

# Innovation & Research



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## Engineers against poverty

A report concluding that infrastructure procurement can promote social objectives has been published by ICE in conjunction with Engineers Against Poverty.

**M**odifying infrastructure procurement to enhance social development presents the findings of a study into infrastructure procurement factors that inhibit the achievement of social development objectives in poorer countries.

The research is based on the assumption that infrastructure procurement can have a significant impact on the social and operational performance of the asset, as well as contributing to the achievement of broader social and economic goals. The report explores the social impact and performance of infrastructure and the service it delivers, together with the social opportunities during the project's construction and operation.

Reviews of procurement documentation and practice in four case study countries – India, Indonesia, Kenya and Nigeria – plus roundtable discussions and interviews with stakeholders, including clients, development banks and agencies, consultants and contractors together formed the basis of the methodology.

In the order in which they arise in the procurement cycle, the recommendations are:

**Project identification, planning and design**

- project identification should be in line with national, local or sector plans and/or based on public consultation;
- the asset's whole life cycle should be considered during planning and design, and an operation and maintenance strategy developed for each new project;
- social objectives should be clearly identified at the planning stage and incorporated into the design.

**Finance and procurement strategy**

- funds must be set aside in the budget for the realization of social objectives;
- consideration should be given to alternative procurement strategies to ensure the appropriate



*Finding better and sustainable ways to get water to poor people*

approach for specified social objectives delivery.

**Tender and selection**

- the social objectives must be clearly defined in tender documents and explained at pre-tender meetings;
- attention should be paid to the bidder's social performance and capacity to deliver social obligations.

**Contract agreement**

- the project team must agree contractual mechanisms to deliver social objectives.

**Monitoring, enforcement and evaluation**

- contractual obligations must be monitored and enforced through incentives and/or sanctions;
- social performance audits should be conducted with the same rigour as financial audits.

*For further information, and to download a copy of the report, visit [www.ice.org.uk/procurement\\_report](http://www.ice.org.uk/procurement_report), or please contact John Hawkins at the ICE (020 7665 2217; E-mail: [john.hawkins@ice.org.uk](mailto:john.hawkins@ice.org.uk)).*

# A novel technique for repairing impact-damaged steel bridge beams

Minimising disruption to traffic on England's motorways and trunk roads is central to the Highways Agency's (HA) business. To do this, the HA is continuously seeking and exploiting innovative techniques to achieve business goals of managing traffic, tackling congestion and improving safety and journey time reliability on the strategic road network.

**T**he use of heat straightening to repair impact-damaged composite bridge beams is a technique that was first trialled in May 2000 and has now been adopted by the Highways Agency. The straightening of beams by heating has proven to be an economic and expeditious approach to repairing impact damage to steel bridges, and it minimises disruption to the road users.

HA is collaborating with the British Constructional Steelwork Association (BCSA) in providing guidance on the application of this technique.

The process essentially involves applying controlled and patterned heating and cooling in repetitive cycles to plastically deformed regions of damaged steel to produce a gradual straightening of the material. It relies on internal and external restraints that produce thickening during the heating phase and in-plane contraction during the cooling phase. However, due care and diligence is required in the execution of this method, paying particular attention to pitfalls such as overheating the steel thus changing its properties; applying heat outside hinge areas resulting in straightening at the wrong location, and the limits of the technique with regard to distortion/strain limitations.

It must be noted that, in addition to the requisite inspection, damage and repair assessment, and developing the selected repair option, an experienced heat straightening contractor should be engaged at the earliest opportunity.

The technique has been used for many years in the USA and documented in a US Federal Highways Administration (FHWA) manual. The manual can be obtained from United States Department of Transport On-Line Publications Department at <http://isddc.dot.gov/> (search for Publication Number FHWA/IF-99-004). The technique has evolved, from the craft-based approach, as previously seen in UK steel fabrication workshops used to induce curvatures and remove fabrication distortions from welding, into a scientific process.

Heat straightening is considered by the HA as a potential repair method for most steel girders that have been damaged by impacts of vehicles. The HA has successfully used this technique to repair a number of impact damaged composite bridges on the network, including the M20 Chatham Road Bridge in Kent.

On that bridge, the damaged beams were



Damaged beam before repair



M20 Chatham Road Bridge Beam

After heat straightening treatment

returned to their original shape and some additional stiffeners were required. Traffic disruption was limited due to partial carriageway closure at night time. This repair scheme, for which HA was the client, won the Institution of Civil Engineers South East England Branch Innovation Award for repair works on the bridge using the heat straightening technique.

*For further information please contact*

*Dr Emeka Agbasi (01306 878168; E-mail: [emeka.agbasi@highways.gsi.gov.uk](mailto:emeka.agbasi@highways.gsi.gov.uk)); or Sibdas Chakrabarti (03106 878230; E-mail: [sibdas.chakrabarti@highways.gsi.gov.uk](mailto:sibdas.chakrabarti@highways.gsi.gov.uk)); or the HA Website: [www.highways.gov.uk](http://www.highways.gov.uk)); or Dr David Moore at BCSA (020 78398566; E-mail: [david.moore@steelconstruction.org](mailto:david.moore@steelconstruction.org)); BCSA Website: [www.steelconstruction.org](http://www.steelconstruction.org)).*

## ENVIRONMENT

### CEEQUAL sails past £2bn



The construction value of projects that have been or are being assessed under CEEQUAL – the ICE-led awards scheme that assesses the environmental quality of civil engineering projects – passed £2bn at the end of October, and now stands at £2.1bn. Its 'second billion' took just four months, after passing the £1bn mark in June this year.

**S**ince CEEQUAL was launched in 2003, more than 70 project teams have now signed up for their projects to be assessed under CEEQUAL. Fourteen projects have so far completed the scheme and received Awards.

CEEQUAL assesses how well a project team has dealt with the environmental issues they faced. Minimum regulatory compliance equates roughly to a zero score; to receive an award, projects must score at least 25% and an 'excellent' rating is achieved by exceeding 75%.

Recent CEEQUAL Awards have been made to:

- Cardiff International Sports Village,
- A470 improvement between Dolwyddelan and Pont Yr Afanc, North Wales,
- Carran Hill Water Treatment Works, Crossmaglen, Northern Ireland,
- A689 Durham County Council Crook

Bypass, Durham and  
• Snaresbrook to South Woodford Embankment Stabilisation.

CEEQUAL Chief Executive Roger Venables said: 'To positively influence the activities of another £1bn worth of civil engineering construction so quickly is a great encouragement for all involved in the CEEQUAL scheme and great credit to those undertaking important civil engineering projects in the UK with the intention of improving their environmental performance.'

*To find out more about CEEQUAL – and the projects that have received Awards – visit [www.ceequal.com](http://www.ceequal.com), or for more details on the purpose and operation of the Scheme, contact CEEQUAL's Chief Executive, Roger Venables (020 8399 4389; E-mail: [roger@crane-environmental.co.uk](mailto:roger@crane-environmental.co.uk)).*

# Indicative flood risk mapping in Scotland



An online, interactive flood map has been developed to provide an indication of the areas in Scotland that are at risk of flooding from rivers and the sea.

The flood map – on the Scottish Environmental Protection Agency (SEPA) website – has primarily been developed to provide a strategic national overview, but is also intended to help improve public awareness of flood risk and to encourage actions that reduce this risk.

Furthermore it provides local authorities with sufficient information to be proactive in their responsibilities for managing flood risk – better awareness of which land is at risk of flooding means that they can develop their flood risk management strategies in effective combination with SEPA's flood warning role. The mapping system will also help ensure that flood risk is taken into account when locating new homes, businesses and other developments.

HR Wallingford developed the methodology for mapping national-scale fluvial flooding for SEPA that provides the fluvial flood outlines for the Indicative River & Coastal Flood Map (Scotland), newly launched on the SEPA website. The illustration shows how the system looks to users and indicates the range of facilities.

The work involved applying a suite of tools to the whole of Scotland to produce flood outlines. These tools included GTI Floodplain (a GIS-based tool comprising detailed data manipulation routines), the Conveyance Estimation System and the InfoWorks RS modelling software. Flood outlines were produced for return periods of 100, 200 and 1000 years. The scale of a flood depends on factors such as the amount and intensity of rainfall, and on the catchment conditions (for example hilly/vegetated, or how dry or wet the ground is).

SEPA's public website shows river and coastal flooding (with coastal flood outlines developed by JBA) and flood defence scheme assets. Multimaps also played an instrumental role in the new service combining its mapping technology with the flooding and defence scheme data to create an interface allowing its visualisation on a map at a glance. Multimaps also provided the web mapping and hosting services. The flood hazard maps (up to 1:25,000 scale) cover the whole of Scotland, including all river reaches with catchments greater than 3km<sup>2</sup>. A second layer shows the defence assets.

For further information please contact  
**Mr Quillon Harpham, Informatics Department, HR Wallingford (01491 822380; Fax 01491 826352; E-mail: q.harpham@hrwallingford.co.uk; or view the SEPA website: <http://www.sepa.org.uk/flooding>).**

The interactive flooding map on the SEPA website shows areas estimated as having a 0.5% or greater probability of flooding in any given year.

# EurekaBuild



EurekaBuild is an umbrella programme within the EU EUREKA framework, dedicated to generating and supporting projects in the area of construction.

**E**urekaBuild was created to improve the communication and cooperation between European researchers and industrialists. The aim is to facilitate and stimulate generation of innovative R&D projects, focusing on the development of products, services and applied technology that will improve the international competitiveness of the construction sector. EurekaBuild will tackle two main challenges:

- becoming more-sustainable by reducing resource consumption, managing transport and utilities networks in a sustainable way, reducing environmental and man-made impacts, improving safety and security and protecting cultural heritage;
- becoming a demand-driven sector by including more knowledge in the products and all along the supply chain.

EurekaBuild's main goals are promotion and facilitation of multi-national industrial projects aimed at contributing to the vision for the construction sector and dedicated towards competitive innovation. Work to achieve these goals includes:

- improving cooperation within the European construction technology platform network, focusing more than 20 national construction technology platforms;
- promoting the generation of R&D projects in the following areas:
  - technologies for healthy, safe, accessible and stimulating indoor environment;
  - innovative use of underground space;
  - new technologies, concepts and high-technology materials for efficient and clean buildings;
  - reduced adverse environmental and man-made impacts of built environment;
  - more-sustainable management of transports and utilities networks;
  - a living cultural heritage for an attractive Europe;
  - improve safety and security within the construction sector;
  - new integrated processes for the construction sector;
  - high-added-value materials;
- organising international thematic workshops with brokerage events as a platform for discussing project ideas and possible partnerships;
- supporting EurekaBuild members in gaining access to unconventional innovative technology and scientific methods, and in generating high quality projects.

The founding partners in EurekaBuild are currently Belgium, Croatia, Czech Republic, Denmark, Finland, France, Lithuania, Norway, Poland, Portugal, Slovenia, Spain, Sweden and UK. The advantages of becoming a EurekaBuild member are felt to be:

- the possibility of funds for projects;

- assessment on the first steps of project proposal preparation;
- support in looking for partners and projects;
- EurekaBuild becoming a key player in defining European standards and interoperability for the construction sector;
- dissemination of projects evaluated by EurekaBuild partners;
- a great opportunity for international cooperation with companies, research and technological institutes, universities and professionals in European construction;
- securing access to interesting scientific results on a high European level;
- stimulating the innovation approach to the construction sector and preparing project proposals;
- access to organising workshops and brokerage events to communicate and train



Eurekabuild partner countries

people as well as exchange information, ideas and projects.

*For further information please contact Mr Luc Bourdeau, Eurekabuild Secretariat (E-mail: [luc.bourdeau@cstb.fr](mailto:luc.bourdeau@cstb.fr); Website: [www.eectp.org/eurekabuild](http://www.eectp.org/eurekabuild)).*

## MATERIALS & INTERNAL ENVIRONMENT

### Flexible mass



The Concrete Centre

Combining passive cooling with long-term building flexibility can be challenging, but a newly developed concrete partitioning system known as Coolwall does just this.

**T**he idea for CoolWall came about in response to the conflict between performance and adaptability requirements of PFI projects such as schools and hospitals. The problem is essentially one of providing effective thermal mass for good environmental performance, whilst ensuring the client retains the ability to move or remove internal walls and install false ceilings.

The system uses hollow, pre-cast concrete partitioning that forms part of a mechanical ventilation system and can be easily repositioned if required. The partitions operate as a direct coupled heat exchanger, utilising the thermal storage capacity of their structural mass to regulate internal conditions by tempering the ventilation supply.

This provides passive cooling in the summer months, whilst balancing and thus reducing the heating needs in winter.

The partitions are formed by a series of modular panels, mounted vertically and back-to-back, with an off-set of half the panel width. The panels are formed with three longitudinal ribs that create a series of vertical ducts, two of which provide a path for the supply air and the third a conduit for electrical and piped services. The ribs also provide structural strength, whilst reducing the panel's weight to an optimum level for heat storage.

The panels are located and held in position by purpose-designed steel channels, which are fixed to the structural soffit and floor for speed of assembly (and disassembly). The use of precast concrete ensures a high quality surface finish is achieved that only requires painting. This also ensures the concrete surface is left thermally exposed, providing both radiant and convective cooling during hot weather.

Combined thermal and air flow simulation studies have shown that the system has a high effective volume and intrinsic storage efficiency (thermal capacitance), performing well in a wide range of room geometries and operating conditions.



3D representation of a partition showing the vertical air ducts.

*For further information please contact Tom De Saulles at The Concrete Centre (01276 608714; email: [tdesaulles@concrete-centre.com](mailto:tdesaulles@concrete-centre.com)).*

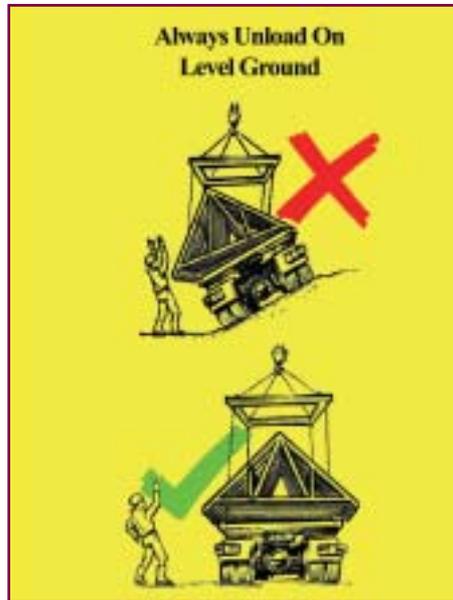
# Improving site safety by Trojan horse messaging



Improving the construction sector's health and safety record is high on the agenda of both industry and the UK Health and Safety Executive (HSE). SCI has just completed the second phase of the Trojan Horse Messaging pilot project, sponsored by the HSE and supported by a number of major contractors and industry bodies. The aim was to deliver vital health and safety messages directly to site operatives. To ensure timeliness and relevance, pictorial messages were attached to the material or equipment being used.

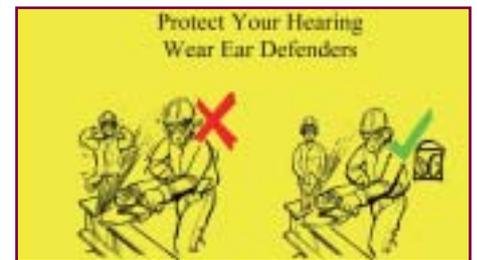
**P**hase II of the Trojan Horse messaging project demonstrates that awareness of the messages increases after repeated exposure to the pictorial messages, and observations show that such technique has both long-term and behavioural positive impacts.

This unique technique overcomes language barriers, delivers the right information at the right place and could be used to influence workers' actions on construction sites. As the UK prepares to welcome more European construction workers it is critical



that key aspects of health and safety are largely understood and embraced by site workers regardless of their native language. The Trojan Horse Messaging technique contributes to a safer environment for construction workers and represents a sustainable solution to site safety.

*For further information please contact Clare Convy, PR and Marketing Manager at SCI (01344 623345; E-mail: c.convy@steel-sci.com).*



The Trojan Horse message improving safety on site.

## HIGHWAYS & SAFETY

# Safe havens and emergency access routes



The idea of turning some hard shoulders into extra traffic lanes raises concerns about how to provide refuge for broken-down vehicles. One answer that the Highways Agency (HA) is exploring involves the construction of purpose-built safe havens.

**I**n a parallel initiative, the HA is also looking at improving emergency access to, and egress from, the trunk road network and the provision of emergency turnaround areas (ETAs) in the road verge. This is a key part of the HA's overall strategy for Traffic Incident Management and as such the HA has recently issued Interim Advice Notes 68/06 and 75/06 to provide guidance on the infrastructure changes needed and the associated codes of practice that would be applied.

Both concepts require paved or strengthened off-road areas (hardened verges, hard standing and lightly trafficked routes) that are sufficiently unobtrusive to deter general use, but can be made quickly operational as required by emergency services. Because both of these requirements could be provided by 'grassed', cellular pavers, the Highways Agency commissioned TRL to undertake research into their design for the trunk road network.

As part of the research, pilot-scale trials have been undertaken in the TRL Pavement Testing Facility (PTF) to establish foundation designs to meet the anticipated design traffic and load bearing requirement. In the trials, examples of grassed paver systems have been subjected to very high loadings, replicating

both the predicted dynamic design traffic and the static load under 'propped' HGVs. The predominant mode of distress varied with the design characteristics of the individual pavers. In one case, cracks appeared after a significant amount of traffic, while another was subject to 'rocking' that resulted in increased 'bedding-in' of the pavers into the underlying sand layer and increased surface deformation. Both trialled materials remained serviceable for



Trials have been undertaken in the TRL Pavement Testing Facility

use and the trials have demonstrated that, provided appropriate engineering standards are developed, grassed cellular pavers do provide a viable low-cost 'green' surfacing option for both safe havens and ETAs subject to heavy wheel loads.

In the next stage of development of these structures, TRL have recommended that a full-scale field trial be built to investigate further issues such as the stresses caused by the manoeuvring of HGVs, the impact of paver design on vegetative cover, and the skid resistance provided by such systems. The results from these trials will be used to improve the current specifications for grassed, cellular pavers.

For further details about the TRL pavement testing activities, please contact Colin Jones, Infrastructure and Environment Division, TRL (01344 770554; E-mail: cjones@trl.co.uk).

*For further details about this work, please contact Lionel Wellappili at The Highways Agency, Room GC01, Federated House, London Road, Dorking (01306 878132; E-mail: lionel.wellappili@Highways.gsi.gov.uk).*

# Stimulating knowledge transfer



The Department of Trade and Industry's Technology Programme is funding a three-year "Knowledge Transfer Network" (KTN) aimed at overcoming the complicated supply chains and diverse interests in the Built Environment community that hinder the take-up and exploitation of new technology in the sector.

**T**he KTN is one of a suite of networks being funded by Government to stimulate innovation, by encouraging collaboration, best practice and knowledge sharing between industry, academia and other knowledge generators. By encouraging partnerships and teamwork, KTNs aim to position the UK as the innovation engine for Europe.

The KTN consortia is led by the Building Research Establishment, but includes The Building Services Research and Information Association (BSRIA), CIRIA, URG(B)E, the University Research Group for the Built Environment and ARUP. ARUP have a key role in the development and delivery of the knowledge transfer strategy.

The Network aims to facilitate the application and uptake of key innovations by:

- helping to identify the primary research and knowledge gaps – the technology and process solutions needed to resolve issues affecting performance, productivity, sustainability and value for money;
- tracking down the appropriate technological and process innovations worldwide so that the potential solutions are disseminated to industry via the network, and more widely, through the KTN's web-based knowledge transfer platform;
- connecting suppliers of technological and process innovation with potential users of innovation – design practices, constructors, component manufacturers, clients and building users.

The KTN is initially focused on identifying and actively facilitating the application of key innovations in three primary sectors.

**Healthcare** – The demands for healthcare provision are changing rapidly, occurring on timescales as short as 2-3 years and forcing new methods of healthcare delivery. Traditional delivery mechanisms and facilities are not economically sustainable. The Healthcare KTN works closely with Department of Health and other stakeholders in the healthcare sector. Its objectives are to identify and facilitate implementation of innovative built environment solutions to provide flexible, sustainable and efficient healthcare for the 21st century.

**Infrastructure** – Infrastructure provides the means to live, communicate and travel, whether by road, rail, water or air. The same infrastructure delivers the energy used to construct, maintain and replace built environment assets. A modern, responsive infrastructure is a vital element in support of the UK's economy.

Working pro-actively with key stakeholders in the infrastructure sector, the objectives of the KTN are to identify, review and facilitate application of primary innovative elements of the UK's built environment infrastructure essential to supporting continued economic prosperity into the future.



Eco-friendly house at London Thamesmead

**Offices** – The potential impact of new technology on the office of the 21st century is enormous and will affect everyone, from where we work, to how we work and even when we work. The manner in which offices are constructed and reconfigured, the way that we gather, share and use information, and the ease with which we communicate and collaborate will all be influenced significantly by technology and process enhancements impacting on the offices sector.

Each area is led by a sector board comprising key clients and businesses working in the field e.g. Department of Health, Arup, BDP, Mott Macdonald, Network Rail, National Grid, British Land, GSK and Gardiner & Theobald.

*For further information and to register your interest please contact Rufus Logan, Modern Built Environment KTN, c/o BRE, Garston, Watford, WD25 9XX (01923 664357; E-mail: loganR@bre.co.uk).*

## CONSTRUCTION FUTURES

### 'PRE-EMPT' Developing built-in resilience: help invited



Recent 'natural' and human-induced events have highlighted the fragility and vulnerability of the built environment to disasters. This two-year EPSRC-funded research project sets out to improve the way buildings and infrastructure are planned, designed, built, managed and retrofitted to cope with a variety of threats by integrating expertise from a wide range of stakeholders. This will be implemented in the form of a hazard mitigation protocol toolkit for use by stakeholders that are (or should be) involved with hazard mitigation strategies in the UK.

**T**he PRE-EMPT research project, which started in October 2006, is an alliance between academia, industry and the public sector. Partners include local authorities, Government agencies, large and medium scale construction companies, architectural and design consultants, utilities companies, engineering consultancies and educational establishments.

PRE-EMPT will be designed to assess the 'resilient performance' of structures in the following areas: management, land use, design, integrated infrastructure, construction methods and materials, and security. PRE-EMPT will be applied to a range of critical infrastructure and built assets, such as offices, residential property, industrial and retail units, schools, hospitals, water supply and sewerage networks, power generation and distribution

networks, transport infrastructure, communications infrastructure, and leisure facilities (such as the 2012 Olympics facilities). Developers and designers in the UK will be encouraged to consider these issues at the earliest opportunity to maximise their chances of achieving a high PRE-EMPT rating.

The PRE-EMPT project presents a unique opportunity for firms and practitioners involved in construction to understand, prepare for and help guide the resilience of the built environment in the UK. IRF readers are invited to participate.

*For further information please contact Lee Boshier at Loughborough University (01509 223640; E-mail L.Boshier@lboro.ac.uk) or visit the PRE-EMPT website at [www.pre-empt.org.uk](http://www.pre-empt.org.uk).*

# Updating the CIRIA Beach Management Manual – and your help is invited



The principal threats we face from our surrounding seas are coastal erosion and coastal flooding. Hard engineering solutions such as seawalls and breakwaters are increasingly questioned in terms of costs, environmental impacts and long-term sustainability (particularly in the face of climate change). An alternative approach is to develop the protective capacity of beaches. Not only are they flexible and aesthetically pleasing, but they offer opportunities to improve local economies and environments.

The principal guidance used by UK coastal engineers is the CIRIA Beach Management Manual, which was published in 1996. Since then, research and experience has progressed considerably and it is generally agreed that an update to the manual is due.

The 2nd edition will include latest research and experience in beach management, and will draw on the latest good practice (including international experience). It will place beach management in the context of developments such as SMPs, CHaMPs and similar, and will address other issues such as sustainability, habitat, biodiversity and changes in legislation.

The scoping study for the update was started in July 2006 for the Environment Agency by a team comprising staff from HR Wallingford as well as CIRIA and Halcrow. The study is reviewing past beach management schemes in the UK, as well as relevant scientific and academic papers and reports (particularly those from recent Defra/ EA

funded research projects and management schemes). Information on the successes and problems experienced in beach management schemes is particularly valuable, and a selection will be included in the revised Manual.

IRF readers can participate. As part of this scoping study HR Wallingford seeks information from Innovation and Research Focus readers that have opinions on the content of the existing Manual. This will help us to identify which sections have proved particularly useful, which could usefully be strengthened, which could be shortened or omitted, plus what new topics should be included. For any reader that feels able to participate, please download the feedback form from [www.hrwallingford.co.uk/projects/BMM2](http://www.hrwallingford.co.uk/projects/BMM2).

*For further information, or to return any completed feedback forms, please contact Dr Alan Brampton (01491 822245; fax 01491 825916; E-mail [ahb@hrwallingford.co.uk](mailto:ahb@hrwallingford.co.uk)); or Nick Bean (020 549 3300; E-mail: [Nick.Bean@ciria.org](mailto:Nick.Bean@ciria.org)).*



(Top) Shingle beach providing flood defence in a storm, Eastoke Beach, Hayling Island  
(Above) Beach maintenance in progress, Eastoke Beach, Hayling Island

## WAVE POWER & DESALINATION

# Making fresh water from waves



A Royal Academy of Engineering Global Research Award, co-financed by Aquamarine Power Ltd, has enabled Dr. Matt Folley, from the Wave Energy Research Group at Queen's University Belfast, to spend 12 months with the Renewable Energy and Water Division of the Instituto Tecnológico de las Canarias, investigating the potential for wave-powered desalination technology. These two research groups complement each other perfectly; the group from QUB provides 30 years of experience in wave power research and development, whilst ITC have over 10 years experience in integrating desalination technology with renewable energy sources.

It is estimated that there are currently one billion people living in the world without an adequate source of clean drinking water. Current desalination technology, where fresh water is produced from salt water, is energy-intensive, making its exploitation problematic for locations where traditional sources of energy are either scarce or expensive; wave energy is ideally suited to provide sustainable and environmental energy for desalination.

The key challenge in wave-powered desalination is powering the desalination technology, which operates most efficiently with a constant energy supply, with the naturally variable wave energy. However, initial studies have indicated that using OYSTER, a seabed mounted oscillating flap powering hydraulic rams that pressurise sea water, to directly feed a reverse osmosis (RO) desalination plant potentially offers dramatic benefits; improving the overall

system efficiency by up to 40%, whilst simultaneously eliminating the need for expensive

electrically-driven high-pressure pumps.

A conceptual design of an autonomous wave-powered desalination system has been developed which successfully links OYSTER and the reverse osmosis plant. The project is now focussed on modelling the wave-to-water performance of the proposed system so that the optimum specifications of the plant can be identified. It is hoped that this will lead to the installation of a full-scale prototype plant in the Canary Islands in 2008–9.

For further information on the Global Research Award scheme, please contact Dr Chris Coulter at The Royal Academy of Engineering (0207 227 0500; E-mail [chris.coulter@raeng.org.uk](mailto:chris.coulter@raeng.org.uk)).

*For further information on the project please contact Dr Matt Folley at Queen's University Belfast, (02890 974751; Email [m.folley@qub.ac.uk](mailto:m.folley@qub.ac.uk)).*



Model of OYSTER in the wave-tank at QUB

# EU Member States join forces to combat water related poverty

**DFID** Department for International Development

European Union member states have joined together in establishing a coordinated approach to support water research for developing countries. Past and present water research knowledge for developing countries will be shared between EU member states, leading to collaborative research programmes in the future.

**D**DFID is the coordinator of this European Union funded initiative to establish a coordinated approach to supporting water research for developing countries. EUWI-ERA-NET is to be launched in January 2007 with a consortium of 15 ministries, funding and research agencies, and technology development authorities from 11 European countries, including, France, Germany, Denmark, Norway, Italy, Austria, Czech Republic, Finland, Belgium, Switzerland, plus and several multilateral research organisations.

In the past, research on water for developing countries has often been funded by donors supporting projects in specific countries. Although DFID has a good reputation for supporting water research, this has often taken place alongside other European countries that have had similar research programmes, sometimes looking at the same issues. This new initiative aims to improve the effectiveness of EU member state funded

research on water for development through better coordination and communication of research activities. The activities include:

- compiling and analysing information on research funding;
- developing best practices for improving research and impact management;
- engaging the main actors in the research communities and beneficiaries;
- building capacity;
- developing joint activities and programmes between national research and technology development programmes and other partners; and
- informing policy.

*For further information on the ERA-NET Scheme, visit website [http://ec.europa.eu/research/fp6/index\\_en.cfm?p=9\\_eranet](http://ec.europa.eu/research/fp6/index_en.cfm?p=9_eranet). For further information on the water network please visit website [www.euwi-era.net](http://www.euwi-era.net) or contact Peter O'Neill (E-mail: [P-O'Neill@dfid.gov.uk](mailto:P-O'Neill@dfid.gov.uk)).*



Participants at a water workshop in Tanzania

## SPONSORING ORGANISATIONS

### GOVERNMENT

#### Department of Trade and Industry

Construction Sector Unit  
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