



## **BRITISH TUNNELLING SOCIETY**

### **Annual Report and Accounts for the Year Ended 31 December 2010**

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# BRITISH TUNNELLING SOCIETY ANNUAL REPORT 2010

## COMMITTEE:

### Chairman:

Robert Ibell  
London Bridge Associates Ltd

### Vice Chairman

Damian McGirr  
Donaldson Associates Ltd

### Immediate Past Chairman

Paul Hoyland  
Balfour Beatty Civil Engineering Ltd

## Elected Members:

Chris Dulake	Crossrail Ltd	Retired 2010
Lawrence Halls	Tam International UK Ltd	Retired 2010
Nathan Wilmot	Arup	Retired 2010
Andrew Hindmarch	Mott MacDonald	Retires 2011
Ken Spiby	London Bridge Associates	Retires 2011
Steve Parker	Bechtel	Retires 2011
Matt Sykes	Arup	Retires 2011
Steve Woodrow	Aecom	Retires 2012
Roger Bridge	Balfour Beatty	Retires 2012
Ian Blight	Halcrow	Retires 2013
John Corcoran	Morgan Sindall	Retires 2013
Mark Kirkbride	ITM Soil	Retires 2013

## Co-opted Members:

Myles O'Reilly	Consultant	T&TI
Helen Natrass	Sir Robert McAlpine	Lobby Group
Donald Lamont	Health and Safety Executive	Health and Safety
John Scholey	Jacobs	Annual Dinner
Anita Wu	Parsons Brinckerhoff	Young Members Chair
Kate Cooksey	Morgan Sindall	Young Members Past Chair
Colin Eddie	Morgan Sindall	Tunnelling MSc

## Members invited to report to the Committee:

Martin Knights	Halcrow	ITA
Shani Wallis	Freelance Tunnelling Journalist	International
Andy Flowerday	Pipejacking Association	Pipe Jacking Association

## Institutional Representatives:

Bill Grose	Institution of Civil Engineers
Alan Bozeat	Institute of Materials, Minerals and Mining

The British Tunnelling Society was formed as an unincorporated association by the Constitution adopted 23 September 1971 as amended 21 January 1993 and 16 May 2002. The Society became a registered charity in March 1993. The Charity number is 1017887.

LEGAL AND ADMINISTRATIVE INFORMATION

The principal and registered office of the charity is:

One Great George Street  
Westminster  
London SW1P 3AA

Names and addresses of other relevant organisations or persons:

Bankers	National Westminster Bank Charing Cross Branch PO Box 113, Cavell House 2a Charing Cross Road London WC2H 0PD	CCLA Investment Management Limited St. Alphage House 2 Fore Street London EC2Y 5AQ
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Solicitors: Solicitors are appointed from time to time as the need arises.

Examiners: Lindeyer Francis Ferguson  
North House  
198 High Street  
Tonbridge  
Kent  
TN9 1BE

Investment Advisers: Investment advisers are appointed from time to time as the need arises.

## CHAIRMAN'S REPORT 2010

The last year has again been very busy for the Society and its Committee.

The 2010 AGM saw the award of the James Clark Medal to Martin Knights for his contribution to tunnelling in the UK and internationally as president of the International Tunnelling Association (ITA). He has been and still is a great advocate for the use of underground space and has sought to make the ITA a more effective leader and to build closer communication between the ITA and the BTS. Though having served his term of office as president, Martin maintains a commitment as past president and advises committee on international matters.

The workload in the industry has been steady throughout 2010, the 2nd Tyne Tunnel is complete and open allowing the refurbishment of the adjacent original tunnel, Brighton Wastewater is well advanced and we should see the tunnelling completed shortly. Shaft sinking has now commenced for the Lee tunnel – an important part of the Tideway scheme, as has work on the underground stations at Tottenham Court Road and Victoria stations and the Preston Waste water scheme.

A contractor has been appointed to further develop the design and then build the Bond Street Underground station upgrade so there is a determination to bring London Transport subsystem into the 21<sup>st</sup> century. It is of course the Crossrail project and the Olympics that are driving other projects as we work around the key dates in July and August 2012.

All the new running tunnel contractors have now been appointed for Crossrail and a number of the early enabling works packages are well advanced. Attention is now switching to the stations, which pose their own problems in terms of methods, geology, programme and interfaces.

Shaft sinking is underway for the National Grid cable tunnels from Hackney to Willesden Green via Kensal Green and from Kensal Green to Wimbledon, which have been let as one major package. More utility tunnels are in contemplation or in the procurement stage.

In a similar manner the large diameter shafts are well underway for the Lee Tunnel, the first section of the Thames Water scheme to improve the ability of London's sewerage system to cope with storm drain overflows. The remainder of the scheme is maintaining programme being currently in the consultation stage with the next stage design contracts to be let shortly.

Satisfying future energy needs is becoming a very important issue to the UK and once again the tunnellers have a contribution to make. We are seeing the revival of nuclear power as the way to meet these needs and of course nuclear stations require quantities of cooling water. That usually means outfall and intake tunnels and outfall diffusers. Work has commenced on the preliminary works for a further reactor at Hinckley Point and the intake and outfall tunnels are in the procurement stage. We hope the tragic events in Japan will be seen as a risk to be managed not avoided.

Work has continued on the remedial works at Glendoe and the refurbishment works for the Blackwall tunnel and AI Hatfield Tunnel. The Hindhead tunnel will open to traffic the summer.

As we look forward the picture is beginning to emerge of a sustainable workload for a number of years, and it is the aim of the BTS to try and ensure that this is used to rebuild the UK capacity, skills and expertise and bring forward the wealth of talent that is available in our young people to meet the needs of 2020. There seems to be a realisation that the demand for tunnelling and tunnellers is here to stay but that needs to develop into a structured approach to meeting demands and bringing down costs.

The BTS has joined with the ICE and industry stakeholders to contribute to the report by Infrastructure UK into the cost of our infrastructure and how it can be reduced. The BTS contribution was well received and an excellent forward looking and progressive report was produced with some suggestions on how the cost might be reduced. HM Treasury accepted this and an action plan has now been issued to implement those recommendations. This is certain to impact tunnelling and all major projects over the coming years.

The 2010 Tunnel Design and Construction course was held at Warwick University from 5<sup>th</sup> to 9<sup>th</sup> July, and was moved from Brunel to Warwick to tie in with the future Tunnelling MSc course. The course programme followed previous courses very closely, but for the first time included a session on Sustainability. It, as always, introduced improvements in a number of ways, was well attended and brought a good reaction from its participants.

The third annual BTS Underground Health and Safety Course was held at the ICE on 22<sup>nd</sup> and 23<sup>rd</sup> November 2010 and feedback received from the majority of delegates was in the main extremely positive, confirming the perception at the time that the course was once again a great success.

The BTS continues to support TunnelSkills in their endeavours to improve the competence of the UK workforce (operatives and supervisors) and provide competence standard for new entrants into the industry.

New NVQ or Qualification and Credit Framework (QCF) qualifications, as they are now known, have been developed for tunnelling supervisors. TunnelSkills has also been working with other groups to develop other tunnelling related qualifications; with the Minerals products Qualifications Awarding Body (MPQC) who are producing NVQ-QCF qualifications in Shot firing and Transportation of explosives in the tunnel environment, and with the CPCPS who are producing a category for Tunnel Loco drivers. The qualifications for tunnellers have been revamped, new QCF qualifications have been developed and a new learning diploma, which will form the basis of tunnelling apprenticeships, has been prepared and is currently going forward for approval by the Sector Skills Council.

In the field of engineer training the BTS has been working with Warwick University to develop a MSc in Tunnelling and this is moving forward rapidly towards its first entrants in Autumn this year. The course will have a substantial contribution from industry via BTS members and has already attracted offers of sponsorship.

The BTS is also considering how it can better recognise competence in tunnelling and is studying the ways this is done by other societies to develop its own arrangements.

The Young Members Committee goes from strength to strength is expanding its numbers and its activities. As well as providing considerable support to the main committee they have launched a number of initiatives. It now has its own programme of technical lectures, is developing contacts with the universities, has developed its own website and gives its support to other related organisations and tunnelling related groups. Your committee feels that this is an important activity and one that should be supported and developed further.

The UK membership has again increased slightly to 574, this included for a slight decline in individual members and an increase in corporate members. Overseas is a very similar story.

The Societies finances remain in good health although we are keen to build up a reserve to provide some sponsorship to the first students on the MSc in Tunnelling course. This year we again made a modest surplus on the year due to well attended courses and social events.

Work on the New Guide to Instrumentation and Monitoring has been completed by the Technical Committee and this will be published shortly. The Timbering Guide (to past practice) is also in a completed draft stage and also will be moving forwards to publication in the Autumn. A new Sub-Committee is being formed to look at Operating Principles for Full face TBMs this being an area to which the BTS feels better clarity could be brought.

The past year was very busy for the All Party Parliamentary Group for Underground Space (APGUS), as it included the General Election and the consequent re-establishment of APGUS in the new Parliament. This was achieved in July 2010 before the cut-off date for re-registration. Four meetings have been held over the 2010-2011 season including a reception in Parliament (Joint with APPG Infrastructure): 'Infrastructure for Growth'. We hope to continue our efforts over the 2011-2012 season with our AGM and a talk in the Houses of Parliament in July 2011 and further visits to local tunnelling projects.

The BTS website continues to improve its presentation of the Society and is a source of information to members and non-members alike. It provides downloads of a number of informative reference documents and real efforts have been made to make it more user friendly and useful. We have just recently provided a downloadable events calendar for instance.

The mainstay of the Society's activities is the varied programme of discussions and presentations held at the Institution each month. These cover projects of interest, latest developments in tunnelling and other issues for our industry. We strive to build upon that programme each year, to fulfil our learned society function of knowledge sharing. Attendance at the meetings is extremely high, and with the resurgence of interest as the programme of tunnelling work discussed above gets underway, the Thomas Telford lecture theatre is full to overflowing. We have also this year established the facility for live webcasts of lectures, which allows us to reach our members overseas as well as making recordings available via the internet.

At the April 2010 meeting the Harding Lecture was presented by Dr Alistair Biggart on the history of modern tunnelling, covering the advances made from 1825 to the present day. It was an excellent lecture and the published text is a 'must keep' for anyone who needs to understand the basics of tunnelling safely and the current state of the art. I would like to repeat my thanks to Alistair for his contribution.

Our engagement with the ICE and the other Associated Societies of the ICE has taken on a new energy as the importance of these are appreciated by the ICE and apart from resolving issues all are trying to work together and improve sharing of information and events. A joint meeting was held with the Min South and we joined with the ICE in organising the Sir Alan Muir Wood Symposium which was very well attended and, we hope, brought out the spirit and the principles that Sir Alan endorsed when he was with us.

Our Health & Safety and Standards sub-committee continues to be busy, with revisions to CEN standards, managing a review of the tunnelling bible BS6164, and on-going development work on compressed air working. Five CEN standards and the draft new BS6164 are now in the consultation stage and the Compressed Air

Working Group has been involved with our European colleagues in gathering knowledge on high pressure compressed air working.

Tunnels and Tunnelling (T&T) continues to be delivered to all members monthly and is also now available on-line as part of the BTS subscription fee. We are constantly looking at the ways in which this can be improved and there have been a number of meetings to look at how these improvements can be made to the magazine and to the service delivered to BTS members. The magazine continues to deliver a good standard of reporting and editorial content and is watched over by our Advisory Board which meets with T&T four times a year.

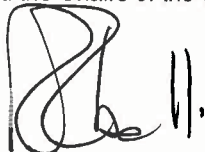
The Society of course continues to publish the BTS Newsletter providing information on upcoming meetings and conferences, health and safety updates, courses and news on members.

An essential part of the BTS is of course the social activities where tunnelling, tunnelling people and tunnelling activities are reviewed in detail, when good relationships are built in a knowledge-sharing atmosphere.

Our Annual Dinner 2010 was held once again at the popular Brewery. The after-dinner speaker was well known to those whose way of life is Radio 4, Giles Brandreth, and what an entertaining evening it was. It will be difficult to follow but we shall try.

In closing, I would once again like to thank all the members of the committee for their continued support, commitment and hard work. The fact that this Society is so successful, well-respected, well-attended, and sociable is due in no small measure to the tremendous enthusiasm of the committee, who give their time so generously, and to the support of their employers who accept the cost of this time.

In particular I would like to thank Damian McGirr for his support as Vice Chairman and Ben McAlinden as Secretary and the Chairs of the Sub-Committees.



Robert Ibell  
BTS Chairman

Date of Approval: 17.05.2011

## **TRUSTEES REPORT**

The Trustees present their report together with the financial statements of the British Tunnelling Society (the 'Society') for the year ended 31 December 2010. The financial statements have been prepared on the accounting policies set out on page 22 of the financial statements and comply with the current statutory requirements, applicable law and the Statement of Recommended Practice "Accounting and Reporting by Charities" issued in April 2005.

### **Organisational structure**

The Trustees of the British Tunnelling Society are the ex-officio and elected members of its Committee.

The Committee shall consist of elected members, nominated members, co-opted members and ex-officio members.

Nine members of the Committee shall be elected by postal ballot of the members of the Society. The result of a postal ballot shall be announced at the Annual General Meeting. Members so elected to the Committee shall serve for a term of three years and shall then retire from the Committee unless elected Chairman or Vice-Chairman. A retiring member shall be ineligible for re-election to membership of the Committee for a period of one year after retirement.

Two members, one nominated by each of the Institutions of Civil Engineers and Mining and Metallurgy, shall serve for a three-year term of office and then retire from the Committee unless elected Chairman or Vice-Chairman.

The Committee shall elect from amongst its members a Chairman who shall hold office for two years immediately following the Annual General Meeting of the previous Chairman's term of office. Such election shall be held at the last Committee meeting of the previous Chairman's term of office. On expiration of a Chairman's term of office, he may serve on the Committee in an ex officio capacity for a period of two years as immediate past Chairman.

The Committee shall elect from amongst its members a Vice-Chairman who shall hold office for two years immediately following the Annual General Meeting of the previous Vice-Chairman's term of office. Such election shall be held at the last meeting of the Committee of the previous Vice-Chairman's term of office.

The Committee may co-opt a member of the Society to the Committee at any time and for whatever purpose the Committee so decides. A co-opted member to the Committee shall hold office until the following Annual General Meeting.

Any casual vacancy, whether in the offices of Chairman or Vice-Chairman or amongst the elected or nominated members of the Committee, may be filled by the Committee, with the approval of the appropriate Institution in the case of a nominated member.

A person so appointed to fill a casual vacancy shall hold office until the following Annual General Meeting and shall then retire. The casual vacancy shall then be filled either by an election by postal ballot or by a nominated person from an Institution as appropriate.

A term of office in a co-opted capacity or as the result of an appointment to fill a casual vacancy shall not be counted for purposes of eligibility for subsequent re-election to the Committee.

Any individual member of the Society or nominated representative of a corporate subscriber of the Society or a nominated individual from an Institution shall be eligible, except as otherwise provided, for election or appointment or co-option to the Committee.

### **Objects and policies & public benefit**

The Society's objective is summarised as the advancement of the education of the public in and the promotion of the art and science of tunnelling, including the creation and use of underground space by fostering learning, understanding, experience, interest and research therein.

In furtherance of this the Society:-

- Provides a forum for the discussion of the problems and techniques of tunnelling by holding monthly meetings which are free and open to all interested parties in addition to Society members
- Encourages tunnelling research and development so as to improve health and safety of the workforce, reducing both risk to the public and the cost of provision of infrastructure
- Provides training courses on a non profit-making basis to train young tunnellers in tunnelling best practice

- Supports a young members section who embrace the objectives of the society but face towards the graduate, the school leaver and students still at school
- Produces and arranges for the publication of papers and reports to disseminate information on tunnelling and to provide points of reference
- Co-operates with other associations in holding meetings and conferences locally, nationally and internationally
- Maintains liaison with similar associations and individuals in other countries and co-operates and participates in the formation, continuance and furtherance of an international society devoted to the interests of tunnelling and of other international, national or local associations whose objects are allied to those of the Society
- Offers specialist assistance and advice to H.M. Government, statutory authorities, boards, institutions and similar bodies and to make representations to such bodies
- To do all such other things as are incidental or conducive to the attainment of any or all of the above aims.

## **ADMINISTRATION OF THE SOCIETY**

The business affairs of the society are administered by a committee consisting of nine elected members, several co-opted and ex officio members together with a representative from the Institution of Civil Engineers, the Institute of Materials, Minerals and Mining and the Pipejacking Association.

The 2010 AGM saw the end of Paul Hoyland's term of office as Chairman of the BTS, as he stepped down to become Immediate Past Chairman for 2010-12. Robert Ibell took up the role of Chairman and Damian McGirr the role of Vice-Chairman for the same period.

Furthermore, vacancies arise in the Committee, due to retirement of elected members. This year three BTS members were duly elected to serve from the 2010 AGM for a period of three years. They are:

Ian Blight  
John Corcoran  
Mark Kirkbride

In addition, the Committee requested that Myles O'Reilly, Colin Eddie, Donald Lamont, Helen Nattrass and John Scholey continue their roles as co-opted members of the Committee, which they agreed to do. Furthermore, the BTS Young Members elected a new Chair in 2010, with Anita Wu taking the helm and a co-opted position on the main BTS Committee. Kate Cooksey also continues her co-opted position on the Committee as Immediate Past Chair of the Young Members.

The British Tunnelling Society is one of the largest and most active of the Associated Societies of the Institution of Civil Engineers. The Committee deals with its substantial workload by allocating it to subcommittees as follows:

### **1. 1. PAPERS AND MEETINGS**

Steve Parker (Chair); Roger Bridge; John Corcoran; Shani Wallis

This year a series of interesting papers on a variety of UK and international tunnelling topics have been presented, highlighting the latest developments in tunnelling and the issues that are affecting our industry.

Offers of suitable presentations are always welcome and the society is grateful for the support of the speakers, especially the international speakers who travel to the UK to give their presentations.

Papers presented in 2010 were:-

Date	Title	Speaker & Company
21 <sup>st</sup> Jan	<p><b>Design and Construction of Deep Shafts</b>            This presentation reviewed the current situation with regard to deep shaft construction in the UK and worldwide. It covered the geological and hydrogeological data requirements for designing deep shaft linings and the methods for their design were discussed. Construction aspects such as excavation methods, ground stability control and water control methods and lining installation procedures were also described. To illustrate the presentation examples of actual construction projects were shown.</p>	Alan Auld – Director, Alan Auld Group Ltd
18 <sup>th</sup> Feb	<p><b>Joint Meeting with MinSouth Construction of Road Tunnels in Iceland, Hédinsfjardargöng Project</b>            The speakers presented the history and highlighted the main problems which were met during the planning and construction of the Hédinsfjardargöng Project, which includes two road tunnels, 3.6 km and 6.9 km long. The project is located in the North of Iceland and during the construction of this Drill &amp; Blast job the extreme conditions in respect of water inflows had to be dealt with. Experience with extensive chemical pre-grouting in cold and high pressure water were described. The Project completion is scheduled for September 2010</p>	<p>Ermin Stehlik - Project Director, Metrostav a.s. Prague</p> <p>Hreinn Haraldsson – Director General, Vegagerdin, Iceland (Icelandic Road Administration)</p>
17 <sup>th</sup> Mar	<p><b>Gotthard Base Tunnel Project - Switzerland</b>            The Gotthard Base Tunnel is the longest rail tunnel worldwide. The presentation showed its significance for and location within the European rail network as well as its historic roots. The presentation included information about the technical conditions (geology, programme) of overall project. The central section (C360 Sedrun) of the tunnel was visited in more detail, describing the technical challenges of deep mountain tunnelling with up to 2000 meters of overburden through a 800m deep vertical shaft with regard of geology, logistics, operations, safety and its contractual framework.</p>	Michael Gutzeit & Hans-Juergen Bartschat – Project Managers, Bilfinger Berger Ingenieurbau GmbH (Civil Tunnelling Division)
15 <sup>th</sup> Apr	<p><b>Harding Lecture – Development and Use of Closed Face Tunnelling Machines</b>            The lecture began with some tunnelling history, commencing with the introduction of tunnel shields leading on from Brunel's Thames Tunnel shield. The introduction of circular shields followed by the early tunnelling machines was also covered. The introduction of closed face tunnelling machines commenced from the time of John Bartlett's 1964 patent for the original Bentonite Tunnelling Machine and continued through the rapid development of Slurry Machines in Europe and Japan. This was followed by the introduction and development of Earth Pressure Balance Machines in Japan. Important details of closed face machines were discussed, especially requirements for the proper control of ground movement. The lecture finished with a look at some major projects where closed face TBMs have been used.</p>	Dr Alastair Biggart

20 <sup>th</sup> May	<p><b>BTS Annual General Meeting</b> Followed by <b>West Ham Flood Alleviation Scheme</b> West Ham Flood Alleviation Scheme Project Managers explained the complications and solutions involved in an east end tunnelling project. Suitable for future expansion, the completed conduit now provides relief from flooding for over 800 homes in the Newham area following completion in March of a 2.8m diameter, 3.3km tunnel. This acts as a transfer tunnel for over 2.4km of additional open cut upgrade and 2.2 km of microtunnelling to the new main pumping station situated at historic Abbey Mills, Stratford. The scheme involved sinking 24 shafts, using 5 TBMs and over 120 service diversions as well as some unexpected challenges along the route.</p>	Andrew Morgan – Costain Tony Parsons – Costain John Sweetnam – Thames Water Steve Lousley – Thames Water
17th June	<p><b>Atlantic Sea Tunnels in Norway</b> In Norway, almost 30 sub sea road tunnels have been built since the Vardø tunnel was opened in 1983. In addition 8 sub sea tunnels have been built for the oil industry as shore approaches and pipeline tunnels, and another 8 for water supply and sewerage. All these tunnels are excavated entirely in bedrock by drilling and blasting relying on probe drilling and pre-grouting, and with drained rock support structures. The Bømlafjord tunnel is the longest at 7.9km. The Eikesund tunnel is the deepest at 287mbsl. These tunnels have successfully replaced many congested ferries on the stem roads and connected island communities to the mainland. In total, this represents no less than a new era in coastal communication and development. A record breaking 24km long sub sea road tunnel is at the planning stage.</p>	Prof. Eivind Grøv – Research Manager, SINTEF
16th Sept	<p><b>Tunnelling in Seattle - Past, Present and Future</b> How tunnels have been used in Seattle and why they are now starting to push the envelope in American tunnelling. The talk looked in detail at recent projects, particularly Brightwater, and at the planned 58ft diameter bore for the Alaskan Way viaduct replacement tunnel. Brightwater is a \$2 billion new wastewater treatment system, which includes 14 miles of soft-ground bored tunnel. Currently under construction, the tunnels are being bored using 2 EPB and 2 slurry TBMs, and are notable for their long drives and high mining pressures.</p>	Anthony Pooley – Jacobs, PM for Brightwater project
21 <sup>st</sup> Oct All day event	<p><b>Sir Alan Muir Wood Symposium –</b> Replacing the BTS October evening meeting. Sir Alan Muir Wood, who died in 2009, was one of the most eminent Civil Engineers in recent times. He was a Fellow of the Royal Society, a Fellow of the Royal Academy of Engineering and a Past President of the Institution of Civil Engineers. He was a founder member of the British Tunnelling Society and the International Tunnelling Association. The British Tunnelling Society held a Symposium in his memory. The themes discussed were centred on Tunnelling, Coastal and Geotechnical Engineering with contributions on recent case histories of tunnelling and geotechnical interest, tunnel design, research advances in geotechnical engineering and the modelling of catastrophic coastal flooding.</p>	Prof Robert Mair Prof John Burland Prof David Muir Wood Robert Muir Wood Andy Alder Rodney Craig Prof Paul Jowitt Martin Knights John Sharp

18 <sup>th</sup> Nov	<p><b>Pittsburgh Northshore Connector</b> Light Rail Tunnels in mixed ground conditions with challenging vertical alignment. The tunnelling works for the North Shore Connector Project in Pittsburgh, USA, involved several engineering challenges. The construction included twin 6.5 m ID bored tunnels, 660m long, passing under the Allegheny River to connect downtown Pittsburgh to the PNC Baseball Stadium and the Heinz Field American Football Stadium. This presentation described the engineering challenges associated with the tunnelling works and the geotechnical ground improvements implemented to minimise settlement and provide additional structural support.</p>	Stephen Woodrow & Andy Miller – AECOM
16 <sup>th</sup> Dec	<p><b>Heathrow Airport's Transfer Baggage System</b> BAA, Mott MacDonald and Ferrovial Agroman have completed a vital link in Heathrow Airport's underground integrated transfer baggage system – a 2.1km tunnel running between Terminals 5, 3 and 1. The scale of the transfer baggage system is unique – when completed it will be the world's largest. The talk described the meticulous project management and innovative design and construction which were essential to ensure that none of the 268 structures and services at risk from the tunnel were adversely affected.</p>	Andrew Stephenson – BAA Enrique Blanco – Ferrovial Agroman Arthur Darby – Mott MacDonald

The February meeting was held jointly with MinSouth. In May the BTS AGM was held and the October evening presentation was replaced by the well attended Sir Alan Muir Wood Symposium.

All meetings were held at One Great George Street.

2011 should see another good array of papers including:-

- East Side Access Project, New York
- The Ingula Pumped Storage Scheme – BTS / MinSouth Joint Event
- Green Park Step Free Access
- Harding Prize Competition
- Limerick Immersed Tunnel
- High Speed Railway Tunnels in Spain at the Underground Conference 2011
- Crossrail
- Ground Reference Conditions & Geotechnical Baseline Reports - BTS / BGA Joint Event
- Dulles Airport Rail Tunnel, Washington DC
- Cleaner Seas for Sussex

## **2. TRAINING & COURSES and YOUNG MEMBERS' COMMITTEE**

Ken Spiby (Chair); Andrew Hindmarch; Roger Bridge; Bob Ibell

YMC Reps: Anita Wu, Kate Cooksey

### **BTS Tunnel Design and Construction Course (KS / AH / KC)**

The 2010 Tunnel Design and Construction course was held at the University of Warwick from 5<sup>th</sup> to 9<sup>th</sup> July, and was moved from Brunel to Warwick to tie in with the future Tunnelling MSc course. The course programme followed previous courses very closely, but for the first time included a session on Sustainability.

The course was attended by 42 delegates, representing a mix of Clients, Designers, and Contractors. Feedback was sought from delegates during and following the course, and the Committee has made a number of changes to the 2011 course in response to this, including lectures on additional subjects and new workshops, as well as administrative arrangements.

The 2011 course will be held from 4<sup>th</sup> to 8<sup>th</sup> July, and will once more be held at the University of Warwick.

### **BTS Underground Health & Safety Course**

The third annual BTS Underground Health and Safety Course was held at the ICE on 22<sup>nd</sup> and 23<sup>rd</sup> of November 2010. The course was attended by 54 people representing a wide mix of Clients, Designers, and Contractors.

Feedback was received from the majority of delegates, with the vast majority very positive, confirming the perception at the time that the course was once again a great success. The detailed feedback will be used to further improve the 2011 course.

The 2011 course will be held at the ICE on 28<sup>th</sup> and 29<sup>th</sup> November.

## **TunnelSkills**

The membership of TunnelSkills has continued to expand and now includes the majority of UK tunnel contractors and labour supply companies.

The Tunnelling Safety Passport has been developed as a basic safety qualification, designed to be taken before anyone is permitted underground, with an industry launch in September 2009. Trainers have been qualified and a large number of courses have been held, and large numbers of first Safety Passports awarded applications number some 500 and awarded passports 320.

Arrangements have been made for the running of the Safety Passport Database and the issue of Passports, and the Safety Passport Website is now operating.

Work has continued on the development of the Tunnelling Apprenticeship, which will be not be restricted to young people, and is being developed with the support and assistance of Construction Skills. The intention is to construct a framework so that young people (and older people) can develop skills and knowledge in a structured manner and become qualified via learning diplomas related to the Tunnelling NVQs.

The other activity that has absorbed Tunnelskills is input into further development of NVQs or Qualifications and Credit Frameworks (QCF) as they have now become. Further occupational standards for Tunnelling supervisors and managers have been developed and recently working with MPQC, CSkills and others a series of vocational qualifications have been developed for Shot firing and transportation of explosives in the tunnel environment. We have also seen work commence on the creation of a CPCS category for Loco Driving.

Tunnel Skills is a force behind improving standards and competence in our tunnelling industry and the BTS is pleased to give it full support.

## **Qualifications for Tunnelling Professionals / Registration of Engineers**

The debate on qualifications for tunnelling professionals has been around for some time and made a number of moves forward but only intermittently. To try and get it moving to a debate and an agreed way forward the BTS has established a Sub-Committee responsible for Education and Registration and they are developing proposals for ways of taking this forward.

## **British Tunnelling Society Young Members Committee (BTSYM)**

The BTSYM has once again been busy the past year holding a series of events. The Committee for 2010/11 had 31 members split into 5 subgroups; Management, Education, Promotion, Support and Website Group all with individual defined objectives within tunnelling related activities. The 2010/11 year saw further development of the BTS Young Members and a much increased direction.

Following the introduction of a lecture series aimed at Young Members last year, we continued the same format and hosted five lectures. It has been interesting to see the increasing attendance at the young members hosted events and we would like to take this opportunity to mention that they are open to all and we do encourage all BTS members, not just the young members to attend.

Our first talk of the 2010/11 year was entitled 'What Do Young Tunnellers Need To Know About Contracts' which was presented by Rand Watkins, from London Underground Ltd in June. The presentation included different types of contracts used for tunnel projects and how contracts have changed with time. We had a good turn out of young engineers, however felt that this lecture would also have been of interest to an even wider audience. At this lecture we trialled live recording of the lecturers so that international young members could still benefit from our talks and activities. This was so successful that the Main BTS Lectures have since been recording all their lectures as well. In September maintaining the theme of furthering the development of young engineers we invited Donald Lamont (HSE) to talk about Tunnelling safety and he kindly gave us a presentation on 'Occupational Health in Tunnelling'. We had a fantastic turn out for this event with a full lecture theatre. This event then received a lot of coverage in a number of tunnelling publications.

In November 2010 we held our second AGM and at this event it was time for Kate Cooksey to hand over the role of Chair of the BTSYM Committee to Anita Wu. Kate described the progress of the committee in her closing speech and reviewed how much the committee has grown since it was started in October 2008. The role of the

BTSYM committee has certainly grown over the past two years and we have been able to get involved with so many activities.

The AGM was followed by a presentation on 'Challenges in SCL Tunnelling' presented by Kurt Zeidler (Gall Zeidler Consultants).

In December we had planned a talk entitled 'Sustainability in Tunnelling' but due to extreme unforeseen weather conditions this was postponed until January so that all the speakers could attend. The talk was presented by Benoit Jones (OTB Engineering), Matt Sykes (Arup), both members of the BTS Sustainability Committee, and Matt Cooke (Mott MacDonald). The topic provoked much thought amongst the year members about the impact sustainability will have on the tunnelling industry into the future and how things will perhaps have to be very differently in the future.

Our next talk will be held in March, titled 'Fibre Reinforced Concrete for Underground Structures' presenters are John Greenhalgh & Benoit de Rivaz (Bekaert).

We are currently planning our future talks and have asked the BTSYM mailing list to choose one of six topics for the talk in June. We will be getting young engineers from the industry more involved in the future so our events continue to be aimed specifically at young engineers from the industry.

The BTSYM have also organised a several site visits over the past year to help us achieve our aim of getting young people down a tunnel to see what tunnelling is really about. When we first started the committee it was clear that there were a number of engineers who were working as tunnelling engineers without ever having been underground. This year our visits included the Tyne Tunnel (where we invited the local ICE Graduate and Student members to establish cross ICE/BTS links), A3 Hindhead Tunnel, Green Park Station Upgrade and the Broadway Flood Alleviation Scheme. We are always looking site visit opportunities so if you are able to help further the knowledge of young members in the industry please get in touch.

We've had our first standalone social in February at the Anchor in Bankside. It was a great opportunity for young engineers from the industry to find out about the BTSYM and what we do in a non-formal atmosphere. The event was also attended by university students who have shown an interesting the tunnelling industry and this was a great way to talk to them about what the industry is really like. We are currently planning further socials to help foster contacts between young members in the industry and also encourage more student member involvement in the committee activities. We would ask that all BTS Members encourage their younger members to get involved with the BTSYM events.

The BTSYM website was launched last year in May. The website is maintained by the BTSYM Website group and they are currently working on updating the website with Invicta who have created the website for us. We do have plans to significantly increase the content on our website and we would like to ask that if anyone has anything suitable that we could use we would be most grateful for your support. The group is also in the process of writing a Wikipedia page for the BTS, as this is another idea we have had to increase traffic and the rating of both the BTS and BTSYM webpages.

We have continued producing BTSYM newsletter every quarter, updating our Facebook page and using our mailing list to keep everyone up to date with BTSYM news and activities.

The BTSYM committee has also continued to support a number of BTS Main Committee events during the year, this includes the BTS Design and Construction Course, the BTS Underground Health and Safety Course, BTS Sustainability Committee, BTS Training and Courses Committee and by carrying out the recording of the BTS lecturers each month.

We have also continued our support of other organisations and tunnelling related groups. In December we were once again invited to the Thames Tunnel Banquet at the Brunel Museum to celebrate the Underwater Banquet in 1827, we now have strong links with the Brunel Museum and would like to further align our activities where possible. The young members committee have also very much appreciated the ability to attend the APGUS events and have the opportunity to speak to politicians about the future of the tunnelling industry. In March 14 members of the BTSYM attended the APGUS reception and it was great to be given the opportunity for young people to attend this event.

### **3. EDUCATION incl. REGISTRATION & MSc**

Damian McGirr (Chair); Robert Ibell; Matt Sykes; Ian Blight; Kate Cooksey, Colin Eddie

Significant advancements have taken place in the past year on the development of the MSc in tunnelling with the University of Warwick. The MSc has been approved by the University and is due to commence in September 2011. The course has also received accreditation from the Institution of Civil Engineers.

The committee has been working closely with the University of Warwick in the development of the course and in particular the content of the course. This will be finalised early in 2011. The intention is that the course will be supported by people for the tunnelling industry to deliver some elements of the course and the committee is currently developing this and obtaining support from the wider tunnelling community.

The University of Warwick is now accepting applications for the course.

The BTS is also providing annual bursaries for the MSc course up to a maximum of £12,000 per annum (to be awarded in 4 No. £3,000 bursaries). A number of companies have also provided additional bursaries. The University of Warwick are still looking for further pledges of support from the tunnelling industry to the MSc course.

The MSc course is seen by the committee to be an important step in the development of tunnel engineers in the UK and would welcome the support of the membership in starting up this new initiative in 2011.

#### **Qualifications for Tunnelling Professionals / Registration of Engineers**

The debate on qualifications for tunnelling professionals has been around for some time and made a number of moves forward but only intermittently. To try and get it moving to a debate and an agreed way forward the BTS has established a Sub-Committee responsible for Education and Registration and they are developing proposals for ways of taking this forward.

### **4. AWARDS**

Roger Bridge (Chair); Andrew Hindmarch; Steve Parker; Steve Woodrow; Mark Kirkbride

#### **James Clarke Medal**

The James Clarke Medal was awarded to Martin Knights in 2010 for his long association with the tunnelling industry, contribution to the BTS and international achievements as President of the ITA.

As a Bachelor graduate of civil engineering from University of Manchester, Martin has been part of many major tunnelling projects both in the UK and internationally. These include planning and design of more than 75km of cable tunnels in the London area; Project Management of the 6km long twin-tube Dublin Port Road Tunnel in Ireland; construction of the Drakensburg Pumped Storage Scheme in South Africa; design of new underground facilities for the LHC nuclear physics experiment machine at the CERN laboratory in Geneva Switzerland, and development of the Egnatia Highway in Northern Greece which includes more than 30km of twin-tube four-lane highway tunnels on the 800km route.

As the 12<sup>th</sup> President of the International Tunnelling and Underground Space Association (ITA), Martin oversaw in his three years as President the expansion of the number of member nations from 51 to 63 by end of 2010 and an increase in the Association's list of corporate and individual members.

In 2010 Martin moved from Jacobs Engineering to Halcrow. He is also a Trustee of London's Brunel Museum in Rotherhithe, the Trustees of which were recently awarded this year's The Queen's Award for Voluntary Service – the MBE for volunteer groups.

Martin's association with tunnelling, geotechnical engineering and the promotion of the use of underground space for sustainable urban development and national economic growth is set to continue, as is his connection with the ITA as its immediate past president.

#### **Harding Lecture**

The 2010 Lecture was given by **Dr. Alistair Biggart** on the Development and Use of Closed Face Tunnelling Machines.

The lecture covered the development of close face tunnelling technology starting with the introduction of circular shields followed by the development of early tunnelling machines. The lecture progressed through the introduction of closed face machines commencing with the 1964 patent by John Bartlett for the original bentonite tunnelling machine and the rapid development of the technology across Europe and Japan and the subsequent

introduction of earth pressure balanced machines. Alistair covered important issues relating to the operation of closed face machines including the proper control of ground movement. The lecture was closed with details of a number of major projects where closed face TBMs had been used.

## **5. FINANCE AND MEMBERSHIP**

Damian McGirr (Chair); Robert Ibell

### **Finance**

Due to the current economic climate the committee decided to hold the rates for 2011 at the 2010 rates. The previously agreed increase for 2011 will now be applied for 2012.

The rates for 2011 are as follows:

	<b>UK</b>	<b>Overseas</b>
	<b>£</b>	<b>£</b>
Corporate Member Small (Up to 50 Employees)	390.00	470.00
Corporate Member Medium (50 to 500 Employees)	620.00	820.00
Corporate Member Large (Over 500 Employees)	1005.00	1400.00
Individual	77.00	120.00
Retired	30.00	38.00
Student	26.00	38.00

The membership fee for 2011 will again include for provision of a digital version of Tunnels and Tunnelling.

**Membership:** The detail of the current membership is set out below:

	<b>Member Classification</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>	<b>Change</b>
<b>UK</b>	Corporate members	57	48	28	+9
	Individual members	463	472	513	-9
	Students & Retired	54	53	28	+1
	<b>Total</b>	<b>574</b>	<b>573</b>	<b>569</b>	<b>+1</b>
<b>Overseas</b>	Corporate members	4	3	3	+1
	Individual members	164	161	158	+3
	Students & Retired	7	10	6	-3
	<b>Total</b>	<b>175</b>	<b>174</b>	<b>167</b>	<b>+1</b>
	<b>Overall Total</b>	<b>749</b>	<b>747</b>	<b>736</b>	<b>+2</b>

It is pleasing to see the increased corporate membership, there does seem to be a steady increase and the support allows an increasing level of activity. This is consistent with trends in past years when there has been an increase in tunnelling activity in the UK. The young members are also doing an excellent job at bringing in number of student members. Unfortunately we have seen a small drop in the number of individual members.

The committee made a modest profit in 2010 despite budgeting for a small loss. This however does not account for the £12,000 allocated for bursaries. It is the committee's intention to carry this forward to 2011 and have a bursary pot of £24,000 for 2011.

The new committee will attempt to set a budget for the forthcoming year which will produce a modest loss consistent with the charitable status of the society, the surplus achieved in the current year, and the wish to accommodate additional expenditure such as sponsoring students on the new MSc Course in Tunnelling. At the same time the BTS will be funding the increasing level of activity in the society such as the Young Members Committee who are seeking to attract more young people into tunnelling.

## **6. HEALTH & SAFETY and STANDARDS**

Donald Lamont (Chair); Helen Nattrass; John Corcoran

**CEN Standards** – draft revisions to the CEN standards prEN 12110 (Airlocks), prEN 12111 (Roadheaders) and prEN 16191 (Tunnel Boring Machines) formed by the revision/combination of ENs 12336 (Shield machines) and 815 (Hard rock TBMs), were published for a 5-month CEN enquiry in Autumn 2010. Copies of the drafts were made available to members through the BTS Secretary.

**BS 6164** – the revision of BS 6164:2001 continued throughout the year with considerable input from the BTS representatives on the BSI committee. A draft for public comment was completed in late 2010 for publication as a “draft for public comment” in early 2011.

**Compressed Air Working Group** – CAWG met twice during the year. In the Spring meeting CAWG reviewed the HSE report on the use of real-time Doppler monitoring at Belfast Sewer Tunnel project. The Autumn meeting was particularly notable with presentations on high pressure compressed air work from Dr Walter Sterk and on post decompression physiological monitoring by J-C le Pechon and French colleagues.

CAWG has undertaken to assist ITA WG5 in the production of guidance on “High Pressure Compressed Air work”. A first draft was circulated for consultation in late 2010.

CAWG still intends to hold a workshop/conference covering a number of topics including compressed air work at pressures in excess of 5 bar, MRI scanning and the use of Doppler monitoring to be held in March 2012.

## **7. TECHNICAL**

Andrew Hindmarch (Chair); Steve Woodrow; Ian Blight; Alan Bozeat

The Technical Committee has been working on three main threads of work during 2010/2011, Best Practice Monitoring Guide, a summary of past practice in the use of timbering in underground construction and Operating Principles for Full Face TBMs.

The publication of the Best Practice Monitoring Guide is scheduled for the end of April 2011.

A draft version of the Timbering Guide has been produced and copies have been sent to selected committee members to review. The final date for drafting needs to be reviewed but provisionally this has been set for May 2011.

The Operating Principles for Full Face TBMs is in the early stages and currently the sub-committee have yet to meet.

Errata have been received for the BTS Tunnelling Specification (3rd Edition). It is envisaged that an errata will be issued with the specification.

The committee is currently considering what technical issues to address next with a guide to the use of fibre reinforcement in underground works currently proposed.

## **8. TUNNELLING LOBBY**

Helen Natrass (Chair); Robert Ibell; Paul Hoyland; Steve Parker; John Corcoran

The past year was very busy for the All Party Parliamentary Group for Underground Space (APGUS), as it included the General Election and the consequent re-establishment of APGUS in the new Parliament. This was achieved in July 2010 before the cut-off date for re-registration. The current Officers of APGUS are:

Chairman: The Rt Hon Nick Raynsford MP

Co-Chairman: The Lord Methuen

Vice Chairman: Stephen Pound MP

Secretary: The Lord Haworth

Treasurer: Don Foster MP

Four meetings have been held over the 2010-2011 season which were:

Presentation about the second Tyne Tunnel

Presentation and Update about the Thames Tideway Project

Site visit to the Brighton & Hove Wastewater Treatment Scheme

Reception in Parliament (Joint with APPG Infrastructure): ‘Infrastructure for Growth’.

The site visit to Brighton was attended by a small number of Parliamentarians. They did, however get to the front of the small TBM and saw rings being built. The presentations also attracted smaller numbers of Parliamentarians. However the reception with its slogan of ‘Infrastructure for Growth’ seemed to bring in much larger numbers, well into double figures. We hope that this joint venture between the ICE and the BTS has provided a useful template for future collaborative efforts on lobbying.

We hope to continue our efforts over the 2011-2012 season with our AGM and a talk in the Houses of Parliament in July 2011 and further visits to local tunnelling projects.

## **9. WEBSITE**

Ken Spiby (Chair); Ian Blight; Shani Wallis

The BTS website ([www.britishtunnelling.org.uk](http://www.britishtunnelling.org.uk)) is performing well and traffic figures continue to be healthy. The site averaged 1,235 visits per month (844 unique visitors) visiting on average 3.85 pages per visit. 68% of visitors were from the UK, with the remaining 32% spread around the globe, demonstrating the global appeal of the BTS.

The site has been continuously updated during the past year. This has included maintaining the latest news items on the homepage, updating the meetings programme as this has developed through the year, uploading newsletters as they are issued, and updating the membership pages when requested, or as information changes. In addition, certain out of date sections have been updated, and changes made to improve clarity.

Specific updates have included:

- A "next meeting" button on the Home page, taking the viewer directly to the flyer for the next meeting
- A frequently asked questions (FAQs) page has been added to the Contact page, such that viewers can find answers to many questions without the need to contact the BTS
- A new conference section has been added, which has initially been used to include the presentations from, and some photographs of, the Sir Alan Muir Wood Symposium of October 2010. This facility will be available for future conferences
- A list of the BTS Chairmen has been added to the Committee page
- A description of the Harding Memorial Lecture has been added to the Sponsorship and Awards page, together with a list of presenters
- Pages describing the benefits of individual and corporate membership have been added

Further planned updates include:

- A calendar function which will enable viewers to download events into their Outlook calendars – work is progressing on this and it should be operational by late March 2011
- Links to the web recordings of evening meetings
- An update of the APGUS working group page

The UK Tunnels Database is now unfortunately some years out of date, and proposals are being developed as to how to take this forward.

## **10. TUNNELS AND TUNNELLING INTERNATIONAL EDITORIAL ADVISORY BOARD**

Myles O'Reilly (Chair); Damian McGirr; Ken Spiby; Roger Bridge

All members of the British Tunnelling Society (BTS) receive Tunnels and Tunnelling International (T&TI) every month. This magazine contains a wide range of technical articles and reports, up to the minute news of the tunneling industry worldwide and reports of the BTS meetings held at the Institution of Civil Engineers, Great George Street, London. It is also used to circulate to the Society's notices of meetings, circulars and other information to members.

The Advisory Board met on four occasions during 2010. At meetings the editorial content of the journal is reviewed with the Editorial Staff and ideas on topics for inclusion in future issues are mooted and discussed. It is very important that the standard of articles in T&TI is high and that the range of topics covered in each issue is sufficiently broad and comprehensive so that there is always something of interest to every BTS member in each issue. It is important, too, given T&TI's close relationship with the Society that the journal is well regarded internationally.

The views of the BTS members on any matter relating to T&TI are always welcome and invariably some members of the Advisory Board are available to be buttonholed in the bar following the meetings of the Society at Great George Street. For those abroad and outside the London area in this country there is always email ([bts@ice.org.uk](mailto:bts@ice.org.uk)).

Letters news items and articles for inclusion in T&TI are welcomed and encouraged. In particular lively and provocative correspondence columns can greatly enhance interest in the journal.

## **11. INTERNATIONAL TUNNELLING ASSOCIATION (ITA)**

Donald Lamont (Chair, Member Nation Representative); Martin Knights (Past President of ITA)

The ITA General Assembly and World Tunnel Congress was held in Vancouver in May 2010. Martin Knights completed his term of office as President of the ITA and was succeeded by Prof In Mo Lee of Korea. Donald Lamont was the UK Member Nation representative.

There was a very successful training course run by the Tunnelling Association of Canada immediately before the GA. Both Martin Knights and Donald Lamont were invited to present lectures on the course.

The inaugural Muir-Wood lecture was delivered by Prof Einar Broch of Norway. Prof Broch was a long time friend and fellow founding member of ITA with Sir Alan. Prof Robert Mair was chosen to deliver the 2011 lecture.

Switzerland was chosen to host the 2013 GA and WTC.

As usual only a very small number of UK delegates attended the GA and WTC but the BTS influence remains disproportionately high.

## **12. ANNUAL DINNER**

John Scholey (Chair); Robert Ibell; Steve Woodrow; Kate Cooksey

The Society's twenty-second annual dinner was held at The Brewery banqueting centre on Friday 7th May 2010. The attendance was an all time record of 613.

The dinner was followed by short addresses from BTS Chairman Paul Hoyland and Crossrail CEO Rob Holden. The formalities were rounded off with a most entertaining oration by writer, broadcaster and former MP, Gyles Brandreth.

The evening concluded with the traditional networking and recounting of past tunnel projects, while some danced to recorded music. It is no longer possible to squeeze a live band into the evening's programme as the venue has been obliged to impose a curfew of 11:00pm on live bands because of environmental noise restrictions.

This was our sixteenth dinner at The Brewery. As has become customary, the dinner was preceded by a champagne reception which was again sponsored by P&H MinePro Services Continental Conveyor Products to whom very many thanks.

We are also most grateful to our other two sponsors, Hunter Personnel, and Tunnel Talk, who arranged for the presence of a roving photographer.

The event supplemented BTS funds by around £4,000.

Please note that the 2011 dinner is on 6<sup>th</sup> May 2011. This is our usual 'slot', i.e. the one following the early May Bank Holiday. See you there!

## **13. NEWSLETTER**

Andrew Hindmarch (Chair); John Corcoran

There have been three newsletters this year – April, July and January. The newsletter continues to keep members up to date with latest BTS activities including news on liaisons with other professional institutions, upcoming meetings and conferences, health and safety updates, courses and news on members. The newsletter continues to include reports on the activities of the Young Members' Committee and the Parliamentary Lobby Group.

## **14. SUSTAINABILITY**

Steve Woodrow (Chair); Bill Grose; Mark Kirkbride

During 2010, the Sustainability Sub-committee has achieved a number of its goals.

A sustainability workshop was included as part of the BTS Training Course in 2010. This interactive session was lead by Casey Fleming and David Keeble and proved to be a great success. It is now planned for sustainability to be a part of the BTS Training Course going forward.

"Sustainability in Tunnelling" was the subject of the BTS Young Members Evening Meeting on the 1<sup>st</sup> of December 2010. The presentation, which was given by Benoit Jones, Matt Sykes and Caroline Beirne, aimed to promote tunnelling as a sustainable construction option, outlined the principles of tunnelling in the planning, design, construction and maintenance of tunnels and identified best practice to increase efficiency and reduce depletion of resources when constructing tunnels.

The Sustainability Sub-committee now hope to include a sustainability presentation as part of the main BTS Evening Meeting Programme by the end of 2012.

The Sustainability web page of the BTS website has been further developed and has now been populated with a list of useful links and a checklist of typical issues when considering sustainability on tunnelling projects. Going forward, it is the intention of the Sub-committee to further develop this web page and to add working examples of sustainability good practice applied to previous tunnelling projects.

## **15. RELATIONSHIP WITH ICE AND OTHER BODIES**

As an Associated Society of the Institution of Civil Engineers, the Society continues actively to pursue this relationship with its joint meetings with other associated societies and its representation on other committees. The use of the ICE facilities is invaluable to the Society, and is regularly used by the various subcommittee meetings and for general meetings with industry representatives.

The Society's role is to advance knowledge in and encourage the art and science of tunnelling by fostering understanding, experience, interest and research therein, which is not something that can exist in isolation and there are many important links with other engineering disciplines and sciences. Although totally separate from other organisations the Society seeks to co-operate in areas of common ground with other bodies.

## **16. RESERVES POLICY**

The reserves as of the 31 December 2010 are £150,907; the trustees consider it important to keep unrestricted reserve levels equivalent to a year's subscription income. In addition, it is necessary to ensure that there are sufficient funds to meet the needs of current and future activities of the Society. As a result, the reserves policy is renewed annually. Currently, funds have been set aside for certain activities and projects, for example the new MSc course being co-ordinated at the University of Warwick and the associated bursary scheme. These activities are of a long-term nature and require continuity of funding. Reserves can therefore be relied on to act as contingency in the event of income flows being disrupted. However, it is recognised that current reserve levels exceed the budgeted target and we intend to run at a deficit in 2011 in order to reduce the levels of reserves. Trustees will continue to monitor the reserves over the forthcoming year to ensure that they remain at an acceptable level.

## **17. INDEPENDENT EXAMINERS**

The audit requirement for a Charity such as the BTS is for an 'independent examination of our accounts', but we felt that we were paying too much for this service. We have therefore, as proposed at the last AGM, changed our accountants and this year have engaged the services of **Lindeyer Francis Ferguson**, who also have a track record of working with the ICE. We have been satisfied with the service provided and propose that this relationship continues for the forthcoming year.

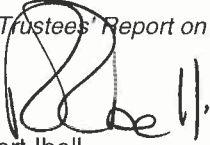
### **Trustees' responsibilities for the financial statements**

The trustees are required to prepare financial statements for each financial year which give a true and fair view of the state of affairs of the charity and the incoming resources and application of resources, including the net income or expenditure, of the charity for the year. In preparing those financial statements, the trustees are required to:

- select suitable accounting policies and then apply them consistently
- make judgements and estimates that are reasonable and prudent
- state whether applicable accounting standards and statements of recommended practice have been followed, subject to any material departures disclosed and explained in the financial statements.
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the charity will continue in business.

The trustees are responsible for keeping proper accounting records which disclose with reasonable accuracy at any time the financial position of the charity and which enable them to ensure that the financial statements comply with the Charities Act 1993. They are also responsible for safeguarding the assets of the charity and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

The Trustees' Report on pages 7 – 20 was approved by the Committee and was signed on its behalf by:



Robert Ibell  
Chairman of the Society

Date of Approval: 17.05.2011

**REPORT OF THE INDEPENDENT EXAMINER TO THE TRUSTEES OF  
BRITISH TUNNELLING SOCIETY**

I report on the accounts for the year ended 31 December 2010, which are set out on pages 19 to 24.

This report is made solely to the trustees, as a body, in accordance with the regulations made under Section 44 of the Charities Act 1993, as amended by the Charities Act 2006, (the Act). My work has been undertaken so that I might state to the charity's trustees those matters I am required to state to them in an independent examiner's report and for no other purpose. To the fullest extent permitted by law, I do not accept or assume responsibility to anyone other than the charity and the charity's trustees, as a body, for my work, for this report, or for the opinions I have formed.

**RESPECTIVE RESPONSIBILITIES OF TRUSTEES AND EXAMINER**

As described on page 19, the charity's trustees are responsible for the preparation of the accounts. The charity's trustees consider that an audit is not required for this year (under section 43(2) of the Act) and that an independent examination is needed.

It is my responsibility to:

- Examine the accounts under section 43 of the Act;
- To follow the procedures laid down the General Directions given by the Charity Commission under section 43(7)(b) of the Act; and
- To state whether particular matters have come to my attention.

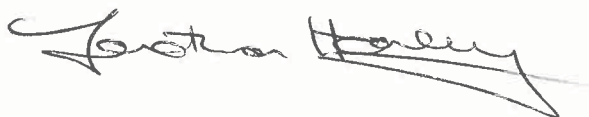
**BASIS OF INDEPENDENT EXAMINER'S STATEMENT**

My examination was carried out in accordance with the General Directions given by the Charity Commission. An examination includes a review of the accounting records kept by the charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and seeks explanations from you as trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit, and consequently no opinion is given as to whether the accounts represent a "true and fair" view and the report is limited to those matters set out in the statement below.

**INDEPENDENT EXAMINER'S STATEMENT**

In connection with my examination, no matter has come to my attention:

- i. which gives me reasonable cause to believe that in any material respect, the requirements:
  - to keep accounting records in accordance with section 41 of the Act; and
  - to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the Act;have not been met; or
- ii. to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.



Jonathan Healey ACA  
LINDEYER FRANCIS FERGUSON  
Chartered Accountants  
Tonbridge, Kent

17 May 2011

## **PRINCIPAL ACCOUNTING POLICIES**

### **BASIS OF PREPARATION**

The financial statements have been prepared under the historical cost convention as in accordance with United Kingdom applicable accounting standards and the Statement of Recommended Practice "Accounting and Reporting by Charities" (SORP) issued in April 2005.

The principal accounting policies remain unchanged and are set out below.

### **TAXATION**

The Society is exempt from taxation under current legislation.

### **INCOMING RESOURCES**

Income is included when the conditions for receipt have been met and there is a reasonable assurance of receipt.

#### **Income and Donations and Member subscriptions**

Income from member subscriptions, donations and any other sources is included in incoming resources when these are receivable.

#### **Interest receivable**

Interest is included when receivable by the Society.

### **RESOURCES EXPENDED**

Resources expended are included in the SOFA on an accruals basis.

#### **Costs in support of charitable activities**

Costs in support of charitable activities are comprised mainly of the costs of organising meetings.

#### **Governance Costs**

Comprises the costs of trustees' expenses and independent examiner's fees.

#### **Fund accounting**

Restricted funds are to be used for specified purposes laid down by the donor. Expenditure for those purposes is charged to the fund.

**BRITISH TUNNELLING SOCIETY**  
**STATEMENT OF FINANCIAL ACTIVITIES FOR THE YEAR ENDED 31 DECEMBER 2010**

	Note	Unrestricted Funds £	Restricted Funds £	Total Funds 2010 £	Total Funds 2009 £
<b>Incoming Resources</b>					
<b>Incoming Resources from Charitable Activities</b>					
Members subscriptions	1	84,461	-	84,461	77,351
Activities for Generating Funds	2	130,837	-	130,837	116,081
<b>Total Incoming Resources</b>		<b>215,298</b>	<b>-</b>	<b>215,298</b>	<b>193,432</b>
<b>Resources Expended</b>					
Costs of Generating Funds:					
Activities in furtherance of the charity	3	167,477	-	167,477	115,870
Costs in support of charitable activities	4	39,023	-	39,023	30,886
Governance Costs	5	5,110	-	5,110	7,638
<b>Total charitable expenditure</b>		<b>211,610</b>	<b>-</b>	<b>211,610</b>	<b>154,394</b>
<b>Net Movement in Funds</b>		3,688	-	3,688	39,038
Total Funds at 1 January		146,398	821	147,219	108,181
<b>Total Funds at 31 December</b>		<b>150,086</b>	<b>821</b>	<b>150,907</b>	<b>147,219</b>

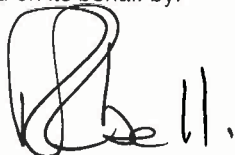
All the Society's activities derived from continuing operations during the above two financial periods.  
The notes on pages 25 to 27 form part of these financial statements.

**BRITISH TUNNELLING SOCIETY**  
**BALANCE SHEET AT 31 DECEMBER 2010**

		2010	2009
	Note	£	£
<b>CURRENT ASSETS</b>			
Debtors	8	2,318	12,480
Short term deposits		101,824	71,806
Cash at bank		75,450	89,339
		179,592	173,625
<b>CURRENT LIABILITIES</b>			
Creditors:			
Amounts falling due within one year	9	28,685	26,406
<b>NET CURRENT ASSETS</b>		<b>150,907</b>	<b>147,219</b>
<b>INCOME FUNDS</b>			
Unrestricted	11	150,086	146,398
Restricted	11	821	821
		150,907	147,219

Approved by the board and signed on its behalf by:

Mr Robert Ibell - Chairman



Date

17.05.2011

The notes on pages 25 to 27 form part of these financial statements.

**BRITISH TUNNELLING SOCIETY**  
Notes to the accounts for year ended 31 December 2010

**1. Members' subscriptions**

The geographical analysis of subscriptions is as follows:

	2010 £	2009 £
United Kingdom	63,535	56,733
Rest of the world	20,926	20,618
	<u>84,461</u>	<u>77,351</u>

**2. Activities for generating funds**

	2010 £	2009 £
Courses & Annual Dinner	100,767	99,790
Sir Alan Muir Wood Symposium	22,053	-
Tunnelling Conference	-	8,547
Publications	2,163	1,362
Underground Health & Safety Course	5,520	5,625
APGUS Reception	-	-
Investment Income	334	757
	<u>130,837</u>	<u>116,081</u>

**3. Activities in furtherance of the charity**

	Total 2010 £	Total 2009 £
Expenses re course & dinner	82,123	59,020
Sir Alan Muir Wood Symposium	21,583	-
Tunnels & Tunnelling	55,120	51,775
General Function expenses	748	-
Underground Health & Safety Course	1,300	4,602
APGUS Reception	504	-
Parliamentary working group	614	88
Compressed Air Working Group	1,044	334
Young Members' Committee	3,641	-
Harding Lecture Honorary	800	-
CEN fund (restricted)	-	51
	<u>167,477</u>	<u>115,870</u>

**BRITISH TUNNELLING SOCIETY**  
**Notes to the accounts for year ended 31 December 2010**

<b>4. Costs in support of charitable activities</b>	<b>2010</b>	<b>2009</b>
	£	£
Printing, stationery & photocopying	5,300	3,665
Postage	3,000	2,907
Meeting expenses & secretarial	23,253	15,433
Subscription to other bodies	925	1,542
Website Costs	3,441	2,186
Other costs	24	22
Publicity	-	1,015
Awards & Prizes	81	1,116
Grant	3,000	3,000
	<u><u>39,023</u></u>	<u><u>30,886</u></u>

<b>5. Governance Costs</b>	<b>2010</b>	<b>2009</b>
	£	£
Examiner fees	1,980	3,915
Trustee meeting expenses	3,130	3,723
	<u><u>5,110</u></u>	<u><u>7,638</u></u>

**6. Employees and Employment costs**

The Society does not employ staff directly.

**7. Trustees' remuneration**

Trustees do not receive remuneration.

Two Trustees were reimbursed expenses to the value of £694.

<b>8. Debtors</b>	<b>2010</b>	<b>2009</b>
	£	£
ICE Intercompany	-	10,398
Other debtors	2,318	2,082
	<u><u>2,318</u></u>	<u><u>12,480</u></u>

**BRITISH TUNNELLING SOCIETY**  
Notes to the accounts for year ended 31 December 2010

<b>9. Creditors: amounts falling due within one year</b>	<b>2010</b>	<b>2009</b>
	£	£
ICE Intercompany	229	-
Purchase Ledger Control Account	2,400	-
Subscriptions in advance	24,256	21,392
Accruals	1,800	5,014
	<u>28,685</u>	<u>26,406</u>

**10. Restricted Funds**

The committee administers the BTS CEN fund which was established in January 1991 to provide financial support to UK members of the CEN TC/151 Working group 4 which is producing European Standards for the safety aspects of tunnelling machines.

The Historical Database fund was established in July 2000. The fund is to provide financial support for a tunnelling database.

<b>11. Analysis of net assets between funds</b>	Unrestricted funds	Restricted funds	Total funds
	£	£	£
Fund balances at 31 December 2010 are represented by:			
Current assets	178,770	821	179,591
Current liabilities falling due within one year	(28,684)	-	(28,684)
	<u>150,086</u>	<u>821</u>	<u>150,907</u>