

Knowledge Transfer Partnerships

KTP BENEFITS

Knowledge Transfer Partnerships are designed to benefit everyone involved

- 🔄 Businesses will acquire new knowledge and expertise
- 🔄 KTP Associates will gain business-based experience and personal development opportunities
- 🔄 University, college or research organisation will bring their experience to enhance the business relevance of their research and teaching

A DTI Business Support Solution

RICHARDS, MOOREHEAD AND LAING (RML) KTP CEMENTS WAY TO SUCCESS

ABOUT THIS CASE STUDY

SINCE 1984, RICHARDS, MOOREHEAD AND LAING (RML) LTD HAS BEEN AT THE FOREFRONT OF ENVIRONMENTAL, ENGINEERING AND LANDSCAPE TECHNOLOGY AND PRACTICE. IN THIS KNOWLEDGE TRANSFER PARTNERSHIP (KTP), THEY WORKED WITH CARDIFF UNIVERSITY TO DEVELOP A SYSTEM FOR USING WASTES AS CEMENT REPLACEMENTS, RESULTING IN CONCRETE PRODUCTS WITH ENHANCED PROPERTIES.

ABOUT THE SPONSORS

THE DEPARTMENT FOR TRADE AND INDUSTRY (DTI) (50%) DRIVES THE AMBITION OF 'PROSPERITY FOR ALL' BY WORKING TO CREATE THE BEST ENVIRONMENT FOR BUSINESS SUCCESS IN THE UK. THE DTI HELP PEOPLE AND COMPANIES BECOME MORE PRODUCTIVE BY PROMOTING ENTERPRISE, INNOVATION AND CREATIVITY.

THE WELSH ASSEMBLY GOVERNMENT (WAG) (50%) IS RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING POLICIES AND PROGRAMMES FOR ALL ISSUES THAT HAVE BEEN DEVOLVED TO WALES, INCLUDING RURAL AFFAIRS, EDUCATION, ENVIRONMENT, HEALTH AND TRANSPORT.

FAST FACTS

- 🔄 Development of cement replacements from waste materials
- 🔄 Projected increase in profits of £50,000 per annum for the next three years
- 🔄 Leading role for RML in Cardiff University's GeoEnvironmental Research Park
- 🔄 2004 KTP Award Winner

The Company



"We found working with Cardiff University was a worthwhile experience in itself. The KTP has enhanced our knowledge of concrete and mineral technology, which we are intent on exploiting. Based on the value and importance of the first project to our development plans, we are now discussing with Cardiff a new KTP project which is in a quite different field of civil engineering."

Ivor Richards OBE, Managing Director at Richards, Moorehead and Laing Ltd

ABOUT THIS PROJECT

The use of waste materials as additives to products in the construction and energy industries is not new. This KTP examined a wide range of materials for inclusion in blends as cement substitutes, generating many thousands of individual chemical and physical analytical results.

BENEFITS

RML has a market lead in offering a process for incorporating solid wastes into cement blends with enhanced properties. The company now has a decision tool for evaluating the potential for using wastes as cement replacements and is able to offer this service worldwide.

RML expanded its knowledge of the constituents and performance of cement and the impact that waste disposal has on manufacturing companies. Significant advances were made, including analysis techniques specifically adapted to the type of raw material, the effect of drying at different

temperatures and the influence on performance of the resulting cement blends.

Several blends were developed that exhibited attractive strength properties with negligible environmental impact and significant costs reduction. This was achieved through the pre-treatment of carefully selected wastes, thus avoiding heating the waste to kiln temperatures (typically 1,500°C).

Today RML works closely with Cardiff University's GeoEnvironmental Research Park. This has led to several joint projects with various partners from the private and public sectors.

RESULTS

- Specialist in their field, with greater ability to exploit opportunities in the cement industry
- Development of cement with reduced environmental impact

- Completed detailed engineering design and costing for constructing treatment plants in UK and Europe
- Projected increased profits of £50,000 per annum for the next three years
- Part ownership of an associated new business
- Leading role in Cardiff's GeoEnvironmental Research Park

The Associate

During the KTP, Associate Louise Davies was involved in investigating a wide range of candidate materials for inclusion in blends as cement substitutes, recording results in databases according to both technical and economic considerations.

BENEFITS

Louise Davies developed significantly as an engineer and manager, with extensive experience in the use of analytical equipment such as ICP-OES, XRF, XRD, LASER Sizing, SEM and a range of techniques in cement analysis and concrete testing. She also gained an in-depth appreciation of the various standards (UK and EU) applying to cement and concrete.

Her presentation skills were enhanced through attendance at KTP courses and several marketing initiatives in conjunction with RML.

She co-authored a technical paper which she presented at an international conference at Dundee University.

Her current work in helping local authorities develop strategies for meeting the pressing targets for diversion of solid waste from landfill has been helped enormously by the experience gained during this KTP programme.

RESULTS

- Gained an MPhil in Environmental Engineering and NVQ Level Four in Management
- Excellent training in environmental analysis, presentation skills and project management
- Employment as consultant with significant responsibility for implementing national waste strategies
- Main speaker at Cardiff University Innovation Network event for business

The Academic Partner

“As the knowledge based organisation in this partnership, Cardiff University has directly benefited by attracting new research funds to the University's GeoEnvironmental Research Park, producing conference and journal papers as well as signing an Intellectual Property Rights (IPR) agreement related to cement replacement manufacture.”

Professor K P Williams, lead academic supervisor at the School of Engineering, Cardiff University

BENEFITS

The experience of close involvement with the commercial development of young technology has been of benefit, enhancing the syllabi of several modules, such as civil engineering degrees that are now expected to give a clear indication of sustainable construction.

The KTP has also provided case study material used in the Construction Materials module, in the Professional Studies module and on a rotating basis for an MEng module taken by fourth year students of Environmental Engineering and Civil and Environmental Engineering.

The Programme has been partially responsible for the initiation of studies into the effect of cement additives on the durability of concrete - particularly the changes in permeability.

A further KTP project with a concrete manufacturer has resulted directly from this Programme, aimed at advancing the commercialisation of the concepts. This extension from basic materials research into the production of concretes with enhanced properties is a significant step.

Lead supervisor, Professor Williams, increased his knowledge of cement characterisation and strength.

RESULTS

- An MPhil research degree awarded
- Published conference and journal papers
- Two teaching case studies at undergraduate level
- Signed IPR agreement with royalty payments for the next ten years related to cement replacement manufacture
- Success in establishing a new KTP programme with Minimix Ltd

