WORLD LEADERS IN
ELECTRIFIED RAIL TRANSPORT SYSTEMS
Our Journey ...

Brecknell Willis has been involved in transportation engineering since 1854. In 1894 the company moved into the electrification business, which at that time was still in its infancy. The first major contract was with the Bristol Tramway Company supplying the complete system including roadside standards, overhead wires and tram collectors.

New growth came in the 1970’s with the advent of mainline electrification and the introduction of the new single arm pantograph. In the 1980’s our activities spread even further with new metro systems being introduced.

The Company has been operating from Chard since 1938 providing rail transport systems worldwide. We are proud of the contracts we have gained and achieved from those early beginnings.

Today Brecknell Willis is capable of providing the complete ‘power to move’ service for the entire industry from light rail overhead to high speed main line systems.

moving forward ...

Brecknell Willis was acquired by the Wabtec Corporation through their purchase of the Fandstan Electric Group Ltd in June 2014. Wabtec Corporation is a global provider of value-added, technology-based products and services for the rail and transit industry and a strong influence in enhancing our reputation in this growing market.

Our new purpose built factory was completed in September 2014 enabling us to upgrade and streamline our processes to accommodate a growing order book and employee base.

Brecknell Willis have a strong engineering and R & D team working towards new possibilities in an ever evolving world. We have collaborated in the development of the new Tramwave system, which removes the need for overhead lines and incorporates magnets in a road based current collection system. Brecknell Willis were also involved in the development of a Duplex pantograph housing two arms for the purposes of redundancy and reliability. New funding has been won for developing a closed loop pantograph.

We are proud to be part of tomorrows technology.
What we do

Conductor Rail

Shoe gear

Light Rail Overhead

Pantographs

design

development

prototype and testing

manufacture

supply

installation

commissioning

site support

maintenance

test facilities

technical support

site support

training

spares supply
Conductor Rail

One way to provide electric power to a railway vehicle is via a conductor rail, mounted alongside the two running rails and parallel with them. The conductor rail is manufactured from a high-conductivity aluminium alloy which is able to supply the train currents without the large volt-drops and consequent energy loss associated with conductor rails made of steel. The aluminium is fitted with a wearing surface made of stainless steel. The stainless steel is formed in two sections and is fixed to the aluminium by welding the two sections together, providing both a good mechanical and electrical bond to the aluminium.

The composite aluminium conductor rail is installed in various applications. It is used as a long term cost effective replacement for steel or aluminium reinforced steel conductor rail and is proven in service in severe environmental conditions.

The conductor rail is mounted to moulded insulators which provide the required electrical insulation as well as supporting the conductor rail weight and dynamic loadings of the system. The insulators are in turn mounted on a variety of support brackets to the various kinds of track work found in different parts of the railway.

System Design

The layout of the conductor rail system is an important part of the project and involves interface with the track work designers and train builders to ensure correct arrangement of conductor rails with regard to operational safety and continuity of the supply to the trains. This is most important in areas of intricate work such as depot throats.

Our expertise enables us to design the entire system encompassing overall layout drawings, rail, ramps, expansion joints, supports, cabling, covers and off-load switchgear.

Complex studies of the dynamics between current collector and conductor rail are carried out by the Brecknell Willis engineering team.

With many years as specialists in electrified rail transport systems, the Brecknell Willis team of designers and engineers are pleased to meet new challenges.
Shoegear

Brecknell Willis offers complete solutions for low level current collectors which are based on complete systems knowledge, engineering expertise and extensive experience; this covers design, manufacture, supply and installation.

Selection of the right collector/rail combination plays an important part in the achievement of good current collection.

The parameters used to assure optimum performance in all applications are minimum dynamic mass, minimum friction and frangible construction.

Shoe loss detection is now a universal requirement driven by industry and customers. Brecknell Willis offer a solution that can be applied to the frangible shoes and can be integrated into the depot environment to reduce maintenance time and costs.

Brecknell Willis also offer fuse blown indication for incorporating into the Train Integrated Monitor System (TIMS) on third rail shoegear.

We are compliant with many international standards when designing and validating our shoegear design which includes BS EN 15085 as well as full Finite Element Analysis (FEA) to GMRT2100 requirements.

Advantages of the Brecknell Willis design include:

- High traction power efficiency
- Reduced maintenance
- Reduced arc damage at working interface
- Maximum life of wearing components on both sides of the working interface (conductor rail and shoe)
- Reduced electrical interference to auxiliary signalling and communications equipment.

It is often a requirement to be able to retract shoegear clear of the conductor rails, to allow emergency isolation, or through running into an area of overhead power supplies. Our systems can provide retraction by mechanical (by rope or lever), electrical, pneumatic or hydraulic and there are many designs options available.


**Pantographs**

Brecknell Willis design and manufacture pantographs for all rail operations. With our development, testing and interface knowledge the Brecknell solution will offer out of the box functionality, optimum reliability and total life cycle costs.

The design principles are based upon minimising both dynamic and installed mass which will optimise contact strip life and contact wire life, minimum electromagnetic interference, and extend maintenance periods. For the higher speed requirements a range of aerodynamic optimisation techniques are available.

Pantographs comply with the relevant European and/or international standards where applicable.

Amongst the various solutions available include ..

- spring operated units activated either manually, electrically or pneumatically
- pneumatic direct operation
- automatic extension and pan housed detection systems

Brecknell Willis are also able to offer ancillary equipment and complete pantograph systems such as ..

- auxiliary compressors
- pantograph raising, lowering, autodrop control and signalling
- maintenance tooling including pantograph force monitors
- insulating air feed equipment
- mounting insulators

To aid integration into the clients vehicle full 3D models may be provided for the supply scope along with all necessary structural analysis where demanded. Other documentation such as full maintenance instructions, illustrated parts catalogues, reliability analysis etc.

To keep your pantographs in tip top condition we offer a complete overhaul and repair service.
Overhead Line Systems

Brecknell Willis have extensive experience in the design of high performing trolley wire systems for light rail and tramways.

Our overhead line philosophy is to provide an aesthetically pleasing system while retaining both performance, safety and reliability. The use of in-house designed components, intended specifically for light rail, enables this philosophy.

Years of experience working on tramway projects enables us to provide interface management with local authorities, local utilities, emergency services, as well as the civil contractor and the client.

A full package for the overhead line can be provided, from design, supply, installation and commissioning. Once the system is complete, a comprehensive as-built package can be supplied for the client and maintainer.

Design
Brecknell Willis offer a full design service from top level OLE design for Major Projects to design for small works packages. We design from first principles giving a cost effective, aesthetically pleasing overhead system whilst minimising the equipment used and delivering performance requirements.

Supply
Brecknell Willis offer a range of equipment for all types of tramways and light rail systems. This includes equipment and components for Catenary systems, Trolley Wire systems and Heritage tramways.

The typical supply for projects includes poles, supporting equipment, contact wire, switchgear, along track cabling and wall fixings.

Installation
Our installation teams provide a skilled and dependable resource for installation of overhead line equipment, whilst keeping safety the top priority.

Testing and Commissioning
Our test and commissioning teams offer a full range of electrical and mechanical tests to prove the performance of the Overhead Line system.