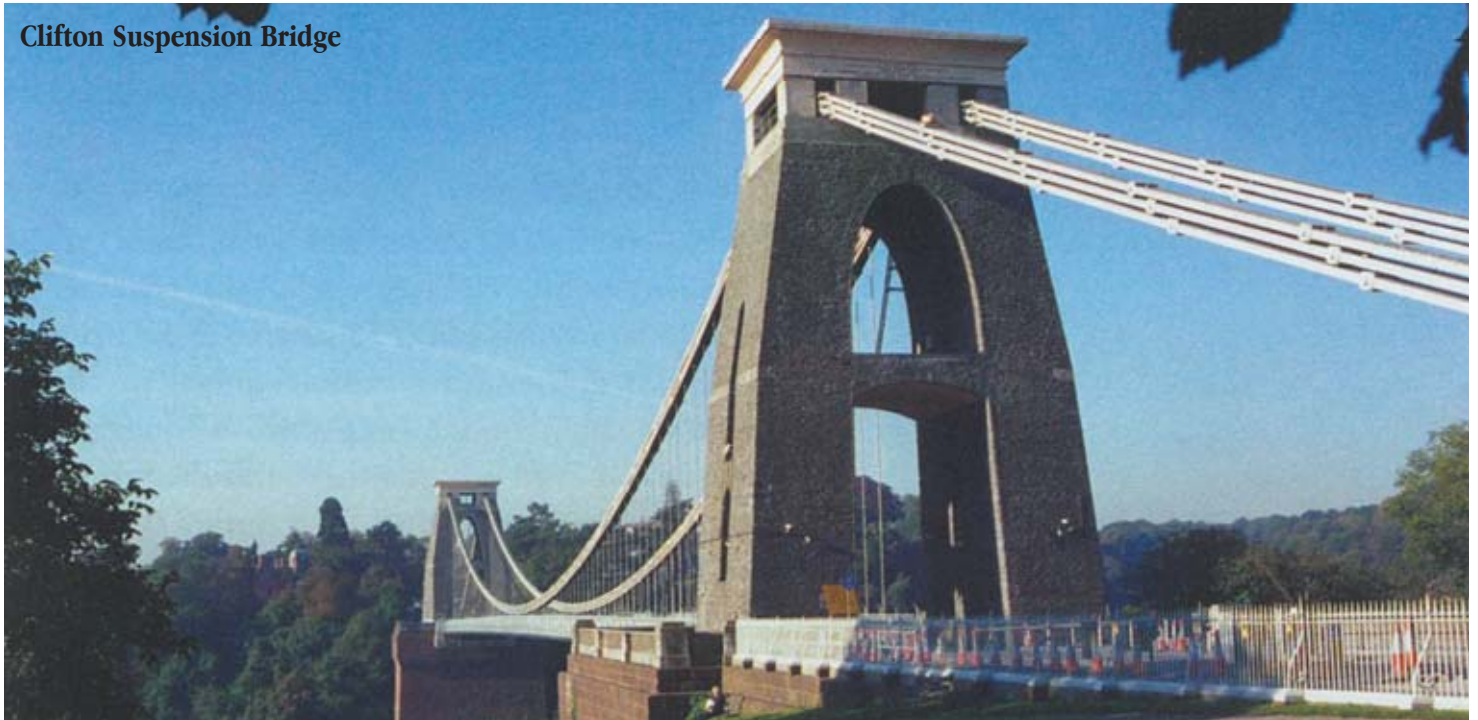


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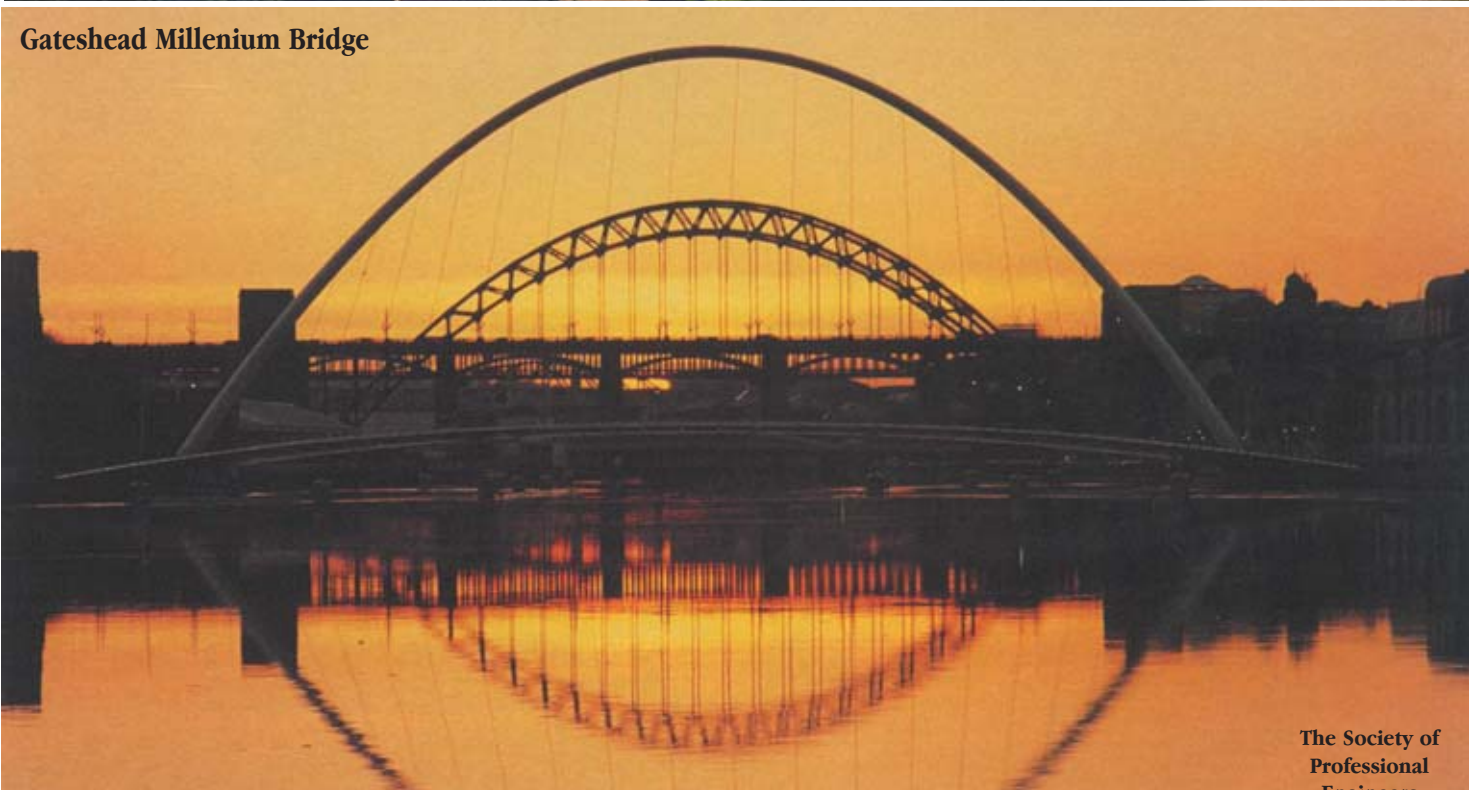
ENGINEER

Issue 73, Spring 2011

Clifton Suspension Bridge



Gateshead Millenium Bridge



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The Society of
Professional
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was founded in 1969.





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1974/75	D.J. AYRES	1980/81	V.C. EALEY	1990/91	K.A. STATHAM	2003/05	DAVID PARRATT		



Welcome to the latest publication of the Bulletin in which we feature articles on 'The

Signal Box- a great survivor', 'Fastnet Lighthouse', Kittiwake House, Slough', 'Alderman Michael Bear is the 683rd Lord Mayor of the City of London', 'V.A.T. and Property', 'Commitment to public over cheque abolition' and 'the beginning of the technological revolution'.

Also mentioned are 'Future issues of the Bulletin', and the need to reduce publication to three issues this year, whatever happens, subscriptions are likely to remain the Society's most reliable source of income for the foreseeable future.

Any member likely to have difficulty paying the subscription should contact the office, don't just fade into the shadows, every member is important.

I do hope you enjoy reading this issue, and may I remind members that any articles you may have for future issues, particularly from overseas, are always most welcome.

I hope you enjoy the Bulletin.

Brian R. Dixon, BA, P. Eng.
Editor

As I write, Council approaches its first full meeting since last year's AGM.

Following agreement to give prominence to PEng as post-nominal letters, I ask all Members to use these letters, PEng yourselves, whenever you can.

CPD is an important part of maintaining modern professionalism, & an up-to-date skills base. Please consider the CPD information on our website www.professionalengineers-uk.org/membership/cpdguide.htm & Record your own CPD in the way suggested. Validation of Professional Qualifications is sure to grow in importance, & you should be able to produce your own CPD Record.

Council continues working to economise, to achieve efficiencies in administration, & to use

new technology. In addition to email, audio & video conferencing (Skype etc) are used to manage the Society's business.

Council is considering options for enhanced communications with Members, & would like to use email for this. Further information, of ongoing interest to Members is to be found on the Society's website, which is being revised in content, design & layout. A short URL www.speng.org may be used for convenience.

"Exciting Engineering", our charity, has a new website www.excitingengineering.org.uk We wish to encourage bright young minds to consider Professional Engineering as a career. This is your Society. Council does its best, but comments, criticisms & suggestions for improvement, are all important & welcome.



Members interested in joining Council are invited to enquire at any time.

Hugh Wynne PEng
President

The Bulletin

In the current economic climate, SPE Council feels it would be responsible to make cost savings by reducing the number of issues of the Bulletin from four to three per year.

However, these issues will have more articles and content to make up for the shortfall in issue numbers over the year.

We are also offering our members the choice to opt out of receiving Bulletins in traditional paper form and to receive them electronically. This would assist greatly in reducing printing and mailing costs and support our developing green agenda.

Therefore, please will you give us your choice and consent (for data protection purposes) to email contact by sending an email to us at spe@abe.org.uk Please put "Bulletin Choice" in your subject line and, along with your choice and consent, please include your name, email address, postal address, and SPE membership number in your message.

We thank you your assistance and continued support of the SPE.

Do you have non-member colleagues? Encourage them to join the Register

A membership information pack is available on request from

The Society of Professional Engineers, Lutyens House, Billing Brook Road, Weston Favell, Northampton NN3 8NW

Tel: 01604 415729 • Fax: 01604 415729 • Email: spe@abe.org.uk

The Signal Box- A Great Survivor



Signal boxes are among the most distinctive building types associated with railway infrastructure, combining form and function in a highly satisfying way. While the majority of mechanical signal boxes combine the elements of large windows, a ground-floor locking room, an outside staircase and balcony, the number of variations around these themes is considerable. Once to be found at almost every railway station and junction and at many level crossings, 60 years ago they numbered more than 10,000. Despite advances in signalling technology, a surprising number of traditional signal boxes survive, some of them approaching 140 years old.

Some 498 mechanical signal boxes continue in use with Network Rail but as predominantly timber structures they need regular repair and repainting. Sliding sash windows more than 100 years old may be draughty, and this has led in many instances to their replacement in uPVC. As the window area of a signal box is so large the replacement of small paned sashes by large frames filled with sheet glass has a very significant effect on the appearance and character of the building.

Littleport Signal Box, built in 1882 on the main line between Ely and King's Lynn, shows how an unlisted railway structure can be treated sympathetically. It was repainted in 2009 in a traditional green and cream colour scheme as used by the London & North Eastern Railway in the inter-war years. This colour scheme and the retention of the original sliding sash windows give the building a sparkle and provide an object lesson in how a 19th-century industrial building can enter into its third century of use for its original purpose. The

refurbishment is part of a programme undertaken by the Network Rail Operations Manager, Ely, and carried out by the contractors, May Gurney, under which 14 boxes have been renovated: one of them, Bury St. Edmunds, won a National Railway Heritage Award in 2006.

In the UK 124 signal boxes are listed. However, their subsequent management poses distinct problems. Their location – in many cases next to a working railway with 100mph trains running within a few feet of them – means that, once redundant, alternative in-situ uses for them are very difficult to find. They are often isolated on railway land with no access, which can make them easy targets for vandalism if left unoccupied. The problem is illustrated by the Grade II-listed St Albans South, which stood derelict for many years after closure in 1979, until its recent opening as a signaling museum

by the St. Albans Signal Box Preservation Trust.

In addition to those in active use with Network Rail, more than 300 further boxes survive, either out of use, preserved or re-used. Often largely of timber construction, some are relatively portable and many have been moved to new sites. A number have been re-used for their original purpose on preserved railways while others fulfill an alternative use. One has been turned into a hide on a nature reserve at Lewes, while others on closed lines have been turned into homes, such as that at the former royal station at Wolferton, Norfolk, or into summerhouses, such as Haugh Crossing near Wooler, Northumberland.

So whether in service on the national rail network, or fulfilling an alternative use, a goodly number of these intrinsically attractive buildings will continue to be a part of the landscape for the future.



Modern Interior for Aberdeen Council HQ



Members of the Aberdeen Centre paid a site visit to Aberdeen City Council's new flagship headquarters on two occasions in September. The £68m alteration work to Aberdeen's famous Marischal College is being carried out by main contractor Sir Robert McAlpine. Project manager Steve Traynor gave the tour of the second-largest granite building in the world. The project will have more than 60 different trade packages and is due for completion at

the end of May 2011.

The scheme, which involves the demolition of the interior of the building and the creation of a 21st century office building, will provide 174,000 sq ft of modern office space over four floors for up to 1,300 city council staff. All granite elevations of the 100 year-old A-listed façade are being retained, although the inside of the building will feature a new, predominantly open-plan interior of contemporary, hi-tech and sustainable design.



River Boyne Spanned with Steel



A steel composite bridge was the solution used for the recently opened M3 motorway's longest structure needed to span the River Boyne.

Covering a length of approximately 66km, the motorway links Clonee- just north of Dublin- with the commuter towns of Navan and Kells.

SIAC Butlers Steel fabricated and erected the bridge, known as structure S19, using 650t of structural steel. The bridge features two 37m long spans with a third central span of 56m. The structure required 12 girders which were brought to the site in braced

pairs. The outer spans (37m) were brought to the site in completed lengths, while the middle span was assembled on site from two sections.

"Most of the connections on the bridge are bolted, but for aesthetic reasons the outermost girders were site welded," explained Tony Callanan, SIAC Butlers' Construction Director.

Working on behalf of the M3 Motorway JV, SIAC Butlers also supplied and erected the steel signage gantries along the M3 and toll booths at either end of the motorway.



Kittiwake House, Slough

Garry Trinder
Hill Partnerships
Project Kittiwake House, Slough
Value £7.9m
Contract JCT 2005



Garry Trinder's guiding hand was evident in virtually every aspect of this project. Right at the start, when a planning error, meant the building had to be redesigned to allow it to fit on the site, Trinder was heavily involved in ensuring the project remained viable for the client. He then pulled back the six-week delay by first-class management.

Bordered by a busy road, a railway, a university and two office blocks, the building filled the entire site footprint. Trinder demonstrated excellent professional skills to make the access and logistics work. He minimised disruption to the neighbours by allocating and policing strict delivery times. He regularly invited them on to site for construction updates over tea and biscuits. He programmed works

thoroughly and well in advance, and constantly developed a good rapport. He rented 30 spaces in a nearby car park for staff use, and located the site offices and welfare facilities on the project roof. And with no room for an external staircase on the scaffolding, he came up with an innovative internal precast staircase as the access solution. Trinder saved time and money by championing pre-made steel shutters and alloy formers for the concrete frame. He persuaded the electricity company that an adjacent substation had the capacity to serve the development, saving £35,000. He ensured the piling methodology minimised disruption to boundary walls and allowed rapid frame erection.

He enjoyed excellent relations with suppliers and subcontractors, who accepted his determination to accept nothing but the best. The completion of the project on time and within budget was accordingly enhanced by superb quality of finish.



New Motherwell College

John Downey
Miller Construction
Project New Motherwell College
Value £47.3m
Contract SBCC 1999

Leading a £47m project from conception to completion on time and ahead of budget would be a source of pride to any construction manager, but to do so at the age of 33 is accomplishment indeed. From the start John Downey's open, transparent and enthusiastic approach gave confidence that he was the man to deliver the project. He immediately established effective lines of communication and took the time to gain an understanding of the client's aspirations. He repeatedly went beyond his contractual obligations to alert the client to specific design details that did not match those

aspirations, offering a review to find a better solution.

Downey clearly explained the build's progress in monthly reports. He accompanied it with high quality pictures of the site, an assessment of works recently completed and a schedule of what was to come. Confident of delivery on time, the client was able to dovetail its internal procurement and relocation plans with Downey's handover dates. As well as his professional ethos, the client and the construction team alike benefited from his technical insight. For example, his removal of a 300m-long stainless steel cleaning rail within the atrium of one block in favour of an alternative maintenance regime brought savings and

programming benefits. His unbending approach to quality control also delivered an exemplary finish.



DESIGN A LOGO

The Society's charitable arm, Exciting Engineering, which was launched at the House of Lords in December 2009, has so far done very little because it needed first to have its own website to achieve the publicity it needs. However, although this website is not quite finished, it is now online and can be found at www.excitingengineering.org.uk

However, we believe that it could be improved by a good logo and we are therefore looking for help from our other members. If you have any good ideas, even if only in sketch form, please send them to David Parratt, 18, Orchard Close, New Alresford, Hampshire SO24 9PY or by email to mail@davidparratt.com

At this stage they do not need to be fully finished ideas because this work can be done later. We will try to show as many entries as possible in a future edition of The Professional Engineer. Unfortunately, we cannot offer any prizes for these good ideas but the names of those supplying the winning entries together with the names of their firms will receive the appropriate recognition.

Future Publications of the Bulletin

At the Council meeting in February this year it was agreed that the Bulletin would be published 3 times this year.

This would be in March, July and November, with the deadlines being the 15th of the month prior to publication, i.e.- February, June and October.

According to the old adage, you only truly appreciate things when they are gone: an observation that could hardly be more true than when applied to heritage. We enjoy the many benefits of living in a country with a remarkable wealth of history. The significance of our buildings and countryside lies, in particular, in their extraordinary breadth and diversity, reflecting a huge range of cultural and natural heritage. The future of that heritage is, however, dependent on our ability to meet the duty of care passed down to us along with the historic sites and spaces that comprise it.

The main reason the United Kingdom is such a popular tourist destination is precisely because of its rich and colourful past. While the most important and iconic buildings are protected by statutory legislation, many of these buildings are still at risk, whether through neglect or through the erosion of their character by inappropriate development.

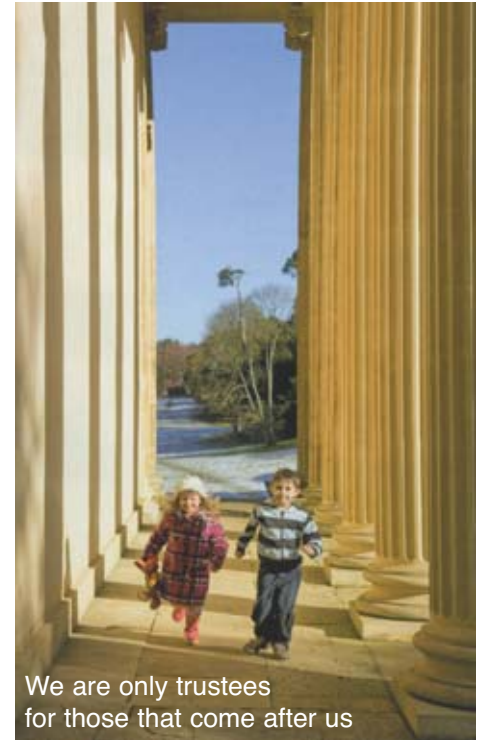
The responsibilities of guardianship must be applied to the country as a whole as well as to the individual elements that make up our heritage, which cannot effectively be protected piecemeal or without clear, overarching objectives. Rather, we must respect and protect our past while looking firmly to the future.

Keeping History Alive

The National Trust was born in 1895 from a desire to protect the elements of our environment that people value. As well as country houses, these protected places now include ancient stone circles, mills, gardens, villages, castles, cottages, woods, farms, works of art and libraries, historic landscapes, stretches of coastline and important wildlife habitats.

The same belief in the vital importance of heritage protection also led to the founding of other organisations such as the Society for the Preservation of Historic Buildings (SPAB) in the 1870s and Save Britain's Heritage in the 1970s.

Although the loss of historic structures has declined substantially in recent years, they continue to face considerable threats, whether from shifting lifestyle expectations or changes in legislation. Many of the applications for listed building consent that conservation officers have to consider relate to alterations to accommodate changes perceived as necessary. Yet in reality these often have to be turned down because they erode the character of historic buildings to an unacceptable degree. It can be hard to suggest that the occupants should simply move somewhere else more suited to their requirements but this is often the only sure



We are only trustees
for those that come after us

means of safeguarding the building. While the overall character of our historic fabric must be the main priority, this is not to say that all historic buildings should be preserved exactly as they are.

VAT and Property- A Legislative Maze Explored

The VAT legislation that relates to property is renowned for its complexity. This is mainly because much of it is based on VAT case law and relies on a 'fair and reasonable' apportionment basis which is, of course, subjective and could be disputed by HM Revenue & Customs (HMRC).

This article aims to set out the basics and include some helpful hints to gain the best solution for both contractor and client.

Listed Buildings

The zero-rate of VAT applies to construction services (and building materials supplied with those services) provided in the course of 'approved alterations' to a 'protected building'.

A protected building itself is defined by HMRC as any building which is a listed building (within the meaning of the Planning (Listed Buildings and Conservation Areas) Act 1990) and for VAT purposes it must satisfy one of the following conditions:

- It is designed to remain or become a dwelling or number of dwellings. This is satisfied where, in relation to each dwelling:
 - the dwelling consists of self-contained living accommodation
 - there is no provision for direct internal access from the dwelling to any other dwelling or part of a dwelling, and
 - the separate use or disposal of the dwelling is not prohibited by the terms of any covenant, statutory planning consent or similar provisions.
- It is intended for use solely for a relevant

residential or charitable purpose after the alterations.

Following the House of Lords decision in the case of Zielenski Baker (2004), HMRC issued further guidance on 'approved alterations' to buildings and structures that share listing with the protected building. As a result 'approved alterations' which qualify for zero-rating are those to:

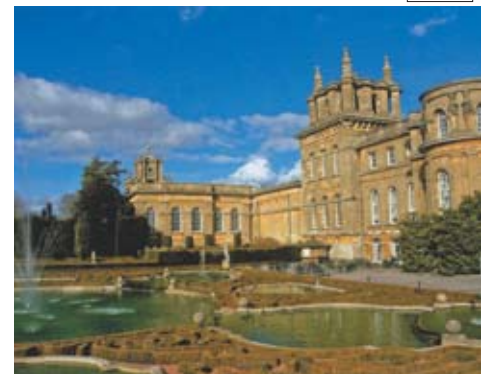
- the main dwelling
- a garage, which meets the legal test for being part of a dwelling
- any outbuilding which in its own right is designed to remain or become a dwelling.

Approved alterations are defined as those which are carried out under listed planning consent. HMRC regard a building as being altered when its fabric, such as walls, roof, internal surfaces, floors, stairs, windows, doors, plumbing and wiring are changed in a meaningful way. Works of repair and maintenance, or any incidental alteration resulting from works of repair and maintenance, are standard rated, even if the work has been included in the listed planning consent.

Works that do not alter the fabric of the property do not qualify for the zero-rating. This includes civil engineering works, works to driveways, paths and gardens.

The following services are always standard rated:

- the installation of goods that are not building materials, such as carpets or fitted bedroom furniture



- the hire of goods (without an operator)
- the provision of professional services, such as those provided by architects, surveyors, consultants and supervisor.

The key overriding principle for deciding whether works are of repair or alteration is to consider the reason why those works have taken place, rather than considering each piece of work in complete isolation.

HMRC's own guidance states that it will include; "preparatory work before the alteration is carried out and remedial works required to make good the area immediately surrounding the alteration. It must be carried out at the same time as the alteration is carried out."

Conversion of a Building for Residential or Charitable Use

Although the zero rate applies for work which amounts to an approved alteration of a protected building, the balance of services provided would normally fall to be standard

rated. However, services provided in connection with the 'qualifying conversion' of a building may be charged at the reduced rate of VAT. A qualifying conversion is one which ends with a different number of residential dwellings than at the start.

As an example, If a protected barn is being converted to a dwelling then the majority of work to the fabric of the building is zero rated as long as listed building consent has been granted. The remaining repair and renovation will be liable to five percent reduced VAT rather than at the standard rate. In addition to this a DIY housebuilder's claim can then be submitted to HMRC to recoup the five percent VAT charge as long as the owner intends to use the barn conversion as his dwelling. Strict rules need to be met but it is possible for a property conversion to be structured so that the owner incurs little or no VAT by the end of the project!

In the case of a protected building which is being converted to charitable use then the zero rating applies to works of approved alterations but the charity must issue a certificate of eligibility to the contractor before work commences in order for the zero rate to apply. The definition of 'charitable' use is that of non-business' so charities must be careful that their actual use of the property is for at least 95 percent non-business activity otherwise there are onerous VAT ramifications. Be aware that HMRC has recently amended the rules relating to charitable use of buildings and we are currently in a transitional period which started on 1 July 2009 and which ceases on

30 June 2010. After this period the precise interpretation of 'charitable use' will be more stringent.

There are other scenarios where the reduced or zero rates will apply to property transactions, such as the reduced rate being charged on renovations and repairs to residential property that have been empty for two or more years. The sale of a substantially reconstructed property may also qualify for the zero rate of VAT, thus providing eligibility to VAT registration for the owner and consequent recovery of VAT incurred on the costs of the work.

VAT Reclaim Schemes

Listed Places of Worship Scheme

This grant scheme applies specifically for places of worship and it allows the difference between the VAT charged and the reduced rate (five percent) to be recovered on works relating to specified repairs and maintenance. The scheme was introduced as existing VAT legislation does not allow the reduced rate to apply to places of worship and it therefore gives a refund to religious bodies to bring the standard VAT rate down to that of the reduced rate. The scheme acts as a grant fund and is not operated by HMRC but by the Department for Culture, Media & Sport. At present the scheme is authorized to run until 31 March 2011. Further details on the scheme and its application may be found at: www.lpwsscheme.org.uk.

DIY Housebuilder's Scheme

Some individuals having a new dwelling built, or indeed converting non-residential dwelling

into a dwelling, may be in a position to recover the VAT incurred on building works back under a DIY claim. The process allows VAT to be claimed back on conversion costs directly from HMRC at the end of a project. There are strict time limits and other criteria to be adhered to, but the reclaim has benefited many individuals in the past. The aim of this scheme is to put the individual in the same position as if they had bought a brand new dwelling from a developer (on which no VAT would be charged).

The key point to note is that HMRC will only ever refund correctly charged VAT, thus if your contractor charges 15 percent where the supply benefited from the reduced rate (five percent), HMRC will only refund you the five percent and the rest will need to be recovered from the contractor who incorrectly charged it.

Sale of Properties

If a residential property has been created or renovated after the building has been empty for ten years or more, then it is possible that, when the property is sold (the freehold sale or a leasehold over 21 years), the building works will qualify to be treated as a zero rated supply. In this case the owner is entitled to register for VAT and then to recover the VAT incurred on the costs of the project.

VAT remains a maze of legislation and case law, but careful planning at the start will always help to alleviate tensions regarding the VAT liability and make sure that budgets are clear from the start.

Zaenia Rogers

World's first carbon neutral convention centre opens for business

After 40 months of development and construction, Ireland's first purpose-built conference centre is ready to open its doors to international delegates to host events for up to 8,000 people. The Convention Centre Dublin (The CCD) has already secured 150 events, which will bring more than €110* (£97.6m) of economic benefit for Dublin.

Recognised as the world's first carbon neutral convention centre, The CCD is the result of a private public partnership with the Office of Public Works. Located on the banks of the

River Liffey, this exciting project was developed by Treasury Holdings and designed by Pritzker Prize-winning and Irish-born architect Kevin Roche. This is the first Irish building for Roche.

The CCD's focal point is a unique glass atrium, which contains 475 panes of different-sized curved glass panels that encompass the full height of the building. Visitors attending events at the CCD will have an opportunity to experience Dublin with extensive views across the skyline, bay and the Dublin Mountains.



The CCD is the world's first carbon neutral convention centre



Commitment to public over cheque abolition



Ahead of the planned closure in 2018 of the central cheque clearing facility, the Payments Council has made a number of commitments to reassure cheque users that the banks won't leave them high and dry.

The move comes after Council research showing 55% of consumers are unaware the cheque clearing system is to close. One commitment is to investigate the feasibility of an alternative paper-based method of payment for those highly dependent on cheques.

Meanwhile, the use of debit cards passed a historic milestone in the third quarter of 2010 when the running total of debit card spending (£272bn) overtook the cumulative amount of cash spent (£269bn)

**By: Joseph Alcock BSc., Dip. Soc. Studies
(National University of Ireland). Post Grad.
Ed. Mgt. (Keele), P. Eng., F.S.P.E. (Retd),
Senior Craft Cert.
Supervised by:
Dr. Ted O'Keeffe,
European Union Research, Brussels.**

The Fastnet is the quintessential lighthouse, a magnificent finger of granite rising from the base of the rock and clinging to it till at last it thrusts defiantly skywards, in isolated splendour, exposed to the full might of the Atlantic ocean. Permission for its building was granted by the Elder Brethren of Trinity House in December 1891, but before such a major project could be undertaken, it was decided on a study of the most detailed nature, particularly to survey the rock and assess its ability to support a substantially large tower.

Work began on the construction of the cut-granite tower in 1896 and it took seven years to complete. William Douglas who designed the structure began his career as an apprentice with the famous maritime engineering firm of Robert Stevenson & Co. of Newcastle-on-Tyne. William had worked with his father, Nicholas, as Construction Engineer on the building of Hanoi Rock lighthouse in Guernsey, completed in 1862. Here, Nicholas had invented the construction method of bedding and side-dovetailing each masonry block, so effectively used by William in the new Fastnet lighthouse some 40 years later. William had also worked with his brother James on the Wolf Rock lighthouse, off Cornwall, which took eight years to complete so treacherous was the construction site. He also worked on the granite lighthouse at the Great Basses Reef in Ceylon which was completed in 1873.

The contract for the supply of granite was secured by Messrs. John Freeman & Sons of Penrhyn, Cornwall, consisting of 2,074 granite blocks (stones), weighing 4,300 tons and in 1897, its stone-cutters started chiselling away, at each block weighing from 1.7 to 3 tons. Each block was dovetailed into those around it and cemented into the blocks above and below, like a Chinese puzzle, so that if it were desired to remove any one block, the courses above would first have to be removed, and even then it would be necessary to break off the dovetailed joggle of the course below it. This system virtually bonds the structure into a monolith. Meticulous to a fault, Douglass ordered the contractors to assemble the tower in sections in their Cornish yard, to ensure that not a stone was out of place. Sections of the tower, six to eight courses in height were erected. When approved the blocks were numbered, dismantled and each block was delicately wrapped and crated for shipment. The top course of each section being kept to form the bottom course of the next setting. Douglass fell ill in 1898 and the "quiet and

reserved man" retired in 1900. "There was probably no man in the world so well fitted by experience to carry out this important and difficult piece of work," wrote Charles W. Scott, who then took over the project, which when completed would have a height of 147ft (45m) and a diameter of 42ft (13m) at the base. The focal plane of the light at an elevation of 159ft (48m) above high-water mark.

James Kavanagh, a stonemason by trade, who had first landed on the rock as foreman in 1896, was personally to supervise the laying of every block in the tower. Grainy photographs of him show a portly, charismatic man with a bushy moustache and white jacket, always keeping up appearances. He lived on the rock continuously for ten to twelve months of each year from August 1896 to June 1903, sleeping in a bed of rock close to the landing strip in quarters carved out of the rock face.

Tragically, James Kavanagh was taken ill on the Fastnet in late June 1903 and went ashore with his son (also a mason on the rock), and died a week later on 6th July 1903. He lived long enough to put the 89th and last granite course of the tower in place. His obituary stated; ...'His coffin was draped with the Union Jack and over a thousand people attended his funeral, all business houses being shuttered and business suspended while the cortege was passing;' he was only forty-seven years old.

One of the most attractive features of the Fastnet is the double balconies, one outside the service room, the other in the usual position outside the lantern itself. The lantern proper was designed by Charles W. Scott (already mentioned), and built up in the workshop of Messrs. Chance Bros. Ltd., Birmingham. A biform apparatus was decided upon for several reasons, but mainly because that if by accident one burner failed, the light was not totally extinguished. The whole apparatus revolving in a mercury float. Each tier consisting of four panels, each of which is

composed of a central plano-convex lens, with catadioptric prisms filling up the remainder of the square frame. While it was being installed the apparatus was damaged by heavy seas which washed right over the rock in a sudden storm on 10th October 1903, causing part of the equipment to be washed away and as a result the lantern was returned to the workshop in Birmingham for repair. In April 1904, the repaired apparatus was returned to the rock. On the night of 27th June 1904, the new Fastnet light was introduced into action. The character of the light was a single flash, recurring every five seconds, the duration of the flash of maximum intensity being 0.122 second. At the maximum intensity, the power of the beam was 750,000 candles.

To quote Scott on the completion of the tower; 'Not a single stone was lost or seriously damaged, the only damage of any kind being that about sixteen stones had very slight chips knocked off their arrises, the bulk of these occurring at the contractor's yard, as only six were chipped during the building of the tower on the rock. All the chips were cut out and small pieces cemented in to make good the defect, and it would be practically impossible to find any of the damaged stones now, even by the most careful scrutiny of the face of the work.'

He went on to say; 'Every course was carefully checked on its completion, and the greatest variation from the figured dimensions on the drawings on any course is one-quarter inch (6.3mm) in the diameter. A steel tape trammel working round the steel setting-mast was employed for these measurements, and gave results true within a maximum error of one-sixteenth of an inch (1.6mm). Checked by a plum bob suspended from the top of the tower, the variation from the vertical is under three-sixteenths of an inch (4.7mm).'

Sir Robert Ball, scientific adviser to the Inspecting Committee, in his report of July 24th 1904, on board the Steamer Alexandra, stated; ...'At a



Articles for the Bulletin - We are always looking for news of members and project articles for publication in the bulletin, do you have something of interest, lets hear from you. Please supply articles up to 1000 words.

distance of nineteen miles, the Fastnet flashes were splendid. At a distance of twenty-two miles the lantern of the Fastnet passed below my horizon, but the glow of each flash was distinctly perceptible for a further distance. I may say it is a matter of congratulation to every one concerned that the Fastnet is now at length provided with a monumental tower and a superb light, well worthy of the position of this lonely rock as being, from the navigator's point of view, the most important outpost of Europe.'

The Fastnet lends itself to one of the world's best-known ocean races. The first race was held in 1925, and it was recommended that it begin in the Solent and take a course westwards, down the English Channel around the Fastnet Rock and back to Plymouth, a course consisting of 615 miles. Over its 80-year history, the Fastnet Race has attracted boats from all over the world. In the early 1970s, Sir Edward Heath, the former British Prime Minister, took part for the first time on board his boat, Morning Cloud. Heath also took part in the fateful 1979 Fastnet, which claimed the lives of 15 yachtsmen. On Monday

13th August, at 1505 hours, the BBC was forecasting imminent gales, repeating these conditions at 1750. Ten minutes later, at 1800, winds were forecast increasing to force 9 and just before midnight a storm force 10 warning was issued. An inquiry was held into the disaster of Fastnet '79 by the Royal Ocean Racing Club (RORC). The final report recommended that radios be fitted on every yacht taking part in any future race and that only crew and craft with offshore experience would be considered. The report concluded: 'The Fastnet is a supreme challenge to ocean racing yachtsmen in British waters. In the 1979 race, the sea showed that it can be a deadly enemy and those who go to sea for pleasure must do so in the full knowledge that they may encounter dangers of the highest order. However, provided that the lessons so harshly taught in this race are well learnt, we feel that yachts should continue to race over the fastnet course.'

Not only was the Fastnet technically ahead of its time, but it was, and remains, the highest and widest rock tower in the British Isles and one of

the most beautiful lighthouses in the world. [Joseph Alcock, is celebrating his forty years membership of the Society of Professional Engineers].



**William Douglass, MICE, MIMÉ
(1831-1923)**



Alderman Michael Bear is the 683rd Lord Mayor of the City of London

He is a leading figure in the property and construction industries and has a long history of heading inner-city regeneration projects, for example Spitalfields, in the east of the City. A trained civil engineer, Alderman Bear is Regeneration Director at Hammerson plc, MD of Balfour Beatty Property and a non-executive director of Arup.

He was born in Kenya and educated in Cyprus, England and South Africa. His civic career began in 2003 when he was elected to the Court of Common Council and he later became Alderman for the ward of Portsoken. The Lord Mayor is head of the City of London Corporation and his main role is as a global ambassador for UK business. This means that a significant part of his year will be spent travelling abroad promoting the City, its markets and its expertise and fostering good will. His business background is also important grounding for him to be able to speak on behalf of industry and articulate its needs to heads of government, state and other decision makers.

His charitable theme for the year is 'Bear necessities' – aimed at helping children in London access education and have greater life opportunities through Coram; and at

supporting international disaster relief through RedR. Assisting Alderman Bear in his year, and particularly in this area, will be his wife, Barbara.



Contracts body launches project bank account documentation

Following an industry-wide consultation, the Joint Contracts Tribunal (JCT) has published its project bank account (PBA) documentation for use in conjunction with its main standard forms of contract. When a PBA is used, clients deposit money into a ring-fenced bank account. It is then released to pre-agreed parties – which can include subcontractors normally at the bottom of the supply chain – when certain milestones or certificates are achieved. Professor Peter Hibberd, JCT chairman, said: "The JCT was keen to get feedback on its PBA provisions, and to put this into a review."

The consultation found that just 5% of respondents had been involved in a project with a PBA. But when asked to estimate the number of projects likely to use PBAs, answers ranged from zero to 100%, the average being 30%. PBAs have recently won backing from Defence Estates, the Office of Government Commerce, and Crossrail, which is due to use a PBA to keep payment times down. The JCT PBA documentation is available from Thompson Reuters, Sweet & Maxwell or via specialist and trade bookshops.

Exciting Engineering

By way of preparation for talks to school etc, a PowerPoint presentation is being prepared. This will contain a number of illustrations of exciting engineering projects past and present. This is where our members can help by providing details of what they believe might be good examples to show how good designs in engineering can not only be of value in the world but exciting to produce. Some of these may be bridges, machines etc but can be as domestic as a baby feeding bottle or a vacuum cleaner. The principal requirement for the present is the name and the source and an investigation over the internet will provide the detail but if photographs can be provided as well, so much the better.

Please send your ideas as soon as possible to David Parratt, 18, Orchard Close, New Alresford, Hampshire SO24 9PY or by email to mail@davidparratt.com

How Engineering Services v Southern Insulation (Medway) Technology and Construction Court, July 2010

How Engineering was the M&E subcontractor to Sir Robert McAlpine on the development of an office building in Silk Street, London in 1995-96 Southern Insulation carried out insulation works to the air conditioning chilled water pipework under a subcontract with How.

In 2006, the building's tenant discovered a problem with the chilled water pipework, which was replaced at a cost of £3.5m. Late in 2009, the tenant raised a claim to recover these costs against McAlpine under the terms of its collateral warranty, and McAlpine subsequently claimed against How as its subcontractor responsible for the pipework. How in turn raised proceedings against Southern Insulation for negligent workmanship on the basis that Southern owed it a duty of care under "tort", or common law, which ran alongside its

contractual obligations.

The judge agreed that Southern owed a duty of care to carry out the works with responsible skill and care. This tortious duty ran in parallel to Southern's contractual responsibilities to How, and the extent of the duty of care was defined by the contractual liabilities under the sub-sub-contract.

This common law duty of care was key as it impacted upon the limitation periods applicable to Southern's liability. Under a contract executed as a deed, limitation would normally kick in as a valid defence 12 years after the cause of the action; in this case, the alleged negligent work was carried out some 14 years earlier. However under section 14b of the Limitation Act 1980, as amended by the Latent Damage Act 1986, the long-stop date with regards to negligence claims is 15 years from the alleged breach of duty – so How's claim potentially remained live.

Southern also argued that, as any liability

upon How only arose as a consequence of McAlpine's contractual liability through the tenant's collateral warranty, this fell outside of the scope of the duty of care it owed, as reaffirmed by the absence of any indemnity within the wording of its sub-contract. However, the judge held that Southern could reasonably have expected to be liable for the costs of putting right any carelessly executed insulation work; hence such costs fell within the scope of both its common law duty of care, and its contractual liability.

The fact that How's liability came via a collateral warranty between the main contractor and tenant, rather than down the direct contractual chain from developer to main contractor to subcontractor, made no real difference to Southern's legal position, as the use of collateral warranties was commonplace and thus foreseeable. The judge held that Southern owed a duty of care to How, the scope of which potentially extended to damages.

A Celebration for the Life of: Raymond Arthur Elders, Member of Council



We are surrounded by angels... in more ways than one! Some of you have been the angels, who by your visits, prayers and concerns have supported Ray, Betty and Shona over these last six months of his illness.

But these angels around us are reminders of the parts they played in the Christmas story bringing messages of joy, peace, hope and love... to all the world. I have to say that as I look into the birth of Jesus I don't think much of this was evident at the time. But with the passage of time I can grasp that this Jesus has brought joy, peace, hope and love to millions. He was given the name Emmanuel, meaning 'God with us', to remind us that he is with us now to minister to our needs today. It's my hope that we may feel something of his peace, hope, love and even joy today.

Born and brought up in Rotherham and he attended the Grammar School there. His first job was as an apprentice engineering cadet with the Navy in Plymouth... and this was excellent training for a life in engineering. He then finished his apprenticeship in Rosythe and spent 10 years at sea before leaving the Navy to work for national Vulcan Insurance Company in Manchester.

He had met Betty in Rosythe, they were married, enjoyed a long and happy marriage and had 1 daughter, Shona. He deeply loved them both but over the last few months we often joked about all the fussing & bossing they did!

In his role as engineer Surveyor he was meticulous, conscientious and very skilled...

and he loved his work. He inspected equipment under high pressure before the firm would insure it. He never really retired, just reduced the number of days in the week that he worked. One of the girls in the office asked why there were no young men doing his job. The answer was that they no longer went to train as old steam engineers as he did. He did a lot of work in the mills of the Colne and Holme valleys when they were still active and his favourite visit was to Langley Farm where he always came away with cream and yoghurt.

They moved to Millhouse Green in 1967 and Ray became very involved in many areas of community life:

- Chairman of the Millhouse Green youth club
- President of the Thurlstone Brass Band (having been a drummer in his Navy days)
- A keen supporter of the Millhouse Green Male Voice Choir.
- Involved with the Conservatives in Penistone.
- Auditor for the Sheffield Rose Society – he loved roses & hence those on the coffin.
- Social Treasurer of the Northern Branch of the Institute of Marine Engineers. He trained as a Financial Accountant with the intention of taking on clients in his retirement- but as he never retired he used his skills to support such groups.
- His Masonic involvement that Michael has mentioned.

- Supporting Betty in her role as councillor and especially in her Mayoral year when he became Mayoress and had fun telling of his frock & high heels at home!

He enjoyed many things:

Shooting in any form but especially clay pigeon and game shooting. He was a country sportsman, loved walking and the country shows such as Chatsworth and the Great Yorkshire Show.

In his younger days he swam and boxed for Yorkshire.

He enjoyed vegetable gardening and nature in general. He would sit for ages watching the birds in the garden, and had such a keen eye for detail that he could distinguish between the different Pheasants, blackbirds etc.

He loved his whisky and was an outgoing friendly man who could charm the ladies. Shona wanted me to recount how he very much admired the lovely long legs of a friend of hers, which he described as having legs up to her bottom. When Shona commented that surely hers were too, he replied, "I'm sorry dear, but your bottom comes down to your legs."

Though he didn't suffer fools gladly he was well liked and greatly admired. Sadly, the last 6 months, when I've seen him a lot, have been very difficult for him and the family, and they're grateful for the help and support they've received from so many.

Let us now come with all our memories and thank God for Ray and support Betty and Shona in our prayers.

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Collaborative and Membership Agreements with other Professional Bodies

Collaborative and Membership agreements are in force with the bodies mentioned below. In every case Members wishing to apply should first contact the Society for an Application Form and/or a letter of recommendation.



National Society of Professional Engineers®

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Self Inking Personal Stamps

As Members will be aware the Society has for many years had on offer a Stamp for use on notepaper and drawings containing the name of the Society and the name and Registration Number of the Member. The Firm that supplies the Stamps can now offer a self-inking Stamp which produces an even more finished appearance and is enclosed in an impressive case that will sit well on the office desk. These are now available from the Society at the modest price of £30.00 each which includes VAT, postage and packing.



Lapel Badges

Lapel Badges are now available from the Society at a cost of £3.00 each inclusive of postage. All paid up members are encouraged to purchase a lapel badge to indicate their membership of the Society, and to be proud to wear it among their professional colleagues.



Society Ties

We are pleased to advise members that we now have good quality ties in stock of polyester satin in Silver Grey, Navy and Maroon with the Society Logo picked out in gold. They are very striking and will certainly provoke discussion when worn in the office and at business meetings and training. Support the Society by ordering one now at the modest price of £11.50 (including postage and packing).



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The Beginning of the Technological Revolution



The First Technological Revolution

This began about 125,000 years ago when people developed skills that enabled them to fasten a stone to a stick and produce weapons and tools. The fastening was grass and birch pitch (a glue like substance). By varying the shaft and stone more useful tools could be made for digging and general purpose use. Despite this technical advance life remained unchanged as did the tools which had to be carried along on the migratory routes.

About 15,000 years ago people began to settle and construct buildings of wood and later stone to protect them from the weather and wildlife. The wooden buildings had infill of wattle and claydaub. Later came the clay sun dried bricks such as those used to build Jericho. Later engineering / building technology was to reach a peak in ancient Egyptian architecture.

The Second Technological Revolution

This was the invention of the nail and it was made of wood and earliest records put the date from carbon dating and the wood structure at about 5000 BC.

First metal nails with heads were made in Mesopotamia about 2500 BC. Generally they

were used in instrument and jewellery making. As metal was rare and expensive they could not be considered for construction until the Roman era. For ship building and planking the Egyptians secured the joints using rope pulled through holes. The Greeks, Phoenicians and other boat builders of the period used wooden dowels.

Iron nails as joining technique for construction were introduced by the Romans who exploited them in ship building for their load bearing and security. The Roman pilum spear tip was secured with three iron nails. The Roman soldiers sandal/boot had dozens of nails in its sole enabling the legions ground mileage.

After the collapse of the Roman Empire joining technology stagnated, for centuries, until in an effort to prevent nails loosening, the rivet was invented. This came about, again in shipbuilding when nails hammered in had their protruding ends bent over and hammered flat. In 1777 the first Iron Bridge was constructed in Coalbrookdale by Abraham Darby to the design of Thomas Farnolls Pritchard who specified rivets for joining the ribs and ties in the structure. Later Isombard Kingdom Brunel



used riveting to connect joints in his engineering triumphs, bridges, shipbuilding, rail locomotives. Today riveting has been superceded in many applications by the use of welding technology and specialist adhesives. The technological revolution is continuing with the use of screws, nuts and bolts made from base and special materials. Adhesives of all types are being used for applications that in the past used traditional joining. Some of these are so tenacious their joint strength (bond) supercedes the material they are joining.

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Visitor Centre combines energy efficiency with traditional technologies



A new, experimental visitor centre at Staffordshire's Apedale Community Park is being constructed to explore whether traditional methods can deliver sustainable buildings.

Staffordshire Centre members visited the Newcastle-under-Lyme site to see the new build and learn about the technologies being used.

The building is using Scandanavian build methods rather than BREEAM "standard" solutions. The structure is a timber frame using glulam columns and rafters for the major members with studding and lightweight rafters

for the secondary members. The spaces between the studs on the external walls have been infilled to a thickness of 450mm using Hemcrete, a lime/chopped hemp strand mix with a special binder. The roof construction is a metal sheet and insulation design; heating is provided by a heat pump.

Very little plastic has been used; PFA has been used as far as possible and insulation board is made of wood fibre. Much of the material used has been chosen because it can be re-used if the building is demolished. Smart metering will be used to monitor energy usage and to check actual performance against that expected of



the design. Repeater displays of the metering will be available for the public to see. The centre will be a working building but is also an experiment to see if it is possible to produce energy-efficient buildings using comparatively simple design solutions and existing proven technologies.



Left: Once an alien presence in the countryside, the red telephone box became one of the best-loved pieces of infra-structure in the English landscape

Below: London Landscape

