

# Enterprise and Learning Committee

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## Institution of Civil Engineers Wales Cymru

### Evidence to the Enterprise and Learning Committee

#### The Institution

ICE Wales Cymru represents over 3000 civil engineers and technicians practicing in Wales. It has an office in Cardiff Bay, and covers the qualification of its members, the training and education requirements of its members, it represents the Institution, and promotes the cause of civil engineering. It is a registered charity.

In its liaison work within a, historically, disaggregated and nucleated industry, it has very strong links with Construction Skills Wales, Constructing Excellence Wales (ICE held the CEW chairmanship for its first 4 years), and the Construction Industry Council in Wales (ICE chairmanship 2002 - 2008).

ICE sets great store in co-operation and doing what it can to contribute to industry integration in Wales. ICE WC has a representative (Simon Lander) on the new Strategic Forum for Construction in Wales.

#### The Background

ICE Wales Cymru has been a member of the Advisory Committee for the former CITB and now CSkills since 2000. ICE WC is represented on the Courts of the three Universities (Cardiff, Swansea and Glamorgan), and has close working relationships with those Colleges operating civil engineering or construction courses. ICE WC offers prizes for best student on all civil engineering courses in Wales. It actively seeks to promote civil engineering through its Bridge to Schools programme and complementary Schools to Bridges programme, supported by graduate civil engineering Ambassadors.. Sixth formers are supported via our active participation in the Engineering Education Scheme for Wales, the finals of which have just been completed at Celtic Manor for 2008. We finance, and have intellectual property rights to 6 games for schoolchildren to generate interest in construction and civil engineering. For 2008, we have a major Project, the Severn Gateway, an interpretation and education centre, to be located at Magor Services on the M4, covering the existing two Severn Bridges, possible developments in the Estuary regarding renewable energy, and providing a teaching/education facility for all ages on the civil engineering heritage of South Wales. We similarly support Canolfan Thomas Telford at Menai Bridge.

We have, even so, had great concern about several issues associated with potential civil engineer candidates emerging from the education system, and the numbers available as industry entrants:-

The decline in Mathematics and Physics in our schools

The small (and reducing) number of civil engineering courses in HE/FE in Wales, compared to the proven needs into the future.

The increasing reliance upon "imported" engineers to manage not only the peaks (which has been traditional), but also a significant part of the mainstream

#### Discussion

The reduction in maths and physics is a real concern. Maths AS has virtually collapsed, and A level Maths is in some distress. Latest figures show that nearly 70% of teachers teaching Physics in our 6<sup>th</sup> Forms do not have a first degree in physics! The alternative subjects to study, frequently deemed as easier options, available to Welsh schoolchildren are far more numerous than 20 years ago.

Diversity may be argued to be enriching, overall, a view from which as citizens we would not dissent, but it leads to massive shortages in those skills that society needs and requires for its very survival and for sustaining the very life support systems necessary for civilised living, upon which society depends, and all too often, takes for granted. Changes in the school curriculum to embrace the Welsh Baccalaureate and the Diploma in Construction may help, but these are small scale, tentative and experimental, as this is written, and cannot be expected to have an effect for about 5 years. The crisis is now!

With the commercialisation of Universities, courses that are expensive to put on, comparatively, have suffered. Most civil engineering courses in Wales depend, disproportionately, on foreign students with their overseas Government grants. Between 1994 and 2004, the intake onto civil engineering courses fell by 40%. Although there has been some recovery in first year student intakes in the last 3 years, the numbers have a long way to go to recover to 1994 levels. At the same time, needs have increased, not decreased. As a result of retrenchment since 1994, the problem now becomes the physical capacity of Universities and Colleges to accept increased students, rather than the proven needs for the future.

This Institution also accepts that there are several ways to produce qualified civil engineers and technicians. The traditional route is a 4 years MEng degree for the former and an HNC/HND for the latter. ICE WC have embraced alternative routes to membership. For technicians, the NVQ level 3 routes are established, taking on board vocational as well as academic prowess, and keying into present College courses. For Engineers, "experience" based routes are available for those whose academic base is not what has been required for

the level to which they are aspiring. This effectively converts practical experience back into "academic equivalence". The Reviews to achieve this are some years old now and are effective. In general terms, we are totally supportive of steps to remove artificial barriers to movement within the profession. We have several notable examples of people, with a low academic base, effectively moving, progressively, "from the tools" into professional engineer and technician roles. We condemn "glass ceilings" - the only criteria is what an individual is capable of becoming, and we seek to support routes to enable progression to occur.

What are the numbers required for our future? ConstructionSkills surveys, supplemented by ICE survey work, have shown that something like 5000 new entrants (all levels) into the construction industry are required, every year, over the next 5 years, just to stand still, never mind any expansion driven by WAG aspirations to close the GDP gap with the rest of the UK. A significant downwards driver of numbers will be demographics, which hit this industry disproportionately. One third of currently practicing civil engineers will be retired within 10 years. Their replacements are neither apparent, nor guaranteed, unless there is high level intervention to influence the forward supply.

A ConstructionSkills funded survey of professional skills needs in Wales, managed by the Regeneration Skills Collective (an elective liaison between the 6 professional Institutions involved in regeneration in Wales, including ICE WC) is due to report soon. This will give definitive figures, for each construction professional disciplines, for Wales over the next five years. Preliminary indications are that, in civil engineering, the capacity of our graduate schools will need to increase by 30% over 5 years, from 2008 levels, simply to keep pace with demand, once allowances for demographic changes and an appropriate overseas engineer/indigenous engineer balance is struck.

There has always been a thoroughly healthy exchange of young engineers around the world. This is formative, developmental, international co-operation friendly, and much to be desired, maybe inevitable, in a global economy. To some extent, it has always been thus - the difference today is that we are increasingly reliant upon imported engineers to manage our base load, whereas traditionally, imported engineers have "taken out" the peaks. For this reason alone, we need to expand our graduate capacity, and take additional steps to retain those talents for the benefit of the Welsh economy. Otherwise, the prospect of Wales stripping out technical professionals from third world countries, who need such people for their own development will be inevitable. It is sobering that China and India produce 500,000 such graduates per year, every year!

ICE WC have concluded that a period, say 5 years, of assertive WAG action to ensure sufficient graduates to secure our futures, is needed. We strongly advocate, therefore, that students in subjects for which society has strong needs, are benefited over those in "good to have/but not immediately required by society" subjects. We acknowledge that those subjects may go beyond construction and civil engineering, into, say care professionals also. But our basic thesis is that such students should be benefited over those studying, say, sports studies or media studies. This could take the form of a 5 years period of bursaries weighted towards these "needs" subjects, or a regime which excuses student debt in those "needed" areas. We believe there must be administrative means of achieving the desired outcomes, that should not be beyond our collective wit!

### **ICE Wales Cymru's Published Position**

I attach to this paper of evidence, ICE WC's sheet, dated January, 2008, on Wales Capacity and Skills, which sets out our position in detail, and could be regarded as our manifesto! I commend this evidence to the Committee.

Denys Morgan  
31 March 2008 Director Wales Cymru, ICE