



An institution for everyone?

Nick Russell 2014 President of The Institution of Structural Engineers

Recounting his perhaps unusual route into structural engineering, 2014 Institution President, Nick Russell, outlines initiatives that will help to ensure the Institution remains relevant in today's society and in particular, how it can help those members that work in small practices.

Introduction

I am honoured and rather humbled to be given the privilege of being the Institution's president for 2014. Having spent five years as a vice president, I have met many people and been involved in many aspects of the Institution's work. I'd like to thank all the current Institution staff members, as well as those I've worked with in the 27 years I've been involved with the Institution; your help and friendship is very much appreciated.

Although I'm also in full time employment, I'll do my best to combine the demands of my work with the expectations that the Institution quite rightly has of its president. There is a lot to be excited about in 2014; not least because the Institution will relocate from its home of 75 years to a larger freehold

building in London's Barbican area. I have been working as part of a small group of property trustees (Martin Powell, Tim Ibell and past president John Nolan) to oversee the development of our new building in Bastwick Street. It will be an impressive example of how a 1960s building can be adapted to serve a modern, international professional institution (Figures 1-3).

This article is divided into three sections. The first is a little bit about me and how I came to be a structural engineer, while the second goes on to mention my career in a small to medium sized consultancy. The final part looks at the Institution's objectives for the year, how these have been developed and how we plan to implement them. I will explain how I, along with a group of vice presidents, have worked together to develop presidential themes that can be passed from one president to another. In short, it is part of how I see the Institution developing in the next few years. By way of a snapshot:

The indications are that the economy is at last improving in some parts of the world. The Institution, as the leading body on structural engineering standards and qualifications, is in a good position to help its members. We must be outward facing in our approach to this. As a membership organisation, it can be all too easy for our discussion and messaging to remain within our membership. While member-to-member communication is of course essential, we must also project what we do; taking every available opportunity to showcase the valuable societal contribution we make. These contributions are not only evidenced in large, multi-collaborator projects but also (and perhaps to an even greater extent) in the many vital, smaller-scale commissions a significant proportion of our membership undertake. Providing support for members working in SMEs or as sole-practitioners is a central function of this Institution. Shining a light on the value of this activity, while continuing to celebrate those larger projects is so important; irrespective of where in the world our members are based. An 'institution for everyone' is the underlying theme of my Address.

The beginnings of a structural engineer

School

In many ways I had a typical education at a 1960s primary school and a 1970s secondary school. Secondary school for me was Malory Secondary Modern Comprehensive on the borders of London and Kent. It was at this time that I developed an interest for the many outdoor activities that I enjoy today; the emphasis was very much on participating in sports at a high level rather than academic achievement. Within three years, I was part

of the London and South England team for cross country running.

In my fourth year I had to choose a course of study. There were four options: Science; The Arts; Modern Languages with English Literature, and lastly Engineering. I say lastly engineering because it was acknowledged that those in the school who were less academically able followed the engineering syllabus! Until the late 1970s, there was a significant amount of light and medium engineering/manufacturing carried out in the area and many left school at the age of 15, without sitting O-levels, to serve apprenticeships in such organisations. The school tailored the engineering syllabus very much to this need. The engineering module consisted of metalwork, engineering drawing and physics. I followed this, but could not see myself spending a career in manufacturing and operating a lathe. I wasn't sure what to do.

I was very interested in research and design, and the opportunities that might be out there to develop new products. I took my O-levels (although the results were not overly inspiring) and continued to spend a lot of time on sporting pursuits (which, by then, also included volleyball and club level cycle racing). I decided to stay at school to study for A-levels.

During the first year of the A-level course we had a visit from a careers adviser. I can recall sitting in front of him explaining that I was interested in engineering research and design, didn't want to go into manufacturing and had really found myself remaining in education as I didn't really know what to do. I was also interested in continuing my active outdoor life. The careers adviser looked at me and said that a career in civil engineering would be an ideal combination of my interests in engineering and the outdoors. I do not know to this day if he really knew what he was talking about. However, I started to look into civil engineering and was enthused by what I saw. It meant a change in my approach to school because until now I had never contemplated university and the school had seldom sent any of its pupils there.

University

Although my A-level grades weren't particularly strong, I was offered a place at Thames Polytechnic (now the University of Greenwich) on their civil engineering degree course - on the strict understanding that study had to take priority over sport! No problem there, I took up sailing instead, which has been a passion of mine ever since. As it happens, learning to sail was the best thing that I ever did, because in 1982 I met my wife Rita who was on a similar sailing course to mine.

The academics amongst our membership might be pleased to note that I continued my

interest in research and design, not only at the Transport and Road Research Laboratory where I studied for part of my industrial training, but also in my final year at university where I designed an apparatus to measure the effect of wall friction on earth pressure behind retaining walls.

I graduated from Thames Polytechnic with first class honours in Civil Engineering; a rather better academic outcome than I achieved at school! The point of telling you this in some detail, is to demonstrate that however poor a school academic record might be, there is often hidden potential beyond the school pupil that we need to tap into. Successful admission to a university course is sometimes achieved through

interview but more commonly by examination grades. We base entry to our Chartered Membership Examination on an engineering degree at Master's level; perhaps we should look harder at alternative routes via the Associate and Technician membership grade? I'll return to this shortly.

Professional life

Early career and professional qualification

I accepted an offer from R Travers Morgan and Partners (now part of Capita Property and Infrastructure Ltd) who had in fact, turned me down some years previously, as a school leaver! My career as a structural engineer had begun. The training I received was first class and I was fortunate in having Bill Morgan



Figure 1
Architect's impression of Bastwick Street building

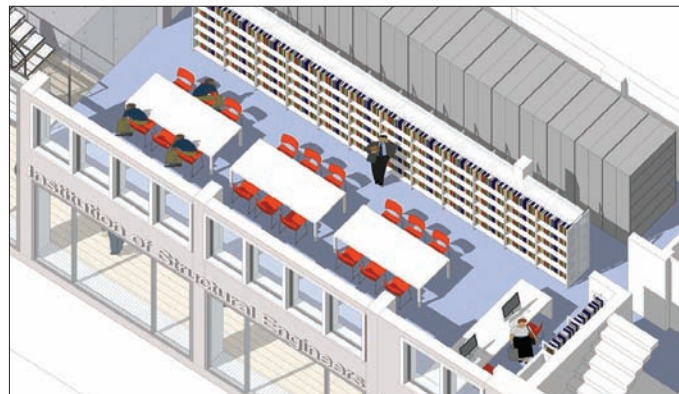


Figure 2
Library and business centre

Figure 3
View of reception area (ground floor) and library (first floor)



as an excellent tutor, with most of my work being carried out as part of a small team. I became quite self-sufficient and was given the opportunity to spend 18 months on site as part of my training. In 1982 at the age of 24 I passed the Institution's Chartered Membership Exam and the following year passed the Institution of Civil Engineers' exam too.

Perhaps things went a bit too well... I still recall the stark lesson I learnt when I designed a gantry crane which, despite being checked in-house and by the local authority's checking engineer, deflected far too much when tested and had to be strengthened. Travers Morgan were ahead of their time and used the error as a learning experience (either that or the partners didn't find out!) and I had to explain to the client what had happened, who was at fault and then put it right.

Perhaps there are opportunities for us as employers and clients to deal with these occurrences as a way of enhancing the training that we provide to our younger engineers? In my own organisation such occurrences are few and far between, but it's how you address the issue that counts. I have found that young engineers really do appreciate the opportunity to learn from instances like these.

Thomasons

After six years at Travers Morgan I decided to move on, joining a much smaller consultancy called R H Thomason and Partners (now Thomasons). This was not without trepidation as Travers Morgan had an international staff totalling 900+ while Thomasons was some 20 strong and had two offices in the UK. We now have eight UK offices with a total complement of approximately 110 staff and are enjoying some early experience of international work.

I was given a fairly significant project in Cardiff that entailed the construction of a large atrium within an existing department store as well as the addition of a further floor. At the start of the project nobody could really work out why the ground floor had very few columns or why the first floor was suspended via a number of hangers from very deep roof girders. As investigations started and record drawings were found, the building started to give up its secrets. It was discovered that the original building was constructed over a canal basin. To compound matters, below the adjoining street was a basement restaurant. The project was a success and the development became the first shopping galleria in Wales. Other large projects followed and I became quite self-sufficient; indeed most of my projects were designed by me with little assistance.

One of my current projects is the redevelopment of a large site in Gloucester.



It is bounded by two major railway lines and a busy dual carriageway which is 6m higher than the site (Figure 4). The site is covered by up to 6m of contaminated railway ballast and had been vacant for over 20 years as the cost of remediation was prohibitive. Extensive geotechnical and chemical testing demonstrated that the contaminants had not leached into neighbouring watercourses and posed a minimal risk to the users of the site. On this basis I enabled a client to realise the potential value of the site. Through careful development the area is being brought back into use.

Throughout my career, the projects I've been involved with have afforded the opportunity to learn a great deal and I have continually developed my skills and learnt new ones.

Expert Witness

As my experience in the profession has grown, I've been increasingly involved in expert witness work; I'm currently working on an international arbitration case in Dubai. It is something that one can do having gained a wide experience in engineering matters, but further training is also essential if you are to provide a genuinely balanced view. Of course, an expert's duty is to the Court or other jurisdiction and it still surprises me that I come across experts (and for that matter solicitors) that tend to support an untenable view! This type of work has given me a huge opportunity to increase my knowledge not, I hasten to add, at the expense of other people's mistakes, but in the project that was the subject of the dispute. There are a couple of examples that I'd like to share here, as a reminder of how overlooking fairly simple research can cause significant problems.

Several years ago, I was asked by an insurance company to advise on the liability

Figure 5
Installing replacement high pressure gas pipeline

Figure 4
Contaminated and derelict site brought back to use



for the collapse of a dual carriageway. A 1.2m diameter high pressure gas main was being augered and jacked under the road (just beyond the background area in Figure 5).

In soft ground the auger operates within the pipe which is pushed into the ground. In harder ground the auger extends in front of the pipe. All of this goes on approximately 70m in front of the operator at the point where the jacks are positioned and the spoil is collected (bottom right of Fig. 5). All was going well until the operator noticed the remains of an old signpost and mud and water in the spoil being augered from beneath the dual carriageway, by which time part of it had collapsed. The earlier pipeline which caused the collapse had been positioned at a somewhat shallower depth. Some fairly basic research would have shown that the dual carriageway was widened from a two lane road (which itself had once been a minor road and a country lane before that) with a ditch alongside it and a signpost. The embarrassment and considerable cost of putting half of a major dual carriageway out of action for eight weeks would have been avoided.

Figure 6 is an example of several collapses that I have looked into. This one was caused by poorly conceived and constructed underpinning that resulted in the collapse of a four storey section of a large old building. A river bed runs beneath the site - it being one of the UK's 'lost rivers'. Unfortunately the soils beneath the underpinning were very compressible and unintended settlement of the underpinning occurred over a short period of time. Being the type of building it was, there was little in the way of flexibility in the construction and after several hours of showing distress, part of it collapsed. Pressures of cost (and hence fees) and time, together with a lack of coordination and confusion over individual responsibilities, undoubtedly contributed to the collapse. Thankfully nobody was hurt.

Charitable and public benefit work

I have very much enjoyed the opportunity to carry out work for schools, university and charitable organisations. Like many of our members, I have worked with these organisations on a number of occasions by way of providing professional advice, but I've also found myself in less familiar roles! One of the most enjoyable was my time with the Leatherhead Northdown Round Table where I was elected as Chairman. I would wholeheartedly recommend this type of activity to anyone, as an opportunity not only to be involved in charitable work, but also for exposure to public speaking, thinking on your feet and a host of character building opportunities.

I have also been fortunate to continue to serve on the University of Surrey's Industrial Advisory Board which advises on the content and teaching of civil engineering degree courses.

My year as president

I'd like to think that both my professional and non-professional experience and interests make me well placed to lead the Institution in 2014.

I've been very fortunate to have been involved with the Institution continuously since 1986 when I became a marking examiner. It was a five year term with a year's rest but somehow I've remained part of the Institution's examinations ever since! At around the same time, I received a letter from the then secretary of the Surrey Regional Group saying that the committee had noted my attendance at their evening technical meetings and that they would like me to consider joining them. They must have been mistaken as I had yet to go to any meetings but it did the trick!

We have an enviable record of achievement, with representation in 105

countries. Every member, no matter where they are located geographically, forms part of one of the Institution's 32 Regional Groups. We have entry qualifications to our membership grades that are widely acknowledged as world-class. Our members feel justifiably proud to refer to themselves as part of our Institution.

So how might our Institution develop in the next few years? What is our overarching message? Who do we support? How accessible are we to those that want to join us, but do not 'fit the norm' with regard to qualifications? What is the message that we as an Institution want to give to our members and for that matter the outside world?

Consistency through collaboration

Clearly the challenges we face are more numerous and longer-term than a president

“We have entry qualifications to our membership grades that are widely acknowledged as world-class”



can achieve single-handedly in a year. Would it not be better to collaborate in some way with those who, in future years, will tread the same path as I?

The realisation in 2011, that I was more than halfway through my term as a vice president, meant that it was time to give some detailed consideration to what I really wanted to achieve in my presidential year. Being a president is clearly a busy task and 12 months is a very short time in the Institution's life. While a lot can be achieved in that time, I feel that succeeding presidents' messages should link up from one year to the next. Aligning the interests of successive presidents helps to reinforce the consistent, powerful messaging that will derive greater benefit to the membership and society itself.

As we progress, we envisage that vice presidents will (as they have already started to do) join in and develop the strands that we have started, whilst bringing their own interests and knowledge to the fore. To date, what has evolved through collaboration between Immediate Past President Y.K. Cheng, myself and now Senior Vice President

Tim Ibell, is a 'thread' of interests that have been combined in a way that will enhance the message that we project outwardly, and at the same time improve the service that the Institution provides its members. The thread is based on three key elements:

- Offering additional support for our members (with an emphasis on those at the SME and sole-practitioner level)
- Strengthening our relationships with academia, in order to develop students who will become the profession's leaders
- The continuation of our international outreach

Additional support for members

For many, their day to day life working in larger organisations is assisted by an infrastructure of information and support functions. Matters of compliance with statutory regulations, dealing with terms and conditions, employing staff and training provision for example, are taken care of by the organisation. We must not forget that a significant number of members work in organisations employing 10 people or fewer. As such, part of my work this year and beyond is to help develop a means of supporting these members. This is something that I feel is very important; not just for those based in the UK but internationally too.

Sole Traders' panel

I am delighted to be able to announce that from this year, there will be a Sole Traders' panel operating within the Institution. This group will be looking at the initiatives that I have outlined along with others. Results will not occur overnight but we have made a start.

Domestic client's guide

I served for several years on the Institution's Professional Practice Committee which deals with complaints levelled at our members; normally by clients but occasionally by other members. The vast majority of complaints are by clients having work carried out on their homes and of these, most were against members working for small practices. A large proportion pertained to the level of fee and what was agreed to be carried out as part of the service.

While there are a number of guideline documents available for larger projects, are these really relevant to the small practitioner and individual homeowner? Indeed, are they relevant to the smaller projects that many of the larger organisations undertake? I am pleased to tell you that a new *Domestic client's guide to appointing a structural engineer* will be published this year, and will be written very much with the smaller practitioner in mind.

Professional guidance

What are the appropriate terms and conditions for employing staff? How should you deal with agreements and warranties? What can you do to ensure that you're complying with health and safety obligations? We live in a world where there is more and more legislation with which to comply; potential pitfalls for the unwary/those without previous experience. What can the Institution do to help those smaller organisations who are very busy carrying out professional work and perhaps cannot devote enough time to keep up with evolving legislation? It is difficult even for larger organisations to keep abreast of this, and anything that the Institution can do must be a good thing. I would like to see this viewed from an international perspective, perhaps by involving other organisations and for it not to be viewed as a UK-centric initiative.

Dissemination of knowledge

Perhaps there is also a need for a pool of knowledge from those who have 'done it before'. People who've retired from small practices having successfully arranged their exit whilst ensuring continuity; those that are able and prepared to impart wisdom and knowledge to others. How could we best identify experts in the more specialised areas of our profession? How can sole traders for example, or those working in small practices, gain access to them? Many of our members face challenges for which they're unprepared or ill-equipped to embark upon. Again, larger organisations will take this in their stride, but smaller ones will probably struggle. I have some personal experience of these issues (albeit in a medium sized organisation) having been involved in a restructuring process at Thomasons. I am sure that there are many members out there who would be only too pleased to help smaller practices. We need some sort of register so that we know who they are.

Career development for younger members*Associate and Technician qualifications*

By promoting not only our Chartered Membership Examination, but also both the Associate and Technician qualifications, we can offer support to our younger members and encourage them to qualify as technicians and incorporated engineers as part of their career development, with the ultimate aim of becoming a Chartered structural engineer. This is something that is of benefit to all organisations large and small. Smaller organisations in particular, whilst highly resourceful, are less likely to have the in-house experience to mentor aspiring engineers through something that might not



← **Figure 6**
Result of
poorly constructed
underpinning

be the obvious route. Continually developing our training courses will surely help those in smaller organisations.

Outreach*Regional Groups*

So, what can we do to support those in the numerous smaller organisations that practice and promote structural engineering? Our Regional Groups worldwide should be able to play a bigger part. These groups currently assume an important role in organising technical meetings, preparation for examinations, organising and hosting annual dinners and more - all of which are valued and necessary, but are also relatively inward-facing. We must grasp the opportunity to look outwards and engage with society in supporting our members.

Over the coming months, I will be visiting as many Regional Groups as I am able and I've already received some interesting feedback from some. I am very interested in hearing what sort of positive help we can offer. Our resources are finite and I will say to those that I meet, that it is not only what the Institution can do for you, but also what you can do for yourself. In the past some have, with good reason, said that the Institution is London-centric and that everything happens at HQ. The reality is that we are here to help you in anything that is sensibly practical. During the year I would like to talk to as many people as possible, to make sure that some of the ideas that I have expressed become a reality.

Raising our profile

We should continue to do more to raise the profile of our profession. We should be brave; challenging ourselves by being outward facing, and in doing this we will raise not only our own public profile but that of the structural engineer in society. As an example, during the worst part of the recession (and just as I became a vice president) I instigated some positive help for members who had

been made redundant from their jobs. This was mainly in the form of advice on interview skills, presentation and the writing of a good CV. The initiatives were well received by those who needed help. However, in helping our members we did not tell anyone else. You might think that this inward assistance for members is of little interest to an external audience, but that is not necessarily the case. The point is, that by telling everyone else what we had done we could have raised our profile further, making the Institution more visible to society as a whole.

In summary

I consider that I have been very fortunate to become a structural engineer. I might have missed the opportunity had my school careers adviser not suggested that I look at civil engineering, because I can say with certainty, that the course of study that I was following would not have led me here! Hence my reason for wanting to support all routes of entry into our profession, not just those that stipulate a university degree. For similar reasons I am eager to make our Institution as accessible as possible to those that wish to join us. Our membership must continue to diversify. I mentioned previously that, in a way, I have been lucky to become a structural engineer. If we really are to succeed then we must be accessible to people from all backgrounds; regardless of gender, social circumstances and academic record. Indeed some of the best engineers that I've known have been those without a degree qualification.

I suppose my overarching message is this: We have done an extremely competent job in reaching out internationally. Our qualifying examination is acknowledged as world-class and I hope you'll agree that we are approachable and supportive of our members. However, we must be more outward facing and take every opportunity to tell the world what we do. Above all, we must remain relevant to our members.