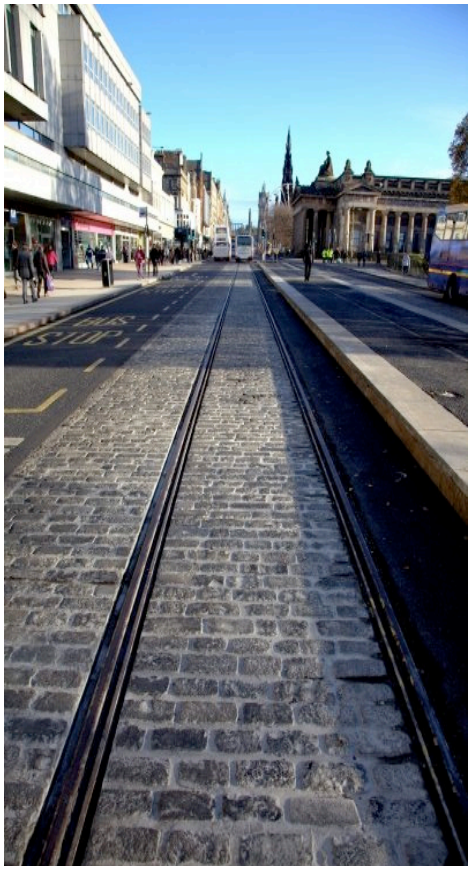
Edinburgh Trams

Photo Update

January 2010

PRINCES STREET



Princes Street was re-opened to buses, taxis and cyclists early on Sunday 29th November.

The approximate quantities of some of the materials used on the Princes Street section include:

- 900 Cubic Metres of Concrete
- 15000 Square Metres of Bitumen Surfacing
- 4000 Linear Metres of Rail
- 2000 Square Metres of Granite Setts
- 1200m of Rhino fencing was removed from Princes St in the few hours prior to its re-opening

To give you an idea of the volume of work involved on Princes Street, the construction process is outlined below.

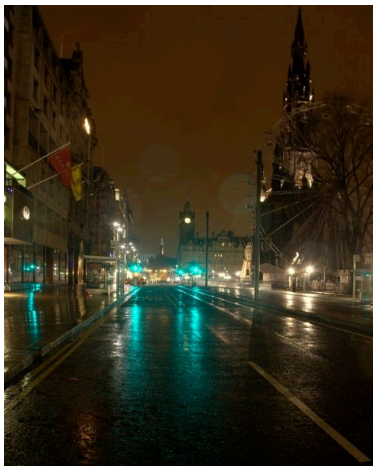
The construction process

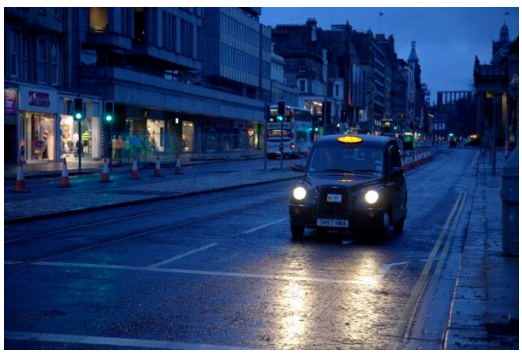
Track building follows a complex process in order to give the rails the ability to sustain a busy tram full of passengers on a regular basis.

Firstly, foundations for the track are dug two feet below the road surface and a layer of concrete is added to create the base on which work would begin. Sleepers are then laid at 600mm apart and partly cast into the concrete. The rails are laid on top of timber blocks in order to support them while a rubber sealing is created around the foot of the rail to stop any moisture entering. Spindles are also added before the timber blocks can finally be removed and a gauge fixed.

The track is balanced, and then laid, to create the final design level. As with the foot of the rail, rubber seals are then attached to the sides of the track, to stop the entrance of any excess moisture.

The next stage is to lay the concrete around the sleepers and under the rail, providing the first glimpse of the final surface level of the tracks. More rubber sealant is then applied to the fixings to provide further protection from residual current before the final surface layer of tarmac is added, along with the final sealant.



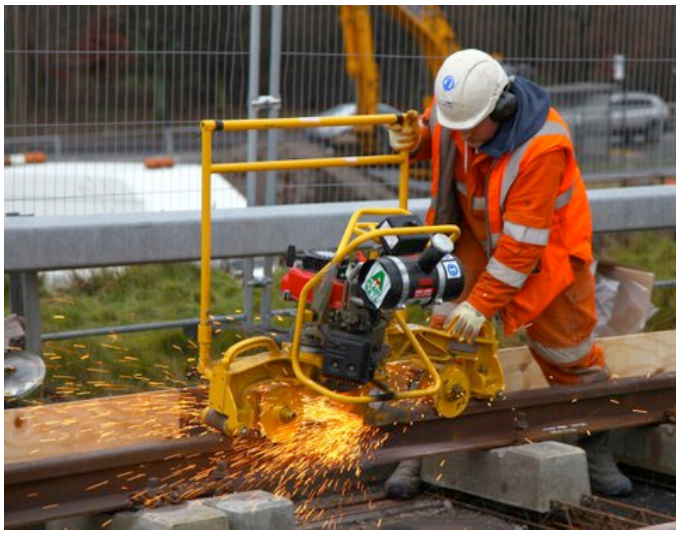


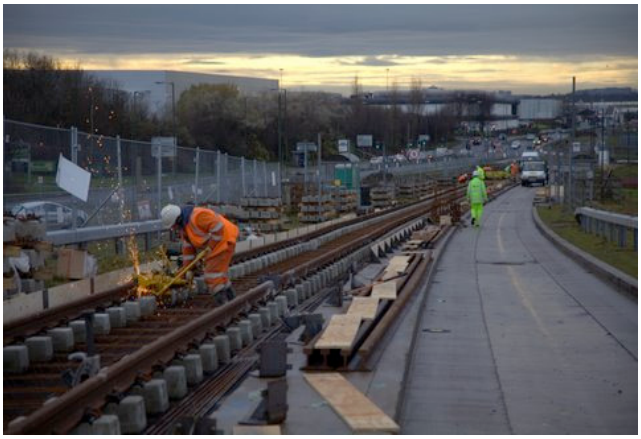
GUIDED BUSWAY

Trackwork on the guided busway is well underway and continues to make significant progress

The Outer Loop Track consists of:

- 1350m sleepers & rail installed
- 1300m rail welded
- 500m track to final level
- 150m of track concreted





STRUCTURES

Burnside Bridge at Edinburgh Airport was lifted into place in October 2009

The bridge is a Bailey type construction – 32 metres, Steel truss.

This was a complicated procedure due to the proximity of the lights on the cranes which had potential of causing confusion to incoming flights.

The bridge was essentially lifted at one end by the 200T crane and rolled across the Gogar Burn in order to be placed onto the abutment on the Terminal Building side.

Ian Clark, Edinburgh Trams Project Manager, said:

"The new Burnside Bridge signals the next phase of major tram works to commence in close proximity to Edinburgh Airport. The utility diversions along the tram route at the airport are nearing completion.

"With the tram stop located at the terminal building, the purpose of the bridge is to allow access to the airport's service yard, a vital artery for its operation as an international hub for visitors to Edinburgh."

Work continues apace on the tram viaduct at Edinburgh Park

The viaduct allows the tram to cross the main heavy rail lines at Edinburgh Park Station continuing on to the Gyle

Gogar Depot takes shape

Construction work on the Gogar Depot building itself is now well underway with daily progress being visible from both the road and the railway line. Before getting to this stage however, a considerable amount of preparation work on the site had to be undertaken to make the site ready for actual construction on the building itself.

The site, which measures approximately 60,000m^2 was originally wasteland and included enormous earth bunds. Since preparation work first commenced on the site in Spring 2007, approximately 411,000m^3 has been moved. In addition, a large 800mm high pressure water main as well as a gas main which serviced a large proportion of Edinburgh had to be diverted from the middle of the site before any construction work could commence.

When complete, the Gogar Depot will be used to house and service the fleet of trams and provide accommodation for around 100 employees as well as the tram system control room. The building itself, when complete will measure approximately 4,600m^3

The roof cladding is now complete and works to construct the perimeter edge beaming and base slab are underway, along with the Depot access road being prepared for asphalt.

Carrick Knowe Viaduct construction begins

The new viaduct will enable the tram vehicles to traverse the network rail tracks which travel westbound out of Edinburgh and also service the City Centre.
It is important as it links the off road section of the tram line to the guided bus way on the southern side of the tracks.

Bridge specifications are:

- 73m length
- 5.3m in height (at a minimum)
- Standard concrete and steel construction

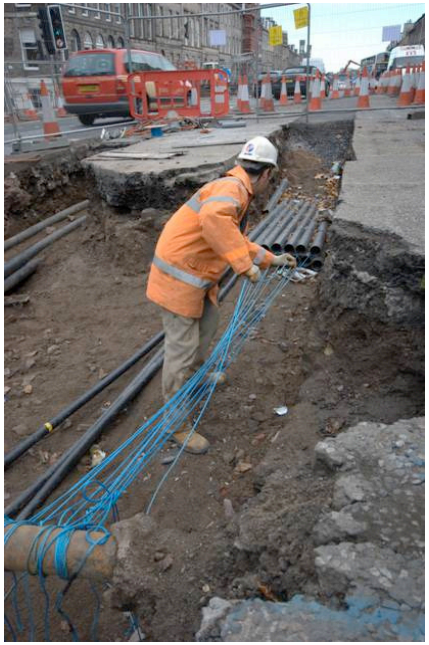
The construction process is delicate in nature due to the work taking place in proximity to an active rail line. As such a fail safe operation has to be implemented in order to ensure the viaduct is constructed safely.

Foundations for the viaduct have been completed with casting of the abutment walls due to be carried out over the coming weeks. Following completion of the abutments, the approaches for the viaduct will begin and take until around March 2010 to complete. The bridge will be structurally complete after deck beams have been lifted into place during March.

For part of the construction process a 1000T crane will be used to lift and place the deck beams which will span the abutments on either side of the railway line.

UTILITIES

Cabling work



Above Left
Once new conduits for optical fibre or electrical cable have been laid, the cables must be drawn through and connected. Ropes are blown through the new conduit using compressed air to provide a guide line for drawing through the new cables. These ropes will guide a metal cable or 'bond' from one end of the conduit to the other. This metal 'bond' is used to pull new service cables into position.

Above Centre
The new cable emerges from the conduit, being drawn slowly and carefully under about 1 tonne of traction. Once all cables have been drawn through, new service connections can be made.

Above Right
A reel of new electrical cable ready to be pulled through underground conduits to replace the existing, old supply. This new cable and the conduits are designed for heat resistance and resilience to maximise longevity. This powerful winch unit can provide several tonnes of traction. The guide ropes are used to draw a steel cable or 'bond' back through to the new cables on the reel. This winch then applies traction under careful supervision to draw the new cable through underground conduits to its new location.

Winning photograph

This photograph was taken early last year by Bilfinger Berger's Safety & Environmental Advisor, James Willoughby who entered it into a pan-European photo competition organised by the European Agency for Safety and Health at Work to promote awareness on occupational safety and health.

James's photograph was selected by a panel of professional photographers as one of the twelve 'commended' pictures out of 1700 entries. They have been used for a calendar to promote occupational safety and health. The calendars have been distributed to employers and other safety agencies across Europe.

The photo depicts representatives from Edinburgh Trams, Bilfinger Berger and a Sub-contractor on a safety tour of Princes Street at the early stages of work on Princes Street during April 2009.

James said
"The photo symbolises how crucial good communication is between all parties for successful health and safety management, from the very outset of a project. It demonstrates commitment to a shared vision of first class health and safety performance."

Design and Branding

One of our key objectives is to increase the visibility of Edinburgh Trams branding throughout the length of the tram route as well as out with of the area to not only promote the Project itself, but also to raise the profile of the City throughout Scotland and further afield.

Right
A small selection of some of the in-house design work that we've created here at Edinburgh Trams to help promote the Trams as well as local business and events along the tram route.

Below
One of the poster designs created for the Edinburgh Sparkles campaign.

Stewart Hardy, Design & Print Manager at Edinburgh Trams, said:

"Recognition of the tram project, as well as those businesses affected by the tram works is essential for informing the public.

"We are currently undertaking an extensive programme of continuously developing signage and designs - from information posters and tram routing signage to broader illustrations of the tram project and its benefits."

Above
Open for business signage designed by Edinburgh Trams to help support local businesses.

Right
Cllr Gordon Mackenzie pictured in front of the new signage at the Airport.