

**DESIGN IN THE BUILT ENVIRONMENT WORKSHOP
REPORT OF OUTPUTS
19/20 JANUARY 2006
SCARMAN HOUSE, UNIVERSITY OF WARWICK**

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INTRODUCTION

The aim of this event was to give the design community (comprising engineering, architecture and other disciplines from academia and practice) space and time to talk to each other and identify the areas where more communication and work is needed so that you the community can set up a network to continue this interaction. The event was an excellent forum for learning about each other and **thanks** to all those of you who attended and brought so much enthusiasm and great ideas to the sessions.

In addition to the opportunities for networking over the two days, the group discussions brought up many interesting topics for further discussion. **This report contains** the flipchart outputs from the small group sessions on the second day (main report), the ideas put forward by all the delegates on the first day (appendix 4) and the delegates list detailing their expertise (appendices 3 and 5).

I was heartened by the huge interest in this event and 135 people applied to attend. We were able to accommodate 52 people and of the 85 who couldn't be present 23 wish to be **included in the next steps of forming the network** (appendix 6).

The provisional title I have given is "Design in the Built Environment" and ambitious though it is, **I would like the network proposal to be representative of the design community, inclusive and broad in it's remit, bringing people together who don't normally have the time, opportunity or reason to work together.**

I expect **only one network proposal** on Design in the Built Environment to be submitted to me at EPSRC for peer review as an outcome of this event and multiple proposals would suggest to me that this initiative to bring the community together has not been successful. Fortunately the themes identified at the event appear to cross traditional discipline boundaries and will give real opportunities for interaction and real benefits.

There is budget available for you to apply for a **full time network manager** in addition to **part time leadership and promotion by the Principal Investigator**. The network can run for up to 3 years on EPSRC funding. **Please submit the final proposal by 30th June 2006.**

EPSRC welcomes project proposal applications on design related projects at any time through the EPSRC Engineering Programme's responsive mode mechanism. Please call me or my colleague Katie Daniel (01793 444441) for more information or to discuss whether your research ideas will fall within the EPSRC remit.

Kind regards,

Dr Fionnuala Costello
Associate Programme Manager, Built Environment
Engineering and Physical Sciences Research Council
Fionnuala.costello@epsrc.ac.uk
Tel: 01793 444134

Theme 1 Bridging the Design Performance Gap to Foster Sustainability

Ideas put forward by the delegates individually answering (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

- Research Theme – zero CO₂ buildings operation and cradle to grave
- Iconic Landscape/Built Environment – human - media - built-environment relationship
- Designing for Uncertainty – (climate, technological, social)
- Network theme: Environmental impact of buildings – All Aspects –
- Themes – Ecological Design Complexity (based on complexity theory)
- Need to understand: sustainable design at all scales – individual building - urban/regional
- Network Activity: Gather evidence on how buildings are used and valued – cross sector, multidiscipline, exploring social, energy, environmental impacts...
- Implementing sustainable construction practices
- Themes: case studies, in depth, and action research, related to buildings/built environment for 2050 and climate change.
- Post occupancy evaluation: Network of social –psychologists, architects, engineers establish standard procedure
- Impact of design on individual well being, and business value
- An International Network of young and experienced researchers, led by UK on learning and designing **Bio/Nature – Inspired Structures (BIS)**
- Climate change poses multi-disciplinary design challenges creating resilient designs should be a focus for a multi-disciplinary network
- Impact of design on people (behaviour and well-being)
- Research Themes: Sustainability in urban areas (noise, pollution...)
- Sustainable design
- Network on understanding and designing ‘self-healing structures and materials in the Built Environment’.
- Observing, measuring and quantifying building and urban performance for improved (better informed) building and urban design.
- Evidence based design
- Providing feedback/learning from the actual performance of low environmental impact buildings in use.
- Sustainable design

Theme 1 Bridging the Design Performance Gap to Foster Sustainability

Outputs detailing the groups' plans as Who, Why, What, Where, When for their selected topic on flip charts answering the question ("What do we the community need to do to overcome the identified barriers for Design in the Built Environment")

Aims of the Network Theme

- Supporting engagement between research and practitioners
- Overcome fragmentation
- Identify projects
- Identify expertise
- Raise profile
- Influence government policy
- Enable relationships
- Create directory of expertise

Network Theme Activity

- Hold 4 to 6 events over the three years
- At different scales of the built environment
- To present case studies illustrating design gaps and propose solutions
- Invite members of the broad design community
- Meeting themes designed in consultation with industry
- Initiate further collaborations and linking to national and international funding opportunities

Feedback from other delegates on these proposals

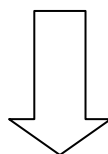
- Need to create a 'safe' environment in which practitioners will be comfortable exposing problems areas to the network
- Excellent plan strong link to evidence –based group
- How can you take lessons learned from case studied forward with new projects?
- Nice overlap with evidence – based interaction aims and objectives

DESIGN GAP flipcharts

Showcase of work

Meetings:

- six monthly
- moves around the country
- "design gap" as an overarching theme
- two sessions am and pm
- framed in a way to be attractive to practitioners
- establish links with practitioners
- two-way communication –designers pulling as well



Spin-outs activities
CPD
Professional training
Etc.

Research themes of interest to industry

NETWORK ACTIVITIES: "DESIGN PERFORMANCE GAP"

- Open directory of who is doing what

- connected to a website?
- Events
 - Presenting case studies?
 - Methodologies
- Check what else has been done (EU etc)
- Meetings – to enable connections (esp build KTPs)
 - Engaging with the design process
 - Levering into other funding areas
- Projects with a practise based direction

How? “meetings” – Design Gap

- Network members to approach their contacts in practices to find presenters/case studied etc
- Breakdown scales at this stage, contacts to develop 3-4 themes
- Overall network to stimulate smaller scale sub-networks
- Collect ‘unresolved’ issues to form “research projects”
- Themes for meetings defined in consultation with industry – gather researchers with relevant work for the meeting – develops commitment – better definition of design intent

AIMS OF THE NETWORK

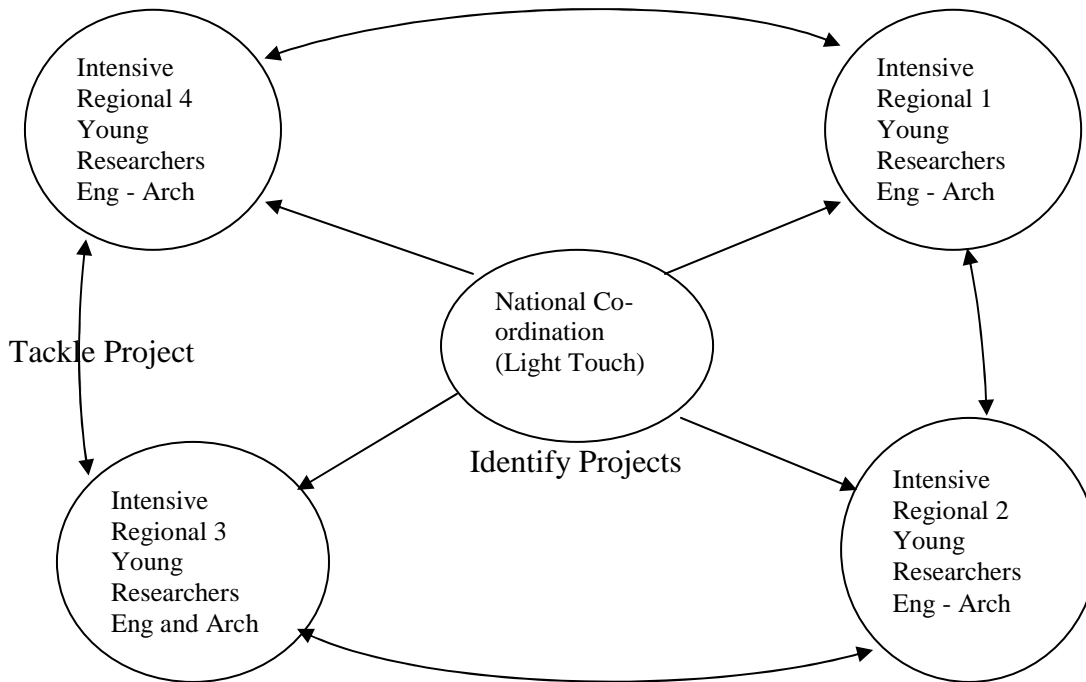
- Support the practitioners
- Over-come fragmentation
- Get agreement on the term “environmental impact”
- Then identify research priorities
- Identify expertise for projects
- Enable relationship forming
- Expand membership of the network
- Influence policy
- Rise profile

Theme 2 INTERACTION AND COMMUNICATION

Ideas put forward by the delegates individually answering (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

- Network to represent all the “fragments” of the industry, preference for young

“Regional “Young” Network” “Task Group Wheel”



- Facilitate opportunities for engineering and architecture students to interact between disciplines and with practitioners
- Collaborations between academia and practice
- Increase awareness of skills/problems/best practice in both academia and industry
- Need to bridge gap between academia and industry
- Develop “motivators” to enable people to work together eg demonstrate value – share financial/research benefits
- Encourage closer links between architectural practices (+Eng) and universities – work through the RIBA R&D group to raise awareness
- Breaking down discipline barriers – encouraging collaboration
- Persuasion or persuasiveness training for less confident academics
- Improve communication between disciplines – themed workshops on big problems which need multi-disciplinary solutions
- Inspire young researchers to explore the fund of collaboration
- Engage and consult designers (not intermediaries)

- Two-way secondments between architects and engineers (swap roles) with the network facilitating and reflecting on the process
- Increase understanding and real communication between stakeholders, Engineers, Architects, QS etc
- Trust building
- Learn how to foster greater trust in project design environments
- Improve communication skills between professionals in the built environment
- Greater understanding of disciplinary boundaries
- Improve communication between industry and academia – transfer of research O/P; transfer of industry problems
- Network partnership between academics and practice
- Facilitate joint research between engineers and architects
- Joint partnerships (commercial) between universities and industry
- Network capacity building – eco-design & design complexity
- Form and sustain academic/industry networks

Theme 2 INTERACTION AND COMMUNICATION

Outputs detailing the groups' plans as Who, Why, What, Where, When for their selected topic on flip charts answering the question ("What do we the community need to do to overcome the identified barriers for Design in the Built Environment")

WHY?

- Focus on project and optimisation teams
- Improve interface between research and practice
- Improve interface between professions
- Improve quality of design research through collaboration (young researchers)
- Collaboration
- Drivers (economic and Env)

Feedback from other delegates on their proposals

- Lot of useful overlap with evidence-based design interaction and design processes
- What's in it for practitioners?

HOW

- Regionally – based (N, S, Mid etc)
- Develop research themes further (examples)
- how to use leading edge design tools (eg VR)
- linking design to total integration performance
- regional total design success
- problem-focussed learning activities (eg housing problems) could be regional-focussed
- Timescale
- (2 – monthly regional)
- (6 – monthly network meeting)
- (12 – monthly total)

Feedback from other delegates on their proposals

- International
- Regional basis and problem focus make this accessible and potentially productive
- What's the driver to contribute?
- Regional focus wrong

WHO

- Practice
- Researchers
- Academic institutions
- Young people (researchers graduates)
- Industry

WHAT (HOW)

- Looking at scenarios for collaboration
- Changing reality of BE
- Researching the problem (scoping the problems)
- Identify good and bad practice
- Synthesising data
- Relevance of education for practice (practice and research)

Theme 3 STAKEHOLDER INVOLVEMENT (Keeping human needs at the centre of design in the Built Environment)

Ideas put forward by the delegates individually answering (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

- Research theme: user/community involvement in design and production of the built environment
- Outreach type work to schools of architecture/engineering to help break down barriers
- Better built environment for **all** – understanding user needs
- Research on and in support of community initiatives on environmental development

Theme 3 STAKEHOLDER INVOLVEMENT (Keeping human needs at the centre of design in the Built Environment)

Outputs detailing the groups’ plans as Who, Why, What, Where, When for their selected topic on flip charts answering the question (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

What?

- How built environment can better meet human needs and improve quality of life

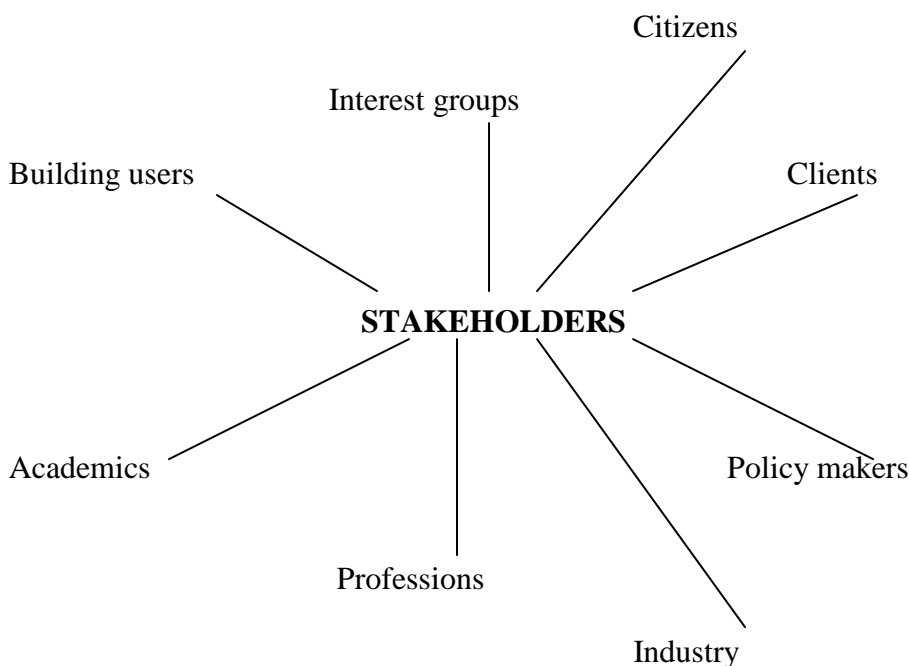
Why?

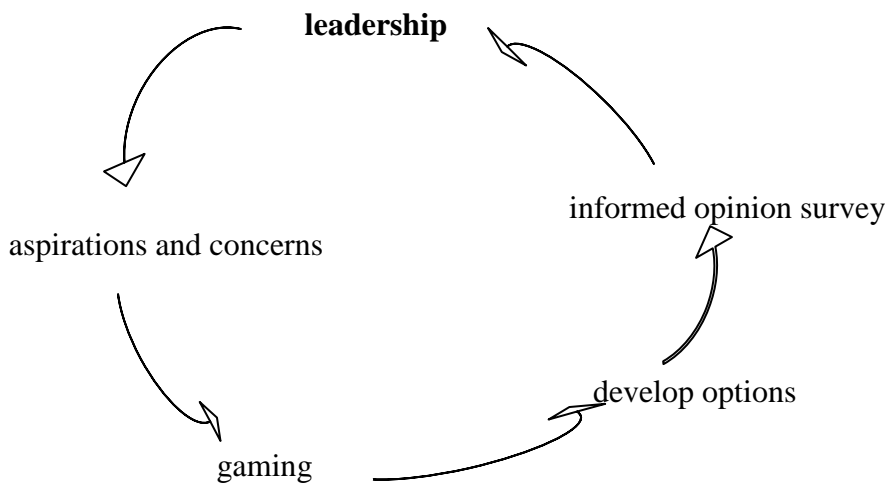
- To promote social equity as part of sustainable development

Feedback from other delegates on these proposals

- Power networks regime (Theory)

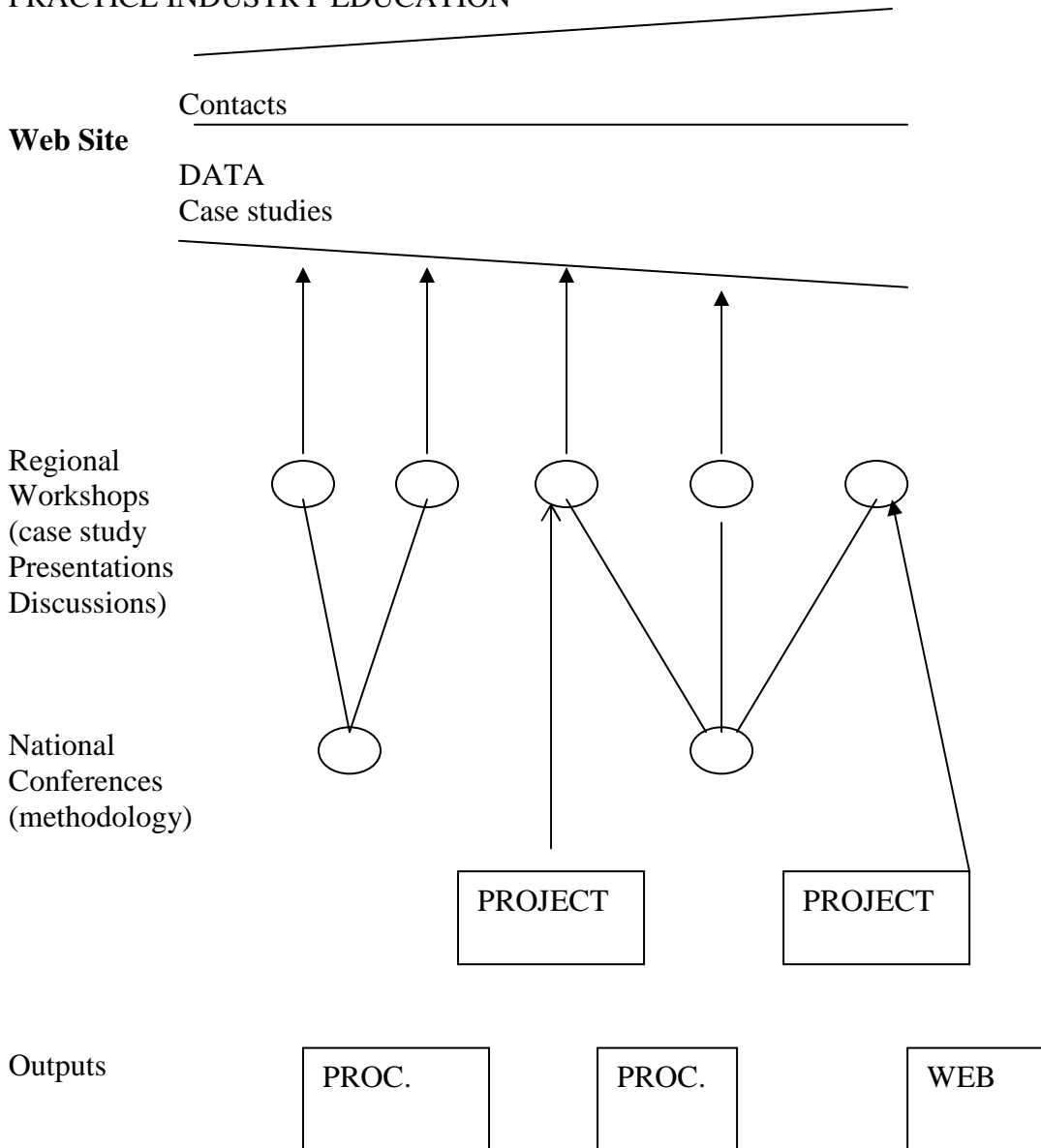
Who?





How?

PRACTICE INDUSTRY EDUCATION



Research community

Feedback from other delegates on these proposals

- How can this be connected to future projects and research?
- What's the deliverable out of the process

Theme 4 DESIGN PRACTISE, HOLISTIC DESIGN

Ideas put forward by the delegates individually answering (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

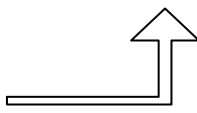
- Research theme holistic design of places
- Help to stimulate greater design team integration
- Producing better designs in less time
- Multi-objective multi-disciplinary decision making
- Activity – investigate barriers to practices doing research
- Make research more focuses ie development of design tools and processes so it belongs more realistic to industry/practice and XXXXXXXX it the professions
- Develop design guidance “good practise”
- More durable adaptable design for 500 years?
- Better understanding of the implications of design decisions
- Identify how BE design experts can establish their contribution to design value drivers

Theme 4 DESIGN PRACTISE, HOLISTIC DESIGN

Outputs detailing the groups’ plans as Who, Why, What, Where, When for their selected topic on flip charts answering the question (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

Design Processes

- Design tools – early analysis
- Benchmarking
- Deliverables at each stage – cross discipline
- Post occupancy - feedback
- Different culture/breaking down barriers (co-location)
- Briefing
- All of the above – **design process**

What 

Who - the network – industry/academics/everybody
- clients
- architects
- engineers
- contractors
- specialist contractors



Review meetings

Focus workshop

- How** - WK1 web base info sharing and contribution
What's there and what's missing
Research priorities – from this
Live project reviews

When – now

Design process definition and dissemination

Feedback from other delegates on these proposals

- Not clear what is gained by redefining the design process!!
- What's in it for practioners? Simple access to leading edge knowledge

Sketch-up

- Improving design process
- Different cultures
- What is design
- How can research help
- Design assumptions
- Implications of design decisions
- Co-location
- Process-design decisions/implications
- Computer design for improved design solus.
- Benchmarking/case studies
- Usable building trust – WWW
- (post occupant data)
- Disseminating information
- What do we expect of each other
- Priorities for research

Feedback from other delegates on these proposals

- Who is organising and setting up the web-based outcome?

Theme 5 EVIDENCE BASED DESIGN INTERACTION

Ideas put forward by the delegates individually answering (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

- Field work
- Do design (and research) together
- Practice/research methodology exchanged events (profession doesn't believe academia can help)
- Engaging industry (much wider than 'construction') in built env research
- Themes: sustainability, integrating IT and assisting technology, people environment, design visualisation
- Theme: Implementation of ideas and acceptance of innovation by researching the enablers and barriers to change and implementation
- Feature Focus Groups:
 - soliciting tours
 - perspective collections
 - create collections of building aspects from either perspective
 - via data libraries
 - find common ground
 - establish feature, focus grounds
- Connect problems with (potential) solutions – the “science Shop” approach
- We need to obtain more field data on various aspects of performance of the built-environment. The network support his by identifying inter-disciplinary sub-groups

Theme 5 EVIDENCE BASED DESIGN INTERACTION

Outputs detailing the groups’ plans as Who, Why, What, Where, When for their selected topic on flip charts answering the question (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

Novel clients

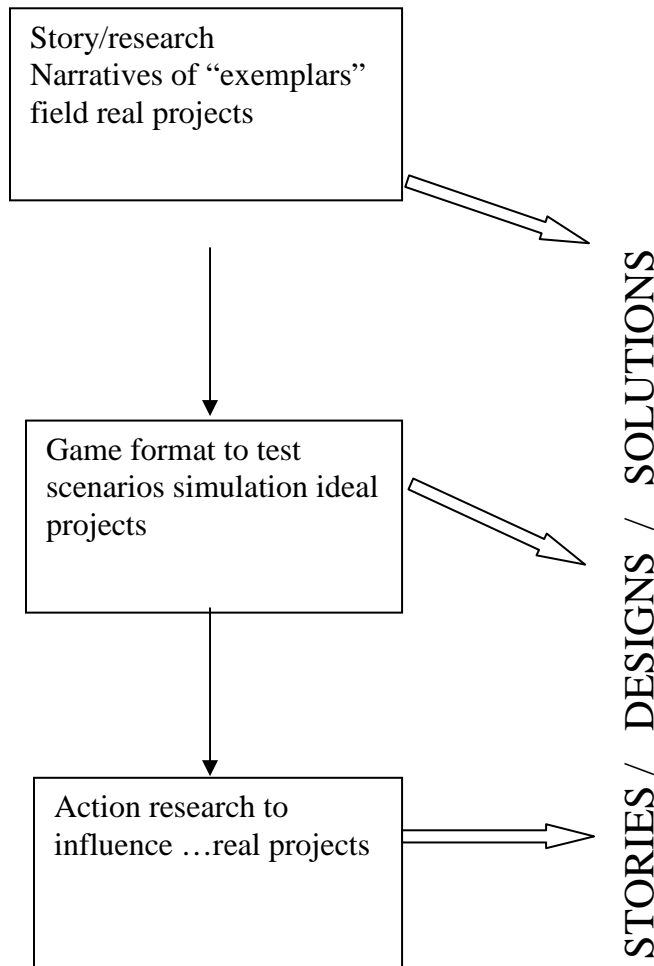
Network
Identifies
‘trauma’
pinch

points

Design team A

A/B

Design team B



Feedback from other delegates on these proposals

- What’s the deliverable?
- What’s in it for practitioners?
- Good idea but is this achievable with typical funding?
- Great idea I want to take part
- Might really deliver something useful out of compiling recent narratives

Theme 6 PROJECT SCOPING – FUTURE CHALLENGES

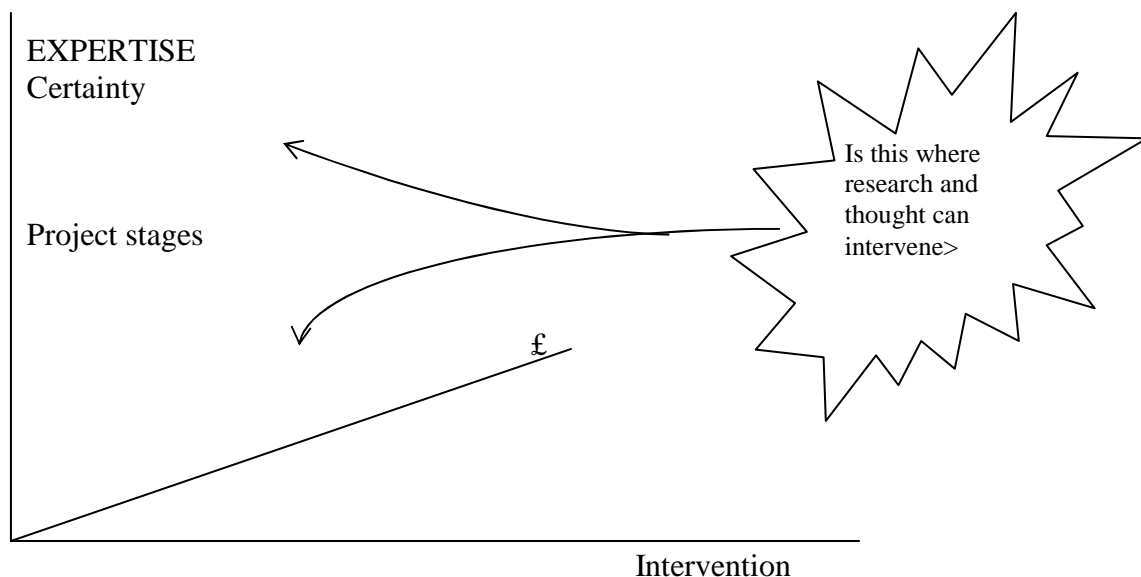
Ideas put forward by the delegates individually answering (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

- Theme: prioritising a small number of key themes
- Host targeted activities to share results and to build trust ie carbon neutral urbanisation
- Industry engagement with field studies over the long term
- Select series of social economic environmental, politics issues for 2020 and development concepts to define practice and research strategies

Theme 6 PROJECT SCOPING – FUTURE CHALLENGES

Outputs detailing the groups' plans as Who, Why, What, Where, When for their selected topic on flip charts answering the question (“What do we the community need to do to overcome the identified barriers for Design in the Built Environment”)

- Theme radical design solutions for themed projects
- Scope the territory “design”....”built Environment....”
- Identification of challenges (future)
- Act as a think tank to brief commercially sponsored design competitions
- Questions of Quality – what do people mean when they talk about “quality” in the build environment?
- Use broad range of experience. To explore the future challenges (21st cent. Cities) and develop research topics
- Problem-focused interest groups and projects
- Future space – How will changes in the ways we work affect the design of buildings, neighbourhoods and towns?
- Research community needs to provide means of expressing project goals that are understandable to all parties and tools for optimising their achievement
- Catalyst for establishing ‘constraints-free’ pilot projects for allowing graduate engineers/architects to explore working together in a safe environment
- Enable emergence of research themes with wide variety of constituents
- Recognise links across many sectors and reinforce them
- To overcome cultural differences the network should promote cross-disciplinary and cross-sector design meetings exploring different themes



Radically rethinking the front end of the design process
Radically rethinking the impact on the product

- against agreed matrix of priorities
- review of previous cycles

So what? Transparent, agile, start-ups

A focus for all, well spring for responsive, themed, rep etc projects
Industry and academic and EPSRC relevance

- 5 events – 36k, 6k events, 30k ideas
- Panel and extras
- Matrix of spread of research
- Expertise awareness data abase
- Matrix of voting
- Nominal maximum 0.5k
- Ideas – squash ladder – voted popularly
- Industry top up possibility
- Intellectual property
- Car auction
- Exclusive infinite licenses to partners
- Dragons den
- Now disclosure agreement
- Matrix of attendees
- Immediate decisions transparent lightness of touch
- Funding details top slicing special arrangements with university or EPSRC

Feedback from other delegates on these proposals

- What is the feedback and feed forward process?
- Fresh idea, perhaps to see how practitioner s can join the ‘dragons’ den
- Opens up opportunities for new research ideas and young researchers
- We know who should write the proposals!
- Very good
- Very interesting great
- Isn’t this simply duplications what funders are supposed to do?
- Great



Design in the Built Environment

An EPSRC facilitated event to identify the scope and membership of a new network to support architects and engineers working together

Warwick conference centre, 19-20th January 2006
Deadline for expressions of interest 15th November 2005

A Call for Participants

Background/Context

£100bn is spent every year on construction in the UK. This represents 10% of GDP and is important for the economy. Added to this, the construction sector employs nearly 2 million people in 350,000 companies, over 90% of which have less than 7 employees. A major strength of the industry is design and the UK is a world leader and major exporter of design expertise. EPSRC would like to be supporting excellence in this area.

There are several interesting areas requiring creativity and innovation in the future of design. These include:

- Realising the revolutionary potential of ambient, interactive and intelligent buildings including embedded sensor and other smart technologies
- The challenge of simultaneously designing for function and use, performance and ease of facilities management, flexibility and adaptability to future uses.
- Process improvements and use of common software and communication technologies between design professionals to clarify processes and agree common objectives.
- Incorporating sustainability into design, including increased use of sustainable materials, reuse/recycling of materials and use of sustainable technologies e.g. to lower energy consumption or generate power.
- Design for Offsite Manufacture

This is a call for Expressions of Interest from anyone interested in attending a facilitated workshop on 19/20th January. The aim of the workshop will be to generate enthusiasm and action amongst the community to form the basis of a network in the area of design. The remit of the workshop will be **designing buildings and places** with relevance to commercial buildings, housing, large capital projects and government as clients.

Introduction

The EPSRC has identified a need for greater interactions between research active architects and engineering researchers in the Built Environment portfolio of research. Consequently EPSRC would welcome more project proposal applications from architects and engineers working together on design research projects.

In order to encourage and facilitate such interactions EPSRC is, as a first step, holding a workshop to bring representatives from the academic and industrial / practitioner communities together to identify research challenges and the expertise needed to address them.

The aim of such a network will be to disseminate knowledge and develop new collaborative research ideas between architects and engineers. Engineers are traditionally well informed on applying to EPSRC for funding and architects in the network should benefit from this experience when formulating research proposals for submission to EPSRC Responsive Mode.

Who should be interested

This is an opportunity to share ideas and meet future collaborators. Academics can expect to learn the issues of critical importance for practitioners and through the network can work up research ideas based on industry needs. Practitioners will have the opportunity to influence the direction of future academic research and to make contact with top UK academic expertise in their field.

Attendees at the event are expected to be a mix of **academics and practitioners, engineers and architects**. It is also expected that representatives from other areas with an interest in the area will wish to contribute e.g. **construction management academics** who provide tools for facilitating communication across teams, **clients, including local and central government, consultants, construction companies, contractors, developers, designers and project managers**.

Applicants do not need to have any prior knowledge of the challenges in this area but must demonstrate enthusiasm for enhancing the combined efforts of architects and engineers when working together on practical projects.

Workshop Event

The workshop is designed to be a fun event, including activities to break the ice and encourage discussion between participants. The discussion will highlight areas of common interest between participants. Together you will generate ways for a network to facilitate better communication between architects and engineers i.e. by identifying research themes, network activities, events etc. and the membership and expertise required to do this successfully.

The workshop will run from lunchtime on Thursday 19th to lunchtime on Friday 20th January. Through the facilitated sessions you will have the opportunity to contribute to the focus of the network and interact with a large number of

participants, learning and sharing ideas. The whole event will be designed to maximise your networking opportunities.

EPSRC envisage only one network proposal being submitted to peer review in response to this call and workshop. This network proposal will ideally involve most organisations and university groups present at the workshop. At the workshop an individual academic should be identified to write the full network proposal for submission to EPSRC peer review after 1st April 2006.

Any research ideas generated during the workshop or secondary spin off network groups are however free to apply to the Engineering Programme's responsive mode at any time.

How to apply

Applications are invited from individuals representing their university group or organisation at this event who wish to be involved in the expected network. Approximately 40 participants will be identified to take part from the Expressions of Interest received by 3rd November. A broad spread of academics/practitioners, architects/engineers/others is needed to ensure the success of this event. This will be taken into account in the selection process and may result in only one representative from each organisation/department/research group.

Applicants should complete the two-sided Expression of Interest Form (see appendix). The deadline for applications is **Tuesday 15th November**. Applications should be submitted electronically to dbecall@epsrc.ac.uk who will inform you of a place at the event by the end of November. Please include "Design in the Built Environment" in the subject field.

Closing date for submission of Expressions of Interest	15 th Nov
Notification of place at event	End Nov
Date of Workshop	19 th +20 th Jan

Appendix 2 Workshop Agenda

DESIGN IN THE BUILT ENVIRONMENT 19/20 JANUARY 2006 SCARMAN HOUSE, UNIVERSITY OF WARWICK

AGENDA

Thursday 19th Jan

11.30-1pm	Registration and buffet lunch
1pm	Start with 2 minute welcome followed by icebreaker – human bingo
1.30-1.45	Short Introduction by EPSRC
1.45 – 3pm	Facilitated speed networking
3-3.30	Tea and Coffee
3.30 – 5.00	Design in the Built Environment breakout groups. Answering the questions “What you have to offer the network” “What do you want to get out of the workshop” “Identification of drivers and barriers to networking for Design in the Built Environment” “How can a network help research in this area”
5.15-7pm	Evening networking activity
8pm dinner	

Friday 20th Jan

9.00-11.40	Developing themes for the Design in the Built Environment network
11-11.20	Tea and coffee
11.20-11.40	Group presentations to plenary
11.40-12.00	Next steps and Q&A session with EPSRC
12 noon	Close.

APPENDIX 3 Listing of Delegates expertise as relating to the network

Francis Aish (Foster and Partners)

- Project driven R & D within a leading international architectural practice
- CAD modelling
- Building simulations
- Advanced user interfaces (VR/AR)
- Design optimisation
- Software development

Andy Atkinson (London South Bank University)

- Finance and costs
- The economic evaluation of design
- Translation – designer → financier

Dr Simon Antony (University of Leeds)

- Computational granular materials
- Particulate mechanics
- Soil-structure interaction
- Measuring of modelling/hybrid methods
- Micro/Nano Technology
- Power Technology
- Industrial Productivity

Dr Lanfranco Aceti (The Slade School of Fine Art)

- Digital media
- VRE
- Spacial Design
- Fine Art
- Regenerations/community

Dr AH Boussabaine (University of Liverpool)

- Eco-design
- Eco-costing
- Design complexity (complexity theory)

David Bownass (WSP Buildings Ltd)

- Design & delivery of engineering in the built environment
- Technical project management
- Developing teams

Dr Ben Croxford (University College London)

- Environmental engineering
- Air pollution
- Energy issues in buildings
- Light and lighting
- Building regulations
- Housing and health

Professor Roger Crouch (University of Durham)

- Computational structural analysis/HPC visualisation
- Membrane Structures

Derek Clements-Croome (University of Reading)

- Intelligent Building Design
- Design and its impact on work performance
- Occupant Behaviour studies
- (work closely with industry)

Dr T Malcolm Crisp (Heriot-Watt University)

Structural Engineering Design

- Development of sustainable structural forms
- Community resourcing of rural building structures

Andrew Compton (University of Manchester)

- Material Science
- Science
- Space
- Fractals
- Psychology
- Picturesque
- Making space from nothing

Roger Courtney (Building Connections)

- International trends in organisation and management of construction roles of practitioners etc
- International technological networking
- Innovation processors

Dr Carlos Calderon (University of Newcastle upon Tyne)

Computing

- Digital representation technologies
 - generative design
- Visual reasoning technologies
 - constraint programming
- Human Computer Interaction
 - Ambience intelligence
 - Ubiquitous computing
- Games Technologies

Paul Chan (Northumbria University)

Expertise:

- Construction management researched into skills and training and education.
- HRM in construction
- Worked with designers and engineers throughout my career
- Contribute:
- Lateral view of disciplines
- Fresh perspective

Professor Rachel Cooper (University of Salford)

- Design policy
- Design process
- Design and construction/production management
- Interdisciplinary research
- Creative thinking

Dr Bill Davies (University of Salford)

Acoustics

- Research track record in room acoustics, especially perceptual aspects.
- Just starting new EPSRC project in soundscapes (many design outputs).
- Member of 3 EPSRC networks (2 in acoustics)

Christian Derix (University of East London)

Computational design in

- Architecture and urban design
- All methods for architectural computing

Phillip Eames (University of Ulster)

- Energy and sustainability in the built environment
- Modelling and experimentation.
- New materials, products, devices.

Dr Andrew Edkins

- Interdisciplinary
- Delivery of PFI/PPP solutions
- Management of design process
- Long-term futures (scenario planning)

Professor Graeme Evans (London Metropolitan University)

- Urban design/planning
- Sustainable design/development
- Mixed/MSE/Density
- Healthcare buildings and elderly housing
- Urban heritage
- Transport

Professor Martin Edge (The Robert Gordon University)

Environments for people centre

- People-environment studies
- Sustainable housing
- Assistive technology in design
- Design visualisation
- Prefabrication-standardisation in architecture

Brian Ford (University of Nottingham)

- Architect with experience in practice on projects located around the world recently joined academia to engage more fully in research.

Professor John Frazer (Gehry Technologies)

- Environmentally and socially motivated design
- Generative and evolutionary design
- Virtual prototyping for performance optimisation
- Design for constructability and offsize fabrication
- Interactive and intelligent buildings
- User environment in design process

Dr Mark Gaterell (University of Birmingham)

- Sustainable construction/environmental design (engineering background)

Professor John Hinks (Glasgow Caledonian University)

- Managing Innovation
- Strategic facilities management
- Industry-academia research and innovation teams.

Dr Keith Jones (University of Greenwich)

- Building maintenance, facilities management, social housing, sustainability.
- Building performance
 - ↳ business perspective
 - ↳ social perspective
- Maintenance management

Facilities solutions

Brian Johnson (Aedas Architects Ltd)

- R&D Director AEDAS Architects (Global Practice)
- Specialism ‘school design’
- Links between education and practice
- Interest ‘knowledge management’ – global
- RIBA PTM Examiner. North West
- RIBA Education and Practice study group

Professor Jian Kang (University of Sheffield)

- Auralisation/acoustic animation
- Acoustic computer modelling
- Sustainable acoustic materials/designs
- Acoustic comfort
- Noise-mapping

Greg Keefe (Manchester Metropolitan University)

- Engineering who works as an architect
- Bio-mimetics
- Living buildings/cities

Professor Geoff Levermore (University of Manchester)

- Modelling built environment for future scenarios.
- Energy and occupant feedback from buildings
- Climate change influences
- “intelligent buildings”

Chris Luebke (ARUP)

- Foresighting
- Global practice
- Global networking
- Connectivity to real practice
- Change

Toby Lewis (Feilden Clegg Bradley Architects LLP)

- Architect in practice with experience of sustainable design for public buildings [galleries/music school/artists studios and housing].

Professor Kevin J Lomas (De Montford University)

- Environmental Design of low-energy (Naturally ventilated) Buildings.
- Thermal Modelling, CFD, daylighting, comfort energy monitoring
- Integration of renewable energy in buildings

Kevin McCartney (University of Portsmouth)

- Design of Bio-climatic arch
- “Intelligent environments”
- ‘Smart’ homes

John Miles (Cardiff University)

- Collaboration and concurrent engineering
- Using computational intelligence to search for good design solutions in complex, highly constrained design search spaces – i.e helping designers find really good solutions

Lamine Mahdjou (UWE, Bristol)

- Better understanding of the implications of design decision-making in –
 - housing design
 - workspace safety
 - vulnerable groups (elderly people, children)
 - healthy places
- Better understanding of existing and emerging tools and technologies on the design process.

Mrs Dragana Mitrovic (University of Leeds)

Construction Management

Academic and Industrial expert in:

- programme and project management
- strategic management
- value management and engineering
- productivity
- health and safety
- ITC in construction

Dr Olga Popovic Larsen (University of Sheffield)

Expertise:

- Interdisciplinary research into design that bridges architecture and structural engineering
- Communication in interdisciplinary teams
- Advanced structural systems and their application in building design

Professor Andrew Price (Loughborough University)

- Construction Project Management
- Design and construction of Healthcare Infrastructures
- Sustainable Design in urban environments (measurement of Social aspects of urban environments)

Dr Stephen Platt (Cambridge Architectural Research)

- Urban design Features
- Sustainable communities
- Informed opinion scenario building and gaming
- Design team composition and management

Colin Rice (Edward Cullinan Architects)

Design Practitioner with particular interests in

- Construction
- Residential
- Urban design
- Performance in use of buildings

Professor Martin Roberts (University of Westminster)

Urban Design

- Night-time economy
- Mixed use streets
- Mixed income communities

Gender and built environment

Dr Rupert Soar (Loughborough University)

- Rapid manufacture
- Freeform construction
- Digital construction
- Construction manufacture
- Termite mounds

Dr Harry Smith (Heriot- Watt University)

Architecture, planning and housing

- Stakeholder involvement in production of built environment with focus on users
- Urban development issues in the rapidly urbanising world.
- Nature of and context for architectural research

Dr DTG Strong (BRE Environment)

- Expertise in integrated building design.
- Access to BRE's breadth/depth of knowledge
- Access to research funding from BRE trust (research and education charity)
- Links to other relevant established networks (Inc international)
- Established network management skills

Professor Alan Short (University of Cambridge)

I design naturally ventilated passively cooled public buildings in a variety of climates. More recently my colleagues and I have been developing hybrid natural/mechanical environmental strategies, our tint draught cooled building just completed with the second going up in Chicago. I am interested in the whole context within which we achieve these buildings, financial, management, content, the architecture.

Chris Tweed (Queens University of Belfast)

- Human interaction with built environment technologies
- Computer aided design
- Environment design

Professor Catharine Ward Thompson (Edinburgh College of Art)

Director, OPEN space research centre

- Open space research – inclusive access to outdoor environments
- Environment behaviour interactions
- Public art evaluation

Dr Katie Williams (Oxford Brookes University)

Areas of Expertise:

- Sustainable urban design
- Sustainable urban form
- Sustainability policies and their impacts
- The sustainable design/behaviour relationship

Elanor Warwick (CABE)

- BE industry and professional contacts
- A dissemination route to the industry
- Design and sustainability focus
- City design and urban design

Dr Jennifer Whyte (Imperial College London)

Design, Visualisation, innovation

- Innovation in processes in design and engineering firms
- Technological change and design
- Visual practices and new tools
- Inter-organisational design and innovation

**Professor Jonathan Wood (Structural Studies & Design Ltd)
FI structure MICE**

- Durability and adaptability of structures and materials
- Analysis of failures of design and construction.

Appendix 4 Answers to the question (“What do You want to get out of the workshop”) attributed.

- Redesigning wind turbines as iconic art looking for industry and academics (Engineers and architects) **Lanfranco Aceti**
- Design knowledge – product places and people – the impact of emerging technologies on our material world
- Getting a feel for what’s happening at the leading edges – **Colin Rice**
- Carbon Neutral urbanisation – **Chris Luebke**
- Achieve a dramatic reduction in the impact of the built environment
- Understand how we deal with climate, energy, social uncertainties and deliver an effective built env.
- Barriers to the sustainable revivification of buildings of the relatively recent past. Transforming the over-familiar into sustainable icons.
- Eco-design indicators
- Mediated spaces designing interaction between community and space/buildings with software and media industry – academics (engineers and architects) – **Lanfranco Aceti**
- New ideas for collaborative working in design teams/constructors – **Colin Rice**
- Identify how we as a sector ensure issues of sustainability are actually implemented on the ground
- Acoustics as part of sustainability – **J Kang Sheffield**
- Blue sky thinking on sustainability and urbanism – **G Keefe**
- Increase awareness of best practice both within industry and academia – **Francis**
- Exploring new technologies (assisting and visualisation) in architecture – **Martin Edge**
- Determining the critical success factors for delivery required design outcomes (as opposed to outputs)
- 203 miles from my un-marked exam scripts. Ideas for tall building design concepts
- Co-author(s) of a breakthrough research paper on analysis of an innovative structural form – **R S Crouch**
- Identify key challenges for the future in designing outdoor environments – Catherine Ward-Thompson
- Inclusive design
- Better design of places to allow for aspects of health, so reduced noise, pollution better lighting reducing crime - **Croxford**
- Routes by which ‘best-practice’ environmentally conscious design might to move widely adopted
- Partners for cross-over research in structural use of glass – **R S Crouch**
- To meet other researchers with an interest in improving quality of the built environment- **Chris Tweed**
- Potential researchers (academic or industry) for CABE commissioned research/collaborations – **Eleanor Warwick - CABE**
- Mates to work on design/analysis of very large scale public sculpture – **R.S. Crouch**
- Widen my own network of academics and professionals with similar areas of interest – Harry Smith
- Performance based design – **Chris Luebke**
- How practice can interact with current and future research projects

- To explore how practice can participate in and apply the results of research – **Brian Ford**
- To enable designers to find better solutions in less time – **John Miles Cardiff U.**
- Doctoral education network supporting community initiatives for economic and environmental development – **Kevin McCartney**
- To enhance computational support for topological/spatial reasoning – **John Miles**
- Networking with those who develop tools for applications in response to real social and environmental problems – **John Frazer**
- How digital technologies will change construction process
- Network and develop links with experts in design for healthcare infrastructures (including hospitals) – **A Price**
- To participate in cross-disciplinary discussion about contemporary issues facing the design of the built environment – **Brian Ford**
- Improved understanding of making multi-discipline teams work – **David Bownass**
- Two-way communications industry – academia
- Learn from the diverse backgrounds present here – **Paul Chan**
- Explore space between architect and engineer – **G Keeffe**
- Proposal for a network of for a bringing together industry, profession and academia, focusing on design of the built environment (ie multidisciplinary) with regular meetings possibly on a regional basis – **Harry Smith**
- An understanding of what's going on in other organisations in terms of R&D
- Better communication in interdisciplinary design teams - **OPL**
- Contacts with the wider design team
- Access of designers to science/engineering expertise in universities
- Developing research ideas in fields that bridge architecture and structural engineering – **OPL**
- Working towards acceptance of the need for DATA and analysis of buildings (physical and social) in architecture – **Martin Edge**
- Participation in design/briefing and evaluation network
- Use of building energy and simulation for real design (rather than 'technical' veneer).
- Portfolio of case-studies of simulation in design
- Design integration:
 - Social
 - Physical
 - Economic
 - Cultural
- Dissemination of application of scientific design advice 'best practice'
- Establish database/funding for post-occupancy performance of buildings
- To study the various levels of technology needed by various business organisations – **DJC**
- Collaborative links with architects and designers
- Gain knowledge and experience of other experts in the design field build collaboration and ideas
- Complexity of design – **HB**
- A network that can help formulate a model of construction project processes and assist the optimisation of project structures and relationships. This could be founded on value metrics – **Roger Courtney**
- To gain different perspectives on research and practice in the build environment – **Chris Tweed**

- Influence policy – the network needs to look at how innovative design practice and research outputs can be used to influence policy-makers – **Bill Davies Salford**
- Be part of something that engenders real change/cultural shift in the way designers and engineers work together – **Paul Chan**
- Wider perspective of complete design process to aid interdisciplinary research – **G H**
- Urban futures – economic/social/design issues – **Steve Platt**
- Design Futures
- Improve build environment – by improving design and delivery process, through better understanding of its organisation
- Visualisation integrated with auralisation – **J Kang Sheffield**
- The build environment should sound better. I'd like to see questions of acoustics addressed earlier in the design process, and with a more positive focus. (“How do we make it sound beautiful”, not “How do we reduce the noise”) – **Bill David – Salford**
- Impacts of noise from street (traffic/people) (night/day) – **Marion Roberts**
- Integrated acoustic comfort in built environment design – our built environment is to silent.... – **J Kang Sheffield**
- Design ecological impact – **HB**
- Effective development of total building models that can be applied in practice
- Research ideas, trends to help produce satisfactory, productive build environment – **G H**
- How good design benefits users? – **Elanor Warwick – CABE**
- Research priorities in design management
- Informed opinion ways of involving people in strategic design decisions – **Steve Platt**
- Implications or wide scale implementation of building models for project procurements :
 - Design process
 - Roles of team members
 - Disaggregated construction industry
 - Improvement of design and construction process **John Frazer**
- How to optimise the various expertise present on client/supply side for long-term BE design success
- Identify colleagues who share an interest in researching particular design problems from a multidisciplinary perspective – **Catherine Ward-Thompson**
- Opportunity to work with a group of adventurous people to address an inter/multi-disciplinary research programme in build-environment
- Bringing together research cultures in design, engineering and social science – **Martin Edge**
- A higher order understanding of the dynamics of successful design exercise, the experiences of whole teams delivery innovative buildings. – **Ali Short**
- Improving the design process to allow not just creative architectural input. But creative input from other disciplines. - **Croxford**
- Network to produce new ideas and Links. Expand current and new links
- To initiate a research groups (interdisciplinary) to study impact of design on people at work (well being, work performance) – **DJC**
- Facilities management feedback on design in –use – and vice versa – **John Hines**
- Designing for a much longer future buildings to last 300 years
 - flexibility
 - maintenance

climate change **Croxford**

- Contact with researchers into post-occupancy/in-use studies across all sectors – **Elanor Warwick – CABE**
 - To discover more about complex, multi-criteria, multi-disciplinary design problems – **John Miles Cardiff U.**
 - Better links between maintenance and FM professionals and the design team
 - - should they be part of it?
 - - how can dialogue opportunity take place? **K Jones**
 - To get broad perspective on which issues require attention from design community: ie prioritising of key/urgent research and network issues **Katie Williams**
 - Ideas on: urban space computation – between planning and architecture
 - Rejecting fashion and fad the bogus ‘innovations’
 - The criteria for innovations should be /better than before/ not just something ‘wacky’ – **J G R Wood**
 - Understanding EPSRC and how it can help – **David Bownass**
 - Sustainable buildings multi-disciplinary group – **Kevin McCartney**
 - What’s the value of good design?
 - (Can we value it? How? Why?) - **Elanor Warwick – CABE**
 - Evidence base for buildings in use - **John Hines**
 - Practice and Academia
 - **Secondments** – in industry for scientists
 - **Problem – solving**
 - Academia curricula **Carlos Calderan**
 - Built environment professionals interested in developing an approach to Design that would promote and encourage community involvement in procurement, resourcing, and construction
 - Information theory and architecture – **A Crompton**
 - Space, computing, HCI (shaping now spaces through – computing – technologies) – **Carlos Calderon**
 - World leading design capability
 - By bringing together different stakeholders
 - Living in the City – odd-places – **A Crompton**
 - ‘Shared Space’ concept for street Design/Management – applicability? **Marion Roberts**
 - Buildings and public/open space
 - Quality - how do we ‘measure’ quality for ‘whom’
 - Link between –
 - Architectural algorithms
 - ↕
 - Engineering algorithms
 - Concept and performance
- Design “Quality” [post-DQIs]
 - Making durability and adaptability replace recycling and share life as design objective – **Jonathan G M Wood**
 - To learn who is doing world class work in this area (design)
 - Develop networks with experts in visualisation of buildings and urban environments – **A Price**

- Understand disciplinary boundaries - Why do they exist?
- Would clients get better solutions if they didn't – or if they were different? - **K Jones**
- 1. Computer visualisation and design decision-making
- 2. Health and safety by design
- 3. Health promotion by design
- - **Lanine Malidjoui UWE, Bristol**
- Studies on Bio-inspired structural design/mechanics – **S J Antony**
- How to live with the car – **A Crompton**

APPENDIX 5 Delegates List

ATTENDEE	INSITUATION	EMAIL
Dr Lanfranco Aceti	The Slade School of Fine Art	lanfranco@communart.com
Francis Aish	Foster & Partners	faish@fosterandpartners.com
Dr Simon Antony	University of Leeds	s.j.antony@leeds.ac.uk
Andy Atkinson	London South Bank University	atkinsar@lsbu.ac.uk
Dr AH Boussabaine	University of Liverpool	halim@liv.ac.uk
David Bownass	WSP Buildings Ltd University of Newcastle upon Tyne	david.bownass@wspgroup.com carlos.calderon@newcastle.ac.uk
Dr Carlos Calderon	Northumbria University	paul.chan@unn.ac.uk
Paul Chan	Heriot-Watt University	t.m.chrisp@hw.ac.uk
Dr T Malcom Chrisp	The University of Reading	d.j.clements-croome@reading.ac.uk
Derek Clemets-Croome	University of Salford	r.cooper@salford.ac.uk
Professor Rachel Cooper	Building Connections	roger.courtney@ntlworld.com
Roger Courtney	University of Manchester	a.crompton@man.ac.uk
Andrew Crompton	University of Durham	r.s.crouch@durham.ac.uk
Professor Roger Crouch	University College London	b.croxford@ucl.ac.uk
Dr Ben Croxford	University of Salford	w.davies@salford.ac.uk
Dr Bill Davies	University of East Anglia	c.derix@uel.ac.uk
Christian Derix	University of Ulster	pc.eames@ulster.ac.uk
Phillip Eames	The Robert Gordon University	m.edge@rgu.ac.uk
Professor Martin Edge	University College London	andrew.edkins@ucl.ac.uk
Dr Andrew Edkins	London Metropolitan University	g.evans@londonmet.ac.uk
Professor Graeme Evans	University of Nottingham	brian.ford@nottingham.ac.uk
Brian Ford	Gehry Technologies	john.frazer@gehrytechnologies.com
Professor John Fraser	University of Birmingham	m.gaterell@bham.ac.uk
Dr Mark Gaterell	Glasgow Caledonian University	John.hinks@rbs.co.uk
Professor John Hinks	Aedas Architects Ltd	brian.johnson@aedas.com
Brian Johnson	University of Greenwich	k.g.jones@gre.ac.uk
Dr Keith Jones	University of Sheffield Manchester Metropolitan University	j.kang@sheffield.ac.uk g.keeffe@mmu.ac.uk
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Professor Geoff Levermore	De Montfort University	klomas@dmu.ac.uk
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Professor Lamine Mahdjoubi	University of Portsmouth	kevin.mccartney@port.ac.uk
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Colin Rice	University of Cambridge	cas64@cam.ac.uk
Professor Marion Roberts	Heriot-Watt University	h.c.smith@sbe.hw.ac.uk
Professor Alan Short	Loughborough University	r.c.soar@lboro.ac.uk
Dr Harry Smith	BRE Environment	stongd@bre.co.uk
Dr Rupert Soar		
Dr DTG Strong		

Chris Tweed	Queens University of Belfast	c.tweed@qub.ac.uk
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Elanor Warwick	CABE	ewarwick@cabe.org.uk
Dr Jennifer Whyte	Imperial College London	j.k.whyte@imperial.ac.uk
Dr Katie Williams	Oxford Brookes University	kwilliams@brookes.ac.uk
Professor Jonathan Wood	Structural Studies & Design Ltd	jonathan@ss-design.demon.co.uk

APPENDIX 6 Names and Institutions of those wishing to be involved in the development of the network following the event who did not attend:

Simon Austin	Loughborough University	s.a.austin@lboro.ac.uk
Dr Samer Bagaeeen	University of Strathclyde	samer.bagaeeen@strath.ac.uk
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