



raising standards in property preservation

# Peter Cox On Track



# Balfour Beatty Rail



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Peter Cox

## On Track

Electrifying key routes on the railway will mean faster, greener, quieter and more reliable journeys for thousands of passengers. The Government is committed to investing in a programme of electrification that will help transform the railway and provide Britain with a sustainable world-class transport system.

Electrifying key railway routes will improve services for thousands of passengers and help support economic growth across many of our cities and towns. It will mean faster and quieter journeys with more seats on trains and improved reliability on some of the busiest routes.

Peter Cox AnchorBond Division, using the Cintec anchoring system, is working closely with the Department for Transport, train operating companies and other key stakeholders to deliver electrification across the UK.



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## North West Electrification Programme **Middleton Viaduct**

At Middleton Railway viaduct, Manchester, Balfour Beatty Rail Projects Ltd was charged with electrifying the line. They had to install new gantries which will hold the electric cables and these huge loads of up to 120Kn meant the viaduct walls were not strong enough to carry the loads and forces involved.

We supplied and fitted 80 anchors for the 22 gantries which were installed over a distance of two miles. They were up to 6m long and went into the brickwork at a 45 degree angle. In some places it was necessary to drill through the viaduct horizontally for 11 metres to enable installation of the cantilever gantries.

For health and safety reasons everything had to be packed away every night and set out again every morning. Some of the work in commercial areas had to be done out of hours. There was also some significant environmental issues with the Leeds Liverpool canal in close proximity. No disruption to the trains was caused during anchor installation.





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### North West Electrification Programme

## Middleton Viaduct



6m long Cintec Anchors installed at 45 degrees



Solid blue engineering brick construction





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## North West Electrification Programme Middleton Viaduct



Smaller horizontal anchors for the base plate.



Close up of 45 degrees washers and locking nuts.



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## North West Electrification Programme Middleton Viaduct



General view.



General view.  
Note: Work carried out whilst line was live.





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## North West Electrification Programme

# Middleton Viaduct



General view.



Portal close up.



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## North West Electrification Programme Middleton Viaduct



Work carried out in open and messy site conditions.



Three off 65mm diameter holes at 11m.





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## North West Electrification Programme Middleton Viaduct



Inserting the Anchor - 11m in length.



Twin Track Cantilever Portal. Installed with 11m long Anchors drilled right through bridge to other side.



## North West Electrification Programme **Castlefield Viaduct**

Castlefield Railway Viaduct in Manchester is a grade 2 listed structure. It sits within the Castlefield conservation area which was the UK's first designated Urban Heritage and boasts Roman origins.

The viaduct was built around 1849 and is arched and made of brick. Lundy Projects had to install 2no new signal gantries in the viaduct to facilitate the electrification process.

The signal gantries are enormous structures and it is vital these Victorian viaducts would be able to safely withstand the additional pressure. We supplied anchors that had been tested to carry 180 kn and fitted 14 of them which were up to 45 mm thick x 3 m long into the walls on either side of the viaduct.

In this project, we had to work very closely with English Heritage to ensure our work did not compromise the aesthetic values of the viaduct. The project was completed in just two weeks and during this time the train timetable was not disrupted.



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### North West Electrification Programme

## Castlefield Viaduct



Combined electric and signal gantry.





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## North West Electrification Programme Castlefield Viaduct



The work was done via fixed scaffold and MEWP (Mobile Electrical Working Platform).



Trains were running whilst working.





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## North West Electrification Programme

# Castlefield Viaduct



All Anchors tested to 185Kn (18.5 Tonnes per Anchor).  
Total structure erected on Christmas Day and only with  
a 6 hour line closure.



Portal close up. Anchor installed at 45 degrees.







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COX**

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# Wall Stabilisation

## With Peter Cox **ANCHORBOND**



### **Cintec Anchor System**

Anchorbond masonry anchors use the Cintec system across the UK and Ireland to provide an effective and cost effective method of structural reinforcement which can be tailored to meet specific building strengthening and repair requirements. In addition to structural repair solutions Anchorbond can be used to create secure fixings on masonry facades.

The anchor is comprised of a stainless steel bar surrounded by a woven polyester fabric mesh sleeve into which a specially formulated cementitious grout is injected under pressure. The flexible sleeve expands and moulds itself into the spaces within the wall, providing a strong mechanical and chemical bond when cured. Various attachments can be welded to the anchor head.



This unique system employs a secondary feed tube at the base of the Anchor, which in turn is connected to the return air side of the pressure pump.

The low pressure zone created at the base of the anchor allows for a smoother and more consistent fill, and eliminates any back pressure.

VTek is particularly important when installing long, inclined or overhead anchors as the system virtually eliminates any air pockets, thus increasing the bond strength between the anchor sock, and its contact area.

### **Benefits & Typical Applications**

#### **Benefits**

- ▶ Purpose designed for each application
- ▶ Versatile in use
- ▶ Can be used in weak substrates
- ▶ Effective in poor quality materials and for bridging cavities
- ▶ Invisible when installed
- ▶ Fire resistant
- ▶ Cementitious based and therefore sympathetic to the original structure
- ▶ Approved by heritage authorities

#### **Typical Applications**

- ▶ Stabilising masonry
  - solid, cavity, hollow pot and rubble filled
- ▶ Lateral restraints
- ▶ Replacement and supplementary wall ties
- ▶ Crack stitching
- ▶ Stitching anchors e.g. for arch consolidation
- ▶ Stud anchors
- ▶ Parapet wall strengthening
- ▶ Retaining wall anchoring





# ANCHORBOND Installation



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## ▶ Inserting Anchor



For stabilisation work anchor lengths are typically 1m to 11m in length. Care needs to be taken not to puncture the polyester sock.

## ▶ Injecting Grout



The cementitious grout is site mixed and then sieved before pouring into a pressure pot which operates at between 2 and 4 bar. The grout is forced into the sock around the anchor. This expands to fill the cavity drilled out, starting to harden after approximately one minute.

## ▶ Anchor Sections



The grout is injected through the rod in the case of hollow section anchors but if solid single or multi bar sections are used, a separate injecting tube is inserted in the fabric sock. As illustrated here, threaded rods can be used to facilitate fixing attachments to the anchor head - for instance for tie bar extensions and support brackets.

## ▶ Surface Repair



Drilling holes are made good so that the repair will be almost invisible – this is particularly important in the case of historic property.

## ▶ Drilling



Installation holes are created in the masonry using a wet diamond drilling process with extension drill bits added as required to achieve the required hole depth. The waste is removed in the form of cores.



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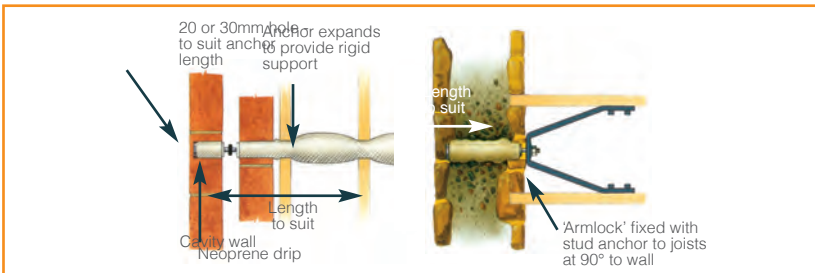
# ANCHORBOND

## Typical applications

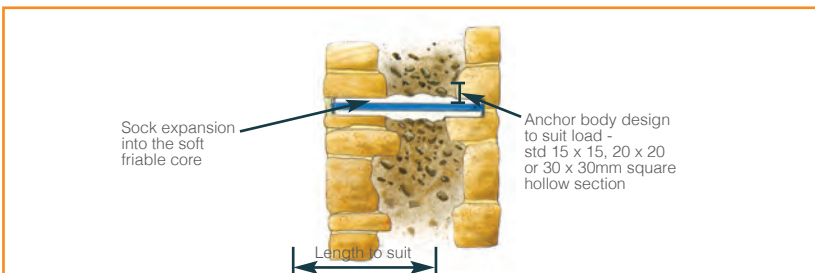


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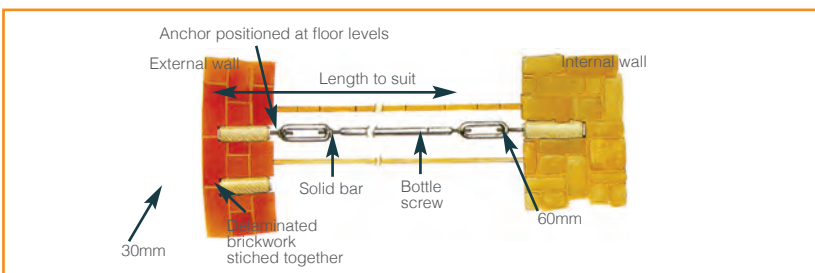
### Lateral Restraint - Wall to Floor Joists



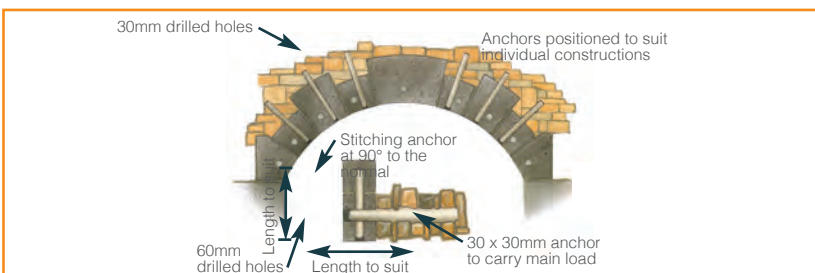
### Stitching Anchor for Rubble Filled Wall



### External Wall Anchored to Internal Wall



### Arch Consolidation



The Peter Cox Anchorbond masonry anchor uses the world renowned Cintec system. It can be used across a variety of materials including stone, concrete, terracotta, clay and wood - and is even be effective under water. The application will not compromise the original material or the appearance of the structure, making it extremely versatile.

Peter Cox technicians are approved installers of the Cintec system in the UK. We are unique in that we have considerable experience of working to stabilise major projects and can, if required, calculate the anchor design and specifications by working with structural engineers familiar with this type or work.



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# ANCHORBOND

## Structural Anchors in action



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### Ruchill Hospital



The hospital was opened in 1891 and only the hospital's A-listed red-brick water tower remains, a much loved local landmark in Glasgow. Water had got into the sandstone structure and caused cracking. Our technicians installed eight, six metre long anchors right at the very top of this 40 metre structure in atrocious weather conditions.

### St Johns Beacon



Radio City Tower (also known as St. John's Beacon) Liverpool is a radio and observation tower built in 1969. It is 138 metres (452 ft) tall, and is the second tallest free-standing structure in Liverpool and the 32nd tallest in the United Kingdom. Our technicians actually worked higher than this to install anchors into the top section to allow a radio mast to be bolted onto a 10m long antenna.

### St Mary's Church



Built in 1850 this Ambleside church has an impressive tower. However, throughout the church's history the combined weight of stonework and bells has been too much for the foundations and caused cracking and so we installed a series of anchors across the beams to stabilise the tower. This is actually a common problem and something we have rectified across several church sites.

### Peel Castle



Peel Castle was originally a place of worship before becoming the fort of Magnus Barefoot, 11th century Viking King of Mann. The structure has no roof and the two side walls were leaning out and so our technicians used Anchorbond to secure them to each other via tie beams. These stainless steel beams prevent movement in the walls of this ruined chapel and stop them from collapsing

### Middleton Junction



The electrification of the railway will mean faster, greener and quieter journeys. At Middleton Railway viaduct, Manchester, Balfour Beatty Rail Projects Ltd is charged with electrifying the line. They are installing steelworks to carry the new gantries which will hold the electric cables. These huge loads of up to 200 kn mean the viaduct walls must be strengthened. The anchors for the gantries were installed over a distance of two miles and are around 6m long, going in at a 45 degree angle. In some places it was necessary to drill through the viaduct horizontally to enable installation of the cantilever gantries. As the line is live, work has to be done out of hours.

### The Theatre Royal



This is the oldest theatre in Glasgow and is the home of Scottish Opera and of Scottish Ballet. When the owners wanted to replace the old canopy fronting the building with a new one, they used our anchor system to hold the new cantilever glass canopy firmly in place.

### Shop conversion



When the owners of the building in York started to renovate it for a shop conversion, they discovered crack in the party wall and so we installed anchors in either side to prevent further deterioration and to stabilise the building.

### HM Prison Pentonville (informally known as "The Ville")



Working in this category B/C men's prison environment presented numerous challenges including thorough personal security checks and the booking in and out of every single tool. Our team worked on the chapel, to strengthen failed arches.



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