



Furse earthing & lightning protection

Brand overview

Furse earthing & lightning protection

Brand history & values

To stay in business for over 125 years is truly a great achievement, but to do it in a century that has seen such unprecedented social and technological change is remarkable. Yet through all that the past century could throw at it, including two World Wars and the recent COVID-19 pandemic, Furse has remained a constant force in an unpredictable world.



Brand history

It started in 1893 when William Joseph Furse acquired the premises and steeplejacking business of Joshua Till in Nottingham, UK. Starting with one employee, Mr. Furse improved and expanded the business. Recognising at an early stage the growing importance of electricity, he diversified into electrical installation, and opened a workshop for the manufacture of switchgear and components.

A new era for the Furse brand

In 1998, Furse became a part of the Thomas & Betts corporation and in 2012, Thomas & Betts was acquired by ABB, a leading global engineering company, that energises the transformation of society and industry to achieve a more productive, sustainable future.

With a history of excellence of its own, stretching back more than 130 years, ABB's success is driven by 144,000 talented employees in over 100 countries.

Today, the Furse name remains as a tribute to its founder, continuing to be synonymous with innovative electrical engineering and management success.

The Furse Total Solution incorporates customer needs for earthing and lightning protection, including structural lightning protection systems, earthing for lightning protection, power and telecommunications systems, transient overvoltage protection and customer project consultations, technical guidance and system design.

Furse delivers the most complete and effective protection against lightning and earth fault current risk, both safeguarding life and ensuring continuous, normal operation of electrical and electronic systems.

Furse continues to reinforce their commitment to both quality and service, providing solutions which deliver safety and protection of people, structures and electrical services within the built environment.





A total solution

Our reach & expertise

Furse is a leading brand of ABB and provides critical solutions for Earthing, Lightning Protection and Electronic Systems Protection.

With a heritage of over 125 years, the Furse brand is synonymous with earthing and lightning protection, and is recognised worldwide for its Total Solution.

The Furse Total Solution incorporates all customer needs for earthing and lightning protection, including:

- Structural lightning protection systems
- Earthing for lightning protection, power and telecommunications systems
- Transient overvoltage protection
- Customer project consultations, technical guidance and system design

The Total Solution delivers the most complete and effective protection against lightning and earth fault current risk, both safeguarding life and ensuring continuous, normal operation of electrical and electronic systems.

Acquired by the ABB Group in 2012, and benefitting from ABB's wider network, the Furse brand has now become an established world leader in earthing and lightning protection, with products specified and installed in many prestigious projects globally.

Why choose Furse products and services?

Being an integral part of ABB reinforces our commitment to quality, service and to providing solutions which deliver safety and protection of people, structures and electrical services within the built environment.

Furse products and services aim to deliver customer value in key areas:

- **Reliability & ease of installation**

Furse products are manufactured from high quality materials within an ISO 9001 environment, to ensure long lasting performance, and are designed for easiest possible installation

- **Convenience & support**

Furse products are readily available through our distributors worldwide, and our sales are supported both locally and globally by technical guidance and support

- **Expertise & experience**

Our time served technical engineers provide specific advice on customers' earthing and lightning protection concerns, and can provide drawings and system designs to any recognised standard

The need for a total solution

The value of earthing & lightning protection

Lightning is one of nature's most powerful and destructive phenomena. Lightning strikes present a real and significant threat to life, to the structures in which we live and work, and to the electronic systems which support us in our daily lives.

Lightning contains awesome amounts of electrical energy. Lightning discharges have been measured from several thousand to over 200,000 Amps (enough to light half a million 100 Watt bulbs) and even though of a very short duration, can cause tremendous damage and destruction.

Lightning can have devastating consequences:

- Direct lightning strikes damage structures, and create fire, explosion and electric shock hazards
- Indirect lightning (up to a kilometre away) creates transient overvoltages which degrade electronic systems and disrupt essential services

The effects of a direct strike are obvious and immediately apparent - buildings damaged, trees blown apart, personal injuries and even loss of life.

However, the secondary effects of lightning – the short duration, high voltage spikes called transient overvoltages - can, and do, cause equally catastrophic, if less visually obvious, damage to electronic systems within structures.

The need for a Total Solution

National and International lightning protection standards now stress the need for a comprehensive solution encompassing both structural lightning and electronic systems protection using Surge Protection Devices (SPDs).

Simply put, a structural lightning protection system cannot and will not protect electronic systems from lightning currents and transient overvoltages.

Earthing standards demand critical safety of the electrical installation and the personnel at site. Both quality of design and product material are paramount.

This is why we advocate our Total Solution to earthing and lightning protection - an approach which delivers effective life safety, together with long lasting, reliable protection of a structure and the electronic systems within.



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Datacentres



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Rail



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Wind & Solar



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Oil & Gas



—
Industrial



—
Telecommunications



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Construction



—
Power & Utilities



Structural lightning protection

From Furse air termination systems including air rods and strike plates to capture lightning strikes, through to our comprehensive range of down conductors and lightning protection components which channel lightning energy safely to an earth termination network.

This includes:

- Air termination systems
- Lightning protection conductors
- Conductor clips, clamps and holdfasts
- Bimetallic connection components



Earthing

The combination of Furse earth electrodes, clamps, conductors and equipotential bonding bars which provides lightning with an effective, low resistance route from the lightning protection system to earth.

This includes:

- Earth rods and conductor systems
- Mechanical earth clamps and bonds
- FurseWELD exothermic welding
- Earth bars and equipotential bonding

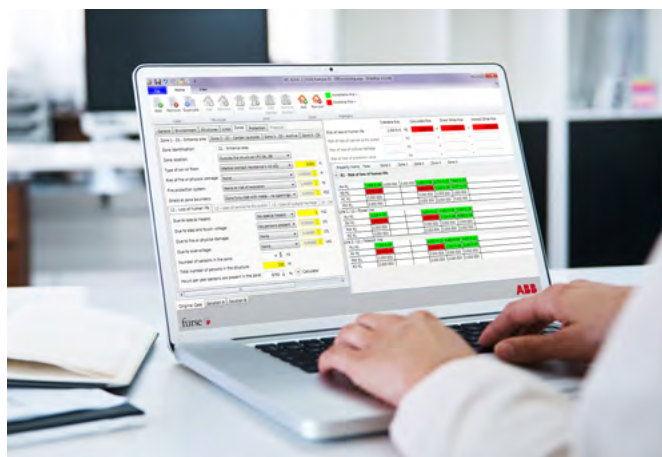


Electronic systems protection

Our exhaustive range of equipotential bonding and transient overvoltage SPDs providing fully coordinated protection against transient overvoltages on all incoming and outgoing metallic service lines including power data, signal & telecoms.

This includes:

- Lightning equipotential bonding SPDs
- Mains power transient overvoltage SPDs
- Data, signal & telecommunication lines SPDs
- DC power & photovoltaic systems SPDs



Technical support

Furse technical design teams ensure all designs for lightning protection, earthing and transient overvoltage protection meet relevant national and international standards, whilst our sales engineers provide key updates on lightning protection matters.

Services include:

- Lightning protection system design
- Site surveys & earthing analysis
- Lightning protection seminars & training
- Technical guides & StrikeRisk software

Technical support, advice & design

Our services

National and international standards indicate the requirements for design and installation of lightning protection and earthing systems.

Given the complexity of these standards, confusion and misinterpretation can easily lead to project delays, budget overruns and costly extra time on site.

Our aim is to help customers to avoid these risks, by fully supporting our Furse product sales with a range of high quality technical support services.

Furse technical services

Furse technical services team actively participates in the development of national and international standards, and offers the ideal starting point for customers confronted by the challenges found in complex lightning protection projects.

Our engineers can provide advice and assistance on all aspects of lightning protection, transient overvoltage and earthing systems, including:

- Structural lightning and transient overvoltage protection system design
- Earthing design
- Supply of comprehensive drawings
- Soil resistivity surveys
- Full earth modelling analysis
- Earth resistance measuring
- Bespoke in-house and hosted training seminars

Using the latest computer aided design & draughting software we can produce detailed or budgetary earth electrode and lightning protection systems designs, in compliance with any given standard and whatever the complexity of system required.

Structural lightning and transient overvoltage protection

In order for us to design a structural and/or transient overvoltage lightning protection system, we need the following information:

- Design standard, e.g. BS EN 62305, NFPA 780, IEC 62305
- A dimensional roof plan & external elevations
- Construction details, e.g. steelwork, reinforced concrete, roofing materials, etc.
- A single line diagram indicating voltage and current for each electrical system, e.g. power, data, telephones, fire alarms, CCTV
- Details of essential equipment, e.g. network servers, PLC controllers

Power earthing systems

There are a number of recognised national and international standards governing the provision of earthing systems. Our technical experience allows us to provide designs to any of these standards.

To design a power earth electrode system, we need the following information:

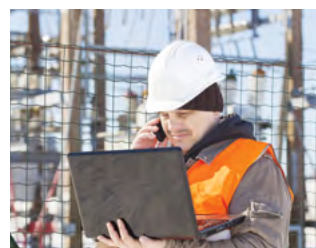
- Design standard, e.g. BS 7430, BS 7354, Ansi IEEE Std 80, ENA TS 41-24 etc.
- A dimensional site plan
- Overall electrical single line diagram
- Soil resistivity survey results
- Earth fault current magnitude (due consideration should be given to the proportion of current flowing through cable sheaths or the aerial earth wires of overhead transmission lines)
- Earth fault current duration



Lightning protection solutions.



Soil resistivity surveys.



Analysis & earthing design.



Earth resistance testing.

Customer site surveys

Proper site surveys and analysis complement fully our in-house service.

Through collation of all relevant information from site, including soil resistivity measurements and earthing analysis, our engineers can produce bespoke earthing designs complete with drawings, calculations and a detailed report, along with a structural lightning protection system if required.

Soil resistivity surveys

A comprehensive soil resistivity survey is key to creating an effective earthing system, as inadequate or erroneous soil resistivity readings are likely in a flawed design.

Furse site surveys take multiple accurate soil resistivity readings at various depths across the site. As these results form the basis of the whole earthing design, the experience of our engineers is critical in ensuring correct implementation of the test data.

Full earthing analysis

Full earthing analysis uses state-of-the-art technology to determine the step and touch voltages, earth potential rise and hot/cold site classification of the site generated by the initial design.

Earth resistance measurement

Earth resistance measurement is essential to accurately determine that the installed earthing system meets the anticipated criteria laid out in the initial design.

Our technicians ensure all measurements are correctly taken and interpreted, so that the true resistance of the earthing system can be defined precisely.

The benefits of coming to Furse

There are many benefits of coming to Furse for earthing, lightning and electronic systems protection design, including:

- Specialist advice from a fully qualified technical team, which focuses solely on lightning protection issues and concerns
- Active contribution to national and harmonised European/international standards ensures our engineers remain at the forefront of new developments in lightning protection
- Designs that comply with all relevant standards – national and international
- Our responsibility for providing a design that is safe
- Experience and the software to provide an 'optimum' design – one that doesn't use more material than is necessary - saving you money
- Manufacturing experience & expertise – utilising our knowledge of the products available to provide a tailored design that can be installed using the most appropriate and up-to-date products
- In addition to technical support and supply of components, where necessary we can also provide for the installation of earthing and lightning protection systems via our partnerships with specialist installers



World-leading earthing & lightning protection

For all our customers, the Furse Total Solution approach to earthing & lightning protection is the leading solution for all project types worldwide.

01 Oil & Gas/petrochemical

- Offshore platforms & oil fields
- Gas & oil refineries
- Pipelines
- Petrochemical processing

02 Renewable energies

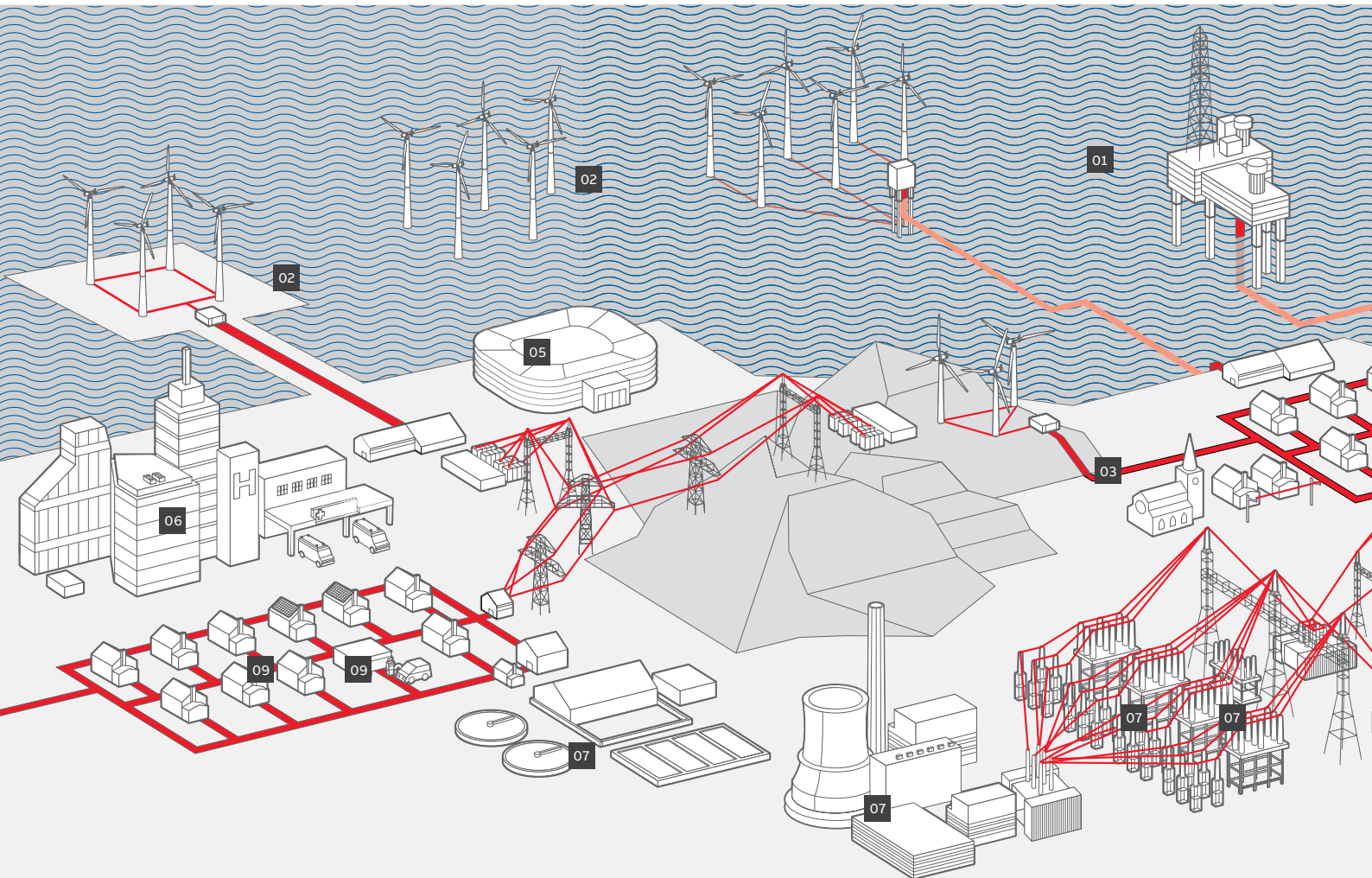
- Solar/PV farms
- Wind turbines
- Hydro-power stations

03 Cultural & heritage

- Historical sites
- Mosques, churches & cathedrals
- National libraries
- Monuments

04 High tech & industrial

- Pharmaceutical factories
- High tech manufacturing & semi-conductor plants
- Telecoms stations, exchanges & transmission towers
- IT Parks and Technoparks
- Heavy industry including steel, cement, glass fibre & synthetics



05 Sports & recreation

- Hotels & resorts
- Sports facilities & training grounds
- Theatres & opera houses
- Shopping malls

06 Government & public sector

- Central government buildings
- Embassies & official residences
- Local authority premises
- Police stations
- Hospitals & healthcare facilities
- Technical colleges & universities

07 Utilities

- Power stations (coal, gas, nuclear)
- Electricity substations
- Overhead transmission lines
- Waste water treatment facilities
- Desalination plants

08 Rail & infrastructure

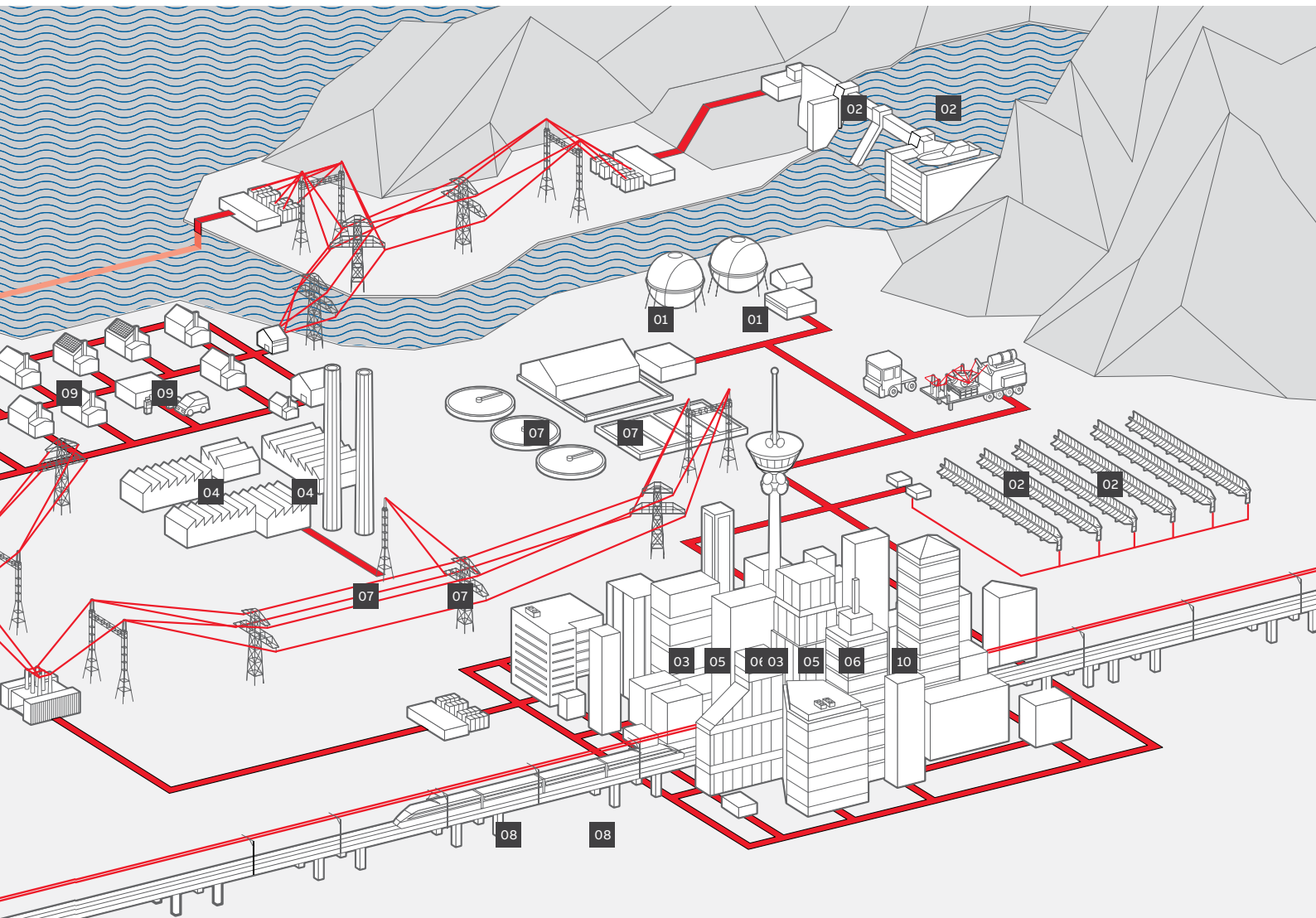
- National railways
- City metro & light rail systems
- Airports & airport terminal expansions
- Subsea tunnels

09 Residential

- High rise residential towers & apartment blocks
- Condominiums
- Housing development projects

10 Commercial construction

- Landmark commercial projects
- Financial services institutions
- Convention & exhibition centres
- Office blocks
- Stock exchanges & trade centres
- Commercial centres, showrooms & retail units





Bank of England, UK.



Channel Tunnel Rail Link, UK.



Canary Wharf, London, UK.



Circle Line, Mass Rapid Transit System, Singapore.

Project references

Our Total Solution approach, which delivers innovative, high quality products supported by intelligent, concise technical support, makes Furse the brand of choice for many projects, in many markets, worldwide.

Oil & gas/Petrochemical

- Oil Fields in Toha, China
- Pertamina Gas / Petrol Depot, Indonesia
- Asab Full Field Development, UAE
- Dorra Gas Field Development, Saudi Arabia
- Jubail Chevron Phillips (JCP)
- Petrochemical Plant, Saudi Arabia

Utilities

- Waste Water Treatment Plant, Shoiba, Saudi Arabia
- JAFZA Desalination Plant, UAE
- Hamas Power Station, Algeria
- Shuwaikh Desalination Plant, Kuwait
- Tianwan Nuclear Power Plant, China
- Mombassa Substation, Kenya
- Kapichira Hydro-Power Station, Malawi

Rail & infrastructure

- Bahrain Int'l Airport Expansion
- Shanghai Metro, China
- Kowloon Rail Link, Hong Kong
- New Terminal, Seeb Airport, Oman
- Circle Line, Mass Rapid Transit System, Singapore
- Channel Tunnel Rail Link, UK
- Cairo monorail, Egypt

Military

- Kazma Camp, Kuwait
- Alexander Barracks, Cyprus
- Dukhan Airbase, Qatar



Heathrow Airport, London, UK.



Kuala Lumpur Stock Exchange, Malaysia.



Manchester United Training Ground, UK.



Financial Towers, Bahrain.

High tech & industrial

- Taiwan Semiconductor Manufacturing Corporation, China
- China Telecom
- Intel Plant, High Tech Kulim, Malaysia
- Kuala Lumpur Telecoms Tower, Malaysia
- Seagate Semiconductor Plant, Singapore
- Alexandra Technopark, Singapore
- Motorola Factories, Singapore
- Najran Cement Factory, Saudi Arabia
- Merck, Sharp & Dohme Pharmaceutical Plant, Singapore
- Alfred McAlpine Quarry Products, UK

Commercial construction

- Bahrain Financial Harbour
- Emirates Towers, Bahrain
- Petronas Twin Towers, Malaysia
- Oman Arab Bank, Oman
- Kuala Lumpur Stock Exchange, Malaysia
- Graha Energy Building, Indonesia
- Canary Wharf, London, UK
- Highland Distilleries Co plc, UK
- Barwa Financial District, Qatar
- London Stock Exchange
- Royal Bank of Scotland, Edinburgh, UK

Sports & recreation

- MGM Grand Hotel & Complex, Macau, China
- Bahrain Opera House
- Azizia Mall, Kuwait
- Disneyland Hong Kong
- Sebang International Formula One Circuit, Malaysia
- Manchester United Training Ground, UK
- Grand Plaza Hotel, Singapore
- Dubai Sports City Complex, UAE

Government & public sector

- Royal College of Surgeons, Muharraq, Bahrain
- Ministry of Foreign Affairs, Brunei
- Singapore Embassy, China
- Prime Minister's Office, Putrajaya, Malaysia
- University Institute of Technology, Ijok-Selangor, Malaysia
- Ministry of Finance Administrative Building, Malaysia
- Mater Dei General Hospital, Malta
- International Maritime College, Oman
- Al Jaber Hospital, Kuwait
- British Library, London, UK
- Dubai Sports City Complex, UAE



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