system and avoid leaks, HAKITEC traditional sheeting a heavily reinforced LD polythene can be cut to size, and suitably fixed to braced guardrail frames. Alternatively HAKI Trak an extremely hard-wearing sheeting can be easily fitted with Keeder beading and aluminium tracks for improved flexibility.



High Level Birdcage

The HAKI high-level birdcage is ideal for infrastructure improvement upgrades, by minimising disruption during suspended ceiling installation programmes. HAKI birdcage scaffolds can be constructed quickly with more than one lift height or single lift, and sections can be partially decked, for speed and economy.

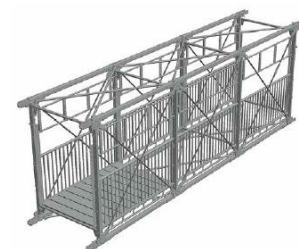
Fall protection safety is improved by utilising advanced guardrails. To remove the need to work from scaffold steps when adding subsequent lifts. Also, noise pollution is kept to a minimum, with no hammering required throughout erection, maintenance, or during the dismantling phase.



HAKI Bridge System

The 2m wide HAKI Bridge System (HBS) is a safe temporary crossing solution for pedestrians and can be built off-site and positioned within just 15 minutes, to minimise possession time disruption on busy track sections. Designed by following leading British and European standards, the system can handle impressive loadings of up to 7.5kN/m² with a maximum span of up to 30-metre dependent on the imposed live load.

HAKI Cladding System can be utilised to enclose the bridge to offer further safety benefits, including the risk of falling objects and falls from height. Whilst also providing noise reduction and protecting the general public from bad weather or high winds.



Cladding System

HAKI cladding system is the ideal site hoarding solution for stairs or bridges to reduce noise and improve public safety. By preventing falling objects from temporary stairs, bridges or working platforms. The lightweight toughened plastic fire-resistant panels are compatible with both scaffolding systems and traditional tube & fitting scaffolding.

The cladding system can be utilised to create swing doors for stair towers, to provide security when not in use. Also, a single person can install when using the specifically designed HAKI cladding track.





Contract Scaffolding



Insulation



Protective Coating



Scaffold Hire & Sales



Industrial Cleaning



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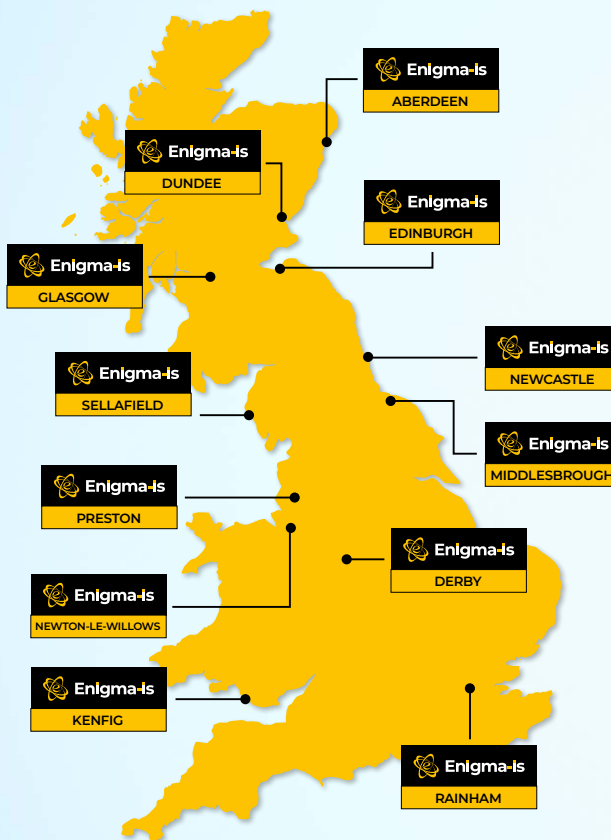
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UK DISTRIBUTION PARTNERSHIP

Nationwide Coverage

Provided by 12 Enigma Service Centres around the UK



STOCK

Enigma operates one of the UK's largest scaffolding asset bases with over 2,000 scaffolding and related products available to purchase or hire.

SERVICE

With over 85 year's industry knowledge & experience, Enigma provides an accredited safety first professional service. Ensuring clients benefit from convenient access to simpler and safer systemised solutions and reduced lead times for projects nationwide.

SUPPORT

The In-house QSHE and design & engineering teams provide clients with economical solutions for complex challenges. Including ongoing training, and technical support services through knowledge and resource-sharing practices.

DELIVERY & COLLECTION

Collect stock, or have it delivered, from Enigma Industrial Services depots strategically located around the UK.